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# Industrial Control

## 2017 Product Catalog

[usa.siemens.com/controls](http://usa.siemens.com/controls)



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## Things you should know about the 2017 Industrial Catalog

This Catalog contains all selection and order-relevant data.

More information can be found on the on-line version of this catalog at [usa.siemens.com/iccatalog](http://usa.siemens.com/iccatalog)

### Navigation

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Siemens Industry, Inc. Industrial Control Product Catalog 2017

### Delivery time (DT)

- ▶ Preferred type
- A 9 to 10 working days
- B 11 to 13 working days
- C 14 to 23 working days
- D 24 to 38 working days
- X On request

Normal quantities of the products are usually delivered within the specified time following receipt of an order.

In exceptional cases, the actual delivery time may differ from that specified.

The delivery times specified here represent the state as of 5/2017. For up-to-the-minute information, please visit our Industry Mall website at [www.usa.siemens.com/industrymall](http://www.usa.siemens.com/industrymall)

Note: Delivery Time (DT) does not appear on all selection pages due to space constraints or coil voltage variations.

### Price units (PU)

The price unit defines the number of units, sets or lengths to which the price and weight apply.

### Packaging sizes (PS)

The packaging size defines the number of units, sets or length, for outer packaging. Only the quantity defined by the packaging size or a multiple thereof can be ordered.

## Symbols

On many selection pages in this catalog, you will find these symbols to aid in the quick identification of critical product features.

#### Connections

Combicon connection	
Insulation piercing method	
Fast Connect	
Spring-type terminals	
Flat connectors	
Solder pin connections	
Ring terminal lug connections	
Screw terminals	

#### Types of coordination

Type of coordination "1"	
Type of coordination "2"	

#### Distinguishing between units

Complete units	
Modular system	

#### Support function

Configurator available in the Industry Mall	
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## IEC Motor Starter Protectors

## Section 1

SIRIUS 3RV Motor Starter Protectors (MSPs) are built for a wide range of applications and meet the requirements of control users worldwide. Each MSP features a manual ON/OFF switch, a Class 10 adjustable bimetallic overload relay (Class 20 available in the two largest frame sizes), and magnetic trip elements for short circuit protection.

**3RV20** MSPs can be used in a variety of applications:

- \* Manual Motor Starter
- \* Manual Self-Protected Combination Motor Controller, Type E
- \* Combination Motor Controller Type F when combined with a 3RT contactor
- \* IEC Circuit Breaker for export applications

**3RV27** are UL listed as a Circuit Breaker for branch circuit protection of both motor and non-motor loads

**3RV28** is UL listed as a Circuit Breaker for transformer protection

**3RV29** is an infeed system for quick installation of MSP and contactor assemblies



## IEC Contactors

## Section 2

High contact reliability, a narrow design, long life time, and the ability to operate under extreme conditions (up to 60° C), ensure that SIRIUS 3RT Contactors are suited for almost any application. A large array of easily installed, standard accessories may be used to customize the contactors for different applications.

**3RT\*0** – 3 Pole Standard

**3RT12** – 3 Pole Vacuum

**3RT\*3** – 4 Pole with 4 normally open poles for switching Resistive loads (AC-1)

**3RT\*4** – 3 Pole for switching Resistive loads (AC-1)

**3RT\*5** – 4 Pole with 2 normally open & 2 normally closed poles

**3RT\*6** – 3 Pole for switching capacitors

**3RA\*9** – Contactor Accessories

**3RA\*3** – Reversing contactor assemblies

**3TB5** – 3 Pole with true DC coils

**3TC** – 2 Pole for switching DC loads

**3TF6** – 3 Pole Vacuum, 630 & 700A



## IEC Overload Relays

## Section 3

Complete motor protection can be achieved through the SIRIUS family of overload relays (OLR's).

**3RU21** – Thermal OLR's, up to 100 A, are ambient compensated bimetallic in Trip Class 10

**3RB30** – Solid State OLR's, up to 630 A, with an internal power supply and 4:1 FLA adjustment range in Trip Class 10 or 20

**3RB31** – Features of the 3RB20 / 30 plus adjustable Trip Class 5 to 30, ground fault detection, and remote reset

**3RB22 / 23** – Features of the 3RB21 / 31 plus status LED's and external power supply

**3RB24** – Features of the 3RB23 plus communication via IO-Link

**3UF7** – SIMOCODE pro intelligent motor protection is more than just a programmable overload relay. By linking the motor and automated control circuits, SIMOCODE allows for predictive and conditional maintenance on critical systems.





**Section 4**

**IEC Combination Starters**



The SIRIUS 3RA1/2 Combination Starters consist of a pre-wired and mechanically connected 3RV MSP and 3RT contactor, allowing for quick installation of a complete branch circuit. The Non-Reversing or Reversing assemblies come on a Fast Bus mounting shoe or as a Panel Mount version.

The SIRIUS 3RA6 Compact Starters provide the functionality of an MSP, Contactor and Electronic Overload Relay in one easy to install housing, saving wiring and installation time. Available in both non-reversing and reversing starters that can be mounted on a Fast Bus shoe. The SIRIUS 3RA6 Infeed system further saves line side wiring in multiple motor panels.

- 3RA21** – Non-Reversing Combination Starters
- 3RA22** – Reversing Combination Starters
- 3RA6** – Compact Non-Reversing & Reversing Combination Starters

**Section 5**

**Fast Bus Power Distribution System**



The UL508A Fast Bus Multi-Motor Control System is a 3 phase insulated busbar system used to reduce wire connections and hole drilling when building control panels. Quickly mount Sirius 3RA combination starters and/or Siemens circuit breaker assemblies.

The Siemens Fast Bus system uses standard off-the-shelf components, with both domestic and international approvals, to allow for economical installation, compact panel designs, touch safe equipment, that allow for easy expansion and maintenance.

- FB** – Installation kits for quick ordering & installation
- FBCB** – Circuit breakers pre-assembled on Fast Bus adapter shoes
- 3RA** – Combination starters for Fast Bus mounting (see section 4)
- 8US** – Fast Bus components for Field assembly

**Section 6**

**Hybrid Motor Starters**



SIRIUS 3RM1 motor starters are compact devices with a width of 22.5 mm, combining a large number of functions in a single unit. They consist of combinations of relay contacts, power semiconductors (hybrid technology), and a solid state overload relay for operational switching of three phase motors up to 3 HP @ 480 V.

Hybrid technology provides reduced size, lower heat losses and longer service life in motor starter applications. Even the reversing units are only 22.5mm wide.

- 3RM10** – Non-reversing starters
- 3RM11** – Non-reversing starters with safety related shutdown
- 3RM20** – Reversing starters
- 3RM21** – Reversing starters with safety related shutdown



## Solid State Soft Starters

## Section 7

SIRIUS Solid State Soft Starters are designed to ramp up your efficiency at every turn. Easy to specify, integrate, operate, and maintain, our controls fulfill your need for more thoughtful system-wide solutions. With innovations, such as 2 phase control up to 300HP@ 480V to a high end Profibus DP capable soft starter, Siemens is your trusted source for soft start control.

**3RW30** – Soft Starters in compact frame sizes up to 75HP for standard applications

**3RW40** – A compact Soft Starter from 7.5 to 300HP, with built-in bypass contacts, overload protection and device self protection

**3RW44** – A high feature Soft Starter offering, from 15HP to 900HP, with built-in bypass contacts, overload protection, torque control functionality, multiple parameter settings, braking and slow speed capability, programmable inputs and outputs, and kick start and multiple starting and stopping modes

**Class 73** – Non-Combination Enclosed Soft Starters

**Class 74** – Combination Enclosed Soft Starters with circuit breaker or fusible disconnect



## Solid State Switching Devices

## Section 8

Designed for high operating switching frequency the Sirius Solid State Relays and Contactors feature a long lifespan of rugged reliability in adverse conditions, quiet operation, compact size, and snap on function modules for convenient flexible use.

**3RF20** – 1-Phase Relays in a 45mm wide “hockey-puck” design

**3RF21** – 1-Phase Relays in a 22.5mm narrow width design

**3RF22** – 3-Phase Relays in a 45mm wide design

**3RF23** – 1-Phase Contactors, a 22.5mm wide relay mounted to a heat sink

**3RF24** – 3-Phase Contactors, a 45mm wide relay mounted to a heat sink

**3RF29** – Function Modules, such as, converters, load monitors and power controllers

**3RF34** – 3-Phase non-reversing and reversing Contactors for switching



## General Purpose Control

## Section 9

Siemens NEMA controls are built rugged to withstand the most severe and demanding industrial and continuous duty commercial applications. Siemens offers the most complete and diverse product line in the world of NEMA. This includes standard full NEMA sizes and motor matched half sizes exclusive to Siemens. All are available as open or enclosed devices with a wide selection of accessories and spare parts.

Manual Starters & Switches

Non-Reversing & Reversing Starters & Contactors

Multi-Speed Starters

Reduced Voltage Starters – Autotransformer and Wye-Delta

Combination Starters

Pump Controllers

Overload Relays – Solid State & Bimetallic with Replaceable Heaters

Current Sensitive Relays

Lighting & Heating Contactors

Control Power Transformers



Section 10

Pilot Devices



Siemens offers an extensive array of Pilot Devices and Signal Columns for a wide variety of applications.

- 3SB2** – 16mm SIRIUS Pilot Devices for applications where panel space is a premium
- 3SU1** – 22mm SIRIUS ACT Pilot Devices offer maximum flexibility, industry best time install savings and environmental ratings in round-metal and round-plastic versions
- Class 50** – Standard Duty Control Stations
- Class 52** – 30mm is the classic pushbutton design for the NEMA markets offering both standard die cast metal and the ultra rugged BLACK MAX for corrosion resistant applications
- Class 51** – 30mm in NEMA 7 & 9 for hazardous locations
- 8WD** – Signal Columns offer twist and connect technology in both 50mm and 70mm diameter styles. Single element signal beacons add additional options for OEMs and panel builders

Section 11

Function Relays

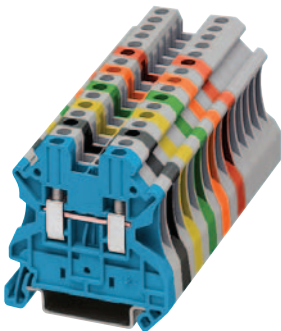


The SIRIUS family of compact, DIN rail mountable function relays offers complete solutions for monitoring, switching, interfacing and timing applications.

- 3RN** – Thermistor Motor Protection
- 3RP / 7PV** – Solid State Timing with single or multiple timing functions
- 3RS10 / 20** – Temperature Monitoring in solid, liquid and gaseous media
- 3RQ** – Coupling Relays and Interfaces
- 3RS18** – Relay Interfaces
- 3RS70** – Interface Converters
- 3TG10** – Compact Power Relays/Contactors
- 3TX71** – Plug-in Relays & Timers
- 3UG4** – Line Monitoring of voltage and insulation or load monitoring of Current & Cos Phi, Level Monitoring of conductive liquids, and under speed monitoring

Section 12

Terminal Blocks



For the wiring of machines and control systems, Siemens Terminal Blocks meet or exceed the requirements of CSA, IEC, NEMA, UL, VDE and other international standards. Meeting these requirements, combined with worldwide acceptability and availability, enables Siemens Terminal Blocks to be used domestically, as well as, in equipment which will be exported.

- 8WA1 / 8WH1** – Terminals with Screw Connection
- 8WH2** – Terminals with Spring-Loaded Connection
- 8WH3** – Terminals with Insulation Displacement Connection
- 8WH5** – Terminals with Combination Plug-in Connection
- 8WH6** – Terminals with iPo Plug-in and Installation Connections

Section 12 contains the 'Table of Contents' of the Terminal Block Supplemental Catalog, Order No. PDCA-TERMB-1013; Labeling Plates for Ink Plotter System; and, Special Label Instructions for 8WA terminal block labeling plate inscriptions.

## Safety Systems

## Section 13

Siemens Switches and Machine Safety devices provide the means for protecting workers and equipment where hazardous conditions exist. Compliance with NEMA, OSHA and international standards (IEC) are a critical requirement for machine OEMs and end users. Siemens has provided safety relay and contactor products to the international community for almost 50 years.

- 3SB38** – Two-Hand Control Stations
- 3RK3** – Modular Safety System (MSS)
- 3SE03** – North American (NEMA) Limit Switches
- 3SE5** – International (IEC) Limit Switches
- 3SE5 / 3SE2** – Interlock Switches & Hinge Switches
- 3SE6** – RFID Non-Contact Safety Switches & Magnetic Monitoring Systems
- 3SE7** – Cable-Operated Switches
- 3SK** – Modular Safety Relays
- 3TK28** – Safety Relays with special functions.



## AS-Interface & IO-Link Systems

## Section 14

**Actuator-Sensor Interface** is the simple and effective networking system for the field level. It is extremely rugged even under the toughest of conditions. With compatible safety components, AS-Interface offers safety applications according to Safety Category 4. AS-Interface is easily linked to higher-level networks for a complete automation solution — simple, safe and fast in the field.

**IO-Link** is an open communication standard based on point-to-point connection between a Master and up to 4 devices. For an OEM wiring multiple motor starters, IO-Link technology can greatly reduce control cabinet wiring for motor starters while increasing diagnostics. For End Users, IO-Link provides a cost effective way in to monitor common analog values such as motor current, power consumption, temperature and voltage without adding an additional network.



## Programmable Relays & Power Supplies

## Section 15

The LOGO! Programmable Relay is a compact, easy to use and low cost solution for simple control tasks. Functions can be changed at the touch of a button through the integrated operator panel or remote display.

SITOP offers a broad offering of compact single- and 3-phase switched mode power supplies and 24VDC power security components, which provide reliable solutions for the most common power interruptions, helping to minimize downtimes and increase the efficiency of production.

SCALENCE Managed and Unmanaged Industrial Ethernet Switches with up to eight RJ45 ports.

- 6ED1** – LOGO! Programmable Relays
- 6EP1** – SITOP Power Supplies and Power Security Components
- 6GK5** – SCALENCE Industrial Ethernet Switches





**Section 16**

**Control Circuit Protection**



Siemens UL 489 miniature circuit breakers and accessories are designed to provide branch circuit and feeder protection.

Siemens UL 1077 Supplementary Protectors are designed to provide additional protection where branch circuit protection is already provided or, not required at all. Since Siemens Supplementary protectors are made to trip faster than other components, they are able to provide additional protection for more sensitive devices inside a panel.

- 5SJ4** – Miniature Circuit Breakers up to 480Y / 277 VAC, 63A
- 5SY** – High feature Supplementary Protectors from 0.3 to 63A
- 5SP** – High amperage Supplementary Protectors from 80 to 125A
- 3NW7** – Cylindrical Fuse Holders meeting UL 512 and IEC 60269-1, -2, -3
- 3NC1** – Open type Cylindrical Fuse Holders meeting UL 512

**Section 17**

**Circuit Breakers**



Siemens offers a full line of interchangeable and non-interchangeable thermal-magnetic trip circuit breakers with a wide variety of interrupting ratings from 10KAIC to 200KAIC. These circuit breakers are available with multi-functional internal accessories, which are field installable on most breakers, and a full line of external accessories. Electronic trip circuit breakers are available for 150A through 1600A breakers.

- Molded Case Circuit Breakers
- BQ and QJ** – 240VAC Breakers
  - CQD** – 480VAC Breakers
  - GG, Sentron, and VL** – 600VAC Breakers

- Insulated Case and Power Circuit Breakers
- WL frame** – 600VAC

**Section 18**

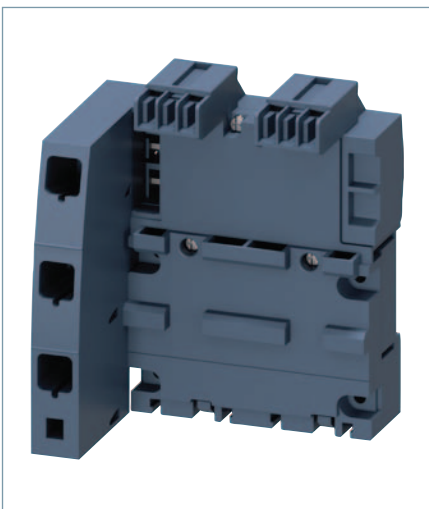
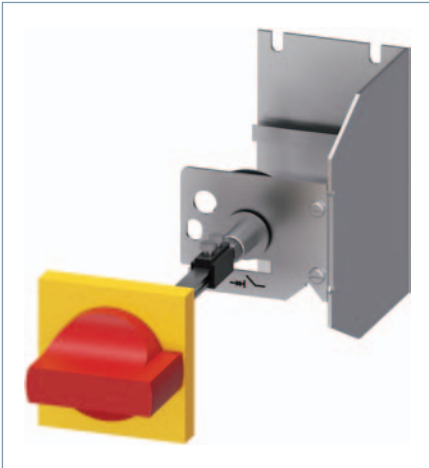
**Switches**



Siemens offers a complete line of both enclosed and open style switches to meet a wide range of applications.

- HF & HNF** – Heavy Duty Safety Switches with Side Mounted Operating Handle
- 3LD2** – Rotary Switches in Non-metallic Enclosures
- VBF & VBNF** – Open Switches with Flange Mounted Operating Handle
- MCS** – Open Switches with Flange or Rotary Operating Handle
- CFS** – Open Compact Fusible Switches with Rotary Operating Handle

# Motor Starter Protectors



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### SIRIUS 3RV motor starter protectors up to 100 A



Size S00, S0



**For motor protection  
CLASS 10**

**Selection and ordering data**

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S0	up to 40 A	1/4
S2	up to 65 A	1/5
S3	up to 100 A	1/5



**For motor protection  
CLASS 20**

**Selection and ordering data**

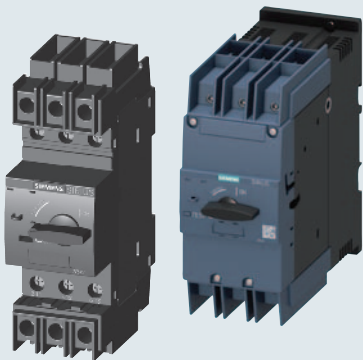
Size	Rated Current	Page
S2	up to 65 A	1/5
S3	up to 100 A	1/5



**General data for SIRIUS  
motor starter protectors**

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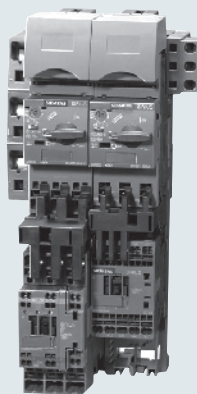
### Circuit Breakers 3RV27, 3RV28



**Selection and ordering data**

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Selection and ordering data	1/6
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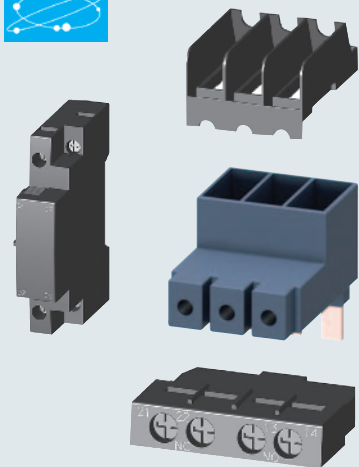
### SIRIUS 3RV29 infeed system



**Selection and ordering data**

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### 3RV MSP auxiliaries and accessories



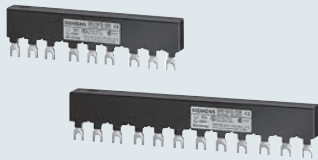
**Selection and ordering data**

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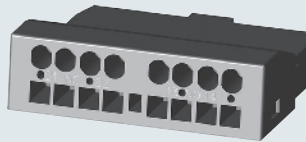
**contents**

**3RV busbar and accessories**



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**Accessories for motor starter protectors with Spring-Type terminals**



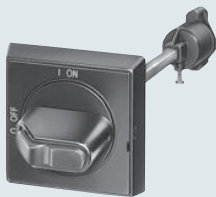
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**Mounting Accessories**



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**Rotary operating mechanisms**

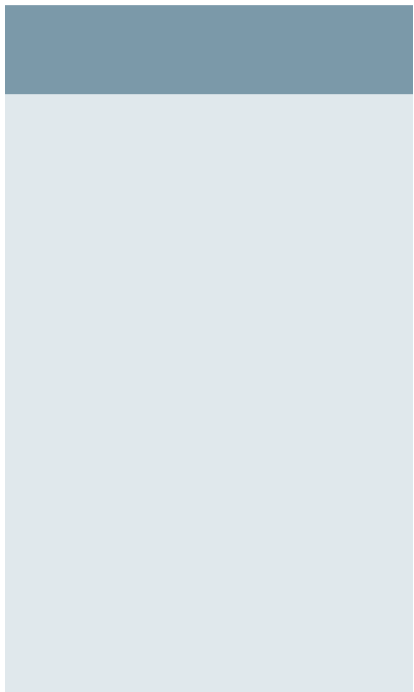


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**Enclosures and front plates**



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# For Motor Protection

3RV20 Class 10 – up to 40A

MOTOR STARTER PROTECTORS 1

Description	Ordering Information
<p>The 3RV20x MSPs are UL approved as Self Protected Combination Motor Controllers which are also called Type E. In this application, all the required functions for a motor branch are provided in one device: disconnect, short circuit protection, motor control and overload protection. A type E terminal adaptor is required. The 3RV20x MSPs are also approved for use as follows:</p> <ul style="list-style-type: none"> <li>– Manual Motor Controller: Motor starter, motor disconnect, control and overload—protection.</li> <li>– Group Installation: Motor starter only, motor disconnect, control and overload protection.</li> <li>– Tap conductor Protection in Group Installation acc. NEC: Motor starter only; motor disconnect, control and overload protection.</li> </ul> <p>When the 3RV20x is used with one of the 3 above mentioned approvals, the 3RV20x can be installed downstream of one circuit breaker or fuse set.</p> <p>For more detailed application information and rules how to apply, size and rate the 3RV20x in control panels in general, in group installations or in accordance to international IEC standards visit our website: <a href="http://www.usa.siemens.com/controlpaneldesign">www.usa.siemens.com/controlpaneldesign</a></p>	<ul style="list-style-type: none"> <li>▶ ON/OFF rotary handle with lockout and visible trip indication.</li> <li>▶ Adjustment dial for setting to motor FLA.</li> <li>▶ Class 10 overload trip characteristics.</li> <li>▶ Short circuit trip at 13 times the maximum setting of the FLA adjustment dial.</li> <li>▶ Short circuit current rating:</li> <li>▶ Ambient compensated up to 140° F (applies to side by side mounting).</li> <li>▶ Phase loss sensitivity.</li> <li>▶ Test trip function.</li> <li>▶ Terminal versions: screw, spring, ring lug.</li> <li>▶ Auxiliaries and Accessories see pages 1/7–1/17.</li> <li>▶ General Information see pages 1/29–1/32.</li> <li>▶ Technical Data see pages 1/18–1/28.</li> <li>▶ Dimensions see page 1/33.</li> </ul>

Note: Select MSP by motor Full Load Amperes. Horsepower ratings are for reference only.

Illustration	FLA Adjustment Range [A]	Single-Phase HP Ratings		Three-Phase HP Ratings <sup>1)</sup>				Instantaneous short circuit release [A]	UL short-circuit breaking capacity @ 480V [kA]	Size S00 <sup>2) 4)</sup>	
		115V	230V	200V	230V	460V	575V			Order Number	Order Number
	0.11-0.16	—	—	—	—	—	—	2.1	65	3RV2011-0AA●●	—
	0.14-0.2	—	—	—	—	—	—	2.6	65	3RV2011-0BA●●	—
	0.18-0.25	—	—	—	—	—	—	3.3	65	3RV2011-0CA●●	—
	0.22-0.32	—	—	—	—	—	—	4.2	65	3RV2011-0DA●●	—
	0.28-0.4	—	—	—	—	—	—	5.2	65	3RV2011-0EA●●	—
	0.35-0.5	—	—	—	—	—	—	6.5	65	3RV2011-0FA●●	—
	0.45-0.63	—	—	—	—	—	—	8.2	65	3RV2011-0GA●●	3RV2021-0GA●●
	0.55-0.8	—	—	—	—	—	—	10	65	3RV2011-0HA●●	3RV2021-0HA●●
	0.7-1	—	—	—	—	—	1/2	13	65	3RV2011-0JA●●	3RV2021-0JA●●
	0.9-1.25	—	—	—	—	1/2	1/2	16	65	3RV2011-0KA●●	3RV2021-0KA●●
	1.1-1.6	—	1/10	—	—	3/4	3/4	21	65	3RV2011-1AA●●	3RV2021-1AA●●
	1.4-2	—	1/8	—	—	3/4	1	26	65	3RV2011-1BA●●	3RV2021-1BA●●
	1.8-2.5	—	1/8	1/2	1/2	1	1 1/2	33	65	3RV2011-1CA●●	3RV2021-1CA●●
	2.2-3.2	1/10	1/4	1/2	3/4	1 1/2	2	42	65	3RV2011-1DA●●	3RV2021-1DA●●
	2.8-4	1/8	1/8	3/4	3/4	2	3	52	65	3RV2011-1EA●●	3RV2021-1EA●●
	3.5-5	1/8	1/2	1	1	3	3	65	65	3RV2011-1FA●●	3RV2021-1FA●●
	4.5-6.3	1/4	1/2	1	1 1/2	3	5	82	65	3RV2011-1GA●●	3RV2021-1GA●●
	5.5-8	1/3	1	2	2	5	5	104	65	3RV2011-1HA●●	3RV2021-1HA●●
	7-10	1/2	1 1/2	2	3	5	7 1/2	130	65	3RV2011-1JA●●	3RV2021-1JA●●
	9-12.5	1/2	2	3	3	7 1/2	10	163	65	3RV2011-1KA●●	3RV2021-1KA●●
	11-16	1	2	3	5	10	—	208	65	3RV2011-4AA●●	3RV2021-4AA●●
	14-20	1 1/2	3	5	5	10	—	260	65	—	3RV2021-4BA●●
	17-22	1 1/2	3	5	7 1/2	15	—	286	65	—	3RV2021-4CA●●
	20-25	2	3	5	7 1/2	15	—	325	65	—	3RV2021-4DA●●
	23-28	2	5	7 1/2	10	20	—	364	50	—	3RV2021-4NA●●
	27-32	2	5	7 1/2	10	20	—	400	50	—	3RV2021-4EA●●
	30-36 <sup>3)</sup>	3	5	10	10	25	—	432	12	—	3RV2021-4PA●●
	34-40 <sup>3)</sup>	3	7 1/2	10	10	30	—	480	12	—	3RV2021-4FA●●

Screw terminals, no auxiliary: ●● = 10  
 Screw Terminals, with 1NO/1NC Aux: ●● = 15  
 Spring terminals, no auxiliary: ●● = 20  
 Spring Terminals, with 1NO/1NC Aux: ●● = 25  
 Ring Lug Terminals, no Auxiliary: ●● = 40

1) Select motor starter protector by motor full load amps. Horsepower ratings for reference only.

2) The motor starter protectors rated up to 32 A can be used as manual motor controllers or as Type E combination motor controllers. For use as a Type E combination motor controller, a Type E terminal is required. See accessories page 1/10.

3) These products are NOT certified as Type E combination motor controllers. They can only be used as manual motor controllers.

4) 3RV2 MSPs can only be used with Innovations contactors and accessories

# For Motor Protection

3RV10 Class 10 & 20 – up to 100A

Description	Ordering Information
<p>The 3RV203/204 MSPs are UL approved as Self Protected Combination Motor Controllers which are also called Type E. In this application, all the required functions for a motor branch are provided in one device: disconnect, short circuit protection, motor control and overload protection. A type E terminal adaptor is required for all S2 frame 3RV2031 above 45A and all S2 frame 3RV2032 as well as for all S3 frame motor starter protectors.</p> <p>The 3RV203/204 MSPs are also approved for use as follows:</p> <ul style="list-style-type: none"> <li>– Manual Motor Controller: Motor starter, motor disconnect, control and overload protection.</li> <li>– Group Installation: Motor starter only, motor disconnect, control and overload protection.</li> <li>– Tap conductor Protection in Group Installation acc. NEC: Motor starter only; motor disconnect, control and overload protection.</li> </ul> <p>When the 3RV203/204 is used with one of the 3 above mentioned approvals, they can be installed downstream of one circuit breaker or fuse set.</p> <p>For more detailed application information and rules how to apply, size and rate these MSPs in control panels in general, in group installations or in accordance to international IEC standards visit our website: <a href="http://www.usa.siemens.com/controlpaneldesign">www.usa.siemens.com/controlpaneldesign</a></p>	<ul style="list-style-type: none"> <li>▶ ON/OFF rotary handle with lockout and visible trip indication.</li> <li>▶ Adjustment dial for setting to motor FLA.</li> <li>▶ Class 10 overload trip characteristics.</li> <li>▶ Short circuit trip at 13 times the maximum setting of the FLA adjustment dial.</li> <li>▶ Short circuit current rating:</li> <li>▶ Ambient compensated up to 140° F (applies to side by side mounting).</li> <li>▶ Phase loss sensitivity.</li> <li>▶ Test trip function.</li> <li>▶ Auxiliaries and Accessories see pages 1/7–1/17.</li> <li>▶ General Information see pages 1/29–1/32.</li> <li>▶ Technical Data see pages 1/18–1/28.</li> <li>▶ Dimensions see page 1/33.</li> </ul>

Note: Select MSP by motor Full Load Amperes. Horsepower ratings are for reference only.

Illustration	FLA Adjustment Range [A]	Single Phase HP rating <sup>1)</sup>		3 Phase HP Rating <sup>1)</sup>				Inst. Short-Circuit Release [A]	UL AIC (480V) [kA] <sup>6)</sup>	Trip Class 10	Trip Class 20	
		115V	240V	200V	230V	460V	575V			Order Number <sup>4)</sup>	Order Number <sup>4)</sup>	
	<b>3RV203 Frame Size S2</b>											
	9.5 - 14	1.5	3	5	5	10	15	208	65	<b>3RV2031-4SA10</b>	<b>3RV2031-4SB10</b>	
	12 - 17	1.5	3	5	7.5	15	15	260	65	<b>3RV2031-4TA10</b>	<b>3RV2031-4TB10</b>	
	14 - 20	1.5	3	7.5	7.5	15	20	260	65	<b>3RV2031-4BA10</b>	<b>3RV2031-4BB10</b>	
	18 - 25	2	5	7.5	10	20	25	325	65	<b>3RV2031-4DA10</b>	<b>3RV2031-4DB10</b>	
	22 - 32	3	5	10	10	25	30	416	65	<b>3RV2031-4EA10</b>	<b>3RV2031-4EB10</b>	
	28 - 36	3	7.5	15	15	30	40	520	65	<b>3RV2031-4PA10</b>	<b>3RV2031-4PB10</b>	
	32 - 40	3	7.5	15	15	30	40	585	65	<b>3RV2031-4UA10</b>	<b>3RV2031-4UB10</b>	
	35 - 45	3	10	15	15	40	50	650	65	<b>3RV2031-4VA10</b>	<b>3RV2031-4VB10</b>	
	42 - 52	5	10	15	20	40	50	741	65	<b>3RV2031-4WA10</b>	<b>3RV2031-4WB10</b>	
	49 - 59	5	15	20	25	50	60	845	30	<b>3RV2031-4XA10</b>	<b>3RV2031-4XB10</b>	
	54 - 65	5	15	20	25	50	60	845	30	<b>3RV2031-4JA10</b>	<b>3RV2031-4JB10</b>	
		<b>3RV204 Frame Size S3</b>										
		28 - 40	3	7.5	15	15	30	40	520A	65	<b>3RV2041-4FA10</b>	<b>3RV2042-4FB10</b>
36 - 50		5	10	15	20	40	50	650A	65	<b>3RV2041-4HA10</b>	<b>3RV2042-4HB10</b>	
45 - 63		5	15	20	25	50	60	819A	65	<b>3RV2041-4JA10</b>	<b>3RV2042-4JB10</b>	
57 - 75		7.5	15	25	25	60	75	975A	65	<b>3RV2041-4KA10</b>	<b>3RV2042-4KB10</b>	
65 - 84		7.5	15	25	30	60	75	1170A	65	<b>3RV2041-4RA10</b>	<b>3RV2042-4RB10</b>	
75 - 93		7.5	20	30	40	75	100 <sup>3)</sup>	1300A	65	<b>3RV2041-4YA10</b>	<b>3RV2042-4YB10</b>	
80 - 100		10	25	40	40	75	100 <sup>3)</sup>	1300A	65	<b>3RV2041-4MA10</b>	<b>3RV2042-4MB10</b>	

1) Select motor starter protector by motor full load amps. Horsepower ratings for reference only.

2) Size S2 and S3 are listed as type E combination motor controllers. For required Type E terminals see page 1/10. 3RV2031 MSPs with a current setting limit of 45A or less do not require a type E terminal and fulfill the spacing requirements of UL508.

3) Shaded ratings apply for group installation only. These ratings do not apply as UL listed manual combination starters.

4) Pre-assembled motor starter protector and transverse auxiliary switch with 1NO + 1NC is available. Replace the last digit of the order no. with a "5".

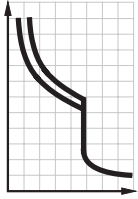
5) 3RV1 MSPs can only be used with 3RT1 contactors and accessories. 3RV2 MSPs can only be used with 3RT2 contactors and accessories.

6) For 100kA SCCR rated MSPs, change the part number from 3RV2031 to 3RV2032. (applies to S2 frame only through 65A).

Refer to pages 1/18 to 1/20 when using an MSP in a Manual Motor Starter or a Manual Self-Protected Combination Motor Controller.



Selection and ordering data



Rated Current <sup>1)</sup> [A]	Thermal overload release (non-adjustable) [A]	Short Circuit breaking capacity [kA]			For Motor Protection <sup>2)</sup>			For Transformer Protection <sup>3)</sup>		
		480 VAC	480Y/277VAC	600Y/347VAC	Instantaneous Over Current Release [A]	Order Number (Screw Terminals)	Weight [kg]	Instantaneous Over Current Release [A]	Order Number (Screw Terminals)	Weight [kg]
<b>Innovations Frame Size S00<sup>4)</sup></b>										
0.16	0.16	—	65	10	2.1	<b>3RV2711-0AD10</b>	0.390	3.3	<b>3RV2811-0AD10</b>	0.390
0.2	0.2	—	65	10	2.6	<b>3RV2711-0BD10</b>	0.390	4.2	<b>3RV2811-0BD10</b>	0.390
0.25	0.25	—	65	10	3.3	<b>3RV2711-0CD10</b>	0.390	5.2	<b>3RV2811-0CD10</b>	0.390
0.32	0.32	—	65	10	4.2	<b>3RV2711-0DD10</b>	0.390	6.5	<b>3RV2811-0DD10</b>	0.390
0.4	0.4	—	65	10	5.2	<b>3RV2711-0ED10</b>	0.390	8.2	<b>3RV2811-0ED10</b>	0.390
0.5	0.5	—	65	10	6.5	<b>3RV2711-0FD10</b>	0.390	10	<b>3RV2811-0FD10</b>	0.390
0.63	0.63	—	65	10	8.2	<b>3RV2711-0GD10</b>	0.390	13	<b>3RV2811-0GD10</b>	0.400
0.8	0.8	—	65	10	10	<b>3RV2711-0HD10</b>	0.390	16	<b>3RV2811-0HD10</b>	0.450
1	1	—	65	10	13	<b>3RV2711-0JD10</b>	0.450	21	<b>3RV2811-0JD10</b>	0.450
1.25	1.25	—	65	10	16	<b>3RV2711-0KD10</b>	0.450	26	<b>3RV2811-0KD10</b>	0.460
1.6	1.6	—	65	10	21	<b>3RV2711-1AD10</b>	0.460	33	<b>3RV2811-1AD10</b>	0.460
2	2	—	65	10	26	<b>3RV2711-1BD10</b>	0.460	42	<b>3RV2811-1BD10</b>	0.460
2.5	2.5	—	65	10	33	<b>3RV2711-1CD10</b>	0.460	52	<b>3RV2811-1CD10</b>	0.460
3.2	3.2	—	65	10	42	<b>3RV2711-1DD10</b>	0.460	65	<b>3RV2811-1DD10</b>	0.460
4	4	—	65	10	52	<b>3RV2711-1ED10</b>	0.450	82	<b>3RV2811-1ED10</b>	0.460
5	5	—	65	10	65	<b>3RV2711-1FD10</b>	0.460	104	<b>3RV2811-1FD10</b>	0.460
6.3	6.3	—	65	10	82	<b>3RV2711-1GD10</b>	0.460	130	<b>3RV2811-1GD10</b>	0.460
8	8	—	65	10	104	<b>3RV2711-1HD10</b>	0.460	163	<b>3RV2811-1HD10</b>	0.460
10	10	—	65	10	130	<b>3RV2711-1JD10</b>	0.460	208	<b>3RV2811-1JD10</b>	0.460
12.5	12.5	—	65	10	163	<b>3RV2711-1KD10</b>	0.460	260	<b>3RV2811-1KD10</b>	0.460
15	15	—	65	—	208	<b>3RV2711-4AD10</b>	0.470	286	<b>3RV2811-4AD10</b>	0.470
<b>Innovations Frame Size S0<sup>4)</sup></b>										
20	20	—	50	—	260	<b>3RV2721-4BD10</b>	0.514	325	<b>3RV2821-4BD10</b>	0.516
22	22	—	50	—	286	<b>3RV2721-4CD10</b>	0.516	364	<b>3RV2821-4CD10</b>	0.528
<b>Innovations Frame Size S3<sup>5)</sup></b>										
10	10	65	—	20	150	<b>3RV2742-5AD10</b>	0.460	—	—	—
15	15	65	—	20	225	<b>3RV2742-5BD10</b>	0.460	—	—	—
20	20	65	—	20	260	<b>3RV2742-5CD10</b>	0.460	—	—	—
25	25	65	—	20	325	<b>3RV2742-5DD10</b>	0.460	—	—	—
30	30	65	—	20	390	<b>3RV2742-5ED10</b>	0.460	—	—	—
35	35	—	65	20	455	<b>3RV2742-5FD10</b>	0.460	—	—	—
40	40	—	65	20	520	<b>3RV2742-5GD10</b>	0.460	—	—	—
45	45	—	65	20	585	<b>3RV2742-5HD10</b>	0.460	—	—	—
50	50	—	65	20	650	<b>3RV2742-5JD10</b>	0.460	—	—	—
60	60	—	65	20	780	<b>3RV2742-5LD10</b>	0.460	—	—	—
70	70	—	65	10	910	<b>3RV2742-5QD10</b>	0.460	—	—	—



1) 100 % rated value acc. to UL 489 and IEC 60947-2 (100 % rated breaker).

2) Circuit breakers for system protection of motor and non-motor loads. Requires use of separate overload protection for motor applications.

3) Circuit breakers for system and transformer protection according to UL/CSA. Specially designed for transformers with high inrush current.

4) Transverse and lateral auxiliary switches can be ordered separately (see "Mountable accessories").

5) Transverse auxiliary switches must not be mounted. Lateral auxiliary switches can be ordered separately (see "Mountable accessories").

Refer to page 1/21 when using as upstream protection of a Manual Motor Controller or a Manual Motor Controller Suitable for Tap Conductor Protection in Group Installations.

# Accessories

## Auxiliaries and Accessories

### Selection and ordering data

	Type	Version	Width	Innovations	
				Fits 3RV2 Frame Size	Screw Connection Order No.
<b>Auxiliary switches<sup>3)</sup></b>					
3RV2901-1E 	<b>Transverse auxiliary switches</b>	1 CO 1 NO + 1 NC 2 NO		S00, S0, S2, S3	<b>3RV2901-1D</b> 1), 2) <b>3RV2901-1E</b> 1) <b>3RV2901-1F</b>
3RV2901-1G 	<b>Solid-state compatible, transverse auxiliary switches for use in dusty atmosphere and in electronic circuits with low operating currents</b>	1 CO		S00, S0, S2, S3	<b>3RV2901-1G</b>
3RV2901-1A 	<b>Covering caps for transverse auxiliary switch slots (pack of 10)</b>			S00, S0, S2, S3	<b>3RV2901-0H</b>
	<b>Lateral auxiliary switches (side mount)</b> Width = 9 mm	1 NO + 1 NC 2 NO 2 NC 2 NO + 2 NC	9 9 9 18	S00, S0, S2, S3	1), 2) <b>3RV2901-1A</b> 1) <b>3RV2901-1B</b> 1) <b>3RV2901-1C</b> <b>3RV2901-1J</b>
<b>Signaling switch<sup>4)</sup></b>					
3RV2921-1M 	<b>Signaling switch (side mount)</b> Individual tripped and short-circuit signaling Width = 18 mm	1 NO + 1 NC each	18	S00, S0, S2, S3	1), 2) <b>3RV2921-1M</b>
<b>Auxiliary releases<sup>5)</sup></b>					
3RV2902-1AB4 	<b>Undervoltage releases (side mount)</b> Width = 18 mm	<b>DC</b> 24 V		S00, S0, S2, S3	<b>3RV2902-1AB4</b>
		<b>AC 50 Hz</b> 24 V 110 V — 230 V 400 V 415 V 500 V	<b>AC 60 Hz</b> — 120 V 208 V 240 V 440 V 480 V 600 V	S00, S0, S2, S3	<b>3RV2902-1AB0</b> <b>3RV2902-1AF0</b> 1), 2) <b>3RV2902-1AM1</b> 1), 2) <b>3RV2902-1AP0</b> <b>3RV2902-1AV0</b> <b>3RV2902-1AV1</b> <b>3RV2902-1AS0</b>
	<b>Undervoltage releases with leading auxiliary contacts 2 NO (side mount)</b> Width = 18 mm	230 V 400 V 415 V	240 V 440 V 480 V	S00, S0, S2, S3	1) <b>3RV2922-1CP0</b> 1) <b>3RV2922-1CV0</b> 1), 2) <b>3RV2922-1CV1</b>
	<b>Shunt releases (side mount)</b> Width = 18 mm	<b>AC 50/60 Hz 100% ON<sup>6)</sup></b> 20-24 V 90-110 V 210-240 V 350-415 V 500 V	<b>AC 50/60 Hz 5 sec ON<sup>7)</sup></b> 20-70 V 70-190 V 190-330 V 330-500 V 500 V	S00, S0, S2, S3	1), 2) <b>3RV2902-1DB0</b> 1), 2) <b>3RV2902-1DF0</b> 1) <b>3RV2902-1DP0</b> <b>3RV2902-1DV0</b> <b>3RV2902-1DS0</b>

1) This product is also available with spring terminals. The order no. must be changed in the 8th position to a "2": e.g. 3RV1901-2E or 3RV2901-2E

2) This product is also available with ring lug terminals. The order no. must be changed in the 8th position to a "4": e.g. 3RV2901-4E

3) Each motor starter protector can be fitted with one transverse and one lateral auxiliary switch. The lateral auxiliary switch 2 NO + 2 NC is used without transverse auxiliary switch.

4) One signaling switch can be mounted at the left of the motor starter protector. This accessory cannot be used on the 3RV27 and 3RV28 circuit breakers.

5) One auxiliary release can be mounted at the right of each MSP: motor starter protector.

6) The response voltage at the lower limit of the voltage range at 0.85 (Tu=60°C) is valid for 100% (infinite)

7) The response voltage at the lower limit of the voltage range at 0.9 (Tu=60°C) applies for a duty cycle of 5 seconds at AC 50/60 Hz and DC.

# Accessories

## Mounting accessories

1  
MOTOR STARTER PROTECTORS

### Selection and ordering data

Modular spacing mm	Number of motor starter protectors that can be connected			Rated current $I_n$ at 690 V A	For motor starter protectors Size	Order No.	Order quantity	Weight approx. kg
	Without lateral accessories	Incl. lateral auxiliary switch	With auxiliary trip unit					

#### Three-phase busbar systems for Classic and Innovations

Product	Modular spacing (mm)	Without lateral accessories	Incl. lateral auxiliary switch	With auxiliary trip unit	Rated current (A)	For motor starter protectors Size	Order No.	Order quantity	Weight approx. (kg)
 3RV19 15-1AB	45	2	--	--	63	S00, S0 <sup>1)2)</sup>	<b>3RV19 15-1AB</b> <b>3RV19 15-1BB</b> <b>3RV19 15-1CB</b> <b>3RV19 15-1DB</b>	1 unit	0.044
		3				S00, S0 <sup>1)2)</sup>			
		4				S00, S0 <sup>1)2)</sup>			
		5				S00, S0 <sup>1)2)</sup>			
 3RV19 15-1BB	55	--	2	--	63	S00, S0 <sup>1)2)</sup>	<b>3RV19 15-2AB</b> <b>3RV19 15-2BB</b> <b>3RV19 15-2CB</b> <b>3RV19 15-2DB</b>	1 unit	0.048
		3				S00, S0 <sup>1)2)</sup>			
		4				S00, S0 <sup>1)2)</sup>			
		5				S00, S0 <sup>1)2)</sup>			
 3RV19 15-1CB	63	--	--	2	63	S00, S0 <sup>1)2)</sup>	<b>3RV19 15-3AB</b> <b>3RV19 15-3CB</b>	1 unit	0.052
		4				S00, S0 <sup>1)2)</sup>			
 3RV19 15-1DB	75	2	--	--	108	S2 <sup>3)</sup>	<b>3RV19 35-1A</b> <b>3RV19 35-1B</b> <b>3RV19 35-1C</b>	1 unit	0.150
		3				S2 <sup>3)</sup>			
		4				S2 <sup>3)</sup>			
		--	2	2		108			
		3	3			S2		1 unit	0.262
		4	4			S2		1 unit	0.369

1) Not suitable for 3RV11 motor starter protectors with overload relay function. The 3RV1915-5DB connecting piece is available for connecting motor starter protectors from size S0 to size S00.

2) Not suitable for 3RV UL 489 circuit breakers.

3) Auxiliary trip units and lateral auxiliary switches cannot be used in combination.

Version	Modular spacing mm	For motor starter protectors Size	Order No.	Order quantity	Weight approx. kg
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#### Connecting pieces for three-phase busbars

Product	Modular spacing (mm)	For motor starter protectors Size	Order No.	Order quantity	Weight approx. (kg)
 3RV19 15-5DB	45	S00, S0	<b>3RV19 15-5DB</b>	1 unit	0.042

Conductor cross-section, AWG cables, solid or stranded		Tightening torque Nm	For motor starter protector size
For 3RV1 MSP	For 3RV2 MSP		
AWG	AWG		

Order No.
<b>3RV2 Innovations<sup>2)</sup></b>

#### Three-phase feeder terminals

Product	Connection from top	Rated current (A)	For motor starter protector size	Order No.
 3RV29 25-5AB	— 10...4	3...4	S00	<b>3RV2925-5AB</b>
	— 10...4	3...4	S0	
 3RV2915-5B	Connection from below <sup>3)</sup>			<b>3RV2915-5B</b>
	— 10...4	Input: 4, Output: 2 ... 2.5	S00, S0	
 3RV2935-5A	14...0	--	4-6	<b>3RV2935-5A</b>

#### Three-phase feeder terminals for constructing "Type E Starters" Innovations

Product	Connection from top	Rated current (A)	For motor starter protector size	Order No.
 3RV2935-5E	— 10...4	3-4	S00	<b>3RV2925-5EB</b>
	— 10...4	3-4	S0	
	8...0	10...2/0	4.5-6	

1) Do not mix 3RV1 Classic Accessories with 3RV2 Innovations MSPs

2) Do not mix 3RV2 Innovations Accessories with 3RV1 Classic MSPs

3) This terminal is connected in place of a switch, please take the space requirement into account.



# Accessories

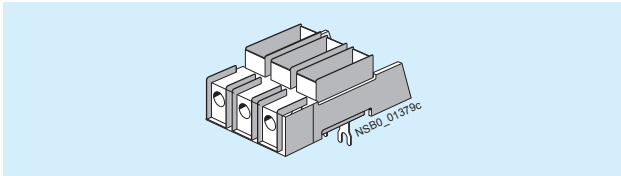
## Mounting accessories

### Overview

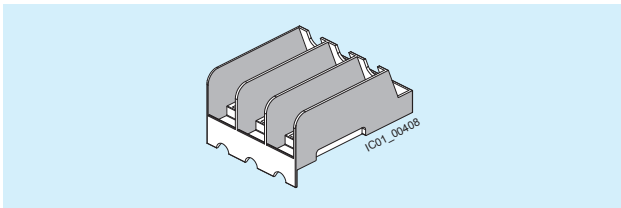
#### Accessories for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1

The 3RV20 motor starter protectors with screw terminals are approved according to UL 508/UL 60947-4-1 as "Self-Protected Combination Motor Controllers (Type E)".

This requires increased clearance and creepage distances (1 inch and 2 inches respectively) at the input side of the device, which are achieved by mounting a terminal block or a phase barrier.



SIRIUS 3RV2928-1H terminal block



SIRIUS 3RV2938-1K phase barrier

Motor starter protectors/ circuit breakers	Size	Essential accessories for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1
3RV201., 3RV202.	S00/S0	3RV2928-1H terminal block or 3RV2928-1K phase barrier
3RV2031-4B.1., 3RV2031-4D.1., 3RV2031-4E.1., 3RV2031-4P.1., 3RV2031-4S.1., 3RV2031-4T.1., 3RV2031-4U.1., 3RV2031-4V.1.	S2	--
3RV2031-4J.1., 3RV2031-4K.1., 3RV2031-4R.1., 3RV2031-4W.1., 3RV2031-4X.1., 3RV2032	S2	3RV2938-1K phase barrier
3RV204	S3	3RT2946-4GA07 terminal block

-- No accessories needed

Special threephase infeed terminals are required for constructing "Type E Starters" with an insulated threephase busbar system (see page 1/8).

The 3RV29 infeed system also enables the assembly of "Type E Starters", see page 1/14 onwards.

**Note:**

According to CSA, these terminal blocks and the phase barriers can be omitted when the device is used as a "Self-Protected Combination Motor Controller (Type E)".

### Link modules

Feeders can be easily assembled from single devices with the help of the link modules. The following table shows the different combination options for devices with screw or spring-type terminals.

Combination devices	3RV2 motor starter protectors/ circuit breakers	3RT2 contactors; 3RW30, 3RW40 soft starters; 3RF34 solid-state contactors	Link modules	
			Screw terminals	Spring-type terminals
	Size	Size		

#### Link modules for connecting switching devices to 3RV2 motor starter protectors/circuit breakers<sup>1)</sup>

3RT2 contactors with AC or DC coil	S00	S00	3RA1921-1DA00	3RA2911-2AA00
	S0	S00		--
	S2	S2	3RA2931-1AA00	--
3RT2 contactors with AC coil	S0	S0	3RA2921-1AA00	3RA2921-2AA00
	S00	S0		--
3RT2 contactors with DC coil	S0	S0	3RA2921-1BA00	3RA2921-2AA00
	S00	S0		--
3RW30 soft starters	S00	S00	3RA2921-1BA00	3RA2911-2GA00
	S0	S00		--
3RW30/3RW40 soft starters	S0	S0	3RA2921-1BA00	3RA2921-2GA00
	S00	S0		--
	S2 <sup>2)</sup>	S2 <sup>2)</sup>	3RA2931-1AA00	--
3RF34 solid-state contactors	S00/S0	S00	3RA2921-1BA00	--

#### Hybrid link modules for connecting contactors with spring-type terminals to 3RV2 motor starter protectors/circuit breakers with screw terminals<sup>3)</sup>

3RT2 contactors with AC or DC coil	S00	S00	3RA2911-2FA00	--
	S0	S0	3RA2921-2FA00	--

-- Version not possible

<sup>1)</sup> The link modules cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV2.31-4K.1., 3RV2.31-4R.1., 3RV2.32-4K.1., 3RV2.32-4R.1., 3RV27 and 3RV28 motor starter protectors/circuit breakers.

<sup>2)</sup> To assemble the feeder between a motor starter protector and a soft starter in size S2, the 3RA2932-1AC00 standard mounting rail adapter must be used.

<sup>3)</sup> The motor starter protector to contactor hybrid link modules cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV27 and 3RV28 motor starter protectors/circuit breakers. They are only suitable for constructing direct-on-line starters.

**Note:**

- Link modules can be used in
  - Sizes S00 and S0: up to max. 32 A
  - Size S2: up to max. 65 A
- Hybrid link modules can be used in
  - Sizes S00 and S0: up to max. 32 A

### Selection and ordering data

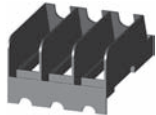
Version	For motor starter protector size	Innovations 3RV2/3RT2 Order No.	Order Quantity
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#### Terminal blocks and phase barriers for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508 / UL 60947-4-1

Note:  
 UL 508 / UL 60947-4-1 demands 1-inch clearance and 2-inch creepage distance at line side for "Combination Motor Controller Type E".  
 The following terminal blocks or phase barriers must be used on 3RV motor starter protectors.  
 The terminal blocks or phase barriers cannot be used in combination with the 3RV19 .5 three-phase busbars.  
 For construction with three-phase busbars, see "Accessories for busbar"



3RV29 28-1H



3RV29 28-1K



3RT1946-4GA07

Terminal blocks type E	For extended clearance and creepage distances (1 and 2 inch)	Size	3RV motor starter protector	Innovations 3RV2/3RT2 Order No.	Order Quantity
		S00, S0		<b>3RV29 28-1H</b>	1 unit
		S0		—	1 unit
		S2		<b>3RV29 35-5E</b>	1 unit
		S3		<b>3RT2946-4GA07</b>	1 unit

Phase barriers	For extended clearance and creepage distances (1 and 2 inch)	Size	3RV motor starter protector	Innovations 3RV2/3RT2 Order No.	Order Quantity
		S00, S0		<b>3RV29 28-1K</b>	1 unit
		S2		<b>3RV29 38-1K</b>	1 unit

Actuating voltage of contactor	Size 3RT contactor	3RV motor starter protector	Innovations 3RV2/3RT2 Order No.	Order Quantity
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#### Link modules for motor starter protector to contactor <sup>1)</sup>

For mechanical and electrical connection between motor starter protector and contactor with screw terminals.

##### Single-unit packaging

AC/DC	Size	3RV motor starter protector	Innovations 3RV2/3RT2 Order No.	Order Quantity
AC/DC	S00	S00/S0	<b>3RA19 21-1DA00</b>	1 unit
AC	S0	S00/S0	<b>3RA29 21-1AA00</b>	1 unit
AC	S2	S2	<b>3RA29 31-1AA00</b>	1 unit
AC	S3	S3	<b>3RA19 41-1AA00</b>	1 unit
DC	S0	S00/S0	<b>3RA29 21-1BA00</b>	1 unit
DC	S2	S2	<b>3RA29 31-1AA00</b>	1 unit
DC	S3	S3	<b>3RA19 41-1AA00</b>	1 unit

##### Multi-unit packaging

AC/DC	S00	S00/S0	<b>3RA19 21-1D</b>	10 units
AC	S0	S00/S0	<b>3RA29 21-1A</b>	10 units
DC	S0	S00/S0	<b>3RA29 21-1B</b>	10 units
AC/DC	S2	S2	<b>3RA29 31-1A</b>	5 units
AC/DC	S3	S3	<b>3RA19 41-1A</b>	5 units

For mechanical and electrical connection between motor starter protector and contactor with spring-type terminals.

##### Spring-type Terminals

##### Single-unit packaging

AC/DC	S00	S00	<b>3RA29 11-2AA00</b>	1 unit
AC <sup>2)</sup>	S0	S0	<b>3RA29 21-2AA00</b>	1 unit
DC	S0	S0	<b>3RA29 21-2AA00</b>	1 unit

##### Multi-unit packaging

AC/DC	S00	S00	<b>3RA29 11-2A</b>	10 units
AC <sup>2)</sup>	S0	S0	<b>3RA29 21-2A</b>	10 units
DC	S0	S0	<b>3RA29 21-2A</b>	10 units

##### Spacers

For compensating height on AC contactors				
Single-unit packaging	S0	S0	<b>3RA29 11-1CA00</b>	1 unit
Multi-unit packaging	S0	S0	<b>3RA29 11-1C</b>	5 units

1) The link modules for motor starter protector to contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors

2) A spacer for height compensation on AC contactors size S0 is optionally available

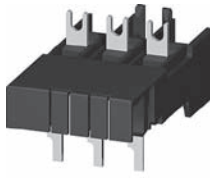
Note  
 Size S0 link modules can be used up to max. 32 A.  
 Size S2 link modules can be used up to 65A max.

### Selection and ordering data

Size	Order No.	PU (UNIT, SET, M)	PS*	Weight approx. kg
3RW30, 3RW40 soft starters; 3RF34 solid-state contactors	3RV2 motor starter protectors			

### Link modules for motor starter protector to soft starter<sup>1) 3)</sup> and motor starter protector to solid-state contactor

Connection between motor starter protector and soft starter / solid-state contactor with screw terminals



3RA29 21-1BA00

#### Single-unit packaging

Order No.	Size	Weight approx. kg
S00	S00/S0	0.068
S0	S00/S0	0.068
S2 <sup>3)</sup>	S2	0.104
S3 <sup>4)</sup>	S3	0.104

#### Multi-unit packaging

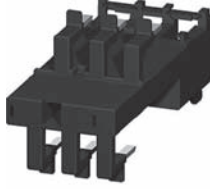
Order No.	Size	Weight approx. kg
S00	S00/S0	0.068
S0	S00/S0	0.068
S2 <sup>3)</sup>	S2	0.104
S3 <sup>4)</sup>	S2	0.104

#### Screw terminals



Order No.	PU	PS*	Weight approx. kg
3RA29 21-1BA00	1	1 unit	0.068
3RA29 21-1BA00	1	1 unit	0.068
3RA29 31-1AA00	1	1 unit	0.104
3RA19 41-1A	1	1 unit	0.104
3RA29 21-1B	1	10 units	0.068
3RA29 21-1B	1	10 units	0.068
3RA29 31-1A	1	5 units	0.104
3RA19 41-1A	1	5 units	0.104

Connection between motor starter protector and soft starter with spring-type terminals



3RA29 21-2GA00

#### Single-unit packaging

Order No.	Size	Weight approx. kg
S00	S00	0.038
S0	S0	0.072

#### Multi-unit packaging

Order No.	Size	Weight approx. kg
S00	S00	0.380
S0	S0	0.720

#### Spring-type terminals



Order No.	PU	PS*	Weight approx. kg
3RA29 11-2GA00	1	1 unit	0.038
3RA29 21-2GA00	1	1 unit	0.072
3RA29 11-2G	1	10 units	0.380
3RA29 21-2G	1	10 units	0.720

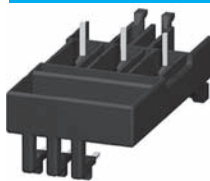
<sup>1)</sup> The link modules for motor starter protector to soft starter and for motor starter protector to solid-state contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors.

*Note:*  
S0 link modules can be used up to max. 32 A.  
S2 link modules can be used up to max. 65 A.

Actuating voltage of contactor	Size	Order No.	PU (UNIT, SET, M)	PS*	Weight approx. kg
	3RT2 contactors	3RV2 motor starter protectors			

### Hybrid link modules for motor starter protector to contactor<sup>1)</sup>

For mechanical and electrical connection between motor starter protector with screw terminals and contactor with spring-type terminals



3RA29 11-2FA00

#### Single-unit packaging

Order No.	Size	Weight approx. kg
AC/DC	S00	0.029
AC <sup>2)</sup> /DC	S0	0.056

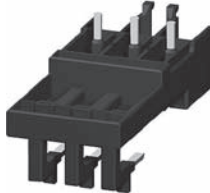
#### Multi-unit packaging

Order No.	Size	Weight approx. kg
AC/DC	S00	0.290
AC <sup>2)</sup> /DC	S0	0.560

#### Spacers<sup>2)</sup>

for compensating the height on AC contactors

Order No.	Size	Weight approx. kg
Single-unit packaging	S0	0.001
Multi-unit packaging	S0	0.001



3RA29 21-2FA00

#### Hybrid link modules

Order No.	PU	PS*	Weight approx. kg
3RA29 11-2FA00	1	1 unit	0.029
3RA29 21-2FA00	1	1 unit	0.056
3RA29 11-2F	1	10 units	0.290
3RA29 21-2F	1	10 units	0.560
3RA29 11-1CA00	1	1 unit	0.001
3RA29 11-1C	1	5 units	0.001

<sup>1)</sup> The hybrid link modules for motor starter protector to contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors or reversing starters.

*Note:*  
Hybrid link modules can be used up to max. 32 A.

<sup>2)</sup> A spacer for height compensation on AC contactors size S0 is optionally available. See 3RA2911-1CA00

<sup>3)</sup> To assemble the starter between a motor starter protector and a soft starter in size S2, the 3RA2932-1AC00 standard mounting rail adapter must be used.

<sup>4)</sup> It is only permissible to assemble the feeder between the motor starter protector and the soft starter in Size S3 on a mounting plate.

## Accessories

## Mounting accessories

## Selection and ordering data

Type	Design	For SIRIUS MSP size	Order No.	Order Quantity	Weight approx. (kg)	
<b>Isolator module <sup>1)</sup></b>						
3RV2938-1A without padlock	Visible isolating distance for isolating individual motor starter protectors from the network, lockable in isolating position.	S00, S0	<b>3RV29 28-1A</b>	1 unit	0.132	
3RV29 28-1A without padlock		S2 <sup>1)</sup>	<b>3RV29 38-1A</b>	1 unit	0.368	
						
<b>Auxiliary terminal, 3 pole</b>						
3RT19 46-4F	For connection of auxiliary and control cables to the main conductor connections	S3	<b>3RT29 46-4F</b>	1 unit	0.10	
						
<b>Covers</b>						
3RV1 (size S3) with 3RT19 46-4EA1	<b>Terminal cover</b> for box terminals	Additional touch guard to be fitted at the box terminals (2 units can be mounted per MSP)	S2	<b>3RT29 36-4EA2</b>	1 unit	0.014
		S3	<b>3RT29 46-4EA2</b>	1 unit	0.019	
						
3RV29 28-4AA00	<b>Terminal cover</b> for cable lug and bar connection	For maintaining the required voltage clearance and as protection against the equipment being touched if distant box terminals are used (2 units can be mounted per MSP)	S3	<b>3RT19 46-4EA1</b>	1 unit	0.03
						
3RV29 08-4AA10	<b>Terminal cover</b> for devices with ring lug terminal connection	• Main current level	S00, S0 <sup>2)</sup>	<b>3RV29 28-4AA00</b>	1 unit	0.01
		• For transverse auxiliary switches	S00, S0 <sup>2)</sup>	<b>3RV29 08-4AA10</b>	1 unit	0.01
						
3RV29 08-0P	<b>Scale cover</b>	For covering the current setting scale. Packing unit: Bag with 10 scale covers.	S00, S0, S2 <sup>3)</sup>	<b>3RV29 08-0P</b>	10 units	10 units
		S3	<b>3RV19 08-0P</b>			
						
<b>Fixing Material</b>						
3RB1900-0B	<b>Push-in lugs</b> For screwing the motor starter protector onto mounting plates.	Two units are required for each motor starter protector.	S00	<b>3RB19 00-0B</b>	10 units	0.10
						
<b>Tools for opening spring-type terminals by hand</b>						
3RA29 08-1A	<b>Screwdriver</b> For all SIRIUS devices with spring terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black partially insulated	S00, S0, S2	<b>3RA29 08-1A</b>	1 unit	0.045
						

1) The isolator module for size S2 can be used only with 3RV2 motor starter protectors/circuit breakers up to max. 65 A. Similarly, it cannot be used with the transverse auxiliary switch or three-phase busbars.

2) Compatible with 3RV20 motor starter protectors.


3) Compatible with 3RV20, 3RV21, and 3RV24 motor starter protectors.

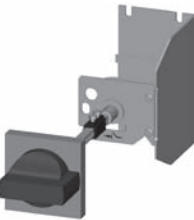


# Accessories


## Rotary operating mechanisms



### Selection and ordering data

Type	Details	For SIRIUS MSP size	Order No.	Approx. Wt. (kg)	
<b>Door-coupling rotary operating mechanisms for Classic and Innovations</b>					
 <p>3RV29 26-0B</p> <p>The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and a 130/330 mm long extension shaft (6 mm x 6 mm). The door-coupling rotary operating mechanisms are designed to degree of protection IP64. The door locking device prevents accidental opening of the control cabinet door in the ON position of the motor starter protector. The OFF position can be locked with up to 3 padlocks.</p>	<b>Door-coupling rotary operating mechanisms (black)</b>	Extension shaft 130 mm	S00, S0 S2, S3	<b>3RV29 26-0B</b> <b>3RV29 26-0B</b>	0.111 0.1
		Extension shaft 330 mm	S00, S0 S2, S3	<b>3RV29 26-0K</b> <b>3RV29 26-0K</b>	0.324 0.3
	<b>EMERGENCY STOP door-coupling rotary operating mechanisms (red/yellow)</b>	Extension shaft 130 mm	S00, S0 S2, S3	<b>3RV29 26-0C</b> <b>3RV29 26-0C</b>	0.110 0.1
		Extension shaft 330 mm	S00, S0 S2, S3	<b>3RV29 26-0L</b> <b>3RV29 26-0L</b>	0.316 0.3

Type	Details	For SIRIUS MSP size	Order No.	Approx. Wt. (kg)	
<b>Door-coupling rotary operating mechanisms for arduous conditions</b>					
 <p>3RV29 26-2C</p> <p>The door-coupling rotary operating mechanisms consist of a knob, a coupling driver, an extension shaft of 300 mm length (8 mm x 8 mm), a spacer and two metal brackets, into which the MSP is inserted. The door-coupling rotary operating mechanisms are designed for degree of protection IP65. The door locking device reliably prevents accidental opening of the control cabinet door in the ON position of the MSP. The OFF position can be locked with up to 3 padlocks. Laterally mountable auxiliary releases and two-pole auxiliary switches can be used. The door-coupling rotary operating mechanisms thus meet the requirements for isolating functions according to IEC 60 947-2.</p>	<b>Door-coupling rotary operating mechanisms (gray)</b>		S00, S0 S2 S3	<b>3RV29 26-2B</b> <b>3RV29 36-2B</b> <b>3RV29 46-2B</b>	1.2 1.6 1.7
	<b>EMERGENCY STOP door-coupling rotary operating mechanisms (red/yellow)</b>		S00, S0 S2 S3	<b>3RV29 26-2C</b> <b>3RV29 36-2C</b> <b>3RV29 46-2C</b>	1.2 1.5 1.7

### Enclosures and front plates

Type	Details	For SIRIUS MSP size	Order No.	Approx. Wt. (kg)	
<b>Front Plates</b>					
 <p>3RV19 23-4B + 3RV19 23-4G</p>	<b>Molded-plastic front plate</b> with rotary operating mechanism, lockable. For actuation of 3RV motor starter protectors in any enclosure		S00, S0 S2, S3	<b>3RV19 23-4B</b>	0.08
	<b>Molded-plastic front plate with EMERGENCY STOP door-coupling rotary operating mechanisms (red/yellow)</b>	EMERGENCY-STOP operation of 3RV MSPs in any enclosure, degree of protection IP55	S00, S0 S2, S3	<b>3RV19 23-4E</b>	0.08
	<b>Holders for front plates</b>	Holder is mounted on front plate, MSP size S00 or S0 with or without accessories is snapped in	S00, S0	<b>3RV19 23-4G</b>	0.19

Type	Details	For SIRIUS MSP size	Order No.	Approx. Wt. (kg)	
<b>Enclosures for wall mounting <sup>2)</sup></b>					
 <p>3RV19 23-1CA00</p>	<b>Molded-plastic enclosure for wall mounting</b> with rotary operating mechanism, lockable, with metric cable gland		S00, S0	<b>3RV19 23-1CA00</b>	0.26
		<b>overall width:</b> 54 mm (for switch + lateral auxiliary switch)	S00, S0	<b>3RV19 23-1DA00</b>	0.30
		72 mm (for switch + lateral auxiliary switch + auxiliary release)	S00, S0		
 <p>3RV19 23-1DA01</p>	<b>Cast aluminum surface-mount enclosure</b> with rotary operating mechanism, lockable, with metric cable gland		S00, S0	<b>3RV19 23-1DA01</b>	1.02
		<b>overall width:</b> 72 mm (for MSP + lateral auxiliary switch + auxiliary release)	S00, S0	<b>3RV19 23-1GA01</b>	1.01
		72 mm (for MSP + lateral auxiliary switch + auxiliary release)	S00, S0		

1) If required, an additional N terminal can be mounted (e.g. 8WA10 11-1BG11).

2) For S2 versions, see 3RV1933-1DA00 (black) or 3RV1933-1GA00 (red/yellow)

# Accessories

## 3RV29 infeed system

MOTOR STARTER PROTECTORS 1

### Overview

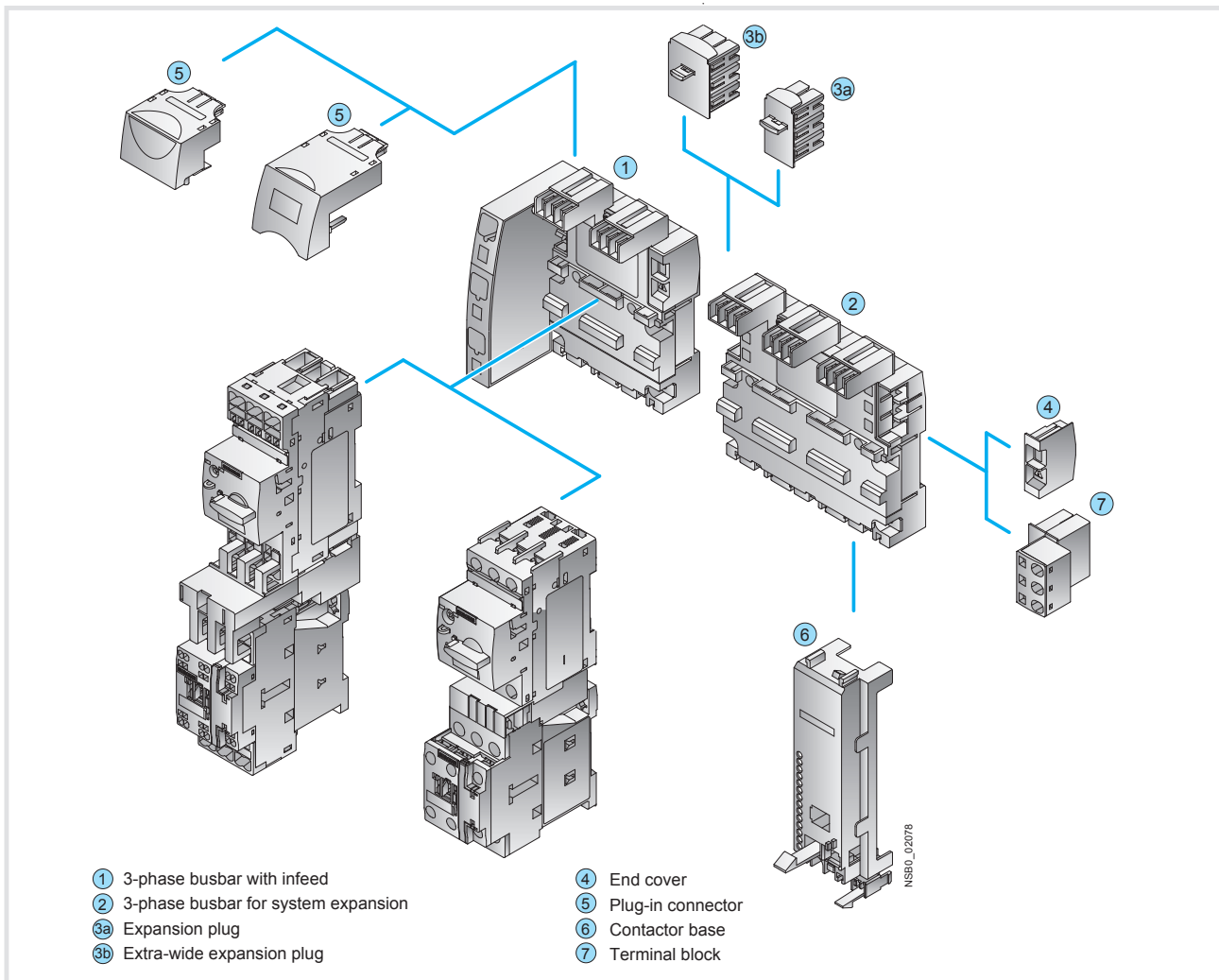
The 3RV29 infeed system is a convenient means of energy supply and distribution for a group of several motor starter protectors or complete motor starters with a screw or spring-type connection in sizes S00 and S0 (exception: this system cannot be used for the 3RV21, 3RV27 and 3RV28 motor starter protectors/circuit breakers).

The 3RV29 infeed system is approved in accordance with IEC to 500V. It is also UL approved and authorized for "Self-Protected Combination Motor Controller" (Type E starter) as well as for Type F starter (Type E starter + contactor). The system is based on a basic module complete with a lateral incoming unit (three-phase busbar with infeed). This infeed with spring-type terminals is mounted on the right or left depending on the version and can be supplied with a maximum conductor cross-section of 4 AWG (with end sleeve). A basic module has two sockets onto each of which a motor starter protector can be snapped.

Expansion modules are available for extending the system (three-phase busbars for system expansion). The individual modules are connected through an expansion plug.

The electrical connection between the three-phase busbars and the motor starter protectors is implemented through plug-in connectors. The complete system can be mounted on a TH 35 standard mounting rail to EN 60715 and can be expanded as required up to a maximum current carrying capacity of 63 A.

The system is mounted extremely quickly and easily thanks to the simple plug-in technique. Thanks to the lateral infeed, the system also saves space in the control cabinet. The additional overall height required for the infeed unit is only 30 mm. The alternative infeed possibilities on each side offer a high degree of flexibility for configuring the control cabinet: Infeed on left-hand or right-hand side as well as infeed on one side and out-feed on the other side to supply further loads are all possible. A terminal block with spring-type connections in combination with a standard mounting rail enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components such as 5SY miniature circuit breakers or SIRIUS relay components.



3RV29 infeed system

### ① Three-phase busbars with infeed

A three-phase busbar with infeed unit is required for connecting the energy supply. This module comprises one infeed module and 2 sockets which each accept one motor starter protector. A choice of two versions with infeed on the left or right is available. The infeed is connected using spring-type terminals. The spring-type terminals permit conductor cross-sections of up to 25 mm<sup>2</sup> with end sleeves. An end cover is supplied with each module.

### ② Three-phase busbars for system expansion

The three-phase busbars for system expansion allow the system to be expanded. There is a choice of modules with 2 or 3 sockets. The system can be expanded as required up to a maximum current carrying capacity of 63 A. An expansion plug is supplied with each module.

#### ③<sup>a</sup> Expansion plug

The expansion plug is used for electrical connection of adjacent three-phase busbars. The current carrying capacity of this plug equals 63 A. One expansion plug is supplied with each three-phase busbar for system expansion. Additional expansion plugs are therefore only required as spare parts.

#### ③<sup>b</sup> Extra-wide expansion plug

The wide expansion plug makes the electrical connection between two three-phase busbars, thus performing the same function as the 3RV29 17-5BA00 expansion plug; the electrical characteristics (e.g. a current carrying capacity of 63 A) are identical.

The 3RV29 17-5E expansion plug is 10 mm wider than the 3RV29 17-5BA00 expansion plug, hence in the plugged state there is a distance of 10 mm between the connected three-phase busbars. This distance can be used to lay the auxiliary current and control current wiring ("wiring duct"). The motor starter protector and contactor can be wired from underneath, which means that the complete cable duct above the system can be omitted.

### ④ End cover

The end cover is used to cover the three-phase busbar at the open end of the system. This cover is therefore only required once for each system. An end cover is supplied with each three-phase busbar system with infeed. Further end covers are therefore only required as spare parts.

### ⑤ Plug-in connector

The plug-in connector is used for the electrical connection between the three-phase busbar and the 3RV2 motor starter protector. These plug-in connectors are available in versions for screw or spring-type terminals.

### ⑥ Contactor base

Motor starters can be assembled in the system using the contactor base. The contactor bases are suitable for contactors sizes S00 and S0 with spring-type and screw terminals and are simply snapped onto the three-phase busbars. Direct-on-line starters and reversing starters are possible. One contactor base is required for direct-on-line starters and two are required for reversing starters.

To assemble motor starters for reversing starters, the contactor bases can be arranged alongside each other (90 mm overall width). In this case the mechanical interlocking of the contactors is possible. The contactor bases are also suitable for soft starters size S00 and S0 with screw connection.

The infeed system is designed for mounting on a 35 mm standard mounting rail with 7.5 mm overall depth. This standard mounting rail gives the contactor base a stable mounting surface to sit on. If standard mounting rails with a depth of 15 mm are used, the spacer connected to the bottom of the contactor base must be knocked out and plugged into the mating piece that is also on the underside. Then the contactor base also has a stable mounting surface. When standard mounting rails with a depth of 7.5 mm are used, the spacer has no function and can be removed.

The link modules are used for direct start motor starters, in which case the use of a contactor base is not absolutely necessary. Motor starter protector and contactor assemblies can then be directly snapped onto the sockets of the three-phase busbars. For starters of size S00 and S0, the corresponding 3RA19 21-1...., 3RA29 11-2...., 3RA29 21-1.... or 3RA29 21-2.... link modules should generally be used.

### ⑦ Terminal block

The 3RV29 17-5D terminal block enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components. Using the terminal block the 3 phases can be fed out of the system; which means that single-phase loads can also be integrated in the system. The terminal block is plugged into the slot of the expansion plug and thus enables outfeeding from the middle or end of the infeed system. The terminal block can be rotated through 180° and be locked to the support modules of the infeed system. The 3RV19 17-7B 45 mm standard mounting rail for screwing onto the support plate is available in addition in order to be able to plug the single-phase, 2-phase and 3-phase components onto the infeed system.

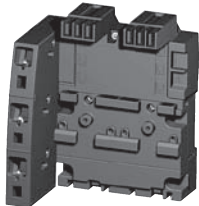
# Accessories

## 3RV29 infeed system

### Selection and ordering data

Type	Version	For 3RV20, 3RV23, 3RV24 motor starter protectors	Order No.	Standard Pack Quantity	Weight approx.
		Size			kg

#### Three-phase busbars with infeed



**3-phase busbars with infeed**  
incl. end cover  
3RV29 17-6A

For 2 motor starter protectors with screw connection or spring-type terminals

- With infeed on the left S00, S0
- With infeed on the right S00, S0

**3RV29 17-1A**

1 unit

0.369

**3RV29 17-1E**

1 unit

0.369

3RV29 17-1A

#### Three-phase busbars for system expansion



**Three-phase busbars**  
incl. 3RV29 17-5BA00 expansion plug

For motor starter protectors with screw connection or spring-type terminals

- For 2 motor starter protectors S00, S0
- For 3 motor starter protectors S00, S0

**3RV29 17-4A**

1 unit

0.229

**3RV29 17-4B**

1 unit

0.328

3RV29 17-4A

#### Plug-in connectors



3RV29 17-5AA00

**Plug-in connectors**  
to make contact with the motor starter protectors

- For spring-type terminals
  - Single-unit packaging S00<sup>1)</sup> S0<sup>2)</sup>
  - Multi-unit packaging S00<sup>1)</sup> S0<sup>2)</sup>

**Spring-type terminals**



**3RV29 17-5AA00**

1 unit

0.046

**3RV29 27-5AA00**

1 unit

0.059

**3RV29 17-5A**

10 units

0.046

**3RV29 27-5A**

10 units

0.059



3RV29 17-5CA00

- For screw terminals
  - Single-unit packaging S00<sup>1)</sup> S0<sup>2)</sup>
  - Multi-unit packaging S00<sup>1)</sup> S0<sup>2)</sup>

**Screw terminals**



**3RV29 17-5CA00**

1 unit

0.029

**3RV19 27-5AA00**

1 unit

0.040

**3RV29 17-5C**

10 units

0.029

**3RV19 27-5A**

10 units

0.036

Type	Version	For contactors	Order No.	Standard Pack Quantity	Weight approx.
		Size			kg

#### Contactor bases



3RV29 27-7AA00

**Contactor bases**  
for mounting  
direct-on-line or  
reversing starters

- Single-unit packaging S00
- S00, S0

**3RV29 17-7AA00**

1 unit

0.042

**3RV29 27-7AA00**

1 unit

0.050






<sup>1)</sup> I > 14 A, note derating; see the system manual "SIRIUS Innovations", Chapter "Motor Starter Protectors".

<sup>2)</sup> I > 16 A, note derating; see the system manual "SIRIUS Innovations", Chapter "Motor Starter Protectors".



# Accessories

## 3RV29 infeed system

Type	Version	Order No.	Standard Pack Quantity	Weight approx. kg
<b>Terminal blocks</b>				
 3RV29 17-5D	<b>Terminal blocks</b> For integration of single-phase, two-phase and three-phase components	Single-unit packaging <b>3RV29 17-5D</b>	1 unit	0.049
<b>45 mm standard mounting rails</b>				
 3RV19 17-7B	<b>45 mm standard mounting rails</b> for mounting onto bus bar adapters	Single-unit packaging <b>3RV19 17-7B</b>	1 unit	0.261
<b>Extra-wide expansion plugs</b>				
 3RV29 17-5E	<b>Extra-wide expansion plugs as accessory</b>	Single-unit packaging <b>3RV29 17-5E</b>	1 unit	0.037
<b>Expansion plugs</b>				
 3RV29 17-5BA00	<b>Expansion plugs<sup>1)</sup></b> as spare part	Single-unit packaging <b>3RV29 17-5BA00</b>	1 unit	0.026
<b>End covers</b>				
 3RV29 17-6A	<b>End covers<sup>2)</sup></b> as spare part	Multi-unit packaging <b>3RV29 17-6A</b>	10 units	0.005

<sup>1)</sup> The expansion plug is included in the scope of supply of the 3RV29 17-4 three-phase busbars for system expansion.  
<sup>2)</sup> The end cover is included in the scope of supply of the 3RV29 17-1 three-phase busbars with infeed system.

# General Data

## 3RV – up to 100 A (Domestic applications)

### Permissible rated data of devices approved for North America (UL/CSA)

Motor starter protectors of the 3RV2 series are approved for UL/CSA, and according to UL508/UL 60947-4-1 and CSA C22.2 No. 14/CSA C22.2 No. 60947-4-1 they can be used on their own or as load feeders in combination with a contactor.

These motor starter protectors can be used as "Manual Motor Controllers" for "Group Installations", as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" and as "Self-Protected Combination Motor Controllers" (Type E).

### 3RV motor starter protectors as "Manual Motor Controllers"

If used as a "Manual Motor Controller", the motor starter protector is always operated in combination with an upstream short-circuit protection device. Approved fuses or a circuit breaker according to UL 489/CSA C22.2 No. 5 can be used. These devices must be dimensioned according to the National Electrical Code (UL) or Canadian Electrical Code (CSA).

Approval of the 3RV as a Manual Motor Controller can be found under the following file numbers:

- UL File No. 47705, CCN: NLRV,
- CSA Master Contract 165071, Product Class: 3211 05.

Motor starter protectors	hp rating <sup>1)</sup> for FLA <sup>2)</sup> max.		Rated current $I_n$	240 V AC UL/CSA $I_{bc}$ <sup>3)</sup>	480 V AC UL/CSA $I_{bc}$ <sup>3)</sup>	600 V AC UL/CSA $I_{bc}$ <sup>3)</sup>				
	1-phase	3-phase								
Type	V		A	kA	kA	kA				
<b>Size S00</b>										
<b>3RV2011, 3RV2111, 3RV2311, 3RV2411</b>			0.16 ... 2	65	65	30				
FLA <sup>2)</sup> max.	115	1	2	65	65	30				
16 A, 480 V	200	2	3	65	65	30				
12.5 A, 600 V	230	2	5	65	65	30				
	460	--	10	65	65	30				
	575/600	--	10	8	65	30				
				10	65	30				
				12.5	65	30				
				16	65	—				
<b>Size S0</b>										
<b>3RV2021, 3RV2121, 3RV2321, 3RV2421</b>			0.16 ... 12.5	65	65	30				
FLA <sup>2)</sup> max.	115	3	5	65	65	--/(30) <sup>4)</sup>				
40 A, 480 V	200	5	10	65	50	--				
	230	7 1/2	10	65	12	--				
	460	--	30							
	575/600	--	--							
<b>Size S2</b>				<b>3RV2031</b>	<b>3RV2032</b>	<b>3RV2031</b>	<b>3RV2032</b>	<b>3RV2031</b>	<b>3RV2032</b>	
<b>3RV2031, 3RV2131, 3RV2331, 3RV2032, 3RV2332</b>			14	65	100	65	100	25	25	
			17	65	100	65	100	25	25	
			20	65	100	65	100	25	25	
FLA <sup>2)</sup> MAX. 65A	115/120	5	10	25	65	100	100	25	25	
600V	200/208	10	20	32	65	100	100	25	25	
NEMA size 2	230/240	15	25	36	65	100	100	25	25	
	460/480	—	50	40	65	100	100	22	22	
	575/600	—	60	45	65	100	100	22	22	
				52	65	100	100	22	22	
		a) with max 225A Class J fuse		59	65 <sup>a)</sup>	100 <sup>a)</sup>	65 <sup>a)</sup>	100 <sup>a)</sup>	20 <sup>a)</sup>	25 <sup>a)</sup>
		b) with max 250A Class J fuse		65	65 <sup>b)</sup>	100 <sup>b)</sup>	65 <sup>b)</sup>	100 <sup>b)</sup>	20 <sup>b)</sup>	25 <sup>b)</sup>
<b>Size S3</b>										
<b>3RV20 41/3RV20 42, 3RV21 42, 3RV23 41/3RV23 42</b>			16	65		65		30		
FLA <sup>2)</sup> max. 99 A,	115	7 1/2	--	20	65	65		30		
600 V	200	20	30	25	65	65		30		
NEMA size 3	230	20	40	32	65	65		30		
	460	--	75	40	65	65		30		
	575/600	--	100	50	65	65		30		
				63	65	65		30		
				75	65	65		30		
				90	65	65		10		
				100	65	65		10		

1) HP rating = Power rating in horse power (maximum motor rating).  
 2) FLA = Full Load Amps/Motor full load current.  
 3) Corresponds to "short-circuit breaking capacity" according to UL/CSA.  
 4) The values in brackets only apply to 3RV2.23 motor starter protectors.

# General Data

## 3RV – up to 100 A (Domestic applications)

### 3RV motor starter protectors as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations"

The application as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" is only available from UL.

CSA does not recognize this approval! When the motor starter protector is used as a "Manual Motor Controller Suitable for Tap Conductor Protection in Group Installations", it must always be combined with upstream short-circuit protection. As short-circuit-protection device, approved fuses or a motor starter

protector according to UL 489 can be used.

These devices must be dimensioned according to the National Electrical Code.

The 3RV motor starter protectors are approved as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" under the following file number:

- UL File No. 47705, CCN: NLRV.

Motor starter protectors	hp rating <sup>1)</sup> for FLA <sup>2)</sup> max.		Rated current $I_n$ A	240 V AC	Up to 480Y/277V AC	Up to 600Y/347V AC
	1-phase	3-phase		UL $I_{bc}$ <sup>3)</sup> kA	UL $I_{bc}$ <sup>3)</sup> kA	UL $I_{bc}$ <sup>3)</sup> kA
Type	V			kA	kA	kA
<b>Size S00</b>						
<b>3RV20 11</b>						
FLA <sup>2)</sup> max. 16 A, 480 Y / 277 V	115/120	1	0.16 ... 0.8	65	65	30
NEMA size 0	200/208	2	1	65	65	30
	230/240	2	1.25	65	65	30
	460/480	--	2	65	65	30
	575/600	--	2.5	65	65	30
			3.2	65	65	30
			4	65	65	30
			5	65	65	30
			6.3	65	65	30
			8	65	65	30
			16	65	65	—
<b>Size S0</b>						
<b>3RV20 21</b>						
FLA <sup>2)</sup> max. 25 A, 480 Y / 277 V	115/120	2	0.63 ... 1.6	65	65	30
12.5 A, 600 V	200/208	3	2	65	65	30
NEMA size 1	230/240	3	2.5	65	65	30
	460/480	3	3.2	65	65	30
	575/600	—	4	65	65	30
			5	65	65	30
			6.3	65	65	30
			8	65	65	30
			10	65	65	30
			12.5	65	65	30
			25	65	65	—
			32	50	50	—
<b>Size S2</b>						
<b>3RV2031, 3RV2032, 3RV2431</b>						
FLA <sup>2)</sup> MAX. 65A 600V	115/120	5	14	65	100	25
NEMA size 2	200/208	10	17	65	100	25
	230/240	15	20	65	100	25
	460/480	—	25	65	100	25
	575/600	—	32	65	100	25
			36	65	100	25
			40	65	100	22
			45	65	100	22
			52	65	100	22
			59	65	100	--
			65	65	100	--
<b>Size S3</b>						
<b>3RV20 4.</b>						
FLA <sup>2)</sup> max. 100 A, 480 V	115/120	7 1/2	16	65	65	30
75 A, 600 V	200/208	20	20	65	65	30
NEMA size 3	230/240	20	25	65	65	30
	460/480	--	32	65	65	30
	575/600	--	40	65	65	30
			50	65	65	30
			63	65	65	30
			75	65	65	30
			90	65	65	--
			100	65	65	--

<sup>1)</sup> HP rating = Power rating in horse power (maximum motor rating).

<sup>2)</sup> FLA = Full Load Amps/Motor full load current.

<sup>3)</sup> Complies with "short-circuit breaking capacity" according to UL.

# General Data

## 3RV – up to 100 A (Domestic applications)

3RV motor starter protectors as "Self-Protected Combination Motor Controllers (Type E)"

UL 508/UL 60947-4-1 approval demands 1-inch clearance and 2-inch creepage distance at line side for "Self-Protected Combination Motor Controller Type E".

Therefore, 3RV20 motor starter protectors of sizes S00 to S2 are approved according to UL 508/UL 60947-4-1 in combination with the terminal blocks listed below.

CSA does not require these extended clearances and creepage distances. According to CSA, these terminal blocks can be omitted

when the device is used as a "Self-Protected Combination Motor Controller".

The 3RV20 motor starter protectors are approved as "Self-Protected Combination Motor Controllers" under the following file numbers:

- UL File No. E156943, CCN: NKJH
- CSA Master Contract 165071, Product Class: 3211 08

1  
MOTOR STARTER  
PROTECTORS

Motor starter protectors	hp rating <sup>1)</sup> for FLA <sup>2)</sup> max.		Rated current I <sub>n</sub>	Up to 240 V AC UL/CSA I <sub>bc</sub> <sup>3)</sup>	Up to 480 Y/277 V AC UL/CSA I <sub>bc</sub> <sup>3)</sup>	Up to 600 Y/347 V AC UL/CSA I <sub>bc</sub> <sup>3)</sup>
	Type	V				
<b>Size S00</b>						
<b>3RV2011 + 3RV29 28-1H<sup>4)</sup></b>			0.16 ... 12.5 16	65 65	65 65	30 —
FLA <sup>2)</sup> max. 16 A	115	1	2			
480 V	200	2	3			
NEMA size 0	230	2	5			
	230	—	10			
	575/600	—	10			
<b>Size S0</b>						
<b>3RV2021 + 3RV29 28-1H<sup>4)</sup></b>			0.63 ... 1.6 2 2.5	65 65 65	65 65 65	30 30 30
FLA <sup>2)</sup> max.	115	2	5			
25 A, 480 V	200	3	7.5			
12.5 A, 600 V	230	3	10			
	460	—	20			
NEMA size 1	575/600	—	—			
			6.3	65	65	30
			8	65	65	30
			10	65	65	30
			12.5	65	65	30
			16	65	65	—
			20	65	65	—
			22	65	65	—
			25	65	65	—
			32	50	50	—
<b>Size S2</b>						
<b>3RV2031/3RV2032 + 3RV2938-1K<sup>4)</sup></b>			14 17 20 25	65 65 65 65	100 100 100 100	25 25 25 25
FLA <sup>2)</sup> MAX. 65A	115/120	5	10			
600V	200/208	10	20			
NEMA size 2	230/240	15	25			
	460/480	—	50			
	575/600	—	60			
			32	65	100	25
			36	65	100	25
			40	65	100	22
			45	65	100	22
			52	65	100	22
			59	65	100	20
			65	65	100	20
<b>Size S3</b>						
<b>3RV2041 + 3RT2946-4GA07<sup>4)</sup></b>			16 20 25	65 65 65	65 65 65	30 30 30
FLA <sup>2)</sup> max.	115	10	—			
100 A, 480 V	200	20	30			
75 A, 600 V	230	20	40			
	460	—	75			
NEMA size 3	575/600	—	75			
			63	65	65	30
			75	65	65	30
			90	65	65	—
			100	65	65	—
<b>Ratings of the auxiliary switches and alarm switches</b>				<b>Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC and signalling switch</b>	<b>Transverse auxiliary switch with 1 changeover contact</b>	<b>Transverse auxiliary switch with 1 NO + 1 NC, 2 NO</b>
Max. rated voltage	• to NEMA Ⓢ		AC V	600		250
	• to NEMA Ⓞ		AC V	600		250
Uninterrupted current			A	10	5	2.5
Breaking capacity				A600 Q300	B600 R300	C300 R300

1) HP rating = Power rating in horse power (maximum motor rating).

2) FLA = Full Load Amps/Motor full load current.

3) Corresponds to "short-circuit breaking capacity" according to UL/CSA.

4) Not required for CSA.

5) Alternatively, the 3RV2928-1K phase barrier can also be used.



# General Data

## 3RV27/28 circuit breakers

### 3RV27/28 circuit breakers

These circuit breakers are approved according to UL 489 and CSA C22.2 No. 5-02 for 100 % rated current (100 % rated breaker). They can be used therefore as upstream short-circuit protective devices for "Manual Motor Controllers" and "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations".

The 3RV27/28 circuit breakers are approved under the following file numbers:

- UL File No. E235044, CCN: DIVQ,
- CSA Master Contract 165071, Product Class: 1432 01.

Circuit breakers	Rated current $I_n$	240 V AC UL/CSA $I_{bc}^{(1)}$ kA	480 Y/277 V AC UL/CSA $I_{bc}^{(1)}$ kA	480 V AC UL/CSA $I_{bc}^{(1)}$ kA	600 Y/347 V AC UL/CSA $I_{bc}^{(1)}$ kA
Type	A				
<b>Size S00/S0</b>					
<b>3RV27 11 / 3RV28 11</b>	0.16 ... 1.25	65	65	65	10
<b>3RV27 21 / 3RV28 21</b>	1.6	65	65	65	10
	2	65	65	65	10
	2.5	65	65	65	10
	3.2	65	65	65	10
	4	65	65	65	10
	5	65	65	65	10
	6.3	65	65	65	10
	8	65	65	65	10
	10	65	65	65	10
	12.5	65	65	65	10
	15	65	65	65	--
	20	50	50	50	--
	22	50	50	50	--
<b>Size S3</b>					
<b>3RV27 42</b>	10	65	65	65	20
	15	65	65	65	20
	20	65	65	65	20
	25	65	65	65	20
	30	65	65	65	20
	35	65	65	--	20
	40	65	65	--	20
	45	65	65	--	20
	50	65	65	--	20
	60	65	65	--	20
	70	65	65	--	10

1) Complies with "short-circuit breaking capacity" according to UL.

# General Data

## 3RV – up to 100 A (Export applications)

MOTOR STARTER PROTECTORS

### Technical specifications

#### Short-circuit breaking capacity $I_{cu}$ , $I_{cs}$ acc. to IEC 60947-2

This table shows the rated ultimate short-circuit breaking capacity  $I_{cu}$  and the rated service short-circuit breaking capacity  $I_{cs}$  of the 3RV2 motor starter protectors/circuit breakers with different inception voltages dependent of the rated current  $I_n$  of the motor starter protectors/circuit breakers.

Power can be supplied to the motor starter protectors/circuit breakers via the terminals at the top or at the bottom without restricting the rated data. If the short-circuit current at the place of installation exceeds the rated short-circuit breaking capacity of the motor starter protector/circuit breaker as specified in the

table, a back-up fuse is required. It is also possible to install an upstream motor starter protector/circuit breaker with a limiter function.

The maximum rated current for the back-up fuse is specified in the tables. The rated ultimate short-circuit breaking capacity then applies as specified on the fuse.

#### Fuseless construction

Motor starter protector contactor combinations for short-circuit currents up to 150 kA can be ordered in the form of fuseless load feeders according to Chapter 6.

Motor starter protectors/circuit breakers	Rated current $I_n$	Up to 240 V AC <sup>1)</sup>			Up to 400 V <sup>1)</sup> /415 V AC <sup>2)</sup>			Up to 440 V <sup>1)</sup> /460 V AC <sup>2)</sup>			Up to 500 V <sup>1)</sup> /525 V AC <sup>2)</sup>			Up to 690 V AC <sup>1)</sup>		
		$I_{cu}$	$I_{cs}$	Max. fuse (gL/gG)	$I_{cu}$	$I_{cs}$	Max. fuse (gL/gG) <sup>3)</sup>	$I_{cu}$	$I_{cs}$	Max. fuse (gL/gG) <sup>3)</sup>	$I_{cu}$	$I_{cs}$	Max. fuse (gL/gG) <sup>3)</sup>	$I_{cu}$	$I_{cs}$	Max. fuse (gL/gG) <sup>3)4)</sup>
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
<b>Size S00</b>																
3RV2.11	0.16 ... 1	100	100	°	100	100	°	100	100	°	100	100	°	100	100	°
	1.25; 1.6	100	100	°	100	100	°	100	100	°	100	100	°	100	100	°
	2; 2.5	100	100	°	100	100	°	100	100	°	100	100	°	10	10	25
	3.2; 4	100	100	°	100	100	°	50	10	°	100	100	°	10; 6	10; 4	32
	5; 6.3	100	100	°	100	100	°	50	10	°	100	100	°	6	4	32
	8	100	100	°	50	12.5	°	50	50	63	42	42	63	6	4	50
	10	100	100	°	50	12.5	°	50	50	80	42	42	63	6	4	50
12	100	100	°	50	12.5	°	50	50	80	42	42	80	4	4	63	
16	100	100	°	55	30	100	50	10	80	10	5	80	4	4	63	
<b>Size S0</b>																
3RV2.21	16	100	100	°	55	25	100	50	10	80	10	5	80	4	2	63
	20	100	100	°	55	25	125	50	10	80	10	5	80	4	2	63
	22	100	100	°	55	25	125	50	10	100	10	5	80	4	2	63
	25	100	100	°	55	25	125	50	10	100	10	5	80	4	2	63
	28	100	100	°	55	25	125	30	10	125	10	5	100	4	2	100
	32	100	100	°	55	25	125	30	10	125	10	5	100	4	2	100
	36	100	100	°	20	10	125	12	8	125	6	3	100	3	2	100
	40	100	100	°	20	10	125	12	8	125	6	3	100	3	2	100
<b>Size S2</b>																
3RV2.31	14; 17	100	100	°	65	30	100	50	25	100	12	6	63	5	3	63
	20	100	100	°	65	30	100	50	25	100	12	6	80	5	3	80
	25	100	100	°	65	30	100	50	15	100	12	6	80	5	3	80
	32; 36	100	100	°	65	30	125	50	15	125	10	5	100	4	2	100
	40; 45	100	100	°	65	30	160	50	15	125	10	5	100	4	2	100
	52	100	100	°	65	30	160	50	15	125	10	5	125	4	2	125
	59 ... 80	Values on request														
<b>Size S2, with increased switching capacity</b>																
3RV2.32	14; 17	100	100	°	100	50	°	65	30	100	18	10	63	8	5	63
	20; 25	100	100	°	100	50	°	65	30	100	18	10	80	8	5	80
	32 ... 45	100	100	°	100	50	°	65	30	125	15	8	100	6	4	100
	52	100	100	°	100	50	°	65	30	125	15	8	125	6	4	125
59 ... 80	Values on request															
<b>Size S3</b>																
3RV2.41	40	100	100	°	50	25	125	50	20	125	12	6	100	6	3	63
	50	100	100	°	50	25	125	50	20	125	12	6	100	6	3	80
	63	100	100	°	50	25	160	50	20	160	12	6	100	6	3	80
	75	100	100	°	50	25	160	50	20	160	8	4	125	5	3	100
	90; 100	100	100	°	50	25	160	50	20	160	8	4	125	5	3	125

Short-circuit resistant up to at least 50 kA

° No back-up fuse required, since short-circuit resistant up to 100 kA

1) 10 % overvoltage.

2) 5 % overvoltage.

3) Back-up fuse only required if the short-circuit current at the place of installation >  $I_{cu}$ .

4) Alternatively, fuseless limiter combinations for 690 V AC can also be used.

# General Data

## 3RV – up to 100 A (Export applications)

### Short-circuit breaking capacity $I_{cuIT}$ in the IT system (IT network) according to IEC 60947-2

3RV motor starter protectors are suitable for operation in IT systems. Values valid for triple-pole short-circuit are  $I_{cu}$  up to  $I_{cs}$ . In case of double ground fault on different phases at the input and output side of a motor starter protector, the special short-circuit breaking capacity  $I_{cuIT}$  applies. The specifications in the table below apply to 3RV motor starter protectors.

In the colored areas,  $I_{cuIT}$  is 100 kA, or in some ranges it is 50 kA. Therefore the motor starter protectors are short-circuit resistant in these ranges.

If the short-circuit current at the place of installation exceeds the rated short-circuit breaking capacity of the motor starter protector as specified in the table, a back-up fuse is required. The maximum rated current for the back-up fuse is specified in the tables. The rated short-circuit breaking capacity then applies as specified on the fuse.

Motor starter protectors	Rated current $I_n$	Up to 240 V AC <sup>1)</sup>		Up to 400 V <sup>1)</sup> /415 V AC <sup>2)</sup>		Up to 500 V <sup>1)</sup> /525 V AC <sup>2)</sup>		Up to 690 V AC <sup>1) 5)</sup>	
		$I_{cuIT}$	Max. fuse (gL/gG) <sup>3)</sup>	$I_{cuIT}$	Max. fuse (gL/gG) <sup>3)4)</sup>	$I_{cuIT}$	Max. fuse (gL/gG) <sup>3)</sup>	$I_{cuIT}$	Max. fuse (gL/gG) <sup>3)</sup>
Type	A	kA	A	kA	A	kA	A	kA	A
<b>Size S00</b>									
3RV20, 3RV26 11-0BD10	0.16 ... 0.63 0.8; 1 1.25; 1.6 2; 2.5 3.2; 4 5; 6.3 8; 10 12.5 16	100 100 100 100 100 100 100 100 55	° ° ° ° ° ° ° ° 80	100 100 100 8;4 4 4 4 4	° ° ° 25 32 32:50 50 63 63	On request	On request	On request	On request
<b>Size S0</b>									
3RV2.21	16 20 22 25 28 32 36 40	55 55 55 55 55 55 20 20	80 80 80 80 80 80 80 80	4 4 4 4 2 2 2 2	63 63 63 63 63 63 63 63	2 2 2 2 2 2 2 2	50 50 50 50 63 63 63 63	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	40 50 50 50 63 63 63 63
<b>Size S2</b>									
3RV2.31	14...25 32...45 52 59 ... 80	100 100 100 Values on request	° ° °	8 6 4	100 125 160	6 4 3	80 100 125	4 3 2	63 80 100
<b>Size S2, with increased switching capacity</b>									
3RV2.32	14 ... 25 32 ... 45 52 59 ... 80	100 100 100 Values on request	° ° °	8 6 6	100 125 160	6 6 6	80 100 125	4 4 4	63 80 100
<b>Size S3</b>									
3RV2.41	40 50 63 75 90; 100	50 50 50 50 50	125 125 160 160 160	10 8 6 5 5	63 80 80 100 125	5 3 3 2 2	50 63 63 80 100	5 3 3 2 2	50 63 63 80 100

Short-circuit resistant up to at least 50 kA  
 ° No back-up fuse required, since short-circuit resistant up to 100 kA

1) 10 % overvoltage.  
 2) 5 % overvoltage.  
 3) Back-up fuse only required, if short-circuit current at the place of installation >  $I_{cuIT}$ .  
 4) Alternatively, fuseless limiter combinations for 690 V AC can also be used.  
 5) Over-voltage category II applies for applications on IT systems > 600V

# General Data

3RV – up to 100 A

MOTOR STARTER PROTECTORS 1

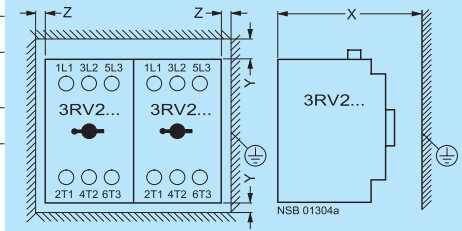
## Technical data

### Rules for mounting motor starter protectors/circuit breakers

When mounting MSPs, the following clearance must be maintained to grounded or live parts.

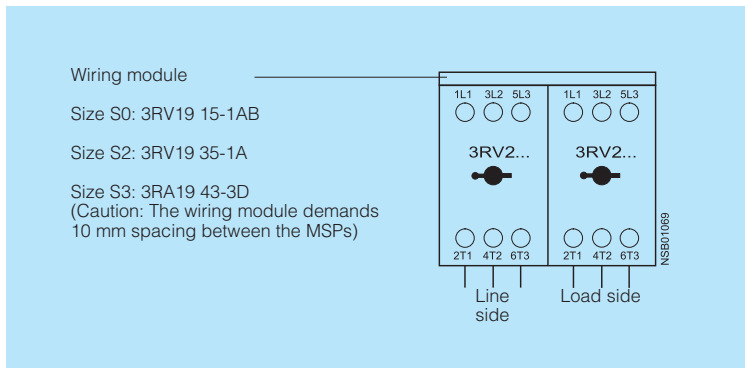
SIRIUS MSP			Clearance to grounded or live parts		
Type	size		Y mm	X mm	at the side Z mm
3RV2.1	S00	up to 690 V	30	70	9
3RV2. 2	S0 <sup>2)</sup>	up to 500 V up to 690 V	30 50 <sup>1)</sup>	90 90	9 30
3RV2. 3	S2	up to 690 V	50	—	10
3RV2. 4	S3	up to 240 V	50	167	10
		up to 440 V	70	167	10
		up to 500 V	110	167	10
		up to 690 V	150	167	30
3RV27 42	S3	up to 240 V up to 400 V	90 90	167 167	10 10

Minimum clearance between MSPs and grounded or live parts



- 1) Up to and including the setting range of 32 A. For the 36/40 A setting range the clearance is 70 mm.
- 2) In conjunction with the type E terminal block 3RV2928-1H the applicable lateral clearance is 30 mm for all voltages.

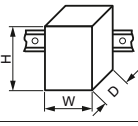
Standard mounting for S0, S2 and S3





# General Data

3RV – up to 80 A

General data		3RV2.1.	3RV2.2.	3RV2.3.	3RV27, 3RV28
<b>Type</b>		S00	S0	S2	S00, S0
Size					
Dimensions (W x H x D)		mm	mm	mm	mm
• Screw terminals		45 x 97 x 91	45 x 97 x 91	55 x 140 x 149	45 x 144 x 92
• Spring-type terminals		45 x 106 x 91	45 x 119 x 91	--	--
<b>Standards</b>		Yes			
• IEC 60947-1, EN 60947-1 (VDE 0660 Part 100)		Yes			
• IEC 60947-2, EN 60947-2 (VDE 0660 Part 101)		Yes			
• IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)		Yes	Yes	Yes	--
• UL 508/UL 60947-4-1, CSA C22.2 No. 14/CSA C22.2 No. 60947-4-1		Yes	Yes	Yes	--
• UL 489, CSA C22.2 No. 5		--	--	--	Yes
<b>Number of poles</b>		3			
<b>Max. rated current <math>I_n</math> max (= max. rated operational current <math>I_e</math>)</b>	A	16	40	80	22
<b>Permissible ambient temperature</b>					
• Storage/transport		°C	-50 ... +80		
• Operation	$I_n$ : 0.16 ... 32 A	°C	-20 ... +70	--	
	$I_n$ : 36 ... 40 A	°C	(current reduction above +60 °C)	--	
			-20 ... +40		
			(the devices must not be mounted side-by-side and they must not be assembled with link modules with contactors. A lateral clearance of 9 mm is required.)		
	$I_n$ : 14 ... 80 A	°C	--	-20 ... +70	--
				(current reduction above +60 °C)	
<b>Permissible rated current at inside temperature of control cabinet</b>					
• +60 °C	%	100			
• +70 °C	%	87			
<b>Permissible rated current at ambient temperature of enclosure (applies for motor starter protector/circuit breaker inside enclosure ≤ 32 A)</b>					
• +35 °C	%	100		On request	100
• +60 °C	%	87			87
<b>Rated operational voltage <math>U_e</math></b>		V AC	690 (when a molded-plastic enclosure is used only 500 V)		
• Acc. to IEC		V AC	600		
• Acc. to UL/CSA					
<b>Rated frequency</b>		Hz	50/60		
<b>Rated insulation voltage <math>U_i</math></b>		V	690		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		kV	6		
<b>Utilization category</b>					
• IEC 60947-2 (motor starter protector/circuit breaker)		A			
• IEC 60947-4-1 (motor starter)		AC-3			
<b>Trip class CLASS</b>	Acc. to IEC 60947-4-1	10		10/20	--
<b>DC short-circuit breaking capacity</b> (time constant $t = 5$ ms)					
• 1 conducting path 150 V DC	kA	10		On request	10
• 2 conducting paths in series 300 V DC	kA	10			10
• 3 conducting paths in series 450 V DC	kA	10			10
<b>Power loss <math>P_V</math> for each motor starter protector/circuit breaker</b>		W			
$I_n$ : 0.16 ... 0.63 A	W	5	--	--	5
$I_n$ : 0.8 ... 6.3 A	W	6	--	--	6
$I_n$ : 8 ... 16 A	W	7	--	--	7
Dependent on the rated current $I_n$ (upper setting range)					
$I_n$ : 16 A	W	--	7	10	7
$I_n$ : 17 ... 25 A	W	--	8	12	8
$I_n$ : 28 ... 32 A	W	--	11	14	--
$I_n$ : 36 ... 40 A	W	--	14	15	--
$I_n$ : 45 ... 52 A	W	--	--	17	--
$I_n$ : ... 80 A	W	--	--	On request	--
$R_{per\ conducting\ path} = \frac{P}{I^2 \times 3}$					
<b>Shock resistance</b>	Acc. to IEC 60068-2-27	g/ms	25/11 (square and sine pulse)		
<b>Degree of protection</b>	Acc. to IEC 60529		IP20		
<b>Touch protection</b>	Acc. to EN 50274		Finger-safe for vertical contact from the front		
<b>Temperature compensation</b>	Acc. to IEC 60947-4-1	°C	-20 ... +60		
<b>Phase failure sensitivity</b>	Acc. to IEC 60947-4-1		Yes (only for 3RV23 motor starter protectors)		No
<b>Explosion protection – Safe operation of motors with "increased safety" type of protection</b>			Yes (only for 3RV20 motor starter protectors)		
EC type test certificate number according to directive 94/9/EC (ATEX)			DMT 02 ATEX F 001	II (2) GD	On request
					No

# General Data

3RV – up to 80 A

MOTOR STARTER PROTECTORS 1

Conductor cross-sections of main circuit						
Type		3RV2.11	3RV2.21	3RV2.31-4B1., 3RV2.31-4D.1., 3RV2.31-4E.1., 3RV2.31-4P.1., 3RV2.31-4S.1., 3RV2.31-4T.1., 3RV2.31-4U.1., 3RV2.31-4V.1.	3RV2.31-4J.1., 3RV2.31-4K.1., 3RV2.31-4R.1., 3RV2.31-4W.1., 3RV2.31-4X.1., 3RV2431-4VA1., 3RV2.32	3RV27, 3RV28
Size		S00	S0	S2		S00, S0
<b>Connection type</b>		<b>Screw terminals</b>				
<b>Terminal screw</b>		M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2		M4, Pozidriv size 2
<b>Operating devices</b>	mm	∅ 5 ... 6	∅ 5 ... 6	∅ 5 ... 6		∅ 5 ... 6
<b>Prescribed tightening torque</b>	Nm	0.8 ... 1.2	2 ... 2.5	3.0 ... 4.5		2.5 ... 3
<b>Conductor cross-sections (min./max.),</b> 1 or 2 conductors can be connected						
• Solid or stranded	mm <sup>2</sup>	2 x (0.75 ... 2.5) <sup>1)</sup> , 2 x 4	2 x (1 ... 2.5) <sup>1)</sup> , 2 x (2.5 ... 10) <sup>1)</sup>	2 x (1 ... 25) <sup>1)</sup> , 1 x (1 ... 35) <sup>1)</sup>	2 x (1 ... 35) <sup>1)</sup> , 1 x (1 ... 50) <sup>1)</sup>	2 x (1 ... 10) <sup>1)</sup> , max. 1 x 25
• Finely stranded with end sleeve (DIN 46228-1)	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> , 2 x (0.75 ... 2.5) <sup>1)</sup>	2 x (1 ... 2.5) <sup>1)</sup> , 2 x (2.5 ... 6) <sup>1)</sup> , 1 x 10	2 x (1 ... 16) <sup>1)</sup> , 1 x (1 ... 25) <sup>1)</sup>	2 x (1 ... 25) <sup>1)</sup> , 1 x (1 ... 35) <sup>1)</sup>	1 x (1 ... 16), max. 6 + 16
• AWG cables, solid or stranded	AWG	2 x (20 ... 16) <sup>1)</sup> , 2 x (18 ... 12) <sup>1)</sup>	2 x (16 ... 12) <sup>1)</sup> , 2 x (14 ... 8) <sup>1)</sup>	2 x (18 ... 3) <sup>1)</sup> , 1 x (18 ... 2) <sup>1)</sup>	2 x (18 ... 2) <sup>1)</sup> , 1 x (18 ... 1) <sup>1)</sup>	2 x (14 ... 10)
<b>Connection type</b>		<b>Spring-type terminals</b>				
<b>Operating devices</b>	mm	3.0 x 0.5 and 3.5 x 0.5				
<b>Conductor cross-sections (min./max.),</b> 1 or 2 conductors can be connected						
• Solid or stranded	mm <sup>2</sup>	2 x (0.5 ... 4)	2 x (1 ... 10)	--		
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--		
• Finely stranded with end sleeve (DIN 46228-11)	mm <sup>2</sup>	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--		
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)	2 x (18 ... 8)	--		
Max. external diameter of the conductor insulation	mm	3.6	3.6	--		
<b>Connection type</b>		<b>Ring terminal lug connections</b>				
<b>Terminal screw</b>		M3, Pozidriv size 2	M4, Pozidriv size 2	--		
<b>Operating devices</b>	mm	∅ 5 ... 6	∅ 5 ... 6	--		
<b>Prescribed tightening torque</b>	Nm	0.8 ... 1.2	2 ... 2.5	--		
<b>Usable ring terminal lugs</b>	mm	d <sub>2</sub> = min. 3.2, d <sub>3</sub> = max. 7.5	d <sub>2</sub> = min. 4.3, d <sub>3</sub> = max. 12.2	--		
<ul style="list-style-type: none"> <li>• DIN 46234 without insulation sleeve</li> <li>• DIN 46225 without insulation sleeve</li> <li>• DIN 46237 with insulation sleeve</li> <li>• JIS C2805 Type R without insulation sleeve</li> <li>• JIS C2805 Type RAV with insulation sleeve</li> <li>• JIS C2805 Type RAP with insulation sleeve</li> </ul>						

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

		3RV2.1. S00	3RV2.2. S0	3RV2.3. S2	3RV27, 3RV28 S00, S0
<b>Front transverse auxiliary switches</b>					
<b>Switching capacity for different voltages</b>					
		<b>1 CO</b>		<b>1 NO + 1 NC, 2 NO</b>	
<b>Rated operational current <math>I_e</math></b>					
• At AC-15, alternating voltage					
- 24 V	A	4		2	
- 230 V	A	3		0.5	
• At AC-12 = $I_{th}$ , alternating voltage					
- 24 V	A	10		2.5	
- 230 V	A	10		2.5	
• At DC-13, direct voltage $L/R$ 200 ms					
- 24 V	A	1		1	
- 48 V	A	--		0.3	
- 60 V	A	--		0.15	
- 110 V	A	0.22		--	
- 220 V	A	0.1		--	
<b>Minimum load capacity</b>		V	17		
		mA	1		
<b>Front transverse solid-state compatible auxiliary switches</b>					
<b>Switching capacity for different voltages</b>					
<b>1 CO</b>					
<b>Rated operational voltage <math>U_e</math></b>		Alternating voltage	V	125	
<b>Rated operational current <math>I_e/AC-14</math></b>		at $U_e = 125$ V	A	0.1	
<b>Rated operational voltage <math>U_e</math></b>		Direct voltage $L/R$ 200 ms	V	60	
<b>Rated operational current <math>I_e/DC-13</math></b>		at $U_e = 60$ V	A	0.3	
<b>Minimum load capacity</b>		V	5		
		mA	1		
<b>Lateral auxiliary switches with signaling switch</b>					
<b>Switching capacity for different voltages:</b>					
<b>Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC</b>					
<b>Signaling switch</b>					
<b>Rated operational current <math>I_e</math></b>					
• At AC-15, alternating voltage					
- 24 V	A	6			
- 230 V	A	4			
- 400 V	A	3			
- 690 V	A	1			
• At AC-12 = $I_{th}$ , alternating voltage					
- 24 V	A	10			
- 230 V	A	10			
- 400 V	A	10			
- 690 V	A	10			
• At DC-13, direct voltage $L/R$ 200 ms					
- 24 V	A	2			
- 110 V	A	0.5			
- 220 V	A	0.25			
- 440 V	A	0.1			
<b>Minimum load capacity</b>		V	17		
		mA	1		
<b>Auxiliary releases</b>					
		<b>Undervoltage releases</b>		<b>Shunt releases</b>	
<b>Power consumption</b>					
• During pick-up					
- AC voltages	VA/W	20.2/13		20.2/13	
- DC voltages	W	20		13 ... 80	
• During uninterrupted duty					
- AC voltages	VA/W	7.2/2.4		--	
- DC voltages	W	2.1		--	
<b>Response voltage</b>					
• Tripping		V	0.35 ... 0.7 × $U_s$		0.7 ... 1.1 × $U_s$
• Pick-up		V	0.85 ... 1.1 × $U_s$		--
<b>Opening time maximum</b>		ms	20		
<b>Short-circuit protection for auxiliary and control circuits</b>					
<b>Melting fuses</b> operational class gG		A	10		
<b>Miniature circuit breakers</b> C characteristic		A	6 (prospective short-circuit current < 0.4 kA)		

# General Data

3RV – up to 80 A

Conductor cross-sections for auxiliary and control circuits		3RV2.11	3RV2.21	3RV2.31, 3RV2.32	3RV27, 3RV28
<b>Type</b>		S00	S0	S2	S00, S0
<b>Size</b>					
<b>Connection type</b>		<b>Screw terminals</b>			
<b>Terminal screw</b>		M3, Pozidriv size 2			
<b>Operating devices</b>	mm	Ø 5 ... 6			
<b>Prescribed tightening torque</b>	Nm	0.8 ... 1.2			
<b>Conductor cross-sections (min./max.)</b> , 1 or 2 conductors can be connected					
• Solid or stranded	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> , 2 x (0.75 ... 2.5) <sup>1)</sup>			
• Finely stranded with end sleeve (DIN 46228-1)	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> , 2 x (0.75 ... 2.5) <sup>1)</sup>			
• AWG cables, solid or stranded	AWG	2 x (18 ... 14) <sup>1)</sup> , 2 x (20 ... 16) <sup>1)</sup>			
<b>Connection type</b>		<b>Spring-type terminals</b>			
<b>Operating devices</b>	mm	3.0 x 0.5 and 3.5 x 0.5			
<b>Conductor cross-sections (min./max.)</b> , 1 or 2 conductors can be connected					
• Solid or stranded	mm <sup>2</sup>	2 x (0.5 ... 2.5)			
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve (DIN 46228-1)	mm <sup>2</sup>	2 x (0.5 ... 1.5)			
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)			
Max. external diameter of the conductor insulation	mm	3.6			
<b>Connection type</b>		<b>Ring terminal lug connections</b>			
<b>Terminal screw</b>		M3, Pozidriv size 2			
<b>Operating devices</b>	mm	Ø 5 ... 6			
<b>Tightening torque</b>	Nm	0.8 ... 1.2			
<b>Usable ring terminal lugs</b>	mm	d <sub>2</sub> = min. 3.2, d <sub>3</sub> = max. 7.5			
• DIN 46234 without insulation sleeve					
• DIN 46225 without insulation sleeve					
• DIN 46237 with insulation sleeve					
• JIS C2805 Type R without insulation sleeve					
• JIS C2805 Type RAV with insulation sleeve					
• JIS C2805 Type RAP with insulation sleeve					

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

### Terminals for "Self-Protected Combination Motor Controllers (Type E) according to UL 508/UL 60947-4-1"

Type	3RV2928-1H	
<b>Prescribed tightening torque</b>	Nm	2.5 ... 3
<b>Conductor cross-sections</b>		
• Front clamping point connected		
- Solid	mm <sup>2</sup>	1 ... 10
- Finely stranded with end sleeve	mm <sup>2</sup>	1 ... 16
- Stranded	mm <sup>2</sup>	2.5 ... 25
- AWG cables, solid or stranded	AWG	14 ... 3
- Terminal screw		M4
• Rear clamping point connected		
- Solid	mm <sup>2</sup>	1 ... 10
- Finely stranded with end sleeve	mm <sup>2</sup>	1 ... 16
- Stranded	mm <sup>2</sup>	1.5 ... 25
- AWG cables, solid or stranded	AWG	14 ... 6
- Terminal screw		M4
• Both clamping points connected		
- Front clamping point:		
Solid	mm <sup>2</sup>	1 ... 10
Finely stranded with end sleeve	mm <sup>2</sup>	1 ... 10 <sup>1)</sup> , 1 ... 6 <sup>1)</sup>
Stranded	mm <sup>2</sup>	2.5 ... 10
AWG cables, solid or stranded	AWG	14 ... 6
Terminal screw		M4
- Rear clamping point:		
Solid	mm <sup>2</sup>	1 ... 10
Finely stranded with end sleeve	mm <sup>2</sup>	1 ... 10 <sup>1)</sup> , 1 ... 16 <sup>1)</sup>
Stranded	mm <sup>2</sup>	2.5 ... 10
AWG cables, solid or stranded	AWG	16 ... 3
Terminal screw		M4

<sup>1)</sup> The following can be connected when both clamping points are connected:  
 - Front 1 ... 10 mm<sup>2</sup> and rear 1 ... 10 mm<sup>2</sup>  
 - Front 1 ... 6 mm<sup>2</sup> and rear 1 ... 16 mm<sup>2</sup>

# General Data

3RV – up to 100 A

## Overview

**S00 MSP with laterally mounted undervoltage release with leading auxiliary switch**



3RV Motor Starter Protectors (MSPs) are built for a world of applications while meeting the requirements of control users worldwide. Each MSP features a manual ON/OFF switch, a Class 10 adjustable bimetallic overload relay (Class 20 available in the two largest frame sizes), and magnetic trip elements for short circuit protection.

## Construction

The motor starter protectors are available in four sizes:

- Size S00 - 3RV201  
Maximum rated current is 16 Amps. Suitable for motors up to 10 HP at 600V. Available in both screw terminal and spring-type terminal versions.
- Size S0 - 3RV202  
Maximum rated current is 40 Amps. Suitable for motors up to 20 HP at 600V. Available in both screw terminal and spring-type terminal versions.
- Size S2 - 3RV203  
Maximum rated current is 50 Amps. Suitable for motors up to 50 HP at 600V.
- Size S3 - 3RV204  
Maximum rated current is 100 Amps. Suitable for motors up to 100 HP at 600V.

## Functions

### Releases

3RV motor starter protectors are equipped with bimetallic-based, inverse-time delayed overload releases - electromagnetic short-circuit releases.

The overload releases can be set in accordance with the load current. The overcurrent releases are permanently set to a value 13 times the rated current and thus enable trouble-free start-up of motors.

The scale cover can be sealed to prevent unauthorized adjustments to the set current.

### Release classes

The release classes of thermally delayed releases are based on the tripping time ( $t_A$ ) at 7.2 times the operational current in cold state (excerpt from IEC 60 947-4):

- CLASS 10  $A \ 2 \text{ s} < t_A < 10 \text{ s}$
- CLASS 10  $4 \text{ s} < t_A < 10 \text{ s}$
- CLASS 20  $6 \text{ s} < t_A < 20 \text{ s}$
- CLASS 30  $9 \text{ s} < t_A < 30 \text{ s}$

The release must trip within this time!

### Operating mechanisms

S00, S0, S2 and S3 MSPs are actuated via a rotary operating mechanism. If the MSP trips, the rotary operating mechanism switches to the tripped position to indicate this. Before the MSP is reclosed, the rotary operating mechanism must be reset manually to 0 position, in order to prevent the former from closing by mistake before the fault has been cleared.

In the case of MSPs with rotary operating mechanisms, an electrical signal can be output via a signalling switch to indicate that the MSP has tripped.

All operating mechanisms can be locked in 0 position with a padlock (shackle diameter 3.5 to 4.5 mm).

## Application

### Operating conditions

3RV MSPs are suitable for use in any climate. They are designed for operation in closed rooms under normal conditions (e.g. no dust, corrosive vapours or harmful gases). Suitable enclosures must be provided for installation in dusty or damp rooms.

### Motor Protection

3RV MSPs use bimetallic heater elements to provide class 10 or 20 overcurrent protection for both AC and DC motors. The bimetallic heaters sense the motor current directly, so the overloads are insensitive to high frequencies, harmonic waves and sinusoidal currents and voltages.

Each MSP has a fourth bimetallic strip that reacts only to the ambient temperature inside the control panel. This ambient compensation prevents the MSP from nuisance tripping when the panel temperature is higher than the ambient temperature of the motor.

A built-in differential trip bar causes the MSP to trip faster on a phase loss condition, to help reduce motor damage from phase loss.

Magnetic trip elements in each MSP take the device off line when it senses currents of 13 times the maximum FLA dial setting.

3RT2	0	1	1	-	0	A	A	1	0
<b>SIRIUS MSP or Circuit Breaker</b>	Application 0 = Motor Protection 7 = UL 489	Frame Size 3 = S2 4 = S3	Standard		Amperage Range Possible choices listed below see page 1/4-1/7 for an entire listing 0, 1, 4	B through K	Class A = 10	Terminal Type 1 = Screw 2 = Spring Loaded 4 = Ring Lug	Auxiliary Switch
3RV2	0	1	1	-	0	A	A	1	0
<b>SIRIUS Innovations MSP or Circuit Breaker</b>	Application 0 = Motor Protection 7 = UL 489	Frame Size 1 = S00 2 = S0 3 = S2 4 = S3	Standard		Amperage Range Possible choices listed below see page 1/4-1/7 for an entire listing 0, 1, 4	B through K	Class A = 10 B = 20	Terminal Type 1 = Screw 2 = Spring Loaded 4 = Ring Lug	Auxiliary Switch

**Note:** MSPs and Contactors of the same frame size are made to easily fit together with the use of a link module.



# General Data

## Mounting accessories

1  
MOTOR STARTER  
PROTECTORS

**Applications:**

*The 3RV MSPs can be used in a variety of applications:*

**As a manual starter**

All 3RV MSPs are UL listed as Manual Motor Controllers per UL508. This makes them ideal for applications requiring simple manual starting and stopping of motors. A separate short circuit protective device, such as a circuit breaker or fuses, is still required ahead of the MSP. This up-stream protective device should be sized per NEC code, not to exceed 400% of the maximum FLA adjustment dial setting.

**As a component in a group installation**

A group motor installation indicates multiple motor controllers under one short circuit protective device, such as a circuit breaker. 3RV MSPs have a group installation short-circuit current rating of 65 kA at 480V and up to 30kA at 600V. By using a link module, a 3RT contactor can be directly mounted to the load side of the MSP.

3RV MSPs have been UL tested with and without 3RT contactors for group installation.

**As a Self-protected manual combination starter, Type E.**

Most 3RV MSPs have also been UL listed as UL508 Type E, Self-protected Manual Combination Starters. This UL listing allows the MSP to be mounted in a manually operated machine without having to add separate short circuit protection upstream.

These devices have a short circuit current rating of 65 kA @ 240V, 480Y/277V and up to 30kA @ 600Y/347V.

**Terminals for "Combination Motor Controller Type E" to UL 508**

The 3RV MSP for motor protection is approved according to UL 508 as "Combination Motor Controller Type E".

As of July, 2001, UL 508 demands at line-side of the device used for this purpose an increased clearance and creepage distance (1" or 2").

Here, the terminal block 3RV29 28-1H must be used for size S0. The block is simply screwed to the basic unit.

Basic units of size S2 are already compliant with new clearance and creepage distance requirements.

**As part of a Combination Motor Controller, Type F**

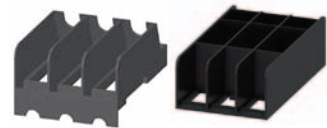
When a 3RT contactor is connected to the load side of a 3RV device that is rated as a "Manual Self-protected Combination Motor Controller, Type E", the assembly can be applied as a "Combination Motor Controller, Type F". This versions allows for remote starting and stopping of the motor load.

These assemblies have a short circuit current rating of 65 kA @ 240V, 480Y/277V and up to 30 kA @ 600Y/347V.

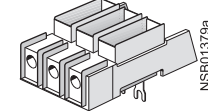
**As a circuit breaker for export**

When exporting to many countries outside of the U.S. and North America, the 3RV can be applied as a thermal magnetic circuit breaker for use in motor branch circuits.

3RV29 28-1K      3RV29 38-1K



3RV29 28-1H

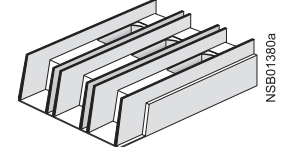


The terminal block 3RT29 46-4GA07 must be used for size S3. The standard box terminal is to be replaced by this terminal block.

According to CSA, these terminal blocks can be omitted when the device is used as "Combination Motor Controller Type E".

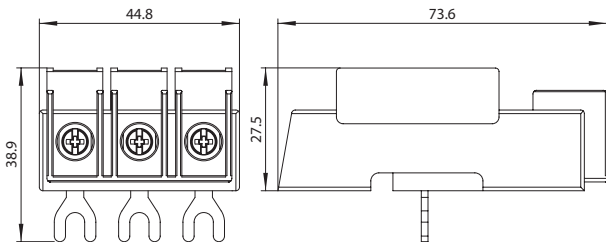
By using a link module, a 3RT contactor can be directly mounted to the load side of a 3RV MSP. This assembly of a 3RV and a 3RT provides a complete, remotely operated, combination starter, Type F.

3RT29 46-4GA07

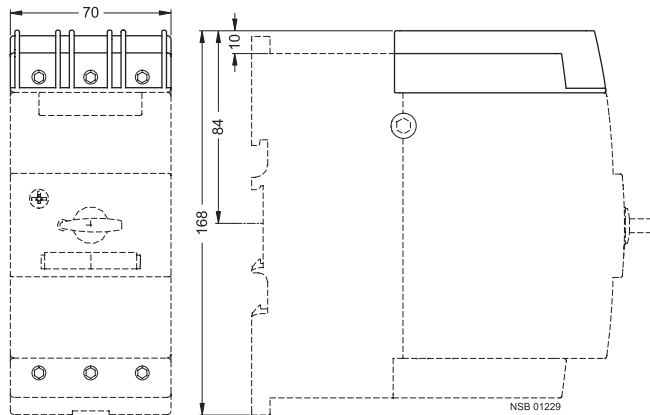


**Terminals for "Combination Motor Controller Type E" to UL 508**

3RV29 28-1H



3RT29 46-4GA07



# General Data

## 3RV – up to 100 A

### Switching of direct current

3RV motor starter protectors for alternating currents are also suitable for DC switching.

The maximum permissible DC voltage per conducting path must, however, be adhered to. Higher voltages require a series connection with 2 or 3 conducting paths.

The response values of the overload release remain unchanged; the response values of a short-circuit release increase by approximately 30 % for DC. The example circuits for DC switching can be seen in the table below.

Example circuit for size S00 to S3 3RV motor starter protectors

Example circuit for size S00 to S3 3RV motor starter protectors	Maximum permitted DC voltage $U_e$	Notes
	150 V DC	Three-pole switching, non-grounded system <sup>1)</sup> If there is no possibility of a ground fault, or if every ground fault is rectified immediately (ground-fault monitoring), then the maximum permitted DC voltage can be tripled.
	300 V DC	Two-pole switching, grounded system The grounded pole is always assigned to the individual conducting path, so that there are always 2 conducting paths in series in the event of a ground fault.
	450 V DC	Single-pole switching, grounded system 3 conducting paths in series. The grounded pole is assigned to the unconnected conducting path.

<sup>1)</sup> It is assumed that this circuit always provides safe disconnection even in the event of a double ground fault that bridges two contacts.

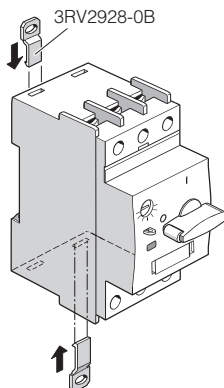
### Design

#### Mounting

The motor starter protectors are secured in position by snapping them onto 35 mm standard mounting rails according to DIN EN 50 022. A mounting rail with a height of 15 mm is required for S3 MSPs. A 75-mm mounting rail can be used as an alternative here.

S2 and S3 MSPs can also be screwed directly onto a base-plate.

The push-in lugs 3RV29 28-0B are available for screw mounting of S00 and S0 MSPs.



#### Screw connection

3RV MSPs of sizes S00 and S0 are fitted with terminals with captive screws and clamping pieces, allowing the connection of 2 conductors with different cross-sections.

The box terminals of the S2 and S3 MSPs also enable 2 conductors with different cross-sections to be connected. With the exception of S3 MSPs which are equipped with 4 mm hexagon socket terminal screws, all terminal screws are tightened with a Pozidriv screwdriver size 2.

The box terminals of the S3 MSPs can be removed in order to connect conductors with cable lugs or connecting bars. A terminal cover is available to help prevent contact with shock protection and to ensure that the required clearances and creepage distances are maintained if the box terminals are removed.

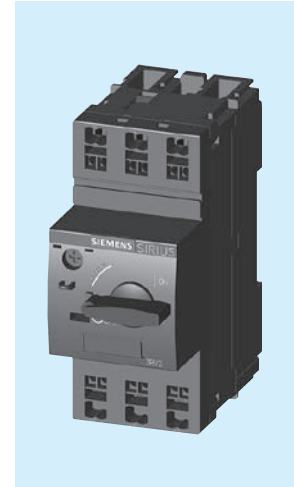
#### Spring-type connection <sup>2)</sup>

As an alternative to screw terminals, S00 and S0 devices are also available with Spring-type terminal connection.

This screwless Spring-type terminal technique, as known for modular terminal blocks, offers shock-proof and vibration proof connection of conductors.

Devices with Spring-type connection allow independent connection of two conductors per terminal.

#### MSP with Spring-type terminal connection



<sup>1)</sup> It is assumed that this circuit always provides safe cut-out, even in the event of a double earth fault that bridges two contacts.  
<sup>2)</sup> For notes on Spring-type terminal connection, see section 19.

# General Data

3RV – up to 100 A

MOTOR STARTER PROTECTORS 1

## Characteristics

The time/current limiting characteristic, the current limiting characteristics and the  $I^2t$  characteristics were determined in accordance with DIN VDE 0660 or IEC 60 947.

The tripping characteristic of the **inverse-time delayed overload releases** (thermal overload releases or 'A' releases) for DC and AC with a frequency of 0 to 400 Hz also apply to the time/current characteristic.

The characteristics apply to the cold state. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25 %.

Under normal operating conditions, all three poles of the device must be loaded. The three main conducting paths must be connected in series in order to protect single-phase or DC loads.

With 2-pole and 3-pole loading, the maximum deviation in the tripping time for 3 times the setting current and upwards is  $\pm 20\%$  and thus in accordance with DIN VDE 0165.

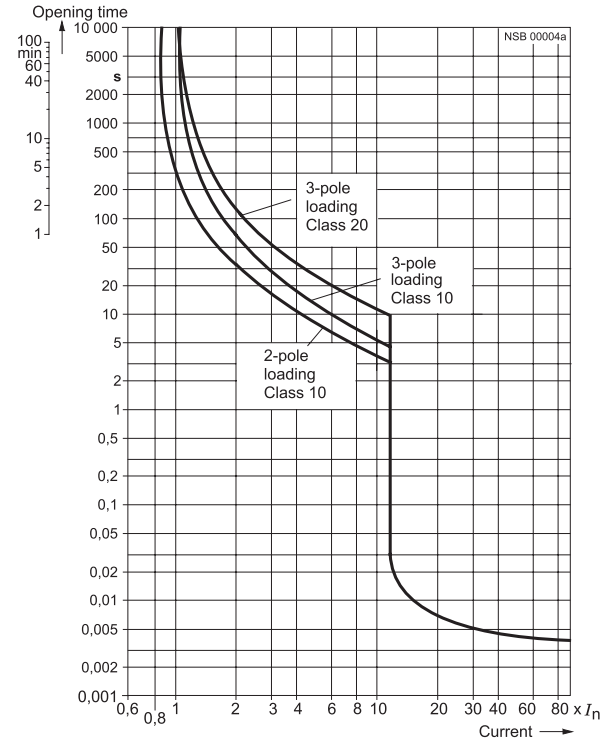
The tripping characteristics for the instantaneous, electromagnetic overcurrent releases

(short-circuit releases, 'N' releases) are based on the rated current  $I_n$  that represents the maximum value of the setting range for MSPs with adjustable overload releases. If the current is set to a lower value, the tripping current of the 'N' release is increased by a corresponding factor.

The characteristics of the electromagnetic overcurrent releases apply to frequencies of 50/60 Hz. Appropriate correction factors must be used for lower frequencies up to  $16 \frac{2}{3}$  Hz, for higher frequencies up to 400 Hz and for DC.

The printed characteristic curve determined for the MSP relates to a specific setting range. It is, however, also valid as a schematic representation of MSPs with other current ranges.

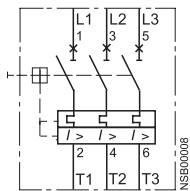
Typical time/current characteristic of 3RV



## Circuit diagrams

### Internal connections

Motor starter protectors 3RV.



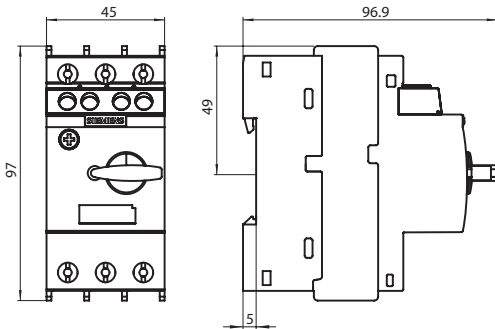
# General Data

3RV – up to 100 A

## Dimension drawings

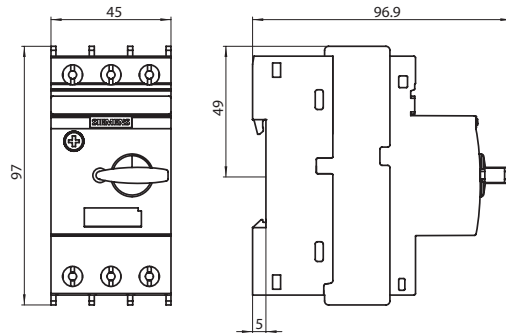
### 3RV2 MSP, size S00

3RV20 11

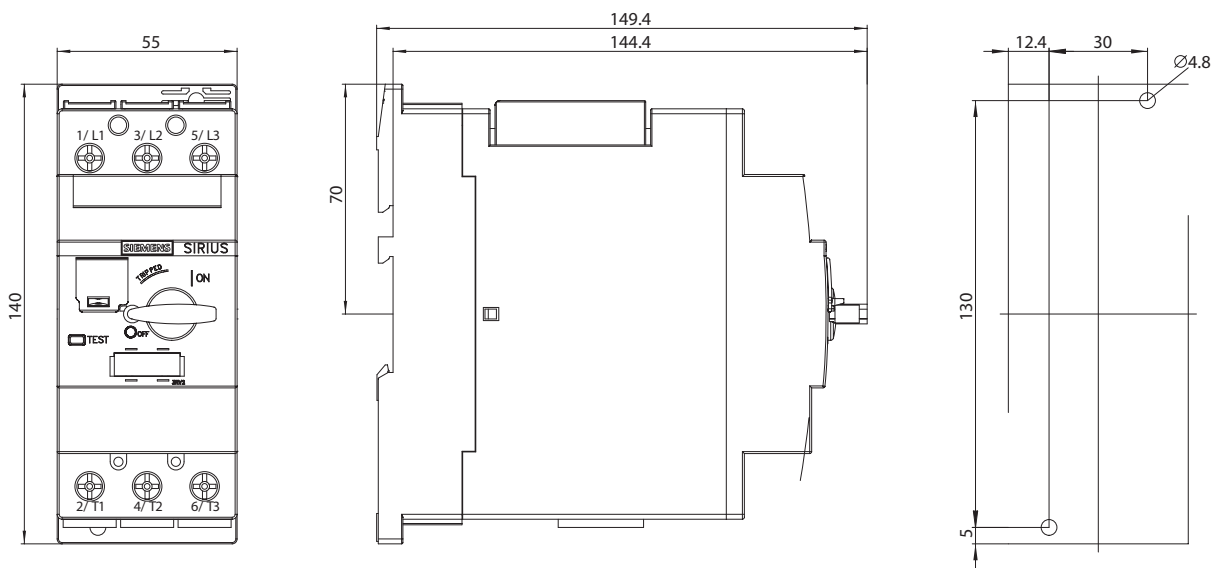


### 3RV2 MSP, size S0

3RV20 21



### 3RV2 MSP, size S2



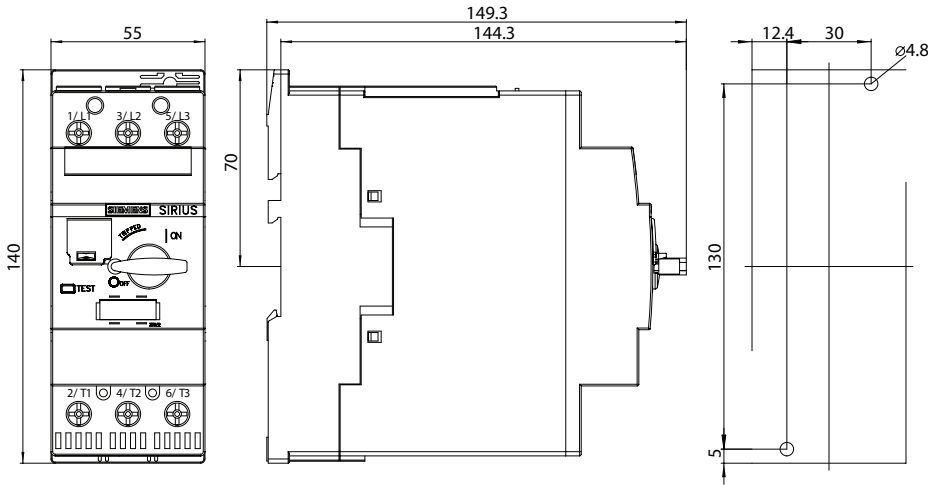
3RV2.31 motor starter protector (<= 45A)

# General Data

3RV – up to 100 A

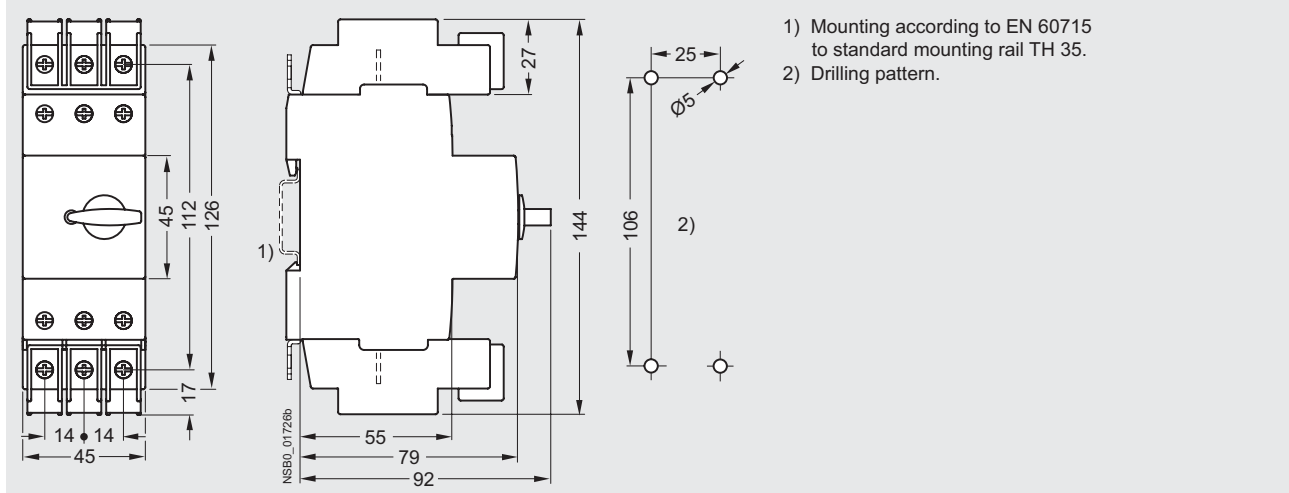
MOTOR STARTER PROTECTORS

### 3RV2.32 MSP, size S2



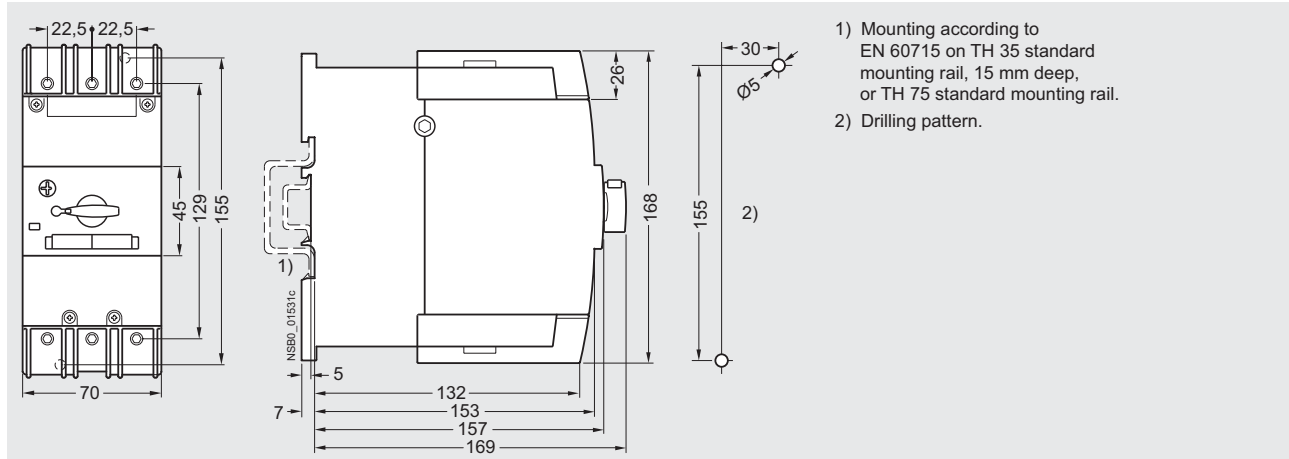
### 3RV27 and 3RV28 circuit breakers, size S00, S0 and S3

3RV27 21, 3RV28 21



### 3RV27 circuit breakers, size S3

3RV27 42





# General Data

## Mountable accessories

### Overview

#### Mounting location and function

The 3RV2 motor starter protectors/circuit breakers have three main contact elements. In order to achieve maximum flexibility, auxiliary switches, signaling switches, auxiliary releases and isolator modules can be supplied separately.

These components are easily fitted to the switches without the use of any tools according to requirements.

Overview graphic, [see page 7/7](#).

<p><b>Front side</b></p> <p><u>Notes:</u></p> <ul style="list-style-type: none"> <li>A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breaker.</li> </ul>	<p><b>Transverse auxiliary switches, solid-state compatible transverse auxiliary switches</b></p> <p>1 NO + 1 NC or 2 NO or 1 CO</p>	<p>An auxiliary switch block can be inserted transversely on the front. The overall width of the motor starter protectors/circuit breakers remains unchanged.</p>
<p><b>Left-hand side</b></p> <p><u>Notes:</u></p> <ul style="list-style-type: none"> <li>A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breaker.</li> <li>Lateral auxiliary switches (two contacts) and signaling switches can be mounted separately or together.</li> <li>The signaling switch cannot be used for the 3RV27 and 3RV28 circuit breakers.</li> </ul>	<p><b>Lateral auxiliary switches (2 contacts)</b></p> <p>1 NO + 1 NC or 2 NO or 2 NC</p> <p><b>Lateral auxiliary switches (4 contacts)</b></p> <p>2 NO + 2 NC</p>	<p>One of the three lateral auxiliary switches can be mounted on the left side per motor starter protector/circuit breaker. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector/circuit breaker.</p> <p>The width of the lateral auxiliary switch with two contacts is 9 mm.</p> <p>One lateral auxiliary switch with four contacts can be mounted on the left side per motor starter protector/circuit breaker. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector/circuit breaker.</p> <p>The width of the lateral auxiliary switch with four contacts is 18 mm.</p>
	<p><b>Signaling switches</b></p> <p>Tripping 1 NO + 1 NC Short circuit 1 NO + 1 NC</p>	<p>One signaling switch can be mounted on the left side of each motor starter protector.</p> <p>The signaling switch has two contact systems.</p> <p>One contact system always signals <u>tripping</u> irrespective of whether this was caused by a short circuit, an overload or an auxiliary release. The other contact system only switches in the event of a short circuit. There is no signaling as a result of <u>switching off</u> with the actuator.</p> <p>In order to be able to switch on the motor starter protector again after a short circuit, the signaling switch must be reset manually after the error cause has been eliminated.</p> <p>The overall width of the signaling switch is 18 mm.</p>
<p><b>Right-hand side</b></p> <p><u>Notes:</u></p> <ul style="list-style-type: none"> <li>One auxiliary release can be mounted per motor starter protector/circuit breaker.</li> <li>Accessories cannot be mounted at the right-hand side of the 3RV21 motor starter protectors for motor protection with overload relay function.</li> </ul>	<p><b>Auxiliary releases</b></p> <p>Shunt releases</p> <p>or</p> <p>Undervoltage releases</p> <p>or</p> <p>Undervoltage releases with leading auxiliary contacts 2 NO</p>	<p>For remote-controlled tripping of the motor starter protector/circuit breaker. The release coil should only be energized for short periods (see circuit diagrams).</p> <p>Trips the motor starter protector/circuit breaker when the voltage is interrupted and prevents the motor from being restarted accidentally when the voltage is restored. Used for remote-controlled tripping of the motor starter protector/circuit breaker.</p> <p>Particularly suitable for EMERGENCY-STOP disconnection by way of corresponding EMERGENCY-STOP pushbuttons according to DIN EN 60204-1.</p> <p>Function and use as for the undervoltage release without leading auxiliary contacts, but with the following additional function: the auxiliary contacts will open in switch position OFF to deenergize the coil of the undervoltage release, thus interrupting energy consumption. In the "tripped" position, these auxiliary contacts are not guaranteed to open. The leading contacts permit the motor starter protector/circuit breaker to reclose.</p> <p>The overall width of the auxiliary release is 18 mm.</p>
<p><b>Top</b></p> <p><u>Notes:</u></p> <ul style="list-style-type: none"> <li>The isolator module cannot be used for the 3RV27 and 3RV28 circuit breakers.</li> <li>The isolator module for size S2                     <ul style="list-style-type: none"> <li>can only be used with 3RV2 motor starter protectors/circuit breakers up to max. 65 A</li> <li>cannot be used with the transverse auxiliary switch</li> </ul> </li> <li>The isolator module covers the terminal screws of the transverse auxiliary switch. If the isolator module is used, we therefore recommend that either the lateral auxiliary switches be fitted or that the isolator module not be mounted until the auxiliary switch has been wired.</li> </ul>	<p><b>Isolator modules</b></p>	<p>Isolator modules can be mounted to the upper connection side of the motor starter protectors.</p> <p>The supply cable is connected to the motor starter protector through the isolator module.</p> <p>The plug can only be unplugged when the motor starter protector is open and isolates all 3 poles of the motor starter protector from the network. The shock-protected isolation point is clearly visible and secured with a padlock to prevent reinsertion of the plug.</p>

For a complete overview of which accessories can be used for the various motor starter protectors/circuit breakers, [see page 7/2](#)

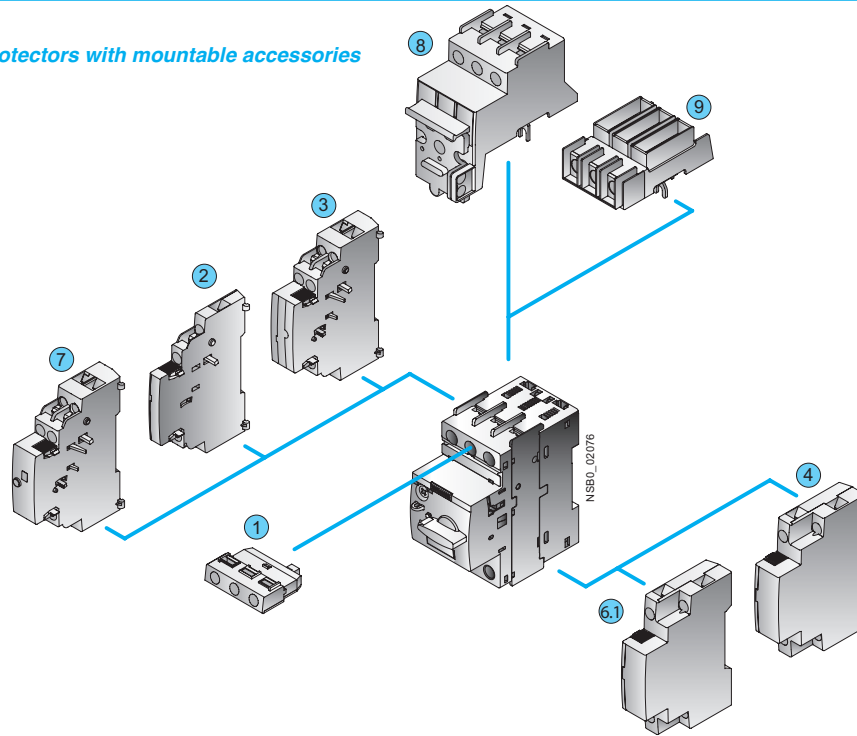
# General Data

## Mountable accessories

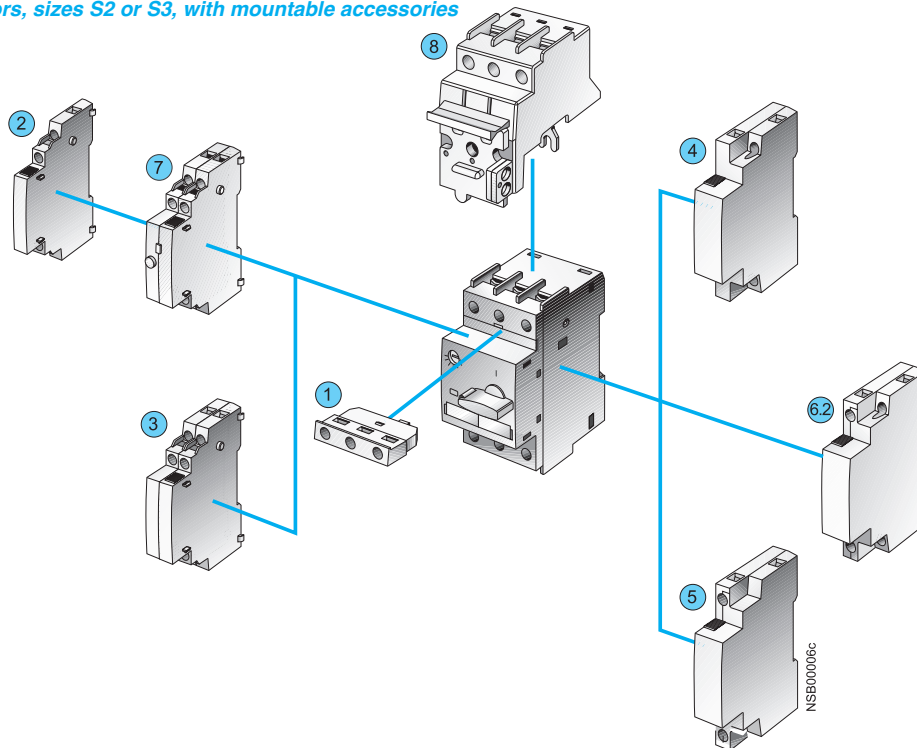
1  
MOTOR STARTER  
PROTECTORS

### Overview

#### S00 and S0 motor starter protectors with mountable accessories



#### Motor starter protectors, sizes S2 or S3, with mountable accessories



Mountable accessories for all sizes S00 ... S3

- ① Transverse auxiliary switch
- ② Lateral auxiliary switch with 2 contacts
- ③ Lateral auxiliary switch with 4 contacts
- ④ Shunt release
- ⑤ Undervoltage release

Mountable accessories

- ⑥.1 Undervoltage release with leading auxiliary contacts (can not be used with 3RV21 circuit breakers)
- ⑥.2 Undervoltage release with leading auxiliary contacts

for sizes

- S00, S0
- S2, S3

Mountable accessories

- ⑦ Signaling switch (can not be used with 3RV27 and 3RV28 circuit breakers)
- ⑧ Isolator module (can not be used with 3RV27 and 3RV28 circuit breakers)
- ⑨ Terminal block E

for sizes

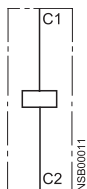
- S00 ... S3
- S0 and S2

## Circuit diagrams

### Internal connections

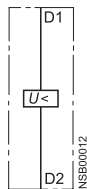
#### Shunt release

3RV19 02-1D / 3RV29 02-1D



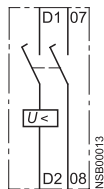
#### Undervoltage release

3RV19 02-1A / 3RV29 02-1A



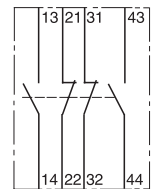
#### Undervoltage release with leading auxiliary contacts

3RV19 12-1C / 3RV29 12-1C  
3RV19 22-1C / 3RV29 22-1C



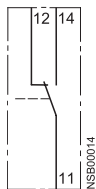
#### Lateral auxiliary switch with 4 contacts

3RV19 01-1J / 3RV29 01-1J

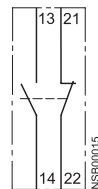


#### Transverse auxiliary switch

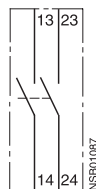
3RV19 01-1D  
3RV29 01-1D  
3RV19 01-1G  
3RV29 01-1G



3RV19 01-1E  
3RV29 01-1E  
3RV19 01-2E  
3RV29 01-2E

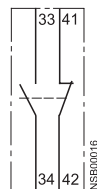


3RV19 01-1F  
3RV29 01-1F

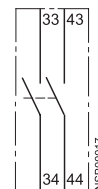


#### Lateral auxiliary switch with 2 contacts

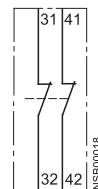
3RV19 01-1A  
3RV29 01-1A  
3RV19 01-2A  
3RV29 01-2A



3RV19 01-1B  
3RV29 01-1B  
3RV19 01-2B  
3RV29 01-2B

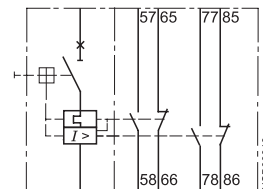


3RV19 01-1C  
3RV29 01-1C  
3RV19 01-2C  
3RV29 01-2C



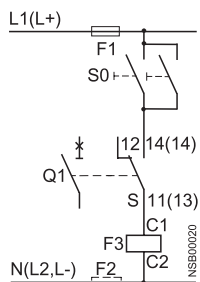
#### Signaling switch

3RV19 21-1M / 3RV29 21-1M

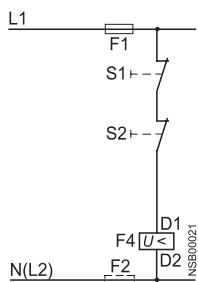


### External connections

#### Shunt release



#### Undervoltage release



- S0; S1; S2      OFF pushbuttons in system
- Q1                Motor starter protectors
- S                 Auxiliary switch of MSP Q1
- F1; F2            Fuses (gL/gG) max. 10 A
- F3                Shunt release
- F4                Undervoltage release

# General Data

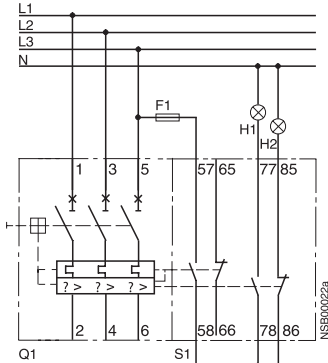
## Mountable accessories

1  
MOTOR STARTER  
PROTECTORS

### Circuit diagrams

#### Typical circuits

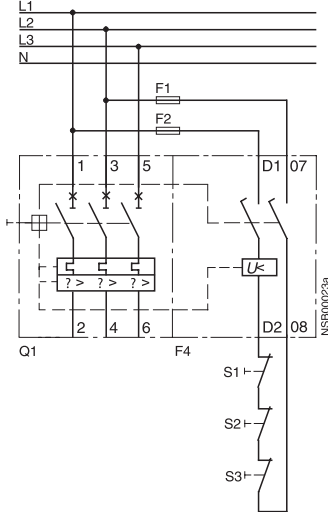
##### 3RV2 MSPs with 3RV29 21-1M signalling switch



- |   |        |                         |
|---|--------|-------------------------|
| H1: "Short circuit" signal                              | H1; H2 | Indicator lights        |
| H2: "Overload" or "Tripped by auxiliary release" signal | F1     | Fuses (gL/gG) max. 10 A |
|   | Q1     | MSP                     |
|   | S1     | Signalling switch       |

Separate "Tripped" and "Short circuit" signals

##### Motor starter protectors tripped by means of pushbutton or EMERGENCY STOP button in the system

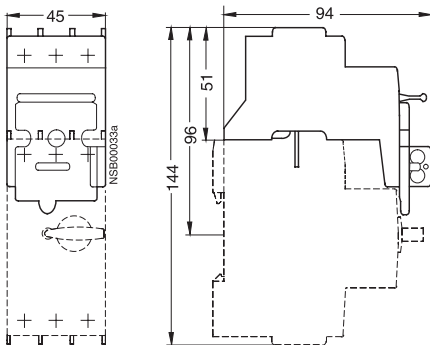


- The leading auxiliary contacts open in "OFF" position of the MSP to switch off the coil voltage of the undervoltage release, thus avoiding power consumption in switched off state.
- In the "tripped" position of the MSP, these contacts are not guaranteed to open.
- |            |                           |
|------------|---------------------------|
| F1; F2     | Fuses (gL/gG) max. 10 A   |
| Q1         | MSP                       |
| F4         | Undervoltage release      |
| S1; S2, S3 | OFF pushbuttons in system |

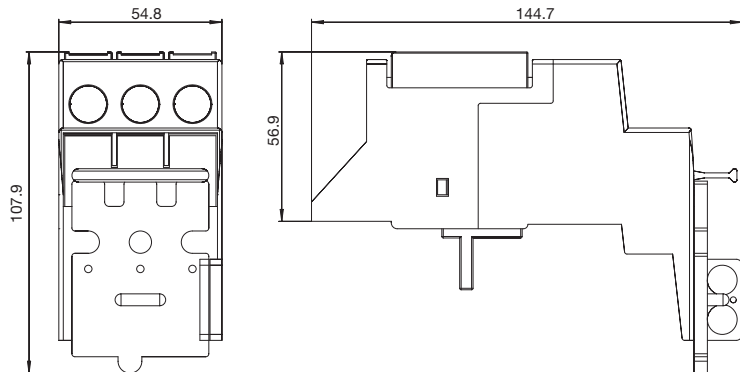
### Dimension drawings

#### Isolator modules

3RV29 28-1A  
for MSPs size S00, S0



3RV29 38-1A  
for MSPs size S2



For dimension drawings of auxiliary switches, signalling switches and auxiliary releases, see page 1/33 and 1/34.

# 3RV Motor Starter Protectors up to 100 A

## Accessories – Busbar accessories

### Overview

#### Busbar adapters

The MSPs are mounted directly with the aid of busbar adapters on FastBus-busbar systems with 40 mm and 60 mm centerline spacing, in order to save space and to reduce wiring times and costs.

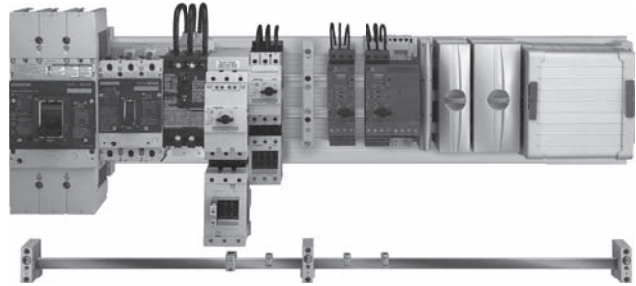
FastBus-busbar adapters for busbar systems with 40 mm centerline spacing are suitable for copper busbars with a width of 12 mm to 15 mm, while those with 60 mm centerline spacing are suitable for widths of 12 mm to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

The MSPs are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

Refer to page 1/10 for busbar adapters for specific MSPs and accessories.

Further busbar adapters for snap-mounting direct-on-line starters and reversing starters, as well as additional accessories such as line terminals and outgoing terminals, busbar copper, etc., can be found in Section 5.

#### SIRIUS MSPs and combination starters with FastBus-busbar adapters snapped onto busbars

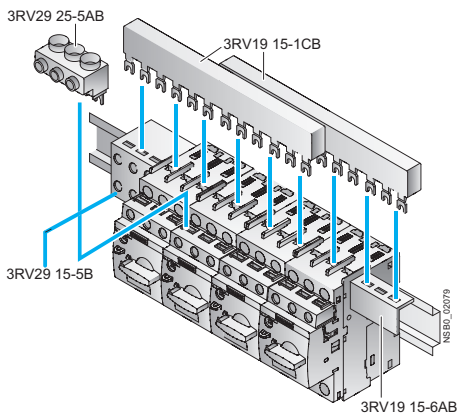


#### Insulated three-phase busbar system

Three-phase busbar systems provide an easy, time-saving and clearly arranged means of feeding 3RV2 motor starter protectors with screw terminals. They can be used for the different types of motor starter protector up to 32 A. The 3RV19 15 three-phase busbar systems are generally unsuitable for the 3RV21 motor starter protectors for motor protection with overload relay function and for the 3RV27 and 3RV28 circuit breakers according to UL 489 / CSA C22.2 No. 5-02.

The busbars are suitable for between 2 and 5 circuit breakers/motor starter protectors. However, any kind of extension is possible by clamping the tags of an additional busbar (rotated by 180°) underneath the terminals of the respective last motor starter protector.

A combination of motor starter protectors of different sizes is possible. The motor starter protectors are supplied by appropriate feeder terminals.



#### SIRIUS three-phase busbar system size S00/S0

The three-phase busbar systems are finger-safe. They are designed for any short-circuit stress which can occur at the output side of connected motor starter protectors.

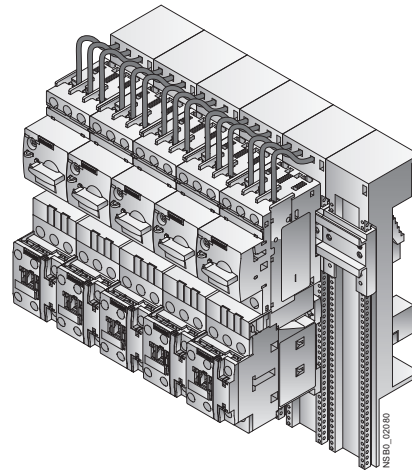
#### 8US busbar adapters for 60 mm systems

The motor starter protectors are mounted directly with the aid of busbar adapters on busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs.

The busbar adapters for busbar systems with 60 mm center-to-center clearance are suitable for copper busbars with a width of 12 mm to 30 mm. The busbars can be 5 mm or 10 mm thick.

The motor starter protectors are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For further busbar adapters for snap-mounting direct-on-line starters and reversing starters as well as additional accessories such as line terminals and outgoing terminals, flat copper profile, etc., can be found in Section 5.



#### SIRIUS load feeders with busbar adapters snapped onto busbars

The three-phase busbar systems can also be used to construct "Type E Starters" according to UL/CSA. Special feeder terminals must be used for this purpose however (see "Selection and Ordering Data" on page 1/8).



# General Data

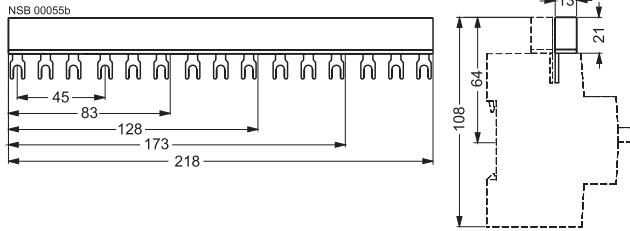
## Busbar accessories

1  
MOTOR STARTER  
PROTECTORS

### Dimension drawings

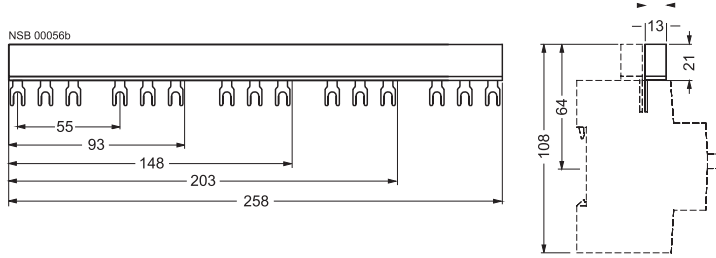
#### 3RV19 15-1.. 3-phase busbar

for S00 and S0 MSPs, modular spacing 45 mm  
 for 2 MSPs 3RV19 15-1AB  
 for 3 MSPs 3RV19 15-1BB  
 for 4 MSPs 3RV19 15-1CB  
 for 5 MSPs 3RV19 15-1DB



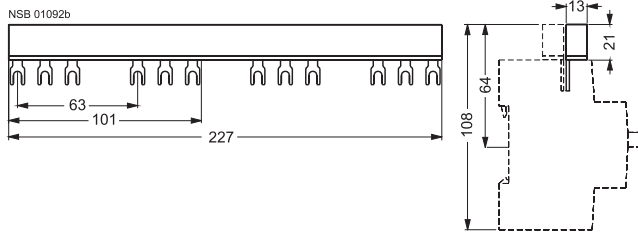
#### 3RV19 15-2.. 3-phase busbar

for S00 and S0 circuit-breakers, modular spacing 55 mm  
 for 2 MSPs with accessories 3RV19 15-2AB  
 for 3 MSPs with accessories 3RV19 15-2BB  
 for 4 MSPs with accessories 3RV19 15-2CB  
 for 5 MSPs with accessories 3RV19 15-2DB



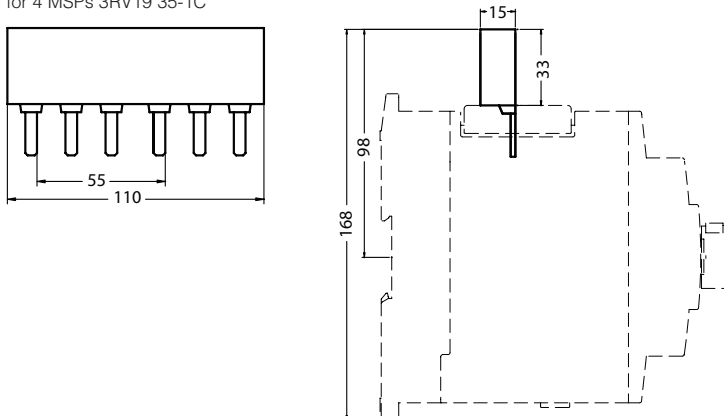
#### 3RV19 15-3.. 3-phase busbar

for S00 and S0 MSPs, modular spacing 63 mm  
 for 2 MSPs with accessories 3RV19 15-3A  
 for 3 MSPs with accessories 3RV19 15-3B  
 for 4 MSPs with accessories 3RV19 15-3C



#### 3RV19 35-1.. 3-phase busbar

for S2 MSP, modular spacing 55 mm  
 for 2 MSPs 3RV19 35-1A  
 for 3 MSPs 3RV19 35-1B  
 for 4 MSPs 3RV19 35-1C



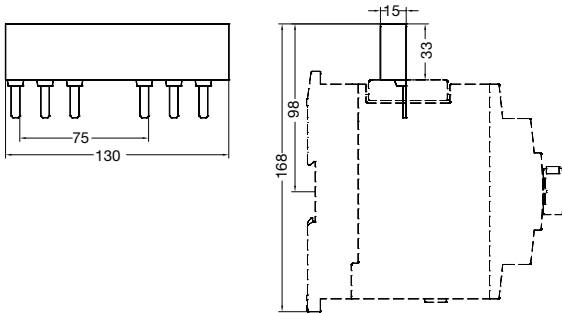
# General Data

## Busbar accessories

### Dimension drawings

#### 3RV19 35-3.. 3-phase busbar

for S2 MSP, modular spacing 75 mm  
for 2 MSPs with accessories 3RV19 35-3A  
for 3 MSPs with accessories 3RV19 35-3B  
for 4 MSPs with accessories 3RV19 35-3C



#### 3RV29 25-5AB. 3-phase line-side terminals

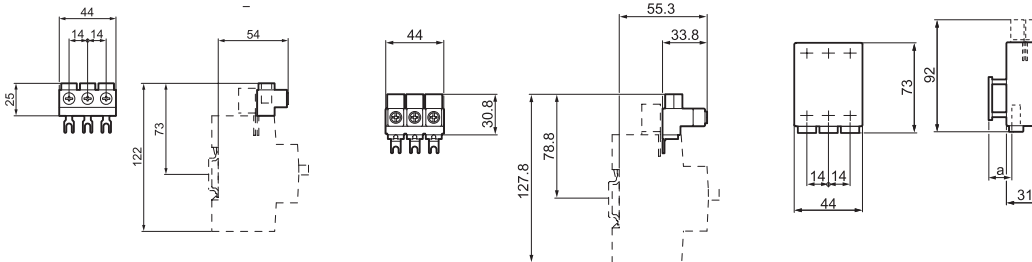
connection from above,  
size S00 and S0

3RV29 35-5B  
connection from above,  
size S00 and S0

a) 3RV1. 1 19 mm  
3RV1. 2 23 mm

#### 3RV29 25-5EB 3-phase line-side terminal

connection from above,  
size S0

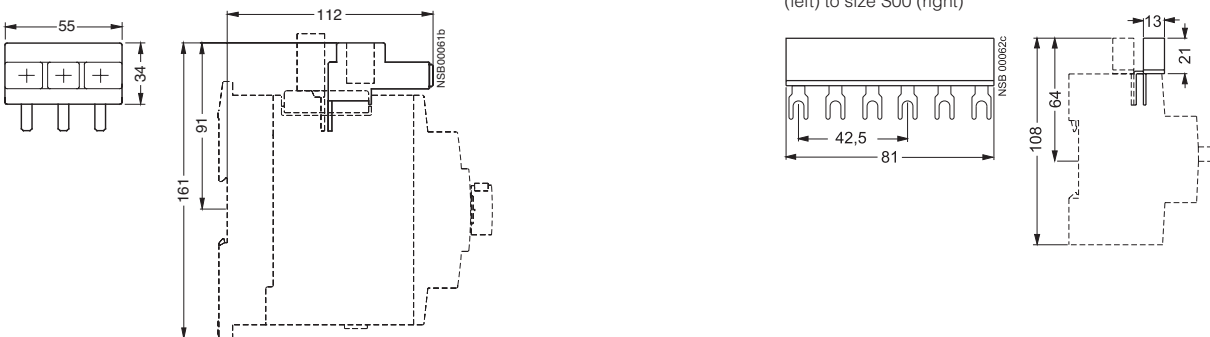


#### 3RV19 35-5A 3-phase line-side terminal

for MSP size S2

#### 3RV19 15-5DB Connector

For connecting a 3-phase busbar for  
MSPs of the size S0  
(left) to size S00 (right)

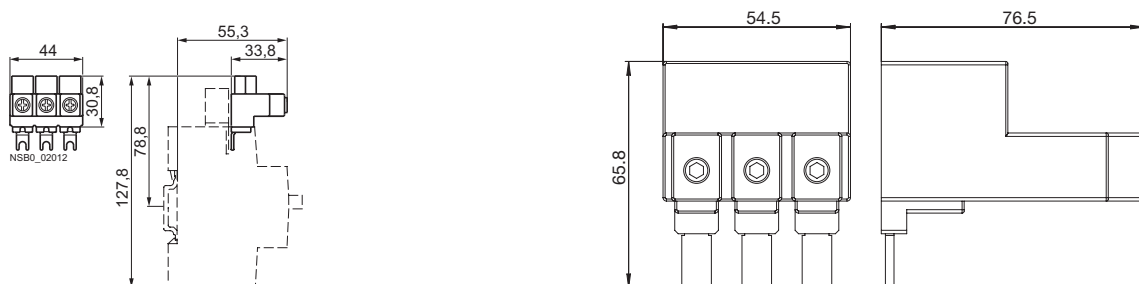


#### 3RV19 25-5EB to construct "Type E Starters"

Connected from top, for motor starter protector size S0

#### 3RV29 35-5E

Connected from top, for motor starter protector size S2



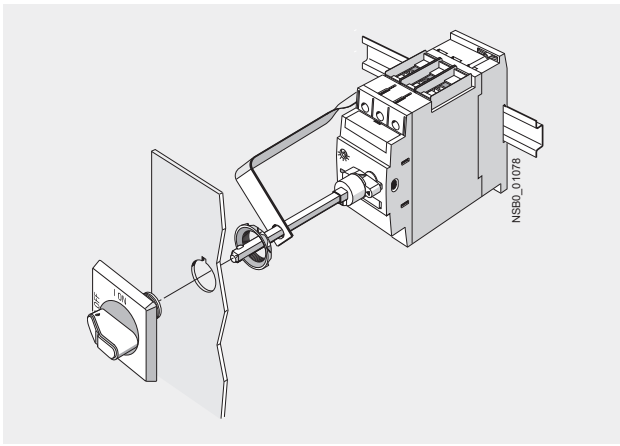
# General Data

## Busbar accessories

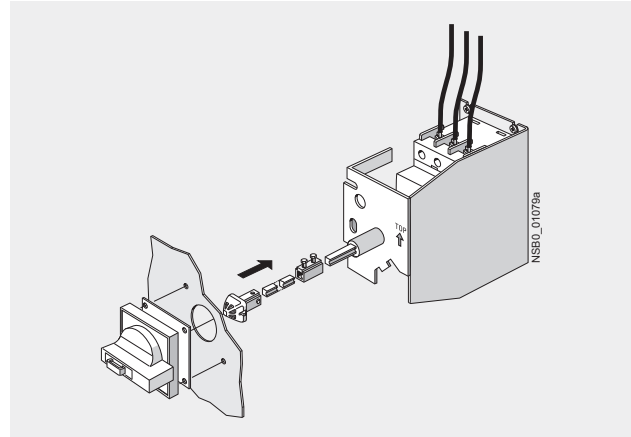
### Overview

#### Door-coupling rotary operating mechanisms

Motor starter protectors with a rotary operating mechanism can be mounted in a control cabinet and operated externally by means of a door-coupling rotary operating mechanism. When the cabinet door with motor starter protector is closed, the operating mechanism is coupled. When the motor starter protector closes, the coupling is locked which prevents the door from being opened unintentionally. This interlock can be defeated by the maintenance personnel. In the OPEN position, the rotary operating mechanism can be secured against reclosing with up to 3 padlocks. Inadvertent opening of the door is not possible in this case either.



SIRIUS 3RV29 26-0K door-coupling rotary operating mechanism



SIRIUS 3RV29 26-2B door-coupling rotary operating mechanism for arduous conditions

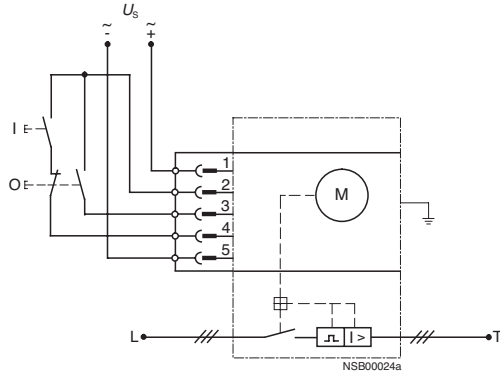
# General Data

## Rotary operating mechanisms

### Circuit diagrams

#### Typical circuits

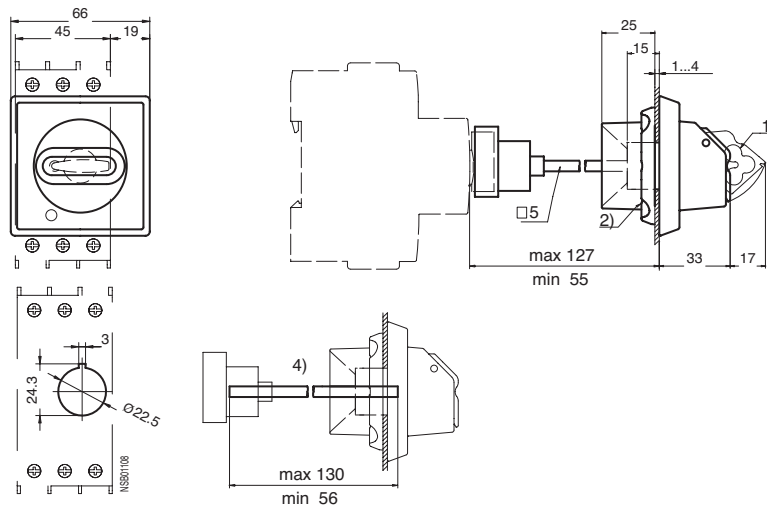
3RV MSP with 3RV19 36/3RV19 46 remote-controlled motorized operating mechanism



### Dimensional drawings

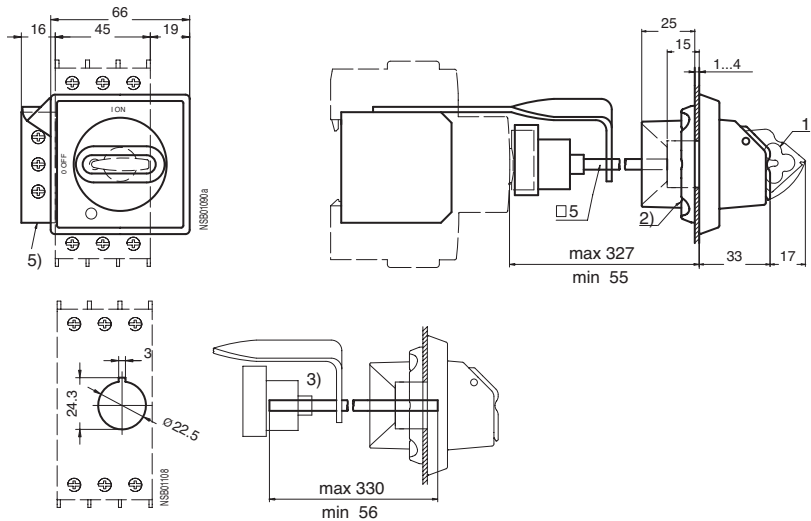
#### Door coupling rotary mechanism

3RV29 26-0B/3RV29 26-0C short shaft<sup>4)</sup>, for MSP sizes S00, S0, S2 and S3



- 1) Lockable in 0 position, with shackle diameter max. 8 mm
- 2) Mounting with screw cap
- 3) Supplied with a shaft length of 330 mm; adaptable by shortening of the shaft.
- 4) Supplied with a shaft length of 130 mm; adaptable by shortening of the shaft.
- 5) Grounding terminal 35 mm<sup>2</sup> and bracket for 330 mm shaft.

3RV29 26-0K/3RV29 26-0L long shaft (with bracket)<sup>3)</sup>, for MSP sizes S00, S0, S2 and S3

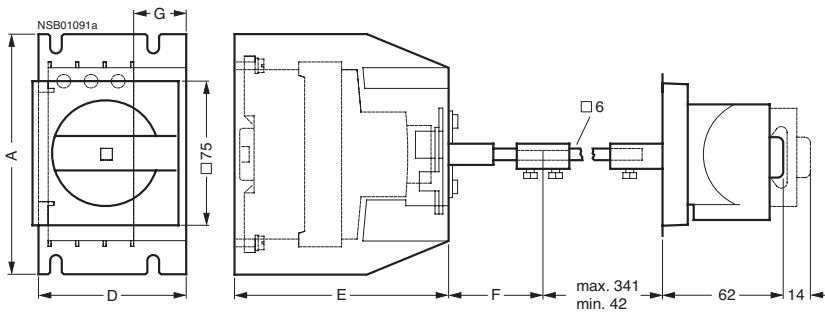


# General Data

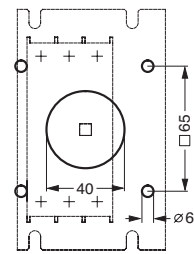
## Rotary operating mechanisms

### Dimension drawings

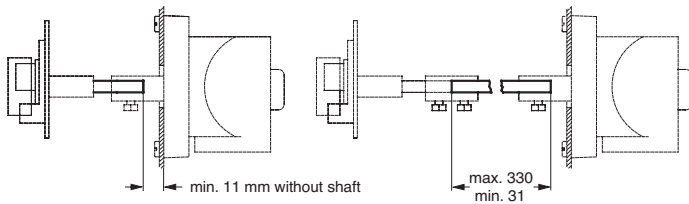
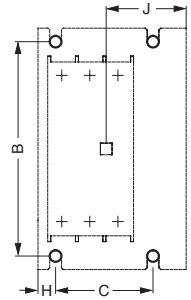
**3RV29 .6-2. Door coupling rotary mechanism for heavy duty**  
 3RV29 26-2., 3RV29 36-2., 3RV29 46-2.  
 for sizes S00, S0, S2 and S3



Drilling template, door



Drilling template, base



Type	Size	Dimensions								
		A	B	C	D	E	F	G	H	I
3RV29 26-2.	S00, S0	125	111	50	77	112	50	27	9	42
3RV29 36-2.	S2	170	144	60	87	162	50	27	10	47
3RV29 46-2.	S3	194	180	60	100	187	48	25	10	53



# General Data

## Accessories – Enclosures and front plates

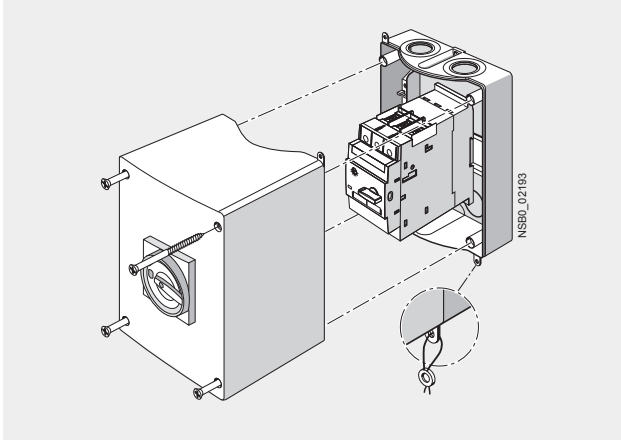
### Overview

#### Enclosure

For stand-alone installation of motor starter protector size S2 ( $I_{n\ max} = 65\ A$ ), molded-plastic enclosures for surface mounting are available.

When installed in a molded-plastic enclosure the motor starter protectors have a rated operational voltage  $U_e$  of 500 V.

The molded-plastic enclosures are designed to degree of protection IP55.



Enclosures for surface mounting

All enclosures are equipped with N and PE terminals. There are two knock-out cable entries for cable glands at the top and two at the bottom; also on the rear corresponding cable entries are scored. There is a knockout on the top of the enclosure for indicator lights that are available as accessories.

In the enclosure for motor starter protector size S2 there is also room for the laterally mounted auxiliary release. There is no provision for installing a motor starter protector with a signaling switch.

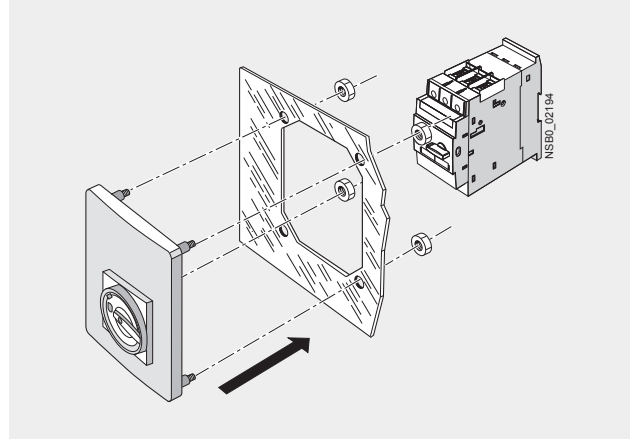
The molded-plastic enclosures of the size S2 motor starter protectors are fitted with a rotary operating mechanism.

The enclosures can be supplied with either a black rotary operating mechanism or with an EMERGENCY-STOP rotary operating mechanism with a red/yellow knob.

The rotary operating mechanisms can be locked in the Open position with up to 3 padlocks.

#### Front plates

Motor starter protectors are frequently required to be actuated in any enclosure. Front plates equipped with a rotary operating mechanism for motor starter protector sizes S2 and S3 are available for this purpose.



Front plate for size S2

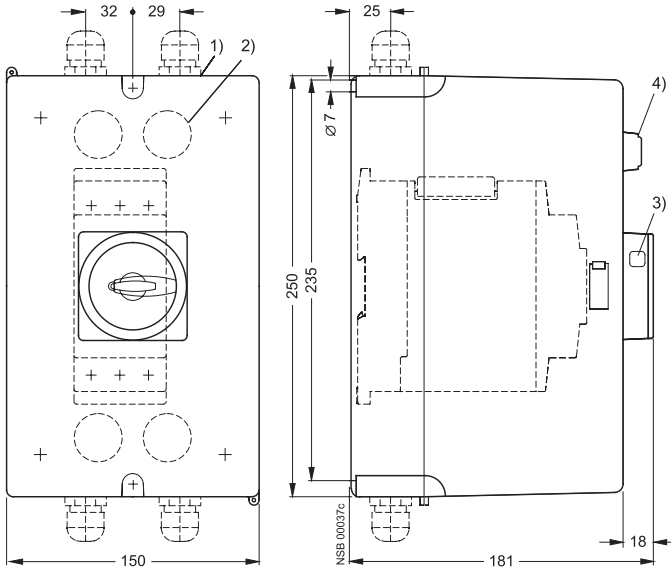
# General Data

## Mounting accessories

### Dimension drawings

#### 3RV19 . 3-1.... Cast aluminum enclosure for wall mounting

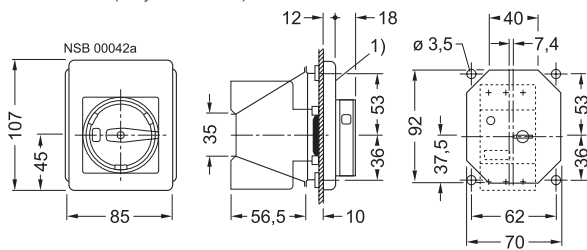
for MSPs of size S2  
3RV19 33-1....



- 1) Knock-outs for M32 (left) and M40 (right).
- 2) M32 knock-outs for rear-side cable entry.
- 3) Opening for padlock with shackle diameter max. 8 mm.
- 4) Indicator light 3RV19 03-5.

#### Molded-plastic front plate 3RV19 23-4.

for MSP sizes S0, S2, S3  
3RV29 23-4B  
3RV29 23-4E  
3RV19 23-4G (only for size S0)



# General Data

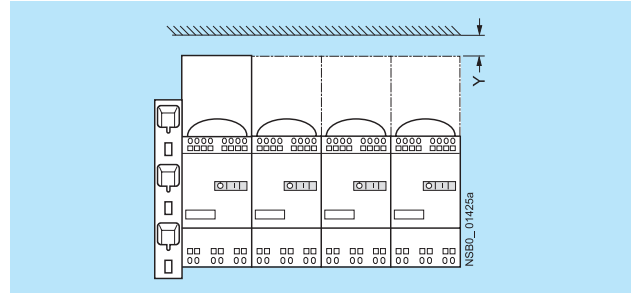
## 3RV Spring-type terminal infeed system

### Design

#### Installation guidelines

Distance in Y direction from live, earthed or insulated parts according to IEC 60947-4: 10 mm.

In addition, the installation guidelines for motor starter protectors or fuseless load feeders including the clearances must be complied with.



### Technical specifications

Type	<b>3RV29 .7</b>	
<b>Rated operational voltage <math>U_e</math></b>		
• IEC	V	500
- 10 % overvoltage	V	525
- 5 % overvoltage	V	600
• UL/CSA	V	600
<b>Rated frequency</b>	Hz	50/60
<b>Rated current <math>I_n</math></b>	A	63
<b>Permissible ambient temperature</b>		
• During storage/transport	°C	-50 ... +80
• During operation	°C	-20 ... +60
<b>Permissible rated current of the 3RV10 11 motor starter protectors (size S00) at control cabinet internal temperature</b>		
• +60 °C	%	100
<b>Permissible rated current of the 3RV10 21 motor starter protectors (size S0) up to 16 A at control cabinet internal temperature</b>		
• +60 °C	%	100
<b>Permissible rated current for 3RV1. 21 motor starter protectors (size S0) from 16 A at control cabinet internal temperature</b>		
• +40 °C	%	100
• +60 °C	%	87
<b>Degree of protection acc. to IEC 60529</b>		IP20 <sup>1)</sup>
<b>Touch protection acc. to IEC 61140</b>		Finger-safe
<b>Conductor cross-sections for main circuit infeed</b>		
• Solid, stranded:	mm <sup>2</sup>	4 ... 25
• Finely stranded with end sleeve	mm <sup>2</sup>	4 ... 25
• Finely stranded without end sleeve	mm <sup>2</sup>	6 ... 25
• AWG cables, solid or stranded	AWG	10 ... 3
<b>Conductor cross-sections of terminal block</b>		
• Solid	mm <sup>2</sup>	1.5 ... 6
• Finely stranded with end sleeve	mm <sup>2</sup>	1.5 ... 4
• Finely stranded without end sleeve	mm <sup>2</sup>	1.5 ... 6
• AWG cables, solid or stranded	AWG	15 ... 10

<sup>1)</sup> In infeed terminal compartment without a conductor connected: IP00.

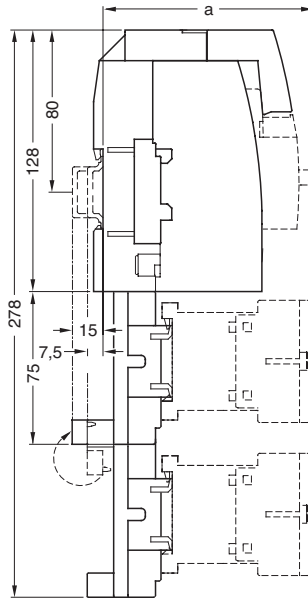
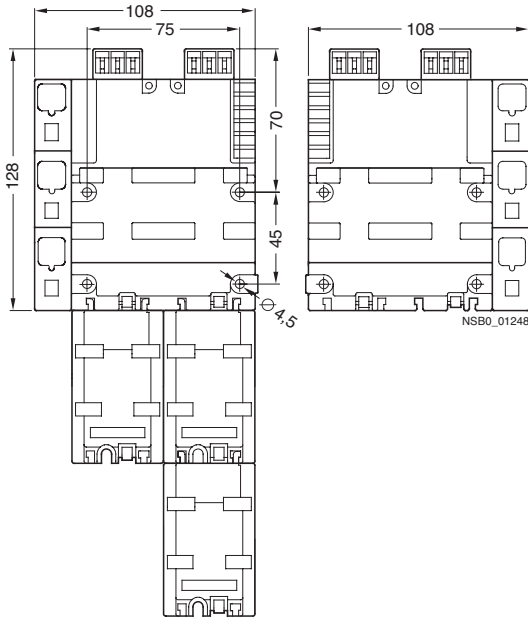
# General Data

## 3RV Cage clamp infeed system

MOTOR STARTER PROTECTORS 1

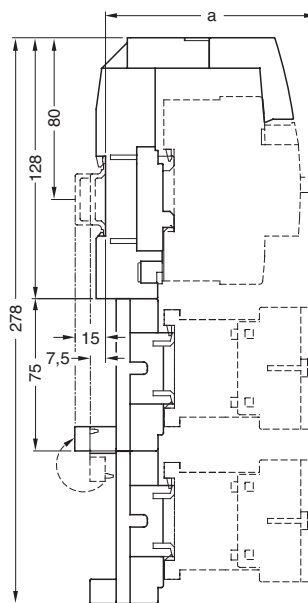
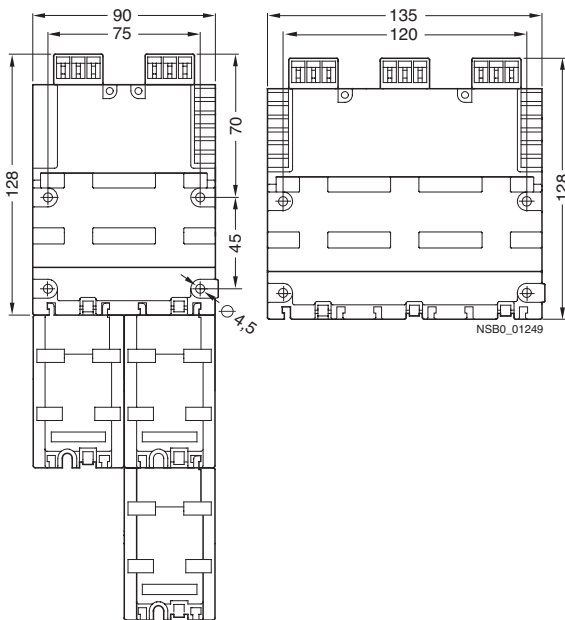
### Cage Clamp infeed system

**3-phase busbars with line-side terminals**  
for 2 circuit-breakers of sizes S00 and S0  
3RV29 17-1.



	S00	S0
a	104	125

**3-phase busbars for system expansion**  
for 2 and 3 circuit-breakers of sizes S00 and S0  
3RV29 17-4.



	S00	S0
a	104	125

# Contactors and Contactor Assemblies

Industrial Controls Product Catalog 2017

Section



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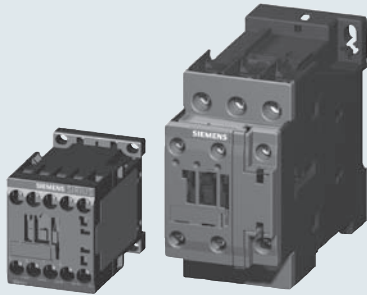
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# Contactors and Contactor Assemblies

## Contactors for switching three-phase motors

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#### Contactors for switching three-phase motors



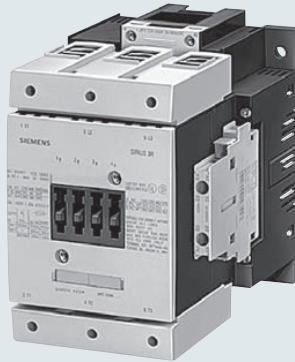
**3RT20 contactors, 3-pole  
3 to 75 HP, Sizes S00 to S3**  
with screw, spring or ring lug  
connections

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#### Selection and ordering data

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**3RT10 contactors, 3-pole,  
100 to 400 HP,  
sizes S6, S10 and S12**

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**3RT20 NEMA  
labeled contactors,  
NEMA size 0 to 6**

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#### Contactor assemblies for switching three-phase motors



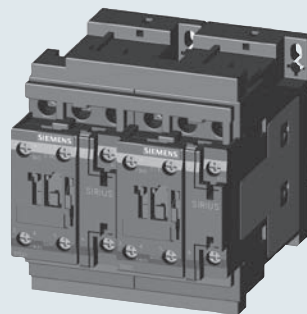
**3RT12 vacuum contactors, 3-pole,  
150 to 400 HP,  
sizes S10 and S12**

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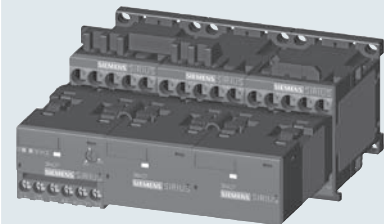
**3RA13 / 23 contactor assemblies for  
reversing, 3 to 75 HP, sizes S00 to S3**  
with screw or spring loaded connections

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- AC/DC operation 2/40
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**Wye Delta for  
customer assembly of  
sizes S00 to S12**

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- Accessories 2/83
- Spare parts 2/94

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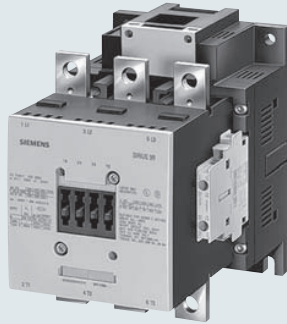


# Contactors and Contactor Assemblies

## Contactors for special applications

### contents

#### Contactors for special applications



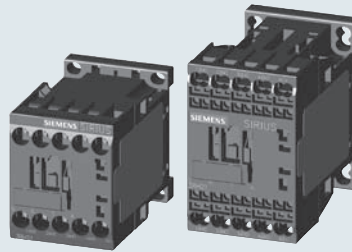
**3RT14 / 24 contactors,**  
 **$I_e$ /AC-1: 140 to 690 A,**  
**3-pole, sizes S3 to S12,**  
with screw connections

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#### Selection and ordering data

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- Accessories 2/66
- Spare parts 2/97

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Technical Data	2/158
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Position of terminals	2/204
Dimension drawings	2/211



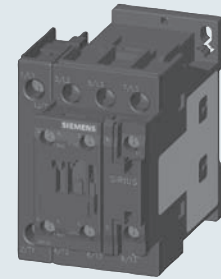
**3RT23 contactors,**  
**AC-1: 18 to 140 A with 4 NO main**  
**contacts, sizes S00 to S3**  
with screw or spring connections

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- Accessories 2/66
- Spare parts 2/94

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**3RT25 contactors,**  
**AC-3: 7.5-25 HP with 2 NO + 2 NC**  
**main contacts, sizes S00 to S2**  
with screw or spring connections

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#### Selection and ordering data

- AC/DC operation 2/13
- Accessories 2/66
- Spare parts 2/94

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Technical Data	2/168
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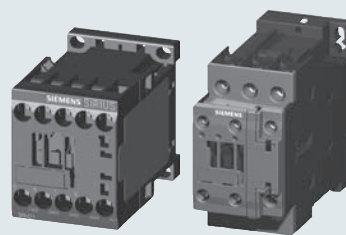
**3RT26 capacitor**  
**contactors, up to 75 kvar,**  
**sizes S00 to S2**  
with screw connections

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#### Selection and ordering data

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- Accessories 2/66
- Spare parts 2/96

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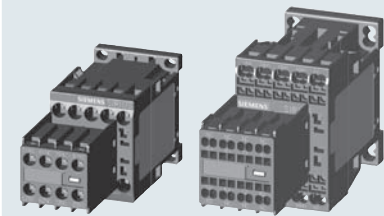
**3RT20 coupling relays up to 20 HP**  
**(interface,) 3-pole, for switching**  
**motors, sizes S00 and S0**  
with screw or spring connections

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#### Selection and ordering data

- DC operation 2/20
- Accessories 2/66
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**3RT Safety Contactors and**  
**3RH Safety Control Relays**

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#### Selection and ordering data

- Safety with standard devices 2/22
- Safety with permanently mounted auxiliaries 2/23
- Accessories 2/73

Description	2/22
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## Contactors for special applications



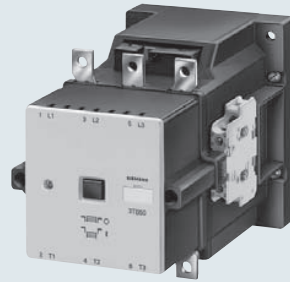
**3TF68 and 3TF69 vacuum contactors, 500 to 700 HP; contactor assemblies**

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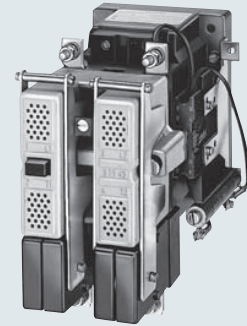


**3TB50 to 3TB56 contactors with DC solenoid system, 100 to 300 HP**

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**Selection and ordering data**

- Spare parts 2/101



**3TC Contactors**

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**Selection and ordering data**

- DC operation 2/55
- Spare parts 2/55

Technical Data	2/178
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**3RT1 SIRIUS Nomenclature**

3RT1	0	3	5	1	A	B0	1
<b>SIRIUS Contactor</b>	<b>Application</b> 0 = 3 pole Standard 2 = 3 pole Vacuum 3 = 4 pole NO 4 = 3 pole resistive load 5 = 4 pole 2 NO + 2 NC 6 = 3 pole Capacitive	<b>Frame</b> 5 = S6 6 = S10 7 = S12	<b>Current</b> Designation Choices = 4,5,6	<b>Terminal</b> 2 = Spring Loaded Coil only 6 = Busbar Terminal	<b>Coil Type</b> A = AC/DC (S6-S12) N = UC Solid state (S6-S12) P = UC Solid state with RLT (S6-S12)	<b>Coil Voltage</b> See Coil Selection Chart page 2/49	<b>Aux Contacts A)</b> 0 = None 4 = 2NO + 2NC (S6-S12) 5 = 1NO + 1 NC (S6-S12) 6 = 2 NO + 2 NC (S6-S12) A) per EN50012

**3RT2 SIRIUS Innovations Nomenclature**

3RT2	0	1	5	1	A	B0	1
<b>SIRIUS Innovations Contactor</b>	<b>Application</b> 0 = 3 pole Standard 3 = 4 pole NO 5 = 4 pole 2 NO + 2 NC 6 = 3-pole Capacitive	<b>Frame</b> 1 = S00 2 = S0 3 = S2 4 = S3	<b>Current</b> 3,4,5,6,7,8	<b>Terminal</b> 1 = Screw 2 = Spring Loaded 3 = Spring Loaded Coil only 4 = Ring Lug	<b>Coil Type</b> A = AC (S0-S3) B = DC N = UC Electronic	<b>Coil Voltage</b> See Coil Selection Chart page 2/49	<b>Aux Contacts A)</b> 0 = 1NO + 1NC (S0-S3) 1 = 1 NO (S00) 2 = 1 NC (S00) 4 = 2NO + 2NC (S00-S3) A) per EN50012

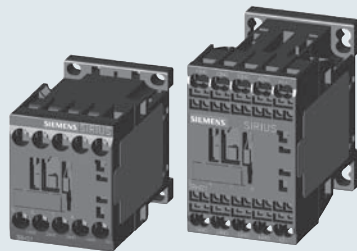
Note: MSPs and Contactors of the same frame size are made to easily fit together with the use of a link module or can be purchased pre-assembled as 3RA starter assemblies. See section 4.

Note: Contactors and Overloads of the frame size S00 - S3 are made to easily fit together without the use of accessories.

Note: This is only a guide to decode the model number. All possible combinations of these are not available.

## Contents

## SIRIUS contactor relays

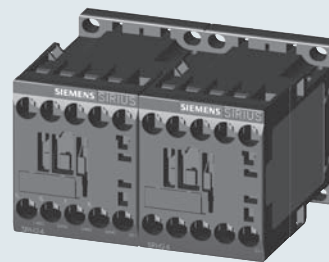

**3RH21, 3RH22 control relays 4- and 8-pole, size S00, AC/DC operation**

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**Selection and ordering data**

- With screw connections 2/50
- With spring connections 2/50
- Accessories for 3RH2 2/51

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Terminal diagrams	2/202
Position of terminals	2/203
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**3RH24 latched control relays, 4-pole, size S00, AC/DC operation**

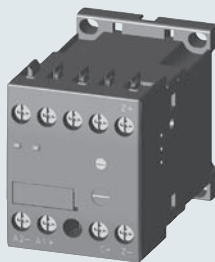
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- With screw connections 2/51
- Accessories for 3RH2 2/51

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Position of terminals	2/203
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## SIRIUS coupling relays (interface)


**3RH21 coupling relays for switching auxiliary circuits, 4-pole, size S00, DC operation**

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**Selection and ordering data**

- With screw connections 2/52
- with Cage Clamp connections 2/52

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## SIRIUS current monitoring relays


**3RR current monitoring relays for direct mounting to SIRIUS contactors**

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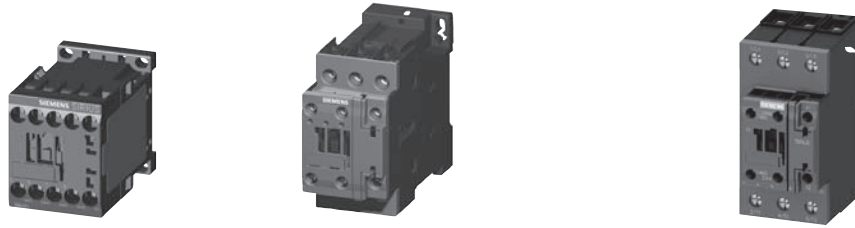
**Selection and ordering data**

- Basic versions 2/87
- Standard versions 2/87
- Versions with IO-Link 2/91
- Accessories for 3RR 2/92

Overview	2/84
Application	2/84
Technical data	2/85

## Contactors and Contactor Assemblies

## Overview



Type	S00 3RT20 1				S0 3RT20 2						S2 3RT20 3				
<b>3RT20 contactors</b>															
Type	3RT2015	3RT2016	3RT2017	3RT2018	3RT2023	3RT2024	3RT2025	3RT2026	3RT2027	3RT2028	3RT2035	3RT2036	3RT2037	3RT2038	
AC/DC operation	(p. 2/8)				(p. 2/8)						(p. 2/8)				
Type															
AC/DC operation															
<b>Maximum 3-phase horsepower ratings at 460V (UL and CSA listed values)</b>															
200 V	HP	1.5	2	3	3	2	3	5	7.5	10	10	10	15	20	20
230 V	HP	2	3	3	5	3	3	5	7.5	10	10	15	15	20	25
<b>460 V</b>	<b>HP</b>	<b>3</b>	<b>5</b>	<b>7.5</b>	<b>10</b>	<b>5</b>	<b>7.5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>50</b>
575 V	HP	5	7.5	10	10	7.5	10	15	20	25	25	40	50	50	60
<b>AC-3</b>															
$I_e$ /AC-3/400V	A	6	9	12	16	9	12	17	25	32	38	40	50	65	80
230 V	kW	1.5	2.2	3	4	2.2	3	4	5.5	7.5	11	11	15	18.5	22
<b>400 V</b>	<b>kW</b>	<b>3</b>	<b>4</b>	<b>5.5</b>	<b>7.5</b>	<b>4</b>	<b>5.5</b>	<b>7.5</b>	<b>11</b>	<b>15</b>	<b>18.5</b>	<b>18.5</b>	<b>22</b>	<b>30</b>	<b>37</b>
500 V	kW	3.5	4.5	5.5	7.5	4.5	7.5	10	11	18.5	18.5	22	30	37	37
690 V	kW	4	5.5	5.5	7.5	7.5	7.5	11	11	18.5	18.5	22	22	37	45
1000 V	kW	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>AC-4 (at <math>I_a = 6 \times I_e</math>)</b>															
<b>400 V</b>	<b>kW</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>5.5</b>	<b>4</b>	<b>5.5</b>	<b>7.5</b>	<b>7.5</b>	<b>11</b>	<b>11</b>	<b>18.5</b>	<b>22</b>	<b>30</b>	<b>37</b>
400 V (200,000 operating cycles)	kW	1.15	2	2	2.5	2	2.6	3.5	4.4	6	6	11.6	12.6	14.7	15.8
<b>AC-1 (40°C, ≤ 690V)</b>															
$I_e$	A	<b>18</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>50</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>90</b>

**Accessories for contactors**

Auxiliary switch blocks	front	3RH29 11	(p. 2/66)	3RH29 11	(p. 2/66)	3RT29 36	(p. 2/77)
	lateral	3RH29 11	(p. 2/68)	3RH29 21	(p. 2/68)	—	—
Terminal covers	—	—	—	—	—	—	—
Box terminals	—	—	—	—	—	—	—
Surge suppressor	3RT29 16	(p. 2/73)	3RT29 26	(p. 2/73)	3RT29 36	(p. 2/73)	—

**3RU21 and 3RB3 overload relays (Section 3)**

3RU21, thermal, CLASS 10	3RU21 16	0.1-16A	(p. 3/10)	3RU21 26	0.18-40A	(p. 3/10)	3RU21 36	11-80A	(p. 3/10)
3RB30/31, solid-state, CLASS 5, 10, 20 and 30	3RB30 16	0.1-16A	(p. 3/22)	3RB30 26	0.1-40A	(p. 3/22)	3RB30 36	12-80A	(p. 3/22)
	3RB31 13	(p. 3/23)	3RB31 23	(p. 3/23)	3RB31 33	(p. 3/23)	3RB31 33	(p. 3/23)	
3RB22/23, solid-state, CLASS 5, 10, 20 and 30	3RB2.83+ 3RB29 06	0.3-25A	(p. 3/34)	3RB22, 3RB23 and 3RB24 with current measuring module	10-100A	(p. 3/34)	—	—	—

**3RV20 circuit-breakers (Section 1)**

Type	3RV20 11	0.18-16A	(p. 1/4)	3RV20 21	11-40A	(p. 1/4)	3RV20 31	9.5-80A	(p. 1/5)
Link modules	3RA29 11	(p. 1/10)	3RA29 21	(p. 1/10)	3RA29 31	(p. 1/10)	—	—	—

**3RA23 Reversing contractor assemblies**

Complete units	Type	3RA2315	3RA2316	3RA2317	3RA2318	3RA2324	3RA2325	3RA2326	3RA2327	3RA2328	3RA2335	3RA2336	3RA2337	3RA2338
		(page 2/40)				(page 2/42)					(page 2/43)			
<b>460 V</b>	<b>HP</b>	<b>3</b>	<b>5</b>	<b>7.5</b>	<b>10</b>	<b>7.5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>50</b>
Installation kits / wiring connectors		3RA2913-2AA1 (p. 2/81)				3RA2923-2AA1 (p. 2/81)					3RA2933-2AA1 (p. 2/81)			
Mechanical interlocks		3RA2912-2H (p. 2/82)				3RA2922-2H (p. 2/82)					3RA2934-2B (p. 2/80)			

## Contactors and Contactor Assemblies

## Overview



Type	S3	3RT2. 4			S6	3RT1. 5			S10	3RT1. 6			S12	3RT1. 7		S14	3TF6	
<b>3RT20 contactors</b>																		
Type		3RT2045	3RT2046	3RT2047	3RT1054	3RT1055	3RT1056	3RT1064	3RT1065	3RT1066	3RT1075	3RT1076	—	—				
AC/DC operation		(p. 2/8)			(p. 2/9)			(p. 2/9)			(p. 2/9)							
Type								3RT1264	3RT1265	3RT1266	3RT1275	3RT1276	3TF68	3TF69				
AC/DC operation								(p. 2/10)			(p. 2/10)		(p. 2/53)					
<b>Maximum 3-phase horsepower ratings at 460V (UL and CSA listed values)</b>																		
200 V	HP	25	30	30	40	50	60	60	75	100	125	150	200	290				
230 V	HP	30	30	40	50	60	75	75	100	125	150	200	250	350				
<b>460 V</b>	<b>HP</b>	<b>60</b>	<b>75</b>	<b>75</b>	<b>100</b>	<b>125</b>	<b>150</b>	<b>150</b>	<b>200</b>	<b>250</b>	<b>300</b>	<b>400</b>	<b>500</b>	<b>700</b>				
575 V	HP	60	75	100	125	150	200	200	250	300	400	500	650	860				
<b>AC-3</b>																		
$I_e$ /AC-3/400V	A	80	95	110	115	150	185	225	265	300	400	500	630	820				
230 V	kW	22	22	30	37	45	55	55	75	90	132	160	200	260				
<b>400 V</b>	<b>kW</b>	<b>37</b>	<b>45</b>	<b>55</b>	<b>55</b>	<b>75</b>	<b>90</b>	<b>110</b>	<b>132</b>	<b>160</b>	<b>200</b>	<b>250</b>	<b>335</b>	<b>450</b>				
500 V	kW	45	55	75	75	90	110	160	160	200	250	355	434	600				
690 V	kW	55	75	90	110	132	160	200	250	250	400	400/500	600	800				
1000 V	kW	37	—	—	75	90	90	90/315	132/355	132/400	250/560	250/710	600	800				
<b>AC-4 (at <math>I_a = 6 \times I_e</math>)</b>																		
<b>400 V</b>	<b>kW</b>	<b>37</b>	<b>45</b>	<b>55</b>	<b>55</b>	<b>75</b>	<b>90</b>	<b>110</b>	<b>132</b>	<b>160</b>	<b>200</b>	<b>250</b>	<b>355</b>	<b>400</b>				
400 V (200,000 operating cycles)	kW	17.9	22	24.3	29	38	45	54/78	66/93	71/112	84/140	98/161	168	191				
<b>AC-1 (40°C, ≤ 690V)</b>																		
$I_e$	A	125	130	130	160	185	215	275/330	330	330	430/610	610	700	910				

**Accessories for contactors**

Auxiliary switch blocks	front lateral	3RH29 11	(p. 2/66)	3RH19 21	(p. 2/66)	—	—	—	—	—	—	—	—	—	—	—	—
		3RH29 21	(p. 2/68)	3RH19 21	(p. 2/68)	—	—	—	—	—	—	—	—	—	—	—	3TY7 561 (p. 2/53)
Terminal covers		3RT2946-4EA2	(p. 2/79)	3RT19 56-4EA1/2/3	(p. 2/79)	3RT19 66-4EA1/2/3	(p. 2/79)	—	—	—	—	—	—	—	—	—	3TX7 686/696 (p. 2/54)
Box terminals		—	—	3RT19 55/56-4G	(p. 2/79)	3RT19 66-4G	(p. 2/79)	—	—	—	—	—	—	—	—	—	—
Surge suppressor		3RT29 36	(p. 2/73)	3RT19 56-1C (RC element)	(p. 2/73)	—	—	—	—	—	—	—	—	—	—	—	3TX7 572 (p. 2/54)

**3RU21 and 3RB3 overload relays (Section 3)**

3RU21, thermal, CLASS 10		3RU21 46	18-100A (p. 3/10)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3RB30/31, solid-state, CLASS 5, 10, 20 and 30		3RB30 46	12.5-100A (p. 3/22)	3RB20 56	50-200A (p. 3/22)	3RB20 66	50-630A (p. 3/22)	3RB20 66	160-630A (p. 3/22)	3RB20 66	160-630A (p. 3/22)	3RB20 66	160-630A (p. 3/22)	3RB20 66	160-630A (p. 3/22)	3RB20 66	160-630A (p. 3/22)
		3RB31 43	(p. 3/23)	3RB21 56	(p. 3/23)	3RB21 66	(p. 3/23)	3RB21 66	(p. 3/23)	3RB21 66	(p. 3/23)	3RB21 66	(p. 3/23)	3RB21 66	(p. 3/23)	3RB21 66	(p. 3/23)
3RB22/23, solid-state, CLASS 5, 10, 20 and 30		—	—	3RB2.83 + 3RB29 56	20-200A (p. 3/34)	3RB2.83 + 3RB29 56	63-640A (p. 3/34)	—	—	—	—	—	—	—	—	—	—

**3RV20 circuit-breakers (Section 1)**

Type		3RV20 41	45-100A (p. 1/5)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Link modules		3RA19 41	(p. 1/10)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**3RA23 Reversing contractor assemblies**

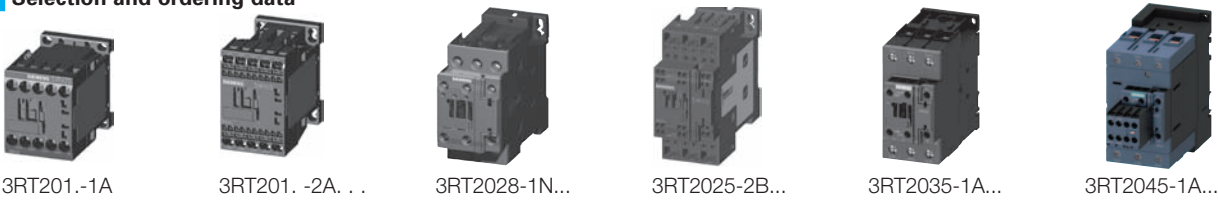
Complete units	Type	3RA23 45	3RA23 46	3RA23 47	—	—	—	—	—	—	—	—	—	—	—	—	—
		(p. 2/44)															
<b>460 V</b>	<b>HP</b>	<b>60</b>	<b>75</b>	<b>75</b>	<b>100</b>	<b>125</b>	<b>150</b>	<b>150</b>	<b>200</b>	<b>250</b>	<b>300</b>	<b>400</b>	<b>500</b>	<b>700</b>			
Installation kits / wiring connectors		3RA2943-2AA1	(p. 2/81)	3RA1953-2A	(p. 2/81)	3RA1963-2A	(p. 2/81)	3RA1973-2A	(p. 2/81)	3TX7680-1A							
Mechanical interlocks		3RA2934-2B		3RA1954-2A	(p. 2/80)	—	—	—	—	—	—	—	—	—	—	—	3TX7686-1A

# Contactors for Switching Motors

## 3RT contactors, 3-pole – Size S00 to S3

CONTACTORS AND ASSEMBLIES 2

### Selection and ordering data



Frame Size	Amp Ratings		Single-phase HP ratings			Three-phase HP ratings				Auxiliary contacts		Screw Terminals	Spring-Loaded Terminals	Weight approx. kg
	AC3	AC1	115V	208V	230V	208V	230V	460V	575V	NO	NC	Order No.	Order No.	
<b>3RT 3-pole contactors</b>														
S00	6	18	0.25	0.5	0.75	1.5	2	3	5	1	0	3RT2015-1□●●1	3RT2015-2□●●1	0.24/0.29
	9	22	0.33	1	1	2	3	5	7.5	1	0	3RT2016-1□●●1	3RT2016-2□●●1	
	12	22	0.5	1.5	2	3	3	7.5	10	1	0	3RT2017-1□●●1	3RT2017-2□●●1	
	16	22	1	2	2	3	5	10	10	1	0	3RT2018-1□●●1	3RT2018-2□●●1	
S0	9	40	1	1	1	2	3	5	7.5	1	1	3RT2023-1□●●0	3RT2023-2□●●0	0.42/0.60
	12	40	1	2	2	3	3	7.5	10	1	1	3RT2024-1□●●0	3RT2024-2□●●0	
	17	40	1	2	3	5	5	10	15	1	1	3RT2025-1□●●0	3RT2025-2□●●0	
	25	40	2	3	3	7.5	7.5	15	20	1	1	3RT2026-1□●●0	3RT2026-2□●●0	
	32	50	2	5	5	10	10	20	25	1	1	3RT2027-1□●●0	3RT2027-2□●●0	
S2	40	60	3	5	7.5	10	15	30	40	1	1	3RT2035-1□●●0	3RT2035-3□●●0	0.99/1.121
	50	70	3	7.5	10	15	15	40	50	1	1	3RT2036-1□●●0	3RT2036-3□●●0	
	65	80	5	10	10	20	20	50	50	1	1	3RT2037-1□●●0	3RT2037-3□●●0	
	80 <sup>2)</sup>	90	5	10	15	20	25	50	60	1	1	3RT2038-1□●●0	3RT2038-3□●●0	
S3	80	125	7.5	10	15	25	30	60	60	1	1	3RT2045-1□●●0	3RT2045-3□●●0	1.8/2.8
	95	130	10	10	20	30	30	75	75	1	1	3RT2046-1□●●0	3RT2046-3□●●0	
	110	130	10	10	20	30	40	75	100	1	1	3RT2047-1□●●0	3RT2047-3□●●0	
Size S2 & S3 only: Replace "B" with "K" for 24VDC coil only Size S0-S3 only: UC Electronic with integrated varistor												□	□	
												AC Coil = A	A	
												DC Coil = B	B	
												UC Coil = N	N	

NEMA Size	Amp Ratings	Single-phase HP ratings		Three-phase HP ratings				Auxiliary contacts		Screw Terminals with AC coil	Screw Terminals with 24 VDC coil	Weight approx. kg
		115V	230V	208V	230V	460V	575V	NO	NC	Order No.	Order No.	
<b>NEMA Labeled Contactors</b>												
0	18	1	2	3	3	5	5	1	0	3RT2018-1A●●1-0UA0	3RT2018-1BB41-0UA0	0.28
1	27	2	3	7.5	7.5	10	10	1	1	3RT2027-1A●●0-0UA0	3RT2027-1BB40-0UA0	0.42
2	45	3	7.5	10	15	25	25	1	1	3RT2036-1A●●0-0UA0	3RT2036-1NB30-0UA0	0.986/1.121
3	90	7.5	15	25	30	50	50	1	1	3RT2046-1A●●0-0UA0	3RT2046-1NB40-0UA0	1.8 / 2.8

1) All terminals are spring loaded on frame sizes S00 & S0.  
 Only the coil terminals are spring loaded on frame sizes S2 & S3.  
 2) Max UL FLA = 65A at 460V

Note: Ring lug terminals are also available in size S00 & S0 contactors, except contactors with communication interface or UC coil. Change the 8th digit of the order number to a "4", e.g. 3RT2015-4AK61.

For further coil voltages, see page 2/49.  
 For auxiliaries and accessories, see page 2/66-2/83.  
 For spare parts, see page 2/94-2/99.  
 For technical data, see page 2/121-2/142.  
 For description, see page 2/104-2/105.  
 For int. circuit diagrams, see page 2/190-2/197.  
 For dimension drawings, see page 2/209-2/212.

### AC Coil Selection for 3RT201 through 3RT204

●●Coil Code	C2 <sup>2)</sup>	H2 <sup>3)</sup>	K6	P6	U6	V6	T6
60 Hz	24 V	48 V	120 V	240 V	277 V	480 V	600 V
50 Hz	24 V	48 V	110 V	220 V	—	—	—

<sup>2)</sup> Use Code B0 for 3RT201, S00  
<sup>3)</sup> Use Code H0 for 3RT201, S00

### DC Coil Selection for 3RT201 & 3RT202 (for 3RT203 & 3RT204 see UC)

●●Coil Code	A4 <sup>4)</sup>	B4	W4	E4	F4	G4	M4
DC	12 V	24 V	48 V	60 V	110 V	125 V	220 V

<sup>4)</sup> 3RT201 and 3RT202 only

### UC Coil Selection for 3RT202

●●Coil Code	B3	F3	P3 <sup>4)</sup>
UC	21-28V	95-130V	200-280V

### UC Coil Selection for 3RT203 & 3RT204

●●	B3	F3	P3 <sup>5)</sup>
UC	20-33V	83-155V	175-280V

<sup>5)</sup> at upper limit = 1.1 x U<sub>S</sub>

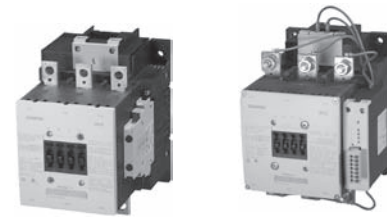


# Contactors for Switching Motors

3RT contactors, 3-pole – Size S6-S12 and NEMA size 4-6

### Selection and ordering data

- \* AC/DC Coils with built in surge suppressor
- \* Coil Types (40Hz to 60Hz, DC):
- \* Conventional Coil
- \* Solid-state operated coil with wider range and 24 V DC PLC input
- \* Solid-state operated coil with Remaining Lifetime Indication (RLT)
- \* Box terminals ordered separately



3RT1054-6A . . 6

3RT1065-6P . . 5

Frame Size	Amp Ratings		Single-phase HP ratings		Three-phase HP ratings			Auxiliary contacts		Screw Terminals on coil and aux. Order No.	Spring-type terminals on coil and aux. contacts Order No.	Weight approx. kg	
	AC3	AC1	115V	230V	200V	230V	460V	575V	NO				NC
<b>3RT 3-pole Contactors</b>													
S6	115	160	—	25	40	50	100	125	2	2	3RT1054-6□●●6	3RT1054-2□●●6	3.5
	150	185	—	30	50	60	125	150	2	2	3RT1055-6□●●6	3RT1055-2□●●6	
	185	215	—	30	60	75	150	200	2	2	3RT1056-6□●●6	3RT1056-2□●●6	
S10	225	275	—	—	60	75	150	200	2	2	3RT1064-6□●●6	3RT1064-2□●●6	6.7
	265	330	—	—	75	100	200	250	2	2	3RT1065-6□●●6	3RT1065-2□●●6	
	300	330	—	—	100	125	250	300	2	2	3RT1066-6□●●6	3RT1066-2□●●6	
S12	400	430	—	—	125	150	300	400	2	2	3RT1075-6□●●6	3RT1075-2□●●6	10.5
	500	610	—	—	150	200	400	500	2	2	3RT1076-6□●●6	3RT1076-2□●●6	
										□ A N P●●5	□ A N —		

NEMA Size	Amp Ratings	Single-phase HP ratings		Three-phase HP ratings			Auxiliary contacts		Screw Terminals on coil and aux. Order No.	Spring-type terminals on coil and aux. contacts Order No.	Weight approx. kg	
		115V	230V	208V	230V	460V	575V	NO				NC
<b>NEMA Labeled Contactors</b>												
4	135	—	30	40	50	100	100	2	2	3RT1056-6A●●6-0UA0	—	3.5
5	300	—	—	100	125	250	300	2	2	3RT1066-6A●●6-0UA0	—	6.7
6	400	—	—	150	200	400	500	2	2	3RT1076-6A●●6-0UA0	—	10.5

All coil voltages are in the adjacent table.  
 For auxiliaries and accessories, see page 2/66-2/83.  
 For spare parts, see page 2/94-2/99.  
 For technical data, see page 2/143-2/151.  
 For description, see page 2/106-2/107.  
 For int. circuit diagrams, see page 2/196-2/198.  
 For dimension drawings, see page 2/213-2/214.

### Sizes S6 to S12 Coil Codes - UC operation (AC 50 to 60 Hz and DC)

UC Conventional Coil		Solid-State Coil	
Rated control supply voltage Us Us min ... Us max <sup>1)</sup>	Coil Codes	Rated control supply voltage Us Us min ... Us max <sup>1)</sup>	Coil Codes
3RT1. 5.-.A	●●	3RT1. 5.-.N	●●
3RT1. 6.-.A	B3	3RT1. 5.-.P	●●
3RT1. 7.-.A	D3	3RT1. 6.-.N	●●
	F3	3RT1. 6.-.P	●●
	F3	3RT1. 7.-.N	●●
	M3	3RT1. 7.-.P	●●
	P3		
	U3		
	V3		
	R3		
	S3		
	T3		

1) Operating range:  
0.8 x Us min to 1.1 x Us max.

# Contactors for Switching Motors

## 3RT12 vacuum contactors, 3-pole

CONTACTORS AND ASSEMBLIES 2

### Selection and ordering data

- AC/DC operation (40 Hz ... 60 Hz, DC)
- Withdrawable coils
- Integrated coil circuit (varistor)
- Auxiliary and control conductors: screw connections
- Main conductor: bar connections

Size	Horsepower ratings and utilization categories					Auxiliary contacts, lateral			Rated control supply voltage $U_s$	Order No.	Weight approx. kg	
	AC-3 Maximum inductive current	Ratings of three-phase motors				AC-1 Maximum resistive current	NO	NC				AC/DC V
	Amps	HP	HP	HP	HP	Amps						
<b>Conventional operating mechanism</b>												
3RT12 6.	<b>S10</b>	225	60	75	<b>150</b>	200	330	2	2	110 ... 127 220 ... 240	<b>3RT12 64-6AF36</b> <b>3RT12 64-6AP36</b>	6.4
		265	75	100	<b>200</b>	250	330	2	2	110 ... 127 220 ... 240	<b>3RT12 65-6AF36</b> <b>3RT12 65-6AP36</b>	
		300	100	125	<b>250</b>	300	330	2	2	110 ... 127 220 ... 240	<b>3RT12 66-6AF36</b> <b>3RT12 66-6AP36</b>	
3RT12 7.	<b>S12</b>	400	125	150	<b>300</b>	400	610	2	2	110 ... 127 220 ... 240	<b>3RT12 75-6AF36</b> <b>3RT12 75-6AP36</b>	9.6
		500	150	200	<b>400</b>	500	610	2	2	110 ... 127 220 ... 240	<b>3RT12 76-6AF36</b> <b>3RT12 76-6AP36</b>	
<b>Solid-state operating mechanism - for DC 24 V PLC output</b>												
3RT12 6.	<b>S10</b>	225	60	75	<b>150</b>	200	330	2	2	96 ... 127 200 ... 277	<b>3RT12 64-6NF36</b> <b>3RT12 64-6NP36</b>	6.4
		265	75	100	<b>200</b>	250	330	2	2	96 ... 127 200 ... 277	<b>3RT12 65-6NF36</b> <b>3RT12 65-6NP36</b>	
		300	100	125	<b>250</b>	300	330	2	2	96 ... 127 200 ... 277	<b>3RT12 66-6NF36</b> <b>3RT12 66-6NP36</b>	
3RT12 7.	<b>S12</b>	400	125	150	<b>300</b>	400	610	2	2	96 ... 127 200 ... 277	<b>3RT12 75-6NF36</b> <b>3RT12 75-6NP36</b>	9.6
		500	150	200	<b>400</b>	500	610	2	2	96 ... 127 200 ... 277	<b>3RT12 76-6NF36</b> <b>3RT12 76-6NP36</b>	



Universal Coil Selection for 3RT126 through 3RT127: Conventional Operation										
Coil Code	B3	D3	F3	M3	P3	U3	V3	R3	S3	T3
Volts AC/DC 40 - 60 Hz, DC	23 .. 26 V	42 .. 48 V	110 .. 127 V	200 .. 220 V	220 .. 240 V	240 .. 277 V	380 .. 420 V	440 .. 480 V	500 .. 550 V	575 .. 600 V

Solid State Selection for 3RT126 through 3RT127: Solid-State			
Coil Code	B3	F3	P3
Volts AC/DC 40 - 60 Hz, DC	21 .. 27.3 V	96 .. 127 V	200 .. 277 V

For further vacuum contactors, 500Hp and 700Hp (3TF68/69), see page 2/53.  
 For auxiliaries and accessories, see page 2/68.  
 For spare parts, see page 2/98-2/99.  
 For technical data, see page 2/152-2/157.  
 For int. circuit diagrams, see page 2/196  
 For dimension drawings, see page 2/215.

# Contactors for Special Applications

## 3RT23 contactors, 4-pole (4 NO contacts) for switching resistive loads (AC-1)

### Standards

IEC 60947-1, EN 60947-1  
 IEC 60947-4-1, EN 60947-4-1  
 IEC 60947-5-1, EN 60947-5-1 (auxiliary switches)

### Design

The contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106, Part 100. The accessories for the 3-pole SIRIUS contactors can also be used for the 4-pole designs.

#### Mountable auxiliary contacts

Size S00: 4 auxiliary contacts of which up to 3 can be NC.  
 Size S0 & S2: 4 additional auxiliary contacts up to 3 can be NC.  
 Sizes S2 and S3: Up to 4 auxiliary contacts (either laterally mounted or snapped onto the top).

#### Contactor assemblies with mechanical interlock

The 4-pole 3RT23 contactors with 4 NO contacts as the main contacts are suitable for making contactor assemblies with a mechanical interlock, e.g. for system transfers.

**Size S00:** Contactor assemblies can be made using two 3RT23.1 contactors in conjunction with the mechanical interlock and two connecting clips (Order No. 3RA2912-2H, pack comprising 10 interlocking elements and 20 clips for 10 contactor assemblies, see accessories on page 2/72).

**Size S0:** In order to make 4-pole contactor assemblies using two 3RT23.2 contactors, the fourth pole of the left-hand contactor must always be moved to the left-hand side. The contactor assembly can then be made easily with the aid of the 3RA2922-2H mechanical interlock and connecting clip set fitted between the two contactors.

**Sizes S2 and S3:** Contactor assemblies can be made using two 3RT23 3 or 3RT23 4 contactors in conjunction with the laterally mountable mechanical interlock and the mechanical connectors. The mechanical interlock for fitting onto the front cannot be used for size S2 and S3 contactors.

### Application

- Switching resistive loads
- Isolating systems with unearthed or poorly earthed neutral conductors
- System transfers when alternative AC power supplies are used
- As contactors which only carry current and do not have to switch in case of inductive loads – e.g. variable-speed operating mechanisms
- Switching mixed loads in distribution systems (e.g. for supplying heaters, lamps, motors, PC power supply units) with p.f. > 0.8 according to IEC 60947-4-1, test conditions for utilization category AC-1

### Selection and ordering data

Rating data			Auxiliary contacts			Rated control supply voltage $U_s$ 50/60 Hz	AC Operation Screw Terminals <sup>1)</sup> Order No.	Rated control supply voltage $U_s$ V DC	DC Operation Screw Terminals <sup>1)</sup> Order No.
AC-1 Max resist. current $I_e$	UL ratings AC loads at 600 V, 60 Hz		Ident-ification No.	Version					
40°C Amps	60°C Amps			NO	NC	V AC	V DC		

### For screwing and stepping onto 35 mm mounting rail

3RT23 17-1AP60



**Size S00** – Auxiliary switches can be retrofitted

18	16	18	—	—	—	24 110/120 220/240	3RT23 16-1AB00 3RT23 16-1AK60 3RT23 16-1AP60	24 125 220	3RT23 16-1BB40 3RT23 16-1BG40 3RT23 16-1BM40
22	20	20	—	—	—	24 110/120 220/240	3RT23 17-1AB00 3RT23 17-1AK60 3RT23 17-1AP60	24 125 220	3RT23 17-1BB40 3RT23 17-1BG40 3RT23 17-1BM40

**Size S0** – Terminal designations according to EN 50012 —1 NO + 1 NC, identification number 11E

35 <sup>2)</sup>	30 <sup>2)</sup>	30	11E	1	1	24 110/120 220/240	3RT23 25-1AC20 3RT23 25-1AK60 3RT23 25-1AP60	24 125 220	3RT23 25-1BB40 3RT23 25-1BG40 3RT23 25-1BM40
40 <sup>2)</sup>	35 <sup>2)</sup>	35	11E	1	1	24 110/120 220/240	3RT23 26-1AC20 3RT23 26-1AK60 3RT23 26-1AP60	24 125 220	3RT23 26-1BB40 3RT23 26-1BG40 3RT23 26-1BM40
50 <sup>2)</sup>	42 <sup>2)</sup>	38	11E	1	1	24 110/120 220/240	3RT23 27-1AC20 3RT23 27-1AK60 3RT23 27-1AP60	24 125 220	3RT23 27-1BB40 3RT23 27-1BG40 3RT23 27-1BM40

#### Size S2

60	55	60	11E	1	1	24 110/120 220/240	3RT23 36-1AC20 3RT23 36-1AK60 3RT23 36-1AP60	20-33 83-155 175-280	3RT23 36-1NB30 3RT23 36-1NF30 3RT23 36-1NP30
110	95	105	11E	1	1	24 110/120 220/240	3RT23 37-1AC20 3RT23 37-1AK60 3RT23 37-1AP60	20-33 83-155 175-280	3RT23 37-1NB30 3RT23 37-1NF30 3RT23 37-1NP30

#### Size S3

140	130	120	—	—	—	24 110/120 220/240	3RT23 46-1AC20 3RT23 46-1AK60 3RT23 46-1AP60	20-33 83-155 175-280	3RT23 46-1NB30 3RT23 46-1NF30 3RT23 46-1NP30
-----	-----	-----	---	---	---	--------------------------	--	----------------------------	--

3RT23 36-1AP60



1) Size S00 and S0 contactors are also available with spring-type terminals. Replace the 8th digit of the order no. with a "2" e.g. "3RT23 16-2AK60"

2) Minimum conductor cross-section 8 AWG.

For further voltages, see page 2/49.  
 For coil voltage tolerance, p. 2/49  
 For auxiliaries and accessories, see page 2/66-2/83.  
 For spare parts, see page 2/94-2/99.

For technical data, see page 2/166-2/167.  
 For in. circuit diagrams, see page 2/191-2/196.  
 For dimension drawings, see page 2/216.

# Contactors for Special Applications

## 3RT24, 3-pole for switching resistive loads (AC-1)

### Application

**AC and DC operation (size S3)**  
**UC operation (AC/DC)**  
 (sizes S6 to S12)

IEC 60 947, EN 60 947  
 (VDE 0660)

The contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100.

3RT14/3RT24 contactors are used for switching resistive loads.

(AC-1) or as contactors, for example in variable-speed drives which normally only have to carry the current.

The accessories for the SIRIUS 3RT10/3RT20 contactors can also be used here.

### Selection and ordering data

3RT24 46-1A..0



Ratings AC-1 utilization category,		UL Ratings			Rated control supply voltage $U_s$	Order No.	Weight approx. kg
Maximum current Amps	IEC Ratings Rated power of three phase loads $\cos \varnothing = 0.95$ (@ 60°C)	Max Current Amps	230/240V Hp	460/480V Hp			
	230V kW   400V kW   500V kW   690V kW						

**With screw connections · for screwing and snapping onto 35 mm and 75 mm standard mounting rails**

**Size S3** · (without auxiliary contacts)

#### • AC operation

140	50	86	107	148	140	15	30	40	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	3RT24 46-1AC2 0 3RT24 46-1AK6 0 3RT24 46-1AP6 0	1.8
-----	----	----	-----	-----	-----	----	----	----	--	---	-----

#### • DC operation · DC solenoid system

140	50	86	107	148	131	15	30	40	DC 24 V DC 48 V	3RT24 46-1BB4 0 3RT24 46-1BW40	2.7
-----	----	----	-----	-----	-----	----	----	----	--------------------	-----------------------------------	-----

• AC/DC operation (40 Hz ... 60 Hz, DC)  
 • Withdrawable coils

• Integrated coil circuit (varistor)

• Auxiliary and control conductors: screw connections

• Main conductor: bar connections

3RT14 6.



Size	Ratings AC-1 utilization category,		UL Rating	Auxiliary contacts, lateral		Rated control supply voltage $U_s$	Order No.	Weight approx. kg
	AC-1 Maximum resistive current Amps	IEC Ratings Rated power of three phase loads $\cos \varnothing = 0.95$ (@ 60°C)		Max Current Amps	NO			
	230V kW   400V kW   500V kW   690V kW							

#### Conventional operating mechanism

<b>S6</b>	<b>275</b>	95	165	205	285	210	2	2	110 ... 127 220 ... 240	3RT14 56-6AF36 3RT14 56-6AP36	3.1
<b>S10</b>	<b>400</b>	145	250	315	430	360	2	2	110 ... 127 220 ... 240	3RT14 66-6AF36 3RT14 66-6AP36	5.7
<b>S12</b>	<b>690</b>	245	430	535	740	580	2	2	110 ... 127 220 ... 240	3RT14 76-6AF36 3RT14 76-6AP36	9.1

#### Solid-state operating mechanism · for DC 24 V PLC output

<b>S6</b>	<b>275</b>	95	165	205	285	210	2	2	96 ... 127 200 ... 277	3RT14 56-6NF36 3RT14 56-6NP36	3.1
<b>S10</b>	<b>400</b>	145	250	315	430	360	2	2	96 ... 127 200 ... 277	3RT14 66-6NF36 3RT14 66-6NP36	5.7
<b>S12</b>	<b>690</b>	245	430	535	740	580	2	2	96 ... 127 200 ... 277	3RT14 76-6NF36 3RT14 76-6NP36	9.1

#### Solid-state operating mechanism · for DC 24 V PLC with remaining lifetime indication

<b>S6</b>	<b>275</b>	95	165	205	285	210	1	1	96 ... 127 200 ... 277	3RT14 56-6PF35 3RT14 56-6PP35	3.1
<b>S10</b>	<b>400</b>	145	250	315	430	360	1	1	200 ... 277	3RT14 66-6PP35	5.7
<b>S12</b>	<b>690</b>	245	430	535	740	580	1	1	200 ... 277	3RT14 76-6PP35	9.1

3RT14 7.



Universal Coil Selection for 3RT145 through 3RT147: Conventional Operation										
Coil Code	B3	D3	F3	M3	P3	U3	V3	R3	S3	T3
Volts AC/DC 40 - 60 Hz, DC	23 .. 26 V	42 .. 48 V	110 .. 127 V	200 .. 220 V	220 .. 240 V	240 .. 277 V	380 .. 420 V	440 .. 480 V	500 .. 550 V	575 .. 600 V

Universal Coil Selection for 3RT145 through 3RT147: Solid-State			
Coil Code	B3	F3	P3
Volts AC/DC 40 - 60 Hz, DC	21 .. 27.3 V	96 .. 127 V	200 .. 277 V

Note: B3 code not available for Remaining Lifetime Contactors.

For further coil voltages, see page 2/49.  
 For auxiliaries and accessories, see page 2/66-2/83.  
 For spare parts, see page 2/94-2/99.  
 For technical data, see page 2/158-2/165.  
 For int. circuit diagrams, see page 2/196.  
 For dimension drawings, see page 2/211, 2/213-2/214.

# Contactors for Special Applications

## 3RT25 contactors, 4-pole (2 NO + 2 NC) contacts for switching motors

### AC and DC operation

IEC 60 947-4-1/EN 60 947-4-1  
(VDE 0660, Part 102)

### Design

The contactors are suitable for use in any climate. They are safe to touch according to EN 50274. The accessories for the 3-pole SIRIUS contactors can also be used for the 4-pole designs.

### Mountable auxiliary contacts

#### Size S00 and S0:

4 auxiliary contacts, of which up to 4 can be NC contacts.

#### Size S2

Up to 4 auxiliary contacts (either laterally mounted or snapped onto the top; auxiliary switch blocks to EN 50 012 and EN 50 005)

### Application

- Changing the polarity of hoisting gear motors
- Switching two separate loads from the same source

### Selection and ordering data

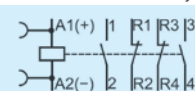
Rating data			Auxiliary contacts Version	Rated control supply voltage $U_s$	AC Operation <sup>2)</sup> Screw terminals	Rated control supply voltage $U_s$	DC Operation <sup>2)</sup> Screw terminals		
AC-2/AC-3 $T_U$ : up to 60°C		AC-1 Max resistive current						Order No.	Order No.
Max Current $I_e$ at 400 V	Max motor HP at 460 V, 60 Hz								
Amps	<b>NO</b> <b>NC</b>	Amps	NO	NC	V AC, 50/60 Hz	V DC			

### For screwing and snapping onto 35 mm standard mounting rail

3RT25 16-1AB00

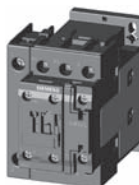


**Size S00** <sup>3)</sup> - Auxiliary switches can be retrofitted

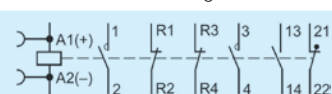


9	5	18	16	—	—	24 110/120 220/240	<b>3RT25 16-1AB00</b> <b>3RT25 16-1AK60</b> <b>3RT25 16-1AP60</b>	24 125 220	<b>3RT25 16-1BB40</b> <b>3RT25 16-1BG40</b> <b>3RT25 16-1BM40</b>
12	7.5 <sup>4)</sup>	22	20	—	—	24 110/120 220/240	<b>3RT25 17-1AB00</b> <b>3RT25 17-1AK60</b> <b>3RT25 17-1AP60</b>	24 125 220	<b>3RT25 17-1BB40</b> <b>3RT25 17-1BG40</b> <b>3RT25 17-1BM40</b>
16	10 <sup>4)</sup>	22	20	—	—	24 110/120 220/240	<b>3RT25 18-1AB00</b> <b>3RT25 18-1AK60</b> <b>3RT25 18-1AP60</b>	24 125 220	<b>3RT25 18-1BB40</b> <b>3RT25 18-1BG40</b> <b>3RT25 18-1BM40</b>

3RT25 26-1AC20



**Size S0** - Terminal designations according to EN 50012, 1 NO + 1 NC, identification number 11E

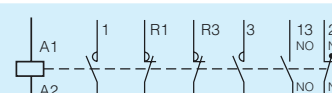


25	15	15	40	35	1	1	24 110/120 220/240	<b>3RT25 26-1AC20</b> <b>3RT25 26-1AK60</b> <b>3RT25 26-1AP60</b>	24 125 220	<b>3RT25 26-1BB40</b> <b>3RT25 26-1BG40</b> <b>3RT25 26-1BM40</b>
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3RT25 35-1AC20



**Size S2**



35	30	20	60	55	1	1	24 110/120 220/240	<b>3RT25 35-1AC20</b> <b>3RT25 35-1AK60</b> <b>3RT25 35-1AP60</b>	V UC 20-33 83-155 175-280	<b>3RT25 35-1NB30</b> <b>3RT25 35-1NF30</b> <b>3RT25 35-1NP30</b>
41	30	25	70	60	1	1	24 110/120 220/240	<b>3RT25 36-1AC20</b> <b>3RT25 36-1AK60</b> <b>3RT25 36-1AP60</b>	20-33 83-155 175-280	<b>3RT25 36-1NB30</b> <b>3RT25 36-1NF30</b> <b>3RT25 36-1NP30</b>

For further voltages, see page 2/49.  
For auxiliaries and accessories, see page 2/66-2/83.  
For spare parts, see page 2/94-2/99.  
For technical data, see page 2/168-2/169.  
For int. circuit diagrams, see page 2/191-2/196.  
For dimension drawings, see page 2/216.

1) For changing polarity; not suitable for reversing.  
2) Size S00 and S0 contactors are also available with spring-type terminals. Replace the 8th digit of the order no. with a "2" e.g. "3RT25 16-2AK60"

3) Size S00:  
Coil voltage tolerance  
at 50 Hz: 0.8 ... 1.1 x  $U_s$   
at 60 Hz: 0.85 ... 1.1 x  $U_s$   
4) The NC contact can switch up to 5 HP.

# 3RT, 3RH Contactors for Special Applications

## 3RH21 contactor relays

### Overview

#### DC operation

IEC 60947-4-1, EN 60947-4-1, for requirements according to IEC 60077-1 and IEC 60077-2.

The contactor relays are finger-safe according to EN 50274. The size S00 contactor relays have spring-type connections for all terminals.

#### Ambient temperature

The permissible ambient temperature for operation of the contactor relays (across the full coil operating range) is -40 to +70 °C.

Uninterrupted duty at temperatures > +60 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

#### Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from 0.7 to 1.25 x  $U_s$  and are fitted as standard with suppressor diodes to provide protection against overvoltage. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

### Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

#### Contactor relays without series resistor

##### Control and auxiliary circuits

These contactor relays have an extended operating range from 0.7 to 1.25 x  $U_s$ ; the solenoid coils are fitted with a suppressor diode. An additional series resistor is not required.

##### Note:

*An additional auxiliary switch block cannot be mounted.*

##### Side-by-side mounting

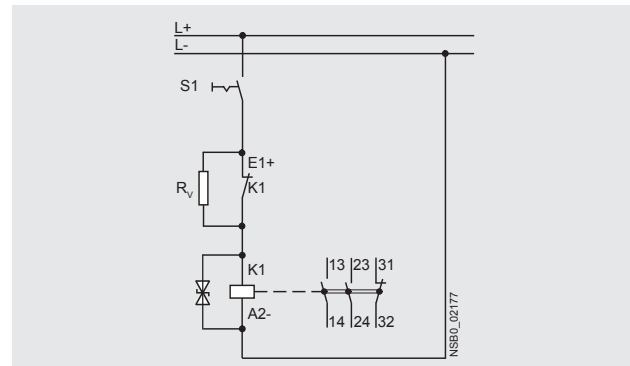
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

#### Contactor relays with series resistor

##### Control and auxiliary circuits

The DC solenoid systems of the contactor relays are modified (to hold-in coil) by means of a series resistor.

The size S00 contactor relays are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated.



A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

##### Side-by-side mounting

Side-by-side mounting is permitted at ambient temperatures up to 70 °C.

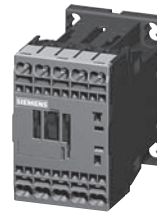


# 3RT, 3RH Contactors for Special Applications

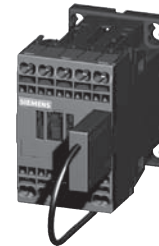
## 3RH21 contactor relays

### Selection and ordering data

**DC operation · DC solenoid system**  
**Spring-type terminals**  
**For screw and snap-on mounting onto standard mounting rail**  
**Solenoid coil fitted with suppressor diode**



3RH21 22-2K.40



3RH21 22-2K.40-0LA0

Rated operational current $I_e/AC-15/AC-14$ $T_{ij}: 70\text{ °C at}$	Contacts	Rated control supply voltage $U_s$	Spring-type terminals	Weight approx.
230 V 400 V 500 V 690 V	Version			
A A A A	NO NC	V DC	Order No.	kg

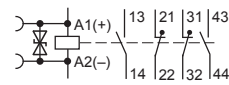
### 3RH21 contactor relays

Size S00

#### Without series resistor

Terminal designations according to EN 50011

2 NO + 2 NC, identification number **22E**



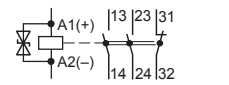
10 3 2 1 2 2<sup>1)</sup> 24 110

**3RH21 22-2KB40** 0.300  
**3RH21 22-2KF40** 0.300

#### With series resistor

Terminal designations according to EN 50005

2 NO + 1 NC, identification number **21E**



10 3 2 1 2 1<sup>2)</sup> 24 110

**3RH21 22-2KB40-0LA0** 0.300  
**3RH21 22-2KF40-0LA0** 0.300

<sup>1)</sup> It is not possible to mount an auxiliary switch block.  
<sup>2)</sup> 4-pole auxiliary switch block according to EN 50005 can be mounted.

### More information

Contactors	Type	3RH21 ..
<b>Upright mounting position</b>		
• Contactors with series resistor		Special version (on request)
• Contactors without series resistor		Special version (on request)
<b>Ambient temperature</b>		
• During operation	°C	-40 ... +70
• During storage	°C	-55 ... +80
<b>Solenoid coil operating range</b> DC		
		0.7 ... 1.25 x $U_s$
<b>Power consumption of the solenoid coils</b>		
For cold coil and 1.0 x $U_s$		
• Contactors with series resistor	- Closing	W 13
	- Closed	W 4
• Contactors without series resistor	- Closing	W 2.8
	- Closed	W 2.8

All specifications and technical specifications not mentioned here are identical to those of the standard contactor relays.

# 3RT, 3RH Contactors for Special Applications

## 3RT20 motor contactors, 7.5 ... 25 HP

### Overview

#### DC operation

IEC 60947-4-1, EN 60947-4-1, for requirements according to IEC 60077-1 and IEC 60077-2.

The contactors are finger-safe according to EN 50274. The contactors have spring-type connections as well as screw connections. The size S00 and S0 contactors have spring-type connections for all terminals.

#### Ambient temperature

The permissible ambient temperature for operation of the contactors (across the full coil operating range) is  $-40$  to  $+70$  °C.

Uninterrupted duty at temperatures  $> +60$  °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

#### Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from  $0.7$  to  $1.25$  or  $1.3 \times U_s$  and are fitted as standard with suppressor diodes. The opening delay is consequently  $2$  to  $5$  ms longer than for standard contactors.

### Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

#### Contactors without series resistor

##### Control and auxiliary circuits

These contactors have an extended operating range from  $0.7$  to  $1.25 \times U_s$ ; on size S00 the coils are fitted with suppressor diodes, on size S0 with varistors. An additional series resistor is not required.

##### Note:

*An additional auxiliary switch block cannot be mounted.*

##### Side-by-side mounting

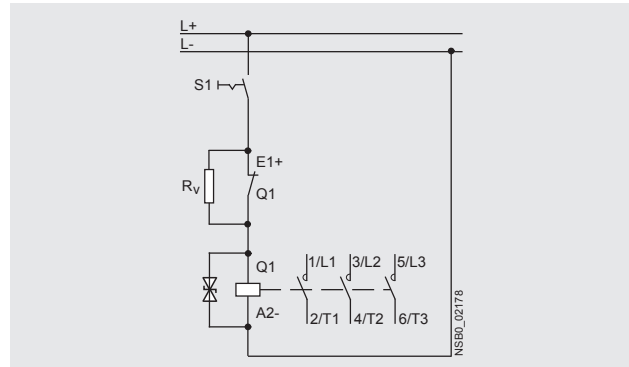
A clearance of  $10$  mm is required for side-by-side mounting at ambient temperatures  $> 60$  °C  $\leq 70$  °C.

### 3RT20 1. contactors with series resistor

#### Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from  $0.7$  to  $1.25 \times U_s$  and are fitted as standard with suppressor diodes to provide protection against overvoltage.

The DC solenoid systems of the contactors are modified (to holding excitation) by means of a series resistor.



The size S00 contactors are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated. A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

A circuit diagram showing the terminals is labeled on each contactor. One NC of the auxiliary contacts is required for the series resistor function. The selection and ordering data shows the number of additional, unassigned auxiliary contacts. With size S00 it is possible to extend the number of auxiliary contacts.

#### Side-by-side mounting

At ambient temperatures up to  $70$  °C, the size S00 contactors and contactor relays are allowed to be mounted side by side.

### 3RT20 2. contactors with solid-state operating mechanism, extended operating range

#### Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from  $0.7$  to  $1.3 \times U_s$  and are fitted as standard with varistors to provide protection against overvoltage.

The contactors are energized via upstream control electronics which ensure the coil operating range of  $0.7$  to  $1.3 \times U_s$  at an ambient temperature of  $70$  °C. They are supplied as complete units with integrated coil electronics. A varistor is integrated for damping opening surges in the coil.

The mounting possibilities for auxiliary switches correspond to those of the standard contactors for switching motors in the matching size (see page 2/58).

#### Side-by-side mounting

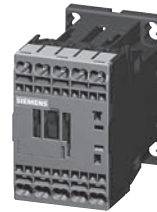
Side-by-side mounting is permitted at ambient temperatures up to  $70$  °C for these contactor versions in size S0.

# 3RT, 3RH Contactors for Special Applications

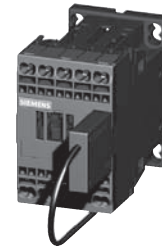
## 3RT20 motor contactors, 7.5 ... 25 HP

### Selection and ordering data

**DC operation · DC solenoid system**  
**Spring-type terminals**  
**For screw and snap-on mounting onto standard mounting rail**  
**Solenoid coil fitted with suppressor diode (S00)**



3RT20 1.-2K.4.



3RT20 1.-2K.42-0LA0

Rated data		Auxiliary contacts		Rated control supply voltage $U_s$	Spring-type terminals	Weight approx.
AC-3	Operational current $I_e$ at	Ident. No.	Version			
400 V	200 V 230 V <b>460 V</b> 575 V			V DC		
A	HP HP <b>HP</b> HP				Order No.	kg

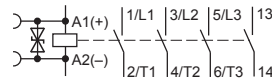
### 3RT20 contactors for switching motors

#### Size S00

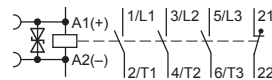
#### Without series resistor<sup>4)</sup>

Terminal designations according to EN 50012 or EN 50005

- 1 NO, identification number **10E**

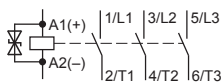


- 1 NC, identification number **01**



12	--	3	<b>7.5</b>	10	<b>10E<sup>1)</sup></b>	1	--	24 125	<b>3RT20 17-2KB41</b> <b>3RT20 17-2KG41</b>	0.300 0.300
12	--	3	<b>7.5</b>	10	<b>01<sup>1)</sup></b>	--	1	24 125	<b>3RT20 17-2KB42</b> <b>3RT20 17-2KG42</b>	0.300 0.300

#### With series resistor



12	--	3	<b>7.5</b>	10	-- <sup>2)</sup>	--	1 <sup>3)</sup>	24 125	<b>3RT20 17-2KB42-0LA0</b> <b>3RT20 17-2KG42-0LA0</b>	0.300 0.300
16	--	5	<b>10</b>	10	-- <sup>2)</sup>	--	1 <sup>3)</sup>	24 125	<b>3RT20 18-2KB42-0LA0</b> <b>3RT20 18-2KG42-0LA0</b>	0.300 0.300

For accessories and spare parts, see page 2/66-2/69.

- <sup>1)</sup> It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.
- <sup>2)</sup> One 4-pole auxiliary switch block according to EN 50005 can be mounted; no distance required up to 70 °C.
- <sup>3)</sup> NC contact cannot be used because it is required for switching the series resistor.
- <sup>4)</sup> Versions available with screw terminals.

# 3RT, 3RH Contactors for Special Applications

3RT20 motor contactors, 7.5 ... 25 HP

**DC operation · DC solenoid system**  
**Spring-type terminals**  
 For screw and snap-on mounting onto standard mounting rail  
 Solenoid coil fitted with varistor (S0)



3RT20 2.-2K.40



3RT20 2.-2X.40-0LA2

CONTACTORS AND ASSEMBLIES

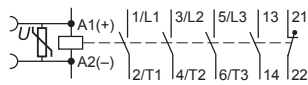
Rated data AC-3	Auxiliary contacts	Rated control supply voltage $U_s$	<b>Spring-type terminals</b>	Weight approx.
Operational current $I_e$ at	Ident. No.	Version	Order No.	
400 V		NO NC		kg
200 V				
230 V				
<b>460 V</b>				
575 V				
A	HP	HP	HP	

**3RT20 contactors for switching motors**

**Size S0**

Terminal designations according to EN 50012

1 NO + 1 NC, identification number **11E**



**Without series resistor<sup>1)</sup>**

16	--	5	<b>10</b>	15	<b>11E</b>	1	1	24 125	<b>3RT20 25-2KB40</b> <b>3RT20 25-2KG40</b>	0.600 0.600
25	--	7.5	<b>15</b>	20	<b>11E</b>	1	1	24 125	<b>3RT20 26-2KB40</b> <b>3RT20 26-2KG40</b>	0.600 0.600
32	--	10	<b>20</b>	25	<b>11E</b>	1	1	24 125	<b>3RT20 27-2KB40</b> <b>3RT20 27-2KG40</b>	0.600 0.600

**With solid-state operating mechanism**

16	--	5	<b>10</b>	15	<b>11E</b>	1	1	24 125	<b>3RT20 25-2XB40-0LA2</b> <b>3RT20 25-2XG40-0LA2</b>	0.580 0.580
25	--	7.5	<b>15</b>	20	<b>11E</b>	1	1	24 125	<b>3RT20 26-2XB40-0LA2</b> <b>3RT20 26-2XG40-0LA2</b>	0.580 0.580
32	--	10	<b>20</b>	25	<b>11E</b>	1	1	24 125	<b>3RT20 27-2XB40-0LA2</b> <b>3RT20 27-2XG40-0LA2</b>	0.580 0.580
38	--	10	<b>25</b>	25	<b>11E</b>	1	1	24 125	<b>3RT20 28-2XB40-0LA2</b> <b>3RT20 28-2XG40-0LA2</b>	0.580 0.580

For accessories and spare parts, see page 2/66-2/69.

<sup>1)</sup> It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.

**More information**

Contactors	Type		3RT20 17	3RT20 2.	3RT20 2.-2XB40-0LA2	3RT20 2.-2XF40-0LA2
<b>Ambient temperature</b>						
• During operation		°C	-40 ... +70			
• During storage		°C	-55 ... +80			
<b>Solenoid coil operating range</b>			DC		0.7 ... 1.25 x $U_s$	
<b>Power consumption of the solenoid coils</b>			For cold coil and 1.0 x $U_s$			
• Contactors with series resistor	- Closing	W	13	--	--	--
	- Closed	W	4	--	--	--
• Contactors without series resistor	- Closing	W	2.8	4.5	--	--
	- Closed	W	2.8	4.5	--	--
• Contactors with solid-state operating mechanism	- Closing	W	--	--	6.7	13.2
	- Closed	W	--	--	0.8	1.56

All specs and technical specs not mentioned here are identical to those of the standard contactors for switching motors.

# Contactors for Special Applications

## 3RT26 capacitor contactors

### AC operation

IEC 60947-5, DIN EN 60947-5-1, (VDE 0660 Part 200)

The contactors are suitable for use in any climate and are finger safe per DIN EN 50274.

The 3RT26 capacitor contactors are application specific variants of the size S00 to S2 SIRIUS Innovations contactors. The capacitors are precharged by means of the mounted leading NO contacts and resistors; only then do the main contacts close.

This prevents disturbances in the power system and welding of the contactors.

Only discharged capacitors are permitted to be switched on with capacitor contactors. Recommendation: use discharge chokes for parallel connection with the capacitors.

The capacitor contactors of size S00 contain either 1NO or 1NC in the basic unit and another unassigned NC contact in the auxiliary switch block fitted to the basic unit.

The auxiliary switch block which is snapped onto the capacitor contactor of sizes S0 contains the three leading NO contacts and one standard NO contact, which is unassigned.

The capacitor contactors of size S2 can be fitted additionally with a 2-pole auxiliary switch on the right side (2 NO, 2 NC or 1 NO + 1 NC), type 3RH19 21-1EA.. for lateral mounting.

For the capacitor making and breaking capacity of the basic 3RT20 contactor variant, see the technical data.

### Selection and ordering data

#### AC operation

AC-6b utilization category For switching three-phase capacitors at an ambient temperature of 60 °C <sup>2)</sup>					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
UL capacitor rating at operational voltage									
200/208 230/240 460/480 575/600								Order No.	
Phase	kvar	kvar	kvar	kvar			AC		kg

#### For screwing and snapping onto 35 mm standard mounting rail

3RT26 17-1AK63



• Size S00					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	3.6	4	8.3	10					
3Ø	6.2	6.9	14	17			120 V, 60 Hz	3RT26 17-1AK63	
							240 V, 60 Hz	3RT26 17-1AP63	

• Size S0					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	4.8	5.3	11	13					
3Ø	8.3	9.1	18	23			120 V, 60 Hz	3RT26 25-1AK65	
							240 V, 60 Hz	3RT26 25-1AP65	

• Size S0					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	5.8	6.4	13	16					
3Ø	10	11	22	28			120 V, 60 Hz	3RT26 26-1AK65	
							240 V, 60 Hz	3RT26 26-1AP65	

3RT2637-1NF35



• Size S0					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	6.6	7.3	15	18					
3Ø	11	13	25	31			120 V, 60 Hz	3RT26 27-1AK65	
							240 V, 60 Hz	3RT26 27-1AP65	

• Size S0					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	8.6	9.5	20	24					
3Ø	15	16	33	41			120 V, 60 Hz	3RT26 28-1AK65	
							240 V, 60 Hz	3RT26 28-1AP65	

• Size S2					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	14	16	33	40					
3Ø	25	27	55	69			83-155 VUC	3RT26 36-1NF35	
							175-280 VUC	3RT26 36-1NP35	

• Size S2					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	20	22	45	54					
3Ø	34	38	75	94			83-155 VUC	3RT26 37-1NF35	
							175-280 VUC	3RT26 37-1NP35	

1) Coil voltage tolerance: 0.85 ... 1.1 x  $U_s$ .

2) A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C

For further voltages, see page 2/49.  
 For auxiliaries and accessories, see page 2/66-2/83.  
 For technical data, see page 2/170.  
 For wiring diagram, see page 2/198.  
 For dimension drawings, see page 2/217.

#### DC Coil Selection for 3RT261 only

Coil Code	B4	W4	E4	F4	G4	M4
DC	24 V	48 V	60 V	110 V	125 V	220 V

#### UC Coil Selection for 3RT262

Coil Code	NB3	NF3	NP3
UC	21-28V	95-130V	200-280V

#### UC Coil Selection for 3RT263

Coil Code	B3	F3	P3
UC	20-33V	83-155V	175-280V

3) at upper limit = 1.1 x  $U_s$

# Contactors for Special Applications

## 3RT20 coupling contactors (interface) for switching motors, 3-pole

### AC and DC operation

IEC 60947, EN 60947.  
The 3RT20 coupling contactors for switching motors are tailored to the special requirements of working with electronic controls.

The 3RT20 1 coupling contactors cannot be expanded with auxiliary switch blocks.  
Coupling contactors have a low power consumption and an extended solenoid coil operating range.

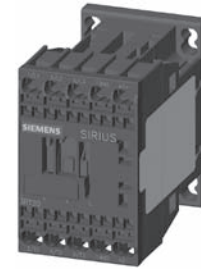
Depending on the version, the solenoid coils are supplied either without overvoltage damping or with a diode, suppressor diode or varistor connected as standard.

### Selection and ordering data

#### DC operation



3RT2015-1HB41



3RT2015-2HB41

Surge suppressor	Ratings Utilization category		Auxiliary contacts		Screw connection	Spring-type connection	Weight approx. (screw/spring)  kg
	AC-3	Maximum inductive current  Amps	Maximum <sup>1)</sup> horsepower ratings at 460 V  HP	Ident. no.	Design no.	Order No.	
				NO	NC		

#### For screwing and snapping onto 35 mm standard mounting rail

##### • Size S00

Terminal designations according to EN 50 012

Rated control supply voltage  $U_s = DC 24 V$ , coil voltage tolerance  $0.7$  to  $1.25 \times U_s$

Power consumption of the coils **2.8 W** at 24 V (no auxiliary switch blocks can be mounted)

Diode, varistor or RC element can be mounted	7	3	10E01	1	–	3RT20 15-1HB41 3RT20 15-1HB42	3RT20 15-2HB41 3RT20 15-2HB42	0.28/0.30
Diode integrated	7	3	10E01	1	–	3RT20 15-1J B41 3RT20 15-1J B42	3RT20 15-2J B41 3RT20 15-2J B42	0.28/0.30
Suppressor diode integrated	7	3	10E01	1	–	3RT20 15-1KB41 3RT20 15-1KB42	3RT20 15-2KB41 3RT20 15-2KB42	0.28/0.30
Diode, varistor or RC element can be mounted	9	5	10E01	1	–	3RT20 16-1HB41 3RT20 16-1HB42	3RT20 16-2HB41 3RT20 16-2HB42	0.28/0.30
Diode integrated	9	5	10E01	1	–	3RT20 16-1J B41 3RT20 16-1J B42	3RT20 16-2J B41 3RT20 16-2J B42	0.28/0.30
Suppressor diode integrated	9	5	10E01	1	–	3RT20 16-1KB41 3RT20 16-1KB42	3RT20 16-2KB41 3RT20 16-2KB42	0.28/0.30
Diode, varistor or RC element can be mounted	12	7.5	10E01	1	–	3RT20 17-1HB41 3RT20 17-1HB42	3RT20 17-2HB41 3RT20 17-2HB42	0.28/0.30
Diode integrated	12	7.5	10E01	1	–	3RT20 17-1J B41 3RT20 17-1J B42	3RT20 17-2J B41 3RT20 17-2J B42	0.28/0.30
Suppressor diode integrated	12	7.5	10E01	1	–	3RT20 17-1KB41 3RT20 17-1KB42	3RT20 17-2KB41 3RT20 17-2KB42	0.28/0.30

For technical data, see page 2/171.

For int. circuit diagrams, see page 2/190-2/195.

For dimension drawings, see page 2/209.

1) Complete HP ratings on page 2/124



# Contactors for Special Applications

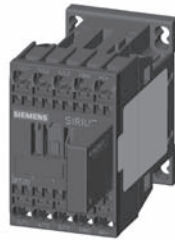
## 3RT20 coupling contactors (interface) for switching motors

### Selection and ordering data

#### DC operation



3RT2015-1VB41



3RT2015-2VB41



3RT2024-1KB40

Surge suppressor	Ratings		Auxiliary contacts		Screw connection		Spring-type connection		Weight approx. (screw/spring)  kg
	Utilization category	Category	Ident. no.	Design	Order No.	Order No.			
	AC-3								
	Maximum inductive current	Maximum horsepower ratings at 460 V							
	Amps	HP		NO NC					

#### For screwing and snapping onto 35 mm standard mounting rail

##### • Size S00

Terminal designations according to EN 50 012

Rated control supply voltage  $U_s = DC 24 V$ , coil voltage tolerance  $0.85 \text{ to } 1.85 \times U_s$

Power consumption of the coils **1.6 W** at 24 V (no auxiliary switch blocks can be mounted)

Diode, varistor or RC element can be mounted	7	3	10E 01	1 – – 1	3RT20 15-1MB41-0KT0 3RT20 15-1MB42-0KT0	3RT20 15-2MB41-0KT0 3RT20 15-2MB42-0KT0	0.28/0.30
Diode integrated	7	3	10E 01	1 – – 1	3RT20 15-1VB41 3RT20 15-1VB42	3RT20 15-2VB41 3RT20 15-2VB42	0.28/0.30
Suppressor diode integrated	7	3	10E 01	1 – – 1	3RT20 15-1SB41 3RT20 15-1SB42	3RT20 15-2SB41 3RT20 15-2SB42	0.28/0.30
Diode, varistor or RC element can be mounted	9	5	10E 01	1 – – 1	3RT20 16-1MB41-0KT0 3RT20 16-1MB42-0KT0	3RT20 16-2MB41-0KT0 3RT20 16-2MB42-0KT0	0.28/0.30
Diode integrated	9	5	10E 01	1 – – 1	3RT20 16-1VB41 3RT20 16-1VB42	3RT20 16-2VB41 3RT20 16-2VB42	0.28/0.30
Suppressor diode integrated	9	5	10E 01	1 – – 1	3RT20 16-1SB41 3RT20 16-1SB42	3RT20 16-2SB41 3RT20 16-2SB42	0.28/0.30
Diode, varistor or RC element can be mounted	12	7.5	10E 01	1 – – 1	3RT20 17-1MB41-0KT0 3RT20 17-1MB42-0KT0	3RT20 17-2MB41-0KT0 3RT20 17-2MB42-0KT0	0.28/0.30
Diode integrated	12	7.5	10E 01	1 – – 1	3RT20 17-1VB41 3RT20 17-1VB42	3RT20 17-2VB41 3RT20 17-2VB42	0.28/0.30
Suppressor diode integrated	12	7.5	10E 01	1 – – 1	3RT20 17-1SB41 3RT20 17-1SB42	3RT20 17-2SB41 3RT20 17-2SB42	0.28/0.30

##### • Size S0

Rated control supply voltage  $U_s = DC 24 V$ , coil voltage tolerance  $0.7 \text{ to } 1.25 \times U_s$

Power consumption of the coils **4.5 W** at 24 V no auxiliary switch blocks can be mounted.

Varistor integrated	12	7.5	11E	1 1	3RT20 24-1KB40	3RT20 24-2KB40	0.58/0.60
	16	10	11E	1 1	3RT20 25-1KB40	3RT20 25-2KB40	0.58/0.60
	25	15	11E	1 1	3RT20 26-1KB40	3RT20 26-2KB40	0.58/0.60
	32	20	11E	1 1	3RT20 27-1KB40	3RT20 27-2KB40	0.58/0.60

For technical data, see page 2/171.

For int. circuit diagrams, see page 2/190-2/195.

For dimension drawings, see page 2/209.

# Contactors & Relays for Safety Applications

## 3RT, 3TF safety contactors and 3RH2, 3TH2 safety control relays

CONTACTORS AND ASSEMBLIES 2

### Applications

#### “Safety” Contactors

Safety rated contactors are required to have mirrored contact construction according to IEC 60947-4-1 Annex F. A mirror contact is a Normally Closed (NC) auxiliary contact which can not be closed simultaneously with a Normally Open (NO) main contact.

In some industries, such as automotive, requirements have been established that a safety rated contactor must also have permanently mounted auxiliary contact blocks. See page 2/23 for Contactors with permanently mounted auxiliary contacts.

#### Siemens Contactors for “Safety” applications:

All Siemens standard 3RT, 3TF6, 40HN & 40PH Contactors are provided with positively driven (mirror) contacts which meet or exceed the criteria for “Safety Contactors” according to IEC 60947-4 Annex F which describes the requirements for mirror contact performance.

When applying Safety Contactors in safety circuits, the NC auxiliary contacts must be wired in series or parallel and must be used as monitoring contacts with feedback to the safety evaluation device (i.e. safety relay or failsafe logic controller).

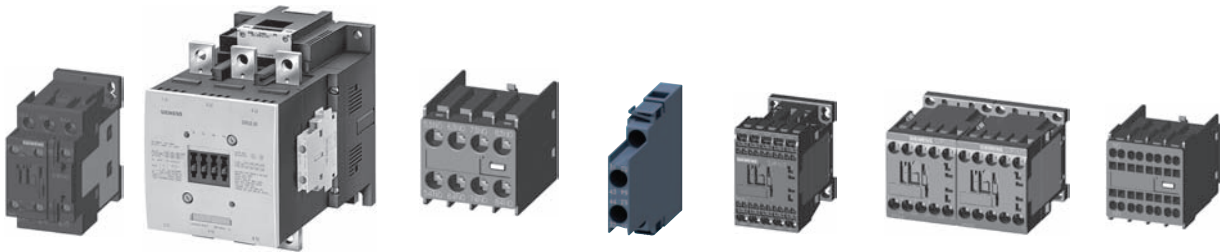
#### “Safety” Control Relays

Safety rated control relays are required to have positively driven contact elements according to IEC 60947-5-1 Annex L. Positively driven contact elements are a combination of NO auxiliary contacts and NC auxiliary contacts whose construction prevents them from being closed simultaneously.

In some industries, such as automotive, requirements have been established that a safety rated control relays must also have permanently mounted auxiliary contact blocks. See page 2/18 for Control Relays with permanently mounted auxiliary contacts.

#### Siemens Control Relays for “Safety” applications:

All SIRIUS 3RH control relays (with at least 1 NC contact) meet or exceed the criteria for “Safety Control Relays” according to IEC 60947-5-1 Annex L. This is true for the basic 3RH relay with or without an additional auxiliary contact block.



3RT20 2.-1A..00

3RT10 7.-6A..6

3RH29 21.-1F

3RH29 21.-1DA 11

3RH21

3RH24

3RH2911-2HA..

Frame size	Contactors	Auxiliary contact block
S00	3RT201	3RH2911
	3RT231	
	3RT251	
	3RT261	
S0	3RT202	3RH2921
	3RT232	
	3RT252	
	3RT262	
S2	3RT203	3RH2921
	3RT233	
	3RT253	
S3	3RT204	3RH2921
	3RT234	
	3RT244	
S6	3RT105	3RH1921
	3RT145	
S10	3RT106	3RH1921
	3RT126	
	3RT146	
S12	3RT107	3RH1921
	3RT127	
	3RT147	
	3TF6	3TY7561-1UA00

Frame size	Control Relays	Auxiliary contact block
S00	3RH21	3RH2911
	3RH24	
	3TH20	3TX44

For contactors, see pages 2/8-2/9.  
 For auxiliaries contact blocks, see pages 2/66-2/68.  
 For control relays, see pages 2/50-2/52.  
 For auxiliaries contact blocks, see page 2/66-2/68..

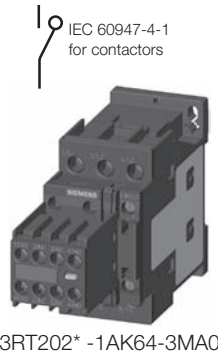
# Contactors & Relays for Safety Applications

3RT safety contactors, 3RH2 safety control relays with permanently mounted auxiliary contact blocks

## Application

### "Safety" Contactors

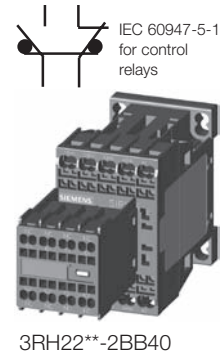
Safety rated contactors are required to have mirrored contact construction according to IEC 60947-4 Annex F. A mirror contact is a Normally Closed (NC) auxiliary contact which can not be closed simultaneously with a Normally Open (NO) main contact. In some industries, such as Automotive, the auxiliary contact blocks are required to be permanently attached to meet the requirements of "unintentional misuse" as specified in IEC 60292, paragraph 3.12. Tested by SUVA.



3RT202\* -1AK64-3MA0

### "Safety" Control Relays

Safety rated control relays are required to have positively driven contact elements according to IEC 60947-5-1 Annex L. Positively driven contact elements are a combination of NO auxiliary contacts and NC auxiliary contacts whose construction prevents them from being closed simultaneously. In some industries, such as automotive, the auxiliary contact blocks are required to be permanently attached to meet the requirements of "unintentional misuse" as specified in IEC 60292, paragraph 3.12. Tested by SUVA.



3RH22\*\* -2BB40

2 CONTACTORS AND ASSEMBLIES

## Application

Frame Size	Max. current		Single-phase HP ratings		Three-phase HP ratings				Auxiliary contacts			Screw Terminals	Spring-Type Terminals <sup>1)</sup>
	AC3	AC1	115V	220/240V	200V	230V	460V	575V	Ident. No.	NO	NC	Order No.	Order No.

Contactors with permanently mounted auxiliary contact blocks													
S00	6	18	¼	¾	1 ½	2	3	5	22E	2	2	3RT2015-1●●●4-3MA0	3RT2015-2●●●4-3MA0
	9	22	½	1	2	3	5	7 ½	22E	2	2	3RT2016-1●●●4-3MA0	3RT2016-2●●●4-3MA0
	12	22	½	2	3	3	7 ½	10	22E	2	2	3RT2017-1●●●4-3MA0	3RT2017-2●●●4-3MA0
	16	22	1	2	3	5	10	10	22E	2	2	3RT2018-1●●●4-3MA0	3RT2018-2●●●4-3MA0
S0	9	40	1	1	2	3	5	7 ½	22E	2	2	3RT2023-1●●●4-3MA0	3RT2023-2●●●4-3MA0
	12	40	1	2	3	3	7 ½	10	22E	2	2	3RT2024-1●●●4-3MA0	3RT2024-2●●●4-3MA0
	17	40	1	3	5	5	10	15	22E	2	2	3RT2025-1●●●4-3MA0	3RT2025-2●●●4-3MA0
	25	40	2	3	7 ½	7 ½	15	20	22E	2	2	3RT2026-1●●●4-3MA0	3RT2026-2●●●4-3MA0
	32	50	2	5	10	10	20	25	22E	2	2	3RT2027-1●●●4-3MA0	3RT2027-2●●●4-3MA0
	38	50	3	5	10	10	25	25	22E	2	2	3RT2028-1●●●4-3MA0	3RT2028-2●●●4-3MA0
S2	40	60	3	7 ½	10	15	30	40	22E	2	2	3RT2035-1●●●4-3MA0	3RT2035-3●●●4-3MA0
	50	70	3	10	15	15	40	50	22E	2	2	3RT2036-1●●●4-3MA0	3RT2036-3●●●4-3MA0
	65	80	5	10	20	20	50	50	22E	2	2	3RT2037-1●●●4-3MA0	3RT2037-3●●●4-3MA0
S3	80 <sup>4)</sup>	90	5	15	20	25	50	60	22E	2	2	3RT2038-1●●●4-3MA0	3RT2038-3●●●4-3MA0
	80	120	7 ½	15	25	30	60	75	22E	2	2	3RT2045-1●●●4-3MA0	3RT2045-3●●●4-3MA0
S6	95	120	10	20	30	30	75	100	22E	2	2	3RT2046-1●●●4-3MA0	3RT2046-3●●●4-3MA0
	150	185	--	30	50	60	125	150	22E	2	2	3RT1055-6●●●6-3PA0	—
S10	185	215	--	30	60	75	150	200	22E	2	2	3RT1056-6●●●6-3PA0	—
	225	275	--	--	60	75	150	200	22E	2	2	3RT1064-6●●●6-3PA0	—
	265	330	--	--	75	100	200	250	22E	2	2	3RT1065-6●●●6-3PA0	—
	300	330	--	--	100	125	250	300	22E	2	2	3RT1066-6●●●6-3PA0	—

### Control circuit coil options: Replace ●●● with the desired code

Frame Size S00 - S0	●●●	Frame Size S2	●●●	Frame Size S3	●●●	Frame Size S6 - S10	●●●
120 V AC	<b>AK6</b>	120 V AC	<b>AK6</b>	120 V AC **	<b>AK6</b>	23 ... 26 V UC*, conventional coil	<b>AB3</b>
120 V AC, integrated varistor	<b>CK6</b>	120 V AC w/ Varistor	<b>CK6</b>	24V DC	<b>KB4</b>	21-27 V UC*, solid state coil	<b>NB3</b>
230 V AC	<b>AP0</b>	24 V DC w/Varistor	<b>KB4</b>	w/ integrated varistor		w/ PLC interface	
24 V DC	<b>BB4</b>			24V AC/DC	<b>NB3</b>	110 ... 127 V UC*, conventional coil	<b>AF3</b>
24 V DC, integrated varistor	<b>DB4</b>			w/integrated varistor		*UC coil: accepts DC voltage or AC voltage, 40 to 60 Hz.	
24 V DC, integrated diode assy.	<b>FB4</b>						

Frame Size	Max. current at 240 V <sup>2)</sup>	Rated control supply voltage U <sub>s</sub>	Auxiliary contacts			Screw Terminals <sup>3)</sup>	Spring Terminals <sup>3)</sup>
A			Ident. No.	NO	NC	Order No.	Order No.

Control relays with permanently mounted auxiliary contact blocks							
<b>S00-S00</b>	<b>10</b>	110 V AC, 50 Hz / 120 V AC, 60 Hz	44E	4	4	3RH2244-1AK60	3RH2244-2AK60
	<b>10</b>	24 V DC	44E	4	4	3RH2244-1BB40	3RH2244-2BB40
	<b>10</b>	110 V AC, 50 Hz / 120 V AC, 60 Hz	62E	6	2	3RH2262-1AK60	3RH2262-2AK60
	<b>10</b>	24 V DC	62E	6	2	3RH2262-1BB40	3RH2262-2BB40

For other voltages see page 2/49.

For accessories, see pages 2/73-2/78.

For spare parts, see pages 2/94-2/97.

For technical data, see pages 2/121-2/142.

For description, see pages 2/104-2/105.

For int. circuit diagrams, see page 2/190-2/196.

For dimension drawings, see pages 2/209-2/215.

1) All terminals are spring loaded on frame size S00 and S0.

Only the coil and auxiliary contact terminals are spring loaded on frame sizes S2 & S3.

2) For AC-15/AC-14, max current for front mounted auxiliary contacts = 6 A.

3) The 3RH22 control relays are also available with ring lug terminals. Replace the 8th digit of the order number with a "4", e.g. 3RH2244-4AK60










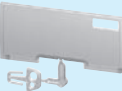


4) Max UL FLA = 65A at 460V

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## Introduction

### Overview

The function modules for mounting onto contactors enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking, and can be connected to the control system by either parallel wiring or through IO-Link or AS-Interface.

Version	SIRIUS function modules for parallel wiring	SIRIUS function modules for IO-Link <sup>1)</sup>	SIRIUS function modules for AS-Interface <sup>1)</sup>
For direct-on-line starting	<p>Timing relays: ON or OFF-delay with semiconductor output With screw or spring-type terminals</p> 	<p>With screw or spring-type terminals</p> 	<p>With screw or spring-type terminals</p> 
For reversing starting	<p>Wiring modules for sizes S00, S0 &amp; S2 With screw or spring-type terminals (with screw terminals for main and control circuit)</p> 	<p>1 function module for size S00, S0 &amp; S2, screw and spring-type connection, plus the respective wiring modules<sup>1)</sup></p> 	<p>1 function module for size S00, S0 &amp; S2, screw and spring-type connection, plus the respective wiring modules<sup>1)</sup></p> 
For wye-delta starting	<p>1 function module for size S00, S0 &amp; S2, screw and spring-type connection of the contactors, plus the respective wiring modules<sup>2)</sup></p> 	<p>For wye-delta starting: 1 function module for size S00, S0 &amp; S2, plus screw and spring-type connection, plus the respective wiring modules<sup>2)</sup></p> 	<p>For wye-delta starting: 1 function module for size S00, S0 &amp; S2, plus screw and spring-type connection, plus the respective wiring modules<sup>2)</sup></p> 
Accessories	<p>Sealable covers</p> 	<p>Operator panel for autonomous controlling of up to 4 starters Module connector for the grouping of starters Connection cable between the operator panel and the starter group Sealable covers</p> 	<p>AS-Interface addressing units Sealable covers</p> 

<sup>1)</sup> Use of the communication-capable function modules for IO-Link or AS-Interface requires contactors with communication interface (see pages 2/26).

<sup>2)</sup> The modules for the control current wiring, which are included in the wiring kit, are not required.

*Note:*  
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules

### Overview

Simply by being plugged in place, the SIRIUS function modules enable different functionalities required for the assembly of starters to be realized in the starter. The function modules and wiring kits help to reduce the wiring work within the starter practically to zero.

#### SIRIUS function modules for direct-on-line starting

The electronic timing relays which can be mounted onto the contactor are available in these versions:

- Sizes S00 and S0 for applications in the range from 24 to 240 V AC/DC (wide voltage range)
- Size S2 for applications in either the range from 24 to 90 V AC/DC or 90 to 240 V AC/DC

Both the electrical and mechanical connection are made by simple snapping on and locking.

A protection circuit (varistor) is integrated in each module.

The electronic timing relay with semiconductor output uses two contact legs to actuate the contactor underneath by means of a semiconductor after the set time  $t$  has elapsed.

The switching state feedback is performed by a mechanical switching state indicator (plunger). In addition, the auxiliary switches in the contactors are freely accessible and can be used for feedbacks to the control system or for signal lamps.

A sealable cover is available to protect against careless adjustment of the set times.

#### SIRIUS function modules for reversing starting

The wiring kits for reversing starters enable the cost-effective assembly of contactor assemblies. They can be used for all applications with reversing duty up to 50 HP.

For a detailed description see page 2/37.

#### SIRIUS function modules for wye-delta starting

Both interlocking and timing functions are required for the assembly of wye-delta starters. With the function modules for wye-delta starting and the matching link modules for the main circuit, these starters can be assembled easily and with absolutely no errors.

The entire sequence in the control circuit is integrated in the snap-on modules. This covers:

- An adjustable wye time  $t$  from 0.5 to 60 s
- A non-adjustable dead interval of 50 ms
- Electrical contacting to the contactors by means of coil pick-off (contact legs)
- Feedback of the switching state at the contactor using a mechanical switch position indicator (plunger)
- Electrical interlocking between the contactors

These modules do not require their own terminals and can therefore be used for contactors with both screw and spring-type terminals in the S00, S0 and S2. To start the wye-delta starter, only the first of the three contactors (line contactor) is actuated. All other functions then take place inside the individual modules.

This also offers advantages if the timing function was previously implemented in a controller, as it again results in a significant reduction in the number of PLC outputs, the programming work and the wiring outlay.

The kits for the main circuit include the mechanical interlock, the star jumper, the wiring modules at the top and at the bottom, and the required connecting clips.

A protection circuit (varistor) is integrated in the basic module.

### Application

The snap-on function modules for direct-on-line starting are used above all for realizing timing functions independently of the control system.

With the OFF-delay variant of the timing relay it is possible for example for the fan motor for cooling a main drive to be switched off with a delay so that sufficient cooling after operation is guaranteed even if the plant and its control system have already been switched off.

The ON-delay timing relays enable for example the time-delayed starting of several drives so that the summation starting current does not rise too high, which could result in voltage failure.

The function modules for wye-delta starting are mostly used where current-limiting measures for starting a drive are required, e.g. for large fans and ventilators, and a high level of availability is essential at the same time. This technology has been used with success for several decades and has the additional advantage of requiring relatively little know-how. Through the use of function modules, the assembly work with simple standard components is even easier and error-free.

### Benefits

The use of snap-on function modules for direct-on-line starting (timing relays) results in the following advantages:

- Reduction of control current wiring
- Prevention of wiring errors
- Reduction of testing costs
- Implementation of timing functions independently of the control system
- Less space required in the control cabinet compared to a separate timing relay
- No additive protection circuit required (varistor integrated)

The use of function modules for wye-delta starting results in the following advantages:

- Operation solely through the line contactor A1/A2 – no further wiring needed
- Reduction of the control current wiring inside the contactor assembly and to the higher-level control system where applicable
- Prevention of wiring errors
- Reduction of testing costs
- Integrated electrical interlocking saves costs and prevents errors
- Less space needed in the control cabinet compared to using a separate timing relay
- Adjustable starting in star mode from 0.5 to 60 s
- Independent of the contactor's control supply voltage (24 to 240 V AC/DC)
- Varistor integrated – no additive protection circuit required
- No control current wiring thanks to plug-in technology and connecting cables
- Mechanically coded assembly enables easy configuration and reliable wiring
- Fewer versions – one module kit for screw and spring-type connection and for the two sizes S00 to S2
- Mechanical interlocking (with wiring kit for the main circuit)






# Contactors for Switching Motors

## 3RT2 contactors, 3-pole – Communication Contactors

### Selection and ordering data

- Ideal for diagnostics to the automation controller
- Quickly locate and rectify faults
- Configuration available in Step 7 and TIA Portal
- Easy engineering of parameters
- For DOL, reversing and wye delta starters up to 50 HP
- Manual starter operation with optional operator panel
- Reduces control wiring in the panel
- Available for 24VDC control systems
- Easily snap on IO-Link or AS-Interface modules onto contactors



Frame Size	Amp Ratings		Single-phase HP ratings		Three-phase HP ratings				Auxiliary contacts		Screw Terminals 24 V DC coil	Spring-type Terminals 1) 24 V DC coil	Weight approx. kg		
	AC3	AC1	115V	230V	208V	230V	460V	575V	NO	NC	Order No.	Order No.			
<b>3RT 3-pole Contactors</b>															
 3RT2018-1BB41-0CC0	S00	7	18	0.25	0.75	1.5	2	3	5	1	0	3RT2015-1BB41-0CC0	3RT2015-2BB41-0CC0	0.28	
		0	1	3RT2015-1BB42-0CC0	3RT2015-2BB42-0CC0										
		9	22	0.33	1	2	3	5	7.5	1	0	3RT2016-1BB41-0CC0	3RT2016-2BB41-0CC0		
		0	1	3RT2016-1BB42-0CC0	3RT2016-2BB42-0CC0										
		12	22	0.5	2	3	3	7.5	10	1	0	3RT2017-1BB41-0CC0	3RT2017-2BB41-0CC0		
		0	1	3RT2017-1BB42-0CC0	3RT2017-2BB42-0CC0										
 3RT2028-1BB40-0CC0	S0	16	22	1	2	3	5	10	10	1	0	3RT2018-1BB41-0CC0	3RT2018-2BB41-0CC0	0.58	
		0	1	3RT2018-1BB42-0CC0	3RT2018-2BB42-0CC0										
		9	40	1	1	2	3	5	7.5	1	1	3RT2023-1BB40-0CC0	3RT2024-2BB40-0CC0		
		12	40	1	2	3	3	7.5	10	1	1	3RT2024-1BB40-0CC0	3RT2024-2BB40-0CC0		
		16	40	1	3	5	5	10	15	1	1	3RT2025-1BB40-0CC0	3RT2025-2BB40-0CC0		
		25	40	2	3	7.5	7.5	15	20	1	1	3RT2026-1BB40-0CC0	3RT2026-2BB40-0CC0		
 3RT2038-1NB30-0CC0	S2	32	50	2	5	10	10	20	25	1	1	3RT2027-1BB40-0CC0	3RT2027-2BB40-0CC0	1.122	
		38	50	3	5	10	10	25	25	1	1	3RT2028-1BB40-0CC0	3RT2028-2BB40-0CC0		
		40	60	3	7.5	10	15	30	40	1	1	3RT2035-1NB30-0CC0	3RT2035-3NB30-0CC0		
		50	70	3	10	15	15	40	50	1	1	3RT2036-1NB30-0CC0	3RT2036-3NB30-0CC0		
		65	80	5	10	20	20	50	50	1	1	3RT2037-1NB30-0CC0	3RT2037-3NB30-0CC0		
		80	90	5	15	20	25	50	60	1	1	3RT2038-1NB30-0CC0	3RT2038-3NB30-0CC0		

1) All terminals are spring loaded in sizes S00 and S0.  
For size S2, only the coil and aux contacts are spring loaded.

Communication capable contactors are ideal for starter feedback to the automation level. IO-Link starters in the cabinet save considerable wiring effort. AS-Interface is best suited for distributed systems.

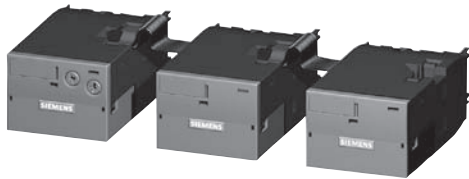
- For reversing contactors with communication capability, see pages 2/39-2/43
- For accessories, see page 2/27, 2/30, 2/34.
- For technical data, see page 2/31, 2/35, 2/36
- For description, see page 2/24.
- For further information on IO-Link and AS-Interface, see page 2/28-2/29 and 2/32-2/33.



# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

SIRIUS function modules for reversing starting / wye-delta starting

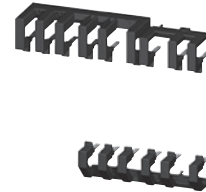
## Selection and ordering data



3RA28 16-0EW20



3RA29 13-2AA1



3RA29 13-2BB2

For contactors	Rated control supply voltage $U_s$ <sup>1)</sup>	Time setting range $t$	Screw terminals	Weight approx.	Spring-type <sup>2)</sup> terminals	Weight approx.
Type	V	s	Order No.	kg	Order No.	kg

### Assembly kits for reversing starting

#### Assembly kits for making 3-pole contactor assemblies

The assembly kit contains:  
Mechanical interlock;  
2 connecting clips for 2 contactors,  
wiring modules on the top and bottom

3RT20 1.	• For size S00	<b>3RA29 13-2AA1</b>	0.046	<b>3RA29 13-2AA2</b>	0.070
3RT20 2.	• For size S0	<b>3RA29 23-2AA1</b>	0.089	<b>3RA29 23-2AA2</b>	0.112
3RT20 3.	• For size S2 (w/o mechanical interlock, see pg. 2/43)	<b>3RA29 33-2AA1</b>	0.159	<b>3RA29 33-2AA2</b>	0.156

### Assembly kits for wye-delta starting

#### Assembly kits for making 3-pole contactor assemblies

The assembly kit contains:  
Mechanical interlock,  
4 connecting clips for 3 contactors;  
star jumper,  
wiring modules on the top and bottom

3RT20 1.	• For size S00	<b>3RA29 13-2BB1</b>	0.051	<b>3RA29 13-2BB2</b>	0.080
3RT20 2.	• For size S0 (only main circuit for version with spring-type terminals)	<b>3RA29 23-2BB1</b>	0.099	<b>3RA29 23-2BB2</b>	0.133
3RT20 3.	• For size S2 (only main circuit for version with spring-type terminals)	<b>3RA29 33-2BB1</b>	0.242	<b>3RA29 33-2BB2</b>	0.182

### Function modules for wye-delta starting

The electrical connection between the function module and the contactor assembly is established automatically by snapping on and plugging in the connecting cables.

#### Wye-delta function (varistor integrated)

3RT20 1. 3RT20 2. 3RT20 3.	24 ... 240 AC/DC	0.5 ... 60 (10, 30, 60 selectable)	<b>3RA28 16-0EW20</b>	0.170	<b>3RA28 16-0EW20</b>	0.170
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### Accessories

#### Sealable covers

for 3RA27, 3RA28, 3RA29

<b>3RA29 10-0</b>	0.002	<b>3RA29 10-0</b>	0.002
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<sup>1)</sup> AC voltage values apply for 50 Hz and 60 Hz.

<sup>2)</sup> Assembly kits in sizes S0 and S2 are supplied with wiring modules for the main circuit only.

*Note:*

*When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.*

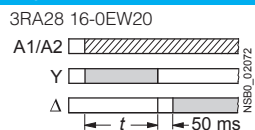
Function	Function charts
----------	-----------------

- Timing relay energized
- Contact closed
- Contact open

### 2 NO contacts (internally connected)

Wye-delta function (varistor integrated)

- 1 NO contact, delayed
- 1 NO contact, instantaneous



# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules for IO-Link

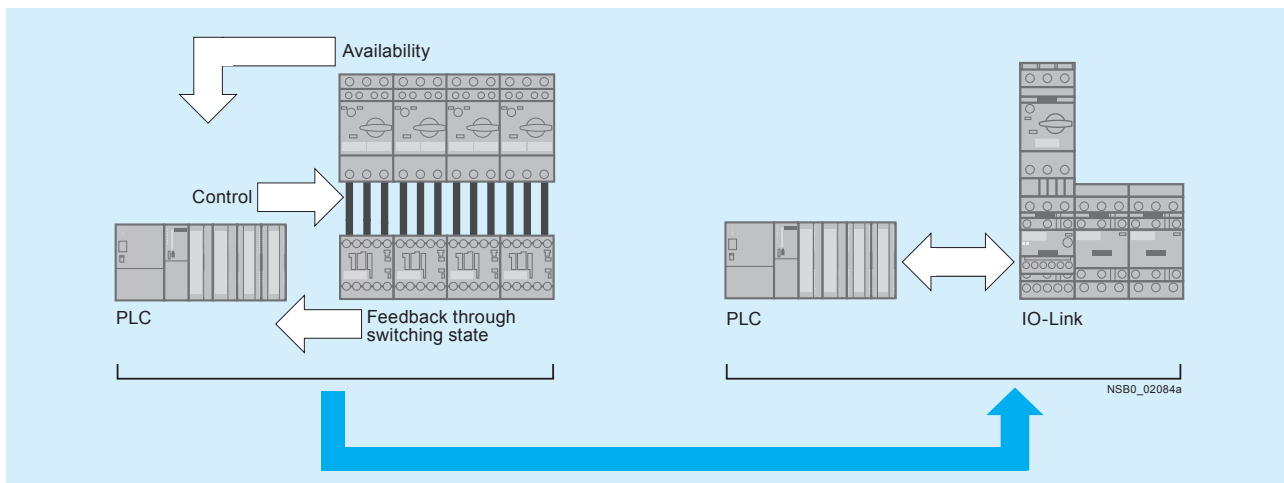
### Overview

The SIRIUS function modules for IO-Link enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking. The electrical and mechanical connection to the contactor is established by snapping on and locking. An additive protection circuit for the individual contactors can be dispensed with completely, and feedback from the contactor contacts is performed with Hall sensors which provide reliable feedback concerning the switching state even under extremely dusty conditions. The starters are connected to the higher-level

control system through IO-Link, with the possibility of connecting up to four starters as a group to one port of the IO-Link master.

Through this type of connection to the control system, a maximum of wiring is saved. The following essential signals are transmitted:

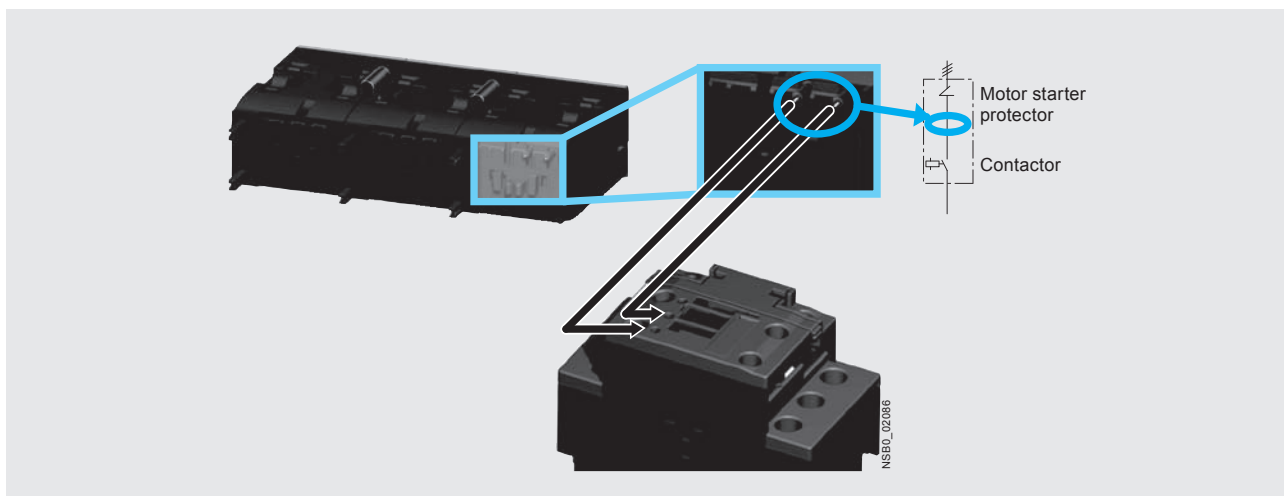
- Availability of the starter in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



Signal transmission through IO-Link

The inquiry from the motor starter protector does not take place through additional wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

This requires the use of communication versions of the contactors with communication interface (see page 2/26).



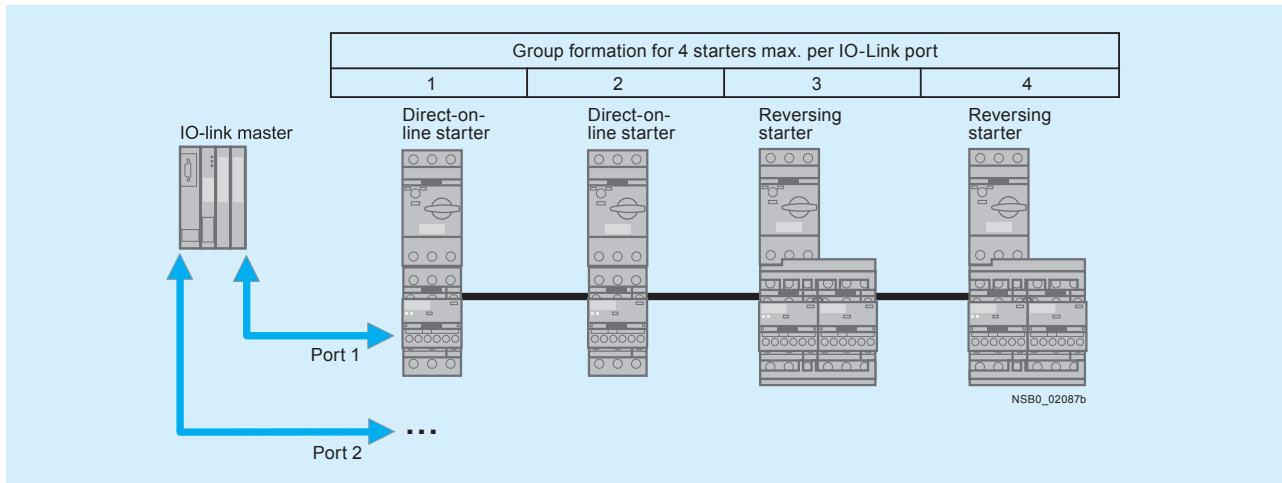
Availability signal through voltage pick-off

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules for IO-Link

By grouping up to four starters it is possible to connect up to 16 starters to one master of the ET200S. All the signals of the individual controls are made available through only 3 individual wires per starter group directly in the process image. If the

potential at the master of the ET200S is the same as that of the controls, a further reduction in wiring is possible by providing the control supply voltage to the contactors by jumpering the corresponding communication wires.



Group formation with IO-Link

In case of a malfunction, the corresponding error signals are also sent directly to the PLC in acyclic mode. This is in addition to transmission of the switching signals and status signals.

Possible error signals:

- Device defect
- No main voltage (motor starter protector tripped)
- No control supply voltage
- Limit position on the right / on the left
- Manual mode
- Process image fault

This easy integration of the starters in the TIA world does not limit the flexibility in the field in the least. For example, all function modules have special terminals in order to enable direct local disconnection. These terminals can be connected for example to a position switch. The input interrupts the voltage supply to the contactor coil directly, i. e. without going through the PLC. These terminals are jumpered in the as-delivered state.

Local manual operation of the complete starter group is also straight-forward using an operator panel. The latter is easily connected to the last starter and can be built into the front panel of the control cabinet if required. This offers significant advantages particularly for commissioning.

### Application

The use of SIRIUS function modules with IO-Link is recommended above all in machines and plants in which there are several motor starters in one control cabinet. Using IO-Link, the connection of these starters to the automation level is easy, quick and error-free. And with IO modules no longer needed, the width of the ET200S becomes far smaller.

### Benefits

- Reduction of the control current wiring to no more than one cable having three conductors for four starters
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Integration in TIA for clear diagnostics if a fault occurs
- Fewer IO modules saves space in the control cabinet
- All essential timing and interlocking functions for reversing duty and wye-delta starting are integrated
- No additional control circuit required

Further information on the application and benefits of the SIRIUS function modules for connection to the control system through IO-Link can be found in Chapter 14 "Industrial Communication".

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules for IO-Link

### Selection and ordering data

Version	Screw terminals	Spring-type terminals	Weight
	Order No.	Order No.	kg
<b>Function modules for direct-on-line starting</b>			
<p><b>IO-Link connection</b> Includes one module connector for assembling an IO-Link group</p> <p>3RA2711-1AA00</p>	3RA2711-1AA00	3RA2711-2AA00	
<p>3RA2711-2AA00</p>			
<b>Function modules for reversing starting<sup>1)</sup></b>			
<p><b>IO-Link connection,</b> comprising one basic and one coupling module and an additional module connector for assembling an IO-Link group</p> <p>3RA2711-1BA00</p>	3RA2711-1BA00	3RA2711-2BA00	
<p>3RA2711-2BA00</p>			
<b>Assembly kits for making 3-pole contactor assemblies</b>			
<p>3RA2923-2AA1</p>	<p>The assembly kit contains: mechanical interlock, 2 connecting clips for two contactors, wiring modules on the top and bottom</p> <ul style="list-style-type: none"> <li>• For size S00</li> <li>• For size S0                             <ul style="list-style-type: none"> <li>- For main, auxiliary and control circuits</li> <li>- Only for main circuit<sup>2)</sup></li> </ul> </li> </ul>	3RA2913-2AA2	
<p>3RA2923-2AA2</p>			
	3RA2913-2AA1	3RA2913-2AA2	
	3RA2923-2AA1	--	
	--	3RA2923-2AA2	
	3RA2933-2AA1	--	
	--	3RA2933-2AA2	

1) For prewired contactor assemblies for reversing starting with voltage tap-off, see pages 2/40 and 2/43. When these contactor assemblies are used, the assembly kit for the wiring is already integrated.

2) Version in sizes S0 and S2 with spring-type terminals:  
Only the wiring modules for the main circuit are included.  
No connectors are included for the auxiliary and control circuit.

Matching contactors with communications interface required; see pages 2/26.

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules for IO-Link

### Function modules for wye-delta starting<sup>1)</sup>

Version	Screw terminals	Spring-type terminals	Weight
	Order No.	Order No.	kg
<p><b>IO-Link connection</b>, comprising one basic module and two coupling modules, plus an additional module connector for assembling an IO-Link group</p> <p>3RA2711-1CA00</p>	3RA2711-1CA00	3RA2711-2CA00	
<p><b>Assembly kits for making 3-pole contactor assemblies<sup>2)</sup></b> The assembly kit contains: mechanical interlock, 4 connecting clips for 3 contactors; star jumper, wiring modules on the top and bottom</p> <ul style="list-style-type: none"> <li>• For size S00</li> <li>• For size S0                             <ul style="list-style-type: none"> <li>- For main, auxiliary and control circuits</li> <li>- Only for main circuit<sup>3)</sup></li> </ul> </li> <li>• For size S2                             <ul style="list-style-type: none"> <li>- For main, auxiliary and control circuits</li> <li>- Only for main circuit<sup>3)</sup></li> </ul> </li> </ul>	3RA2913-2BB1	3RA2913-2BB2	
<p>3RA2923-2BB1</p>	3RA2923-2BB1	--	
<p>3RA2923-2BB2</p>	--	3RA2923-2BB2	
<p>3RA2933-2BB1</p>	3RA2933-2BB1	--	
<p>3RA2933-2BB2</p>	--	3RA2933-2BB2	

- 1) For complete contactor assemblies for wye-delta starting including function modules, see pages 2/47 and 2/48.
- 2) When using the function modules for wye-delta starting, the wiring modules for the auxiliary current are not required.
- 3) Version in sizes S0 and S2 with spring-type terminals: Only the wiring modules for the main circuit are included. No connectors are included for the auxiliary and control circuit.

Matching contactors with communications interface required; see pages 2/26.

Version	Order No.	Weight
		kg
<p><b>Module connector set</b>, comprising:</p> <ul style="list-style-type: none"> <li>• 2 module connectors, 14-pole, short</li> <li>• 2 interface covers</li> </ul> <p>3RA2711-0EE10</p>	3RA2711-0EE10	
<p><b>Module connectors</b></p> <ul style="list-style-type: none"> <li>• 14-pole, 9 cm For size jump + 1 space</li> <li>• 14-pole, 26 cm For various space combinations</li> <li>• 14-pole, 33.5 cm For various space combinations</li> <li>• 10-pole, 9 cm For separate control signal infeed within an IO-Link group</li> </ul> <p>3RA2711-0EE06</p>	3RA2711-0EE06	
<p>3RA2711-0EE07</p>	3RA2711-0EE07	
<p>3RA2711-0EE08</p>	3RA2711-0EE08	
<p>3RA2711-0EE15</p>	3RA2711-0EE15	
<p><b>Interface covers</b> (Set of 5)</p> <p>3RA2711-0EE15</p>	3RA2711-0EE15	
<p><b>Sealable covers</b> For 3RA27, 3RA28, 3RA29</p> <p>3RA2910-0</p>	3RA2910-0	

### Operator panels<sup>1)</sup>

<p><b>Operator panel (set)</b>, comprising:</p> <ul style="list-style-type: none"> <li>• 1 x operator panel</li> <li>• 1 x enabling module</li> <li>• 1 x interface cover</li> <li>• 1 x fixing terminal</li> </ul> <p>3RA6935-0A</p>	3RA6935-0A	
<p><b>Connection cable</b>, length 2 m, 10- to 14-pole For connecting the operator panel to the communication module</p> <p>3RA2711-0EE11</p>	3RA2711-0EE11	
<p>Enabling modules (replacement)</p> <p>3RA6936-0A</p>	3RA6936-0A	
<p>Interface covers (replacement)</p> <p>3RA6936-0B</p>	3RA6936-0B	

<sup>1)</sup> Suitable only for communication through IO-Link.

For manuals, see <http://support.automation.siemens.com/WW/view/en/39319600>.

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules for AS-Interface

CONTACTORS AND ASSEMBLIES 2

### Overview

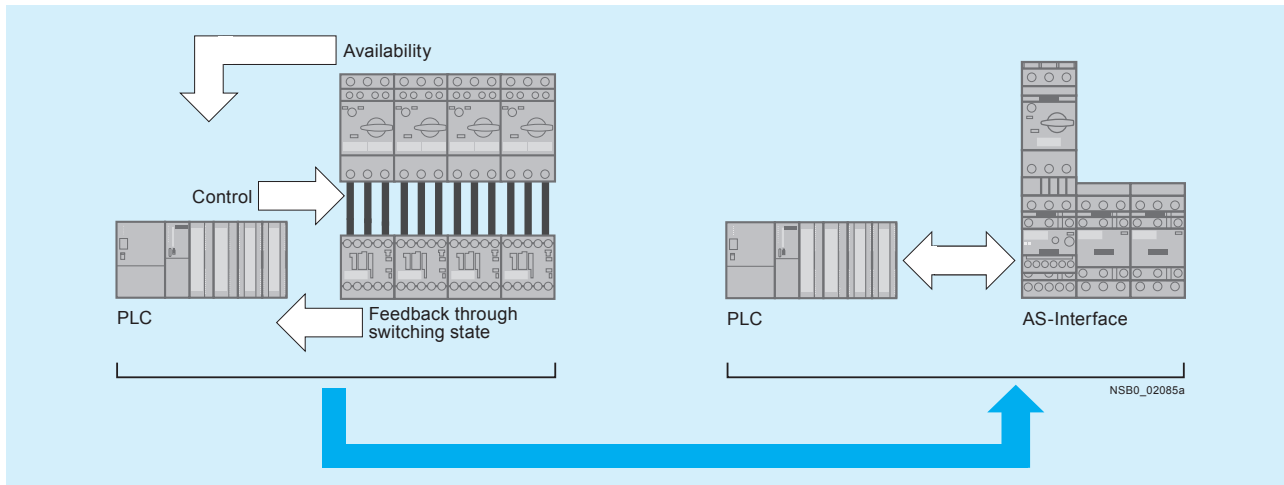
The SIRIUS function modules for AS-Interface enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking. The electrical and mechanical connection to the contactor is established by snapping on and locking. An additional control circuit for the individual contactors can be eliminated with completely because a varistor is integrated in the modules. Feedback from the contactor contacts is performed with Hall sensors which provide reliable feedback concerning the switching state even under extremely dusty conditions. Connection of the starters to the higher-level control system takes place through AS-Interface with the Specification V2.1 in A/B technology. As the result, up to 62 starters can be con-

nected to one master and the address is entered in normal manner with an addressing unit.

Through the AS-Interface connection to the control system, a maximum of wiring is saved. The wiring outlay is reduced to the control supply voltage and the two individual wires for AS-Interface.

The following essential signals are transmitted:

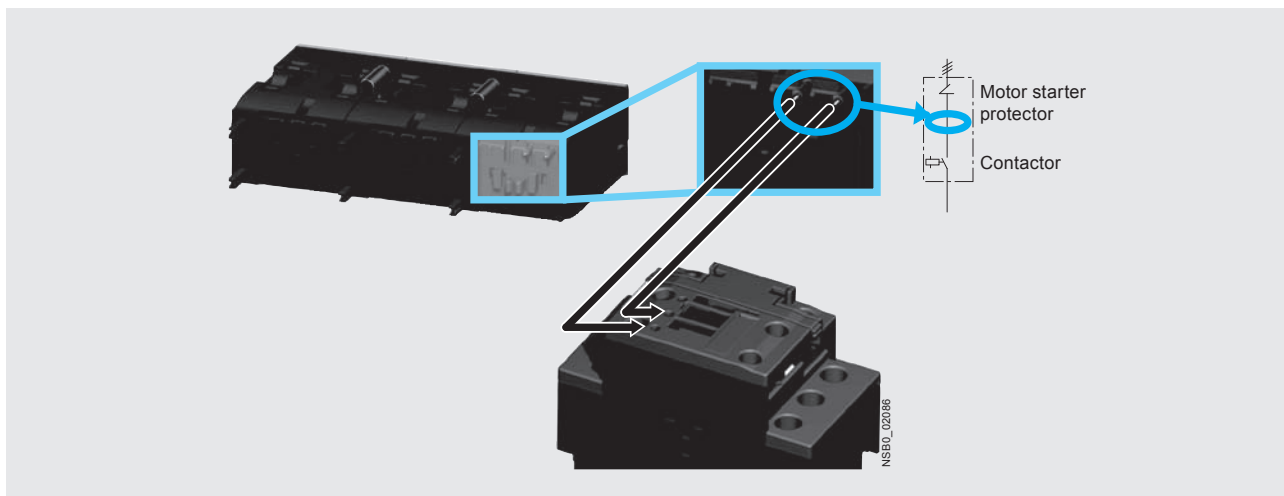
- Availability of the starter in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



Signal transmission through AS-Interface

The inquiry from the motor starter protector does not take place through additional wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

This requires use of communication versions of the contactors with communication interface (see page 2/26).

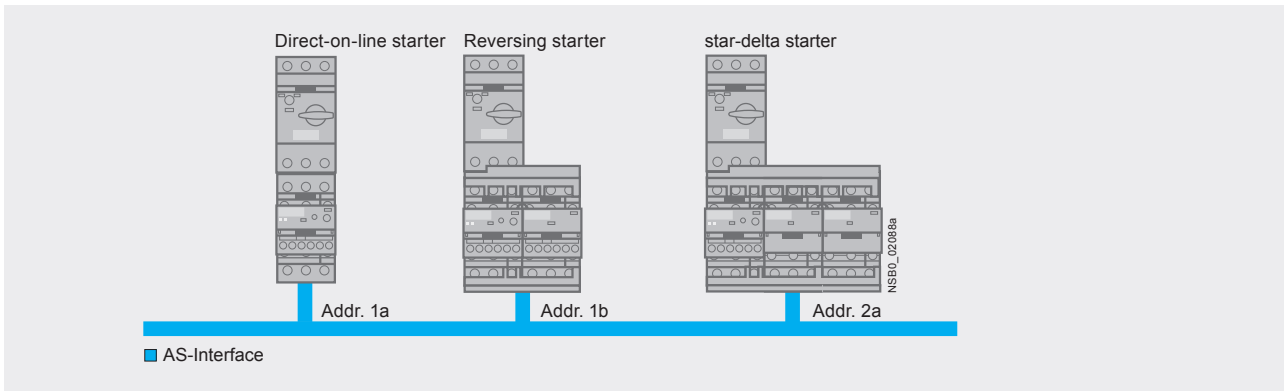


Availability signal through voltage pick-off



# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules for AS-Interface



Topology with AS-Interface

This easy integration of the starters in the TIA world does not limit the flexibility in the field in the least. For example, all function modules have special terminals in order to enable direct local disconnection. These terminals can be connected for example,

to a position switch. The input interrupts the voltage supply to the contactor coil directly, i. e. without going through the PLC. These terminals are jumpered in the as-delivered state.

### Application

The use of SIRIUS function modules with AS-Interface is recommended above all in machines and plants requiring easy connection of several different sensors and actuators both inside and outside the control cabinet to the higher-level control system. And with IO modules no longer needed, the width of the PLC is far smaller.

### Benefits

- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Elimination of IO modules saves space in the control cabinet
- All essential timing and interlocking functions for reversing duty and wye-delta starting are integrated
- No additional control circuit required

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules for AS-Interface

CONTACTORS AND ASSEMBLIES 2

### Selection and ordering data

Version	Screw terminals	Spring-type terminals	Weight
	Order No.	Order No.	kg
<b>Function modules for direct-on-line starting</b>			
<p>3RA2712-1AA00</p>	<b>AS-Interface connection</b> 3RA2712-1AA00	3RA2712-2AA00	
<p>3RA2712-2AA00</p>			
<b>Function modules for reversing starting<sup>1)</sup></b>			
<p>3RA2712-1BA00</p>	<b>AS-Interface connection, comprising one basic and one coupling module</b> 3RA2712-1BA00	3RA2712-2BA00	
<p>3RA2712-2BA00</p>			
<b>Assembly kits for making 3-pole contactor assemblies</b>			
<p>3RA2923-2AA1</p>	The assembly kit contains: mechanical interlock, 2 connecting clips for two contactors, wiring modules on the top and bottom	3RA2913-2AA1	3RA2913-2AA2
<p>3RA2923-2AA1</p>		3RA2923-2AA1 --	-- 3RA2923-2AA2
<p>3RA2923-2AA2</p>		3RA2933-2AA1 --	-- 3RA2933-2AA2

Matching contactors with communications interface required; see page 2/26.

For matching AS-Interface masters, routers and power supply units, see Chapter 14 "Industrial Communication".

1) For prewired contactor assemblies for reversing starting with communication interface, see pages 2/40 and 2/43. When these contactor assemblies are used, the assembly kit for the wiring is already integrated.

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules for AS-Interface

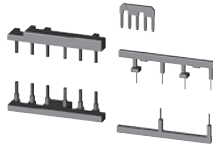
### Function modules for wye-delta starting<sup>1)</sup>



3RA2712-1CA00



3RA2712-2CA00



3RA2923-2BB1



3RA2923-2BB2

**AS-Interface connection,** comprising one basic module and two coupling modules

**Assembly kits for making 3-pole contactor assemblies**

The assembly kit contains:  
mechanical interlock,  
4 connecting clips for 3 contactors;  
star jumper,  
wiring modules on the top and bottom

- For size S00
- For size S0
  - For main, auxiliary and control circuits
  - Only for main circuit
- For size S2
  - For main, auxiliary and control circuits
  - Only for main circuit

1) For complete contactor assemblies for wye-delta starting including function modules, see pages 2/47 and 2/48.

Version	Screw terminals	Spring-type terminals	Weight
	Order No.	Order No.	kg
	3RA2712-1CA00	3RA2712-2CA00	
	3RA2913-2BB1	3RA2913-2BB2	
	3RA2923-2BB1 --	-- 3RA2923-2BB2	
	3RA2933-2BB1 --	-- 3RA2933-2BB2	

Matching contactors with communications interface required; see page 2/26.

For matching AS-Interface masters, routers and power supply units, see Chapter 14 "Industrial Communication".

### Accessories



3RA2711-0EE10



3RA2711-0EE06



3RA2711-0EE15



3RA2910-0

**Module connector set,** comprising:  
• 2 module connectors, 14-pole, short  
• 2 interface covers

**Module connectors**

- 14-pole, 9 cm  
For size jump + 1 space

**Interface covers**  
(Set of 5)

**Sealable covers**  
For 3RA27, 3RA28, 3RA29

Version	Order No.	Weight
		kg
	3RA2711-0EE10	
	3RA2711-0EE06	
	3RA2711-0EE15	
	3RA2910-0	

For manuals, see <http://support.automation.siemens.com/WW/view/en/39318922>.

# Function Modules for Mounting onto SIRIUS 3RT2 Contactors

## SIRIUS function modules

### Technical specifications

Type	3RA2811	3RA2831	3RA2812	3RA2832	3RA2816
Can be used for size	S00, S0	S2	S00, S0	S2	S00, S0, S2
Function	ON-delay		OFF-delay with control signal		Wye-delta function
<b>General data</b>					
<b>Rated insulation voltage <math>U_i</math></b>	V AC	300			
Pollution degree 3 Overvoltage category III					
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV AC	4			
<b>Operating range of excitation</b>		0.85 ... 1.1 x $U_s$ , 0.95 ... 1.05 times the rated frequency			
<b>Overvoltage protection</b>		Varistor integrated			
<b>Rated power</b>	W	1			1
• Power consumption at 230 V AC, 50 Hz	VA	1			2
<b>DIASED protection</b>	Operational class gG	A			4
<b>Switching frequency</b> for load					
• With $I_g$ at 230 V AC	$h^{-1}$	2 500			--
• With 3RT2 contactor at 230 V AC	$h^{-1}$	2 500			--
<b>Recovery time</b>	ms	50			150
<b>Minimum ON period</b>	ms	--	35		--
<b>Residual current</b>	Max.	mA	5	--	--
<b>Voltage drop</b>	Max.	VA	3.5	--	--
With conducting output					
<b>Setting accuracy</b>	Typ.		±15 %		
With reference to upper limit of scale					
<b>Repeat accuracy</b>	Max.		±1 %		
<b>Electrical endurance</b>		Operating cycles	100 000		--
• With 3RT2028 contactor		Operating cycles	--		100 000
• At AC-15, 250 V, 3 A					
<b>Mechanical endurance</b>		Operating cycles	100 x 10 <sup>6</sup>		10 x 10 <sup>6</sup>
<b>Permissible ambient temperature</b>					
• During operation	°C	-25 ... +60			
• During storage	°C	-40 ... +80			
<b>Degree of protection</b> acc. to IEC 60947-1, Appendix C			IP20		
<b>Shock resistance</b>	g/ms	15/11			
Half-sine acc. to IEC 60068-2-27					
<b>Vibration resistance</b>					
According to IEC 60068-2-6	Hz/mm	10 ... 55/0.35			
<b>Electromagnetic compatibility (EMC)</b>			IEC 61000-6-2, IEC 61000-6-4, IEC 61812-1, IEC 60947-4-1		
<b>Overvoltage protection</b>			Varistor integrated		
<b>Permissible mounting position</b>			Any (see contactor)		
<b>Conductor cross-sections</b>					
<b>Connection type</b> (1 or 2 conductors can be connected)			<b>Screw terminals</b>		
• Solid	mm <sup>2</sup>	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)			--
• Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)			--
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)			--
• Terminal screws		M3 (for standard screw driver size 2 or Pozidriv 2)			--
• Tightening torque	Nm	0.8 ... 1.2			--
<b>Connection type</b> (1 or 2 conductors can be connected)			<b>Spring-type terminals</b>		
• Operating devices	mm	3.0 x 0.5			--
• Solid	mm <sup>2</sup>	2 x (0.25 ... 1.5)			--
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.25 ... 1.5)			--
• Finely stranded	mm <sup>2</sup>	2 x (0.25 ... 1.5)			--
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)			--

# Contactors Assemblies for Switching Motors

## 3RA reversing contactor assemblies

### Design

#### Complete equipment assemblies

The fully wired reversing contactor assemblies are suitable for use in any climate. They are safe from touch to EN 50274.

The contactor assemblies each consist of two contactors with identical ratings. The contactors are mechanically and electrically interlocked (NC contact interlock). The main and control circuits are wired according to the circuit diagrams on page 2/199.

For motor protection, either 3RU2 or 3RB3 overload relays for direct mounting or individual mounting or thermistor motor protection tripping units must be ordered separately.

#### Components for customer assembly

Installation kits for all sizes are available for customer assembly of reversing contactor assemblies.

Contactors, overload relays, the mechanical interlock and — for momentary-contact operation — auxiliary switch blocks for latching must be ordered separately

The following points should be noted:

#### Size S00

- For maintained-contact operation: use contactors with an NC contact in the basic unit for the electrical interlock.
- For momentary-contact operation: use contactors with an NC contact in the basic unit for the electrical interlock; in addition, an auxiliary switch block with at least one NO contact for latching is required per contactor.

#### Size S0 and S2

Contactors come equipped with integrated 1 NO and 1 NC aux contacts in each contactor. Both electrical interlocking and latching are satisfied with the integrated auxiliaries. Mechanical interlocking is required in either size and comes in the assembly kits except for size S2 where you need to order 3RA2934-2B interlock separately.

#### Sizes S3

- For maintained-contact operation: the contactors have no auxiliary contact in the basic unit; NC contacts for the electrical interlock are therefore integrated in the mechanical interlock that can be mounted on the side of each contactor (one contact each for the left and right-hand contactors).
- For momentary-contact operation: the electrical interlock is the same as for maintained-contact operation; in addition, an auxiliary switch with one NO contact for latching is required per contactor. This contact can be snapped onto the top of the contactors. Alternatively, auxiliary switch blocks mounted on the side can be used; they must be fitted onto the outside of each contactor.

If the front-mounted mechanical interlock is used for size S2 to S3 contactors, two location holes for single-pole auxiliary switch blocks are provided on the front of each S2 contactor while three additional, single-pole auxiliary switch blocks can be snapped onto S3 contactors. The maximum auxiliary switch complements per contactor stated on page 2/12 must not be exceeded.

When size S3 contactors are combined with a front-mounted mechanical interlock, the 3RA19 33-2B and 3RA19 43-2B installation kits cannot be used.

#### Sizes S6 to S12

To insert the mechanical interlock, the prestamped location holes positioned opposite on the contactor must be knocked out. The internal auxiliary contacts (up to 1 NO + 1 NC per contactor) can be used for the electrical interlock and latching. The mechanical interlock itself does not contain any auxiliary contacts. Additional auxiliary contacts can be used on the outside and front (on the front in the case of 3RT10) of the reversing contactor assembly.

### Principle of operation

The operating times of the individual 3RT10/20 contactors are rated in such a way that no overlapping of the contact making and the arcing time between two contactors can occur on reversing, providing they are interlocked via their auxiliary switches (NC contact interlock) and the operating mechanisms. An additional dead interval of 50 ms is necessary on reversing if the individual contactors are used at voltages > 500 V. The operating times of the individual contactors are not affected by the mechanical interlock.

### Surge suppression

#### Sizes S00 to S3

All contactor assemblies can be fitted with RC elements or varistors for damping opening surges in the coil.

As with the individual contactors, the surge suppressors can either be plugged onto the front of the contactors (S00) or fitted onto the coil terminals on the top or bottom (S3). For sizes S0 and S2, the surge protection fits behind the hinged door on the front of the contactor and does not take up any additional space.

#### Sizes S6 to S12

The contactors are fitted with varistors as standard.

# Contactors and Contactor Assemblies for Switching Motors

## 3RA13 and 3RA23 reversing contactor assemblies

### Overview

The 3RA13 and 3RA23 reversing contactor assemblies can be ordered as follows:

#### Sizes S00 to S3

- Fully wired and tested, open type, with mechanical and electrical interlock. 1)

#### Sizes S00 to S12

- As components for customer assembly.

There is also a range of accessories (auxiliary switch blocks, surge suppressors, etc.) that must be ordered separately.

For overload relays for motor protection, see section 3.

The 3RA23 and 3RA13 contactor assemblies have screw connections and are available for screwing or snapping onto 35 mm standard mounting rails. The 3RA23 contactor assemblies are also available with spring-type terminals.

The Ⓒ and Ⓓ approvals only apply to the complete contactor assemblies and not to the components for customer assembly.

#### AC and DC operation

See pages 2/40 through 2/44 for complete part numbers.

Maximum horsepower rating at 460 V AC	AC-3 maximum inductive current	Size	Order No.				Installation kit	Fully wired and tested contactor assembly
			Contactor	Mechanical interlock <sup>2)</sup>	Mechanical interlock <sup>3)</sup>	Mechanical interlock <sup>4)</sup>		
<b>HP</b>	<b>A</b>							
<b>3</b>	7	<b>S00</b>	3RT20 15	3RA29 13-2AA1 <sup>6)</sup>	–	–	3RA29 13-2AA1 <sup>6)</sup>	<b>3RA23 15-8XB30- ...</b>
<b>5</b>	9		3RT20 16					<b>3RA23 16-8XB30- ...</b>
<b>7.5</b>	12		3RT20 17					<b>3RA23 17-8XB30- ...</b>
<b>10</b>	16		3RT20 18					<b>3RA23 18-8XB30- ...</b>
<b>7.5</b>	12	<b>S0</b>	3RT20 24	3RA29 23-2AA1 <sup>6)</sup>	–	–	3RA29 23-2AA1 <sup>6)</sup>	<b>3RA23 24-8XB30- ...</b>
<b>10</b>	16		3RT20 25					<b>3RA23 25-8XB30- ...</b>
<b>15</b>	25		3RT20 26					<b>3RA23 26-8XB30- ...</b>
<b>20</b>	32		3RT20 27					<b>3RA23 27-8XB30- ...</b>
<b>25</b>	38		3RT20 28					<b>3RA23 28-8XB30- ...</b>
<b>30</b>	40	<b>S2</b>	3RT20 35	3RA29 34-2B	–	–	3RA29 33-2AA1 <sup>7)</sup>	<b>3RA23 35-8XB30-1 ..</b>
<b>40</b>	50		3RT20 36					<b>3RA23 36-8XB30-1 ..</b>
<b>50</b>	65		3RT20 37					<b>3RA23 37-8XB30-1 ..</b>
<b>50</b>	80		3RT20 38					<b>3RA23 38-8XB30-1 ..</b>
<b>50</b>	65	<b>S3</b>	3RT20 44	3RA29 34-2B	–	–	3RA29 43-2AA1 <sup>6)</sup>	<b>3RA13 44-8XB30-1 ..</b>
<b>60</b>	80		3RT20 45					<b>3RA13 45-8XB30-1 ..</b>
<b>75</b>	95		3RT20 46					<b>3RA13 46-8XB30-1 ..</b>
<b>100</b>	115	<b>S6</b>	3RT10 54	–	–	3RA19 54-2A	3RA19 53-2A <sup>9)</sup>	–
<b>125</b>	150		3RT10 55					
<b>150</b>	185		3RT10 56					
<b>150</b>	225	<b>S10</b>	3RT10 64	–	–	3RA19 54-2A	3RA19 63-2A <sup>9)</sup>	–
<b>200</b>	265		3RT10 65					
<b>250</b>	300		3RT10 66					
<b>300</b>	400	<b>S12</b>	3RT10 75	–	–	3RA19 54-2A	3RA19 73-2A <sup>9)</sup>	–
<b>400</b>	500		3RT10 76					

For accessories, see page 2/80-2/83.  
 For circuit diagrams, see page 2/199.  
 For dimension drawings, see page 2/218-2/220.

- 1) An additional dead interval of 50 ms is necessary on reversing at voltages > 500 V.
- 2) Laterally mountable with one auxiliary contact (except no auxiliary contact in S2 & S3)
- 3) For front mounting with one auxiliary contact.
- 4) Laterally mountable without auxiliary contact.
- 5) Interlock must be ordered with installation kit.
- 6) Installation kit contains: mechanical interlock; 2 connecting clips for 2 contactors; wiring connectors on the top and bottom.
- 7) Installation kit contains: 2 connecting clips for 2 contactors; wiring connectors on the top and bottom and the mechanical interlock.
- 8) Installation kit contains: 2 connecting clips for 2 contactors; wiring connectors on the top and bottom.
- 9) Installation kit contains: wiring connector on the top and bottom.

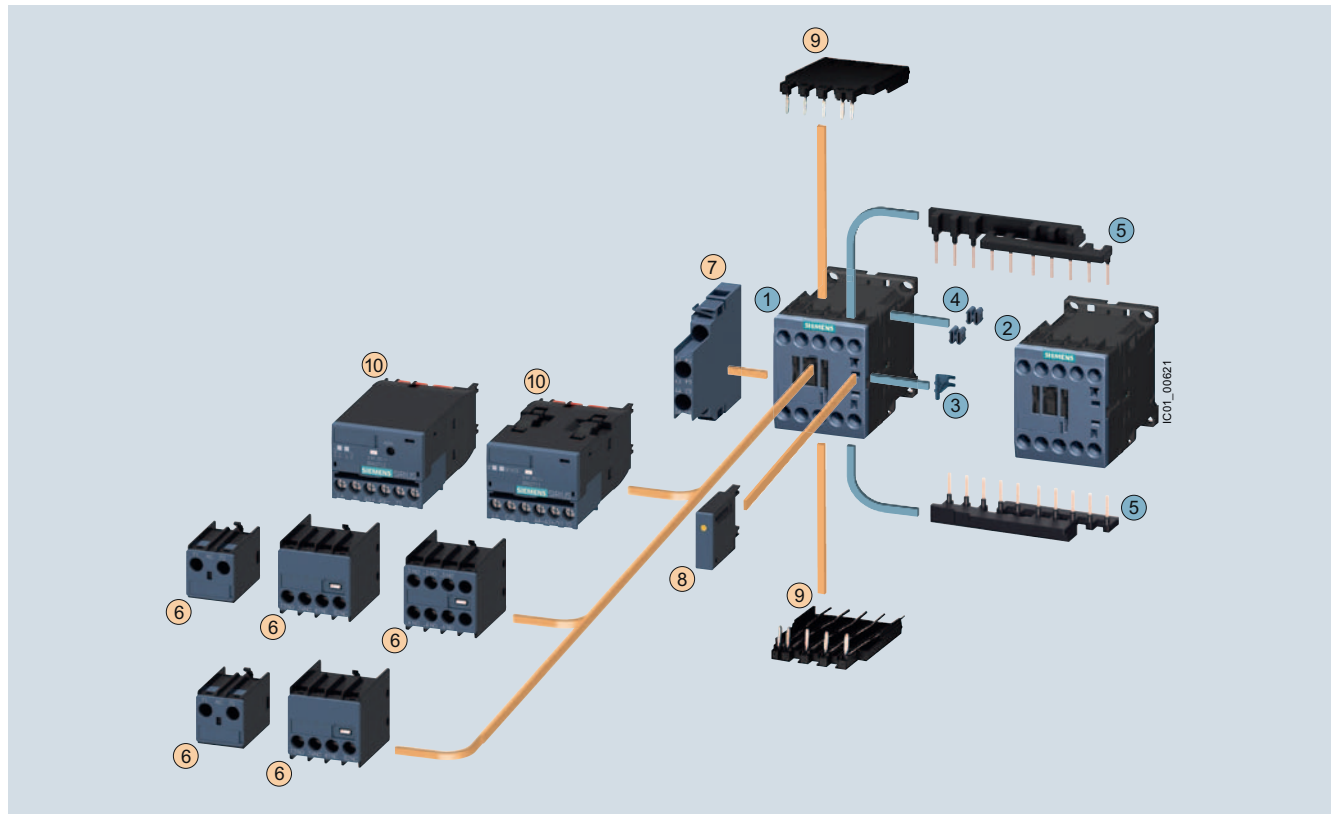


# Contactors Assemblies for Switching Motors

## 3RA23 reversing contactor assemblies

Fully wired and tested reversing contactor assemblies · Size S00 – Up to 10 HP

The figure shows the version with screw terminals



### Mountable accessories (optional)

To be ordered separately	Type
⑥ Auxiliary switch block, front <sup>1)</sup>	3RH2911
⑦ Auxiliary switch block, lateral	3RH2921
⑧ Surge suppressors	3RT2916
⑨ Solder pin adapters	3RT1916-4KA1
⑩ Function module for connection to the control system	3RA271.-1BA00

### Complete reversing contactor assembly

Individual parts	Type	
	Q11	Q12
① ② Contactors, 3 kW	3RT2015	3RT2015
① ② Contactors, 4 kW	3RT2016	3RT2016
① ② Contactors, 5.5 kW	3RT2017	3RT2017
① ② Contactors, 7.5 kW	3RT2018	3RT2018
③ ... ⑤ Assembly kit comprising:	3RA2913-2AA1	
③	Mechanical interlock <sup>2)</sup>	
④	Two connecting clips for two contactors <sup>2)</sup>	
⑤	Wiring modules on the top and bottom for connecting the main current circuits, electrical interlock included <sup>3)</sup> , interruptible (NC contact interlock)	

<sup>1)</sup> Auxiliary switch block according to EN 50005 must be used.

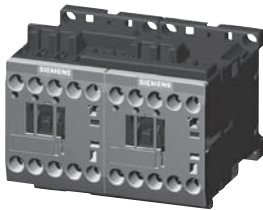
<sup>2)</sup> The parts ③ and ④ can only be ordered together as 3RA2912-2H mechanical connectors.

<sup>3)</sup> 3RT201. contactors with one NC contact in the basic unit are required for the electrical interlock. An additional NO contact is required for momentary-contact operation.

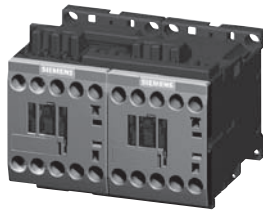
# Contactors Assemblies for Switching Motors

## 3RA23 reversing contactor assemblies

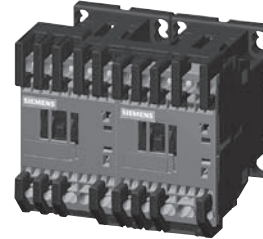
Fully wired and tested contactor assemblies<sup>2)</sup> · Size S00 · Up to 10 HP



3RA23 18-8XE30-1BB4



3RA23 1.-8XB30-1A..



3RA23 1.-8XB30-2A..

CONTACTORS AND ASSEMBLIES 2

AC data		UL data					Screw terminals		Spring-type terminals		Weight approx. kg
Amp ratings	AC2/AC3	Single-phase HP ratings	Three-phase HP ratings		Rated control supply voltage $U_s$ at 50/60 Hz		Auxiliary contacts	NO	NC	Order No.	
		115 V	230 V	200 V	230 V	460 V	575 V				

AC operation, 50/60 Hz											
Size S00 <sup>1)</sup>											
7	1/4	3/4	1 1/2	2	3	5	24 AC	0	2	3RA23 15-8XB30-□AB0	0.46/0.50
7	1/4	3/4	1 1/2	2	3	5	110/120 AC	0	2	3RA23 15-8XB30-□AK6	0.46/0.50
7	1/4	3/4	1 1/2	2	3	5	220/240 AC	0	2	3RA23 15-8XB30-□AP6	0.46/0.50
9	1/3	1	2	3	5	7 1/2	24 AC	0	2	3RA23 16-8XB30-□AB0	0.46/0.50
9	1/3	1	2	3	5	7 1/2	110/120 AC	0	2	3RA23 16-8XB30-□AK6	0.46/0.50
9	1/3	1	2	3	5	7 1/2	220/240 AC	0	2	3RA23 16-8XB30-□AP6	0.46/0.50
12	1/2	2	3	3	7 1/2	10	24 AC	0	2	3RA23 17-8XB30-□AB0	0.46/0.50
12	1/2	2	3	3	7 1/2	10	110/120 AC	0	2	3RA23 17-8XB30-□AK6	0.46/0.50
12	1/2	2	3	3	7 1/2	10	220/240 AC	0	2	3RA23 17-8XB30-□AP6	0.46/0.50
16	1	2	3	5	10	10	24 AC	0	2	3RA23 18-8XB30-□AB0	0.46/0.50
16	1	2	3	5	10	10	110/120 AC	0	2	3RA23 18-8XB30-□AK6	0.46/0.50
16	1	2	3	5	10	10	220/240 AC	0	2	3RA23 18-8XB30-□AP6	0.46/0.50
DC operation											
7	1/4	3/4	1 1/2	2	3	5	24 DC	0	2	3RA23 15-8XB30-□BB4	0.58/0.62
9	1/3	1	2	3	5	7 1/2	24 DC	0	2	3RA23 16-8XB30-□BB4	0.58/0.62
12	1/2	2	3	3	7 1/2	10	24 DC	0	2	3RA23 17-8XB30-□BB4	0.58/0.62
16	1	2	3	5	10	10	24 DC	0	2	3RA23 18-8XB30-□BB4	0.58/0.62
With communication interface <sup>3)</sup>											
7	1/4	3/4	1 1/2	2	3	5	24 DC	0	2	3RA23 15-8XE30-□BB4	0.58/0.62
9	1/3	1	2	3	5	7 1/2	24 DC	0	2	3RA23 16-8XE30-□BB4	0.58/0.62
12	1/2	2	3	3	7 1/2	10	24 DC	0	2	3RA23 17-8XE30-□BB4	0.58/0.62
16	1	2	3	5	10	10	24 DC	0	2	3RA23 18-8XE30-□BB4	0.58/0.62

1 Screw terminals  
2 Spring-loaded terminals

For other voltages see page 2/49

For accessories and spare parts, see page 2/66-2/83.

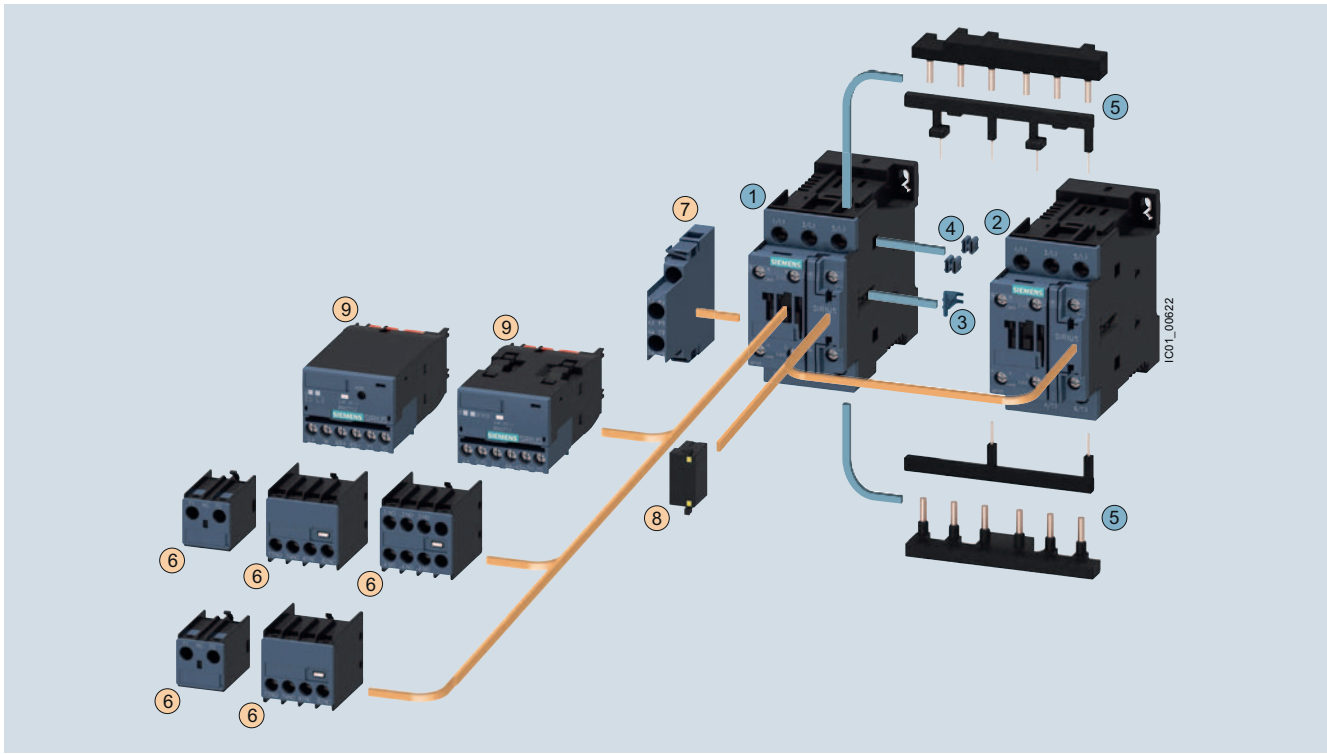
- 1) For coil operating range, see page 2/49.
- 2) The contactors integrated in the contactor assemblies have no unassigned auxiliary contacts.
- 3) For use with 3RA27 and 3RA28 communication modules. See pages 2/24 to 2/31.

# Contactors Assemblies for Switching Motors

## 3RA23 reversing contactor assemblies

Fully wired and tested reversing contactor assemblies · Size S0 – Up to 25 HP

The figure shows the version with screw terminals



### Mountable accessories (optional)

To be ordered separately	Type
⑥ Auxiliary switch block, front	3RH2911
⑦ Auxiliary switch block, lateral	3RH2921
⑧ Surge suppressors	3RT2926
⑨ Function module for connection to the control system	3RA271.-1BA00

### Complete reversing contactor assembly

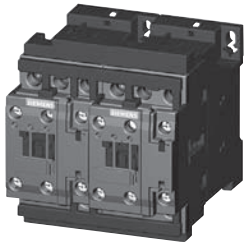
Individual parts	Type	
	Q11	Q12
① ② Contactors, 5.5 kW	3RT2024	3RT2024
① ② Contactors, 7.5 kW	3RT2025	3RT2025
① ② Contactors, 11 kW	3RT2026	3RT2026
① ② Contactors, 15 kW	3RT2027	3RT2027
① ② Contactors, 18.5 kW	3RT2028	3RT2028
③ ... ⑤ Assembly kit comprising:	3RA2923-2AA1	
③ Mechanical interlock <sup>1)</sup>		
④ Two connecting clips for two contactors <sup>1)</sup>		
⑤ Wiring modules on the top and bottom for connecting the main current circuits, electrical interlock included (NC contact interlock)		

<sup>1)</sup> The parts ③ and ④ can only be ordered together as 3RA2922-2H mechanical connectors.

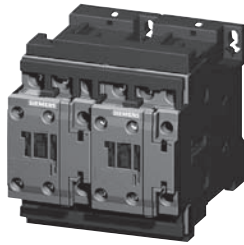
# Contactors Assemblies for Switching Motors

## 3RA23 reversing contactor assemblies

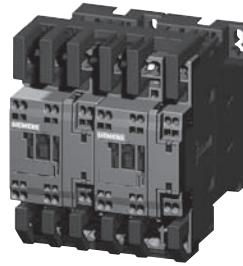
Fully wired and tested contactor assemblies · Size S0 · up to 25 HP



3RA23 24-8XE30-1BB4



3RA23 2.-8XB30-1A..



3RA23 2.-8XB30-2A..

CONTACTORS AND ASSEMBLIES 2

AC data		UL data					Rated control supply voltage $U_s$ at 50/60 Hz V	Auxiliary contacts		Screw terminals		Weight approx. kg
Amp ratings AC2/AC3	Single-phase HP ratings 115 V	230 V	Three-phase HP ratings 200 V		230 V	460 V		575 V	NO	NC	Spring-type terminals	

### AC operation, 50/60 Hz

Size S0<sup>1)</sup>

AC rating	115 V	230 V	200 V	230 V	460 V	575 V	Rated control supply voltage $U_s$ at 50/60 Hz V	NO	NC	Order No.	Weight approx. kg
12	1	2	3	3	7 1/2	10	24 AC	2	2	3RA23 24-8XB30-□AC2	0.84/0.94
12	1	2	3	3	7 1/2	10	110/120 AC	2	2	3RA23 24-8XB30-□AK6	0.84/0.94
12	1	2	3	3	7 1/2	10	220/240 AC	2	2	3RA23 24-8XB30-□AP6	0.84/0.94
16	1	3	5	5	10	15	24 AC	2	2	3RA23 25-8XB30-□AC2	0.84/0.94
16	1	3	5	5	10	15	110/120 AC	2	2	3RA23 25-8XB30-□AK6	0.84/0.94
16	1	3	5	5	10	15	220/240 AC	2	2	3RA23 25-8XB30-□AP6	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	24 AC	2	2	3RA23 26-8XB30-□AC2	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	110/120 AC	2	2	3RA23 26-8XB30-□AK6	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	220/240 AC	2	2	3RA23 26-8XB30-□AP6	0.84/0.94
32	2	5	10	10	20	25	24 AC	2	2	3RA23 27-8XB30-□AC2	0.84/0.94
32	2	5	10	10	20	25	110/120 AC	2	2	3RA23 27-8XB30-□AK6	0.84/0.94
32	2	5	10	10	20	25	220/240 AC	2	2	3RA23 27-8XB30-□AP6	0.84/0.94
38	3	5	10	10	25	25	24 AC	2	2	3RA23 28-8XB30-□AC2	0.84/0.94
38	3	5	10	10	25	25	110/120 AC	2	2	3RA23 28-8XB30-□AK6	0.84/0.94
38	3	5	10	10	25	25	220/240 AC	2	2	3RA23 28-8XB30-□AP6	0.84/0.94

### DC operation

AC rating	115 V	230 V	200 V	230 V	460 V	575 V	Rated control supply voltage $U_s$ at 50/60 Hz V	NO	NC	Order No.	Weight approx. kg
12	1	2	3	3	7 1/2	10	24 DC	2	2	3RA23 24-8XB30-□BB4	1.22/1.32
16	1	3	5	5	10	15	24 DC	2	2	3RA23 25-8XB30-□BB4	1.22/1.32
25	2	3	7 1/2	7 1/2	15	20	24 DC	2	2	3RA23 26-8XB30-□BB4	1.22/1.32
32	2	5	10	10	20	25	24 DC	2	2	3RA23 27-8XB30-□BB4	1.22/1.32
38	3	5	10	10	25	25	24 DC	2	2	3RA23 28-8XB30-□BB4	1.22/1.32

### With communication interface<sup>2)</sup>

AC rating	115 V	230 V	200 V	230 V	460 V	575 V	Rated control supply voltage $U_s$ at 50/60 Hz V	NO	NC	Order No.	Weight approx. kg
12	1	2	3	3	7 1/2	10	24 DC	2	2	3RA23 24-8XE30-□BB4	1.22/1.32
16	1	3	5	5	10	15	24 DC	2	2	3RA23 25-8XE30-□BB4	1.22/1.32
25	2	3	7 1/2	7 1/2	15	20	24 DC	2	2	3RA23 26-8XE30-□BB4	1.22/1.32
32	2	5	10	10	20	25	24 DC	2	2	3RA23 27-8XE30-□BB4	1.22/1.32
38	3	5	10	10	25	25	24 DC	2	2	3RA23 28-8XE30-□BB4	1.22/1.32

1 Screw terminals  
2 Spring-loaded terminals

For other voltages see page 2/49.

For accessories and spare parts, see page 2/66-2/83.

1) For coil operating range, see page 2/49.

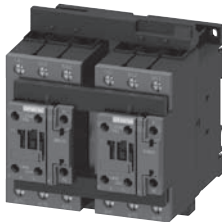
2) For use with 3RA27 and 3RA28 communication modules. See pages 2/24 to 2/31.

# Contactors Assemblies for Switching Motors

## 3RA23 reversing contactor assemblies

### Selection and ordering data

#### Size S2 · up to 50 HP



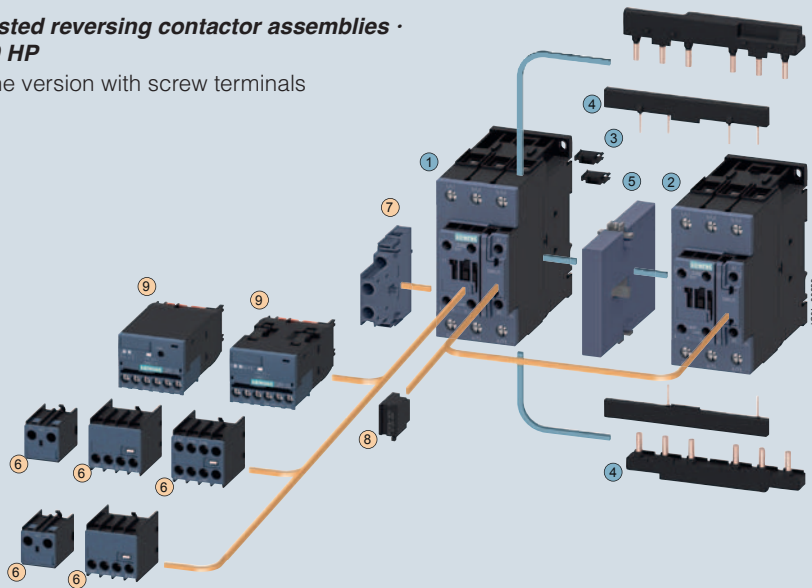
AC data Amp ratings AC2/AC3	UL data Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage <sup>1)</sup>	Auxiliary contacts		Screw Terminals ⊕ Order No.	Weight approx. kg
	115 V	230 V	200 V	230 V	460 V	575 V		NO	NC		
A	HP	HP	HP	HP	HP	HP					
<b>AC operation</b>											
40	3	7.5	10	15	30	40	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	2 2 2 2 2 2		3RA2335-8XB30-1AC2 3RA2335-8XB30-1AK6 3RA2335-8XB30-1AP6	1.72
50	3	10	15	15	40	50	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	2 2 2 2 2 2		3RA2336-8XB30-1AC2 3RA2336-8XB30-1AK6 3RA2336-8XB30-1AP6	1.72
65	5	10	20	20	50	50	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	2 2 2 2 2 2		3RA2337-8XB30-1AC2 3RA2337-8XB30-1AK6 3RA2337-8XB30-1AP6	2.548
80 <sup>1)</sup>	5	15	20	25	50	60	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	2 2 2 2 2 2		3RA2338-8XB30-1AC2 3RA2338-8XB30-1AK6 3RA2338-8XB30-1AP6	2.548
<b>AC/DC operation</b>											
40	3	7.5	10	15	30	40	20-33 AC/DC	2 2		3RA2335-8XB30-1NB3	2.5
50	3	10	15	15	40	50	20-33 AC/DC	2 2		3RA2336-8XB30-1NB3	
65	5	10	20	20	50	50	20-33 AC/DC	2 2		3RA2337-8XB30-1NB3	
80 <sup>1)</sup>	5	15	20	25	50	60	20-33 AC/DC	2 2		3RA2338-8XB30-1NB3	

For Reversing Contactors with communication interface: replace the 8XB30-1NB3 with 8XE30-1NB3.

1) Max UL FLA = 65A at 460V

### Fully wired and tested reversing contactor assemblies · Size S2 · Up to 50 HP

The figure shows the version with screw terminals



#### Mountable accessories (optional)

To be ordered separately	Type
⑥ Auxiliary switch block, front	3RH2911
⑦ Auxiliary switch block, lateral	3RH2921
⑧ Surge suppressors	3RT2936
⑨ Function module for connection to the control system	3RA2711.-1BA00

For further voltages, see page 2/49.  
 For overview, see page 2/37-2/38.  
 For accessories, see page 2/66-2/83.  
 For circuit diagrams, see page 2/200.  
 For dimension drawings, see page 2/218.

**Coil voltage tolerance:**  
 at 50Hz: 0.8 to 1.1 x Us  
 at 60Hz: 0.85 to 1.1 x Us  
 at AC/DC: 0.8 to 1.1 x Us

#### Complete reversing contactor assembly

Individual parts	Type	Q11	Q12
① ② Contactors, 18.5 kW		3RT2035	3RT2035
① ② Contactors, 22 kW		3RT2036	3RT2036
① ② Contactors, 30 kW		3RT2037	3RT2037
① ② Contactors, 37 kW		3RT2038	3RT2038
③ ④ Assembly kit comprising:		3RA2933-2AA1	
③ Two connectors for two contactors			
④ Wiring modules on the top and bottom for connecting the main and auxiliary current circuits, electrical interlock included (NC contact interlock)			
⑤ Mechanical interlock (must be ordered separately)		3RA2934-2B	

# Contactors Assemblies for Switching Motors

## 3RA23 reversing contactor assemblies

**Selection and ordering data**

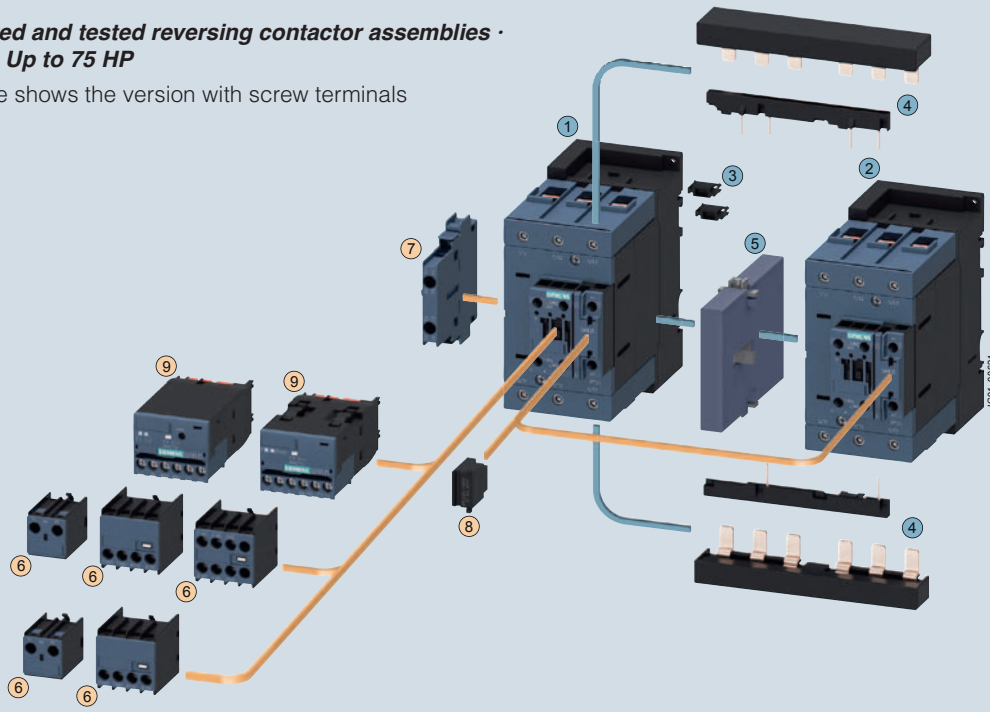
**Size S3 · up to 75 HP**

AC data Amp ratings AC2/AC3	UL data Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage <sup>1)</sup>	Auxiliary contacts		Fully wired and tested contactor assembly Order No.	Weight approx. kg
	115 V	230 V	200 V	230 V	460 V	575 V		NO	NC		
A	HP	HP	HP	HP	HP	HP					
<b>AC operation</b>											
80	5	15	20	25	<b>50</b>	60	24 V, 50/60 Hz	0	2	<b>3RA2345-8XB30-1AC2</b>	3.9
							120 V, 60 Hz	0	2	<b>3RA2345-8XB30-1AK6</b>	
							240 V, 60 Hz	0	2	<b>3RA2345-8XB30-1AP6</b>	
95	7.5	15	25	30	<b>60</b>	75	24 V, 50/60 Hz	0	2	<b>3RA2346-8XB30-1AC2</b>	3.9
							120 V, 60 Hz	0	2	<b>3RA2346-8XB30-1AK6</b>	
							240 V, 60 Hz	0	2	<b>3RA2346-8XB30-1AP6</b>	
110	10	20	30	30	<b>75</b>	100	24 V, 50/60 Hz	0	2	<b>3RA2347-8XB30-1AC2</b>	3.9
							120 V, 60 Hz	0	2	<b>3RA2347-8XB30-1AK6</b>	
							240 V, 60 Hz	0	2	<b>3RA2347-8XB30-1AP6</b>	
<b>AC/DC operation</b>											
80	5	15	20	25	<b>50</b>	60	20-33 V AC/DC	0	2	<b>3RA2345-8XB30-1NB3</b>	5.7
95	7.5	15	25	30	<b>60</b>	75	20-33 V AC/DC	0	2	<b>3RA2346-8XB30-1NB3</b>	
110	10	20	30	30	<b>75</b>	100	20-33 V AC/DC	0	2	<b>3RA2347-8XB30-1NB3</b>	



**Fully wired and tested reversing contactor assemblies · Size S3 · Up to 75 HP**

The figure shows the version with screw terminals



**Mountable accessories (optional)**

To be ordered separately	Type
① Auxiliary switch block, front	3RH2911
② Auxiliary switch block, lateral	3RH2921
③ Surge suppressors	3RT2936
④ Function module for connection to the control system (the associated module connectors 3RA2711-0EE17 must be ordered separately)	3RA2711.-1BA00

For further voltages, see page 2/49.  
 For overview, see page 2/37-2/38.  
 For accessories, see page 2/66-2/83.  
 For circuit diagrams, see page 2/200.  
 For dimension drawings, see page 2/218.

1) Coil voltage tolerance  
 at 50 Hz: 0.8 ... 1.1 x U<sub>s</sub>  
 at 60 Hz: 0.85 ... 1.1 x U<sub>s</sub>

**Complete reversing contactor assembly**

Individual parts	Type	Q11	Q12
① ② Contactors, 37 kW	3RT2045	3RT2045	
① ② Contactors, 45 kW	3RT2046	3RT2046	
① ② Contactors, 55 kW	3RT2047	3RT2047	
③ ④ Assembly kit comprising:	3RA2943-2AA1		
③ Two connectors for two contactors			
④ Wiring modules on the top and bottom for connecting the main and auxiliary current circuits, electrical interlock included (NC contact interlock)			
⑤ Mechanical interlock (must be ordered separately)	3RA2934-2B		



# 3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

## Overview

These 3RA24 contactor assemblies for wye-delta starting are designed for standard applications.

**Note:**

*Contactor assemblies for wye-delta starting in special applications such as very heavy starting or wye-delta starting of special motors must be customized. Help with designing such special applications is available from Technical Assistance.*

The 3RA24 contactor assemblies for wye-delta starting can be ordered as follows:

**Sizes S00 and S0**

- Fully wired and tested, with electrical and mechanical interlock.
- As individual parts for customer assembly.

A dead interval of 50 ms on reversing is already integrated in the function module for wye-delta starting.

There is also a range of accessories (lateral auxiliary switch blocks, etc.) that must be ordered separately.

[For overload relays for motor protection see Chapter 3 "Overload Relays" --> "3RB3 Solid-State Overload Relays".](#)

The 3RA24 contactor assemblies have screw or spring-type terminals and are suitable for screwing or snapping onto TH 35 standard mounting rails.

With the fully wired and tested 3RA24 contactor assemblies, the auxiliary contacts included in the basic devices are unassigned.

## Motor protection

Overload relays or thermistor motor protection releases can be used for overload protection.

The overload relay can be either mounted onto the line contactor or separately fitted. It must be set to 0.58 times the rated motor current.

## Surge suppression

Sizes S00 and S0

Surge suppression (varistor) is included in the function modules for wye-delta starting.

## Function modules for wye-delta starting

The 3RA28 16-0EW20 wye-delta function module ([see page 2/27](#)) replaces the complete wiring in the control circuit and can be used in the voltage range from 24 to 240 V AC/DC. It is snapped onto the front of the contactor assembly size S00 or S0.

One function module comprises a complete module kit:

- One 3RA29 12-0 basic module with integrated control logic and time setting,
- And two 3RA29 11-0 coupling modules with related connecting cables.

The scope of supply comprises a complete module kit for one contactor assembly for wye-delta starting size S00 or S0, regardless of the connection method.

## Screw terminals

Rated data at AC 50 Hz 400 V			Size			
Power kW	Operational current $I_e$ A	Motor current A		Line/delta contactor	Star contactor	Order No. complete
5.5	12	9.5 ... 13.8	<b>S00-S00-S00</b>	3RT2015-1....	3RT2015-1....	3RA2415-8XF32-1...
7.5	16	12.1 ... 17		3RT2017-1....	3RT2015-1....	3RA2416-8XF32-1...
11	25	19 ... 25		3RT2018-1....	3RT2016-1....	3RA2417-8XF32-1...
11	25	19 ... 25	<b>S0-S0-S0</b>	3RT2024-1...0	3RT2024-1...0	3RA2423-8XF32-1...
15	32	24.1 ... 34		3RT2026-1...0	3RT2024-1...0	3RA2425-8XF32-1...
18.5	40	34.5 ... 40		3RT2026-1...0	3RT2024-1...0	3RA2425-8XF32-1...
22	50	31 ... 43		3RT2027-1...0	3RT2026-1...0	3RA2426-8XF32-1...
22/30	50	31 ... 43	<b>S2-S2-S0</b>	3RT2035-1...0	3RT2026-1...0	3RA2434-8XF32-1...
37	80	62.1 ... 77.8		3RT2035-1...0	3RT2027-1...0	3RA2435-8XF32-1...
45	86	69 ... 86		3RT2036-1...0	3RT2028-1...0	3RA2436-8XF32-1...
55	115	77.6 ... 108.6	<b>S2-S2-S2</b>	3RT2037-1...0	3RT2035-1...0	3RA2444-8XF32-1...
75	150	120.7 ... 150		3RT2045-1...0	3RT2036-1...0	3RA2445-8XF32-1...
90	160	86 ... 160		3RT2046-1...0	3RT2037-1...0	3RA2446-8XF32-1...

## Spring-type terminals

Rated data at AC 50 Hz 400 V			Size			
Power kW	Operational current $I_e$ A	Motor current A		Line/delta contactor	Star contactor	Order No. complete
5.5	12	9.5 ... 13.8	<b>S00-S00-S00</b>	3RT2015-2....	3RT2015-2....	3RA24 15-8XF31-2...
7.5	16	12.1 ... 17		3RT2017-2....	3RT2015-2....	3RA24 16-8XF31-2...
11	25	19 ... 25		3RT2018-2....	3RT2016-2....	3RA24 17-8XF31-2...
11	25	19 ... 25	<b>S0-S0-S0</b>	3RT2024-2....0	3RT2024-2....0	3RA24 23-8XF32-2...
15	32	24.1 ... 34		3RT2026-2....0	3RT2024-2....0	3RA24 25-8XF32-2...
18.5	40	34.5 ... 40		3RT2026-2....0	3RT2024-2....0	3RA24 25-8XF32-2...
25	50	31 ... 43		3RT2027-2....0	3RT2026-2....0	3RA24 26-8XF32-2...

**Note:**

*The selection of contactor types refers to fused configurations.*

# 3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

CONTACTORS AND ASSEMBLIES 2

### Components for customer assembly

Assembly kits with wiring modules and mechanical connectors are available for contactor assemblies for wye-delta starting. Contactors, overload relays, function modules for wye-delta starting or wye-delta timing relays, auxiliary switches for electrical interlock – if required also feeder terminals and base plates – must be ordered separately.

The wiring kits for sizes S00 and S0 contain the top and bottom main conducting path connections between the line and delta

contactors (top) and between the delta and star contactors (bottom).

### Control circuit

Features:

- Time setting range 0.5 to 60 s (3 selectable settings)
- Wide voltage range 24 to 240 V AC/DC
- Dead interval of 50 ms, non-adjustable.

### Screw terminals

Power kW	Accessories for customer assembly			Overload relay, thermal (trip class CLASS 10)		Overload relay, solid-state (trip class CLASS 10)	
	Function modules for wye-delta starting	Assembly kit B, for single infeed	Star jumper	Setting range	Order No.	Setting range	Order No.
5.5	3RA28 16-0EW20	3RA29 13-2BB1 <sup>1)</sup>	3RT29 16-4BA31	5.5 ... 8	3RU21 16-1HB0	4 ... 16	3RB30 16-1TB0
7.5				7 ... 10	3RU21 16-1JB0		
11				11 ... 16	3RU21 16-4AB0		
11	3RA28 16-0EW20	3RA29 23-2BB2 <sup>2)</sup>	3RT29 26-4BA31	11 ... 16	3RU21 26-4AB0	6 ... 25	3RB30 26-1QB0
15				14 ... 20	3RU21 26-4BB0		
18.5				20 ... 25	3RU21 26-4DB0		
22				20 ... 25	3RU21 26-4DB0		

### Spring-type terminals

Power kW	Accessories for customer assembly			Overload relay, thermal (trip class CLASS 10)		Overload relay, solid-state (trip class CLASS 10)	
	Function modules for wye-delta starting	Assembly kit B, for single infeed	Star jumper	Setting range	Order No.	Setting range	Order No.
5.5	3RA28 16-0EW20	3RA29 13-2BB1 <sup>1)</sup>	3RT29 16-4BA32	5.5 ... 8	3RU21 16-1HC0	4 ... 16	3RB30 16-1TE0
7.5				7 ... 10	3RU21 16-1JC0		
11				11 ... 16	3RU21 16-4AC0		
11	3RA28 16-0EW20	3RA29 23-2BB2 <sup>2)</sup>	3RT29 26-4BA32	11 ... 16	3RU21 26-4AC0	6 ... 25	3RB30 26-1QE0
15				14 ... 20	3RU21 26-4BC0		
18.5				20 ... 25	3RU21 26-4DC0		
22				20 ... 25	3RU21 26-4DC0		

<sup>1)</sup> The assembly kit contains: mechanical interlock, 4 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and star contactor); star jumper and auxiliary circuit wiring.

<sup>2)</sup> The assembly kit contains: mechanical interlock, 4 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and star contactor); star jumper.

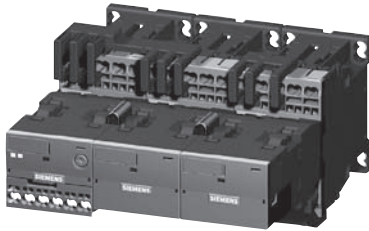
### Order No. scheme

Digit of the Order No.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.		
SIRIUS contactor assemblies	3 R A																	
2nd generation	2																	
Device type (e. g. 4 = contactor assembly for wye-delta starting)	4																	
Contactor size (1 = S00, 2 = S0)	<input type="checkbox"/>																	
Power dependent on size (e. g. 25 = 15 kW)	<input type="checkbox"/>																	
Type of overload relay (8X = without)	<input type="checkbox"/> <input type="checkbox"/>																	
Assembly (F = ready-assembled, E, H = ready-assembled with communication)	<input type="checkbox"/>																	
Interlock (3 = mechanical and electrical)	<input type="checkbox"/>																	
Free auxiliary switches (e. g. S00: 1 = 3 NO total, S0: 2 = 3 NO + 3 NC total)	<input type="checkbox"/>																	
Connection type (1 = screw, 2 = spring)	<input type="checkbox"/>																	
Operating range / solenoid coil circuit (e. g. A = AC standard / without)	<input type="checkbox"/>																	
Rated control supply voltage (e. g. K6 = 110/120 V, 50/60 Hz)	<input type="checkbox"/> <input type="checkbox"/>																	
Example	3	R	A	2	4	2	5	-	8	X	F	3	2	-	1	A	K	6

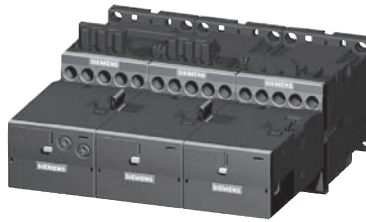
# 3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

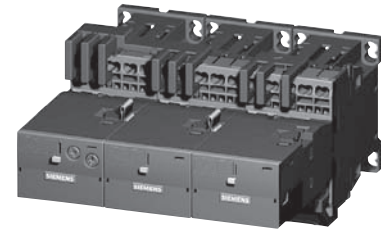
Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW



3RA24 1.-8XE31-2BB4



3RA24 1.-8XF31-1A.0



3RA24 1.-8XF31-2A.0

2 CONTACTORS AND ASSEMBLIES

Rated data AC-3						Rated control supply voltage $U_s$ <sup>1)</sup> at 50/60 Hz	Screw terminals		Weight approx. kg	Spring-type terminals		Weight approx. kg
Operational current $I_e$ up to	Ratings of induction motors at 50 Hz and				Order No.		Order No.					
400 V	230 V	400 V	500 V	690 V								
A	kW	kW	kW	kW	V							
<b>AC operation, 50/60 Hz</b>												
12	3.3	5.5	7.2	9.2	24 AC 110/120 AC 220/240 AC	3RA24 15-8XF31-1AB0 3RA24 15-8XF31-1AF0 3RA24 15-8XF31-1AP0	0.910 0.850 0.850	3RA24 15-8XF31-2AB0 3RA24 15-8XF31-2AF0 3RA24 15-8XF31-2AP0	0.910 0.910 0.910			
16	4.7	7.5	10.3	9.2	24 AC 110/120 AC 220/240 AC	3RA24 16-8XF31-1AB0 3RA24 16-8XF31-1AF0 3RA24 16-8XF31-1AP0	0.910 0.850 0.850	3RA24 16-8XF31-2AB0 3RA24 16-8XF31-2AF0 3RA24 16-8XF31-2AP0	0.910 0.910 0.910			
25	5.5	11	11	11	24 AC 110/120 AC 220/240 AC	3RA24 17-8XF31-1AB0 3RA24 17-8XF31-1AF0 3RA24 17-8XF31-1AP0	0.850 0.850 0.850	3RA24 17-8XF31-2AB0 3RA24 17-8XF31-2AF0 3RA24 17-8XF31-2AP0	0.910 0.910 0.910			
<b>DC operation</b>												
12	3.3	5.5	7.2	9.2	24 DC	3RA24 15-8XF31-1BB4	0.910	3RA24 15-8XF31-2BB4	0.910			
16	4.7	7.5	10.3	9.2	24 DC	3RA24 16-8XF31-1BB4	0.910	3RA24 16-8XF31-2BB4	0.910			
25	5.5	11	11	11	24 DC	3RA24 17-8XF31-1BB4	1.030	3RA24 17-8XF31-2BB4	1.090			
<b>For IO-Link connection</b>												
12	3.3	5.5	7.2	9.2	24 DC	3RA24 15-8XE31-1BB4	1.030	3RA24 15-8XE31-2BB4	1.090			
16	4.7	7.5	10.3	9.2	24 DC	3RA24 16-8XE31-1BB4	1.030	3RA24 16-8XE31-2BB4	1.090			
25	5.5	11	11	11	24 DC	3RA24 17-8XE31-1BB4	1.030	3RA24 17-8XE31-2BB4	1.090			
<b>For AS-Interface connection</b>												
12	3.3	5.5	7.2	9.2	24 DC	3RA24 15-8XH31-1BB4	1.050	3RA24 15-8XH31-2BB4	1.110			
16	4.7	7.5	10.3	9.2	24 DC	3RA24 16-8XH31-1BB4	1.050	3RA24 16-8XH31-2BB4	1.110			
25	5.5	11	11	11	24 DC	3RA24 17-8XH31-1BB4	1.050	3RA24 17-8XH31-2BB4	1.110			

The wye-delta starters listed here are assembled from individual contactors which are UL Listed. The overall assembly Catalog Number is not UL Listed.

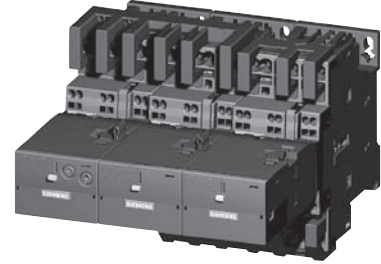
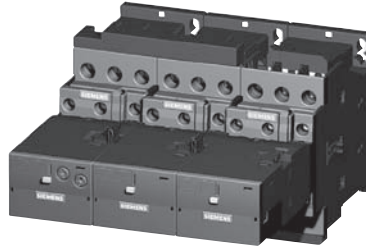
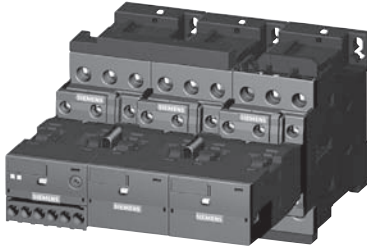
<sup>1)</sup> Coil operating range at 50 Hz: 0.8 ... 1.1 x  $U_s$ ; at 60 Hz: 0.85 ... 1.1 x  $U_s$ .

For other voltages see page 2/49.

# 3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW



3RA24 2.-8XE32-1BB4

3RA24 2.-8XF32-1A.2

3RA24 2.-8XF32-2A.2

CONTACTORS AND ASSEMBLIES 2

Rated data AC-3						Rated control supply voltage $U_s$ <sup>1)</sup> at 50/60 Hz	Screw terminals		Weight approx.	Spring-type terminals		Weight approx.
Operational current $I_e$ up to	Ratings of induction motors at 50 Hz and				Order No.		Order No.					
400 V	230 V	<b>400 V</b>	500 V	690 V								
A	kW	<b>kW</b>	kW	kW	V			kg			kg	
<b>AC operation, 50/60 Hz</b>												
25	7.1	<b>11</b>	15.6	19	24 AC 110/220 AC 220/240 AC	<b>3RA24 23-8XF32-1AC2</b> <b>3RA24 23-8XF32-1AK6</b> <b>3RA24 23-8XF32-1AP6</b>		1.370 1.370 1.370		<b>3RA24 23-8XF32-2AC2</b> <b>3RA24 23-8XF32-2AK6</b> <b>3RA24 23-8XF32-2AP6</b>	1.530 1.530 1.530	
32 / 40	11.4	<b>15 / 18.5</b>	19	19	24 AC 110/220 AC 220/240 AC	<b>3RA24 25-8XF32-1AC2</b> <b>3RA24 25-8XF32-1AK6</b> <b>3RA24 25-8XF32-1AP6</b>		1.370 1.370 1.370		<b>3RA24 25-8XF32-2AC2</b> <b>3RA24 25-8XF32-2AK6</b> <b>3RA24 25-8XF32-2AP6</b>	1.530 1.530 1.530	
50	--	<b>22</b>	19	19	24 AC 110/220 AC 220/240 AC	<b>3RA24 26-8XF32-1AC2</b> <b>3RA24 26-8XF32-1AK6</b> <b>3RA24 26-8XF32-1AP6</b>		1.390 1.390 1.390		<b>3RA24 26-8XF32-2AC2</b> <b>3RA24 26-8XF32-2AK6</b> <b>3RA24 26-8XF32-2AP6</b>	1.550 1.550 1.550	
<b>DC operation</b>												
25	7.1	<b>11</b>	15.6	19	24 DC	<b>3RA24 23-8XF32-1BB4</b>		1.940		<b>3RA24 23-8XF32-2BB4</b>	2.100	
32 / 40	11.4	<b>15 / 18.5</b>	19	19	24 DC	<b>3RA24 25-8XF32-1BB4</b>		1.940		<b>3RA24 25-8XF32-2BB4</b>	2.100	
50	--	<b>22</b>	19	19	24 DC	<b>3RA24 26-8XF32-1BB4</b>		1.960		<b>3RA24 26-8XF32-2BB4</b>	2.120	
<b>For IO-Link connection</b>												
25	7.1	<b>11</b>	15.6	19	24 DC	<b>3RA24 23-8XE32-1BB4</b>		1.940		<b>3RA24 23-8XE32-2BB4</b>	2.100	
32 / 40	11.4	<b>15 / 18.5</b>	19	19	24 DC	<b>3RA24 25-8XE32-1BB4</b>		1.940		<b>3RA24 25-8XE32-2BB4</b>	2.100	
50	--	<b>22</b>	19	19	24 DC	<b>3RA24 26-8XE32-1BB4</b>		1.960		<b>3RA24 26-8XE32-2BB4</b>	2.120	
<b>For AS-Interface connection</b>												
25	7.1	<b>11</b>	15.6	19	24 DC	<b>3RA24 23-8XH32-1BB4</b>		1.960		<b>3RA24 23-8XH32-2BB4</b>	2.120	
32 / 40	11.4	<b>15 / 18.5</b>	19	19	24 DC	<b>3RA24 25-8XH32-1BB4</b>		1.960		<b>3RA24 25-8XH32-2BB4</b>	2.120	
50	--	<b>22</b>	19	19	24 DC	<b>3RA24 26-8XH32-1BB4</b>		1.980		<b>3RA24 26-8XH32-2BB4</b>	2.140	

The wye-delta starters listed here are assembled from individual contactors which are UL Listed. The overall assembly Catalog Number is not UL Listed.

<sup>1)</sup> Coil operating range at 50 Hz: 0.8 ... 1.1 x  $U_s$ ; at 60 Hz: 0.85 ... 1.1 x  $U_s$ .

For other voltages see page 2/49 .

## Rated control supply voltages

### Selection and ordering data

Contactor type	3RT201 3RA211	3RT231 3RT251	3RT202 3RA212	3RT232 3RT252	3RT2617 3RT2627 3RT2637	3RT203 3RA213	3RT233 3RT253	3RT104 3RT134 3RT144 3RA114
Rated control supply voltage $U_s$	S00	S00	S0	S0	S00-S2	S2	S2	S3

### Rated control supply voltages (changes to 10th and 11th positions of the Order No.)

#### AC Operation<sup>1)</sup>

<b>Coils for 50 Hz</b> (exception: size S00: 50 and 60 Hz <sup>2)</sup> )	<b>24 V AC</b>	B0	B0	B0	B0	B0	B0	B0	B0
	<b>42 V AC</b>	D0	D0	D0	--	--	D0	--	D0
	<b>48 V AC</b>	H0	H0	H0	--	--	H0	--	H0
	<b>110 V AC</b>	F0	F0	F0	F0	F0	F0	F0	F0
	<b>230 V AC</b>	P0	P0	P0	P0	P0	P0	P0	P0
	<b>400 V AC</b>	V0	V0	V0	V0	V0	V0	V0	V0
<b>Coils for 50 and 60 Hz<sup>2)</sup></b>	<b>24 V AC</b>	B0	B0	C2	C2	C2	C2	C2	C2
	<b>42 V AC</b>	D0	D0	D2	D2	--	D2	D2	D2
	<b>48 V AC</b>	H0	H0	H2	H2	--	H2	H2	H2
	<b>110 V AC</b>	F0	F0	G2	G2	G2	G2	G2	G2
	<b>208 V AC</b>	M2	M2	M2	M2	M2	M2	M2	M2
	<b>220 V AC</b>	N2	N2	N2	N2	N2	N2	N2	N2
	<b>230 V AC</b>	P0	P0	L2	L2	L2	L2	L2	L2
<b>240 V AC</b>	P2	P2	P2	P2	P2	P2	P2	P2	
<b>For USA and Canada<sup>3)</sup></b>	50 Hz:	60 Hz:							
	<b>110 V AC</b>	<b>120 V AC</b>	K6	K6	K6	K6	K6	K6	K6
	<b>220 V AC</b>	<b>240 V AC</b>	P6	P6	P6	P6	P6	P6	P6
		<b>277 V AC</b>	—	—	—	U6	—	U6	U6
		<b>480 V AC</b>	V6	—	V6	—	—	V6	V6
	<b>600 V AC</b>	—	—	—	T6	—	T6	T6	
<b>For Japan</b>	50/60 Hz <sup>4)</sup> :	60 Hz <sup>5)</sup> :							
	<b>100 V AC</b>	<b>110 V AC</b>	G6	G6	G6	G6	G6	G6	G6
	<b>200 V AC</b>	<b>220 V AC</b>	N6	N6	N6	N6	N6	N6	N6
	<b>400 V AC</b>	<b>440 V AC</b>	R6	R6	R6	R6	R6	R6	R6

#### DC Operation<sup>1)</sup>

	<b>12 V DC</b>	A4	A4	—	—	—	—	—	—
	<b>24 V DC</b>	B4	B4	B4	B4	—	—	—	—
	<b>42 V DC</b>	D4	D4	D4	D4	—	—	—	—
	<b>48 V DC</b>	W4	W4	W4	W4	—	—	—	—
	<b>60 V DC</b>	E4	E4	E4	E4	—	—	—	—
	<b>72 V DC</b>	J8	J8	J8	J8	—	—	—	—
	<b>80 V DC</b>	—	—	—	—	—	—	—	—
	<b>110 V DC</b>	F4	F4	F4	F4	—	—	—	—
	<b>125 V DC</b>	G4	G4	G4	G4	—	—	—	—
	<b>220 V DC</b>	M4	M4	M4	M4	—	—	—	—
	<b>230 V DC</b>	P4	P4	P4	—	—	—	—	—

Coil codes for frame sizes S6-S12 can be found on page 2/9. Further voltages on request

Rated control supply voltage	Contactor type	3RT2. 2.-N	Rated control supply voltage	Contactor type	3RT2. 3.-N	3RT2. 2.-N
$U_{s \min} \dots U_{s \max}^{6)}$	Size S00	S0	$U_{s \min} \dots U_{s \max}^{6)}$	Size S2	S2	S3

#### Sizes S00 to S3

#### AC/DC operation (50/60 Hz AC, DC)

21 ... 28 V AC/DC	--	B3	20 ... 33 V AC/DC	B3	B3
95 ... 130 V AC/DC	--	F3	83 ... 155 V AC/DC	F3	F3
200 ... 280 V AC/DC <sup>7)</sup>	--	P3	175 ... 280 V AC/DC	P3	P3

<sup>1)</sup> For deviating coil voltages and coil operating ranges of sizes S00 and S0, the SITOP power 24 V DC power supply unit with wide range input (93 to 264 V AC; 30 to 264 V DC) can be used for coil excitation (For more SITOP information see section 15).

<sup>2)</sup> Coil operating range  
at 50 Hz: 0.8 ... 1.1 x  $U_s$   
at 60 Hz: 0.85 ... 1.1 x  $U_s$

<sup>3)</sup> Coil operating range  
Size S00: at 50 Hz: 0.85 ... 1.1 x  $U_s$   
at 60 Hz: 0.8 ... 1.1 x  $U_s$   
Size S0 to S3: at 50 Hz and 60 Hz: 0.8 ... 1.1 x  $U_s$

<sup>4)</sup> Coil operating range  
Size S00: at 50/60 Hz: 0.85 ... 1.1 x  $U_s$   
Size S0: at 50 Hz: 0.8 ... 1.1 x  $U_s$   
at 60 Hz: 0.85 ... 1.1 x  $U_s$

<sup>5)</sup> Coil operating range  
at 60 Hz: 0.8 ... 1.1 x  $U_s$

<sup>6)</sup> Coil operating range for S0: 0.7 x  $U_{s \min} \dots 1.3 \times U_{s \max}$   
Coil operating range for S2: 0.8 x  $U_{s \min} \dots 1.1 \times U_{s \max}$

<sup>7)</sup> The following applies to S0 and  $U_{s \max} = 280$  V: Upper limit = 1.1 x  $U_{s \max}$

# Control Relays, Coupling Relays

## 3RH21 control relays, 4-pole

### Selection and ordering data AC and DC operation

CONTACTORS AND ASSEMBLIES 2



3RH11...-1...



3RH11...-2...

**Size S00** – Terminal designations according to EN 50011

Rated current at <b>240 V</b> NEMA A600/Q600 Amps	Auxiliary contacts		Rated control supply voltage $U_s$ V AC 50/60 Hz <sup>3)</sup>	AC Operation Screw Terminals <sup>1)2)</sup>  Order No.	Rated control supply voltage $U_s$ V DC	DC Operation Screw Terminals <sup>1)2)</sup>  Order No.
	Ident- ification No.	Version     NO NC				

#### For screw and snap-on mounting onto TH 35 standard mounting rail

	10	40E	4	—	24 110/120 220/240	<b>3RH2140-1AB00</b> <b>3RH2140-1AK60</b> <b>3RH2140-1AP60</b>	24 110 220	<b>3RH2140-1BB40</b> <b>3RH2140-1BF40</b> <b>3RH2140-1BM40</b>
	10	31E	3	1	24 110/120 220/240	<b>3RH2131-1AB00</b> <b>3RH2131-1AK60</b> <b>3RH2131-1AP60</b>	24 110 220	<b>3RH2131-1BB40</b> <b>3RH2131-1BF40</b> <b>3RH2131-1BM40</b>
	10	22E	2	2	24 110/120 220/240	<b>3RH2122-1AB00</b> <b>3RH2122-1AK60</b> <b>3RH2122-1AP60</b>	24 110 220	<b>3RH2122-1BB40</b> <b>3RH2122-1BF40</b> <b>3RH2122-1BM40</b>

**Notes:**

- For further voltages, see page 2/49.
- For accessories, see pages 2/66-2/77.
- For technical data, see pages 2/185-2/188.
- For overview, see page 2/116.
- For position terminals, see page 2/202-2/203.
- For dimension drawings, see page 2/124.

- 1) The 3RH21 contactor relays are also available with spring-type terminals. Replace the 8th digit of the order number with a "2" e.g. "3RH2140-2AB00"
- 2) The 3RH21 contactor relays are also available with ring lug terminals. Replace the 8th digit of the order number with a "4" e.g. "3RH2140-4AB00"
- 3) AC coil operating range at 50 Hz: 0.8 to 1.1 x  $U_s$  at 60 Hz: 0.85 to 1.1 x  $U_s$
- 4) For AC-15/AC-14 the following applies:  $I_e = 6A$  for mounted auxiliary contacts.



# Control Relays, Coupling Relays

## 3RH24 latched control relays, 4-pole

### Overview

The contactor coil and the coil of the release solenoid are both designed for uninterrupted duty.

The number of auxiliary contacts can be extended by means of front auxiliary switch blocks (up to 4 poles).

RC elements, varistors diodes or diode assemblies can be fitted to both coils from the front for damping opening surges in the coil.

### Selection and ordering data

**Size S00** – Terminal designations according to EN 5001

	Rated current at 240 V AC-14, AC-15 NEMA A600/Q600 Amps	Aux. contacts		Rated control supply voltage $U_s$ V AC	AC Operation Screw Terminals <sup>1)</sup> Order No.	Rated control supply voltage $U_s$ V DC	DC Operation Screw Terminals Order No.
		Ident. No.	Version				
<b>For screw and snap-on mounting onto TH 35 standard mounting rail</b>							
 3RH2422-1BB40	10	40E	4	—	24, 50/60 Hz 110, 50 Hz/120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	24 110 125 220	3RH2440-1BB40 3RH2440-1BF40 3RH2440-1BG40 3RH2440-1BM40
	10	31E	3	1	24, 50/60 Hz 110, 50 Hz / 120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	24 110 125 220	3RH2431-1BB40 3RH2431-1BF40 3RH2431-1BG40 3RH2431-1BM40
	10	22E	2	2	24, 50/60 Hz 110, 50 Hz / 120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	24 110 125 220	3RH2422-1BB40 3RH2422-1BF40 3RH2422-1BG40 3RH2422-1BM40

For accessories for 3RH24, see below and page 2/66-2/77  
For technical data, see page 2/185-2/188.  
For overview, see page 2/116.

For position of terminals, see page 2/202-2/203.  
For dimension drawings, see page 2/224.

### Auxiliary switch blocks for 3RH21, 3RH24 control relays

**Size S00** – For assembling to control relays to have 8 contacts

For contactor type	HS Block Ident. No.	Contacts Version		Weight approx. kg.	Screw Terminals Order No.	Spring Terminals Order No.
		NO	NC			

### Auxiliary switch blocks for snapping onto the front according to EN 50011

 3RH2911-1GA40		3RH2140, 3RH2440, Ident. No. 40 E	80E	4	—	0.050	3RH2911-1GA40	3RH2911-2GA40
		3RH2140, 3RH2440, Ident. No. 40 E	71E	3	1	0.050	3RH2911-1GA31	3RH2911-2GA31
 3RH2911-2GA40		3RH2140, 3RH2440, Ident. No. 40 E	62E	2	2	0.050	3RH2911-1GA22	3RH2911-2GA22
		3RH2140, 3RH2440, Ident. No. 40 E	53E	1	3	0.050	3RH2911-1GA13	3RH2911-2GA13
		3RH2140, 3RH2440, Ident. No. 40 E	44E	—	4	0.050	3RH2911-1GA04	3RH2911-2GA04

1) Coil voltage tolerance  
at 50 Hz: 0.8 to 1.1 x  $U_s$   
at 60 Hz: 0.85 to 1.1 x  $U_s$

For further accessories see pages 2/66-2/77

# Coupling Relays

## 3RH21 coupling relays for switching auxiliary circuits, 4 pole

### Application

#### DC operation

IEC 60 947 and EN 60 947

The 3RH21 coupling relays for switching auxiliary circuits are tailored to the special requirements of working with electronic controls.

The 3RH21 coupling relays cannot be extended with auxiliary switch blocks.

Coupling relays have a low power consumption, an extended coil voltage tolerance and an integrated surge suppressor for damping opening surges on select versions

### Selection and ordering data

#### DC operation

**Size S00** – Terminal designations according to EN 50 011

Surge suppressor	Rated current		Auxiliary contacts		Screw Terminals <sup>1)</sup> Order No.	Spring Terminals <sup>1)</sup> Order No.	Weight approx. kg.
	at 240 V NEMA A600/Q600	Amps	Ident-ification No.	Version			
				NO   NC			

#### For screw and snap-on mounting onto TH 35 standard mounting rail

Rated control supply voltage  $U_s = 24$  V DC, coil voltage tolerance **0.7 to 1.25 x  $U_s$**   
Power consumption of the coils **2.8 W** at 24 V (no auxiliary switch blocks can be mounted)



3RH2140-1HB40

Diode, varistor, or RC element can be mounted	10	<b>40E</b>	4	—	<b>3RH2140-1HB40</b>	<b>3RH2140-2HB40</b>	0.300
	10	<b>31E</b>	3	1	<b>3RH2131-1HB40</b>	<b>3RH2131-2HB40</b>	0.300
	10	<b>22E</b>	2	2	<b>3RH2122-1HB40</b>	<b>3RH2122-2HB40</b>	0.300
Diode integrated	10	<b>40E</b>	4	—	<b>3RH2140-1JB40</b>	<b>3RH2140-2JB40</b>	0.300
	10	<b>31E</b>	3	1	<b>3RH2131-1JB40</b>	<b>3RH2131-2JB40</b>	0.300
	10	<b>22E</b>	2	2	<b>3RH2122-1JB40</b>	<b>3RH2122-2JB40</b>	0.300
Suppressor diode integrated	10	<b>40E</b>	4	—	<b>3RH2140-1KB40</b>	<b>3RH2140-2KB40</b>	0.300
	10	<b>31E</b>	3	1	<b>3RH2131-1KB40</b>	<b>3RH2131-2KB40</b>	0.300
	10	<b>22E</b>	2	2	<b>3RH2122-1KB40</b>	<b>3RH2122-2KB40</b>	0.300

Rated control supply voltage  $U_s = 24$  V DC, coil voltage tolerance **0.85 to 1.85 x  $U_s$**   
Power consumption of the coils **1.6 W** at 24 V (no auxiliary switch blocks can be mounted)



3RH2140-2SB40

Diode, varistor, or RC element can be mounted	10	<b>40E</b>	4	—	<b>3RH2140-1MB40-0KT0</b>	<b>3RH2140-2MB40-0KT0</b>	0.300
	10	<b>31E</b>	3	1	<b>3RH2131-1MB40-0KT0</b>	<b>3RH2131-2MB40-0KT0</b>	0.300
	10	<b>22E</b>	2	2	<b>3RH2122-1MB40-0KT0</b>	<b>3RH2122-2MB40-0KT0</b>	0.300
Diode integrated	10	<b>40E</b>	4	—	<b>3RH2140-1VB40</b>	<b>3RH2140-2VB40</b>	0.300
	10	<b>31E</b>	3	1	<b>3RH2131-1VB40</b>	<b>3RH2131-2VB40</b>	0.300
	10	<b>22E</b>	2	2	<b>3RH2122-1VB40</b>	<b>3RH2122-2VB40</b>	0.300
Suppressor diode integrated	10	<b>40E</b>	4	—	<b>3RH2140-1SB40</b>	<b>3RH2140-2SB40</b>	0.300
	10	<b>31E</b>	3	1	<b>3RH2131-1SB40</b>	<b>3RH2131-2SB40</b>	0.300
	10	<b>22E</b>	2	2	<b>3RH2122-1SB40</b>	<b>3RH2122-2SB40</b>	0.300

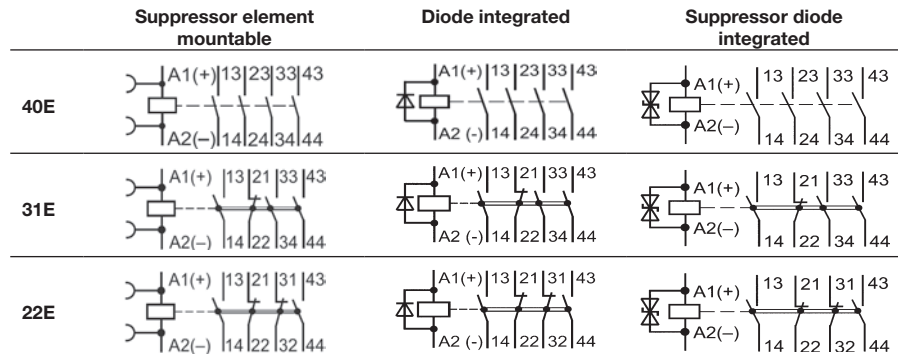
For technical data, see 2/189.

For position of terminals, see 2/202-2/203.

For dimension drawings, see 2/224.

1) Ring lug terminals are also available.

Replace the 8th digit of the order number with a "4", e.g. 3RH2140-4HB40



# Contactors for Switching Motors

## 3TF68 and 3TF69 vacuum contactors, 3-pole

### Selection and ordering data

Maximum inductive current AC-3	Maximum power ratings					Max. resistive current AC-1	Auxiliary contacts		Rated control supply voltage <sup>1)</sup>	Order No.	Weight approx. kg
	UL Ratings		IEC ratings				NO	NC			
A	HP	HP	HP	HP	kW	A	NO	NC	V		
<b>AC operation <sup>2) 3)</sup></b>											
<b>Size 14</b>											
<b>Auxiliary and control conductors: screw terminals</b>											
<b>Main conductor: bar connections</b>											
<b>• AC Operation</b>											
630	200	250	<b>500</b>	600	600	700	4	4	110-132, 50/60 Hz	<b>3TF6844-■CF7</b>	15
630	200	250	<b>500</b>	600	600	700	4	4	200-240, 50/60 Hz	<b>3TF6844-■CM7</b>	15
820	290	350	<b>700</b>	860	800	910	4	4	110-132, 50/60 Hz	<b>3TF6944-■CF7</b>	19
820	290	350	<b>700</b>	860	800	910	4	4	200-240, 50/60 Hz	<b>3TF6944-■CM7</b>	19
<b>UL ratings shown in above table: ■=0</b>											
<b>For IEC use only up to 1000 V: ■=8</b>											
<b>• DC Operation</b>											
630	200	250	<b>500</b>	600	600	700	3	3	24 V DC	<b>3TF6833-■DB4</b>	16.9
820	290	350	<b>700</b>	860	800	910	3	3	24 V DC	<b>3TF6933-■DB4</b>	20.9
<b>UL ratings shown in above table: ■=1</b>											
<b>For IEC use only up to 1000 V: ■=8</b>											

3TF68



### Accessories and Spare parts for 3TF68 and 3TF69 vacuum contactors

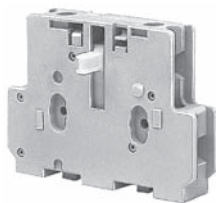
#### Selection and ordering data

Details	For contactor type	Order No.	Weight approx. kg
<b>Coils</b>			
<b>AC Operation</b>			
The coils are fitted with varistors for damping surges as standard; the coil is supplied with the closing electronics included.	3TF68	<b>3TY7683-0C●●</b>	0.65
	3TF69	<b>3TY7693-0C●●</b>	
<b>DC Operation</b>			
Reversing contactors are required for size 14 contactors:			
Contactor type    Reversing contactor type	3TF68	<b>3TY7683-0D●●</b>	0.56
3TF68 and 3TF69:    3TC44 (70 mm wide, 85 mm high)	3TF69	<b>3TY7693-0D●●</b>	
The coils are supplied without a reversing contactor.			
●● For rated control supply voltages, see page 2/102.			
<b>Vacuum interrupters</b>			
<b>In order to ensure reliable operation of the contactors, only Siemens original replacement interrupters should be used.</b>			
3 vacuum interrupters with mounting parts per set.	3TF68	<b>3TY7680-0B</b>	3.2
	3TF69	<b>3TY7690-0B</b>	3.5
<b>Auxiliary switch blocks with screw terminals</b>			
1 NO and 1 NC	First auxiliary switch block, left or right. Replacement type for: 3TY7561-1A, -1B	3TF68 / 3TF69	<b>3TY7561-1AA00</b> 0.042
1 NO and 1 NC	First auxiliary switch block, left or right late break	3TF68 / 3TF69	<b>3TY7561-1EA00</b> 0.042
1 NO and 1 NC	Second auxiliary switch block, left or right. Replacement type for: 3TY7 561-1K, -1L	3TF68 / 3TF69	<b>3TY7561-1KA00</b> 0.042
<b>Auxiliary switches for coil reconnection, for DC economy circuit with screw connections</b>			
1 NC	Auxiliary switch block late break	3TF68 / 3TF69	<b>3TY7681-1G</b> 0.042
<b>Solid-state compatible auxiliary switch block with screw terminals</b>			
	For mounting onto the side of contactors. For use in dusty atmosphere and electronic circuits with rated operational currents <i>I<sub>e</sub></i> AC-14 and DC-13 from 1 mA to 300 mA at 3 V to 60 V.	3TF68 / 3TF69	<b>3TY7561-1UA00</b> 0.042

3TY7



3TY7561-1.








For accessories, see page 2/53-2/54.  
 For technical data, see page 2/172-2/177.  
 For description, see page 2/117.  
 For internal circuit diagrams, see page 2/211.  
 For position of terminals, see page 2/208  
 For dimension drawings, see page 2/221.

1) For further voltages, see page 2/102.  
 2) Surge suppression integrated: fitted with varistor.  
 3) For EMC, see description on page 2/117.  
 3TF68/69 vacuum contactors are supplied with integrated surge suppression for the main conducting paths (for description, see page 2/117). In operation in circuits with DC choppers, frequency converters, variable-speed drives, for example, this protective circuitry is not required. It might be damaged by voltage peaks and harmonics generated, possibly followed by phase-to-phase shortcircuits. For this reason, the contactors can be supplied without overvoltage damping. To order these versions add a "-Z" and the order code "A02".

# Contactors for Switching Motors

## Accessories and Spare parts for 3TF68 and 3TF69 vacuum contactors

### Selection and ordering data

For contactor		Design	Order No.	Weight approx. kg	Std. Pack Qty
Size	Type				
<b>Interface for control by PLC</b>					
3TX7 090-0D					
	14	3TF68 and 3TF69	Coil voltage tolerance: DC 17 V to 30 V Power consumption: 0.5 W at DC 24 V Fitted with varistor For technical data, see Part 7.  For snapping onto the side of auxiliary switch blocks, with surge suppression	<b>3TX7 090-0D</b>	0.1 1
<b>Terminal covers</b>					
3TX7 686-0A					
	14	3TF68 3TF69	for protection against inadvertent contact with the exposed busbar connections (DIN VDE 0106 Part 100)*	(Order No. and price per set) <b>3TX7 686-0A</b> <b>3TX7 696-0A</b>	0.17 1 set = 2 units
<b>Link for paralleling (star jumper) · 3-pole, without terminal <sup>1)</sup></b>					
3TX7 680-0D					
	14	3TF68		<b>3TX7 680-0D</b>	0.26 1
	14	3TF68	• <b>Cover plate for paralleling link</b> A cover plate must be used in order to protect against inadvertent contact (DIN VDE 0106 Part 100).	<b>3TX7 680-0E</b>	0.18 1
<b>Box terminals for laminated copper bars</b>					
3TX7570-1E					
	14	3TF68	• <b>Without auxiliary conductor terminal</b> With single covers for protection against inadvertent contact (EN 50274)	<b>3TX7 570-1E</b>	0.6 1
	14	3TF69	• <b>With auxiliary conductor terminal</b> Conductor cross-sections for auxiliary conductors: Solid: 2 × (0.75 ... 2.5) mm <sup>2</sup> Finely stranded with end sleeve: 2 × (0.5 ... 2.5) mm <sup>2</sup> Solid or stranded: 2 × (18 ... 12) AWG Tightening torque: 0.8 Nm ... 1.4 Nm (7 ... 12 lb.in)	<b>3TX7 690-1F</b>	2.0 1
<b>Surge suppressors — Varistors</b>					
3TX7 572-3G					
	14	3TF68 and 3TF69	For DC economy circuit; for lateral snapping onto auxiliary switches  The varistor is included in the scope of supply of the 3TF68 and 3TF69 contactors with AC operation.  Includes the peak value of the alternating voltage on the DC side.	<i>Rated control supply voltage, V<sub>DC</sub></i> 24 ... 48 48 ... 127 127 ... 240  <b>3TX7 572-3G</b> <b>3TX7 572-3H</b> <b>3TX7 572-3J</b>	0.09 1 0.09 1 0.09 1

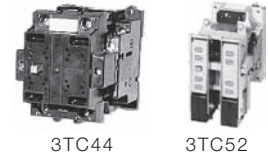
1) The link for paralleling can be reduced by one pole.

# Contactors and Replacement Parts



## General Purpose - Type 3TC


### Ordering information

- Select Contactor from table below.
- Complete catalog number replace the two daggers (††) with appropriate coil voltage suffix. See corresponding coil voltage suffix table below.
- Technical Data [see page 2/178-2/181](#).
- Dimensions [see page 2/221](#).



Frame Size	Ampere Rating		2 Pole DC HP Ratings (DC-3, DC-5)				Auxiliary contacts		AC-Operated	DC-Operated
	Open	Enclosed	115 V	230 V	500 V	575 V	NO	NC	Order No.	Order No.
<b>3TC DC Contactors</b>										
2	40	40	5	10	15	15	2	2	<b>3TC4417-0B††</b>	<b>3TC4417-0A††</b>
4	75	68	8	18	40	45	2	2	<b>3TC4817-0B††</b>	<b>3TC4817-0A††</b>
8	220	200	25	50	100	100	2	2	<b>3TC5217-0B††</b>	<b>3TC5217-0A††</b>
12	330	300	40	75	150	150	2	2	<b>3TC5617-0B††</b>	<b>3TC5617-0A††</b>

Device	Frame Size	Catalog Number						
<b>Coils, AC</b>		<b>24V AC</b>	<b>120V AC</b>	<b>220/240V AC</b>	<b>277V AC</b>	<b>480V AC</b>	<b>600V AC</b>	
	3TC	<b>3TY7403-0AC2</b>	<b>3TY7403-0AK6</b>	<b>3TY7403-0AP6</b>	<b>3TY7403-0AU1</b>	<b>3TY7403-0AV0</b>	<b>3TY7403-0AS0</b>	
		<b>3TY6483-0AC1</b>	<b>3TY6483-0AK6</b>	<b>3TY6483-0AP6</b>	<b>3TY6483-0AP0</b>	<b>3TY6483-0AV0</b>	<b>3TY6483-0AS0</b>	
			<b>3TY6523-0AK6</b>	<b>3TY6523-0AP6</b>	<b>3TY6523-0AP0</b>	<b>3TY6523-0AV0</b>		
			<b>3TY6566-0AK6</b>		<b>3TY6566-0AP0</b>	<b>3TY6566-0AV0</b>	<b>3TY6566-0AS0</b>	
<b>Coils, DC</b>		<b>24V DC</b>	<b>48V DC</b>	<b>110V DC</b>	<b>125V DC</b>	<b>230V DC</b>		
	3TC	<b>3TY6443-0BB4</b>		<b>3TY6443-0BF4</b>	<b>3TY6443-0BG4</b>			
		<b>3TY6483-0BB4</b>	<b>3TY6483-0BW4</b>	<b>3TY6483-0BF4</b>	<b>3TY6483-0BG4</b>			
		<b>3TY6523-0BB4</b>		<b>3TY6523-0BF4</b>	<b>3TY6523-0BG4</b>	<b>3TY6523-0BP4</b>		
		<b>3TY6563-0BB4</b>		<b>3TY6563-0BF4</b>	<b>3TY6563-0BG4</b>	<b>3TY6563-0BP4</b>		

Frame size	Contact type	Mounting position	Solid state	Order No.	
<b>Auxiliary Contact Blocks with 1 NO + 1 NC contacts <sup>2)</sup></b>					
	2, 4	3TC44 or 3TC48	1st block, left or right	—	<b>3TY6501-1AA00</b>
			2nd block, left or right	Yes <sup>3)</sup>	<b>3TY7561-1UA00</b>
	4	3TC48	2nd block, left <sup>5)</sup>	—	<b>3TY6501-1K</b>
			2nd block, right <sup>5)</sup>	—	<b>3TY6501-1L</b>
	8, 12	3TC52 or 3TC56	1st block, left	—	<b>3TY6561-1A</b>
			1st block, right	—	<b>3TY6561-1B</b>
			2nd block, left <sup>5)</sup>	—	<b>3TY6561-1K</b>
			2nd block, right <sup>5)</sup>	—	<b>3TY6561-1L</b>

### Coil Suffix Table ††

Replace †† in the contactor Order No. with a coil code from the table below.

V AC 50/60 Hz	Code	V DC	Code
24	C1	24	B4
120	K1*	36	V4
240	P1	48	W4
460	V0	60	E4
600	S0	72	J8
		110	F4
		125	G4
		220	M4
		230	P4



<sup>1)</sup> Main contact kits for size 3TC48 and larger include springs. Smaller sizes do not.

<sup>2)</sup> On DC operated contactors the maximum number of auxiliary contacts is 2 NO, 2 NC.

<sup>3)</sup> For use in dusty atmosphere and electronic circuits with rated operational currents I<sub>e</sub> AC-14 and DC-13 from 1 mA to 300 mA at 3V to 60V. With 1 changeover contact.

<sup>4)</sup> Discount Code: DC Contactors

<sup>5)</sup> Can only be mounted on AC-operated contactors.

Device Type	Frame Size	Catalog Number
<b>Main Contacts <sup>1)</sup></b>		
	3TC44	<b>3TY2440-0A</b>
	3TC48	<b>3TY2480-0A</b>
	3TC52	<b>3TY2520-0A</b>
	3TC56	<b>3TY2560-0A</b>
<b>Arc Chutes</b>		
	3TC44	<b>3TY2442-0A</b>
	3TC48	<b>3TY2482-0A</b>
	3TC52	<b>3TY2522-0A</b>
	3TC56	<b>3TY2562-0A</b>

# DC Contactor Replacement Parts

## General Purpose - Type 3TC

CONTACTORS AND ASSEMBLIES

### Surge suppressors · Varistors



3TX7 402-3.



3TX7 462-3.



3TX7 522-3.

For contactors		Version	Rated control supply voltage $U_s$		Order No.	Std. Pack Qty
Size	Type		V AC	V DC		
2	3TC44 <sup>1)</sup>	<b>Varistors<sup>2)</sup></b> with line spacer, for mounting onto the coil terminal	24 ... 48	24 ... 70	<b>3TX7 402-3G</b>	1
			48 ... 127	70 ... 150	<b>3TX7 402-3H</b>	1
			127 ... 240	150 ... 250	<b>3TX7 402-3J</b>	1
			240 ... 400		<b>3TX7 402-3K</b>	1
			400 ... 600		<b>3TX7 402-3L</b>	1
4	3TC48	<b>Varistors<sup>2)</sup></b> for sticking onto the contactor base or for mounting separately	24 ... 48	24 ... 70	<b>3TX7 462-3G</b>	1
			48 ... 127	70 ... 150	<b>3TX7 462-3H</b>	1
			127 ... 240	150 ... 250	<b>3TX7 462-3J</b>	1
			240 ... 400		<b>3TX7 462-3K</b>	1
400 ... 600		<b>3TX7 462-3L</b>	1			
8 and 12	3TC52, 3TC56	<b>Varistor</b> for sticking onto the contactor base or for mounting separately	24 ... 48	24 ... 70	<b>3TX7 462-3G</b>	1
			48 ... 127	70 ... 150	<b>3TX7 462-3H</b>	1
			127 ... 240	150 ... 250	<b>3TX7 462-3J</b>	1
			240 ... 400		<b>3TX7 462-3K</b>	1
400 ... 600		<b>3TX7 462-3L</b>	1			
8 and 12	3TC52, 3TC56	<b>Varistors<sup>2)</sup></b> for separate screw connection or snapping onto TH 35 standard mounting rail	24 ... 48	24 ... 70	<b>3TX7 522-3G</b>	1
			48 ... 127	70 ... 150	<b>3TX7 522-3H</b>	1
			127 ... 240	150 ... 250	<b>3TX7 522-3J</b>	1

### Surge suppressors · RC elements



3TX7 462-3R,  
3TX7 522-3R.

4	3TC48	<b>RC elements</b> For lateral snapping onto auxiliary switch or TH 35 standard mounting rail	24 ... 48	24 ... 70	<b>3TX7 462-3R</b>	
			48 ... 127	70 ... 150	<b>3TX7 462-3S</b>	
			127 ... 240	150 ... 250	<b>3TX7 462-3T</b>	
			240 ... 400		<b>3TX7 462-3U</b>	
			400 ... 600		<b>3TX7 462-3V</b>	
8 and 12	3TC52, 3TC56	<b>RC elements</b> For lateral snapping onto auxiliary switch or TH 35 standard mounting rail	24 ... 48	24 ... 70	<b>3TX7 522-3R</b>	
			48 ... 127	70 ... 150	<b>3TX7 522-3S</b>	
			127 ... 240	150 ... 250	<b>3TX7 522-3T</b>	
			240 ... 400		<b>3TX7 522-3U</b>	
			400 ... 600		<b>3TX7 522-3V</b>	

### Surge suppressors · Diodes



3TX7 462-3D.

4 to 12	3TC48, 3TC52, 3TC56	<b>Diode assemblies<sup>3)</sup></b> (diode and Zener diode) for DC solenoid system, for sticking onto the contactor base or for mounting separately	24 ... 250	<b>3TX7 462-3D</b>	
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### Terminal covers



3TX6 506-3B

6	3TC48	For protection against inadvertent contact with exposed busbar connections. Can be screwed on free screw end. Covers one busbar connection		<b>3TX6 506-3B</b>	1 set= 6 units
10 and 14	3TC52, 3TC56			<b>3TX6 546-3B</b>	1 set= 6 units

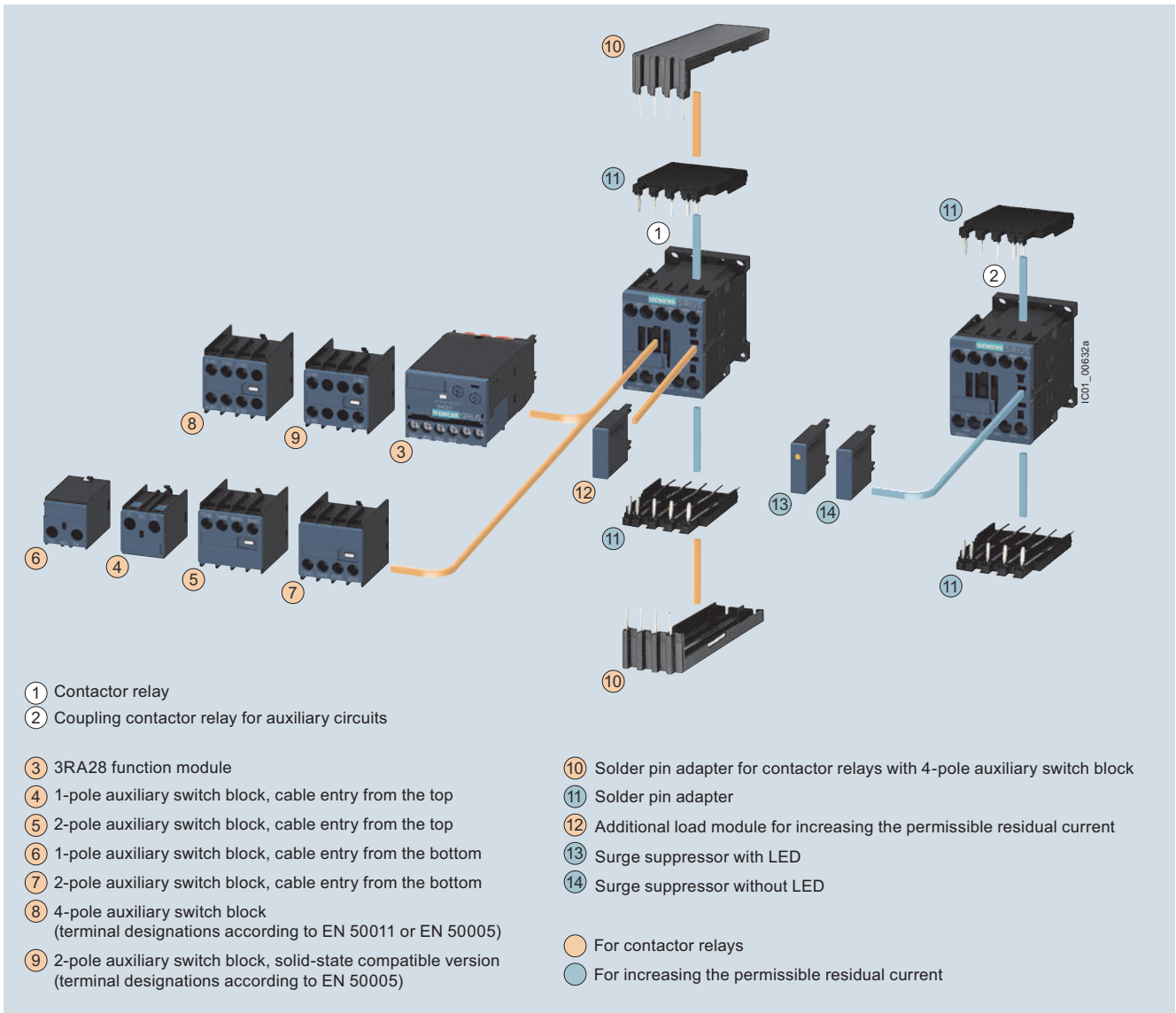
<sup>1)</sup> The connection piece for mounting the surge suppressor must be bent slightly.

<sup>2)</sup> Includes the peak value of the alternating voltage on the DC side.

<sup>3)</sup> Not for DC economy circuit.



Contactor relays and coupling relays – Size S00 with accessories



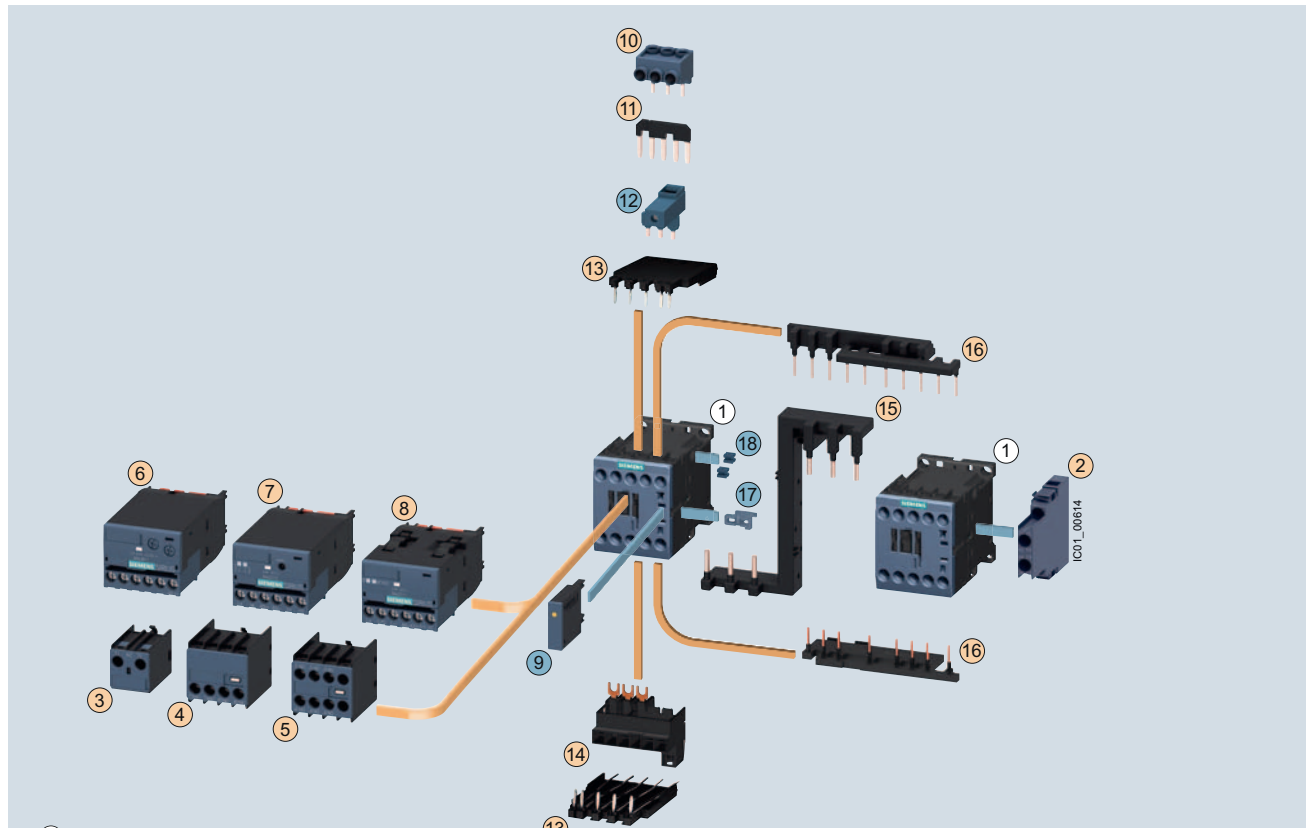
3RT2 contactors and coupling relays – Size S00 with mountable accessories

Overview

The SIRIUS family of controls

The SIRIUS modular system with its components for the switching, starting, protection and monitoring of motors and industrial systems stands for the fast, flexible and space-saving construction of control cabinets.

3RT2 contactors  
Size S00 with mountable accessories



① Contactor size S00

- ② 2-pole auxiliary switch block, laterally mountable
- ③ 1-pole auxiliary switch block, for snapping onto the front cable entry from the top
- ④ 2-pole auxiliary switch block, for snapping onto the front cable entry from the bottom
- ⑤ 4-pole auxiliary switch block, for snapping onto the front
- ⑥ 3RA28 function module
- ⑦ 3RA27 function module for AS-Interface, direct starting
- ⑧ 3RA27 function module for IO-Link, direct starting
- ⑨ Surge suppressor with/without LED
- ⑩ Three-phase feeder terminal

- ⑪ Star jumper, 3-pole, without connecting terminal
- ⑫ Link for paralleling, 3-pole, with connecting terminal
- ⑬ Solder pin adapter
- ⑭ Connection module (adapter and connector) for contactors with screw-type connection
- ⑮ Safety main current connector for two contactors

Assembly kit 3RA2913-2AA1 comprising:

- ⑯ Wiring modules on the top and bottom for connecting the main, auxiliary and control current paths, electrical interlock<sup>1)</sup> included (NC contact interlock), can be broken off (NC contact interlock)
- ⑰ Mechanical interlocks<sup>2)</sup>
- ⑱ Two connecting clips for two contactors<sup>2)</sup>

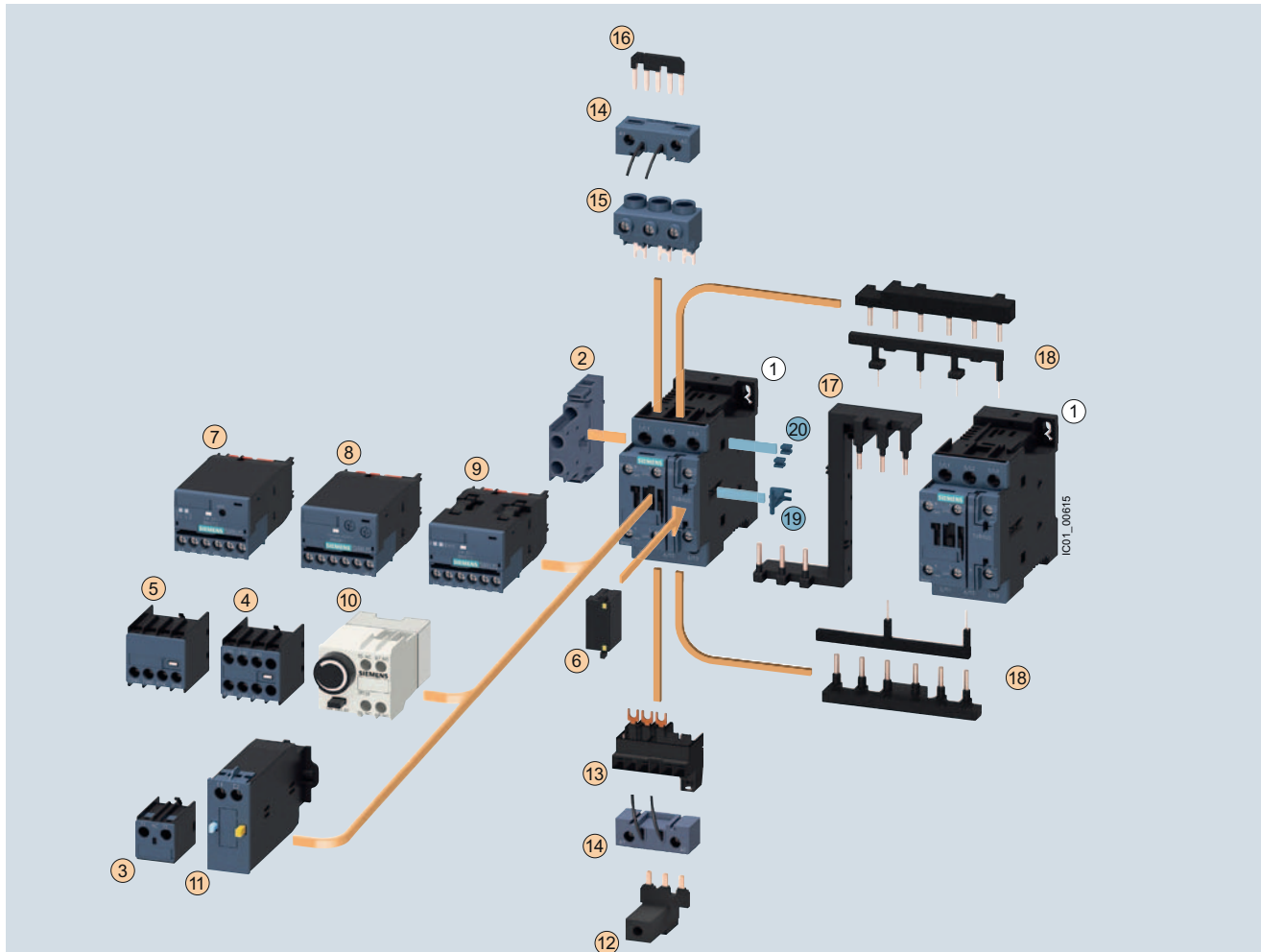
- For contactors
- For contactors and coupling contactors

<sup>1)</sup> 3RT201. contactors with one NC contact in the basic unit are required for the electrical interlock. An additional NO contact is required for momentary-contact operation.

<sup>2)</sup> The parts ⑰ and ⑱ can only be ordered together as 3RA2912-2H mechanical connectors.

3RT2 contactors and coupling relays – Size S0 with mountable accessories

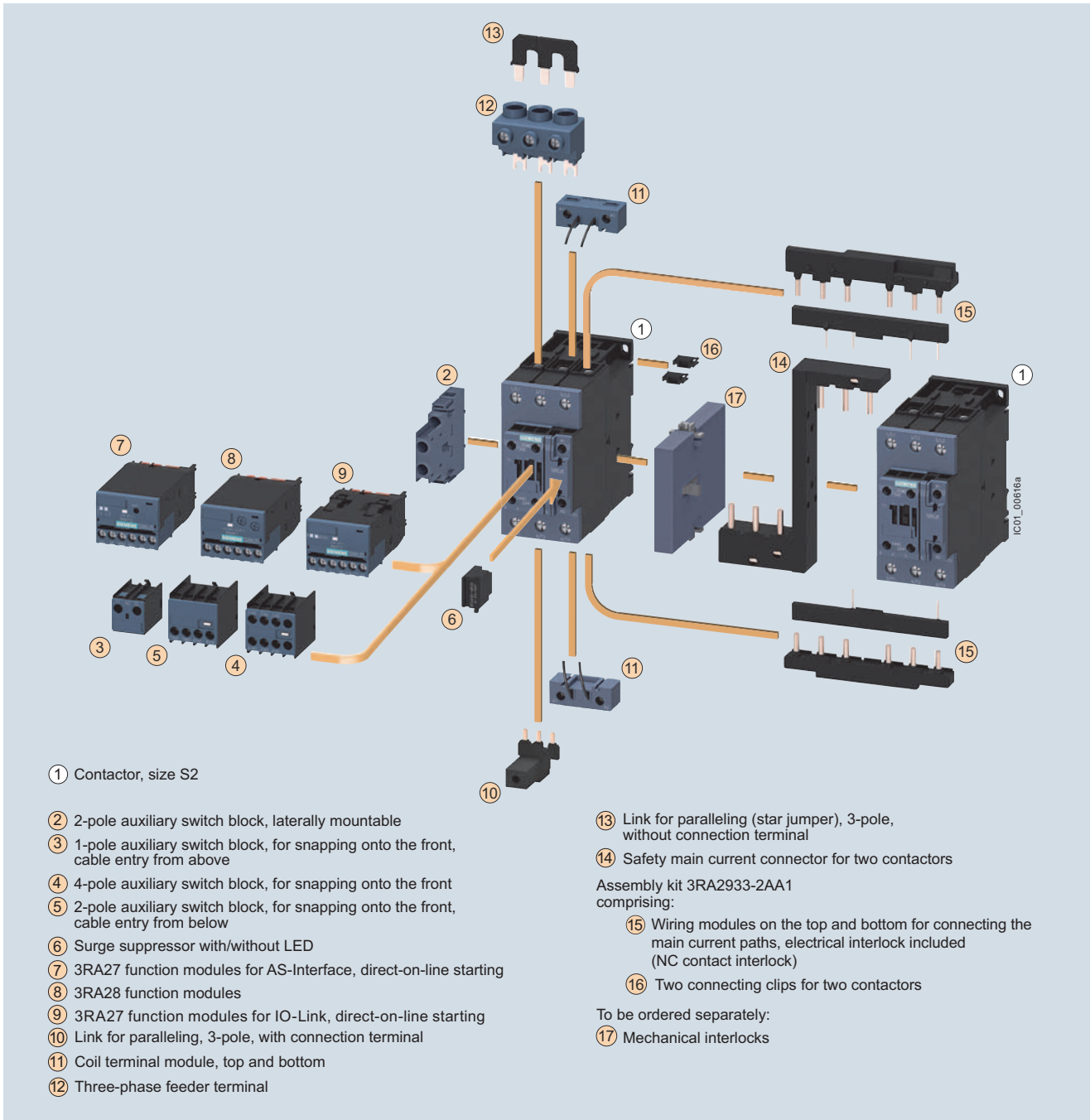
**3RT2 contactors**  
Size S0 with mountable accessories



- ① Contactor size S0
  - ② 2-pole auxiliary switch block, laterally mountable
  - ③ 1-pole auxiliary switch block, for snapping onto the front cable entry from the top
  - ④ 4-pole auxiliary switch block, for snapping onto the front cable entry from the bottom
  - ⑤ 2-pole auxiliary switch block, for snapping onto the front cable entry from the bottom
  - ⑥ Surge suppressor with/without LED
  - ⑦ 3RA27 function module for AS-Interface, direct starting
  - ⑧ 3RA28 function module
  - ⑨ 3RA27 function module for IO-Link, direct starting
  - ⑩ Pneumatically delayed auxiliary switch block
  - ⑪ Mechanical latching block
  - ⑫ Link for paralleling, 3-pole, with connecting terminal
  - ⑬ Connection module (adapter and plug) for contactors with screw-type connection
  - ⑭ Coil terminal module, on the top and bottom
  - ⑮ Three-phase feeder terminal
  - ⑯ Link for paralleling (star jumper), 3-pole, without connecting terminal
  - ⑰ Safety main current connector for two contactors
- Assembly kit 3RA2923-2AA1 comprising:
- ⑱ Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included (NC contact interlock)
  - ⑲ Mechanical interlocks<sup>1)</sup>
  - ⑳ Two connecting clips for two contactors<sup>1)</sup>
- For contactors  
● For contactors and coupling contactors

1) The parts ⑲ and ⑳ can only be ordered together as 3RA2912-2H mechanical connectors.

3RT2 contactors – Size S2 with mountable accessories



① Contactor, size S2

- ② 2-pole auxiliary switch block, laterally mountable
- ③ 1-pole auxiliary switch block, for snapping onto the front, cable entry from above
- ④ 4-pole auxiliary switch block, for snapping onto the front
- ⑤ 2-pole auxiliary switch block, for snapping onto the front, cable entry from below
- ⑥ Surge suppressor with/without LED
- ⑦ 3RA27 function modules for AS-Interface, direct-on-line starting
- ⑧ 3RA28 function modules
- ⑨ 3RA27 function modules for IO-Link, direct-on-line starting
- ⑩ Link for paralleling, 3-pole, with connection terminal
- ⑪ Coil terminal module, top and bottom
- ⑫ Three-phase feeder terminal

- ⑬ Link for paralleling (star jumper), 3-pole, without connection terminal
- ⑭ Safety main current connector for two contactors

Assembly kit 3RA2933-2AA1 comprising:

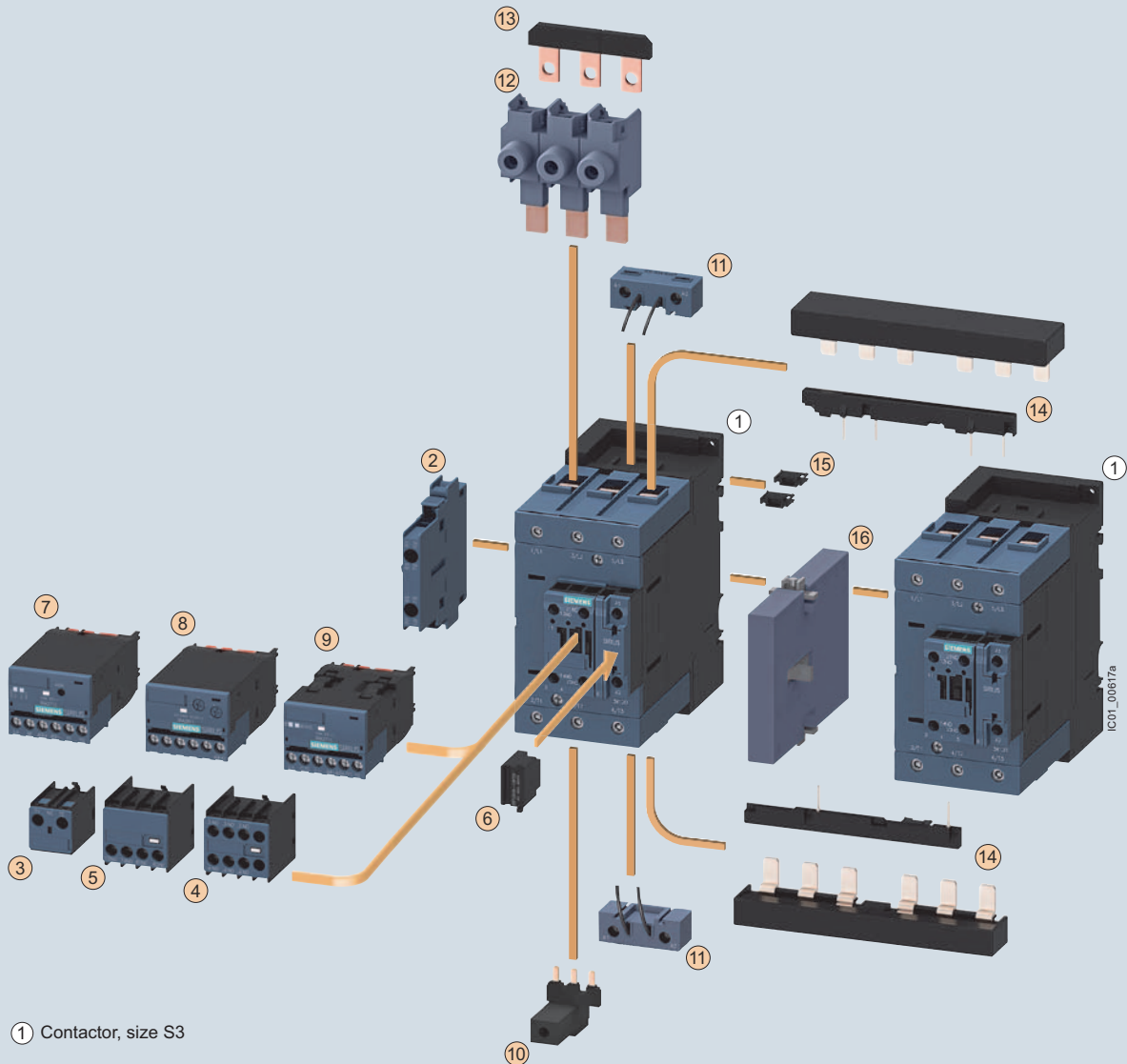
- ⑮ Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included (NC contact interlock)
- ⑯ Two connecting clips for two contactors

To be ordered separately:

- ⑰ Mechanical interlocks

Accessories see pages 2/66 to 2/81.

3RT2 contactors – Size S3 with mountable accessories



① Contactor, size S3

- ② 2-pole auxiliary switch block, laterally mountable
- ③ 1-pole auxiliary switch block, for snapping onto the front, cable entry from above
- ④ 4-pole auxiliary switch block, for snapping onto the front
- ⑤ 2-pole auxiliary switch block, for snapping onto the front, cable entry from below
- ⑥ Surge suppressor with/without LED
- ⑦ 3RA27 function modules for AS-Interface, direct-on-line starting
- ⑧ 3RA28 function modules
- ⑨ 3RA27 function modules for IO-Link, direct-on-line starting

- ⑩ Links for paralleling, 3-pole, with connection terminal
- ⑪ Coil terminal module, top and bottom
- ⑫ Single-phase infed terminals (3 units)
- ⑬ Links for paralleling (star jumper), 3-pole without connecting terminal

Assembly kit 3RA2943-2AA1 comprising:

- ⑭ Wiring modules on the top and bottom for connecting the main, auxiliary and control current paths, electrical interlock<sup>1)</sup> included, can be broken off (NC contact interlock)
- ⑮ Two connectors for two contactors

To be ordered separately:

- ⑯ Mechanical interlock

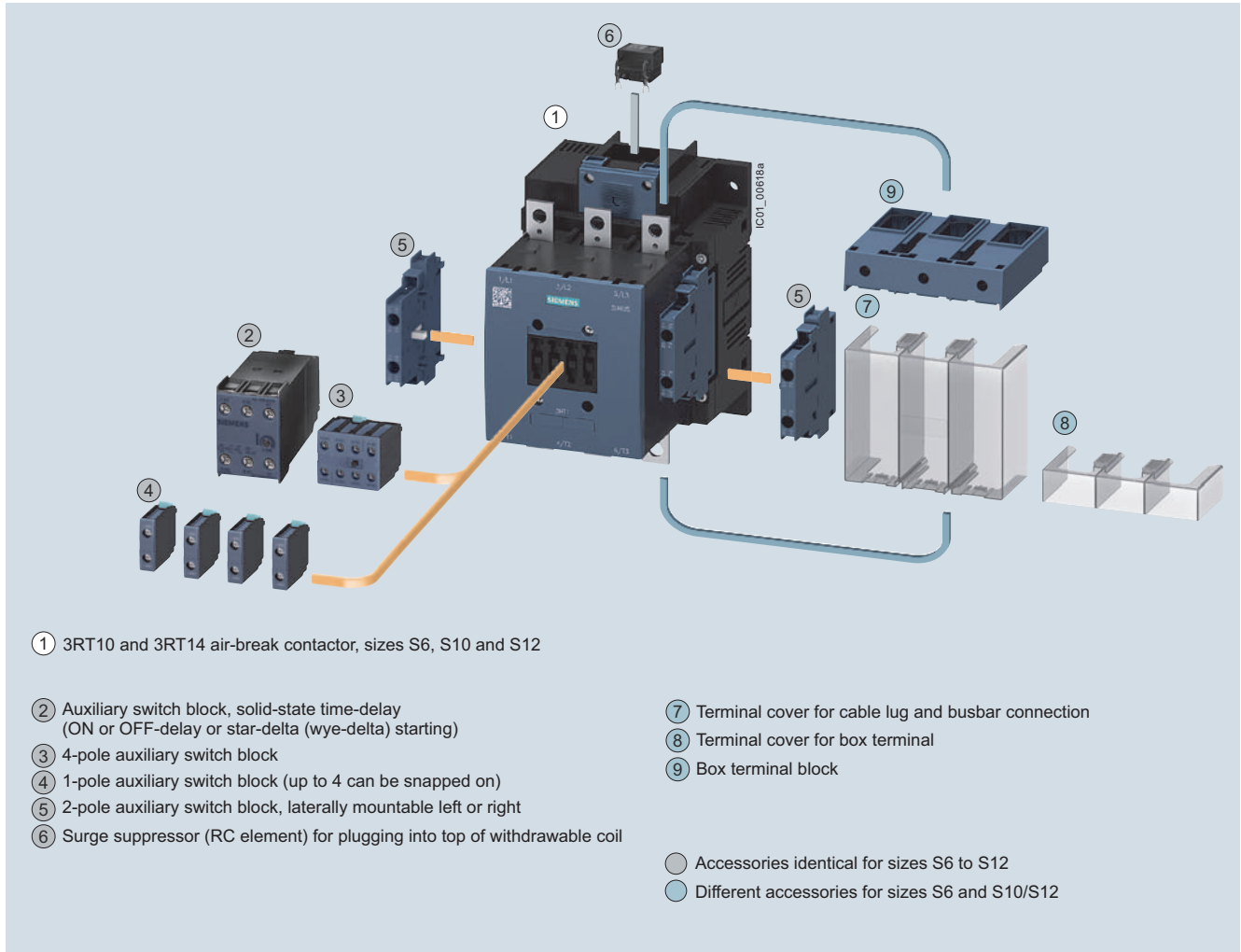
<sup>1)</sup> 3RT201. contactors with one NC contact in the basic unit are required for the electrical interlock. An additional NO contact is required for momentary-contact operation.

Accessories see pages 2/66 to 2/81.

Motor Starters see Chapter 4 Combination Starters & Starters for group installation

3RT1 contactors – Sizes S6 to S12 with mountable accessories

(illustration for basic unit)



① 3RT10 and 3RT14 air-break contactor, sizes S6, S10 and S12

② Auxiliary switch block, solid-state time-delay (ON or OFF-delay or star-delta (wye-delta) starting)

③ 4-pole auxiliary switch block

④ 1-pole auxiliary switch block (up to 4 can be snapped on)

⑤ 2-pole auxiliary switch block, laterally mountable left or right

⑥ Surge suppressor (RC element) for plugging into top of withdrawable coil

⑦ Terminal cover for cable lug and busbar connection

⑧ Terminal cover for box terminal

⑨ Box terminal block

○ Accessories identical for sizes S6 to S12

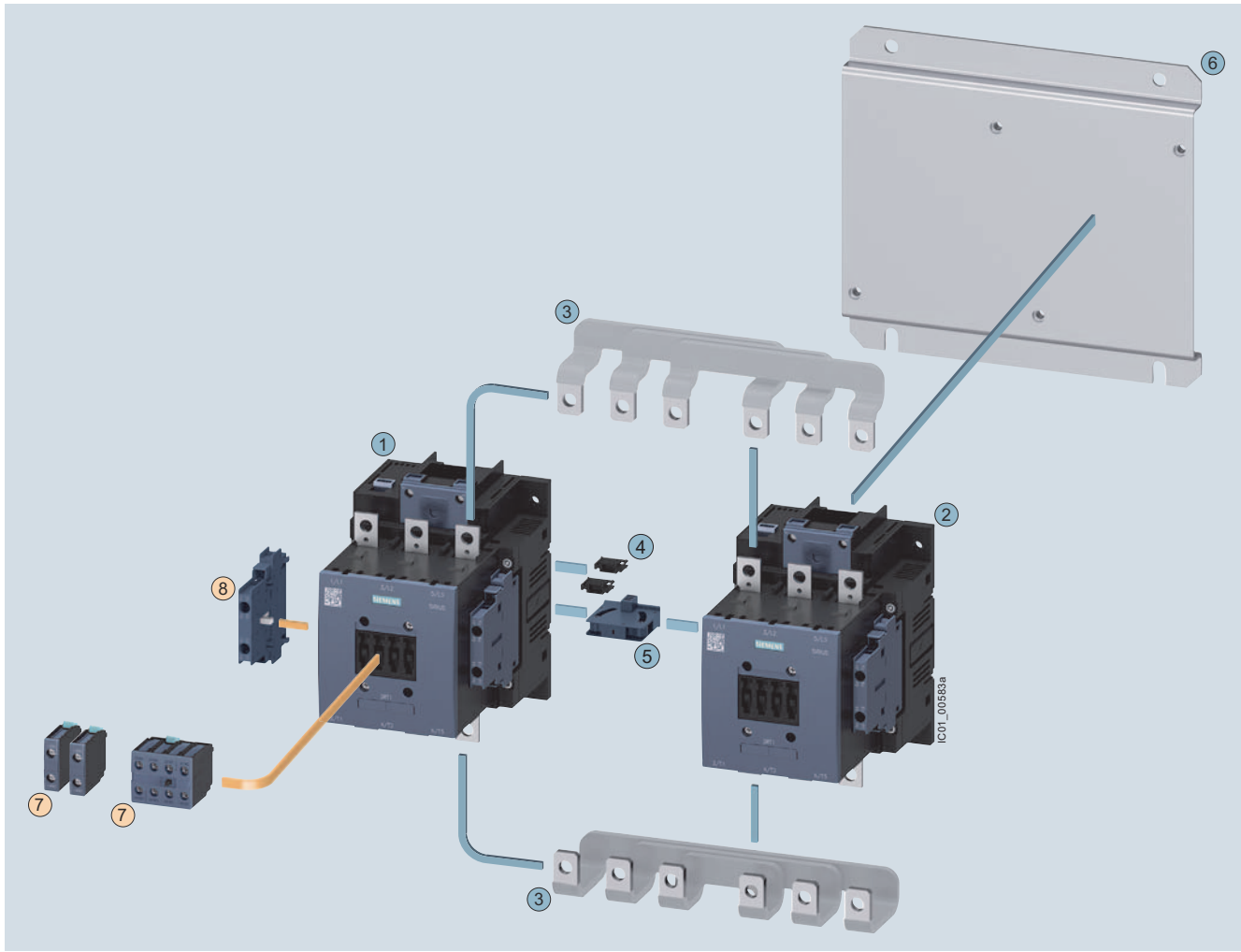
○ Different accessories for sizes S6 and S10/S12

For accessories [see pages 2/66 to 2/83](#).

For mountable overload relays [see Chapter 3, "Overload Relays"](#).



3RT1 contactors – Sizes S6, S10 and S12 reversing contactors



Mountable accessories (optional)

To be ordered separately	Type
⑥	Auxiliary switch block, front 3RH1921
⑦	Auxiliary switch block, lateral 3RH1921

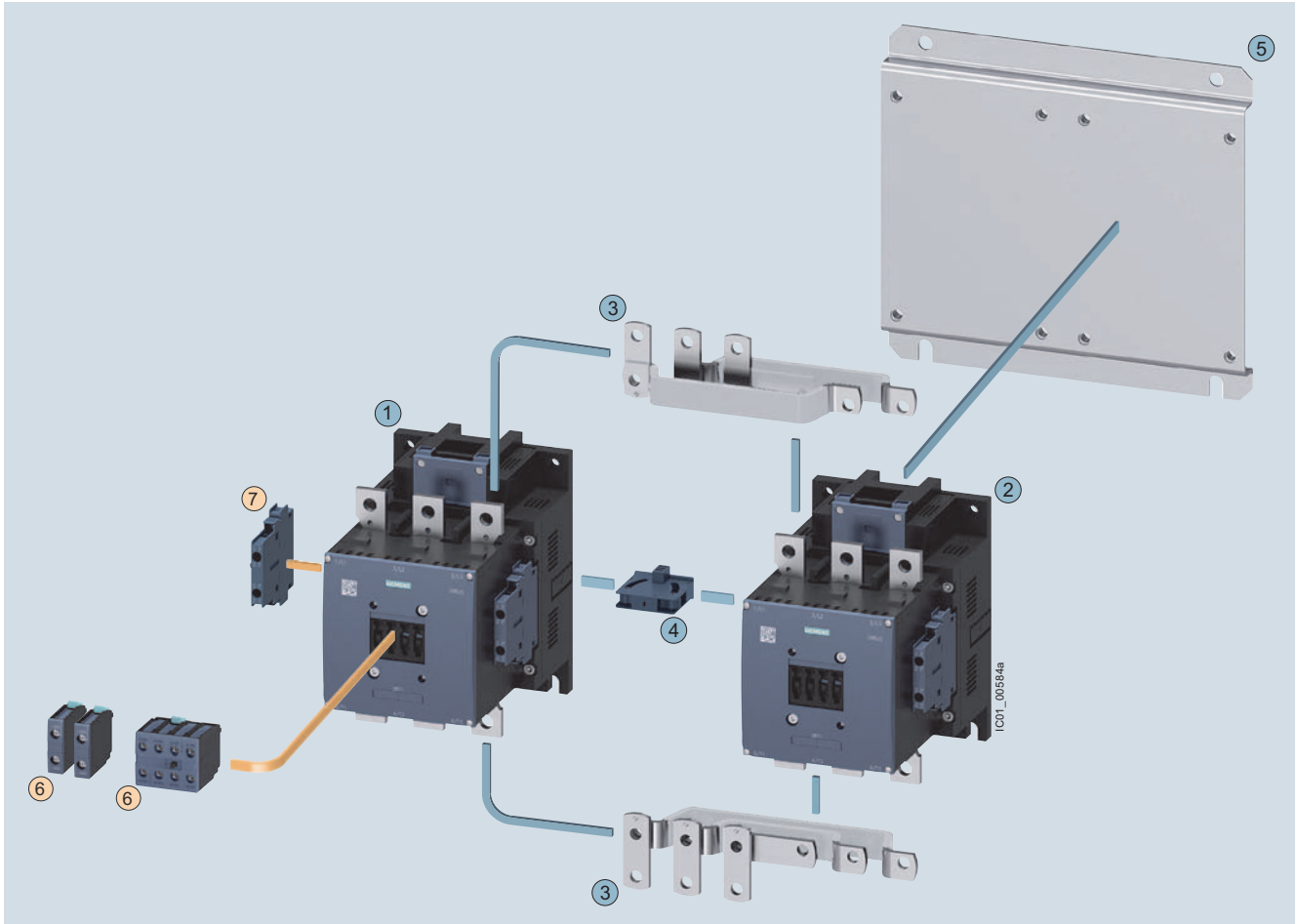
Reversing contactor assembly for customer assembly

Individual parts	Type	
	Q11	Q12
① ②	3RT1.54	3RT1.54
① ②	3RT1.55	3RT1.55
① ②	3RT1.56	3RT1.56
③	3RA1953-2A	
Assembly kit consisting of: Wiring modules on the top and bottom for contactors without box terminals for connecting the main and auxiliary circuits, electrical interlock included (NC contact interlock)		
④	3RA1932-2D	
⑤	3RA1954-2A	
⑥	3RA1952-2A	
Base plate for reversing contactor assemblies		

For accessories see pages 2/66-2/83.

Mountable overload relays see Chapter 3, "Overload Relays".

3RT1 contactors – Sizes S6, S10 and S12 reversing contactors



Mountable accessories (optional)

To be ordered separately	Type
6 Auxiliary switch block, front	3RH1921
7 Auxiliary switch block, lateral	3RH1921

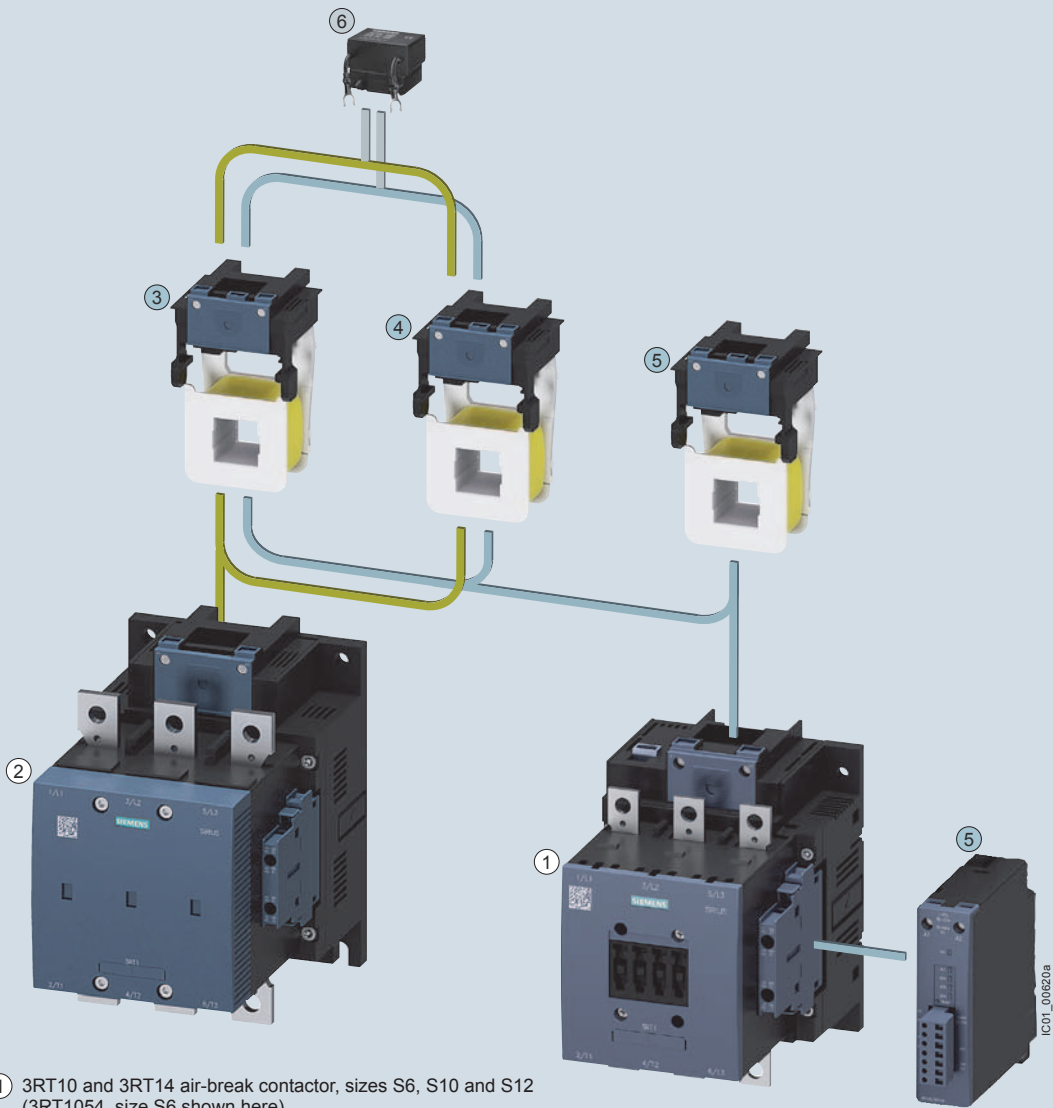
Reversing contactor assembly for customer assembly

Individual parts	Type	
	Q11	Q12
1 2 Contactors, 110 kW	3RT1.64	3RT1.64
1 2 Contactors, 132 kW	3RT1.65	3RT1.65
1 2 Contactors, 160 kW	3RT1.66	3RT1.66
3 Assembly kit consisting of: Wiring modules on the top and bottom for contactors without box terminals for connecting the main and auxiliary circuits, electrical interlock included (NC contact interlock)	3RA1963-2A	
4 Mechanical interlock (must be ordered separately)	3RA1954-2A	
5 Base plate for reversing contactor assemblies	3RA1962-2A	

For accessories see pages 2/66-2/83.

For mountable overload relays see Chapter 3, "Overload Relays".

3RT1 contactors – Sizes S6 to S12 with accessories



- ① 3RT10 and 3RT14 air-break contactor, sizes S6, S10 and S12 (3RT1054, size S6 shown here)
  - ② 3RT12 vacuum contactor, sizes S10 and S12 (3RT1266, size S10 shown here)
  - ③ Withdrawable coils for 3RT1...-A... contactors with conventional operating mechanism (size S10: differentiation between 3RT10/3RT14 air-break contactors and 3RT12 vacuum contactors) (size S12: the same for air-break and vacuum contactors)
  - ④ Withdrawable coils for 3RT1...-N... contactors with solid-state operating mechanism. (size S10: differentiation between 3RT10/3RT14 air-break contactors and 3RT12 vacuum contactors) (size S12: the same for air-break and vacuum contactors)
  - ⑤ Withdrawable coils and laterally mountable module (plug-on) for 3RT1...-P... air-break contactors with solid-state operating mechanism and remaining lifetime indicator
  - ⑥ Surge suppressor (RC element), plug-mountable on withdrawable coils
    - 3RT1...-A... with conventional operating mechanism
    - 3RT1...-N... with solid-state operating mechanism
- Same accessories for sizes S6 to S12  
 ● Different accessories depending on size

For surge suppressors [see page 2/73](#),  
 withdrawable coils [see page 2/98](#).

For mountable overload relays [see Chapter 3](#),  
 “Overload Relays”.

# Accessories for 3RT contactors / 3RH control relays

## Auxiliary switch blocks

### Selection and ordering data



3RH2911-1HA01



3RH2911-2HA01



3RH19 21-1HA .



3RH19 21-2HA . .

For contactors/ control relays	Rated operational Current <sup>3)</sup> 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Connections position	Auxiliary contacts				Screw Terminals <sup>1)</sup>  Order No.	Spring Terminals <sup>1)</sup>  Order No.
				Version					
Type				NO	NC	NO	NC		

### Auxiliary switch blocks for snapping onto the front according to EN 50012 (also compliant with the requirements according to EN 50005)

#### Size S00 <sup>2)</sup>

#### For assembling contactors with 2, 3, 4, or 5 auxiliary contacts

3RT201., Ident. No. 10E	<b>11E</b>	—	1	—	—	<b>3RH2911-1HA01</b>	<b>3RH2911-2HA01</b>
3RT231.	<b>12E</b>	—	2	—	—	<b>3RH2911-1HA02</b>	<b>3RH2911-2HA02</b>
3RT251.	<b>13E</b>	—	3	—	—	<b>3RH2911-1HA03</b>	<b>3RH2911-2HA03</b>
	<b>21E</b>	1	—	—	—	<b>3RH2911-1HA10</b>	<b>3RH2911-2HA10</b>
	<b>21E</b>	1	1	—	—	<b>3RH2911-1HA11</b>	<b>3RH2911-2HA11</b>
	<b>22E</b>	1	2	—	—	<b>3RH2911-1HA12</b>	<b>3RH2911-2HA12</b>
	<b>23E</b>	1	3	—	—	<b>3RH2911-1HA13</b>	<b>3RH2911-2HA13</b>
	<b>31E</b>	2	—	—	—	<b>3RH2911-1HA20</b>	<b>3RH2911-2HA20</b>
	<b>31E</b>	2	1	—	—	<b>3RH2911-1HA21</b>	<b>3RH2911-2HA21</b>
	<b>32E</b>	2	2	—	—	<b>3RH2911-1HA22</b>	<b>3RH2911-2HA22</b>
	<b>41E</b>	3	—	—	—	<b>3RH2911-1HA30</b>	<b>3RH2911-2HA30</b>
	<b>41E</b>	3	1	—	—	<b>3RH2911-1HA31</b>	<b>3RH2911-2HA31</b>

#### Size S0 to S3

#### For assembling contactors with 3, 4, or 5 auxiliary contacts

3RT202., Ident. No. 11E	<b>12E</b>	—	1	—	—	<b>3RH2911-1HA01</b>	<b>3RH2911-2HA01</b>
3RT232.	<b>13E</b>	—	2	—	—	<b>3RH2911-1HA02</b>	<b>3RH2911-2HA02</b>
3RT252.	<b>14E</b>	—	3	—	—	<b>3RH2911-1HA03</b>	<b>3RH2911-2HA03</b>
3RT203.	<b>21E</b>	1	—	—	—	<b>3RH2911-1HA10</b>	<b>3RH2911-2HA10</b>
3RT233.	<b>22E</b>	1	1	—	—	<b>3RH2911-1HA11</b>	<b>3RH2911-2HA11</b>
3RT235.	<b>23E</b>	1	2	—	—	<b>3RH2911-1HA12</b>	<b>3RH2911-2HA12</b>
	<b>24E</b>	1	3	—	—	<b>3RH2911-1HA13</b>	<b>3RH2911-2HA13</b>
	<b>31E</b>	2	—	—	—	<b>3RH2911-1HA20</b>	<b>3RH2911-2HA20</b>
	<b>32E</b>	2	1	—	—	<b>3RH2911-1HA21</b>	<b>3RH2911-2HA21</b>
	<b>33E</b>	2	2	—	—	<b>3RH2911-1HA22</b>	<b>3RH2911-2HA22</b>
	<b>41E</b>	3	—	—	—	<b>3RH2911-1HA30</b>	<b>3RH2911-2HA30</b>
	<b>42E</b>	3	1	—	—	<b>3RH2911-1HA31</b>	<b>3RH2911-2HA31</b>

### Auxiliary switch blocks for snapping onto the front according to EN 50012

#### Sizes S6 to S12

#### 4-pole

3RT1. 4 to	<b>31</b>	3	1	—	—	<b>3RH1921-1HA31</b>	<b>3RH1921-2HA31</b>
3RT1. 7,	<b>22</b>	2	2	—	—	<b>3RH1921-1HA22</b>	<b>3RH1921-2HA22</b>
3RT11.	<b>13</b>	1	3	—	—	<b>3RH1921-1HA13</b>	<b>3RH1921-2HA13</b>
	<b>22</b>	(with location digits 5, 6, 7, 8)	2	2	—	<b>3RH1921-1XA22-0MA0</b>	<b>3RH1921-2XA22-0MA0</b>

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.

For position of the terminals see pages 2/202-2/206.

For int. circuit diagrams see page 2/190.

3RH29 aux blocks are not intended for use with 3RT1 or 3RH1 contactors and relays.

3RH19 aux blocks are not intended for use with 3RT2 or 3RH2 contactors and relays.

For auxiliary switch blocks for 3RH2140 and 3RH2440 see page 2/51.

1) The 3RH2911-.HA.. aux. switches are available with ring-lug terminals. Replace the 8th digit of the Order No. with a "4".

2) Size S00 can be mounted according to EN 50012 only on basic units which have no integrated NC contact.

3) UL ratings: See appendix page 19/7

# Accessories for 3RT contactors / 3RH control relays

## Auxiliary switch blocks

### Selection and ordering data



3RH2911-1FA40



3RH2911-2FA40



3RH19 21-1C...



3RH19 21-2C...



3RH19 21-1LA...



3RH19 21-1MA...

For contactors/ control relays	Rated operational Current <sup>3)</sup> 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Connections position	Auxiliary contacts				Screw Terminals <sup>1)</sup>  Order No.	Spring Terminals <sup>1)</sup>  Order No.
				Version					
Type				NO	NC	NO	NC		

### Auxiliary switch blocks for snapping onto the front according to EN 50005

#### Sizes S00 to S3

2- or 4-pole auxiliary switch blocks for assembling contactors with 3 and 5 or 4 and 6 auxiliary contacts

3RT2. 1.,	40	4	—	—	—	3RH2911-1FA40	3RH2911-2FA40
3RT2. 2.,	22	2	2	—	—	3RH2911-1FA22	3RH2911-2FA22
3RT2. 3.,	04 <sup>1)</sup>	—	4	—	—	3RH2911-1FA04	3RH2911-2FA04
3RH21 ...,	11 <sup>2)</sup>	—	—	1	1	3RH2911-1FB11	3RH2911-2FB11
3RH24 ..	22 <sup>2)</sup>	1	1	1	1	3RH2911-1FB22	3RH2911-2FB22
	22 <sup>2)</sup>	—	—	2	2	3RH2911-1FC22	3RH2911-2FC22

#### 1- and 2- pole auxiliary switch blocks, cable entry from above or below

3RT2. 1.,	10	Top	1	—	—	3RH2911-1AA10	—
3RT2. 2.,		Bottom	1	—	—	3RH2911-1BA10	—
3RT2. 3.,	01	Top	—	1	—	3RH2911-1AA01	—
3RH21 ...,		Bottom	—	1	—	3RH2911-1BA01	—
3RH24 ..	11	Top	1	1	—	3RH2911-1LA11	—
		Bottom	1	1	—	3RH2911-1MA11	—
	20	Top	2	—	—	3RH2911-1LA20	—
		Bottom	2	—	—	3RH2911-1MA20	—

#### Sizes S6 to S12

#### 4-pole auxiliary switch blocks

3RT1. 4 to	40	4	—	—	—	3RH1921-1FA40	3RH1921-2FA40
3RT1. 7,	31	3	1	—	—	3RH1921-1FA31	3RH1921-2FA31
3RT11	22	2	2	—	—	3RH1921-1FA22	3RH1921-2FA22
	04	—	4	—	—	3RH1921-1FA04	3RH1921-2FA04
	22 U	—	—	2	2	3RH1921-1FC22	3RH1921-2FC22

#### Single-pole auxiliary switch blocks (also compliant with EN 5001<sup>2)</sup>)

3RT1. 4 to	—	1	—	—	—	3RH1921-1CA10	3RH1921-2CA10
3RT1. 7,	—	—	1	—	—	3RH1921-1CA01	3RH1921-2CA01
3RT11	—	—	—	1	—	3RH1921-1CD10	—
	—	—	—	—	1	3RH1921-1CD01	—

#### 2-pole auxiliary switch blocks with cable entry from one side

3RT1. 4 to	—	Top	1	1	—	3RH19 21-1LA11	—
3RT1. 7,	—	Bottom	1	1	—	3RH19 21-1MA11	—
3RT11	—	Top	2	—	—	3RH19 21-1LA20	—
	—	Bottom	2	—	—	3RH19 21-1MA20	—
	—	Top	—	2	—	3RH19 21-1LA02	—
	—	Bottom	—	2	—	3RH19 21-1MA02	—

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.  
For position of the terminals see pages 2/202-2/206.  
For int. circuit diagrams see page 2/190.

1) Mounting is permitted only on basic units which have no integrated NC contact.

3) UL ratings: See appendix page 19/7

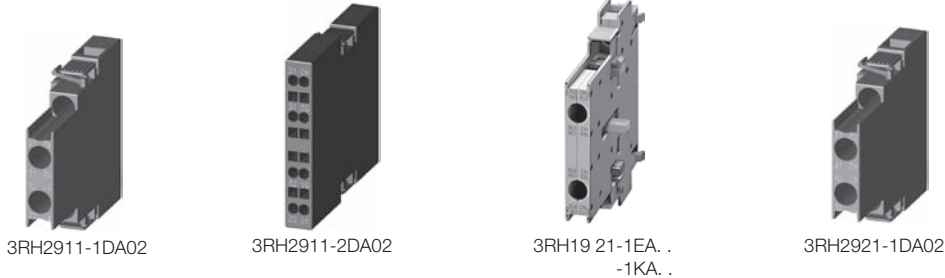
2) Version with early make and delayed break contacts

# Accessories for 3RT contactors / 3RH control relays

## Laterally mountable auxiliary switch blocks

CONTACTORS AND ASSEMBLIES

Selection and ordering data



For contactors/ control relays	Rated operational Current <sup>4)</sup> 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Mountable to contactor/ contactor relay side	Auxiliary contacts		Screw Terminals <sup>1)</sup>  Order No.	Spring Terminals <sup>1)</sup>  Order No.
				Version			
Type				NO	NC		

Laterally mountable auxiliary switch blocks according to EN 50012

Laterally mountable auxiliary switch block, 2-pole

Size S00 <sup>1) 2)</sup>

3RT201. Ident. No. 10E	A600/Q600 A600/Q600	<b>12E</b> <b>21E</b>	right or left right or left	— 1	2 1	<b>3RH2911-1DA02</b> <b>3RH2911-1DA11</b>	<b>3RH2911-2DA02</b> <b>3RH2911-2DA11</b>
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Size S0 to S3

3RT2.2. <sup>3)</sup> Ident.No. 11E	A600/Q600 A600/Q600	<b>13E</b> <b>22E</b>	right or left right or left	— 1	2 1	<b>3RH2921-1DA02</b> <b>3RH2921-1DA11</b>	<b>3RH2921-2DA02</b> <b>3RH2921-2DA11</b>
3RT2.3.	A600/Q600	<b>31E</b>	right or left	2	—	<b>3RH2921-1DA20</b>	<b>3RH2921-2DA20</b>

First laterally mountable auxiliary switch block, 2-pole

Sizes S6 to S12

3RT1. 3 to 3RT1. 7	A600/Q600		right or left	1	1	<b>3RH1921-1DA11</b>	<b>3RH1921-2DA11</b>
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Second laterally mountable auxiliary switch block, 2-pole

Sizes S6 to S12

3RT1. 4 to 3RT1. 7	A300/Q300		right or left	1	1	<b>3RH1921-1JA11</b>	<b>3RH1921-2JA11</b>
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Laterally mountable auxiliary switch blocks according to EN 50005

First laterally mountable auxiliary switch block, 2-pole

Sizes S00 <sup>1) 2)</sup>

3RT2.1. Ident.No. 10E	A600/Q600 A600/Q600 A600/Q600	<b>02</b> <b>11</b> <b>20</b>	right or left right or left right or left	— 1 2	2 1 —	<b>3RH2911-1DA02</b> <b>3RH2911-1DA11</b> <b>3RH2911-1DA20</b>	<b>3RH2911-2DA02</b> <b>3RH2911-2DA11</b> <b>3RH2911-2DA20</b>
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Sizes S0 to S3

3RT2.2., 3RT2.3. <sup>3)</sup>	A600/Q600 A600/Q600	<b>02</b> <b>11</b>	right or left right or left	— 1	2 1	<b>3RH2921-1DA02</b> <b>3RH2921-1DA11</b>	<b>3RH2921-2DA02</b> <b>3RH2921-2DA11</b>
	A600/Q600	<b>20</b>	right or left	2	—	<b>3RH2921-1DA20</b>	<b>3RH2921-2DA20</b>

Sizes S6 to S12

3RT1. 4 to 3RT1. 7	A300/Q300 A300/Q300		right or left right or left	— 1	2 1	<b>3RH1921-1EA02</b> <b>3RH1921-1EA11</b>	<b>3RH1921-2EA02</b> —
	A300/Q300		right or left	2	—	<b>3RH1921-1EA20</b>	<b>3RH1921-2EA20</b>

Second laterally mountable auxiliary switch block, 2-pole

Sizes S6 to S12

3RT1. 4 to 3RT1. 7	A300/Q300 A300/Q300		right or left right or left	— 1	2 1	<b>3RH1921-1KA02</b> <b>3RH1921-1KA11</b>	<b>3RH1921-2KA02</b> —
	A300/Q300		right or left	2	—	<b>3RH1921-1KA20</b>	<b>3RH1921-2KA20</b>

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.  
For position of the terminals see pages 2/202-2/206.  
For int. circuit diagrams see pages 2/190-2/195.

1) With size S00, mounting according to EN 50012 is permitted only on basic units which have no NC contact integrated.

2) Ident. No. 41, 32 and 23 according to EN 50012 is also possible. Please note the corresponding circuit diagrams for mounting 3RH29 11-1DA.. on the left.

3) With 3RT23 2., 3RT25. 2. mountable only on the right.

4) UL ratings: See appendix page 19/7



# Accessories for 3RT contactors / 3RH control relays

## Solid-state auxiliary switch blocks

### Selection and ordering data

- Operation in dusty atmospheres
- Solid-state circuits with rated operational currents  $I_e$ /AC-14 and DC-13 from 1 ... 300 mA at 3 ... 60 V
- Hard gold-plated contacts
- Mirror contacts according to EN 60947-4-1, Appendix F, for laterally mountable auxiliary switches

### Selection and ordering data



3RH2911-1NF02



3RH2911-2NF02



3RH2911-2DE11



3RH1921-2DE11



3RH19 21-2DE11

For contactors/ control relays	Contactor with HS block Ident. No.	Mountable to contactor/ contactor relay side	Auxiliary contacts Version	Screw Terminals <sup>1)</sup>	Spring Terminals <sup>1)</sup>
Type				Order No.	Order No.

### Solid-state compatible auxiliary switch blocks for snapping onto the front according to EN 50005<sup>1)</sup>

#### Sizes S00 to S3

3RT2. 1., 3RT2.2., 3RT2.3.	<b>02</b> <b>11</b>	—	—	—	2	<b>3RH2911-1NF02</b> <b>3RH2911-1NF11</b> <b>3RH2911-1NF20</b>	<b>3RH2911-2NF02</b> <b>3RH2911-2NF11</b> <b>3RH2911-2NF20</b>
3RH21 .., 3RH24 ..	<b>20</b>	—	—	—	—		

#### Sizes S6 to S12

3RT1. 4 to 3RT1. 7	— —	—	1	1	1	1	<b>3RH1921-1FE22</b>	<b>3RH19 21-2FE22</b> <b>3RH1921-2FJ22</b>
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### Solid-state compatible auxiliary switch blocks, laterally mountable, according to EN 50012

#### First laterally mountable auxiliary switch block, 2-pole

##### Size S00<sup>2)</sup>

3RT2. 1., Ident. No. 10E	<b>21E</b>	right	1	—	—	1	—	<b>3RH2911-2DE11</b>
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##### Size S0 to S3

3RT2. 2, 3RT2. 3 Ident. No. 10E	<b>22E</b>	right	1	—	—	1	—	<b>3RH2921-2DE11</b>
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##### Sizes S6 to S12

3RT1. 4 to 3RT1. 7	—	right or left	1	—	—	1	—	<b>3RH1921-2DE11</b>
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#### Second laterally mountable auxiliary switch block, 2-pole

##### Sizes S6 to S12

3RT1. 4 to 3RT1. 7	—	right or left	1	—	—	1	—	<b>3RH1921-2JE11</b>
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### Solid-state compatible auxiliary switch blocks, laterally mountable, according to EN 50005

#### Size S00

3RT2. 1., Ident. No. 10E	<b>11</b>	right or left	1	—	—	1	—	<b>3RH2911-2DE11</b>
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#### Size S0 to S2

3RT2. 2., 3RT2. 3	<b>11</b>	right or left	1	—	—	1	—	<b>3RH2921-2DE11</b>
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EN50005 and EN50012 designate the markings of the auxiliary terminal numbers. For position of the terminals see pages 2/202 -2/206. For int. circuit diagrams see pages 2/190-2/195.

1) The 3RH29 11-.NF.. auxiliary switches are also available with ring lug terminal connection. The 8th digit of the order number must be replaced with "4", e. g.: 3RH2911-1NF11 -> 3RH2911-4NF11

2) Size S00 can be mounted according to EN 50012 only on basic units which have no integrated NC contact.

# Accessories for 3RT contactors / 3RH control relays

## Auxiliary switch blocks, delayed

### Selection and ordering data

	For contactors	Rated control supply voltage $U_s^{1)}$	Time setting range $t$	Output / auxiliary contacts	Screw Terminals Order No.	Spring Terminals Order No.	
	Type	V	Sec				
<b>Time-delay, solid-state auxiliary switch blocks for snapping onto the front according to DIN 46199-5</b>							
The electrical connection between the solid-state time-delay auxiliary switch and the contactor underneath is established automatically when it is snapped on and locked into place.							
<b>Sizes S00 to S3</b>							
<p>3RA2813-1AW10</p>	3RT2., 3RH21 <sup>2)</sup> 3RH24	<b>ON-delay (varistor integrated)</b>					
		24 ... 240 AC/DC	0.05 ... 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	<b>3RA2813-1AW10</b> <b>3RA2813-1FW10</b>	<b>3RA2813-2AW10</b> <b>3RA2813-2FW10</b>	
		<b>OFF-delay with auxiliary voltage (varistor integrated)</b>					
		24 ... 240 AC/DC	0.05 ... 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	<b>3RA28 14-1AW10</b> <b>3RA28 14-1FW10</b>	<b>3RA28 14-2AW10</b> <b>3RA28 14-2FW10</b>	
		<b>OFF-delay without auxiliary voltage<sup>3)</sup> (varistor integrated)</b>					
		24 ... 240 AC/DC	0.05 ... 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	<b>3RA2815-1AW10</b> <b>3RA2815-1FW10</b>	<b>3RA2815-2AW10</b> <b>3RA2815-2FW10</b>	
<b>Sizes S6 to S12</b>							
<p>3RT1926-2FJ11</p>	3RT10, 3RT13, 3RT14, 3RT15	<b>ON-delay (varistor integrated)</b>					
		24 AC/DC <sup>4)</sup>	0.05 ... 1 0.5 ... 10 5 ... 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	<b>3RT19 26-2EJ11</b> <b>3RT19 26-2EJ21</b> <b>3RT19 26-2EJ31</b>	— — —	
		100 ... 127 AC <sup>4)</sup>	0.05 ... 1 0.5 ... 10 5 ... 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	<b>3RT19 26-2EC11</b> <b>3RT19 26-2EC21</b> <b>3RT19 26-2EC31</b>	— — —	
		200 ... 240 AC <sup>4)</sup>	0.05 ... 1 0.5 ... 10 5 ... 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	<b>3RT19 26-2ED11</b> <b>3RT19 26-2ED21</b> <b>3RT19 26-2ED31</b>	— — —	
		<b>OFF-delay without auxiliary voltage <sup>5)</sup></b>					
		24 AC/DC <sup>4)</sup>	0.05 ... 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	<b>3RT19 26-2FJ11</b> <b>3RT19 26-2FJ21</b> <b>3RT19 26-2FJ31</b>	— — —	
		100 ... 127 AC <sup>4)</sup>	0.05 ... 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	<b>3RT19 26-2FK11</b> <b>3RT19 26-2FK21</b> <b>3RT19 26-2FK31</b>	— — —	
		200 ... 240 AC <sup>4)</sup>	0.05 ... 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	<b>3RT19 26-2FL11</b> <b>3RT19 26-2FL21</b> <b>3RT19 26-2FL31</b>	— — —	
		<b>WYE-delta function</b>					
		24 AC/DC <sup>4)</sup>	1.5 ... 30	each have: 1 NO delayed	<b>3RT19 26-2GJ51</b>	—	
		100 ... 127 AC <sup>4)</sup>	1.5 ... 30	1 NO instant	<b>3RT19 26-2GC51</b>	—	
		200 ... 240 AC <sup>4)</sup>	1.5 ... 30	interval 50ms	<b>3RT19 26-2GD51</b>	—	

For technical data, see pages 2/182-2/183.  
 For int. circuit diagrams, see page 2/198.  
 For position of terminals, see page 2/206.

When the solid-state time-delay auxiliary switches are used, no other auxiliary switches are allowed to be mounted on the basic units.

1) AC voltage values apply for 50 Hz and 60 Hz.

2) Cannot be fitted onto coupling relays.

3) Setting of output contacts in as-supplied state not defined (bistable relay). Application of the control supply voltage once results in contact change-over to the correct setting.

4) Terminals A1 and A2 for the rated control supply voltage of the solid-state time-delay auxiliary switch must be connected to the associated contactor by means of connecting leads.

5) Position of the output contacts not defined in the as-delivered state (bistable relay). Applying the control voltage once results in the contacts switching to the correct position.

# Accessories for 3RT contactors / 3RH control relays

## Function modules, delay blocks

### Selection and ordering data



3RA2812-1DW10



3RA2811-2CW10

For contactors	Rated control supply voltage $U_s$ <sup>1)</sup>	Time setting range $t$	<b>Screw terminals</b>	<b>Spring-type terminals</b>	Weight
Type	V AC/DC	s	Order No.	Order No.	kg

### Timing relays for mounting on 3RT2 contactors

#### Sizes S00 to S3

The electrical connection between the timing relay and the contactor underneath is established automatically when it is snapped on and locked.

#### ON-delay

Two-wire design, varistor integrated

Type	Rated control supply voltage $U_s$	Time setting range $t$	Order No. (Screw terminals)	Order No. (Spring-type terminals)
3RT20..., 3RT23..., 3RT25..., 3RH21 <sup>2)</sup> , 3RH24	24 ... 240	0.05 ... 100 (1, 10, 100; selectable)	3RA2811-1CW10	3RA2811-2CW10
3RT203.	24 ... 90 90 ... 240	0.05 ... 100 (1, 10, 100; selectable)	3RA2831-1DG10 3RA2831-1DH10	3RA2831-2DG10 3RA2831-2DH10
<b>OFF-delay with control signal</b> Varistor integrated				
3RT20..., 3RT23..., 3RT25..., 3RH21 <sup>2)</sup> , 3RH24	24 ... 240	0.05 ... 100 (1, 10, 100; selectable)	3RA2812-1DW10	3RA2812-2DW10
3RT203.	24 ... 90 90 ... 240	0.05 ... 100 (1, 10, 100; selectable)	3RA2832-1DG10 3RA2832-1DH10	3RA2832-2DG10 3RA2832-2DH10

<sup>1)</sup> AC voltage values apply for 50 Hz and 60 Hz.

<sup>2)</sup> Cannot be fitted onto coupling relays.

For description, see page 2/119.  
For technical data, see page 2/182.  
For circuit diagrams, see page 2/198.

<sup>1)</sup> AC voltage ratings apply for 50 and 60 Hz.

<sup>2)</sup> The 3RA28 time-delay blocks are available with spring-type terminals. Replace the 8th digit of the order number with a "2".




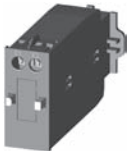
<sup>3)</sup> Cannot be fitted onto coupling relays

# Accessories for 3RT contactors / 3RH control relays

Function modules, delay blocks, and mechanical latching blocks

CONTACTORS AND ASSEMBLIES 2

## Selection and ordering data

	For contactors Type	Rated control supply voltage $U_s$ <sup>1)</sup> V	Time setting range $t$ sec	Screw Terminals <sup>2)</sup> Order No.	Weight approx. kg	
<b>Off-delay device</b>						
3RT2916-2B.01 	<b>Sizes S00 to S2</b>					
	<b>For contactors with DC operation. Non-adjustable delay time</b>					
	3RT2., 3RH2. ...-1BF40	110 AC/DC	S00: > 0.1 S0: > 0.08; S2: > 0.25	<b>3RT2916-2BK01</b>	0.150	
	3RT2., 3RH2. ...-1BM40	220 ... 230 AC/DC	S00: > 0.5 S0: > 0.3; S2: > 0.8	<b>3RT2916-2BL01</b>	0.150	
3RT2916-2BE01 	3RT2., 3RH2. ...-1BB40	24 DC	S00: > 0.2 S0: > 0.1; S2: > 0.1	<b>3RT2916-2BE01</b>	0.150	
	<b>Sizes S3</b>					
	3RT2. 4	24 DC	S3: 70 fixed	<b>3RT2916-2BE01</b>	0.093	
<b>Pneumatic delay blocks, terminal designation according to EN 50005 <sup>4)</sup></b>						
3RT2926-2PA01 	<b>Size S0</b>					
	<b>For snapping onto the front of contactors <sup>5)</sup> Auxiliary contacts 1 NO and 1 NC</b>					
	<b>With ON-delay</b>		—	0.1 ... 30	<b>3RT2926-2PA01</b>	0.080
	3RT2. 2		1 ... 60	<b>3RT2926-2PA11</b>	0.080	
<b>With OFF-delay</b>		—	0.1 ... 30	<b>3RT2926-2PR01</b>	0.080	
3RT2. 2		1 ... 60	<b>3RT2926-2PR11</b>	0.080		
<b>Mechanical latching blocks</b>						
3RT2926-3AB31 	<b>For mounting onto the front of contactors</b>					
	<b>The contactor remains in the energized state even after voltage failure</b>					
	<b>Size S0</b>					
	3RT2. 2	24 AC/DC	—		<b>3RT2926-3AB31</b>	0.100
	110 AC/DC	—		<b>3RT2926-3AF31</b>	0.100	
	230 AC/DC	—		<b>3RT2926-3AP31</b>	0.100	

For description, see page 2/119.  
 For technical data, see page 2/182.  
 For circuit diagrams, see page 2/198.

1) AC voltage ratings apply for 50 and 60 Hz.  
 2) The 3RA28 time-delay blocks are available with spring-type terminals. Replace the 8th digit of the order number with a "2".  
 3) Cannot be fitted onto coupling relays.  
 4) Versions according to DIN VDE 0116 on request.  
 5) In addition to these, no other auxiliary contacts are permitted.

# Accessories for 3RT contactors / 3RH control relays

## Surge suppressors

### Selection and ordering data

For contactors	Version	Rated control supply voltage $U_s$ <sup>1)</sup>		Order No.	Weight
		AC operation	DC operation		
Type		V AC	V DC		kg

### Surge suppressors without LED (also for spring-type terminals)

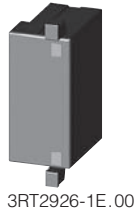
#### Size S00



For plugging onto the front side of the contactors (with and without auxiliary switch block)

For contactors	Version	Rated control supply voltage $U_s$ (V AC)	Rated control supply voltage $U_s$ (V DC)	Order No.
3RT2.1, 3RH2.	<b>Varistors</b>	24 ... 48	24 ... 70	3RT2916-1BB00
		48 ... 127	70 ... 150	3RT2916-1BC00
		127 ... 240	150 ... 250	3RT2916-1BD00
		240 ... 400	--	3RT2916-1BE00
		400 ... 600	--	3RT2916-1BF00
3RT2.1, 3RH2.	<b>RC elements</b>	24 ... 48	24 ... 70	3RT2916-1CB00
		48 ... 127	70 ... 150	3RT2916-1CC00
		127 ... 240	150 ... 250	3RT2916-1CD00
		240 ... 400	--	3RT2916-1CE00
		400 ... 600	--	3RT2916-1CF00
3RT2.1, 3RH2.	<b>Noise suppression diodes</b>	--	12 ... 250	3RT2916-1DG00
3RT2.1, 3RH2.	<b>Diode assemblies</b> (diode and Zener diode) for DC operation	--	12 ... 250	3RT2916-1EH00

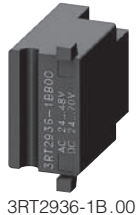
#### Size S0



For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)

For contactors	Version	Rated control supply voltage $U_s$ (V AC)	Rated control supply voltage $U_s$ (V DC)	Order No.
3RT2.2	<b>Varistors</b>	24 ... 48	24 ... 70	3RT2926-1BB00
		48 ... 127	70 ... 150	3RT2926-1BC00
		127 ... 240	150 ... 250	3RT2926-1BD00
		240 ... 400	--	3RT2926-1BE00
		400 ... 600	--	3RT2926-1BF00
3RT2.2	<b>RC elements</b>	24 ... 48	24 ... 70	3RT2926-1CB00
		48 ... 127	70 ... 150	3RT2926-1CC00
		127 ... 240	150 ... 250	3RT2926-1CD00
		240 ... 400	--	3RT2926-1CE00
		400 ... 600	--	3RT2926-1CF00
3RT2.2	<b>Diode assembly</b> for DC operation	--	24	3RT2926-1ER00
		--	30 ... 250	3RT2926-1ES00

#### Size S2 and S3



For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)

For contactors	Version	Rated control supply voltage $U_s$ (V AC)	Rated control supply voltage $U_s$ (V DC)	Order No.
3RT2.3.	<b>Varistors</b>	24 ... 48	24 ... 70	3RT2936-1BB00
		48 ... 127	70 ... 150	3RT2936-1BC00
		127 ... 240	150 ... 250	3RT2936-1BD00
		240 ... 400	--	3RT2936-1BE00
		400 ... 600	--	3RT2936-1BF00
3RT2.3.	<b>RC elements</b>	24 ... 48	24 ... 70	3RT2936-1CB00
		48 ... 127	70 ... 150	3RT2936-1CC00
		127 ... 240	150 ... 250	3RT2936-1CD00
		240 ... 400	--	3RT2936-1CE00
		400 ... 600	--	3RT2936-1CF00
3RT2.3.	<b>Diode assembly</b> for DC operation	--	24	3RT2936-1ER00
		--	30 ... 250	3RT2936-1ES00







<sup>1)</sup> Can be used for AC operation for 50/60 Hz. Please inquire about further voltages.

# Accessories for 3RT contactors / 3RH control relays

## Surge suppressors

### Selection and ordering data

For contactors	Version	Rated control supply voltage $U_s$ 1)			Order No.	Weight approx. kg	
		AC operation	DC operation	mW			
Type		V AC	V DC				
<b>Surge suppressors without LED (also for spring-type terminals)</b>							
3RT1936-1C.00	<b>Sizes S6, S10, S12</b>	<b>For plugging onto the conventional or solid-state coil</b>					
	3RT1.5, 3RT1.6 3RT1.7	<b>RC element</b>	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600	24 ... 70 70 ... 150 150 ... 250 — —	<b>3RT1956-1CB00</b> <b>3RT1956-1CC00</b> <b>3RT1956-1CD00</b> <b>3RT1956-1CE00</b> <b>3RT1956-1CF00</b>	0.03 0.03 0.03 0.03 0.03	
<b>Surge suppressors with LED (also for spring-type terminals)</b>							
3RT2916-1J.00	<b>Size S00</b>	<b>For plugging onto the front side of the contactors (with and without auxiliary switch block)</b>					
	3RT2.1, 3RH2.	<b>Varistor</b>	24 ... 48 48 ... 127 127 ... 240 —	12 ... 24 24 ... 70 70 ... 150 150 ... 250	10 ... 120 20 ... 470 50 ... 700 160 ... 950	<b>3RT2916-1JJ00</b> <b>3RT2916-1JK00</b> <b>3RT2916-1JL00</b> <b>3RT2916-1JP00</b>	0.010 0.010 0.010 0.010
	3RT2.1, 3RH2.	<b>Noise suppression diode</b>	—	24 ... 70 50 ... 150 150 ... 250	20 ... 470 50 ... 700 160 ... 950	<b>3RT2916-1LM00</b> <b>3RT2916-1LN00</b> <b>3RT2916-1LP00</b>	0.010 0.010 0.010
3RT2926-1MR00	<b>Size S0</b>	<b>For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)</b>					
	3RT2.2	<b>Varistor</b>	24 ... 48 48 ... 127 127 ... 240	12 ... 24 24 ... 70 70 ... 150	10 ... 120 20 ... 470 50 ... 700	<b>3RT2926-1JJ00</b> <b>3RT2926-1JK00</b> <b>3RT2926-1JL00</b>	0.010 0.010 0.010
	3RT2.2	<b>Diode assembly</b>	—	24	20 ... 470	<b>3RT2926-1MR00</b>	0.010
3RT2936-1J.00	<b>Sizes S2 and S3</b>	<b>For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)</b>					
	3RT2.3.	<b>Varistor</b>	24 ... 48 48 ... 127 127 ... 240	12 ... 24 24 ... 70 70 ... 150	10 ... 120 20 ... 470 50 ... 700	<b>3RT2936-1JJ00</b> <b>3RT2936-1JK00</b> <b>3RT2936-1JL00</b>	0.010 0.010 0.010

1) Can be used for AC operation for 50/60 Hz.  
Please inquire about further voltages.



# Accessories for 3RT contactors / 3RH control relays

## Surge suppressors, terminals, labels

### Selection and ordering data

For contactors	Version	Units	Order No.	Weight approx. kg
<b>Main conducting path surge suppression module for 3RT12 vacuum contactors</b>				
<b>Sizes S10 and S12</b> 3RT12	For damping overvoltages and protecting the motor windings against multiple reignition when switching off three-phase motors. For connection on the contactor feeder side (2-T1/4-T2/6-T3). For separate installation. Rated operational voltage $U_e \geq 500$ V AC ... $\leq 690$ V AC Rated operational voltage $U_e \leq 1000$ V AC		<b>3RT1966-1PV3</b> <b>3RT1966-1PV4</b>	0.18 0.36
<b>Auxiliary conductor terminal, 3-pole</b>				
3RT2946-4F	<b>Size S3</b> 3RT204.	For connecting auxiliary and control leads to the main conductor terminals (for one side).	<b>3RT2946-4F</b>	
<b>Blank Labels</b>				
3RT29 00- 1SB20		Unit labeling plates 20 mm x 7 mm, pastel PC labeling system for individual inscription of unitlabeling plates available from: murplastik Systems, Inc.	340 units <b>3RT2900-1SB20</b>	0.200
		10 mm x 7 mm	816 units <b>3RT2900-1SB10</b>	0.294

### Links for paralleling



3RT1916-4BB31



3RT1916-4BB41



3RT1936-4BB31



3RT1956-4BA31

Size	For contactors	Maximum resistive current $I_e$ /AC-1 (at 60 °C) of contactors	Max. conductor cross sections	Screw Terminals	Standard package quantity	Weight approx. kg
	Type	A		Order No.		
S00	3RT201.	3-pole, with terminal 1), 2)	4 AWG, stranded	<b>3RT1916-4BB31</b>		0.015
S0	3RT202.		0 AWG, stranded	<b>3RT2926-4BB31</b>		0.042
S2	3RT203.		95 mm <sup>2</sup>	<b>3RT1936-4BB31</b>		0.139
S3	3RT204.	3-pole, with through hole	185 mm <sup>2</sup>	<b>3RT1946-4BB31</b>		0.205
S6	3RT1. 5	(WYE jumpers) 1), 2)	—	<b>3RT1956-4BA31</b>		0.159
S10/S12	3RT1. 6 3RT1. 7		—	<b>3RT1966-4BA31</b>		0.541
S00	3RT231. 3RT251.	4-pole, with terminal 1), 2)	4 AWG, stranded	<b>3RT1916-4BB41</b>		0.016

1) Can be used for AC operation for 50/60 Hz. Please inquire about further voltages.

# Accessories for 3RT contactors / 3RH control relays

Other function blocks, PLC control, load modules, control kit

## Selection and ordering data

For contactors Type	Version	Order No.	Weight
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### EMC suppression modules; 3-phase, up to 10 HP

**Size S00 (for contactors with AC or DC operation)**



3RT2916-1PA

3RT201	<b>RC elements</b> (3 x 220 Ω/0.22 μF) Up to 400 V Up to 575 V Up to 690 V
3RT201	<b>Varistors</b> Up to 400 V Up to 575 V Up to 690 V

#### Screw terminals

3RT2916-1PA1  
3RT2916-1PA2  
3RT2916-1PA3

3RT2916-1PB1  
3RT2916-1PB2  
3RT2916-1PB3

### Coupling links for control by PLC

**Size S0**



3RH2924-1GP11

3RT2..2	<b>For mounting onto the coil terminals of the contactors (only for contactors with screw terminals)</b> With LED for indicating switching state. With integrated varistor for damping opening surges. 24 V DC control, 17 ... 30 V DC operating range
---------	--

3RH2924-1GP11

**Sizes S00 to S3**



3RH2914-1GP11

3RT2..1, 3RT2..2, 3RT2..3	<b>For mounting on the front side of contactors with AC, DC or AC/DC operation</b> 24 V DC control, 17 ... 30 V DC operating range
---------------------------------	--

3RH2914-1GP11

	24 V DC control, 17 ... 30 V DC operating range
--	--

#### Spring-type terminals

3RH2914-2GP11

### Additional load modules

**Size S00**



3RT2916-1GA00

3RT2..1, 3RH2..	<b>For plugging onto the front side of the contactors with or without auxiliary switch blocks</b> For increasing the permissible residual current and for limiting the residual voltage. It ensures the safe opening of contactors with direct control via 230 V AC semiconductor outputs of SIMATIC controllers. It acts simultaneously as a surge suppressor. Rated voltage: 50/60 Hz, 180 to 255 V AC
--------------------	---

3RT2916-1GA00

### LED module for indicating contactor operation

**Sizes S00 to S3**



3RT2926-1QT00

3RT2..	<b>For snapping into the location hole of an inscription label on the front of a contactor</b> either directly on the contactor or on the front auxiliary switch. The LED module is connected to coil terminals A1 and A2 of the contactor and indicates its energized state. Yellow LED. Rated voltage: 24 ... 240 V AC/DC, with reverse polarity protection.
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3RT2926-1QT00

### Control kit

**Sizes S00 to S3**



3RT2916-4MC00

3RT2..1, 3RH2.. 3RT2..2 3RT2..3	<b>For manual operation of the contactor contacts for start-up and service</b>
--	--

3RT2916-4MC00

3RT2926-4MC00  
3RT2936-4MC00

# Accessories for 3RT contactors / 3RH control relays

## Terminals, covers, adapters, connectors

### Selection and ordering data

For contactors Type	Version	Order No.	Weight
<b>Sealable covers</b>			
<b>Sizes S00 to S3</b>			
	3RT2.1, 3RT2.2, 3RT2.3, 3RT2.4, 3RH2. <sup>1)</sup>	Sealable covers for preventing manual operation (Not suitable for coupling relays)	3RT2916-4MA10
<b>Connection modules for contactors with screw terminals</b>			
<b>Sizes S00 and S0</b>			
	3RT2.1, 3RH2.	<b>Adapters for contactors</b> Ambient temperature $T_{U\max} = 60\text{ °C}$ Size S00, rated operational current $I_e$ at AC-3/400 V: 20 A	<b>Screw terminals</b> 
3RT1926-4RD01	3RT2.2	Size S0, rated operational current $I_e$ at AC-3/400 V: 25 A	3RT1916-4RD01  3RT1926-4RD01
	3RT2.1, 3RT2.2, 3RH2.	<b>Plugs for contactors</b> Size S00, S0	3RT1900-4RE01
3RT1900-4RE01			
<b>Terminal covers for contactors with box terminals</b>			
<b>Size S2</b>			
	3RT203 3RT233, 3RT253	<b>Covers for box terminals</b> For 3-pole contactors For 4-pole contactors (see Chapter 4)	3RT2936-4EA2 3RT2936-4EA4
3RT2936-4EA2			
<b>Coil connection modules</b>			
<b>Sizes S0 and S2</b>			
	3RT2.2, 3RT2.3	Connection from top Connection from below Connection diagonally	3RT2926-4RA11 3RT2926-4RB11 3RT2926-4RC11
3RT2926-4RA11			
	3RT2.2	Connection from top Connection from below	<b>Spring-type terminals</b> 
3RT2926-4RA12			3RT2926-4RA12 3RT2926-4RB12
<b>Covers for contactors with ring cable lug connections</b>			
<b>Size S00</b>			
	3RT2.1, 3RH2	<b>Covers for ring terminal lug connections</b> Single covers	<b>Ring terminal lug connections</b> 
3RT2916-4EA13			3RT2916-4EA13
	3RT2.2	<b>Covers for ring terminal lug connections</b> Set for one device, comprising 4 single covers: - 2 x 3RT2926-4EB13 - 2 x 3RV2928-4AA00	3RT2926-4EB13
3RT2926-4EB13			

1) Exception: contactors and contactor relays with auxiliary switch block mounted onto the front.

# Accessories for 3RT contactors / 3RH control relays

## Terminals, covers, adapters, connectors

CONTACTORS AND ASSEMBLIES 2

For contactors Type	Version	Order No.	Weight
------------------------	---------	-----------	--------

### Screw adapters for fixing the contactors

#### Sizes S0 and S2



NSB0\_01470  
3RT1926-4P

3RT2.2,  
3RT2.3

Screw adapters for easier screw fixing  
2 units required per contactor  
(1 pack contains 10 sets for 10 contactors)

3RT1926-4P

### Solder pin adapters for contactors up to 7.5 HP / 12 A

#### Size S00, up to 7.5 HP



3RT2.1,  
3RH21

Assembly kit for soldering contactors onto a printed circuit board.  
For 1 contactor, 1 set is required.

#### Screw terminals



3RT1916-4KA1



3RT1916-4KA1

### Solder pin adapters for contactors up to 7.5 HP / 12 A with mounted 4-pole auxiliary switch block

#### Size S00, up to 7.5 HP



3RT2.1,  
3RH21

Assembly kit for soldering contactors with an auxiliary switch block onto a printed circuit board.  
For 1 contactor, 1 set is required.

3RT1916-4KA2



3RT1916-4KA2

### Safety main current connectors for 2 contactors

#### Sizes S00 to S2

For series connection of 2 contactors



3RT2.1  
3RT2.2  
3RT2.3

3RA2926-1A

3RA2916-1A  
3RA2926-1A  
3RA2936-1A

1) Exception: contactors and contactor relays with auxiliary switch block mounted onto the front.

# Accessories for 3RT contactors / 3RH control relays

## Terminals, covers, accessories

### Selection and ordering data

For contactors	Design	Order No.	Weight approx.
Size	Type		kg.

#### Box terminal block for contactors with screw connections

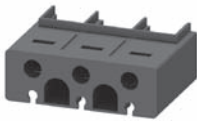
3RT19 5. -4G



		For circular conductors and ribbon cables For connectable cross-sections, see technical data of contactors, page 2/99		
<b>S3</b>	3RT2. 4	16 mm <sup>2</sup> / 10 AWG (solid), 70 mm <sup>2</sup> / 0 AWG (stranded)	<b>3RT19 46-4G</b>	
<b>S6</b>	3RT1. 5 (3RB205)	up to 70 mm <sup>2</sup> / 2/0 AWG up to 120 mm <sup>2</sup> / 4/0 AWG	<b>3RT19 55-4G</b> <b>3RT19 56-4G</b>	0.23 0.26
<b>S10, S12</b>	3RT1. 6, 3RT1. 7 (3RB206)	240 mm <sup>2</sup> - 500 mm <sup>2</sup> / 500 MCM - 750 MCM with auxiliary conductor connection	<b>3RT19 66-4G</b>	0.64

#### Covers for contactors with screw connections

3RT29 36-4EA2



		Terminal cover for box terminals		
<b>S2</b>	3RT20 3	Additional shock-hazard protection for mounting on the box terminals (2 units required per contactor)	<b>3RT29 36-4EA2</b>	0.012
<b>S3</b>	3RT20 4		<b>3RT19 46-4EA2</b>	
<b>S6</b>	3RT1. 5	Length: 25 mm	<b>3RT19 56-4EA2</b>	0.016
<b>S10, S12</b>	3RT1. 6, 3RT1. 7	Length: 30 mm	<b>3RT19 66-4EA2</b>	

3RT19 46-4EA1



		Terminal cover for cable lug and busbar connection		
<b>S3</b>	3RT20 4 3RT24 4	For complying with the phase clearances and as shock-hazard protection in the case of a distant box terminal <sup>1)</sup> (2 units required per contactor)	<b>3RT19 46-4EA1</b>	0.028
<b>S6</b>	3RT1. 5	Length: 100 mm	<b>3RT19 56-4EA1</b>	0.05
<b>S10, S12</b>	3RT1. 6, 3RT1. 7	Length: 120 mm	<b>3RT19 66-4EA1</b>	
<b>S6</b>	3RT1. 5	For covering bars between the contactor and 3RB20 overload relay or wiring connector for contactor assemblies Length: 27 mm	<b>3RT19 56-4EA3</b>	0.018
<b>S10, S12</b>	3RT1. 6, 3RT1. 7	Length: 42 mm	<b>3RT19 66-4EA3</b>	

Design	Order No.	Package quantity	Weight approx.
			kg

#### Insulation stop for securely holding back the conductor insulation on conductors up to 1 mm<sup>2</sup> (17 AWG)

3RT1916-4JA02



		Insulation stop strips can be inserted in cable entry of the spring terminal (2 strips per contactor required)		
		• For basic devices S00 (3RT201. or 3RH2. ), removable individually	<b>3RT2916-4JA02</b>	20 strips 0.005
		• For auxiliary and control circuit on basic devices size S0 and S2 (3RT2.2., 3RT2.3.) and for mountable 3RH29 auxiliary switches, removable in pairs	<b>3RT1916-4JA02</b>	20 strips 0.010

#### Tool for opening spring-type terminals

3RA2908-1A






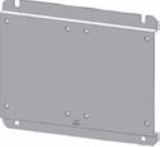
<b>Screwdriver</b>		for all SIRIUS devices with spring-type terminals Length: approx. 200 mm, 3,0 mm x 0,5 mm, titanium gray/black, partially insulated	<b>3RA2908-1A</b>	1 unit 0.045
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1) Refer to the note on page 2/142, conductor cross-sections.

# Contactors Assemblies for Switching Motors

## 3RA13, 3RA23 reversing contactor assemblies

### Accessories

	For contactors Type	Size	Design	Order No.	Weight approx. kg	
<b>Mechanical interlocks</b>						
	3RA19 24-2B	3RT2.3	<b>S2</b>	<b>laterally mountable</b> for 3RT2 S2 contactors only. There are no NC auxiliary contacts. Use the integrated NC auxiliary on the contactor.	<b>3RA2934-2B</b>	0.04
		3RT204, 3RT234, 3RT245	<b>S3</b> <sup>1)</sup>	<b>laterally mountable</b> each with one auxiliary contact (1 NC) per contactor (can only couple contactors of max. 1 level different size. The mounting depth of the smaller contactor has to be adapted.) Interlock width: 10 mm	<b>3RA2934-2B</b>	0.05
	3RA19 54-2C	3RT204 to 3RT105	<b>S3 to S6</b>	<b>adapter to mechanically</b> interlock a 3RT204 with a 3RT105 includes the adapter and QTY 2 - 3RA1942-2G mechanical connectors requires the 3RA1954 - 2A to be ordered separately  Note: Fits 3RT104 AC coil versions only. Does not fit 3RT104 DC coil versions.	<b>3RA1954-2G</b>	
	3RA19 54-2A	3RT1. 5 to 3RT1. 7	<b>S6, S10, S12</b>	<b>laterally mountable</b> without auxiliary contacts; size S6, S10 and S12 contactors can be interlocked with each other as required; no adaptation of mounting depth is necessary. Contactor clearance 10 mm.	<b>3RA1954-2A</b>	0.02
<b>Baseplates</b>						
	3RA1972-2A	3RT10 5	<b>S6</b>	for customer mounting of contactor assemblies for reversing	<b>3RA1952-2A</b>	1.3
		3RT1. 6	<b>S10</b>		<b>3RA1962-2A</b>	2.4
		3RT1. 7	<b>S12</b>		<b>3RA1972-2A</b>	2.6

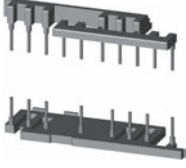
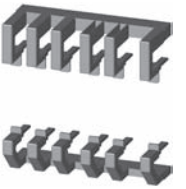
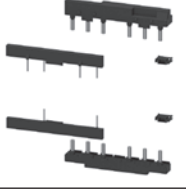
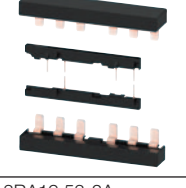
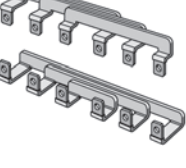
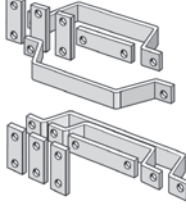
1) Can also be used for size S3 4-pole contactors.



# Contactor Assemblies for Switching Motors

## 3RA13, 3RA23 reversing contactor assemblies

### Accessories

	For contactors Type	Size	Details	Screw Terminals Order No.	Spring Terminals Order No.	Pkg. qty.
<b>Assembly kits for making 3-pole contactor assemblies</b>						
	3RT201	<b>S00</b>	The assembly kit contains: Mechanical interlock, 2 connecting clips for 2 contactors, Wiring modules on the top and bottom  • For main, auxiliary and control circuits	<b>3RA2913-2AA1</b>	<b>3RA2913-2AA2</b>	1 kit
	3RT202	<b>S0</b>	The assembly kit contains: Mechanical interlock, 2 connecting clips for 2 contactors, Wiring modules on the top and bottom  • For main, auxiliary and control circuits <sup>1)</sup> • Only for main circuit <sup>2)</sup>	<b>3RA2923-2AA1</b> —	— <b>3RA2923-2AA2</b>	1 kit 1 kit
	3RT203	<b>S2</b>	The installation kit contains: 2 connecting clips for 2 contactors, Wiring modules on the top and bottom  • Only for main circuit <sup>3)</sup>	<b>3RA2933-2AA1</b> —	— <b>3RA2933-2AA2</b>	1 kit 1 kit
	3RT204	<b>S3</b>	The installation kit contains: 2 connecting clips for 2 contactors, Wiring modules on the top and bottom and the mechanical interlock	<b>3RA2943-2AA1</b>	—	
	3RT105	<b>S6</b>	The installation kit contains: Wiring modules on the top and bottom (for connection with box terminal)	<b>3RA19 53-2A</b>	—	1 kit
	3RT105 3RT1. 6 3RT1. 7	<b>S6</b> <b>S10</b> <b>S12</b>	The installation kit contains: Wiring modules on the top and bottom (for connection without box terminals)	<b>3RA1953-2M</b> <b>3RA1963-2A</b> <b>3RA1973-2A</b>		1 kit

1) Use of the 3RA2923-2AA1 assembly kit in conjunction with the 3RT202-.....-3MA0 contactors is limited because the auxiliary switches in the basic unit are not allowed to be used on account of the permanently mounted auxiliary switch block.

2) Version in size S0 with spring-type terminals: Only the wiring modules for the main circuit are included. No connectors are included for the auxiliary and control circuit.

3) Version in size S2 with spring-type terminals in the auxiliary and control circuits: Only the wiring modules for the main circuit are included. A cable set is included for the auxiliary circuit.

# Contactors Assemblies for Switching Motors

## 3RA13, 3RA23 reversing contactor assemblies

### Accessories

CONTACTORS AND ASSEMBLIES 2

	For contactors	Size	Contactor gap for interlock	Version	Screw Terminals Order No.	Spring Terminals Order No.	Pkg. qty.
<b>Wiring modules</b>							
	3RT201	<b>S00-S00</b>	0 mm	Top (in-phase) Bottom (phase reversal)	<b>3RA2913-3DA1</b> <b>3RA2913-3EA1</b>	<b>3RA2913-3DA2</b> <b>3RA2913-3EA2</b>	1 1
	3RT202	<b>S0-S0</b>	0 mm	Top (in-phase) Bottom (phase reversal)	<b>3RA2923-3DA1</b> <b>3RA2923-3EA1</b>	<b>3RA2923-3DA2</b> <b>3RA2923-3EA2</b>	1 1
	3RT203	<b>S2-S2</b>	10 mm	Top (in-phase) Bottom (phase reversal)	<b>3RA1933-3D</b> <b>3RA1933-3E</b>	<b>3RA1933-3D</b> <b>3RA1933-3E</b>	1 1
	3RT204	<b>S3-S3</b>	10 mm	Top (in-phase) Bottom (phase reversal)	<b>3RA1943-3D</b> <b>3RA1943-3E</b>	<b>3RA1943-3D</b> <b>3RA1943-3E</b>	1 1
	3RT105	<b>S6-S6</b>	10 mm	Top (in-phase, for connection with box terminal)	<b>3RA1953-3D</b>	<b>3RA1953-3D</b>	1
	3RA1953-3P			Top (with phase reversal, for connection without box terminal)	<b>3RA1953-3P</b>	<b>3RA1953-3P</b>	1

	For contactors	Size	Contactor gap for interlock	Interlock Type	Version	Order No.	Pkg. qty.
<b>Mechanical connectors<sup>1)</sup></b>							
	3RT201	<b>S00-S00</b>	0 mm	Laterally mountable	For 3-pole contactors and 4-pole contactors	<b>3RA2912-2H</b>	1 set
	3RT202	<b>S0-S0</b>	0 mm	Laterally mountable	For 3-pole contactors and 4-pole contactors	<b>3RA2922-2H</b>	1 set
	3RT203	<b>S2-S2</b>	0 mm	Laterally mountable	For 3-pole contactors	<b>3RA2932-2C</b>	5 sets
			10 mm	Laterally mountable	For 3-pole contactors	<b>3RA2932-2D</b>	5 sets
	3RT233			Laterally mountable	For 4-pole contactors	<b>3RA2932-2G</b>	5 sets
	3RT2. 4	<b>S3-S3</b>	0 mm	Mountable on front	For 3-pole contactors	<b>3RA2932-2C</b>	10 sets
			10 mm	Laterally mountable	For 3-pole contactors	<b>3RA2932-2D</b>	10 sets
					For 4-pole contactors	<b>3RA2942-2G</b>	10 sets
	3RT1. 5	<b>S6-S6</b>	10 mm	Laterally mountable	Top (with phase reversal, for connection without box terminal)	<b>3RA1932-2D</b>	10 sets

**Note:** Standard package quantities may change. Check Industry Mall for current package quantities.

1) 1 set for 1 contactor. Size S00 & S0: 1 set includes 2 connectors and 1 interlock. **Size S2: The mechanical interlock must be ordered separately.** S3-S6: 1 set includes 2 connectors; one connector for top and one connector for bottom.

# Contactors Assemblies for Switching Motors

## WYE-delta accessories

Accessories					
Design	Sizes	Order No.		Weight approx. kg	
<b>Installation kits<sup>1) 2)</sup></b>					
<p>3RA19 53-2B</p>	The installation kit contains: Mechanical interlock, 4 connecting clips, WYE jumper, Wiring connectors on the top and bottom,- For main, auxiliary, and control circuits <sup>3)</sup>	<b>S00-S00-S00</b>	<b>3RA2913-2BB1</b>	1 set	0.05
	The installation kit contains: mechanical interlock, 4 connecting clips, WYE jumper, wiring connectors on the top and bottom - For main, auxiliary, and control circuits <sup>3)</sup>	<b>S0-S0-S0</b> <b>S2-S2-S0</b> <b>S2-S2-S2</b>	<b>3RA2923-2BB1</b> <b>3RA2933-2C</b> <b>3RA2933-2BB1</b>	1 set 1 set	0.10 0.16 0.16
<p>3RA19 53-2N, 3RA19 63-2B, 3RA19 73-2B</p>	The installation kit contains: WYE jumper on the top Wiring jumper on the bottom	<b>S3-S3-S2</b> <b>S3-S3-S3</b> <b>S6-S6-S6</b>	<b>3RA2943-2C</b> <b>3RA2943-2BB1</b> <b>3RA1953-2B</b>		0.33 0.16 0.85
	(The wiring connector on the top is not included in the scope of supply. A double infeed between the line contactor and the delta contactor is recommended.)	<b>S6-S6-S6</b> <b>S10-S10-S10</b> <b>S12-S12-S12</b>	<b>3RA1953-2N</b> <b>3RA1963-2B</b> <b>3RA1973-2B</b>		0.60 1.80 2.20
	<b>3-phase feeder terminal</b>				
	Feeder terminal block for the line contactor for large conductor cross-sections Conductor cross-section: 6 mm <sup>2</sup> , 10 AWG Conductor cross-section: 16 mm <sup>2</sup> , 6 AWG Conductor cross-section: 70 mm <sup>2</sup> , 2/0 AWG	<b>S00</b> <b>S0</b> <b>S2</b>	<b>3RA2913-3K</b> <b>3RV2925-5AB</b> <b>3RV2935-5A</b>		1 unit
<b>1-phase feeder terminals</b>					
Conductor cross-section: 95 mm <sup>2</sup>	<b>S3</b>	<b>3RA2943-3L</b>			0.280
<b>3-phase busbar</b>					
For in-phase bridging of all input terminals of the line contactor (K1) and the delta contactor (K3)	<b>S0</b> <b>S2</b>	<b>3RV1915-1AB</b> <b>3RV2935-5E</b>		1 unit	0.03 0.15
<b>Link for paralleling, 3-pole (WYE jumpers)</b>					
3RT19 26-4BA31 	Without terminal (the links for paralleling can be reduced by one pole)	<b>S00<sup>1)</sup></b> <b>S0<sup>1)</sup></b> <b>S2</b> <b>S3</b> <b>S6<sup>4)</sup></b> <b>S10, S12<sup>4)</sup></b>	<b>3RT1916-4BA31</b> <b>3RT1926-4BA31</b> <b>3RT1936-4BA31</b> <b>3RT1946-4BA31</b> <b>3RT1956-4BA31</b> <b>3RT1966-4BA31</b>	1 unit	0.010 0.020 0.02 0.02 0.15
<b>Baseplates</b>					
For customer assembly of WYE-delta contactor assemblies with a <b>laterally mounted</b> time-delay				1 unit	
Side-by-side mounting		<b>S2 S2 S0</b>	<b>3RA2932-2F</b>		0.45
10 mm clearance between K3 and K2		<b>S2 S2 S2</b>	<b>3RA2932-2F</b>		0.48
Side-by-side mounting		<b>S3 S3 S2</b>	<b>3RA2942-2F</b>		0.72
Side-by-side mounting		<b>S3 S3 S3</b>	<b>3RA2942-2F</b>		0.72
10 mm clearance between K1, K3 and K2		<b>S S S</b> <b>S6 S6 S3</b> <b>S6 S6 S6</b> <b>S10 S10 S6</b> <b>S10 S10 S10</b> <b>S12 S12 S10</b> <b>S12 S12 S12</b>	<b>3RA1952-2E</b> <b>3RA1952-2F</b> <b>3RA1962-2E</b> <b>3RA1962-2F</b> <b>3RA1972-2E</b> <b>3RA1972-2F</b>	1 unit	2.0 2.1

1) Size S00, S0 and S2 installation kits for paralleling are available in spring-type terminals. Change the last digit of the order number to a "2".

2) When using the function modules for wye-delta starting, the wiring modules for the auxiliary current are not required. See page 2/45 for more information.

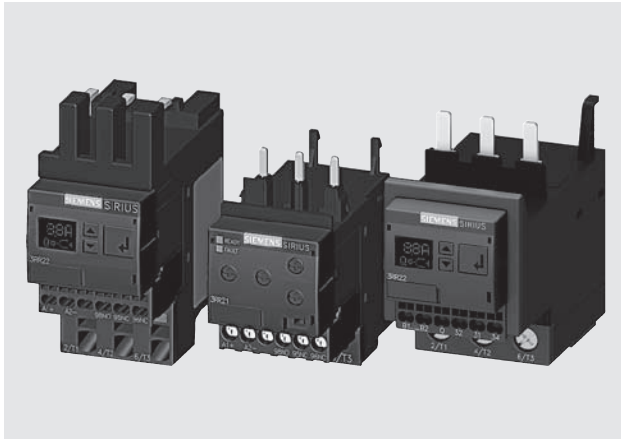
3) Also requires quantity (1) 3RA2816-0EW20 function module set for all control functions. See page 2/45.

4) The 3RT19 56-4EA1 (S6) or 3RT19 66-4EA1 (S10, S12) cover can be used for shock-hazard protection.

# Contactor Assemblies for Switching Motors

## Current Monitoring Relays

### Overview



SIRIUS 3RR2242, 3RR2142 and 3RR2243 current monitoring relays

The SIRIUS 3RR2 current monitoring relays are suitable for the load monitoring of motors or other loads. In two or three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR2 current monitoring relays can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. No separate transformers are required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal supports for stand-alone installation are available for separate standard rail mounting.

### Versions

#### Basic versions

The basic versions with two-phase apparent current monitoring, a CO contact output and analog adjustability provide a high level of monitoring reliability especially in the rated and overload range.

#### Standard versions

The standard versions monitor the current in three phases with selectable active current monitoring. They have additional diagnostics options such as residual current monitoring and phase sequence monitoring, and they are also suitable for monitoring motors below the rated torque. These devices have an additional independent semiconductor output, an actual value indicator, and are digitally adjustable.

Both versions are available optionally with screw or spring-type terminals, in each case for sizes S00 and S0. With variants of size S2 the main current paths always have screw terminals; the control current side can have screw or spring-type terminals.

#### Note:

In addition to the features of the standard versions, 3RR24 monitoring relays for mounting onto 3RT2 contactors for IO-Link also offer the possibility of transmitting the measured values and diagnostics data to a controller via an IO-Link. Furthermore, the devices can be parameterized on the devices themselves or via IO-Link.

### Benefits

- Can be mounted directly on 3RT2 contactors and 3RA23 reversing contactor assemblies, in other words, there is no need for additional wiring in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw terminals or spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for broken cables, phase failure, phase sequence, residual current and motor blocking

### Application

- Monitoring of current overshoot and undershoot
- Monitoring of broken conductors
- Monitoring of no-load operation and load shedding, e.g. in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g. on conveyor belts or cranes due to an excessive load
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g. caused by damaged insulation or moisture

# Contactors Assemblies for Switching Motors

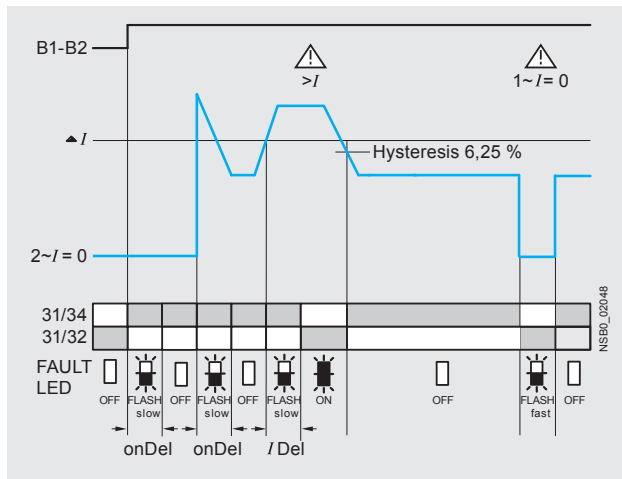
## Current Monitoring Relays

### Technical specifications

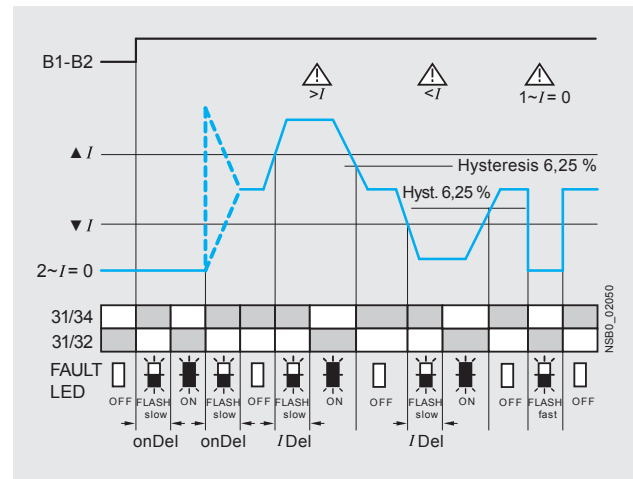
#### Function charts of 3RR214.-A.30 basic variants, analog dial adjustable

Closed-circuit principle upon application of the control supply voltage

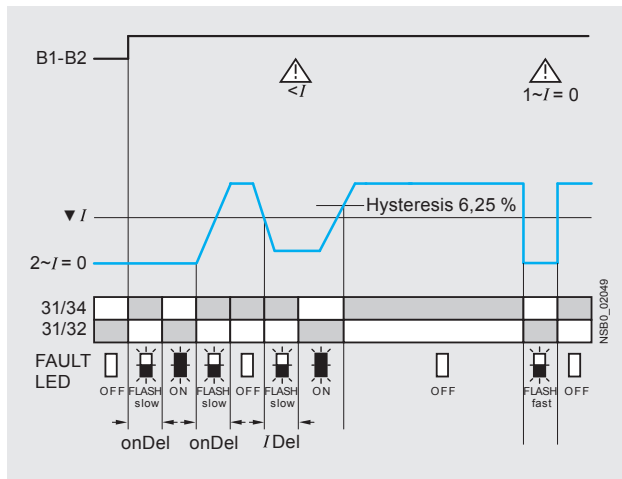
Current overshoot



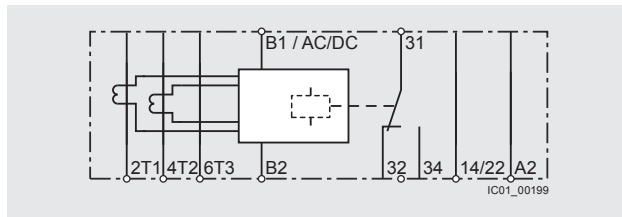
Range monitoring



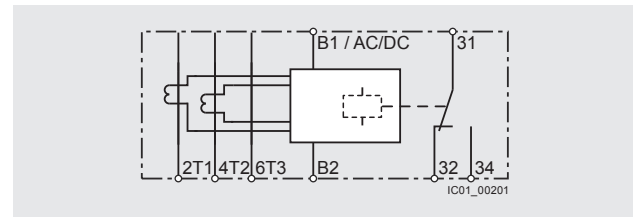
Current undershoot



### Circuit diagrams



3RR2141-1A.30



3RR2141-2A.30, 3RR2142-.A.30, 3RR2143-.A.30

#### Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

# Contactor Assemblies for Switching Motors

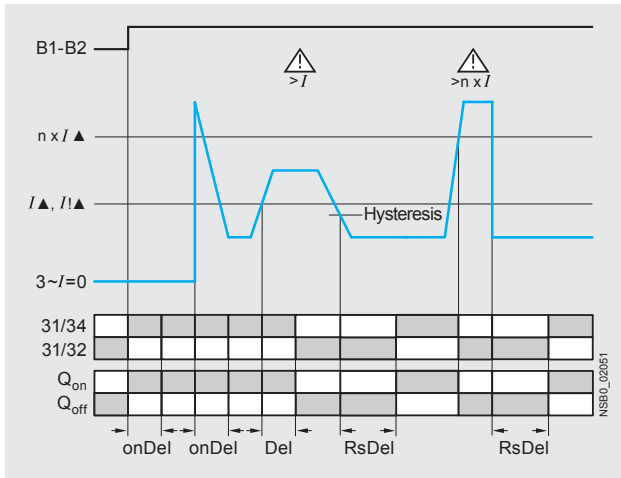
## Current Monitoring Relays

### Function charts of 3RR224-..F.30 standard versions, digitally adjustable

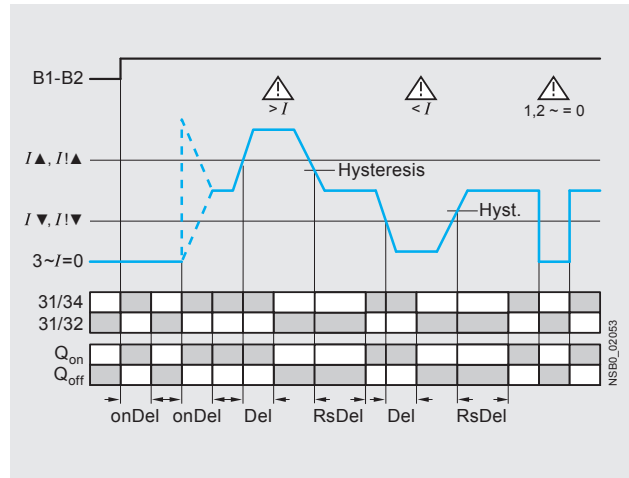
With the closed-circuit principle selected upon application of the control supply voltage

2 CONTACTORS AND ASSEMBLIES

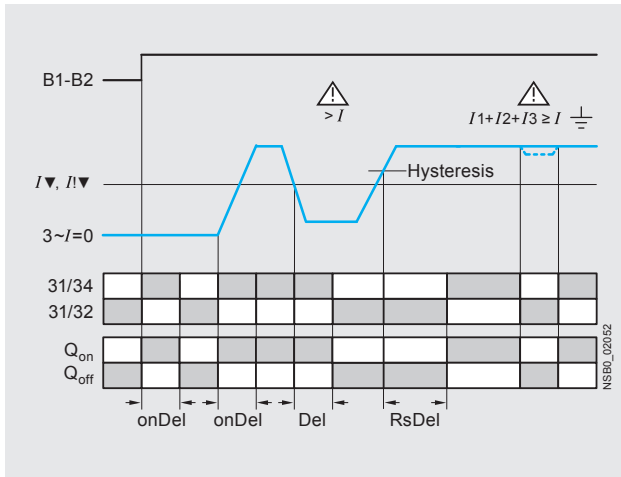
Current overshoot



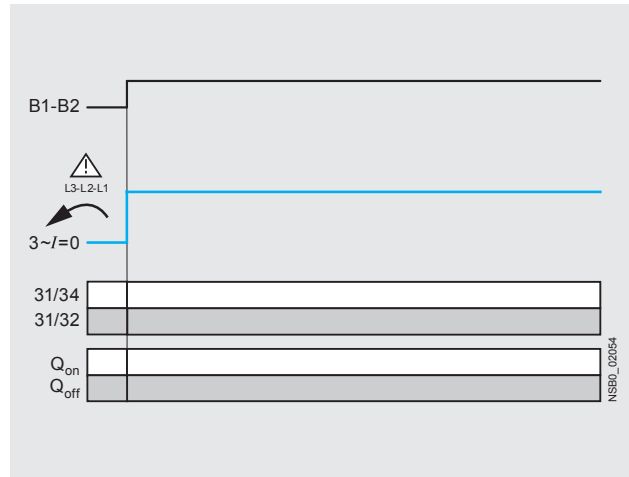
Range monitoring



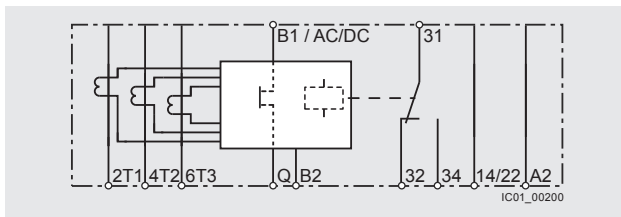
Current undershoot with residual current monitoring



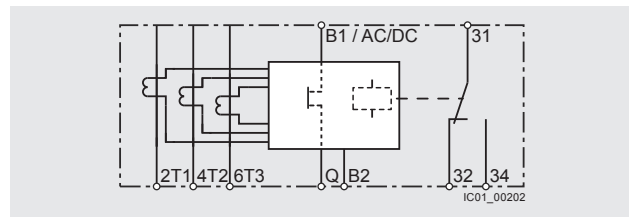
Phase sequence monitoring



### Circuit diagrams



3RR2241-1F.30



3RR2241-2F.30, 3RR2242-..F.30, 3RR2243-..F.30

**Note:**

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

# Contactor Assemblies for Switching Motors

## Current Monitoring Relays

### Selection and ordering data

#### SIRIUS 3RR21/3RR22 current monitoring relays

- For load monitoring of motors or other loads
- Multi-phase monitoring of undercurrent and overcurrent
- Starting and tripping delay can be adjusted separately
- Tripping delay 0 to 30 s
- Auto or Manual RESET



3RR2141-1AW30



3RR2142-1AW30



3RR2241-1FW30



3RR2242-1FW30



3RR2141-2AA30



3RR2243-3FW30

Size	Measuring range	Hysteresis	Control supply voltage $U_s$	Screw terminals	Spring-type terminals
A	A	A	V	Order No.	Order No.

#### Basic versions

- Analogically adjustable
- Closed-circuit principle
- 1 CO contact
- 2-phase current monitoring
- Apparent current monitoring
- Start-up delay 0 ... 60 s

<b>S00</b>	1.6 ... 16	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	<b>3RR2141-1AA30</b> <b>3RR2141-1AW30</b>	<b>3RR2141-2AA30</b> <b>3RR2141-2AW30</b>
<b>S0</b>	4 ... 40	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	<b>3RR2142-1AA30</b> <b>3RR2142-1AW30</b>	<b>3RR2142-2AA30</b> <b>3RR2142-2AW30</b>
<b>S2</b>	8 ... 80	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	<b>3RR2143-1AA30</b> <b>3RR2143-1AW30</b>	<b>3RR2143-3AA30</b> <b>3RR2143-3AW30</b>

#### Standard versions

- Digitally adjustable
- LC display
- Open or closed-circuit principle
- 1 CO contact
- 1 semiconductor output
- 3-phase current monitoring
- Active current or apparent current monitoring
- Phase sequence monitoring
- Residual current monitoring
- Blocking current monitoring
- Reclosing delay time 0 ... 300 min
- Start-up delay 0 ... 99 s
- Separate settings for warning and alarm thresholds

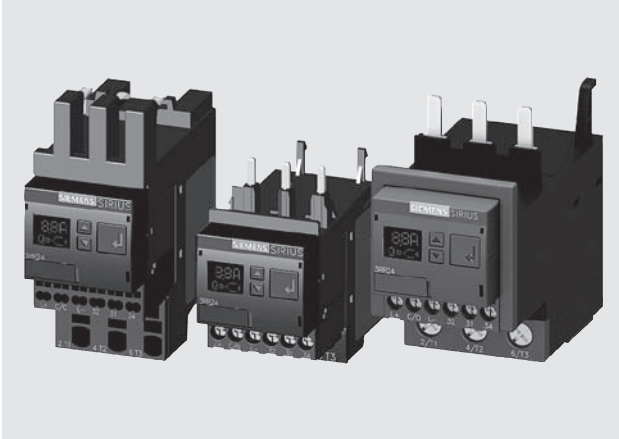
<b>S00</b>	1.6 ... 16	0.1 ... 3	24 AC/DC 24 ... 240 AC/DC	<b>3RR2241-1FA30</b> <b>3RR2241-1FW30</b>	<b>3RR2241-2FA30</b> <b>3RR2241-2FW30</b>
<b>S0</b>	4 ... 40	0.1 ... 8	24 AC/DC 24 ... 240 AC/DC	<b>3RR2242-1FA30</b> <b>3RR2242-1FW30</b>	<b>3RR2242-2FA30</b> <b>3RR2242-2FW30</b>
<b>S2</b>	8 ... 80	0.2 ... 16	24 AC/DC 24 ... 240 AC/DC	<b>3RR2243-1FA30</b> <b>3RR2243-1FW30</b>	<b>3RR2243-3FA30</b> <b>3RR2243-3FW30</b>



# Contactors and Contactor Assemblies for Switching Motors

## Current Monitoring Relays with IO-Link

### Overview



SIRIUS 3RR2441, 3RR2442 and 3RR2443 current monitoring relays

The SIRIUS 3RR24 current monitoring relays for IO-Link are suitable for the load monitoring of motors or other loads. In three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option, which is also selectable, can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR24 current monitoring relays for IO-Link can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. No separate transformers are required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal supports for stand-alone installation are available for separate standard rail mounting.

The SIRIUS 3RR24 current monitoring relays for IO-Link also offer many other options based upon the monitoring functions of the conventional SIRIUS 3RR2 monitoring relays:

- Measured value transmission to a controller, including resolution and unit, may be parameterizable as to which value is cyclically transmitted
- Transmission of alarm flags to a controller
- Full diagnosis capability by inquiry as to the cause of the fault in the diagnosis data record
- Remote parameterization is also possible, in addition to or instead of local parameterization

- Rapid parameterization of the same devices by duplication of the parameterization in the controller
- Parameter transmission by upload to a controller by IO-Link call or by parameter server (if IO-Link master from IO-Link Specification V 1.1 and higher is used)
- Consistent central data storage in the event of parameter change locally or via a controller
- Automatic reparameterizing when devices are exchanged
- Blocking of local parameterization via IO-Link possible
- Faults are saved in parameterizable and non-volatile fashion to prevent an automatic start up after voltage failure and to make sure diagnostics data is not lost
- By integration into the automation level the option exists of parameterizing the monitoring relay at any time via a display unit or displaying the measured values in a control room or locally at the machine/control cabinet

Even without communication via IO-Link the devices continue to function fully autonomously:

- Parameterization can take place locally at the device, independently of a controller
- In the event of failure or before the controller becomes available the monitoring relays work as long as the control supply voltage (24 V DC) is present
- If the monitoring relays are operated without the controller, the 3RR24 monitoring relays for IO-Link have, thanks to the integrated SIO mode, an additional semiconductor output, which switches when the adjustable warning threshold is exceeded

Thanks to the combination of autonomous monitoring relay function and integrated IO-Link communication, redundant sensors and/or analog signal converters – which previously took over the transmission of measured values to a controller, leading to considerable extra cost and wiring outlay – are no longer needed.

Because the output relays are still present, the monitoring relays increase the functional reliability of the system, since only the controller can fulfill the control tasks if the current measured values are available, whereas the output relays can also be used for the disconnection of the system if limit values that cannot be reached during operation are exceeded.

For further information on the IO-Link communication system, see [Chapter 14](#).

# Contactors and Contactor Assemblies for Switching Motors

## Current Monitoring Relays with IO-Link

### Benefits

- Can be mounted directly on 3RT2 contactors and 3RA23 reversing contactor assemblies, in other words, there is no need for additional wiring in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw or spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for current unbalance, broken cables, phase failure, phase sequence, residual current and motor blocking
- Integrated counter for operating cycles and operating hours to support requirements-based maintenance of the monitored machine or application
- Simple cyclical transmission of the current measured values, relay switching states and events to a controller
- Remote parameterization
- Automatic reparameterizing when devices are exchanged
- Simple duplication of identical or similar parameterizations
- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Integration in TIA means clear diagnostics if a fault occurs
- Cost saving and space saving in control cabinet due to the elimination of AI and IO modules as well as analog signal converters and duplicated sensors

### Application

- Monitoring of current overshoot and undershoot
- Monitoring of broken conductors
- Monitoring of no-load operation and load shedding, e.g. in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g. on pumps due to a dirty filter system
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g. caused by damaged insulation or moisture

The use of SIRIUS monitoring relays for IO-Link is particularly recommended for machines and plant in which these relays, in addition to their monitoring function, are to be connected to the automation level for the rapid, simple and fault-free provision of the current measured values and/or for remote parameterization.

The monitoring relays can either relieve the controller of monitoring tasks or, as a second monitoring entity in parallel to and independent of the controller, increase the reliability in the process or in the system. In addition, the elimination of AI and IO modules allows the width of the controller to be reduced despite significantly expanded functionality.

# Contactors Assemblies for Switching Motors

## Current Monitoring Relays with IO-Link

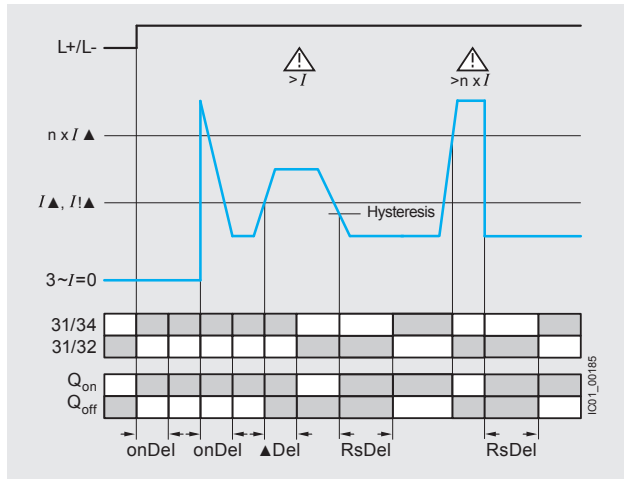
CONTACTORS AND ASSEMBLIES 2

### Technical specifications

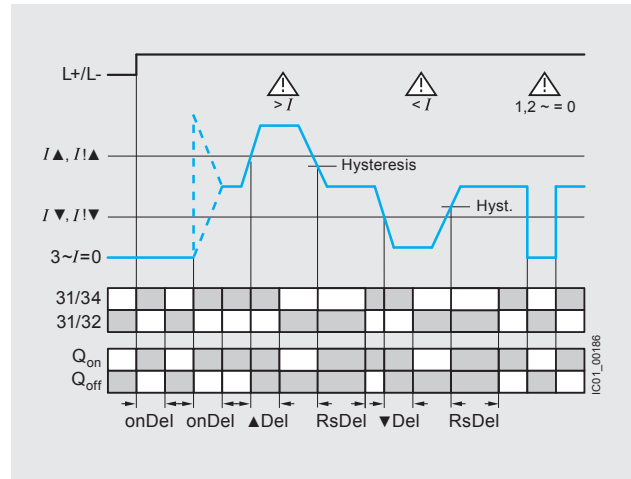
#### Function charts for 3RR24 for IO-Link, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

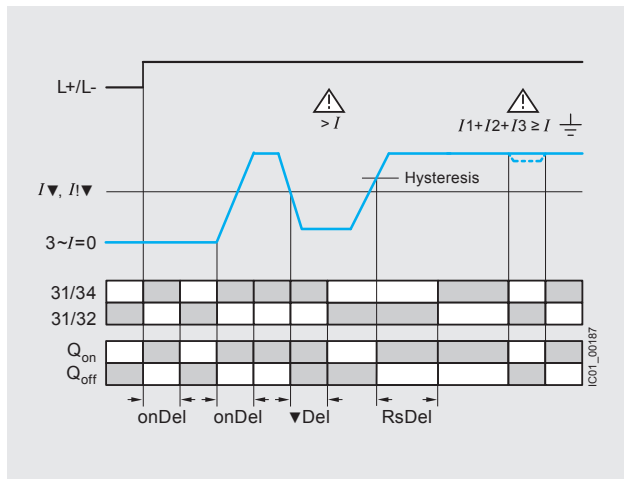
Current overshoot



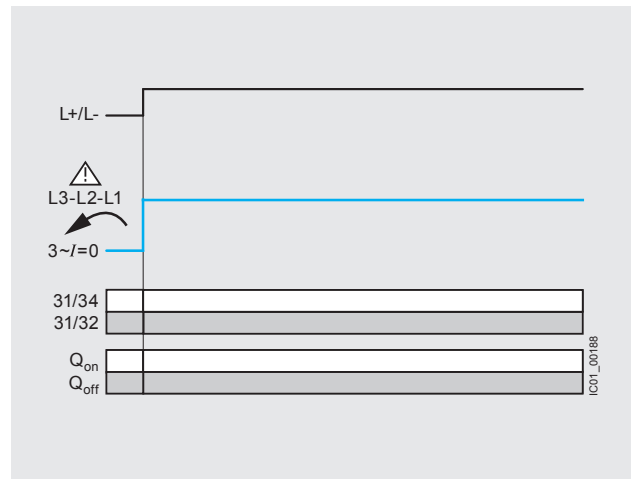
Range monitoring



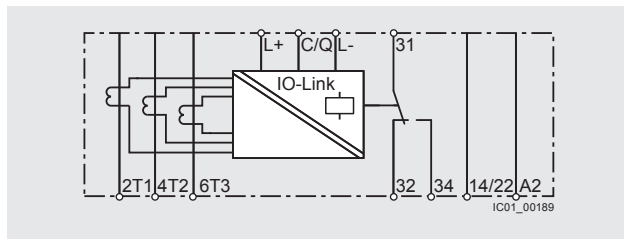
Current undershoot with residual current monitoring



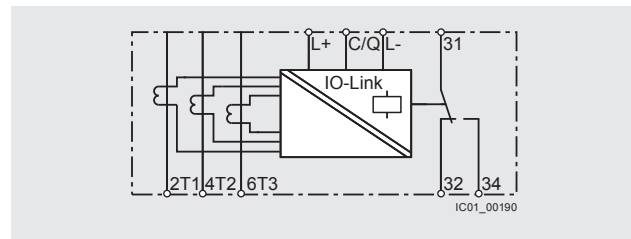
Phase sequence monitoring



### Circuit diagrams



3RR2441-1AA40



3RR2441-2AA40, 3RR2442-AA40, 3RR2443-AA40

#### Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

# Contactors and Contactor Assemblies for Switching Motors

## Current Monitoring Relays

### Selection and ordering data

#### SIRIUS 3RR24 current monitoring relays for IO-Link

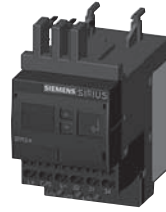
- For load monitoring of motors or other loads
- Multi-phase monitoring of undercurrent and overcurrent
- Starting and tripping delay can be adjusted separately
- Tripping delay 0 to 999.9 s
- Auto or Manual RESET



3RR2441-1AA40



3RR2442-1AA40



3RR2441-2AA40



3RR2442-2AA40



3RR2443-1AA40







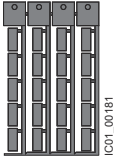



3RR2443-3AA40

Size	Measuring range	Hysteresis	Control supply voltage $U_c$	Screw terminals	Spring-type terminals
A	A	A	V	Order No.	Order No.
<ul style="list-style-type: none"> <li>• Digitally adjustable</li> <li>• LC display</li> <li>• Open or closed-circuit principle</li> <li>• 1 CO contact</li> <li>• 1 semiconductor output (in SIO mode)</li> <li>• 3-phase current monitoring</li> <li>• Active current or apparent current monitoring</li> <li>• Current unbalance monitoring</li> <li>• Phase sequence monitoring</li> <li>• Residual current monitoring</li> <li>• Blocking current monitoring</li> <li>• Operating hours counter</li> <li>• Operating cycles counter</li> <li>• Reclosing delay time 0 ... 300 min</li> <li>• Start-up delay 0 ... 999.9 s</li> <li>• Separate settings for warning and alarm thresholds</li> </ul>					
<b>S00</b>	1.6 ... 16	0.1 ... 3	24 DC	<b>3RR2441-1AA40</b>	<b>3RR2441-2AA40</b>
<b>S0</b>	4 ... 40	0.1 ... 8	24 DC	<b>3RR2442-1AA40</b>	<b>3RR2442-2AA40</b>
<b>S2</b>	8 ... 80	0.2 ... 16	24 DC	<b>3RR2443-1AA40</b>	<b>3RR2443-3AA40</b>

# Contactors Assemblies for Switching Motors

## Current Monitoring Relay Accessories

### Accessories

Use	Version	Size	Order No.	Standard Pack Quantity
<b>Terminal supports for stand-alone installation<sup>1)</sup></b>				
 3RU2916-3AA01	For 3RR21, 3RR22, 3RR24 For separate mounting of the overload relays or monitoring relays; screw and snap-on mounting onto TH 35 standard mounting rail according to IEC 60715 • Screw connection	S00	<b>Screw terminals</b>  3RU2916-3AA01 3RU2926-3AA01 3RU2936-3AA01	1 unit
		S0		1 unit
		S2		1 unit
 3RU2926-3AC01	• Spring-type connection	S00	<b>Spring-type terminals</b>  3RU2916-3AC01 3RU2926-3AC01	1 unit
		S0		1 unit
<b>Blank labels</b>				
 3RT2900-1SB20	For 3RR21, 3RR22, 3RR24 <b>Unit labeling plates<sup>2)</sup></b> For SIRIUS devices 20 mm x 7 mm, titanium gray		3RT2900-1SB20	340 units
<b>Sealable covers</b>				
 3RR2940	For 3RR21, 3RR22, 3RR24 <b>Sealable covers</b> For securing against unintentional or unauthorized adjustment of settings		3RR2940	5 units
	For 3RR21 <b>Sealing foil</b> For securing against unauthorized adjustment of setting knobs		3TK2820-0AA00	1 unit
<b>Tools for opening spring-type terminals</b>				
 3RA2908-1A	For auxiliary circuit connections <b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated		<b>Spring-type terminals</b>  3RA2908-1A	1 unit

<sup>1)</sup> The accessories are identical to those of the 3RU21 thermal overload relays and the 3RB3 electronic overload relays, see Chapter 3 "Overload Relays".

<sup>2)</sup> PC labeling system for individual inscription of unit labeling plates available from: Systems, Inc. [www.murrplastic.com](http://www.murrplastic.com)

# Contactors Assemblies for Switching Motors

## NEMA 1 Enclosure

### Selection and ordering data

- \* NEMA Type 1 Enclosures
- \* Lift off cover
- \* Accepts SIRIUS power control components
- \* Non-reversing contactors
- \* Reversing contactors
- \* Starters with thermal overload relays
- \* Starters with solid-state overload relays



### Application

The 49EC14\*B separate enclosures are designed for field assembly of a wide range of Siemens SIRIUS open style control components and field modification kits as listed in the charts below. Note that certain components require the addition of a DIN Rail kit for proper mounting in the enclosure.

### NEMA 1 Enclosures

Max. current A	Contactor		Max. current A	Overload relay		Required DIN rail kit Order No.	NEMA 1 Enclosure Order No.
	Non-reversing	Reversing		Thermal	Solid-state		
16	3RT201	3RA231	16	3RU2116	3RB3016	MTR5	49EC14EB110705R
38	3RT202	3RA232	40	3RU2126	3RB3026	MTR5	
50	3RT203		50	3RU2136	3RB3036	—	49EC14GB140807R
12		3RA231	12	3RU2116	3RB3016	MTR5	
25		3RA232	25	3RU2126	3RB3036	MTR5	
50		3RA233	50	3RU2136	3RB3036	—	
95	3RT204		100	3RU2146	3RB3046	—	49EC14IB201208R
95		3RA234	100	3RU2146	3RB3046	—	



### Accessories for NEMA 1 Enclosures

Accessory type	Description	Legends	Voltage	Order No.
Push buttons	Momentary	Start - Stop	none	49SDPB5
	Monentary	Reset (blue)		49MBRS
Selector Switch	2 position	Off - On	none	49SDSB4
	3 position	Hand - Off - Auto	none	49SDSB1
		For - Off - Rev		49SDSB2
Pilot light	Light module and lens color: RED, GREEN, and AMBER"	ON, RUN, OFF, OL TRIPPED	24 to 240 AC DC	49SDLBU
			277V AC	49SDLBL
	Light module and lens color: RED, RED	REV - FOR or HIGH - LOW	24 to 240 AC DC	49SDLB7RU
			277V AC	49SDLB7RL
Light module and lens color: GREEN, GREEN	REV - FOR or HIGH - LOW	24 to 240 AC DC	49SDLB7GU	
		277V AC	49SDLB7GL	

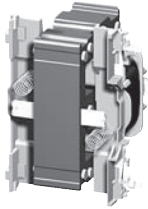
For 3RT contactors, see page 2/8.  
 For 3RA reversing, see pages 2/37.  
 For thermal overloads, see page 3/10.  
 For solidstate overloads, see pages 3/22.  
 For enclosure dimensions, see figures 1, 2, and 3 on page 9/150.

# 3RT Contactors

## Spare parts for 3RT2 contactors

### Selection and ordering data

*For screw, spring-type and ring lug terminal connection*



3RT29 24-5A.01

For contactors		Rated control supply voltage $U_s$			Order No.	Weight approx. kg	
Size	Type	50 Hz V	50/60 Hz V	60 Hz V			
<b>Solenoid coils • AC operation</b>							
<b>S0</b>	3RT20 23,	24	--	--	<b>3RT29 24-5AB01</b>	0.100	
	3RT20 24,	42	--	--	<b>3RT29 24-5AD01</b>	0.100	
	3RT20 25	48	--	--	<b>3RT29 24-5AH01</b>	0.100	
		110	--	--	<b>3RT29 24-5AF01</b>	0.100	
		230	--	--	<b>3RT29 24-5AP01</b>	0.100	
		400	--	--	<b>3RT29 24-5AV01</b>	0.100	
		--	24	--	<b>3RT29 24-5AC21</b>	0.100	
		--	42	--	<b>3RT29 24-5AD21</b>	0.100	
		--	48	--	<b>3RT29 24-5AH21</b>	0.100	
		--	110	--	<b>3RT29 24-5AG21</b>	0.100	
		--	220	--	<b>3RT29 24-5AN21</b>	0.100	
		--	230	--	<b>3RT29 24-5AL21</b>	0.100	
		110	--	120	<b>3RT29 24-5AK61</b>	0.100	
		220	--	240	<b>3RT29 24-5AP61</b>	0.100	
		--	100	110	<b>3RT29 24-5AG61</b>	0.100	
		--	200	220	<b>3RT29 24-5AN61</b>	0.100	
		--	400	440	<b>3RT29 24-5AR61</b>	0.100	
	<b>S0</b>	3RT20 26,	24	--	--	<b>3RT29 26-5AB01</b>	0.100
		3RT20 27,	42	--	--	<b>3RT29 26-5AD01</b>	0.100
		3RT20 28	48	--	--	<b>3RT29 26-5AH01</b>	0.100
3RT23 25,		110	--	--	<b>3RT29 26-5AF01</b>	0.100	
3RT23 26,		230	--	--	<b>3RT29 26-5AP01</b>	0.100	
3RT23 27		400	--	--	<b>3RT29 26-5AV01</b>	0.100	
3RT25 26		--	24	--	<b>3RT29 26-5AC21</b>	0.100	
		--	42	--	<b>3RT29 26-5AD21</b>	0.100	
		--	48	--	<b>3RT29 26-5AH21</b>	0.100	
		--	110	--	<b>3RT29 26-5AG21</b>	0.100	
		--	208	--	<b>3RT29 26-5AM21</b>	0.100	
		--	220	--	<b>3RT29 26-5AN21</b>	0.100	
		--	230	--	<b>3RT29 26-5AL21</b>	0.100	
		110	--	120	<b>3RT29 26-5AK61</b>	0.100	
		220	--	240	<b>3RT29 26-5AP61</b>	0.100	
		--	100	110	<b>3RT29 26-5AG61</b>	0.100	
		--	200	220	<b>3RT29 26-5AN61</b>	0.100	
		--	400	440	<b>3RT29 26-5AR61</b>	0.100	
		500	--	--	<b>3RT29 26-5AQ21</b>	0.100	
			277	--	<b>3RT29 26-5AU61</b>	0.100	
		480	--	<b>3RT29 26-5AV61</b>	0.100		
		600	--	<b>3RT29 26-5AT61</b>	0.100		

**Note:**

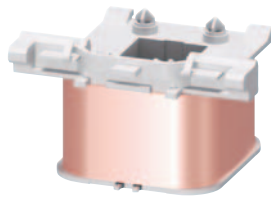
Contactors with AC and AC/DC coils have different depths. It is only possible to replace the coils on AC contactors with AC coils, and on AC/DC contactors with AC/DC coils. It is not possible to replace the coils on DC contactors in the S0 frame.



# Contactor Assemblies for Switching Motors

## Spare parts for 3RT2 contactors

### Screw terminals and spring-type terminals



3RT2934-5A.01



3RT2934-5N.31

For contactors Type	Rated control supply voltage $U_c$				SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	50 Hz	50/60 Hz	60 Hz	DC						
	V	V	V		d					
<b>Solenoid coils · AC operation</b>										
<b>Size S2</b>										
3RT203.-.A,	24	--	--	--	5	3RT2934-5AB01		1	1 unit	41B
3RT233.-.A,	42	--	--	--	5	3RT2934-5AD01		1	1 unit	41B
3RT253.-.A	48	--	--	--	5	3RT2934-5AH01		1	1 unit	41B
	110	--	--	--	5	3RT2934-5AF01		1	1 unit	41B
	230	--	--	--	5	3RT2934-5AP01		1	1 unit	41B
	400	--	--	--	5	3RT2934-5AV01		1	1 unit	41B
	--	24	--	--	5	3RT2934-5AC21		1	1 unit	41B
	--	42	--	--	5	3RT2934-5AD21		1	1 unit	41B
	--	48	--	--	5	3RT2934-5AH21		1	1 unit	41B
	--	110	--	--	5	3RT2934-5AG21		1	1 unit	41B
	--	220	--	--	5	3RT2934-5AN21		1	1 unit	41B
	--	230	--	--	5	3RT2934-5AL21		1	1 unit	41B
	110	--	120	--	5	3RT2934-5AK61		1	1 unit	41B
	220	--	240	--	5	3RT2934-5AP61		1	1 unit	41B
	--	--	480	--	5	3RT2934-5AV61		1	1 unit	41B
	--	--	600	--	5	3RT2934-5AT61		1	1 unit	41B
	--	100	110	--	5	3RT2934-5AG61		1	1 unit	41B
	--	200	220	--	5	3RT2934-5AN61		1	1 unit	41B
	--	400	440	--	5	3RT2934-5AR61		1	1 unit	41B
<b>Size S3 <span style="color: red;">NEW</span></b>										
3RT2.4.-.A	24	--	--	--	X	3RT2944-5AB01		1	1 unit	41B
	42	--	--	--	X	3RT2944-5AD01		1	1 unit	41B
	48	--	--	--	X	3RT2944-5AH01		1	1 unit	41B
	110	--	--	--	X	3RT2944-5AF01		1	1 unit	41B
	230	--	--	--	X	3RT2944-5AP01		1	1 unit	41B
	400	--	--	--	X	3RT2944-5AV01		1	1 unit	41B
	--	24	--	--	X	3RT2944-5AC21		1	1 unit	41B
	--	42	--	--	X	3RT2944-5AD21		1	1 unit	41B
	--	48	--	--	X	3RT2944-5AH21		1	1 unit	41B
	--	110	--	--	X	3RT2944-5AG21		1	1 unit	41B
	--	220	--	--	X	3RT2944-5AN21		1	1 unit	41B
	--	230	--	--	X	3RT2944-5AL21		1	1 unit	41B
	110	--	120	--	X	3RT2944-5AK61		1	1 unit	41B
	220	--	240	--	X	3RT2944-5AP61		1	1 unit	41B
	--	--	480	--	X	3RT2944-5AV61		1	1 unit	41B
	--	--	600	--	X	3RT2944-5AT61		1	1 unit	41B
	--	100	110	--	X	3RT2944-5AG61		1	1 unit	41B
	--	200	220	--	X	3RT2944-5AN61		1	1 unit	41B
	--	400	440	--	X	3RT2944-5AR61		1	1 unit	41B
<b>Solenoid coils · AC/DC operation, with varistor</b>										
<b>Size S2</b>										
3RT203.-.A,	--	20 ... 33	--	20 ... 33	5	3RT2934-5NB31		1	1 unit	41B
3RT233.-.A,	--	30 ... 42	--	30 ... 42	5	3RT2934-5ND31		1	1 unit	41B
3RT253.-.A	--	48 ... 80	--	48 ... 80	5	3RT2934-5NE31		1	1 unit	41B
	--	83 ... 155	--	83 ... 155	5	3RT2934-5NF31		1	1 unit	41B
	--	175 ... 280	--	175 ... 280	5	3RT2934-5NP31		1	1 unit	41B
<b>Size S3 <span style="color: red;">NEW</span></b>										
3RT2.4.-.A	--	20 ... 33	--	20 ... 33	X	3RT2944-5NB31		1	1 unit	41B
	--	30 ... 42	--	30 ... 42	X	3RT2944-5ND31		1	1 unit	41B
	--	48 ... 80	--	48 ... 80	X	3RT2944-5NE31		1	1 unit	41B
	--	83 ... 155	--	83 ... 155	X	3RT2944-5NF31		1	1 unit	41B
	--	175 ... 280	--	175 ... 280	X	3RT2944-5NP31		1	1 unit	41B

**Note:**




It is only possible to replace the coils on AC contactors with AC coils, and on AC/DC contactors with AC/DC coils.

# 3RT Contactors

## Spare parts for 3RT1 contactors





CONTACTORS AND ASSEMBLIES 2

### Selection and ordering data

For contactor	Rated control supply voltage $U_s$	Screw connection		Spring-type connection		Weight approx. kg
		Order No.	Order No.	Order No.	Order No.	
Size	Type					
<b>Coils - AC operation</b>						
 3RT19 24-5A.01	<b>S0</b>	3RT10 2.,	24 V, 50 Hz	3RT19 24-5AB01 3RT19 24-5AD01 3RT19 24-5AH01 3RT19 24-5AF01 3RT19 24-5AP01 3RT19 24-5AV01 3RT19 24-5AC21 3RT19 24-5AD21 3RT19 24-5AH21 3RT19 24-5AG21 3RT19 24-5AM21 3RT19 24-5AN21 3RT19 24-5AL21 3RT19 24-5AK61 3RT19 24-5AP61 3RT19 24-5AU61 3RT19 24-5AV61 3RT19 24-5AT61 3RT19 24-5AG61 3RT19 24-5AN61 3RT19 24-5AR61	3RT19 24-5AB02 3RT19 24-5AD02 3RT19 24-5AH02 3RT19 24-5AF02 3RT19 24-5AP02 3RT19 24-5AV02 3RT19 24-5AC22 3RT19 24-5AD22 3RT19 24-5AH22 3RT19 24-5AG22 3RT19 24-5AM22 3RT19 24-5AN22 3RT19 24-5AL22 3RT19 24-5AK62 3RT19 24-5AP62 3RT19 24-5AU62 3RT19 24-5AV62 3RT19 24-5AT62 3RT19 24-5AG62 3RT19 24-5AN62 3RT19 24-5AR62	0.069
		3RT13 2.,	42 V, 50 Hz			
		3RT15 2.,	48 V, 50 Hz			
			110 V, 50 Hz			
			230 V, 50 Hz			
			400 V, 50 Hz			
			24 V, 50/60 Hz			
			42 V, 50/60 Hz			
			48 V, 50/60 Hz			
			110 V, 50/60 Hz			
			208 v, 50/60 Hz			
			220 V, 50/60 Hz			
			230 V, 50/60 Hz			
			110 V, 50 Hz/120 V, 60 Hz			
			220 V, 50 Hz/240 V, 60 Hz			
	277 V, 60 Hz					
	480 V, 60 Hz					
	600 V, 60 Hz					
	100 V, 50/60 Hz/110 V, 60 Hz					
	200 V, 50/60 Hz/220 V, 60 Hz					
	400 V, 50/60 Hz/440 V, 60 Hz					
 3RT19 24-5A.02	<b>S2</b>	3RT10 33	24 V, 50 Hz	3RT19 34-5AB01 3RT19 34-5AD01 3RT19 34-5AH01 3RT19 34-5AF01 3RT19 34-5AP01 3RT19 34-5AV01 3RT19 34-5AD21 3RT19 34-5AH21 3RT19 34-5AC21 3RT19 34-5AG21 3RT19 34-5AM21 3RT19 34-5AN21 3RT19 34-5AL21 3RT19 34-5AK61 3RT19 34-5AP61 3RT19 34-5AU61 3RT19 34-5AV61 3RT19 34-5AT61 3RT19 34-5AG61 3RT19 34-5AN61 3RT19 34-5AR61	3RT19 34-5AB02 3RT19 34-5AD02 3RT19 34-5AH02 3RT19 34-5AF02 3RT19 34-5AP02 3RT19 34-5AV02 3RT19 34-5AD22 3RT19 34-5AH22 3RT19 34-5AC22 3RT19 34-5AG22 3RT19 34-5AM22 3RT19 34-5AN22 3RT19 34-5AL22 3RT19 34-5AK62 3RT19 34-5AP62 3RT19 34-5AU62 3RT19 34-5AV62 3RT19 34-5AT62 3RT19 34-5AG62 3RT19 34-5AN62 3RT19 34-5AR62	0.088
		3RT10 34	42 V, 50 Hz			
			48 V, 50 Hz			
			110 V, 50 Hz			
			230 V, 50 Hz			
			400 V, 50 Hz			
			42 V, 50/60 Hz			
			48 V, 50/60 Hz			
			24 V, 50/60 Hz			
			110 V, 50/60 Hz			
			208 V, 50/60 Hz			
			220 V, 50/60 Hz			
			230 V, 50/60 Hz			
			110 V, 50 Hz/120 V, 60 Hz			
			220 V, 50 Hz/240 V, 60 Hz			
	277 V, 60 Hz					
	480 V, 60 Hz					
	600 V, 60 Hz					
	100 V, 50/60 Hz/110 V, 60 Hz					
	200 V, 50/60 Hz/220 V, 60 Hz					
	400 V, 50/60 Hz/440 V, 60 Hz					
 3RT19 34-5A.01	<b>S2</b>	3RT10 35,	24 V, 50 Hz	3RT19 35-5AB01 3RT19 35-5AD01 3RT19 35-5AH01 3RT19 35-5AF01 3RT19 35-5AP01 3RT19 35-5AV01 3RT19 35-5AC21 3RT19 35-5AD21 3RT19 35-5AH21 3RT19 35-5AG21 3RT19 35-5AM21 3RT19 35-5AN21 3RT19 35-5AL21 3RT19 35-5AK61 3RT19 35-5AP61 3RT19 35-5AU61 3RT19 35-5AV61 3RT19 35-5AT61 3RT19 35-5AG61 3RT19 35-5AN61 3RT19 35-5AR61	3RT19 35-5AB02 3RT19 35-5AD02 3RT19 35-5AH02 3RT19 35-5AF02 3RT19 35-5AP02 3RT19 35-5AV02 3RT19 35-5AC22 3RT19 35-5AD22 3RT19 35-5AH22 3RT19 35-5AG22 3RT19 35-5AM22 3RT19 35-5AN22 3RT19 35-5AL22 3RT19 35-5AK62 3RT19 35-5AP62 3RT19 35-5AU62 3RT19 35-5AV62 3RT19 35-5AT62 3RT19 35-5AG62 3RT19 35-5AN62 3RT19 35-5AR62	0.088
		3RT10 36,	42 V, 50 Hz			
		3RT13 3.,	48 V, 50 Hz			
		3RT15 3.,	110 V, 50 Hz			
			230 V, 50 Hz			
			400 V, 50 Hz			
			24 V, 50/60 Hz			
			42 V, 50/60 Hz			
			48 V, 50/60 Hz			
			110 V, 50/60 Hz			
			208 V, 50/60 Hz			
			220 V, 50/60 Hz			
			230 V, 50/60 Hz			
			110 V, 50 Hz/120 V, 60 Hz			
			220 V, 50 Hz/240 V, 60 Hz			
	277 V, 60 Hz					
	480 V, 60 Hz					
	600 V, 60 Hz					
	100 V, 50/60 Hz/110 V, 60 Hz					
	200 V, 50/60 Hz/220 V, 60 Hz					
	400 V, 50/60 Hz/440 V, 60 Hz					

# 3RT Contactors

## Spare parts for 3RT1 contactors

Selection and ordering data											
Size	Type	For contactor	Rated control supply voltage $U_s$	Screw connection	Spring-type connection	Weight approx. kg					
				Order No.	Order No.						
<b>Coils · AC operation</b>											
	<b>S3</b>	3RT10 44	24 V, 50 Hz	3RT19 44-5AB01 3RT19 44-5AD01 3RT19 44-5AH01 3RT19 44-5AF01 3RT19 44-5AP01 3RT19 44-5AV01 3RT19 44-5AC21 3RT19 44-5AD21 3RT19 44-5AH21 3RT19 44-5AG21 3RT19 44-5AM21 3RT19 44-5AN21 3RT19 44-5AL21 3RT19 44-5AK61 3RT19 44-5AP61 3RT19 44-5AU61 3RT19 44-5AV61 3RT19 44-5AT61 3RT19 44-5AG61 3RT19 44-5AN61 3RT19 44-5AR61	3RT19 44-5AB02 3RT19 44-5AD02 3RT19 44-5AH02 3RT19 44-5AF02 3RT19 44-5AP02 3RT19 44-5AV02 3RT19 44-5AC22 3RT19 44-5AD22 3RT19 44-5AH22 3RT19 44-5AG22 3RT19 44-5AM22 3RT19 44-5AN22 3RT19 44-5AL22 3RT19 44-5AK62 3RT19 44-5AP62 3RT19 44-5AU62 3RT19 44-5AV62 3RT19 44-5AT62 3RT19 44-5AG62 3RT19 44-5AN62 3RT19 44-5AR62	0.130					
			42 V, 50 Hz								
			48 V, 50 Hz								
			110 V, 50 Hz								
			230 V, 50 Hz								
			400 V, 50 Hz								
			24 V, 50/60 Hz								
			42 V, 50/60 Hz								
			48 V, 50/60 Hz								
			110 V, 50/60 Hz								
			208 V, 50/60 Hz								
			220 V, 50/60 Hz								
			230 V, 50/60 Hz								
			110 V, 50 Hz/120 V, 60 Hz								
			220 V, 50 Hz/240 V, 60 Hz								
277 V, 60 Hz											
480 V, 60 Hz											
600 V, 60 Hz											
		3RT10 45, 3RT10 46, 3RT13 4., 3RT14 46	24 V, 50 Hz	3RT19 45-5AB01 3RT19 45-5AD01 3RT19 45-5AH01 3RT19 45-5AF01 3RT19 45-5AP01 3RT19 45-5AV01 3RT19 45-5AC21 3RT19 45-5AD21 3RT19 45-5AH21 3RT19 45-5AG21 3RT19 45-5AM21 3RT19 45-5AN21 3RT19 45-5AL21 3RT19 45-5AK61 3RT19 45-5AP61 3RT19 45-5AU61 3RT19 45-5AV61 3RT19 45-5AT61 3RT19 45-5AG61 3RT19 45-5AN61 3RT19 45-5AR61	3RT19 45-5AB02 3RT19 45-5AD02 3RT19 45-5AH02 3RT19 45-5AF02 3RT19 45-5AP02 3RT19 45-5AV02 3RT19 45-5AC22 3RT19 45-5AD22 3RT19 45-5AH22 3RT19 45-5AG22 3RT19 45-5AM22 3RT19 45-5AN22 3RT19 45-5AL22 3RT19 45-5AK62 3RT19 45-5AP62 3RT19 45-5AU62 3RT19 45-5AV62 3RT19 45-5AT62 3RT19 45-5AG62 3RT19 45-5AN62 3RT19 45-5AR62	0.130					
			42 V, 50 Hz								
			48 V, 50 Hz								
			110 V, 50 Hz								
			230 V, 50 Hz								
			400 V, 50 Hz								
			24 V, 50/60 Hz								
			42 V, 50/60 Hz								
			48 V, 50/60 Hz								
			110 V, 50/60 Hz								
			208 V, 50/60 Hz								
			220 V, 50/60 Hz								
			230 V, 50/60 Hz								
			110 V, 50 Hz/120 V, 60 Hz								
			220 V, 50 Hz/240 V, 60 Hz								
277 V, 60 Hz											
480 V, 60 Hz											
600 V, 60 Hz											
100 V, 50/60 Hz/110 V, 60 Hz											
200 V, 50/60 Hz/220 V, 60 Hz											
400 V, 50/60 Hz/440 V, 60 Hz											
		3RT10 45, 3RT10 46, 3RT13 4., 3RT14 46	24 V, 50 Hz	3RT19 45-5AB01 3RT19 45-5AD01 3RT19 45-5AH01 3RT19 45-5AF01 3RT19 45-5AP01 3RT19 45-5AV01 3RT19 45-5AC21 3RT19 45-5AD21 3RT19 45-5AH21 3RT19 45-5AG21 3RT19 45-5AM21 3RT19 45-5AN21 3RT19 45-5AL21 3RT19 45-5AK61 3RT19 45-5AP61 3RT19 45-5AU61 3RT19 45-5AV61 3RT19 45-5AT61 3RT19 45-5AG61 3RT19 45-5AN61 3RT19 45-5AR61	3RT19 45-5AB02 3RT19 45-5AD02 3RT19 45-5AH02 3RT19 45-5AF02 3RT19 45-5AP02 3RT19 45-5AV02 3RT19 45-5AC22 3RT19 45-5AD22 3RT19 45-5AH22 3RT19 45-5AG22 3RT19 45-5AM22 3RT19 45-5AN22 3RT19 45-5AL22 3RT19 45-5AK62 3RT19 45-5AP62 3RT19 45-5AU62 3RT19 45-5AV62 3RT19 45-5AT62 3RT19 45-5AG62 3RT19 45-5AN62 3RT19 45-5AR62	0.130					
			42 V, 50 Hz								
			48 V, 50 Hz								
			110 V, 50 Hz								
			230 V, 50 Hz								
			400 V, 50 Hz								
			24 V, 50/60 Hz								
			42 V, 50/60 Hz								
			48 V, 50/60 Hz								
			110 V, 50/60 Hz								
			208 V, 50/60 Hz								
			220 V, 50/60 Hz								
			230 V, 50/60 Hz								
			110 V, 50 Hz/120 V, 60 Hz								
			220 V, 50 Hz/240 V, 60 Hz								
277 V, 60 Hz											
480 V, 60 Hz											
600 V, 60 Hz											
100 V, 50/60 Hz/110 V, 60 Hz											
200 V, 50/60 Hz/220 V, 60 Hz											
400 V, 50/60 Hz/440 V, 60 Hz											
<b>Coils · DC operation</b>											
	<b>S2</b>	3RT10 3., 3RT13 3., 3RT15 3.	24 V	3RT19 34-5BB41 3RT19 34-5BD41 3RT19 34-5BW41 3RT19 34-5BE41 3RT19 34-5BF41 3RT19 34-5BG41 3RT19 34-5BM41 3RT19 34-5BP41	3RT19 34-5BB42 3RT19 34-5BD42 3RT19 34-5BW42 3RT19 34-5BE42 3RT19 34-5BF42 3RT19 34-5BG42 3RT19 34-5BM42 3RT19 34-5BP42	0.558					
			42 V								
			48 V								
			60 V								
			110 V								
			125 V								
			220 V								
			230 V								
			<b>S3</b>				3RT10 4., 3RT13 4., 3RT14 4.	24 V	3RT19 44-5BB41 3RT19 44-5BD41 3RT19 44-5BW41 3RT19 44-5BE41 3RT19 44-5BF41 3RT19 44-5BG41 3RT19 44-5BM41 3RT19 44-5BP41	3RT19 44-5BB42 3RT19 44-5BD42 3RT19 44-5BW42 3RT19 44-5BE42 3RT19 44-5BF42 3RT19 44-5BG42 3RT19 44-5BM42 3RT19 44-5BP42	0.916
								42 V			
								48 V			
								60 V			
								110 V			
								125 V			
								220 V			
230 V											

# 3RT Contactors

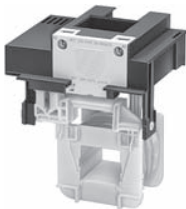
## Spare parts for 3RT1 contactors

### Selection and ordering data

For contactor	Rated control supply voltage $U_{s \text{ min}}$ to $U_{s \text{ max}}$	Order No.	Weight approx.
Size	Type	AC/DC V	kg


### Withdrawable coils

#### Conventional operating mechanism

	<b>S6</b>	3RT10 5, 3RT14 5	23 ... 26	<b>3RT19 55-5AB31</b> <b>3RT19 55-5AD31</b> <b>3RT19 55-5AF31</b> <b>3RT19 55-5AM31</b> <b>3RT19 55-5AP31</b> <b>3RT19 55-5AU31</b> <b>3RT19 55-5AV31</b> <b>3RT19 55-5AR31</b> <b>3RT19 55-5AS31</b> <b>3RT19 55-5AT31</b>	0.49	
			42 ... 48			
			110 ... 127			
			200 ... 220			
			220 ... 240			
			240 ... 277			
	380 ... 420					
	440 ... 480					
	500 ... 550					
	575 ... 600					
		<b>S10</b>	3RT10 6, 3RT14 6	23 ... 26	<b>3RT19 65-5AB31</b> <b>3RT19 65-5AD31</b> <b>3RT19 65-5AF31</b> <b>3RT19 65-5AM31</b> <b>3RT19 65-5AP31</b> <b>3RT19 65-5AU31</b> <b>3RT19 65-5AV31</b> <b>3RT19 65-5AR31</b> <b>3RT19 65-5AS31</b> <b>3RT19 65-5AT31</b>	0.65
				42 ... 48		
110 ... 127						
200 ... 220						
220 ... 240						
240 ... 277						
380 ... 420						
440 ... 480						
500 ... 550						
575 ... 600						
			3RT12 6 Vacuum contactor	23 ... 26	<b>3RT19 66-5AB31</b> <b>3RT19 66-5AD31</b> <b>3RT19 66-5AF31</b> <b>3RT19 66-5AM31</b> <b>3RT19 66-5AP31</b> <b>3RT19 66-5AU31</b> <b>3RT19 66-5AV31</b> <b>3RT19 66-5AR31</b> <b>3RT19 66-5AS31</b> <b>3RT19 66-5AT31</b>	
				42 ... 48		
	110 ... 127					
	200 ... 220					
	220 ... 240					
	240 ... 277					
	380 ... 420					
	440 ... 480					
	500 ... 550					
	575 ... 600					
		<b>S12</b>	3RT10 7, 3RT14 7, 3RT12 7 Vacuum contactor	23 ... 26	<b>3RT19 75-5AB31</b> <b>3RT19 75-5AD31</b> <b>3RT19 75-5AF31</b> <b>3RT19 75-5AM31</b> <b>3RT19 75-5AP31</b> <b>3RT19 75-5AU31</b> <b>3RT19 75-5AV31</b> <b>3RT19 75-5AR31</b> <b>3RT19 75-5AS31</b> <b>3RT19 75-5AT31</b>	1.1
				42 ... 48		
110 ... 127						
200 ... 220						
220 ... 240						
240 ... 277						
380 ... 420						
440 ... 480						
500 ... 550						
575 ... 600						

### Withdrawable coils

#### Solid-state operating mechanism · for DC 24 V PLC output

	<b>S6</b>	3RT10 5, 3RT14 5	21 ... 27.3	<b>3RT19 55-5NB31</b> <b>3RT19 55-5NF31</b> <b>3RT19 55-5NP31</b>	0.49			
			96 ... 127					
			200 ... 277					
		<b>S10</b>	3RT10 6, 3RT14 6	21 ... 27.3	<b>3RT19 65-5NB31</b> <b>3RT19 65-5NF31</b> <b>3RT19 65-5NP31</b>	0.65		
				96 ... 127				
				200 ... 277				
				3RT12 6 Vacuum contactor	21 ... 27.3	<b>3RT19 66-5NB31</b> <b>3RT19 66-5NF31</b> <b>3RT19 66-5NP31</b>		
					96 ... 127			
					200 ... 277			
				<b>S12</b>	3RT10 7, 3RT14 7, 3RT12 7 Vacuum contactor	21 ... 27.3	<b>3RT19 75-5NB31</b> <b>3RT19 75-5NF31</b> <b>3RT19 75-5NP31</b>	1.1
						96 ... 127		
						200 ... 277		

#### Solid-state operating mechanism · for DC 24 V PLC output/PLC relay output, with remaining lifetime indication (withdrawable coil with lateral electronics module)

<b>S6</b>	3RT10 5, 3RT14 5	96 ... 127	<b>3RT19 55-5PF31</b> <b>3RT19 55-5PP31</b>	1.1
		200 ... 277		
<b>S10</b>	3RT10 6, 3RT14 6	96 ... 127	<b>3RT19 65-5PF31</b> <b>3RT19 65-5PP31</b>	1.1
		200 ... 277		
<b>S12</b>	3RT10 7, 3RT14 7	96 ... 127	<b>3RT19 75-5PF31</b> <b>3RT19 75-5PP31</b>	1.1
		200 ... 277		

# 3RT Contactors

## Spare parts for 3RT1 contactors

### Selection and ordering data

For contactor		Design	Order No.	Weight approx.	Pack.
Size	Type			kg	

### Arc chutes

<b>S2</b>	3RT20 3. 3RT20 3.	For AC coil contactors only For UC (AC/DC) coil contactors only	<b>3RT29 36-7A</b> <b>3RT29 36-7B</b>		1 unit
<b>S3</b>	3RT10 4., 3RT14 46		<b>3RT19 46-7A</b>		
<b>S6</b>	3RT10 54 3RT10 55 3RT10 56		<b>3RT19 54-7A</b> <b>3RT19 55-7A</b> <b>3RT19 56-7A</b>	0.72	
<b>S10</b>	3RT10 64 3RT10 65 3RT10 66		<b>3RT19 64-7A</b> <b>3RT19 65-7A</b> <b>3RT19 66-7A</b>	1.24	
<b>S12</b>	3RT10 75 3RT10 76		<b>3RT19 75-7A</b> <b>3RT19 76-7A</b>	1.4	
<b>S6</b>	3RT14 56		<b>3RT19 56-7B</b>	0.72	
<b>S10</b>	3RT14 66		<b>3RT19 66-7B</b>	1.24	
<b>S12</b>	3RT14 76		<b>3RT19 76-7B</b>	1.4	

### Contacts with fixing parts

<b>• for contactors with 3 main contacts</b>					
<b>S2</b>	3RT20 35 3RT20 36 3RT20 37 3RT20 38	Main contacts (3 NO) for AC-3 utilization category (1 set = 3 moving and 6 fixed contacts with fixing parts)	<b>3RT29 35-6A</b> <b>3RT29 36-6A</b> <b>3RT29 37-6A</b> <b>3RT29 38-6A</b>		1 set
<b>S3</b>	3RT10 44 3RT10 45 3RT10 46		<b>3RT19 44-6A</b> <b>3RT19 45-6A</b> <b>3RT19 46-6A</b>		
<b>S6</b>	3RT10 54 3RT10 55 3RT10 56		<b>3RT19 54-6A</b> <b>3RT19 55-6A</b> <b>3RT19 56-6A</b>	0.28	
<b>S10</b>	3RT10 64 3RT10 65 3RT10 66		<b>3RT19 64-6A</b> <b>3RT19 65-6A</b> <b>3RT19 66-6A</b>	0.48	
<b>S12</b>	3RT10 75 3RT10 76		<b>3RT19 75-6A</b> <b>3RT19 76-6A</b>	0.9	
<b>S3</b>	3RT14 46	Main contacts (3 NO) for AC-1 utilization category (1 set = 3 moving and 6 fixed contacts with fixing parts)	<b>3RT19 46-6D</b>		
<b>S6</b>	3RT14 56		<b>3RT19 56-6D</b>	0.28	
<b>S10</b>	3RT14 66		<b>3RT19 66-6D</b>	0.48	
<b>S12</b>	3RT14 76		<b>3RT19 76-6D</b>	0.9	
<b>• for 3RT12 vacuum contactors</b>					
<b>S10</b>	3RT12 64 3RT12 65 3RT12 66	3 vacuum interrupters with fixing parts	<b>3RT19 64-6V</b> <b>3RT19 65-6V</b> <b>3RT19 66-6V</b>	1.4	1 set
<b>S12</b>	3RT12 75 3RT12 76		<b>3RT19 75-6V</b> <b>3RT19 76-6V</b>	1.5	
<b>• for contactors with 4 main contacts</b>					
<b>S2</b>	3RT23 36 3RT23 37	Main contacts (4 NO contacts) for utilization category AC-1	<b>3RT29 36-6E</b> <b>3RT29 37-6E</b>		1 set
<b>S3</b>	3RT13 44 3RT13 46	(1 set = 4 moving and 8 fixed contacts with fixing parts)	<b>3RT19 44-6E</b> <b>3RT19 46-6E</b>		

# 3TB World Series Contactors

## Rated control supply voltages for coils

CONTACTORS AND ASSEMBLIES 2

### Selection and ordering data

Coil type		3TY6 503-0A..	3TB50	3TY7 683-0C..	3TF68
Rated control supply voltage $U_s$	Control supply voltage at	3TY6 523-0A..	3TB52	3TY7 693-0C..	3TF69
		3TY6 543-0A..	3TB54		
		3TY6 566-0A..	3TB56		

### Rated control supply voltages (changes to 10th and 11th positions of the Order No.)

#### AC operation

Coils for 50 Hz					
50 Hz	60 Hz				
AC 24 V	AC 39 V	B0		-	
AC 32 V	AC 28 V	-		-	
AC 36 V	AC 42 V	G0		-	
AC 42 V	AC 50 V	D0		-	
AC 48 V	AC 58 V	H0		-	
AC 60 V	AC 72 V	E0		-	
AC 110 V	AC 132 V	F0		-	
AC 125/127 V	AC 150/152 V	L0		-	
AC 230/220 V	AC 277 V	P0 <sup>1)</sup>		-	
AC 240 V	AC 288 V	U0		-	
AC 400/380 V	AC 480/460 V	V0 <sup>1)</sup>		-	
AC 415 V	AC 500 V	R0		-	
AC 500 V	AC 600 V	S0		-	
Coils for 50/60 Hz					
AC 110 V ... 132 V		-		F7	
AC 200 V ... 240 V		-		M7	
AC 230 V ... 277 V		-		P7 <sup>2)</sup>	
AC 380 V ... 460 V		-		Q7	
AC 500 V ... 600 V		-		S7	

Coil type		3TY6 503-0B..	3TB50	3TY7 683-0D..	3TF68
Rated control supply voltage $U_s$		3TY6 523-0B..	3TB52	3TY7 693-0D..	3TF69
		3TY6 543-0B..	3TB54		
		3TY6 563-0B..	3TB56		

### Rated control supply voltages (changes to 10th and 11th positions of the Order No.)

#### DC operation

DC 24 V	B4		B4		
DC 30 V	C4		-		
DC 36 V	V4		-		
DC 42 V	D4		-		
DC 48 V	W4		-		
DC 60 V	E4		-		
DC 110 V	F4		F4		
DC 125 V	G4		G4		
DC 180 V	K4		-		
DC 220 V	M4		M4		
DC 230 V	P4		P4		

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1) Coil voltage tolerance at 220 V or 380 V:  
0.85 to 1.15 x  $U_s$ ;  
lower tolerance range limit acc. to IEC 60 947.

2) Lower tolerance range limit at 220 V:  
0.85 x  $U_s$  acc. to IEC 60 947.

# 3TB World Series Contactors

## Spare parts

Coils, AC <sup>1)</sup>								
Frame Size	Catalog No							
	24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC	
3TB40-44	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0	
3TB47-48	3TY6483-0AC1	3TY6483-0AK6	3TY6483-0AM1	3TY6483-0AP6	3TY6483-0AP0	3TY6483-0AV0	3TY6483-0AS0	
3TB52	—	3TY6523-0AK6	3TY6523-0AM1	3TY6523-0AP6	3TY6523-0AP0	3TY6523-0AV0	—	
3TB56	—	—	—	—	3TY6566-0AP0	3TY6566-0AV0	3TY6566-0AS0	



3TY6463-0AK6

Coils, DC								
Frame Size	Catalog No							
	12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC	
3TB40-43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4	
3TB44	3TY6443-0BA4	3TY6443-0BB4	3TY6443-0BD4	3TY6443-0BW4	3TY6443-0BF4	3TY6443-0BG4	3TY6443-0BQ4	
3TB46	—	—	3TY6463-0BD4	3TY6463-0BW4	3TY6463-0BF4	—	3TY6463-0BQ4	
3TB47-48	—	3TY6483-0BB4	3TY6483-0BD4	3TY6483-0BW4	3TY6483-0BF4	3TY6483-0BG4	—	
3TB50	—	3TY6503-0BB4	3TY6503-0BD4	3TY6503-0BW4	3TY6503-0BF4	3TY6503-0BG4	3TY6503-0BQ4	
3TB52	—	3TY6523-0BB4	3TY6523-0BD4	—	3TY6523-0BF4	3TY6523-0BG4	—	
3TB54	—	3TY6543-0BB4	3TY6543-0BD4	3TY6543-0BW4	3TY6543-0BF4	—	3TY6543-0BQ4	
3TB56	—	3TY6563-0BB4	3TY6563-0BD4	—	3TY6563-0BF4	3TY6563-0BG4	3TY6563-0BQ4	
3TB58	—	—	—	—	—	—	—	



3TY6483-0BB4

Main Contacts (Includes 3 Moving and 6 Fixed Contacts) <sup>2)</sup>		
Frame Size	Catalog No	
3TB40-43	Not Replaceable	
3TB44	3TY6440-0A	
3TB46	3TY6460-0A	
3TB47	3TY6470-0A	
3TB48	3TY6480-0A	
3TB50	3TY6500-0A	
3TB52	3TY6520-0A	
3TB54	3TY6540-0A	
3TB56	3TY6560-0A	
3TB58	3TY6580-0A	



3TY6500-0A

Select Complete Catalog Number From Above <sup>1)</sup>	
Old Number	New Number
3TY6465-0A††	3TY6463-0A††
3TY6485-0A††	3TY6483-0A††
3TY6505-0A††	3TY6503-0A††
3TY6525-0A††	3TY6523-0A††
3TY6545-0A††	3TY6543-0A††
3TY6565-0A††	3TY6566-0A††

Coil Voltages	
Old Number	New Number
A8	K6
B8	M1
C8	P6
D8	Q0
E8	S0
F8	C1
G8	P0

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1)Some old 3TB coil catalog numbers have been superceded. Cross to current catalog number from these tables.  
 2)Main contact kits for size 3TB47 and larger include springs. Smaller sizes do not.



# 3TF World Series Contactors

## Spare parts

CONTACTORS AND ASSEMBLIES 2

### Coils, AC Type 3TF and CRLTF



3TY7403-0AK6



3TY7483-0AK6

Frame Size	Catalog No							
	24V AC, 60Hz 24V AC, 50Hz	120V AC, 60Hz 110V AC, 50Hz	208V AC, 60Hz 173V AC, 50Hz	240V AC, 60Hz 220V AC, 50Hz	277V AC, 60Hz 220V AC, 50Hz	480V AC, 60Hz 380V AC, 50Hz	600V AC, 60Hz 500V AC, 50Hz	
3TF40-43	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0	
3TF34-35, 3TF44-45	3TY7443-0AC2	3TY7443-0AK6	3TY7443-0AM1	3TY7443-0AP6	3TY7443-0AU1	3TY7443-0AV0	3TY7443-0AS0	
3TF46-47	3TY7463-0AC2	3TY7463-0AK6	3TY7463-0AM1	3TY7463-0AP6	3TY7463-0AU1	3TY7463-0AV0	3TY7463-0AS0	
3TF48-49	3TY7483-0AC2	3TY7483-0AK6	3TY7483-0AM1	3TY7483-0AP6	3TY7483-0AU1	3TY7483-0AV0	3TY7483-0AS0	
3TF50-51	3TY7503-0AC2	3TY7503-0AK6	3TY7503-0AM1	3TY7503-0AP6	3TY7503-0AU1	3TY7503-0AV0	3TY7503-0AS0	
3TF52-53	3TY7523-0AC2	3TY7523-0AK6	3TY7523-0AM1	3TY7523-0AP6	3TY7523-0AU1	3TY7523-0AV0	3TY7523-0AS0	
3TF54-55	3TY7543-0AC2	3TY7543-0AK6	3TY7543-0AM1	3TY7543-0AP6	3TY7543-0AU1	3TY7543-0AV0	3TY7543-0AS0	
3TF56	3TY7563-0AC2	3TY7563-0AK6	3TY7563-0AM1	3TY7563-0AP6	3TY7563-0AU1	3TY7563-0AV0	3TY7563-0AS0	
3TF57	—	3TY7573-0CF7	—	3TY7573-0CM7	—	3TY7573-0CQ7	—	
3TF68	—	3TY7683-0CF7	—	3TY7683-0CM7	—	3TY7683-0CQ7	3TY7683-0CS7	
3TF69	—	3TY7693-0CF7	—	3TY7693-0CM7	—	3TY7693-0CQ7	3TY7693-0CS7	

### Coils, DC Type 3TF and CRLTF



3TY4803-0BB4

Frame Size	Catalog No							
	12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC	
DC Solenoid								
3TF30-33 3TF40-43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4	
3TF34-35, 3TF44-45	3TY7443-0BA4	3TY7443-0BB4	3TY7443-0BD4	3TY7443-0BW4	3TY7443-0BF4	3TY7443-0BG4	—	
3TF46-47	—	3TY7463-0BB4	3TY7463-0BD4	3TY7463-0BW4	—	3TY7463-0BG4	3TY7463-0BQ4	
DC Economy Circuit (Replacement coils only. Does not include interlock or interposing relay.)								
3TF46-47	—	3TY7463-0DB4	3TY7463-0DD4	3TY7463-0DW4	3TY7463-0DF4	3TY7463-0DG4	3TY7463-0DQ4	
3TF48-49	—	—	3TY7483-0DD4	3TY7483-0DW4	3TY7483-0DF4	3TY7483-0DG4	3TY7483-0DQ4	
3TF50-51	—	3TY7503-0DB4	3TY7503-0DD4	3TY7503-0DW4	3TY7503-0DF4	3TY7503-0DG4	3TY7503-0DQ4	
3TF52-53	—	3TY7523-0DB4	3TY7523-0DD4	3TY7523-0DW4	3TY7523-0DF4	3TY7523-0DG4	3TY7523-0DQ4	
3TF54-55	—	—	3TY7543-0DD4	3TY7543-0DW4	3TY7543-0DF4	3TY7543-0DG4	3TY7543-0DQ4	
3TF56	—	3TY7563-0DB4	3TY7563-0DD4	3TY7563-0DW4	—	3TY7563-0DG4	3TY7563-0DQ4	
3TF57	—	3TY7573-0DB4	3TY7573-0DD4	3TY7573-0DW4	3TY7573-0DF4	3TY7573-0DG4	3TY7573-0DQ4	
3TF68	—	3TY7683-0DB4	—	—	3TY7683-0DF4	—	—	

### Main Contacts (Includes 3 Moving and 6 Fixed Contacts)



3TY7460-0A

Frame Size	Catalog No	List Price \$
3TF30-35	Not Replaceable	
3TF40-43	Not Replaceable	
3TF44	3TY7440-0A	
3TF45	3TY7450-0A	
3TF46	3TY7460-0A	
3TF47	3TY7470-0A	
3TF48	3TY7480-0A	
3TF49	3TY7490-0A	
3TF50	3TY7500-0A	
3TF51	3TY7510-0A	
3TF52	3TY7520-0A	
3TF53	3TY7530-0A	
3TF54	3TY7540-0A	
3TF55	3TY7550-0A	
3TF56	3TY7560-0A	
3TF57	3TY7570-0A	
3TF68	3TY7680-0B <sup>1)</sup>	
3TF69	3TY7690-0B <sup>1)</sup>	

### Arc Chutes



3TY7482-0A

Frame Size	Catalog No
3TF30-35	Not Replaceable
3TF40-43	Not Replaceable
3TF44	3TY7442-0A
3TF45	3TY7452-0A
3TF46	3TY7462-0A
3TF47	3TY7472-0A
3TF48	3TY7482-0A
3TF50	3TY7502-0A
3TF51	3TY7512-0A
3TF52	3TY7522-0A
3TF53	3TY7532-0A
3TF54	3TY7542-0A
3TF55	3TY7552-0A
3TF56	3TY7562-0A
3TF57	3TY7572-0A
3TF68	Not Available
3TF69	Not Available


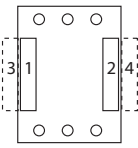
Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1) Vacuum bottles with mounting hardware.

# 3TF Contactors and 3TH Control Relays

## Spare parts

### Auxiliary Contact Blocks

Illustration	Frame Size	Auxiliary Contacts		NO/Early Make	NC/Early Break	Auxiliary Contact Mounting Position	Position	Block Location	Obsolete Catalog No	Current Catalog	
		NO	NC								
	3TF30 to 3TF35, 3TH3	1	—	—	—		—	Top	—	3TX4010-2A	
		—	1	—	—		—	Top	—	3TX4001-2A	
		—	—	1	—		—	Top	—	3TX4010-4A	
		—	—	—	1		—	Top	—	3TX4001-4A	
	3TF40 to 3TF43		Not Replaceable								
	3TF44 to 3TF68	1	1	—	—		1	Left	3TY7561-1A	3TY7561-1AA00	
		1	1	—	—		2	Right	3TY7561-1B	3TY7561-1AA00	
		1	—	—	1		4	Right	3TY7561-1K	3TY7561-1EA00	
	3TF46 to 3TF68 2nd Aux Contact Block	1	1	—	—		3	Left	3TY7561-1K	3TY7561-1KA00	
		1	1	—	—		4	Right	3TY7561-1L	3TY7561-1KA00	
3TF46 to 3TF68 For Electronic Circuits	1	1	—	—		3	Left	3TY7561-1U	3TY7561-1UA00		
	1	1	—	—		4	Right	3TY7561-1V	3TY7561-1UA00		

### Mechanical Interlocks



3TX7466-1A

Frame Size	Catalog No
3TF44-54	3TX7466-1A

### Arc Chutes



3TY6462-0A

Type	Frame Size	Catalog No	List Price \$	Frame Size	Catalog No
3TB	3TB40-43	Not Replaceable		3TB50	3TY6502-0A
	3TB44	—		3TB52	3TY6522-0A
	3TB46	—		3TB54	3TY6542-0A
	3TB47	—		3TB56	3TY6562-0A
	3TB48	3TY6482-0A		3TB58	—

### Control Relays, Type 3TH3, 3TH4 Coils, AC



3TY7403-0AK6

Type	Frame Size	Catalog No							
		24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC	
3TH	3TH30-33 3TH40-43	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0	

### Coils, DC

Type	Frame Size	Catalog No							
		12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC	
3TH	3TH30-33 3TH40-43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4	

### Auxiliary Contact Blocks<sup>1)</sup>

Type	Frame Size	Auxiliary Contacts		Normally Open/ Early Make	Normally Closed/ Late Break	Block Location	Catalog No
		NO	NC				
3TH	3TH3	1	—	—	—	Top	3TX4010-2A
		—	1	—	—	Top	3TX4001-2A
		—	—	1	—	Top	3TX4010-4A
		—	—	—	1	Top	3TX4001-4A

### Control Relays, Type 3TH8 Coils, AC

Type	Frame Size	Catalog No							
		24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC	
3TH	3TH80-83	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0	

### Coils, DC

Type	Frame Size	Catalog No							
		12V AC	24V AC	42V AC	48V AC	110V AC	125V AC	240V AC	
3TH	3TH80-83	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4	

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1) Maximum 4 blocks per relay.

# Contactors for Switching Motors

## 3RT contactors, 3-pole, sizes S00 to S3

### AC and DC operation

IEC 60 947, EN 60 947 (VDE 0660), UL 508

### Design

The 3RT contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100.

The 3RT contactors are available screw, spring-type, or ring lug connections.

An auxiliary contact is integrated in the basic unit of size S00 contactors. The basic units of sizes S0 to S3 only contain the main conducting paths.

All the basic units can be extended with auxiliary switch blocks. Cabinet units with 2 NO + 2 NC (terminal designations acc. to EN 50 012) are available as of size S0; the auxiliary switch block is removable.

The size S3 contactors have removable box terminals for the main conductor connections. Ring cable lugs or bars can thus also be connected.

### Contact reliability

If voltages  $\leq 110$  V and currents  $\leq 100$  mA are to be switched, the auxiliary contacts of 3RT contactors and 3RH contactor relays should be used to ensure good contact stability.

These auxiliary contacts are suitable for electronic circuits with currents  $\geq 1$  mA at a voltage of 17 V.

### Short-circuit protection of contactors

For the short-circuit protection of contactors without an overload relay, see the technical data.

For the short-circuit protection of contactors with an overload relay, see section 3.

### Motor protection

3RU overload relays can be mounted onto the 3RT contactors for protection against overloads. The overload relays must be ordered separately (see section 3).

### Surge suppression

The 3RT contactors can be retrofitted with RC elements, varistors, diodes or diode assemblies (combination of an interference suppression diode and a Zener diode for short tripping times) for suppressing opening surges in the coil.

The surge suppressors are plugged onto the front of size S00 contactors. Space is provided for them next to a snap-on auxiliary switch block.

With all size S0 to S3 contactors, varistors and RC elements can be plugged on directly at the coil terminals, either on the top or underneath. Diode assemblies are available in two different designs with different polarities. Depending on the application, they can be attached either only on the bottom (assembly with circuit-breaker) or only on the top (assembly with overload relay).

The plug-in direction of the diodes and diode assemblies is determined by a coding device. Exceptions: 3RT29 26-1E.00 and 3RT19 36-1T.00; in these cases the plug-in direction is identified by "+" and "-".

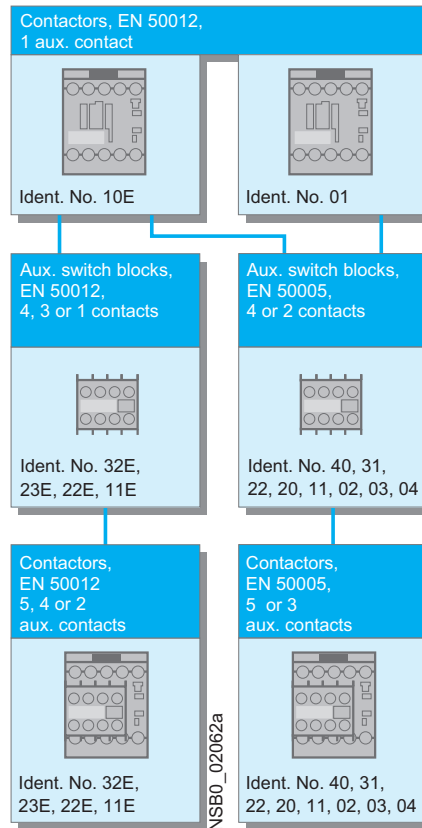
Coupling relays are supplied either without surge suppression or with a varistor or diode connected as standard, according to the design.

#### Note

*The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (interference suppression diode 6 to 10 times; diode assemblies 2 to 6 times; varistor +2 ms to 5 ms).*

### 3RT20 1. contactors (size S00),

Terminal designations acc. to EN 50 012 or DIN 50 005.



### Auxiliary switch blocks

The 3RT basic units can be extended with various auxiliary switch blocks, depending on the application:

#### Size S00 (3RT201)

Contactors with one NO contact as the auxiliary contact and with either screw or spring-type connections, identification number 10E, can be extended to obtain contactors with 2, 4 or 5 auxiliary contacts in accordance with EN 50 012 using auxiliary switch blocks. The identification numbers 11E, 22E, 23E and 32E on the auxiliary switch blocks apply to the complete contactors. These auxiliary switch blocks cannot be combined with contactors that have an NC contact in their basic unit, identification number 01, as these are coded.

All size S00 contactors with one auxiliary contact, identification number 10E or 01, and the contactors with 4 main contacts can be extended to obtain contactors with 3 or 5 auxiliary contacts (contactors with 4 main contacts: 2 or 4 auxiliary contacts) according to EN 50 005 using auxiliary switch blocks

with identification numbers 40 to 02. The identification numbers on the auxiliary switch blocks apply only to the attached auxiliary contacts.

Single or 2-pole auxiliary switch blocks that can be connected on either the top or the bottom facilitate quick, straightforward wiring, especially when assembling feeders. These auxiliary switch blocks are only available with screw-type terminals.

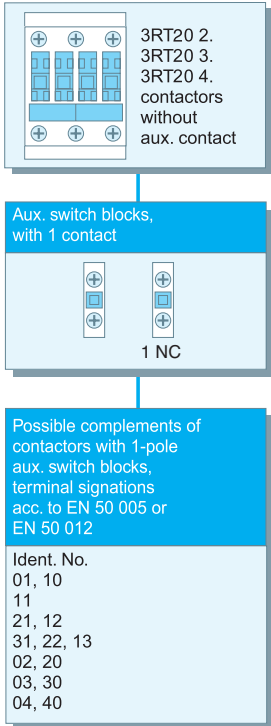
The solid-state compatible 3RH29 11-1NF.. auxiliary switch blocks for size S00 contactors contain two enclosed contact elements. They are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in dusty atmosphere. The contacts do not have positively-driven operation.

All the above-mentioned auxiliary switch variants can be snapped into the location holes on the front of the contactors. The auxiliary switch block has a centrally positioned release lever for disassembly.

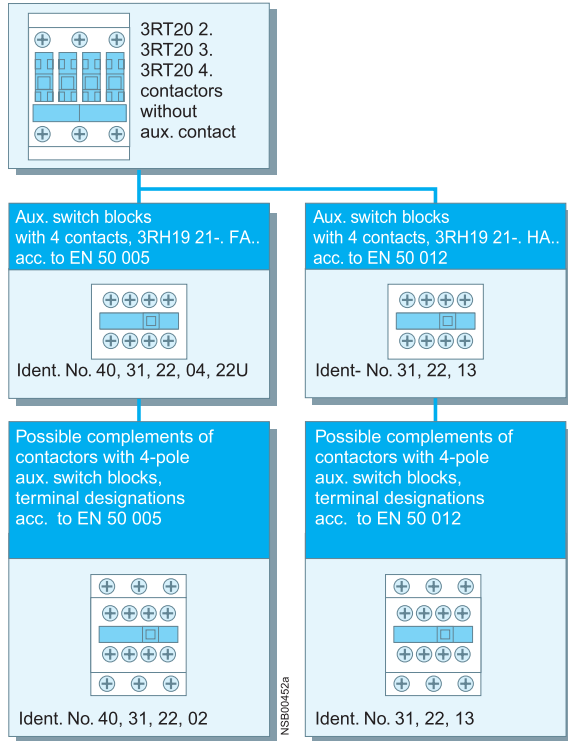
# Contactors for Switching Motors

## 3RT2 contactors, 3-pole, sizes S00 to S3

**3RT20 2. to 3RT20 4. contactors (sizes S0 to S3), single-pole auxiliary switch blocks,**  
terminal designations acc. to EN 50 005 or EN 50 012.



**3RT20 2. to 3RT20 4. contactors (sizes S0 to S3), single-pole auxiliary switch blocks,**  
terminal designations acc. to EN 50 005 or EN 50 012.



### Sizes S0 to S3 (3RT202 to 3RT204)

An extensive range of auxiliary switch blocks is available for various applications. The contactors themselves do not have an integrated auxiliary conducting path.

### The auxiliary switch variants are identical for all size S0 to S3 contactors.

One 4-pole or up to four single-pole auxiliary switch blocks (with screw or spring-type connections) can be snapped onto the front of the contactors. When the contactors are energized, the NC contacts open before the NO contacts close.

The terminal designations of the single-pole auxiliary switch blocks consist of location digits on the basic unit and function digits on the auxiliary switch blocks.

In addition, 2-pole auxiliary switch blocks (screw-type terminals) are provided for cable entries from above or below in the style of a four-connector block (feeder auxiliary switch).

If the available installation depth is restricted, 2-pole auxiliary switch blocks (screw or spring-type connections) can be mounted laterally on the left or right.

The auxiliary switch blocks designed for mounting onto the front can be disassembled with the aid of a centrally positioned release lever; the laterally mountable auxiliary switch blocks can be removed easily by pressing on the fluted grips.

The terminal designations of the individual auxiliary switch blocks comply with EN 50 005 or EN 50 012, while those of the complete contactors with an auxiliary switch block with 2 NO + 2 NC comply with EN 50 012.

The laterally mountable auxiliary switch blocks to EN 50 012 can only be used if no 4-pole auxiliary switch blocks are snapped onto the front. If single-pole auxiliary switch blocks are used in addition, the location digits on the contactor must be noted.

Two enclosed contact elements and two standard contact elements are available for the 3RH29 21-FE22 solid-state compatible auxiliary switch block mountable on the front. The laterally mountable 3RH29 21-2DE11 solid-state compatible auxiliary switch block contains 2 enclosed contact elements (1 NO + 1 NC). The enclosed contact elements are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in a dusty atmosphere. The contacts are positively driven.

### Sizes S0 and S2 (3RT202 and 3RT203)

Up to four auxiliary contacts can be mounted, whereby any design of the auxiliary switch blocks is permitted. If two 2-pole, laterally mounted, auxiliary switch blocks are used, one must be mounted on the left and one on the right for the sake of symmetry.

Under certain circumstances, more auxiliary contacts are allowed for size S2 (please ask for details).

With regard to 3RT23 and 3RT24 4-pole contactors, please refer to pages 2/12 to 2/14.

### Sizes S3 to S12 (3RT204 to 3RT107)

Up to eight auxiliary contacts can be mounted, whereby the following points must be noted:

- Of these eight auxiliary contacts, no more than four must be NC contacts.
- If laterally mounted auxiliary switch blocks are used, they must be symmetrical.

With regard to 3RT15 4-pole contactors, please refer to pages 2/11 to 2/13.

# Contactors for Switching Motors

## 3RT1 contactors, 3-pole, sizes S6 to S12

CONTACTORS AND ASSEMBLIES 2

### Overview

#### Design

- 3RT10 contactors for switching motors
- 3RT12 vacuum contactors for switching motors
- 3RT14 contactors for AC-1 applications

#### Operating mechanism

Two types of solenoid-operated mechanism are available:

- Conventional operating mechanism
- Solid-state operating mechanism (with 3 performance levels)

#### UC operation

The contactors can be AC (40 to 60 Hz) and DC driven.

#### Withdrawable coils

To allow easy coil changing, for example if the application is changed, the magnetic coil can be pulled out upwards without tools after the release mechanism has been actuated, and can be replaced by any other required coil of the same size.

#### Auxiliary contact complement

The contactors can be equipped with a maximum of 8 auxiliary contacts, with identical auxiliary switch blocks from S0 to S12. Of these, no more than 4 are permitted to be NC contacts.

- 3RT10 and 3RT14 contactors: auxiliary contacts mounted laterally and on front
- 3RT12 vacuum contactors: auxiliary contact mounted laterally

### Contactors with conventional operating mechanism

#### 3RT1...-A:

The magnetic coil is switched on and off directly with the control supply voltage  $U_s$  via terminals A1/A2.

Multi-voltage range for the control supply voltage  $U_s$ : Several closely adjacent control supply voltages, available around the world, are covered by just one coil, for example UC 110-115-120-127 V or UC 220-230-240 V.

In addition, allowance is also made for a coil voltage tolerance of 0.8 times the lower rated control supply voltage ( $U_{s\ min}$ ) and 1.1 times the upper rated control supply voltage ( $U_{s\ max}$ ), within which the

contactor switches reliably and no thermal overloading occurs.

### Contactors with solid-state operating mechanism

The power required for reliable switching and holding is supplied selectively to the magnetic coil by series-connected control electronics.

#### Features:

- Extended voltage range for the control supply voltage  $U_s$ : Compared with the conventional operating mechanism, the solid-state operating mechanism covers an even broader range of globally available control supply voltages within one coil variant. For example, the globally available voltages 200-208-220-230-240-254-277 V are covered with the coil for UC 200 to 277 V ( $U_{s\ min}$  to  $U_{s\ max}$ ).

- Extended coil voltage tolerance 0.7 to  $1.25 \times U_s$ : On account of the broad range for the rated control supply voltage and the additionally allowed coil voltage tolerance of  $0.8 \times U_{s\ min}$  to  $1.1 \times U_{s\ max}$ , an extended coil voltage tolerance of at least 0.7 to  $1.25 \times U_s$ , within which the contactors will operate reliably, is available for the most common control supply voltages of 24, 110 and 230 V.
- Bridging short-time voltage dips: Control voltage failures dipping to 0 V (at A1/A2) are bridged for up to approx. 25 ms, therefore preventing unintentional disconnection.

- Defined ON and OFF thresholds: As of voltages  $\geq 0.8 \times U_{s\ min}$ , the electronics reliably switch the contactor on and as of  $\leq 0.5 \times U_{s\ min}$  it is reliably switched off. The differential travel in the switching thresholds prevents chattering of the main contacts and hence increased wear or welding when operated in weak, unstable networks. Similarly, thermal overloading of the contactor coil is prevented if the voltage applied is too low – the contactor is not switched on and is operated with overexcitation.
- Low control power consumption when closing and in closed state.

#### Electromagnetic compatibility (EMC)

The contactors with solid-state operating mechanism conform to the requirements for operation in industrial plants.

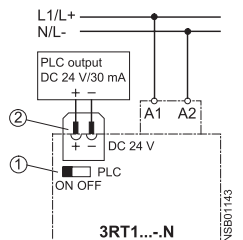
- **Noise immunity**
  - Burst (IEC 61 000-4-4): 4 kV
  - Surge (IEC 61 000-4-5): 4 kV
  - Electrostatic discharge, ESD (IEC 61 000-4-2): 8/15 kV
  - Electromagnetic field (IEC 61 000-4-3): 10 V/m
- **Emitted interference**
  - Limiting value class A to EN 55 011

**Note:**  
In connection with converters, the control cables should be installed separately from the load cables to the converter.

### 3RT1...-N: for DC 24 V PLC output

#### 2 control options:

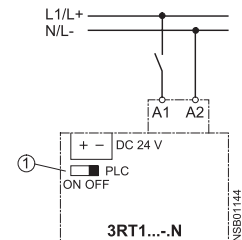
- Control without an interface directly via a DC 24 V  $\geq 30$  mA PLC output (EN 61 131-2). Connection via a 2-pole plug-in connection; the connector, using screwless spring-force technology, is included in the scope of supply. The control supply voltage for supplying power to the solenoid operating mechanism must be connected to A1/A2.



- ① Sliding-dolly switch, must be in PLC "ON" position
- ② Plug-in connection, 2-pole

- Conventional control by applying the control supply voltage at A1/A2 via a switching contact.

**Note:**  
The sliding-dolly switch must be in the "PLC OFF" position (= setting ex works).



- ① Sliding-dolly switch, must be in PLC "OFF" position



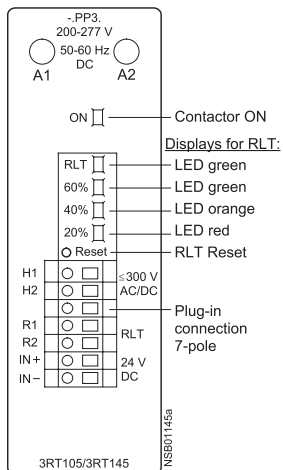
# Contactors for Switching Motors

## 3RT1 contactors, 3-pole, sizes S6 to S12

### Overview

#### Contactors with solid-state operating mechanism

**3RT1...-P:** for DC 24 V PLC output or PLC relay output, with indication of remaining lifetime  
(Indication of remaining lifetime RLT: see 2/69.)



To supply power to the solenoid operating mechanism and the remaining lifetime indication, the control supply voltage  $U_s$  must be run to terminals A1/A2 of the laterally mounted electronics module. The control inputs of the contactor are brought out to a 7-pole plug-in connection; the connector, using screwless spring-force technology, is included in the scope of supply.

- The remaining lifetime RLT status signal is available at terminals R1/R2 via a floating relay contact (hard gold-plated, enclosed) and can be processed for example via SIMOCODE-DP or PLC inputs or elsewhere.

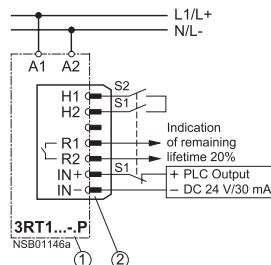
Permissible current carrying capacity of relay output R1/R2:  
 –  $I_{e,AC}$ -15/24 to 230 V: 3 A  
 –  $I_{e,DC}$ -13/24 V: 1 A

#### LED indicators

- The following statuses are indicated by LEDs on the laterally mounted electronics module:
- Contactor ON (energized state): Green LED ("ON")
  - Indication of remaining lifetime (see 2/69)

#### 2 control options:

- Contactor control without an interface directly via a DC 24 V  $\geq 30$  mA PLC output (EN 61 131-2) via terminals IN+/IN-.



Electronics module of 3RT1 ...-P contactor  
 Plug-in connection, 7-pole

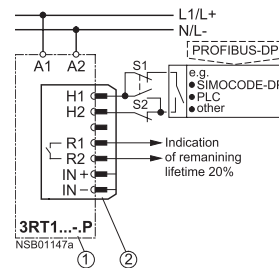
S1 Changeover switch from automatic control via PLC semiconductor output to local control

S2 Local control option

Possibility of switching from automatic control to local control via terminals H1/H2, i.e. automatic control via a PLC or SIMOCODE-DP/PROFIBUS-DP can be deactivated, for example during start-up or in the event of a fault, and the contactor can be controlled manually.

- Contactor control via relay outputs, e.g. by
  - PLC
  - SIMOCODE-DP 3UF5 via terminals H1/H2.
 Contact loading:  
 $U_s$ /approx. 5 mA.

When operated via SIMOCODE-DP, a communication link to PROFIBUS-DP is also provided.



Electronics module of 3RT1 ...-P contactor  
 Plug-in connection, 7-pole

S1 Changeover switch from automatic control, e.g. via SIMOCODE-DP or PLC relay output to local control

S2 Local control option

#### 3RT12 vacuum contactors

In contrast with the 3RT10 contactors – the main contacts operate in air under atmospheric conditions – the contact gaps of the 3RT12 vacuum contactors are contained in hermetically enclosed vacuum contact tubes. Neither arcs nor arcing gases are produced. The particular benefit of 3RT12 vacuum contactors, however, is that their electrical endurance is at least twice as long as that of 3RT10 contactors.

They are therefore particularly well suited to frequent switching in jogging/mixed operation, for example in crane control systems.

#### Advantages:

- Very long electrical endurance
- High short-time current-carrying capacity for heavy starting
- No open arcs, no arcing gases, i.e. no minimum clearances from earthed parts required either
- Longer maintenance intervals
- Increased plant availability

#### Notes on operation:

– Switching motors with rated operational voltages  $U_e > 500$  V:

In order to damp overvoltages and protect the motor winding insulation against multiple reignition when switching off three-phase motors, it is recommended to fit the contactors on the outgoing side (T1/T2/T3) with the 3RT19 66-1PV. surge suppression module – RC varistor – (accessory).

This additional equipment is not required for operation in circuits with converters. It might be damaged by the voltage peaks and harmonics generated.

- Switching DC voltage: Vacuum contactors are basically unsuitable for switching DC voltage.

# Contactors Assemblies for Switching Motors

## Contactors assemblies for WYE-delta starting

### Overview

The contactor assemblies for star-delta starting can be ordered as follows:

- Sizes S00-S0 as assemblies. (see pages 2/47-2/48)
- Sizes S2-S12 as components for customer assembly

HP	Calculated horsepower ratings at 460 V AC	Operat. current $I_e$ A	Motor current A	Size	Line/delta contactor	WYE contactor	Accessories for customer assembly		
							Time-delay relay	Installation kit A double infeed	
30		50	9.5 ... 13.8	S2-S2-S0	3RT2028	3RT2026		3RP2574-1N.30	3RA2933-2C <sup>3)</sup>
			12.1 ... 17.2						
			15.5 ... 21.5						
			19 ... 27.6						
			24.1 ... 34						
31 ... 43									
50		80	37.9 ... 55.2	S2-S2-S2	3RT2935	3RT2035			3RA2933-2BB1 <sup>3)</sup>
			48.3 ... 65						
60		86	62.1 ... 77.8		3RT2036				
75		115	31 ... 43.1	S3-S3-S2	3RT2045	3RT2035		3RP2574-1N.30	3RA2943-2C <sup>3)</sup>
			37.9 ... 55.2						
			48.3 ... 69						
			62.1 ... 77.6						
100		150	77.6 ... 108.6		3RT2045	3RT2036			
			98.3 ... 129.3						
120.7 ... 150									
125		160	86 ... 160	S6-S6-S3	3RT1054	3RT2045		3RP2574-1N.30	
150		195	86 ... 195						
190		230	86 ... 230		3RT1055	3RT2046			
200		280	86 ... 280		3RT1056	3RT2046			
250		350	95 ... 350	S10-S10-S6	3RT1064	3RT1054		3RP2574-1N.30	
300		430	95 ... 430		3RT1065	3RT1056			
400		540	347 ... 540	S12-S12-S10	3RT1075	3RT1064		3RP2574-1N.30	
450		610	347 ... 610						
500		690	347 ... 690			3RT1065			
650		850	347 ... 850		3RT1076	3RT1066			

For accessories, see page 2/83.  
For circuit diagrams, see page 2/200.

1) The installation kit contains mechanical interlock; 3 connecting clips; wiring connectors on the top (connection between line contactor and delta contactor) and the bottom (connection between delta contactor and star contactor); WYE jumper.

2) The installation kit contains 5 connecting clips; wiring connectors on the top (connection between line contactor and delta contactor) and the bottom (connection between delta contactor and WYE contactor); star jumper.



# Contactors Assemblies for Switching Motors

## Contactors assemblies for WYE-delta starting

Installation kit B for single infeed	WYE jumper	Baseplates	Overload relay, thermal		Overload relay, solid-state			
			Range of overload relay, thermal [A]	Order No. overload relay, thermal	Range of overload relay, solid-state [A]	Order No. overload relay, solid-state		
3RA1933-3D <sup>4)</sup>	3RT1926-4BA31	3RA2932-2E	5.5 ... 8	3RU2136-1HB	12.5 ... 50	-		
			7 ... 10	3RU2136-1JB0				
			9 ... 12.5	3RU2136-1KB0				
			11 ... 16	3RU2136-4AB0				
			14 ... 20	3RU2136-4BB0				
			18 ... 25	3RU2136-4DB0				
			22 ... 32	3RU2136-4EB0			20 ... 80	3RB3036-1WB0
			28 ... 40	3RU2136-4FB0				
			36 ... 45	3RU2136-4GB0				
			40 ... 50	3RU2136-4HB0				
3RA1943-3D <sup>4)</sup>	3RT1946-4BA31	3RA2942-2E	28 ... 40	3RU2146-4FB0	12.5 ... 50	3RB3046-1UB0		
			36 ... 45	3RU2146-4HB0				
			45 ... 63	3RU2146-4JB0				
			57 ... 75	3RU2146-4KB0			32 ... 115	3RB3046-1XB0
			70 ... 90	3RU2146-4LB0				
			80 ... 100 <sup>7)</sup>	3RU2146-4MB0				
3RA1953-3D <sup>5)</sup>	3RT1946-4BA31	3RA1952-2E	-	-	50 ... 200	3RB2056-1FC2		

3) Installation kit contains wiring connector on the bottom (connection between delta contactor and WYE contactor) and WYE jumper.  
 4) Wiring connector on top from reversing contactor assembly (note conductor cross-sections).

5) A mechanical interlock adapter, 3RA1954-2C, is required to use the standard 3RA1954-2A mechanical interlock for the AC version of the S6-S6-S3 WYE-Delta starter. The S6-S6-S3 WYE-Delta DC version would require a special custom build spacer, which is not manufactured, to allow the mechanical interlock to operate.

6) Only use wiring connector on the top from reversing contactor assembly (note conductor cross-sections); order WYE jumper in addition.  
 7) For overload relays >100A, see 3RB2 electronic Section 3, page 23.

# Contactors Assemblies for Switching Motors

## Contactors assemblies for WYE-delta starting

### Application

WYE-delta starting can only be used either if the motor normally operates in a  $\Delta$  (delta) connection or starts softly or if the load torque during  $\Upsilon$  starting is low and does not increase sharply. On the  $\Upsilon$  step the motors can carry approximately 50% (class KL 16) or 30% (class KL 10) of their rated torque; the starting torque is approximately  $\frac{1}{3}$  of that during direct on-line starting. The starting current is approximately 2 to 2.7 times the rated motor current.

The changeover from  $\Upsilon$  to  $\Delta$  must not be effected until the motor has run up to rated speed. Drives which require this changeover to be performed earlier are unsuitable for WYE-delta starting.

The ratings given in the above table are only applicable to motors with a starting current ratio of  $I_A \leq 8.4 \times I_N$  and using either a 3RT19 16-2G or 3RT19 26-2G solid-state time-delay auxiliary switch block with a WYE-delta function or a 3RP1574 WYE-delta time-delay relay with a dead interval of approximately 50 ms on reversing.

For the circuit diagrams for the main and control circuits, see page 2/161. The size selected for the installation kits for WYE-delta starting is determined by the line contactor.

### Design

#### Components for customer assembly

Installation kits with wiring connectors and, if necessary, mechanical connectors are available for contactor assemblies for WYE-delta starting. Contactors, overload relays, star-delta time-delay relays and auxiliary switches for the electrical interlock – if required also feeder terminals, mechanical interlocks <sup>1)</sup> and baseplates – must be ordered separately.

The wiring installation kits for sizes S00 and S0 contain the top and bottom main conducting path connections between the line and delta contactors (top) and between the delta and WYE contactors (bottom).

In the case of sizes S2 to S12 only the bottom main conducting path connection between the delta and WYE contactors is included in the wiring connector, owing to the larger conductor cross-section at the infeed.

### Motor protection

Overload relays or thermistor motor protection tripping units can be used for overload protection.

The overload relay can be either mounted onto the line contactor or separately fitted. It must be set to 0.58 times the rated motor current.

### Surge suppression

#### Sizes S00 to S3

All contactor assemblies can be fitted with RC elements, varistors or diode assemblies for damping opening surges in the coil.

As with the individual contactors, the surge suppressors can either be plugged onto the top of the contactors (S00) or fitted onto the coil terminals on the top or bottom (S0 to S3).

#### Sizes S6 to S12

The contactors are fitted with varistors as standard.

1) Exception:  
The mechanical interlock between the delta and WYE contactors is included in the installation kit for size S00 contactor assemblies.

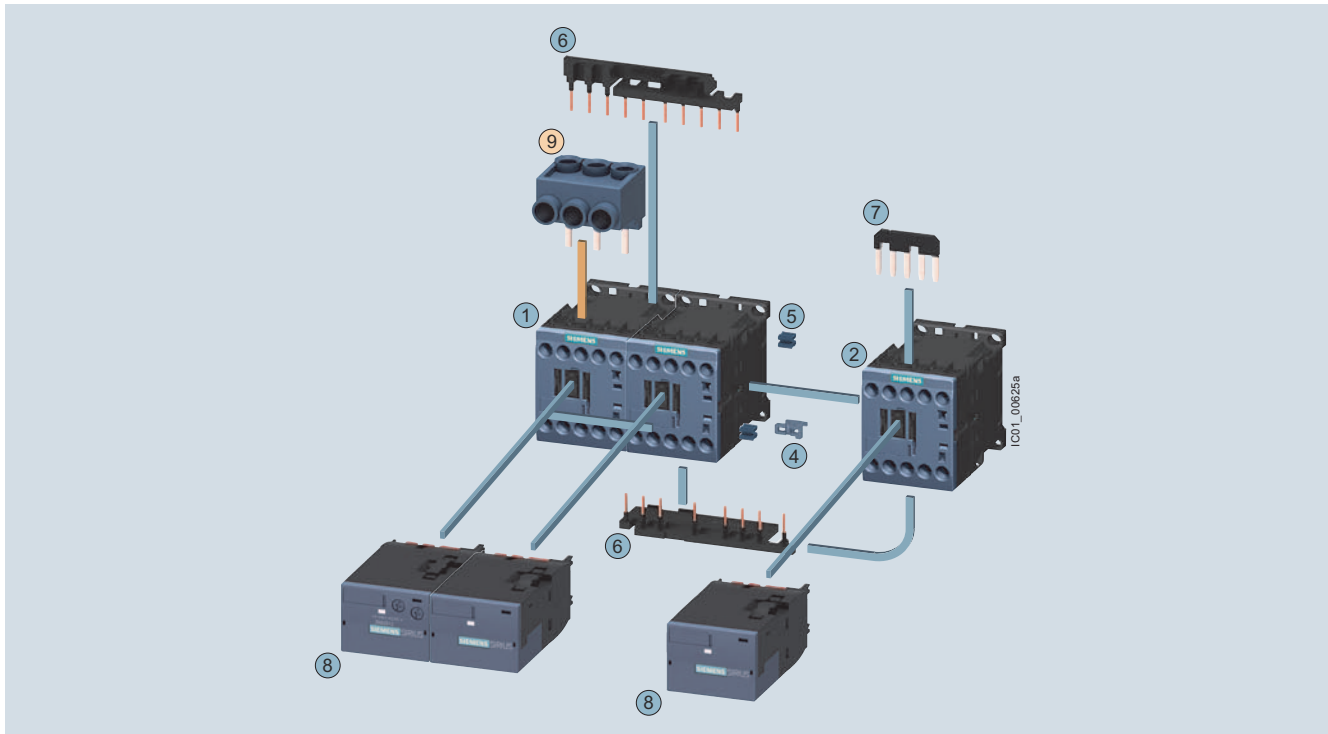
# Contactors Assemblies for Switching Motors

## Contactors assemblies for WYE-delta starting

### Selection and ordering data

Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW

The figure shows the version with screw terminals



#### Mountable accessories (optional)

To be ordered separately	Type	Page
⑨ Three-phase infeed terminal <sup>1)</sup>	3RA2913-3K	2/83

#### Complete contactor assembly for star-delta (wye-delta) starting

Individual parts	Type			Page
	Q11 <sup>2)</sup>	Q13	Q12	
① ② ③ Contactors, 5.5 kW	3RT2015	3RT2015	3RT2015	2/8
① ② ③ Contactors, 7.5 kW	3RT2017	3RT2017	3RT2015	2/8
① ② ③ Contactors, 11 kW	3RT2018	3RT2018	3RT2016	2/8
④ ... ⑦ Assembly kit S00-S00-S00 comprising:	3RA2913-2BB1			2/83
④ Mechanical interlock				
⑤ Four connecting clips for three contactors				
⑥ Wiring modules on top and bottom for connecting the main and auxiliary circuits				
⑦ Star jumper				
⑧ Function modules for star-delta (wye-delta) starting	3RA2816-0EW20			2/27

<sup>1)</sup> Part ⑨ can only be mounted in the case of contactors with screw terminal.

<sup>2)</sup> The version with 1 NO is required for momentary-contact operation.

**Note:**

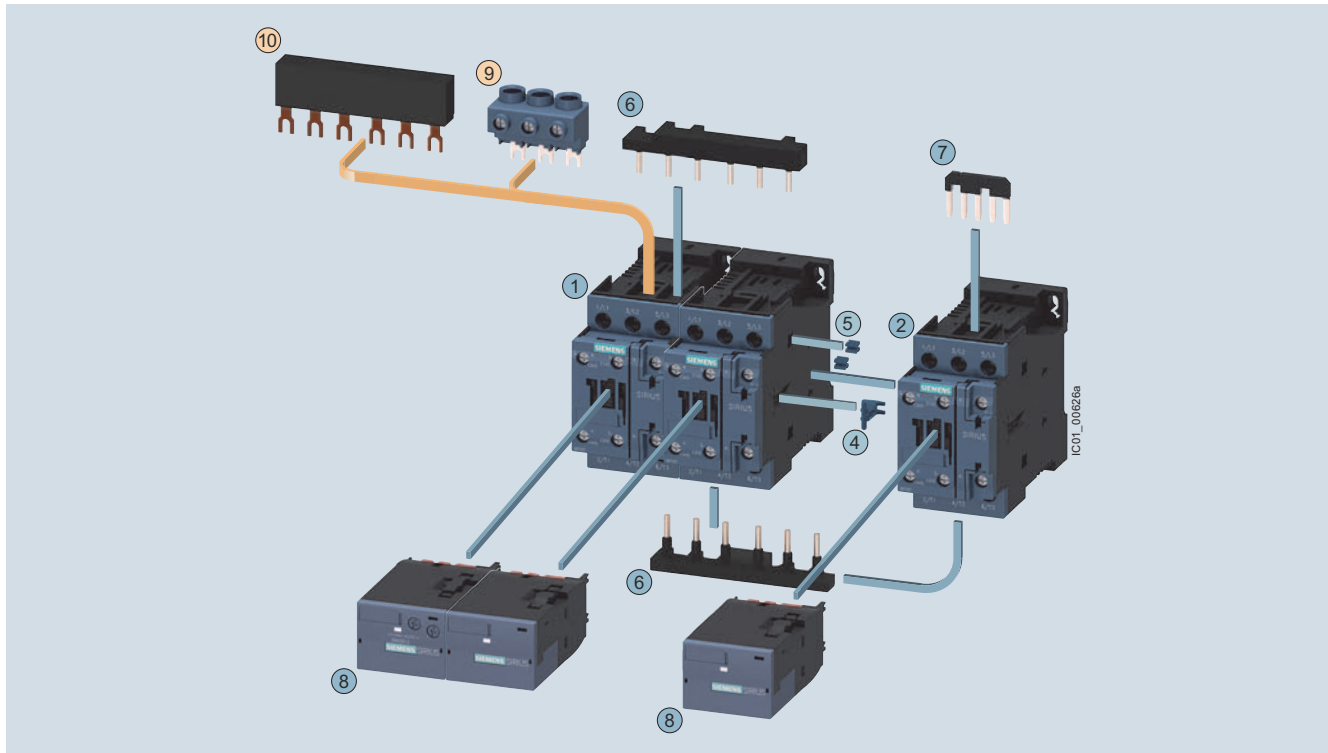
When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

# Contactors Assemblies for Switching Motors

## Contactors assemblies for WYE-delta starting

Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW

The figure shows the version with screw terminals



### Mountable accessories (optional)

To be ordered separately	Type	Page
⑨ Three-phase infeed terminal <sup>1)</sup>	3RV2925-5AB	2/83
⑩ Three-phase busbar <sup>1)</sup>	3RV1915-1AB	1/8

### Complete contactor assembly for star-delta (wye-delta) starting

Individual parts	Type			Page
	Q11	Q13	Q12	
① ② ③ Contactors, 11 kW	3RT2024	3RT2024	3RT2024	2/8
① ② ③ Contactors, 15/18.5 kW	3RT2026	3RT2026	3RT2024	2/8
① ② ③ Contactors, 22 kW	3RT2027	3RT2027	3RT2026	2/8
④ ... ⑦ Assembly kit S0-S0-S0 comprising:	3RA2923-2BB1			2/83
④ Mechanical interlock				
⑤ Four connecting clips for three contactors				
⑥ Wiring modules on top and bottom for connecting the main and auxiliary circuits				
⑦ Star jumper				
⑧ Function modules for star-delta (wye-delta) starting	3RA2816-0EW20			2/27

<sup>1)</sup> The parts ⑨ and ⑩ can only be mounted with contactors with screw terminal, the ⑥ wiring modules must be removed beforehand.

**Note:**

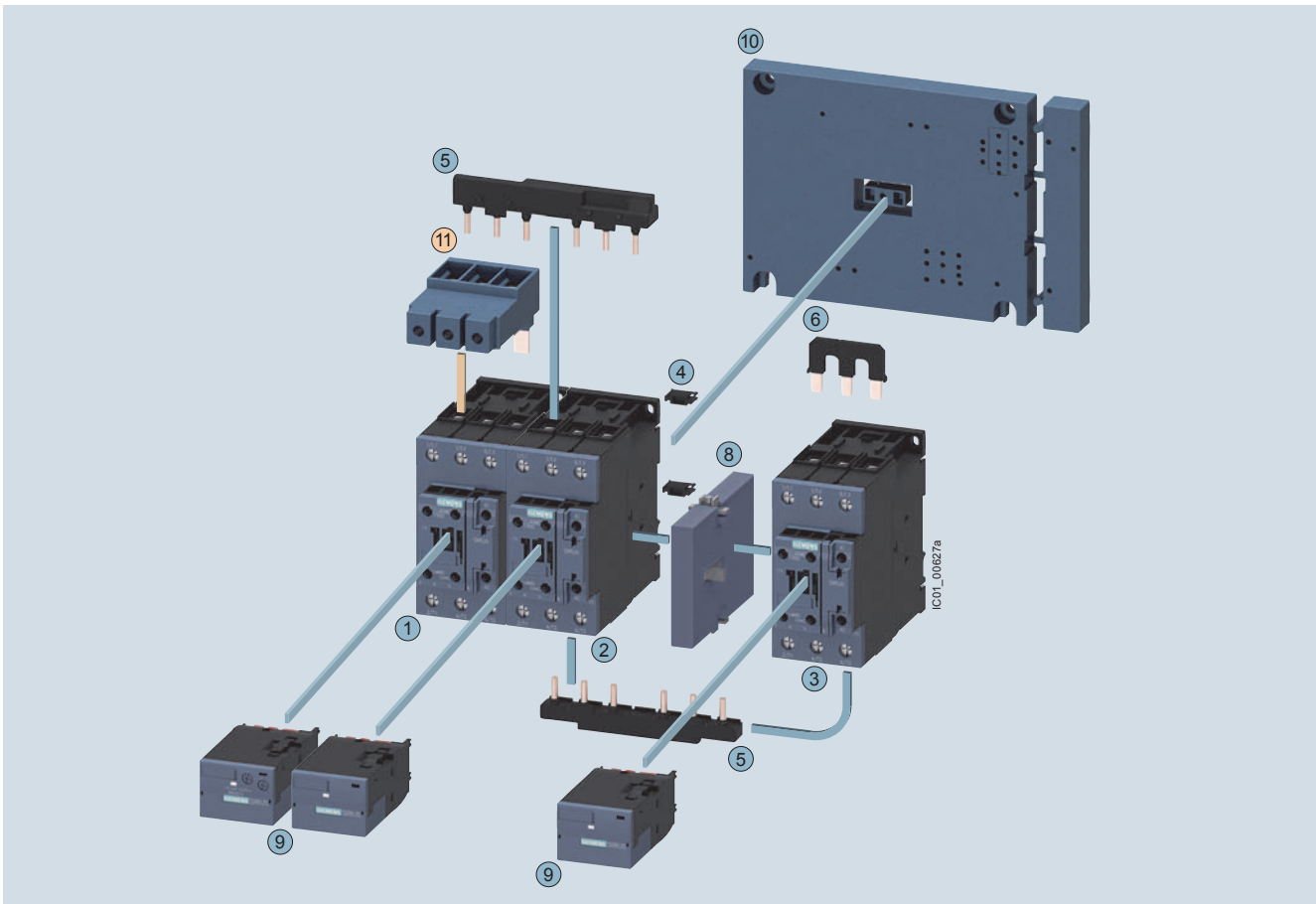
When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

# Contactors Assemblies for Switching Motors

## Contactors assemblies for WYE-delta starting

Size S2-S2-S0 · up to 65 A, 30 HP

The figure shows the version with screw terminals in S2-S2-S2



### Mountable accessories (optional)

To be ordered separately	Type
11 Three-phase infeed terminal	3RV2935-5A

### Complete contactor assembly for star-delta (wye-delta) starting

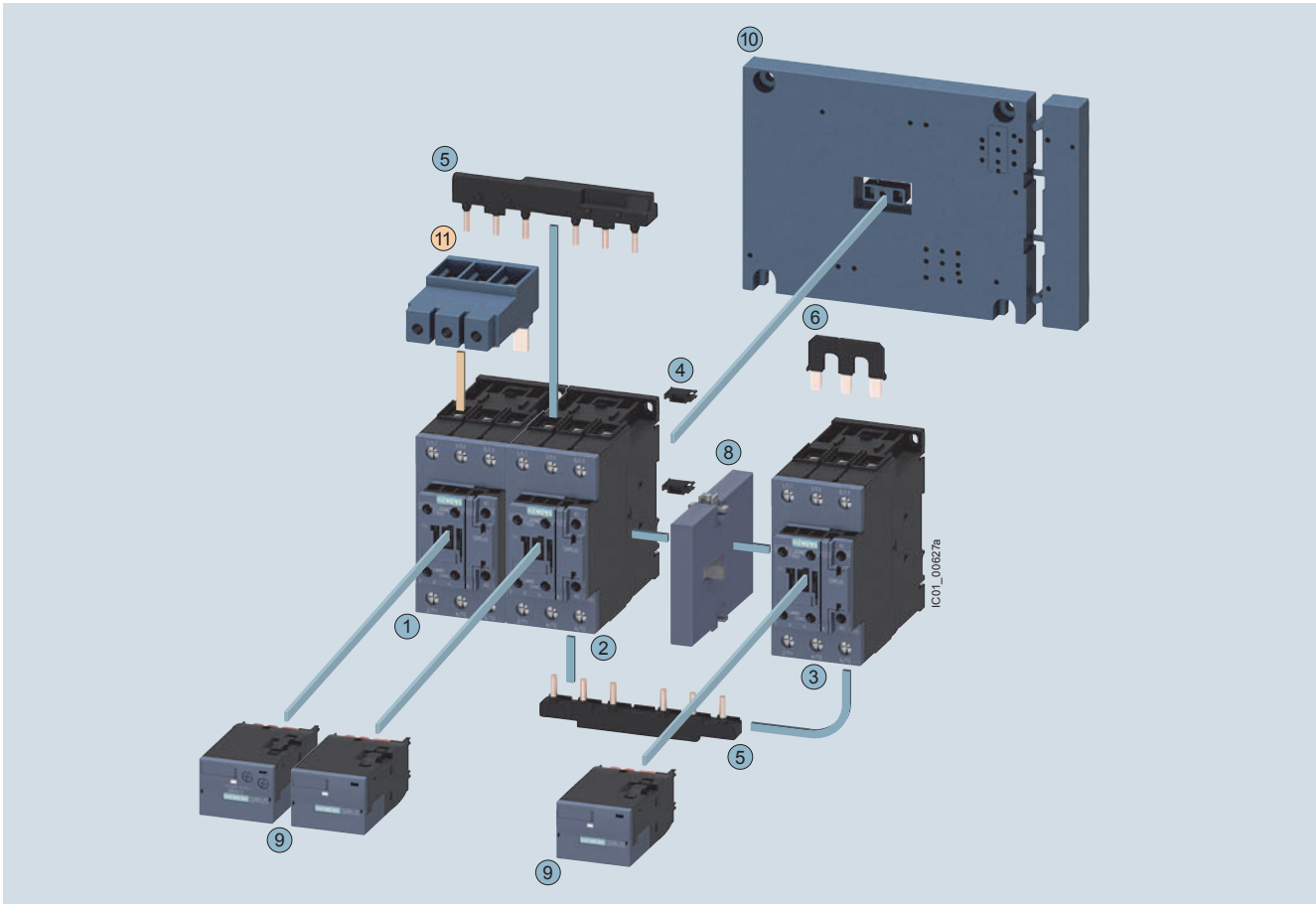
Individual parts	Type		
	Q11	Q13	Q12
1 2 3 Contactors, 22/30 kW	3RT2035	3RT2035	3RT2026
1 2 3 Contactors, 37 kW	3RT2035	3RT2035	3RT2027
1 2 3 Contactors, 45 kW	3RT2036	3RT2036	3RT2028
4 ... 7 Assembly kit S2-S2-S0 comprising:	3RA2933-2C		
4 Four connectors for three contactors (not required for fully pre-wired contactor assemblies for star-delta (wye-delta) starting)			
5 Wiring modules on top and bottom for connecting the main and auxiliary circuits			
6 Star jumper S2			
7 Cable for connecting the A2 coil contact from the line contactor with the A2 coil contact of the delta contactor (not shown in the drawing)			
8 Mechanical interlock	3RA2934-2B		
9 Function modules for star-delta (wye-delta) starting	3RA2816-0EW20		
10 Base plate star-delta (wye-delta)	3RA2932-2F		

For overview, see page 2/110.  
For circuit diagrams, see page 2/200.

# Contactors Assemblies for Switching Motors

## Contactors assemblies for WYE-delta starting

Size S2-S2-S2 · up to 86 A, 60 HP



### Mountable accessories (optional)

To be ordered separately	Type
⑪ Three-phase infeed terminal	3RV2935-5A

### Complete contactor assembly for star-delta (wye-delta) starting

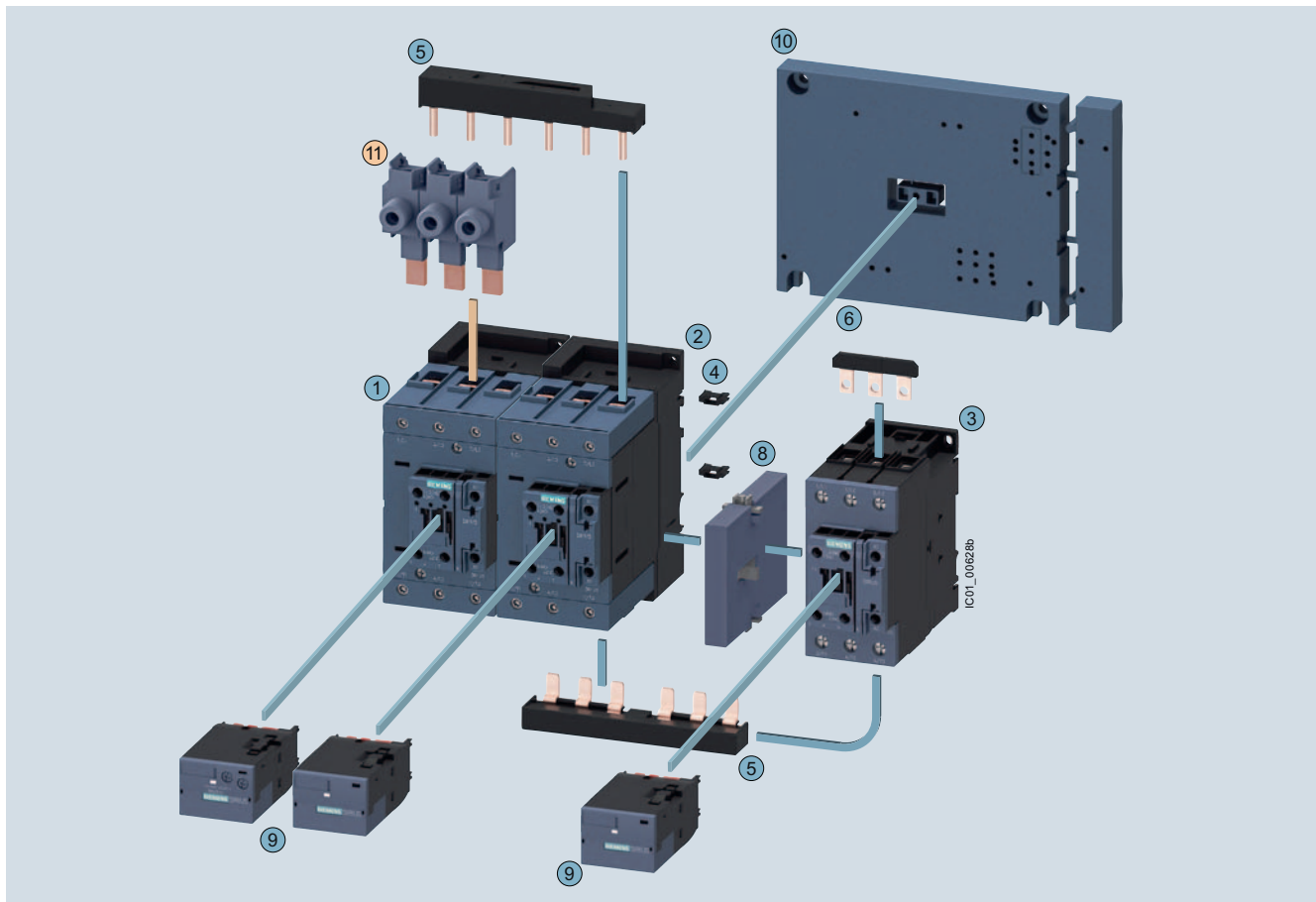
Individual parts	Type		
	Q11	Q13	Q12
① ② ③ Contactors, 55 kW	3RT2037	3RT2037	3RT2035
④ ... ⑦ Assembly kit S2-S2-S2 comprising:	3RA2933-2BB1		
④ Four connectors for three contactors (not required for fully pre-wired contactor assemblies for star-delta (wye-delta) starting)			
⑤ Wiring modules on top and bottom for connecting the main and auxiliary circuits			
⑥ Star jumper S2			
⑦ Cable for connecting the A2 coil contact from the line contactor with the A2 coil contact of the delta contactor (not shown in the drawing)			
⑧ Mechanical interlock	3RA2934-2B		
⑨ Function modules for star-delta (wye-delta) starting	3RA2816-0EW20		
⑩ Base plate star-delta (wye-delta)	3RA2932-2F		

For overview, see page 2/110.  
For circuit diagrams, see page 2/200.

# Contactors Assemblies for Switching Motors

Contactor assemblies for WYE-delta starting

Size S3-S3-S2 · up to 150 A, 100 HP



**Mountable accessories (optional)**      **Complete contactor assembly for star-delta (wye-delta) starting**

To be ordered separately	Type
11 Single-phase infeed terminal (3 units are required)	3RA2943-3L

Individual parts	Type		
	Q11	Q13	Q12
1 2 3 Contactors, 55 kW	3RT2045	3RT2045	3RT2035
1 2 3 Contactors, 75 kW	3RT2045	3RT2045	3RT2036
1 2 3 Contactors, 90 kW	3RT2046	3RT2046	3RT2037
4 ... 7 Assembly kit S3-S3-S2 comprising:	3RA2943-2C		
4 Two connectors for three contactors (not required for fully pre-wired contactor assemblies for star-delta (wye-delta) starting)			
5 Wiring modules on top and bottom (S3-S2) for connecting the main and auxiliary circuits and a cable set for the auxiliary circuit			
6 Star jumper S2			
7 Cable for connecting the A2 coil contact from the line contactor with the A2 coil contact of the delta contactor (not shown in the drawing)			
8 Mechanical interlock	3RA2934-2B		
9 Function modules for star-delta (wye-delta) starting	3RA2816-0EW20		
10 Base plate star-delta (wye-delta)	3RA2942-2F		

<sup>1)</sup> Contactor assembly for star-delta (wye-delta) starting for customer assembly in size S3-S3-S3 (not shown): The 3RA2943-2BB. assembly kit is to be used here, see page 3/106.

For overview, see page 2/110.  
For circuit diagrams, see page 2/200.



# Control Relays, Coupling Relays

## 3RH21 control relays, size S00 with 4 or 8 contacts

### AC and DC operation

IEC 60947, EN 60947.

The 3RH2 contactor relays have screw, ring lug terminal or spring-type terminals. Four contacts are available in the basic unit.

The 3RH2 contactor relays are suitable for use in any climate. They are finger-safe according to EN 50274. The devices with ring lug terminal connection comply with degree of protection IP20 when fitted with the related terminal cover.

### Contact reliability

High contact stability at low voltages and currents, suitable for solid-state circuits with currents  $\geq 1$  mA at a voltage of 17 V.

### Surge suppression

RC elements, varistors, diodes or diode assemblies (combination of a diode and a Zener diode) can be plugged onto all contactor relays from the front for damping opening surges in the coil. The plug-in direction is determined by a coding device.

### Note:

*The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).*

### Auxiliary switch blocks

The 3RH2 contactor relays can be expanded by up to four contacts by the addition of snap-on auxiliary switch blocks.

The auxiliary switch block can easily be snapped onto the front of the contactors. The auxiliary switch block has a centrally positioned release lever for disassembly.

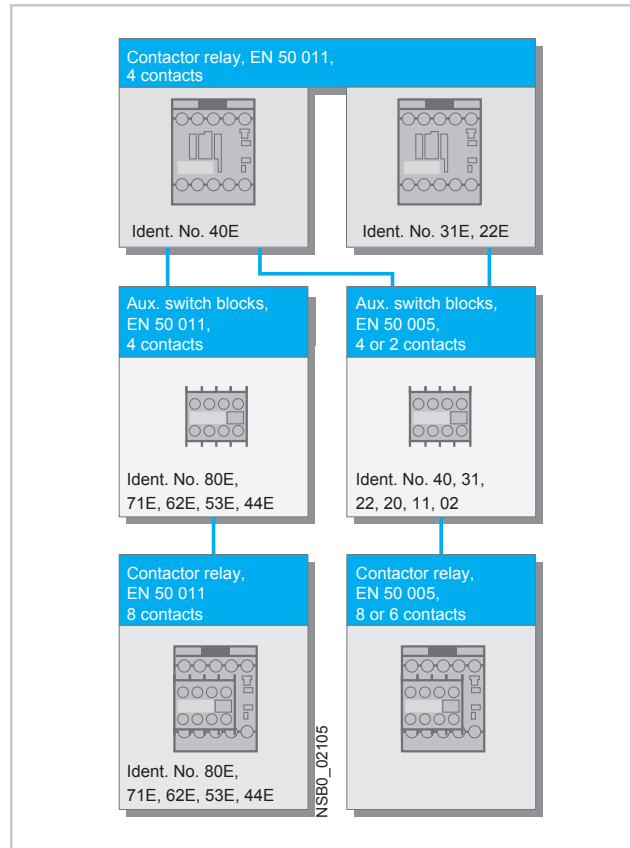
The contactor relays with 4 contacts according to EN 50011, with the identification number 40E, can be extended with 80E to 44E auxiliary switch blocks to obtain contactor relays with 8 contacts according to EN 50011. The identification numbers 80E to 44E on the auxiliary switch blocks apply to the complete contactors. These auxiliary switch blocks (3RH29 11-1GA..) cannot be combined with contactor relays with identification numbers 31E and 22E; they are coded.

All contactor relays with 4 contacts according to EN 50011, identification numbers 40E to 22E, can be extended with auxiliary switch blocks 40 to 02 to obtain contactor relays with 6 or 8 contacts in accordance with EN 50005. The identification numbers on the auxiliary switch blocks apply only to the attached auxiliary switch blocks.

In addition, fully mounted 3RH22 8-pole contactor relays are available; the mounted 4-pole auxiliary switch block in the 2nd tier is not removable. The terminal designations are according to EN 50011.

These versions are built according to special Swiss regulations SUVA and are distinguished externally by a red labeling plate.

Of the auxiliary contacts (integrated plus mountable) possible on the device, no more than four NC contacts are permitted.



## 3RH24 latched control relays, size S00

### Application

#### AC and DC operation

IEC 60 947, EN 60 947 (VDE 0660)

The terminal designations comply with EN 50 011.

The relay coil and the coil of the release solenoid are both designed for continuous duty.

The number of auxiliary contacts can be extended by means of auxiliary switch blocks (up to 4 poles).

RC elements, varistors, diodes or diode assemblies can be plugged onto both coils

from the front for damping opening surges.

The control relay can also be switched on and released manually.

# Contactors for Switching Motors

## 3TF68 and 3TF69 vacuum contactors, 3-pole

### Design

EN 60 947-4-1 (VDE 0660 Part 102).

The 3TF contactors are suitable for use in any climate. They are safe from touch according to DIN VDE 0106 Part 100. Terminal covers (see accessories) may have to be fitted onto the connecting bars, depending on the configuration with other devices.

### Main contacts

#### Contact erosion indication with 3TF68/69 vacuum contactors

The contact erosion of the vacuum interrupters can be monitored in the closed position by means of three white double slides on the contactor base.

The vacuum interrupter must be replaced if the distance indicated by one of the double slides is less than 0.5 mm while the contactor is in the closed position.

It is advisable to replace all three interrupters in order to ensure maximum reliability.

### Auxiliary contacts

The terminal designations comply with EN 50 012.

When the contactors are energized, the NC contacts open before the NO contacts close.

#### Contact reliability

The auxiliary contacts are extremely reliable and as such are suitable for electronic circuits

- with currents  $\geq 1$  mA,
- at voltages greater than 17 V.

### Surge suppression

#### Control circuit

Protection of the coil circuits against surges:

#### AC operation

- fitted with varistors as standard.

#### DC operation

- Retrofitting options:
- varistors.

### Electromagnetic compatibility (EMC)

3TF68/69...C contactors for AC operation are equipped with an electronically controlled solenoid mechanism with a high level of immunity to interference (see table opposite).

#### Note:

In operation in installations where it is not possible to observe the emitted interference limits, e.g. as an output contactor in static frequency changers, use of 3TF68/69...Q contactors (NS E catalogue, available in German) is recommended, without a main conductor path circuit (for further information refer also to the description below).

Contactors Type	Rated control supply voltage $U_s$	Overvoltage type (IEC 60 801)	Severity to IEC 60 801	Surge strength
3TF68 44-.C.., 3TF69 44-.C..	110 V ... 132 V	Burst	3	2 kV
	200 V ... 276 V	Surge	4	6 kV
	380 V ... 600 V	Burst	4	4 kV
		Surge	4	5 kV
		Burst	4	4 kV
		Surge	4	6 kV

### Circuit of the main conducting paths

An integrated RC varistor circuit in the main conducting paths of the contactors damps the rate of rise of switching overvoltages to uncritical values. Multiple restriking of the switching arcs is thereby prevented.

The operator of an installation can thus assume that the danger to the motor winding arising from switching overvoltages with a high rate of rise is ruled out.

The contactors can therefore be used without reservation for all AC switching applications, including three-phase motors with the demanding AC-4 utilization category.

#### Important note

The surge suppression circuit is not necessary when 3TF68/69 contactors are used in circuits with e.g. d.c. choppers, frequency converters or variable-speed drives.

It might be damaged by the voltage peaks and harmonics generated. This may also cause phase-to-phase short-circuits in the contactors.

**Remedy:** Order the special contactor design without surge suppression. In this case the Order No. must be supplemented with "-Z" and the order code "A02". No additional charge is made.

### Short-circuit protection of contactors

For assembling fuseless load feeders, please select a circuit-breaker/contactor combination according to the brochure entitled "Verbraucherabzweige in sicherungsloser Bauweise", Order No. E20001-P285-A726 (available in German only).

# Accessories for 3RT / 3RH Contactors

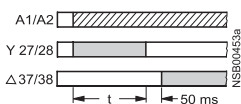
## Solid-state, time-delay auxiliary switch box

The timer module, which is available in "ON-delay" and "OFF-delay" designs, allows time-delayed functions up to 100 s (3 distinct delay ranges).

It contains a relay with one NO contact and one NC contact; the relay is switched either after an ON-delay or after an OFF-delay.

The timer module with a WYE-DELTA function is equipped with one delayed and one instantaneous NO contact, with an interval time of 50 ms between the two (see diagram). The delay time of the NO contact can be set between 1.5 s and 30 s.

### WYE-delta function



The timer module, which is available in "ON-delay" and "OFF-delay" with auxiliary power supply designs, allows time-delayed functions up to 100 s (3 distinct delay ranges). Contactors fitted with a time-delay block close or open after a delay according to the set time.

The ON-delay variant of the time-delay relay is connected in series with the contactor coil; terminal A1 of this coil must not be connected.

With the OFF-delay variant of the time-delay relay, the contactor coil is contacted directly via the relay; terminals A1 and A2 of the coil must not be connected.

The time-delay relays are suitable for both AC and DC operation.

The contactor on which the solid-state, time-delay auxiliary switch block is mounted operates without a delay.

### Size S00 (3RT201)

The solid-state, time-delay auxiliary switch block is fitted onto the front of the contactor. The timer module is supplied with power directly by plug-in contacts via the coil terminals of the contactor, in parallel with A1/A2. The time function is activated by closing the contactor on which the auxiliary switch block is mounted. The OFF-delay variant operates without an auxiliary power supply. Minimum ON period: 200 ms.

A varistor is integrated in the timer module for damping opening surges in the contactor coil.

The solid-state, time-delay auxiliary switch block cannot be mounted on size S00 coupling relays.

### Sizes S0 to S12 (3RT202 to 3RT107)

The solid-state, time-delay auxiliary switch block is fitted onto the front of the contactor.

The timer module is supplied with power via two terminals (A1/A2); the time delay of the auxiliary switch block can be activated either by a parallel link to any contactor coil or by any power source.

The OFF-delay variant operates without an auxiliary power supply. Minimum ON period: 200 ms.

A single-pole auxiliary switch block cannot be snapped onto the front of the contactor in addition to the timer module.

The timer module has no integrated components for damping opening surges.

## Solid-state time-delay block with semiconductor output

### Size S00 (3RT201)

The variant for size S00 contactors is fitted onto the front of the contactor (with the supply voltage switched off) and then slid into its latched position; at the same time, the time-delay relay is connected by means of plug-in contacts to coil terminals A1 and A2 of the contactor. Any contactor coil terminals which are not required are sealed off by means of covers on the enclosure of the time-delay block, to prevent them from being connected inadvertently (for circuit diagrams, see page 2/149).

A varistor is integrated in the timer module for damping opening surges in the contactor coil.

The solid-state, time-delay block cannot be mounted on size S00 coupling relays.

### Sizes S0 to S3 (3RT202 to 3RT107)

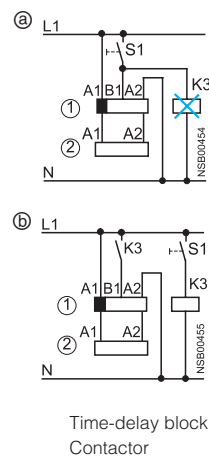
The time-delay block for size S0 to S3 contactors is plugged into coil terminals A1 and A2 on top of each contactor; the time-delay relay is connected both electrically and mechanically by means of pins.

A varistor is integrated in the timer module for damping opening surges in the contactor coil.

### Configuration note

Activation of loads parallel to the start input is not permitted with AC operation (see ②).

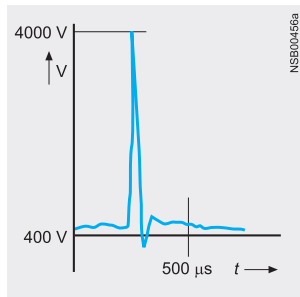
The 3RT19 16-2D.../3RT19 26-2D... time-delay blocks with an OFF delay have a voltage-carrying start input B1. This means that if there is a parallel load on terminal B1, activation can be simulated with AC voltage. In this case, the additional load (e.g. contactor K3) must be wired as shown in ①.



# Accessories for 3RT / 3RH Contactors

## 3-phase EMC interference suppression module for size S00 contactor

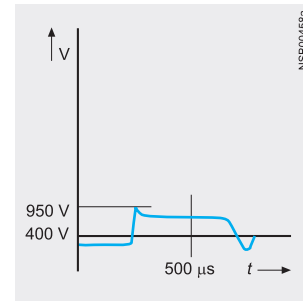
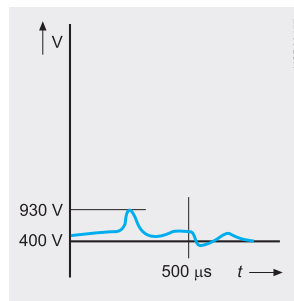
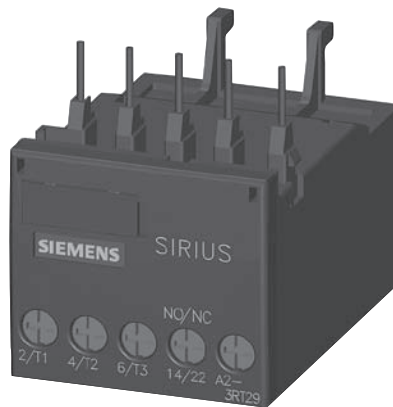
A so-called back-e.m.f. (electromotive force) is produced when motors or various inductive loads are turned off. Voltage peaks of up to 4 000 V may occur as a result, with a frequency spectrum from 1 kHz to 10 MHz and a rate of voltage variation from 0.1 to 20 V/ns.



The connection between the main conducting path and the EMC interference suppression module enables contact arcing, which is responsible for contact erosion and the majority of clicking noises, to be reduced; this in turn is conducive to an electromagnetically compatible design.

Since the EMC interference suppression module achieves a significant reduction in radio-frequency components and the voltage level in three phases, the contact endurance is also improved considerably. This makes an important contribution towards enhancing the reliability and availability of the system as a whole.

There is no need for fine graduations within each performance class, as smaller motors inherently have a higher inductance, so that one solution for all fixed-speed drives up to 7.5 HP is adequate.



Two electrical variants are available:

The advantages of the RC circuit lie mainly in the reduction in the rate of rise and in its RF damping ability. The selected values ensure effective interference suppression over a wide range.

The varistor circuit is able to absorb high energy levels and is also suitable for frequencies from 10 to 400 Hz (variable-speed drives). There is no limiting below the knee-point voltage, however.

### OFF-delay device for size S00 to S3 contactors

**AC and DC operation**  
IEC 60 947, EN 60 947

For screwing and snapping onto 35 mm standard mounting rail. The OFF-delay devices have screw connections.

contactor does not open. The 3RT19 16/3RT29 16 OFF-delay devices are specifically designed for operation with the 3RT contactors and 3RH contactor relays of the SIRIUS series.

A contactor opens after a delay when the capacitors of the contactor coil, built into the OFF-delay device, are switched in parallel. In the event of voltage failures, the capacitors are discharged via the coil and thereby delay the opening of the contactor.

**Operation**

In the case of the versions for rated control supply voltages of 110 V and 230 V, either AC voltage or DC voltage can be applied on the line side, where as the variant for 24 V is designed for DC operation only. A DC-operated contactor is connected to the output in accordance with the input voltage that is applied.

**Application**

The OFF-delay device prevents a contactor from dropping out unintentionally when there is a short-time voltage dip or voltage failure. It supplies the necessary power for a series-connected, DC-operated contactor during a voltage dip to ensure that the

**Principle of operation**

The OFF-delay device operates without external voltage on a capacitive basis, and can be energized with either AC or DC (24 V version for DC operation only). Voltage matching, which is only necessary with AC operation, is performed using a rectifier bridge.

If the command devices are upstream of the OFF-delay device in the circuit, the OFF delay takes effect with every opening operation. If the opening operation is downstream of the OFF-delay device, an OFF delay only applies in the event of failure of the mains voltage.

The mean value of the OFF delay is approximately 1.5 times the specified minimum time.

# Accessories for 3RT Contactors

Interface for mounting on size S0 to S3 contactors

### Application

#### DC operation

IEC 60 947 and EN 60 947  
The interface is suitable for use in any climate. It is safe from touch to DIN VDE 0106 Part 100. The terminal designations conform to EN 50 005.

### Functions

#### Design

System-compatible operation with DC 24 V, coil voltage tolerance 17 V to 30 V.  
Low power consumption in conformity with the technical data of the electronic systems.  
A light-emitting diode indicates the circuit state.

#### Surge suppression

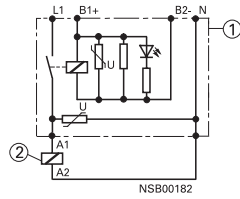
The 3RH29 24-1GP11 interface has an integrated surge suppressor (varistor) for the contactor coil being switched.

#### Mounting

The 3RH29 24-1GP11 interface is mounted directly on the contactor coil.

### Terminal diagram

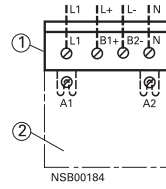
**3RH19/29 24-1GP1**  
with surge suppression



- ① Interface
- ② Contactor

### Connection example

**3RH19/29 24-1GP1**  
with surge suppression



- ① Interface
- ② Contactor

# Contactors Assemblies for Switching Motors

## 3RT2 contactors

### More information

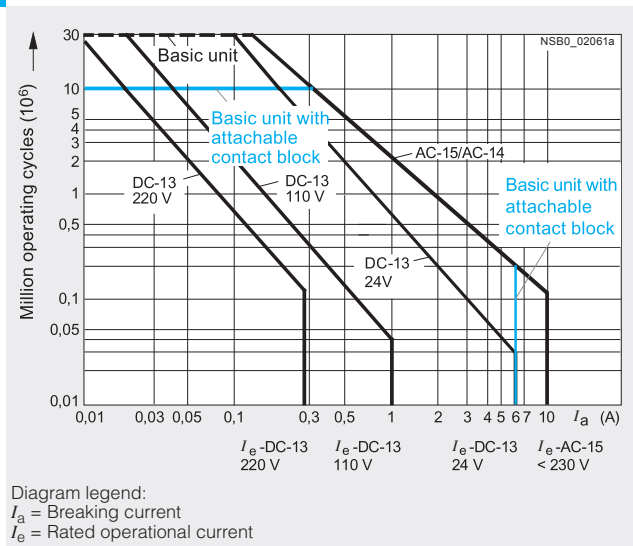
Contactors	Type Size Width	mm	3RT2 S00 and S0 45
<b>Rated data of the auxiliary contacts</b>			
<b>According to IEC 60947-5-1/EN 60947-5-1</b> The data apply to integrated auxiliary contacts and contacts in the auxiliary switch blocks for contactor sizes S00 to S0 <sup>1)</sup>			
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)		V	690
<b>Conventional thermal current <math>I_{th}</math> = Rated operational current <math>I_e/AC-12</math></b>		A	10
<b>AC load</b>			
<b>Rated operational current <math>I_e/AC-15/AC-14</math></b>			
• For rated operational voltage $U_e$	24 V	A	10 <sup>1)</sup>
	110 V	A	10 <sup>1)</sup>
	125 V	A	10 <sup>1)</sup>
	220 V	A	10 <sup>1)</sup>
	230 V	A	10 <sup>1)</sup>
	380 V	A	3
	400 V	A	3
	500 V	A	2
	660 V	A	1
	690 V	A	1
<b>DC load</b>			
<b>Rated operational current <math>I_e/DC-12</math></b>			
• For rated operational voltage $U_e$	24 V	A	6
	60 V	A	6
	110 V	A	3
	125 V	A	2
	220 V	A	1
	440 V	A	0.3
	600 V	A	0.15
<b>Rated operational current <math>I_e/DC-13</math></b>			
• For rated operational voltage $U_e$	24 V	A	6
	60 V	A	2
	110 V	A	1
	125 V	A	0.9
	220 V	A	0.3
	440 V	A	0.14
	600 V	A	0.1
<b>Contact reliability at 17 V, 1 mA</b> acc. to EN 60947-5-4			Frequency of contact faults $<10^{-8}$ i. e. $<1$ fault per 100 million operating cycles

**Endurance of the auxiliary contacts**

It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system. The contact endurance is mainly dependent on the breaking current.

The characteristic curves apply to:

- Integrated auxiliary contacts on 3RT20
- Auxiliary switch blocks 3RH 29 11, 3RH29 21 for contactors size S00 and S0.



<sup>1)</sup> Integrated auxiliary contacts in size S0, auxiliary switches for snapping onto the front and for mounting onto the side in size S00 and S0:  $I_e = 6$  A at AC-14/AC-15.

# Contactors for Switching Motors

## 3RT2 contactors

### Endurance of the main contacts

The characteristic curves show the contact endurance of the contactors when switching resistive and inductive AC loads (AC-1/AC-3) depending on the breaking current and rated operational voltage. It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.

The rated operational current  $I_e$  complies with utilization category AC-4 (breaking six times the rated operational current) and is intended for a contact endurance of at least 200,000 operating cycles.

If a shorter endurance is sufficient, the rated operational current  $I_e/AC-4$  can be increased.  $I_e$

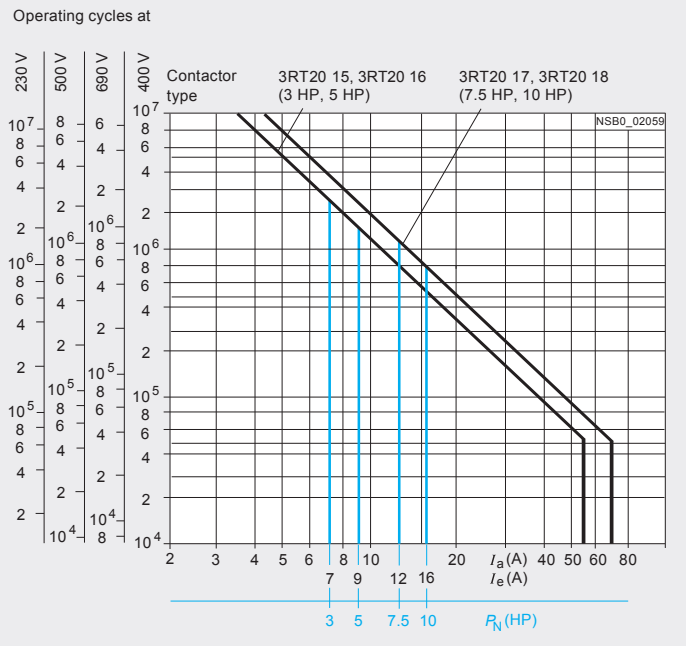
**If the contacts are used for mixed operation**, i. e. normal switching (breaking the rated operational current according to utilization category AC-3) in combination with intermittent inching (breaking several times the rated operational current according to utilization category AC-4), the contact endurance can be calculated approximately from the following equation:

$$X = \frac{A}{1 + \frac{C}{100} \left( \frac{A}{B} - 1 \right)}$$

Characters in the equation:

- X Contact endurance for mixed operation in operating cycles
- A Contact endurance for normal operation ( $I_a = I_e$ ) in operating cycles
- B Contact endurance for inching ( $I_a = \text{multiple of } I_e$ ) in operating cycles
- C Inching operations as a percentage of total switching operations

### Size S00



### Size S0

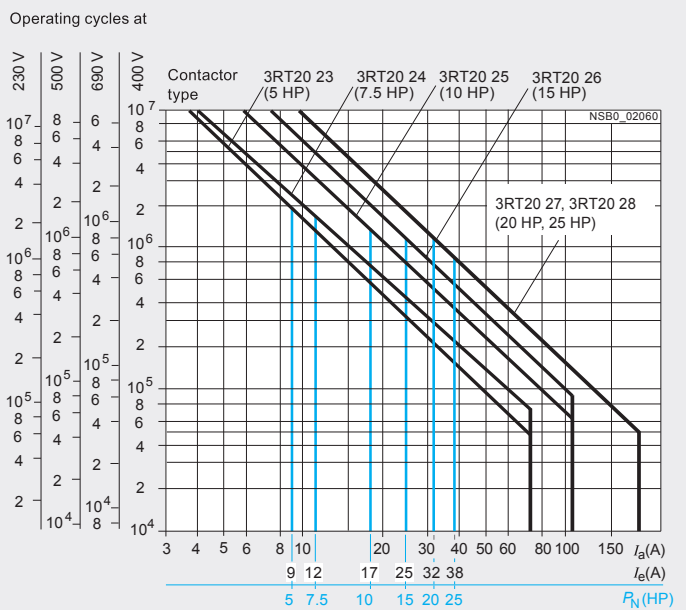


Diagram legend:  
 $P_N$  = Rated power for squirrel-cage motors at 460 V  
 $I_a$  = Breaking current  
 $I_e$  = Rated operational current



# Contactors for Switching Motors

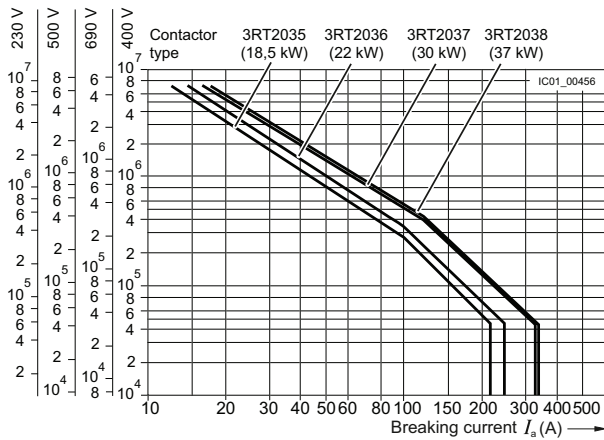
## 3RT contactors

### Technical data

#### Endurance of the main contacts

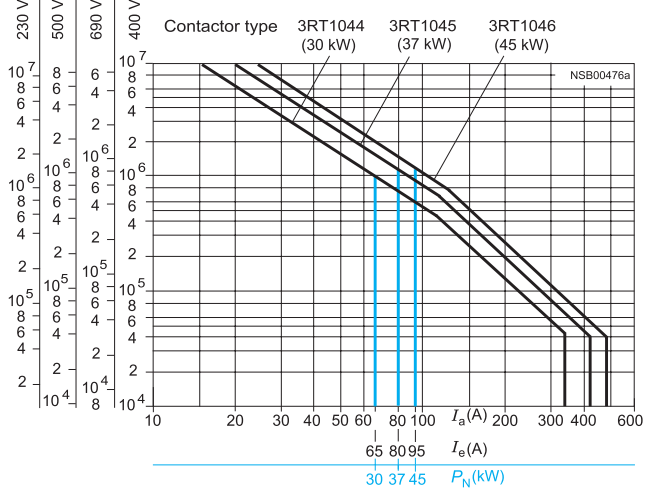
##### Size S2

Operating cycles at



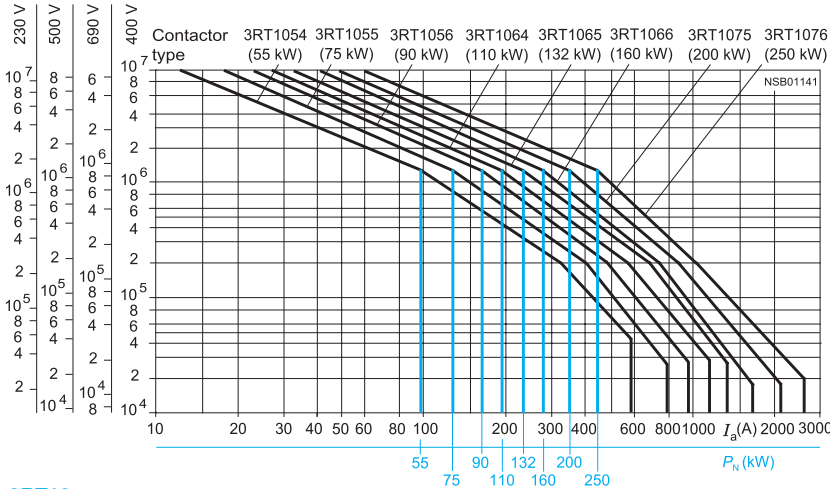
##### Size S3

Operating cycles at



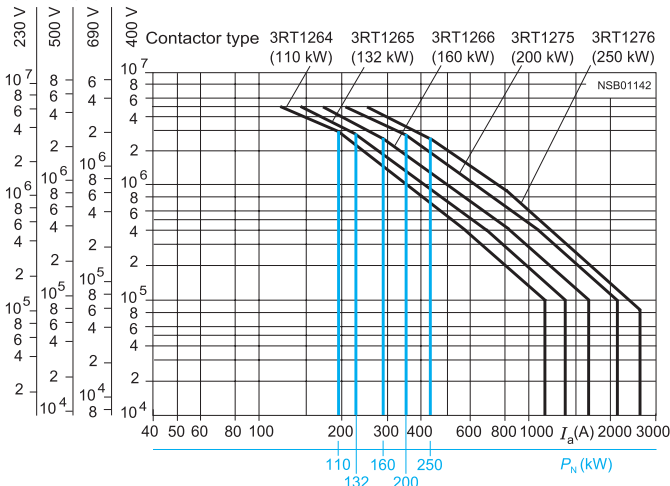
#### Sizes S6 to S12

Operating cycles at



#### 3RT12 vacuum contactors Sizes S10 and S12

Operating cycles at



Legend:  
 $P_N$  = Ratings of three-phase motors with squirrel-cage rotor at 400 V  
 $I_a$  = Breaking current  
 $I_e$  = Rated operational current

# Contactors for Switching Motors

## 3RT2 contactors

Contactors	Type		3RT20 15	3RT20 16	3RT20 17	3RT20 18
	Size		S00	S00	S00	S00
	Width	mm	45	45	45	45
<b>Ⓢ and Ⓣ rated data</b>						
<b>Rated insulation voltage</b>		V AC	600			
<b>Uninterrupted current, at 40 °C</b>		• Open and enclosed	A 20			
<b>Maximum horsepower ratings</b> (Ⓢ and Ⓣ approved values)						
• Rated power for induction motors at 60 Hz		At 200 V hp	1.5	2	3	3
		230 V hp	2	3	3	5
		460 V hp	3	5	7.5	10
		575 V hp	5	7.5	10	10
<b>Short-circuit protection<sup>1)</sup></b> (contactor or overload relay)		At 600 V kA	5	5	5	5
		• Fuse CLASS J <sup>2)</sup>	A 40	40	40	40
		• Circuit breakers with overload protection according to UL 489	A 50	50	50	50
• Combination motor controllers type E according to UL 508			...3)	...3)	...3)	...3)
<b>NEMA/EEMAC ratings</b>						
NEMA/EEMAC size			--			0
• Uninterrupted current		- Open	A --			18
		- Enclosed	A --			18
• Rated power for induction motors at 60 Hz		At 200 V hp	--			3
		230 V hp	--			3
		460 V hp	--			5
		575 V hp	--			5
<b>Overload relays</b>		• Type	3RU21 1 / 3RB30 1			
		• Setting range	A 0.11 ... 16 / 0.1 ... 16			

Contactors	Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28	
	Size		S0	S0	S0	S0	S0	S0	
	Width	mm	45	45	45	45	45	45	
<b>Ⓢ and Ⓣ rated data</b>									
<b>Rated insulation voltage</b>		V AC	600				600		
<b>Uninterrupted current, at 40 °C</b>		• Open and enclosed	A 35				42		
<b>Maximum horsepower ratings</b> (Ⓢ and Ⓣ approved values)									
• Rated power for induction motors at 60 Hz		At 200 V hp	2	3	5	7.5	10	10	
		230 V hp	3	3	5	7.5	10	10	
		460 V hp	5	7.5	10	15	20	25	
		575 V hp	7.5	10	15	20	25	25	
<b>Short-circuit protection<sup>1)</sup></b> (contactor or overload relay)		At 600 V kA	5	5	5	5	5	5	
		• Fuse CLASS J <sup>2)</sup>	A 45	45	45	70	110	110	
		• Circuit breakers with overload protection according to UL 489	A 70	70	70	100	100	100	
• Combination motor controllers type E according to UL 508			- At 480 V		Type 3RV20 2				
					A --				
					kA ...3)				
			- At 600 V		Type 3RV20 2				
					A --				
					kA ...3)				
<b>NEMA/EEMAC ratings</b>									
NEMA/EEMAC size			--					1	
• Uninterrupted current		- Open	A --					27	
		- Enclosed	A --					27	
• Rated power for induction motors at 60 Hz		At 200 V hp	--					7.5	
		230 V hp	--					7.5	
		460 V hp	--					10	
		575 V hp	--					10	
<b>Overload relays</b>		• Type	3RU21 2 / 3RB30 2						
		• Setting range	A 1.8 ... 40 / 0.1 ... 40						

<sup>1)</sup> For more information about short-circuit values, e. g. for protection against short-circuit currents, see UL reports (<http://support.automation.siemens.com>) for the individual devices.

<sup>2)</sup> Values for RK5 fuses on request.

<sup>3)</sup> Values on request.

# Contactors for Switching Motors

## 3RT20 contactors

### Ⓢ and Ⓛ ratings of the contactors

Contactor	Size Type		S2 3RT20 35	S2 3RT20 36	S2 3RT20 37	S2 3RT20 38	S3 3RT20 45	S3 3RT20 46	S3 3RT20 47	
<b>Rated Insulation Voltage</b>		AC V	600				600			
<b>Continuous current</b> , at 40 °C Free air and enclosed		A	55	60	80	90	90	105		
<b>Maximum horsepower ratings</b>	Ratings at 115 V single at 230 V phase motors at 50/60 Hz	hp	3	3	5	5	5	7.5	10	
		hp	7.5	10	10	15	15	15	-	
Ⓢ and Ⓛ approved values										
Ratings of three-phase motors at 50/60 Hz	at 200 V	hp	10	15	20	20	20	25	30	
	230 V	hp	15	15	20	25	25	30	30	
	460 V	hp	30	40	50	50	50	60	75	
	575 V	hp	40	50	50	60	60	75	100	
<b>Short-circuit protection</b>	Fuse or circuit-breaker acc. to UL 489	kA	5	10	10	10	5	10	10	
		A	150	200	250	250	250	300	350	
		A	150	200	200	200	250	300	400	
<b>NEMA/EEMAC ratings</b>	NEMA/EEMAC Size			2			-		3	
Conventional thermal current	Free air	A	-	45	-	-	-	-	90	
	Enclosed	A	-	45	-	-	-	-	90	
Ratings of three-phase motors at 60 Hz	at 200 V	hp	-	10	-	-	-	-	25	
	230 V	hp	-	15	-	-	-	-	30	
	460 V	hp	-	25	-	-	-	-	50	
	575 V	hp	-	25	-	-	-	-	50	
<b>Overload Relay</b>	Type Setting Range	A	3RU213 / 3RB303 11 ... 80 / 12 ... 80				3RU11 4 18 ... 100			
<b>Contactor Size</b>			S00 - S0 Screw and Spring connection Integrated or snap-on aux. switch block			Screw and Spring connection Laterally mountable aux. switch block		S2 - S12 Screw and Spring connection Single pole and 4-pole Snap-on aux. switch block		Screw and Spring connection Laterally mountable aux. switch block

### Ⓢ and Ⓛ ratings of the auxiliary contactors

<b>Rated Voltage</b>		AC	600		600		600		600
<b>Switching Capacity Uninterrupted current</b>	At 240 VAC	A	A 600, P 600 10		A 600, Q 600 10		A 600, P 300 10		A 300, Q 300 10

# Contactors for Switching Motors

## 3RT10 contactors

CONTACTORS AND ASSEMBLIES 2

### Technical data

Contactor	Size Type	S6 3RT10 54	S6 3RT10 55	S6 3RT10 56	S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
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### Ⓢ and Ⓜ ratings of the contactors

<b>Rated insulation voltage</b>		AC V	600			600	
<b>Continuous current, at 40 °C</b>	Free air and enclosed	A	140	195	195	250	330
<b>Maximum horsepower ratings</b>	Ratings at 115 V single phase motors at 50/60 Hz	HP	25	30	30		
(Ⓢ and Ⓜ-approved values)							
Ratings of three-phase motors at 50/60 Hz	200 V	HP	40	50	60	60	75
	230 V	HP	50	60	75	75	100
	460 V	HP	100	125	150	150	200
	575 V	HP	125	150	200	200	250
<b>Short-circuit protection</b>		kA	10	10	10	10	18
	CLASS RK5 fuse	A	450	500	500	700	800
	Circuit-breaker acc. to UL 489	A	350	450	500	500	700
<b>NEMA/EEMAC ratings</b>	NEMA/EEMAC SIZE		–	4	–	–	5
Conventional thermal current	Free air	A	–	150	–	–	300
	Enclosed	A	–	135	–	–	270
Ratings of three-phase motors at 60 Hz	at 200 V	HP	–	40	–	–	75
	230 V	HP	–	50	–	–	100
	460 V	HP	–	100	–	–	200
	575 V	HP	–	100	–	–	200
<b>Overload relay</b>	Type	3RB20 56			3RB20 66		

Contactor	Size Type	S12 3RT10 75	S12 3RT10 76
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<b>Rated insulation voltage</b>		AC V	600	
<b>Continuous current, at 40 °C</b>	Free air and enclosed	A	400	540
<b>Maximum horsepower ratings</b>	(Ⓢ and Ⓜ-approved values)			
Ratings of three-phase motors at 50/60 Hz	at 200 V	HP	125	150
	230 V	HP	150	200
	460 V	HP	300	400
	575 V	HP	400	500
<b>Short-circuit protection</b>		kA	18	30
	CLASS RK5 fuse	A	1000	1200
	Circuit-breaker acc. to UL 489	A	900	900
<b>NEMA/EEMAC ratings</b>	NEMA/EEMAC SIZE		–	6
Conventional thermal current	Free air	A	–	600
	Enclosed	A	–	540
Ratings of three-phase motors at 60 Hz	at 200 V	HP	–	150
	230 V	HP	–	200
	460 V	HP	–	400
	575 V	HP	–	400
<b>Overload relay</b>	Type	3RB20 66		

# Contactors for Switching Motors

## 3RT12 vacuum contactors, 3RT contactors for resistive loads

Technical data												
Contactor	Size Type		<b>S10</b> 3RT12 64	<b>S10</b> 3RT12 65	<b>S10</b> 3RT12 66	<b>S12</b> 3RT12 75	<b>S12</b> 3RT12 76					
<b>Ⓢ and Ⓜ ratings of the contactors</b>												
<b>Rated insulation voltage</b>	AC V	600					600					
<b>Continuous current, at 40 °C</b>	Free air and enclosed	A	330					540				
<b>Maximum horsepower ratings</b> (Ⓢ and Ⓜ-approved values)												
Ratings of three-phase motors at 50/60 Hz	at 200 V	HP	60	75	100	125	150	150				
	230 V	HP	75	100	125	150	200	200				
	460 V	HP	150	200	250	300	400	400				
	575 V	HP	200	250	300	400	500	500				
<b>Short-circuit protection</b>	CLASS RK5 fuse	kA	10	18	18	18	30	30				
	Circuit-breaker acc. to UL 489	A	700	800	800	1200	1200	1200				
		A	500	700	900	1000	1200	1200				
<b>NEMA/EEMAC ratings</b>	NEMA/EEMAC SIZE		-			5	-		6			
Conventional thermal current	Free air	A	-				-					
	Enclosed	A	-				-					
Ratings of three-phase motors at 60 Hz	at 200 V	HP	-				-					
	230 V	HP	-				-					
	460 V	HP	-				-					
	575 V	HP	-				-					
<b>Overload relay</b>	Type	3RB20 66					3RB20 66					
<b>3RT14 contactors for resistive loads</b>												
Contactor	Size Type		<b>S3</b> 3RT14 46	<b>S6</b> 3RT14 56	<b>S10</b> 3RT14 66	<b>S12</b> 3RT14 76						
<b>Rated insulation voltage</b>	AC V	600										
<b>Maximum UL resistive load ratings</b>	A	110	210	360	580							
<b>3RT23 contactors for resistive loads</b>												
Contactor	Size Type	<b>S00</b> 3RT23 15	<b>S00</b> 3RT23 16	<b>S00</b> 3RT23 17	<b>S0</b> 3RT23 24	<b>S0</b> 3RT23 25	<b>S0</b> 3RT23 26	<b>S0</b> 3RT23 27	<b>S2</b> 3RT23 36	<b>S3</b> 3RT13 44	<b>S3</b> 3RT13 46	
<b>Rated insulation voltage</b>	AC V	600										
<b>Maximum UL resistive load ratings</b>	A	16	18	20	30	30	35	42	60	100	110	

# Contactors for Switching Motors

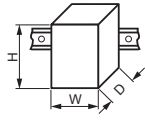
## 3RT2. 1. contactors

Type

Size

Dimensions (W x H x D)<sup>1)</sup>

- With mounted auxiliary switch block
- With mounted function block



**3RT20 15, 3RT20 16**

**S00**

45 x 57.5 x 73 / 45 x 70 x 73

45 x 57.5 x 116 / 45 x 70 x 121

45 x 57.5 x 142 / 45 x 70 x 142

**3RT20 17, 3RT20 18**

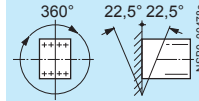
**S00**

**General data**

**Permissible mounting positions**

The contactors are designed for operation on a vertical mounting surface.

AC and DC operation



Upright mounting position

AC and DC operation



Special design required. Positions 13 to 16 of the Order No. must be changed to **-1AA0**. Additional charge.

**Mechanical endurance**

- Basic unit
- Basic unit with snap-on auxiliary switch block
- Solid-state compatible auxiliary switch block

Operating cycles  
Operating cycles  
Operat. cycles

30 million  
10 million  
5 million

**Electrical endurance**

2)

**Rated insulation voltage  $U_i$**  (pollution degree 3)

V

690

**Rated impulse withstand voltage  $U_{imp}$**

kV

6

**Protective separation** between the coil and the main contacts acc. to EN 60947-1, Appendix N

V

400

**Mirror contacts**

A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.

- 3RT20 1., 3RT23 1. (removable auxiliary switch block)
- 3RT20 1., 3RT23 1. (permanently mounted auxiliary switch block)
- 3RH29 19-.NF. . . solid-state compatible auxiliary switch blocks have no mirror contacts.

Yes, this applies to both the basic unit as well as to between the basic unit and the mounted auxiliary switch block acc. to EN 60947-4-1, Appendix F  
Yes, acc. to EN 60947-4-1, Appendix F

**Ambient temperature**

- During operation
- During storage

°C  
°C

-25 ... +60  
-55 ... +80

**Degree of protection** acc. to EN 60947-1, Appendix C

IP20, coil assembly IP40

**Touch protection** acc. to EN 50274

Finger-safe

**Shock resistance** rectangular pulse

- AC operation
- DC operation

g/ms  
g/ms

6.7/5 and 4.2/10	7.3/5 and 4.7/10
6.7/5 and 4.2/10	7.3/5 and 4.7/10

**Shock resistance** sine pulse

- AC operation
- DC operation

g/ms  
g/ms

10.5/5 and 6.6/10	11.4/5 and 7.3/10
10.5/5 and 6.6/10	11.4/5 and 7.3/10

**Conductor cross-sections**

3)

**Short-circuit protection for contactors without overload relays**

For short-circuit protection for contactors with overload relays see [Section 3: Overload Relays](#)  
For short-circuit protection for fuseless load feeders see [Section 4: Combination Starters](#)

**Main circuit**

- Fuse links, operational class gG : NH 3NA, DIAZED 5SB, NEOZED 5SE acc. to IEC 60947-4-1/ EN 60947-4-1
  - Type of coordination "1" A
  - Type of coordination "2" A
  - Weld-free<sup>4)</sup> A
- Miniature circuit breakers (up to 230 V) with C characteristic Short-circuit current 1 kA, type of coordination "1" A

35	50
20	25
10	10
10	10

**Auxiliary circuit**

- Fuse links, operational class gG : DIAZED 5SB, NEOZED 5SE (weld-free protection for  $I_k \geq 1$  kA) A
- Miniature circuit breakers up to 230 V with C characteristic Short-circuit current  $I_k < 400$  A A

10  
6

1) Dimensions for devices with screw terminals / spring-type terminals.  
2) For endurance of the main contacts see page 2/122.

3) For conductor cross-sections see page 2/130 .  
4) Test conditions according to IEC 60947-4-1.

# Contactors for Switching Motors

## 3RT2. 1. contactors

Contactors	Type Size Width	mm	3RT20 15, 3RT20 16 S00 45	3RT20 17, 3RT20 18 S00 45
<b>Control</b>				
<b>Solenoid coil operating range</b>				
• AC operation	50 Hz		0.8 ... 1.1 x $U_s$	
	60 Hz		0.85 ... 1.1 x $U_s$	
• DC operation	Up to 50 °C		0.8 ... 1.1 x $U_s$	
	Up to 60 °C		0.85 ... 1.1 x $U_s$	
<b>Power consumption of the solenoid coils (when coil is cold and 1.0 x <math>U_s</math>)</b>				
• AC operation, 50/60 Hz, standard version	- Closing	VA	27/24.3	37/33
	- P.f.		0.8/0.75	0.8/0.75
	- Closed	VA	4.2/3.3	5.7/4.4
	- P.f.		0.25/0.25	0.25/0.25
• AC operation, 50 Hz, USA/Canada	- Closing	VA	26.4	36
	- P.f. for closing		0.81	0.8
	- Closed	VA	4.4	5.9
	- P.f. for closed		0.24	0.24
• AC operation, 60 Hz, USA/Canada	- Closing	VA	31.7	43
	- P.f. for closing		0.81	0.8
	- Closed	VA	4.8	6.5
	- P.f. for closed		0.25	0.25
• DC operation	Closing = Closed	W	4	4
<b>Permissible residual current of the electronics (with 0 signal)</b>				
	• AC operation		<3 mA x (230 V/ $U_s$ ) <sup>1)</sup>	<4 mA x (230 V/ $U_s$ ) <sup>1)</sup>
	• DC operation		<10 mA x (24 V/ $U_s$ ) <sup>1)</sup>	
<b>Operating times<sup>2)</sup></b>				
Total break time = Opening delay + Arcing time				
• AC operation at 0.8 ... 1.1 x $U_s$	- Closing delay	ms	9 ... 35	8 ... 33
	- Opening delay	ms	3.5 ... 14	4 ... 15
• DC operation at 0.85 ... 1.1 x $U_s$	- Closing delay	ms	30 ... 100	30 ... 100
	- Opening delay	ms	7 ... 13	7 ... 13
• Arcing time		ms	10 ... 15	10 ... 15
<b>Operating times for 1.0 x <math>U_s</math><sup>2)</sup></b>				
• AC operation	- Closing delay	ms	9.5 ... 24	9 ... 22
	- Opening delay	ms	4 ... 14	4.5 ... 15
• DC operation	- Closing delay	ms	35 ... 50	35 ... 50
	- Opening delay	ms	7 ... 12	7 ... 12

<sup>1)</sup> The 3RT29 16-1GA00 additional load module is recommended for higher residual currents.

<sup>2)</sup> The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

Contactors	Type Size		3RT20 15 S00	3RT20 16 S00	3RT20 17 S00	3RT20 18 S00	
<b>Main circuit</b>							
<b>AC capacity</b>							
<b>Utilization category AC-1</b>							
<b>Switching resistive loads</b>							
• Rated operational current $I_e$	At 40 °C up to 690 V	A	18	22	22	22	
	At 60 °C up to 690 V	A	16	20	20	20	
• Rated power for AC loads <sup>1)</sup> P.f.= 0.95 (at 60 °C)	230 V	kW	6.3	7.5	7.5	7.5	
	400 V	kW	11	13	13	13	
	500 V	kW	13.8	17	17	17	
	690 V	kW	19	22	22	22	
• Minimum conductor cross-section for loads with $I_e$	At 40 °C	mm <sup>2</sup>	2.5	2.5	2.5	2.5	
	At 60 °C	mm <sup>2</sup>	2.5	2.5	2.5	2.5	
<b>Utilization category AC-3</b>							
• Rated operational currents $I_e$	Up to 400 V	A	7	9	12	16	
	440 V	A	7	9	11	15	
	500 V	A	6	7.7	9.2	12.4	
	690 V	A	4.9	6.7	6.7	8.8	
• Rated power for slipping or squirrel-cage motors at 50 and 60 Hz	At 200 V	HP	1.5	2	3	3	
	230 V	HP	2	3	3	5	
	460 V	HP	3	5	7.5	10	
	575 V	HP	5	7.5	10	10	
<b>Thermal load capacity</b>		10 s current <sup>2)</sup>	A	56	72	96	128

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

<sup>2)</sup> According to IEC 60947-4-1. For rated values for various start-up conditions see Section 3 --> "Overload Relays".



# Contactors for Switching Motors

## 3RT2. 1. contactors

Contactors	Type Size Width	mm	3RT20 15 S00 45	3RT20 16 S00 45	3RT20 17 S00 45	3RT20 18 S00 45
<b>Main circuit</b>						
<b>AC capacity</b>						
<b>Power loss per conducting path</b>		At $I_e/AC-3$ W	0.42	0.7	1.24	2.2
<b>Utilization category AC-4 (for <math>I_a = 6 \times I_e</math>)<sup>1)</sup></b>						
• Rated operational current $I_e$	Up to 400 V	A	6.5	8.5	8.5	11.5
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	Up to 400 V	kW	3	4	4	5.5
• The following applies to a contact endurance of about 200000 operating cycles:						
- Rated operational currents $I_e$	Up to 400 V	A	2.6	4.1	4.1	5.5
	690 V	A	1.8	3.3	3.3	4.4
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 230 V	kW	0.67	1.1	1.1	1.5
	400 V	kW	1.15	2	2	2.5
	500 V	kW	1.45	2	2	3
	690 V	kW	1.15	2.5	2.5	3.5

### Switching frequency

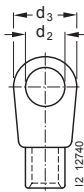
<b>Switching frequency z</b> in operating cycles/hour					
• Contactors without overload relays	No-load switching frequency AC	h <sup>-1</sup>	10000		
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot (I_e/I') \cdot (400 V/U')^{1.5} \cdot 1/h$	No-load switching frequency DC	h <sup>-1</sup>	10000		
	Rated operation AC-1 (AC/DC)	h <sup>-1</sup>	1000		
	AC-2 (AC/DC)	h <sup>-1</sup>	750		
	AC-3 (AC/DC)	h <sup>-1</sup>	750		
• Contactors with overload relays (mean value)	AC-4 (AC/DC)	h <sup>-1</sup>	250		
		h <sup>-1</sup>	15		

<sup>1)</sup> The data only apply to 3RT25 16 and 3RT25 17 (2 NO + 2 NC) up to a rated operational voltage of 400 V.

Contactors	Type Size	mm	3RT20 15 S00 45	3RT20 16 S00 45	3RT20 17 S00 45	3RT20 18 S00 45
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### Conductor cross-sections

<b>Main conductors and auxiliary conductors</b> (1 or 2 conductors can be connected)				<b>Screw terminals</b>
• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup> according to IEC 60947; max. 2 x (0.5 ... 4)		
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup>		
• AWG cables, solid or stranded	AWG	2 x (20 ... 16) <sup>1)</sup> ; 2 x (18 ... 14) <sup>1)</sup> ; 2 x 12		
• Terminal screw		M3 (for standard screwdriver size 2 and Pozidriv 2)		
• Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		
<b>Main conductors, auxiliary conductors and coil terminals</b> (1 or 2 conductors can be connected)				<b>Spring-type terminals</b>
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5		
• Solid	mm <sup>2</sup>	2 x (0.5 ... 4)		
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 2.5)		
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.5 ... 2.5)		
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)		
<b>Auxiliary conductors for front and laterally mounted auxiliary switches</b> (1 or 2 conductors can be connected)				
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5		
• Solid	mm <sup>2</sup>	2 x (0.5 ... 2.5)		
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)		
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)		
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)		
<b>Main conductors and auxiliary conductors</b>				<b>Ring lug terminal connection</b>
• Terminal screw		M3, Pozidriv 2		
• Operating devices	mm	Ø 5 ... 6		
• Tightening torque	Nm	0.8 ... 1.2		
• Usable ring terminal lugs	mm	d <sub>2</sub> = min. 3.2		
- DIN 46234 without insulation sleeve	mm	d <sub>3</sub> = max. 7.5		
- DIN 46225 without insulation sleeve				
- DIN 46237 with insulation sleeve				
- JIS C2805 Type R without insulation sleeve				
- JIS C2805 Type RAV with insulation sleeve				
- JIS C2805 Type RAP with insulation sleeve				



For tool for opening the spring-type terminals (see Accessories on page 2/79).  
Maximum external diameter of the conductor insulation: 3.6 mm.

An "insulation stop" must be used for conductor cross-sections ≤ 1 mm<sup>2</sup> (see Accessories on page 2/79).

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

# Contactors for Switching Motors

## 3RT2. 2. contactors

Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
Size		S0	S0	S0	S0	S0	S0
Dimensions (W x H x D) for AC operation <sup>1)</sup>		mm					
• With mounted auxiliary switch block		mm					
• With mounted function block		mm					
Dimensions (W x H x D) for DC operation <sup>1)</sup>		mm					
• With mounted auxiliary switch block		mm					
• With mounted function block		mm					
<b>General data</b>							
<b>Permissible mounting positions</b>							
The contactors are designed for operation on a vertical mounting surface.							
Upright mounting position							
AC and D operation							
Special version required, also applies to 3RT20 2.-.K.40. coupling relays.							
<b>Mechanical endurance</b>							
• Basic unit	Operating cycles	10 million					
• Basic unit with snap-on auxiliary switch block	Operating cycles	10 million					
• Solid-state compatible auxiliary switch block	Operat. cycles	5 million					
<b>Electrical endurance</b>							
2)							
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	690					
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6					
<b>Protective separation</b> between the coil and the main contacts (acc. to EN 60947-1, Appendix N)	V	400					
<b>Mirror contacts</b>							
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.							
• 3RT20 2., 3RT23 2. (removable auxiliary switch block)							
Yes, acc. to EN 60947-4-1, Appendix F							
• 3RT20 2., 3RT23 2. (permanently mounted auxiliary switch block)							
Yes, acc. to EN 60947-4-1, Appendix F							
<b>Permissible ambient temperature</b>							
• During operation	°C	-25 ... +60					
• During storage	°C	-55 ... +80					
<b>Degree of protection</b> acc. to EN 60947-1, Appendix C							
IP20, coil assembly IP20							
<b>Touch protection</b> acc. to EN 50274							
Finger-safe							
<b>Shock resistance</b> rectangular pulse							
• AC operation	g/ms	7.5/5 and 4.7/10			8.3/5 and 5.3/10		
• DC operation	g/ms	>10/5 and 7.5/10			>10/5 and 7.5/10		
<b>Shock resistance</b> sine pulse							
• AC operation	g/ms	11.8/5 and 7.4/10			13.5/5 and 8.3/10		
• DC operation	g/ms	>15/5 and >10/10			>15/5 and >10/10		
<b>Conductor cross-sections</b>							
3)							
<b>Short-circuit protection for contactors without overload relays</b>							
<b>Main circuit</b>							
For short-circuit protection for contactors with overload relays see "Protection Equipment -> Overload Relays".							
For short-circuit protection for fuseless load feeders see "Motor Starters".							
• Fuse links, operational class gG : Type NH 3NA, DIAZED 5SB, NEOZED 5SE acc. to IEC 60947-4-1/ EN 60947-4-1	A	63		100		125	
- Type of coordination "1"	A	25		35		50	
- Type of coordination "2"	A	10		16		16	
- Weld-free <sup>4)</sup>	A	25		32		40	
• Miniature circuit breakers with C characteristic (short-circuit current 3 kA, type of coordination "1")	A	25		32		40	
<b>Auxiliary circuit</b>							
• Fuse links, operational class gG : DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA)	A	10					
• Miniature circuit breaker with C characteristic (short-circuit current $I_k < 400$ A)	A	10					

1) Dimensions for devices with screw terminals / spring-type terminals.  
 2) For endurance of the main contacts see page 2/122.

3) For conductor cross-sections page 2/134.  
 4) Test conditions according to IEC 60947-4-1.

# Contactors for Switching Motors

## 3RT20.2. contactors

Contactors	Type		3RT20 23 ... 3RT20 25	3RT20 26 ... 3RT20 28	3RT20 2. -NB3	3RT20 2. -NF3..	3RT20 2. -NP3	
	Size		S0	S0	S0	S0	S0	
	Width	mm	45	45	45	45	45	
<b>Control</b>								
<b>Solenoid coil operating range</b>	AC/DC		0.8 ... 1.1 x U <sub>s</sub>			0.7 ... 1.3 x U <sub>s</sub>		
<b>Power consumption of the solenoid coils</b> (when coil is cold and 1.0 x U <sub>s</sub> )								
• AC operation, 50 Hz, standard version	- Closing	VA	65	77	6.5	13.6	16.1	
	- P.f.		0.82	0.82	0.98	0.98	0.98	
	- Closed	VA	7.6	9.8	1.26	1.91	3.41	
• AC operation, 50/60 Hz, standard version	- P.f.		0.25	0.25	0.25	0.25	0.25	
	- Closing	VA	68/67	81/79	6.5/5.7	13.6/13.2	16.1/15.9	
	- P.f.		0.72/0.74	0.72/0.74	0.98/0.96	0.98/0.99	0.99/0.99	
• AC operation, 50 Hz, USA/Canada	- Closed	VA	7.9/6.5	10.5/8.5	1.26/1.30	1.91/1.90	3.41/3.58	
	- P.f.		0.25/0.28	0.25/0.28	0.25/0.28	0.25/0.28	0.25/0.28	
	- Closing	VA	65	77	--	--	--	
• AC operation, 60 Hz, USA/Canada	- P.f.		0.82	0.82	--	--	--	
	- Closed	VA	7.6	9.8	--	--	--	
	- P.f.		0.25	0.28	--	--	--	
• DC operation	- Closing	VA	73	87	--	--	--	
	- P.f.		0.76	0.76	--	--	--	
	- Closed	VA	7.2	9.4	--	--	--	
	- P.f.		0.28	0.28	--	--	--	
• DC operation	Closing/closed	W	5.9/5.9	5.9/5.9	6.7/0.8	13.2/1.56	15/1.83	
<b>Permissible residual current of the electronics</b> (with 0 signal)								
	• AC operation	mA	< 6 mA x (230 V/U <sub>s</sub> )		< 7 mA x (230 V/U <sub>s</sub> )			
	• DC operation	mA	< 16 mA x (24 V/U <sub>s</sub> )					
<b>Operating times for 0.8 ... 1.1 x U<sub>s</sub><sup>1)</sup></b>								
Total break time = Opening delay + Arcing time								
• AC operation	- Closing delay	ms	9 ... 38	8 ... 40	60 ... 80	50 ... 70	60 ... 80	
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	35 ... 45	
• DC operation	- Closing delay	ms	50 ... 170	50 ... 170	60 ... 75	50 ... 70	50 ... 75	
	- Opening delay	ms	15 ... 17.5	15 ... 17.5	30 ... 45	35 ... 45	40 ... 50	
• Arcing time		ms	10	10	10	10	10	
<b>Operating times for 1.0 x U<sub>s</sub><sup>1)</sup></b>								
• AC operation	- Closing delay	ms	10 ... 18	10 ... 17	65 ... 80	50 ... 70	60 ... 80	
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	30 ... 50	
• DC operation	- Closing delay	ms	55 ... 80	55 ... 80	60 ... 80	56 ... 70	60 ... 80	
	- Opening delay	ms	16 ... 17	16 ... 17	30 ... 45	35 ... 45	30 ... 50	

<sup>1)</sup> The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms, diode assembly: 2 to 6 times).

# Contactors for Switching Motors

## 3RT20 2. contactors

Contactors	Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size		S0	S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45	45

### Main circuit

#### AC capacity

##### Utilization category AC-1, switching resistive loads

• Rated operational current $I_e$	At 40 °C up to 690 V	A	40				50	
	At 60 °C up to 690 V	A	35				42	
• Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	230 V	kW	13.3				15.5	
	400 V	kW	23				27.5	
	500 V	kW	29				35	
	690 V	kW	40				47.5	
• Minimum conductor cross-section for loads with $I_e$	At 40 °C	mm <sup>2</sup>	10				10	
	At 60 °C	mm <sup>2</sup>	10				10	

##### Utilization category AC-3

• Rated operational currents $I_e$	Up to 400 V	A	9	12	17	25	32	38
	440 V	A	9	12	17	22	32	35
	500 V	A	9	12	17	18	32	32
	690 V	A	9	9	13	13	21	21
• Rated power for slipping or squirrel-cage motors at 50 and 60 Hz	At 230 V	HP	3	3	5	7.5	10	10
	460 V	HP	5	7.5	10	15	20	25
	575 V	HP	7.5	10	15	20	25	25

<b>Thermal load capacity</b>	10 s current <sup>2)</sup>	A	80	110	150	200	260	300
<b>Power loss per conducting path</b>	at $I_e$ /AC-3	W	0.4	0.5	0.9	1.6	2.7	3.8

##### Utilization category AC-4 (for $I_a = 6 \times I_e$ )

• Rated operational current $I_e$	Up to 400 V	A	8.5	12.5	15.5	15.5	22	
• Rated power for squirrel-cage motors with 50 and 60 Hz	At 400 V	kW	4	5.5	7.5	7.5	11	
• The following applies to a contact endurance of about 200000 operating cycles:								
- Rated operational currents $I_e$	Up to 400 V	A	4.1	5.5	7.7	9	12	
	690 V	A	3.3	5.5	7.7	9	12	
- Rated power for squirrel-cage motors with 50 and 60 Hz	At 110 V	kW	0.5	0.73	1	1.2	1.6	
	At 230 V	kW	1.1	1.5	2	2.5	3.4	
	400 V	kW	2	2.6	3.5	4.4	6	
	500 V	kW	2	3.3	4.6	5.6	7.5	
	690 V	kW	2.5	4.6	6	7.7	10.3	

### Switching frequency

#### Switching frequency $z$ in operating cycles/hour

• Contactors without overload relays	No-load switching frequency AC	h <sup>-1</sup>	5000					
	No-load switching frequency DC	h <sup>-1</sup>	1500					
Dependence of the switching frequency $z'$ on the operational current $I'$ and operational voltage $U'$ : $z' = z \cdot (I_e/I') \cdot (400 V/U')^{1.5} \cdot 1/h$	AC-1 (AC/DC)	h <sup>-1</sup>	1000					
	AC-2 (AC/DC)	h <sup>-1</sup>	1000			750		
	AC-3 (AC/DC)	h <sup>-1</sup>	1000			750		
	AC-4 (AC/DC)	h <sup>-1</sup>	300			250		
• Contactors with overload relays (mean value)		h <sup>-1</sup>	15					

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

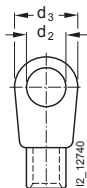
<sup>2)</sup> According to IEC 60947-4-1. For rated values for various start-up conditions see Section 3 --> "Overload Relays"

# Contactors for Switching Motors

## 3RT20 2. contactors

CONTACTORS AND ASSEMBLIES 2

Contactor	Type	3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size	S0	S0	S0	S0	S0	S0
	Width mm	45	45	45	45	45	45
<b>Conductor cross-sections (1 or 2 conductors connectable)</b>							
<b>Main conductors</b>		<b>Screw terminals</b>					
Conductor cross-section		2 x (1 ... 2.5) <sup>1)</sup> ; 2 x (2.5 ... 10) <sup>1)</sup> according to IEC 60947					
• Solid	mm <sup>2</sup>	2 x (1 ... 2.5) <sup>1)</sup> ; 2 x (2.5 ... 10) <sup>1)</sup>					
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1 ... 2.5) <sup>1)</sup> ; 2 x (2.5 ... 6) <sup>1)</sup> ; 1 x 10					
• AWG cables, solid or stranded	AWG	2 x (16 ... 12); 2 x (14 ... 8)					
• Terminal screws		M4 (Pozi driv size 2)					
- Tightening torque	Nm	2 ... 2.5 (18 ... 22 lb.in)					
<b>Auxiliary conductors</b>		<b>Spring-type terminals</b>					
• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup> according to IEC 60947					
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup>					
• Solid or stranded AWG (2 x)	AWG	2 x (20 ... 16) <sup>1)</sup> ; 2 x (18 ... 14) <sup>1)</sup> ; 1 x 12					
• Terminal screws		M3					
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)					
<b>Main conductors</b>		<b>Ring lug terminal connection</b>					
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5					
• Solid	mm <sup>2</sup>	2 x (1 ... 10)					
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1 ... 6)					
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (1 ... 6)					
• AWG cables, solid or stranded	AWG	2 x (18 ... 8)					
<b>Auxiliary conductors</b>		3.0 x 0.5; 3.5 x 0.5					
• Operating devices		3.0 x 0.5; 3.5 x 0.5					
• Solid	mm <sup>2</sup>	2 x (0.5 ... 2.5)					
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)					
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)					
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)					
<b>Main conductors</b>		<b>Ring lug terminal connection</b>					
• Terminal screw	mm	M4, Pozi driv size 2					
• Operating devices	mm	Ø 5 ... 6					
• Tightening torque	Nm	2 ... 2.5					
• Usable ring lug terminals	mm	d <sub>2</sub> = min. 4.3					
- DIN 46234 without insulation sleeve	mm	d <sub>3</sub> = max. 12.2					
- DIN 46225 without insulation sleeve	mm						
- DIN 46237 with insulation sleeve	mm						
- JIS C2805 Type R without insulation sleeve	mm						
- JIS C2805 Type RAV with insulation sleeve	mm						
- JIS C2805 Type RAP with insulation sleeve	mm						
<b>Auxiliary conductors</b>		M3, Pozi driv size 2					
• Terminal screw		M3, Pozi driv size 2					
• Operating devices	mm	Ø 5 ... 6					
• Tightening torque	Nm	0.8 ... 1.2					
• Usable ring terminal lugs	mm	d <sub>2</sub> = min. 3.2					
	mm	d <sub>3</sub> = max. 7.5					



<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Contactor	Size	S00	S0	S0
		<b>Screw or spring-type terminals</b>	<b>Screw or spring-type terminals</b>	<b>Screw or spring-type terminals</b>
		Integrated or snap-on auxiliary switch block	1- and 4-pole snap-on auxiliary switch block	Laterally mountable auxiliary switch block
<b>Ⓢ and Ⓜ rated data of the auxiliary contacts</b>				
Rated voltage	V AC	600	600	600
Switching capacity		A 600, Q 600	A 600, Q 600	A 300, Q 300
Uninterrupted current	• At 240 V AC	A 10	10	10

# Contactors for Switching Motors

## 3RT20.3. contactors

Type		3RT2035	3RT2036	3RT2037	3RT2038
Size		S2	S2	S2	S2
Dimensions (W x H x D)		mm	55 x 114 x 130		
• With mounted auxiliary switch block <sup>1)</sup>		mm	55 x 114 x 174 / 55 x 114 x 178		
• With mounted function module <sup>1)</sup>		mm	55 x 114 x 199 / 55 x 114 x 202		
<b>General data</b>					
<b>Permissible mounting position</b>		<p>The contactors are designed for operation on a vertical mounting surface.</p>			
Upright mounting position		<p>Special version required</p>			
<b>Mechanical endurance</b>					
• Basic units	Operating cycles	10 million			
• Basic units with snap-on auxiliary switch block	Operating cycles	10 million			
• Solid-state compatible auxiliary switch block	Operating cycles	5 million			
<b>Electrical endurance</b>					
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)		V	690		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		kV	6		
<b>Protective separation</b> between the coil and the main contacts (acc. to IEC 60947-1, Appendix N)		V	400		
<b>Mirror contacts</b>					
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.					
• Integrated auxiliary switches	Yes, acc. to IEC 60947-4-1, Appendix F				
• 3RT202., 3RT232. (removable auxiliary switch block)	Yes, acc. to IEC 60947-4-1, Appendix F				
• 3RT202., 3RT232. (permanently mounted auxiliary switch block)	Yes, acc. to IEC 60947-4-1, Appendix F				
<b>Permissible ambient temperature</b>					
• During operation	°C	-25 ... +60			
• During storage	°C	-55 ... +80			
<b>Degree of protection</b> acc. to IEC 60947-1, Appendix C		IP20			
<b>Connection range</b>		IPO0/open (where applicable, use additional terminal covers)			
<b>Touch protection</b> acc. to EN 50274		Finger-safe			
<b>Shock resistance</b> rectangular pulse					
• AC operation	g/ms	11.8/5 and 7.4/10			
• AC/DC operation	g/ms	7.7/5 and 4.5/10			
<b>Shock resistance</b> sine pulse					
• AC operation	g/ms	18.5/5 and 11.6/10			
• AC/DC operation	g/ms	12/5 and 7/10			
<b>Conductor cross-sections</b>		3)			
<b>Short-circuit protection</b>					
<b>Main circuit</b>					
• Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1					
- Type of coordination "1"	A	160	160	250	250
- Type of coordination "2"	A	80	80	125	160
- Weld-free <sup>5)</sup>	A	On request			
<b>Auxiliary circuit</b>					
• Fuse links, operational class gG: DIAZED, type 5SB; NEOZED, type 5SE (weld-free protection $I_k \leq 1$ kA)	A	10			
• Miniature circuit breakers 230 V, C characteristic (short-circuit current $I_k < 400$ A)	A	10			

1) Dimensions for devices with screw terminals / spring-type terminals.  
 2) For contact endurance of the main contacts, see page 3/17.  
 3) For conductor cross-sections, see page 3/28.  
 4) See <http://support.automation.siemens.com/WW/view/en/39714188>  
 5) Test conditions according to IEC 60947-4-1.

# Contactors for Switching Motors

## 3RT20.3. contactors

Type		3RT2035	3RT2036	3RT2037	3RT2038	
Size		S2	S2	S2	S2	
<b>Control</b>						
<b>Type of operating mechanism</b>		AC			AC/DC	
<b>Solenoid coil operating range</b>						
• AC operation, 50 Hz		0.8 ... 1.1 x U <sub>s</sub>	0.8 ... 1.1 x U <sub>s</sub>	0.8 ... 1.1 x U <sub>s</sub>	0.8 ... 1.1 x U <sub>s</sub>	
• AC operation, 60 Hz		--	0.85 ... 1.1 x U <sub>s</sub>	0.8 ... 1.1 x U <sub>s</sub>	0.8 ... 1.1 x U <sub>s</sub>	
• DC operation		--	--	--	0.8 ... 1.1 x U <sub>s</sub>	
<b>Power consumption of the solenoid coils</b> (for cold coil and 1.0 x U <sub>s</sub> )						
• AC operation, 50 Hz, standard version	- Closing	VA	190	--	--	
	- P.f.		0.72	--	--	
	- Closed	VA	16	--	--	
	- P.f.		0.37	--	--	
• AC operation, 50/60 Hz, standard version	- Closing	VA	--	210/188	--	
	- P.f.		--	0.69/0.65	--	
	- Closed	VA	--	17.2/16.5	--	
	- P.f.		--	0.36/0.39	--	
• AC operation, 50/60 Hz, for USA/Canada	- Closing	VA	--	212/188	--	
	- P.f.		--	0.67/0.65	--	
	- Closed	VA	--	18.5/16.5	--	
	- P.f.		--	0.37/0.39	--	
• AC/DC operation	- Closing for AC operation	VA	--	--	40	
	- P.f.		--	--	0.64/0.5	
	- Closed for AC operation	VA	--	--	2	
	- P.f.		--	--	0.36/0.39	
	- Closing for DC operation	W	--	--	23	
	- Closed for DC operation	W	--	--	1	
<b>Permissible residual current of the electronics</b> (with 0 signal)						
• AC operation	mA	<20				
• DC operation	mA	<20				
<b>Operating times for 0.8 ... 1.1 x U<sub>s</sub><sup>1)</sup></b>						
Total break time = Opening delay + Arcing time						
• AC operation	- Closing delay	ms	10 ... 80		45 ... 70	
	- Opening delay	ms	10 ... 18		35 ... 55	
• DC operation	- Closing delay	ms	--		45 ... 60	
	- Opening delay	ms	--		35 ... 55	
• Arcing time		ms	10 ... 20		10 ... 20	
<b>Operating times for 1.0 x U<sub>s</sub><sup>1)</sup></b>						
• AC operation	- Closing delay	ms	12 ... 22		50 ... 60	
	- Opening delay	ms	10 ... 18		40 ... 50	
• DC operation	- Closing delay	ms	--		45 ... 55	
	- Opening delay	ms	--		40 ... 50	
<b>Main circuit</b>						
<b>Load rating with AC</b>						
<b>Utilization category AC-1, switching resistive loads</b>						
• Rated operational current I <sub>e</sub>	At 40 °C up to 690 V	A	60	70	80	90
	At 60 °C up to 690 V	A	55	60	70	80
• Rated power for AC loads <sup>2)</sup> P.f. = 0.95 (at 60 °C)	230 V	kW	23	26	30	34
	400 V	kW	39	46	53	59
	690 V	kW	68	79	91	102
• Minimum conductor cross-section for loads with I <sub>e</sub>	At 40 °C	mm <sup>2</sup>	16	25	25	35
	At 60 °C	mm <sup>2</sup>	16	16	25	25
<b>Utilization categories AC-2 and AC-3</b>						
• Rated operational currents I <sub>e</sub>	Up to 400 V	A	40	50	65	80
	440 V	A	40	50	65	80
	500 V	A	40	50	65	80
	690 V	A	24	24	47	58
• Rated power for slipping or squirrel-cage motors at 50 and 60 Hz	At 230 V	kW	11	15	18.5	22
	400 V	kW	18.5	22	30	37
	690 V	kW	22	22	37	45
<b>Thermal load capacity</b>	10 s current <sup>3)</sup>	A	400	420	520	640
<b>Power loss per conducting path</b>	At I <sub>e</sub> /AC-3	W	2.2	4	3.8	5.7

<sup>1)</sup> The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms, diode assembly: 2 to 6 times).

<sup>2)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

<sup>3)</sup> According to IEC 60947-4-1.  
Rated values for various start-up conditions, see Chapter 7, "Protection Equipment" → "Overload Relays".



# Contactors for Switching Motors

## 3RT20.3. contactors

Type		3RT2035	3RT2036	3RT2037	3RT2038
Size		S2	S2	S2	S2
<b>Main circuit</b>					
<b>Load rating with AC</b>					
<b>Utilization category AC-4 (for <math>I_a = 6 \times I_e</math>)</b>					
• Maximum values:					
- Rated operational current $I_e$	Up to 400 V A	35	41	55	55
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V kW	18.5	22	30	30
• The following applies to a contact endurance of about 200 000 operating cycles:					
- Rated operational currents $I_e$	Up to 400 V A	22	24	28	30
	690 V A	18.5	20	22	24
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 110 V kW	3.2	3.5	4.1	4.3
	230 V kW	6.7	7.3	8.5	9.1
	400 V kW	11.6	12.6	14.7	15.8
	690 V kW	16.8	18.2	20	21.8
<b>Load rating with DC</b>					
<b>Utilization category DC-1, switching resistive loads (<math>L/R \leq 1</math> ms)</b>					
• Rated operational currents $I_e$ (at 60 °C)					
- 1 conducting path	Up to 24 V A	55			
	60 V A	23			
	110 V A	4.5			
	220 V A	1			
	440 V A	0.4			
	600 V A	0.25			
- 2 conducting paths in series	Up to 24 V A	55			
	60 V A	45			
	110 V A	25			
	220 V A	5			
	440 V A	1			
	600 V A	0.8			
- 3 conducting paths in series	Up to 24 V A	55			
	60 V A	55			
	110 V A	55			
	220 V A	45			
	440 V A	2.9			
	600 V A	1.4			
<b>Utilization category DC-3/DC-5, shunt-wound and series-wound motors (<math>L/R \leq 15</math> ms)</b>					
• Rated operational currents $I_e$ (at 60 °C)					
- 1 conducting path	Up to 24 V A	35			
	60 V A	6			
	110 V A	2.5			
	220 V A	2			
	440 V A	0.1			
	600 V A	0.06			
- 2 conducting paths in series	Up to 24 V A	55			
	60 V A	45			
	110 V A	25			
	220 V A	5			
	440 V A	0.27			
	600 V A	0.16			
- 3 conducting paths in series	Up to 24 V A	55			
	60 V A	55			
	110 V A	55			
	220 V A	25			
	440 V A	0.6			
	600 V A	0.35			
<b>Switching frequency</b>					
<b>Switching frequency <math>z</math> in operating cycles/hour</b>					
Contactors without overload relays					
• No-load switching frequency					
	AC	$h^{-1}$	5 000		
	AC/DC	$h^{-1}$	1 500		
• Switching frequency $z$ during rated operation <sup>1)</sup>					
- $I_e/AC-1$	At 400 V	$h^{-1}$	1 200	1 000	800
- $I_e/AC-2$	At 400 V	$h^{-1}$	750	600	400
- $I_e/AC-3$	At 400 V	$h^{-1}$	1 000	800	700
- $I_e/AC-4$	At 400 V	$h^{-1}$	300	250	200
Contactors with overload relays					
• Mean value					
		$h^{-1}$	15		

<sup>1)</sup> Dependence of the switching frequency  $z'$  on the operational current  $I'$  and operational voltage  $U'$ :  
 $z' = z \times (I_e/I') \times (400 V/U')^{1.5} \times 1/h$

# Contactors for Switching Motors

## 3RT20.3. contactors

Type		3RT2035	3RT2036	3RT2037	3RT2038
Size		S2	S2	S2	S2
<b>Conductor cross-sections (1 or 2 conductors connectable)</b>					
<b>Main conductors</b>		<b>Screw terminals</b>			
• Solid or stranded	mm <sup>2</sup>	2 x (1 ... 35) <sup>1)</sup> ; 1 x (1 ... 50) <sup>1)</sup>			
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1 ... 25) <sup>1)</sup> ; 1 x (1 ... 35) <sup>1)</sup>			
• AWG cables, solid or stranded	AWG	2 x (18 ... 2) <sup>1)</sup> ; 1 x (18 ... 1) <sup>1)</sup>			
• Terminal screws		Pozidriv size 2; Ø 5 ... 6			
- Tightening torque	Nm	3 ... 4.5 (27 ... 40 lb.in)			
<b>Auxiliary and control conductors</b>					
• Solid or stranded	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup>			
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup>			
• Solid or stranded AWG (2 x)	AWG	2 x (20 ... 16) <sup>1)</sup> ; 2 x (18 ... 14) <sup>1)</sup>			
• Terminal screws		M3 (for Pozidriv size 2, Ø 5 ... 6)			
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)			
<b>Auxiliary and control conductors<sup>2)</sup></b>		<b>Spring-type terminals</b>			
• Operating devices <sup>3)</sup>	mm	3.0 x 0.5			
• Solid or stranded	mm <sup>2</sup>	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)			
• Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.5 ... 2.5)			
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)			


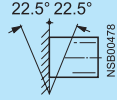

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

<sup>2)</sup> Max. external diameter of the cable insulation: 3.6 mm.  
On spring-type terminals with conductor cross-sections ≤ 1 mm<sup>2</sup>, an insulation stop must be used, see [Accessories](#), page 3/76.

<sup>3)</sup> Tool for opening the spring-type terminals; see ["Accessories"](#), page 3/76.

# Contactors for Switching Motors

## 3RT20.4. contactors

Technical data				S3 3RT20 45	S3 3RT20 46	S3 3RT20 47	
Contactor	Size Type						
<b>General data</b>							
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.		AC and DC operation				For DC operation and forward inclination up to 22.5°: coil voltage tolerance 0.85 ... 1.1 x U <sub>s</sub>	
Upright mounting position:		AC and DC operation		 Special design required. Positions 13 to 16 of the Order No. must be changed to <b>-1AA0</b> . Additional charge.			
<b>Mechanical endurance</b>	Basic units Basic unit with snap-on auxiliary switch block Solid-state compatible aux. switch block	Oper. cycles		10 million 10 million 5 million			
<b>Electrical endurance</b>				See page 2/123.			
<b>Rated insulation voltage U<sub>i</sub></b> (pollution degree 3)			V	1000			
<b>Rated impulse withstand voltage U<sub>imp</sub></b>			kV	6			
<b>Safe isolation</b> between coil and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690			
<b>Positively driven operation</b> There is positively driven operation if the NC and NO contacts cannot be closed at the same time		3RT20 4., 3RT23 4., 3RT24 5. (removable aux. switch block) 3RT20 4., 3RT23 4., 3RT24 5. (permanent aux. switch block)		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC) in accordance with Swiss regulations (SUVA) on request.			
<b>Permissible ambient temperature</b>		in operation when stored	°C °C	-25 ... +60 -55 ... +80			
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050				IP 20 (terminal compartment IP 00), coil system IP 40			
<b>Shock resistance</b>		Rectangular pulse Sine pulse	AC and DC operation AC and DC operation	g/ms g/ms	6.8/5 and 4/10 10.6/5 and 6.2/10		
<b>Conductor cross-sections</b>				See page 2/142.			
<b>Short-circuit protection of contactors without overload relays</b>				For short-circuit protection of contactors with overload relays, see Section 3. For short-circuit protection of fuseless load feeders, see Section 4.			
<b>Main circuit</b> Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – acc. to IEC 60 947-4/ EN 60 947-4-4 (VDE 0660 Part 102)				Type of coord. "1"¹) Type of coord. "2"¹) Weld-free ²)	A A A	250 125 63	250 160 100
<b>Auxiliary circuit</b> Fuse links, utilization category gL/gG DIAZED Type 5SB, NEOZED Type 5SE (weld-free protection at I <sub>k</sub> ≥ 1 kA) or miniature circuit-breaker with C-characteristic (short-circuit current I <sub>k</sub> < 400 A)				A A		10 10	

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):  
Type of coordination "1":  
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary

Type of coordination "2":  
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

# Contactors for Switching Motors

## 3RT20.4. contactors

CONTACTORS - AN11

### Technical data

Contactor	Size Type	S3 3RT20 45	S3 3RT20 46	S3 3RT20 47
<b>Control circuit</b>				
<b>Coil voltage tolerance</b>		AC/DC 0.8 to 1.1 × U <sub>s</sub>		
<b>Power consumption of the coils</b> (with coil in cold state and 1.0 × U <sub>s</sub> )		<b>Standard design</b>		
AC operation		Hz	50	50/60
	Closing	VA	218	247 / 211
	p.f.		0.61	0.62/ 0.57
	Closed	VA	21	25 / 18
	p.f.		0.26	0.27/ 0.3
			0.68	0.7/ 0.62
			22	27 / 20
			0.27	0.29/ 0.31
<b>For USA and Canada</b>				
		Hz	50	60
	Closing	VA	218	232
	p.f.		0.61	0.55
	Closed	VA	21	20
	p.f.		0.26	0.28
			0.27	0.29
DC operation	closing = closed	W	15	15
<b>Permissible residual current of the electronics</b> (with 0 signal)				
	AC operation	mA	$< 25 \text{ mA} \times \left(\frac{230 \text{ V}}{U_s}\right)$	
	DC operation	mA	$< 43 \text{ mA} \times \left(\frac{24 \text{ V}}{U_s}\right)$	
<b>Operating times at 0.8 to 1.1 × U<sub>s</sub> 1)</b>		Break-time = opening time + arcing time		
AC operation	closing time	ms	16 ... 57	17 ... 90
	opening time	ms	10 ... 19	10 ... 25
DC operation	closing time	ms	90 ... 230	90 ... 230
	opening time	ms	14 ... 20	14 ... 20
Arcing time		ms	10 ... 15	10 ... 15
<b>Operating times at 1.0 × U<sub>s</sub> 1)</b>				
AC operation	closing time	ms	18 ... 34	18 ... 30
	opening time	ms	11 ... 18	11 ... 23
DC operation	closing time	ms	100 ... 120	100 ... 120
	opening time	ms	16 ... 20	16 ... 20
<b>Main circuit</b>				
<b>Load ratings with AC</b>				
<b>AC-1 utilization category, switching resistive load</b>				
Rated operational currents I <sub>e</sub>	at 40 °C up to 690 V	A	100	120
	1000 V	A	50	60
	at 60 °C up to 690 V	A	90	100
	1000 V	A	40	50
Ratings of three-phase loads 2)	at 230 V	kW	34	38
p.f. = 0.95 (at 60 °C)	400 V	kW	59	66
	500 V	kW	74	82
	690 V	kW	102	114
	1000 V	kW	66	82
Minimum conductor cross-section with I <sub>e load</sub>	at 40 °C	mm <sup>2</sup>	35	50
	60 °C	mm <sup>2</sup>	35	35
<b>AC-2 and AC-3 utilization categories</b>				
Rated operational currents I <sub>e</sub>	up to 400 V	A	65	80
	500 V	A	65	80
	690 V	A	47	58
	1000 V	A	25	30
Ratings of slipping or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	18.5	22
	400 V	kW	30	37
	500 V	kW	37	45
	690 V	kW	55	55
	1000 V	kW	30	37
<b>Thermal loading capacity</b>	10 s current 3)	A	600	760
<b>Power loss per conducting path</b>	at I <sub>e</sub> /AC-3	W	4.6	7.7
				10.8

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (varistor +2 ms to 5 ms, diode assem-

2) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

3) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

# Contactors for Switching Motors

## 3RT20.4. contactors

Technical data		S3 3RT20 45	S3 3RT20 46	S3 3RT20 47				
Contactor	Size Type							
<b>Main circuit</b>								
<b>Load ratings with AC</b>								
<b>AC-4 utilization category (at <math>I_a = 6 \times I_e</math>)</b>								
Rated operational current $I_e$	up to 400 V	A	55	66	80			
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	30	37	45			
• For a contact endurance of approx. 200 000 operating cycles:								
Rated operational currents $I_e$	up to 400 V	A	28	34	42			
	690 V	A	28	34	42			
	1000 V	A	20	23	23			
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	8.7	10.4	12			
	400 V	kW	15.1	17.9	22			
	500 V	kW	18.4	22.4	27			
	690 V	kW	25.4	30.9	38			
	1000 V	kW	22	30	30			
<b>AC-5a utilization category, switching gas discharge lamps</b>								
per main conducting path at 230 V								
	Rating per lamp	Rated operational current per lamp (A)						
	uncorrected							
	L 18 W	0.37	Units	243	270			
	L 36 W	0.43	Units	209	232			
	L 58 W	0.67	Units	134	149			
	lead-lag							
	L 18 W	0.11	Units	818	909			
	L 36 W	0.21	Units	428	476			
	L 58 W	0.32	Units	281	312			
<b>Switching gas discharge lamps with correction, electronic ballast</b>								
per main conducting path at 230 V								
Rating per lamp	Capacitor (µF)	Rated operational current per lamp (A)						
Parallel correction								
L 18 W	4.5	0.11	Units	160	197	234		
L 36 W	4.5	0.21	Units	160	197	234		
L 58 W	7	0.32	Units	103	127	150		
With electronic ballast, single lamp								
L 18 W	6.8	0.10	Units	455	560	665		
L 36 W	6.8	0.18	Units	253	311	369		
L 58 W	10	0.27	Units	168	207	246		
With electronic ballast, twin lamp								
L 18 W	10	0.18	Units	253	311	369		
L 36 W	10	0.35	Units	130	160	190		
L 58 W	22	0.52	Units	88	108	128		
<b>AC-5b utilization category, switching incandescent lamps</b>								
per main conducting path at 230/220 V								
		kW	9	14.6	17.3			
<b>AC-6a utilization category, switching three-phase transformers</b>								
with inrush								
		n	30	20	30	20	30	20
Rated operational current $I_e$	up to 400 V	A	42.3	63.5	56.3	80	56.3	84.4
	690 V	A	42.3	47	56.3	58	56.3	58
Ratings of three-phase transformers with an inrush of n = 30 or 20.	at 230 V	kVA	16.8	25.3	22.4	31.9	22.4	33.6
The ratings must be re-calculated for other inrush factors x:	400 V	kVA	29.3	43.9	39	55.4	39	58
	500 V	kVA	36.6	54.9	48.7	69.3	48.7	73.1
	690 V	kVA	50.3	56.2	67.3	69.3	67.3	69.3
$P_x = P_{n30} \cdot \frac{30}{x}$								
<b>AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors</b>								
Ambient temperature 40 °C								
Rated operational currents $I_e$	up to 400 V	A	57	72				
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	24	29				
	400 V	kvar	40	50				
	525 V	kvar	50	65				
	690 V	kvar	40	50				

# Contactors for Switching Motors

## 3RT20.4. contactors

CONTACTORS AND ASSEMBLIES 2

### Technical data

Contactor	Size Type	S3 3RT20 45	S3 3RT20 46	S3 3RT20 47
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### Main circuit

#### Load ratings with DC

**DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)**

**Rated operational current  $I_e$**  (at 60 °C)

Number of conducting paths connected in series

	1	2	3	1	2	3	1	2	3
up to 24 V A	90	90	90	100	100	100	100	100	100
60 V A	23	90	90	60	100	100	60	100	100
110 V A	4.5	90	90	9	100	100	9	100	100
220 V A	1	5	70	2	10	80	2	10	80
440 V A	0.4	1	2.9	0.6	1.8	1.8	0.6	1.8	4.5
600 V A	0.26	0.8	1.4	0.4	1	1	0.4	1	2.6

**DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)**

**Rated operational current  $I_e$**  (at 60 °C)

Number of conducting paths connected in series

	1	2	3	1	2	3	1	2	3
up to 24 V A	40	90	90	40	100	100	40	100	100
60 V A	6	90	90	6.5	100	100	6.5	100	100
110 V A	2.5	90	90	2.5	100	100	2.5	100	100
220 V A	1	7	35	1	7	35	1	7	35
440 V A	0.15	0.42	0.8	0.15	0.42	0.8	0.15	0.42	0.8
600 V A	0.06	0.16	0.35	0.06	0.16	0.35	0.06	0.16	0.35

#### Operating frequency

**Operating frequency  $z'$**  in operating cycles per hour

Contactor without overload relays	No-load operating frequency	1/h	AC	DC	AC	DC	AC	DC
			5000	1000	5000	1000	5000	1000
Dependence of the operating frequency $z'$ on the operational current $I'$ and the operational voltage $U'$ :		1/h	AC/DC		AC/DC		AC/DC	
			1000	900	1000	900	1000	900
			400	400	400	350	400	350
			1000	1000	1000	850	1000	850
for AC-1	1/h	300	300	300	250	300	250	
		15	15	15	15	15	15	

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 \text{ V}}{U'}\right)^{1.5} \text{ 1/h}$$

Contactor	Size Type	S3 3RT20 4.
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### Conductor cross-sections

**Screw connections**  
(1 or 2 conductor connections possible)

**Main conductor:**  
With box terminal

Finely stranded with end sleeve	mm <sup>2</sup>	2.5 ... 35
Finely stranded without end sleeve	mm <sup>2</sup>	4 ... 50
Solid	mm <sup>2</sup>	2.5 ... 16
Stranded	mm <sup>2</sup>	4 ... 70
Ribbon cable (qty. × width × thickness)	mm	6 × 9 × 0.8
AWG conductor connections, solid and stranded	AWG	10 ... 2/0
- Terminal screws		
- Tightening torque	Nm	4 ... 6 (36 ... 53 lb.in)

Front terminal connected	Back terminal connected	Both terminals connected
2.5 ... 35 4 ... 50 2.5 ... 16 4 ... 70 6 × 9 × 0.8	2.5 ... 50 10 ... 50 2.5 ... 16 10 ... 70 6 × 9 × 0.8	max. 2 × 35 max. 2 × 35 max. 2 × 16 max. 2 × 50 2 × (6 × 9 × 0.8)

Connection for drilled copper bars

max. width	mm	10	If bars larger than 12 × 10 mm are connected, a 3RT19 46-4EA1 terminal cover is to comply with the phase clearance.
Without box terminal	mm <sup>2</sup>	10 ... 50 <sup>1)</sup>	If conductors larger than 25 mm <sup>2</sup> are connected, a 3RT19 46-4EA1 terminal cover is needed to comply with the phase clearance.
With cable lugs (1 or 2 conductor connections possible)	mm <sup>2</sup>	10 ... 70 <sup>1)</sup> 7 ... 1/0	

**Auxiliary conductor:**

Solid	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)
Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)
AWG conductor connections, solid or stranded	AWG	2 × (20 ... 16); 2 × (18 ... 14); 1 × 12
- Terminal screws		M 3
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)

**Cage Clamp connections**  
(1 or 2 conductor connections possible)

**Auxiliary conductor:**

Solid	mm <sup>2</sup>	2 × (0.25 ... 2.5)
Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.25 ... 1.5)
Finely stranded without end sleeve	mm <sup>2</sup>	2 × (0.25 ... 2.5)
AWG conductor connections, solid or stranded	AWG	2 × (24 ... 14)

- For tool for opening the Cage Clamp connection, see on accessories [page 2/79](#)
  - An "insulation stop" must be used for conductor cross-sections ≤ 1 mm<sup>2</sup>, see accessories on [page 2/79](#).
  - Max. outer diameter of conductor insulation: 3.6 mm.
  - For information about Cage Clamp connections, see Appendix page 19/17.
- 1) Only crimping cable lugs acc. to DIN 46 234

# Contactors for Switching Motors

## 3RT10.5. contactors

Technical data		S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
Contactor	Size Type			
<b>General data</b>				
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.				
<b>Mechanical endurance</b>	Oper. cycles	10 million		
<b>Electrical endurance</b>		See page 2/123		
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1000		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8		
<b>Safe isolation</b> between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])	V	690		
<b>Positively driven operation</b> There is positively driven operation if the NC and NO contacts cannot be closed at the same time		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)		
<b>Permissible ambient temperature</b>	in operation °C when stored °C	-25 ... +60/+55 with AS-Interface -55 ... +80		
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050		IP 00/open type, coil system IP 20		
<b>Shock resistance</b>	Rectangular pulse g/ms Sine pulse g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
<b>Conductor cross-sections</b>		See page 2/145		
<b>Electromagnetic compatibility (EMC)</b>		See page 2/106		
<b>Short-circuit protection of contactors without overload relays</b>		See Part 4.		
<b>Main circuit</b> Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – acc. to IEC 60 947-4-1/EN 60 947-4-1		Type of coord. "1" 1) A Type of coord. "2" 1) A Weld-free 2) A	355 315 80	355 315 160
<b>Auxiliary circuit</b> Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ( $I_k < 400$ A)		A	10	

Contactor		Size Type	S6 3RT10 5.			
<b>Control circuit</b>						
<b>Coil voltage tolerance</b>		AC/DC (UC)	$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$			
<b>Power consumption of solenoid mechanism</b> (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$ )			Conventional op. mechanism		Solid-state op. mechanism	
			$U_{s \min}$	$U_{s \max}$	$U_{s \min}$	$U_{s \max}$
AC operation	Closing p.f.	VA	250	300	190	280
	Closed p.f.	VA	0.9	0.9	0.8	0.8
	DC operation Closing	W	4.8	5.8	3.5	4.4
	Closed	W	0.8	0.8	0.5	0.4
	DC operation Closing	W	300	360	250	320
	Closed	W	4.3	5.2	2.3	2.8
<b>PLC control input</b> (EN 61 131-2/Type 2)			DC 24 V/≤ 30 mA			
<b>Operating times</b> (Break-time = opening time + arcing time)			Conventional op. mechanism		Solid-state op. mechanism Operation via A1/A2	
					PLC input	
– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	ms	20 ... 95		95 ... 135	
	opening time	ms	40 ... 60		80 ... 90	
– at $U_{s \min} \dots U_{s \max}$	closing time	ms	25 ... 50		100 ... 120	
	opening time	ms	40 ... 60		80 ... 90	
Arcing time		ms	10 ... 15		10 ... 15	

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):  
Type of coordination "1":  
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":  
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.



# Contactors for Switching Motors

## 3RT10.5. contactors

### Technical data

Contactor	Size Type	S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
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### Main circuit

#### Load ratings with AC

#### AC-1 utilization category, switching resistive load

Rated operational currents $I_e$	at 40 °C up to 690 V	A	160	185	215
	at 60 °C up to 690 V	A	140	160	185
	at 60 °C up to 1000 V	A	80	90	100
Ratings of three-phase loads <sup>1)</sup> p.f. = 0.95 (at 60 °C)	at 230 V	kW	53	60	70
	400 V	kW	92	105	121
	500 V	kW	115	131	152
	690 V	kW	159	181	210
	1000 V	kW	131	148	165
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm <sup>2</sup>	70	95	95
	60 °C	mm <sup>2</sup>	50	70	95

#### AC-2 and AC-3 utilization categories

Rated operational currents $I_e$	up to 500 V	A	115	150	185
	690 V	A	115	150	170
	1000 V	A	53	65	65
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	37	50	61
	400 V	kW	64	84	104
	500 V	kW	81	105	132
	690 V	kW	113	146	167
	1000 V	kW	75	90	90

#### Thermal loading capacity

10 s current <sup>2)</sup>	A	1100	1300	1480
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#### Power loss per conducting path

at $I_e/AC-3/500$ V	W	7	9	13
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#### AC-4 utilization category (at $I_a = 6 \times I_e$ )

Rated operational current $I_e$	up to 400 V	A	97	132	160
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	55	75	90
• For a contact endurance of approx. 200 000 operating cycles:					
Rated operational currents $I_e$	up to 500 V	A	54	68	81
	690 V	A	48	57	65
	1000 V	A	34	38	42
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	16	20	25
	400 V	kW	29	38	45
	500 V	kW	37	47	57
	690 V	kW	48	55	65
	1000 V	kW	49	55	60

#### AC-6a utilization category, switching three-phase transformers

with inrush	n	30	20	30	20	30	20	
Rated operational current $I_e$	up to 690 V	A	90	115	99	148	99	148
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA	35	45	39	58	39	58
	400 V	kVA	62	79	68	102	68	102
	500 V	kVA	77	99	85	128	85	128
	690 V	kVA	107	137	118	176	118	176
	1000 V	kVA	80	80	98	98	117	117

#### AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C								
Rated operational currents $I_e$	up to 500 V	A	105	125	145			
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 μH) at 50 Hz, 60 Hz and	at 230 V	kvar	42	50	58			
	400 V	kvar	72	86	100			
	500 V	kvar	90	108	125			
	690 V	kvar	72	86	100			

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

# Contactors for Switching Motors

## Technical data

Contactant	Size Type	<b>S6</b> <b>3RT10 54</b>	<b>S6</b> <b>3RT10 55</b>	<b>S6</b> <b>3RT10 56</b>
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### Main circuit

#### Load ratings with DC

<b>DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)</b>				
<b>Rated operational current <math>I_e</math></b> (at 60 °C)				
	Number of conducting paths connected in series	1	2	3
	up to 24 V A	160	160	160
	60 V A	160	160	160
	110 V A	18	160	160
	220 V A	3.4	20	160
	440 V A	0.8	3.2	1.4
	600 V A	0.5	1.6	0.75
<b>DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)</b>				
<b>Rated operational current <math>I_e</math></b> (at 60 °C)				
	Number of conducting paths connected in series	1	2	3
	up to 24 V A	160	160	160
	60 V A	7.5	160	160
	110 V A	2.5	160	160
	220 V A	0.6	2.5	160
	440 V A	0.17	0.65	11.5
	600 V A	0.12	0.37	4

#### Operating frequency

<b>Operating frequency <math>z</math></b> in operating cycles per hour			
Contactors without overload relays	No-load operating frequency 1/h	2000	2000
Dependence of the operating frequency $z'$ on the operational current $I'$ and the operational voltage $U'$ :	for AC-1 1/h	800	800
	for AC-2 1/h	400	300
	for AC-3 1/h	1000	750
	for AC-4 1/h	130	130
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 V}{U'}\right)^{1.5}$ 1/h			
Contactors with overload relays (mean value)	1/h	60	60

Contactant	Size Type	<b>S6</b> <b>3RT10 5.</b>
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### Conductor cross-sections

<b>Screw connections</b>	<b>Main conductor:</b> with 3RT19 55-4G box terminal (75 HP)		Front terminal connected	Back terminal connected	Both terminals connected
	finely stranded with end sleeve	mm <sup>2</sup>	16 ... 70	16 ... 70	max. 1 × 50, 1 × 70
	Finely stranded without end sleeve	mm <sup>2</sup>	16 ... 70	16 ... 70	max. 1 × 50, 1 × 70
	Stranded	mm <sup>2</sup>	16 ... 70	16 ... 70	max. 2 × 70
	AWG conductor connections, solid/stranded		6 ... 2/0	6 ... 2/0	max. 2 × 1/0
	Ribbon cable (qty. × width × thickness)	mm	min. 3 × 9 × 0.8	min. 3 × 9 × 0.8	max. 2 × (6 × 15.5 × 0.8)
		mm	max. 6 × 15.5 × 0.8	max. 6 × 15.5 × 0.8	
	with 3RT19 56-4G box terminal				
	Finely stranded with end sleeve	mm <sup>2</sup>	16 ... 120	16 ... 120	max. 1 × 95, 1 × 120
	Finely stranded without end sleeve	mm <sup>2</sup>	16 ... 120	16 ... 120	max. 1 × 95, 1 × 120
Stranded	mm <sup>2</sup>	16 ... 120	16 ... 120	max. 2 × 120	
AWG conductor connections, solid/stranded		6 ... 250 kcmil	6 ... 250 kcmil	max. 2 × 3/0	
Ribbon cable (qty. × width × thickness)	mm	min. 3 × 9 × 0.8	min. 3 × 9 × 0.8		
	mm	max. 10 × 15.5 × 0.8	max. 10 × 15.5 × 0.8	max. 2 × (10 × 15.5 × 0.8)	
- Terminal screws		M 10 (hexagon socket, A/F4)			
- Tightening torque	Nm	10 ... 12 (90 ... 110 lb.in)			
<b>Without box terminal/busbar connection</b>					
Finely stranded with cable lug	mm <sup>2</sup>	16 ... 95	If cable lugs acc. to DIN 46 235 are connected, as of a conductor cross-section of 95 mm <sup>2</sup> a 3RT19 56-4EA1 terminal cover is necessary to comply with the phase clearance.		
Stranded with cable lug	mm <sup>2</sup>	25 ... 120			
AWG conductor connections, solid or stranded	AWG	4 ... 250 kcmil			
Connecting bar (max. width)	mm	17			
- Terminal screws		M 8 × 25 (A/F 13)			
- Tightening torque	Nm	10 ... 14 (89 ... 124 lb.in)			
<b>Auxiliary conductor:</b>					
Solid	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)			
Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)			
AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)			
- Terminal screws		M 3 (PZ 2)			
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)			

# Contactors for Switching Motors

## 3RT10.6. contactors

CONTACTORS AND ASSEMBLIES 2

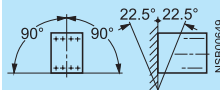
### Technical data

Contactors	Size Type	<b>S10 3RT10 64</b>	<b>S10 3RT10 65</b>	<b>S10 3RT10 66</b>
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### General data

**Permissible mounting position**

The contactors are designed for operation on a vertical mounting surface.



**Mechanical endurance**

Oper. cycles 10 million

**Electrical endurance**

See page 2/123

**Rated insulation voltage  $U_i$**  (pollution degree 3)

V 1000

**Rated impulse withstand voltage  $U_{imp}$**

kV 8

**Safe isolation** between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])

V 690

**Positively driven operation**

There is positively driven operation if the NC and NO contacts cannot be closed at the same time

Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)

**Permissible ambient temperature**

in operation °C -25 ... +60/+55 with AS-Interface  
when stored °C -55 ... +80

**Degree of protection** acc. to IEC 60 947-1 and DIN 40 050

IP 00/open type, coil system IP 20

**Shock resistance**

Rectangular pulse  
Sine pulse

g/ms 8.5/5 and 4.2/10  
g/ms 13.4/5 and 6.5/10

**Conductor cross-sections**

See page 2/148

**Electromagnetic compatibility (EMC)**

See page 2/106

### Short-circuit protection

**Main circuit**

Fuse links, utilization category gL/gG  
NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE  
- acc. to IEC 60 947-4-1/EN 60 947-4-1

Type of coord. "1"¹) A 500  
Type of coord. "2"¹) A 400  
Weld-free²) A 250

**Auxiliary circuit**

Fuse links, utilization category gL/gG  
(weld-free protection at  $I_k \geq 1$  kA)  
DIAZED Type 5SB, NEOZED Type 5SE  
or miniature circuit-breaker with C-characteristic ( $I_k < 400$  A)

A 10

Contactors	Size Type	<b>S10 3RT10 6.</b>
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### Control circuit

**Coil voltage tolerance**

AC/DC (UC)

$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$

**Power consumption of solenoid mechanism**

(with coil in cold state and rated range  $U_{s \min} \dots U_{s \max}$ )

		Conventional op. mechanism		Solid-state op. mechanism	
		$U_{s \min}$	$U_{s \max}$	$U_{s \min}$	$U_{s \max}$
AC operation	closing	490	590	400	530
	p.f.	0.9	0.9	0.8	0.8
	closed	5.6	6.7	4	5
DC operation	p.f.	0.9	0.9	0.5	0.4
	closing	540	650	440	580
	closed	6.1	7.4	3.2	3.8

**PLC control input** (EN 61 131-2/Type 2)

DC 24 V /  $\leq 30$  mA

**Operating times**

(Break-time = opening time + arcing time)

		Conventional op. mechanism		Solid-state op. mechanism	
				Operation via A1/A2	PLC input
- at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	30 ... 95		105 ... 145	45 ... 80
	opening time	40 ... 80		80 ... 100	80 ... 100
- at $U_{s \min} \dots U_{s \max}$	closing time	35 ... 50		110 ... 130	50 ... 65
	opening time	50 ... 80		80 ... 100	80 ... 100
Arcing time		10 ... 15		10 ... 15	10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):  
Type of coordination "1":  
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":  
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

# Contactors for Switching Motors

## 3RT10.6. contactors

### Technical data

Contactor	Size Type	S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
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#### Main circuit

##### Load ratings with AC

##### AC-1 utilization category, switching resistive load

Rated operational currents $I_e$	at 40 °C up to 690 V	A	275	330	
	at 60 °C up to 690 V	A	250	300	
	at 60 °C up to 1000 V	A	100	150	
Ratings of three-phase loads <sup>1)</sup> p.f. = 0.95 (at 60 °C)	at 230 V	kW	94	113	
	400 V	kW	164	197	
	500 V	kW	205	246	
	690 V	kW	283	340	
	1000 V	kW	164	246	
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm <sup>2</sup>	150	185	
	60 °C	mm <sup>2</sup>	120	185	

##### AC-2 and AC-3 utilization categories

Rated operational currents $I_e$	up to 500 V	A	225	265	300
	690 V	A	225	265	280
	1000 V	A	68	95	95
Ratings of slipping or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	73	85	97
	400 V	kW	128	151	171
	500 V	kW	160	189	215
	690 V	kW	223	265	280
	1000 V	kW	90	132	132

##### Thermal loading capacity

10 s current <sup>2)</sup>	A	1800	2400	2400
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##### Power loss per conducting path

at $I_e/AC-3/500$ V	W	17	18	22
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##### AC-4 utilization category (at $I_a = 6 \times I_e$ )

Rated operational current $I_e$	up to 400 V	A	195	230	280
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	110	132	160
• For a contact endurance of approx. 200 000 operating cycles:					
Rated operational currents $I_e$	up to 500 V	A	96	117	125
	690 V	A	85	105	115
	1000 V	A	42	57	57
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	30	37	40
	400 V	kW	54	66	71
	500 V	kW	67	82	87
	690 V	kW	82	102	112
	1000 V	kW	59	80	80

##### AC-6a utilization category, switching three-phase transformers

with inrush	n	30	20	30	20	30	20	
Rated operational current $I_e$	up to 690 V	A	151	227	182	265	182	273
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA	60	90	72	105	72	109
	400 V	kVA	105	157	126	183	126	189
	500 V	kVA	130	196	158	229	158	236
	690 V	kVA	180	271	217	317	217	326
	1000 V	kVA	117	117	164	164	164	164
$P_x = P_{n30} \cdot \frac{30}{x}$								

##### AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C							
Rated operational currents $I_e$	up to 500 V	A	183	220			
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	73	88			
	400 V	kvar	127	152			
	500 V	kvar	159	191			
	690 V	kvar	127	152			

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

# Contactors for Switching Motors

## 3RT10.6. contactors

CONTACTORS AND ASSEMBLIES 2

### Technical data

Contactor	Size Type	S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
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### Main circuit

#### Load ratings with DC

<b>DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)</b>							
<b>Rated operational current <math>I_e</math> (at 60 °C)</b>							
Number of conducting paths connected in series		1	2	3	1	2	3
up to 24 V A		200	200	200	300	300	300
60 V A		200	200	200	300	300	300
110 V A		18	200	200	33	300	300
220 V A		3.4	20	200	3.8	300	300
440 V A		0.8	3.2	11.5	0.9	4	11
600 V A		0.5	1.6	4	0.6	2	5.2
<b>DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)</b>							
<b>Rated operational current <math>I_e</math> (at 60 °C)</b>							
Number of conducting paths connected in series		1	2	3	1	2	3
up to 24 V A		200	200	200	300	300	300
60 V A		7.5	200	200	11	300	300
110 V A		2.5	200	200	3	300	300
220 V A		0.6	2.5	200	0.6	2.5	300
440 V A		0.17	0.65	1.4	0.18	0.65	1.4
600 V A		0.12	0.37	0.75	0.125	0.37	0.75

#### Operating frequency

<b>Operating frequency z</b> in operating cycles per hour							
Contactor without overload relays	No-load operating frequency	1/h	2000		2000		2000
Dependence of the operating frequency z' on the operational current I' and the operational voltage U':	for AC-1	1/h	750		800		750
	for AC-2	1/h	250		300		250
	for AC-3	1/h	500		700		500
	for AC-4	1/h	130		130		130
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400V}{U'}\right)^{1.5}$ 1/h							
Contactor with overload relays (mean value)		1/h	60		60		60

Contactor	Size Type	S10 3RT10 6.
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### Conductor cross-sections

<b>Screw connections</b>	<b>Main conductor:</b> with 3RT19 66-4G box terminal	Front terminal connected	Back terminal connected	Both terminals connected	
	Finely stranded with end sleeve	mm <sup>2</sup>	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Finely stranded without end sleeve	mm <sup>2</sup>	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	mm <sup>2</sup>	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240
	AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 2 × 500 kcmil
	Ribbon cable (qty. × width × thickness)	mm	min. 6 × 9 × 0.8	min. 6 × 9 × 0.8	max. 2 × (20 × 24 × 0.5)
	– Terminal screws	mm	max. 20 × 24 × 0.5	max. 20 × 24 × 0.5	
	– Tightening torque	Nm	M 12 (hexagon sokket, A/F 5)		
					20 ... 22 (180 ... 195 lb.in)
	<b>Without box terminal/busbar connection</b>				
	Finely stranded with cable lug	mm <sup>2</sup>	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm <sup>2</sup> and acc. to DIN 46 235 as of a conductor cross-section of 185 mm <sup>2</sup> a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm <sup>2</sup>	70 ... 240		
AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil			
Connecting bar (max. width)	mm	25			
– Terminal screws		M 10 × 30 (A/F 17)			
– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)			
<b>Auxiliary conductor:</b>					
Solid	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)			
Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)			
AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)			
– Terminal screws		M 3 (PZ 2)			
– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)			

# Contactors for Switching Motors

## 3RT10.7. contactors

Technical data		S12 3RT10 75	S12 3RT10 76
Contactors	Size Type		
<b>General data</b>			
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.			
<b>Mechanical endurance</b>	Oper. cycles	10 million	
<b>Electrical endurance</b>		See page 2/123	
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1000	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8	
<b>Safe isolation</b> between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])	V	690	
<b>Positively driven operation</b> There is positively driven operation if the NC and NO contacts cannot be closed at the same time		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)	
<b>Permissible ambient temperature</b>	in operation when stored	°C	-25 ... +60/+55 with AS-Interface -55 ... +80
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050		IP 00/open type, coil system IP 20	
<b>Shock resistance</b>	Rectangular pulse Sine pulse	g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10
<b>Conductor cross-sections</b>		See page 2/151	
<b>Electromagnetic compatibility (EMC)</b>		See page 2/106	
<b>Short-circuit protection</b>			
<b>Main circuit</b> Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – to IEC 60 947-4/EN 60 947-4-4 (VDE 0660 Part 102)		Type of coord. "1" 1) Type of coord. "2" 1) Weld-free 2)	A A A
		630 500 250	630 500 315
<b>Auxiliary circuit</b> Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ( $I_k < 400$ A)		A	10
<b>Control circuit</b>			
<b>Coil voltage tolerance</b>	AC/DC (UC)	$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	
<b>Power consumption of solenoid mechanism</b> (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$ )		Conventional op. mechanism	Solid-state op. mechanism
		$U_{s \min}$	$U_{s \max}$
AC operation	closing	700	560
	p.f.	0.9	0.8
	closed	7.6	5.4
	p.f.	0.9	0.8
DC operation	closing	770	600
	closed	8.5	5
		830	750
		0.9	0.8
		9.2	7
		0.9	0.8
		920	800
		10	5
<b>PLC control input</b> (EN 61 131-2/Type 2)		DC 24 V/≤ 30 mA	
<b>Operating times</b> (Break-time = opening time + arcing time)		Conventional op. mechanism	Solid-state op. mechanism Operation via A1/A2
			PLC input
– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	45 ... 100	120 ... 150
	opening time	60 ... 100	80 ... 100
– at $U_{s \min} \dots U_{s \max}$	closing time	50 ... 70	125 ... 150
	opening time	70 ... 100	80 ... 100
Arcing time		10 ... 15	10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):  
Type of coordination "1":  
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":  
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

# Contactors for Switching Motors

## 3RT10.7. contactors

CONTACTORS AND ASSEMBLIES 2

### Technical data

Contactor	Size Type	S12 3RT10 75	S12 3RT10 76
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### Main circuit

#### Load ratings with AC

#### AC-1 utilization category, switching resistive load

Rated operational currents $I_e$	at 40 °C up to 690 V	A	430	610
	at 60 °C up to 690 V	A	400	550 <sup>3)</sup>
	at 60 °C up to 1000 V	A	200	200
Ratings of three-phase loads <sup>1)</sup> p.f. = 0.95 (at 60 °C)	at 230 V	kW	151	208
	400 V	kW	263	362
	500 V	kW	329	452
	690 V	kW	454	624
	1000 V	kW	329	329
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm <sup>2</sup>	2 × 150	2 × 185
	60 °C	mm <sup>2</sup>	240	2 × 185

#### AC-2 and AC-3 utilization categories

Rated operational currents $I_e$	up to 500 V	A	400	500 <sup>4)</sup>
	690 V	A	400	450
	1000 V	A	180	180
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	132	164
	400 V	kW	231	291
	500 V	kW	291	363
	690 V	kW	400	453
	1000 V	kW	250	250

#### Thermal loading capacity

10 s current <sup>2)</sup>	A	3200	4000
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#### Power loss per conducting path

at $I_e/AC-3/500$ V	W	35	55
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#### AC-4 utilization category (at $I_a = 6 \times I_e$ )

Rated operational current $I_e$	up to 400 V	A	350	430
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	200	250
• For a contact endurance of approx. 200 000 operating cycles:				
Rated operational currents $I_e$	up to 500 V	A	150	175
	690 V	A	135	150
	1000 V	A	80	80
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	48	56
	400 V	kW	85	98
	500 V	kW	105	123
	690 V	kW	133	148
	1000 V	kW	113	113

#### AC-6a utilization category, switching three-phase transformers

with inrush	n	30	20	30	20	
Rated operational current $I_e$	up to 690 V	A	251	377	270	404
Ratings of three-phase transformers with an inrush of $n = 30$ or $20$ . The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA	100	150	107	161
	400 V	kVA	173	261	187	280
	500 V	kVA	217	326	234	350
	690 V	kVA	300	450	323	483
	1000 V	kVA	311	311	311	311

$$P_x = P_{n30} \cdot \frac{30}{x}$$

#### AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C					
Rated operational currents $I_e$	up to 500 V	A	287	407	
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 μH) at 50 Hz, 60 Hz and	at 230 V	kvar	114	162	
	400 V	kvar	199	282	
	500 V	kvar	248	352	
	690 V	kvar	199	282	

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

3) Ambient temperature 50 °C for 3RT10 76-.N contactor

4) Ambient temperature 55 °C for 3RT10 76-.N contactor



# Contactors for Switching Motors

## 3RT10.7. contactors

### Technical data

Contactor	Size Type	S12 3RT10 75	S12 3RT10 76
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### Main circuit

#### Load ratings with DC

DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)		Number of conducting paths connected in series		
Rated operational current $I_e$ (at 60 °C)		1	2	3
up to 24 V	A	400	400	400
60 V	A	330	400	400
110 V	A	33	400	400
220 V	A	3.8	400	400
440 V	A	0.9	4	11
600 V	A	0.6	2	5.2




DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)		Number of conducting paths connected in series		
Rated operational current $I_e$ (at 60 °C)		1	2	3
up to 24 V	A	400	400	400
60 V	A	11	400	400
110 V	A	3	400	400
220 V	A	0.6	2.5	400
440 V	A	0.18	0.65	1.4
600 V	A	0.125	0.37	0.75

#### Operating frequency

Operating frequency $z$ in operating cycles per hour		No-load operating frequency	
Contactor without overload relays	1/h	2000	2000
Dependence of the operating frequency $z'$ on the operational current $I'$ and the operational voltage $U'$ :	for AC-1	700	500
	for AC-2	200	170
	for AC-3	500	420
	for AC-4	130	130
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400V}{U'}\right)^{1.5}$ 1/h			
Contactor with overload relays (mean value)	1/h	60	60

Contactor	Size Type	S12 3RT10 7.
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### Conductor cross-sections

Screw connections		Front terminal connected	Back terminal connected	Both terminals connected
<b>Main conductor:</b> with 3RT19 66-4G box terminal				
Finely stranded with end sleeve	mm <sup>2</sup>	70 ... 240 	120 ... 185 	min. 2 × 50, max. 2 × 185 
Finely stranded without end sleeve	mm <sup>2</sup>	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
Stranded	mm <sup>2</sup>	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240
AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 2 × 500 kcmil
Ribbon cable (qty. × width × thickness)	mm	min. 6 × 9 × 0.8	min. 6 × 9 × 0.8	max. 2 × (20 × 24 × 0.5)
- Terminal screws	mm	max. 20 × 24 × 0.5	max. 20 × 24 × 0.5	
- Tightening torque	Nm	M 12 (hexagon socket, A/F 5)		
		20 ... 22 (180 ... 195 lb.in)		
<b>Without box terminal/busbar connection</b>				
Finely stranded with cable lug	mm <sup>2</sup>	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm <sup>2</sup> and acc. to DIN 46 235 as of a conductor cross-section of 185 mm <sup>2</sup> a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
Stranded with cable lug	mm <sup>2</sup>	70 ... 240		
AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil		
Connecting bar (max. width)	mm	25		
- Terminal screws		M 10 × 30 (A/F 17)		
- Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)		
<b>Auxiliary conductor:</b>				
Solid	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947;		
Finely stranded with end sleeve	mm <sup>2</sup>	max. 2 × (0.75 ... 4)		
		2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)		
- Terminal screws		M 3 (PZ 2)		
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		

# Contactors for Switching Motors

## 3RT12.6. vacuum contactors

CONTACTORS AND ASSEMBLIES 2

Technical data		S10 3RT12 64	S10 3RT12 65	S10 3RT12 66																																														
Contactors	Size Type																																																	
<b>General data</b>																																																		
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.																																																		
<b>Mechanical endurance</b>	Oper. cycles	10 million																																																
<b>Electrical endurance</b>		See page 2/123																																																
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1000																																																
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8																																																
<b>Safe isolation</b> between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])	V	690																																																
<b>Positively driven operation</b> There is positively driven operation if the NC and NO contacts cannot be closed at the same time		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)																																																
<b>Permissible ambient temperature</b>	in operation when stored	°C °C	-25 ... +60/+55 with AS-Interface -55 ... +80																																															
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050		IP 00/open type, coil system IP 20																																																
<b>Shock resistance</b>	Rectangular pulse Sine pulse	g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10																																															
<b>Conductor cross-sections</b>		See page 2/154																																																
<b>Electromagnetic compatibility (EMC)</b>		See page 2/106																																																
<b>Short-circuit protection</b>																																																		
<b>Main circuit</b> Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE - to IEC 60 947-4/EN 60 947-4-4 (VDE 0660 Part 102)																																																		
	Type of coord. "1" 1) Type of coord. "2" 1) Weld-free 2)	A A A	500 500 400																																															
<b>Auxiliary circuit</b> Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ( $I_k < 400$ A)																																																		
		A	10																																															
<b>Control circuit</b>																																																		
<b>Coil voltage tolerance</b>	AC/DC (UC)		$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$																																															
<b>Power consumption of solenoid mechanism</b> (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$ )			<table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="2">Conventional op. mechanism</th> <th colspan="2">Solid-state op. mechanism</th> </tr> <tr> <th colspan="2"></th> <th><math>U_{s \min}</math></th> <th><math>U_{s \max}</math></th> <th><math>U_{s \min}</math></th> <th><math>U_{s \max}</math></th> </tr> </thead> <tbody> <tr> <td rowspan="4">AC operation</td> <td>closing</td> <td>530</td> <td>630</td> <td>420</td> <td>570</td> </tr> <tr> <td>p.f.</td> <td>0.9</td> <td>0.9</td> <td>0.8</td> <td>0.8</td> </tr> <tr> <td>closed</td> <td>6.1</td> <td>7.4</td> <td>4.3</td> <td>5.6</td> </tr> <tr> <td>p.f.</td> <td>0.9</td> <td>0.9</td> <td>0.8</td> <td>0.8</td> </tr> <tr> <td rowspan="2">DC operation</td> <td>closing</td> <td>580</td> <td>700</td> <td>460</td> <td>630</td> </tr> <tr> <td>closed</td> <td>6.8</td> <td>8.2</td> <td>3.4</td> <td>4.2</td> </tr> </tbody> </table>				Conventional op. mechanism		Solid-state op. mechanism				$U_{s \min}$	$U_{s \max}$	$U_{s \min}$	$U_{s \max}$	AC operation	closing	530	630	420	570	p.f.	0.9	0.9	0.8	0.8	closed	6.1	7.4	4.3	5.6	p.f.	0.9	0.9	0.8	0.8	DC operation	closing	580	700	460	630	closed	6.8	8.2	3.4	4.2		
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	opening time	50 ... 80		80 ... 100	80 ... 100																																													
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1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):  
Type of coordination "1":  
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":  
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

# Contactors for Switching Motors

## 3RT12.6. vacuum contactors

### Technical data

Contactor	Size Type	S10 3RT12 64	S10 3RT12 65	S10 3RT12 66
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### Main circuit

#### Load ratings with AC

##### AC-1 utilization category, switching resistive load

Rated operational currents $I_e$	at 40 °C up to 1000 V	A	330		
	at 60 °C up to 1000 V	A	300		
Ratings of three-phase loads <sup>1)</sup> p.f. = 0.95 (at 60 °C)	at 230 V	kW	113		
	400 V	kW	197		
	500 V	kW	246		
	690 V	kW	340		
	1000 V	kW	492		
Minimum conductor cross-section with $I_{e,load}$	at 40 °C	mm <sup>2</sup>	185		
	60 °C	mm <sup>2</sup>	185		

##### AC-2 and AC-3 utilization categories

Rated operational currents $I_e$	up to 1000 V	A	225	265	300
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	73	85	97
	400 V	kW	128	151	171
	500 V	kW	160	189	215
	690 V	kW	223	265	288
	1000 V	kW	320	378	428

##### Thermal loading capacity

10 s current <sup>2)</sup>	A	1800	2120	2400
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##### Power loss per conducting path

at $I_e/AC-3$	W	9	12	14
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##### AC-4 utilization category (at $I_a = 6 \times I_e$ )

Rated operational current $I_e$	up to 690 V	A	195	230	280
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	110	132	160
• For a contact endurance of approx. 400 000 operating cycles:					
Rated operational currents $I_e$	up to 690 V	A	97	115	140
	1000 V	A	68	81	98
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	30	37	45
	400 V	kW	55	65	79
	500 V	kW	68	81	98
	690 V	kW	94	112	138
	1000 V	kW	95	114	140

##### AC-6a utilization category, switching three-phase transformers

with inrush	n	30	20		
Rated operational current $I_e$	up to 690 V	A	185	278	
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA	74	111	
	400 V	kVA	128	193	
	500 V	kVA	160	241	
	690 V	kVA	221	332	
	1000 V	kVA	320	482	
$P_x = P_{n30} \cdot \frac{30}{x}$					

##### AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C					
Rated operational currents $I_e$	up to 500 V	A	220		
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	88		
	400 V	kvar	152		
	500 V	kvar	191		
	690 V	kvar	152		

#### Operating frequency

<b>Operating frequency z</b> in operating cycles per hour					
Contactors without overload relays	No-load operating frequency	1/h	2000	2000	
Dependence of the operating frequency z' on the operational current I' and the operational voltage U':	for AC-1	1/h	800	750	
	for AC-2	1/h	300	250	
	for AC-3	1/h	750	750	
	for AC-4	1/h	250	250	
	$z' = z \cdot \frac{I_e}{I'} \cdot \left( \frac{400 V}{U'} \right)^{1.5}$ 1/h				
Contactors with overload relays (mean value)		1/h	60	60	




1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

# Contactors for Switching Motors

## 3RT12.6. vacuum contactors

### Technical data

Contactor	Size Type	S10 3RT12 6.		
<b>Conductor cross-sections</b>				
<b>Screw connections</b>				
	<b>Main conductor:</b> with 3RT19 66-4G box terminal	Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	70 ... 240 	120 ... 185 	min. 2 × 50, max. 2 × 185 
	Finely stranded without end sleeve	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240
	AWG conductor connections, solid or stranded	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 1 × 500 kcmil
	Ribbon cable (qty. × width × thickness)	mm mm	min. 6 × 9 × 0.8 max. 20 × 24 × 0.5	min. 6 × 9 × 0.8 max. 20 × 24 × 0.5 max. 2 × (20 × 24 × 0.5)
	– Terminal screws	M 12 (hexagon socket, A/F 5)		
	– Tightening torque	Nm 20 ... 22 (180 ... 195 lb.in)		
<b>Without box terminal/busbar connection</b>				
	Finely stranded with cable lug	mm <sup>2</sup>	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm <sup>2</sup> and acc. to DIN 46 235 as of a conductor cross-section of 185 mm <sup>2</sup> a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm <sup>2</sup>		
	AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil	
	Connecting bar (max. width)	mm	25	
	– Terminal screws		M 10 × 30 (A/F 17)	
	– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)	
<b>Auxiliary conductor:</b>				
	Solid	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)	
	Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)	
	AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)	
	– Terminal screws		M 3 (PZ 2)	
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)	

# Contactors for Switching Motors

## 3RT12.7. contactors

Technical data		S12 3RT12 75	S12 3RT12 76																																										
Contactor	Size Type																																												
<b>General data</b>																																													
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.																																													
<b>Mechanical endurance</b>	Oper. cycles	10 million																																											
<b>Electrical endurance</b>		See page 2/123																																											
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1000																																											
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8																																											
<b>Safe isolation</b> between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])	V	690																																											
<b>Positively driven operation</b> There is positively driven operation if the NC and NO contacts cannot be closed at the same time		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)																																											
<b>Permissible ambient temperature</b>	in operation when stored	°C	-25 ... +60/+55 with AS-Interface -55 ... +80																																										
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050		IP 00/open type, coil system IP 20																																											
<b>Shock resistance</b>	Rectangular pulse	g/ms	8.5/5 and 4.2/10																																										
	Sine pulse	g/ms	13.4/5 and 6.5/10																																										
<b>Conductor cross-sections</b>		See page 2/157																																											
<b>Electromagnetic compatibility (EMC)</b>		See page 2/106																																											
<b>Short-circuit protection</b>																																													
<b>Main circuit</b>																																													
Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – to IEC 60 947-4/EN 60 947-4-4 (VDE 0660 Part 102)																																													
	Type of coord. "1" 1)	A	800																																										
	Type of coord. "2" 1)	A	800																																										
	Weld-free 2)	A	500																																										
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Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ( $I_k < 400$ A)																																													
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	Conventional op. mechanism		Solid-state op. mechanism																																										
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Arcing time		10 ... 15	10 ... 15	10 ... 15																																									

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):  
Type of coordination "1":  
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":  
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

# Contactors for Switching Motors

## 3RT12.7. vacuum contactors

### Technical data

Contactors	Size Type	S12 3RT12 75	S12 3RT12 76
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### Main circuit

#### Load ratings with AC

##### AC-1 utilization category, switching resistive load

Rated operational currents $I_e$	at 40 °C up to 1000 V	A	610	
	at 60 °C up to 1000 V	A	550	
Ratings of three-phase loads 1) p.f. = 0.95 (at 60 °C)	at 230 V	kW	208	
	400 V	kW	362	
	500 V	kW	452	
	690 V	kW	624	
	1000 V	kW	905	
Minimum conductor cross-section with $I_{e,load}$	at 40 °C	mm <sup>2</sup>	2 × 185	
	60 °C	mm <sup>2</sup>	2 × 185	

##### AC-2 and AC-3 utilization categories

Rated operational currents $I_e$	up to 1000 V	A	400	500
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	132	164
	400 V	kW	231	291
	500 V	kW	291	363
	690 V	kW	400	507
	1000 V	kW	578	728

##### Thermal loading capacity

	10 s current 2)	A	3200	4000
--	-----------------	---	------	------

##### Power loss per conducting path

	at $I_e/AC-3$	W	21	32
--	---------------	---	----	----

##### AC-4 utilization category (at $I_a = 6 \times I_e$ )

Rated operational current $I_e$	up to 690 V	A	350	430
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	200	250

• For a contact endurance of approx. 400 000 operating cycles:

Rated operational currents $I_e$	up to 690 V	A	175	215
	1000 V	A	123	151
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	56	70
	400 V	kW	98	122
	500 V	kW	124	153
	690 V	kW	172	212
	1000 V	kW	183	217

##### AC-6a utilization category, switching three-phase transformers

with inrush		n	30	20
Rated operational current $I_e$	up to 690 V	A	279	419
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA	111	167
	400 V	kVA	193	290
	500 V	kVA	241	363
	690 V	kVA	332	501
	1000 V	kVA	482	726

$$P_x = P_{n,30} \cdot \frac{30}{x}$$

##### AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C				
Rated operational currents $I_e$	up to 500 V	A	407	
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	162	
	400 V	kvar	282	
	500 V	kvar	352	
	690 V	kvar	282	

#### Operating frequency

##### Operating frequency z in operating cycles per hour

Contactors without overload relays	No-load operating frequency	1/h	2000	
Dependence of the operating frequency z' on the operational current I' and the operational voltage U':	for AC-1	1/h	700	
	for AC-2	1/h	250	
	for AC-3	1/h	750	
	for AC-4	1/h	250	
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 V}{U'}\right)^{1.5}$		1/h		
Contactors with overload relays (mean value)		1/h	60	




1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

# Contactors for Switching Motors

## 3RT12.7. vacuum contactors

### Technical data

Contactor	Size Type	S12 3RT12 7.		
<b>Conductor cross-sections</b>				
<b>Screw connections</b>				
<b>Main conductor:</b> with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected
Finely stranded with end sleeve	mm <sup>2</sup>	70 ... 240 	120 ... 185 	min. 2 × 50, max. 2 × 185 
Finely stranded without end sleeve	mm <sup>2</sup>	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
Stranded	mm <sup>2</sup>	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240
AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 2 × 500 kcmil
Ribbon cable (qty. × width × thickness)	mm	min. 6 × 9 × 0.8	min. 6 × 9 × 0.8	max. 2 × (20 × 24 × 0.5)
– Terminal screws	mm	max. 20 × 24 × 0.5	max. 20 × 24 × 0.5	
– Tightening torque	Nm	M 12 (hexagon socket, A/F 5)		
<u>Without box terminal/busbar connection</u>				
Finely stranded with cable lug	mm <sup>2</sup>	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm <sup>2</sup> and acc. to DIN 46 235 as of a conductor cross-section of 185 mm <sup>2</sup> a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
Stranded with cable lug	mm <sup>2</sup>	70 ... 240		
AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil		
Connecting bar (max. width)	mm	25		
– Terminal screws		M 10 × 30 (A/F 17)		
– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)		
<b>Auxiliary conductor:</b>				
Solid	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947;		
Finely stranded with end sleeve	mm <sup>2</sup>	max. 2 × (0.75 ... 4) 2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)		
– Terminal screws		M 3 (PZ 2)		
– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		



# Contactors for Switching Motors

## 3RT24 contactors, 3-pole, for switching resistive loads (AC-1)

Technical data																																												
Contactor	Size	<b>S3</b>																																										
	Type	<b>3RT24 46</b>																																										
General data																																												
<b>Permissible mounting position</b>		AC and DC operation																																										
The contactors are designed for operation on a vertical mounting surface.																																												
Upright mounting position:																																												
	AC operation		Special design required. Positions 13 ... 16 of the Order No. must be changed to <b>-1AA0</b> . Additional charge.																																									
	DC operation		-																																									
<b>Mechanical endurance</b>		Oper. cycles	10 million																																									
<b>Electrical endurance</b>		Oper. cycles	0.5 million																																									
AC-1 utilization category at $I_e$																																												
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)		V	1000																																									
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		kV	6																																									
<b>Safe isolation</b> between coil and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])		V	690																																									
<b>Permissible ambient temperature</b>		in operation	°C	-25 ... +60																																								
		when stored	°C	-55 ... +80																																								
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050		IP 20 (terminal compartment IP 00), coil system IP 40																																										
Shock resistance																																												
Rectangular pulse	AC and DC operation	g/ms	6.8/5 and 4/10																																									
Sine pulse	AC and DC operation	g/ms	10.6/5 and 6.2/10																																									
<b>Conductor cross-sections</b>		See page 2/160																																										
Short-circuit protection of contactors without overload relays																																												
Main circuit																																												
Fuse links, utilization category gL/gG NH, Type 3NA		Type of coord. "1" 2)	A	250																																								
Fuse links, utilization category gR SITOR, Type 3NE		Type of coord. "2" 2)	A	250																																								
Auxiliary circuit																																												
Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE			A	10																																								
or miniature circuit-breaker with C-characteristic ( $I_k < 400$ A)			A	10																																								
Control circuit																																												
<b>Coil voltage tolerance</b>		AC/DC	0.8 ... 1.1 × $U_s$																																									
<b>Power consumption of the coils</b> (with coil in cold state and 1.0 × $U_s$ )			<table border="1"> <thead> <tr> <th colspan="2">Standard design</th> <th colspan="2">For USA and Canada</th> </tr> </thead> <tbody> <tr> <td>AC operation</td> <td>Hz</td> <td>50</td> <td>60</td> <td>50</td> <td>60</td> </tr> <tr> <td></td> <td>VA</td> <td>270</td> <td>298 / 274</td> <td>270</td> <td>300</td> </tr> <tr> <td></td> <td>p.f.</td> <td>0.68</td> <td>0.7 / 0.62</td> <td>0.68</td> <td>0.52</td> </tr> <tr> <td></td> <td>closed VA</td> <td>22</td> <td>27 / 20</td> <td>22</td> <td>21</td> </tr> <tr> <td></td> <td>p.f.</td> <td>0.27</td> <td>0.29/ 0.31</td> <td>0.27</td> <td>0.29</td> </tr> <tr> <td>DC operation</td> <td>W</td> <td colspan="4">15</td> </tr> </tbody> </table>		Standard design		For USA and Canada		AC operation	Hz	50	60	50	60		VA	270	298 / 274	270	300		p.f.	0.68	0.7 / 0.62	0.68	0.52		closed VA	22	27 / 20	22	21		p.f.	0.27	0.29/ 0.31	0.27	0.29	DC operation	W	15			
Standard design		For USA and Canada																																										
AC operation	Hz	50	60	50	60																																							
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	closed VA	22	27 / 20	22	21																																							
	p.f.	0.27	0.29/ 0.31	0.27	0.29																																							
DC operation	W	15																																										
<b>Operating times at 0.8 ... 1.1 × <math>U_s</math> 1)</b>		Break-time = opening time + arcing time																																										
AC operation	closing time	ms	17 ... 90																																									
	opening time	ms	10 ... 25																																									
DC operation	closing time	ms	90 ... 230																																									
	opening time	ms	14 ... 20																																									
Arcing time		ms	10 ... 15																																									
<b>Operating times at 1.0 × <math>U_s</math> 1)</b>																																												
AC operation	closing time	ms	18 ... 30																																									
	opening time	ms	11 ... 23																																									
DC operation	closing time	ms	100 ... 120																																									
	opening time	ms	16 ... 20																																									

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks: varistor +2 ms to 5 ms, diode assemblies 2 to 6 times.

2) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102): Type of coordination "1": Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2": No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

# Contactors for Special Applications

## 3RT24 contactors, 3-pole, for switching resistive loads (AC-1)

### Technical data

Contactors	Size Type	<b>S3</b> <b>3RT24 46</b>
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### Main circuit

#### Load ratings with AC

##### AC-1 utilization category, switching resistive load

Rated operational currents $I_e$	at 40 °C up to 690 V	A	140
	at 60 °C up to 690 V	A	130
	at 1000 V	A	60
Ratings of three-phase loads p.f. = 0.95 (at 60 °C)	at 230 V	kW	50
	400 V	kW	86
	500 V	kW	107
	690 V	kW	148
	1000 V	kW	98
Minimum conductor cross-section with $I_{e\text{load}}$	at 40 °C	mm <sup>2</sup>	50
	at 60 °C	mm <sup>2</sup>	50

##### AC-2 and AC-3 utilization categories

With an electrical endurance of 1.3 million operating cycles

Rated operational current $I_e$	up to 690 V	A	44
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz (at 60 °C)	at 230 V	kW	12.7
	400 V	kW	22
	500 V	kW	29.9
	690 V	kW	38.2

Power loss per conducting path	at $I_e/AC-1$	W	12.5
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#### Load ratings with DC

##### DC-1 utilization category, switching resistive load L/R ≤ 1 ms)

Number of conducting paths when connected in series

			1	2	3
Rated operational currents $I_e$ (at 60 °C)	up to 24 V	A	130	130	130
	60 V	A	80	130	130
	110 V	A	12	130	130
	220 V	A	2.5	13	130
	440 V	A	0.8	2.4	6
	600 V	A	0.48	1.3	3.4

##### DC-3 and DC-5 utilization categories, shunt and series motors

Number of conducting paths when connected in series

			1	2	3
Rated operational currents $I_e$ (at 60 °C)	up to 24 V	A	6	130	130
	60 V	A	3	130	130
	110 V	A	1.25	130	130
	220 V	A	0.35	1.75	4
	440 V	A	0.15	0.42	0.8
	600 V	A	0.1	0.27	0.45

#### Operating frequency

Operating frequency $z$ in operating cycles per hour				AC operation	DC operation
Contactors without overload relays	No-load operating frequency	1/h		5000	1000
Rated operation	for AC-1	1/h		650	650
	for AC-3	1/h		1000	1000

Dependence of the operating frequency  $z'$  on the operational current  $I'$  and the operational voltage  $U'$ :



$$z' = z \cdot \frac{I_e}{I'} \cdot \left( \frac{400V}{U'} \right)^{1.5} \quad 1/h$$

# Contactors for Special Applications

## 3RT24 contactors, 3-pole, for switching resistive loads (AC-1)

CONTACTORS AND ASSEMBLIES 2

### Technical data

Contactor	Size Type	<b>S3 3RT24 46</b>			
<b>Conductor cross-sections</b>					
<b>Screw connections</b> (1 or 2 conductor connections possible)	<b>Main conductor:</b> <u>With box terminal</u>		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve Finely stranded without end sleeve Solid Stranded Ribbon cable (qty. x width x thickness) AWG conductor connections – Terminal screws – Tightening torque	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm AWG Nm mm	2.5 ... 50 4 ... 50 2.5 ... 16 4 ... 70 6 × 9 × 0.8 10 ... 2/0	 2.5 ... 50 10 ... 50 2.5 ... 16 10 ... 70 6 × 9 × 0.8 10 ... 2/0	 2.5 ... 50 10 ... 50 2.5 ... 16 10 ... 70 6 × 9 × 0.8 10 ... 2/0
Connection for drilled copper bars	max. width	M 6 (hexagon socket) 4 ... 6 (36 ... 53 lb.in) 10	If bars larger than 12 × 10 mm are connected, a 3RT19 46-4EA1 terminal cover is necessary to comply with the phase clearance		
	<u>Without box terminal with cable lugs</u>				
	Finely stranded with cable lug	mm <sup>2</sup>	10 ... 50 <sup>1)</sup>	If conductors larger than 25 mm <sup>2</sup> are connected, a 3RT19 46-4EA1 terminal cover is necessary to comply with the phase clearance	
	Stranded with cable lug	mm <sup>2</sup>	10 ... 70 <sup>1)</sup>		
	AWG conductor connections, solid or stranded	AWG	7 ... 1/0		
	<b>Auxiliary conductor:</b>				
	Solid	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)		
	Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG	2 × (20 ... 16); 2 × (18 ... 14); 1 × 12		
	– Terminal screws – Tightening torque	Nm	M 3 0.8 ... 1.2 (7 ... 10.3 lb.in)		

# Contactors for Special Applications

## 3RT14 contactors, 3-pole, for switching resistive loads (AC-1)

Technical data			
Contactors	Size Type	S6 3RT14 56	
General data			
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.			
<b>Mechanical endurance</b>	Oper. cycles	10 million	
<b>Electrical endurance</b> AC-1 utilization category at $I_e$	Oper. cycles	0.5 million	
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1000	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8	
<b>Safe isolation</b> between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])	V	690	
<b>Permissible ambient temperature</b>	in operation when stored	°C	-25 ... +60/+55 with AS-Interface -55 ... +80
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050	IP 00/open type, coil system IP 20		
<b>Shock resistance</b>			
Rectangular pulse	g/ms	8.5/5 and 4.2/10	
Sine pulse	g/ms	13.4/5 and 6.5/10	
<b>Conductor cross-sections</b>	See page 2/162		
<b>Electromagnetic compatibility (EMC)</b>	See page 2/106		
Short-circuit protection			
<b>Main circuit</b>			
Fuse links, utilization category gL/gG, NH, Type 3NA	Type of coordination "1" A	355	
Fuse links, utilization category gR, SITOR, Type 3NE	Type of coordination "2" A	350	
<b>Auxiliary circuit</b>			
Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ( $I_k < 400$ A)	A	10	
Control circuit			
<b>Coil voltage tolerance</b>	AC/DC (UC)	$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	
<b>Power consumption of solenoid mechanism</b> (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$ )		Conventional op. mechanism	
		$U_{s \min}$	$U_{s \max}$
AC operation	closing	250	300
	p.f.	0.9	0.9
	closed	4.8	5.8
	p.f.	0.8	0.8
DC operation	closing	300	360
	closed	4.3	5.2
			Solid-state op. mechanism
		$U_{s \min}$	$U_{s \max}$
		190	280
		0.8	0.8
		3.5	4.4
		0.5	0.4
		2.3	2.8
<b>PLC control input</b> (EN 61 131-2/Type 2)	DC 24 V ≤ 30 mA		
<b>Operating times</b> (Break-time = opening time + arcing time)		Conventional op. mechanism	
		Solid-state op. mechanism Operation via A1/A2	
			PLC input
- at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	20 ... 95	95 ... 135
	opening time	40 ... 60	80 ... 90
- at $U_{s \min} \dots U_{s \max}$	closing time	25 ... 50	100 ... 120
	opening time	40 ... 60	80 ... 90
Arcing time		10 ... 15	10 ... 15
Main circuit			
Load ratings with AC			
<b>AC-1 utilization category, switching resistive load</b>			
Rated operational currents $I_e$	at 40 °C up to 690 V	A	275
	at 60 °C up to 690 V	A	250
	at 1000 V	A	100
Ratings of three-phase loads	at 230 V	kW	95
p.f. = 0.95 (at 60 °C)	400 V	kW	165
	500 V	kW	205
	690 V	kW	285
	1000 V	kW	165
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm <sup>2</sup>	2 × 70
	at 60 °C	mm <sup>2</sup>	120
<b>Power loss per conducting path</b>	at $I_e/AC-1$	W	20

# Special Applications

## 3RT14 contactors, 3-pole, for switching resistive loads (AC-1)

CONTACTORS AND ASSEMBLIES 2

### Technical data

Contactor	Size Type	<b>S6</b> <b>3RT14 56</b>
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### Main circuit

#### Load ratings with AC

##### AC-2 and AC-3 utilization category

With an electrical endurance of 1.3 million operating cycles

Rated operational current $I_e$	up to 690 V	A	97
Ratings of slipping or squirrel-cage motors at 50 Hz and 60 Hz (at 60°C)	at 230 V	kW	30
	400 V	kW	55
	500 V	kW	55
	690 V	kW	90

#### Load ratings with DC

##### DC-1 utilization category, switching resistive load ( $L/R \leq 1$ ms)

Number of conducting paths connected in series

				1	2	3
Rated operational currents $I_e$ (at 60°C)	up to 24 V	A		315	315	315
	60 V	A		315	315	315
	110 V	A		18	315	315
	220 V	A	3.4		20	315
	440 V	A	0.8		3.2	11.5
	600 V	A	0.5		1.6	4

##### DC-3 and DC-5 utilization categories, shunt and series motors ( $L/R \leq 15$ ms)

Number of conducting paths connected in series

				1	2	3
Rated operational currents $I_e$ (at 60°C)	up to 24 V	A		315	315	315
	60 V	A	7.5		315	315
	110 V	A	2.5		315	315
	220 V	A	0.6		2.5	315
	440 V	A	0.17		0.65	1.4
	600 V	A	0.12		0.37	0.75

### Operating frequency

#### Operating frequency $z$ in operating cycles per hour

Contactors without overload relays	No-load op. frequency	for AC-1	1/h	2000
		for AC-3	1/h	600
			1/h	1000

Dependence of the operating frequency  $z'$  on the operational current  $I'$  and operational voltage  $U'$ :

$$z' = z \cdot \frac{I_e}{I'} \cdot \left( \frac{400V}{U'} \right)^{1.5} \quad 1/h$$

### Conductor cross-sections

#### Screw connections

##### Main conductor:

with 3RT19 55-4G box terminal

Finely stranded with end sleeve	mm <sup>2</sup>	10 ... 70
Finely stranded without end sleeve	mm <sup>2</sup>	10 ... 70
Stranded	mm <sup>2</sup>	16 ... 70
AWG conductor connections, solid or stranded		6 ... 2/0
Ribbon cable (qty. x width x thickness)	mm	min. 3 x 9 x 0.8
	mm	max. 6 x 15.5 x 0.8

with 3RT19 56-4G box terminal

Finely stranded with/without end sleeve	mm <sup>2</sup>	10 ... 120
Stranded	mm <sup>2</sup>	16 ... 120
AWG conductor connections, solid or stranded	AWG	6 ... 250 kcmil
Ribbon cable (qty. x width x thickness)	mm	min. 3 x 9 x 0.8
	mm	max. 10 x 15.5 x 0.8

– Terminal screws

– Tightening torque

Without box terminal/busbar connection

Finely stranded with cable lug	mm <sup>2</sup>	16 ... 95
Stranded with cable lug	mm <sup>2</sup>	25 ... 120
AWG conductor connections, solid or stranded	AWG	4 ... 250 kcmil
Connecting bar (max. width)	mm	17
– Terminal screws		M 8 x 25 (A/F 13)
– Tightening torque	Nm	10 ... 14 (89 ... 124 lb.in)

##### Auxiliary conductor:

Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5) acc. to IEC 60 947; max. 2 x (0.75 ... 4)
Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5)
AWG conductor connections, solid or stranded	AWG	2 x (18 ... 14)
– Terminal screws		M 3 (PZ2)
– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)

Front terminal connected	Back terminal connected	Both terminals connected
10 ... 70 10 ... 70 16 ... 70 6 ... 2/0	10 ... 70 10 ... 70 16 ... 70 6 ... 2/0	max. 1x50, 1x70 max. 1x50, 1x70 max. 2 x 70 max. 2 x 1/0
min. 3 x 9 x 0.8 max. 6 x 15.5 x 0.8	min. 3 x 9 x 0.8 max. 6 x 15.5 x 0.8	max. 2 x (6 x 15.5 x 0.8)
10 ... 120 16 ... 120 6 ... 250 kcmil	10 ... 120 16 ... 120 6 ... 250 kcmil	max. 1 x 95, 1 x 120 max. 2 x 120 max. 2 x 3/0
min. 3 x 9 x 0.8 max. 10 x 15.5 x 0.8	min. 3 x 9 x 0.8 max. 10 x 15.5 x 0.8	max. 2 x (10 x 15.5 x 0.8)
M 10 (hexagon socket, A/F4)		
10 ... 12 (90 ... 110 lb.in)		
16 ... 95 25 ... 120 4 ... 250 kcmil	If cable lugs acc. to DIN 46 235 are connected, as of a conductor cross-section of 95 mm <sup>2</sup> a 3RT19 56-4EA1 terminal cover is necessary to comply with the phase clearance.	
17		
M 8 x 25 (A/F 13)		
10 ... 14 (89 ... 124 lb.in)		

# Contactors for Special Applications

## 3RT14 contactors, 3-pole, for switching resistive loads (AC-1)

Technical data						
Contactors	Size Type	S10 3RT14 66	S12 3RT14 76			
<b>General data</b>						
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.						
<b>Mechanical endurance</b>	Oper. cycles	10 million				
<b>Electrical endurance</b> AC-1 utilization category at $I_e$	Oper. cycles	0.5 million				
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1000				
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8				
<b>Safe isolation</b> between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])	V	690				
<b>Permissible ambient temperature</b>	in operation when stored	°C	-25 ... +60/+55 with AS-Interface -55 ... +80			
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050	IP 00/open type, coil system IP 20					
<b>Shock resistance</b>						
Rectangular pulse	g/ms	8.5/5 and 4.2/10				
Sine pulse	g/ms	13.4/5 and 6.5/10				
<b>Conductor cross-sections</b>	<a href="#">See page 2/165</a>					
<b>Electromagnetic compatibility (EMC)</b>	<a href="#">See page 2/106</a>					
<b>Short-circuit protection</b>						
<b>Main circuit</b>						
Fuse links, utilization category gL/gG, NH, Type 3NA	Type of coordination "1"	A	500			
Fuse links, utilization category gR, SITOR, Type 3NE	Type of coordination "2"	A	500			
<b>Auxiliary circuit</b>		A	10			
Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ( $I_k < 400$ A)						
Contactors	Size Type	S10 3RT14 66				
<b>Control circuit</b>						
<b>Coil voltage tolerance</b>	AC/DC (UC)	$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$				
<b>Power consumption of solenoid mechanism</b> (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$ )						
AC operation	closing	VA	490	590	400	530
		p.f.	0.9	0.9	0.8	0.8
	closed	VA	5.6	6.7	4	5
DC operation	closing	W	540	650	440	580
		W	6.1	7.4	3.2	3.8
<b>PLC control input</b> (EN 61 131-2/Type 2)	DC 24 V/≤ 30 mA					
<b>Operating times</b> (Break-time = opening time + arcing time)						
- at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	ms	30 ... 95	105 ... 145	45 ... 80	
		ms	40 ... 80	80 ... 200	80 ... 100	
- at $U_{s \min} \dots U_{s \max}$	closing time	ms	35 ... 50	110 ... 130	50 ... 65	
		ms	50 ... 80	80 ... 100	80 ... 100	
Arcing time		ms	10 ... 15	10 ... 15	10 ... 15	

# Contactors for Special Applications

## 3RT14 contactors, 3-pole, for switching resistive loads (AC-1)

CONTACTORS AND ASSEMBLIES 2

### Technical data

Contactors	Size Type	<b>S12</b> <b>3RT14 76</b>
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### Control circuit

<b>Coil voltage tolerance</b>		AC/DC (UC)	$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$			
<b>Power consumption of solenoid mechanism</b> (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$ )			Conventional op. mechanism		Solid-state op. mechanism	
AC operation	closing	VA	$U_{s \min}$	$U_{s \max}$	$U_{s \min}$	$U_{s \max}$
	p.f.		700	830	560	750
	closed	VA	0.9	0.9	0.8	0.8
DC operation	p.f.		7.6	9.2	5.4	7
	closing	W	0.9	0.9	0.8	0.8
	closed	W	770	920	600	800
			8.5	10	4	5
<b>PLC control input</b> (EN 61 131-2/Type 2)			DC 24 V/≤ 30 mA			
<b>Operating times</b> (Break-time = opening time + arcing time)			Conventional op. mechanism		Solid-state op. mechanism Operation via A1/A2	
– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	ms	45 ... 100		120 ... 150	60 ... 90
	opening time	ms	60 ... 100		80 ... 100	80 ... 100
– at $U_{s \min} \dots U_{s \max}$	closing time	ms	50 ... 70		125 ... 150	65 ... 80
	opening time	ms	70 ... 100		80 ... 100	80 ... 100
Arcing time		ms	10 ... 15		10 ... 15	10 ... 15

Contactors	Size Type	<b>S10</b> <b>3RT14 66</b>	<b>S12</b> <b>3RT14 76</b>
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### Main circuit

#### Load ratings with AC

<b>AC-1 utilization category, switching resistive load</b>				
Rated operational currents $I_e$	at 40 °C up to 690 V	A	400	690
	at 60 °C up to 690 V	A	380	650 1)
	at 1000 V	A		
Ratings of three-phase loads p.f. = 0.95 (at 60 °C)	at 230 V	kW	145	245
	400 V	kW	250	430
	500 V	kW	315	535
	690 V	kW	430	740
	1000 V	kW		
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm <sup>2</sup>	240	2 × 240
	at 60 °C	mm <sup>2</sup>	240	2 × 240
<b>Power loss per conducting path</b>	at $I_e/AC-1$	W	27	55
<b>AC-2 and AC-3 utilization categories</b> With an electrical endurance of 1.3 million operating cycles				
Rated operational current $I_e$	up to 690 V	A	138	170
Ratings of slipping or squirrel-cage motors at 50 Hz and 60 Hz (at 60 °C)	at 230 V	kW	37	55
	400 V	kW	75	90
	500 V	kW	90	110
	690 V	kW	132	160

#### Load ratings with DC

<b>DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)</b>			Number of conducting paths connected in series			1	2	3	1	2	3
Rated operational currents $I_e$ (at 60 °C)	up to 24 V	A	380	380	380	500	500	500	500	500	500
	60 V	A	380	380	380	500	500	500	500	500	500
	110 V	A	33	380	380	33	500	500	33	500	500
	220 V	A	3.8	380	380	3.8	500	500	3.8	500	500
	440 V	A	0.9	4	11	0.9	4	11	0.9	4	11
600 V	A	0.6	2	5.2	0.6	2	5.2	0.6	2	5.2	
<b>DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)</b>			Number of conducting paths connected in series			1	2	3	1	2	3
Rated operational currents $I_e$ (at 60 °C)	up to 24 V	A	380	380	380	500	500	500	500	500	500
	60 V	A	11	380	380	11	500	500	11	500	500
	110 V	A	3	380	380	3	500	500	3	500	500
	220 V	A	0.6	2.5	380	0.6	2.5	500	0.6	2.5	500
	440 V	A	0.18	0.65	1.4	0.18	0.65	1.4	0.18	0.65	1.4
600 V	A	0.125	0.37	0.75	0.125	0.37	0.75	0.125	0.37	0.75	

1) Ambient temperature 50 °C for 3RT14 76-N contactor



# Contactors for Special Applications

## 3RT14 contactors, 3-pole, for switching resistive loads (AC-1)

Technical data		S10 3RT14 66	S12 3RT14 76
Contactors	Size Type		
<b>Main circuit</b>			
<i>Operating frequency</i>			
<b>Operating frequency z</b> in operating cycles per hour			
Contactors without overload relays	No-load op. frequency	1/h	2000
	for AC-1	1/h	600
	for AC-3	1/h	1000
Dependence of the operating frequency z' on the operational current I' and operational voltage U':			
$z' = z \cdot \frac{I_e}{I'} \cdot \left( \frac{400V}{U'} \right)^{1.5} \text{ 1/h}$			
<b>Conductor cross-sections</b>			
<b>Screw connections</b>	<b>Main conductor:</b> with 3RT19 66-4G box terminal	Front terminal connected	Back terminal connected
	Finely stranded with end sleeve	mm <sup>2</sup> 70 ... 240	mm <sup>2</sup> 120 ... 185
	Finely stranded without end sleeve	mm <sup>2</sup> 70 ... 240	mm <sup>2</sup> 120 ... 185
	Stranded	mm <sup>2</sup> 95 ... 300	mm <sup>2</sup> 120 ... 240
	AWG conductor connections, solid or stranded	3/0 ... 600 kcmil	250 ... 500 kcmil
	Ribbon cable (qty. x width x thickness)	mm min. 6 x 9 x 0.8 mm max. 20 x 24 x 0.5	mm min. 6 x 9 x 0.8 mm max. 20 x 24 x 0.5
	– Terminal screws	M 12 (hexagon socket, A/F 5)	
	– Tightening torque	Nm 20 ... 22 (180 ... 195 lb.in)	
	<u>Without box terminal/busbar connection</u>		
	Finely stranded with cable lug	mm <sup>2</sup> 50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm <sup>2</sup> and DIN 46 235 as of a conductor cross-section of 185 mm <sup>2</sup> , a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.
	Stranded with cable lug	mm <sup>2</sup> 70 ... 240	
	AWG conductor connections, solid or stranded	2/0 ... 500 kcmil	
	Connecting bar (max. width)	mm 25	
	– Terminal screws	M 10 x 30 (A/F 17)	
	– Tightening torque	Nm 14 ... 24 (124 ... 210 lb.in)	
	<b>Auxiliary conductor:</b>		
	Solid	mm <sup>2</sup> 2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5) acc. to IEC 60 947;	
		max. 2 x (0.75 ... 4)	
	Finely stranded with end sleeve	mm <sup>2</sup> 2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5)	
	AWG conductor connections, solid or stranded	AWG 2 x (18 ... 14)	
	– Terminal screws	M 3 (PZ3)	
	– Tightening torque	Nm 0.8 ... 1.2 (7 ... 10.3 lb.in)	

# Contactors for Special Applications

## 3RT23 contactors, 4-pole (4 NO), switching resistive loads

### More information

Contactors	Type		3RT23 16	3RT23 17	3RT23 25	3RT23 26	3RT23 27
	Size		S00		S0		
Dimensions (W x H x D) <sup>3)</sup>	Width	mm	45 x 57.5 x 73		60 x 85 x 97		
<b>General data</b>							
<b>Permissible mounting position<sup>1)</sup></b>							
<b>Mechanical endurance</b>		Operating cycles	30 million		10 million		
<b>Electrical endurance at I<sub>e</sub>/AC-1</b>		Operating cycles	Approx. 0.5 million				
<b>Rated insulation voltage U<sub>i</sub></b> (pollution degree 3)		V	690				
<b>Permissible ambient temperature</b>	• During operation • During storage	°C	-25 ... +60				
		°C	-55 ... +80				
<b>Degree of protection</b> Acc. to EN 60947-1, Appendix C	Device Connection range		IP20			IP20 IP00	
<b>Touch protection</b> acc. to EN 50274			Finger-safe				
<b>Short-circuit protection of contactors without overload relays</b>							
<b>Main circuit</b>							
Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE according to IEC 60947-4-1/ EN 60947-4-1	• Type of coordination *1 <sup>1)</sup> • Type of coordination *2 <sup>1)</sup> • Weld-free	A A A	35 20 10		63 20 16		
<b>Control</b>							
<b>Solenoid coil operating range</b>							
• AC operation	- At 50 Hz - At 60 Hz		0.8 ... 1.1 x U <sub>s</sub> 0.85 ... 1.1 x U <sub>s</sub>		-- --		
• DC operation	- At 50 °C - At 60 °C		0.8 ... 1.1 x U <sub>s</sub> 0.85 ... 1.1 x U <sub>s</sub>		-- --		
• AC/DC operation			--		0.8 ... 1.1 x U <sub>s</sub>		
<b>Power consumption of the solenoid coils</b> (when coil is cold and 1.0 x U <sub>s</sub> )							
• AC operation, 50 Hz, standard version	- Closing - P.f.	VA	--		77 0.82		
	- Closed - P.f.	VA	--		9.8 0.25		
• AC operation, 50/60 Hz, standard version	- Closing - P.f.	VA	27/24.3 0.8/0.75	37/33 0.8/0.75	81/79 0.72/0.74		
	- Closed - P.f.	VA	4.2/3.3 0.25/0.25	5.7/4.4 0.25/0.25	10.5/8.5 0.25/0.28		
• AC operation, 60 Hz, USA, Canada	- Closing - P.f.	VA	31.7 0.77	43 0.77	87 0.76		
	- Closed - P.f.	VA	4.8 0.25	6.5 0.25	9.4 0.28		
• DC operation	- Closing = Closed	W	4		5.9		
<b>Operating times for 0.8 ... 1.1 x U<sub>s</sub><sup>2)</sup></b>							
Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay - Opening delay	ms	8 ... 35 3.5 ... 14	8 ... 33 4 ... 15	9 ... 38 4 ... 16	8 ... 40 4 ... 16	
• DC operation	- Closing delay - Opening delay	ms	30 ... 100 7 ... 13		50 ... 170 15 ... 17.5		
• Arcing time		ms	10 ... 15		10		
<b>Main circuit</b>							
<b>AC capacity</b>							
<b>Utilization category AC-1, switching resistive loads</b>							
• Rated operational currents I <sub>e</sub>	At 40 °C, up to 690 V	A	18	22	35	40	50
	At 60 °C, up to 690 V	A	16	20	30	35	42
• Rated power for AC loads P.f. = 0.95 (at 40 °C)	At 460 V	HP	5	5	10	10	10
• Minimum conductor cross-section for loads with I <sub>e</sub>	At 40 °C	mm <sup>2</sup>	2.5	2.5	10	10	10
	At 60 °C	mm <sup>2</sup>	2.5	2.5	10	10	10
<b>Utilization category AC-3</b>							
• Rated operational currents I <sub>e</sub>	At 60 °C, up to 400 V	A	9	12	15.5	17	17
• Rated power for slipping or squirrel-cage motors at 60 Hz	At 460 V	HP	5	5	10	10	10

<sup>1)</sup> In accordance with the corresponding 3-pole 3RT2. contactors.

<sup>2)</sup> With size S00, DC operation: Operating times at 0.85 ... 1.1 x U<sub>s</sub>.

<sup>3)</sup> Dimensions for devices with screw terminals. Size S0 for AC operation. DC operation: Depth + 10mm.

# Contactors for Special Applications

## 3RT23 contactors, 4-pole (4 NO), for switching resistive loads

### Technical specifications

Type		<b>3RT23 36</b>	<b>3RT23 44</b>	<b>3RT23 46</b>
Size		<b>S2</b>	<b>S3</b>	<b>S3</b>
Dimensions (W x H x D)		mm	74.5 x 113.5 x 130 / 74.5 x 113.5 x 130	73 x 112 x 110 93 x 146 x 134
• With mounted auxiliary switch block		mm	74.5 x 113.5 x 173.5 / 74.5 x 113.5 x 177.5	73 x 112 x 160 93 x 146 x 183

### General technical specifications

<b>Permissible mounting position<sup>1)</sup></b>				
<b>Mechanical endurance</b>	Operating cycles		10 million	
<b>Electrical endurance at I<sub>e</sub>/AC-1</b>	Operating cycles		Approx. 0.5 million	
<b>Rated insulation voltage U<sub>i</sub></b> (pollution degree 3)	V		690	
<b>Permissible ambient temperature</b>				
• During operation	°C		-25 ... +60	
• During storage	°C		-55 ... +80	
<b>Degree of protection</b> acc. to IEC 60947-1, Appendix C	Device Connection range		IP20	
<b>Touch protection</b> acc. to EN 50274			Finger-safe	

### Short-circuit protection of contactors without overload relays

<b>Main circuit</b>				
Fuse links, operational class gG:				
LV HRC, 3NA; DIAZED, 5SB; NEOZED, 5SE	• Type of coordination "1" <sup>1)</sup>	A	on request	250
according to IEC 60947-4-1/EN 60947-4-1	• Type of coordination "2" <sup>1)</sup>	A	on request	125
	• Weld-free	A	on request	63
				250
				160
				100

### Control circuit

<b>Coil operating range (AC/DC)</b>			0.8 ... 1.1 x U <sub>s</sub>	
<b>Power consumption of the solenoid coils</b> (when coil is cold and 1.0 x U <sub>s</sub> )				
• AC operation, 50 Hz	- Closing	VA	190	270
	- P.f.	VA	0.72	0.68
	- Closed	VA	16	22
	- P.f.	VA	0.37	0.27
• AC operation, 50/60 Hz	- Closing	VA	210/188	298/274
	- P.f.	VA	0.69/0.65	0.72/0.62
	- Closed	VA	17.2/16.5	27/20
	- P.f.	VA	0.36/0.3	0.29/0.31
• DC operation	- Closing	W		15
	= Closed	W		
<b>Operating times for 0.8 ... 1.1 x U<sub>s</sub><sup>2)</sup></b> Total break time = Opening delay + Arcing time				
• DC operation	- Closing delay	ms		110 ... 200
	- Opening delay	ms		14 ... 20
• AC operation	- Closing delay	ms	10 ... 80	20 ... 50
	- Opening delay	ms	10 ... 18	10 ... 25
• Arcing time		ms	10 ... 20	10 ... 15

### Main circuit

#### AC capacity

<b>Utilization category AC-1, switching resistive loads</b>				
• Rated operational currents I <sub>e</sub>	At 40 °C, up to 690 V	A	60	110
	At 60 °C, up to 690 V	A	55	100
• Rated power for AC loads	At 230 V	kW	21	42
P.f. = 0.95 (at 40 °C)	400 V	kW	36	72
• Minimum conductor cross-section	At 40 °C	mm <sup>2</sup>	16	50
for loads with I <sub>e</sub>	At 60 °C	mm <sup>2</sup>	25	50
<b>Utilization categories AC-2 and AC-3</b>				
• Rated operational currents I <sub>e</sub>	At 60 °C, up to 400 V	A	--	--
• Rated power for slipping	At 230 V	kW	--	--
or squirrel-cage motors at 50 and 60 Hz	400 V	kW	--	--

<sup>1)</sup> In accordance with the corresponding 3-pole 3RT1 contactors.

<sup>2)</sup> With size S00, DC operation: Operating times for 0.85 ... 1.1 x U<sub>s</sub>

# Contactors for Special Applications

## 3RT25 contactors, 4-pole (2 NO + 2 NC), for switching motors

### Technical specifications

Type		3RT2516	3RT2517	3RT2518	3RT2526	3RT2535	3RT2536	
Size		S00			S0	S2		
<b>General technical specifications</b>								
<b>Permissible mounting position</b>								
The contactors are designed for operation on a vertical mounting surface.								
Upright mounting position		<p>Special version required</p>						
Mechanical endurance	Operating cycles	30 million			10 million			
<b>Electrical endurance at I<sub>e</sub>/AC-1</b>		Operating cycles: Approx. 0.5 million						
<b>Rated insulation voltage U<sub>i</sub></b> (Pollution degree 3)		V: 690						
<b>Permissible ambient temperature</b>								
• During operation		°C: -25 ... +60			-25 ... +60			
• During storage		°C: -55 ... +80			-55 ... +80			
<b>Degree of protection</b> acc. to IEC 60947-1, Appendix C		IP20						
<b>Touch protection</b> acc. to EN 50274		Finger-safe						
<b>Short-circuit protection</b>								
<b>Main circuit</b>								
Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1								
• Type of coordination "1"		A	35			63	125	160
• Type of coordination "2"		A	20			35	63	80
• Weld-free		A	10			16	--	--

Type		3RT2516	3RT2517	3RT2518	3RT2536	3RT2537
Size		S00			S2	
Dimensions (W x H x D) <sup>1)</sup>		45 x 57.5 x 73 / 45 x 70 x 73			74.5 x 113.5 x 130 / 74.5 x 113.5 x 130	
• with mounted auxiliary switch block		45 x 57.5 x 116 / 45 x 70 x 121			74.5 x 113.5 x 173.5 / 74.5 x 113.5 x 177.5	
Type		<b>3RT2526</b>				
Size		<b>S0</b>				
Dimensions (W x H x D) for AC operation <sup>1)2)</sup>		mm	60 x 85 x 97 / 60 x 101.5 x 97			
• with mounted auxiliary switch block		mm	60 x 85 x 141 / 60 x 101.5 x 144			
Dimensions (W x H x D) for DC operation <sup>1)2)</sup>		mm	60 x 85 x 107 / 60 x 101.5 x 107			
• with mounted auxiliary switch block		mm	60 x 85 x 151 / 60 x 101.5 x 154			

<sup>1)</sup> Dimensions for devices with screw terminals/spring-type terminals.  
<sup>2)</sup> For size S0, devices for AC and DC operation differ in depth. The following applies: Depth (DC) = Depth (AC) + 10 mm.

# Contactors for Special Applications

## 3RT25 contactors, 4-pole (2 NO + 2 NC), for switching motors

Type		3RT2516	3RT2517	3RT2518	3RT2526	3RT2535	3RT2536
Size		S00			S0	S2	
<b>Control circuit</b>							
<b>Solenoid coil operating range</b>							
• AC operation	at 50 Hz	0.8 ... 1.1 x $U_s$			0.8 ... 1.1 x $U_s$		
	at 60 Hz	0.85 ... 1.1 x $U_s$			0.8 ... 1.1 x $U_s$		
• DC operation	up to 50 °C	0.8 ... 1.1 x $U_s$				--	
	up to 60 °C	0.85 ... 1.1 x $U_s$				--	
• AC/DC operation		--				0.8 x $U_{smin}$ ... 1.1 x $U_{smax}$	
<b>Power consumption of the solenoid coils</b> (for cold coil and 1.0 x $U_g$ )		see 3RT2316	see 3RT2317		see 3RT2326	see 3RT233	
<b>Operating times for 0.8 to 1.1 x <math>U_s</math></b> (Total break time = Opening delay + Arcing time)		see 3RT2316	see 3RT2317		see 3RT2326	see 3RT233	
<b>Main circuit</b>							
<b>Load rating with AC</b>							
<b>Utilization category AC-1</b>							
<b>Switching resistive loads</b>							
• Rated operational currents $I_e$	at 40 °C up to 690 V	A	18	22	40	60	70
	at 60 °C up to 690 V	A	16	20	35	55	60
• Rated power for AC loads	at 230 V	kW	6	7.5	13.3	21	23
	400 V	kW	10.5	13	23	36	39
	p.f. = 0.95 (at 60 °C)						
• Minimum conductor cross-section for loads with $I_e$	at 40 °C	mm <sup>2</sup>	2.5	2.5	10	16	25
<b>Utilization categories AC-2 and AC-3</b>							
• Rated operational currents $I_e$	NO up to 400 V	A	9	12	16	AC <sup>1)</sup> 25	DC <sup>1)</sup> 25
	NC up to 400 V	A	9	9	9	25	20
						35	35
						41	41
• Rated power for slipping or squirrel-cage motors at 50 and 60 Hz	NO at 230 V	kW	2.2	3	4	5.5	5.5
	NC at 230 V	kW	2.2	2.2	2.2	5.5	5.5
						11	11
	NO at 400 V	kW	4	5.5	7.5	11	11
	NC at 400 V	kW	4	4	4	11	7.5
						18.5	18.5
						22	22
<b>Load rating with DC</b>							
<b>Utilization category DC-1</b>							
<b>Switching resistive loads (<math>L/R \leq 1</math> ms)</b>							
• Rated operational currents $I_e$ (at 60 °C)							
- 1 conducting path	up to 24 V	A	16	20	35	55	60
	60 V	A	16	20	20	23	
	110 V	A	2.1	2.1	4.5	4.5	
	220 V	A	0.8	0.8	1	1	
	440 V	A	0.6	0.6	0.4	0.4	
- 2 conducting paths in series	up to 24 V	A	16	20	35	55	
	60 V	A	16	20	35	45	
	110 V	A	12	12	35	45	
	220 V	A	1.6	1.6	5	5	
	440 V	A	0.8	0.8	1	1	
<b>Utilization category DC-3/DC-5<sup>2)</sup></b>							
<b>Shunt-wound and series-wound motors (<math>L/R \leq 15</math> ms)</b>							
• Rated operational currents $I_e$ (at 60 °C)							
- 1 conducting path	up to 24 V	A	16	20	20	35	
	60 V	A	0.5	0.5	5	6	
	110 V	A	0.15	0.15	2.5	2.5	
	220 V	A	0.75	0.75	1	1	
	440 V	A	--	--	0.09	0.1	
- 2 conducting paths in series	up to 24 V	A	16	20	35	55	
	60 V	A	5	5	35	45	
	110 V	A	0.35	0.35	15	25	
	220 V	A	--	--	3	5	
	440 V	A	--	--	0.27	0.27	

<sup>1)</sup> Values for devices with AC and DC operation: for 3RT25 26 with DC operation, different values apply to AC-2 and AC-3 for the NC.

<sup>2)</sup> For  $U_s > 24$  V, the rated operational currents  $I_e$  for the NC contact conducting paths are 50 % of the values for the NO contact conducting paths.

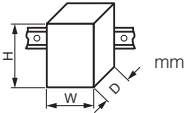
# Contactors for Special Applications

## 3RT16 capacitor contactors

CONTACTORS AND ASSEMBLIES 2

### Technical specifications

All technical specifications not mentioned in the table below are identical to those of the 3RT10 17 contactors for size S00, to those of the 3RT10 26 contactors for size S0 and to those of the 3RT10 45 contactors for size S3.

Type		<b>3RT16 17-.A..3</b>	<b>3RT16 27-.A..1</b>	<b>3RT16 47-.A..1</b>
Size		<b>S00</b>	<b>S0</b>	<b>S3</b>
Dimensions (W x H x D) including auxiliary switches and connecting cables		45 x 101 x 105	45 x 100 x 130	70 x 167 x 183

### General technical specifications

<b>Capacitor rating at rated power</b> (utilization category AC-6b)	230 V, 50/60 Hz kvar <b>400 V, 50/60 Hz kvar</b> 525 V, 50/60 Hz kvar 690 V, 50/60 Hz kvar	3 ... 7.5 <b>5 ... 12.5</b> 7.5 ... 15 10 ... 21	3.5 ... 15 <b>6 ... 25</b> 7.8 ... 30 10 ... 42	3.5 ... 30 <b>5 ... 50</b> 7.5 ... 60 10 ... 84
<b>Auxiliary contacts mounted</b> (unassigned)		1 NO + 1 NC	1 NO	
<b>Auxiliary contacts mountable</b> (lateral), not for sizes S00 and S0		--		2 NC + 2 NO or 1 NO + 1 NC
<b>Max. switching frequency</b>	h <sup>-1</sup>	180	100	
<b>Electrical endurance</b>	Operating cycles	> 250000	> 150000	> 100000
<b>Ambient temperature</b>	°C	60		
<b>Short-circuit protection</b>		1.6 ... 2.2 × I <sub>e</sub>		
<b>Coil operating range</b>		0.8 ... 1.1 × U <sub>s</sub>		

### Conductor cross-sections (1 or 2 conductors connectable)

Main conductors		Screw terminals		
• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>2</sup> ; 2 x (0.75 ... 2.5) <sup>2</sup> according to IEC 60947; max. 2 x (1 ... 4) <sup>2</sup>	2 x (1 ... 2.5) <sup>2</sup> ; 2 x (2.5 ... 6) <sup>2</sup> <sup>1</sup> according to IEC 60947; max. 1 x 10 <sup>1</sup> <sup>2</sup>	--
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>2</sup> ; 2 x (0.75 ... 2.5) <sup>2</sup>	2 x (1 ... 2.5) <sup>2</sup> ; 2 x (2.5 ... 6) <sup>1</sup> <sup>2</sup>	--
• AWG cables				
- Solid	AWG	2 x (20 ... 16)	2 x (16 ... 12)	--
- Solid or stranded	AWG	2 x (18 ... 14)	2 x (14 ... 10)	--
- Stranded	AWG	1 x 12	1 x 8	--
• Terminal screws		M3	M4 (Pozidriv size 2)	--
- Tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	--
	lb.in	7 ... 10.3	18 ... 22	--

<sup>1</sup>) 3RV19 25-5AB feeder terminal for 16 mm<sup>2</sup>.  
<sup>2</sup>) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

# Contactors for Special Applications

## 3RT20 coupling relays (interface) for switching motors

### More information

All technical specifications not mentioned in the table below are identical to those of the 3RT20 contactors for switching motors (see 2/128-2/130)

Contactors	Type	3RT20 1.-.HB4.	3RT20 1.-.JB4.	3RT20 1.-.KB4.	3RT20 2.-.KB4.
	Size	S00	S00	S00	S0
	Width	mm 45	45	45	45

General data						
<b>Mechanical endurance</b>		Operating cycles	30 million			10 million
<b>Protective separation</b> between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400			
Control						
<b>Solenoid coil operating range</b>			0.7 ... 1.25 x U <sub>s</sub>			
<b>Power consumption of the solenoid coil</b> (for cold coil) Closing = Closed		At U <sub>s</sub> 17 V W	1.6			2.3
		24 V W	2.8			4.5
		30 V W	4.4			7
<b>Permissible residual current</b> of the electronics (for 0 signal)			< 10 mA x (24 V/U <sub>s</sub> )			< 6 mA x (24 V/U <sub>s</sub> )
<b>Overvoltage configuration of the solenoid coil</b>			Without overvoltage damping 	With diode 	With suppressor diode 	With varistor 
Operating times of the coupling contactors						
• Closing						
- At 17 V	ON-delay NO	ms	40 ... 130			70 ... 270
	OFF-delay NC	ms	30 ... 80			60 ... 250
- At 24 V	ON-delay NO	ms	35 ... 60			65 ... 90
	OFF-delay NC	ms	25 ... 40			55 ... 80
- At 30 V	ON-delay NO	ms	25 ... 50			52 ... 65
	OFF-delay NC	ms	15 ... 30			43 ... 57
• Closing at 17 ... 30 V						
	OFF-delay NO	ms	7 ... 20	38 ... 65	7 ... 20	19 ... 21
	ON-delay NC	ms	20 ... 30	55 ... 75	20 ... 30	25 ... 31

Contactors	Type	3RT20 1.-1MB4.-0KT0	3RT20 1.-1VB4.	3RT20 1.-1WB4.
	Size	S00	S00	S00
	Width	mm 45	45	45

General data						
<b>Mechanical endurance</b>		Operating cycles	30 million			
<b>Protective separation</b> between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400			
Control						
<b>Solenoid coil operating range</b>			0.85 ... 1.85 x U <sub>s</sub>			
<b>Power consumption of the solenoid coil</b> (for cold coil) Closing = Closed		At U <sub>s</sub> 24 V W	1.6			
<b>Permissible residual current, upright mounting position</b>			On request			
<b>Overvoltage configuration of the solenoid coil</b>			Without overvoltage damping 	With diode 	With suppressor diode 	
Operating times of the coupling contactors						
• Closing						
- At 20.5 V	ON-delay NO	ms	30 ... 120			
	OFF-delay NC	ms	20 ... 110			
- At 24 V	ON-delay NO	ms	25 ... 90			
	OFF-delay NC	ms	15 ... 80			
- At 44 V	ON-delay NO	ms	15 ... 60			
	OFF-delay NC	ms	10 ... 50			
• Opening						
	OFF-delay NO	ms	5 ... 20	20 ... 80	5 ... 20	
	ON-delay NC	ms	10 ... 30	30 ... 90	10 ... 30	



3TF68 and 3TF69 Vacuum contactors

**Overview**

**Standards**

IEC 60947-1, EN 60947-1,  
IEC 60947-4-1, EN 60947-4-1,  
IEC 60947-5-1, EN 60947-5-1 (auxiliary switches)

The 3TF68/69 contactors are climate-proof.

They are finger-safe according to EN 50274. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices (see [Accessories and Spare Parts](#) on page 2/54).

**Main contacts**

Contact erosion indication with 3TF68/69 vacuum contactors

The contact erosion of the vacuum interrupters can be checked during operation with the help of 3 white double slides on the contactor base. If the distance indicated by one of the double slides is < 0.5 mm while the contactor is in the closed position, then the vacuum interrupter must be replaced. To ensure maximum reliability, it is recommended to replace all 3 vacuum interrupters simultaneously.

**Auxiliary contacts**

Contact reliability

These auxiliary contacts are particularly suitable for solid-state circuits with currents  $\geq 1$  mA at a voltage  $\geq 17$  V.

**Electromagnetic compatibility**

The 3TF68/69...**C** contactors for AC operation are fitted with an electronically controlled solenoid operating mechanism with a high interference immunity (for EMC values see page 3/115). The solenoid coil is connected to varistors for protection against overvoltages.

The 3TF68/69...**Q**.. contactors for AC operation are designed for operation in systems with AC control supply voltage which is subject to strong interference. The solenoid systems of these contactors are configured in the DC economy circuit with rectification. The rectifier bridge is connected to varistors for protection against overvoltages.

**Protection of the main current paths**

An integrated RC varistor connection for the main current paths dampens the switching overvoltage rises to safe values. This prevents multiple restricting. It can therefore be assumed that the motor winding cannot be damaged by switching overvoltages with steep voltage rises.

Note:

During operation in installations in which the emitted interference limits cannot be observed, e.g. when used for output contactors in converters, 3TF68/69...**Q** contactors without a main current path circuit are recommended.

**Technical specifications**

Contactor	Type	3TF68 and 3TF69	
<b>Rated data of the auxiliary contacts</b>		Acc. to IEC 60947-5-1	
<b>Rated insulation voltage</b> $U_i$ (pollution degree 3)	V	690	
<b>Conventional thermal current</b> $I_{th} = \text{Rated operational current } I_e/\text{AC-12}$	A	10	
<b>AC load</b>			
<b>Rated operational current</b> $I_e/\text{AC-15}/\text{AC-14}$			
• For rated operational voltage $U_e$			
- At 24 V	A	10	
- At 110 V	A	10	
- At 125 V	A	10	
- At 220 V	A	6	
- At 230 V	A	5.6	
- At 380 V	A	4	
- At 400 V	A	3.6	
- At 500 V	A	2.5	
- At 660 V	A	2.5	
- At 690 V	A	2.3	
<b>DC load</b>			
<b>Rated operational current</b> $I_e/\text{DC-12}$			
• For rated operational voltage $U_e$			
- At 24 V	A	10	
- At 60 V	A	10	
- At 110 V	A	3.2	
- At 125 V	A	2.5	
- At 220 V	A	0.9	
- At 440 V	A	0.33	
- At 600 V	A	0.22	
<b>Rated operational current</b> $I_e/\text{DC-13}$			
• For rated operational voltage $U_e$			
- At 24 V	A	10	Auxiliary contacts with delayed NC contact: NS = No specification
- At 60 V	A	5	6
- At 110 V	A	1.14	NS
- At 125 V	A	0.98	0.98
- At 220 V	A	0.48	NS
- At 440 V	A	0.13	NS
- At 600 V	A	0.07	0.07
<b>Ⓢ and Ⓣ rated data of the auxiliary contacts</b>			
Rated voltage, max.	V AC	600	
Switching capacity		A 600, P 600	

3TF68 and 3TF69 Vacuum contactors

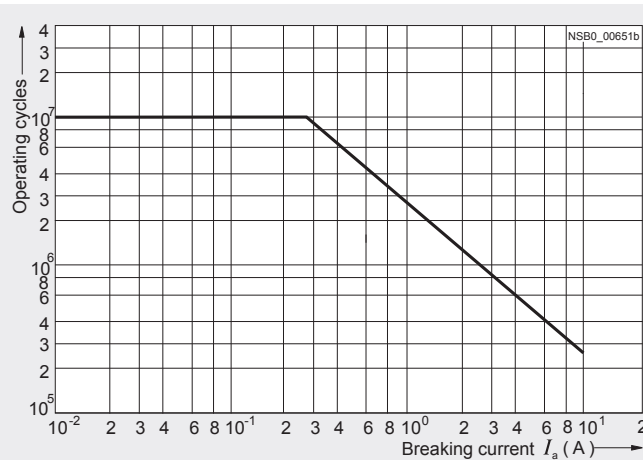
Contactor

3TF68 and 3TF69

Contact endurance of the auxiliary contacts

The contact endurance for utilization category AC-12 or AC-15/AC-14 depends mainly on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

The characteristic curves apply to 230 V AC.



Contact erosion indication with vacuum contactors

The contact erosion of the vacuum interrupters can be checked during operation with the help of 3 white double slides on the contactor base.

If the distance indicated by one of the double slides is < 0.5 mm while the contactor is in the closed position, the vacuum interrupter must be replaced. To ensure maximum reliability, it is recommended to replace all 3 vacuum interrupters.

Contact endurance of the main contacts

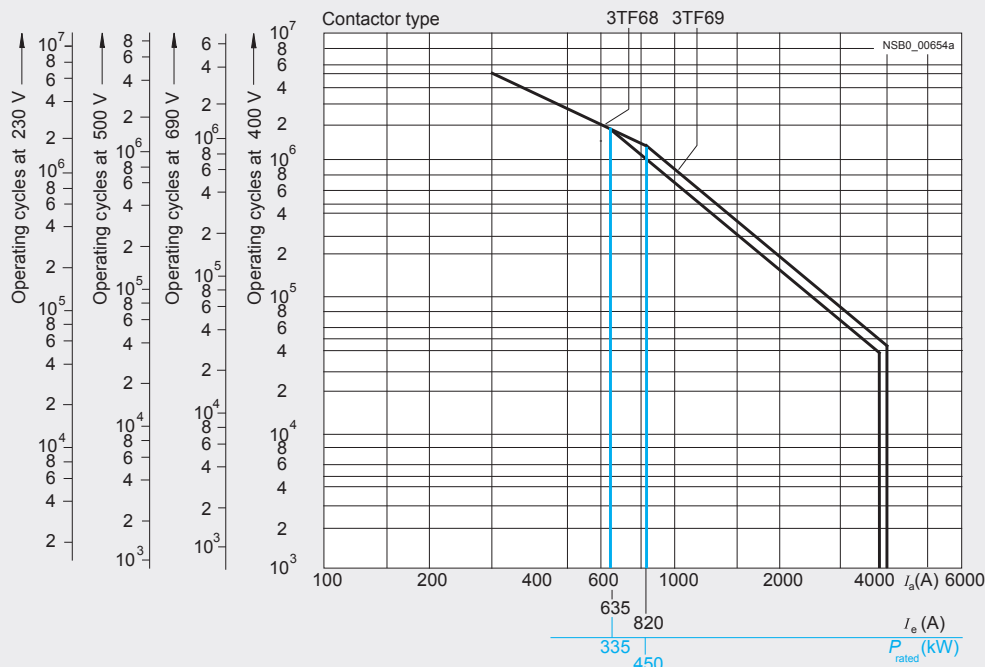


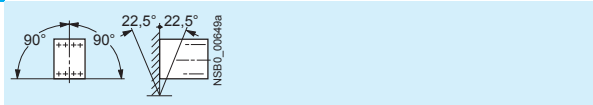
Diagram legend:  
 $P_{rated}$  = Rated power for squirrel-cage motors at 400 V  
 $I_a$  = Breaking current  
 $I_e$  = Rated operational current

3TF68 and 3TF69 Vacuum contactors

Type		<b>3TF68</b>	<b>3TF69</b>
Size		<b>14</b>	<b>14</b>
Dimensions (W x H x D)		230 x 276 x 237	230 x 295 x 237

**General data**

**Permissible mounting position, installation instructions**<sup>1) 2)</sup>  
 The contactors are designed for operation on a vertical mounting surface.



<b>Mechanical endurance</b>	Operating cycles	5 million	
<b>Electrical endurance</b>	Operating cycles	<sup>3)</sup>	
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	kV	1	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8	
<b>Protective separation</b> between the coil and the main contacts acc. to IEC 60947-1, Appendix N	kV	1	
<b>Mirror contacts</b> A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact. One NC contact each must be connected in series for the right and left auxiliary switch block respectively.		Yes, acc. to IEC 60947-4-1, Appendix F	
<b>Permissible ambient temperature</b>	°C	-25 ... +55	
	°C	-55 ... +80	
<b>Degree of protection</b> acc. to IEC 60947-1, Appendix C		IP00/open (where applicable, use additional terminal covers)	
<b>Touch protection</b> acc. to EN 50274		Finger-safe with cover	
<b>Shock resistance</b>			
• Rectangular pulse			
- AC operation	g/ms	8.1/5 and 4.7/10	9.5/5 and 5.7/10
- DC operation	g/ms	9/5 and 5.7/10	8.6/5 and 5.1/10
• Sine pulse			
- AC operation	g/ms	12.8/5 and 7.4/10	13.5/5 and 7.8/10
- DC operation	g/ms	14.4/5 and 9.1/10	13.5/5 and 7.8/10
<b>Conductor cross-sections</b>		See page 2/177.	
<b>Electromagnetic compatibility (EMC)</b>		See page 2/106.	

**Short-circuit protection**

**Main circuit**  
 Fuse links, gG operational class:  
 LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1

• Type of coordination "1"	A	1000	1250
• Type of coordination "2"	A	500	630
• Weld-free <sup>4)</sup>	A	400	500

**Auxiliary circuit**

• Short-circuit test with fuse links of gG operational class: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE with $I_k = 1$ kA acc. to IEC 60947-5-1	A	10	
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1	A	10	

<sup>1)</sup> To easily replace the laterally mounted auxiliary switches it is recommended to maintain a minimum distance of 30 mm between the contactors.  
<sup>2)</sup> If mounted at a 90° angle (conducting paths are horizontally above each other), the switching frequency is reduced by 80% compared with the normal values.  
<sup>3)</sup> See "Endurance of the auxiliary contacts", page 2/173.  
<sup>4)</sup> Test conditions according to IEC 60947-4-1.  
<sup>5)</sup> For ambient temperatures > 55°C, only 3TF6.33-Q.-Z A02 contactors (= without connection of the main current path circuits) can be used. Then derating is also possible with these contactors:  
 - AC-1:  $I_{th} = 782$  A, 644 operating cycles/h;  
 - AC-3: operating range 0.85-1.05 x Us, 460 operating cycles/hour, mechanical endurance 5 million operating cycles, lateral clearance 10 mm

3TF68 and 3TF69 Vacuum contactors

Contactor	Type	3TF68	3TF69
	Size	14	14
<b>Control</b>			
<b>Coil operating range</b>		0.8 x $U_{s\ min}$ ... 1.1 x $U_{s\ max}$	
<b>Power consumption of the solenoid coils</b> (when coil is cold and 1.0 x $U_s$ )			
• AC operation, $U_{s\ max}$	- Closing - Closed	VA/p.f. VA/p.f.	1850/1 49/0.15
• AC operation, $U_{s\ min}$	- Closing - Closed	VA/p.f. VA/p.f.	1200/1 13.5/0.47
• DC economy circuit <sup>1)</sup>	- Closing at 24 V - Closed	W W	1010 28
For contactors of type 3TF68/69...-Q:			
• AC operation, $U_{s\ min}$ <sup>2)</sup>	- Closing - Closed	VA/p.f. VA/p.f.	1000/0.99 11/1
<b>Operating times for 0.8 ... 1.1 x <math>U_s</math></b> (Total break time = Opening delay + Arcing time)		(Values apply to cold and warm coil)	
• AC operation	- Closing delay - Opening delay	ms ms	70 ... 120 (22 ... 65) <sup>3)</sup> 70 ... 100
• DC economy circuit	- Closing delay - Opening delay	ms ms	76 ... 110 50
• Arcing time		ms	10 ... 15
For contactors of type 3TF68/69...-Q:			
• AC operation	- Closing delay - Opening delay	ms ms	35 ... 90 65 ... 90
<b>Operating times for 1.0 x <math>U_s</math></b> (Total break time = Opening delay + Arcing time)			
• AC operation	- Closing delay - Opening delay	ms ms	80 ... 100 (30 ... 45) <sup>3)</sup> 70 ... 100
• DC economy circuit	- Closing delay - Opening delay	ms ms	80 ... 90 50
<b>Minimum command duration</b> for closing	Standard Reduced make-time	ms ms	120 90
<b>Minimum interval time</b> between two ON commands		ms	100

1) At 24 V DC; for further voltages, deviations of up to ±10 % are possible.  
 2) Including reversing contactor.  
 3) Values in brackets apply to contactors with reduced operating times.

Contactor	Type	3TF6. 44- .CF7	3TF6. 44- .CM7	3TF6. 44- .CP7	3TF6. 44- .CQ7	3TF6. 44- .CS7
<b>Electromagnetic compatibility</b>						
<b>Rated control supply voltage <math>U_s</math></b>	V AC	110 ... 132	200 ... 240	230 ... 277	380 ... 460	500 ... 600
<b>Overvoltage type</b> acc. to IEC 60801		Burst/Surge				
<b>Degree of severity</b> acc. to IEC 60801						
• Burst		3	4	4	4	4
• Surge		4	4	4	4	4
<b>Overvoltage resistance</b>						
• Burst	kV	2	4	4	4	4
• Surge	kV	6	5	5	6	6

3TF68 and 3TF69 Vacuum contactors

Contactor	Type		3TF68	3TF69
	Size		14	14
<b>Main circuit</b>				
<b>AC capacity</b>				
<b>Utilization category AC-1</b>				
<b>Switching resistive loads</b>				
• Rated operational currents $I_e$	At 40 °C up to 690 V	A	700	910
	At 55 °C up to 690 V	A	630	850
	At 55 °C up to 1000 V	A	450	800
• Rated power for AC loads with p.f. = 0.95 at 55°C	230 V	kW	240	323
	400 V	kW	415	558
	500 V	kW	545	735
	690 V	kW	720	970
	1000 V	kW	780	1385
• Minimum conductor cross-sections for loads with $I_e$	At 40°C	mm <sup>2</sup>	2 x 240	$I_e \geq 800$ A: 2 x 60 x 5 (copper busbars)
	At 55°C	mm <sup>2</sup>	2 x 185	$I_e < 800$ A: 2 x 240
<b>Utilization categories AC-2 and AC-3</b>				
• Rated operational currents $I_e$	Up to 690 V	A	630	820
	1000 V	A	435	580
• Rated power for slipping or squirrel-cage motors at 50 Hz and 60 Hz	At 230 V	kW	200	260
	400 V	kW	347	450
	500 V	kW	434	600
	690 V	kW	600	800
	1000 V	kW	600	800
<b>Thermal load capacity</b>			10 s current	A
			5 040	7 000
<b>Power loss per conducting path</b>			At $I_e/AC-3$	W
			45	70
<b>Utilization category AC-4 (for <math>I_a = 6 \times I_e</math>)</b>				
• Rated operational current $I_e$	Up to 690 V	A	610	690
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V	kW	355	400
The following applies to a contact endurance of about 200000 operating cycles:				
• Rated operational currents $I_e$	Up to 690 V	A	300	360
	1000 V	A	210	250
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 230 V	kW	97	110
	400 V	kW	168	191
	500 V <sup>1)</sup>	kW	210	250
	690 V <sup>1)</sup>	kW	278	335
	1000 V <sup>1)</sup>	A	290	350
<b>Switching frequency</b>				
<b>Switching frequency z</b> in operating cycles/hour				
• Contactors without overload relays	No-load switching frequency AC	1/h	2000	1000
	No-load switching frequency DC	1/h	1000	1000
	AC-1	1/h	700	700
	AC-2	1/h	200	200
	AC-3	1/h	500	500
	AC-4	1/h	150	150
• Contactors with overload relays (mean value)		1/h	15	15

<sup>1)</sup> Max. permissible rated operational current  $I_e/AC-4 = I_e/AC-3$  up to 500 V, for reduced contact endurance and reduced switching frequency.

3TF68 and 3TF69 Vacuum contactors

Contactor	Type	3TF68	3TF69
	Size	14	14
<b>Conductor cross-sections</b>			
<b>Main conductors:</b>		<b>Screw terminals</b>	
<ul style="list-style-type: none"> <li>• Busbar connections                             <ul style="list-style-type: none"> <li>- Finely stranded with cable lug</li> <li>- Stranded with cable lug</li> <li>- Solid or stranded</li> <li>- Connecting bar (max. width)</li> </ul> </li> <li>• Terminal screw                             <ul style="list-style-type: none"> <li>- Tightening torque</li> </ul> </li> <li>• With box terminal<sup>1)</sup> <ul style="list-style-type: none"> <li>- Connectable copper bars</li> <li>- Width</li> <li>- Max. thickness</li> <li>- Terminal screw</li> <li>- Tightening torque</li> </ul> </li> </ul>	mm <sup>2</sup> mm <sup>2</sup> AWG mm  Nm  mm mm  Nm lb.in	50 ... 240 70 ... 240 2/0 ... 500 MCM 50  M10 x 30 14 ... 24 (124 ... 210 lb.in)  15 ... 25 1 x 26 or 2 x 11 A/F 6 (hexagon socket) 25 ... 40 221 ... 354	50 ... 240 50 ... 240 2/0 ... 500 MCM 60 (U <sub>g</sub> ≤ 690 V) 50 (U <sub>g</sub> > 690 V)  M12 x 40 20 ... 35 (177 ... 310 lb.in)  15 ... 38 1 x 46 or 2 x 18 A/F 8 (hexagon socket) 35 ... 50 266 ... 443
<b>Auxiliary conductors:</b>			
<ul style="list-style-type: none"> <li>• Solid</li> <li>• Finely stranded with end sleeve</li> <li>• Pin-end connector acc. to DIN 46231</li> <li>• Solid or stranded</li> <li>• Tightening torque</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> AWG Nm lb.in	2 x (0.5 ... 1) <sup>2</sup> /2 x (1 ... 2.5) <sup>2</sup> 2 x (0.5 ... 1) <sup>2</sup> /2 x (0.75 ... 2.5) <sup>2</sup> 2 x (1 ... 1.5) 2 x (18 ... 12) 0.8 ... 1.4 7 ... 12	

<sup>1)</sup> See "Accessories and Spare Parts", page 2/54.

<sup>2)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Contactor	Type	3TF68	3TF69
	Size	14	14
<b>Ⓢ and Ⓣ rated data</b>			
<b>Rated insulation voltage</b>	V AC	600	600
<b>Uninterrupted current</b>	A	630	820
<b>Maximum horsepower ratings</b> (Ⓢ and Ⓣ approved values)			
<ul style="list-style-type: none"> <li>• Rated power for induction motors at 60 Hz                             <ul style="list-style-type: none"> <li>- At 200 V</li> <li>- At 230 V</li> <li>- At 460 V</li> <li>- At 575 V</li> </ul> </li> </ul>	hp hp hp hp	231 266 530 664	290 350 700 860
<b>NEMA/EEMAC ratings</b>			
SIZE	hp	6	7
<ul style="list-style-type: none"> <li>• Uninterrupted current                             <ul style="list-style-type: none"> <li>- Open</li> <li>- Enclosed</li> </ul> </li> <li>• Rated power for induction motors at 60 Hz                             <ul style="list-style-type: none"> <li>- At 200 V</li> <li>- At 230 V</li> <li>- At 460 V</li> <li>- At 575 V</li> </ul> </li> </ul>	A A  hp hp hp hp	600 540  150 200 400 400	820 810  -- 300 600 600
<b>Overload relays</b>	Type	3RB12 .	
<ul style="list-style-type: none"> <li>• Setting range</li> </ul>	A	200 ... 820	

3TC contactors

**Overview**

**3TC4 and 3TC5**

IEC 60947-1, EN 60947-1,  
IEC 60947-4-1, EN 60947-4-1

The contactors are finger-safe according to EN 50274. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

The DC motor ratings given in the tables are applicable to the DC-3 and DC-5 utilization categories with two-pole switching of the load or with the two conducting paths of the contactor connected in series.

One contactor conducting path can switch full power up to 220 V. The ratings for higher voltages are available on request.

**3TC7**

IEC 60947-4-1, EN 60947-4-1.

The contactors are suitable for use in any climate. They are suitable for switching and controlling DC motors as well as all other DC circuits.

The solenoid excitation is configured for a particularly large operating range. It is between 0.7 or 0.8 to 1.2 x  $U_s$ .

3TC74 contactors can be used at up to 750 V/400 A and 50 Hz in AC-1 operation.

**Application**

The contactors are suitable for switching and controlling DC motors as well as all other DC circuits.

A version with an especially large coil operating range is available for operation in electrically driven vehicles and in switchgears with significant fluctuations in the actuating voltage

**Technical specifications**

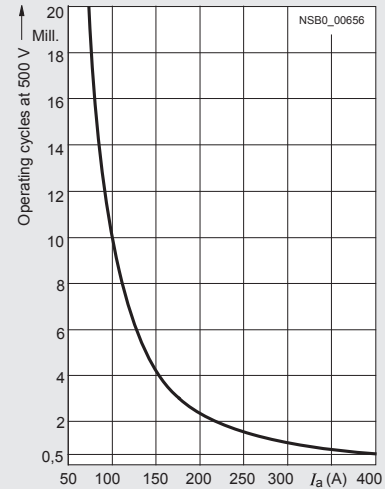
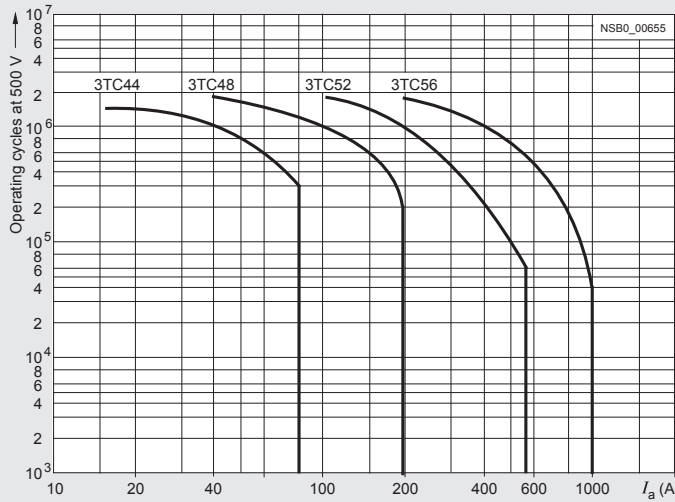
Contactors	Type	3TC4 and 3TC7	3TC5
<b>Rated data of the auxiliary contacts</b>			
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	690	
<b>Conventional thermal current <math>I_{th}</math> = Rated operational current <math>I_e/AC-12</math></b>	A	10	10
<b>AC load</b>			
<b>Rated operational current <math>I_e/AC-15/AC-14</math></b> • For rated operational voltage $U_e$			
	24 V A	10	10
	110 V A	10	10
	125 V A	10	10
	220 V A	6	6
	230 V A	5.6	5.6
	380 V A	4	4
	400 V A	3.6	3.6
	500 V A	2.5	2.5
	660 V A	2.5	2.5
	690 V A	--	--
<b>DC load</b>			
<b>Rated operational current <math>I_e/DC-12</math></b> • For rated operational voltage $U_e$			
	24 V A	10	10
	60 V A	10	10
	110 V A	3.2	8
	125 V A	2.5	6
	220 V A	0.9	2
	440 V A	0.33	0.6
	600 V A	0.22	0.4
<b>Rated operational current <math>I_e/DC-13</math></b> • For rated operational voltage $U_e$			
	24 V A	10	10
	60 V A	5	5
	110 V A	1.14	2.4
	125 V A	0.98	2.1
	220 V A	0.48	1.1
	440 V A	0.13	0.32
	600 V A	0.07	0.21



3TC contactors

Contactors	Type	<b>3TC44 ... 3TC56</b>
<b>Ⓢ and Ⓣ rated data of the auxiliary contacts</b>		
Rated voltage, max.	V AC	600
Switching capacity		A 600, P 600

Contactors	Type	<b>3TC44 ... 3TC78</b>
<b>Contact endurance of the main contacts</b>		



3TC44 to 3TC56 contactors

3TC74 and 3TC78 contactors

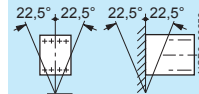
Legend for the diagrams:  
 $I_a$  = Breaking current

Contactors	Type Size	<b>3TC44 2</b>	<b>3TC48 4</b>	<b>3TC52 8</b>	<b>3TC56 12</b>
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**General technical specifications**

**Permissible mounting positions**

The contactors are designed for operation on a vertical mounting surface.



<b>Mechanical endurance</b>	Operating cycles	10 million				
<b>Electrical endurance</b>	Operating cycles	1) <sup>1)</sup>				
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	800		1000		
<b>Protective separation</b> between the coil and the main contacts acc. to IEC 60947-1, Appendix N	V	Up to 300		Up to 660		
<b>Mirror contacts<sup>2)</sup></b> A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.		Yes, acc. to IEC 60947-4-1, Appendix F				
<b>Permissible ambient temperature</b>						
• During operation	°C	-25 ... +55				
• During storage	°C	-50 ... +80				
<b>Degree of protection</b> acc. to IEC 60947-1, Appendix C		IP00/open, for AC operation, coil assembly IP40				
<b>Shock resistance</b>	Rectangular pulse	<i>g</i> /ms	7.5/5 and 3.4/10	10/5 and 5/10	12/5 and 5.5/10	12/5 and 5.6/10

**Short-circuit protection**

**Main circuit**

Fuse links, operational class gG:  
 LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE

• Type of coordination "1"	A	50	160	250	400
• Type of coordination "2"	A	35	63	80	250

**Auxiliary circuit**

• Short-circuit test with fuse links of gG operational class: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current $I_k = 1$ kA acc. to IEC 60947-5-1	A	16			
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1	A	10			

1) See the endurance diagram above.

2) For 3TC44, one NC contact each must be connected in series for the right and left auxiliary switch block respectively.

3TC contactors

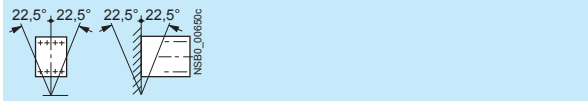
Type			3TC44	3TC48	3TC52	3TC56
Size			2	4	8	12
Dimensions (W x H x D)		mm	70 x 85 x 141	100 x 183 x 180	135 x 238 x 232	160 x 279 x 310
		mm	70 x 85 x 100	100 x 183 x 154	135 x 238 x 200	160 x 279 x 251
<b>Control circuits</b>						
<b>Coil operating range</b>			0.8 ... 1.1 x U <sub>s</sub>			
<b>Power consumption of the solenoid coils</b> (for cold coil and 1.0 x U <sub>s</sub> )						
• DC operation	- Closing = Closed	W	10	19	30	86
• AC operation, 50 Hz coil	- Closing	VA/p.f.	68/0.86	300/0.5	640/0.48	1780/0.3
	- Closed	VA/p.f.	10/0.29	26/0.24	46/0.23	121/0.22
• AC operation, 60 Hz coil	- Closing	VA/p.f.	95/0.79	365/0.45	730/0.38	2140/0.3
	- Closed	VA/p.f.	12/0.3	35/0.26	56/0.24	140/0.29
• AC operation, 50/60 Hz coil	- Closing at 50 Hz/60 Hz	VA/p.f.	79/73/0.83/0.78	--	--	--
	- Closed at 50 Hz/60 Hz	VA/p.f.	11/9/0.28/0.27	--	--	--
<b>Operating times</b> (for 0.8 ... 1.1 x U <sub>s</sub> ) Total break time = Opening delay + Arcing time			(The values apply up to and including 20 % undervoltage, 10 % overvoltage, as well as when the coil is cold and warm)			
• DC operation	- Closing delay	ms	35 ... 190	90 ... 380	120 ... 400	110 ... 400
	- Opening delay <sup>1)</sup>	ms	10 ... 25	17 ... 28	22 ... 35	40 ... 110
• AC operation	- Closing delay	ms	10 ... 40	20 ... 50	20 ... 50	20 ... 50
	- Opening delay <sup>1)</sup>	ms	5 ... 25	5 ... 30	10 ... 30	10 ... 30
• Arcing time	- DC-1	ms	20			
	- DC-3/DC-5	ms	30			
<b>Main circuit</b>						
<b>Load rating with DC</b>						
<b>Utilization category DC-1, switching resistive loads (L/R ≤ 1 ms)</b>						
• Rated operational currents I <sub>e</sub> (at 55 °C)	Up to U <sub>e</sub> 750 V	A	32	75	220	400
• Minimum conductor cross-section		mm <sup>2</sup>	6	25	95	240
• Rated power at U <sub>e</sub>	At 220 V	kW	7	16.5	48	88
	440 V	kW	14	33	97	176
	600 V	kW	19.2	45	132	240
	750 V	kW	24	56	165	300
<b>Utilization category DC-3 and DC-5</b>						
<b>Shunt-wound and series-wound motors (L/R ≤ 15 ms)</b>						
• Rated operational currents I <sub>e</sub> (at 55 °C)	Up to 220 V	A	32	75	220	400
	440 V	A	29	75	220	400
	600 V	A	21	75	220	400
	750 V	A	7.5	75	170	400
• Rated power at U <sub>e</sub>	At 110 V	kW	2.5	6.5	20	35
	220 V	kW	5	13	41	70
	440 V	kW	9	27	82	140
	600 V	kW	9	38	110	200
	750 V	kW	4	45	110	250
<b>Switching frequency</b>						
<b>Switching frequency z</b> in operating cycles/hour						
AC/DC operation						
• With resistive load DC-1		h <sup>-1</sup>	1500	1000		
	• For inductive load DC-3/DC-5		750	600		
<b>Conductor cross-sections (1 or 2 conductors connectable)</b>						
<b>Main conductors:</b>			<b>Screw terminals</b>			
• Solid	mm <sup>2</sup>		2 x (2.5 ... 10)	2 x (6 ... 16)	--	--
• Finely stranded with end sleeve	mm <sup>2</sup>		2 x (1.5 ... 4)	--	--	--
• Stranded with cable lug	mm <sup>2</sup>		2 x 16	2 x 35	2 x 120	2 x 150
• Pin-end connector acc. to DIN 46231	mm <sup>2</sup>		2 x (1 ... 6)	--	--	--
• Busbars	mm		--	15 x 2.5	25 x 4	2 x (25 x 3)
• Terminal screw			M5	M6	M10	M10
<b>Auxiliary conductors:</b>						
• Solid	mm <sup>2</sup>		2 x (1 ... 2.5)			
• Finely stranded with end sleeve	mm <sup>2</sup>		2 x (0.75 ... 1.5)			

<sup>1)</sup> The opening delay times can increase if the contactor coils are damped against voltage peaks. Only 3TC44 contactors are allowed to be fitted with diodes.

Type		<b>3TC74</b>	<b>3TC78</b>
Design		<b>1-pole contactors</b>	<b>2-pole contactors</b>
Dimensions		78 x 352 x 276	160 x 366 x 290

**General technical specifications**

**Permissible mounting positions**  
 The contactors are designed for operation on a vertical mounting surface.



<b>Mechanical endurance</b>	Operating cycles	30 million
<b>Electrical endurance</b>	Operating cycles	1)
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1500
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8
<b>Protective separation</b> between the coil and the main contacts acc. to IEC 60947-1, Appendix N	V	630
<b>Permissible ambient temperature</b>	°C	-25 ... +55
<b>Degree of protection</b> acc. to IEC 60947-1, Appendix C		IP00/open

**Short-circuit protection**

**Main circuit**  
 Fuse links, operational class gG:  
 LV HRC, type 3NA

• Type of coordination "1"	A	630
• Type of coordination "2"	A	500

**Auxiliary circuits**

• Short-circuit test with fuse links of gG operational class: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current $I_k = 1$ kA acc. to IEC 60947-5-1	A	16
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1	A	10

**Control circuits**

**Coil operating range**

• DC operation	At $U_c = 24$ V	0.8 ... 1.2 x $U_s$
	At $U_c > 24$ V	0.7 ... 1.2 x $U_s$
• AC operation	At $U_c = 24$ V	0.7 ... 1.15 x $U_s$
	At $U_c > 24$ V	0.7 ... 1.14 x $U_s$

**Power consumption of the solenoid coils** (when coil is cold and 1.0 x  $U_s$ )

• DC operation	Closing = Closed	W	46	92
• AC operation, 50 Hz	Closing,	VA	80	160
	Closed		0.95	0.95

**Operating times**  
 (Total break time = Opening delay + Arcing time)

• AC and DC operation	- Closing delay	ms	60 ... 100
	- Opening delay	ms	20 ... 35
• Arcing time at 0.06 ... 4 x $I_e$		ms	40 ... 70

(The values apply up to and including 15 % undervoltage, 10 % overvoltage, as well as when the coil is cold and warm)

**Main circuit**

**Load rating with DC**

**Utilization category DC-1, switching resistive loads ( $L/R \leq 1$  ms)**

• Rated operational current $I_n/DC-1$ (at 55 °C)	A	500	500
• Minimum conductor cross-section	mm <sup>2</sup>	2 x 150	2 x 150
• Rated power	At 220 V	kW	110
	440 V	kW	220
	600 V	kW	300
	750 V	kW	375
	1200 V	kW	—
	1500 V	kW	—
• Critical currents, without arc extinction	At 440 V	A	≤ 7
	600 V	A	≤ 13
	750 V	A	≤ 15
	≤ 800 V	A	—
	1200 V	A	≤ 7
	1500 V	A	≤ 13
			≤ 15

**Utilization categories DC-3 and DC-5, switching DC motors** 2)

**Permissible rated current for regenerative braking** At 110 ... 600 V A 400

**Switching frequency**

**Switching frequency  $z$**  in operating cycles/hour

AC/DC operation		
• With resistive load DC-1	h <sup>-1</sup>	750
• For inductive load DC-3/DC-5	h <sup>-1</sup>	500




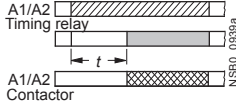
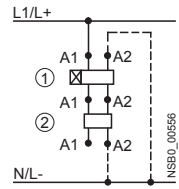
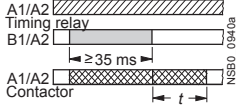
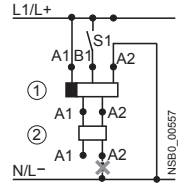
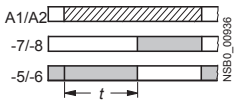
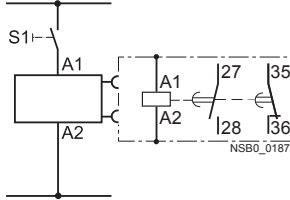
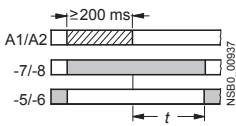
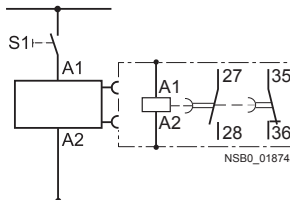
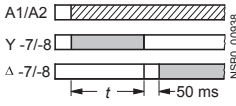
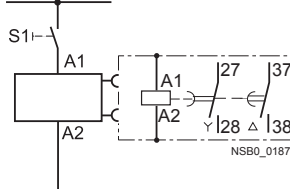
1) Endurance see page 2/179.  
 2) See Selection and ordering data.

Accessories – 3RT1 contactors

**Technical specifications**

Contactor	Type	3RT19 26-2C	3RT19 26-2D	3RT19 26-2E	3RT19 26-2F	3RT19 26-2G
		Solid-state timing relay blocks with semiconductor output		Solid-state time-delay auxiliary switch blocks		
<b>General data</b>						
<b>Rated insulation voltage <math>U_i</math></b>	V AC	250				
Pollution degree 3 Overvoltage category III acc. to EN 60664-1						
<b>Permissible ambient temperature</b>						
• During operation	°C	-25 ... +60				
• During storage	°C	-40 ... +80				
<b>Degree of protection</b> acc. to EN 60947-1, Appendix C						
• Cover		IP40				
• Terminals		IP20				
<b>Shock resistance</b>	g/ms	15/11				
Half-sine acc. to IEC 60068-2-27						
<b>Vibration resistance</b>	Hz/mm	10 ... 55/0.35				
according to IEC 60068-2-6						
<b>EMC tests</b>	Basic specification	IEC 61000-6-4				
<b>Conductor connections</b>						
• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5), 2 x (0.75 ... 4)				
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 2.5)				
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)				
• Terminal screws		M3				
• Tightening torque	Nm lb.in	0.8 ... 1.2 7 ... 10.3				
<b>Permissible mounting positions</b>		Any				
<b>Control</b>						
<b>Operating range of excitation</b>		0.8 ... 1.1 x $U_s$ , 0.95 ... 1.05 times the rated frequency		0.85 ... 1.1 x $U_s$ , 0.95 ... 1.05 times the rated frequency		
<b>Rated power</b>	W	1		2		
• Power consumption at 230 V AC, 50 Hz	VA	1		4		
<b>Overvoltage protection</b>		Varistor integrated in timing relay			--	
<b>Recovery time</b>	ms	50		150		
<b>Minimum ON period</b>	ms	35		200 (with OFF-delay)		
<b>Setting accuracy</b>	Typ. %	±15				
With reference to upper limit of scale						
<b>Repeat accuracy</b>	Max. %	±1				
<b>Load side</b>						
<b>Rated operational currents <math>I_e</math></b>						
• Load current	A	0.3		--		
• AC-15, 230 V, 50 Hz	A	--		3		
• DC-13, 24 V	A	--		1		
• DC-13, 110 V	A	--		0.2		
• DC-13, 230 V	A	--		0.1		
<b>Short-time loading capacity</b>	Up to 10 ms	A 10		--		
<b>DIAZED protection</b> gG operational class	A	--		4		
<b>Residual current</b>	Max. mA	5		--		
<b>Voltage drop</b>	Max. VA	3.5		--		
With conducting output						
<b>Mechanical endurance</b>	Operating cycles	100 x 10 <sup>6</sup>		10 x 10 <sup>6</sup>		
<b>Switching frequency</b> for load						
• With $I_e$ at 230 V AC	h <sup>-1</sup>	200		2500		
• With 3RT20 16 contactor at 230 V AC	h <sup>-1</sup>	2500		5000		

Accessories – 3RT1 contactors

Function	Function chart	
	<p>  Timing relay energized   Contact closed   Contact open                 </p>	
<p><b>Solid-state timing relay blocks</b></p> <p>ON-delay, two-wire design (varistor integrated)</p>	<p><b>1 NO contact (semiconductor output)</b></p> <p>3RT19 26-2C</p> 	 <p>A2 can be connected to N(L-) using either the contactor or the timing relay.</p> <p>--- To be connected optionally</p> <p>① Timing relay block ② Contactor</p>
<p>OFF-delay with auxiliary voltage (varistor integrated)</p>	<p>3RT19 26-2D</p> 	 <p>A2 must only be connected to N(L-) from the timing relay.</p> <p>✗ Do not connect</p> <p>① Timing relay block ② Contactor</p>
<p><b>Solid-state time-delay auxiliary switch blocks</b></p> <p>ON-delay</p>	<p><b>1 NO + 1 NC</b></p> <p>3RT19 26-2E</p> 	 <p>NSB0_01873</p>
<p>OFF-delay without auxiliary voltage</p>	<p>3RT19 26-2F</p> 	 <p>NSB0_01874a</p>
<p><b>Solid-state time-delay auxiliary switch blocks</b></p> <p>Wye-delta function: 1 NO delayed, 1 NO instantaneous, dead time 50 ms (varistor integrated)</p>	<p><b>2 NO</b></p> <p>3RT19 26-2G</p> 	 <p>NSB0_01875</p>

Accessories – 3RT1 contactors

Contactor	Type	<b>3RH19 24, 3TX7 090</b> <b>Coupling links for mounting on contactors</b> <b>acc. to IEC 60947/EN 60947</b>
<b>General data</b>		
<b>Rated insulation voltage</b> $U_i$ (pollution degree 3)	V	300
<b>Protective separation</b> between coil and contacts acc. to IEC 60947-1, Appendix N	V AC	Up to 300
<b>Permissible ambient temperature</b>		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +80
<b>Degree of protection acc. to IEC 60947-1, Appendix C</b>		
• Connections		IP20
• Enclosure		IP40
<b>Circuit diagram</b>		
		<p>① Coupling link ② Contactor</p>
<b>Conductor cross-sections</b>		
• Solid	mm <sup>2</sup>	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)
Terminal screws		M3
<b>Control side</b>		
<b>Rated control supply voltage</b> $U_s$	V DC	24
<b>Operating range</b>	V DC	17 ... 30
<b>Power consumption at</b> $U_s$	W	0.5
<b>Nominal current input</b>	mA	20
<b>Release voltage</b>	V	≥ 4
<b>Function display</b>		Yellow LED
<b>Protection circuit</b>		Varistor
<b>Load side</b>		
<b>Mechanical endurance</b>	Operating cycles	20 x 10 <sup>6</sup>
<b>Electrical endurance at</b> $I_e$	Operating cycles	1 x 10 <sup>5</sup>
<b>Switching frequency</b>	Operating cycles h <sup>-1</sup>	5000
<b>Make-time</b>	ms	Approx. 7
<b>Break-time</b>	ms	Approx. 4
<b>Bounce time</b>	ms	Approx. 2
<b>Contact material</b>		AgSnO
<b>Switching voltage</b>	AC/DC V	24 ... 250
<b>Permissible residual current</b> of the electronics (with 0 signal)	mA	2.5

# Control Relays

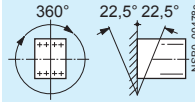
## 3RH2 control relays – size S00

### Technical specifications

Contactor relays	Type	<b>3RH2</b>
	Size	<b>S00</b>

#### Permissible mounting positions

The contactor relays are designed for operation on a vertical mounting surface.



Upright mounting position



Special version required  
(3RH21 22-2K .40 coupling relays and contactor relays with extended operating range on request)

#### Positively-driven operation of contacts in contactor relays

##### 3RH2:

**Yes**, in the basic unit and the auxiliary switch block as well as between the basic unit and the front-mounted auxiliary switch block (removable) acc. to:

- ZH 1/457
- IEC 60947-5-1, Appendix L

##### 3RH22:

**Yes**, in the basic unit and the auxiliary switch block as well as between the basic unit and the snap-on auxiliary switch block (permanently mounted) acc. to:

- ZH 1/457
- IEC 60947-5-1, Appendix L

##### Note:

3RH29 11-.NF. solid-state compatible auxiliary switch blocks have no positively-driven contacts.

##### Explanations:

There is positively-driven operation if it is ensured that the NC and NO contacts cannot be closed at the same time.

##### ZH1/457

Safety Rules for Controls on Power-Operated Metalworking Presses.

##### IEC 60947-5-1, Appendix L

Low-Voltage Controlgear, Controls and Contact Blocks. Special requirements for positively-driven contacts

#### Contact reliability

Contact reliability at 17 V, 1 mA acc. to IEC 60947-5-4

Frequency of contact faults  $< 10^{-8}$  i.e.  $< 1$  fault per 100 million operating cycles

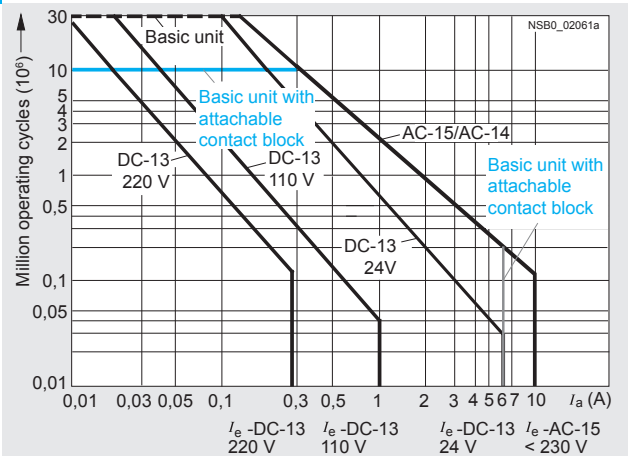
#### Contact endurance for AC-15/AC-14 and DC-13 utilization categories

The contact endurance is mainly dependent on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

If magnetic circuits other than the contactor coil systems or solenoid valves are present, e.g. magnetic brakes, protective measures for the load circuits are necessary, e.g. in the form of RC elements and free-wheel diodes.

The characteristic curves apply to:

- 3RH21/3RH22 contactor relays
- 3RH24 latched contactor relays
- 3RH29 11 auxiliary switch blocks<sup>1)</sup>
- Auxiliary switch blocks for snapping onto the front, max. 4-pole and for mounting onto the side in size S00



##### Diagram legend:

$I_a$  = Breaking current  
 $I_e$  = Rated operational current

<sup>1)</sup>  $I_e$  = 6 A for AC-15/AC-14.



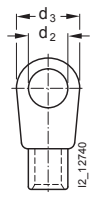
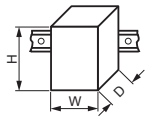
# Control Relays

## 3RH2 control relays – size S00

Type			3RH21	3RH22	3RH24
Size			<b>S00</b>	<b>S00</b>	<b>S00</b>
Dimensions (W x H x D) with screw terminals		mm	45 x 57.5 x 73	--	90 x 57.5 x 73
• With mounted auxiliary switch block		mm	45 x 57.5 x 116	45 x 57.5 x 116	--

General technical specifications					
<b>Mechanical endurance</b>					
• Basic units	Operating cycles		30 million		5 million
• Basic unit with snap-on auxiliary switch block	Operating cycles		10 million		
• Solid-state compatible auxiliary switch block	Operating cycles		5 million		
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V		690		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV		6		
<b>Protective separation</b> between the coil and the contacts in the basic unit acc. to IEC 60947-1, Appendix N	V		400		
<b>Permissible ambient temperature</b>					
• During operation	°C		-25 ... +60		
• During storage	°C		-55 ... +80		
<b>Degree of protection</b> acc. to IEC 60947-1, Appendix C			IP20, coil assembly IP40		
<b>Touch protection</b> acc. to EN 50274			Finger-safe		
<b>Shock resistance</b>					
• Rectangular pulse	- AC operation	g/ms	7.3/5 and 4.7/10		
	- DC operation	g/ms	>10/5 and >5/10		
• Sine pulse	- AC operation	g/ms	11.4/5 and 7.3/10		
	- DC operation	g/ms	>15/5 and >8/10		
<b>Short-circuit protection</b>					
• Short-circuit test with fuse links of gG operational class: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current $I_k = 1$ kA acc. to IEC 60947-5-1	A		10		
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1	A		6		
<b>Conductor cross-sections</b>					
<b>Auxiliary conductors and coil terminals</b> (1 or 2 conductors can be connected)			<b>Screw terminals</b>		
• Solid	mm <sup>2</sup>		2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup> according to IEC 60947; max. 2 x (0.5 ... 4)		
• Finely stranded with end sleeve	mm <sup>2</sup>		2 x (0.5 ... 1.5) <sup>1)</sup> ; 2 x (0.75 ... 2.5) <sup>1)</sup>		
• AWG cables, solid or stranded	AWG		2 x (20 ... 16) <sup>1)</sup> ; 2 x (18 ... 14) <sup>1)</sup>		
• Terminal screw			M3 (for standard screwdriver size 2 or Pozidriv 2)		
- Tightening torque	Nm		0.8 ... 1.2 (7 ... 10.3 lb.in)		
<b>Auxiliary conductors and coil terminals</b> (1 or 2 conductors can be connected)			<b>Spring-type terminals</b>		
• Operating devices	mm		3.0 x 0.5; 3.5 x 0.5		
• Solid	mm <sup>2</sup>		2 x (0.5 ... 4)		
• Finely stranded with end sleeve	mm <sup>2</sup>		2 x (0.5 ... 2.5)		
• Finely stranded without end sleeve	mm <sup>2</sup>		2 x (0.5 ... 2.5)		
• AWG cables, solid or stranded	AWG		2 x (20 ... 12)		
<b>Auxiliary conductors for front and laterally mounted auxiliary switches</b>			<b>Ring terminal lug connection</b>		
• Operating devices	mm		3.0 x 0.5; 3.5 x 0.5		
• Solid	mm <sup>2</sup>		2 x (0.5 ... 2.5)		
• Finely stranded with end sleeve	mm <sup>2</sup>		2 x (0.5 ... 1.5)		
• Finely stranded without end sleeve	mm <sup>2</sup>		2 x (0.5 ... 2.5)		
• AWG cables, solid or stranded	AWG		2 x (20 ... 14)		
<b>Auxiliary conductor and coil terminals</b>			<b>Ring terminal lug connection</b>		
• Terminal screw	mm		M3, Pozidriv size 2		
• Operating devices	Nm		Ø 5 ... 6		
• Tightening torque	mm		0.8 ... 1.2		
• Usable ring terminal lugs	mm		$d_2 = \text{min. } 3.2$		
- DIN 46234 without insulation sleeve	mm		$d_3 = \text{max. } 7.5$		
- DIN 46225 without insulation sleeve					
- DIN 46237 with insulation sleeve					
- JIS C2805 Type R without insulation sleeve					
- JIS C2805 Type RAV with insulation sleeve					
- JIS C2805 Type RAP with insulation sleeve					



<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

**Note:**

Max. external diameter of the cable insulation: 3.6 mm.

Tool for opening the spring-type terminals  
see [Accessories, page 2/79](#).

An insulation stop must be used for conductor cross-sections ≤1 mm<sup>2</sup>, see [Accessories, page 2/79](#).

# Control Relays

## 3RH2 control relays – size S00

Contactor relays	Type	3RH2.
	Size	S00
<b>Control circuits</b>		
<b>Coil operating range</b>		
• AC operation	At 50 Hz	0.8 ... 1.1 x $U_s$
	At 60 Hz	0.85 ... 1.1 x $U_s$
• DC operation	At +50 °C	0.8 ... 1.1 x $U_s$
	At +60 °C	0.85 ... 1.1 x $U_s$
<b>Power consumption of the solenoid coils</b> (when coil is cold and 1.0 x $U_s$ )		
• AC operation, 50 Hz		
- Closing	VA/p.f.	37/0.8
- Closed	VA/p.f.	5.7/0.25
• AC operation, 60 Hz		
- Closing	VA/p.f.	33/0.75
- Closed	VA/p.f.	4.4/0.25
• DC operation (closing = closed)	W	4.0
<b>Permissible residual current of the electronics</b> (with 0 signal)		
• For AC operation <sup>1)</sup>		< 4 mA x (230 V/ $U_s$ )
• For DC operation		< 10 mA x (24 V/ $U_s$ )
<b>Operating times<sup>2)</sup></b>		
Total break time = OFF-delay + Arcing time		
Values apply with coil in cold state and at operating temperature for operating range		
<u>AC operation</u>		
• Closing		
- ON-delay of NO contact	With 0.8 ... 1.1 x $U_s$ ms	8 ... 33
	With 1.0 x $U_s$ ms	9 ... 22
	3RH24 minimum operating time ms	≥ 35
- OFF-delay of NC contact	With 0.8 ... 1.1 x $U_s$ ms	6 ... 25
	With 1.0 x $U_s$ ms	6.5 ... 19
• Opening		
- OFF-delay of NO contact	With 0.8 ... 1.1 x $U_s$ ms	4 ... 15
	With 1.0 x $U_s$ ms	4.5 ... 15
	3RH24 minimum operating time ms	≥ 30
- ON-delay of NC contact	With 0.8 ... 1.1 x $U_s$ ms	5 ... 15
	With 1.0 x $U_s$ ms	5 ... 15
<u>DC operation</u>		
• Closing		
- ON-delay of NO contact	With 0.8 ... 1.1 x $U_s$ ms	30 ... 100
	With 1.0 x $U_s$ ms	35 ... 50
	3RH24 minimum operating time ms	≥ 100
- OFF-delay of NC contact	With 0.8 ... 1.1 x $U_s$ ms	25 ... 90
	With 1.0 x $U_s$ ms	30 ... 45
• Opening		
- OFF-delay of NO contact	With 0.8 ... 1.1 x $U_s$ ms	7 ... 13
	With 1.0 x $U_s$ ms	7 ... 12
	3RH24 minimum operating time ms	≥ 30
- ON-delay of NC contact	With 0.8 ... 1.1 x $U_s$ ms	13 ... 19
	With 1.0 x $U_s$ ms	13 ... 18
• Arcing time		10 ... 15

Dependence of the switching frequency  $z'$  on the operational current  $I'$  and operational voltage  $U'$ :  
 $z' = z \cdot I_0 / I' \cdot (U_0 / U')^{1.5} \cdot 1/h$

1) The 3RT29 16-1GA00 additional load module is recommended for higher residual currents (see page 2/74).

2) The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assembly 2 to 6 times, varistor +2 to 5 ms).

# Coupling Relays

## 3RH2 control relays – size S00

Contactor relays	Type	3RH2.	
	Size	S00	
<b>Load side</b>			
<b>AC capacity</b>			
<b>Rated operational currents <math>I_e</math></b>			
AC-12	A	10	
AC-15/AC-14 for rated operational voltage $U_s$	Up to 230 V	A	6
	400 V	A	3
	500 V	A	2
	690 V	A	1
<b>Load rating with DC</b>			
<b>Rated operational currents <math>I_e</math></b>			
DC-12 for rated operational voltage $U_s$			
• 1 conducting path	24 V	A	6
	60 V	A	6
	110 V	A	3
	220 V	A	1
	440 V	A	0.3
	600 V	A	0.15
• 2 conducting paths in series	24 V	A	10
	60 V	A	10
	110 V	A	4
	220 V	A	2
	440 V	A	1.3
	600 V	A	0.65
• 3 conducting paths in series	24 V	A	10
	60 V	A	10
	110 V	A	10
	220 V	A	3.6
	440 V	A	2.5
	600 V	A	1.8
DC-13 for rated operational voltage $U_s$			
• 1 conducting path	24 V	A	6
	60 V	A	2
	110 V	A	1
	220 V	A	0.3
	440 V	A	0.14
	600 V	A	0.1
• 2 conducting paths in series	24 V	A	10
	60 V	A	3.5
	110 V	A	1.3
	220 V	A	0.9
	440 V	A	0.2
	600 V	A	0.1
• 3 conducting paths in series	24 V	A	10
	60 V	A	4.7
	110 V	A	3
	220 V	A	1.2
	440 V	A	0.5
	600 V	A	0.26
<b>Switching frequency</b>			
<b>Switching frequency <math>z</math> in operating cycles/hour</b>			
• For rated operation	AC-12/DC-12	$h^{-1}$	1000
• For utilization category	AC-15/AC-14	$h^{-1}$	1000
	DC-13	$h^{-1}$	1000
• No-load switching frequency		$h^{-1}$	10000
Dependence of the switching frequency $z'$ on the operational current $I'$ and operational voltage $U'$ : $z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$			
<b>Ⓢ and Ⓜ rated data</b>			
<b>Basic units and auxiliary switch blocks</b>			
• Rated control supply voltage	V AC	max. 600	
• Rated voltage	V AC	600	
• Switching capacity		A 600, Q 600	
• Uninterrupted current at 240 V AC	A	10	

# Control Relays

## SIRIUS 3RH21 coupling relays for switching auxiliary circuits, 4-pole

### Technical specifications

All technical specifications not mentioned in the table below are identical to those of the 3RH21 contactor relays (see page 5/6).

Contactor type	3RH21 ...HB40	3RH21 ...JB40	3RH21 ...KB40
Size	S00	S00	S00
<b>Control circuits</b>			
<b>Coil operating range</b>	0.7 ... 1.85 x U <sub>s</sub>		
<b>Power consumption of the solenoid coil</b> (for cold coil) Closing = Closed			
• At U <sub>s</sub> = 17 V	W	1.4	
• At U <sub>s</sub> = 24 V	W	2.8	
• At U <sub>s</sub> = 30 V	W	4.4	
<b>Permissible residual current</b> of the electronics for 0 signal	< 10 mA x (24 V/U <sub>s</sub> )		
<b>Overvoltage configuration of the solenoid coil</b>	No overvoltage damping 	With diode 	With suppressor diode 
<b>Operating times</b>			
• <b>Closing</b> at 17 V			
- ON-delay NO	ms	40 ... 130	
- OFF-delay NC	ms	30 ... 80	
• At 24 V			
- ON-delay NO	ms	35 ... 60	
- OFF-delay NC	ms	25 ... 40	
• At 30 V			
- ON-delay NO	ms	25 ... 50	
- OFF-delay NC	ms	15 ... 30	
• <b>Opening</b> at 17 ... 30 V			
- OFF-delay NO	ms	7 ... 20	38 ... 65
- ON-delay NC	ms	20 ... 30	55 ... 75
<b>Upright mounting position</b>	Request required		

Contactor type	3RH21 ...MB40-0KT0	3RH21 ...VB40	3RH21 ...WB40
Size	S00	S00	S00
<b>Control circuits</b>			
<b>Coil operating range</b>	0.85 ... 1.85 x U <sub>s</sub>		
<b>Power consumption of the solenoid coil</b> (for cold coil) Closing = Closed at U <sub>s</sub> = 24 V	W	1.6	
<b>Permissible residual current</b> of the electronics for 0 signal	< 8 mA x (24 V/U <sub>s</sub> )		
<b>Overvoltage configuration of the solenoid coil</b>	Diode, varistor or RC element, attachable 	Built-in diode 	Built-in suppressor diode 

<b>Control circuits</b>			
<b>Operating times</b>			
• Closing at 20.5 V			
- ON-delay NO	ms	30 ... 120	
- OFF-delay NC	ms	20 ... 110	
• At 24 V			
- ON-delay NO	ms	25 ... 90	
- OFF-delay NC	ms	15 ... 80	
• At 44 V			
- ON-delay NO	ms	15 ... 60	
- OFF-delay NC	ms	10 ... 50	
• Closing at 17 ... 30 V			
- OFF-delay NO	ms	5 ... 20	20 ... 80
- ON-delay NC	ms	10 ... 30	30 ... 90
<b>Upright mounting position</b>	Request required		

# 3RT Contactors

## 3RT2 and 3RH2 contactors and relays

### Terminal designations and identification numbers for auxiliary contacts

#### Terminal designations

The terminal designations are 2-digit, e.g. 13, 14, 21, 22:

- Tens digit: Sequence digit
  - Related terminals have the same sequence digit
- Units digit: Function digit
  - 1-2 for normally closed contacts (NC)
  - 3-4 for normally open contacts (NO)

#### Identification numbers

The identification number indicates the number and type of the auxiliary contacts, e.g. 40, 31, 22, 13:

- 1st digit: number of normally open contacts (NO)
- 2nd digit: number of normally closed contacts (NC)

Examples:

- 31 = 3 NO + 1 NC
- 40 = 4 NO

### Selection guide for mountable auxiliary switch blocks for power contactors and contactor relays

The auxiliary switch blocks of the 3RH29 series for mounting on the front and side can be used for power contactors as well as for contactor relays.

Where the columns and lines intersect (blue and green in the example) you will find the identification number for the combination of basic unit (column) and auxiliary switch block (line).

The possible combinations of basic unit and mounted auxiliary switch block can be found in the tables below.

Auxiliary contacts		Version		3-pole contactors			Order No.
				3RT20 1 S00	3RT20 1 S00	3RT20 2 S0	
NO	NC	10	01	11			
				2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	
				According to EN 50012 <sup>1)</sup>			
Auxiliary switches without NO contact							
--	1		11	02	12		<b>3RH29 11-.-HA01</b>
--	2		12	03	13		<b>3RH29 11-.-HA02</b>
--	3		13	04	14		<b>3RH29 11-.-HA03</b>
--	4		14	--	--		<b>3RH29 11-.-FA04</b>
Auxiliary switch with 1 NO contact							
1	--		20	11	21		<b>3RH29 11-.-HA10</b>
1	1		21	12	22		<b>3RH29 11-.-HA11</b>

1) Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Type	Example 1	Example 2
Type	<b>3RT20 motor contactor, S00 with 1 NO</b>	<b>3RT20 motor contactor, S0 with 1 NO + 1 NC</b>
Sequence digit	2. 3. 4. 5.	3. 4. 5. 6.
Type	<b>Auxiliary switch with 4 NC, 3RH29 11-.-FA04</b>	<b>Auxiliary switch with 3 NC, 3RH29 11-.-HA03</b>
Function digit	.1 .1 .1 .1 .2 .2 .2 .2	.1 .1 .1 .2 .2 .2
Type	<b>3RT20 motor contactor, S00 with auxiliary switch block</b>	<b>3RT20 motor contactor, S0 with auxiliary switch block</b>
Terminal design.	13 21 31 41 51 14 22 32 42 52	13 21 31 41 51 14 22 32 42 52
Type	<b>Ident. No. 14</b>	<b>Ident. No. 14</b>

# 3RT Contactors

## 3RT2 and 3RH2 contactors and relays

### Additional auxiliary switch blocks



Auxiliary contacts Version NO NC	3-pole contactors			4-pole contactors				Contactor relays			Order No.	
	S00 3RT20 1 10	3RT20 1 01	S0 3RT20 2 11	S00 3RT23 1 --	3RT25 1 --	S0/S2 3RT23 11	3RT25 11	S00 3RH21, 3RH24 40E	3RH21, 3RH24 31E	3RH21, 3RH24 22E		
	2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8	5. 6. 7. 8		
Front auxiliary switches	According to EN 50012 <sup>1)</sup>			According to EN 50012 <sup>1)</sup>				According to EN 50011 <sup>1)</sup>				
<b>Without NO contact</b>												
-- 1		11	02	12	01	01	12	12	41X	32X	23X	<b>3RH29 11-.HA01</b>
-- 2		12	03	13	02	02	13	--	42E	33X	24	<b>3RH29 11-.HA02</b>
-- 3		13	04	14	03	--	--	--	43	34	--	<b>3RH29 11-.HA03</b>
-- 4		14	--	--	--	--	--	--	44E	--	--	<b>3RH29 11-.FA04</b>
<b>With 1 NO contact</b>												
1 --		20	11	21	10	10	21	21	50E	41E	32E	<b>3RH29 11-.HA10</b>
1 1		21	12	22	11	11	22	22	51X	42X	33X	<b>3RH29 11-.HA11</b>
1 2		22	13	23	12	12	23	--	52	43	34	<b>3RH29 11-.HA12</b>
1 3		23	14	24	13	--	--	--	53X	44X	--	<b>3RH29 11-.HA13</b>
<b>With 2 NO contacts</b>												
2 --		30	21	31	20	20	31	31	60E	51X	42X	<b>3RH29 11-.HA20</b>
2 1		31	22	32	21	21	32	32	61	52	43	<b>3RH29 11-.HA21</b>
2 2		32	23	33	22	22	33	--	62X	53	44X	<b>3RH29 11-.HA22</b>
2 2		32	23	33	22	22	33	--	62X	53	44X	<b>3RH29 11-.FA22</b>

<sup>1)</sup> Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

# 3RT Contactors

## 3RT2 and 3RH2 contactors and relays

CONTACTORS AND ASSEMBLIES 2

### Additional auxiliary switch blocks

Auxiliary contacts Version NO NC	3-pole contactors			4-pole contactors				Contactor relays			Order No.	
	S00 3RT20 1 10	S00 3RT20 1 01	S0 3RT20 2 11	S00 3RT23 1 --	S00 3RT25 1 --	S0/S2 3RT23 11	S0/S2 3RT25 11	S00 3RH21, 3RH24 40E   31E   22E				
	2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8	5. 6. 7. 8		
	According to EN 50012 <sup>1)</sup>			According to EN 50012 <sup>1)</sup>				According to EN 50011 <sup>1)</sup>				
<b>Front auxiliary switches with 3 NO contacts</b>												
3 --		40	31	41	30	30	41	41	70	61	52	3RH29 11-.HA30
3 1		41	32	42	31	31	42	42	71X	62X	53X	3RH29 11-.HA31
<b>Front auxiliary switches with 4 NO contacts</b>												
4 --		50	41	51	40	40	51	51	80E	71X	62X	3RH29 11-.FA40
		Acc. to EN 50005			Acc. to EN 50005				Acc. to EN 50005			
<b>Front auxiliary switches with make-before-break</b>												
-- 1		21	12	22	11	11	22	22	51	42	33	3RH29 11-.FB11
-- 2		32	23	33	22	22	33	--	62	53	44	3RH29 11-.FB22
-- 3		32	23	33	22	22	33	--	62	53	44	3RH29 11-.FC22
<b>Front auxiliary switches with complete inscription<sup>2)</sup></b>												
1 --		20	11	21	10	10	21	21	50	41	32	3RH29 11-1AA10
1 --		20	11	21	10	10	21	21	50	41	32	3RH29 11-1BA10
-- 1		11	02	12	01	01	12	12	41	32	23	3RH29 11-1AA01
-- 1		11	02	12	01	01	12	12	41	32	23	3RH29 11-1BA01
1 1		21	12	22	11	11	22	22	51	42	33	3RH29 11-1LA11
1 1		21	12	22	11	11	22	22	51	42	33	3RH29 11-1MA11
2 --		30	21	31	20	20	31	31	60	51	42	3RH29 11-1LA20
2 --		30	21	31	20	20	31	31	60	51	42	3RH29 11-1MA20

<sup>1)</sup> Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005. <sup>2)</sup> Terminals from the top or bottom.



# 3RT Contactors

## 3RT2 and 3RH2 contactors and relays

### Additional auxiliary switch blocks

Auxiliary contacts Version NO NC	3-pole contactors			4-pole contactors				Contactor relays			Order No.
	S00 3RT20 1 10	S0 3RT20 1 01	S0 3RT20 2 11	S00 3RT23 1 --	S0 3RT25 1 --	S0/S2 3RT23 11	S0/S2 3RT25 11	S00 3RH21, 3RH24 40E	S00 3RH21, 3RH24 31E	S00 3RH21, 3RH24 22E	
	2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8.	5. 6. 7. 8.	5. 6. 7. 8.	
	Acc. to EN 50005			Acc. to EN 50005				According to EN 50011 <sup>1)</sup>			

### Front auxiliary switches with complete inscription (for contactor relays)

4 --		--	--	--	--	--	--	--	80E	--	--	<b>3RH29 11-GA40</b>
3 1		--	--	--	--	--	--	--	71E	--	--	<b>3RH29 11-GA31</b>
2 2		--	--	--	--	--	--	--	62E	--	--	<b>3RH29 11-GA22</b>
1 3		--	--	--	--	--	--	--	53E	--	--	<b>3RH29 11-GA13</b>
-- 4		--	--	--	--	--	--	--	44E	--	--	<b>3RH29 11-GA04</b>

### Front auxiliary switches with complete inscription, special version

4 --		50	41	51	40	40	51	51	80E	71X	62X	<b>3RH29 11-XA40-0MA0</b>
3 1		41	32	42	31	31	42	42	71E	62X	53	<b>3RH29 11-XA31-0MA0</b>
2 2		32	23	33	22	22	33	--	62E	53	44X	<b>3RH29 11-XA22-0MA0</b>
-- 4		14	--	--	--	--	--	--	44E	--	--	<b>3RH29 11-XA04-0MA0</b>

### Front auxiliary switches, Solid-state compatible

-- 2		12	03	13	02	02	13	--	42	33	24	<b>3RH29 11-NF02</b>
1 1		21	12	22	11	11	22	22	51	42	33	<b>3RH29 11-NF11</b>
2 --		30	21	31	20	20	31	31	60	51	42	<b>3RH29 11-NF20</b>

<sup>1)</sup> Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

# 3RT Contactors

## 3RT2 and 3RH2 contactors and relays

CONTACTORS AND ASSEMBLIES 2

### Additional auxiliary switch blocks

Auxiliary contacts		3-pole contactors			4-pole contactors				Contactor relays			Order No.	
Version		S00		S0		S0/S2		S00					
NO	NC	3RT20 1	3RT20 1	3RT20 2	3RT23 1	3RT25 1	3RT23	3RT25	3RH21, 3RH24	40E	31E	22E	
		10	01	11	--	--	11	11					
		13 14	21 22	13 21 14 22			13 21 14 22	13 21 14 22	13 23 33 43 14 24 34 44	13 21 33 43 14 22 34 44	13 21 31 43 14 22 32 44		
Left	Right	2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8	5. 6. 7. 8		
		According to EN 50012 <sup>1)</sup>			According to EN 50012 <sup>1)</sup>				According to EN 50011 <sup>1)</sup>				
<b>Lateral auxiliary switches for size S00</b>													
--	2				12	--	--	02	02	--	--	--	3RH29 11-.DA02
--	2				14	--	--	--	--	--	--	--	3RH29 11-.DA02
1	1				21	--	--	11	11	--	--	--	3RH29 11-.DA11
1	1				32	--	--	22	22	--	--	--	3RH29 11-.DA11
2	--				30	--	--	20	20	--	--	--	3RH29 11-.DA20
2	--				50	--	--	40	40	--	--	--	3RH29 11-.DA20
2	--				41	--	--	31	31	--	--	--	3RH29 11-.DA20 + 3RH29 11-.DA11
2	--				32	--	--	22	22	--	--	--	3RH29 11-.DA20 + 3RH29 11-.DA02
1	1				23	--	--	13	--	--	--	--	3RH29 11-.DA11 + 3RH29 11-.DA02
<b>Lateral auxiliary switches for size S0</b>													
--	2				12	03	13	02	02	13	--	--	3RH29 21-.DA02
--	2				14	--	--	--	--	--	--	--	3RH29 21-.DA02
1	1				21	12	22	11	11	22	22	--	3RH29 21-.DA11
1	1				32	23	33	22	22	33	--	--	3RH29 21-.DA11
2	--				30	21	31	20	20	31	31	--	3RH29 21-.DA20
2	--				50	41	51	40	40	51	51	--	3RH29 21-.DA20

<sup>1)</sup> Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

# 3RT Contactors

## 3RT2 and 3RH2 contactors and relays

### Additional auxiliary switch blocks

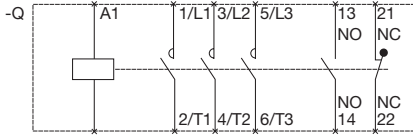
Auxiliary contacts Version NO NC		3-pole contactors			4-pole contactors				Contactor relays			Order No.	
		S00 3RT20 1 10	3RT20 1 01	S0 3RT20 2 11	S00 3RT23 1	3RT25 1	S0/S2 3RT23 11	3RT25 11	S00 3RH21, 3RH24 40E	31E	22E		
Left	Right	2. 3. 4. 5. 5. 6. 7. 8. 3. 4. 5. 6. According to EN 50012 <sup>1)</sup>			1. 2. 3. 4. 1. 2. 3. 4. 3. 4. 5. 6. 3. 4. 5. 6. According to EN 50012 <sup>1)</sup>				5. 6. 7. 8. 5. 6. 7. 8. 5. 6. 7. 8. According to EN 50011 <sup>1)</sup>				
<b>Lateral auxiliary switches for size S0, S00</b>													
2	--		41	32	42	31	31	42	42	--	--	--	<b>3RH29 21-DA20 + 3RH29 21-DA11</b>
1	1		32	23	33	22	22	33	--	--	--	--	<b>3RH29 21-DA20 + 3RH29 21-DA02</b>
1	1		23	14	24	13	--	--	--	--	--	--	<b>3RH29 21-DA11 + 3RH29 21-DA02</b>
--	2		--	--	--	--	--	--	--	42Z	33X	24	<b>3RH29 21-DA02</b>
1	1		--	--	--	--	--	--	--	51X	42X	33X	<b>3RH29 21-DA11</b>
2	--		--	--	--	--	--	--	--	60Z	51X	42X	<b>3RH29 21-DA20</b>
<b>Lateral auxiliary switches, Solid-state compatible for size S00</b>													
1	1		21	--	--	11	11	--	--	--	--	--	<b>3RH29 11-2DE11</b>
1	1		32	--	--	22	22	--	--	--	--	--	<b>3RH29 11-2DE11</b>
<b>Lateral auxiliary switches, Solid-state compatible for size S0, S00</b>													
1	1		21	12	22	11	11	22	22	--	--	--	<b>3RH29 21-2DE11</b>
1	1		32	23	33	22	22	33	--	--	--	--	<b>3RH29 21-2DE11</b>
<b>Lateral auxiliary switches, Solid-state compatible for contactor relays</b>													
1	1		--	--	--	--	--	--	--	51X	42X	33X	<b>3RH29 21-DE11</b>

<sup>1)</sup> Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

**Internal circuit diagrams (applicable to screw, spring and ring lug connection)**

**Sizes S3 to S12**  
**Terminal designations according to EN 50 012**

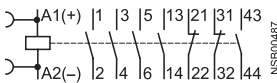
**3RT10 4 to 3RT10 7, 3RT12, 3RT14 contactors**



**3RT10 4 to 3RT10 7, 3RT14 contactors**

With 3RH19 21-. HA22 4-pole auxiliary contact block, mountable on the front

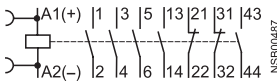
**2 NO + 2 NC**  
 Ident. no. 22E



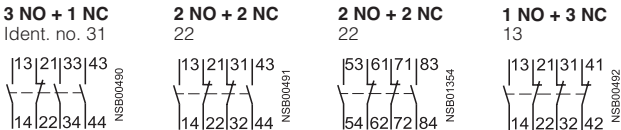
**3RT1. 5, 3RT1. 6, 3RT1. 7 contactors** (sizes S6, S10, S12)

With 3RH19 21-1DA11 2-pole auxiliary switch blocks, laterally mountable

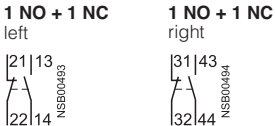
**2 NO + 2 NC**



**3RH19 21-. HA../XA..4-pole auxiliary switch blocks, for snapping onto the front<sup>2)</sup>**

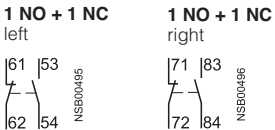


**3RH19 21-. DA11, 3RH19 21-2DE11 first laterally mountable auxiliary switch block (solid-state compatible)**



**3RH19 21-. JA11, 3RH19 21-2JE11 second laterally mountable auxiliary switch block (solid-state compatible)**

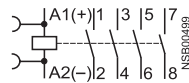
(only for sizes S3 to S12)



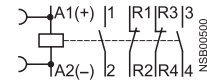
**Contactor with 4 main contacts, sizes S3**  
**Terminal designations acc. to EN 50 005**

**3RT13/23 and 3RT15/25 contactors**

**4 NO**



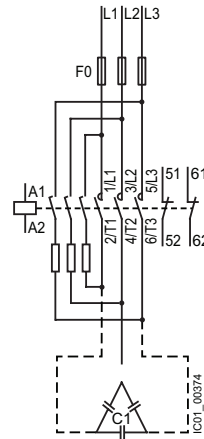
**2 NO + 2 NC**



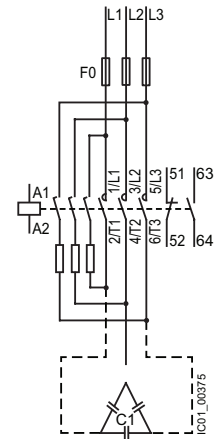
(3RH19 21 auxiliary switch blocks acc. to EN 50 005 can be snapped on)

**3RT26 capacitor contactors**

Size S00



Sizes S0 and S2



**Surge suppressor** (plug-in direction coded; exception: marked +/- for 3RT19 16-1T... diode assembly) **for sizes S2 to S3**



1) 3RH29 auxiliaries are intended to be used only with 3RT2 or 3RH2 base devices.  
 3RH19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.  
 2) Not for 3RT12. vacuum contactors

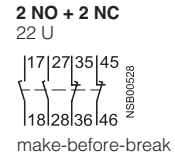
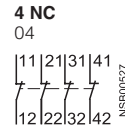
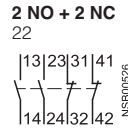
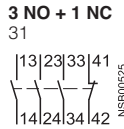
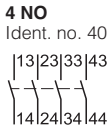
# 3RT1 Contactors

## 3RT1 contactors and accessories

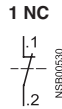
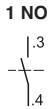
**Internal circuit diagrams (applicable to screw connection and Spring-type terminal connection)**

**Accessories for size S6<sup>1)</sup> to S12 contactors**  
**Terminal designations acc. to EN 50 005**

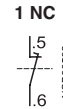
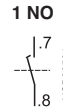
**3RH19 21-.F..., 4-pole,**  
 for snapping onto the front <sup>1)</sup>



**3RH19 21-.CA.. auxiliary switch blocks, single-pole,**  
 for snapping onto the front <sup>2)</sup>



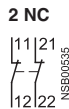
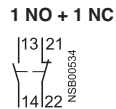
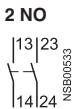
**3RH19 21-1CD.. auxiliary switch blocks, single-pole,**  
 with make-before-break contacts, for snapping onto the front <sup>1)</sup>



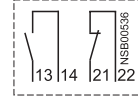
(terminal designations according to EN 50 005 or EN 50 012)

**Accessories for size S0 to S12 contactors**  
**Terminal designations acc. to EN 50 005**

**3RH19 21-1LA.. and 3RH19 21-1MA.. auxiliary switch block, 2-pole,**  
 for snapping onto the front <sup>1)</sup>  
 cable entry from above or below



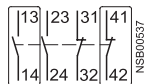
**Internal wiring**



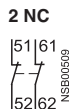
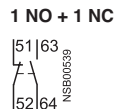
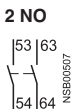
Example: 1 NO + 1 NC,  
 cable entry from below

**3RH19 21-.FE22 solid-state compatible auxiliary switch block, 4-pole,**  
 for snapping onto the front <sup>1)</sup>

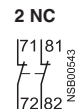
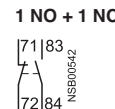
**2 NO + 2 NC**  
 Ident. no. 22



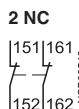
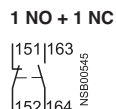
**3RH19 21-.EA.. first laterally mountable auxiliary switch blocks (left)**



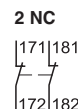
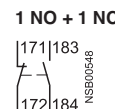
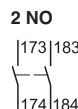
**3RH19 21-.EA.. first laterally mountable auxiliary switch blocks (right)**



**3RH19 21-.KA.. second laterally mountable auxiliary switch blocks (left)**  
 (only for sizes S3 to S12)



**3RH19 21-.KA.. second laterally mountable auxiliary switch blocks (right)**  
 (only for sizes S3 to S12)



1) RH29 auxiliaries are intended to be used only with 3RT2 or 3RH2 base devices.  
 3RH19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.

2) Not for 3RT12. vacuum contactors

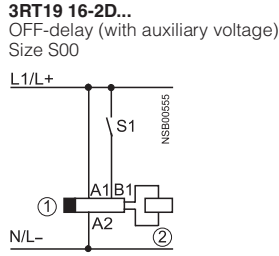
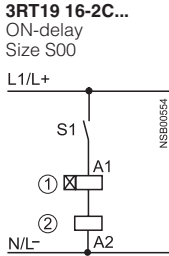
# 3RT Contactors and 3RH2 Control Relays

Accessories for size S00 to S3

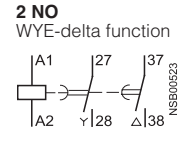
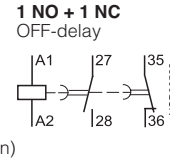
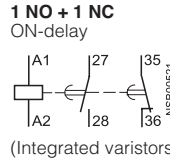
## Circuit diagrams

### Accessories for size S3 contactors and control relays

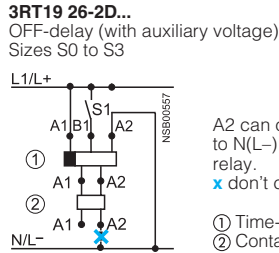
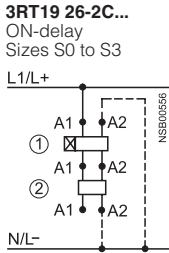
**Solid-state time-delay blocks**  
(see configuring aid on page 2/38)



**Sizes S2 to S12**  
**3RT19 16-2E.../2F.../2G... solid-state, time-delay auxiliary switch blocks**



(Integrated varistors not shown)



A2 can only be connected to N(L-) via the time-delay relay.  
x don't connect

- ① Time-delay block
- ② Contactor

A2 can be connected to N(L-) via either the contactor or the time-delay relay.  
- - - optional connection

Designation	Circuit diagram
3RA2811-.CW10 ON-delay	
3RA2812-.DW10 OFF-delay with auxiliary voltage	
3RA2813-.AW10 ON-delay, 1 CO contact	
3RA2813-.FW10 ON-delay, 1 NC contact/ 1 NO contact	

Designation	Circuit diagram
3RA2814-.AW10 OFF-delay, 1 CO contact	
3RA2814-.FW10 OFF-delay with auxiliary voltage, 1 NC contact/ 1 CO contact	
3RA2815-.AW10 OFF-delay without auxiliary voltage, 1 CO contact	
3RA2815-.FW10 OFF-delay without auxiliary voltage, 1 NC contact/ 1 NO contact	

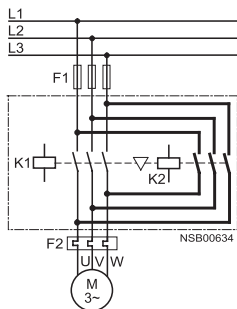
3RT29 accessories are intended to be used only with 3RT2 or 3RH2 base devices.  
3RT19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.

# 3RA Contactor Assemblies

## 3RA23 contactor assemblies for reversing

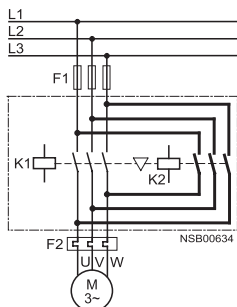
### Circuit diagrams

#### Size S00 to S0 Main circuit



The 3RA2913-2AA. (S00) and 3RA2913-2AA (S0) installation kit contains wiring connectors for connecting the main conducting paths, the mechanical interlock and two connecting clips for the contactors.

#### Sizes S2 to S3 Main circuit

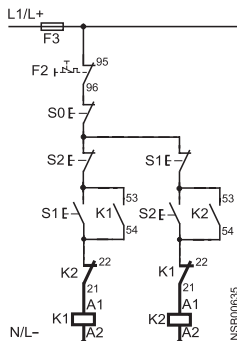


The 3RA19 3-2A installation kits contain, among other things, the wiring connectors on the top and bottom for connecting the main conducting paths.

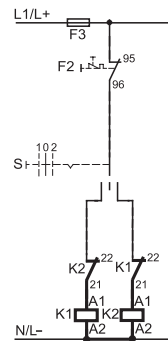
#### Control circuit (sizes S00 and S0)

(terminal designations of contactors according to EN 50 012)

##### for momentary-contact operation



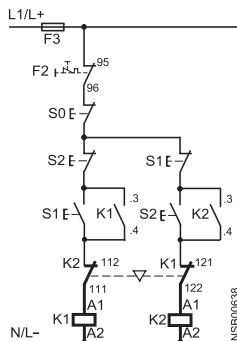
##### for maintained-contact operation



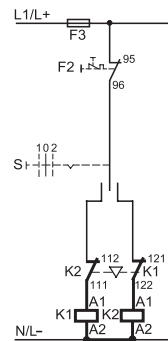
#### Control circuit

(terminal designations of contactors according to EN 50 005)

##### for momentary-contact operation



##### for maintained-contact operation



The 3RA19 24-2B mechanical interlock contains one NC contact for the NC contact interlock for each contactor

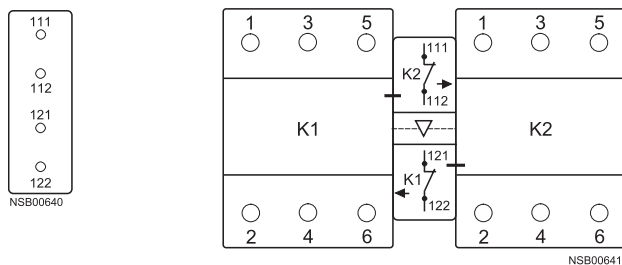
### Position of terminals

#### Sizes S2 to S3

#### Terminal designations according to EN 50 005

3RA19 24-2B mechanical interlock (laterally mountable), integrated in reversing contactor assemblies (reversing starters), contains one NC contact for the electrical interlock for each contactor

#### 2 NC



- S0 "OFF" button
- S1 "Clockwise ON" button
- S2 "Counterclockwise ON" button
- S "CW-OFF-CCW" button

- K1 Clockwise contactor
- K2 Counterclockwise contactor

- F1 Fuses for main circuit
- F3 Fuses for control circuit
- F2 Overload relay

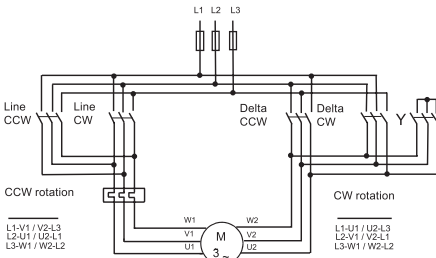


# 3RA Contactor Assemblies

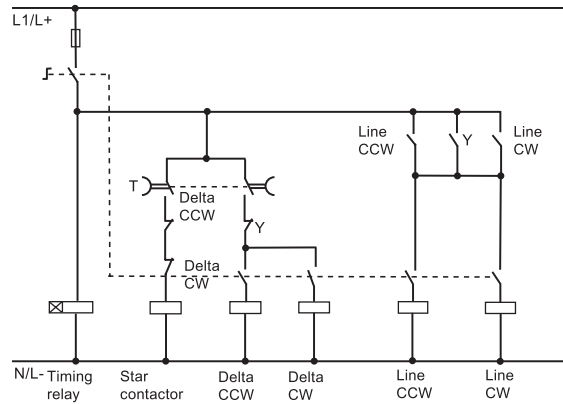
## Circuit Diagrams for WYE-delta switching

### Circuit diagrams

#### Size S00 / S0 Main circuit

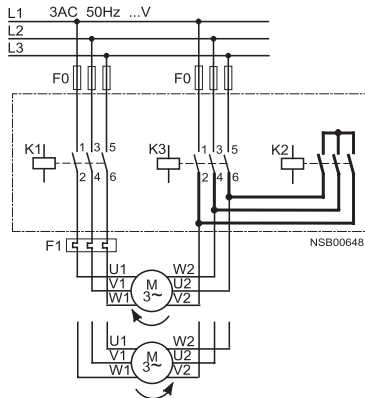


#### Control circuits with 3RA2816-0EW20 function module (set of three) snapped onto the front

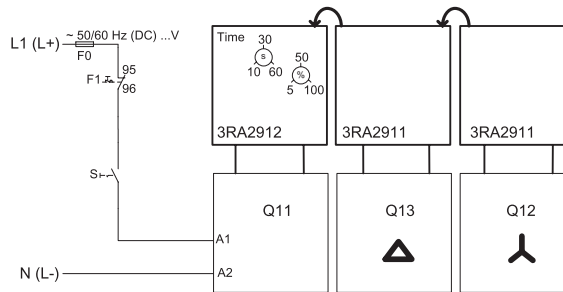


#### Sizes S2 to S3 Main circuit

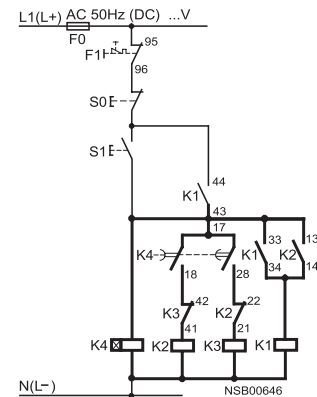
##### Sizes S2 and S3



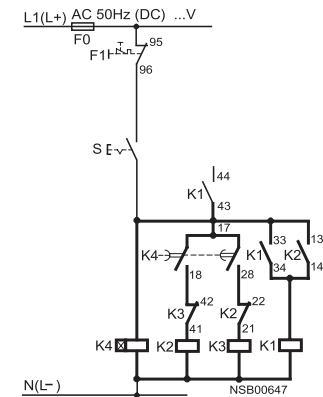
#### 3RA2816-0EW20



#### Control circuits with 3RP15 7. time-delay relay, laterally mounted (typical circuits) for momentary-contact operation



#### for maintained-contact operation



Contact element 17/18 is only closed on the star step; the contact element is open on the delta step and when de-energized.

- S0 "OFF" button
- S1 "ON" button
- S Maintained-contact switch

- K1 Line contactor
- K2 Star contactor
- K3 Delta contactor
- K4 Solid-state, time-delay auxiliary switch block or time-delay relay
- F0 Fuses
- F1 Overload relay

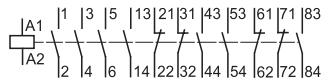
# 3T Contactors

## 3TF68 and 3TF69 vacuum contactors

### Internal circuit diagrams

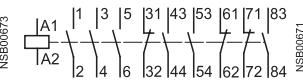
#### 3TF68 44 and 3TF69 44 contactors

**4 NO + 4 NC**  
AC operation  
max. complement of auxiliary switches



#### 3TF68 33 and 3TF69 33 contactors

**3 NO + 3 NC**  
DC operation  
max. complement of auxiliary switches



#### Auxiliary switch blocks 3TY7 681-1G

for coil reconnection, 3TF68 and 3TF69, DC economy circuit



#### Auxiliary switch blocks 3TY7 561-1AA00

first auxiliary switch block  
left or right mounted on left mounted on right



#### Auxiliary switch blocks 3TY7 561-1KA00

second auxiliary switch block  
left or right mounted on left mounted on right



#### Auxiliary switch blocks 3TY7 561-1EA00

with make-before-break contacts  
mounted on left mounted on right



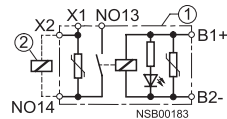
#### Auxiliary switch blocks 3TY7 561-1.

solid-state compatible aux. switch block  
mounted on left mounted on right



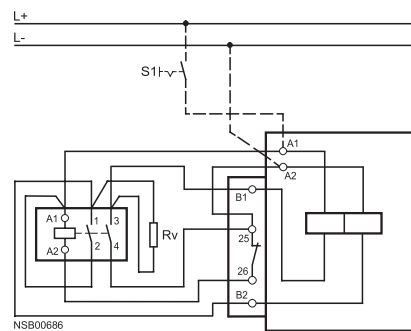
#### Interface for control by PLC 3TX7 090-0D

with surge suppression



### Circuit diagrams for DC economy circuit - maintained-contact operation

#### 3TF68 33 and 3TF69 33 contactors



Terminal designations according to EN 50 012.

# Coupling Relays

## 3RH21 coupling for switching auxiliary circuits

### Terminal diagrams

#### DC operation

L+ is to be connected to coil terminal A1.

**3RH21 coupling relays for auxiliary circuits, size S00**

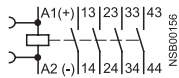
**Terminal designations according to EN 50 011**

(it is not possible to snap on an auxiliary switch block)

Surge suppressor can be mounted

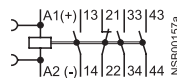
#### 4 NO

Ident no.: 40E



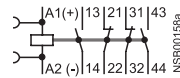
#### 3 NO + 1 NC

31E



#### 2 NO + 2 NC

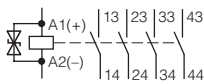
22E



### Suppressor Diode integrate

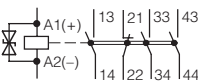
#### 4 NO

Ident no.:40E



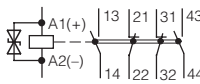
#### 3 NO + 1 NC

31E



#### 2 NO + 2 NC

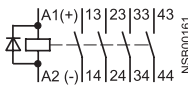
22E



### Diode integrated

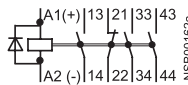
#### 4 NO

Ident no.:40E



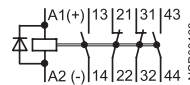
#### 3 NO + 1 NC

31E



#### 2 NO + 2 NC

22E



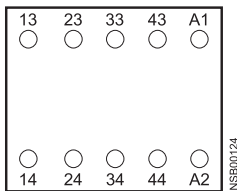
### Position of terminals

#### Size S00

#### 3RH21 coupling relays

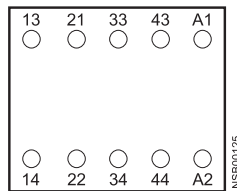
#### 4 NO

Ident no.: 40E



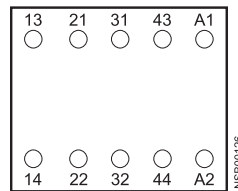
#### 3 NO + 1 NC

31E



#### 2 NO + 2 NC

22E

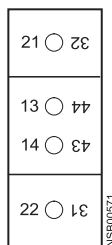


#### 3RH19 21-. DA11 first laterally mountable auxiliary switch block<sup>1)</sup>

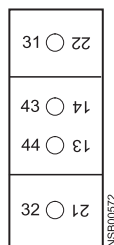
mountable on left or right

#### 1 NO + 1 NC

left



right

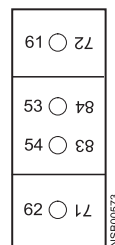


#### 3RH19 21-. JA11 second laterally mountable auxiliary switch block<sup>1)</sup>

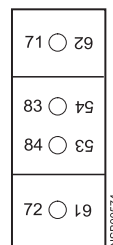
mountable on left or right (only for sizes S3 to S12)

#### 1 NO + 1 NC

left



right



1) Note the location digit.

Can only be used if no 4-pole auxiliary switch block is snapped onto the front.

# 3RH2 Control & Latching Relays

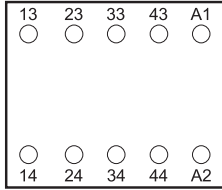
## 3RH2 Terminal Designations

**Terminal designations according to EN 50 011**

**3RH21 control relays**

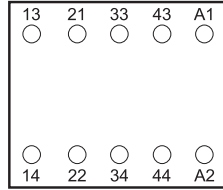
**4 NO**

Ident no.:40E



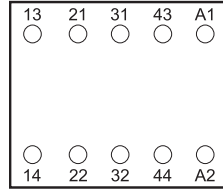
**3 NO + 1 NC**

31E



**2 NO + 2 NC**

22E

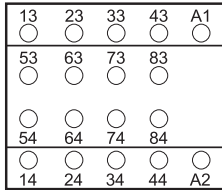


**3RH21 40 control relays**

with 3RH19 11-1GA... auxiliary switch blocks snapped onto the front

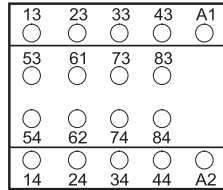
**8 NO**

Ident no.:80E



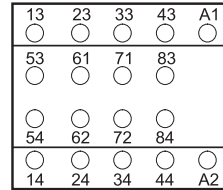
**7 NO + 1 NC**

71E



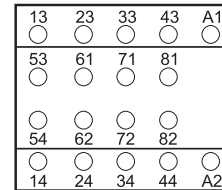
**6 NO + 2 NC**

62E



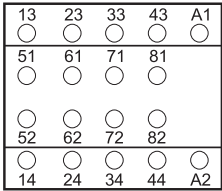
**5 NO + 3 NC**

53E



**4 NO + 4 NC**

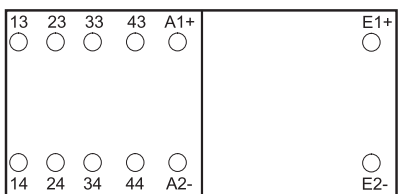
Ident no.:44E



**3RH24 latched control relays**

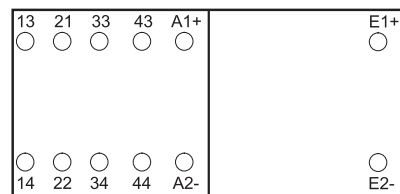
**4 NO**

Ident no.: 40E



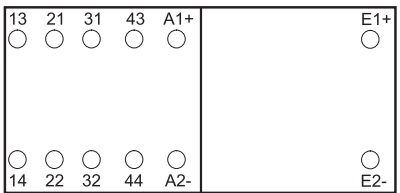
**3 NO + 1 NC**

31E



**2 NO + 2 NC**

Ident no.: 22E



# 3RT Contactors and 3RH Control Relays

## 3RT2 contactors and accessories

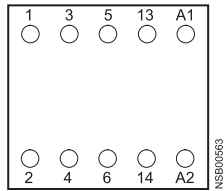
**Position of terminals (applicable to screw connection and Cage Clamp connection)**

**Size S00**

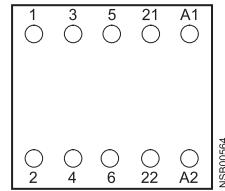
**Terminal designations according to EN 50 012**

**3RT20 1 contactors, 3RT20 1 coupling relays,**

**1 NO**  
Ident. no. 10E



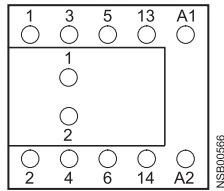
**1 NC**  
01



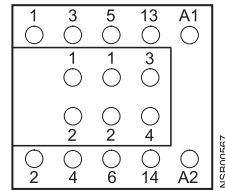
**3RT20 1 contactors (with 1 NO)**

with auxiliary switch blocks snapped onto the front  
3RH19 11-. H...

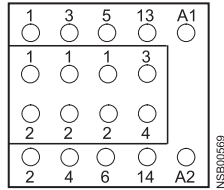
**1 NO + 1 NC**  
Ident. no.: 11



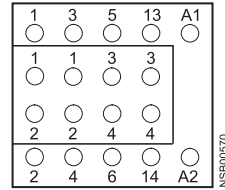
**2 NO + 2 NC**  
22



**2 NO + 3 NC**  
Ident. no.: 23



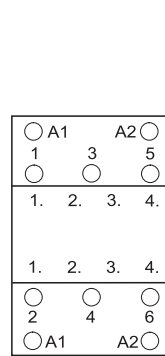
**3 NO + 2 NC**  
32



**Sizes S3 to S12**

**Terminal designations according to EN 50 012**

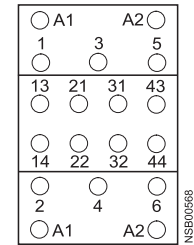
**3RT 20 3, 3RT20 4, 3RT124 46 contactors,**



**3RT 20 3, 3RT 20 4 contactors**

3RH19 21-. HA22  
4-pole auxiliary switch block snapped onto the front

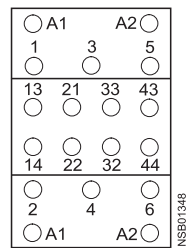
**2 NO + 2 NC**  
Ident. no. 22 E



**3RT20 3, 3RT20 4 contactors**

with 4-pole auxiliary switch block for snapping onto the front  
3RH19 21-. HA31

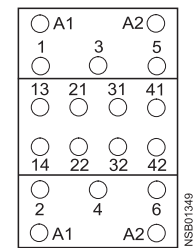
**3 NO + 1 NC**  
Ident. no. 31 E



**3RT20 3, 3RT20 4 contactors**

with 4-pole auxiliary switch block for snapping onto the front  
3RH19 21-. HA13

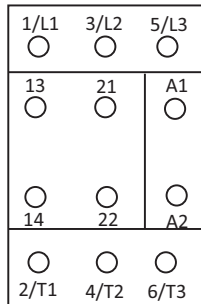
**1 NO + 3 NC**  
13 E



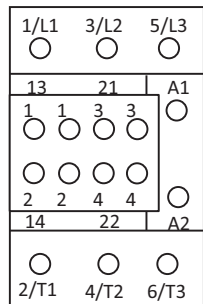
**Size S0**

**Terminal designations according to EN 50 012**

**3RT20 2 Contactors with 1NO + 1NC**  
**3RT20 2 Coupling Relays**



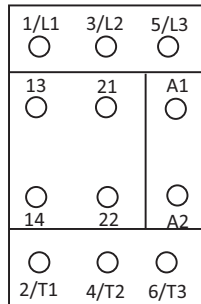
**3RT20 2 Contactors with 3NO + 3NC**



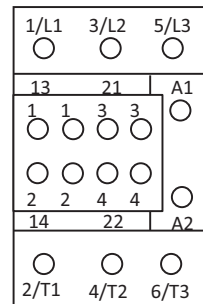
**Size S2**

**Terminal designations according to EN 50 012**

**3RT20 3 Contactors with 1NO + 1NC**  
**3RT20 3 Coupling Relays**



**3RT20 3 Contactors with 3NO + 3NC**



# 3RT Contactors

## 3RT1/2 contactors and accessories

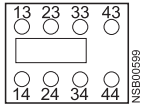
**Position of terminals (applicable to screw connection and Spring-type connection)**

**Accessories for size S3 to S12 contactors**  
Terminal designations acc. to EN 50 005

**3RH19 21- . F.. auxiliary switch blocks, 4-pole,**  
for snapping onto the front

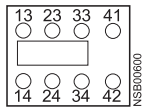
**4 NO**

Ident. no. 40



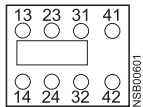
**3 NO + 1 NC**

31



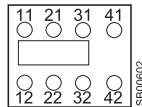
**2 NO + 2 NC**

22



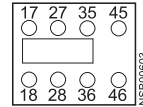
**4 NC**

04



**2 NO + 2 NC**

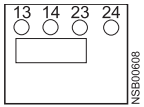
22 U



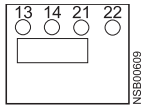
make-before-break

**3RH19 21-1LA.. auxiliary switch blocks, 2-pole,**  
for snapping onto the front, cable entry from above

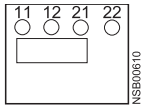
**2 NO**



**1 NO + 1 NC**

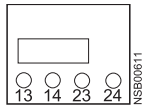


**2 NC**

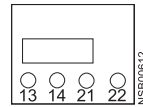


**3RH19 21-1MA.. auxiliary switch blocks, 2-pole,**  
for snapping onto the front, cable entry from below

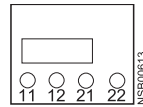
**2 NO**



**1 NO + 1 NC**



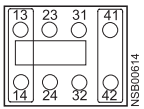
**2 NC**



**3RH19 21- . FE22 solid-state compatible auxiliary switch block, 4-pole,**  
for snapping onto the front

**2 NO + 2 NC**

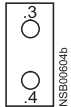
Ident. no. 22



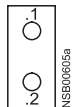
**Terminal designations according to EN 50 005 or EN 50 012**

**3RH19 21- . CA.. auxiliary switch blocks, single-pole,**  
for snapping onto the front

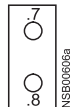
**1 NO**



**1 NC**

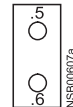


**1 NO**



with extended contact-making

**1 NC**



with extended contact-making

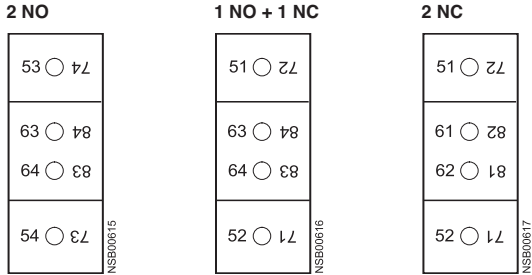
# 3RT Contactors

## 3RT1/2

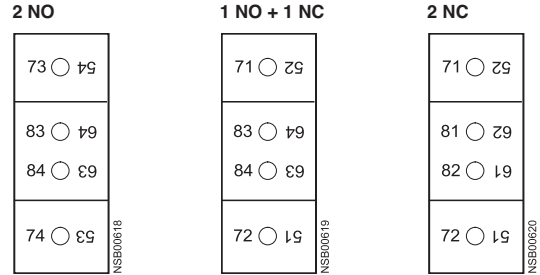
### Position of terminals

**Accessories for size S2 to S12 contactors**  
Terminal designations acc. to EN 50 005

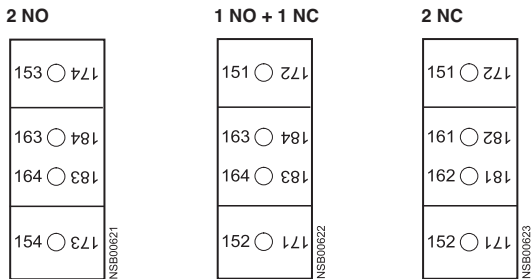
**3RH19 21- . EA.. first laterally mountable auxiliary switch blocks (left)**



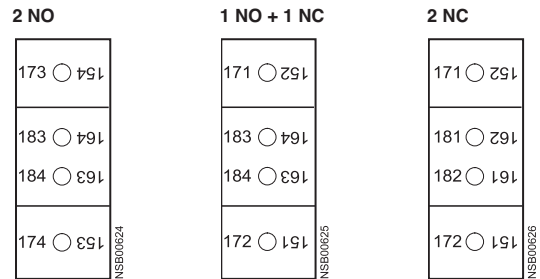
**3RH19 21- . EA.. first laterally mountable auxiliary switch blocks (right)**



**3RH19 21- . KA.. second laterally mountable auxiliary switch blocks (left)**  
(only for sizes S3 to S12; can only be used if no auxiliary switches are snapped onto the front)

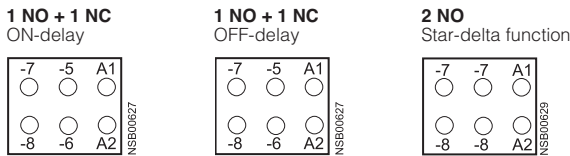


**3RH19 21- . KA.. second laterally mountable auxiliary switch blocks (right)**  
(only for sizes S3 to S12; can only be used if no auxiliary switches are snapped onto the front)



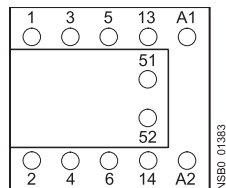
**Accessories for size S3 to S12 contactors**  
Terminal designations acc. to DIN 46 199 Part 5

**3RT19 26-2E.../2F.../2G... solid-state, time-delay auxiliary switch blocks**



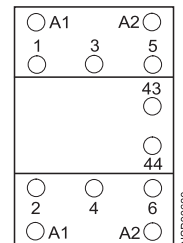
**3RT26 capacitor contactors**

**Size S00**  
with 4-pole auxiliary switch block mounted on the front



The auxiliary switch block comprises 3 leading contacts (not shown) and one unassigned NO contact.

**Sizes S2 and S3**  
with 4-pole auxiliary switch block mounted on the front



The auxiliary switch block comprises 3 leading contacts (not shown) and one unassigned NO contact.



# 3RT1 Contactors

## 3RT1 contactors and accessories

**Position of terminals (applicable to screw connection and Spring-type terminal connection)**

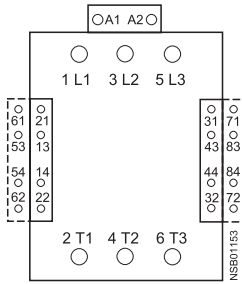
**Sizes S6 to S12**

**3RT1.5, 3RT1.6, 3RT1.7 contactors**

- with conventional op. mechanism (3RT1...-A...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 2 NO + 2 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 4 NO + 4 NC)

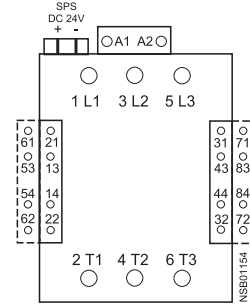
**2 NO + 2 NC or 4 NO + 4 NC**



- with solid-state op. mechanism (3RT1...-N...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 2 NO + 2 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 4 NO + 4 NC)

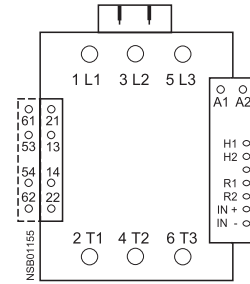
**2 NO + 2 NC or 4 NO + 4 NC**



- with solid-state op. mechanism (3RT1...-P...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 1 NO + 1 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 2 NO + 2 NC)

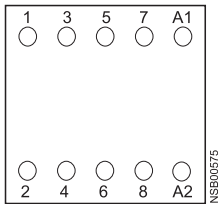
**1 NO + 1 NC or 2 NO + 2 NC**



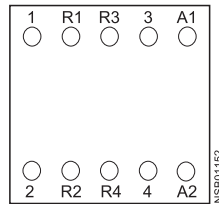
**Contactors with 4 main contacts, size S00**  
Terminal designations acc. to EN 50 005

**3RT23 and 3RT25 contactors**

**4 NO**



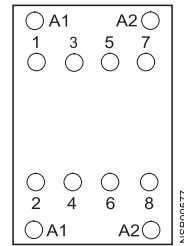
**2 NO + 2 NC**



**Contactors with 4 main contacts, sizes S2 to S3**  
Terminal designations acc. to EN 50 005

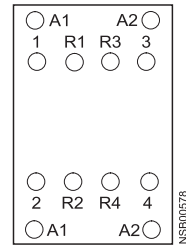
**3RT13 and 3RT15 contactors**

**4 NO**



Size S0 with integrated 1NO + 1NC aux (13/14 + 21/22) and only one set of A1+A2 on front

**2 NO + 2 NC**



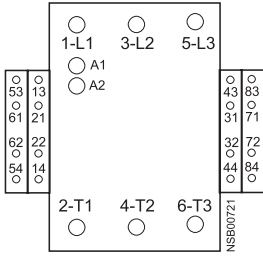
# 3T Contactors

## 3TF68 and 3TF69 vacuum contactors, 3-pole

### Position of terminals

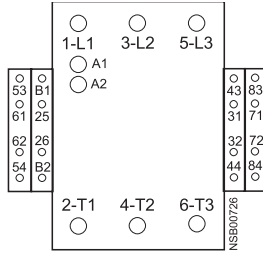
#### AC operation

**3TF68 and 3TF69 contactors**  
4 NO + 4 NC



#### DC operation

**3TF68 and 3TF69 contactors**  
3 NO + 3 NC  
max. complement of auxiliary switches



#### Solid-state compatible auxiliary switch blocks

3TY7 561-1. for lateral mounting onto  
size 6 to 14 contactors

mounted  
on left



mounted  
on right

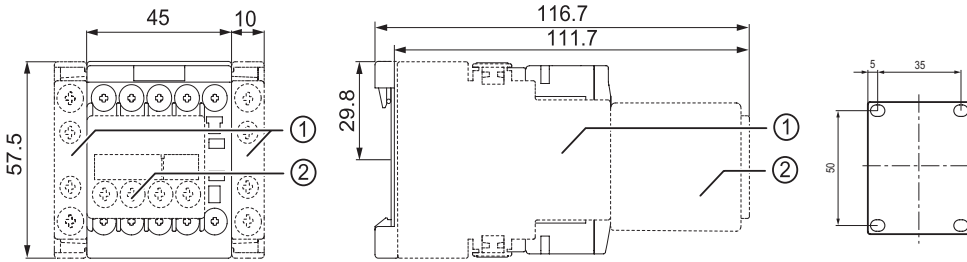


3RT20 contactors, 3-pole

Dimension drawings

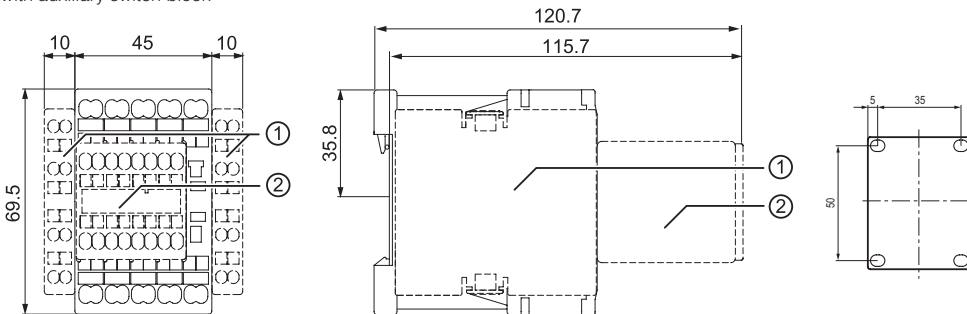
**3RT2.1.-1 contactor and 3RH21.-1 contactor relays**  
 Size S00 and NEMA Size 0, screw connection  
 with surge suppressor and auxiliary switch block

Lateral clearance from earthed parts = 6 mm



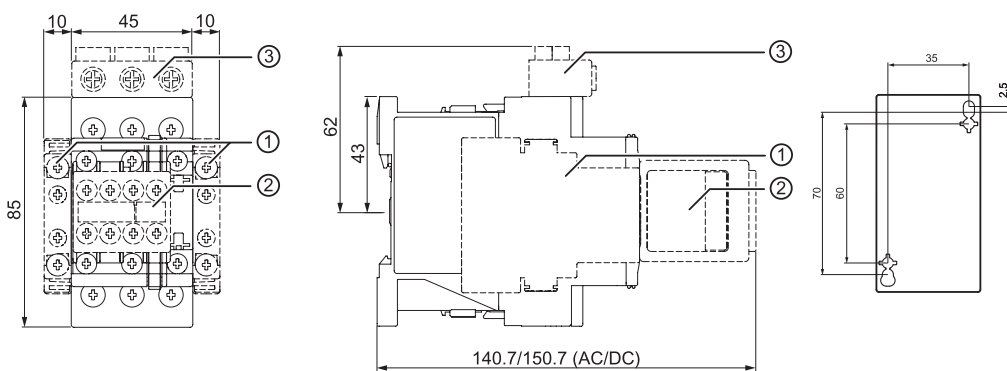
- 1) Laterally mountable auxiliary switch block 3RH2911-1DA.. / -1DE.. / -1EE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..

**3RT2.1.-2 contactor and 3RH21.-2 contactor relay**  
 Size S00, Spring-type terminal connection  
 with auxiliary switch block



- 1) Laterally mountable auxiliary switch block 3RH2911-2DA.. / -2DE.. / -2EE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-2FA.. / -2GA.. / -2HA.. / -2NF..

**3RT2.2.-1 contactors Size S0 and NEMA Size 1,**  
 (screw-type connection system) with auxiliary switch blocks mounted and other accessories



- 1) Laterally mountable auxiliary switch block 3RH2921-1DA.. / -1DE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..
- 3) 3-phase infeed terminal 3RV2925-5AB

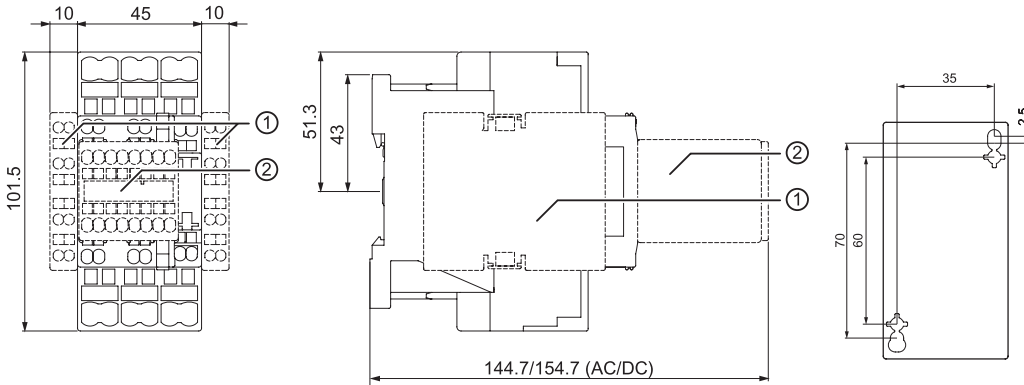
For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

3RT20 contactors, 3-pole

Dimension drawings

3RT2.2-2 and 3RT202-.....0LA2 contactors

Size S0 (spring-loaded connection) with auxiliary switch blocks mounted



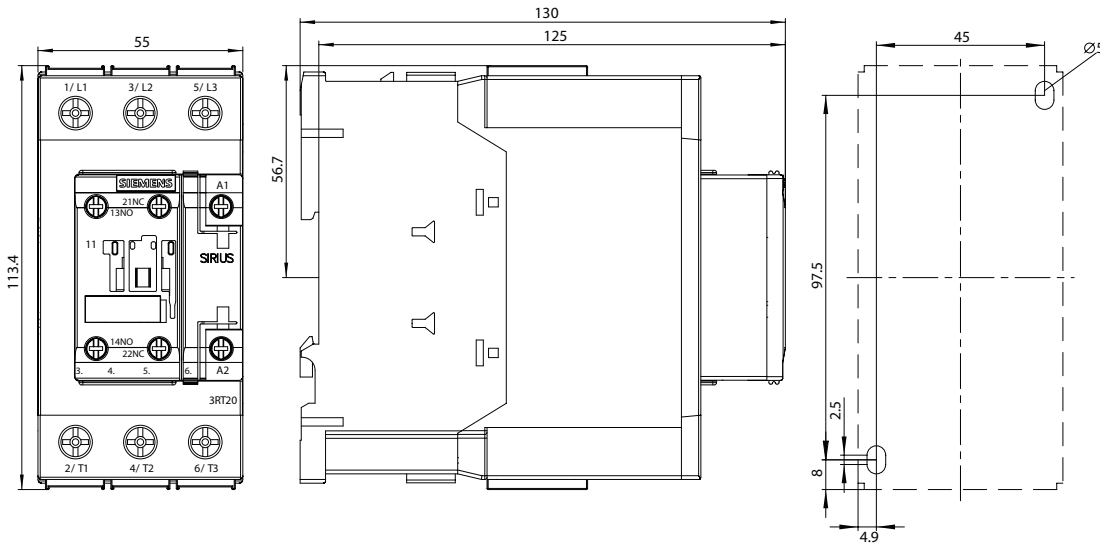
For size S0:

- 1) Laterally mountable auxiliary switch block 3RH2921-2DA.. / -2DE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-2FA.. / -2GA.. / -2HA.. / -2NF..

3RT20 3 contactors

Size S2 and NEMA Size 2, screw connection

with surge suppressor, auxiliary switch blocks and mounted overload relay



For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

For size S2:

- a = 0 mm with varistor < 240 V, diode assembly
- a = 3.5 mm with varistor > 240 V
- a = 17 mm with RC element
- b = DC 15 mm deeper than AC

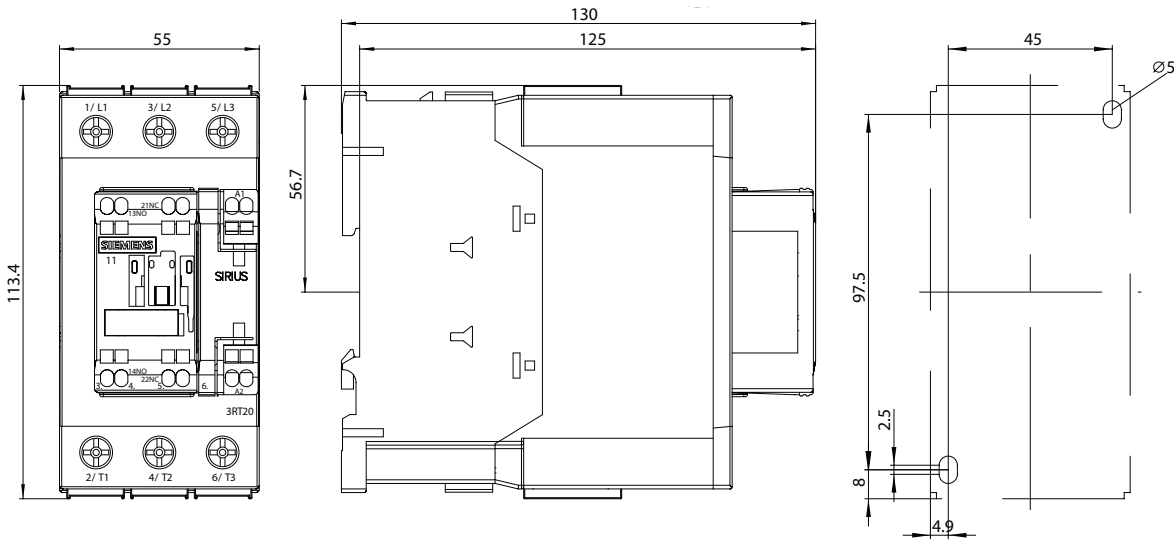
- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole)
- 3) Surge suppressor
- 4) Drilling pattern

3RT20 and 3RT24 contactors, 3-pole

Dimension drawings

3RT20 3 contactors

Size S2, Spring-type terminal connection with surge suppressor, auxiliary switch blocks and mounted overload relay



For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

For size S2:

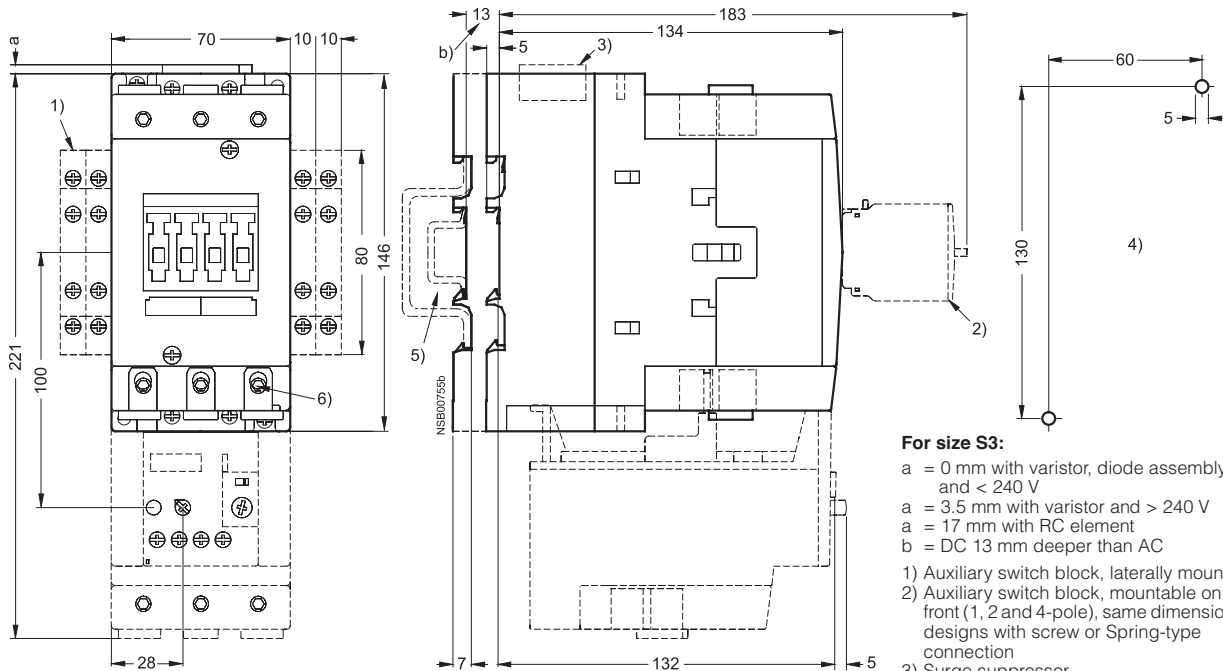
- a = 0 mm with varistor < 240 V, diode assembly
- a = 3.5 mm with varistor > 240 V
- a = 17 mm with RC element
- b = DC 15 mm deeper than AC

- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole)
- 3) Surge suppressor
- 4) Drilling pattern

3RT20 4, 3RT24 46 contactors

Size S3 and NEMA Size 3, screw connection with surge suppressor, auxiliary switch blocks and mounted overload relay

Lateral clearance from earthed parts = 6 mm



For size S3:

- a = 0 mm with varistor, diode assembly and < 240 V
- a = 3.5 mm with varistor and > 240 V
- a = 17 mm with RC element
- b = DC 13 mm deeper than AC

- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole), same dimensions for designs with screw or Spring-type connection
- 3) Surge suppressor
- 4) Drilling pattern
- 5) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or 75 mm standard mounting rail acc. to EN 50 023
- 6) Hexagon socket screw 4 mm

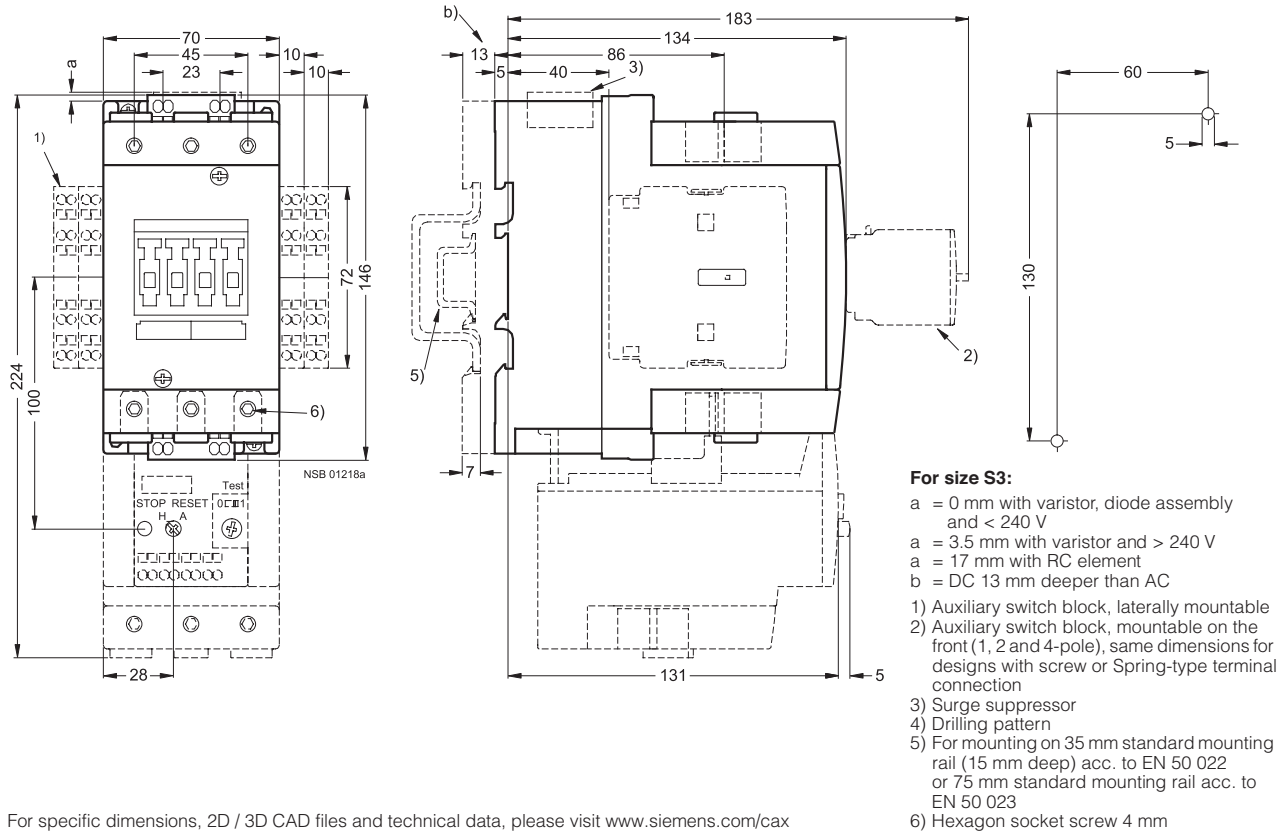
For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

3RT20 contactors, 3-pole

Dimension drawings

**3RT20 4 contactors,**  
**Size S3,** Spring-type terminal connection  
 with surge suppressor, auxiliary switch blocks  
 and mounted overload relay

CONTACTORS AND ASSEMBLIES 2



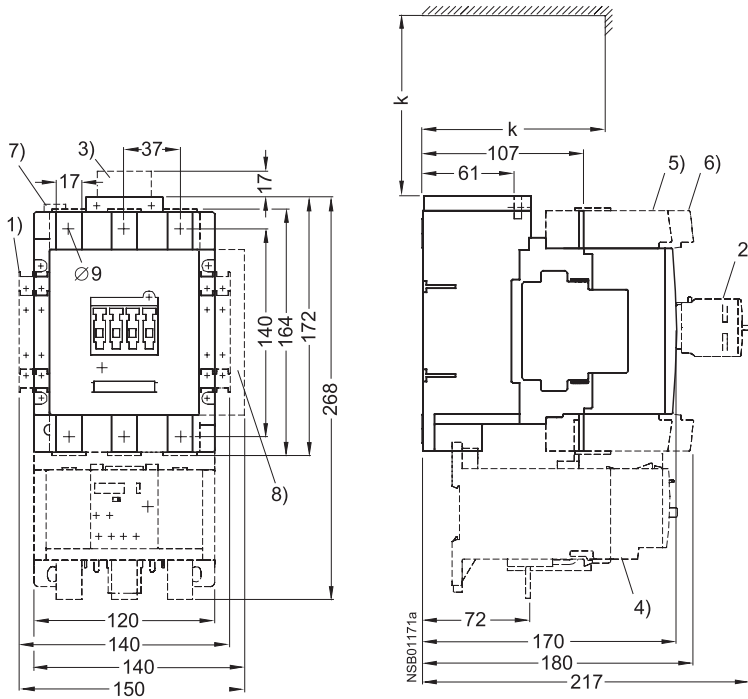
For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

3RT10 and 3RT14 contactors, 3-pole

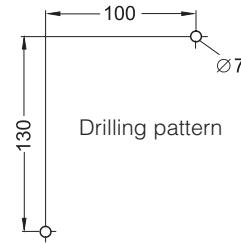
Dimension drawings

3RT10 5, 3RT14 5 contactors  
Size S6 and NEMA Size 4

with auxiliary switch block, laterally mountable and mountable on the front, mounted overload relay and box terminals, laterally mounted electronics module with remaining lifetime indication



Clearance from earthed parts with directly mounted overload relay:  
lateral: 10 mm  
front: 20 mm



For size S6:

k = 120 mm (minimum clearance for removing the withdrawable coil)

- 1) Second auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front
- 3) RC element
- 4) 3RB10 overload relay, mounted
- 5) 3RT19 55-4G box terminal block (hexagon socket 4 mm)
- 6) 3RT19 56-4G box terminal block (hexagon socket 4 mm)
- 7) PLC connection DC 24 V and changeover switch (with 3RT1...-N)
- 8) Electronics module with remaining lifetime indication (auxiliary switch block not mountable on right-hand side)

For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

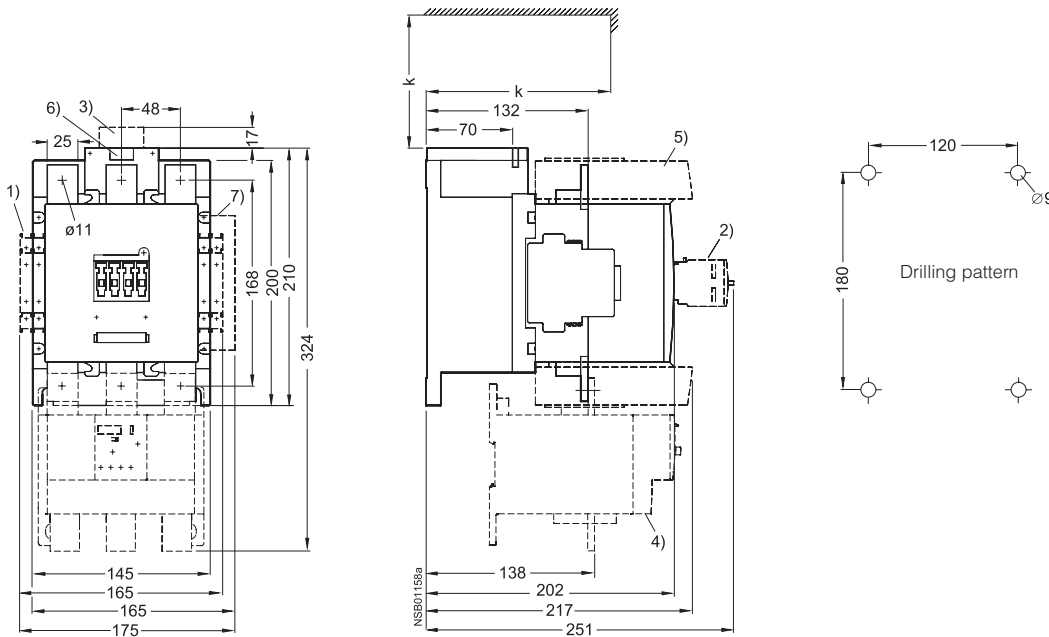


3RT10 and 3RT14 contactors, 3-pole

Dimension drawings

3RT10 6, 3RT14 6 contactors  
Size S10

with auxiliary switch block, laterally mountable and mountable on the front,  
mounted overload relay and box terminals,  
laterally mounted electronics module with remaining lifetime indication

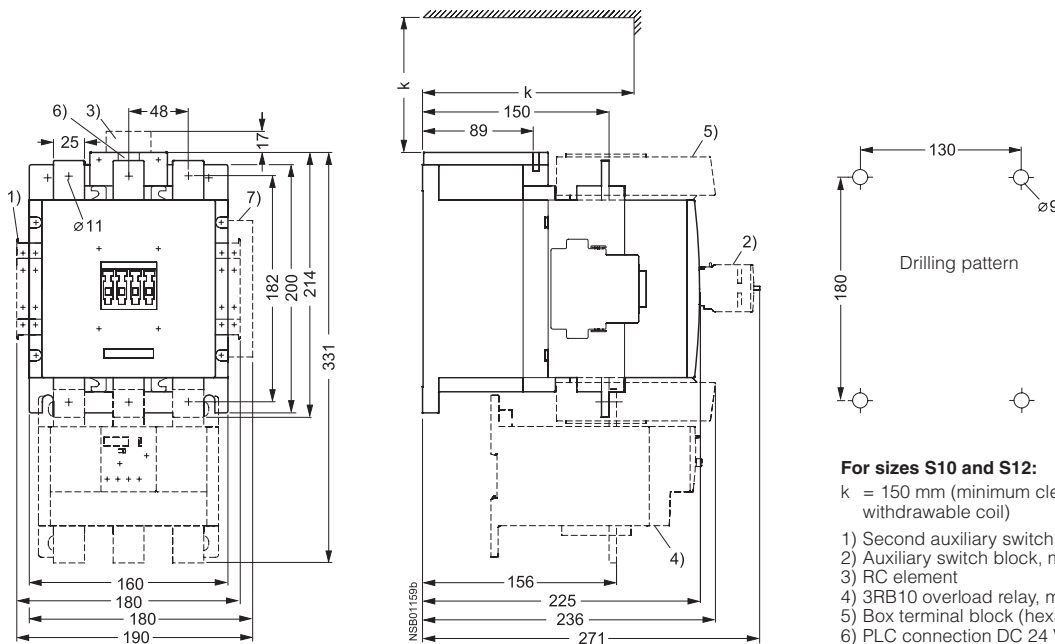


3RT10 7, 3RT14 7 contactors  
Size S12

with auxiliary switch block, laterally mountable and mountable on the front,  
mounted overload relay and box terminals,  
laterally mounted electronics module with remaining lifetime indication

For sizes S10 and S12:

Clearance from earthed parts with directly mounted  
overload relay:  
lateral: 10 mm  
front: 20 mm



For sizes S10 and S12:

k = 150 mm (minimum clearance for removing the  
withdrawable coil)

- 1) Second auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front
- 3) RC element
- 4) 3RB10 overload relay, mounted
- 5) Box terminal block (hexagon socket 6 mm)
- 6) PLC connection DC 24 V and changeover switch (with 3RT1...-N)
- 7) Electronics module with remaining lifetime indication (auxiliary switch block not mountable on right-hand side)

For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

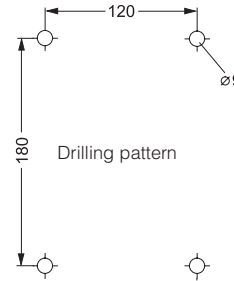
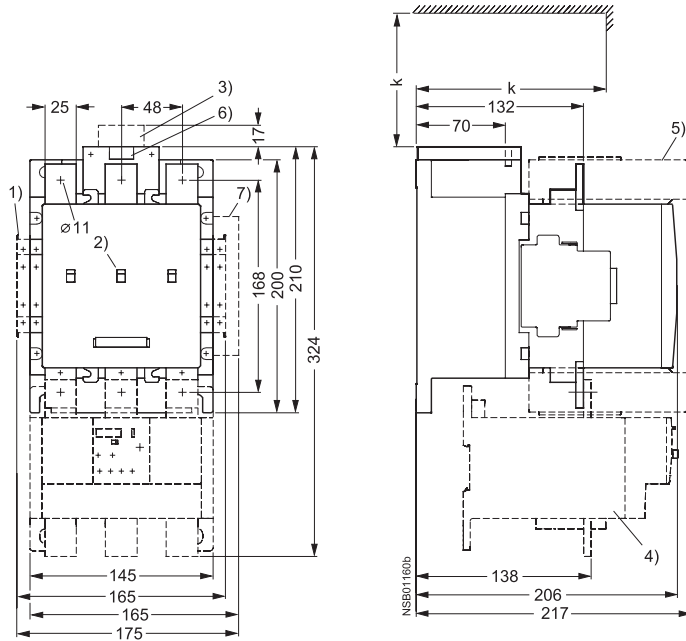
3RT12 vacuum contactors, 3-pole

Dimension drawings

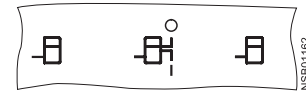
3RT12 6 vacuum contactors

Size S10

with auxiliary switch block, laterally mountable, mounted overload relay and box terminals, laterally mounted electronics module with remaining lifetime indication



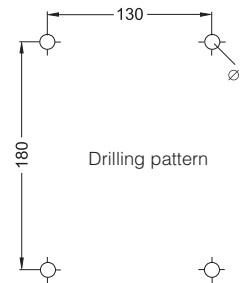
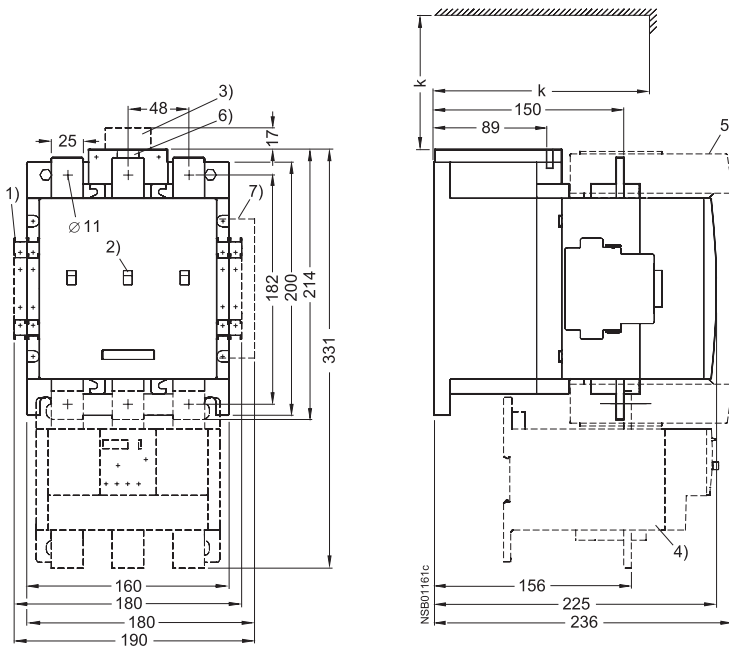
Detail Contact erosion indicator for vacuum interrupters



3RT12 7 vacuum contactors

Size S12

with auxiliary switch block, laterally mountable, mounted overload relay and box terminals, laterally mounted electronics module with remaining lifetime indication



For sizes S10 and S12:

k = 150 mm (minimum clearance for removing the withdrawable coil)

- 1) Second auxiliary switch block, laterally mountable
- 2) Position and contact erosion indicator
- 3) RC element
- 4) 3RB10 overload relay, mounted
- 5) Box terminal block (hexagon socket 6 mm)
- 6) PLC connection DC 24 V and changeover switch (with 3RT1...-.N)
- 7) Electronics module with remaining lifetime indication (auxiliary switch block not mountable on right-hand side)

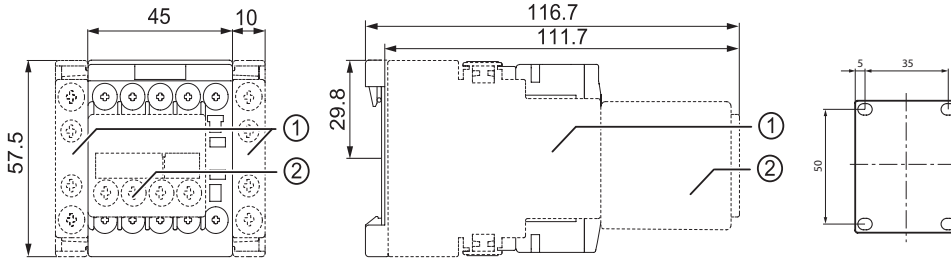
For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

3RT23 and 3RT25 contactors, 4-pole

Dimension drawings

**3RT23 1 and 3RT25 1 contactors**

Size S00, screw connection with surge suppressor and auxiliary switch block



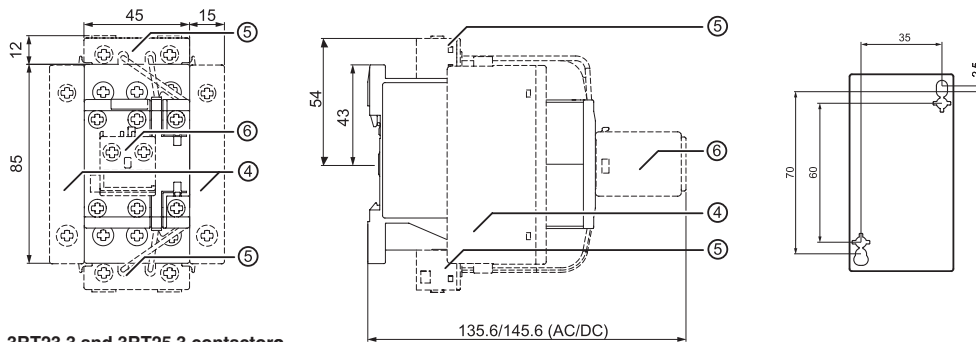
Lateral clearance from earthed parts = 6 mm

**For size S00:**

- 1) Laterally mountable auxiliary switch block 3RH2911-1DA.. / -1DE.. / -1EE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..

**3RT23 2 and 3RT25 2 contactors**

Size S0 with coil terminal module and auxiliary switch block

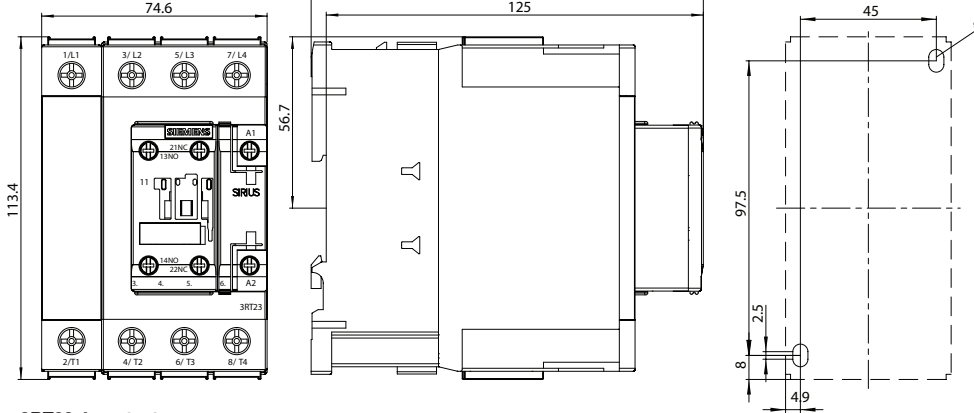


**For size S0:**

- 4) 4-pole contactor for switching 4 resistive loads 3RT232. 4-pole pole-changing contactor for changing the polarity of hoisting gear motors (2 NO contacts and 2 NC contacts) 3RT252.
- 5) Coil terminal module 3RT2926-4RA11/-4RB11
- 6) Auxiliary switch block for mounting on the front 3RH2911-1AA.. / -1BA

**3RT23 3 and 3RT25 3 contactors**

Size S2 with surge suppressor and auxiliary switch block

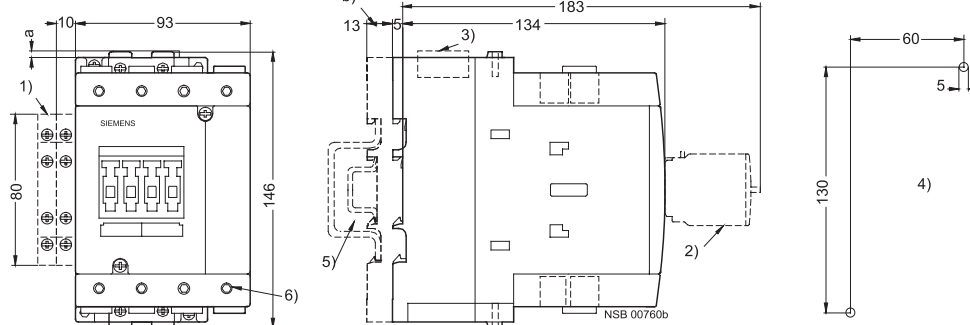


**For sizes S2 and S3:**

- a = 0 mm with varistor < 240 V
  - a = 3.5 mm with varistor > 240 V
  - a = 17 mm with RC element and diode assembly
  - b = S2: DC 15 mm deeper than AC
  - S3: DC 13 mm deeper than AC
- 1) Auxiliary switch block, laterally mountable (right or left)
  - 2) Auxiliary switch block, mountable on the front, (1, 2 and 4-pole, also 3RH19 21-1FE22 solid-state compatible design)
  - 3) Surge suppressor
  - 4) Drilling pattern
  - 5) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or, in the case of size S3, 75mm standard mounting rail acc. to EN 50 023
  - 6) Hexagon socket screw 4 mm

**3RT23 4 contactors**

Size S3 with surge suppressor and auxiliary switch block

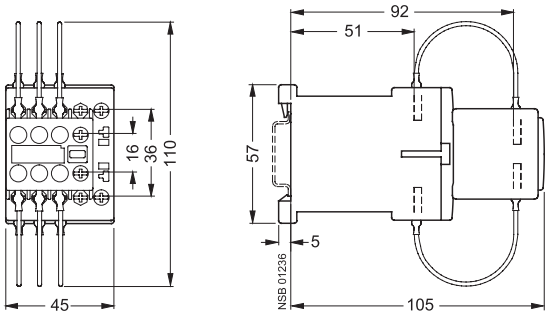


For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

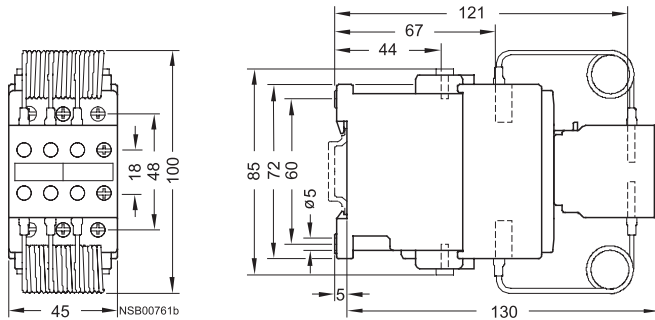
3RT16 capacitor contactors

Dimension drawings

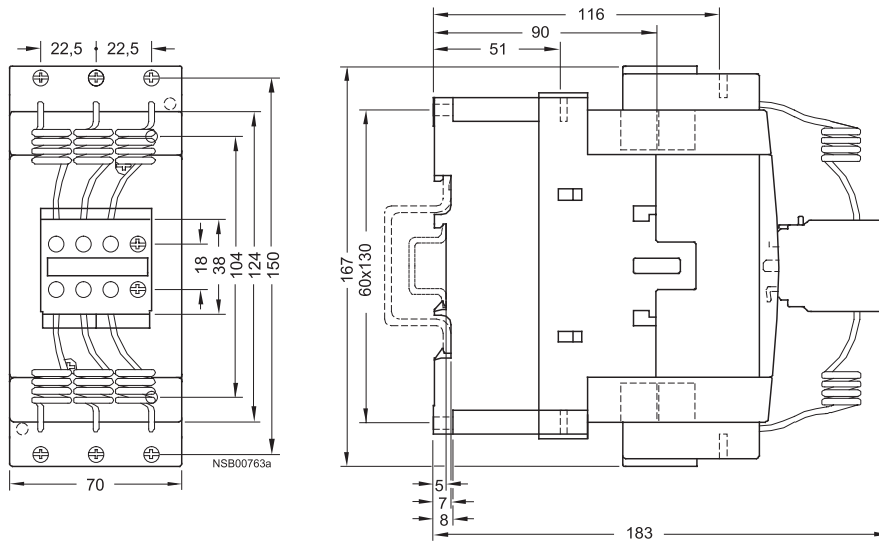
3RT16 17 capacitor contactors  
Size S00



3RT16 27 capacitor contactors  
Size S0



3RT16 47 capacitor contactors  
Size S3

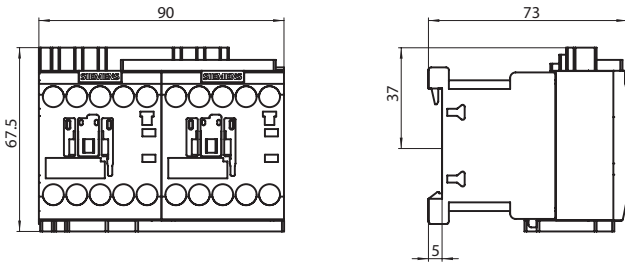


For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

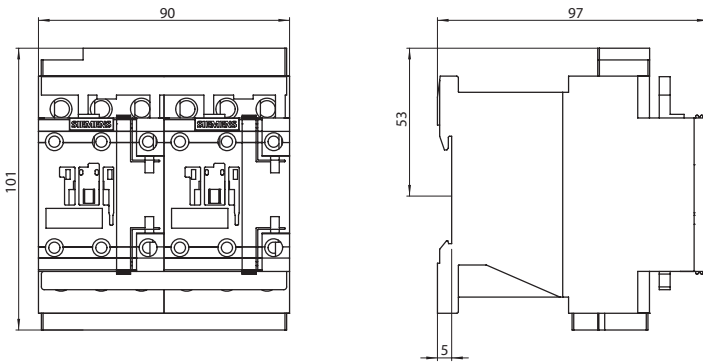
3RA23 contactor assemblies for reversing

Dimension drawings

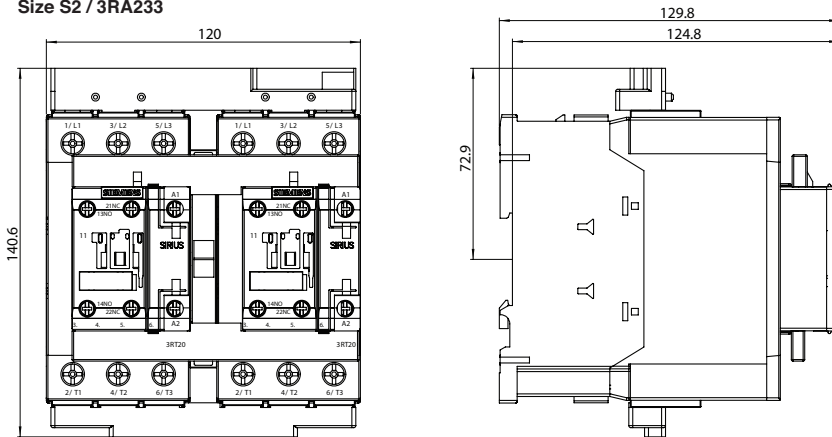
Size S00 / 3RA231



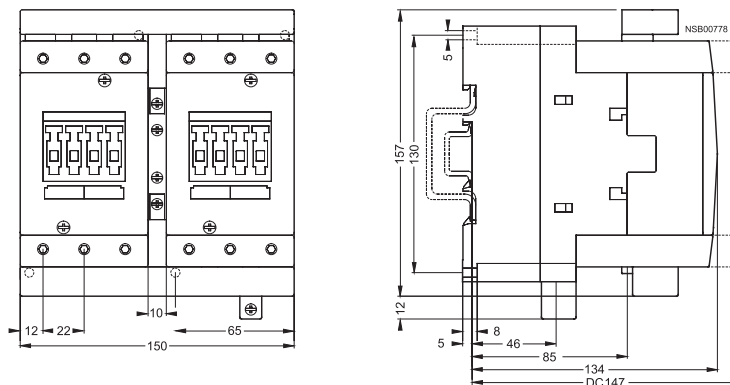
Size S0 / 3RA232



Size S2 / 3RA233



Size S3 / 3RA234

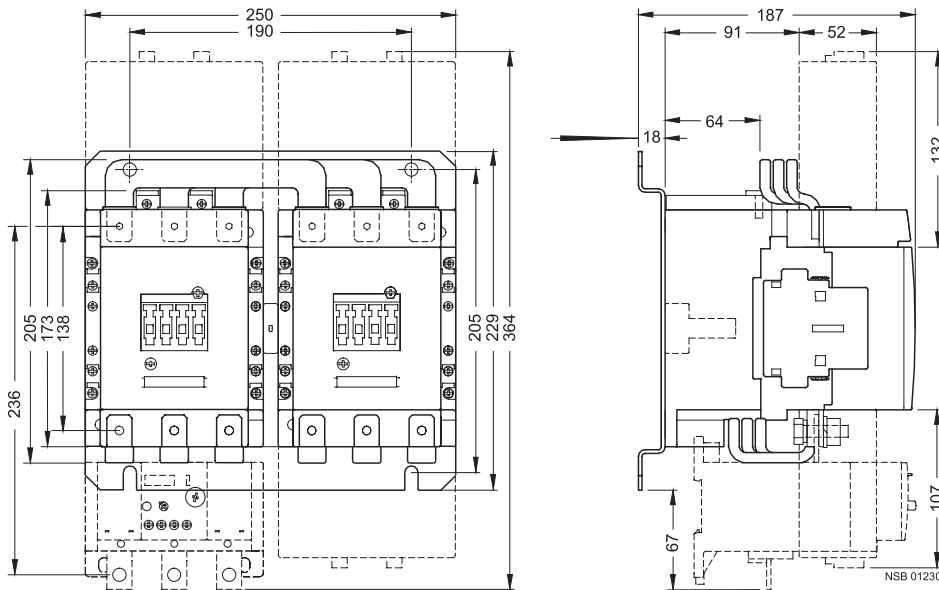


For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

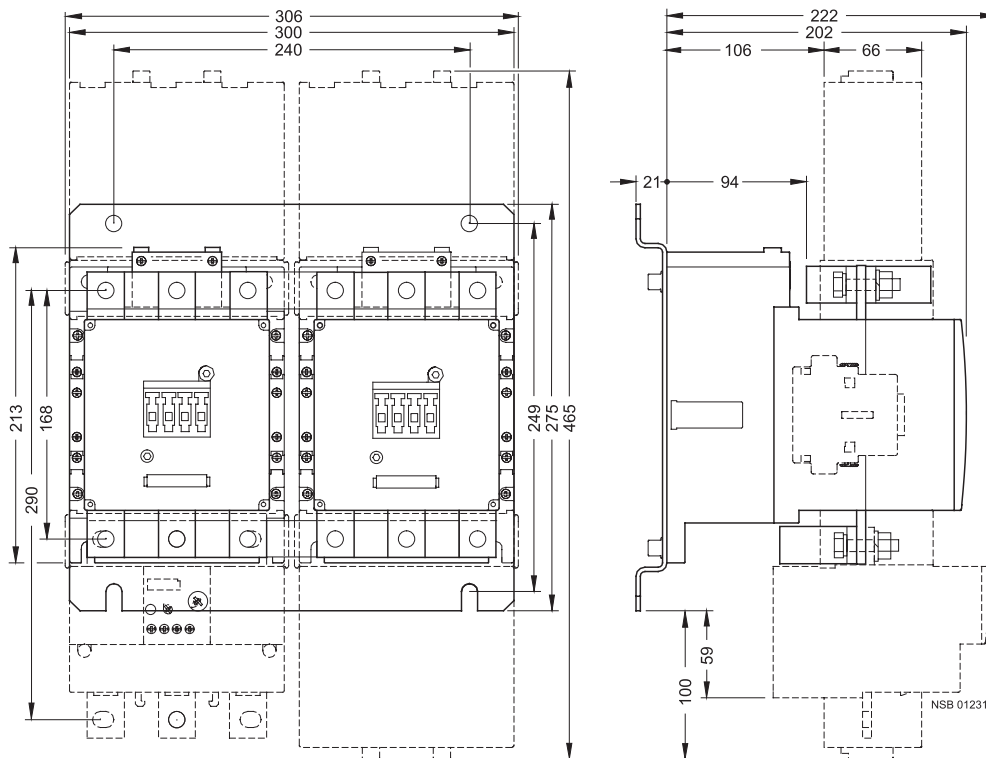
3RA13 contactor assemblies for reversing

Dimension drawings

Size S6



Size S10

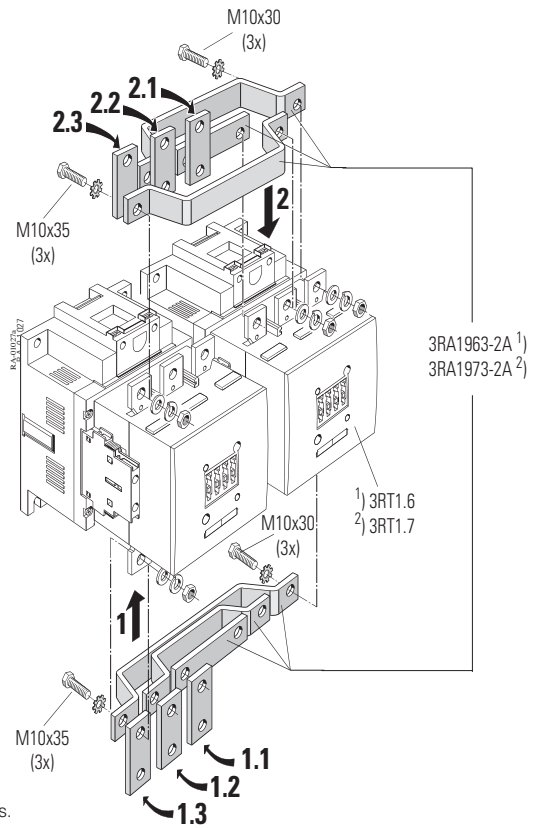
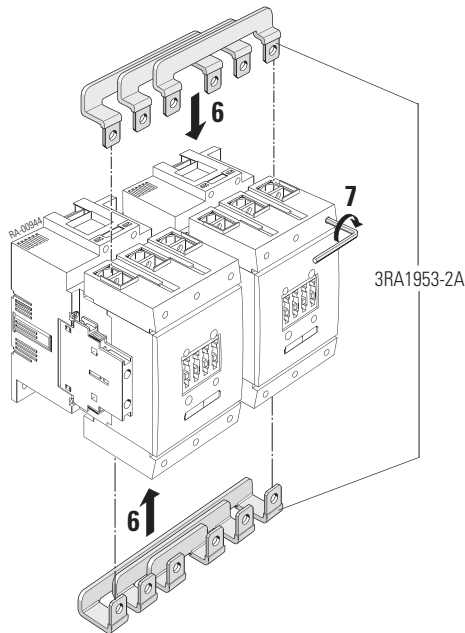
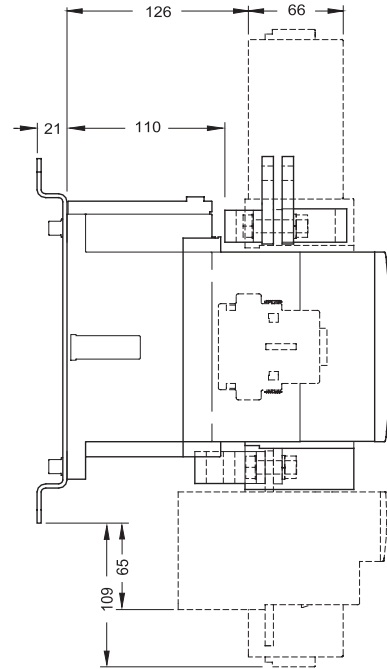
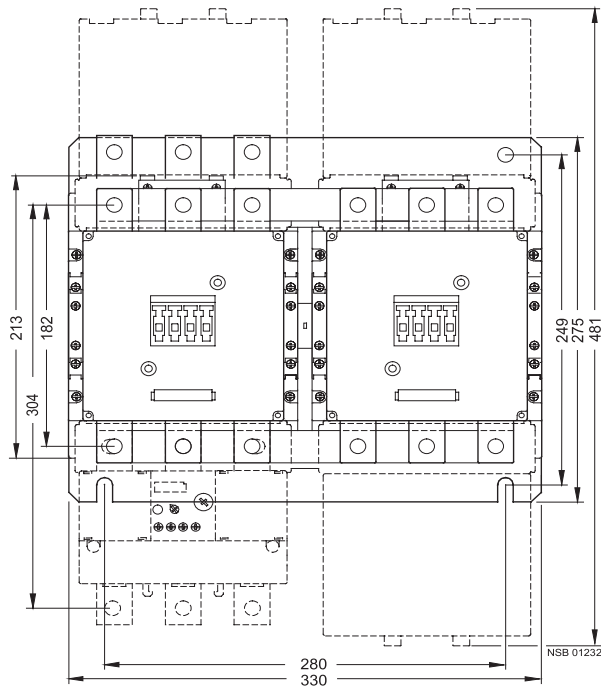


The assemblies shown on this page are for customer assembly with individual components.

3RA13 contactor assemblies for reversing

Dimension drawings

Size S12



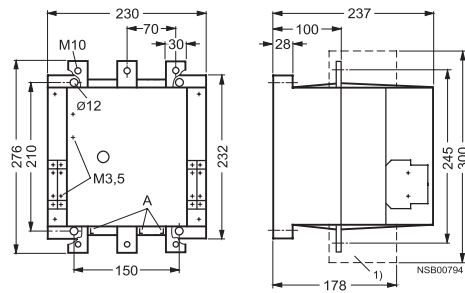
The assemblies shown on this page are for customer assembly with individual components.



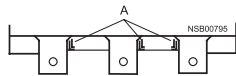
3TF68 and 3TF69 vacuum contactors, 3TC4 and 3TC5 DC contactors

Dimension drawings

3TF68 vacuum contactors

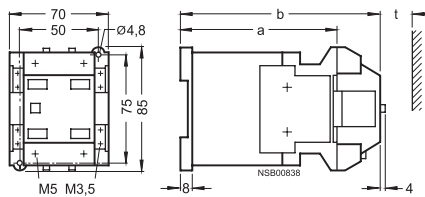


Detail  
A = Contact erosion indicator for vacuum interrupter contacts



3TC4 and 3TC5 contactors

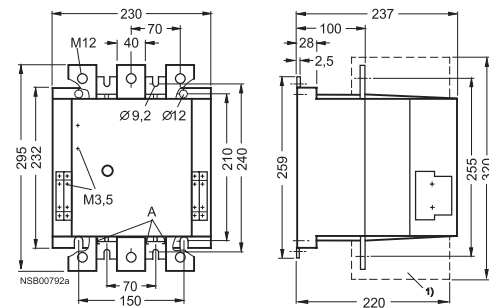
3TC44 contactors  
Size 2, AC and DC operation



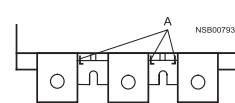
t = minimum clearance from insulated components: 15 mm (600 V and 750 V)  
from grounded components: 30 mm (600 V and 750 V)

	a	b
DC operation	109	141
AC operation	68	100

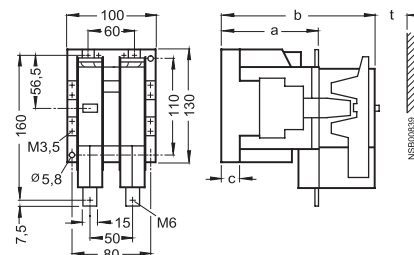
3TF69 vacuum contactors



Detail  
A = Contact erosion indicator for vacuum interrupter contacts



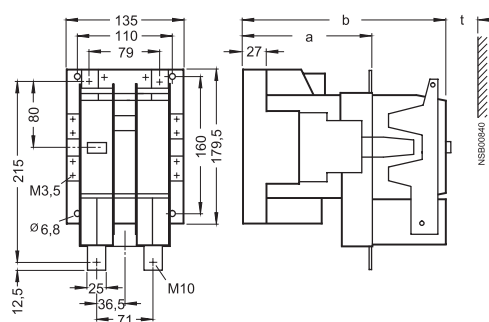
3TC48 contactors  
Size 4, AC and DC operation



t = minimum clearance from insulated components: 15 mm (600 V), 20 mm (750 V)  
from grounded components: 35 mm (600 V), 55 mm (750 V)

	a	b	c
DC operation	112	180	21.5
AC operation	86	154	23.5

3TC52 contactors  
Size 8, AC and DC operation

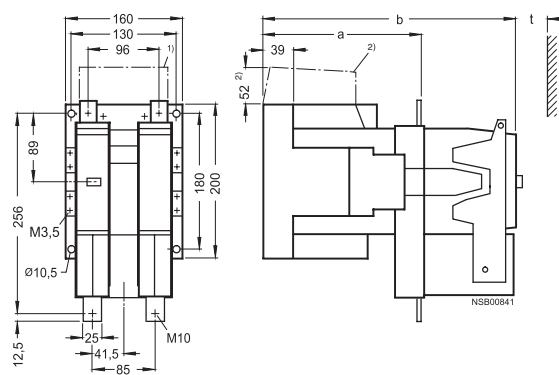


t = minimum clearance from insulated components: 20 mm (600 V and 750 V)  
from grounded components: 70 mm (600 V and 750 V)

	a	b
DC operation	147	232
AC operation	115	200

1) With box terminals for laminated copper bars (accessories).

3TC56 contactors  
Size 12, AC and DC operation



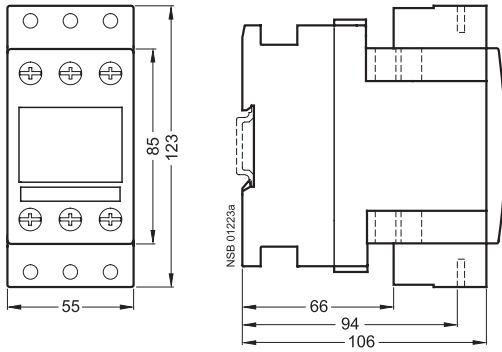
t = minimum clearance from insulated components: 25 mm (600 V and 750 V)  
from grounded components: 80 mm (600 V), 100 mm (750 V)

	a	b
DC operation	200	310
AC operation	141	251

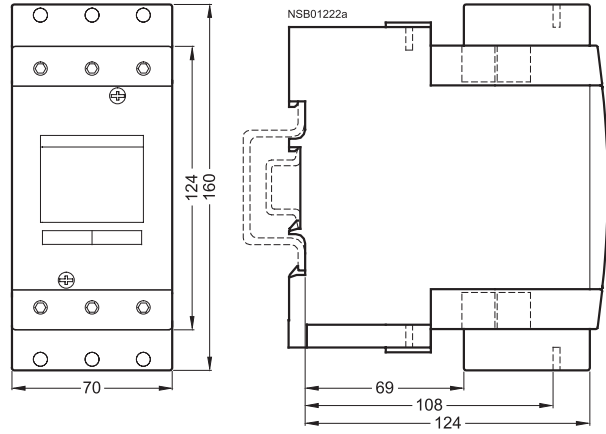
2) DC operation only

**Dimension drawings**

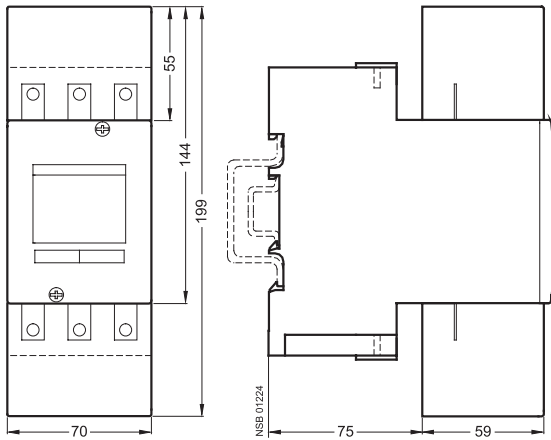
**Terminal cover for box terminals  
for size S2,  
3RT29 36-4EA2**



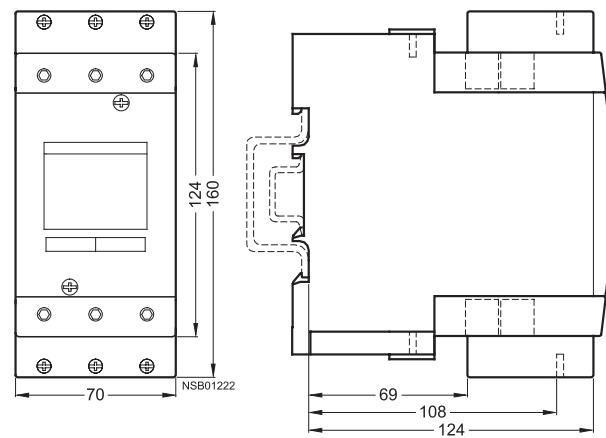
**Terminal cover for box terminals  
for size S3,  
3RT19 46-4EA2**



**Terminal cover for cable lug and bar connection  
for size S3,  
3RT19 46-4EA1**



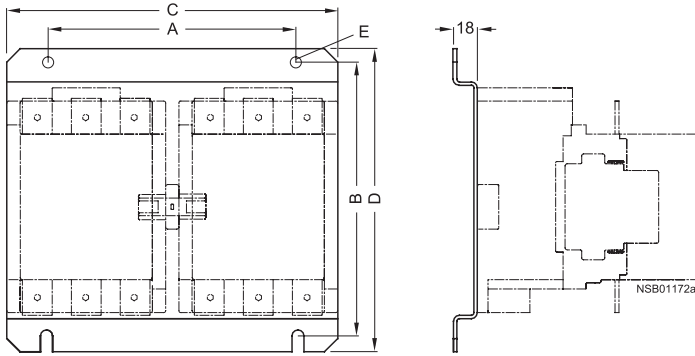
**Auxiliary conductor terminal, 3-pole  
3RT19 46-4F  
Size S3  
mounted on contactor**



For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

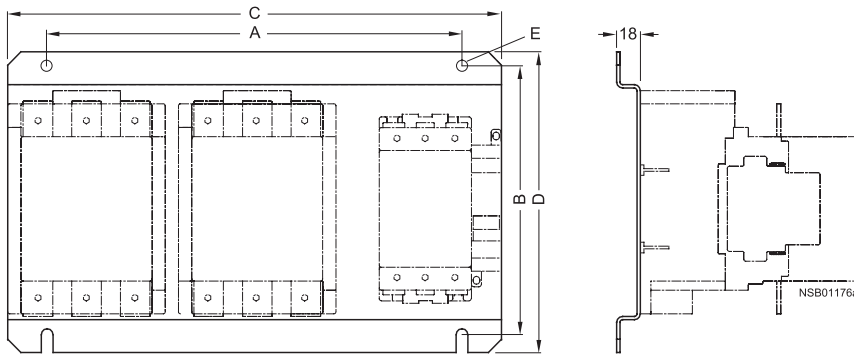
Dimension drawings

3RA19.2-2A baseplates for reversing contactor assemblies



	A	B	C	D	E
S6	190	205	250	229	9
S10	240	249	300	275	11
S12	280	249	330	275	11

3RA19.2-2E, 3RA19.2-2F baseplates for star-delta assemblies



	A	B	C	D	E
S6-S6-S3	316	205	376	229	9
S6-S6-S6	343	205	403	229	9
S10-S10-S6	393	250	453	275	11
S10-S10-S10	423	250	483	275	11
S12-S12-S10	450	250	510	275	11
S12-S12-S12	465	250	525	275	11

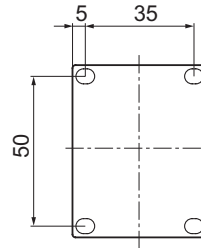
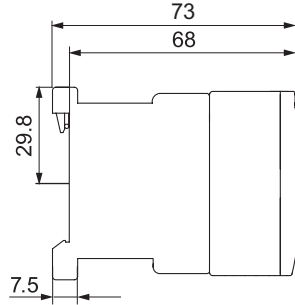
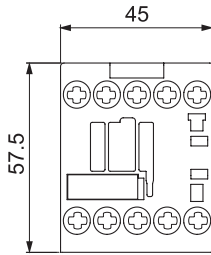
For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

3RH21 and 3RH24 control relays

Dimension drawings

3RH21 control relays

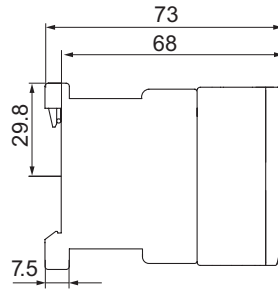
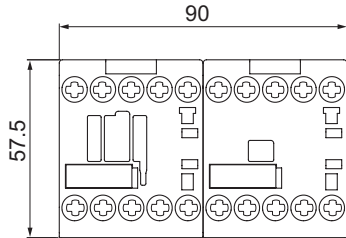
Size S00, with screw connections



Lateral clearance from earthed parts = 6 mm

3RH24 latched control relays

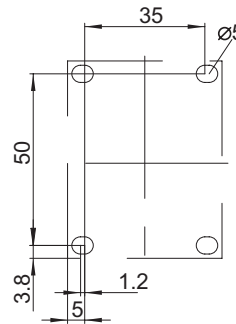
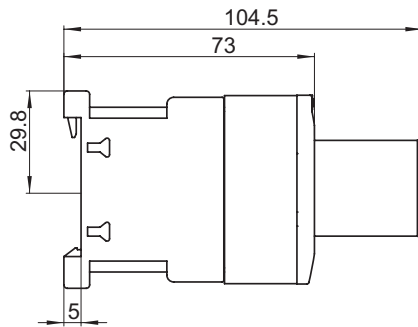
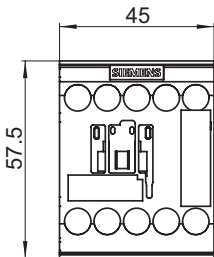
Size S00



3RH21 coupling relay

Dimension drawings

Size S00, with screw connections, with surge suppressor



- 1) Surge suppressor
- 2) Drilling pattern

Deviating dimensions for coupling relays with Spring-type terminal connections

Height: 69.5 mm

For specific dimensions, 2D / 3D CAD files and technical data, please visit [www.siemens.com/cax](http://www.siemens.com/cax)

## contents

### Thermal overload relays



**3RU21 overload relays up to 100 A with screw connection, CLASS 10**

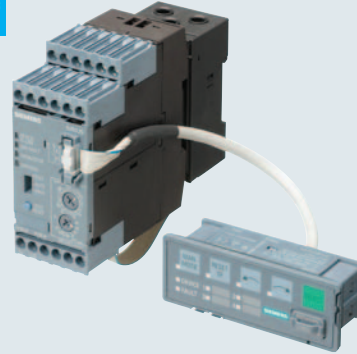
#### Selection and ordering data

- Basic Unit 3/10
- Accessories 3/11

Description	3/8-3/9
Technical data	3/12-3/14
Circuit diagrams	3/15
Dimension drawings	3/16-3/17

Page

### Solid state overload relays



**3RB24 overload relays up to 630A with IO-Link current monitoring**

#### Selection and ordering data

- Basic Unit 3/51
- Accessories 3/55

Description	3/52-3/53
Technical data	3/58-3/62

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### SIRIUS 3RV motor starter protectors up to 100 A



**3RB20/21, 3RB30/31 overload relays up to 630 A, 3RB20/30 CLASS 10 or 20 3RB21/31 CLASS 5, 10, 20, 30**

#### Selection and ordering data

- Basic Unit 3/22-3/23
- Accessories 3/11

Description	3/18-3/19
Cross Reference Aid	3/21
Technical data	3/24-3/28
Dimension drawings	3/30
Circuit diagrams	3/31

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**3RB22/23 overload relays up to 820 A for full motor protection, CLASS 5 to CLASS 30 adjustable**

#### Selection and ordering data

- Basic Unit 3/34-3/35
- Accessories 3/49-3/50

Description	3/47
Technical data	3/40-3/43
Dimension drawings	3/45-3/46
Circuit diagrams	3/47

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**3UF7 SIMOCODE Pro Motor management and control devices**

#### Selection and ordering data

- Basic Unit 3/73-3/75
- Expansion modules 3/76-3/78
- Accessories 3/79-3/81

Description	3/63-3/67
Technical data	3/68-3/72
Software and licenses	3/82-3/85

Page

Overview



Features

**3RU21**    **3RB30/3RB31**    **3RB20/3RB21**    **3RB22/3RB23**    **3RB24**

Benefits

General data

Sizes	S00 ... S3	S00 ... S3	S6 ... S12	S00 ... S12	S00 ... S12	<ul style="list-style-type: none"> <li>• Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, etc., ...)</li> <li>• Permit the mounting of slim and compact load feeders in widths of 45 mm (S00), 45 mm (S0), 55 mm (S2), 70 mm (S3), 120 mm (S6) and 145 mm (S10/S12); this does not include the current measuring modules for the 3RB22 to 3RB24 evaluation modules sizes S00 to S3</li> <li>• Simplify configuration</li> </ul>
<b>Seamless current range</b>	0.11 ... 100 A	0.1 ... 100 A	50 ... 630 A	0.3 ... 630 A (up to 820 A) <sup>1)</sup>	0.3 ... 630 A (up to 820 A) <sup>1)</sup>	

Protection functions

<b>Tripping due to overload</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload</li> </ul>
<b>Tripping due to phase unbalance</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to phase unbalance</li> </ul>
<b>Tripping due to phase failure</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Minimizes heating of induction motors during phase failure</li> </ul>
<b>Protection of single-phase loads</b>	✓	—	—	✓	✓	<ul style="list-style-type: none"> <li>• Enables the protection of single-phase loads</li> </ul>
<b>Tripping in the event of overheating</b> by <b>integrated thermistor motor protection function</b>	— <sup>2)</sup>	— <sup>2)</sup>	— <sup>2)</sup>	✓	✓	<ul style="list-style-type: none"> <li>• Provides optimum temperature-dependent protection of loads against excessive temperature rises e.g. for stator-critical motors or in the event of insufficient coolant flow, contamination of the motor surface or for long starting or braking operations</li> <li>• Eliminates the need for additional special equipment</li> <li>• Saves space in the control cabinet</li> <li>• Reduces wiring outlay and costs</li> </ul>
<b>Tripping in the event of a ground fault</b> by <b>internal ground-fault detection (activatable)</b>	—	✓ (only 3RB31)	✓ (only 3RB21)	✓	✓	<ul style="list-style-type: none"> <li>• Provides optimum protection of loads against high-resistance short circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc.</li> <li>• Eliminates the need for additional special equipment</li> <li>• Saves space in the control cabinet</li> <li>• Reduces wiring outlay and costs</li> </ul>

✓ Available  
— Not available

<sup>1)</sup> Motor currents up to 820 A can be recorded and evaluated by a current measuring module, e.g. 3RB29 06-2BG1 (0.3 to 3 A), in combination with 3UF18 68-3GA00 (820 A/1 A) series transformer.

<sup>2)</sup> The SIRIUS 3RN thermistor motor protection devices can be used to provide additional temperature-dependent protection.

General data



Features	3RU21	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
<b>Features</b>						
<b>RESET function</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Allows manual or automatic resetting of the device</li> </ul>
<b>Remote RESET function</b>	✓ (by means of separate module)	✓ (only with 3RB31 and external auxiliary voltage 24 V DC)	✓ (only with 3RB21 and external auxiliary voltage 24 V DC)	✓ (electrically via external button)	✓ (electrically with button or via IO-Link)	<ul style="list-style-type: none"> <li>Allows the remote resetting of the device</li> </ul>
<b>TEST function for auxiliary contacts</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Allows easy checking of the function and wiring</li> </ul>
<b>TEST function for electronics</b>	—	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Allows checking of the electronics</li> </ul>
<b>Status display</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Displays the current operating state</li> </ul>
<b>Large current adjustment button</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Makes it easier to set the relay exactly to the correct current value</li> </ul>
<b>Integrated auxiliary contacts (1 NO + 1 NC)</b>	✓	✓	✓	✓ (2 ×)	—	<ul style="list-style-type: none"> <li>Allows the load to be switched off if necessary</li> <li>Can be used to output signals</li> </ul>
<b>Integrated auxiliary contacts (1 CO and 1 NO in series)</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Enables the controlling of contactors directly from the higher-level control system through IO-Link</li> </ul>
<b>IO-Link connection</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Reduction of wiring in the control cabinet</li> <li>Enables communication</li> </ul>
<b>Connection of optional handheld device</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Enables local operation</li> </ul>
<b>Communication capability through IO-Link</b>						
<b>Full starter functionality through IO-Link</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and wye-delta starting)</li> </ul>
<b>Reading out of diagnostics functions</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Enables the reading out of diagnostics information such as overload, open circuit, ground fault, etc.</li> </ul>
<b>Reading out of current values</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Enables the reading out of current values and their direct processing in the higher-level control system</li> </ul>
<b>Reading out all set parameters</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Enables the reading out of all set parameters, e.g. for plant documentation</li> </ul>

✓ Available  
 — Not available



General data



Features

**3RU21**   **3RB30/3RB31**   **3RB20/3RB21**   **3RB22/3RB23**   **3RB24**

Benefits

**Design of load feeders**

<b>Short-circuit strength up to 100 kA at 690 V</b> (in conjunction with the corresponding fuses or the corresponding motor starter protector)	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Provides optimum protection of the loads and operating personnel in the event of short circuits due to insulation faults or faulty switching operations</li> </ul>
<b>Electrical and mechanical matching to 3RT contactors</b>	✓	✓	✓	✓ <sup>1)</sup>	✓ <sup>1)</sup>	<ul style="list-style-type: none"> <li>Simplifies configuration</li> <li>Reduces wiring outlay and costs</li> <li>Enables stand-alone installation as well as space-saving direct mounting</li> </ul>
<b>Straight-through transformers for main circuit<sup>2)</sup></b> (in this case the cables are routed through the feed-through openings of the overload relay and connected directly to the box terminals of the contactor)	—	✓ (S2, S3)	✓ (S3 to S6)	✓ (S00 ... S6)	✓ (S00 ... S6)	<ul style="list-style-type: none"> <li>Reduces the contact resistance (only one point of contact)</li> <li>Saves wiring costs (easy, no need for tools, and fast)</li> <li>Saves material costs</li> <li>Reduces installation costs</li> </ul>
<b>Spring-type connection system for main circuit<sup>2)</sup></b>	✓ (S00, S0)	✓ (S00, S0)	—	—	—	<ul style="list-style-type: none"> <li>Enables fast connections</li> <li>Permits vibration-resistant connections</li> <li>Enables maintenance-free connections</li> </ul>
<b>Spring-type connection system for auxiliary circuits<sup>2)</sup></b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Enables fast connections</li> <li>Permits vibration-resistant connections</li> <li>Enables maintenance-free connections</li> </ul>
<b>Ring terminal lug connection method for main and auxiliary circuits<sup>2)</sup></b>	✓ (S00, S0)	—	—	—	—	<ul style="list-style-type: none"> <li>Enables fast connections</li> <li>Permits vibration-resistant connections</li> <li>Enables maintenance-free connections</li> </ul>
<b>Full starter functionality through IO-Link</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and wye-delta starting)</li> </ul>
<b>Starter function</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Integration of feeders via IO-Link in the control system up to 630 A or 820 A</li> </ul>

✓ Available  
— Not available

<sup>1)</sup> Exception: up to size S3, only stand-alone installation is possible.  
<sup>2)</sup> Alternatively available for screw terminals.

General data



Features	3RU21	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
<b>Other features</b>						
<b>Temperature compensation</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Allows the use of the relays at high temperatures without derating</li> <li>Prevents premature tripping</li> <li>Allows compact installation of the control cabinet without distance between the devices/load feeders</li> </ul>
<b>Very high long-term stability</b>	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Provides safe protection for the loads even after years of use in severe operating conditions</li> </ul>
<b>Wide setting ranges</b>	—	✓ (1:4)	✓ (1:4)	✓ (1:10)	✓ (1:10)	<ul style="list-style-type: none"> <li>Minimize the configuration outlay and costs</li> <li>Minimize storage overheads, storage costs, tied-up capital</li> </ul>
<b>Fixed trip class</b>	CLASS 10 CLASS 10A	3RB30: CLASS 10E or CLASS 20E	3RB20: CLASS 10 or CLASS 20			<ul style="list-style-type: none"> <li>Optimum motor protection for standard starts</li> </ul>
<b>Trip classes adjustable on the device CLASS 5, 10, 20, 30</b>	—	3RB31: ✓	3RB21: ✓	✓	✓	<ul style="list-style-type: none"> <li>Enables solutions for very fast starting motors requiring special protection (e.g. Ex motors)</li> <li>Enables heavy starting solutions</li> <li>Reduces the number of versions</li> </ul>
<b>Low power loss</b>	—	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Reduces energy consumption and energy costs (up 98 % less energy is used than for thermal overload relays).</li> <li>Minimizes temperature rises of the contactor and control cabinet – in some cases this may eliminate the need for control-gear cabinet cooling.</li> <li>Direct mounting to contactor saves space, even for high motor currents (i.e. no heat decoupling is required).</li> </ul>
<b>Internal power supply</b>	— <sup>1)</sup>	✓	✓	—	—	<ul style="list-style-type: none"> <li>Eliminates the need for configuration and connecting an additional control circuit</li> </ul>
<b>Supplied from an external voltage through IO-Link</b>	—	—	—	—	✓	<ul style="list-style-type: none"> <li>Eliminates the need for configuration and connecting an additional control circuit</li> </ul>
<b>Overload warning</b>	—	—	—	✓	✓	<ul style="list-style-type: none"> <li>Indicates imminent tripping of the relay directly on the device due to overload, phase unbalance or phase failure through flickering of the LEDs or in the case of the 3RB24 as a signal through IO-Link</li> <li>Allows the imminent tripping of the relay to be signaled</li> <li>Allows measures to be taken in time in the event of inverse-time delayed overloading of the load for an extended period over the current limit</li> </ul>
<b>Analog output</b>	—	—	—	✓	✓	<ul style="list-style-type: none"> <li>Allows the output of an analog output signal for actuating moving-coil instruments, feeding programmable logic controllers or transfer to bus systems</li> <li>Eliminates the need for an additional measuring transducer and signal converter</li> </ul>

✓ Available  
— Not available

<sup>1)</sup> SIRIUS 3RU21 thermal overload relays use a bimetal contactor and therefore do not require a control supply voltage.

General data

Overview of overload relays – matching contactors

Overload relays	Current measurement	Current range	Contactors (type, size, rating in HP)							
			3RT20 1.	3RT20 2.	3RT20 3.	3RT20 4.	3RT20 5.	3RT20 6.	3RT20 7	3TF68/ 3TF69
		A	S00	S0	S2	S3	S6	S10	S12	Size 14
Type	Type	A	3/5/7.5/10	5/7.5/10/15/20/25	30/40/50	50/60/70	100/125/150	150/200/250	300/400	500/700

**SIRIUS 3RU21 thermal overload relays**



3RU21

3RU21 1	Integrated	0.11 ... 16	✓	—	—	—	—	—	—	—
3RU21 2	Integrated	1.8 ... 40	—	✓	—	—	—	—	—	—
3RU21 3	Integrated	22 ... 80	—	—	✓	—	—	—	—	—
3RU21 4	Integrated	28 ... 100	—	—	—	✓	—	—	—	—

**SIRIUS 3RB30 solid-state overload relays<sup>1)</sup>**



3RB30

3RB30 1	Integrated	0.1 ... 16	✓	—	—	—	—	—	—	—
3RB30 2	Integrated	0.1 ... 40	—	✓	—	—	—	—	—	—
3RB30 3	Integrated	12 ... 80	—	—	✓	—	—	—	—	—
3RB30 4	Integrated	32 ... 115	—	—	—	✓	—	—	—	—

**SIRIUS 3RB31 solid-state overload relays<sup>1)</sup>**



3RB31

3RB31 1	Integrated	0.1 ... 16	✓	—	—	—	—	—	—	—
3RB31 2	Integrated	0.1 ... 40	—	✓	—	—	—	—	—	—
3RB31 3	Integrated	12 ... 80	—	—	✓	—	—	—	—	—
3RB31 4	Integrated	32 ... 115	—	—	—	✓	—	—	—	—

**SIRIUS 3RB20 solid-state overload relays<sup>1)</sup>**



3RB20

3RB20 5	Integrated	50 ... 200	—	—	—	—	✓	—	—	—
3RB20 6	Integrated	55 ... 630	—	—	—	—	—	✓	✓	✓
3RB20 1 + 3UF18	Integrated	630 ... 820	—	—	—	—	—	—	—	✓

**SIRIUS 3RB21 solid-state overload relays<sup>1)</sup>**



3RB21

3RB21 5	Integrated	50 ... 200	—	—	—	—	✓	—	—	—
3RB21 6	Integrated	55 ... 630	—	—	—	—	—	✓	✓	✓
3RB21 1 + 3UF18	Integrated	630 ... 820	—	—	—	—	—	—	—	✓

✓ Can be used  
— Cannot be used

<sup>1)</sup> "Technical Specifications" for use of the overload relays with trip class ≥ CLASS 20 can be found in "Short-circuit protection with fuses for motor feeders".

General data

Overview of overload relays – matching contactors (continued)

Overload relays	Current measurement	Current range	Contactors (type, size, rating in HP)							
			3RT20 1	3RT20 2	3RT20 3	3RT20 4	3RT20 5	3RT20 6	3RT20 7	3TF68/ 3TF69
Type	Type	A	S00	S0	S2	S3	S6	S10	S12	Size 14
			3/5/7.5/1.	5/7.5/10/15/ 20/25	30/40/50	50/60/75	100/125/150	150/200/250	300/400	500/700

SIRIUS 3RB22 to 3RB24 solid-state overload relays<sup>1)</sup>



3RB22, 3RB23



3RB24

Overload relays	Current range	3RT20 1	3RT20 2	3RT20 3	3RT20 4	3RT20 5	3RT20 6	3RT20 7	3TF68/ 3TF69
3RB22 83/ 3RB23 83/ 3RB24 83+	3RB29 0	0.3 ... 25	✓	✓	—	—	—	—	—
	3RB29 0	10 ... 100	✓	✓	✓	✓	—	—	—
	3RB29 5	20 ... 200	—	✓	✓	✓	✓	—	—
	3RB29 6	63 ... 630	—	—	—	—	—	✓	✓
	3RB29 0 + 3UF18	630 ... 820	—	—	—	—	—	—	—

✓ Can be used  
— Cannot be used

<sup>1)</sup> "Technical Specifications" for use of the overload relays with trip class ≥ CLASS 20 can be found in "Short-circuit protection with fuses for motor feeders",

Connection methods

Depending on the device version of the 3RU2 and 3RB3 overload relays, the terminals for screw terminals, spring-type terminals or ring terminal lug connection are configured for both the main and auxiliary circuit in frame sizes S00 and S0.

The 3RU21 thermal overload relays come with screw terminals.

The electronic overload relays 3RB20 and 3RB21 are available with screw terminals (box terminals) or spring-type terminals on the auxiliary current side; the same applies for the evaluation modules of the 3RB22 to 3RB24 electronic overload relays for High-Feature applications.

# Thermal Overload Relays

3RU21 up to 100 A, CLASS 10

OVERLOAD RELAYS 3

## Description

The 3RU thermal overload relays up to 100 A are designed for current-dependent protection of applications with normal start-up conditions (see "Trip classes") against impermissibly high rises in temperature as a result of overload or phase failure (see "Phase failure protection"). An overload or phase failure causes the motor current to rise above the set rated motor current (see "Setting"). This current rise heats up the bimetal strips within the relay via heating elements which, in turn, operate the auxiliary contacts via a tripping mechanism due to their deflection (see "Auxiliary contacts"). These switch the load off via a contactor. The switch-off time is dependent on the ratio of tripping current to operational current  $I_e$  and is stored in the form of a tripping characteristic with long-term stability (see "Tripping characteristics"). The "Tripped" state is signalled by means of a switching position indicator (see "Indication of status").

Resetting takes place manually or automatically (see "Manual and automatic resetting") after a recovery time has elapsed (see "Recovery time").

The 3RU thermal overload relays are electrically and mechanically optimised to the 3RT contactors such that, in addition to individual mounting, they can also be directly mounted onto the contactors to save space (see "Design and mounting"). The main and auxiliary circuits can be connected in various ways (see "Connection"), including the use of Cage Clamp terminals. When the overload relay has been connected, it can be tested for correct functioning using a TEST slide (see "TEST function"). In addition to the TEST function, the 3RU thermal overload relay is equipped with a STOP function (see "STOP function").

For a wide variety of application possibilities for the 3RU thermal overload relay, please refer to the sections "Application", "Ambient conditions", "Overload relays in WYE-delta combinations" and "Operation with frequency converters".

The 3RU thermal overload relays can protect your loads from overload and phase failure. You must implement short-circuit protection (see "Short-circuit protection") by means of a fuse or circuit-breaker.

The 3RU thermal overload relays are environmentally friendly

(see "Environmental considerations") and comply with all the main international standards and approvals (see "Specifications" and "Increased safety type of protection EEx").

The accessories for the 3RU thermal overload relays have been designed on the principle that all requirements are covered by a small number of variants.

## Application

The 3RU thermal overload relays are designed for the protection of three-phase and single-phase AC and DC motors.

If single-phase AC or DC loads are to be protected using 3RU thermal overload relays, all three bimetal strips should be heated. Therefore all main circuits of the relay must be connected in series.

## Overload relays in WYE-delta combinations

When overload relays are used in WYE-delta combinations, it is important to note that only  $1/\sqrt{3}$  of the motor current flows through the mains contactor. An overload relay mounted on the main contactor must be set to 0.58 times the motor current.

A second overload relay must be mounted on the star contactor if your load is also to be optimally protected in WYE operation. The WYE current is  $1/3$  of the rated motor current. The relevant relay must be set to this current.

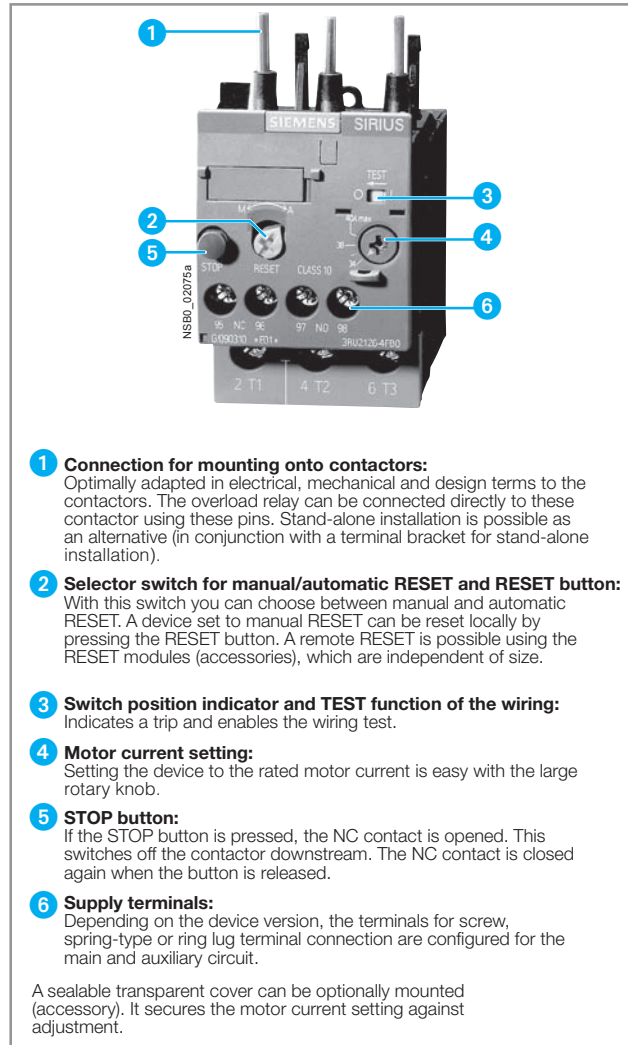
## Control circuit

An additional power supply is not required for operation of the 3RU thermal overload relays.

## Ambient conditions

The 3RU thermal overload relays are temperature compensating according to IEC 60 947-4-1/DIN VDE 0660 Part 102 in the temperature range  $-20\text{ }^{\circ}\text{C}$  to  $+60\text{ }^{\circ}\text{C}$ . For temperatures from  $+60\text{ }^{\circ}\text{C}$  to  $+80\text{ }^{\circ}\text{C}$ , the upper setting value of the setting range must be reduced by a specific factor as given in the table below.

Ambient temperature in $^{\circ}\text{C}$	Reduction factor for the upper setting value
+60	1.0
+65	0.94
+70	0.87
+75	0.81
+80	0.73



- 1 Connection for mounting onto contactors:**  
Optimally adapted in electrical, mechanical and design terms to the contactors. The overload relay can be connected directly to these contactor using these pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal bracket for stand-alone installation).
- 2 Selector switch for manual/automatic RESET and RESET button:**  
With this switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. A remote RESET is possible using the RESET modules (accessories), which are independent of size.
- 3 Switch position indicator and TEST function of the wiring:**  
Indicates a trip and enables the wiring test.
- 4 Motor current setting:**  
Setting the device to the rated motor current is easy with the large rotary knob.
- 5 STOP button:**  
If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream. The NC contact is closed again when the button is released.
- 6 Supply terminals:**  
Depending on the device version, the terminals for screw, spring-type or ring lug terminal connection are configured for the main and auxiliary circuit.

A sealable transparent cover can be optionally mounted (accessory). It secures the motor current setting against adjustment.

3RU21 26-4FB0 thermal overload relays

## Trip classes

The 3RU thermal overload relay is available for normal start-up conditions in CLASS 10. For further details about trip classes, see "Tripping characteristics".

## Tripping characteristics

The tripping characteristics show the relationship between the tripping time and the tripping current as a multiple of the operational current  $I_e$  and are specified for symmetrical three-pole and two-pole loading from cold.

The smallest current at which tripping occurs is called the limiting tripping current. In accordance with IEC 60 947-4-1/DIN VDE 0660 Part 102, this must lie within certain specified limits. The limits of the limiting tripping current lie, in the case of the 3RU11 thermal overload re-

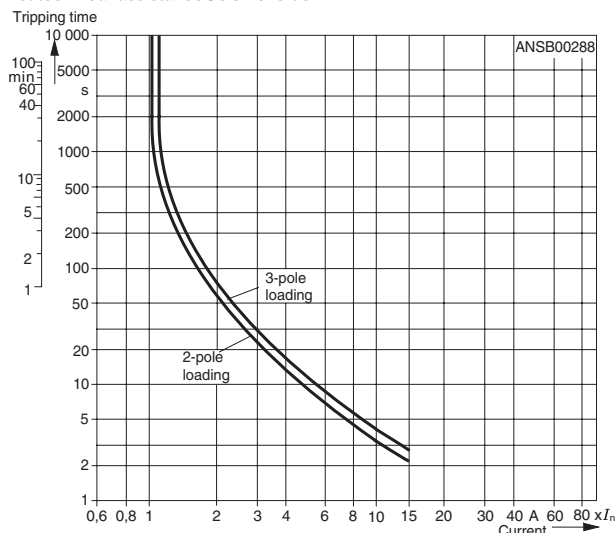
lay for symmetrical three-pole loading between 105 % and 120 % of the operational current. Starting from the limiting tripping current, the tripping characteristic moves on to larger tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time-intervals within which the overload relay must trip with 7.2 times the operational current  $I_e$  for symmetrical three-pole loading from cold.

The tripping times are:

CLASS	Tripping times
10A	2 s to 10 s
10	4 s to 10 s
20	6 s to 20 s
30	9 s to 30 s

## Description

This is the schematic representation of a characteristic. The characteristics of the individual 3RU thermal overload relays can be requested from Technical Assistance at the e-mail address: [nst.technical-assistance@siemens.de](mailto:nst.technical-assistance@siemens.de)



The tripping characteristic of a three-pole 3RU thermal overload relay (see characteristic for symmetrical three-pole loading from cold) is valid when all three bimetal strips are loaded with the same current simultaneously. If, however, only two bimetal strips are heated as a result of phase failure, these two strips would have to provide the force necessary for operating the release mechanism and, if no additional measures were implemented, they would require a longer tripping time or a higher current. These increased current levels over long periods usually result in damage to the consumer. To prevent damage, the 3RU thermal overload relay features phase failure sensitivity which, thanks to an appropriate mechanical mechanism, results in accelerated tripping according to the characteristic for two-pole loading from cold.

In contrast to a load in the cold state, a load at operating temperature has a lower heat reserve. This fact affects the 3RU thermal overload relay in that following an extended period of loading at operational current  $I_n$ , the tripping time reduces by about a quarter.

### Phase failure protection

The 3RU thermal overload relays feature phase failure protection (see "Tripping characteristics") for the purpose of minimizing the heating of the load during single-phase operation as a result of phase failure.

### Setting

The 3RU thermal overload relay is adjusted to the rated motor current using a rotary knob. The scale of the rotary knob is calibrated in Amperes.

### Manual and automatic resetting

It is possible to switch between manual resetting and automatic resetting by depressing and rotating the blue button (RESET button). When manual resetting is selected, a reset can be performed directly on the device by pressing the RESET button. Remote resetting can be implemented by using the mechanical and electrical RESET modules from the range of accessories (see "Accessories"). When the blue button is set to Automatic RESET, the relay will be reset automatically.

A reset is not possible until the recovery time has elapsed (see "Recovery time").

### Recovery time

After tripping due to an overload, it takes a certain length of time for the bimetal strips of the 3RU thermal overload relays to cool down. The relay can only be reset once it has cooled down. This time (recovery time) is dependent on the tripping characteristic and the level of the tripping current.

After tripping due to overload, the recovery time allows the load to cool down.

### TEST function

Correct functioning of the ready 3RU thermal overload relay can be tested with the TEST slide. The slide is operated to simulate tripping of the relay. During this simulation, the NC contact (95-96) is opened and the NO contact (97-98) is closed whereby the overload relay checks that the auxiliary circuit is wired correctly. When the 3RU thermal overload relay is set to Automatic RESET, an automatic reset takes place when the TEST slide is released. The relay must be reset using the RESET button when it is set to Manual RESET.

### STOP function

When the STOP button is pressed, the NC contact is opened and the series-connected contactor and therefore the load is switched Off. The load is reconnected via the contactor when the STOP button is released.

### Status indication

The current status of the 3RU thermal overload relay is indicated by the position of the marking on the "TEST function/switching position indicator" slide. The marking on the slide is on the left at the "O" mark following a trip due to overload or phase failure and at the "I" mark otherwise.

### Auxiliary contacts

The 3RU thermal overload relay is equipped with an NO contact for the tripped signal and an NC contact for switching off the contactor.

### Connection

All the 3RU thermal overload relays have screw terminals for the main and auxiliary circuits. Once the box terminals have been removed from the main conductor connections of the overload relays of size S3, it is possible to connect busbars.

Alternatively the devices are available with either spring loaded or with ring lug terminals on both the control and the main terminals. For details of various connection possibilities, see the "Technical data" and "Selection and ordering data".

### Design and mounting

The 3RU thermal overload relays are suitable for direct mounting on the 3RT contactors. They can also be mounted as single units if the appropriate adapters are used. For details of the mounting possibilities, see the "Selection and ordering data" and the "Technical data".

### Operation with frequency converters

The 3RU thermal overload relays are suitable for operation with frequency converters. Depending on the frequency of the converter, a current higher than the motor current may have to be set due to the occurrence of eddy currents and skin effects.

### Environmental considerations

The devices are manufactured taking environmental considerations into account and comprise environmentally-friendly and recyclable materials.

### Specifications

The 3RU thermal overload relays comply with the requirements of:

- IEC 60 947-1/ DIN VDE 0660 Part 100
- IEC 60 947-4-1/ DIN VDE 0660 Part 102
- IEC 60 947-5-1/ DIN VDE 0660 Part 200
- IEC 60801-2, -3, -4, -5 and
- UL 508/CSA C 22.2.

The 3RU11 thermal overload relays are also safe from touch according to DIN VDE 0106 Part 100 and climate-proof to IEC 721.

### Degree of protection "Increased safety" EEx

The 3RU thermal overload relay meets the requirements for overload protection of motors of the "Increased safety" type of protection EEx e IEC 50 019/ DIN VDE 0165, DIN VDE 0170, DIN VDE 171. KEMA test certificate number Ex-97.Y.3235, DMT 98 ATEX G001, EN 50 019: 1977 + A1 ... A5, Increased Safety "e". Appendix A, Guideline for temperature monitoring of squirrel cage motors during operation.

### Accessories

For the 3RU thermal overload relay, there are:

- one adapter for each of the four overload relay sizes S00 to S3 for individual mounting
- one electrical remote RESET module for all sizes in three different voltage variants
- one mechanical remote RESET module for all sizes
- one cable release for all sizes for resetting inaccessible devices
- terminal covers

The accessories can also be used for the 3RB solid state overload relay.



# Thermal Overload Relays

3RU21 up to 100 A, CLASS 10

### Selection and ordering data

**Features and technical characteristics**

- Auxiliary contacts: 1 NO + 1 NC
- Manual/automatic RESET
- Switching position indication
- CLASS 10
- TEST function
- STOP button
- Phase failure sensitivity
- Sealable cover: optional in S00, S0 & S2. Integrated in S3

### Ordering information

- Replace the (●●) with the letter Number combination from the Terminal types I table
- Replace the (††) with the letter Number combination from the Terminal types II table
- For description, [see page 3/8](#)
- For technical data, [see pages 3/12-3/15](#)
- For circuit diagrams, [see page 3/15](#)
- For dimension drawings, [see page 3/16-3/17](#).

●● Terminal Types I			†† Terminal Types II		
Type	Mounting Type	Ltr	Type	Mounting Type	Ltr
Screw	Direct to Contactor	B0	Screw	Direct to Contactor	B0
Screw <sup>1)</sup>	Stand Alone	B1	Screw <sup>4)</sup>	Stand Alone	B1
Spring <sup>2)</sup>	Direct to Contactor	C0	Spring <sup>3)</sup>	Direct to Contactor	D0
Spring <sup>1) 2)</sup>	Stand Alone	C1	Spring <sup>3) 4)</sup>	Stand Alone	D1
Ring Lug	Direct to Contactor	J0			



3RU2116-1GB0



3RU2116-1GC0



3RU2126-4NB0



3RU2136-4RB1



3RU2146-4JB0

### Thermal Overload Relays up to 40A Frame Size S00 and S0 ●●

Setting Range	Order No.	Setting Range	Order No.	Weight approx. (screw/spring) kg
A		A		
<b>Frame Size S00: For mounting directly to 3RT201 contactors or for stand-alone installation</b>				
0.11 - 0.16	3RU2116-0A●●	1.4 - 2	3RU2116-1B●●	0.13/0.15
0.14 - 0.2	3RU2116-0B●●	1.8 - 2.5	3RU2116-1C●●	
0.18 - 0.25	3RU2116-0C●●	2.2 - 3.2	3RU2116-1D●●	
0.22 - 0.32	3RU2116-0D●●	2.8 - 4	3RU2116-1E●●	
0.28 - 0.4	3RU2116-0E●●	3.5 - 5	3RU2116-1F●●	0.13/0.15
0.35 - 0.5	3RU2116-0F●●	4.5 - 6.3	3RU2116-1G●●	
0.45 - 0.63	3RU2116-0G●●	5.5 - 8	3RU2116-1H●●	
0.55 - 0.8	3RU2116-0H●●	7 - 10	3RU2116-1J●●	
0.7 - 1	3RU2116-0J●●	9 - 12.5	3RU2116-1K●●	0.13/0.15
0.9 - 1.25	3RU2116-0K●●	11 - 16	3RU2116-4A●●	
1.1 - 1.6	3RU2116-1A●●			
<b>Frame Size S0: For mounting directly to 3RT202 contactors or for stand-alone installation</b>				
1.8 - 2.5	3RU2126-1C●●	11 - 16	3RU2126-4A●●	0.16/0.22
2.2 - 3.2	3RU2126-1D●●	14 - 20	3RU2126-4B●●	
2.8 - 4	3RU2126-1E●●	17 - 22	3RU2126-4C●●	
3.5 - 5	3RU2126-1F●●	20 - 25	3RU2126-4D●●	
4.5 - 6.3	3RU2126-1G●●	23 - 28	3RU2126-4N●●	0.16/0.22
5.5 - 8	3RU2126-1H●●	27 - 32	3RU2126-4E●●	
7 - 10	3RU2126-1J●●	30 - 36	3RU2126-4P●●	
9 - 12.5	3RU2126-1K●●	34 - 40	3RU2126-4F●●	

### Thermal Overload Relays up to 100A Frame Size S2 and S3 ††

Setting Range	Order No.	Setting Range	Order No.	Weight approx. (screw/spring) kg
A		A		
<b>Frame Size S2: For mounting directly to 3RT203 contactors<sup>4)</sup></b>				
22 - 32	3RU2136-4E††	47 - 57	3RU2136-4Q††	0.34
28 - 40	3RU2136-4F††	54 - 65	3RU2136-4J††	
36 - 45	3RU2136-4G††	62 - 73	3RU2136-4K††	
40 - 50	3RU2136-4H††	70 - 80	3RU2136-4R††	
<b>Frame Size S3: For mounting directly to 3RT104 contactors<sup>4)</sup></b>				
28 - 40	3RU2146-4F††	57 - 75	3RU2146-4K††	
36 - 50	3RU2146-4H††	70 - 90	3RU2146-4L††	
45 - 63	3RU2146-4J††	80 - 100 <sup>5)</sup>	3RU2146-4M††	

- 1) Not available for size S0 3RU212 with current setting range below 14 A.
- 2) Size S00 and S0: main and auxiliary conductor terminals are spring-type.
- 3) Size S2 and S3 auxiliary terminals are spring-type only. Main conductor terminals are screw.
- 4) 3RU Overloads in S2 and S3 frame are available preassembled with a terminal bracket for standalone mounting. S2 and S3 overloads can also be customer assembled to the terminal bracket (see Accessories).
- 5) For overload relays > 100A, see electronic overload relays.



**Accessories**

Design	for type		Order No.	Weight approx kg	
		Size			
<b>Terminal brackets for stand-alone installation <sup>1)</sup></b>					
 <p>3RU29 36-3AA01</p>	For separate mounting of the overload relay; panel mount or snapped onto 35 mm standard mounting rail, size S3 also for 75 mm standard mounting rail	Screw terminals	S00	3RU29 16-3AA01	0.04
			S0	3RU29 26-3AA01	0.05
			S2	3RU29 36-3AA01	0.18
			S3	3RU29 46-3AA01	0.28
		Spring Loaded terminals	S00	3RU29 16-3AC01	0.04
		S0	3RU29 26-3AC01	0.06	
<b>Mechanical RESET</b>					
 <p>with pushbutton, and reset extension 3RU29 00-1A</p>	<b>Resetting plunger, holder, and former overload reset adapter</b>		S00 to S3	3RU29 00-1A	0.038
	<b>Pushbuttons with extended stroke</b> IP 65 Ø 22 mm, 12 mm hub		S00 to S3	3SU1200-0FB10-0AA0	0.020
	<b>Extension plungers</b> For compensation of the distance between the pushbutton and the unlatching button of the relay		S00 to S3	3SU1900-0KG10-0AA0	0.004
	<b>Complete mechanical reset assembly</b>		S00 to S3	3SBES-RESET	
<b>Cable release with holder for RESET</b>					
 <p>3RU29 00-1</p>	For drilled hole Ø 6.5 mm in the control panel max. control panel thickness 8 mm	Length 400 mm	S00 to S3	3RU29 00-1B	0.063
		Length 600 mm	S00 to S3	3RU29 00-1C	0.073
<b>Module for remote RESET, electrical</b>					
 <p>3RU19 00-2A.71</p>	Operating range 0.85 to 1.1 × U <sub>s</sub> Power consumption AC 80 VA, DC 70 W ON period 0.2 s to 4 s AC/DC 24 V to 30 V AC/DC 110 V to 127 V AC/DC 220 V to 250 V		S00 to S3	3RU19 00-2AB71 3RU19 00-2AF71 3RU19 00-2AM71	0.066 0.066 0.066
<b>Terminal cover</b>					
 <p>3RT1946-4EA1</p>	Cover for cable lug and bar connection		S3	3RT19 46-4EA1	0.040
	Cover for box terminals		S2 S3	3RT29 36-4EA2 3RT29 46-4EA2	0.020 0.025
<b>Sealable covers</b>					
 <p>3RV29 08-0P</p>	For covering the rotary setting dials. Order in multiples of 10.		S00 to S2	3RV29 08-0P	0.100
<b>Tool for opening Spring Loaded terminal connections</b>					
 <p>3RA2908-1A</p>	Suitable up to a For all SIRIUS devices with spring-type terminals			3RA2908-1A	0.045
	<ul style="list-style-type: none"> <li>Length: approx. 200 mm; 3.0 × 0.5 mm (green)</li> </ul>				

3 OVERLOAD RELAYS

<sup>1)</sup> The accessories are identical to those of the 3RB30/3RB31 solid-state overload relays.

Technical data					
Type		3RU21 16	3RU21 26	3RU21 36	3RU21 46
Size		S00	S0	S2	S3
Width		45 mm	45 mm	55 mm	70 mm
<b>General data</b>					
Release on	overload or phase failure				
Trip class	acc. to IEC 60947-4-1	CLASS 10	10, 10A	10	
Phase failure sensitivity	Yes				
Overload warning	No				
Resetting and recovery	Manual, remote and automatic RESET <sup>1)</sup>				
Reset possibilities after tripping	depending on the level of tripping current and the tripping characteristic				
Recovery time	on automatic RESET	min	depending on the level of tripping current and the tripping characteristic		
	on manual RESET	min			
	on remote RESET	min			
Features	Yes, using the slide "TEST function/ON-OFF indicator"				
Indication of status on the device	Yes				
TEST function	Yes				
RESET button	Yes				
STOP button	Yes				
Safe operation of motors with "increased safety" type of protection	EC type test certificate number according to directive 94/9/EC (ATEX)				
		DMT 98 ATEX G 001  II (2) GD	On request		
Ambient temperatures					
Storage/transport	°C	-55 to +80		-55 to +80	
Operation	°C	-40 to +70		-40 to +70	
Temperature compensation	°C	up to +60		up to +60	
Permissible rated current at	Internal cabinet temperature of 60 °C	%	100 (over +60°C, the current must be reduced)	100 (over +60°C, current reduction is not required)	
	Internal cabinet temperature of 70 °C	%	87	87	
Repeat terminals	Yes				
Repeat coil terminal	Yes				
Auxiliary switch repeat terminal	Not required				
Degree of protection	acc. to IEC 60529	IP 20	IP 20 <sup>2)</sup>		
Touch protection	acc. to IEC 61140	Finger-safe for vertical contact from the front			
		Finger-safe only with optional terminal covers			
Shock resistance (sine)	acc. to IEC 60068-2-27	g/ms	15/11 (auxiliary contacts 95/96 and 97/98: 8g/11ms)	8/10	
EMC	Not relevant				
• Interference immunity	Not relevant				
• Emitted interference	Not relevant				
Resistance to extreme climates (humidity)	%	90	100		
Dimensions	see dimensional drawings				
Site altitude	m	Up to 2000; above this on request			
Installation angle	The permissible installation angles for mounting onto contactors and individual mounting are shown in the diagrams. For mounting in the shaded area, adjustment compensation of 10 % is necessary.				
	Individual mounting				
Type of installation/mounting	Mounting onto contactor/stand-alone installation with terminal support (For screw and snap-on mounting onto TH 35 standard mounting rail)			Direct mounting/stand-alone installation with terminal support (For screw and snap-on mounting onto TH34 standard mounting rail size; size S3 also for TH 75 standard mounting rail.*	

1) Remote RESET in combination with the appropriate accessories.

2) Terminal compartment: IP 00 degree of protection.

Technical data					
Type		3RU21 16	3RU21 26	3RU21 36	3RU21 46
Size		S00	S0	S2	S3
Width		45 mm	45 mm	55 mm	70 mm
Main circuit					
Rated insulation voltage $U_i$ (pollution degree 3)	V	690			1000
Rated impulse withstand voltage $U_{imp}$	kV	6			8
Rated operational voltage $U_e$	V	690			1000
Type of current	DC AC	Yes Yes, frequency range up to 400 Hz			
Current setting	A	0.11 – 0.16 to 11 – 16	1.8 – 2.5 to 34 – 40	11-16 up to 70-80	18 – 25 to 80 – 100
Power loss per device (max.)	W	4.1...6.3	6.2...7.5	8...14	10 to 16.5
Short-circuit protection	With fuse without contactor With fuse and contactor	See selection and ordering data See technical data (short-circuit protection with fuses / circuit-breaker for motor feeders)			
Protective separation between main and auxiliary current paths	V	440 440	690: Setting ranges $\leq 25$ A 440: Setting ranges $> 25$ A	690 690	690
Acc. to IEC 60947-1, • Screw terminals or ring terminal lug connections • Spring - type terminals					
Connection of the main circuit					
Type of connection		Screw terminals			Screw connection with box terminal <sup>2)</sup> / bar connection
Screw terminals					
• Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2	Hexagon socket screw 4 mm
• Operating devices	mm	Ø5 ... 6	Ø5 ... 6	Ø5 ... 6	Ø5 ... 6
• Tightening torque	Nm	0.8 to 1.2	2 to 2.5	3 to 4.5	4 to 6
• Conductor cross-section (min./max.), 1 or 2 wires	Solid or stranded mm <sup>2</sup>	2 × (0.5 to 1.5), 2 × (0.75 to 2.5), max. 2 × 4	2 × (1 to 2.5), 2 × (2.5 to 6), max. 2 × (2.5 to 10)	2x(2.5 to 35) 1x(2.5 to 50)	2 × (2.5 to 16)
	Finely stranded with end sleeve mm <sup>2</sup>	2 × (0.5 to 1.5), 2 × (0.75 to 2.5)	2 × (1 to 2.5), 2 × (2.5 to 6) max. 1 × 10	2 × (1 to 25) 1 × (1 to 35)	2 × (2.5 to 35), 1 × (2.5 to 50)
	AWG conductor con., solid or stranded AWG	2 × (20 ... 16) 2 × (18 ... 14) 2 × 12	2 × (16 ... 12) 2 × (14 ... 8)	2 × (18 to 2) 1 × (18 to 1)	2 × (10 to 1/0), 1 × (10 to 2/0)
	Ribbon cable (No. × width × thickness) mm	–	–	–	2 × (6 × 9 × 0.8)
Bar connection					
• Terminal screw		–			M 6 × 20
• Tightening torque	Nm	–			4 to 6
• Conductor cross-section (min./max.)	Finely stranded with cable lug mm <sup>2</sup>	–			2 × 70
	Stranded with cable lug mm <sup>2</sup>	–			2 × 70
	AWG conductor connections, solid or stranded with cable lug AWG	–			2/0
	With connecting bars (max. width) mm	–			12
Auxiliary circuit					
Main contacts: Number of NO contacts		1			
Number of NC contacts		1			
Assignment of auxiliary contacts		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor			
Rated insulation voltage $U_i$ (pollution degree 3)	V	690			
Rated impulse withstand voltage $U_{imp}$	kV	6			
Switching capacity of auxiliary contacts					
NC for AC AC-14/AC-15	Rated operational current $I_e$ at $U_e$ :	A	4		
	• 24 V	A	4		
	• 120 V	A	4		
	• 125 V	A	4		
	• 230 V	A	3		
	• 400 V	A	2		
	• 600 V	A	0.75		
	• 690 V	A	0.75		

1) For conductor cross-sections for Cage Clamp terminals, see "Connection of the auxiliary circuit."

2) The box terminal can be removed. After the box terminal has been removed, bar connection and lug connection is possible.

**Technical data**

Type			3RU21 16	3RU21 26	3RU21 36	3RU11 46	
Size			S00	S0	S2	S3	
Width			45 mm	45 mm	55 mm	70 mm	
NO for AC AC-14/AC-15	Rated operational current $I_e$ at $U_e$ :	• 24 V	A	3			3
		• 120 V	A	3			3
		• 125 V	A	3			3
		• 230 V	A	2			2
		• 400 V	A	1			1
		• 600 V	A	0.75			0.6
		• 690 V	A	0.75			0.5
		NC, NO for DC DC-13	Rated operational current $I_e$ at $U_e$ :	• 24 V	A	1	
• 60 V	A			On request			On request
• 110 V	A			0.22			0.22
• 125 V	A			0.22			0.22
• 220 V	A			0.11			0.11
Conventional thermal current $I_{th}$				A	6		
Contact reliability	(suitable for PLC; 17 V, 5 mA)		Yes			Yes	
<b>Short-circuit protection</b>							
With fuse	Utilization cat. gL/gG fast	A	6				
		A	10				
<b>With miniature circuit-breaker (C characteristic)</b>		A	6 <sup>1)</sup>				
<b>Reliable operational voltage for protective separation between auxiliary current paths</b>		acc. to IEC 60947-1	V	440			

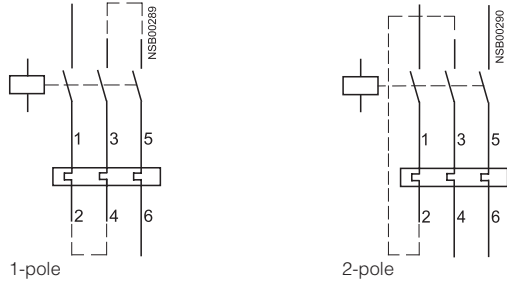
**Connection of the auxiliary circuit**

Type of connection			Screw terminal or Cage Clamp terminal			
Connection characteristics			Screw terminals			Cage Clamp terminals
• Terminal screw			Pozidrive Size 2			–
• Tightening torque		Nm	0.8 to 1.2			2 × (0.25 to 2.5)
• Conductor cross-sections (min./max.), 1 or 2 wires	Solid or stranded	mm <sup>2</sup>	2 × (0.5 to 1.5), 2 × (0.75 to 2.5)			2 × (0.25 to 2.5)
	Finely stranded without end sleeve	mm <sup>2</sup>	–			2 × (0.25 to 2.5)
	Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 to 1.5), 2 × (0.75 to 2.5)			2 × (0.25 to 1.5)
	AWG conductor connections, solid or stranded	AWG	2 × (20 to 16) 2 × (18 to 14)			2 × (20 to 14)

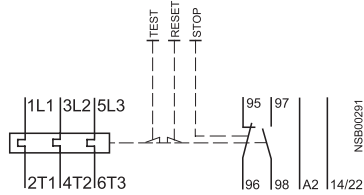
1) Up to  $I_k \leq 0.5$  kA;  $\leq 260$  V.

## Circuit diagrams

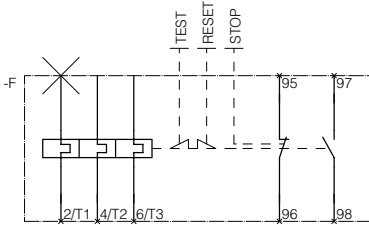
### Protection of DC motors



### 3RU21 16 overload relay



### 3RU21 26 to 3RU21 46 overload relays



# Thermal Overload Relays

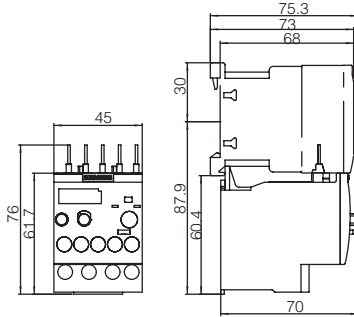
3RU21 up to 100 A, CLASS 10

## Dimension drawings

### Screw connection

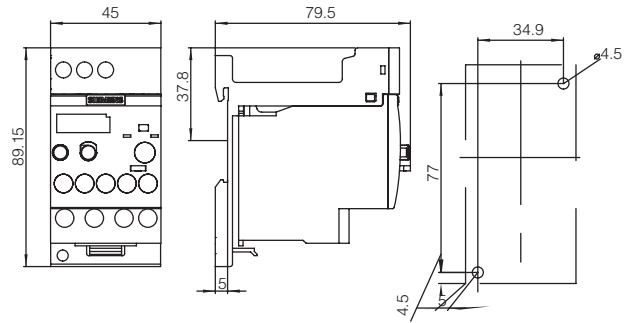
Lateral clearance to grounded components: at least 6 mm.

**3RU21 16..B0**  
Size S00

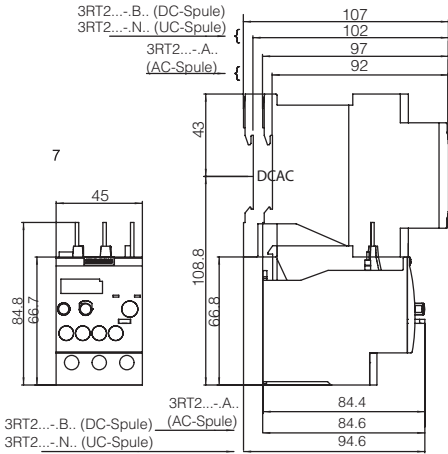


**3RU21 16..B1**  
Size S00

with adapter for installation as a single unit with accessories

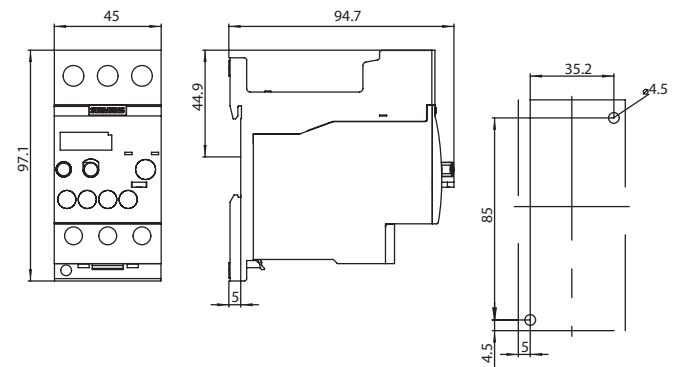


**3RU21 26..B.**  
Size S0



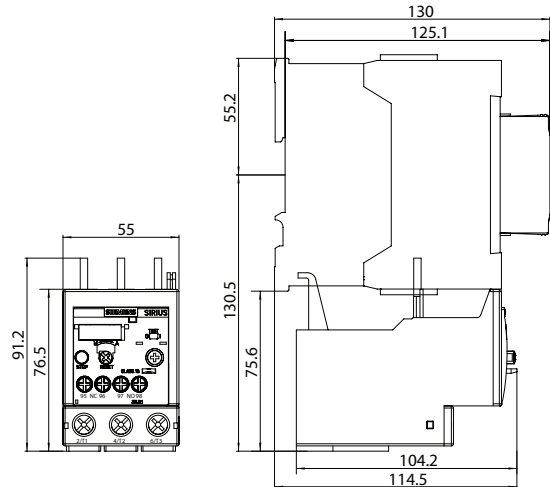
**3RU21 26..B1**  
Size S0

with adapter for installation as a single unit



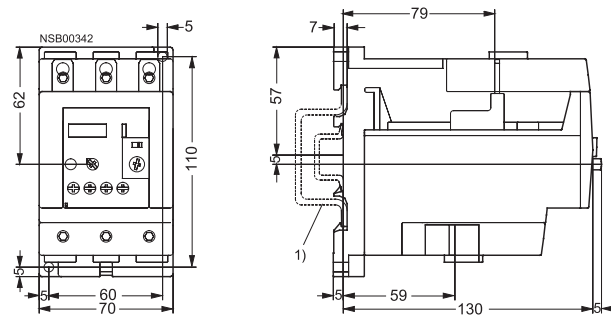
**3RU21 36..B.**  
Size S2

with adapter for installation as a single unit



**3RU21 46..B.**  
Size S3

with adapter for installation as a single unit



1) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or 75 mm standard mounting rail acc. to EN 50023

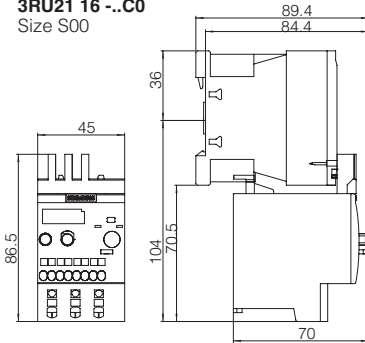
Dimension drawings "Contactor with built-on overload relay" see contactors and contactor combinations.

### Dimension drawings

#### Spring Loaded terminals

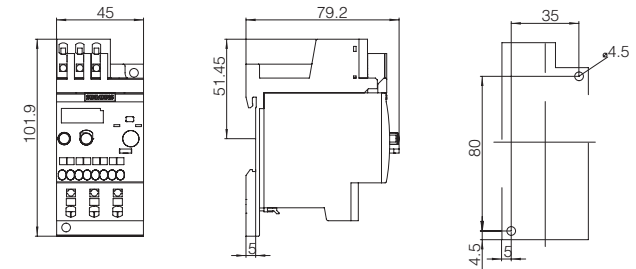
Lateral clearance to grounded components: at least 6 mm.

**3RU21 16 -..C0**  
Size S00



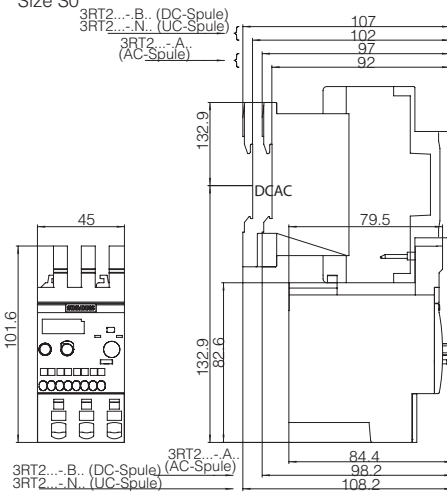
**3RU21 16 -..C1**

Size S00 with with adapter for installation as a single unit



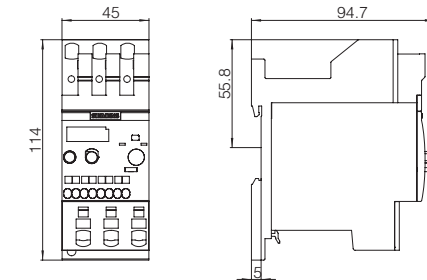
**3RU21 26-..C0**

Size S0



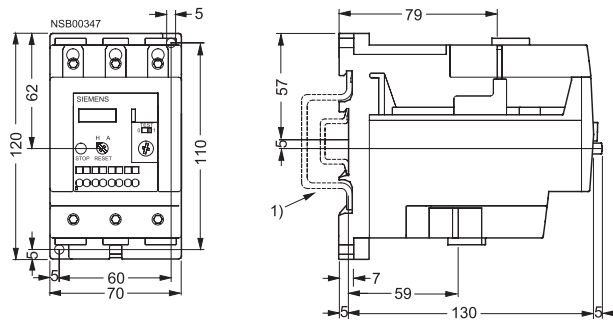
**3RU21 26-..C1**

Size S0 with adapter for installation as a single unit



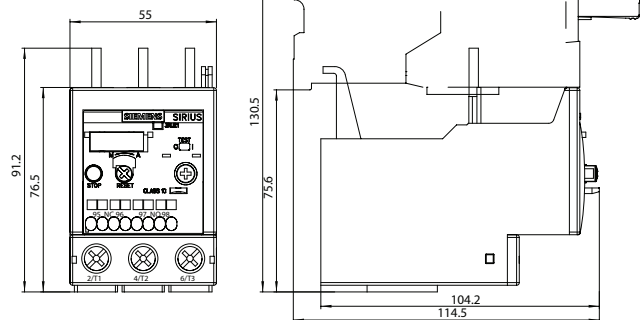
**3RU11 46-..D.**

Size S3



**3RU2136-..D.**

Size S2



- 1) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or 75 mm standard mounting rail acc. to EN 50 023

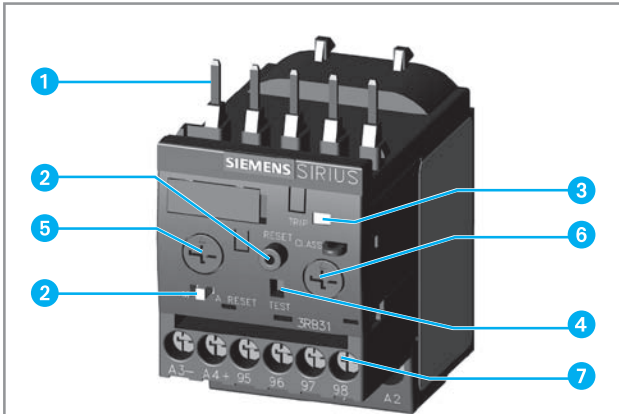
Dimension drawings "Contactor with built-on overload relay" see contactors and contactor combinations.



# 3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

## Overview



- 1 Connection for mounting onto contactors:**  
Optimally adapted in electrical, mechanical and design terms to the contactors. The overload relay can be connected directly to these contactor using these pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal bracket for stand-alone installation).
- 2 Selector switch for manual/automatic RESET and RESET button:**  
With this switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. On the 3RB21 a solid-state remote is integrated into the unit.
- 3 Switch position indicator and TEST function of the wiring:**  
Indicates a trip and enables the wiring test.
- 4 Solid state test:**  
Enables a test of all important device components and functions.
- 5 Motor current setting:**  
Setting the device to the rated motor current is easy with the large rotary knob.
- 6 Trip class setting/internal ground-fault detection (3RB21 only):**  
Using the rotary switch you can set the required trip class and activate the internal ground-fault detection dependent on the starting conditions.
- 7 Connecting terminals (removable terminal block for auxiliary circuits):**  
The generously sized terminals permit connection of two conductors auxiliary circuit can be connected with screw-type terminals or with spring-loaded terminals.

The 3RB and 3RB solid-state overload relays up to 630 A with internal power supply have been designed for inverse-time delayed protection of loads with normal and heavy starting (see [Function](#)) against excessive temperature rise due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set motor rated current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding solid-state circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of the contactors control circuit. The break time depends on the ratio between the tripping current and set current  $I_e$  and is stored in the form of a long-term stable tripping characteristic (see [Characteristic Curves](#)).

In addition to inverse-time delayed protection of loads against excessive temperature rise due to overload, phase unbalance and phase failure, the 3RB21/31 solid-state overload relays also allow internal ground-fault detection (not possible in conjunction with wye-delta assemblies). This provides protection of loads against high-resistance short-circuits due to damage to the insulation material, moisture, condensed water etc.

The "tripped" status is signaled by means of a switch position indicator (see [Function](#)). Resetting takes place either manually or automatically after the recovery time has elapsed (see [Function](#)).

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials. They comply with important worldwide standards and approvals.

## Application

### Industries

The 3RB2 / 3RB3 solid-state overload relays are suitable for customers from all industries who want to provide optimum inverse-time delayed protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5 to CLASS 30), minimize project completion times, inventories and power consumption, and optimize plant availability and maintenance management.

### Application

The 3RB2 / 3RB3 solid-state overload relays have been designed for the protection of three-phase motors in sinusoidal 50/60 Hz voltage networks. The relays are not suitable for the protection of single-phase AC or DC loads.

The 3RU thermal overload relay or the 3RB22/3RB23 solid-state overload relay can be used for single-phase AC loads. For DC loads the 3RU thermal overload relays are available.

### Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive environments, ageing and temperature changes.

For the temperature range from  $-25\text{ °C}$  to  $+60\text{ °C}$ , the 3RB2 / 3RB3 solid-state overload relays compensate the temperature according to IEC 60947-4-1.

The 3RB2 / 3RB3 solid-state overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e according to ATEX guideline 94/9/EC. The relays meet the requirements of EN 60079-7 (Electrical apparatus for potentially explosive atmospheres – Increased safety "e").

The basic safety and health requirements of ATEX guideline 94/9/EG are fulfilled by compliance with

- EN 60947-1
- EN 60947-4-1
- EN 60947-5-1
- EN 60079-14

EU type test certificate for Group II, Category (2) G/D under application. It has the number PTB 09 ATEX 3001.

## Accessories

The following accessories are available for the 3RB2/3RB3 solid-state overload relays:

- One terminal bracket each for the overload relays size S00 and S0 (sizes S2 to S12 can be installed as single units without a terminal bracket)
- One mechanical remote RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for all sizes
- Box terminals for sizes S6 and S10/S12
- Terminal covers for sizes S2 to S10/S12

# 3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

## Design

### Device concept

The 3RB2 / 3RB3 solid-state overload relays are compact devices, i.e. current measurement (transformer) and the evaluation unit are integrated in a single enclosure.

### Mounting options

The 3RB2 / 3RB3 solid-state overload relays are suitable for direct and space-saving mounting onto 3RT1 / 3RT2 contactors and 3RW30/3RW31 soft starters as well as for stand-alone installation. For more information on the mounting options, please see [Technical Specifications and Selection and Ordering Data](#)

### Connection technique

#### Main circuit

All sizes of the 3RB2 / 3RB3 solid-state overload relays can be connected with screw-type terminals. As an alternative for sizes S3 to S10/S12, the main circuits can be connected via the Busbar. Sizes S2 to S6 of the 3RB20/3RB21 relays are also available with a straight-through transformer. In this case, the cables of the main circuit are routed directly through the feed-through openings of the relay to the contactor terminals.

#### Auxiliary circuit

Connection of the auxiliary circuit (removable terminal block) is possible with either screw terminals or spring-loaded terminals.

For more information on the connection options, see [Technical Specifications and Selection and Ordering Data](#).

### Overload relays in contactor assemblies for Wye-Delta starting

When overload relays are used in combination with contactor assemblies for Wye-Delta starting it must be noted that only 0.58 times the motor current flows through the line contactor. An overload relay mounted onto the line contactor must be set to 0.58 times the motor current.

When 3RB21 / 31 solid-state overload relays are used in combination with contactor assemblies for Wye-Delta starting, the internal ground-fault detection must not be activated.

### Operation with frequency converter

The 3RB2 / 3RB3 solid-state overload relays are suitable for frequencies of 50/60 Hz and the associated harmonics. This permits the 3RB2 / 3RB3 overload relays to be used on the incoming side of the frequency converter.

If motor protection is required on the outgoing side of the frequency converter, the 3RN thermistor motor protection devices or the 3RU thermal overload relays are available for this purpose.

# 3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

## Function

### Basic functions

The 3RB2 / 3RB3 solid-state overload relays are designed for:

- Inverse-time delayed protection of loads from overloading
- Inverse-time delayed protection of loads from phase unbalance
- Inverse-time delayed protection of loads from phase failure
- Protection of loads from high-resistance short-circuits (internal ground-fault detection only with 3RB21 / 31).

### Control circuit

The 3RB2 / 3RB3 solid-state overload relays have an internal power supply, i.e. no additional supply voltage is required.

### Short-circuit protection

Fuses or motor starter protectors must be used for short-circuit protection. For assignments of the corresponding short-circuit protection devices to the 3RB2 / 3RB3 solid-state overload relays with/without contactor see [Technical Specifications and Selection and Ordering Data](#).

### Trip classes

The 3RB20 / 30 solid-state overload relays are available for normal starting conditions with trip CLASS 10 or for heavy starting conditions with trip CLASS 20 (fixed setting in each case).

The 3RB21 / 31 solid-state overload relays are suitable for normal and heavy starting. The required trip class (CLASS 5, 10, 20 or 30) can be adjusted by means of a rotary knob depending on the current starting condition.

For details of the trip classes see [Characteristic Curves](#).

### Phase failure protection

The 3RB2 / 3RB3 solid-state overload relays are fitted with phase failure protection (see [Characteristic Curves](#)) in order to minimize temperature rise of the load during single-phase operation.

Phase failure protection is not effective for loads with star-connection and a grounded neutral point or a neutral point which is connected to a neutral conductor.

### Setting

The 3RB2 / 3RB3 solid-state overload relays are set to the motor rated current by means of a rotary knob. The scale of the rotary knob is shown in amps.

With the 3RB21 / 31 solid-state overload relay it is also possible to select the trip class (CLASS 5, 10, 20 or 30) using a second rotary knob and to switch the internal ground-fault detection on and off.

### Manual and automatic reset

In the case of the 3RB2 / 3RB3 solid-state overload relays, a slide switch can be used to choose between automatic and manual resetting.

If manual reset is set, a reset can be carried out directly on the device after a trip by pressing the blue RESET button. Resetting is possible in combination with the mechanical reset options from the accessories range (see [Accessories](#)). As an alternative to the mechanical RESET options, the 3RB21 / 31 solid-state overload relays are equipped with an electrical remote RESET which may be utilized by applying a voltage of 24 V DC to the terminals A3 and A4.

If the slide switch is set to automatic RESET, the relay is reset automatically.

The time between tripping and resetting is determined by the recovery time.

### Recovery time

With the 3RB2 / 3RB3 solid-state overload relays the recovery time after inverse-time delayed tripping is between 0.5 and 3 minutes depending on the preloading when automatic RESET is set. These recovery times allow the load (e.g. motor) to cool down.

If the button is set to manual RESET, the 3RB2 / 3RB3 devices can be reset immediately after inverse-time delayed tripping.

After a ground fault trip the 3RB21 / 31 solid-state overload relays (with ground-fault detection activated) can be reset immediately without a recovery time regardless of the reset mode set.

### TEST function

With motor current flowing, the TEST button can be used to check whether the relay is working correctly (device/solid-state TEST). Current measurement, motor model and trip unit are tested. If these components are OK, the device is tripped in accordance with the table below. If there is an error, no tripping takes place.

Trip class	Required loading with the rated current prior to pressing the test button	Tripping within
CLASS 5	2 min	8 s
CLASS 10	4 min	15 s
CLASS 20	8 min	30 s
CLASS 30	12 min	45 s

Note: The test button must be kept pressed throughout the test.

Testing of the auxiliary contacts and the control current wiring is possible with the switch position indicator slide. Actuating the slide simulates tripping of the relay. During this simulation the NC contact (95-96) is opened and the NO contact (97-98) is closed. This tests whether the auxiliary circuit has been correctly wired.

After a test trip the relay is reset by pressing the RESET button.

### Self-monitoring

The 3RB2 / 3RB3 solid-state overload relays have a self-monitoring feature, i.e. the devices constantly monitor their own basic functions and trip if an internal fault is detected.

### Display of operating status

The respective operating status of the 3RB2 / 3RB3 solid-state overload relays is displayed by means of the position of the marking on the switch position indicator slide. After tripping due to overload, phase failure, phase unbalance or ground fault (ground fault detection possible only with 3RB21 / 31) the marking on the slide is to the left on the "O" mark, otherwise it is on the "I" mark.

### Auxiliary contacts

The 3RB2 / 3RB3 solid-state overload relays are fitted with an NO contact for the "tripped" signal, and an NC contact for switching off the contactor.

# 3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

## Selection and ordering data

Conversion aid 3RB10 or 3RB20 → 3RB20 or 30

Size	Old Order No.	Setting range A	New Order No.	Setting range A
S00	3RB20 16-□RB0	0.1 ... 0.4	3RB30 16-□RB0	0.1 ... 0.4
	3RB20 16-□NB0	0.32 ... 1.25	3RB30 16-□NB0	0.32 ... 1.25
	3RB20 16-□PB0	1 ... 4	3RB30 16-□PB0	1 ... 4
	3RB20 16-□SB0	3 ... 12	3RB30 16-□SB0	3 ... 12
S0	3RB20 26-□RB0	0.1 ... 0.4	3RB30 26-□RB0	0.1 ... 0.4
	3RB20 26-□NB0	0.32 ... 1.25	3RB30 26-□NB0	0.32 ... 1.25
	3RB20 26-□PB0	1 ... 4	3RB30 36-□PB0	1 ... 4
	3RB20 26-□SB0	3 ... 12	3RB30 26-□SB0	3 ... 12
	3RB20 26-□QB0	6 ... 25	3RB30 26-□QB0	6 ... 25
S2	3RB20 36-□QB0	6 ... 25	3RB30 36-□UB0	12.5 ... 50
	3RB20 36-□UB0	13 ... 50	3RB30 36-□WB0	20 ... 80
S3	3RB10 46-□UB0	13 ... 50	3RB30 46-□UB0	12.5 ... 50
	3RB10 46-□EB0	25 ... 100	3RB30 46-□XB0	32 ... 115
S6	3RB10 56-□FW0	50 ... 200	3RB20 56-□FW2	50 ... 200
	3RB10 56-□FG0		3RB20 56-□FC2	
S10/S12	3RB10 66-□GG0	55 ... 250	3RB20 66-□GC2	55 ... 250
	3RB10 66-□KG0	200 ... 540		
	3RB10 66-□LG0	300 ... 630	3RB20 66-□MC2	160 ... 630

CLASS 10  
CLASS 20

1  
2

1  
2

Conversion aid 3RB10 / 21 → 3RB21 / 31

Size	Old Order No.	Setting range A	New Order No.	Setting range A
S00	3RB21 13-□RB0	0.1 ... 0.4	3RB31 13-4RB0	0.1 ... 0.4
	3RB21 13-□NB0	0.4 ... 1.6	3RB31 13-4NB0	0.32 ... 1.25
	3RB21 13-□PB0	1.5 ... 6	3RB31 13-4PB0	1 ... 4
	3RB21 13-□SB0	3 ... 12	3RB31 13-4SB0	3 ... 12
S0	3RB21 23-□RB0	0.1 ... 0.4	3RB31 23-4RB0	0.1 ... 0.4
	3RB21 23-□NB0	0.32 ... 1.25	3RB31 23-4NB0	0.32 ... 1.25
	3RB21 23-□PB0	1 ... 4	3RB31 23-4PB0	1 ... 4
	3RB21 23-□SB0	3 ... 12	3RB31 23-4SB0	3 ... 12
	3RB21 23-□QB0	6 ... 25	3RB31 23-4QB0	6 ... 25
S2	3RB21 33-□QB0	6 ... 25	3RB31 33-4UB0	12.5 ... 50
	3RB21 33-□UB0	13 ... 50	3RB31 33-4WB0	20 ... 80
S3	3RB10 46-□UB0	12.5 ... 50	3RB31 43-4UB0	12.5 ... 50
	3RB10 46-□EB0	25 ... 100	3RB31 43-4XB0	32 ... 115
S6	3RB10 56-□FW0	50 ... 200	3RB21 53-4FW2	50 ... 200
	3RB10 56-□FG0		3RB21 53-4FC2	
S10/S12	3RB10 66-□GG0	55 ... 250	3RB21 63-4GC2	55 ... 250
	3RB10 66-□KG0	200 ... 540		
	3RB10 66-□LG0	300 ... 630	3RB21 63-4MC2	160 ... 630

CLASS 10  
CLASS 20

1  
2

Note:

CLASS 5, 10, 20 and 30 can be set on the unit

# 3RB2 / 3RB3 Solid-State Overload Relays







3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

**3RB20 solid-state overload relays and stand-alone installation<sup>2)3)</sup>, CLASS 10 or CLASS 20 for direct mounting<sup>1)2)</sup>**

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring

OVERLOAD RELAYS 3

Size Contactor <sup>4)</sup>	Set current value of the inverse-time delayed overload trip	Screw Terminal Order Number	Spring Loaded Terminal Order Number	Weight per PU approx.		
	A			kg		
<b>Size S00<sup>1)</sup></b>						
 3RB30 16-1RB0	S00	0.1 ... 0.4	<b>3RB30 16-□RB0</b>	<b>3RB30 16-□RE0</b>	0.172	
		0.32 ... 1.25	<b>3RB30 16-□NB0</b>	<b>3RB30 16-□NE0</b>	0.172	
		1 ... 4	<b>3RB30 16-□PB0</b>	<b>3RB30 16-□PE0</b>	0.172	
		3 ... 12	<b>3RB30 16-□SB0</b>	<b>3RB30 16-□SE0</b>	0.172	
		4 ... 16	<b>3RB30 16-□TB0</b>	<b>3RB30 16-□TE0</b>	0.172	
<b>Size S0<sup>1)</sup></b>						
 3RB30 26-1QB0	S0	0.1 ... 0.4	<b>3RB30 26-□RB0</b>	<b>3RB30 26-□RE0</b>	0.250	
		0.32 ... 1.25	<b>3RB30 26-□NB0</b>	<b>3RB30 26-□NE0</b>	0.250	
		1 ... 4	<b>3RB30 26-□PB0</b>	<b>3RB30 26-□PE0</b>	0.250	
		3 ... 12	<b>3RB30 26-□SB0</b>	<b>3RB30 26-□SE0</b>	0.250	
		6 ... 25	<b>3RB30 26-□QB0</b>	<b>3RB30 26-□QE0</b>	0.250	
	10 ... 40	<b>3RB30 26-□VB0</b>	<b>3RB30 26-□VE0</b>	0.250		
<b>Size S2<sup>1)3)5)</sup></b>						
 3RB30 36-1UB0	S2	12 ... 50	with busbar with pass through CT's	<b>3RB30 36-□UB0</b>	<b>3RB30 36-□UD0</b>	0.360
				<b>3RB30 36-□UW1</b>	<b>3RB30 36-□UX1</b>	0.230
	20 ... 80	with busbar with pass through CT's	<b>3RB30 36-□WB0</b>	<b>3RB30 36-□WD0</b>	0.360	
			<b>3RB30 36-□WW1</b>	<b>3RB30 36-□WX1</b>	0.230	
<b>Size S3<sup>1)3)5)</sup></b>						
 3RB30 46-1XB0	S3	12.5 ... 50	with busbar with pass through CT's	<b>3RB30 46-□UB0</b>	<b>3RB30 46-□UD0</b>	0.560
				<b>3RB30 46-□UW1</b>	<b>3RB30 46-□UX1</b>	0.450
	32 ... 115	with busbar with pass through CT's	<b>3RB30 46-□XB0</b>	<b>3RB30 46-□XD0</b>	0.560	
			<b>3RB30 46-□XW1</b>	<b>3RB30 46-□XX1</b>	0.450	
<b>Size S6<sup>2)5)</sup></b>						
 3RB20 56-1FW2	S6	50 ... 200	with busbar	<b>3RB20 56-□FC2</b>	<b>3RB20 56-□FF2</b>	1.030
			with pass through CT's	<b>3RB20 56-□FW2</b>	<b>3RB20 56-□FX2</b>	0.690
<b>Size S10/S12<sup>2)</sup></b>						
 3RB20 66-1MC2	S10/S12 and size 14 (3TF68/3TF69)	55 ... 250	with busbar	<b>3RB20 66-□GC2</b>	<b>3RB20 66-□GF2</b>	1.820
		160 ... 630	with busbar	<b>3RB20 66-□MC2</b>	<b>3RB20 66-□MF2</b>	1.820

2 Class 20  
1 Class 10

2 Class 20  
1 Class 10

- 1) The relays with an Order No. ending with "0" are designed for direct mounting to the contactor. With the matching terminal brackets (see Accessories) the sizes S00 to S3 can also be installed as stand-alone units.
- 2) The relays with an Order No. ending with "2" are designed for direct mounting and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.
- 3) The relays with an Order No. ending with "1" are designed for stand-alone installation.
- 4) Observe maximum rated operational current of the devices.
- 5) The relays with an Order No. with "X" in 10th position are equipped with a straight-through transformer.

For accessories, see pages 3/49-3/50.  
For description, see pages 3/18-3/20.  
For technical data, see pages 3/24-3/29.  
For dimension drawings, see page 3/30.  
For schematic diagrams, see page 3/31.



# 3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

**3RB21 / 3RB31 solid-state overload relays for direct mounting<sup>1)2)</sup> and stand-alone installation<sup>2)3)</sup>, CLASS 5, 10, 20 and 30 adjustable**

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- Internal ground fault detection (activatable)
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- Switch position indicator
- TEST function and self-monitoring

Size	Set current value of the inverse-time delayed overload trip	Screw Terminal Order Number	Spring Loaded Terminal Order Number	Weight per PU approx.		
Contactor <sup>4)</sup>	A			kg		
<b>Size S00<sup>1)</sup></b>						
 3RB31 13-4RB0	S00	0.1 ... 0.4	<b>3RB31 13-4RB0</b>	<b>3RB31 13-4RE0</b>	0.175	
		0.32 ... 1.25	<b>3RB31 13-4NB0</b>	<b>3RB31 13-4NE0</b>	0.175	
		1 ... 4	<b>3RB31 13-4PB0</b>	<b>3RB31 13-4PE0</b>	0.175	
		3 ... 12	<b>3RB31 13-4SB0</b>	<b>3RB31 13-4SE0</b>	0.175	
		4 ... 16	<b>3RB31 13-4TB0</b>	<b>3RB31 13-4TE0</b>	0.175	
<b>Size S0<sup>1)</sup></b>						
 3RB31 23-4QB0	S0	0.1 ... 0.4	<b>3RB31 23-4RB0</b>	<b>3RB31 23-4RE0</b>	0.215	
		0.32 ... 1.25	<b>3RB31 23-4NB0</b>	<b>3RB31 23-4NE0</b>	0.215	
		1 ... 4	<b>3RB31 23-4PB0</b>	<b>3RB31 23-4PE0</b>	0.215	
		3 ... 12	<b>3RB31 23-4SB0</b>	<b>3RB31 23-4SE0</b>	0.215	
		6 ... 25	<b>3RB31 23-4QB0</b>	<b>3RB31 23-4QE0</b>	0.215	
	10 ... 40	<b>3RB31 23-4VB0</b>	<b>3RB31 23-4VE0</b>	0.215		
<b>Size S2<sup>1)3)5)</sup></b>						
 3RB31 33-4WB0	S2	12 ... 50	with busbar with pass through CT's	<b>3RB31 33-4UB0</b>	<b>3RB31 33-4UD0</b>	0.360
				<b>3RB31 33-4UW1</b>	<b>3RB31 33-4UX1</b>	0.230
		20 ... 80	with busbar with pass through CT's	<b>3RB31 33-4WB0</b>	<b>3RB31 33-4WD0</b>	0.360
				<b>3RB31 33-4WW1</b>	<b>3RB31 33-4WX1</b>	0.230
<b>Size S3<sup>1)3)5)</sup></b>						
 3RB31 43-4XB0	S3	12.5 ... 50	with busbar with pass through CT's	<b>3RB31 43-4UB0</b>	<b>3RB31 43-4UD0</b>	0.560
				<b>3RB31 43-4UW1</b>	<b>3RB31 43-4UX1</b>	0.450
		32 ... 115	with busbar with pass through CT's	<b>3RB31 43-4XB0</b>	<b>3RB31 43-4XD0</b>	0.560
				<b>3RB31 43-4XW1</b>	<b>3RB31 43-4XX1</b>	0.450
<b>Size S6<sup>2)5)</sup></b>						
 3RB21 53-4FC2	S6	50 ... 200	with busbar	<b>3RB21 53-4FC2</b>	<b>3RB21 53-4FF2</b>	1.030
			with pass through CT's	<b>3RB21 53-4FW2</b>	<b>3RB21 53-4FX2</b>	0.690
<b>Size S10/S12<sup>2)</sup></b>						
 3RB21 63-4MC2	S10/S12 and size 14 (3TF68/3TF69)	55 ... 250		<b>3RB21 63-4GC2</b>	<b>3RB21 63-4GF2</b>	1.820
		160 ... 630		<b>3RB21 63-4MC2</b>	<b>3RB21 63-4MF2</b>	1.820

- 1) The relays with an Order No. ending with "0" are designed for direct mounting to the contactor. With the matching terminal brackets (see Accessories) the sizes S00 to S3 can also be installed as stand-alone units.
- 2) The relays with an Order No. ending with "2" are designed for direct mounting and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.
- 3) The relays with an Order No. ending with "1" are designed for stand-alone installation.
- 4) Observe maximum rated operational current of the devices.
- 5) The relays with an Order No. with "X" in 10th position are equipped with a straight-through transformer.

For accessories, see pages 3/49-3/50.  
 For description, see pages 3/18-3/21.  
 For technical data, see pages 3/24-3/29.  
 For dimension drawings, see page 3/30.  
 For schematic diagrams, see page 3/31.



## Technical specifications

Type	3RB30 16, 3RB31 13	3RB30 26, 3RB31 23	3RB30 36 3RB31 33	3RB30 46, 3RB31 43	3RB30 56, 3RB31 53	3RB30 66, 3RB31 63
<b>Size</b>	S00	S0	S2	S3	S6	S10/S12
<b>Width</b>	45 mm	45 mm	55 mm	70 mm	120 mm	145 mm
<b>General data</b>						
<b>Trips in the event of</b>	Overload, phase failure, and phase unbalance + ground fault (for 3RB31 only)					
<b>Trip class</b> according to IEC 60947-4-1	CLASS	3RB30: 10E, 20E; 3RB31: 5E, 10E, 20E or 30E adjustable				
<b>Phase failure sensitivity</b>	Yes					
<b>Overload warning</b>					No	
<b>Reset and recovery</b>	Manual and automatic RESET, 3RB31 has an integrated connection for electrical remote RESET (24 V DC)			3RB20: Manual and automatic RESET; 3RB21: Manual, automatic and remote RESET		
• Reset options after tripping						
• Recovery time						
- For automatic RESET	min.	Approx. 3 min		Approx. 3 min		
- For manual RESET	min.	Immediately		Immediately		
- For remote RESET	min.	Immediately		Immediately		
<b>Features</b>	<ul style="list-style-type: none"> <li>• Display of operating status on device</li> <li>• TEST function</li> </ul>					
• RESET button	Yes					
• STOP button	No					
<b>Explosion protection – Safe operation of motors with "Increased safety" type of protection</b>	PTB 09 ATEX 3001 ⊗ II (2) G [Ex e] [Ex d] [Ex px]		On request	PTB 09 ATEX 3001 ⊗ II (2) G [Ex e] [Ex d] [Ex px]		
EC type test certificate number according to directive 94/9/EC (ATEX)	⊗ II (2) G [Ex t] [Ex p]			⊗ II (2) G [Ex t] [Ex p]		
<b>Ambient temperatures</b>						
• Storage/transport	°C	-40 ... +80				
• Operation	°C	-25 ... +60				
• Temperature compensation	°C	+60				
• Permissible rated current at						
- Temperature inside control cabinet 60 °C, stand-alone installation	%	—		100	100	100 or 90 <sup>2)</sup>
- Temperature inside control cabinet 60 °C, mounted on contactor	%	100		100	70	70
- Temperature inside control cabinet 70 °C	%	On request		On request		
<b>Repeat terminals</b>	<ul style="list-style-type: none"> <li>• Coil repeat terminal</li> <li>• Auxiliary contact repeat terminal</li> </ul>					
• Coil repeat terminal	Yes	Not required				
• Auxiliary contact repeat terminal	Yes	Not required				
<b>Degree of protection</b> according to IEC 60529	IP20				IP20 <sup>3)</sup>	
<b>Touch protection</b> according to IEC 61140	Finger-safe for vertical contact from the front				Finger-safe, for busbar connection with cover	Finger-safe with cover
<b>Shock resistance with sine</b> according to IEC 60068-2-27 9/ms	15/11 (signaling contact 97/98 in position "tripped": 9g/ms)	15/11 (signaling contact 97/98 in position "tripped" position: 8 g/11ms)	15/11 (signaling contact 97/98 in position "tripped": 4 g/11ms)			
<b>Electromagnetic compatibility (EMC) – Interference immunity</b>	<ul style="list-style-type: none"> <li>• Conductor-related interference</li> <li>- Burst according to IEC 61000-4-4 (corresponds to degree of severity 3)</li> <li>- Surge according to IEC 61000-4-5 (corresponds to degree of severity 3)</li> <li>• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)</li> <li>• Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3)</li> </ul>					
- Burst according to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2 (power ports), 1 (signal ports)				
- Surge according to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2 (line to earth), 1 (line to line)				
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	8 (air discharge), 6 (contact discharge)				
• Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	10				
<b>Electromagnetic compatibility (EMC) – Emitted interference</b>	Degree of severity B according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)					
<b>Resistance to extreme climates – air humidity</b>	%	95			100	
<b>Dimensions</b>	See dimensional drawings					
<b>Installation altitude above sea level</b>	m	Up to 2000				
<b>Mounting position</b>	Any					
<b>Type of mounting</b>	Direct mounting/stand-alone installation with terminal support				Direct mounting / Stand-alone installation	

1) Permissible rated current in case of heavy starting  
Size S0 at 10 A up to 40 A  
- CLASS 20, I<sub>e</sub> max = 32 A  
- CLASS 30, I<sub>e</sub> max = 25 A

2) 90 % for relay with current setting range 160A to 630A  
3) Terminal compartment: degree of protection IP00.



Type		3RB30 16, 3RB31 13 S00 45 mm	3RB30 26, 3RB31 23 S0 45 mm	3RB30 36, 3RB31 33 S2 55 mm	3RB30 46, 3RB31 43 S3 70 mm
<b>Main circuit</b>					
Rated insulation voltage $U_i$ (pollution degree 3)	V	690	690	690	1000
Rated impulse withstand voltage $U_{imp}$	kV	6	6	6/8	8
Rated operational voltage $U_e$	V	690	690	690	1000
Type of current • Direct current • Alternating current		No Yes, 50/60 Hz ± 5%			
Set current	A	0.1 ... 0.4 to 4 ... 16	0.1 ... 0.4 to 10 ... 40	12.5 ... 50 and 20 to 80	12.5 ... 50 to 25 ... 100
Power loss per unit (max.)	W	0.05 ... 0.2			0.05
Short-circuit protection - With fuse without contactor - With fuse and contactor		See Selection and Ordering Data See Technical Specifications (short-circuit protection with fuses for motor feeders)			
Protective separation between main and auxiliary conducting path according to IEC 60947-1 (pollution degree 2)	V	690 for grounded networks, otherwise 600 V			
<b>Connection for main circuit</b>					
Electrical connection version		Screw terminal	Screw terminal	Screw terminal	Screw terminal with box terminal /
<b>Screw terminal</b>					
• Terminal screw • Tightening torque • Conductor cross-sections (min./max.) - Solid or stranded	Nm  mm <sup>2</sup>	M3, Pozidriv size 2 0.8 ... 1.2	M3, Pozidriv size 2 2 ... 2.5	M4, Pozidriv size 2 2 ... 2.5	M8, 4 mm Allen screw 4 ... 6
- Finely stranded with end sleeve (DIN 46228 T1)	mm <sup>2</sup>	2 × (0.5 ... 1.5) <sup>3)</sup> 2 × (0.75 ... 2.5) <sup>3)</sup> 2 × (0.05 ... 4) <sup>3)</sup>	2 × (1 ... 2.5) <sup>3)</sup> 2 × (2.5 ... 10)	1 × (1 ... 50) 2 × (1 ... 35) (Solid or Stranded)	2 × (2.5 ... 16)
- Stranded	mm <sup>2</sup>	2 × (0.5 ... 1.5) <sup>3)</sup> 2 × (0.75 ... 2.5) <sup>3)</sup>	2 × (1 ... 2.5) <sup>3)</sup> 2 × (2.5 ... 6) <sup>3)</sup> max. 1 × 10	2 × (1 ... 25), 1 × (1 ... 35)	2 × (2.5 ... 35), 1 × (2.5 ... 50)
- AWG cables, solid or stranded	AWG	2 × (20 ... 16) <sup>3)</sup> 2 × (18 ... 14) <sup>3)</sup> 2 × 12	2 × (16 ... 12) <sup>3)</sup> 2 × (14 ... 8) <sup>3)</sup>	2 × (18 ... 2) 1 × (18 ... 1)	2 × (10 ... 1/0), 2 × (10 ... 2/0)
- Ribbon cable conductors (number x width x circumference)	mm	--	--	--	2 × (6 × 9 × 0.8)
<b>Busbar connections</b>					
• Terminal screw • Tightening torque • Conductor cross-section (min./max.) - Finely stranded with cable lug - Stranded with cable lug - AWG connections, solid or stranded, with cable lug - With connecting bar (max. width)	Nm  mm <sup>2</sup> mm <sup>2</sup> AWG mm	-- -- -- -- --	-- -- -- -- --	-- -- -- -- --	M 6 × 20 4 ... 6  2 × 70 3 × 70 2/0 12
<b>Straight-through transformers</b>					
• Diameter of opening	mm	--	--	15	18

1) For version with straight-through transformer up to 1000 VAC.  
2) For version with straight-through transformer up to 8 kV.

3) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Type	3RB20 56, 3RB21 53	3RB20 66, 3RB21 63
<b>Size</b>	<b>S6</b>	<b>S10/S12</b>
<b>Width</b>	<b>120 mm</b>	<b>145 mm</b>
<b>Main circuit</b>		
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1000
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	8
<b>Rated operational voltage <math>U_e</math></b>	V	1000
<b>Type of current</b>	No	
• Direct current	Yes, 50/60 Hz $\pm$ 5 (other frequencies on request)	
• Alternating current		
<b>Set current</b>	A	50 ... 200
		55 ... 250 to 160 ... 630
<b>Power loss per unit (max.)</b>	W	0.05
<b>Short-circuit protection</b>	See Selection and Ordering Data	
- With fuse without contactor	See Technical Specifications (short-circuit protection with fuses for motor feeders)	
- With fuse and contactor		
<b>Safe isolation between main and auxiliary conducting path</b> according to IEC 60947-1	V	690 <sup>1)</sup>
<b>Connection for main circuit</b>		
<b>Electrical connection version</b>	Screw terminal with box terminal/ Bus connection / Straight-through transformer	Screw terminal with box terminal/ Bus connection
<b>Screw terminal</b>		
• Terminal screw	4 mm Allen screw	5 mm Allen screw
• Tightening torque	Nm 10 ... 12	20 ... 22
• Conductor cross-sections (min./max.), 1 or 2 conductors		
- Solid	mm <sup>2</sup> --	
- Finely stranded without end sleeve	mm <sup>2</sup> With 3RT19 55-4G box terminal: 2 $\times$ (1 $\times$ max. 50, 1 $\times$ max. 70), 1 $\times$ (10 ... 70) With 3RT19 56-4G box terminal: 2 $\times$ (1 $\times$ max. 95, 1 $\times$ max. 120), 1 $\times$ (10 ... 120)	2 $\times$ (50 ... 185), front clamping point only: 1 $\times$ (70 ... 240) rear clamping point only: 1 $\times$ (120 ... 185)
- Finely stranded with end sleeve	mm <sup>2</sup> With 3RT19 55-4G box terminal: 2 $\times$ (1 $\times$ max. 50, 1 $\times$ max. 70), 1 $\times$ (10 ... 70) With 3RT19 56-4G box terminal: 2 $\times$ (1 $\times$ max. 95, 1 $\times$ max. 120), 1 $\times$ (10 ... 120)	2 $\times$ (50 ... 185), front clamping point only: 1 $\times$ (70 ... 240) rear clamping point only: 1 $\times$ (120 ... 185)
- Stranded	mm <sup>2</sup> With 3RT19 55-4G box terminal: 2 $\times$ (max. 70), 1 $\times$ (16 ... 70) With 3RT19 56-4G box terminal: 2 $\times$ (max. 120), 1 $\times$ (16 ... 120)	2 $\times$ (70 ... 240), front clamping point only: 1 $\times$ (95 ... 300) rear clamping point only: 1 $\times$ (120 ... 240)
- AWG conductors, solid or stranded	AWG With 3RT19 55-4G box terminal: 2 $\times$ (max. 1/0), 1 $\times$ (6 ... 2/0) With 3RT19 56-4G box terminal: 2 $\times$ (max. 3/0), 1 $\times$ (6 ... 250 kcmil)	2 $\times$ (2/0 ... 500 kcmil), front clamping point only: 1 $\times$ (3/0 ... 600 kcmil) rear clamping point only: 1 $\times$ (250 kcmil ... 500 kcmil)
- Ribbon cable conductors (number $\times$ width $\times$ circumference)	mm With 3RT19 55-4G box terminal: 2 $\times$ (6 $\times$ 15.5 $\times$ 0.8), 1 $\times$ (3 $\times$ 9 $\times$ 0.8 ... 6 $\times$ 15.5 $\times$ 0.8) With 3RT19 56-4G box terminal: 2 $\times$ (10 $\times$ 15.5 $\times$ 0.8), 1 $\times$ (3 $\times$ 9 $\times$ 0.8 ... 10 $\times$ 15.5 $\times$ 0.8)	2 $\times$ (20 $\times$ 24 $\times$ 0.5), 1 $\times$ (6 $\times$ 9 $\times$ 0.8 ... 20 $\times$ 24 $\times$ 0.5)
<b>Busbar connections</b>		
• Terminal screw	M 8 $\times$ 25	M 10 $\times$ 30
• Tightening torque	Nm 10 ... 14	14 ... 24
• Conductor cross-section (min./max.)		
- Finely stranded with cable lug	mm <sup>2</sup> 16 ... 95 <sup>2)</sup>	50 ... 240 <sup>3)</sup>
- Stranded with cable lug	mm <sup>2</sup> 25 ... 120 <sup>2)</sup>	70 ... 240 <sup>3)</sup>
- AWG connections, solid or stranded, with cable lug	AWG 4 ... 250 kcmil	2/0 ... 500 kcmil
- With connecting bar (max. width)	mm 15	25
<b>Straight-through transformers</b>		
• Diameter of opening	mm 24.5	--
• Conductor cross-section (max.)		
- NYY	mm <sup>2</sup> 120	--
- H07RN-F	mm <sup>2</sup> 70	--

1) For grounded networks, otherwise 600 V.

2) When connecting cable lugs according to DIN 46235, use the 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm<sup>2</sup> to ensure phase spacing.3) When connecting cable lugs according to DIN 46234 for conductor cross-sections from 240 mm<sup>2</sup> as well as DIN 46235 for conductor cross-sections from 185 mm<sup>2</sup>, use the 3RT19 56-4EA1 terminal cover to ensure phase spacing.

Type	3RB30 16, 3RB31 13	3RB30 26, 3RB31 23	3RB30 36, 3RB31 33	3RB30 46, 3RB31 43	3RB30 56, 3RB31 53	3RB30 66, 3RB31 63
Size	S00	S0	S2	S3	S6	S10/S12
Width	45 mm	45 mm	55 mm	70 mm	120 mm	145 mm
<b>Auxiliary circuit</b>						
Number of NO contacts	1					
Number of NC contacts	1					
Auxiliary contacts – assignment	1 NO for the signal "tripped", 1 NC for switching off the contactor					
Rated insulation voltage $U_i$ (pollution degree 3)	V	300				
Rated impulse withstand voltage $U_{imp}$	kV	4				
<b>Auxiliary contacts – Contact rating</b>						
• NC contact with alternating current AC-14/AC-15 Rated operational current $I_e$ at $U_e$ :						
- 24 V	A	4				
- 120 V	A	4				
- 125 V	A	4				
- 250 V	A	3				
• NO contact with alternating current AC-14/AC-15: Rated operational current $I_e$ at $U_e$ :						
- 24 V	A	4				
- 120 V	A	4				
- 125 V	A	4				
- 250 V	A	3				
• NC, NO contact with direct current DC-13: Rated operational current $I_e$ at $U_e$ :						
- 24 V	A	1)				
- 60 V	A	0.55				
- 110 V	A	0.3				
- 125 V	A	0.3				
- 250 V	A	0.11				
• Continuous thermal current $I_{th}$	A	5				
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes				
<b>Short-circuit protection</b>						
• With fuse						
- gL/gG operational class	A	6				
<b>Ground-fault protection (only 3RB31)</b>						
• Tripping value $I_{\Delta}$						
$> 0.75 \times I_{motor}$						
• Operating range $I$						
Lower current setting value $< I_{motor} < 3.5 \times$ upper current setting value						
• Response time $t_{trip}$ (in steady-state condition)						
$< 1$						
<b>Integrated electrical remote RESET (only 3RB31)</b>						
Connecting terminals A3, A4						
24 V DC, max. 200 mA for approx. 20 ms, then $< 10$ mA						
<b>Protective separation between main and auxiliary conducting path</b> according to IEC 60947-1						
V 300						
<b>CSA, UL, and UR rated data</b>						
<b>Auxiliary circuit – switching capacity</b>						
3RB30: B600, R300				B300, R300		
3RB31: B300, R300						
<b>Connection of the auxiliary circuit</b>						
<b>Connection type</b>						
Screw terminal or spring-loaded terminals						
<b>Screw terminal</b>						
• Terminal screw						
Pozidriv size 2						
• Tightening torque						
Nm 0.8 ... 1.2						
• Conductor cross-sections (min./max.), 1 or 2 conductors						
- Solid or stranded	mm <sup>2</sup>	1 × (0.5 ... 4), 2 × (0.5 ... 2.5)				
- Finely stranded with end sleeve	mm <sup>2</sup>	1 × (0.5 ... 2.5), 2 × (0.5 ... 1.5)				
- AWG conductors, solid or stranded	AWG	2 × (20 ... 14)				
<b>Spring-loaded terminals</b>						
• Conductor cross-sections (min./max.), 1 or 2 conductors						
- Solid	mm <sup>2</sup>	2 × (0.25 ... 1.5)				
- Finely stranded without end sleeve	mm <sup>2</sup>	--				
- Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.25 ... 1.5)				
- Stranded	mm <sup>2</sup>	2 × (0.25 ... 1.5)				
- AWG conductors, solid or stranded	AWG	2 × (24 ... 16)				

# 3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

## Short-circuit protection with fuses for motor starters

For short-circuit currents up to 50 kA at 400 to 690 V

Overload relays	Contactor	CLASS									690 V	
		5 and 10			20			30			Fuse links <sup>1)</sup>	
Setting range	Type	Rated operational current $I_e$ AC-3 in A at									Type of coordination <sup>2)</sup>	
		400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	1	2
<b>Size S00</b>												
0.1 ... 0.4 A	3RT20 15	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	35	4
0.32 ... 1.25 A	3RT20 15	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	35	6
1 ... 4 A	3RT20 15	4	4	4	4	4	4	4	4	4	35	20
	3RT20 16	4	4	4	4	4	4	4	4	4	35	20
	3RT20 17	4	4	4	4	4	4	4	4	4	35	20
4 ... 16 A	3RT20 16	9	6.5	5.2	9	6.5	5.2	9	6.5	5.2	35	20
	3RT20 17	12	9	6.3	10	9	6.3	9	9	6.3	35	20
	3RT20 18	16	12.4	8.9	12.9	11.6	8.1	11.6	11.6	8.1	50	25
<b>Size S0</b>												
3 ... 12 A	3RT20 23	9	6.5	5.2	9	6.5	5.2	--	--	--	63	25
	3RT20 24	12	12	9	12	12	9	12	12	9	63	25
	3RT20 25	12	12		12	12	12	12	12	12	63	25
10 ... 40	3RT20 24	12	12	9	12	12	9	12	12	9	63	25
	3RT20 25	17	17	13	16	16	13	14	14	13	63	25
	3RT20 26	25	18	13	16	16	13	14	14	13	100	35
	3RT20 27	32	32	21	18.6	18.6	15.1	16.2	16.2	15.1	125	50
	3RT20 28	38	32	21	22.4	22.4	18.2	19.6	19.6	18.2	125	50
<b>Size S2</b>												
12.5 ... 50 A	3RT20 35	40	40	24	40	40	24	36	36	36	160	80
	3RT20 36	50	50	24	45	45	24	38	38	24	160	80
	3RT20 37	50	50	47	48	48	47	42	42	42	250	125
	3RT20 38	50	50	50	49	49	49	43	43	43	250	160
20 ... 80 A	3RT20 35	40	40	24	40	40	24	36	36	36	160	80
	3RT20 36	50	50	24	45	45	24	38	38	24	160	80
	3RT20 37	65	65	47	48	48	47	42	42	42	250	125
	3RT20 38	80	80	58	49	49	49	43	43	43	250	160
<b>Size S3</b>												
12.5 ... 50 A	3RT20 45	50	50	47	49	49	47	41.7	41.7	41.7	200	125
	3RT20 46	50	50	50	50	50	50	45	45	45	200	160
32 ... 115 A	3RT20 45	65	65	47	49	49	47	41.7	41.7	41.7	200	125
	3RT20 46	80	80	58	53	53	53	45	45	45	200	160
	3RT20 47	95	95	58	59	59	58	50	50	50	200	160
	3RT10 54	100	100	100	81.7	81.7	81.7	69	69	69	355	315
	3RT10 55	--	--	--	100	100	100	90	90	90	355	315
<b>Size S6</b>												
50 ... 200 A	3RT10 54	115	115	115	81.7	81.7	81.7	69	69	69	355	315
	3RT10 55	150	150	150	107	107	107	90	90	90	355	315
	3RT10 56	185	185	170	131	131	131	111	111	111	355	315
<b>Size S10/S12</b>												
55 ... 250 A	3RT10 64	225	225	225	160	160	160	135	135	135	500	400
	3RT10 65	250	250	250	188	188	188	159	159	159	500	400
	3RT10 66	250	250	250	213	213	213	180	180	180	500	400
160 ... 630 A	3RT10 64	225	225	225	160	160	160	--	--	--	500	400
	3RT10 65	265	265	265	188	188	188	--	--	--	500	400
	3RT10 66	300	300	300	213	213	213	180	180	180	500	400
	3RT10 75	400	400	400	284	284	284	240	240	240	630	400
	3RT10 76	500	500	450	355	355	355	300	300	300	630	500
	3RT12 64	225	225	225	225	225	225	173	173	173	500	500
	3RT12 65	265	265	265	265	265	265	204	204	204	500	500
	3RT12 66	300	300	300	300	300	300	231	231	231	500	500
	3RT12 75	400	400	400	400	400	400	316	316	316	800	800
	3RT12 76	500	500	500	500	500	500	385	385	385	800	800
	3TF68 <sup>3)</sup>	630	630	630	440	440	440	376	376	376	800	500 <sup>4)</sup>
	3TF69 <sup>3)</sup>	630	630	630	572	572	572	500	500	500	800	630 <sup>4)</sup>

1) Please observe operational voltage.

2) Coordination and short-circuit equipment according to EN 60947-4-1:

**Type of coordination 1:** the contactor or starter must not endanger persons or the installation in the event of a short-circuit.

They do not need to be suitable for further operation without repair and the renewal of parts.

**Type of coordination 2:** the contactor or starter must not endanger persons or the installation in the event of a short-circuit.

They must be suitable for further operation. There is a risk of contact welding.

3) Contactor cannot be mounted.

4) Please ensure that the maximum AC-3 operational current has sufficient safety clearance from the rated current of the fuses.

### Characteristic curves

The tripping characteristics show the relationship between the tripping time and tripping current as multiples of the set current  $I_e$  and are given for symmetrical three-pole and two-pole loads from the cold state.

The smallest current used for tripping is called the minimum tripping current. According to IEC 60947-4-1, this current must be within specified limits. The limits of the total tripping current for the 3RB20/3RB21 solid-state overload relays for symmetrical three-pole loads are between 105 % and 120 % of the set current.

The tripping characteristic starts with the minimum tripping current and continues with higher tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time intervals within which the overload relays have to trip with 7.2 times the set current  $I_e$  from the cold state for symmetrical three-pole loads.

The tripping times according to IEC 60947-4-1, tolerance band E, are as follows for:

Trip class	Tripping time
CLASS 5	3 ... 5 s
CLASS 10	5 ... 10 s
CLASS 20	10 ... 20 s
CLASS 30	20 ... 30 s

The tripping characteristic for a three-pole overload relay from the cold state (see illustration 1) only apply if all three phases are simultaneously loaded with the same current. In the event of a phase failure the 3RB20/3RB21 solid-state overload relays switch off the contactor more quickly in order to minimize heating of the load in accordance with the tripping characteristic for two-pole loads from the cold state (see illustration 2). With phase unbalance the devices switch off depending on the reason for the unbalance between the two characteristic curves.

Compared with a cold load, a load at operating temperature obviously has a lower temperature reserve. The tripping time of the 3RB2/3RB3 solid-state overload relays is reduced therefore to about 30 % when loaded with the set current  $I_e$  for an extended period.

Tripping characteristics for 3-pole loads

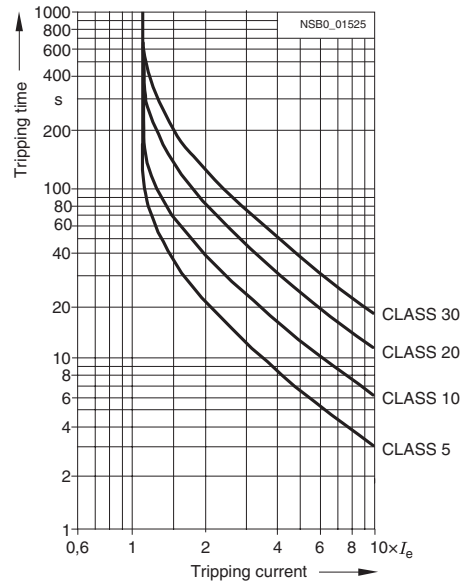


Illustration 1

Tripping characteristics for 2-pole loads

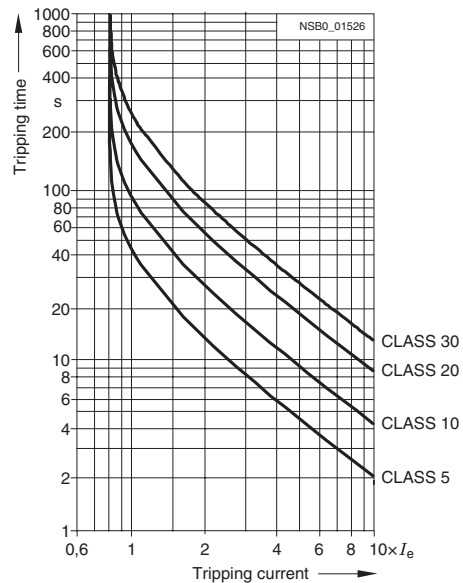


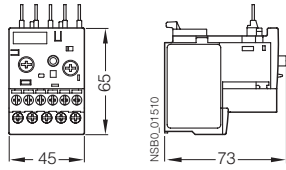
Illustration 2

The above illustrations are schematic representations of characteristic curves.

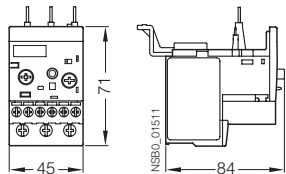
# 3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

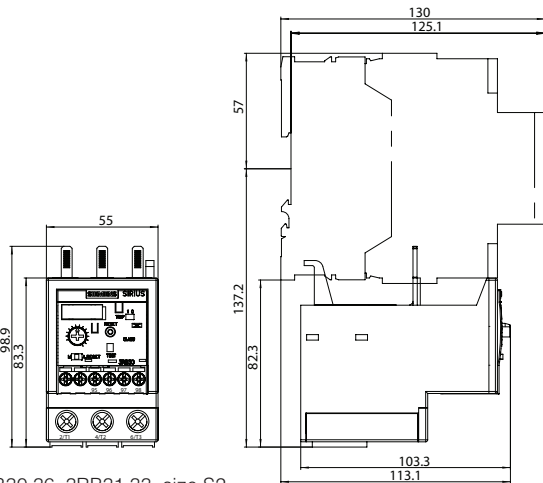
## Dimensional drawings



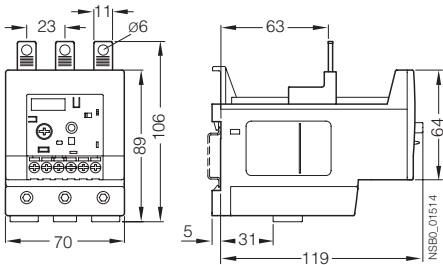
3RB30 16, 3RB31 13, size S00



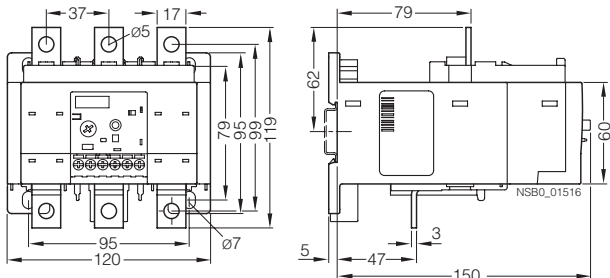
3RB30 26, 3RB31 23, size S0



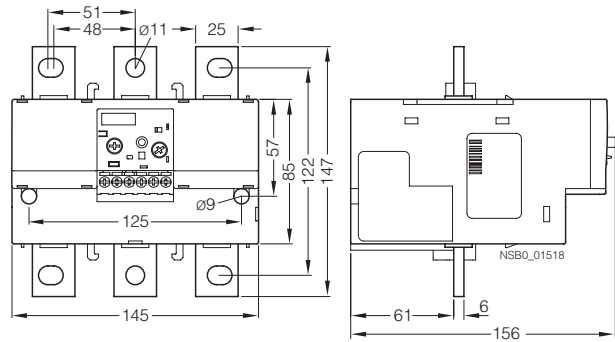
3RB30 36, 3RB31 33, size S2



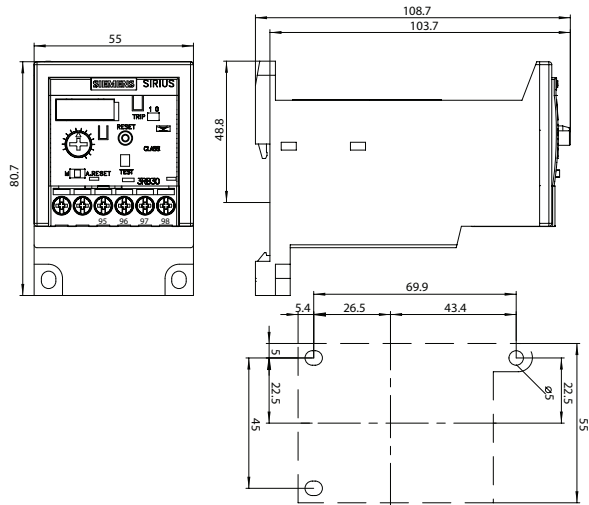
3RB30 46, 3RB31 43, size S3



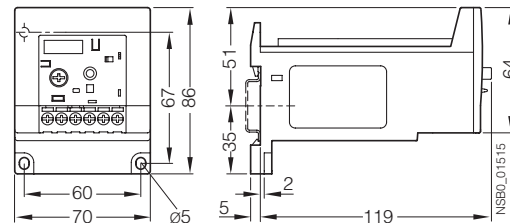
3RB20 56, 3RB21 53, size S6



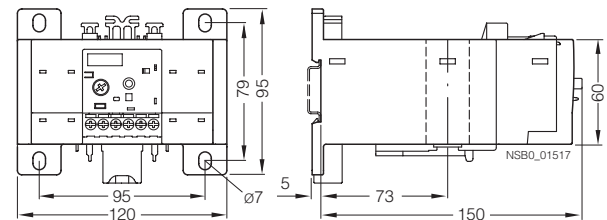
3RB20 66, 3RB21 63, size S10/S12



3RB30 36, 3RB31 33, size S2 with straight-through transformer



3RB30 46, 3RB31 43, size S3 with straight-through transformer

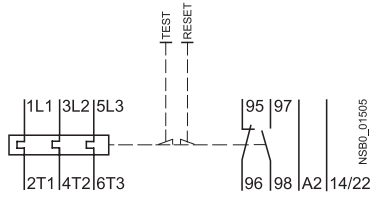


3RB20 56, 3RB21 53, size S6 with straight-through transformer

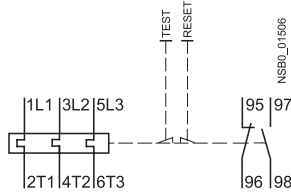
# 3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

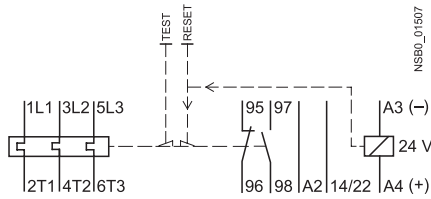
## Schematics



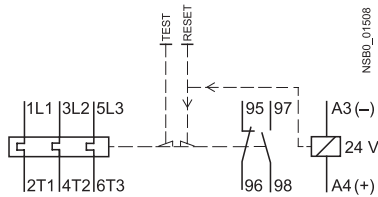
3RB30 16 overload relays



3RB30 26 to 3RB20 66 overload relays



3RB31 13 overload relays



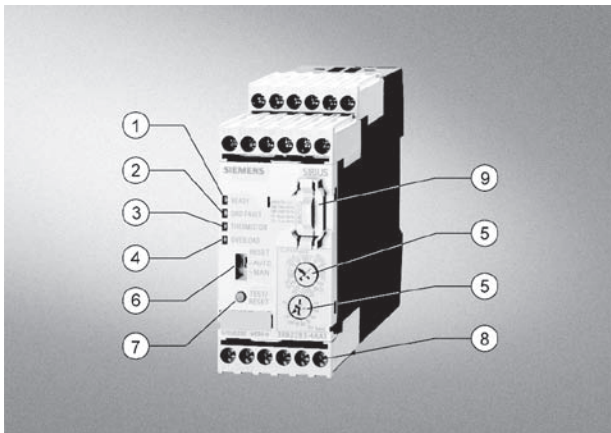
3RB31 23 to 3RB21 63 overload relays



# 3RB2 Solid-State Overload Relays

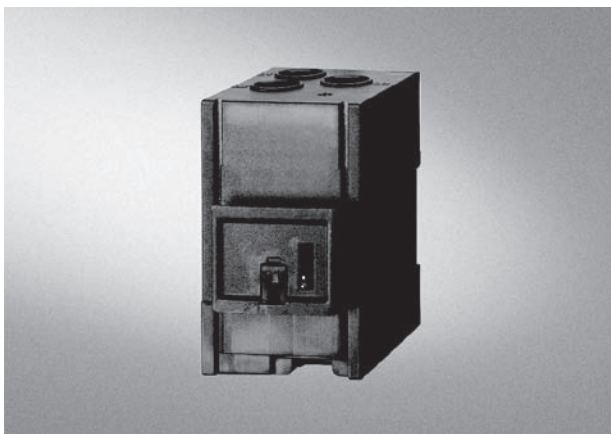
3RB22, 3RB23 for high-feature applications

## Overview



3RB22/3RB23 evaluation module

- (1) Green "Ready" LED:  
A continuous green light signals that the device is working correctly.
- (2) Red "Ground Fault" LED:  
A continuous red light signals a ground fault.
- (3) Red "Thermistor" LED:  
A continuous red light signals an active thermistor trip.
- (4) Red "Overload" LED:  
A continuous red light signals an active overload trip; a flickering red light signals an imminent trip (overload warning).
- (5) Motor current and trip class adjustment:  
Setting the device to the motor current and to the required trip class dependent on the starting conditions is easy with the two rotary knobs.
- (6) Selector switch for manual/automatic RESET:  
With this switch you can choose between manual and automatic RESET.
- (7) Test/RESET button:  
Enables testing of all important device components and functions, plus resetting of the device after a trip when manual RESET is selected.
- (8) Connecting terminals (removable terminal block):  
The generously sized terminals permit connection of two conductors with different cross-sections for the auxiliary, control and sensor circuits. Connection is possible with screw-type terminals and alternatively with spring-loaded terminals.
- (9) 3RB29 85 function expansion module:  
Enables more functions to be added, e.g. internal ground fault detection and/or an analog output with corresponding signals.



3RB29 06 current measuring module

The modular, solid-state overload relays with external power supply type 3RB22 (with monostable auxiliary contacts) and type 3RB23 (with bistable auxiliary contacts) up to 630 A (up to 820 A possible with a series transformer) have been designed for inverse-time delayed protection of loads with normal and heavy starting (see [Function](#)) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set motor rated current. This current rise is detected by means of a current measuring module and electronically evaluated by a special evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of the contactors control circuit. The break time depends on the ratio between the tripping current and set current  $I_{\text{e}}$  and is stored in the form of a long-term stable tripping characteristic (see [Characteristic Curves](#)). The "tripped" status is signaled by means of a continuous red "Overload" LED.

The LED indicates imminent tripping of the relay due to overload, phase unbalance or phase failure by flickering when the limit current has been violated. This warning can also be used as a signal through auxiliary contacts.

In addition to the described inverse-time delayed protection of loads against excessive temperature rise, the 3RB22/3RB23 solid-state overload relays also allow direct temperature monitoring of the motor windings (full motor protection) by failsafe connection of a PTC sensor circuit. With this temperature-dependent protection, the loads can be protected against overheating caused indirectly by reduced coolant flow, for example, which cannot be detected by means of the current alone. In the event of overheating, the devices signal the contactor to switch off, and thus the load, by means of the auxiliary contacts. The "tripped" status is signaled by means of a continuous red "Thermistor" LED.

To also protect the loads against high-resistance short-circuits due to damage to the insulation, humidity, condensed water, etc., the 3RB22/3RB23 solid-state overload relays offer the possibility of internal ground fault monitoring in conjunction with a function expansion module; not possible in conjunction with a contactor assembly for Wye-Delta starting). In the event of a ground fault the 3RB22/3RB23 relays trip instantaneously. The "tripped" status is signaled by means of a red "Ground Fault" LED. Signaling through auxiliary contacts is also possible.

After tripping due to overload, phase unbalance, phase failure, thermistor tripping or ground fault, the relay may be reset manually or automatically after the recovery time has elapsed (see [Function](#)).

In conjunction with a function expansion module the motor current measured by the microprocessor can be output in the form of an analog signal 4 ... 20 mA DC for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers. With an additional AS-Interface analog module the current values can also be transferred over the AS-i bus system.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials.

They comply with important worldwide standards and approvals.

# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for high-feature applications

## Benefits

The most important features and benefits of the 3RB22/3RB23 solid-state overload relays are listed in the overview table (see [Overload Relays, General Data](#)).

## Application

### Industries

The 3RB22/3RB23 solid-state overload relays are suitable for customers from all industries who want to provide optimum inverse-time delayed and temperature-dependent protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5 to CLASS 30), minimize project completion times, inventories and power consumption, and optimize plant availability and maintenance management.

### Application

The 3RB22/3RB23 solid-state overload relays have been designed for the protection of three-phase asynchronous and single-phase AC motors.

If single-phase AC motors are to be protected by the 3RB22/3RB23 solid-state overload relays, the main circuits of the current measuring modules must be series-connected.

### Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive environments, ageing and temperature changes.

For the temperature range from  $-25\text{ °C}$  to  $+60\text{ °C}$ , the 3RB22/3RB23 solid-state overload relays compensate the temperature according to IEC 60947-4-1.

Configuration notes for use of the devices below  $-25\text{ °C}$  or above  $+60\text{ °C}$  on request.

## "Increased safety" type of protection EEx e according to ATEX guideline 94/9/EC

The 3RB22/3RB23 solid-state overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e. The relays meet the requirements of EN 60079-7 (Electrical apparatus for potentially explosive atmospheres – Increased safety "e").

When using 3RB23 solid-state overload relays for the protection of EEx e motors, separate monitoring of the control supply voltage is recommended.

The basic safety and health requirements of ATEX guideline 94/9/EG are fulfilled by compliance with

- EN 60947-1
- EN 60947-4-1
- EN 60947-5-1
- EN 60079-14

EU type test certificate for Group II, Category (2) G/D under application. Number on request.

## Accessories

The following accessories are available for the 3RB22/3RB23 solid-state overload relays:

- A sealable cover for the evaluation module
- Box terminal blocks for the current measuring modules size S6 and S10/S12
- Terminal covers for the current measuring modules size S6 and S10/S12
- Push-in lugs for screw (panel) mounting the size S00 to S3 current measuring modules

# 3RB2 Solid-State Overload Relays



3RB22, 3RB23 for high-feature applications

**3RB22/3RB23 solid-state overload relays for full motor protection with screw connection or spring-loaded terminals for stand-alone installation, CLASS 5, 10, 20 and 30 adjustable**

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- External power supply 24 ... 240 V AC/DC
- Auxiliary contacts 2 NO +2 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- 4 LEDs for operating and status displays
- TEST function and self-monitoring
- Internal ground fault detection with function expansion module
- Screw connection or spring-loaded terminals for auxiliary, control and sensor circuits
- Input for PTC sensor circuit
- Analog output with function expansion module

Size Contactor	Version	Connection type	Order No.	Weight per PU approx. kg
----------------	---------	-----------------	-----------	--------------------------

Evaluation modules					
 <p>3RB2. 83-4AA1</p>	S00 ... S12	Monostable	Screw connection	<b>3RB22 83-4AA1</b>	0.300
				Spring-loaded terminals	<b>3RB22 83-4AC1</b>
		Bistable	Screw connection	<b>3RB23 83-4AA1</b>	0.300
			Spring-loaded terminals	<b>3RB23 83-4AC1</b>	0.300
 <p>3RB2. 83-4AC1</p>					

Function expansion modules					
–		<b>Analog Basic 1 module<sup>1)</sup></b> Analog output DC 4 ... 20 mA, with overload warning		<b>3RB29 85-2AA0</b>	0.030
		<b>Analog Basic 1 GF module<sup>1)2)</sup></b> Analog output DC 4 ... 20 mA, with internal ground fault detection and overload warning		<b>3RB29 85-2AA1</b>	0.030
		<b>Analog Basic 2 GF module<sup>1)2)</sup></b> Analog output DC 4 ... 20 mA, with internal ground fault detection and ground fault signaling		<b>3RB29 85-2AB1</b>	0.030
		<b>Basic 1 GF module<sup>2)</sup></b> with internal ground fault detection and overload warning		<b>3RB29 85-2CA1</b>	0.030
		<b>Basic 2 GF module<sup>2)</sup></b> with internal ground fault detection and ground fault signaling		<b>3RB29 85-2CB1</b>	0.030

- 1) The analog signal 4 ... 20 mA DC can be used for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.
- 2) The following information on ground fault protection refers to sinusoidal residual currents at 50/60 Hz:
  - With a motor current of between 0.3 and 2 times the set current  $I_n$  the unit will trip at a ground fault current equal to 30% of the set current.
  - With a motor current of between 2 and 8 times the set current  $I_n$  the unit will trip at a ground fault current equal to 15% of the set current.
  - The trip delay amounts to between 0.5 and 1 second.





*Note: Analog input modules, e. g. SM 331, must be configured for 4-wire measuring transducers. In this case the analog input module must not supply current to the analog output of the 3RB22/ 3RB23 relay.*

For accessories, see page 3/35  
 For description, see pages 3/32-3/33  
 For technical data, see pages 3/39-3/44.  
 For dimension drawings, see pages 3/45-3/46.  
 For schematic diagrams, see page 3/47.

# 3RB2 Solid-State Overload Relays


3RB22, 3RB23 for high-feature applications

## Current measuring modules for direct mounting<sup>1)</sup> and stand-alone installation<sup>1)2)</sup>

Size Con-factor <sup>3)</sup>	Set current value of the inverse-time delayed overload trip A	Order No.	Weight per PU approx. kg
<b>Size S00/S0<sup>2)4)</sup></b>			
 3RB29 06-2.G1	S00/S0	0.3 ... 3	<b>3RB29 06-2BG1</b> 0.100
		2.4 ... 25	<b>3RB29 06-2DG1</b> 0.150
<b>Size S2/S3<sup>2)4)</sup></b>			
 3RB29 06-2JG1	S2/S3	10 ... 100	<b>3RB29 06-2JG1</b> 0.350
<b>Size S6<sup>1)4)</sup></b>			
 3RB29 56-2TG2	S6	20 ... 200	<b>3RB29 56-2TG2</b> 0.600
		with pass through CT's with busbar	<b>3RB29 56-2TH2</b> 1.000
<b>Size S10/S12<sup>1)</sup></b>			
 3RB29 66-2WH2	S10/S12 and size 14 (3TF68/ 3TF69)	63 ... 630	<b>3RB29 66-2WH2</b> 1.750

- 1) The current measuring modules with an Order No. ending with "2" are designed for direct mounting and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.  
2) The current measuring modules with an Order No. ending with "1" are designed for stand-alone installation.

- 3) Observe maximum rated operational current of the devices.  
4) The modules with an Order No. with "G" in 11th position are equipped with a straight-through transformer.

Size Contactor	Version	Order No.	Weight per PU approx. kg
<b>Connecting cables (essential accessory)</b>			
 3RB29 87-2.	S00 ... S12	For connection between evaluation module and current measuring module	
		<ul style="list-style-type: none"> <li>Length 0.1 m</li> <li>Length 0.5 m</li> </ul>	<b>3RB29 87-2B</b> 0.010 <b>3RB29 87-2D</b> 0.020

For description, see pages 3/36-3/37.  
For technical data, see pages 3/39-3/44.  
For dimension drawings, see pages 3/45-3/46.  
For schematic diagrams, see page 3/47.

## 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for high-feature applications

**Design****Device concept**

The 3RB22/3RB23 solid-state overload relays are based on a modular device concept. Each device always comprises an evaluation module, which is independent of the motor current, and a current measuring module, which is dependent on the motor current. The two modules are electrically interconnected by a connection cable through the system interface.

The basic functionality of the evaluation module can be optionally expanded with corresponding function expansion modules. The function expansion modules are integrated in the evaluation module for this purpose through a simple plug connection.

**Mounting options****Current measuring modules**

The current measuring modules size S00/S0 and S2/S3 are designed for stand-alone installation. By contrast, the current measuring modules size S6 and S10/S12 are suitable for stand-alone installation or direct mounting.

**Evaluation modules**

The evaluation modules can be mounted either on the current measuring module (only sizes S00/S0 and S2/S3) or separately.

**Connection technique****Main circuit (current measuring module)**

For sizes S00/S0, S2/S3 and S6, the main circuit can also be connected by the straight-through transformer method. In this case, the cables of the main circuit are routed directly through the feed-through openings of the relay to the contactor terminals.

For sizes S6 and S10/S12, the main circuit can be connected with the help of the Busbar. In conjunction with the corresponding box terminals, screw terminals are also available.

**Auxiliary circuit (evaluation module)**

Connection of the auxiliary circuit (removable terminal block) is possible with either screw terminals or spring-loaded terminals.

**Overload relays in contactor assemblies for Wye-Delta starting**

When overload relays are used in combination with contactor assemblies for Wye-Delta starting it must be noted that only 0.58 times the motor current flows through the line contactor. An overload relay mounted onto the line contactor must be set to 0.58 times the motor current.

When 3RB22/3RB23 solid-state overload relays are used in combination with contactor assemblies for Wye-Delta starting, the function expansion modules for internal ground-fault detection must not be used.

**Operation with frequency converter**

The 3RB22/3RB23 solid-state overload relays are suitable for frequencies of 50/60 Hz and the associated harmonics. This permits the 3RB22/3RB23 overload relays to be used on the incoming side of the frequency converter.

If motor protection is required on the outgoing side of the frequency converter, the 3RN thermistor motor protection devices or the 3RU11 thermal overload relays are available for this purpose.

**Function****Basic functions**

The 3RB22/3RB23 solid-state overload relays are designed for:

- Inverse-time delayed protection of loads from overloading
- Inverse-time delayed protection of loads from phase unbalance
- Inverse-time delayed protection of loads from phase failure
- Temperature-dependent protection of loads by connecting a PTC sensor circuit
- Protection of loads from high-resistance short-circuits (internal ground-fault detection; detection of fault currents > 30 % of the set current  $I_e$ )
- Output of an overload warning
- Output of an analog signal 4 to 20 mA DC as image of the flowing motor current

The basic functions of the evaluation modules in conjunction with function expansion modules are listed in the following table:

Evaluation module	Function expansion module	Basic functions
3RB22 83-4AA1 3RB22 83-4AC1 3RB23 83-4AA1 3RB23 83-4AC1	None	Inverse-time delayed protection, temperature-dependent protection, electrical remote RESET, overload warning
	3RB29 85-2CA1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, overload warning
	3RB29 85-2CB1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, ground fault signal
	3RB29 85-2AA0	Inverse-time delayed protection, temperature-dependent protection, electrical remote RESET, overload warning, analog output
	3RB29 85-2AA1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, overload warning, analog output
	3RB29 85-2AB1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, ground fault signal, analog output

**Control circuit**

The 3RB22/3RB23 solid-state overload relays require an external power supply (24–240 V AC/DC), i.e. an additional supply voltage is necessary.

**Short-circuit protection**

Fuses or motor starter protectors must be used for short-circuit protection. For assignments of the corresponding short-circuit protection devices to the 3RB22/3RB23 solid-state overload relays with/without contactor see [Technical Specifications and Selection and Ordering Data](#).

**Trip classes**

The 3RB22/3RB23 solid-state overload relays are suitable for normal and heavy starting. The required trip class (CLASS 5, 10, 20 or 30) can be adjusted by means of a rotary knob depending on the current starting condition.

For details of the trip classes see [Characteristic Curves](#).



# 3RB2 Solid-State Overload Relays

## 3RB22, 3RB23 for high-feature applications

### Phase failure protection

The 3RB22/3RB23 solid-state overload relays are fitted with phase failure protection (see [Characteristic Curves](#)) in order to minimize temperature rises of the load during single-phase operation.

### Setting

The 3RB22/3RB23 solid-state overload relays are set to the motor rated current by means of two rotary knobs.

- The upper rotary knob (CLASS/ $I_{e\max}$ ) is divided into 4 ranges: 1 A, 10 A, 100 A and 1000 A. The zone must be selected which corresponds to the rated motor current and the current measuring module to be used with it. With the range selected the required trip class (CLASS 5, 10, 20 or 30) can be determined.
- The lower rotary knob with percent scale (10 % ... 100 %) is then used to set the rated motor current in percent of the range selected with the upper rotary button.

### Example

- Rating of induction motor = 45 kW (50 Hz, 400 V AC)
- Rated motor current = 80 A
- Required trip class = CLASS 20
- Selected transformer: 10 to 100 A

### Solution

- Step 1: Use the upper rotary knob (CLASS) to select the 100 A range
- Step 2: Within the 100 A range set the trip class CLASS 20
- Step 3: Set the lower rotary knob to 80 % (= 0.8) of 100 A  $\times$  0.8 = 80 A.

If the current which is set on the evaluation module does not correspond to the current range of the connected current transformer, an error will result.

### Manual and automatic reset

In the case of the 3RB22/3RB23 solid-state overload relays, a slide switch can be used to choose between automatic and manual resetting.

If manual reset is set, a reset can be carried out directly on the device after a trip by pressing the blue TEST/RESET button. A remote RESET can be carried out electrically by jumpering the terminals Y1 and Y2.

If the slide switch is set to automatic RESET, the relay is reset automatically.

The time between tripping and resetting is determined by the recovery time.

### Recovery time

With the 3RB22/3RB23 solid-state overload relays the recovery time after inverse-time delayed tripping is approx. 3 minutes regardless of the selected reset mode. The recovery time allows the load to cool down.

However, in the event of temperature-dependent tripping by means of a connected PTC thermistor sensor circuit, the device can only be manually or automatically reset once the winding temperature at the installation location of the PTC thermistor has fallen 5 Kelvin below its response temperature.

After a ground fault trip the 3RB22/3RB23 solid-state overload relay trips can be reset immediately without a recovery time.

### TEST function

The combined TEST/RESET button can be used to check whether the relay is working correctly. The test can be aborted at any time by letting go of the TEST/RESET button.

LEDs, the device configuration (this depends on which expansion module is plugged in) and the device hardware are tested while the button is kept pressed for 6 seconds. Simultaneously and for another 18 seconds a direct current proportional in size to the maximum phase of the main current is fed in at the terminals I(+) and I(-). By comparing the analog signal, which is to be measured, with the main current, the accuracy of the current measurement can be determined. In this case 4 mA corresponds to 0 % and 20 mA to 125 % of the set current. After 24 seconds the auxiliary contacts are switched and the feeder switch off as the result, bringing the test to an end.

After a test trip a faultless relay is reset by pressing the TEST/RESET button. If a hardware fault is detected, the device trips and cannot be reset.

### Self-monitoring

The 3RB22/3RB23 solid-state overload relays have a self-monitoring feature, i.e. the devices constantly monitor their own basic functions and trip if an internal fault is detected.

### Display of the operating status

The particular operating status of the 3RB22/3RB23 solid-state overload relays is displayed by means of four LEDs:

- Green "Ready" LED: A continuous green light signals that the overload relay is ready for operation. The 3RB22/3RB23 overload relays are not ready (LED "OFF") if there is no control supply voltage or if the function test was negative.
- Red "Ground fault" LED: A continuous red light signals a ground fault.
- Red "Thermistor" LED: A continuous red light signals a temperature-dependent trip.
- Red "Overload" LED: A continuous red light signals an inverse-time delayed trip; a flickering red light signals an imminent inverse-time delayed trip (overload warning).

### Auxiliary contacts

The 3RB22/3RB23 solid-state overload relays have two outputs, each with one NO contact and one NC contact. Their basic assignment/function may be influenced by function expansion modules.

The 3RB22 and 3RB23 differ with respect to the tripping characteristics of their auxiliary contacts – monostable or bistable:

The monostable 3RB22 solid-state overload relays will enter the "tripped" state if the control supply voltage fails (> 200 ms), and return to the original state they were in before the control supply voltage failed when the voltage returns. These devices are therefore especially suited for plants in which the control voltage is not strictly monitored.

The bistable 3RB23 overload relays do not change their "tripped" or "not tripped" status if the control voltage fails. The auxiliary contacts only switch over in the event of an overload and if the supply voltage is present. These devices are therefore especially suited for plants in which the control voltage is monitored separately.

### Response if the control supply voltage fails

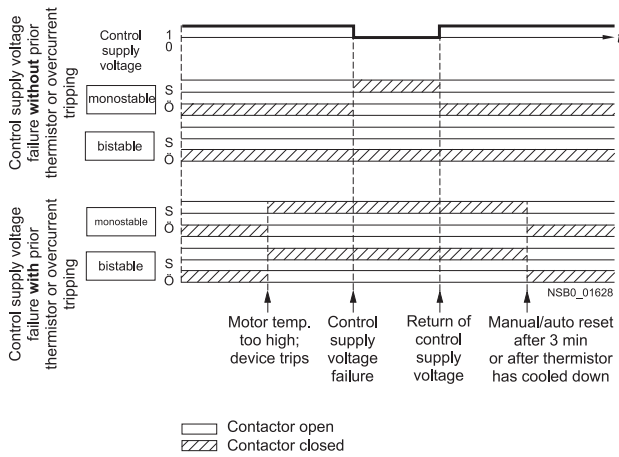
If the control supply voltage fails for more than 0.2 s, the output relays respond differently depending on the version: Monostable or bistable.

# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for high-feature applications

Response of the output relays in the event of	Monostable 3RB22	Bistable 3RB23
Failure of the control supply voltage	The device trips	No change of the switching status of the auxiliary contacts
Return of the control supply voltage without previous tripping	The device resets	No change of the switching status of the auxiliary contacts
Return of the control supply voltage after previous tripping	The device remains tripped Reset: <ul style="list-style-type: none"> <li>• For overload tripping, after 3 minutes</li> <li>• For thermistor tripping, after the temperature has fallen 5 K below the response temperature</li> <li>• For ground-fault tripping, immediately</li> </ul>	The device remains tripped Reset: <ul style="list-style-type: none"> <li>• For overload tripping, after 3 minutes</li> <li>• For thermistor tripping, after the temperature has fallen 5 K below the response temperature</li> <li>• For ground-fault tripping, immediately</li> </ul>

Monostable and bistable responses of the output relays





# 3RB2 Solid-State Overload Relays

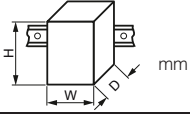

3RB22, 3RB23 for standard applications

## Technical specifications

The following technical information is intended to provide an initial overview of the various types of device and functions.

Detailed information, see

- Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WWW/view/en/35681297>
- or specific information on a particular article number via the product data sheet, <http://support.automation.siemens.com/WWW/view/en/20357046/133200>

Type – Overload relay: evaluation modules		3RB2283-4A.1	3RB2383-4A.1
Size contactor		S00 ... S10/S12	
Dimensions of evaluation modules (W x H x D)		45 x 111 x 95	
<b>General data</b>			
<b>Trips in the event of</b>		Overload, phase failure and phase unbalance (> 40 % according to NEMA), + ground fault (with corresponding function expansion module) and activation of the thermistor motor protection (with closed PTC sensor circuit)	
<b>Trip class</b> acc. to IEC 60947-4-1	CLASS	5, 10, 20 and 30 adjustable	
<b>Phase failure sensitivity</b>		Yes	
<b>Overload warning</b>		Yes, from $1.125 \times I_e$ for symmetrical loads and from $0.85 \times I_e$ for unsymmetrical loads	
<b>Reset and recovery</b>		Manual, automatic and remote RESET	
• Reset options after tripping			
• Recovery time			
- For automatic RESET	min.	- for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature	
- For manual RESET	min.	- for tripping due to a ground fault: no automatic RESET - for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature	
- For remote RESET	min.	- for tripping due to a ground fault: Immediately - for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature	
- For remote RESET	min.	- for tripping due to a ground fault: Immediately	
<b>Features</b>			
• Display of operating state on device		Yes, with four LEDs: - green LED "Ready" - red LED "Ground Fault" - red LED "Thermistor" - red LED "Overload"	
• TEST function		Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET / self-monitoring	
• RESET button		Yes, with the TEST/RESET button	
• STOP button		No	
<b>Protection and operation of explosion-proof motors</b>			
EC type test certificate number according to directive 94/9/EC (ATEX)		PTB 05 ATEX 3022  II (2) GD, see <a href="http://support.automation.siemens.com/WWW/view/en/23115758">http://support.automation.siemens.com/WWW/view/en/23115758</a>	--
<b>Ambient temperatures</b>			
• Storage/transport	°C	-40 ... +80	
• Operation	°C	-25 ... +60	
• Temperature compensation	°C	+60	
• Permissible rated current			
- Temperature inside control cabinet 60 °C	%	100	
- Temperature inside control cabinet 70 °C	%	On request	
<b>Degree of protection</b> acc. to IEC 60529		IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
<b>Touch protection</b> acc. to IEC 61140		Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
<b>Shock resistance with sine</b> acc. to IEC 60068-2-27		g/ms	15/11
<b>Electromagnetic compatibility (EMC) – Interference immunity</b>			
• Conductor-related interference			
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2 (power ports), 1 (signal port)	
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2 (line to earth), 1 (line to line)	
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	8 (air discharge), 6 (contact discharge)	
• Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	10	
<b>Electromagnetic compatibility (EMC) – emitted interference</b>		Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)	

# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

Type – Overload relay of current measuring module	3RB29	3RB29	3RB29	3RB29
Size	S00/S0	S2/S3	S6	S10/S12
Width	45 mm	55 mm	120 mm	145 mm
<b>Main circuit</b>				
Rated insulation voltage $U_i$ (pollution degree 3)	V	1000	1000	
Rated impulse withstand voltage $U_{imp}$	kV	6	8	
Rated operational voltage $U_e$	V	690	1000	
Type of current		No		
• Direct current		Yes, 50/60 Hz $\pm$ 5 % (other frequencies on request)		
• Alternating current				
Set current	A	0.3 ... 3; 2.4 ... 25	10 ... 100	20 ... 200 63 ... 630
Power loss per unit (max.)	W	0.5		
Short-circuit protection		See Selection and Ordering Data		
• With fuse without contactor		See Technical Specifications (short-circuit protection with fuses for motor feeders)		
• With fuse and contactor				
Safe isolation between main and auxiliary conducting path according to IEC 60947-1	V	690 <sup>1)</sup>		
<b>Connection for main circuit</b>				
Electrical connection version		Screw terminals with box terminal		
<b>Screw terminal</b>				
• Terminal screw	--		4 mm Allen screw	5 mm Allen screw
• Tightening torque	--		10 ... 12	20 ... 22
• Conductor cross-sections (min./max.), 1 or 2 conductors				
- Solid	mm <sup>2</sup>	--	--	--
- Finely stranded without end sleeve	mm <sup>2</sup>	--	With 3RT19 55-4G box terminal: 2 x (1 x max. 50, 1 x max. 70), 1 x (10 ... 70)	2 x (50 ... 185), front clamping point only: 1 x (70 ... 240)
			With 3RT19 56-4G box terminal: 2 x (1 x max. 95, 1 x max. 120), 1 x (10 ... 120)	rear clamping point only: 1 x (120 ... 185)
- Finely stranded with end sleeve	mm <sup>2</sup>	--	With 3RT19 55-4G box terminal: 2 x (1 x max. 50, 1 x max. 70), 1 x (10 ... 70)	2 x (50 ... 185), front clamping point only: 1 x (70 ... 240)
			With 3RT19 56-4G box terminal: 2 x (1 x max. 95, 1 x max. 120), 1 x (10 ... 120)	rear clamping point only: 1 x (120 ... 185)
- Stranded	mm <sup>2</sup>	--	With 3RT19 55-4G box terminal: 2 x (max. 70), 1 x (16 ... 70)	2 x (70 ... 240), front clamping point only: 1 x (95 ... 300)
			With 3RT19 56-4G box terminal: 2 x (max. 120), 1 x (16 ... 120)	rear clamping point only: 1 x (120 ... 240)
- AWG conductors, solid or stranded	AWG	--	With 3RT19 55-4G box terminal: 2 x (max. 1/0), 1 x (6 ... 2/0)	2 x (2/0 ... 500 kcmil), front clamping point only: 1 x (3/0 ... 600 kcmil)
			With 3RT19 56-4G box terminal: 2 x (max. 3/0), 1 x (6 ... 250 kcmil)	rear clamping point only: 1 x (250 kcmil ... 500 kcmil)
- Ribbon cable conductors (number x width x circumference)	mm	--	With 3RT19 55-4G box terminal: 2 x (6 x 15.5 x 0.8), 1 x (3 x 9 x 0.8 ... 6 x 15.5 x 0.8)	2 x (20 x 24 x 0.5), 1 x (6 x 9 x 0.8 ... 20 x 24 x 0.5)
			With 3RT19 56-4G box terminal: 2 x (10 x 15.5 x 0.8), 1 x (3 x 9 x 0.8 ... 10 x 15.5 x 0.8)	
<b>Busbar connections</b>				
• Terminal screw	Nm	--	M8 x 25	M10 x 30
• Tightening torque	--	--	10 ... 14	14 ... 24
• Conductor cross-section (min./max.)				
- Solid with cable lug	mm <sup>2</sup>	--	16 ... 95 <sup>2)</sup>	50 ... 240 <sup>3)</sup>
- Stranded with cable lug	mm <sup>2</sup>	--	25 ... 120 <sup>2)</sup>	70 ... 240 <sup>3)</sup>
- AWG connections, solid or stranded, with cable lug	AWG	--	4 ... 250 kcmil	2/0 ... 500 kcmil
- With connecting bar (max. width)	mm	--	15	25
<b>Straight-through transformers</b>				
• Diameter of opening	mm	7.5	14	25
• Conductor cross-section (max.)				
- NYY	mm <sup>2</sup>	4)	4)	120
- H07RN-F	mm <sup>2</sup>	4)	4)	70

1) For grounded networks, otherwise 600 V.

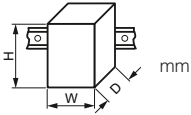
2) When connecting cable lugs according to DIN 46235, use the 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm<sup>2</sup> to ensure phase spacing.

3) When connecting cable lugs according to DIN 46234 for conductor cross-sections from 240 mm<sup>2</sup> as well as DIN 46235 for conductor cross-sections from 185 mm<sup>2</sup>, use the 3RT19 56-4EA1 terminal cover to ensure phase spacing.

4) On request.

# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

<b>Type – Overload relay: evaluation modules</b>		<b>3RB2283-4A.1</b>	<b>3RB2383-4A.1</b>
Size contactor		S00 ... S10/S12	
Dimensions of evaluation modules (W x H x D)		45 x 111 x 95	

<b>General data (continued)</b>			
<b>Resistance to extreme climates – air humidity</b>	%	100	
<b>Dimensions</b>		"Dimensional drawings", see <ul style="list-style-type: none"> <li>Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <a href="http://support.automation.siemens.com/WW/view/en/35681297">http://support.automation.siemens.com/WW/view/en/35681297</a></li> <li>Product data sheet, <a href="http://support.automation.siemens.com/WW/view/en/20357046/133200">http://support.automation.siemens.com/WW/view/en/20357046/133200</a></li> </ul>	
<b>Installation altitude above sea level</b>	m	Up to 2 000	
<b>Mounting position</b>		Any	
<b>Type of mounting</b>		Stand-alone installation	
<ul style="list-style-type: none"> <li>Evaluation modules</li> <li>Current measuring module</li> </ul>	Size	S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors	

<b>Type – Overload relay: evaluation modules</b>	<b>3RB2283-4A.1, 3RB2383-4A.1</b>
Size contactor	S00 ... S10/S12

<b>Auxiliary circuit</b>	
<b>Number of NO contacts</b>	2
<b>Number of NC contacts</b>	2
<b>Number of CO contacts</b>	--
<b>Auxiliary contacts – assignment</b>	<ul style="list-style-type: none"> <li>Alternative 1 <ul style="list-style-type: none"> <li>- 1 NO for the signal "tripped by overload and/or thermistor"</li> <li>- 1 NC for disconnecting the contactor</li> <li>- 1 NO for the signal "tripped by ground fault"</li> <li>- 1 NC for disconnecting the contactor</li> </ul> </li> <li>or<sup>1)</sup></li> <li>Alternative 2 <ul style="list-style-type: none"> <li>- 1 NO for the signal "tripped by overload and/or thermistor and/or ground fault"</li> <li>- 1 NC for disconnecting the contactor</li> <li>- 1 NO for overload warning</li> <li>- 1 NC for disconnecting the contactor</li> </ul> </li> </ul>

<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	300
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4

<b>Auxiliary contacts – contact rating</b>		
<ul style="list-style-type: none"> <li>NC contact with alternating current AC-14/AC-15, rated operational current <math>I_e</math> at <math>U_e</math> <ul style="list-style-type: none"> <li>- 24 V</li> <li>- 120 V</li> <li>- 125 V</li> <li>- 250 V</li> </ul> </li> <li>NO contact with alternating current AC-14/AC-15, rated operational current <math>I_e</math> at <math>U_e</math> <ul style="list-style-type: none"> <li>- 24 V</li> <li>- 120 V</li> <li>- 125 V</li> <li>- 250 V</li> </ul> </li> <li>NC contact, NO contact with direct current DC-13, rated operational current <math>I_e</math> at <math>U_e</math> <ul style="list-style-type: none"> <li>- 24 V</li> <li>- 60 V</li> <li>- 110 V</li> <li>- 125 V</li> <li>- 250 V</li> </ul> </li> <li>Conventional thermal current <math>I_{th}</math></li> <li>Contact reliability (suitability for PLC control; 17 V, 5 mA)</li> </ul>	A	6 6 6 3  6 6 6 3  2 0.55 0.3 0.3 0.2  5 Yes

<b>Short-circuit protection</b>		
<ul style="list-style-type: none"> <li>With fuse, operational class gG</li> <li>With miniature circuit breaker, C characteristic</li> </ul>	A	6 1.6



<b>Protective separation between auxiliary current paths</b> acc. to IEC 60947-1	V	300
--	---	-----

<b>CSA, UL, UR rated data</b>	
<b>Auxiliary circuit – switching capacity</b>	B300, R300

<sup>1)</sup> The assignment of auxiliary contacts may be influenced by function expansion modules.

# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

<b>Type – Overload relay: evaluation modules</b>		<b>3RB2283-4A.1, 3RB2383-4A.1</b>
Size contactor		S00 ... S10/S12
<b>Control circuit</b>		
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	300
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4
<b>Rated control supply voltage <math>U_s</math></b>		
• 50/60 Hz AC	V	24 ... 240
• DC	V	24 ... 240
<b>Operating range</b>		
• 50/60 Hz AC		$0.85 \times U_{s\ min} \leq U_s \leq 1.1 \times U_{s\ max}$
• DC		$0.85 \times U_{s\ min} \leq U_s \leq 1.1 \times U_{s\ max}$
<b>Rated power</b>		
• 50/60 Hz AC	W	0.5
• DC	W	0.5
<b>Mains buffering time</b>	ms	200
<b>Sensor circuit</b>		
<b>Thermistor motor protection (PTC thermistor sensor)</b>		
• Summation cold resistance	k $\Omega$	$\leq 1.5$
• Response value	k $\Omega$	3.4 ... 3.8
• Return value	k $\Omega$	1.5 ... 1.65
<b>Ground-fault detection</b>		
The information refers to sinusoidal residual currents at 50/60 Hz.		
• Tripping value $I_A^{(1)}$ - For $0.3 \times I_e < I_{motor} < 2.0 \times I_e$ - For $2.0 \times I_e < I_{motor} < 8.0 \times I_e$		$> 0.3 \times I_e$ $> 0.15 \times I_{motor}$
• Response time $t_{trip}$	ms	500 ... 1 000
<b>Analog output<sup>1)2)</sup></b>		
<b>Rated values</b>		
• Output signal	mA	4 ... 20
• Measuring range		$0 \dots 1.25 \times I_e$ 4 mA corresponds to $0 \times I_e$ 16.8 mA corresponds to $1.0 \times I_e$ 20 mA corresponds to $1.25 \times I_e$
• Load, max.	$\Omega$	100
<b>Conductor cross-sections for the auxiliary, control and sensor circuit as well as the analog output</b>		
<b>Connection type</b>		 <b>Screw terminals</b>
<b>Terminal screw</b>		M3, Pozidriv size 2
<b>Operating devices</b>	mm	3.0 x 0.5
<b>Prescribed tightening torque</b>	Nm	0.8 ... 1.2
<b>Conductor cross-sections (min./max.),</b> 1 or 2 conductors can be connected		
• Solid or stranded	mm <sup>2</sup>	$1 \times (0.5 \dots 4)^3, 2 \times (0.5 \dots 2.5)^3$
• Finely stranded without end sleeve	mm <sup>2</sup>	--
• Finely stranded with end sleeve (DIN 46228-1)	mm <sup>2</sup>	$1 \times (0.5 \dots 2.5)^3, 2 \times (0.5 \dots 1.5)^3$
• AWG cables, solid or stranded	AWG	$2 \times (20 \dots 14)$
<b>Connection type</b>		 <b>Spring-type terminals</b>
<b>Operating devices</b>	mm	3.0 x 0.5
<b>Conductor cross-sections (min./max.),</b> 1 or 2 conductors can be connected		
• Solid or stranded	mm <sup>2</sup>	$2 \times (0.25 \dots 1.5)$
• Finely stranded without end sleeve	mm <sup>2</sup>	--
• Finely stranded with end sleeve (DIN 46228-1)	mm <sup>2</sup>	$2 \times (0.25 \dots 1.5)$
• AWG cables, solid or stranded	AWG	$2 \times (24 \dots 16)$

<sup>1)</sup> For the 3RB22 and 3RB23 overload relays in combination with a corresponding function expansion module.

<sup>2)</sup> Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. In this case the analog input module must not supply current to the analog output of the 3RB22 and 3RB23 relay.

<sup>3)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

## Short-circuit protection with fuses for motor feeders

For short-circuit currents up to 50 kA at 400 to 690 V

Overload relays	Contactor	CLASS									690 V		
		5 and 10			20			30			Fuse links <sup>1)</sup>		
Setting range	Type	Rated operational current $I_e$ AC-3 in A at									Type of coordination <sup>2)</sup>		
		400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	1	2	
<b>Size S00/S0</b>													
0.3 ... 3 A	3RT20 15	3	3	3	3	3	3	3	3	3	3	35	20
	3RT20 16	3	3	3	3	3	3	3	3	3	3	35	20
2.4 ... 25 A	3RT20 15	7	5	4	7	5	4	7	5	4	35	20	
	3RT20 16	9	6.5	5.2	9	6.5	5.2	9	6.5	5.2	35	20	
	3RT20 17	12	9	6.3	10	9	6.3	9	9	6.3	35	20	
	3RT20 23	9	6.5	5.2	9	6.5	5.2	--	--	--	63	25	
	3RT20 24	12	12	9	12	12	9	12	12	9	63	25	
	3RT20 25	17	17	13	16	16	13	14	14	13	63	25	
	3RT20 26	25	18	13	16	16	13	14	14	13	100	35	
<b>Size S2/S3</b>													
On request	3RT20 35	On request											
	3RT20 36	On request											
	3RT20 45	On request											
	3RT20 46	On request											
	3RT20 47	On request											
<b>Size S6</b>													
20 ... 200 A	3RT10 54	115	115	115	81.7	81.7	81.7	69	69	69	355	315	
	3RT10 55	150	150	150	107	107	107	90	90	90	355	315	
	3RT10 56	185	185	170	131	131	131	111	111	111	355	315	
<b>Size S10/S12</b>													
160 ... 630 A	3RT10 64	225	225	225	160	160	160	135	135	135	500	400	
	3RT10 65	265	265	265	188	188	188	159	159	159	500	400	
	3RT10 66	300	300	280	213	213	213	180	180	180	500	400	
	3RT10 75	400	400	400	284	284	284	240	240	240	630	400	
	3RT10 76	500	500	450	355	355	355	300	300	300	630	500	
	3RT12 64	225	225	225	225	225	225	173	173	173	500	500	
	3RT12 65	265	265	265	265	265	265	204	204	204	500	500	
	3RT12 66	300	300	300	300	300	300	231	231	231	500	500	
	3RT12 75	400	400	400	400	400	400	316	316	316	800	800	
	3RT12 76	500	500	500	500	500	500	385	385	385	800	800	
	3TF68 <sup>3)</sup>	630	630	630	440	440	440	376	376	376	800	500 <sup>4)</sup>	
	3TF69 <sup>3)</sup>	630	630	630	572	572	572	500	500	500	800	630 <sup>4)</sup>	

- 1) Please observe operational voltage.
- 2) Coordination and short-circuit equipment according to EN 60947-4-1:
  - Type of coordination 1:** the contactor or starter must not endanger persons or the installation in the event of a short-circuit. They do not need to be suitable for further operation without repair and the renewal of parts.
  - Type of coordination 2:** the contactor or starter must not endanger persons or the installation in the event of a short-circuit. They must be suitable for further operation. There is a risk of contact welding.
- 3) Contactor cannot be mounted.
- 4) Please ensure that the maximum AC-3 operational current has sufficient safety clearance from the rated current of the fuses.

# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

## Characteristic curves

The tripping characteristics show the relationship between the tripping time and tripping current as multiples of the set current  $I_e$  and are given for symmetrical three-pole and two-pole loads from the cold state.

The smallest current used for tripping is called the minimum tripping current. According to IEC 60947-4-1, this current must be within specified limits. The limits of the minimum tripping current for the 3RB22/3RB23 solid-state overload relays for symmetrical three-pole loads are between 105 % and 120 % of the set current.

The tripping characteristic starts with the minimum tripping current and continues with higher tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time intervals within which the overload relays have to trip with 7.2 times the set current  $I_e$  from the cold state for symmetrical three-pole loads.

The tripping times according to IEC 60947-4-1, tolerance band E, are as follows for:

Trip class	Tripping time
CLASS 5	3 ... 5 s
CLASS 10	5 ... 10 s
CLASS 20	10 ... 20 s
CLASS 30	20 ... 30 s

The tripping characteristic for a three-pole overload relay from the cold state (see illustration 1) only apply if all three phases are simultaneously loaded with the same current. In the event of a phase failure or a current unbalance of more than 40 %, the 3RB22/3RB23 solid-state overload relays switch off the contactor more quickly in order to minimize heating of the load in accordance with the tripping characteristic for two-pole loads from the cold state (see illustration 2).

Compared with a cold load, a load at operating temperature obviously has a lower temperature reserve. The tripping time of the 3RB22/3RB23 solid-state overload relays are reduced therefore to about 30 % when loaded with the set current  $I_e$  for an extended period.

Tripping characteristics for 3-pole loads

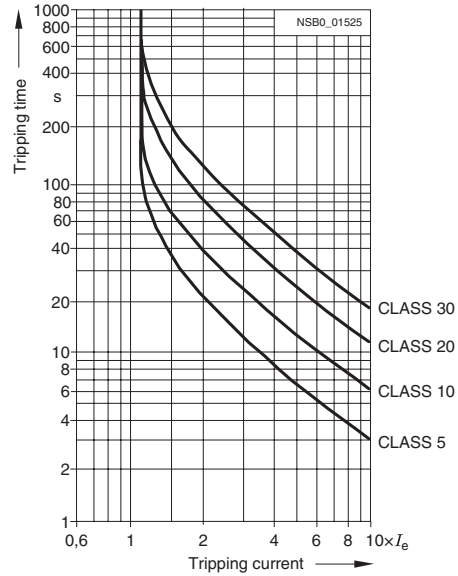


Illustration 1

Tripping characteristics for 2-pole loads

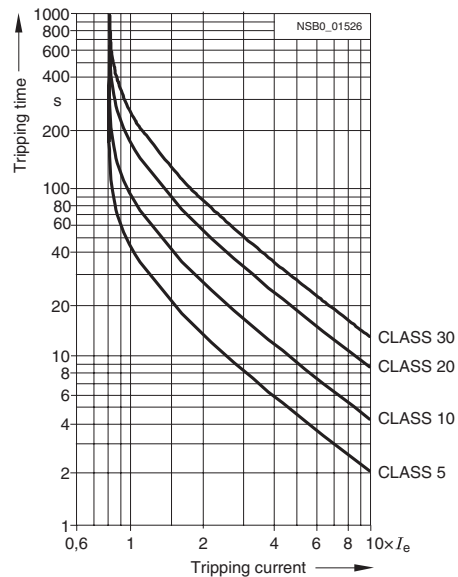


Illustration 2

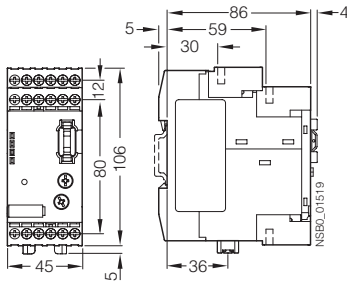
The above illustrations are schematic representations of characteristic curves. The characteristic curves of the individual 3RB22/3RB23 solid-state overload relays can be requested from Technical Assistance at the following e-mail address:

[Technical-assistance@siemens.com](mailto:Technical-assistance@siemens.com)

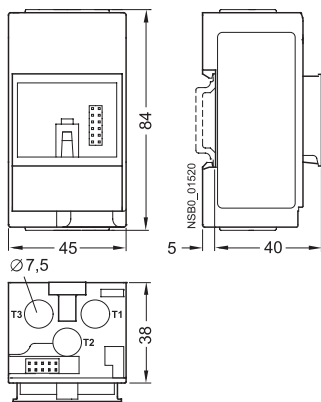
# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

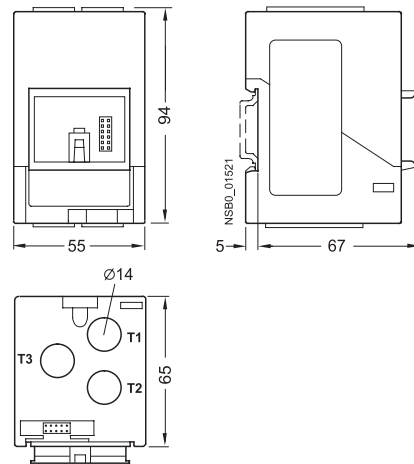
## Dimensional drawings



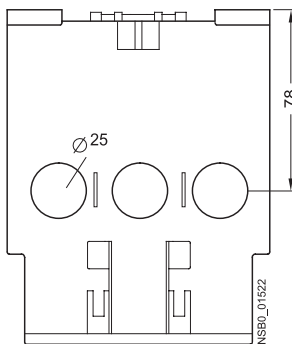
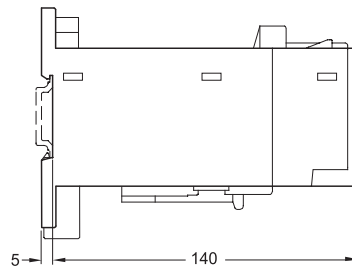
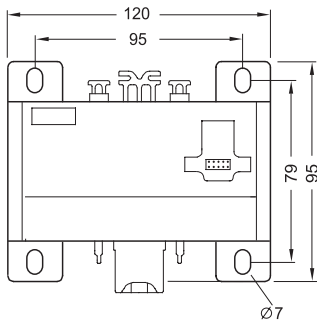
3RB22 83-4, 3RB23 83-4 evaluation module



3RB29 06-2BG1, 3RB29 06-2DG1 current measuring module



3RB29 06-2JG1 current measuring module



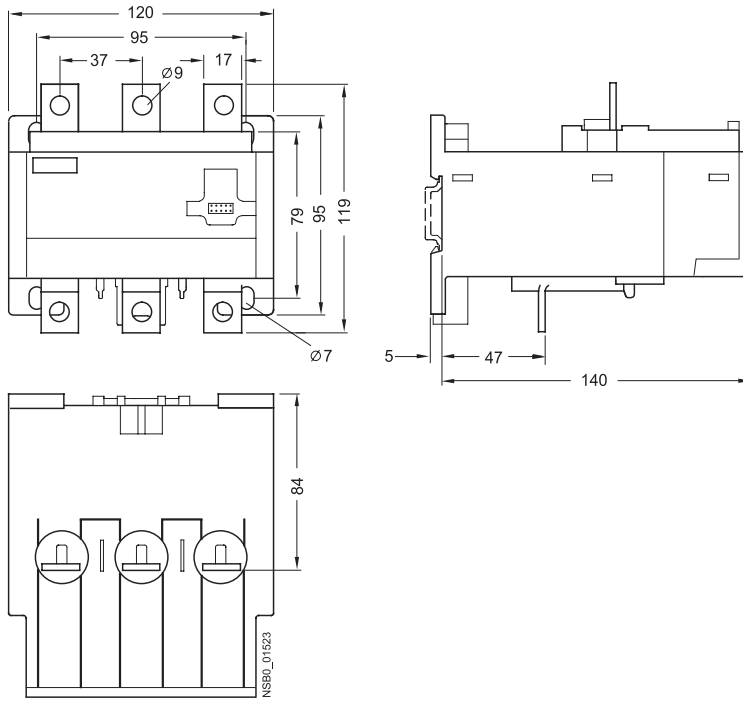
3RB29 56-2TG2 current measuring module



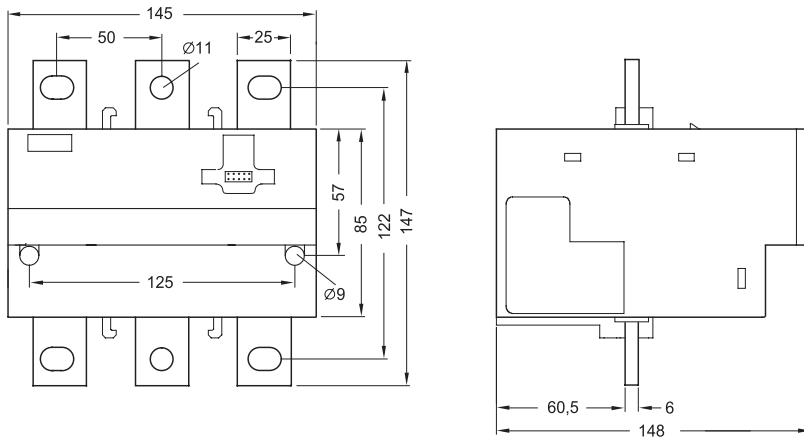
# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

3  
OVERLOAD  
RELAYS



3RB29 56-2TH2 current measuring module



3RB29 66-2WH2 current measuring module

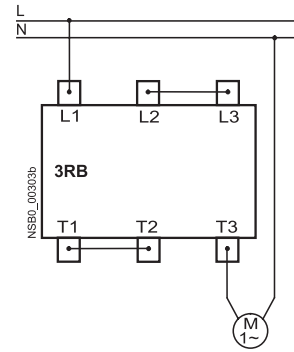
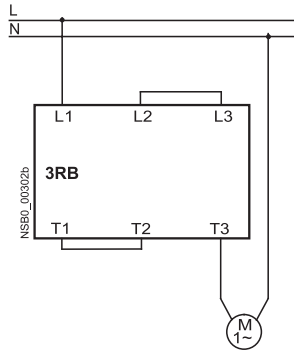
# 3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

## Schematics

### Protection of single-phase motors

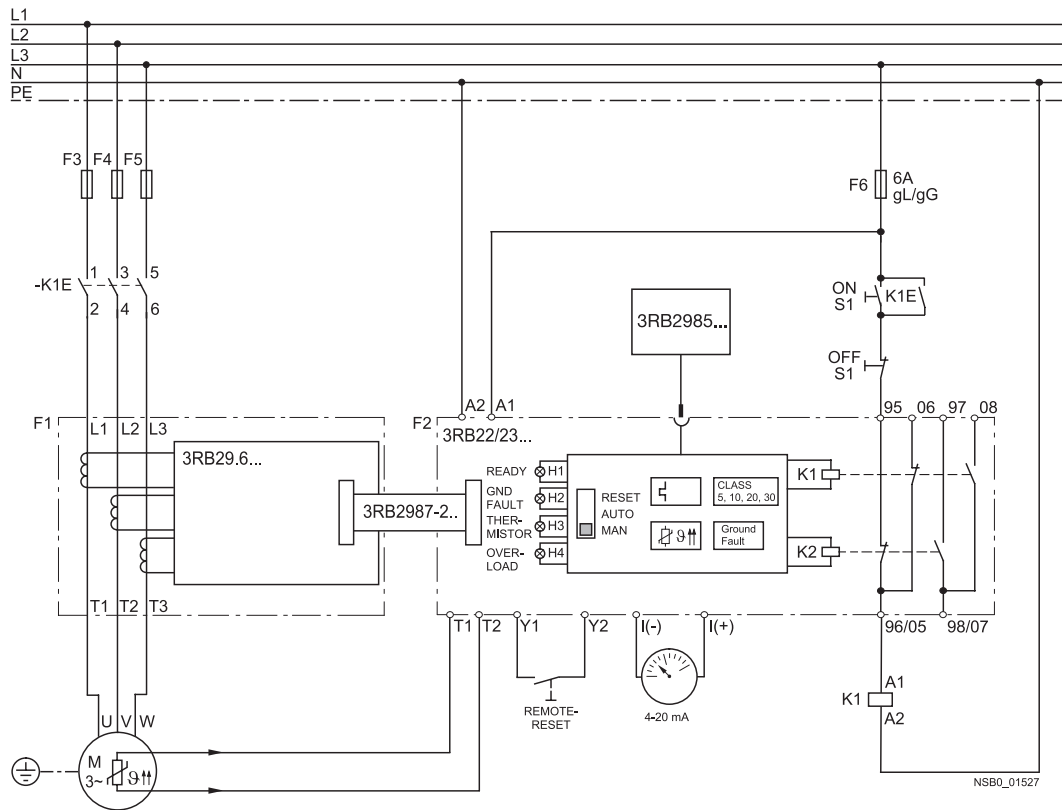
(not in conjunction with internal ground-fault detection)



3RB29 06-2.G1, 3RB29 56-2TG2

3RB29 56-2TH2, 3RB29 66-2WH2

### Schematic representation of a possible application (3-phase)



## 3RB2 Solid-State Overload Relays

## 3RB22, 3RB23 for standard applications

## Connections

Evaluation module	Function expansion module	Basic functions	Inputs		
			A1/A2	T1/T2	Y1/Y2
3RB22 83-4AA1 3RB22 83-4AC1 3RB23 83-4AA1 3RB23 83-4AC1	None	Inverse-time delayed protection, temperature-dependent protection, electrical remote RESET, overload warning	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2CA1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, overload warning	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2CB1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, ground fault signal	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2AA0	Inverse-time delayed protection, temperature-dependent protection, electrical remote RESET, overload warning, analog output	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2AA1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, overload warning, analog output	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2AB1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, ground fault signal, analog output	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET

Evaluation module	Function expansion module	Outputs				
		I (-) / I (+)	95/96 NC	97/98 NO	05/06 NC	07/08 NO
3RB22 83-4AA1 3RB22 83-4AC1 3RB23 83-4AA1 3RB23 83-4AC1	None	No	Switching off the contactor (inverse-time delayed/temperature-dependent protection)	Signal "tripped"	Overload warning	Overload warning
	3RB29 85-2CA1	No	Switching off the contactor (inverse-time delayed/temperature-dependent protection + ground fault)	Signal "tripped"	Overload warning	Overload warning
	3RB29 85-2CB1	No	Switching off the contactor (inverse-time delayed/temperature-dependent protection)	Signal "tripped"	Switching off the contactor (ground fault)	Signal "ground fault trip"
	3RB29 85-2AA0	Analog signal	Switching off the contactor (inverse-time delayed/temperature-dependent protection)	Signal "tripped"	Overload warning	Overload warning
	3RB29 85-2AA1	Analog signal	Switching off the contactor (inverse-time delayed/temperature-dependent protection + ground fault)	Signal "tripped"	Overload warning	Overload warning
	3RB29 85-2AB1	Analog signal	Switching off the contactor (inverse-time delayed/temperature-dependent protection)	Signal "tripped"	Switching off the contactor (ground fault)	Signal "ground fault trip"

# 3RB2/3RB3 Solid-State Overload Relays

## Accessories

### Overview

#### Overload relays for standard applications

The following accessories are available for the 3RB2/3RB3 solid-state overload relays:




- One terminal bracket each for the overload relays size S00 and S0 (sizes S2 to S12 can be installed as single units without a terminal bracket)
- One mechanical RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for all sizes
- Box terminal blocks for sizes S6 and S10/S12
- Terminal covers for sizes S2 to S10/S12

#### Overload relays for high-feature applications

The following accessories are available for the 3RB22/3RB23 solid-state overload relays:

- A sealable cover for the evaluation module
- Box terminal blocks for the current measuring modules size S6 and S10/S12
- Terminal covers for the current measuring modules size S6 and S10/S12
- Push-in lugs for screw mounting the size S00 to S3 current measuring modules

### Selection and ordering data







Version	Size	Order No.	Weight per PU approx. kg		
<b>Terminal brackets for stand-alone installation <sup>1) 2)</sup></b>					
 <p>3RU29.6-3AA01</p>	For separate mounting of the overload relay panel mount or snapped onto 35 mm standard mounting rail, size S3 also for 75 mm standard mounting rail	<i>Screw terminals</i> S00 S0 S2 S3	<b>3RU29 16-3AA01</b> <b>3RU29 26-3AA01</b> <b>3RU29 36-3AA01</b> <b>3RU29 46-3AA01</b>	0.04 0.05 0.18 0.28	
		<i>Spring Loaded terminals</i> S00 S0	<b>3RU29 16-3AC01</b> <b>3RU29 26-3AC01</b>	0.04 0.06	
	<b>Mechanical RESET <sup>1) 2)</sup></b>				
	 <p>3RU19 00-1A with pushbutton and extension plunger</p>	<b>Resetting plungers, holders and formers</b>	S00 to S3 S6 to S12	<b>3RB39 80-0A</b> <b>3RU19 00-1A</b>	0.030 0.038
		<b>Pushbuttons with extended stroke</b> (12 mm), IP65, Ø 22 mm	S3 to S12	<b>3SB30 00-0EA11</b>	0.021
<b>Extension plungers</b> For compensation of the distance between a pushbutton and the unlatching button of the relay		S3 to S12	<b>3SX1 335</b>	0.004	
<b>Complete mechanical reset assembly</b>		S3 to S12	<b>3SBES-RESET</b>		
<b>Cable releases with holder for RESET <sup>1) 2)</sup></b>					
 <p>3RU19 00-1.</p>	For holes with Ø 6.5 mm in the mounting plate; max. control panel thickness 8 mm				
	• Length 400 mm	S00 to S2	<b>3RB39 80-0B</b>	0.060	
	• Length 600 mm	S00 to S2	<b>3RB39 80-0C</b>	0.073	
	• Length 400 mm	S3 to S12	<b>3RU19 00-1B</b>	0.063	
	• Length 600 mm	S3 to S12	<b>3RU19 00-1C</b>	0.073	

1) Accessories with a prefix of 3RB39 are intended for 3RB20/3RB30 overload relays only.

2) Only for 3RB20/3RB21. The accessories are identical to those of the 3RU1/3RU2 thermal overload relays.

## 3RB2 Solid-State Overload Relays

## Accessories

Version	Size	Order No.	List Price \$	Pack Units	Weight per PU approx. kg
<b>Sealable covers</b>					
 3RB3984-0	For covering the setting knobs				
	• For 3RB30/3RB31	S00 to S3	<b>3RB39 84-0</b>	10 units	0.003
	• For 3RB20/3RB21	S6 to S12	<b>3RB29 84-0</b>	10 units	0.020
	• For 3RB22 to 3RB24	–	<b>3RB29 84-2</b>	10 units	0.050
<b>Terminal covers</b>					
 3RT19 46-4EA1	<b>Covers for cable lugs and rail connection</b>				
	• Length 100 mm	S6	<b>3RT19 56-4EA1</b>		0.067
	• Length 120 mm	S10/S12	<b>3RT19 66-4EA1</b>		0.124
 3RT19 36-4EA2	<b>Covers for box terminals</b>				
	• Length 20.6 mm <sup>1)</sup>	S2	<b>3RT29 36-4EA2</b>		0.016
	• Length 20.8 mm <sup>1)</sup>	S3	<b>3RT29 46-4EA2</b>		0.023
	• Length 25 mm	S6	<b>3RT19 56-4EA2</b>		0.028
	• Length 30 mm	S10/S12	<b>3RT19 66-4EA2</b>		0.038
The figures show mounting on the contactor	<b>Covers for screw connections</b>	S6	<b>3RT19 56-4EA3</b>		0.021
	between contactor and overload relay, without box terminals (1 unit required per combination)	S10/S12	<b>3RT19 66-4EA3</b>		0.062
<b>Box terminal blocks</b>					
 3RT19 5.-4G	For round and ribbon cables up to 70 mm <sup>2</sup> 2/0 AWG	S6 <sup>2)</sup>	<b>3RT19 55-4G</b>		0.237
	up to 120mm <sup>2</sup> 4/0 AWG	S6	<b>3RT19 56-4G</b>		0.270
	up to 240mm <sup>2</sup> 500 mcm	S10/S12	<b>3RT19 66-4G</b>		0.676
	For conductor cross-sections, see LV 1 T "Technical Specifications"				
<b>Push-in lugs</b>					
 3RP19 03	For screw fixing of 3RB22/3RB23 overload relays	--	<b>3RP19 03</b>	10 units	0.002
 3RB19 00-0B	For screw mounting of 3RB29 06 current measuring modules (2 units are required per module)	S00 ... S3	<b>3RB29 00-0B</b>	10 units	0.100

For more accessories (tools for spring-loaded terminals and labeling plates), see page 3/57.

1) Only for 3RB20/3RB21. The accessories are identical to those of the 3RU11 thermal overload relays.

2) In the scope of supply for 3RT10 54-1 contactors (55 kW).

# 3RB2 Solid-State Overload Relays

## Accessories

### Overview

#### Overload relays for standard applications

The following accessories are available for the 3RB20/3RB21 solid-state overload relays:

- One terminal bracket each for the overload relays size S00 and S0 (sizes S2 to S12 can be installed as stand-alone installation without a terminal bracket)
- One mechanical remote RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for all sizes
- Box terminal blocks for sizes S6 and S10/S12
- Terminal covers for sizes S2 to S10/S12

#### Overload relays for High-Feature applications

The following accessories are available for the 3RB22/3RB23 solid-state overload relays:

- A sealable cover for the evaluation module
- Box terminal blocks for the current measuring modules size S6 and S10/S12
- Terminal covers for the current measuring modules size S6 and S10/S12

### Technical specifications

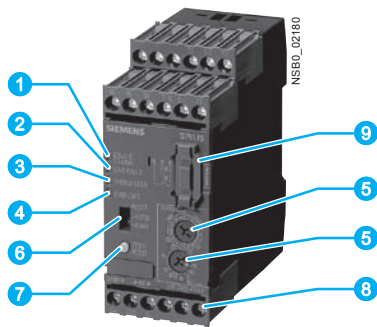
#### Terminal brackets for stand-alone installation

Type	3RB29 13-0AA1	3RB29 23-0AA1
For overload relay	3RB20 16, 3RB21 13	3RB20 26, 3RB21 23
Size	S00	S0
Type of mounting	For screw and snap-on mounting onto TH35 standard mounting rail	
<b>Connection for main circuit</b>		
Connection type	Screw terminal	
<b>Screw terminal</b>		
• Terminal screw	Pozidriv size 2	
• Tightening torque	Nm 0.8 ... 1.2	2 ... 2.5
• Conductor cross-section (min./max.), 1 or 2 conductors		
- Solid	mm <sup>2</sup> 1 × (0.5 ... 2.5), Max. 1 × (... 4)	1 × (1 ... 6), Max. 1 × (... 10)
- Finely stranded without end sleeve	mm <sup>2</sup> --	--
- Finely stranded with end sleeve	mm <sup>2</sup> 1 × (0.5 ... 2.5)	1 × (1 ... 6)
- Stranded	mm <sup>2</sup> 1 × (0.5 ... 2.5), Max. 1 × (... 4)	1 × (1 ... 6), Max. 1 × (... 10)
- AWG conductors, solid or stranded	AWG 1 × (18 ... 14)	1 × (14 ... 10)

## 3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A for High-Feature applications

## Overview



- 1 Green LED "DEVICE/IO-Link":  
A continuous green light signals that the device is working correctly, a green flickering light signals the communication through IO-Link.
- 2 Red LED "GND FAULT":  
A continuous red light signals an active ground-fault trip.
- 3 Red LED "THERMISTOR":  
A continuous red light signals an active thermistor trip.
- 4 Red LED "OVERLOAD":  
A continuous red light signals an active overload trip; a flickering red light signals an imminent trip (overload warning).
- 5 Motor current and trip class setting:  
Setting the device to the motor current and to the required trip class dependent on the start-up conditions is easy with the two rotary switches.
- 6 Selector switch for manual/automatic RESET:  
With this switch you can choose between manual and automatic RESET.
- 7 Test/RESET button:  
Enables testing of all important device components and functions, plus resetting of the device after a trip when manual RESET is selected.
- 8 Connecting terminals (removable terminal block):  
The generously sized terminals permit connection of two conductors with different cross-sections for the auxiliary, control and sensor circuits. Connection is possible with screw connection and alternatively with spring-type connection.
- 9 Plug-in point for operator panel:  
enables connection of the 3RA69 35-0A operator panel.

## SIRIUS 3RB24 evaluation module

The modular electronic overload relay 3RB24, which is powered via IO-Link (with monostable auxiliary contacts) up to 630 A (up to 820 A possible with a series transformer) have been designed for inverse-time delayed protection of loads with normal and heavy starting ("Function" see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link".) against excessive temperature rises due to overload, phase unbalance or phase failure. It comprises an evaluation unit, a current measuring module and a connecting cable. The evaluation module 3RB24 also offers an motor starter function: The contactors, which are connected via the auxiliary contacts, can also be actuated for operation via IO-Link. In this way, direct, reversing and star-delta starters up to 630 A (or 830 A) can be connected to the controller wirelessly via the IO-Link controller.

An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set rated motor current.

This current rise is detected by means of the current measuring module (see page 3/55) and electronically evaluated by the evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The

break time depends on the ratio between the tripping current and current setting  $I_e$  and is stored in the form of a long-term stable tripping characteristic (see [www.siemens.com/sirius/support](http://www.siemens.com/sirius/support) → "Characteristic Curves"). The "tripped" status is signaled by means of a continuously illuminated red "OVERLOAD" LED and also reported as a group fault via IO-Link.

The LED indicates imminent tripping of the relay due to overload, phase unbalance or phase failure by flickering when the limit current has been violated. This warning can also be reported to the higher-level PLC via IO-Link at the 3RB24 overload relay.

In addition to the described inverse-time delayed protection of loads against excessive temperature rises, the 3RB24 solid-state overload relays also allow direct temperature monitoring of the motor windings (full motor protection) by connection with broken-wire interlock of a PTC sensor circuit. With this temperature-dependent protection, the loads can be protected against overheating caused indirectly by reduced coolant flow, for example, which cannot be detected by means of the current alone. In the event of overheating, the devices switch off the contactor, and thus the load, by means of the auxiliary contacts. The "tripped" status is signaled by means of a continuously illuminated "THERMISTOR" LED and also reported as a group fault via IO-Link.

To the loads against incomplete ground faults due to damage to the insulation, humidity, condensation, etc., to protect the electronic overload relay 3RB24 offer the possibility of internal ground-fault detection (for details see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link", not possible in conjunction with contactor assembly for wye-delta starting). In the event of a ground fault, the 3RB24 relays trip instantaneously.

The "tripped" status is signaled by means of a flashing red LED "Ground Fault" and reported at the overload relay 3RB24 as a group fault via IO-Link.

The reset after overload, phase unbalance, phase failure, thermistor or ground-fault tripping is performed manually by key on site, via IO-Link or by electrical remote RESET or automatically after the cooling time (motor model) or for thermistor protection after sufficient cooling. Power cuts in devices due to function monitoring (broken wire or short circuit on the thermistor) can only be reset on-site ("Function" see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link"). In conjunction with a function expansion module, the motor current measured by the microprocessor can be output in the form of an analog signal DC 4 to 20 mA for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.

The current values can be transmitted to the higher-level controller via IO-Link.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials.

They comply with all important worldwide standards and approvals.

**Type of protection "increased safety EEx e and explosion-proof enclosure EEx d" in accordance with ATEX Directive 94/9/EC**

The electronic overload relay 3RB24 (monostable) are suitable for the overload protection of explosion-proof motors of types of protection EEx e and EEx d.

They comply with the requirements of EN 60079-7 (Electrical apparatus for areas subject to explosion hazards - Increased safety "e" as well as for flameproof enclosure "d"); see [www.siemens.com/sirius/atex](http://www.siemens.com/sirius/atex).

EC type test certificate for Group II, Category (2) G/D has been submitted. On request.



# 3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A for High-Feature applications

**Order No. scheme**

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	
Solid-state overload relays	□□□	□	□	□	□	-	□	□	□	
SIRIUS 2nd generation	3 R B			2						
Device series			□							
Size, rated operational current and power				□						
Version of the automatic RESET, electrical remote RESET					□					
Trip class (CLASS)							□			
Setting range of the overload release								□		
Connection methods									□	
Installation type									□	
Example	3 R B	2	4	8	3	-	4	A	A	1

**Note:**

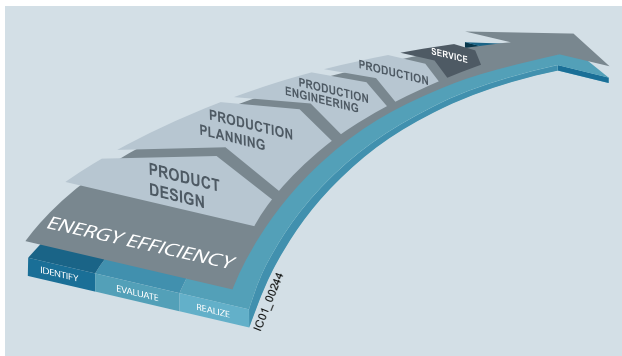
The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quoted in the catalog in the Selection and ordering data.

**Benefits**

The most important features and benefits of the 3RB24 solid-state overload relays for IO-Link are listed in the overview table (see "General Data", page 3/2 onwards).

**Advantages through energy efficiency**



Overview of the energy management process

We offer you a unique portfolio for industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – Identification, Evaluation and Realization – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency (see [www.siemens.com/sirius/energysaving](http://www.siemens.com/sirius/energysaving)).

3RB24 solid-state overload relays for IO-Link contribute to energy efficiency throughout the plant as follows:

- Transmission of current values
- Reduced inherent power loss
- Less heating of the control cabinet
- Smaller control cabinet air conditioners can be used

**Application**

**Industries**

The 3RB24 solid-state overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed and temperature-dependent protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5 to 30), minimize project completion times, inventories and energy consumption, and optimize plant availability and maintenance management.

**Application**

The 3RB24 solid-state overload relays have been designed for the protection of three-phase asynchronous and single-phase AC motors.

In addition to protection function, these devices can be used together with contactors as direct or reversing starters (star-delta (wye-delta) start also possible), which are controlled via IO-Link. This makes it possible to directly control drives via IO-Link from a higher-level controller or on site via the optional hand-held device lamps and also, for example, to return current values directly via IO-Link.

If single-phase AC motors are to be protected by the 3RB24 solid-state overload relays, the main current paths of the current measuring modules must be series-connected ("Schematics" see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link",).

**Ambient conditions**

The devices are insensitive to external influences such as shocks, corrosive ambient conditions, ageing and temperature fluctuations.

For the temperature range from -25 °C to +60 °C, the 3RB24 solid-state overload relays compensate the temperature in accordance with IEC 60947-4-1.

Configuration notes for use of the devices below -25 °C or above +60 °C on request.

# 3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A for High-Feature applications

## Selection and ordering data

**3RB24 solid-state overload relays (evaluation module) for full motor protection, stand-alone installation, CLASS 5, 10, 20 and 30, adjustable**

Type	3RB24 83-4A.1
<b>Features and technical specifications</b>	
Overload protection, phase failure protection and unbalance protection	✓
Supplied from an external voltage	✓ 24 V DC through IO-Link
Direct-on-line or reversing starters (wye-delta starting also possible) controllable through IO-Link	✓
Auxiliary contacts	✓ 1 CO and 1 NO in series
Manual and automatic RESET	✓
Remote-RESET	✓ (electrically or via IO-Link)
4 LEDs for operating and status displays	✓
TEST function and self-monitoring	✓
Internal ground-fault detection	✓
Screw or spring-type terminals for auxiliary, control and sensor circuits	✓
Input for PTC sensor circuit	✓
Analog output	✓
<b>IO-Link-specific functions</b>	
• Connection of direct-on-line, reversing and star-delta starters to the controller via IO-Link	✓
• On-site controlling of the starter using the hand-held device	✓
• Accessing process data (e.g. current values in all three phases) via IO-Link	✓
• Accessing parameterization and diagnostics data (e.g. tripped signals) via IO-Link	✓

✓ Available



PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41G



3RB24 83-4AA1



3RB24 83-4AC1

Size of contactor	Version	Screw terminals 	Spring-type terminals 
		Order No. Price per PU	Order No. Price per PU

Evaluation modules		3RB24 83-4AA1	3RB24 83-4AC1
S00 ... S12	Monostable		

Notes:

- Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 relay.





Current measuring modules and related connecting cables [see page 3/55](#), accessories [see pages 3/56 and 3/57](#).

# 3RB24 Solid-State Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24

## Selection and ordering data

*Current measuring modules for mounting onto contactor<sup>1)</sup> and stand-alone installation<sup>1)2)</sup> (essential accessories)*

Size con-tactor <sup>3)</sup>	Rating for induction motor, <sup>4)</sup>	Current setting of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG <sup>5)</sup>	For over-load relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
	kW	A	A							
<b>Sizes S00/S0<sup>2)6)</sup></b>										
	S00/S0	0.09 ... 1.1	0.3 ... 3	20	3RB22 to 3RB24	▶ <b>3RB29 06-2BG1</b>		1	1 unit	41G
		1.1 ... 11	2.4 ... 25	63		▶ <b>3RB29 06-2DG1</b>		1	1 unit	41G
<b>Sizes S2/S3<sup>2)6)</sup></b>										
	S2/S3	5.5 ... 45	10 ... 100	315	3RB22 to 3RB24	▶ <b>3RB29 06-2JG1</b>		1	1 unit	41G
<b>Size S6<sup>1)6)</sup></b>										
	S6 with busbar connection	11 ... 90	20 ... 200	315	3RB22 to 3RB24	▶ <b>3RB29 56-2TH2</b>		1	1 unit	41G
	For mounting to S6 contactors with box terminals				3RB22 to 3RB24	▶ <b>3RB29 56-2TG2</b>		1	1 unit	41G
<b>Sizes S10/S12<sup>1)</sup></b>										
	S10/S12 and size 14 (3TF68/3TF69)	37 ... 450	63 ... 630	800	3RB22 to 3RB24	▶ <b>3RB29 66-2WH2</b>		1	1 unit	41G

**Note:**

The connecting cable between the current measuring module and the evaluation module is not included in the scope of supply; please order separately.

1) The current measuring modules with an Order No. ending with "2" are designed for mounting onto contactor and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.

2) The current measuring modules with an Order No. ending with "1" are designed for stand-alone installation.


3) Observe maximum rated operational current of the devices.

4) Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

5) Maximum protection by fuse for overload relay, type of coordination "2".  
 "Fuse Values in Connection with Contactors" see  
 - "Configuration Manual for Configuring SIRIUS – Selection Data for Load Feeders in Fuseless and Fused Designs"  
 - "Configuration Manual for Configuring SIRIUS Innovations – Selection Data for Load Feeders in Fuseless and Fused Designs".

6) The modules with an Order No. with "G" in penultimate position are equipped with a straight-through transformer.

## Accessories

Size of con-tactor	Version	For over-load relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
<b>Connecting cables (necessary accessories)</b>								
	S00 ... S3	For connection between evaluation module and current measuring module • Length 0.1 m (only for mounting of the evaluation module directly onto the current measuring module)	3RB24, 3RB29	▶ <b>3RB29 87-2B</b>		1	1 unit	41F
	S00 ... S12	• Length 0.5 m	3RB24, 3RB29	▶ <b>3RB29 87-2D</b>		1	1 unit	41F

Additional general accessories [see page 3/57](#).

# 3RB24 Solid-State Overload Relays

## Accessories for 3RB22, 3RB23, 3RB24

### Overview


#### Overload relays for High-Feature applications

The following optional accessories are available for the 3RB22 to 3RB24 solid-state overload relays:

- Operator panel for the evaluation modules 3RB24
- Manual 3RB24
- Sealable cover for the evaluation modules 3RB22 to 3RB24
- Terminal covers for the 3RB29 current measuring modules sizes S6 and S10/S12
- Box terminal blocks for the 3RB29 current measuring modules sizes S6 and S10/S12
- Push-in lugs for screw fixing for 3RB22 to 3RB24 evaluation modules and 3RB29 06 current measuring modules

### Selection and ordering data

#### Accessories for overload relay 3RB24

Version	For over-load relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
<b>Operator panels for evaluation modules</b>							
	<b>Operator panels (set)</b>	3RB24	A	<b>3RA69 35-0A</b>	1	1 unit	42F
1 set comprises: <ul style="list-style-type: none"> <li>• 1 x operator panel</li> <li>• 1 x 3RA69 36-0A enabling module</li> <li>• 1 x 3RA69 33-0B interface cover</li> <li>• 1 x fixing terminal</li> </ul> Note: The connecting cable between the evaluation module and the operator panel is not included in the scope of supply; please order separately.							
	<b>Connecting cable</b>	3RB24	▶	<b>3UF79 33-0BA00-0</b>	1	1 unit	42J
	<b>Enabling modules (replacement)</b>	3RB24	A	<b>3RA69 36-0A</b>	1	1 unit	42F
	<b>Interface covers</b>	3RB24	A	<b>3RA69 33-0B</b>	1	5 units	42F





<sup>1)</sup> The manual is also available as a free PDF download on the Internet at [www.siemens.com/sirius/support](http://www.siemens.com/sirius/support) → "Manuals/Operating Instructions".

Additional general accessories [see next page](#).

# 3RB24 Solid-State Overload Relays

## Accessories for 3RB22, 3RB23, 3RB24


### General accessories

Version	Size	For over-load relays	Order No.	PU (UNIT, SET, M)	Pack Units
<b>Sealable covers for evaluation modules</b>					
 3RB29 84-2	For covering the setting knobs	--	3RB22 to 3RB24	<b>3RB29 84-2</b>	1 10 units
<b>Terminal covers for current measuring modules</b>					
<b>Covers for cable lugs and busbar connections</b>					
	• Length 100 mm	S6	3RB29 56	<b>3RT19 56-4EA1</b>	1 1 unit
	• Length 120 mm	S10/S12	3RB29 66	<b>3RT19 66-4EA1</b>	1 1 unit
<b>Covers for box terminals</b>					
	• Length 25 mm	S6	3RB29 56	<b>3RT19 56-4EA2</b>	1 1 unit
	• Length 30 mm	S10/S12	3RB29 66	<b>3RT19 66-4EA2</b>	1 1 unit
<b>Covers for screw terminals</b>					
	between contactor and overload relay, without box terminals	S6	3RB29 56	<b>3RT19 56-4EA3</b>	1 1 unit
	(1 unit required per combination)	S10/S12	3RB29 66	<b>3RT19 66-4EA3</b>	1 1 unit
<b>Box terminal blocks for current measuring modules</b>					
 3RT19 5.-4G	For round and ribbon cables				
	• Up to 70 mm <sup>2</sup>	S6 <sup>1)</sup>	3RB29 56	<b>3RT19 55-4G</b>	1 1 unit
	• Up to 120 mm <sup>2</sup>	S6	3RB29 56	<b>3RT19 56-4G</b>	1 1 unit
	• Up to 240 mm <sup>2</sup>	S10/S12	3RB29 66	<b>3RT19 66-4G</b>	1 1 unit
	Technical specifications for conductor cross-sections see "Reference Manual for Protection Equipment-3RU1, 3RB2 Overload Relays".				
<b>Push-in lugs for evaluation modules and current measuring modules</b>					
 3RP19 03	For screw fixing the evaluation modules	--	3RB22 to 3RB24	<b>3RP19 03</b>	1 10 units
 3RB29 00-0B	For screw fixing the current measuring modules (2 units per module)	S00 ... S3	3RB29 06	<b>3RB29 00-0B</b>	100 10 units

<sup>1)</sup> In the scope of supply for 3RT10 54-1 contactors (55 kW).

Version	Size	Color	For over-load relays	Order No.	PU (UNIT, SET, M)	Pack Units
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### Tools for opening spring-type terminals

 3RA29 08-1A	<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/black, partially insulated	Main and auxiliary circuit connection: 3RB2	<b>3RA29 08-1A</b>	1 1 unit
--	--	---	--	---	--------------------	----------

### Blank labels

 3RT19 00-1SB20	<b>Unit labeling plates<sup>1)</sup></b> for SIRIUS devices	20 mm x 7 mm	Titanium gray	3RB24	<b>3RT29 00-1SB20</b>	100 340 units
		20 mm x 7 mm	Pastel turquoise	3RB22, 3RB23	<b>3RT29 00-1SB20</b>	100 340 units

<sup>1)</sup> PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see "Appendix" → "External Partners").

# 3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A for High-Feature applications

## Technical specifications

<b>Type – Overload relay of evaluation modules</b>	<b>3RB24 83-4A.1</b>	
<b>Size of contactor</b>	S00 ... S10/S12	
<b>General data</b>		
<b>Trips in the event of</b>	Overload, phase failure and phase unbalance (> 40 % according to NEMA), + ground fault (connectable and disconnectable) and activation of the thermistor motor protection (with closed PTC sensor circuit)	
<b>Trip class</b> acc. to IEC 60947-4-1	CLASS	5, 10, 20 and 30 adjustable
<b>Phase failure sensitivity</b>	Yes	
<b>Overload warning</b>	Yes, from $1.125 \times I_e$ for symmetrical loads and from $0.85 \times I_e$ for unsymmetrical loads	
<b>Reset and recovery</b>	Manual and automatic RESET, electrical remote RESET or through IO-Link	
<ul style="list-style-type: none"> <li>Reset options after tripping</li> <li>Recovery time                             <ul style="list-style-type: none"> <li>- For automatic RESET</li> <li>- For manual RESET</li> <li>- For remote RESET</li> </ul> </li> </ul>	min	<ul style="list-style-type: none"> <li>- for tripping due to overcurrent: 3 (stored permanently)</li> <li>- for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature</li> <li>- for tripping due to a ground fault: no automatic RESET</li> <li>- for tripping due to overcurrent: 3 (stored permanently)</li> <li>- for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature</li> <li>- for tripping due to a ground fault: Immediately</li> <li>- for tripping due to overcurrent: 3 (stored permanently)</li> <li>- for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature</li> <li>- for tripping due to a ground fault: Immediately</li> </ul>
<b>Features</b>	<ul style="list-style-type: none"> <li>Display of operating state on device</li> <li>TEST function</li> <li>RESET button</li> <li>STOP button</li> </ul>	
<b>Explosion protection – Safe operation of motors with "increased safety EEx e and explosion-proof enclosure EEx d" type of protection</b>	<ul style="list-style-type: none"> <li>EC type test certificate number according to directive 94/9/EC (ATEX)</li> </ul>	
<b>Ambient temperatures</b>	°C	-40 ... +80
<ul style="list-style-type: none"> <li>Storage/transport</li> <li>Operation</li> <li>Temperature compensation</li> <li>Permissible rated current                             <ul style="list-style-type: none"> <li>- Temperature inside control cabinet 60 °C</li> <li>- Temperature inside control cabinet 70 °C</li> </ul> </li> </ul>	°C	-25 ... +60
	°C	+60
	%	100
	%	On request
<b>Repeat terminals</b>	<ul style="list-style-type: none"> <li>Coil repeat terminals</li> <li>Auxiliary contact repeat terminal</li> </ul>	
	Not required	
	Not required	
<b>Degree of protection</b> acc. to IEC 60529	IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover	
<b>Touch protection</b> acc. to IEC 61140	Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover	
<b>Shock resistance with sine</b> acc. to IEC 60068-2-27	g/ms	15/11
<b>Electromagnetic compatibility (EMC) – Interference immunity</b>		
<ul style="list-style-type: none"> <li>Conductor-related interference                             <ul style="list-style-type: none"> <li>- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)</li> <li>- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)</li> </ul> </li> <li>Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)</li> <li>Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3)</li> </ul>	kV	2 (power ports), 1 (signal ports)
	kV	2 (line to earth), 1 (line to line)
	kV	8 (air discharge), 6 (contact discharge)
	V/m	10
<b>Electromagnetic compatibility (EMC) – emitted interference</b>		
	Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)	
<b>Resistance to extreme climates – air humidity</b>	%	100
<b>Dimensions</b>		
<b>Installation altitude above sea level</b>	m	Up to 2000
<b>Mounting position</b>	Any	
<b>Type of mounting</b>	Stand-alone installation	
<ul style="list-style-type: none"> <li>Evaluation modules</li> <li>Current measuring module</li> </ul>	Size	S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors

# 3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A for High-Feature applications



<b>Type – Overload relay of evaluation modules</b>			<b>3RB24 83-4A.1</b>
Size of contactor			S00 ... S10/S12
Dimensions of evaluation modules (W x H x D)			45 x 111 x 95
<b>Auxiliary circuit</b>			
<b>Number of auxiliary switches</b>		1 CO contact, 1 NO contact connected in series internally	
<b>Auxiliary contacts – assignment</b>		<ul style="list-style-type: none"> <li>• 1 CO contact for selecting the contactor (for reversing starter function), actuated by the control system</li> <li>• 1 NO contact for normal switching duty, actuated by the control system (opens automatically when tripping occurs)</li> </ul>	
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	300	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4	
<b>Auxiliary contacts – contact rating</b>			
• NC contact with alternating current AC-14/AC-15, rated operational current $I_e$ at $U_e$			
- 24 V	A	6	
- 120 V	A	6	
- 125 V	A	6	
- 250 V	A	3	
• NO contact with alternating current AC-14/AC-15, rated operational current $I_e$ at $U_e$			
- 24 V	A	6	
- 120 V	A	6	
- 125 V	A	6	
- 250 V	A	3	
• NC contact, NO contact with direct current DC-13, rated operational current $I_e$ at $U_e$			
- 24 V	A	2	
- 60 V	A	0.55	
- 110 V	A	0.3	
- 125 V	A	0.3	
- 250 V	A	0.2	
• Conventional thermal current $I_{th}$	A	5	
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes	
<b>Short-circuit protection</b>			
• With fuse, operational class gG	A	6	
• With miniature circuit breaker, C characteristic	A	1.6	
<b>Protective separation between auxiliary conducting paths</b> acc. to IEC 60947-1	V	300	
<b>CSA, UL, UR rated data</b>			
<b>Auxiliary circuit – switching capacity</b>		B300, R300	
<b>Conductor cross-sections of the auxiliary circuit</b>			
<b>Connection type</b>		<b>Screw terminals</b>	
<b>Terminal screw</b>		M3, Pozidriv size 2	
<b>Operating devices</b>	mm	3.0 x 0.5	
<b>Prescribed tightening torque</b>	Nm	0.8 ... 1.2	
<b>Conductor cross-sections (min./max.), 1 or 2 conductors can be connected</b>			
• Solid	mm <sup>2</sup>	1 x (0.5 ... 4) <sup>1)</sup> , 2 x (0.5 ... 2.5) <sup>1)</sup>	
• Finely stranded without end sleeve	mm <sup>2</sup>	--	
• Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.5 ... 2.5) <sup>1)</sup> , 2 x (0.5 ... 1.5) <sup>1)</sup>	
• Stranded	mm <sup>2</sup>	--	
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)	
<b>Connection type</b>		<b>Spring-type terminals</b>	
<b>Operating devices</b>	mm	3.0 x 0.5	
<b>Conductor cross-sections (min./max.), 1 or 2 conductors can be connected</b>			
• Solid	mm <sup>2</sup>	2 x (0.25 ... 1.5)	
• Finely stranded without end sleeve	mm <sup>2</sup>	--	
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.25 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)	

1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified



# 3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A for High-Feature applications

<b>Type – Overload relay of evaluation modules</b>		<b>3RB24 83-4A.1</b>
Size of contactor		S00 ... S10/S12
<b>Control and sensor circuit as well as the analog output</b>		
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	300
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4
<b>Rated control supply voltage <math>U_s</math></b>		
• DC	V	24 through IO-Link
<b>Operating range</b>		
• DC		$0.85 \times U_{s\ min} \leq U_s \leq 1.1 \times U_{s\ max}$
<b>Rated power</b>		
• DC	W	0.5
<b>Mains buffering time</b>	ms	200
<b>Thermistor motor protection (PTC thermistor detector)</b>		
• Summation cold resistance	k $\Omega$	$\leq 1.5$
• Response value	k $\Omega$	3.4 ... 3.8
• Return value	k $\Omega$	1.5 ... 1.65
<b>Ground-fault detection</b>		
The information refers to sinusoidal residual currents at 50/60 Hz.		
• Tripping value $I_A$		
- For $0.3 \times I_e < I_{motor} < 2.0 \times I_e$		$> 0.3 \times I_e$
- For $2.0 \times I_e < I_{motor} < 8.0 \times I_e$		$> 0.15 \times I_{motor}$
• Response time $t_{trip}$	ms	500 ... 1 000
<b>Analog output<sup>1)</sup></b>		
• Output signal	mA	4 ... 20
• Measuring range		$0 \dots 1.25 \times I_e$ 4 mA corresponds to $0 \times I_e$ 16.8 mA corresponds to $1.0 \times I_e$ 20 mA corresponds to $1.25 \times I_e$
• Load, max.	$\Omega$	100
<b>Conductor cross-sections for the control and sensor circuit as well as the analog output</b>		
<b>Connection type</b>		 <b>Screw terminals</b>
<b>Terminal screw</b>		M3, Pozidriv size 2
<b>Operating devices</b>	mm	3.0 x 0.5
<b>Prescribed tightening torque</b>	Nm	0.8 ... 1.2
<b>Conductor cross-sections (min./max.), 1 or 2 conductors can be connected</b>		
• Solid	mm <sup>2</sup>	$1 \times (0.5 \dots 4)^2, 2 \times (0.5 \dots 2.5)^2$
• Finely stranded without end sleeve	mm <sup>2</sup>	—
• Finely stranded with end sleeve	mm <sup>2</sup>	$1 \times (0.5 \dots 2.5)^2, 2 \times (0.5 \dots 1.5)^2$
• Stranded	mm <sup>2</sup>	—
• AWG cables, solid or stranded	AWG	$2 \times (20 \dots 14)$
<b>Connection type</b>		 <b>Spring-type terminals</b>
<b>Operating devices</b>	mm	3.0 x 0.5
<b>Conductor cross-sections (min./max.), 1 or 2 conductors can be connected</b>		
• Solid	mm <sup>2</sup>	$2 \times (0.25 \dots 1.5)$
• Finely stranded without end sleeve	mm <sup>2</sup>	—
• Finely stranded with end sleeve	mm <sup>2</sup>	$2 \times (0.25 \dots 1.5)$
• Stranded	mm <sup>2</sup>	$2 \times (0.25 \dots 1.5)$
• AWG cables, solid or stranded	AWG	$2 \times (24 \dots 16)$

1) Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 overload relay.

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

# 3RB24 Solid-State Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24

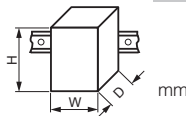
## Overview



SIRIUS 3RB29 06 current measuring module

The current measuring modules are designed as system components for connecting to evaluation units 3RB22 to 3RB24. Using these evaluation units the motor current is measured and the measured value sent to the evaluation unit for evaluation. The current measuring modules in sizes S00 to S3 up to 55 mm wide are equipped with straight-through transformers and can be snap-fitted under the evaluation units. The larger evaluation units are installed directly on the contactor or as stand-alone units.

## Technical specifications

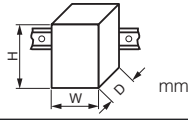
Type – Overload relays: Current measuring modules		3RB29 06		3RB29 56		3RB29 66	
Size of contactor		S00/S0	S2/S3	S6			S10/S12
Dimensions of current measuring modules (W x H x D)	 mm	45 x 84 x 45	55 x 94 x 72	120 x 119 x 145			145 x 147 x 148
<b>Main circuit</b>							
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)	V	1 000					
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6		8			
<b>Rated operational voltage <math>U_e</math></b>	V	1 000					
<b>Type of current</b>		No Yes, 50/60 Hz $\pm 5\%$					
• Direct current		No					
• Alternating current		Yes, 50/60 Hz $\pm 5\%$					
<b>Current setting</b>	A	0.3 ... 3; 2.4 ... 25	10 ... 100	20 ... 200	63 ... 630		
<b>Power loss per unit (max.)</b>	W	0.5					
<b>Short-circuit protection</b>		See "Selection and ordering data" on page 3/55. See - "Configuration Manual for Configuring SIRIUS – Selection Data for Load Feeders in Fuseless and Fused Designs" - "Configuration Manual for Configuring SIRIUS Innovations – Selection Data for Load Feeders in Fuseless and Fused Designs"					
<b>Protective separation between main and auxiliary conducting paths</b> V acc. to IEC 60947-1 (pollution degree 2)		690 for grounded networks, otherwise 600					

# 3RB24 Solid-State Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24

**Type – Overload relays: Current measuring modules**

Size of contactor  
Dimensions of current measuring modules (W x H x D)



**Conductor cross-sections of the main circuit**

**Connection type**

3RB29 06		3RB29 56		3RB29 66	
S00/S0	S2/S3	S6		S10/S12	
45 x 84 x 45	55 x 94 x 72	120 x 119 x 145		145 x 147 x 148	

**Screw terminals with box terminal**

Terminal screw	mm	—	4 mm Allen screw	5 mm Allen screw
<b>Operating devices</b>	mm	—	4 mm Allen screw	5 mm Allen screw
<b>Prescribed tightening torque</b>	Nm	—	10 ... 12	20 ... 22
<b>Conductor cross-sections (min./max.), 1 or 2 conductors can be connected</b>				
• Solid	mm <sup>2</sup>	—	—	—
• Finely stranded without end sleeve	mm <sup>2</sup>	—	With 3RT19 55-4G box terminal: 2 x (1 x max. 50, 1 x max. 70), 1 x (10 ... 70)	2 x (50 ... 185), rear clamping point only: 1 x (70 ... 240)
			With 3RT19 56-4G box terminal: 2 x (1 x max. 95, 1 x max. 120), 1 x (10 ... 120)	Rear clamping point only: 1 x (120 ... 185)
• Finely stranded with end sleeve	mm <sup>2</sup>	—	With 3RT19 55-4G box terminal: 2 x (1 x max. 50, 1 x max. 70), 1 x (10 ... 70)	2 x (50 ... 185), rear clamping point only: 1 x (70 ... 240)
			With 3RT19 56-4G box terminal: 2 x (1 x max. 95, 1 x max. 120), 1 x (10 ... 120)	Rear clamping point only: 1 x (120 ... 185)
• Stranded	mm <sup>2</sup>	—	With 3RT19 55-4G box terminal: 2 x (max. 70), 1 x (16 ... 70)	2 x (70 ... 240), rear clamping point only: 1 x (95 ... 300)
			With 3RT19 56-4G box terminal: 2 x (max. 120), 1 x (16 ... 120)	Rear clamping point only: 1 x (120 ... 240)
• AWG cables, solid or stranded	AWG	—	With 3RT19 55-4G box terminal: 2 x (max. 1/0), 1 x (6 ... 2/0)	2 x (2/0 ... 500 kcmil), rear clamping point only: 1 x (3/0 ... 600 kcmil)
			With 3RT19 56-4G box terminal: 2 x (max. 3/0), 1 x (6 ... 250 kcmil)	Rear clamping point only: 1 x (250 kcmil ... 500 kcmil)
• Ribbon cables (number x width x thickness)	mm	—	With 3RT19 55-4G box terminal: 2 x (6 x 15.5 x 0.8), 1 x (3 x 9 x 0.8 ... 6 x 15.5 x 0.8)	2 x (20 x 24 x 0.5), 1 x (6 x 9 x 0.8 ... 20 x 24 x 0.5)
			With 3RT19 56-4G box terminal: 2 x (10 x 15.5 x 0.8), 1 x (3 x 9 x 0.8 ... 10 x 15.5 x 0.8)	

**Busbar connections**

Terminal screw	mm	—	M8 x 25	M10 x 30
<b>Prescribed tightening torque</b>	Nm	—	10 ... 14	14 ... 24
<b>Conductor cross-sections (min./max.), 1 or 2 conductors can be connected</b>				
• Solid with cable lug	mm <sup>2</sup>	—	16 ... 95 <sup>1)</sup>	50 ... 240 <sup>2)</sup>
• Stranded with cable lug	mm <sup>2</sup>	—	25 ... 120 <sup>1)</sup>	70 ... 240 <sup>2)</sup>
• AWG cable, solid or stranded, with cable lug	AWG	—	4 ... 250 kcmil	2/0 ... 500 kcmil
• with connecting bar (max. width)	mm	—	17	25

**Straight-through transformers**

Diameter of opening	mm	7.5	14	25	—
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<sup>1)</sup> When connecting cable lugs according to DIN 46235 with conductor cross-sections of 95 mm<sup>2</sup> and more, the 3RT19 56-4EA1 terminal cover must be used to ensure phase spacing.

<sup>2)</sup> When connecting cable lugs according to DIN 46234 with conductor cross-sections of 240 mm<sup>2</sup> and more as well as to DIN 46235 with conductor cross-sections of 185 mm<sup>2</sup> and more, the 3RT19 56-4EA1 terminal cover must be used for to keep the phase clearance.

3 OVERLOAD RELAYS

## SIMOCODE pro 3UF7

## General data

## Overview



SIMOCODE pro S for efficient entry into motor management and SIMOCODE pro V for maximum functionality

**More information**

Home page, see [www.usa.siemens.com/simocode](http://www.usa.siemens.com/simocode)

Industry Mall, see [www.siemens.com/product?3UF7](http://www.siemens.com/product?3UF7)

SIMOCODE pro is a flexible, modular motor management system for motors with constant speeds in the low-voltage performance range. It optimizes the connection between I&C and motor feeder, increases plant availability and allows significant savings to be made for installation, commissioning, operation and maintenance of a system.

SIMOCODE pro offers, for example:

- Multifunctional, solid-state full motor protection that is independent of the automation system
- Integrated control functions instead of hardware for the motor control
- Detailed operational, service and diagnostics data
- Open communication via PROFIBUS DP, PROFINET/OPC UA, Modbus RTU or EtherNet/IP
- Safety relay function for the fail-safe disconnection of motors up to SIL 3 (IEC 61508, IEC 62061) or PL e with Category 4 (EN ISO 13849-1)
- SIMOCODE ES is the software package for SIMOCODE pro parameterization, start up and diagnostics.

**Device series**SIMOCODE pro C

The compact system for direct-on-line starters and reversing starters or for controlling a motor starter protector.

SIMOCODE pro S

The smart system for direct-on-line, reversing, and wye-delta starters or for controlling a motor starter protector or soft starter. Its expandability with a multifunction module provides comprehensive input/output project data volume, precise ground-fault detection via the 3UL23 residual-current transformers and temperature measurement.

SIMOCODE pro V

The variable system with all control functions and with the possibility of expanding the inputs, outputs and functions of the system at will using expansion modules

Expansion possibilities	SIMOCODE		pro V <sup>1)</sup>	
	pro C PROFIBUS	pro S PROFIBUS	PROFIBUS <sup>2)</sup> Modbus RTU <sup>2)</sup>	PROFINET EtherNet/IP
Operator panels	✓	✓	✓	✓
Operator panels with display	--	--	✓	✓
Current measuring modules	✓	✓	✓	✓
Current/voltage measuring modules	--	--	✓	✓
Decoupling modules	--	--	✓	✓
Expansion modules:				
• Digital modules	--	--	2	2
• Fail-safe digital modules <sup>3)</sup>	--	--	1	1
• Analog modules	--	--	1	2
• Ground-fault modules	--	--	1	1
• Temperature modules	--	--	1	2
• Multifunction modules	--	1	--	--

✓ Available

-- Not available

<sup>1)</sup> Maximum of five expansion modules.

<sup>2)</sup> When an operator panel with display and/or a decoupling module are used, more restrictions on the number of expansion modules connectable per basic unit must be observed, see page 3/72.

<sup>3)</sup> The fail-safe digital module can be used instead of one of the two digital modules.

Per feeder each system always comprises one basic unit and one separate current measuring module. The two modules are connected together electrically through the system interface with a connection cable and can be mounted mechanically connected as a unit (one behind the other) or separately (side by side). The motor current to be monitored is decisive only for the choice of the current measuring module.

An operator panel for mounting in the control cabinet door is optionally connectable through a second system interface on the basic unit. Both the current measuring module and the operator panel are electrically supplied by the basic unit through the connection cable. More inputs, outputs and functions can be added to the SIMOCODE pro V and SIMOCODE pro S by means of optional expansion modules, thus supplementing the inputs and outputs already existing on the basic unit. With the DM-F Local and DM-F PROFIsafe fail-safe digital modules it is also possible to integrate the fail-safe disconnection of motors in the SIMOCODE pro V motor management system.

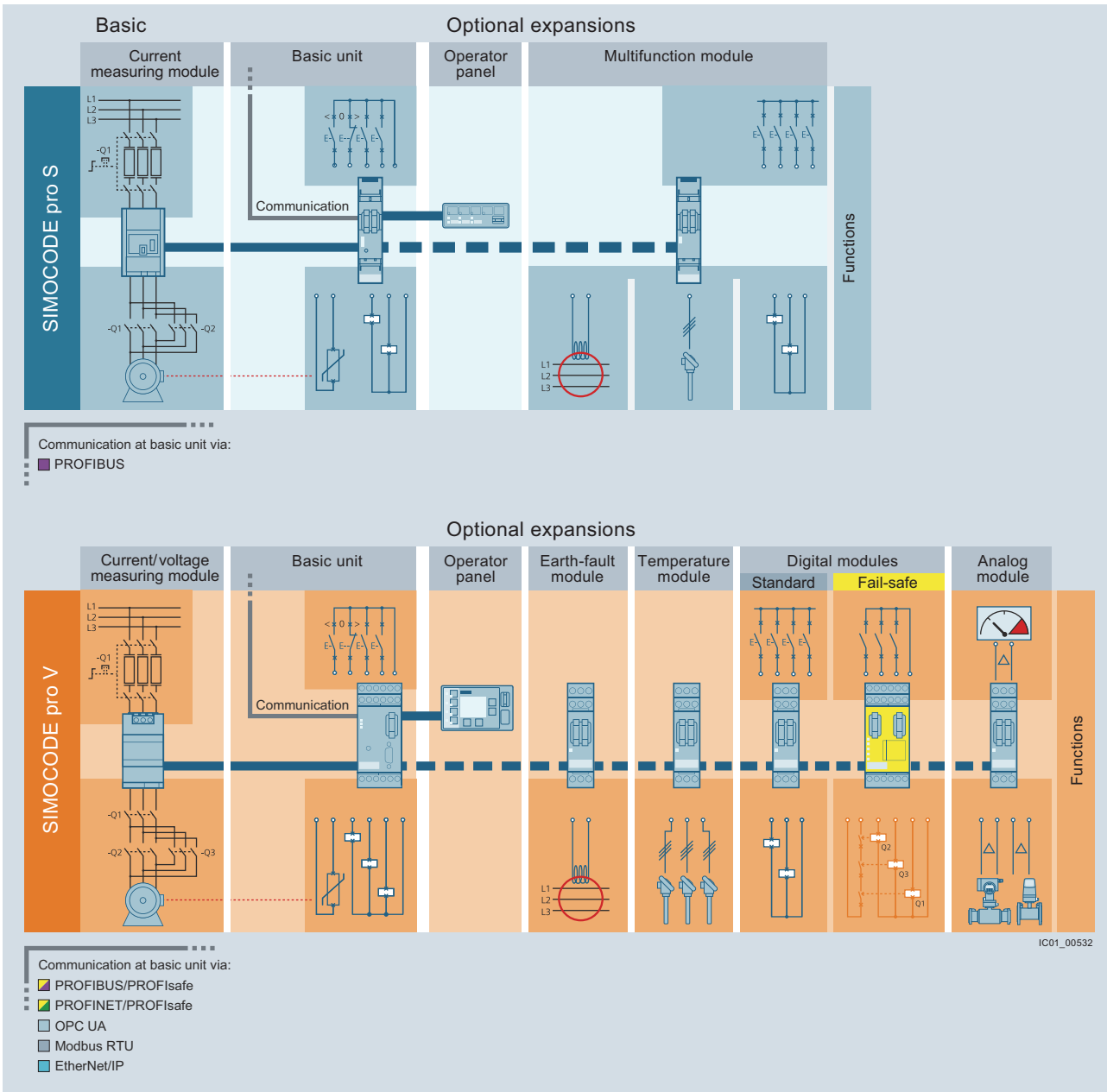
All modules are connected by connection cables. The connection cables are available in various lengths. The maximum distance between the modules (e.g. between the basic unit and the current measuring module) must not exceed 2.5 m. The total length of all the connection cables per system interface of the basic unit may be up to 3 m.

**Note:**

SIMOCODE pro can also be found in the TIA Selection Tool. The various system components can therefore be conveniently selected; see [www.siemens.com/tia-selection-tool](http://www.siemens.com/tia-selection-tool).

# SIMOCODE pro 3UF7

## General data



SIMOCODE pro S and SIMOCODE pro V: system structure

### Article No. scheme

Product versions		Article number	
<b>SIMOCODE pro motor management system</b>		<b>3UF7</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> 1 <input type="checkbox"/> <input type="checkbox"/> 0 <input type="checkbox"/> - 0
Type of unit/module	e.g. 0 = basic unit	<input type="checkbox"/>	<input type="checkbox"/>
Functional version of the module	e.g. 20 = SIMOCODE pro S	<input type="checkbox"/>	<input type="checkbox"/>
Connection type of the current transformer		<input type="checkbox"/>	<input type="checkbox"/>
Voltage version	e.g. B = 24 V DC	<input type="checkbox"/>	<input type="checkbox"/>
Enclosure color	e.g. 1 = titanium gray	<input type="checkbox"/>	<input type="checkbox"/>
Example		<b>3UF7</b>	<b>0 2 0 - 1 A B 0 1 - 0</b>

### Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

## SIMOCODE pro 3UF7

## General data

## Benefits

**General customer benefits**

- Integrating the whole motor feeder into the process control by means of PROFIBUS DP, PROFINET/OPC UA, Modbus RTU or EtherNet/IP significantly reduces the wiring between the motor feeder and the PLC.
- Decentralization of the automated processes by means of configurable control and monitoring functions in the feeder saves resources in the automation system and ensures full functionality and protection of the feeder even if the I&C or bus system fails
- The acquisition and monitoring of operating, service and diagnostics data in the feeder and process control system increases plant availability as well as maintenance and service-friendliness
- The high degree of modularity allows users to perfectly implement their plant-specific requirements for each motor feeder
- The SIMOCODE pro system offers functionally graded and space-saving solutions for each customer application
- The replacement of the control circuit hardware with integrated control functions decreases the number of hardware components and wiring required and in this way limits stock keeping costs and potential wiring errors
- The use of electronic full motor protection permits better utilization of the motors and ensures long-term stability of the tripping characteristic and reliable tripping even after years of service
- Thanks to the precision of the current, voltage, power and energy measurements (especially those acquired by the 2nd-generation current/voltage measuring modules), costs can be internally allocated with a high degree of accuracy.
- By virtue of its wide frequency range of 20 to 400 Hz, SIMOCODE can be used in combination with the 2nd-generation current/voltage measuring modules in a wide range of motor applications.

**Multifunctional, electronic full motor protection for rated motor currents up to 820 A**

SIMOCODE pro offers comprehensive protection of the motor feeder by means of a combination of different, multi-step and delayable protection and monitoring functions:

- Inverse-time delayed electronic overload protection (CLASS 5E to 40E)
- Thermistor motor protection
- Phase failure / unbalance protection
- Stall protection
- Monitoring of adjustable limit values for the motor current
- Voltage and power monitoring
- Monitoring of the power factor (motor idling/load shedding)
- Ground-fault monitoring
- Temperature monitoring, e.g. over PT100/PT1000
- Monitoring of operating hours, downtime and number of starts etc.

**Recording of measuring curves**

SIMOCODE pro can record measuring curves and therefore is able, for example, to present the progression of motor current during motor start up.

**Flexible motor control implemented with integrated control functions (instead of comprehensive hardware interlocks)**

Many predefined motor control functions have already been integrated into SIMOCODE pro, including all necessary logic operations and interlocks:

- Overload relays
- Direct-on-line and reversing starters
- Wye/delta starters (also with direction reversal)
- Two speeds, motors with separate windings (pole-changing starter); also with direction reversal
- Two speeds, motors with separate Dahlander windings (also with direction reversal)
- Positioner actuation
- Solenoid valve actuation
- Actuation of a motor starter protector
- Soft starter actuation (also with direction reversal)

These control functions are predefined in SIMOCODE pro and can be freely assigned to the inputs and outputs of the device (including the PROFIBUS/PROFINET process image).

These predefined control functions can also be flexibly adapted to each customized configuration of a motor feeder by means of freely configurable logic modules (truth tables, counters, timers, edge evaluation, etc.) and with the help of standard functions (power failure monitoring, emergency start, external faults, etc.), without additional auxiliary relays being necessary in the control circuit.

SIMOCODE pro makes a lot of additional hardware and wiring in the control circuit unnecessary, which results in a high level of standardization of the motor feeder in terms of its design and circuit diagrams.

## SIMOCODE pro 3UF7

## General data

**Detailed operational, service and diagnostics data**

SIMOCODE pro makes different operational, service and diagnostics data available and helps to detect potential faults in time and to prevent them by means of preventative measures. In the event of a malfunction, a fault can be diagnosed, localized and rectified very quickly - there are no or very short downtimes.

Operating data

- Motor switching state derived from the current flow in the main circuit
- All phase currents
- All phase voltages and phase-to-phase voltages
- Active power, apparent power and power factor
- Phase unbalance and phase sequence
- Ground-fault current
- Frequency
- Time to trip
- Motor temperature
- Remaining cooling time etc.

Service data

- Motor operating hours
- Motor stop times
- Number of motor starts
- Number of overload trips
- Interval for compulsory testing of the enabling circuits
- Energy consumed
- Internal comments stored in the device etc.

Diagnostics data

- Numerous detailed early warning and fault messages
- Internal device fault logging with time stamp
- Time stamping of freely selectable status, alarm or fault messages etc.

**Easy operation and diagnostics**Operator panel

The operator panel is used to control the motor feeder and can replace all conventional pushbuttons and indicator lights to save space. It makes SIMOCODE pro or the feeder directly operable in the control cabinet. It features all the status LEDs available on the basic unit and externalizes the system interface for simple parameterization or diagnosis on a PC/PG.

Operator panel with display

As an alternative to the 3UF720 standard operator panel for SIMOCODE pro V, a 3UF721 operator panel with display is also available. This can additionally indicate current measured values, operational and diagnostics data or status information of the motor feeder at the control cabinet. The pushbuttons of the operator panel can be used to control the motor. Furthermore, it is possible to set parameters such as rated motor current, limit values, etc. directly via the operator panel with display (with SIMOCODE pro V PROFIBUS as of E15, SIMOCODE pro V Modbus RTU as of E02 and with all SIMOCODE pro V PROFINET and EtherNet/IP).

**Communication**

SIMOCODE pro has either an integrated PROFIBUS DP or Modbus RTU interface (SUB-D or terminal connection) or a PROFINET or EtherNet/IP interface (2 x RJ45).

Fail-safe disconnection through PROFIBUS or PROFINET with the PROFIsafe profile is also possible in conjunction with a fail-safe controller (F-CPU) and the DM-F PROFIsafe fail-safe digital module.

SIMOCODE pro PROFIBUS

SIMOCODE pro PROFIBUS supports, for example:

- Cyclic services (DPV0) and acyclic services (DPV1)
- Extensive diagnostics and hardware interrupts
- Time stamp with high timing precision (SIMATIC S7) for SIMOCODE pro V
- DPV1 communication after the Y-Link

SIMOCODE pro PROFINET

SIMOCODE pro PROFINET supports, for example:

- Line and ring bus topology thanks to an integrated switch
- Media redundancy via MRP protocol
- Operating, service and diagnostics data via standard web browser
- OPC UA server for open communication with visualization and control system
- NTP-synchronized time
- Interval function and measured values for energy management via PROFInergy
- Module exchange without PC memory module through proximity detection
- Extensive diagnostics and maintenance alarms

System redundancy with SIMOCODE pro PROFINET

The device supports the system redundancy mechanisms of PROFINET IO and therefore can be operated directly on fault-tolerant systems such as SIMATIC S7-400 H. As such, SIMOCODE pro can provide decisive added value also for the field level of plants in which plant availability and control system redundancy are priorities.

SIMOCODE pro Modbus RTU

SIMOCODE pro Modbus RTU supports, for example:

- Communication at 1 200/2 400/4 800/9 600/19 200 or 57 600 baud
- Access to freely parameterizable process image via Modbus RTU
- Access to all operating, service and diagnostics data via Modbus RTU

SIMOCODE pro EtherNet/IP

SIMOCODE pro EtherNet/IP supports, for example:

- Line and ring bus topology thanks to an integrated switch
- Ring structures via Device Level Ring (DLR) protocol
- Operating, service and diagnostics data via standard web browser
- NTP-synchronized time
- Parameter assignment via SIMOCODE ES V14 – via local device interface and Ethernet



## SIMOCODE pro 3UF7

## General data

Notes on safety

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement (and continuously maintain) a holistic, state-of-the-art industrial security concept. Siemens products and solutions represent only one component of such a concept.

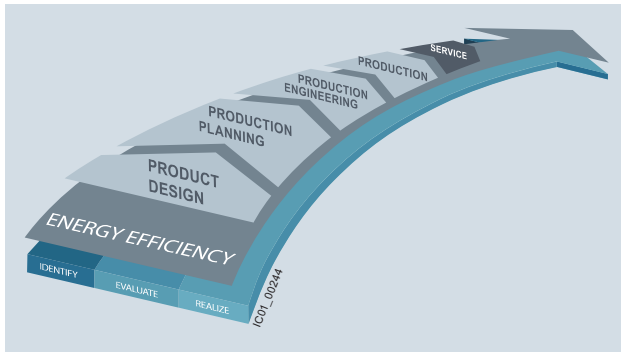
For more information on industrial security, see [www.siemens.com/industrialsecurity](http://www.siemens.com/industrialsecurity).

For SIMOCODE pro motor management and control devices with communication function, see from page 3/73.

Accessories, see from page 3/79.

**Autonomous operation**

An essential feature of SIMOCODE pro is the autonomous execution of all protection and control functions, even when communication to the I&C system is interrupted. This means that even in the event of bus system or automation system failure, full functionality of the feeder is ensured or a specific behavior can be parameterized in case of such a fault, e.g. targeted shutdown of the feeder or execution of particular parameterized control mechanisms (such as reversal of the direction of rotation).

**Advantages through energy efficiency**

Overview of the energy management process

We offer you a unique portfolio for efficient energy management in the industry – a process that is used to optimize the energy requirements. We split up our industrial energy management into three phases – identify, evaluate, and realize – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative SIRIUS industrial controls products can also make a major contribution to the energy efficiency of a plant ([www.siemens.com/sirius/energysaving](http://www.siemens.com/sirius/energysaving)).

The SIMOCODE pro 3UF7 motor management system makes the following contribution to the energy efficiency of the plant as a whole:

- **Energy consumption:**  
Clear display of the energy consumption of a motor feeder or process element by means of the acquisition and transmission of all operating and consumption data, such as current, voltage, active and reactive power, energy consumption, motor temperature, etc.
- **Energy management:**  
Evaluation of measured energy values (e.g. limit value monitoring) with exporting of local or central actions (= forwarding to higher-level)
- **PROFenergy:**  
SIMOCODE pro V PROFINET supports the PROFenergy functions. Reduced energy consumption thanks to automatic disconnection in the intervals and forwarding of the measured values for higher-level energy management systems.

**Advantages from integrated energy management**

[siemens.com/energysuite](http://siemens.com/energysuite)

Ready for  
SIMATIC  
Energy Suite

As an integrated option for the TIA Portal, the SIMATIC Energy Suite couples energy management with automation efficiently, making energy consumption at your production facility transparent.

Thanks to the simplified configuration of energy-measuring components, e.g. SIMOCODE pro V, configuration effort is also clearly reduced.

Thanks to the end-to-end connection with higher-level energy management systems or cloud-based services, you can seamlessly expand the recorded energy data to create a cross-site energy management system.

The advantages at a glance:

- Automatic generation of energy management data
- Integration into TIA Portal and into automation
- Simple configuration

For more information, see [www.siemens.com/energysuite](http://www.siemens.com/energysuite).

## SIMOCODE pro 3UF7

## Technical data

## Application

SIMOCODE pro is often used for automated processes where plant downtimes are very expensive (e.g. chemical, oil/gas, water/wastewater, steel or cement industries) and where it is important to prevent plant downtimes through detailed operational, service and diagnostics data or to locate faults very quickly when they occur.

SIMOCODE pro is modular and space-saving and suited especially for operation in motor control centers (MCCs) in the process industry and for power plant technology.

## Applications

Protection and control of motors in hazardous areas for types of protection EEx e/d according to ATEX guideline 94/9/EC

- With heavy starting (paper, cement, metal and water industries)
- In high-availability plants (chemical, oil, raw material processing industries, power plants)

## Use of SIMOCODE pro 3UF7 with IE3/IE4 motors

## Note:

When using the SIMOCODE pro 3UF7 in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring; see [Application Manual "SIRIUS Controls with IE3/IE4 motors"](#), <https://support.industry.siemens.com/cs/ww/en/view/94770820>.

## Safety technology for SIMOCODE pro

The safe disconnection of motors in the process industry is becoming increasingly important as the result of new and revised standards and requirements in the safety technology field.

With the DM-F Local and DM-F PROFIsafe fail-safe expansion modules it is easy to integrate functions for fail-safe disconnection into the SIMOCODE pro V motor management system while retaining service-proven concepts. The strict separation of safety functions and operational functions proves particularly advantageous for planning, configuring and construction. Seamless integration in the motor management system leads to greater transparency for diagnostics and during operation of the system.

Suitable components for this purpose are the DM-F Local and DM-F PROFIsafe fail-safe expansion modules, depending on the requirements:

- The DM-F Local fail-safe digital module for when direct assignment between a fail-safe hardware shutdown signal and a motor feeder is required, or
- The DM-F PROFIsafe fail-safe digital module for when a fail-safe controller (F-CPU) creates the signal for disconnection and transmits it in a fail-safe manner through PROFIBUS/PROFIsafe or PROFINET/PROFIsafe to the motor management system

## Technical specifications

More information		
Technical specifications, see <a href="https://support.industry.siemens.com/cs/ww/en/ps/16337/td">https://support.industry.siemens.com/cs/ww/en/ps/16337/td</a>		"SIRIUS Controls with IE3/IE4 motors" Application Manual, see <a href="https://support.industry.siemens.com/cs/ww/en/view/94770820">https://support.industry.siemens.com/cs/ww/en/view/94770820</a>
SIMOCODE pro - Manual Collection see <a href="https://support.industry.siemens.com/cs/ww/en/view/109743951">https://support.industry.siemens.com/cs/ww/en/view/109743951</a>		Selection data for type-tested assemblies/load feeders
"SIMOCODE pro Safety Fail-Safe Digital Modules" System Manual, see <a href="https://support.industry.siemens.com/cs/ww/en/view/50564852">https://support.industry.siemens.com/cs/ww/en/view/50564852</a>		• Manual "Configuring SIRIUS", see <a href="https://support.industry.siemens.com/cs/ww/en/view/40625241">https://support.industry.siemens.com/cs/ww/en/view/40625241</a> • Manual "Configuring SIRIUS Innovations", see <a href="https://support.industry.siemens.com/cs/ww/en/view/39714188">https://support.industry.siemens.com/cs/ww/en/view/39714188</a>
General data		
<b>Type</b>		<b>3UF7</b>
<b>Permissible ambient temperature</b>		
• During operation	°C	-25 ... +60; 3UF721: 0 ... +60
• During storage and transport	°C	-40 ... +80; 3UF721: -20 ... +70
<b>Degree of protection (acc. to IEC 60529)</b>		
• Measuring modules with busbar connection		IP00
• Operator panel (front) and door adapter (front) with cover		IP54
• Other components		IP20
<b>Shock resistance (sine pulse)</b>	g/ms	15/11
<b>Mounting position</b>		Any
<b>Frequency</b>	Hz	50/60 ± 5 %
<b>EMC interference immunity (according to IEC 60947-1)</b>		Corresponds to degree of severity 3
• Conducted interference, burst acc. to IEC 61000-4-4	kV	2 (power ports)
	kV	1 (signal ports)
	V	10
• Conducted interference, high frequency acc. to IEC 61000-4-6		
• Conducted interference, surge acc. to IEC 61000-4-5	kV	2 (line to ground); 3UF7320-1AB, 3UF7330-1AB: 1 (line to ground)
	kV	1 (line to line); 3UF7320-1AB, 3UF7330-1AB: 0.5 (line to line)
• Electrostatic discharge, ESD acc. to IEC 61000-4-2	kV	8 (air discharge); 3UF7020: operator input during operation only on the front
	kV	6 (contact discharge); 3UF721: 4 (contact discharge)
• Field-related interference acc. to IEC 61000-4-3	V/m	10
<b>EMC emitted interference (according to IEC 60947-1)</b>		
• Conducted and radiated interference emission		EN 55011/EN 55022 (CISPR 11/CISPR 22) (Corresponds to degree of severity A)
<b>Protective separation (acc. to IEC 60947-1)</b>		All circuits in SIMOCODE pro are safely separated from each other according to IEC 60947-1, i.e. they are designed with doubled creepage paths and clearances. In this context, compliance with the instructions in the test report "Safe Isolation" No. 2668 is required.

## SIMOCODE pro 3UF7

## Technical data

Basic units						
<b>Type</b>		3UF7000-1AU00-0, 3UF7010-1AU00-0, 3UF7000-1AB00-0, 3UF7010-1AB00-0, 3UF7011-1AU00-0, 3UF7020-1AU01-0, 3UF7011-1AB00-0, 3UF7020-1AB01-0, 3UF7012-1AU00-0, 3UF7013-1AU00-0, 3UF7012-1AB00-0, 3UF7013-1AB00-0				
<b>Control circuit</b>						
<b>Rated control supply voltage <math>U_s</math> (acc. to IEC 61131-2)</b>		110 ... 240 AC/DC; 50/60 Hz		24 V DC		
<b>Operating range</b>		0.85 ... 1.1 x $U_s$		0.80 ... 1.2 x $U_s$		
<ul style="list-style-type: none"> <li>SIMOCODE pro C (3UF7000) and SIMOCODE pro V PROFIBUS (3UF7010) SIMOCODE pro V Modbus RTU (3UF7012)</li> <li>SIMOCODE pro V PROFINET (3UF7011), SIMOCODE pro V EtherNet/IP (3UF7013) and SIMOCODE pro S (3UF7020)</li> <li>- Operation</li> <li>- Start up</li> </ul>		0.85 ... 1.1 x $U_s$ 0.85 ... 1.1 x $U_s$		0.80 ... 1.2 x $U_s$ 0.85 ... 1.2 x $U_s$		
<b>Power consumption</b>		7 VA/5 W 10 VA/7 W		5 W 7 W		
<ul style="list-style-type: none"> <li>SIMOCODE pro C (3UF7000) and SIMOCODE pro S (3UF7020)</li> <li>SIMOCODE pro V PROFIBUS (3UF7010) and SIMOCODE pro V Modbus RTU (3UF7012) including two connected expansion modules</li> <li>SIMOCODE pro V PROFIBUS E15/V 4.0 (3UF7010-1A.00-0 -Z B01), incl. two connected expansion modules</li> <li>SIMOCODE pro V PROFINET (3UF7011) and SIMOCODE pro V EtherNet/IP (3UF7013), including two connected expansion modules</li> </ul>		7 VA/5 W		4 W		
		11 VA/8 W		8 W		
<b>Rated insulation voltage <math>U_i</math></b>	V	300 (at pollution degree 3)				
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4				
<b>Relay outputs</b>		3 monostable relay outputs 2 monostable relay outputs				
<ul style="list-style-type: none"> <li>Number</li> <li>- SIMOCODE pro C, SIMOCODE pro V</li> <li>- SIMOCODE pro S</li> <li>Specified short-circuit protection for auxiliary contacts (relay outputs)</li> <li>- Fuse links</li> <li>- Miniature circuit breaker</li> <li>Rated uninterrupted current</li> <li>Rated switching capacity</li> <li>- AC-15</li> <li>- DC-13</li> </ul>	A	6 A operational class gG; 10 A quick-response (IEC 60947-5-1) 1.6 A, C characteristic (IEC 60947-5-1); 6 A, C characteristic ( $I_k < 500$ A) 6 6 A/24 V AC      6 A/120 V AC      3 A/230 V AC 2 A/DC 24 V      0.55 A/DC 60 V      0.25 A/DC 125 V				
<b>Inputs (binary)</b>		4 inputs supplied internally by the device electronics (with 24 V DC) and connected to a common potential				
<b>Thermistor motor protection (binary PTC)</b>		<ul style="list-style-type: none"> <li>Summation cold resistance</li> <li>Response value</li> <li>Return value</li> </ul>				
	k $\Omega$	$\leq 1.5$				
	k $\Omega$	3.4 ... 3.8				
	k $\Omega$	1.5 ... 1.65				
2nd generation current/voltage measuring modules						
<b>Type</b>		3UF7110-1AA01-0	3UF7111-1AA01-0	3UF7112-1AA01-0	3UF7113-1.A01-0	3UF7114-1BA01-0
<b>Main circuit</b>						
<b>Set current <math>I_e</math></b>	A	0.3 ... 4	3 ... +40	10 ... 115	20 ... 200	63 ... 630
<b>Rated insulation voltage <math>U_i</math></b>	V	690				
<b>Rated operational voltage <math>U_e</math></b>	V	690				
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6				
<b>Rated frequency</b>	Hz	50/60				
<b>Type of current</b>		Three-phase current				
<b>Short circuit</b>		Additional short-circuit protection is required in the main circuit				
<b>Typical voltage measuring range</b>		110 ... 690				
<ul style="list-style-type: none"> <li>Phase-to-phase voltage/line-to-line voltage (e.g. <math>U_{L1L2}</math>)</li> <li>Phase voltage (e.g. <math>U_{L1N}</math>)</li> </ul>	V	110 ... 690				
	V	65 ... 400				
<b>Accuracy at 25 °C, 50/60 Hz</b>		0.25 ... 8      7.5 ... 230      15 ... 400      15 ... 400      47 ... 1260				
Valid for current range and for voltage range	A	<ul style="list-style-type: none"> <li>Phase-to-phase voltage <math>V_L</math> in the range 0.85 x 110 V - 1.1 x 690 V</li> <li>Phase voltage <math>V_L</math> in the range 0.85 x 65 V - 1.1 x 400 V</li> </ul>				
<ul style="list-style-type: none"> <li>Current measurement</li> <li>Voltage measurement</li> <li>Power factor measurement (p.f. <math>\geq 0.5</math>)</li> <li>Apparent power measurement (p.f. <math>\geq 0.5</math>)</li> <li>Active power measurement (p.f. <math>\geq 0.5</math>)</li> <li>Energy measurement (p.f. <math>\geq 0.5</math>)</li> <li>Frequency measurement (p.f. <math>\geq 0.5</math>)</li> </ul>	%	1.5 1.5 1.5 3 5 5 1.5				
<b>Notes on voltage measurement</b>		In the supply lines from the main circuit for voltage measurement of SIMOCODE pro it may be necessary to provide additional line protection!				
		Supply lines for voltage measurement				

## SIMOCODE pro 3UF7

## Technical data

Current measuring modules or current/voltage measuring modules						
Type		3UF7110-1AA00-0	3UF7111-1AA00-0	3UF7112-1AA00-0	3UF7113-1.A00-0	3UF7114-1BA00-0
<b>Main circuit</b>						
Set current $I_e$	A	0.3 ... 3	2.4 ... 25	10 ... 100	20 ... 200	63 ... 630
Rated insulation voltage $U_i$	V	690; 3UF7103 and 3UF7104: 1 000 (at pollution degree 3)				
Rated operational voltage $U_e$	V	690				
Rated impulse withstand voltage $U_{imp}$	kV	6; 3UF7103 and 3UF7104: 8				
Rated frequency	Hz	50/60				
Type of current		Three-phase current				
Short circuit		Additional short-circuit protection is required in the main circuit				
Accuracy of current measurement (in the range of 1 x minimum current setting $I_U$ to 8 x max. current setting $I_O$ )	%	± 3				
<b>Typical voltage measuring range</b>						
• Phase-to-phase voltage/line-to-line voltage (e.g. $U_{L1L2}$ )	V	110 ... 690				
• Phase voltage (e.g. $U_{LN}$ )	V	65 ... 400				
<b>Accuracy</b>						
• Voltage measurement (phase voltage $U_L$ in the range 230 ... 400 V)	%	± 3 (typical)				
• Power factor measurement (in the rated load range PF (cos $\varphi$ ) = 0.4 ... 0.8)	%	± 5 (typical)				
• Apparent power measurement (in the rated load range)	%	± 5 (typical)				
<b>Notes on voltage measurement</b>						
• In insulated, high-resistance or asymmetrically grounded forms of power supply system and for single-phase systems		In these networks the current/voltage measuring module can be used only with an upstream decoupling module on the system interface.				
• Supply lines for voltage measurement		In the supply lines from the main circuit for voltage measurement of SIMOCODE pro it may be necessary to provide additional line protection!				
Digital modules or multifunction modules						
Type		3UF7300, 3UF7310, 3UF7600				
<b>Control circuit</b>						
Rated insulation voltage $U_i$	V	300 (at pollution degree 3)				
Rated impulse withstand voltage $U_{imp}$	kV	4				
<b>Relay outputs</b>						
• Number		2 monostable or bistable relay outputs (depending on the version)				
• Specified short-circuit protection for auxiliary contacts (relay outputs)		6 A operational class gG; 10 A quick-response (IEC 60947-5-1)				
- Fuse links		1.6 A, C characteristic (IEC 60947-5-1); 6 A, C characteristic ( $I_k < 500$ A)				
- Miniature circuit breaker		6				
• Rated uninterrupted current	A	6				
• Rated switching capacity		6 A/24 V AC      6 A/120 V AC      3 A/230 V AC				
- AC-15		2 A/24 V DC      0.55 A/60 V DC      0.25 A/125 V DC				
- DC-13						
Inputs (binary)		4 inputs, electrically isolated, supplied externally with 24 V DC or 110 ... 240 V AC/DC depending on the version, connected to a common potential				
Ground-fault modules or multifunction modules						
Type		3UF7510, 3UF7600				
<b>Control circuit</b>						
Connectable residual-current transformer		3UL23				
Type of current for monitoring		Type A (AC and pulsating DC residual currents)				
Adjustable response value		30 mA ... 40 A				
Relative measurement error	%	7.5				
Temperature modules or multifunction modules						
Type		3UF7600, 3UF7700				
<b>Sensor circuit</b>						
<b>Number of temperature sensors</b>						
• 3UF7700		3 temperature sensors				
• 3UF7600		1 temperature sensor				
<b>Typical sensor current</b>						
• PT100	mA	1 (typical)				
• PT1000/KTY83/KTY84/NTC	mA	0.2 (typical)				
<b>Open-circuit/short-circuit detection</b>						
• Sensor type		PT100/PT1000	KTY83-110	KTY84	NTC	
- Open circuit		✓	✓	✓	--	
- Short circuit		✓	✓	✓	✓	
- Measuring range	°C	-50 ... +500	-50 ... +175	-40 ... +300	80 ... 160	
Measuring accuracy at 20 °C ambient temperature (T20)	K	< ± 2				
Deviations due to ambient temperature (in % of the measuring range)	%	0.05 per K deviation from T20				
Conversion time	ms	500				
Connection type		Two- or three-wire connection				
✓ Detection possible		-- Detection not possible				

## SIMOCODE pro 3UF7

## Technical data

Analog module					
<b>Type</b>	<b>3UF74</b>				
<b>Control circuit</b>					
<b>Inputs</b>					
• Channels		2 (passive)			
• Parameterizable measuring ranges	mA	0/4 ... 20			
• Shielding		Up to 30 m shield recommended, from 30 m shield required			
• Max. input current (destruction limit)	mA	40			
• Accuracy	%	± 1			
• Input resistance	Ω	50			
• Conversion time	ms	150			
• Resolution	Bit	12			
• Open-circuit detection		With measuring range 4 ... 20 mA			
<b>Outputs</b>					
• Channels		1			
• Parameterizable output range	mA	0/4 ... 20			
• Shielding		Up to 30 m shield recommended, from 30 m shield required			
• Max. voltage at output	V DC	30			
• Accuracy	%	± 1			
• Max. output load	Ω	500			
• Conversion time	ms	25			
• Resolution	Bit	12			
• Short-circuit proof		Yes			
<b>Connection type</b>	Two-wire connection				
<b>Electrical separation of inputs/output to the device electronics</b>	No				
Fail-safe digital modules					
<b>Type</b>		<b>3UF7320-1AB00-0</b>	<b>3UF7320-1AU00-0</b>	<b>3UF7330-1AB00-0</b>	<b>3UF7330-1AU00-0</b>
<b>Control circuit</b>					
<b>Rated control supply voltage <math>U_s</math></b>	V	24 DC	110 ... 240 AC/DC; 50/60 Hz	24 DC	110 ... 240 AC/DC; 50/60 Hz
<b>Power consumption</b>		3 CO	9.5 VA/4.5 W	4 W	11 VA/5.5 W
<b>Rated insulation voltage</b>	V	300			
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4			
<b>Relay outputs</b>		2 relay enabling circuits, 2 relay outputs			
• Number		2 relay enabling circuits, 2 relay outputs			
<b>Version of the fuse link</b>	A	4, operational class gG			
For short-circuit protection of the relay enabling circuit					
<b>Rated uninterrupted current</b>	A	5			
<b>Rated switching capacity</b>		3 A/AC 24 V; 3 A/AC 120 V; 1.5 A/AC 230 V 4 A/24 V DC; 0.55 A/60 V DC; 0.22 A/125 V DC			
• AC-15					
• DC-13					
<b>Inputs (binary)</b>		5 (with internal power supply from the device electronics)			
<b>Cable length</b>					
• Between sensor/start signal and evaluation electronics	m	1500			
• For further digital signals	m	300			
<b>Safety data <sup>1)</sup></b>					
<b>SIL level max. according to IEC 61508</b>		3			
<b>Performance level PL according to EN ISO 13849-1</b>		e			
<b>Category according to EN ISO 13849-1</b>		4			
<b>Stop category according to EN 60204-1</b>		0			
<b>Probability of a dangerous failure (at 40 °C) for SIL 3 applications</b>					
• Per hour (PFH <sub>d</sub> ) at a high demand rate according to IEC 62061	1/h	4.5 × 10 <sup>-9</sup>	4.6 × 10 <sup>-9</sup>	4.4 × 10 <sup>-9</sup>	4.4 × 10 <sup>-9</sup>
• On demand (PFD <sub>avg</sub> ) at a low demand rate according to IEC 61508		5.4 × 10 <sup>-6</sup>	5.5 × 10 <sup>-6</sup>	5.1 × 10 <sup>-6</sup>	5.2 × 10 <sup>-6</sup>
<b>T1 value for proof-test interval or service life according to IEC 61508</b>	a	20			

<sup>1)</sup> More safety data, see system manual "SIMOCODE pro Safety Fail-Safe Digital Modules", <https://support.industry.siemens.com/cs/ww/en/view/50564852>.

# SIMOCODE pro 3UF7

## Technical data

### More information

#### Configuration instructions when using an operator panel with display and/or a decoupling module with SIMOCODE pro V with PROFIBUS or Modbus RTU

If you want to use an operator panel with display and/or a decoupling module in the SIMOCODE pro V system with PROFIBUS (product version earlier than E15) or Modbus RTU (product version earlier than E02), configuration instructions concerning the type and number of connectable expansion modules must be observed.

The following tables show the maximum possible configuration of the expansion modules for the various combinations. These are also conveniently stored in the TIA Selection Tool. See [www.siemens.com/tia-selection-tool](http://www.siemens.com/tia-selection-tool).

The DM-F Local and DM-F PROFIsafe fail-safe expansion modules behave in this connection like digital modules for standard applications.

#### Use of an operator panel with display

Digital module 1	Digital module 2	Analog module	Temperature module	Ground-fault module
<b>Only operator panel with display for SIMOCODE pro V (24 V DC or 110 ... 240 V AC/DC)</b>				
Max. four expansion modules can be used				
<b>Operator panel with display and current/voltage measurement with SIMOCODE pro V (110 ... 240 V AC/DC)</b>				
Max. three expansion modules can be used or:				
--	--	✓	✓	--

- ✓ Available
- Not available

#### Use of a decoupling module (voltage measurement in insulated networks)

Digital module 1	Digital module 2	Analog module	Temperature module	Ground-fault module
<b>SIMOCODE pro V (24 V DC)</b>				
✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓	✓	✓
<b>SIMOCODE pro V (110 ... 240 V AC/DC)</b>				
✓	✓	--	✓	✓
✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓	✓	--
✓	--	✓	✓	--
✓	--	✓	--	✓

- ✓ Available
  - Not available
- <sup>1)</sup> No bistable relay outputs and no more than five of seven relay outputs active simultaneously (> 3 s).

Use of a decoupling module (voltage measurement in insulated networks) in combination with an operator panel with display

Digital module 1	Digital module 2	Analog module	Temperature module	Ground-fault module
<b>SIMOCODE pro V (24 V DC)</b>				
✓	--	✓	✓	✓
✓	✓	--	✓	✓
<b>SIMOCODE pro V (110 ... 240 V AC/DC)</b>				
✓ <sup>1)</sup>	--	✓	✓	✓
✓	✓	--	--	--
✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>3)</sup>	--	--
✓	--	--	✓	✓

- ✓ Available
  - Not available
- <sup>1)</sup> No bistable relay outputs and no more than three of five relay outputs active simultaneously (> 3 s).
- <sup>2)</sup> No bistable relay outputs and no more than five of seven relay outputs active simultaneously (> 3 s).
- <sup>3)</sup> Analog module output is not used.

#### Configuration instructions for the use of a fail-safe expansion module

Fail-safe digital module	Digital module 2	Analog module	Temperature module	Ground-fault module
<b>DM-F Local</b>				
Max. four expansion modules can be used				
<b>DM-F PROFIsafe</b>				
Max. three expansion modules can be used or:				
✓	✓	✓	✓	--

- ✓ Available
- Not available

#### Protective separation

All circuits in SIMOCODE pro are safely isolated from each other in accordance with IEC 60947-1. That is, they are designed with double creepages and clearances. In the event of a fault, therefore, no parasitic voltages can be formed in neighboring circuits. The instructions of Test log No. 2668 must be complied with.

#### Types of protection EEx e and EEx d

The overload protection and the thermistor motor protection of the SIMOCODE pro system comply with the requirements for overload protection of explosion-proof motors to the type of protection:





- EEx d "flameproof enclosure" e.g. according to IEC 60079-1
- EEx e "increased safety" e.g. according to IEC 60079-7

When using SIMOCODE pro devices with a 24 V DC control voltage, electrical separation must be ensured using a battery or a safety transformer according to IEC 61558-2-6. EC type-examination certificate BVS 06 ATEX F 001 Test report: BVS PP 05.2029 EG.

# SIMOCODE pro 3UF7

Basic units IE3/IE4 ready

## Selection and ordering data

Version	SD	Screw terminals 	PU (UNIT, SET, M)	PS*
	d	Article No.	Price per PU	
<b>SIMOCODE pro PROFIBUS</b>				
 3UF7000-1A.00-0	<b>SIMOCODE pro C</b> PROFIBUS DP interface, 12 Mbps, RS 485 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs Rated control supply voltage $U_s$ : • 24 V DC • 110 ... 240 V AC/DC	▶ 3UF7000-1AB00-0 ▶ 3UF7000-1AU00-0	1 1 unit 1 1 unit	
	<b>SIMOCODE pro S<sup>1)</sup></b> PROFIBUS DP interface, 1.5 Mbps, RS 485 4 I/2 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by a multifunction module Rated control supply voltage $U_s$ : • 24 V DC • 110 ... 240 V AC/DC	▶ 3UF7020-1AB01-0 ▶ 3UF7020-1AU01-0	1 1 unit 1 1 unit	
 3UF7010-1A.00-0	<b>SIMOCODE pro V<sup>2)</sup></b> PROFIBUS DP interface, 12 Mbps, RS 485 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion modules Rated control supply voltage $U_s$ : • 24 V DC • 110 ... 240 V AC/DC	▶ 3UF7010-1AB00-0 ▶ 3UF7010-1AU00-0	1 1 unit 1 1 unit	
	<b>SIMOCODE pro PROFINET</b>			
 3UF7011-1A.00-0	<b>SIMOCODE pro V PROFINET</b> ETHERNET/PROFINET IO, OPC UA server and web server, 100 Mbps, 2 x connection to bus through RJ45, PROFINET system redundancy, media redundancy protocol, 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion modules, web server in German/English/Chinese/Russian Rated control supply voltage $U_s$ : • 24 V DC • 110 ... 240 V AC/DC	▶ 3UF7011-1AB00-0 ▶ 3UF7011-1AU00-0	1 1 unit 1 1 unit	

<sup>1)</sup> The connection cable to the current measuring module must be at least 30 cm.






<sup>2)</sup> For the use of 2nd-generation current/voltage measuring modules, SIMOCODE pro V PROFIBUS with product version E15 (V 4.0) must be ordered. This version does not have marine certification or CCC approval and can be ordered at no extra charge. The article number must be supplemented by "-Z" and the order code "B01", e.g. 3UF7010-1A.00-0 -Z B01.



# SIMOCODE pro 3UF7

Basic units IE3/IE4 ready

3  
OVERLOAD  
RELAYS

Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*																		
	d	Article No.	Price per PU																			
<b>SIMOCODE pro Modbus RTU</b>																						
 <p><b>SIMOCODE pro V Modbus RTU<sup>1)</sup></b>                      Modbus RTU interface, 57.6 kbp, RS485,                      4 I/3 O freely parameterizable,                      input for thermistor connection,                      monostable relay outputs,                      can be expanded using expansion modules                      Rated control supply voltage <math>U_s</math>:                      • 24 V DC                      • 110 ... 240 V AC/DC</p>																						
		3UF7012-1AB00-0	1	1 unit																		
		3UF7012-1AU00-0	1	1 unit																		
<b>SIMOCODE pro EtherNet/IP <i>NEW</i></b>																						
 <p><b>SIMOCODE pro V EtherNet/IP<sup>1)</sup></b>                      EtherNet/IP interface, web server, 100 Mbps,                      2 x connection to bus through RJ45,                      media redundancy DLR,                      4 I/3 O freely parameterizable,                      input for thermistor connection,                      monostable relay outputs,                      can be expanded using expansion modules,                      web server in German/English/Chinese/Russian                      Rated control supply voltage <math>U_s</math>:                      • 24 V DC                      • 110 ... 240 V AC/DC</p>																						
		3UF7013-1AB00-0	1	1 unit																		
		3UF7013-1AU00-0	1	1 unit																		
<b>SIMOCODE pro current or current/voltage measuring modules</b>																						
 <p><b>Current measuring modules</b></p> <ul style="list-style-type: none"> <li>• Straight-through transformers                             <table border="0"> <tr><td>0.3 ... 3</td><td>45</td><td>▶</td></tr> <tr><td>2.4 ... 25</td><td>45</td><td>▶</td></tr> <tr><td>10 ... 100</td><td>55</td><td>▶</td></tr> <tr><td>20 ... 200</td><td>120</td><td>▶</td></tr> </table> </li> <li>• Bus connections                             <table border="0"> <tr><td>20 ... 200</td><td>120</td><td>▶</td></tr> <tr><td>63 ... 630</td><td>145</td><td>▶</td></tr> </table> </li> </ul>	0.3 ... 3	45	▶	2.4 ... 25	45	▶	10 ... 100	55	▶	20 ... 200	120	▶	20 ... 200	120	▶	63 ... 630	145	▶				
	0.3 ... 3	45	▶																			
	2.4 ... 25	45	▶																			
	10 ... 100	55	▶																			
	20 ... 200	120	▶																			
	20 ... 200	120	▶																			
	63 ... 630	145	▶																			
	3UF7100-1AA00-0	1	1 unit																			
	3UF7101-1AA00-0	1	1 unit																			
	3UF7102-1AA00-0	1	1 unit																			
	3UF7103-1AA00-0	1	1 unit																			
	3UF7103-1BA00-0	1	1 unit																			
	3UF7104-1BA00-0	1	1 unit																			
 <p><b>2nd generation current/voltage measuring modules for SIMOCODE pro V<sup>1)</sup> <i>NEW</i></b>                      Voltage measurement up to 690 V,                      measured values with increased accuracy,                      power, power factor and active current monitoring</p> <ul style="list-style-type: none"> <li>• Straight-through transformers                             <table border="0"> <tr><td>0.3 ... 4</td><td>45</td><td>▶</td></tr> <tr><td>3 ... +40</td><td>45</td><td>▶</td></tr> <tr><td>10 ... 115</td><td>55</td><td>▶</td></tr> <tr><td>20 ... 200</td><td>120</td><td>▶</td></tr> </table> </li> <li>• Bus connections                             <table border="0"> <tr><td>20 ... 200</td><td>120</td><td>▶</td></tr> <tr><td>63 ... 630</td><td>145</td><td>▶</td></tr> </table> </li> </ul>	0.3 ... 4	45	▶	3 ... +40	45	▶	10 ... 115	55	▶	20 ... 200	120	▶	20 ... 200	120	▶	63 ... 630	145	▶				
	0.3 ... 4	45	▶																			
	3 ... +40	45	▶																			
	10 ... 115	55	▶																			
	20 ... 200	120	▶																			
	20 ... 200	120	▶																			
	63 ... 630	145	▶																			
	3UF7110-1AA01-0	1	1 unit																			
	3UF7111-1AA01-0	1	1 unit																			
	3UF7112-1AA01-0	1	1 unit																			
	3UF7113-1AA01-0	1	1 unit																			
	3UF7113-1BA01-0	1	1 unit																			
	3UF7114-1BA01-0	1	1 unit																			
 <p><b>Current/voltage measuring modules for SIMOCODE pro V</b>                      Voltage measurement up to 690 V                      If required in connection with a decoupling module</p> <ul style="list-style-type: none"> <li>• Straight-through transformers                             <table border="0"> <tr><td>0.3 ... 3</td><td>45</td><td>▶</td></tr> <tr><td>2.4 ... 25</td><td>45</td><td>▶</td></tr> <tr><td>10 ... 100</td><td>55</td><td>▶</td></tr> <tr><td>20 ... 200</td><td>120</td><td>▶</td></tr> </table> </li> <li>• Bus connections                             <table border="0"> <tr><td>20 ... 200</td><td>120</td><td>▶</td></tr> <tr><td>63 ... 630</td><td>145</td><td>▶</td></tr> </table> </li> </ul>	0.3 ... 3	45	▶	2.4 ... 25	45	▶	10 ... 100	55	▶	20 ... 200	120	▶	20 ... 200	120	▶	63 ... 630	145	▶				
	0.3 ... 3	45	▶																			
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	3UF7111-1AA00-0	1	1 unit																			
	3UF7112-1AA00-0	1	1 unit																			
	3UF7113-1AA00-0	1	1 unit																			
	3UF7113-1BA00-0	1	1 unit																			
	3UF7114-1BA00-0	1	1 unit																			

<sup>1)</sup> The SIMOCODE ES (TIA Portal) V14 software is necessary for parameterization, see page 3/82.

**Note:**


SIMOCODE pro V basic unit in a hardened version via SIPLUS extreme upon request.

# SIMOCODE pro 3UF7

Basic units IE3/IE4 ready

Version	Current setting	Width	SD	Screw terminals	⊕	PU (UNIT, SET, M)	PS*
	A	mm	d	Article No.	Price per PU		

**SIMOCODE pro decoupling modules**



**Decoupling module**  
For connecting upstream from a current/voltage measuring module on the system interface when using voltage detection in insulated, high-resistance or asymmetrically grounded systems and in single-phase systems


3UF7150-1AA00-0

2	<b>3UF7150-1AA00-0</b>	1	1 unit
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**SIMOCODE pro operator panels**

**Operator panels**  
Installation in control cabinet door or front plate, for plugging into all SIMOCODE pro basic units, ten LEDs for status indication and user-assignable buttons for controlling the motor

- Titanium gray ▶ **3UF7200-1AA01-0**
- Light gray ▶ **3UF7200-1AA00-0**



3UF7200-1AA01-0



3UF7200-1AA00-0

	<b>3UF7200-1AA01-0</b>	1	1 unit
	<b>3UF7200-1AA00-0</b>	1	1 unit

**Operator panels for SIMOCODE pro V**

Installation in control cabinet door or front plate, for plugging into SIMOCODE pro V and SIMOCODE pro V PN, seven LEDs for status indication and user-assignable buttons for controlling the motor, multilingual display, e.g. for indication of measured values, status information or fault messages

- Titanium gray **NEW**
  - English/German/French/Spanish/Portuguese/Italian/Polish/Finnish ▶ **3UF7210-1AA01-0**
  - English/Chinese/Russian/Korean ▶ **3UF7210-1BA01-0**
- Light gray
  - English/German/French/Spanish/Portuguese/Italian/Polish/Finnish ▶ **3UF7210-1AA00-0**
  - English/Chinese/Russian/Korean ▶ **3UF7210-1BA00-0**



3UF7210-1.A01-0




3UF7210-1.A00-0

	<b>3UF7210-1AA01-0</b>	1	1 unit
	<b>3UF7210-1BA01-0</b>	1	1 unit
	<b>3UF7210-1AA00-0</b>	1	1 unit
	<b>3UF7210-1BA00-0</b>	1	1 unit

# SIMOCODE pro 3UF7

## Fail-safe expansion modules

### Selection and ordering data

Version	SD	<b>Screw terminals</b>		PU (UNIT, SET, M)	PS*
	d	Article No.	Price per PU		

#### Expansion modules for SIMOCODE pro V

With SIMOCODE pro V, it is possible to expand the type and number of inputs and outputs in steps. Each expansion module has two system interfaces on the front. Through the one system interface the expansion module is connected to the system interface of the SIMOCODE pro V using a connection cable; through the second system interface, further expansion modules or the operator panel can be connected. The power supply for the expansion modules is provided by the connection cable through the basic unit.

**Note:**

Please order connection cable separately, [see page 3/79](#).

#### Digital modules

Up to two digital modules can be used to add additional binary inputs and relay outputs to the basic unit. The input circuits of the digital modules are supplied from an external power supply.

Four binary inputs and two relay outputs  
Up to two digital modules can be connected

Relay outputs	Input voltage			
Monostable	24 V DC	▶	<b>3UF7300-1AB00-0</b>	1 1 unit
	110 ... 240 V AC/DC	▶	<b>3UF7300-1AU00-0</b>	1 1 unit
Bistable	24 V DC	▶	<b>3UF7310-1AB00-0</b>	1 1 unit
	110 ... 240 V AC/DC	▶	<b>3UF7310-1AU00-0</b>	1 1 unit

#### Analog module

By means of the analog module, the basic unit can be optionally expanded with analog inputs and outputs (0/4 ... 20 mA).

Two inputs (passive) for input and one output for output of 0/4 ... 20 mA signals, max. one analog module can be connected per pro V basic unit and max. two analog modules per pro V PN basic unit

#### Ground-fault modules<sup>1)</sup>

Ground-fault monitoring using 3UL23 residual-current transformers and ground-fault modules is used in cases where precise detection of the ground-fault current is required or power systems with high impedance are grounded.

With the ground-fault module, it is possible to determine the precise fault current as a measured value, and to define freely selectable warning and trip limits in a wide range from 30 mA ... 40 A.

One input for connecting a 3UL23 residual-current transformer, up to one ground-fault module can be connected

**Note:**

For corresponding residual-current transformers, [see page 11/66 or Industry Mall](#).

#### Temperature modules

Irrespective of the thermistor motor protection of the basic units, an additional max. three analog temperature sensors can be evaluated using a temperature module.

Sensor types: PT100/PT1000, KTY83/KTY84 or NTC

Three inputs for connecting up to three analog temperature sensors, up to one temperature module can be connected per pro V basic unit and up to two temperature modules per pro V PN basic unit

3  
OVERLOAD  
RELAYS



3UF7300-1AU00-0



3UF7400-1AA00-0



3UF7510-1AA00-0




3UF7700-1AA00-0

<sup>1)</sup> Possible with pro V PROFIBUS basic unit from product version E10, pro V PROFINET basic unit from product version E04, all pro V Modbus RTU or EtherNet/IP basic units.

# SIMOCODE pro 3UF7

## Accessories

Version	SD	<b>Screw terminals</b> 	PU (UNIT, SET, M)	PS*
	d	Article No.	Price per PU	

### Expansion modules for SIMOCODE pro S

With SIMOCODE pro S, it is possible to expand the type and number of inputs and outputs. The expansion module has two system interfaces on the front. Through the one system interface the expansion module is connected to the system interface of the SIMOCODE pro S using a connection cable; through the second system interface, the operator panel can be connected. The power supply for the expansion module is provided by the connection cable through the basic unit.

Note:

Please order connection cable separately, [see page 3/79](#).

### Multifunction modules

The multifunction module is the expansion module of the SIMOCODE pro S device series with the following functions:

- Digital module function with four digital inputs and two monostable relay outputs
- Ground-fault module function with an input for the connection of a 3UL23 residual-current transformer with freely selectable warning and trip limits in a wide zone of 30 mA ... 40 A
- Temperature module function with an input for connecting an analog temperature sensor PT100, PT1000, KTY83, KTY84, or NTC

Max. one multifunction module can be connected per pro S basic unit

Input voltage of the digital inputs:

- 24 V DC
- 110 ... 240 V AC/DC

▶	<b>3UF7600-1AB01-0</b>	1	1 unit
▶	<b>3UF7600-1AU01-0</b>	1	1 unit



3UF7600-1AU01-0

# SIMOCODE pro 3UF7

## Fail-safe expansion modules

### Selection and ordering data

Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	d	Article No.	Price per PU	

#### Fail-safe expansion modules for SIMOCODE pro V

Thanks to the fail-safe expansion modules, SIMOCODE pro V can be expanded with the function of a safety relay for the fail-safe disconnection of motors. A maximum of one fail-safe digital module can be connected; it can be used instead of a digital module.

The fail-safe expansion modules are equipped likewise with two system interfaces at the front for making the connection to other system components. Unlike other expansion modules, power is supplied to the modules through a separate terminal connection.

**Note:**

Please order connection cable separately, [see page 3/79](#).

#### DM-F Local fail-safe digital modules

For fail-safe disconnection using a hardware signal  
Two relay enabling circuits, joint switching; two relay outputs, common potential disconnected fail-safe; inputs for sensor circuit, start signal, cascading and feedback circuit, safety function adjustable using DIP switches  
Rated control supply voltage  $U_s$ :

- 24 V DC
- 110 ... 240 V AC/DC

- ▶ **3UF7320-1AB00-0**
- ▶ **3UF7320-1AU00-0**

- 1 1 unit
- 1 1 unit

#### DM-F PROFI-safe fail-safe digital modules<sup>1)</sup>

For fail-safe disconnection using PROFIBUS/PROFI-safe or PROFINET/PROFI-safe  
Two relay enabling circuits, joint switching; two relay outputs, common potential disconnected fail-safe; one input for feedback circuit; three binary standard inputs  
Rated control supply voltage  $U_s$ :

- 24 V DC
- 110 ... 240 V AC/DC

- ▶ **3UF7330-1AB00-0**
- ▶ **3UF7330-1AU00-0**

- 1 1 unit
- 1 1 unit



3UF7320-1AB00-0



3UF7330-1AB00-0

<sup>1)</sup> Cannot be used in conjunction with SIMOCODE pro V for Modbus RTU or EtherNet/IP communication.

# SIMOCODE pro 3UF7

## Accessories

3 OVERLOAD RELAYS

### Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Connection cables (essential accessory)



3UF7932-0AA00-0

In different lengths for connecting basic unit, current measuring module, current/voltage measuring module, operator panel or expansion modules or decoupling module

Version	Length
Flat	0.025 m
Flat	0.1 m
Flat	0.3 m
Flat	0.5 m
Round	0.5 m
Round	1.0 m
Round	2.5 m

▶	<b>3UF7930-0AA00-0</b>	1	1 unit
▶	<b>3UF7931-0AA00-0</b>	1	1 unit
▶	<b>3UF7935-0AA00-0</b>	1	1 unit
▶	<b>3UF7932-0AA00-0</b>	1	1 unit
▶	<b>3UF7932-0BA00-0</b>	1	1 unit
▶	<b>3UF7937-0BA00-0</b>	1	1 unit
▶	<b>3UF7933-0BA00-0</b>	1	1 unit

#### PC cables and adapters



3UF7941-0AA00-0

**USB PC cables**  
For connecting to the USB interface of a PC/PG, for communication with SIMOCODE pro through the system interface

▶	<b>3UF7941-0AA00-0</b>	1	1 unit
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**USB/serial adapters**  
To connect an RS 232 PC cable to the USB interface of a PC, recommended for use in conjunction with SIMOCODE pro 3UF7

5	<b>3UF7946-0AA00-0</b>	1	1 unit
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#### Memory modules

Enable transmission to a new system, e.g. when a device is replaced, without the need for additional aids or detailed knowledge of the device.

**Memory module for SIMOCODE pro C**  
For saving the complete parameterization of a SIMOCODE pro C system

▶	<b>3UF7900-0AA00-0</b>	1	1 unit
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**Memory module for SIMOCODE pro S and SIMOCODE pro V**  
For saving the complete parameterization of a SIMOCODE pro system

• Titanium gray **NEW**

▶	<b>3UF7901-0AA01-0</b>	1	1 unit
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3UF7901-0AA01-0

• Light gray

▶	<b>3UF7901-0AA00-0</b>	1	1 unit
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3UF7901-0AA00-0

#### Interface covers

For system interface

• Titanium gray

10	<b>3RA6936-0B</b>	1	5 units
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3RA6936-0B

• Light gray

▶	<b>3UF7950-0AA00-0</b>	1	5 units
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3UF7950-0AA00-0

#### Addressing plugs

For assigning the PROFIBUS or Modbus RTU address without using a PC/PG to SIMOCODE pro through the system interface

▶	<b>3UF7910-0AA00-0</b>	1	1 unit
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3UF7910-0AA00-0

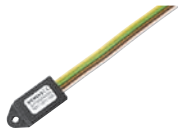
# SIMOCODE pro 3UF7

## Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Accessories for motor control centers

With the draw-out technology often used in motor control centers it is possible to integrate a SIMOCODE pro initialization module in the switchboard on a permanent basis. Feeder-related parameter and address data can then be permanently assigned to this feeder.



3UF7902-0AA00-0

#### Initialization module

For automatic parameterization of SIMOCODE pro S and SIMOCODE pro V basic units (pro V PROFIBUS basic units from product version E09)

▶	<b>3UF7902-0AA00-0</b>	1	1 unit
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#### Y connection cable

For use in conjunction with the initialization module; connects the basic unit, current measuring module or current/voltage measuring module, and initialization module

System interface length	Open cable end
0.1 m	1.0 m
0.5 m	1.0 m
1.0 m	1.0 m

▶	<b>3UF7931-0CA00-0</b>	1	1 unit
▶	<b>3UF7932-0CA00-0</b>	1	1 unit
▶	<b>3UF7937-0CA00-0</b>	1	1 unit

### Bus connection terminals



3UF7960-0AA00-0

For shield support and strain relief of the PROFIBUS cable on a SIMOCODE pro S

▶	<b>3UF7960-0AA00-0</b>	1	1 unit
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### Door adapters



3UF7920-0AA00-0

For external connection of the system interface, e.g. outside a control cabinet

▶	<b>3UF7920-0AA00-0</b>	1	1 unit
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### Adapters for operator panel



3UF7922-0AA00-0

The adapter enables the smaller 3UF7200 operator panel from SIMOCODE pro to be used in a front panel cutout in which previously, e.g. after a change of system, a larger 3UF52 operator panel from SIMOCODE-DP had been used, degree of protection IP54

▶	<b>3UF7922-0AA00-0</b>	1	1 unit
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### Labeling strips



3UF7925-0AA02-0

- ▶ For pushbuttons of the 3UF720 operator panel
- ▶ For pushbuttons of the 3UF721 operator panel with display
- ▶ For LEDs of the 3UF720 operator panel

▶	<b>3UF7925-0AA00-0</b>	100	400 units
▶	<b>3UF7925-0AA01-0</b>	100	600 units
▶	<b>3UF7925-0AA02-0</b>	100	1200 units

### Push-in lugs



3RV2928-0B

For screw fixing, e.g. on mounting plate, two units required per device





- Can be used for 3UF71.0, 3UF71.1 and 3UF71.2
- Can be used for 3UF700, 3UF701, 3UF73, 3UF74, 3UF75 and 3UF77
- Can be used for 3UF7020, 3UF7600

2	<b>3RV2928-0B</b>	100	10 units
5	<b>3RP1903</b>	1	10 units
2	<b>3ZY1311-0AA00</b>	1	10 units



# SIMOCODE pro 3UF7

## Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Terminal covers</b>						
 <p>3RT1956-4EA1</p>  <p>3RT1956-4EA2</p>		<b>Covers for cable lugs and busbar connections</b>				
		▶	Length 100 mm, can be used for 3UF71.3-1BA0.-0	<b>3RT1956-4EA1</b>	1	1 unit
		▶	Length 120 mm, can be used for 3UF71.4-1BA0.-0	<b>3RT1966-4EA1</b>	1	1 unit
			<b>Covers for box terminals</b>			
		▶	Length 25 mm, can be used for 3UF71.3-1BA0.-0	<b>3RT1956-4EA2</b>	1	1 unit
		▶	Length 30 mm, can be used for 3UF71.4-1BA0.-0	<b>3RT1966-4EA2</b>	1	1 unit
		<b>Covers for screw terminals</b>				
		Between contactor and current measuring module or current/voltage measuring module for direct mounting				
	▶	Can be used for 3UF71.3-1BA0.-0	<b>3RT1956-4EA3</b>	1	1 unit	
	▶	Can be used for 3UF71.4-1BA0.-0	<b>3RT1966-4EA3</b>	1	1 unit	
<b>Box terminal blocks</b>						
 <p>3RT195.-4G</p>		For round and ribbon cables				
		▶	Up to 70 mm <sup>2</sup> , can be used for 3UF71.3-1BA0.-0	<b>3RT1955-4G</b>	1	1 unit
		▶	Up to 120 mm <sup>2</sup> , can be used for 3UF71.3-1BA0.-0	<b>3RT1956-4G</b>	1	1 unit
		▶	Up to 240 mm <sup>2</sup> , can be used for 3UF71.4-1BA0.-0	<b>3RT1966-4G</b>	1	1 unit
<b>Bus termination modules</b>						
 <p>3UF1900-1KA00</p>		With separate control supply voltage for bus termination following the last unit on the bus line				
		Supply voltage:				
		• 115/230 V AC	5	<b>3UF1900-1KA00</b>	1	1 unit
	• 24 V DC	5	<b>3UF1900-1KB00</b>	1	1 unit	

3 OVERLOAD RELAYS

## SIMOCODE pro 3UF7

## SIMOCODE ES (TIA Portal)

## Selection and ordering data

## Parameterization and service software for SIMOCODE pro 3UF7

- Delivered without PC cable

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				

## SIMOCODE ES V14 Basic

**Floating license for one user**

Engineering software, software and documentation on DVD, 6 languages (English/German/French/Italian/Spanish/Chinese), combo license for parallel use of versions 2007 and V14 of SIRIUS ES, for all SIMOCODE pro, online functions via system interface

- License key on USB flash drive, Class A
- License key download, Class A

3ZS1322-4CC12-0YA5

▶ 3ZS1322-4CC12-0YA5

1 1 unit

▶ 3ZS1322-4CE12-0YB5

1 1 unit

## SIMOCODE ES V14 Standard

**Floating license for one user**

Engineering software, software and documentation on DVD, 6 languages (English/German/French/Italian/Spanish/Chinese), combo license for parallel use of versions 2007 and V14 of SIRIUS ES, for all SIMOCODE pro, online functions via system interface, parameterizing with the integrated graphics editor (CFC-based)

- License key on USB flash drive, Class A
- License key download, Class A

3ZS1322-5CC12-0YA5

▶ 3ZS1322-5CC12-0YA5

1 1 unit

▶ 3ZS1322-5CE12-0YB5

1 1 unit

**Upgrade for SIMOCODE ES 2007**

2 3ZS1322-5CC12-0YE5

1 1 unit

Floating license for one user, engineering software, software and documentation on DVD, license key on USB flash drive, Class A 6 languages (English/German/French/Italian/Spanish/Chinese), combo license for parallel use of versions 2007 and V14 of SIRIUS ES, for all SIMOCODE pro, online functions via system interface, parameterizing with the integrated graphics editor (CFC-based)

**Powerpack for SIMOCODE ES V14 Basic**

2 3ZS1322-5CC12-0YD5

1 1 unit

Floating license for one user, engineering software, license key on USB flash drive, Class A 6 languages (English/German/French/Italian/Spanish/Chinese), for all SIMOCODE pro, online functions via system interface, parameterizing with the integrated graphics editor (CFC-based)

**Software Update Service**

▶ 3ZS1322-5CC12-0YL5

1 1 unit

For 1 year with automatic extension, requires software version of SIMOCODE ES (TIA Portal), engineering software, software and documentation on DVD, online functions via system interface, parameterizing with the integrated graphics editor (CFC-based)

## Notes:

SIMOCODE ES V13 licenses can also be used for SIMOCODE ES V14.

# SIMOCODE pro 3UF7

## SIMOCODE ES (TIA Portal)

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### SIMOCODE ES V14 Premium



3ZS1322-6CC12-0YA5

**Floating license for one user**

Engineering software, software and documentation on DVD, 6 languages (English/German/French/Italian/Spanish/Chinese), combo license for parallel use of versions 2007 and V14 of SIRIUS ES, for all SIMOCODE pro, online functions via system interface and PROFIBUS/PROFINET/Ethernet/IP, parameterizing with the integrated graphics editor (CFC-based)

- License key on USB flash drive, Class A ▶
- License key download, Class A ▶

<b>3ZS1322-6CC12-0YA5</b>	1	1 unit
<b>3ZS1322-6CE12-0YB5</b>	1	1 unit

**Upgrade for SIMOCODE ES 2007**

2

Floating license for one user, engineering software, software and documentation on DVD, license key on USB flash drive, Class A 6 languages (English/German/French/Italian/Spanish/Chinese), combo license for parallel use of versions 2007 and V14 of SIRIUS ES, for all SIMOCODE pro, online functions via system interface and PROFIBUS/PROFINET/EtherNet/IP, parameterizing with the integrated graphics editor (CFC-based)

<b>3ZS1322-6CC12-0YE5</b>	1	1 unit
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**Powerpack for SIMOCODE ES V14 Standard**

2

Floating license for one user, engineering software, license key on USB flash drive, Class A 6 languages (English/German/French/Italian/Spanish/Chinese), for all SIMOCODE pro, online functions via system interface and PROFIBUS/PROFINET/EtherNet/IP, parameterizing with the integrated graphics editor (CFC-based)

<b>3ZS1322-6CC12-0YD5</b>	1	1 unit
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**Software Update Service**

▶

For 1 year with automatic extension, requires software version of SIMOCODE ES (TIA Portal), engineering software, software and documentation on DVD, online functions via system interface and PROFIBUS/PROFINET/EtherNet/IP, parameterizing with the integrated graphics editor (CFC-based)

<b>3ZS1322-6CC12-0YL5</b>	1	1 unit
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### SIMOCODE ES V14 software download

**Trial license, Class A**

▶

Engineering software, 6 languages (English/German/French/Italian/Spanish/Chinese), for all SIMOCODE pro, online functions via system interface and PROFIBUS/PROFINET/EtherNet/IP, parameterizing with the integrated graphics editor (CFC-based)

<b>3ZS1322-6CE12-0YG8</b>	1	1 unit
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3 OVERLOAD RELAYS

# SIMOCODE pro 3UF7

## SIMOCODE pro block library for SIMATIC PCS 7

### Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
---------	----	-------------	--------------	-------------------	-----

#### SIMOCODE pro block library for SIMATIC PCS 7 Version V8 with Advanced Process Library (APL)



3ZS1632-1XX02-0YA0

#### Engineering software V8

For one engineering station (single license) including runtime software for execution of the AS modules in an automation system (single license), English/German

Scope of supply:  
AS blocks and faceplates for integrating SIMOCODE pro into the PCS 7 process control system with Advanced Process Library, for PCS 7 version V8.0, V8.1 and V8.2

Type of delivery:  
software and documentation on CD,  
one license for one engineering station  
one license for one automation station

▶ **3ZS1632-1XX02-0YA0** 1 1 unit

#### Runtime license V8

For execution of the AS modules in an automation system (single license)  
Required for using the AS modules of the engineering software V8 within a plant

Type of delivery:  
one license for one automation station,  
without software and documentation

▶ **3ZS1632-2XX02-0YB0** 1 1 unit

# SIMOCODE pro 3UF7

## SIMOCODE pro block library for SIMATIC PCS 7

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
---------	----	-------------	--------------	-------------------	-----

**SIMOCODE pro block library for SIMATIC PCS 7 version V7 without Advanced Process Library (APL)**



3UF7982-0AA10-0

<p><b>Engineering software V7</b></p> <p>For one engineering station (single license) including runtime software for execution of the AS modules in an automation system (single license), English/German/French</p> <p>Scope of supply: AS modules and faceplates for integrating SIMOCODE pro into the PCS 7 process control system, for PCS 7 version V7.0/V7.1</p> <p>Type of delivery: software and documentation on CD, one license for one engineering station one license for one automation station</p>	▶	<b>3UF7982-0AA10-0</b>		1	1 unit
<p><b>Runtime license V7</b></p> <p>For execution of the AS modules in an automation system (single license)</p> <p>Required for using the AS modules of the engineering software V7 or the engineering software migration V7-V8 on an additional automation system within a plant</p> <p>Type of delivery: one license for one automation station, without software and documentation</p>	▶	<b>3UF7982-0AA11-0</b>		1	1 unit
<p><b>Upgrade for PCS 7 block library SIMOCODE pro, V6.0 or V6.1 to version SIMOCODE pro V7.0/V7.1</b></p> <p>For one engineering station (single license) including runtime software for execution of the AS modules in an automation system (single license), English/German/French</p> <p>Scope of supply: AS modules and faceplates for integrating SIMOCODE pro into the PCS 7 process control system, for PCS 7 version V7.0 or V7.1</p> <p>Type of delivery: software and documentation on CD, one license for one engineering station one license for one automation station</p>	2	<b>3UF7982-0AA13-0</b>		1	1 unit
<p><b>Engineering software migration V7-V8</b></p> <p>For upgrading (migrating) an existing engineering software V7 of the SIMOCODE pro block library for PCS 7</p> <p>Conditions of use: availability of the engineering software V7 (license) of the SIMOCODE pro block library for PCS 7 for the PCS 7 version V7.0 or V7.1</p> <p>Engineering software migration V7-V8 can be installed directly onto a system with PCS 7 version V8; installation of the previous version is unnecessary.</p> <p>For one engineering station (single license) including runtime software for execution of the AS modules in an automation system (single license), English/German/French</p> <p>Scope of supply: AS blocks and faceplates for integrating SIMOCODE pro into the PCS 7 process control system, for PCS 7 version V8.0 and higher</p> <p>Type of delivery: software and documentation on CD, license for upgrading an existing license for one engineering station and the associated runtime licenses of a plant</p>	▶	<b>3UF7982-0AA20-0</b>		1	1 unit

# SIMOCODE pro 3UF7

## Notes

3

OVERLOAD  
RELAYS

## contents

### Self Protected Motor Starters per UL 508 Type E 3RA6



**3RA61 / 3RA62 up to 32 A**  
for mounting rail, surface,  
comb busbar, infeed system Page

**Selection and ordering data**

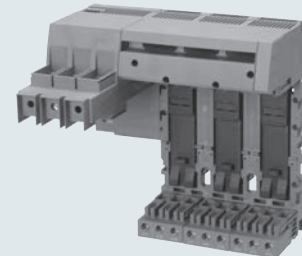
- Direct start, Reversing duty 4/7
- Accessories 4/9-4/13



**3RA64 / 3RA65 up to 32 A**  
for mounting rail, surface,  
comb busbar, infeed system Page

**Selection and ordering data**

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**3RA68 up to 100 A**  
for 3RA6 direct and  
reversing starters Page

**Selection and ordering data**

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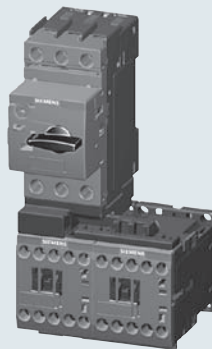


**3RA1/3RA2 up to 100 A**  
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## SIRIUS 3RA6 Compact Starters

## General data

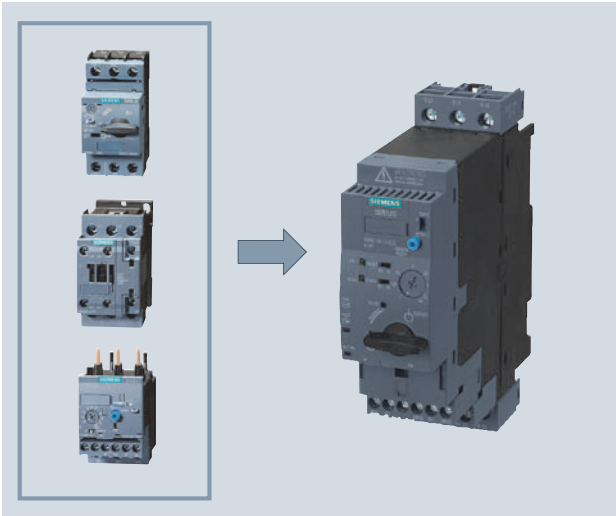
## Overview

**3RA6 fuseless compact starters and infeed system for 3RA6**

3RA62 reversing starter

Integrated functionality

The SIRIUS 3RA6 compact starters are a generation of innovative load feeders with the integrated functionality of a motor starter protector, contactor and electronic overload relay. In addition, various functions of optional mountable accessories (e.g. auxiliary switches, surge suppressors) are already integrated in the SIRIUS compact starter.



3RA6 compact starters with the integrated functionality of a motor starter protector, contactor and electronic overload relay.

Applications

The SIRIUS compact starters can be used wherever standard three-phase motors up to 32 A (20 HP/460 V) are directly started.

The compact starters are not suitable for the protection of DC loads.

Approvals according to IEC, UL, CSA and CCC standards have been issued for the compact starters.

Low variance of devices

Thanks to wide setting ranges for the rated current and wide voltage ranges, the equipment variance is greatly reduced compared to conventional load feeders.

Very high operational reliability

The high short-circuit breaking capacity and defined shut-down when the end of service life is reached means that the SIRIUS compact starter achieves a very high level of operational reliability that would otherwise have only been possible with considerable additional outlay. This sets it apart from devices with similar functionality.

Safe disconnection

The auxiliary switches (NC contacts) of the 3RA6 compact starters are designed as mirror contacts. This enables their use for safe disconnection - e.g. EMERGENCY STOP up to SIL 1 (IEC 62061) or PL c (ISO 13849-1) or, if used in conjunction with an additional infeed contactor, up to SIL 3 (IEC 62061) or PL e (ISO 13849-1).

Communications integration through AS-Interface

To enable communications integration through AS-Interface there is an AS-i add-on module available in several versions for mounting instead of the control circuit terminals on the SIRIUS compact starter.

The design of the AS-i add-on module permits a group of up to 62 feeders with a total of four cables to be connected to the control system. This reduces wiring work considerably compared to the parallel wiring method.

Communications integration using IO-Link

Up to 4 compact starters in IO-Link version (reversing and direct-on-line starters) can be connected together and conveniently linked to the IO-Link master through a standardized IO-Link connection. The SIRIUS 4SI electronic modules are used e.g. as IO-Link masters for connection to the SIMATIC ET 200S distributed I/O system.

The IO-Link connection enables a high density of information in the local range.

Details of the communications integration using IO-Link, see [Chapter 14 Communications](#).

The diagnostics data of the process collected by the 3RA6 compact starter, e.g. short circuit, end of service life, limit position etc., are not only indicated on the compact starter itself but also transmitted to the higher-level control system through IO-Link.

Thanks to the optionally available operator panel, which can be installed in the control cabinet door, it is easy to control the 3RA6 compact starters with IO-Link from the control cabinet door.

Permanent wiring / easy replacement

Using the SIRIUS infeed system for 3RA6 (see page 4/16) it is possible to carry out the wiring in advance without a compact starter needing to be connected.

A compact starter is very easily replaced simply by pulling it out of the device without disconnecting the wiring.

Even with screw connections or mounting on a standard mounting rail there is no need to disconnect any wiring (on account of the removable main and control circuit terminals) in order to replace a compact starter.

Consistent solution from the infeed to the motor feeder

The SIRIUS infeed system for 3RA6 with integrated PE bar is offered as a user-friendly possibility of feeding in summation currents up to 100 A with a maximum conductor cross-section of 2/0 AWG and connecting the motor cable directly without additional intermediate terminals.

Screw and spring-type terminals

The SIRIUS compact starters and the infeed system for 3RA6 are available with screw and spring-type terminals.

## SIRIUS 3RA6 Compact Starters

## General data

To comply with the clearance and creepage distances demanded according to UL 508 there are the following infeed possibilities:

Type of infeed	Feeder terminal (according to UL 508, type E)	Type
Conventional wiring	Terminal block for "Self-Protected Combination Motor Controller (Type E)"	<b>3RV29 28-1H</b>
Three-phase busbars	Three-phase infeed terminal for constructing "Type E Starters", UL 508	<b>3RV29 25-5EB</b>
Infeed systems for 3RA6	Infeed on left, 50/70 mm <sup>2</sup> , screw terminal with 3 sockets, outgoing terminal with screw/spring-type connections, including PE bar	<b>3RA68 13-8AB</b> (screw terminals), <b>3RA68 13-8AC</b> (spring-type terminals)

**SIRIUS 3RA6 compact starters**

The SIRIUS 3RA6 compact starters are universal motor starters according to IEC/EN 60947-6-2. As control and protective switching devices (CPS) they can connect, convey and disconnect the thermal, dynamic and electrical loads from short-circuit currents up to  $I_{cs} = 53$  kA, i.e. they are essentially weld-free. They combine the functions of a motor starter protectors, a contactor and a solid-state overload relay in a single enclosure and can be used wherever standard induction motors up to 32 A (up to approx. 20 HP at 480 V AC) are started directly. Available versions are the direct-on-line starters with 45 mm width and the reversing starters with 90 mm width.

The reversing starter version comes with not only an internal electrical interlock but also with a mechanical interlock to prevent simultaneous actuation of both directions of rotation.

3RA6 compact starters are supplied in 5 current setting ranges. The 3RA61 and 3RA62 have 2 control voltage ranges (AC/DC), the 3RA64 and 3RA65 have one control voltage range (DC):

Current setting range	At 460 V AC for induction motors Standard output P HP	Rated control supply voltage for	
		3RA61, 3RA62 compact starters	3RA64, 3RA65 compact starters for IO-Link
A	HP	V AC/DC	V DC
0.1 ... 0.4	0.12	24	24
0.32 ... 1.25	0.43 ... 1.68	110 ... 240	
1 ... 4	1.34 ... 5.36		
3 ... 12	4.02 ... 16.1		
8 ... 32	10.7 ... 42.9		

Note:

*The 3RA1 motor starters can be used as motor starters > 32 A up to 100 A.*

*The SENTRON 3VL circuit breakers and the SIRIUS 3RT contactors can be used for motor starters > 100 A.*

Operating conditions

The SIRIUS 3RA6 compact starters are suitable for use in nearly all climates. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable covers must be provided for installation in dusty and damp locations.

The SIRIUS compact starters are generally designed to degree of protection IP20. The permissible ambient temperature during operation is -20 to +60 °C.

The maximum short-circuit current based on UL testing is 30 kA up to 12 A and 15 kA for the 8 ... 32 A versions at 480 V.

Note:

*More technical specifications can be found in the system manual at*

[www.siemens.com/compactstarter](http://www.siemens.com/compactstarter)

Overload tripping times

The overload tripping time can be set on the device to less than 10 s (CLASS 10) and less than 20 s (CLASS 20 for heavy starting). As the breaker mechanism still remains closed after an overload, resetting is possible by either local manual reset or autotrip after 3 minutes cooling time.

With autoreset there is no need to open the control cabinet.

Diagnostics options

The compact starter provides the following diagnostics options on site:

- With LEDs
  - Connection to the control voltage
  - Position of the main contacts
- With mechanical indication
  - Tripping due to overload
  - Tripping due to short-circuit
  - Tripping due to malfunction (end of service life reached because of worn switching contacts or a worn switching mechanism or faults in the control electronics)

These states can also be evaluated in the higher-level control system:

- With conventional wiring using the integrated auxiliary and signaling switches of the compact starter
- With AS-Interface or IO-Link in even greater detail using the respective communication interface

Four complement variants for 3RA6 compact starters

- For standard mounting rail or screw mounting: basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals
- For standard mounting rail or screw mounting when using the AS-i add-on module: comes without control circuit terminals because the AS-i add-on module is attached in lieu of them
- For use with the infeed system for 3RA6: without main circuit terminals because they are supplied with the infeed system and the expansion modules
- For use with the infeed system for 3RA6 and AS-i add-on module: without main or control circuit terminals as they are not needed
- The control circuit terminals are always required by the compact starters for IO-Link; the main circuit terminals depend on the use of the infeed system.

Additional components of the 3RA6

The two control circuit terminals on the 3RA61/3RA62 allow access to signalling contacts for overload (1 CO) and short-circuit / malfunction (1 NO). Furthermore, the 3RA61 has two auxiliary contacts (1 NO + 1 NC) for indicating the position of the main contacts, while the 3RA62 has one auxiliary contact (1 NO) per direction of rotation per main contact.

# 3RA6 Compact Starters

## Overview

### Function

#### Trip units

The SIRIUS 3RA6 compact starters are equipped with the following trip units:

- Inverse-time delayed solid-state overload release
- Instantaneous electronic trip unit (electromagnetic short-circuit release)

The overload releases can be adjusted in accordance with the load current.

The electronic trip units are permanently set to a value 13 times the maximum rated current of the 4 A, 12 A and 32 A starter and thus enable trouble-free starting of motors.

#### Trip classes

The trip classes of electronically delayed trip units are based on the tripping time ( $t_A$ ) at 7.2 times the set current in the cold state (excerpt from IEC 60947-4):

CLASS 10:  $4s < t_A < 10s$

CLASS 20:  $6s < t_A < 20s$  (for heavy starting)

The compact starter must trip within this time.

#### Disconnection due to malfunction

The following malfunctions can be detected:

- End of service life
  - Worn switching contacts (for electrical endurance see "Technical data")
  - Worn switching mechanisms (for mechanical endurance see "Technical data")
- Faults in the control electronics

#### Short-circuit protection

If a short-circuit occurs, the short-circuit releases of the SIRIUS 3RA6 compact starters isolate the faulty motor starter from the network and thus prevent further damage. The short-circuit releases are factory-set to 14 times the value of the maximum rated current  $I_n$  of the device.

The SIRIUS compact starters have a short-circuit breaking capacity up to 30 kA at a voltage of 480 V AC.

#### Overload relay function

In the event of an overload, the compact starter switches off without the breaker mechanism being opened.

The overload trip can be signaled to the higher-level control system through an integrated signal switch.

The overload signal can be reset automatically or by means of a manual reset.

#### Control through AS-Interface

For control through AS-Interface, the AS-i add-on module is mounted instead of the two control circuit terminals on the SIRIUS 3RA6 compact starters (direct-on-line starters and reversing starters).

The AS-i auxiliary voltage and the AS-i data line are installed on the AS-i add-on module easily and quickly without tools by means of two plug-in connector blocks with insulation displacement connection.

The AS-i add-on module is equipped with the latest A/B technology and has an addressing socket onboard.

An addressing unit is required and can be ordered for addressing the AS-i add-on module.

Bit assignment (see below) is similar to that for the SIRIUS motor starters, which means that the same programming can be used here.

DI 0.0 ready
DI 0.1 motor on
DI 0.2 group fault
DI 0.3 group warning

DO 0.0 motor on or motor clockwise
DO 0.1 motor counterclockwise

A 24 V DC PELV power supply unit according to EN 61140 safety class III is required for the auxiliary voltage.

The AS-i data line is supplied with voltage by means of a 30 V DC AS-i power supply unit and is controlled by means of the AS-i master.

The AS-i add-on modules are available in the following five versions:

- AS-i add-on module for compact starters
- AS-i add-on module for compact starters with two local inputs for safe disconnection of the "clockwise rotation" or "counterclockwise rotation" outputs
- AS-i add-on module with two free external inputs
- AS-i add-on module with two free external outputs
- AS-i add-on module with one free external input and output

The AS-i add-on module can only be used with compact starters with a control voltage of 24 V AC/DC.

#### Integrated auxiliary switches

The control circuit terminals of the SIRIUS 3RA6 compact starters have the following connections:

- A1/A2 for the control voltage for 3RA61, A1/A2 and B1/B2 for the control voltage for 3RA62
- "Overload" signal switch
- "Fault" signal switch, e. g. "short-circuit"
- Internal auxiliary switch for position of the main contacts (in case of direct-on-line starters: 1 NO + 1 NC with mirror contact to the main contact; in case of reversing starters: 2 NO)

# 3RA6 Compact Starters

## Overview

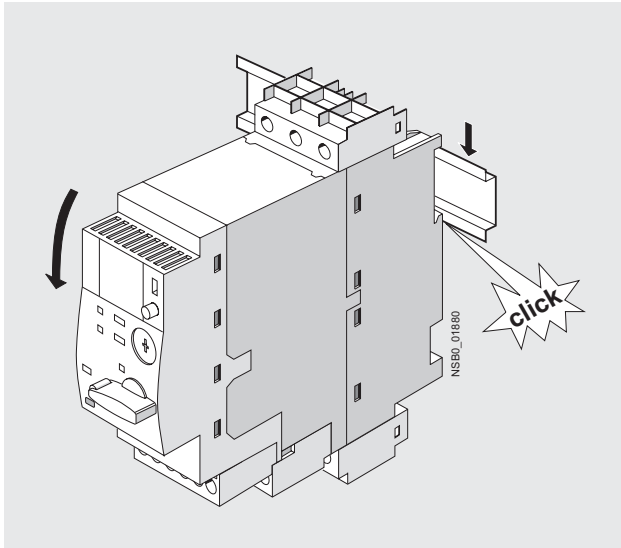
### Design

#### Mounting

The 3RA6 compact starters can be mounted in 4 ways:

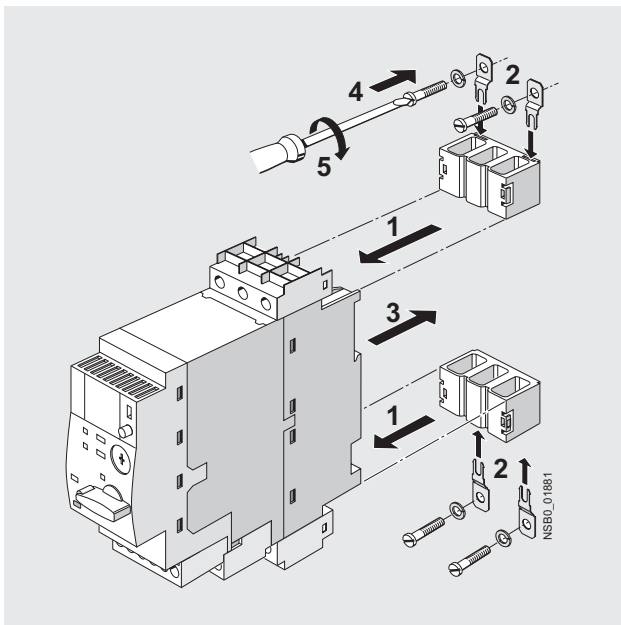
1) By snapping onto a TH 35 standard mounting rail

The SIRIUS compact starters can be snapped onto a standard mounting rail according to EN 60715 with a width of 35 mm.



2) By screw fixing to a flat surface

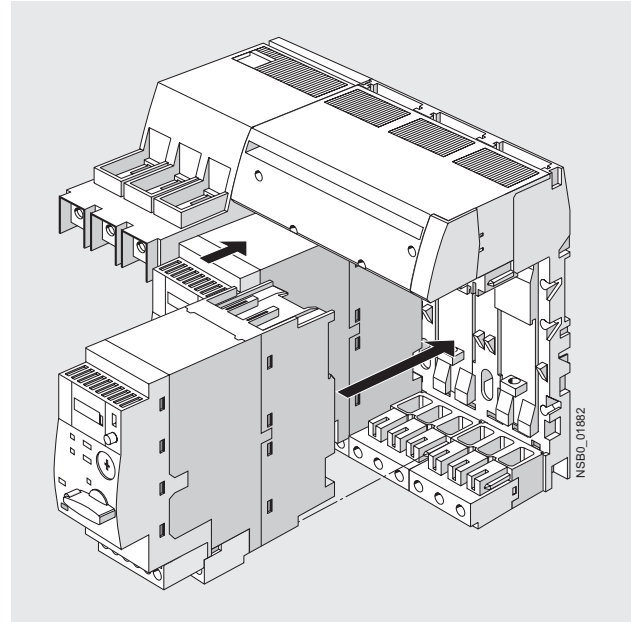
The SIRIUS compact starters are suitable for screw fixing to a flat surface. One set of 3RA69 40-0A adapters for screw connection (including push-in lugs) is required per direct-on-line starter, two sets are required per reversing starter.



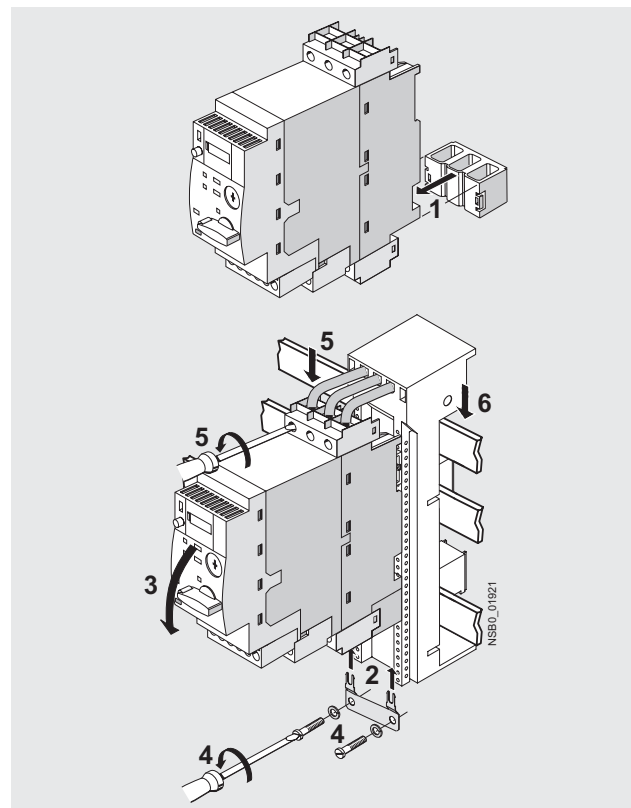
1 ... 5: order of mounting steps

3) By integrating in the infeed system for 3RA6

The SIRIUS compact starters can be assembled with the infeed system for 3RA6 (see "Infeed system for 3RA6").



4) By using the 8US busbar adapter for Fast Bus systems with 60 mm busbar center-to-center clearance



1 ... 6: order of mounting steps

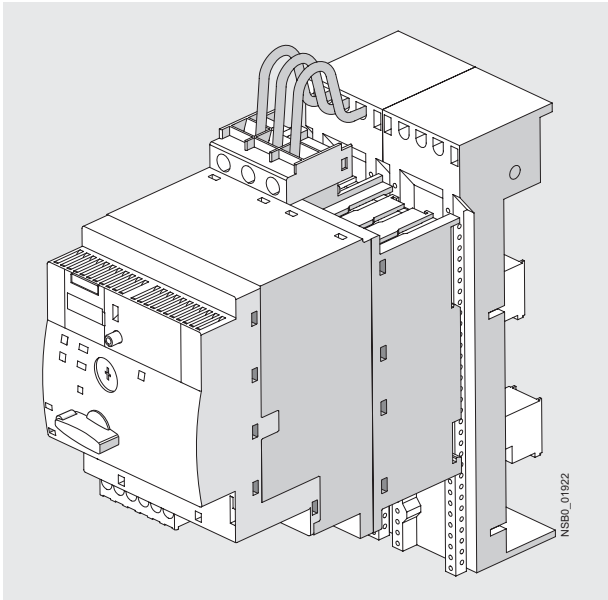
# 3RA6 Compact Starters

## Overview

### 4a) By using an additional device holder in the case of reversing starters

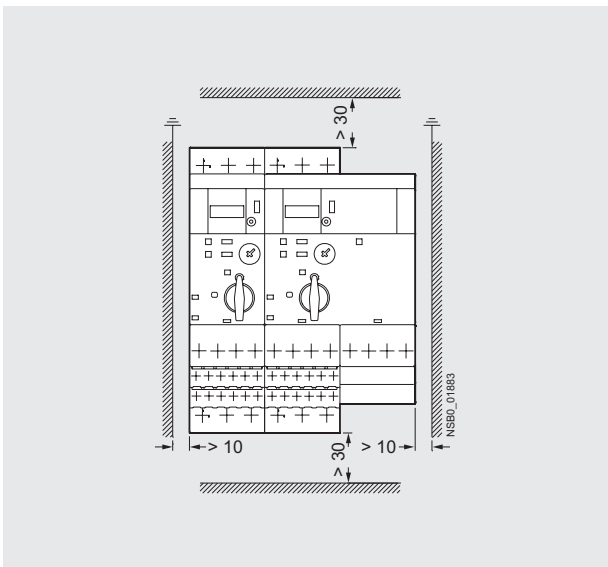
When the 8US busbar adapter is used on Fast Bus systems with 60 mm busbar center-to-center clearance, a device holder is needed in addition for a reversing starter on account of its double width.

The reversing starter is mounted in the same way as the direct-on-line starter on the busbar adapter. Then the device holder is snapped on alongside the busbar adapter.



### Mounting regulations

The module can be installed horizontally or vertically. For the different installations attention must be paid however to limit values for protective separation according to IEC/EN 60947-2 of the compact starters (for details see the "Technical specifications").



The following distances must be observed when mounting the compact starters:

- Lateral clearance to grounded components: 10 mm
- Arcing space at top and bottom: 30 mm

# SIRIUS 3RA6 Compact Starters

3RA61, 3RA62 compact starters; 3RA61 direct-on-line starters

## Selection and ordering data



3RA61 20-1CB32



3RA61 20-2EB32

Width 45 mm  
One set of 3RA69  
40-0A adapters  
is required for  
screw fixing.



3RA62 50-1CP32



3RA62 50-1CP32

Width 90 mm  
One set of  
3RA69  
40-0A adapters  
is required for  
screw fixing.

Standard induction motor 4-pole at 400 V AC <sup>1)</sup> Standard output <i>P</i>	Setting range for solid-state overload release	Order No.	Order No.
HP	A		
<b>For use with the infeed system for 3RA6 and with the AS-i add-on module or as a replacement device, without main and control circuit terminals</b>			
--	0.1 ... 0.4	3RA6□□0-0A □32	—
1/2	0.32 ... 1.25	3RA6□□0-0B □32	—
2	1 ... 4	3RA6□□0-0C □32	—
7 1/2	3 ... 12	3RA6□□0-0D □32	—
20	8 ... 32	3RA6□□0-0E □32	—
		<b>Screw terminals<sup>2)</sup></b>	<b>Spring-type terminals</b>
<b>For standard mounting rail or screw mounting, including 1 pair of main circuit terminals and 1 pair of control circuit terminals</b>			
--	0.1 ... 0.4	3RA6□□0-1A □32	3RA6□□0-2A □32
1/2	0.32 ... 1.25	3RA6□□0-1B □32	3RA6□□0-2B □32
2	1 ... 4	3RA6□□0-1C □32	3RA6□□0-2C □32
7 1/2	3 ... 12	3RA6□□0-1D □32	3RA6□□0-2D □32
20	8 ... 32	3RA6□□0-1E □32	3RA6□□0-2E □32
<b>For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals</b>			
--	0.1 ... 0.4	3RA6□□0-1A □33	3RA6□□0-2A □33
1/2	0.32 ... 1.25	3RA6□□0-1B □33	3RA6□□0-2B □33
2	1 ... 4	3RA6□□0-1C □33	3RA6□□0-2C □33
7 1/2	3 ... 12	3RA6□□0-1D □33	3RA6□□0-2D □33
20	8 ... 32	3RA6□□0-1E □33	3RA6□□0-2E □33
<b>For standard mounting rail or screw mounting when using the AS-i add-on module with 1 pair of main circuit terminals, without control circuit terminals</b>			
--	0.1 ... 0.4	3RA6□□0-1A □34	3RA6□□0-2A □34
1/2	0.32 ... 1.25	3RA6□□0-1B □34	3RA6□□0-2B □34
2	1 ... 4	3RA6□□0-1C □34	3RA6□□0-2C □34
7 1/2	3 ... 12	3RA6□□0-1D □34	3RA6□□0-2D □34
20	8 ... 32	3RA6□□0-1E □34	3RA6□□0-2E □34
		12 25 B P	12 25 B P

**Order No. supplements for rated control supply voltage**

- Direct-on-line starter
- Reversing duty starter
- 24 V AC/DC (for combining with AS-I add-on module)
- 110 ... 240 V AC/DC

<sup>1)</sup> Selection depends on the motor full load amps. Horse Power ratings provided for reference only.

<sup>2)</sup> A set of 3RA69 40-0A adapters is required for screw mounting.



## SIRIUS 3RA6 Compact Starters

3RA64, 3RA65 compact starters for IO-Link

## Selection and ordering data



3RA64 with 3RA69 11-1A

- **Direct-on-line starters**

- Rated control supply voltage 24 V DC
- Width 45 mm
- One set of 3RA69 40-0A adapters is required for screw fixing

Standard induction motor 3-pole at 460 V AC Standard output P HP <sup>1)</sup>	Setting range for solid-state overload release A	Screw terminals Order No.	Spring-type terminals Order No.
<b>For standard mounting rail or screw mounting, including 1 pair of main circuit terminals and 1 pair of control circuit terminals</b>			
--	0.1 ... 0.4	<b>3RA64 00-1AB42</b>	<b>3RA64 00-2AB42</b>
½	0.32 ... 1.25	<b>3RA64 00-1BB42</b>	<b>3RA64 00-2BB42</b>
2	1 ... 4	<b>3RA64 00-1CB42</b>	<b>3RA64 00-2CB42</b>
7½	3 ... 12	<b>3RA64 00-1DB42</b>	<b>3RA64 00-2DB42</b>
20	8 ... 32	<b>3RA64 00-1EB42</b>	<b>3RA64 00-2EB42</b>
<b>For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals</b>			
—	0.1 ... 0.4	<b>3RA64 00-1AB43</b>	<b>3RA64 00-2AB43</b>
½	0.32 ... 1.25	<b>3RA64 00-1BB43</b>	<b>3RA64 00-2BB43</b>
2	1 ... 4	<b>3RA64 00-1CB43</b>	<b>3RA64 00-2CB43</b>
7½	3 ... 12	<b>3RA64 00-1DB43</b>	<b>3RA64 00-2DB43</b>
20	8 ... 32	<b>3RA64 00-1EB43</b>	<b>3RA64 00-2EB43</b>



3RA65 with 3RA69 11-1A

- **Reversing starters**

- Rated control supply voltage 24 V DC
- Width 90 mm
- One set of 3RA69 40-0A adapters is required for screw fixing

<b>For standard mounting rail or screw mounting, including 1 pair of main circuit terminals and 1 pair of control circuit terminals</b>			
—	0.1 ... 0.4	<b>3RA65 00-1AB42</b>	<b>3RA65 00-2AB42</b>
½	0.32 ... 1.25	<b>3RA65 00-1BB42</b>	<b>3RA65 00-2BB42</b>
2	1 ... 4	<b>3RA65 00-1CB42</b>	<b>3RA65 00-2CB42</b>
7½	3 ... 12	<b>3RA65 00-1DB42</b>	<b>3RA65 00-2DB42</b>
20	8 ... 32	<b>3RA65 00-1EB42</b>	<b>3RA65 00-2EB42</b>
<b>For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals</b>			
—	0.1 ... 0.4	<b>3RA65 00-1AB43</b>	<b>3RA65 00-2AB43</b>
½	0.32 ... 1.25	<b>3RA65 00-1BB43</b>	<b>3RA65 00-2BB43</b>
2	1 ... 4	<b>3RA65 00-1CB43</b>	<b>3RA65 00-2CB43</b>
7½	3 ... 12	<b>3RA65 00-1DB43</b>	<b>3RA65 00-2DB43</b>
20	8 ... 32	<b>3RA65 00-1EB43</b>	<b>3RA65 00-2EB43</b>

1) Selection depends on the motor full load amps. Horse power ratings provided for reference only.



# SIRIUS 3RA6 Compact Starters

## Accessories

### Overview

#### Accessories for SIRIUS 3RA6 compact starters

The following accessories are available for the 3RA6 compact starters:

- AS-i add-on module: [see AS-Interface Add-On Modules for 3RA6, page 4/14](#)
- External auxiliary switch blocks: Snap-on auxiliary switch as versions 2 NO, 2 NC and 1 NO +1 NC with screw or spring-type connections; the contacts of the auxiliary switch block open and close jointly with the main contacts of the compact starter. The NC contacts are designed as mirror contacts.
- Control kit: aid for manually closing the main contacts in order to evaluate the wiring and motor direction under conditions of short-circuit protection
- Adapter for screw mounting the compact starter, including push-in lugs
- Main circuit terminals: Available in screw and spring-type terminals
- Main circuit terminals for mixed connection method: With the main circuit terminal for the mixed connection method it is also possible in the main circuit to change over from the screw connection method on the incoming side to the spring-type connection method on the outgoing side. This enables for example the side-by-side mounting of several compact starters and their cost-effective connection using the three-phase busbars on the infeed side. The motors are then directly connected by the quick and reliably contacting spring-type connection method.

#### Accessories for UL applications

The terminal block for "Self-Protected Combination Motor Controller", type E is available for complying with the clearance and creepage distances according to UL 508.

#### Accessories for infeed using three-phase busbar systems

The three-phase busbars can be used as an easy, time-saving and clearly arranged means of feeding SIRIUS 3RA6 compact starters with screw connection. Motor starter protectors size S00 and S0 can also be integrated.

The busbars are suitable for between 2 and 5 devices. However, any kind of extension up to a maximum summation current of 63 A is possible by clamping the terminals of an additional busbar (rotated by 180°) underneath the terminals of the respective last motor circuit protector.

A connecting piece is required for the combination with motor starter protector size S00. S00 and S0 motor starter protectors of the 3RV2 series do not require the additional connecting piece. The motor starter protectors are supplied by appropriate feeder terminals. Special feeder terminals are required for constructing "Type E Starters" according to UL/CSA.

The three-phase busbar systems are finger-safe but empty connection terminals must be fitted with covers. They are designed for any short-circuit stress which can occur at the output side of connected SIRIUS 3RA6 compact starters or motor starter protectors.

#### 8US Fast Bus busbar adapters for 60 mm systems

The compact starters are mounted directly with the aid of busbar adapters on the Fast Bus busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs. These starters are suitable for copper busbars with a width from 12 to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

The 8US Fast Bus busbar system can be loaded with a maximum summation current of 630A.

The "reversing starter" version requires a device holder along side the busbar adapter for lateral mounting.

The compact starters are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For more accessories such as incoming and outgoing terminals, flat copper profiles etc., [see Section 5 "Fastbus Busbar Systems"](#).

#### Accessories for operation with closed control cabinet doors

Door-coupling rotary operating mechanisms for standard and emergency-stop applications are available for operating the compact starter with closed control cabinet doors.

#### Accessories for SIRIUS 3RA6 compact starters in IO-Link version


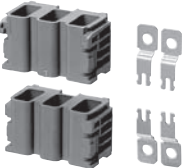








The following accessories are available specifically for the 3RA64, 3RA65 compact starters:

- The 4SI SIRIUS solid-state module as IO-Link master allows for the simple and economical connection of SIRIUS controls with IO-Link (e.g up to four groups of 4 compact starters) to the multifunctional SIMATIC ET 200S distributed I/O system.
- Additional connection cables for side-by-side mounting of up to 4 compact starters
- Operator panel for local control and diagnostics of up to 4 compact starters coupled to each other

# SIRIUS 3RA6 Compact Starters

## Accessories

### Selection and ordering data

Version	Order No.	Std. pack qty.	Weight approx. kg
<b>Accessories for 3RA6 compact starters</b>			
 3RA69 50-0A <b>Control kits</b> For mechanical actuation of the compact starter	<b>3RA69 50-0A</b>	1 unit	0.004
 3RA69 40-0A <b>Adapters for screw mounting the compact starter</b> (set including push-in lugs) Direct-on-line starters require 1 set, reversing starters 2 sets.	<b>3RA69 40-0A</b>	1 unit	0.152
<b>Screw terminals</b> 			
 3RA69 11-1A <b>Auxiliary switch blocks for compact starters</b> <ul style="list-style-type: none"> <li>• 2 NO</li> <li>• 2 NC</li> <li>• 1 NO +1 NC</li> </ul> (these auxiliary contacts are positively driven.)	<b>3RA69 11-1A</b> <b>3RA69 12-1A</b> <b>3RA69 13-1A</b>	1 unit 1 unit 1 unit	0.018 0.018 0.018
 3RA69 20-1A <b>Main circuit terminals</b> (line and load side)	<b>3RA69 20-1A</b>	1 unit	0.038
 3RA69 20-1B <b>Control circuit terminals</b> <ul style="list-style-type: none"> <li>• For 3RA61</li> <li>• For 3RA62</li> </ul>	<b>3RA69 20-1B</b> <b>3RA69 20-1C</b>	1 unit 1 unit	0.042 0.042
<b>Spring-type terminals</b> 			
 3RA69 11-2A <b>Auxiliary switch blocks for compact starters</b> <ul style="list-style-type: none"> <li>• 2 NO</li> <li>• 2 NC</li> <li>• 1 NO +1 NC</li> </ul> (these auxiliary contacts are positively driven.)	<b>3RA69 11-2A</b> <b>3RA69 12-2A</b> <b>3RA69 13-2A</b>	1 unit 1 unit 1 unit	0.018 0.018 0.018
 3RA69 20-2A <b>Main circuit terminals</b> (line and load side)	<b>3RA69 20-2A</b>	1 unit	0.049
 3RA69 20-2B <b>Control circuit terminals</b> <ul style="list-style-type: none"> <li>• For 3RA61</li> <li>• For 3RA62</li> </ul>	<b>3RA69 20-2B</b> <b>3RA69 20-2C</b>	1 unit 1 unit	0.036 0.036

4 COMBINATION STARTERS

# SIRIUS 3RA6 Compact Starters

## Accessories

Version	Order No.	Std. pack qty.	Weight approx. kg
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### Accessories for 3RA6 compact starters (continued)



3RA69 20-3A

**Main circuit terminals for mixed connection method**  
 One set comprises:  
 • 1 joint block on the line side for the screw connection method  
 • 1 joint block on the motor side for the spring-type connection method

	<b>3RA69 20-3A</b>	1 unit	0.044
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Version	Order No.	Std. pack qty.	Weight approx. kg
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### Accessories specifically for 3RA64, 3RA65 compact starters with IO-Link



3RA69 31-0A

**Additional connection cables (flat) for side-by-side mounting of up to 4 compact starters**  
 • 10-pole  
   - 8 mm<sup>1)</sup>  
   - 200 mm<sup>1)</sup>  
 • 14-pole  
   - 8 mm<sup>2)</sup>  
   - 200 mm

	<b>3RA69 32-0A</b>	5 units	0.007
	<b>3RA69 33-0B</b>	5 units	0.012
	<b>3RA69 31-0A</b>	5 units	0.007
	<b>3RA69 33-0C</b>	5 units	0.014



3RA69 35-0A

**Operator panels**  
 - 1 operator panel  
 - 1 enabling module  
 - 1 interface cover  
 - 1 fixing terminal

	<b>3RA69 35-0A</b>	1 unit	0.052
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	<b>3RA69 36-0A</b>	1 unit	0.002
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	<b>3RA69 36-0B</b>	5 units	0.001
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	<b>3RA69 33-0A</b>	1 unit	0.114
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	<b>3RK1 005-0LB00-0AA0</b>	1 unit	0.057
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3RK1 005-0LB00-0AA0

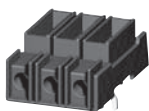
**SIRIUS 4SI solid-state modules**  
 IO-Link master for connection of up to 4 SIRIUS controls (max. 16 in groups of 4) with IO-Link (3-wire connection) to SIMATIC ET 200S, width 15 mm, supports firmware update (STEP 7 V5.4 SP5 and higher)  
 Can be used with the following terminal modules:  
 • TM-E15S26-A1 (screw terminals)  
 • TM-E15C26-A1 (spring-type terminals)  
 • TM-E15N26-A1 (Fast Connect)

<sup>1)</sup> 10-pole connection cables are required for EMERGENCY-STOP group concepts.

<sup>2)</sup> Is included in the scope of supply of the SIRIUS 3RA6 compact starter in IO-Link version.

Version	Order No.	Std. pack qty.	Weight approx. kg
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### Terminal blocks and phase barriers for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508



3RV29 28-1H

*Note:*  
 UL 508 demands 1-inch clearance and 2-inch creepage distance on the line side for "Combination Motor Controller Type E". The following terminal blocks or phase barriers must be used in 3RV20 motor starter protectors.

The terminal blocks or phase barriers cannot be used in combination with the 3RV19 .5 three-phase busbars.

For construction with three-phase busbars, see "Busbar accessories".

	<b>3RV29 28-1H</b>	1 unit	0.065
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# SIRIUS 3RA6 Compact Starters

## Accessories

4  
COMBINATION  
STARTERS

	Modular spacing mm	Number of motor starter protectors that can be connected			Rated current $I_n$ at 690 V A	For motor starter protectors Size	Order No.	Std. pack qty.	Weight approx.
		Without lateral accessories	With lateral auxiliary switch	With auxiliary release					
<b>Three-phase busbars<sup>1)</sup></b>									
For feeding several motor starter protectors with screw terminals, mounted side by side on standard mounting rails, insulated, with touch protection									
3RV1915-1AB	45 <sup>3)</sup>	2	--	--	63	S00, S0 <sup>2)</sup>	<b>3RV1915-1AB</b>	1 unit	0.044
		3	--	--	63	S00, S0 <sup>2)</sup>	<b>3RV1915-1BB</b>	1 unit	0.071
		4	--	--	63	S00, S0 <sup>2)</sup>	<b>3RV1915-1CB</b>	1 unit	0.099
		5	--	--	63	S00, S0 <sup>2)</sup>	<b>3RV1915-1DB</b>	1 unit	0.124
3RV1915-1BB	55 <sup>4)</sup>	--	2	--	63	S00, S0 <sup>2)</sup>	<b>3RV1915-2AB</b>		
		--	3	--	63	S00, S0 <sup>2)</sup>	<b>3RV1915-2BB</b>		
		--	4	--	63	S00, S0 <sup>2)</sup>	<b>3RV1915-2CB</b>		
		--	5	--	63	S00, S0 <sup>2)</sup>	<b>3RV1915-2DB</b>		
3RV1915-1CB		2	--	--	108	S2	<b>3RV1935-1A</b>		
		3	--	--	108	S2	<b>3RV1935-1B</b>		
		4	--	--	108	S2	<b>3RV1935-1C</b>		
3RV1915-1DB	63 <sup>5)</sup>	--	--	2	63	S00, S0 <sup>2)</sup>	<b>3RV1915-3AB</b>		
		--	--	4	63	S00, S0 <sup>2)</sup>	<b>3RV1915-3CB</b>		
	75 <sup>5)</sup>	--	2	2	108	S2	<b>3RV1935-3A</b>		
		--	3	3	108	S2	<b>3RV1935-3B</b>		
		--	4	4	108	S2	<b>3RV1935-3C</b>		

<sup>1)</sup> Not suitable for 3RV21 motor starter protectors for motor protection with overload relay function and for 3RV27 and 3RV28 circuit breakers according to UL 489/CSA C22.2 No. 5.

<sup>2)</sup> Approved for motor starter protectors size S0 with  $I_n \leq 32$  A.

<sup>3)</sup> For 3RV2 motor starter protectors without accessories mounted on the side.

<sup>4)</sup> For 3RV2 motor starter protectors with auxiliary switches with 1 NO + 1 NC, 2 NO and 2 NC mounted on the left (9 mm wide).

<sup>5)</sup> For 3RV2 motor starter protectors with mounted accessories (18 mm wide). Auxiliary switches with 2 NO + 2 NC or signaling switch (mounted on the left) or with auxiliary release (mounted on the right).

Conductor cross-section Solid or stranded mm <sup>2</sup>	Finely stranded with end sleeve mm <sup>2</sup>	AWG cables, solid or stranded AWG	Tightening torque Nm	For motor starter protectors/circuit breakers Size	Order No.	Weight approx.

<b>Three-phase infeed terminals</b>						
<b>Connection from top</b>						
3RV2925-5AB	2.5 ... 25	2.5 ... 16	10 ... 4	3 ... 4	S00, S0	<b>3RV2925-5AB</b>
	2 x (2.5 ... 50) <sup>1)</sup>	2 x (2.5 ... 35) <sup>1)</sup>	2 x (10 ... 1/0) <sup>1)</sup>	4 ... 6	S2 <b>NEW</b>	<b>3RV2935-5A</b>
	1 x (2.5 ... 70) <sup>1)</sup>	1 x (2.5 ... 50) <sup>1)</sup>	1 x (10 ... 2/0) <sup>1)</sup>			
3RV2935-5A						0.043
<b>Connection from below</b>						
This terminal is connected in place of a switch, please take the space requirement into account.						
3RV2915-5B	2.5 ... 25	2.5 ... 16	10 ... 4	Input: 4, Output: 2 ... 2.5	S00, S0	<b>3RV2915-5B</b>
						0.093

<b>Three-phase infeed terminals for constructing "Type E Starters"</b>						
<b>Connection from top</b>						
3RV2925-5EB	2.5 ... 25	2.5 ... 16	10 ... 4	3 ... 4	S00, S0	<b>3RV2925-5EB</b>
	2 x (2.5 ... 50) <sup>1)</sup>	2 x (2.5 ... 35) <sup>1)</sup>	2 x (10 ... 1/0) <sup>1)</sup>	4 ... 6	S2 <b>NEW</b>	<b>3RV2935-5E</b>
	1 x (2.5 ... 70) <sup>1)</sup>	1 x (2.5 ... 50) <sup>1)</sup>	1 x (10 ... 2/0) <sup>1)</sup>			
3RV2935-5E						0.044

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

# SIRIUS 3RA6 Compact Starters

## Accessories

Version	Order No.	Std. pack qty.	Weight approx. kg
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### 8US Fast Bus busbar adapters for 60 mm systems



8US12 11-1NS10

For flat copper profiles according to DIN 46433  
Width: 12 ... 30 mm  
Thickness: 4 ... 5 mm or 10 mm

**8US12 11-1NS10**

1 unit

0.337

### Device holders for lateral mounting along side the Fast Bus busbar adapter for 60 mm systems



8US12 50-1AA10

Required in addition to the busbar adapter for mounting a reversing starter

**8US12 50-1AA10**

1 unit

0.239

Version	Color of handle	Version of extension shaft mm	Order No.	Std. pack qty.	Weight approx. kg
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### Door-coupling rotary operating mechanisms for operating the compact starter with closed control cabinet doors



3RV29 26-0B

The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and an extension shaft of 130/330 mm in length (6 mm x 6 mm). The door-coupling rotary operating mechanisms are designed to degree of protection IP65. The door interlocking prevents accidental opening of the control cabinet door in the ON position of the motor starter protector. The OFF position can be locked with up to 3 padlocks.

**Door-coupling rotary operating mechanisms**

Black

130

**3RV29 26-0B**

1 unit

0.111

**EMERGENCY-STOP door-coupling rotary operating mechanisms**

Red/  
Yellow

130

**3RV29 26-0C**

1 unit

0.110

Version	Order No.	Std. pack qty.	Weight approx. kg
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### Tools for opening spring-type terminals by hand



3RA29 08-1A

#### Screwdrivers

for all SIRIUS devices with spring-type terminals  
Length approx. 200 mm,  
3.0 mm x 0.5 mm,  
titanium gray/black,  
partially insulated

#### Spring-type terminals

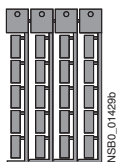


**3RA29 08-1A**

1 unit

0.045

### Blank labels



3RT19 00-1SB20

#### Unit labeling plates<sup>1)</sup>

for SIRIUS devices  
20 mm x 7 mm,  
titanium gray

**3RT19 00-1SB20**

340 units

0.200

<sup>1)</sup> PC labeling system for individual inscription of unit labeling plates available from: Murrplastik Systems, Inc. [www.murrplastik.com](http://www.murrplastik.com).

# SIRIUS 3RA6 Compact Starters

## Add-on modules for AS-Interface

### Overview

Various AS-i add-on modules are available for communication of the 3RA6 compact starter with the control system using AS-Interface:

- Standard version
- With two local inputs
- With two free external inputs
- With one free external input and one free external output
- With two free external outputs
- For local control

The AS-i add-on modules can be combined only in connection with compact starters with a rated control supply voltage of 24 V AC/DC.

#### AS-i add-on module for communications controlling

With this new module it is also possible for the connected compact starter to be operated directly using simple switches, i.e. without recourse to AS-i Communication, if required.

#### "Automatic" mode

NC contacts can be connected to the inputs Y2 and Y4 through the local terminals on the AS-i add-on module. If the "+" connections are connected simultaneously to both local inputs, the AS-i add-on module will be in "Automatic" mode, i.e. it will communicate with the control system through AS-Interface.

#### Local control

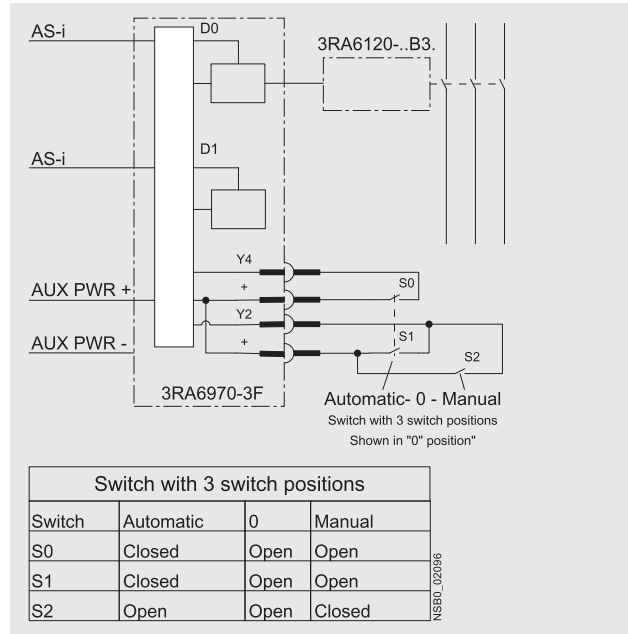
Opening the two inputs Y2 and Y4 will result in the direct disconnection of the compact starter. Operation through AS-i Communication is ended and the compact starter can now be switched on and off directly using NO contacts (one NO contact per direction of rotation on the reversing starter).

"LED AUX Power" must light up green, the 24 V DC supply must be connected and the AS-i control supply voltage must no longer be applied.

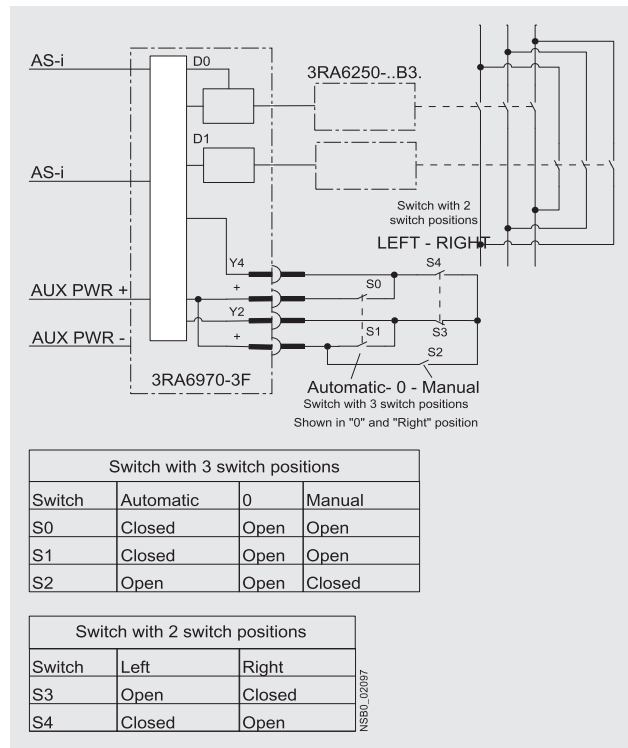
#### Resetting to "Automatic" mode

Simultaneous application of a "1" signal at the local inputs. The availability bit DI 0 is switched to a "1" signal.

If AS-i Communication is reset, the motor is first switched off and then on again when requested by the control system.



Circuit diagram example for operating a 3RA61 20 direct-on-line starter using an AS-i add-on module for on-site controller



Circuit diagram example for operating a 3RA62 50 reversing starter using an AS-i add-on module for on-site controller

## SIRIUS 3RA6 Compact Starters

## Add-on modules for AS-Interface

## Selection and ordering data

Version	Order No.	Std. pack. qty.	Weight approx.
			kg
<b>AS-i add-on modules</b>			
 <p>3RA69 70-3A</p>  <p>3RA69 70-3B to -3F</p>	<b>Standard version</b> For communication of the compact starter with the control system using AS-Interface	<b>3RA69 70-3A</b>	1 unit 0.045
	<b>With two local inputs</b> For safe disconnection through local safety relays, e.g. cable-operated switches	<b>3RA69 70-3B</b>	1 unit 0.045
	<b>With two free external inputs</b> Replaces the digital standard inputs "Motor On" and "Group warning"	<b>3RA69 70-3C</b>	1 unit 0.045
	<b>With one free external input and one free external output</b> Replaces the digital standard input "Group warning"	<b>3RA69 70-3D</b>	1 unit 0.045
	<b>With two free external outputs</b> Only for direct-on-line starters, replaces the digital standard output "Motor left"	<b>3RA69 70-3E</b>	1 unit 0.045
	<b>For local control</b> Control of the compact starter optionally using AS-Interface or local switches	<b>3RA69 70-3F</b>	1 unit 0.045
	<b>Spare parts for AS-i add-on modules</b>		
 	<b>Connectors for data and auxiliary supply cable</b> with 2 insulation displacement terminations for standard litz wires 2 x 0.5 ... 0.75 mm <sup>2</sup>		
	<ul style="list-style-type: none"> <li>• Flat, yellow, extender</li> <li>• Flat, black, extender</li> </ul>	<b>3RK1901-0NA00</b> <b>3RK1901-0PA00</b>	5 units 5 units
<b>Accessories for AS-i add-on modules</b>			
 <p>3RK1904-2AB02</p>	<b>AS-Interface addressing unit V 3.0</b> <ul style="list-style-type: none"> <li>• For AS-Interface modules and sensors and actuators with integrated AS-Interface in accordance with AS-i Specification V3.0</li> <li>• For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves)</li> <li>• With input/output test function and many other commissioning functions</li> <li>• Battery operation with 4 batteries type AA (IEC LR6, NEDA 15)</li> <li>• Scope of supply:               <ul style="list-style-type: none"> <li>- Addressing unit with 4 batteries</li> <li>- Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5m</li> </ul> </li> </ul>	<b>3RK1904-2AB02</b>	1 unit 0.540



# 3RA6 Compact Starters

Infeed systems for 3RA6 – up to 100 A

## Overview

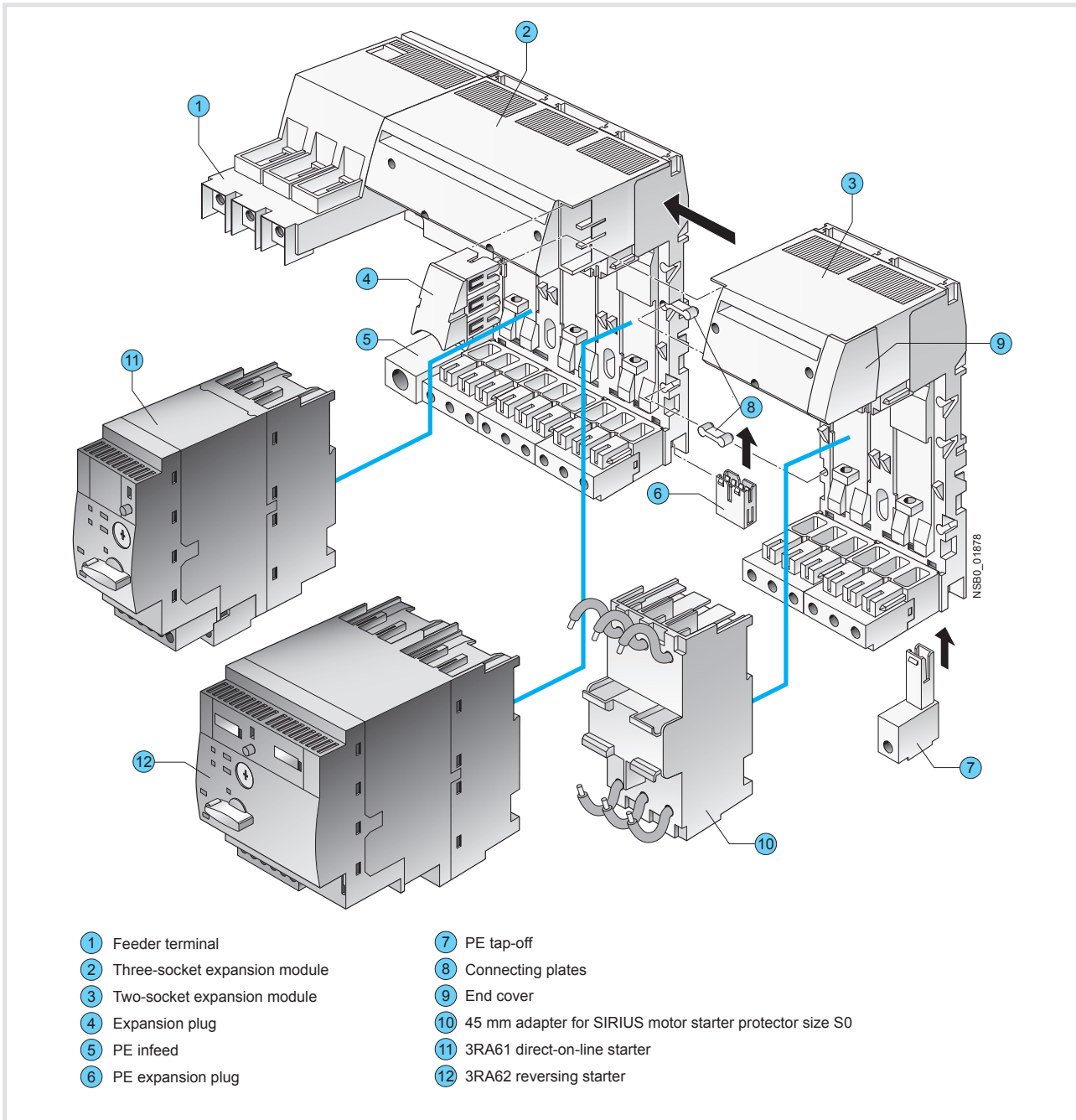
The infeed system for 3RA6 compact starters enables far less wiring in the main circuit and, thanks to the easy exchangeability of the compact starters, reduces the usual downtimes for maintenance work during the plant's operating phase.

The infeed system provides the possibility of completely prewiring the main circuit without a compact starter needing to be connected at the same time. As the result of the removable terminals in the main circuit, compact starters can be integrated in an infeed system in an easy manner (without the use of tools).

In addition, the integrated PE bar means it is optionally possible to connect the motor cable directly to the infeed system without additional intermediate terminals. The infeed system for 3RA6 compact starters is designed for summation currents up to 100 A with a conductor cross-section of max. 2/0 AWG on the feeder terminal block.

The infeed system can be mounted on a standard mounting rail or flat surfaces.

4  
COMBINATION  
STARTERS



Infeed system for 3RA6 compact starters

# SIRIUS 3RA6 Compact Starters

## Infeed systems for 3RA6 – up to 100 A

### 1 Infeed

The 3-phase infeed is available as an infeed with screw connection (4-2 AWG up to 63 A or 0-2/0 AWG up to 100 A) and an infeed with spring-type connection (4-2 AWG up to 63 A).

The infeed with spring-type terminal can be attached to the left side, as well as the right side, of an expansion module.

The screw terminal infeeds are permanently fitted to the left side of a 3-socket expansion module.

The infeeds with screw connection enable connection of the main conductors (L1, L2, L3) either from above or from below.

The infeeds with screw connection come packaged with 1 end cover, while the infeed with spring-type connection comes packaged with 2 end covers.

### 2 Three-socket expansion modules

The expansion module with 3 sockets for compact starters is available with screw connection and with spring-type connection.

Expansion modules enable the infeed system to be expanded and can be connected to each other in any number up to a maximum length of 1.2 meters.

Two expansion modules are held together with the help of 2 connecting plates and 1 expansion plug. These assembly parts are included in the scope of supply of the respective expansion module.

When the infeed system for 3RA6 compact starters is used, the compact starters (plug-in modules) are easily mounted and removed even when live.

Optional possibilities:

- PE connection on motor starter side
- Outfeed for external auxiliary devices
- Connection to 3RV29 infeed system
- Integration of SIRIUS 3RV1 and 3RV2 motor starter protectors size S0 up to 25 A (using 3RA68 90-0BA adapter)

### 3 Two-socket expansion modules

If only 2 instead of 3 additional sockets are required, then the 2-socket expansion module is the right choice. It has the same functionality as the 3-socket expansion module.

### 4 Expansion plug

Two expansion modules can be connected together using the expansion plug. Flexible expansion of the infeed system is thus possible.

### 5 PE infeeds

This module enables a PE cable to be connected.

The PE infeed can be ordered with screw connection and spring-type connection (2 AWG) and can be fitted on the right or left to the expansion block.

### 6 PE expansion plug

The PE expansion plug is inserted from below and enables two PE bars to be connected.

### 7 PE tap-off

The PE tap-off is available with screw connection and spring-type connection (10-8 AWG). It is snapped into the infeed system from below.

### 8 Connecting plates

Two connecting plates are used to hold together 2 adjacent expansion modules.

### 9 End covers

On the last expansion module of a row, the slot provided for the expansion plug can be covered by inserting the end cover.

### 10 45 mm adapters for SIRIUS 3RV motor starter protectors

SIRIUS 3RV1 and 3RV2 motor starter protectors size S0 with screw connection can be fitted to the adapter, enabling them to be plugged into the infeed system.

### Terminal blocks

Using the terminal block, three phase power can be fed out of the infeed system; this means that single-phase, two-phase and three-phase components can also be integrated in the system.

If the end cover is removed, the terminal block can be inserted into an expansion module.

### Expansion plug for SIRIUS 3RV29 infeed systems

If the end cover is removed, the expansion plug for the SIRIUS 3RV29 infeed system can be inserted into an expansion module. It connects the infeed system for 3RA6 compact starters with the SIRIUS 3RV29 infeed system.

### Maximum rated operational current

The following maximum rated operational currents apply for the components of the infeed system for 3RA6:

Component	Maximum rated operational current A
Infeed with screw connection 0-2/0 AWG	100
Infeed with screw connection 4-2 AWG	63
Infeed with spring-type connection 4-2 AWG	63
Expansion plugs	63

When several expansion modules are mounted side by side, the maximum rated operational current from the 2nd expansion module to the end of the row is 63 A.

### Proposal for upstream short-circuit protection devices

The following short-circuit data apply for the components of the infeed system for 3RA6 compact starters:

Conductor cross-section AWG	Inscriptions	Proposal for upstream short-circuit protection device
<b>Short-circuit protection for infeed block (4-2 AWG) with screw connection</b>		
14-2	$I_{d, \max} = 19 \text{ kA}$ , $I^2t = 440 \text{ kA}^2\text{s}$	<b>3RV10 41-4JA10</b>
<b>Short-circuit protection for infeed block (0-2/0 AWG) with screw connection</b>		
14-2/0	$I_{d, \max} = \text{approx. } 22 \text{ kA}$	<b>3RV10 41-4MA10</b>
<b>Short-circuit protection for infeed block with spring-type connection</b>		
12	$I_{d, \max} = 9.5 \text{ kA}$ , $I^2t = 85 \text{ kA}^2\text{s}$	<b>3RV10 21-4DA10</b>
10	$I_{d, \max} = 12.5 \text{ kA}$ , $I^2t = 140 \text{ kA}^2\text{s}$	<b>3RV10 31-4EA10</b>
8	$I_{d, \max} = 15 \text{ kA}$ , $I^2t = 180 \text{ kA}^2\text{s}$	<b>3RV10 31-4HA10</b>
6-4	$I_{d, \max} = 19 \text{ kA}$ , $I^2t = 440 \text{ kA}^2\text{s}$	<b>3RV10 41-4JA10</b>
<b>Short-circuit protection for terminal block</b>		
16	$I_{d, \max} = 7.5 \text{ kA}$	<b>5SY...</b> 1)
14	$I_{d, \max} = 9.5 \text{ kA}$	
12	$I_{d, \max} = 9.5 \text{ kA}$	
10	$I_{d, \max} = 12.5 \text{ kA}$	

1) To prevent the possibility of short-circuits, the cables on the terminal block must be installed so that they are short-circuit proof according to EN 60439-1 Section 7.5.5.1.2.

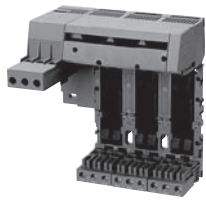
# SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6 – up to 100 A

## Selection and ordering data

Version	Order No.	Weight approx. kg
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### Three-phase infeeds and expansion modules






3RA68 12-8AB

**Infeeds with screw connection  
4-2 AWG left**

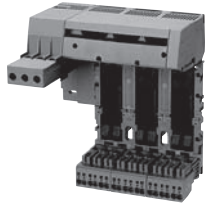
**Infeed with screw connection** with permanently fitted **3-socket expansion module with screw or spring-type terminals on the outgoing side and integrated PE bar**

Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter

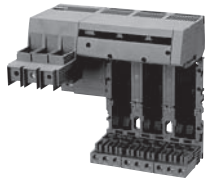
- Screw terminals on outgoing side 
- Spring-type terminals on outgoing side 

**Screw terminals** 

<b>3RA68 12-8AB</b>	0.957
<b>3RA68 12-8AC</b>	0.990



3RA68 12-8AC






3RA68 13-8AB

**Infeeds with screw connection  
0-2/0 AWG left**

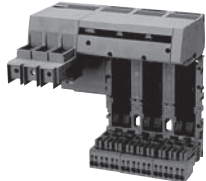
**Infeed with screw connection** with permanently fitted **3-socket expansion module with screw or spring-type terminals** on the outgoing side and integrated PE bar

Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter, suitable for UL duty according to UL 508 Type E

- Screw terminals on outgoing side 
- Spring-type terminals on outgoing side 

**Screw terminals** 

<b>3RA68 13-8AB</b>	1.146
<b>3RA68 13-8AC</b>	1.179




3RA68 13-8AC



3RA68 30-5AC

**Infeeds with spring-type  
connection 4-2 AWG left or right**

Up to 63 A

**Spring-type terminals** 

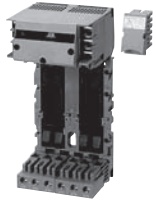
<b>3RA68 30-5AC</b>	0.283
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# SIRIUS 3RA6 Compact Starters

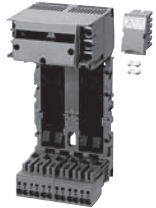
Infeed systems for 3RA6

Version	Order No.	Weight approx. kg
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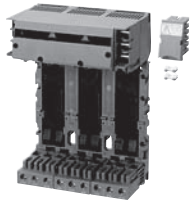
### Expansion modules



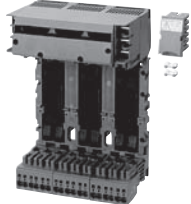
3RA68 22-0AB



3RA68 22-0AC



3RA68 23-0AB



3RA68 23-0AC

#### Two-socket expansion modules

**With screw or spring-type terminals** and integrated PE bar with 2 sockets for 2 direct-on-line starters or 1 reversing starter  
Expansion plug and 2 connecting plates are included in the scope of supply.

- Screw terminals

**Screw terminals**

**3RA68 22-0AB**

0.505

- Spring-type terminals

**Spring-type terminals**

**3RA68 22-0AC**

0.527

#### Three-socket expansion modules

**With screw or spring-type terminals** and integrated PE bar with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter  
Expansion plug and 2 connecting plates are included in the scope of supply.

- Screw terminals

**Screw terminals**

**3RA68 23-0AB**

0.717

- Spring-type terminals

**Spring-type terminals**

**3RA68 23-0AC**

0.750

# SIRIUS 3RA6 Compact Starters

## Infeed systems for 3RA6

### Accessories

Version	Order No.	Weight approx. kg
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#### Accessories for 3RA6 infeed systems

##### PE infeeds 4-2 AWG



3RA68 60-6AB

- Screw terminals

##### Screw terminals

3RA68 60-6AB

0.060



3RA68 60-5AC

- Spring-type terminals

##### Spring-type terminals

3RA68 60-5AC

0.070

##### PE tap-offs 10-8 AWG



3RA68 70-4AB

- Screw terminals

##### Screw terminals

3RA68 70-4AB

0.019



3RA68 70-3AC

- Spring-type terminals

##### Spring-type terminals

3RA68 70-3AC

0.017

##### Expansion plugs



3RA68 90-0EA

##### PE expansion plugs

3RA68 90-0EA

0.008



3RA68 90-1AB

**Expansion plugs**  
between 2 expansion modules  
Is included in the scope of supply of the expansion modules.

3RA68 90-1AB

0.029



3RA68 90-1AA

**Expansion plugs for SIRIUS 3RV19/29 infeed system**  
Connects infeed system for 3RA6 to 3RV29 infeed systems

3RA68 90-1AA

0.079

# SIRIUS 3RA6 Compact Starters

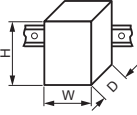
## Infeed systems for 3RA6

Version	Order No.	Weight approx.
<b>Accessories for infeed systems for 3RA6 (continued)</b>		
 <p>3RA6890-0BA</p>	<p><b>45 mm adapters</b>                      For SIRIUS 3RV1.2 and 3RV2.2 motor starter protectors. Size S0 up to 25 A</p> <ul style="list-style-type: none"> <li>Screw terminals (conductor cross-section AWG 10)</li> </ul>	<p><b>Screw terminals</b> </p> <p><b>3RA6890-0BA</b></p> <p>0.152</p>
 <p>3RA6880-2AB</p>	<p><b>Terminal covers for infeeds with screw connection</b>  <b>IP20 terminal covers for infeeds with screw connection 25/35 mm<sup>2</sup> (3RA6812-8AB/AC)</b>                      (2 units per pack)</p>	<p><b>3RA6880-2AB</b></p> <p><b>3RA6880-3AB</b></p>
 <p>3RA6880-3AB</p>	<p><b>IP20 terminal covers for infeeds with screw connection 50/70 mm<sup>2</sup> (3RA6813-8AB/AC)</b>                      (2 units per pack)</p>	
 <p>3RV2917-5D</p>	<p><b>Terminal blocks</b>                      For integration of single-phase, 2-phase and 3-phase external components</p> <ul style="list-style-type: none"> <li>Spring-type terminals</li> </ul>	<p><b>Spring-type terminals</b> </p> <p><b>3RV2917-5D</b></p> <p>.050</p>
<b>Tools for opening spring-type terminals</b>		
 <p>3RA2908-1A</p>	<p><b>Screwdrivers</b>                      For all SIRIUS devices with spring-type terminals</p> <p>Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated</p>	<p><b>Spring-type terminals</b> </p> <p><b>3RA2908-1A</b></p> <p>.045</p>
<b>System Manual "SIRIUS Compact Starters and Accessories"</b>		
<p>The system manual can be downloaded free of charge in PDF format from the Internet, see <a href="http://support.automation.siemens.com/WWW/view/en/27136554/133300">http://support.automation.siemens.com/WWW/view/en/27136554/133300</a></p>		

## SIRIUS 3RA6 Compact Starters

## General data

## More information

Type		3RA61	3RA62	3RA64	3RA65
Size		S0			
Number of poles		3			
<b>General technical specifications</b>					
Device standard		IEC/EN 60947-6-2			
<b>Mounting dimensions (WxHxD)</b>					
• Screw terminals		mm	45 x 170 x 165	90 x 170 x 165	45 x 170 x 165
• Spring-type terminals		mm	45 x 191 x 165	90 x 191 x 165	45 x 191 x 165
			90 x 191 x 165	45 x 191 x 165	90 x 191 x 165
					
<b>Weight</b>		kg	1.4	2.3-2.4	1.3
<b>Permissible mounting positions</b>			No restrictions, preferably vertical or horizontal installation		
<b>Max. rated current <math>I_e</math></b>		A	0.4		
in the respective setting range	0.1 ... 0.4 A	A	0.4		
	0.32 ... 1.25 A	A	1.25		
	1 ... 4 A	A	4		
	3 ... 12 A	A	12		
	8 ... 32 A	A	32		
<b>Permissible ambient temperature</b>					
• During operation	Acc. to IEC/EN 60721-3-3	°C	-20 ... +60, with derating up to +70		
• For installation in SIRIUS infeed system for 3RA6		°C	-20 ... +40		
• During storage	IEC/EN 60732-3-1	°C	-55 ... +80		
• During transport	IEC/EN 60721-3-2	°C	-55 ... +80		
<b>Permissible rated current of the compact starter,</b>					
when several compact starters are mounted side-by-side on a vertical standard mounting rail or in the 3RA6 infeed system					
• For a control cabinet inside temperature of +40 °C		%	100		
• For a control cabinet inside temperature of +60 °C		%	80		
• For a control cabinet inside temperature of +70 °C		%	60		
<b>Relative air humidity</b>		%	10 ... 90		
<b>Installation altitude</b>		m	Up to 2000 above sea level without restriction		
<b>Rated frequency</b>		Hz	50/60		
<b>Rated insulation voltage <math>U_i</math></b>		V	690		
(pollution degree 3)					
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		kV	6		
<b>Trip class (CLASS)</b>			10/20		
	Acc. to IEC 60947-4-1, EN 60947-4-1				
<b>Rated short-circuit current <math>I_q</math> at AC 50/60 Hz 480 V</b>		kA	30 (up to 12 A units) 15 (8 ... 32 A unit)		
	Acc. to IEC 60947-4-1, EN 60947-4-1				
<b>Types of coordination</b>			Continuous		
	Acc. to IEC 60947-6-2, EN 60947-6-2				
<b>Power loss <math>P_{v,max}</math> of all main current paths</b>		mW	10		
Dependent on the rated current $I_e$ (upper setting range)	0.4 A	mW	100		
	1.25 A	W	1		
	4 A	W	1.8		
	12 A	W	5.4		
	32 A	W			
<b>Max. switching frequency</b>		1/h	750		
	AC-41	1/h	250		
	AC-43	1/h	15		
	AC-44	1/h			
<b>Drive losses</b>					
Active power	At 24 V				
	• 0.1 ... 12 A	W	2.7		
	• 8 ... 32 A	W	2.95		
	At 110 ... 240 V				
	• 0.1 ... 12 A	W	3.4		
	• 8 ... 32 A	W	3.8		
<b>Overload function</b>			1:4		
Ratio of lower to upper current mark					
<b>Shock resistance (sine-wave pulse)</b>			$a = 60 \text{ m/s}^2 = 6 \text{ g}$ with 10 ms; for every 3 shocks in all axes		
<b>Vibratory load</b>			$f = 4 \dots 5.8 \text{ Hz}$ ; $d = 15 \text{ mm}$ ; $f = 5.8 \dots 500 \text{ Hz}$ ; $a = 20 \text{ m/s}^2$ ; 10 cycles		
<b>Degree of protection</b>			IP20		
	Acc. to IEC 60947-1				
<b>Touch protection</b>			Finger-safe		
	Acc. to IEC/EN 61140				
<b>Isolating features of the compact starter</b>			Yes: Isolation is assured only by moving the actuator into the *OFF* position		
	Acc. to IEC/EN 60947-3				
<b>Main and EMERGENCY-STOP switch characteristics of the compact starter and accessories</b>			Yes		
	Acc. to IEC 60204				



## General data

Type		3RA61	3RA62	3RA64	3RA65
Size		S0			
Number of poles		3			
<b>General technical specifications (continued)</b>					
<b>Protective separation</b>	Acc. to IEC 60947-2				
<b>Control circuit to auxiliary circuit</b>		V	Up to 400		
• Horizontal standard mounting rail		V	Up to 250		
• Other mounting position					
<b>Auxiliary circuit to auxiliary circuit</b>		V	Up to 400		
• Horizontal standard mounting rail		V	Up to 250		
• Other mounting position					
<b>Main circuit to auxiliary circuit</b>		V	Up to 400		
• Any mounting position					
<b>EMC interference immunity</b>	Acc. to IEC/EN 60947-1		Corresponds to degree of severity 3		
<b>Conductor-related interference</b>	BURST acc. to IEC/EN 61000-4-4				
• In the main circuit		kV	4	4	
• In the auxiliary circuit		kV	3	2	
<b>Conductor-related interference</b>	SURGE acc. to IEC/EN 61000-4-5				
• In the main circuit		kV	4	2	
- Conductor - Ground		kV	2	1	
- Conductor - Conductor					
• In the auxiliary circuit		kV	2	0.5 <sup>1)</sup>	
- Conductor - Ground		kV	1	0.5 <sup>1)</sup>	
- Conductor - Conductor					
<b>Auxiliary switches</b>					
• Integrated			1 NO + 1 NC	2 NO	1 NO + 1 NC 2 NO
- Position of the main contacts			1 CO/1 NO		
- Overload/short-circuit signal					
• Expandable			2 NO, 2 NC, 1 NO + 1 NC		
- Position of the main contacts					
<b>Surge suppressors</b>			Integrated (Varistor)		
<b>Pollution degree</b>			3		
<b>Depth from standard mounting rail</b>	mm	160			
<b>Electromagnetic operating mechanism</b>					
<b>Control voltage</b>		V	24 AC/DC	24 DC	
		V	110 ... 240 AC/DC	--	
<b>Frequency</b>	At AC	Hz	50/60 (±5%)		
<b>Primary operating range</b>			0.7 ... 1.25 $U_s$		0.85 ... 1.2 $U_s$
<b>No-load switching frequency</b>		1/h	3600		
<b>Make-time</b>		ms	max. 70		Max. 70 + IO-Link communication
<b>Break-time</b>		ms	max. 120		Max. 120 + IO-Link communication

<sup>1)</sup> To maintain maximum interference immunity in a harsh electromagnetic environment, additional overvoltage protection should be provided in the control supply current circuit. A suitable choice is for example the Dehn Blitzductor BVT AD 24 V, Art. No. 918 402 or an equivalent protective element.

Manufacturer: DEHN+SÖHNE GmbH+Co. KG, Hans-Dehn-Straße, 1, Postfach 1640, D-92306 Neumarkt

## SIRIUS 3RA6 Compact Starters

## General data

Type	3RA61 20-□B3., 3RA62 50-□B3. □ = A, B, C or D Rated operational current ≤12 A				3RA61 20-.EB3., 3RA62 50-.EB3. Rated operational current 32 A				
Rated control supply voltage	V	24 AC		24 DC		24 AC		24 DC	
Inrush peak current	A	0.59		0.47		0.59		0.47	
Hold current	A	0.13		0.12		0.17		0.14	
Closed	W	2.8		2.9		3.5		3.1	
Operating times, typical									
• On	ms	<160		<140		<160		<140	
• Off	ms	<35		<35		<30		<30	
Type	3RA61 20-□E3., 3RA62 50-□P3. □ = A, B, C or D Rated operational current ≤12 A				3RA61 20-.EE3., 3RA62 50-.EE3. Rated operational current 32 A				
Rated control supply voltage	V	110 AC	240 AC	110 DC	240 DC	110 AC	240 AC	110 DC	240 DC
Inrush peak current	A	0.24	0.40	0.17	0.29	0.24	0.40	0.17	0.29
Hold current	A	0.06	0.08	0.03	0.02	0.06	0.07	0.04	0.03
Closed	W	3.8	6	3.1	5.1	3.7	5.2	3.4	5.8
Operating times, typical									
• On	ms	<160	<140	<150	<140	<160	<140	<150	<140
• Off	ms	<50	<80	<50	<70	<40	<60	<40	<60
Type	3RA64 00-□B4., 3RA65 00-□B4. □ = A, B, C or D Rated operational current ≤12A				3RA64 00-.EB4., 3RA65 00-.EB4. Rated operational current 32 A				
Rated control supply voltage	V	24 DC				24 DC			
Inrush peak current	A	0.39				0.53			
Hold current	A	0.13				0.15			
Closed	W	2.9				3.4			
Operating times, typical <sup>1)</sup>									
• On	ms	<140				<140			
• Off	ms	<35				<30			

## SIRIUS 3RA6 Compact Starters

## General data

Type		3RA61	3RA62	3RA64	3RA65
Size		S0			
Number of poles		3			
<b>Electromagnetic operating mechanism (continued)</b>					
Switching capacity at 480 V	kA	30 (up to 12 A) 15 (8 ... 32 A)			
Switching capacity at 600 V	kA	10 (up to 12 A) 5 (8 ... 32 A)			
Line protection	At 10 kA At 50 kA	AWG AWG	14 12		
Shock resistance					
• Breaker mechanism OFF		<i>g</i>	25		
• Breaker mechanism ON		<i>g</i>	15		
<b>Normal switching duty</b>					
Making capacity			12 x $I_n$		
Breaking capacity			10 x $I_n$		
Switching capacity dependent on rated current	Up to 12 A Up to 32 A	HP HP	7 1/2 20		
Endurance in operating cycles					
• Electrical endurance	At $I_e = 0.9 \times I_n$ and 400 V		3 ... 10 000 000	2 x 3 ... 10 000 000	3 000 000 2 x 1 500 000
<b>Control circuit</b>					
Rated operational voltage					
• External auxiliary switch block		V	400/690		
• Internal auxiliary switch		V	400/690		
• Short-circuit signaling switch		V	400		
• Overload signaling switch		V	400		
Switching capacity					
• External auxiliary switch block					
	<b>AC-15</b>				
	• At $U_e = 230$ V	A	6		
	• At $U_e = 400$ V	A	3		
	• At $U_e = 289/500$ V	A	2		
	• At $U_e = 400/690$ V	A	1		
	<b>DC-13</b>				
	• At $U_e = 24$ V	A	6		
	• At $U_e = 60$ V	A	0.9		
	• At $U_e = 125$ V	A	0.55		
	• At $U_e = 250$ V	A	0.27		
• Internal auxiliary switch	<b>AC-15</b>				
	• At $U_e = 230$ V	A	6		
	• At $U_e = 400$ V	A	3		
	• At $U_e = 289/500$ V	A	2		
	• At $U_e = 400/690$ V	A	1		
	<b>DC-13</b>				
	• At $U_e = 24$ V	A	10		
	• At $U_e = 60$ V	A	2		
	• At $U_e = 125$ V	A	1		
	• At $U_e = 250$ V	A	0.27		
	• At $U_e = 480$ V	A	0.1		
• Signaling switch	<b>AC-15</b>				
	• At $U_e = 230$ V	A	3		
	• At $U_e = 400$ V	A	1		
	<b>DC-13</b>				
	• At $U_e = 24$ V	A	2		
	• At $U_e = 250$ V	A	0.11		





## General data





Type			3RA61	3RA62	3RA64	3RA65
Size			S0			
Number of poles			3			
<b>External auxiliary switch block, internal auxiliary switch</b>						
<b>Endurance in operating cycles</b>						
• Mechanical endurance			10 000 000		3 000 000	
• Electrical endurance	<b>AC-15, 230 V</b>		200 000			
	• At 6 A		500 000			
	• At 3 A		2 000 000			
	• At 1 A		10 000 000			
	• At 0,3 A					
	<b>DC-13, 24 V</b>		300 00			
	• At 6 A		100 000			
	• At 3 A		2 000 000			
	• At 0,5 A		10 000 000			
	• At 0,2 A					
	<b>DC-13, 110 V</b>		40 000			
	• At 1 A		100 000			
	• At 0,55 A		300 000			
	• At 0,3 A		2 000 000			
	• At 0,1 A		10 000 000			
	• At 0,04 A					
	<b>DC-13, 220 V</b>		110 000			
	• At 0,3 A		650 000			
	• At 0,1 A		2 000 000			
	• At 0,05 A		10 000 000			
	• At 0,018 A					
<b>Contact stability</b>	At 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000			
<b>Short-circuit protection</b>						
• Short-circuit current $I_K \leq 1.1$ kA	Fuse links operational class gG - NEOZED Type 5SE - DIAZED Type 5SB - LV HRC Type 3NA	A	10			
• Short-circuit current $I_K < 400$ A	Miniature circuit breaker up to 230 V with C characteristic	A	10			
<b>Signaling switches</b>						
<b>Endurance in operating cycles</b>						
• Mechanical endurance			20000			
• Electrical endurance AC-15	At 230 V and 3 A		6050			
<b>Contact stability</b>	At 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000			
<b>Short-circuit protection</b>						
• Short-circuit current $I_K \leq 1.1$ kA	Fuse links operational class gG - NEOZED Type 5SE - DIAZED Type 5SB - LV HRC Type 3NA	A	6			
• Short-circuit current $I_K < 400$ A	Miniature circuit breaker up to 230 V with C characteristic	A	6			
<b>Overload</b> (short-circuit current $I_K \leq 1.1$ kA)	Fuse links operational class gG - NEOZED Type 5SE - DIAZED Type 5SB - LV HRC Type 3NA	A	4			

## SIRIUS 3RA6 Compact Starters

3RA6 – up to 32 A

## Technical data

Connection type		Screw connection		Spring-type connection	
					
Max. rated current $I_{max}$		12 A	32 A	12 A	32 A
<b>Conductor cross-sections of main circuit terminals</b>					
Tools		Posidrive size 2		(3.5 x 0.5) mm, 8WA2 803	
Prescribed tightening torque		NM 2 ... 2.5		--	
<b>Minimum/maximum conductor cross-sections</b>					
• Solid	mm <sup>2</sup>	2 x (1.5 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm <sup>2</sup>	2 x (2.5 ... 6)	Max. 1 x 10	Max. 1 x 10	Max. 1 x 10
	mm <sup>2</sup>	Max. 1 x 10			
• Finely stranded without ferrule	mm <sup>2</sup>	--	--	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• Finely stranded with ferrule	mm <sup>2</sup>	2 x (1.5 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm <sup>2</sup>	2 x (2.5 ... 6)			
• AWG cables	AWG	2 x (16 ... 14)	2 x (14 ... 10)	2 x (16 ... 10)	2 x (14 ... 10)
	AWG	2 x (14 ... 10)	1 x 8	1 x 8	1 x 8
	AWG				
	AWG	1 x 8			

Connection type		Screw connection		Spring-type connection	
					
<b>Conductor cross-sections of control circuit terminals</b>					
Tools		Posidrive size 2		(3.0 x 0.5) mm, DIN ISO 2380-1A	
Prescribed tightening torque		NM 0.8 ... 1.2		--	
<b>Minimum/maximum conductor cross-sections</b>					
• Solid	mm <sup>2</sup>	1 x (0.5 ... 4)		2 x (0.25 ... 1.5)	
	mm <sup>2</sup>	2 x (0.5 ... 2.5)			
• Finely stranded without ferrule	mm <sup>2</sup>	--		2 x (0.25 ... 1.5)	
• Finely stranded with ferrule	mm <sup>2</sup>	1 x (0.5 ... 2.5)		2 x (0.25 ... 1.5)	
	mm <sup>2</sup>	2 x (0.5 ... 1.5)			
• AWG cables	AWG	2 x (20 ... 14)		2 x (24 ... 16)	
<b>Conductor cross-sections of the auxiliary switch for compact starters</b>					
Order No.		<b>3RA69 1.-1A</b>		<b>3RA69 1.-2A</b>	
Tools		Posidrive size 2		(2.5 x 0.4) mm, 8WA2 807	
Prescribed tightening torque		NM 0.8 ... 1.2		--	
<b>Conductor cross-sections</b>					
• Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5)		2 x (0.25 ... 2.5)	
	mm <sup>2</sup>	2 x (0.75 ... 2.5)			
	mm <sup>2</sup>	2 x (1 ... 4)			
• Finely stranded without ferrule	mm <sup>2</sup>	--		2 x (0.25 ... 2.5)	
• Finely stranded with ferrule	mm <sup>2</sup>	2 x (0.5 ... 1.5)		2 x (0.25 ... 1.5)	
	mm <sup>2</sup>	2 x (0.75 ... 2.5)			
• AWG cables	AWG	2 x (20 ... 16)		2 x (24 ... 14)	
	AWG	2 x (18 ... 14)			
	AWG	1 x 12			

## SIRIUS 3RA6 Compact Starters

3RA6 – up to 32A

## Technical data

Order No.	3RA6970-3A, 3RA6970-3B, 3RA6970-3C, 3RA6970-3D, 3RA6970-3E
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## General data of the AS-i add-on module

<b>Permissible ambient temperature</b>			
• Storage	Acc. to IEC/EN 60721-3-1	°C	-25 ... +70
• Transport	Acc. to IEC/EN 60721-3-2	°C	-25 ... +70
<b>Degree of protection</b>	Acc. to IEC/EN 60947-1		IP20
<b>EMC interference immunity</b>			
Acc. to EN 50295			
<b>Conductor-related interference</b>	BURST acc. to IEC/EN 61000-4-4	kV	1/2
<b>Electrostatic discharge</b>	Acc. to IEC/EN 61000-4-2	kV	6/8
<b>Field-related interference</b>	Acc. to IEC/EN 61000-4-3	V/m	10 (80 MHz ... 2.7 GHz)
<b>Maximum pick-up current</b>		mA	400
<b>Maximum hold current</b>		mA	200
<b>Power consumption, max.</b>		mA	30
<b>IO code</b>			7
<b>ID code</b>			A
<b>ID2 code</b>			E

Order No.	3RA6970-3B, 3RA6970-3C, 3RA6970-3D, 3RA6970-3E
Connection type	 Screw connection

## Conductor cross-sections of the AS-i add-on module

<b>Tools</b>			
			Posidrive size 1
<b>Prescribed tightening torque</b>	NM		0.5 ... 0.6
<b>Conductor cross-sections</b>			
• Solid	mm <sup>2</sup>		1 x (0.5 ... 2.5) 2 x (0.5 ... 1.0)
• Finely stranded with ferrule	mm <sup>2</sup>		1 x (0.5 ... 2.5) 2 x (0.5 ... 1.0)
• AWG cables	AWG		1 x (20 ... 12)

**Technical data**

Type		3RA6.	
<b>General data</b>			
<b>Max. rated operational current</b>			
• Infeed with screw connection 0-2/0 AWG	A	100	
• Infeed with screw connection 4-2 AWG	A	63	
• Infeed with spring-type connection 10-3 AWG	A	63	
• Expansion plug	A	63	
<b>Permissible ambient temperature</b>			
• During operation	°C	-20 ... +60 (over +40 current reduction is required)	
- Permissible rated current at control cabinet inside temperature: +40 °C	%	100	
+60 °C	%	80	
• During storage/transport	°C	-55 ... +80	
<b>Relative air humidity</b>			
		% 10 ... 90	
<b>Installation altitude</b>			
		m Up to 2000 above sea level without restriction	
<b>Rated operational voltage <math>U_e</math></b>			
		V 690 AC	
<b>Rated frequency</b>			
		Hz 50/60	
<b>Shock resistance</b>			
		$a = 60 \text{ m/s}^2 = 6g$ with 10 ms; for every 3 shocks in all axes	
<b>Vibratory load</b>			
		$f = 1 \dots 6 \text{ Hz}$ ; $d = 15 \text{ mm}$ 10 cycles $f = 150 \text{ Hz}$ ; $a = 2 g$	
<b>Degree of protection</b>		Acc. to IEC 60947-1	IP20 (IP 00 terminal compartment)
<b>Touch protection</b>		Acc. to EN 50274	Finger-safe
<b>Degree of pollution</b>		3	
<b>Short-circuit protection for infeed with screw connection 4-2 AWG and infeed with screw connection 0-2/0 AWG</b>			
	$I_{d,max}$	kA	< 21
	$I^2t$	kA <sup>2</sup> s	530
			Recommendation for upstream short-circuit protection device 3RV1041-4JA10 3RV1041-4MA10 LV HRC gL/gG 3NA3, 315 A
<b>Short-circuit protection for infeed with spring-type connection</b>			
• Conductor cross-section 12 AWG	$I_{d,max}$	kA	< 9.5
	$I^2t$	kA <sup>2</sup> s	85
• Conductor cross-section 10 AWG	$I_{d,max}$	kA	< 12.5
	$I^2t$	kA <sup>2</sup> s	140
• Conductor cross-section 8 AWG	$I_{d,max}$	kA	< 15
	$I^2t$	kA <sup>2</sup> s	180
• Conductor cross-section 6-4 AWG	$I_{d,max}$	kA	< 19
	$I^2t$	kA <sup>2</sup> s	440
			Recommendation for upstream short-circuit protection device 3RV2021-4DA10 3RV1031-4EA10 3RV1031-4HA10 3RV1041-4JA10
<b>Short-circuit protection for terminal block</b>			
• Conductor cross-section 16 AWG	$I_{d,max}$	kA	7.5
• Conductor cross-section 14 AWG	$I_{d,max}$	kA	9.5
• Conductor cross-section 12 AWG	$I_{d,max}$	kA	9.5
• Conductor cross-section 10 AWG	$I_{d,max}$	kA	12.5
			Recommendation for upstream short-circuit protection device 5SY... <sup>1)</sup>

<sup>1)</sup> To prevent the possibility of short-circuits, the cables on the terminal block must be installed so that they are short-circuit resistant according to EN 60439-1 Section 7.5.5.1.2.

Type		3RV29.	
<b>Connection type</b>		<input type="radio"/> Spring-type connection <input type="checkbox"/>	
<b>Conductor cross-sections of terminal block</b>			
<b>Order No.</b>		3RV29 17-5D	
<b>Conductor cross-sections</b>			
• Solid	mm <sup>2</sup>	1.5 ... 6	
• Finely stranded with ferrule	mm <sup>2</sup>	1.5 ... 4	
• Finely stranded without ferrule	mm <sup>2</sup>	1.5 ... 6	
• AWG cables, solid or stranded	AWG	15 ... 10	



# SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6 – up to 100 A

4 COMBINATION STARTERS

## Technical data

<b>Type</b>	<b>3RA6.</b>				
<b>Connection type</b>	<b>Screw connection</b>				
<b>Conductor cross-sections of infeed with screw connection 16-2 AWG (L1, L2, L3)<sup>1)</sup> and PE infeed 2 AWG<sup>2)</sup></b>					
<b>Order No.</b>	<b>3RA68 12-8AB, 3RA68 12-8AC, 3RA68 60-6AB</b>				
<b>Tools</b>	Posidrive size 2				
<b>Specified tightening torque</b>	NM	3 ... 4.5			
<b>Conductor cross-sections</b>					
• Solid	mm <sup>2</sup>	2.6 ... 16	2.6 ... 16	max. 2 x 16	
• Stranded	mm <sup>2</sup>	2.5 ... 35	2.5 ... 35	max. 2 x 25	
• Finely stranded with ferrule	mm <sup>2</sup>	2.5 ... 25	2.5 ... 25	max. 2 x 16	
• Finely stranded without ferrule	mm <sup>2</sup>	2.5 ... 25	2.5 ... 25	max. 2 x 16	
• AWG cables	AWG	12 ... 2	12 ... 2	max. 2 x (16 ... 2)	
<b>Connection type</b>	<b>Screw connection</b>				
<b>Conductor cross-sections of infeed with screw connection 10-2/0 AWG (L1, L2, L3)<sup>1)</sup></b>					
<b>Order No.</b>	<b>3RA68 13-8AB, 3RA68 13-8AC</b>				
<b>Tools</b>	SW	4			
<b>Specified tightening torque</b>	NM	6 ... 8			
<b>Conductor cross-sections</b>					
• Solid	mm <sup>2</sup>	2.5 ... 16	2.5 ... 16	max. 2 x 16	
• Stranded	mm <sup>2</sup>	4 ... 70	10 ... 70	max. 2 x 50	
• Finely stranded with ferrule	mm <sup>2</sup>	2.5 ... 35	2.5 ... 50	max. 2 x 35	
• Finely stranded without ferrule	mm <sup>2</sup>	4 ... 50	10 ... 50	max. 2 x 35	
• AWG cables	AWG	10 ... 2/0	10 ... 2/0	max. 2 x (10 ... 1/0)	
<b>Connection type</b>	<b>Spring-type connection</b>				
<b>Conductor cross-sections of infeed with spring-type connection 10-3 AWG (L1, L2, L3)<sup>1)</sup> and PE infeed 3 AWG</b>					
<b>Order No.</b>	<b>3RA68 30-5AC, 3RA68 60-5AC</b>				
<b>Tools</b>	8WA2 806 mm	5.5 x 0.8			
<b>Conductor cross-sections</b>					
• Solid	mm <sup>2</sup>	4 ... 16			
• Stranded	mm <sup>2</sup>	4 ... 35			
• Finely stranded with ferrule	mm <sup>2</sup>	4 ... 25			
• Finely stranded without ferrule	mm <sup>2</sup>	6 ... 25			
• AWG cables	AWG	10 ... 3			
<b>Connection type</b>	<b>Screw connection</b>		<b>Spring-type connection</b>		
<b>Conductor cross-sections of infeed with screw connection 4-2 AWG (T1, T2, T3)<sup>2)</sup>, infeed with screw connection 0-2/0 AWG (T1, T2, T3)<sup>2)</sup> 2-socket and 3-socket expansion modules (T1, T2, T3)<sup>2)</sup> and PE tap-off 10-8 AWG</b>					
<b>Order No.</b>	<b>3RA68 12-8AB, 3RA68 13-8AB, 3RA68 22-0AB, 3RA68 23-0AB, 3RA68 70-4AB</b>		<b>3RA68 12-8AC, 3RA68 13-8AC, 3RA68 22-0AC, 3RA68 23-0AC, 3RA68 70-3AC</b>		
<b>Tools</b>	Posidrive size 2		(3.5 x 0.5) mm, 8WA2 803		
<b>Specified tightening torque</b>	NM	2 ... 2.5		--	
<b>Maximum rated current</b>	A	<b>12</b>	<b>32</b>	<b>12</b>	<b>32</b>
<b>Conductor cross-sections</b>					
• Solid	mm <sup>2</sup>	2 x (1 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm <sup>2</sup>	2 x (2.5 ... 6)	max. 1 x 10	max. 1 x 10	max. 1 x 10
	mm <sup>2</sup>	max. 1 x 10	max. 1 x 10	max. 1 x 10	max. 1 x 10
• Finely stranded with ferrule	mm <sup>2</sup>	--	--	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• Finely stranded without ferrule	mm <sup>2</sup>	2 x (1 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm <sup>2</sup>	2 x (2.5 ... 6)			
• AWG cables	AWG	2 x (16 ... 14)	2 x (14 ... 10)	2 x (16 ... 10)	2 x (14 ... 10)
	AWG	2 x (14 ... 10)			
	AWG	1 x 8	1 x 8	1 x 8	1 x 8

<sup>1)</sup> L1, L2, L3 main conductors on input side.

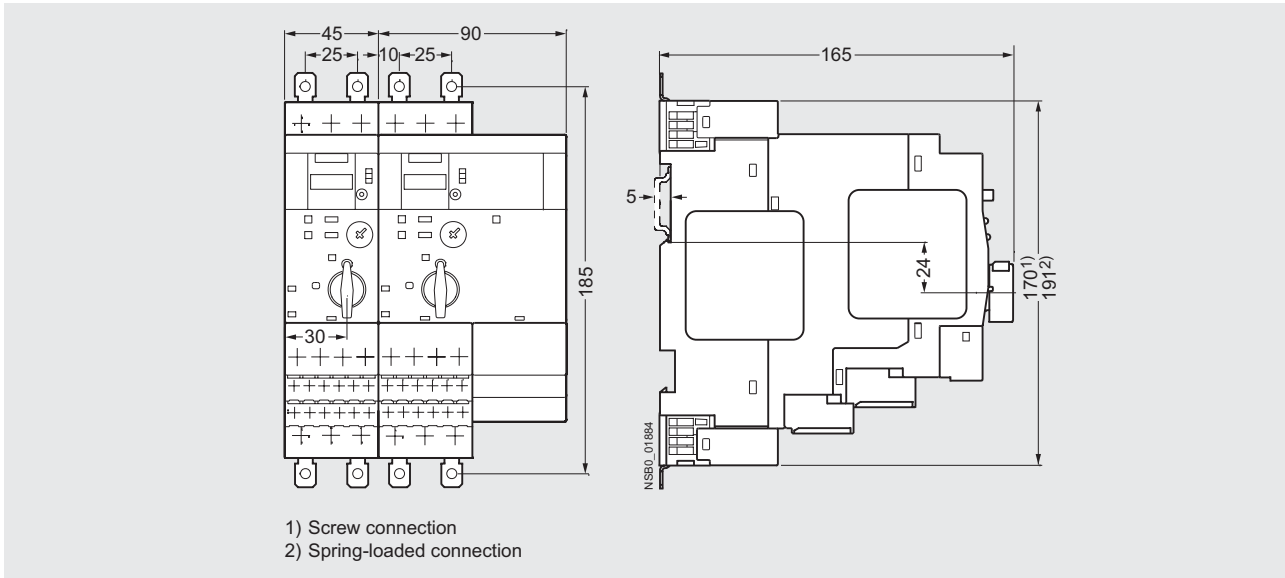
<sup>2)</sup> T1, T2, T3 main conductors on output side.

# SIRIUS 3RA6 Compact Starters

3RA6 – up to 32 A

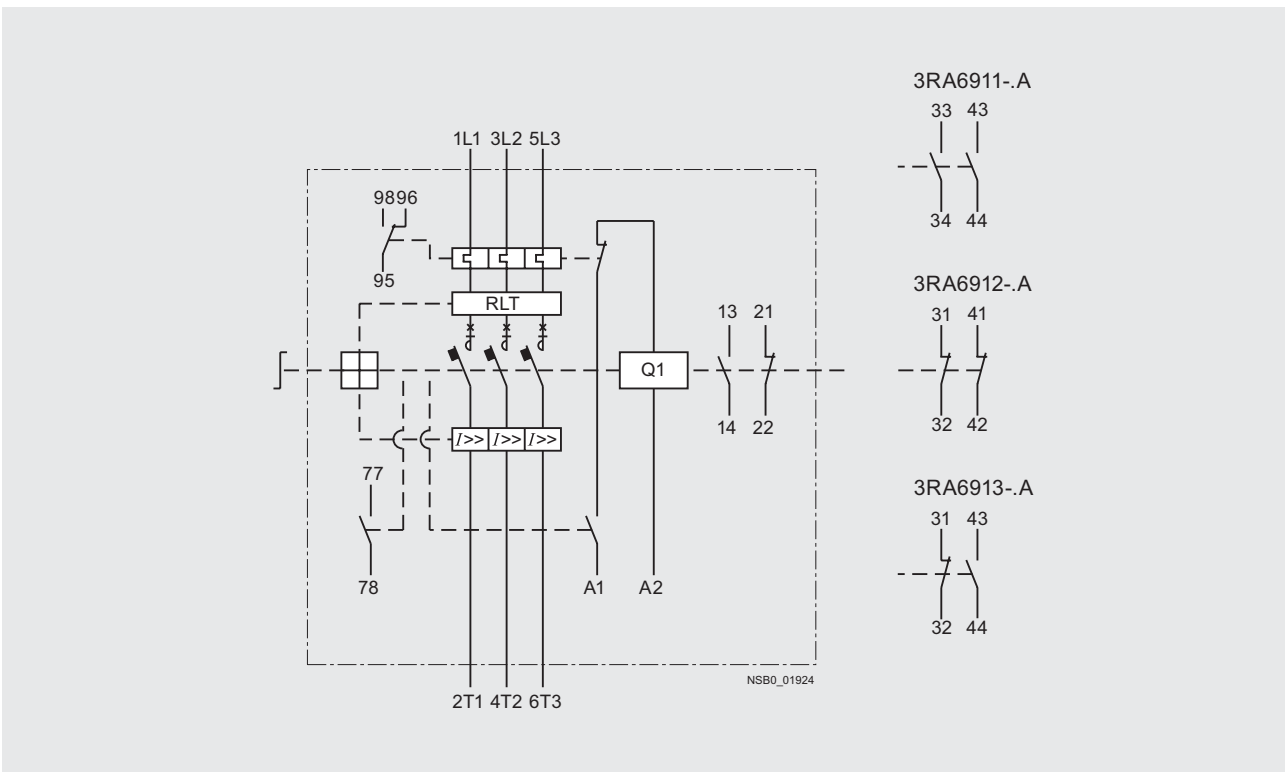
## Dimensional drawings

### Direct-on-line starters and reversing starters



## Schematics

### 3RA61 direct-on-line starters



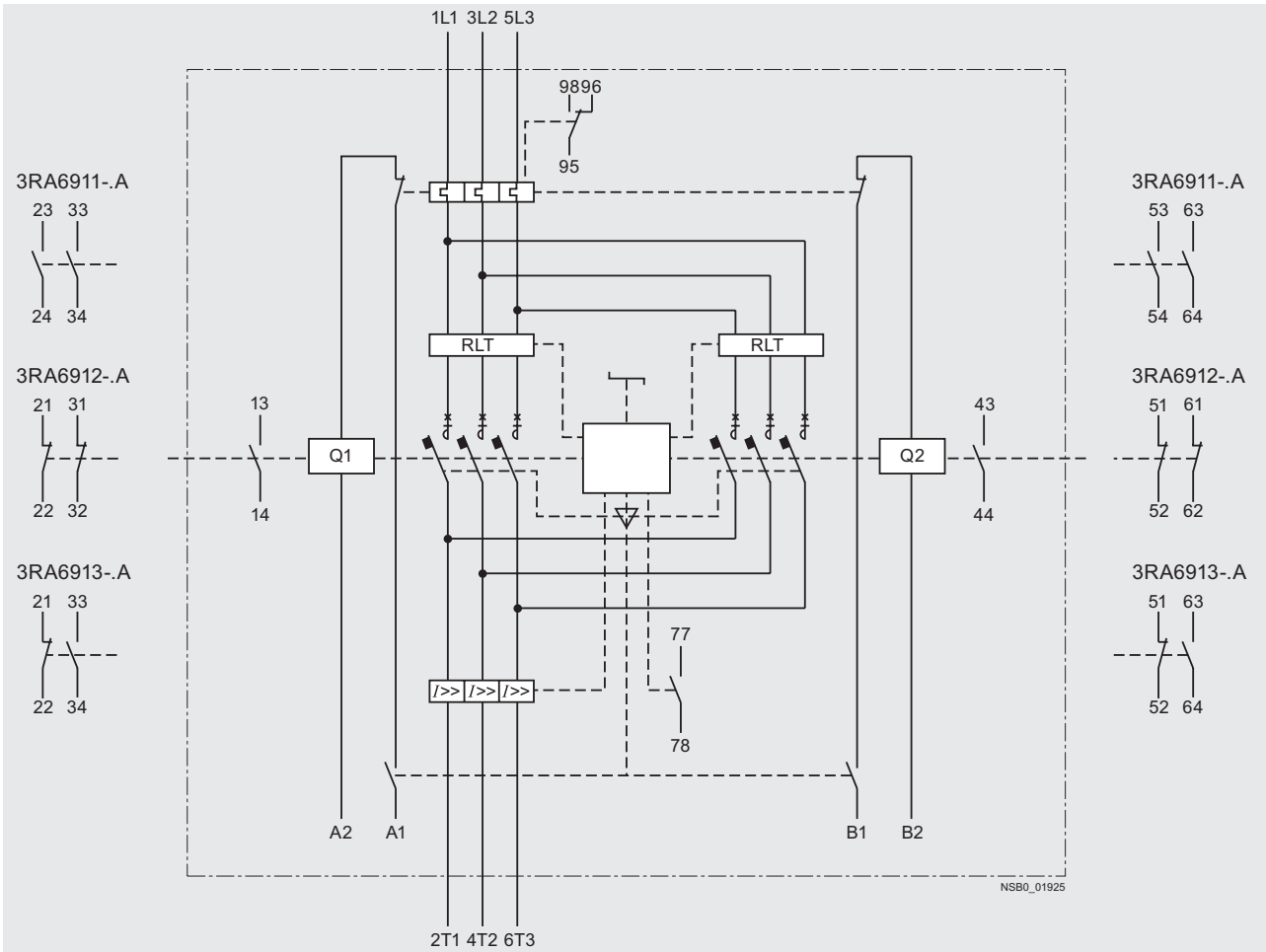
Schematic for 3RA61 direct-on-line starters (main circuit)

# SIRIUS 3RA6 Compact Starters

3RA6 – up to 32 A

## Dimensional drawings

### 3RA62 reversing starters

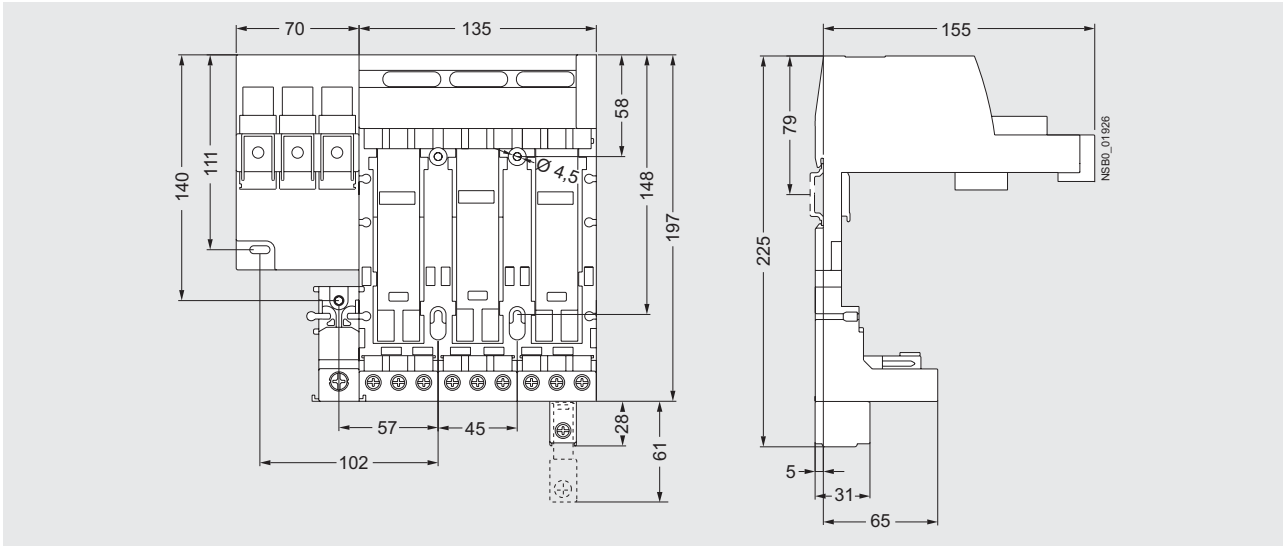


Schematic for 3RA62 reversing starters (main circuit)

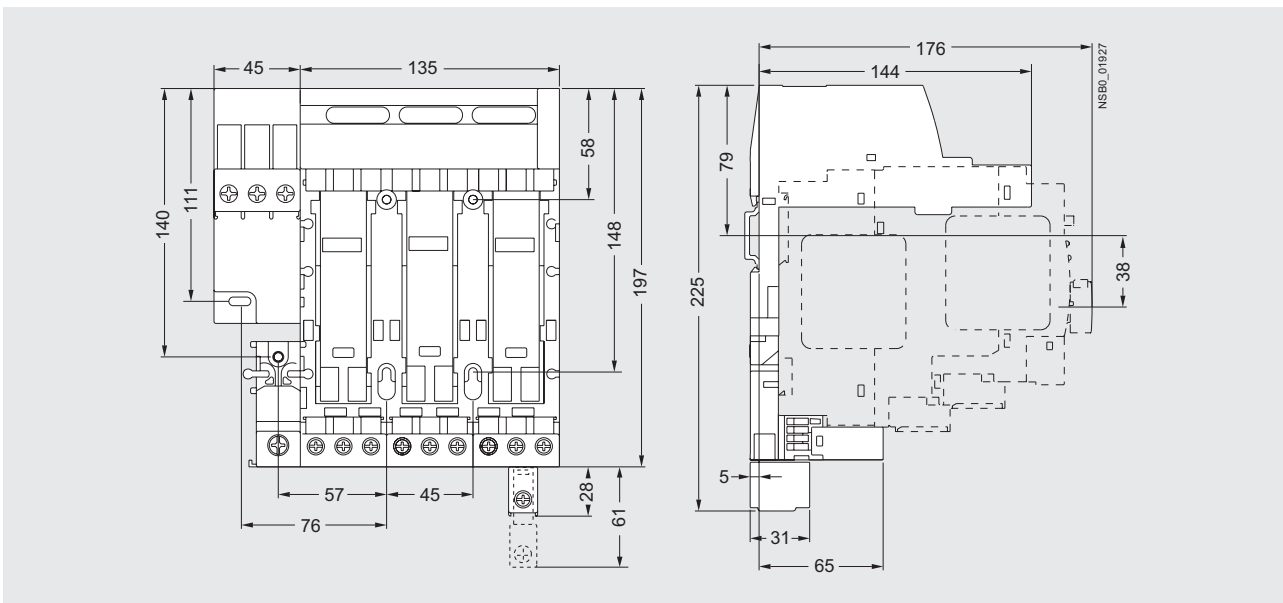
# SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6 – up to 100 A

## Dimensional drawings



Infeed with screw connection 0-2/0 AWG on left with fixed 3-socket expansion module with outgoing screw terminals

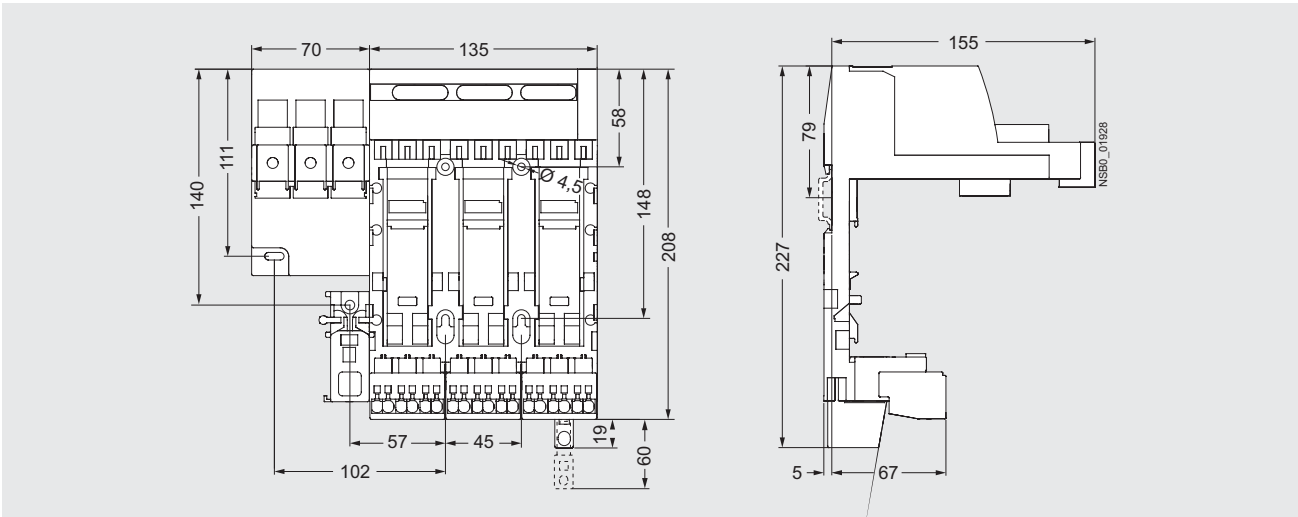


Infeed with screw connection 4-2 AWG on left with fixed 3-socket expansion module with outgoing screw terminals

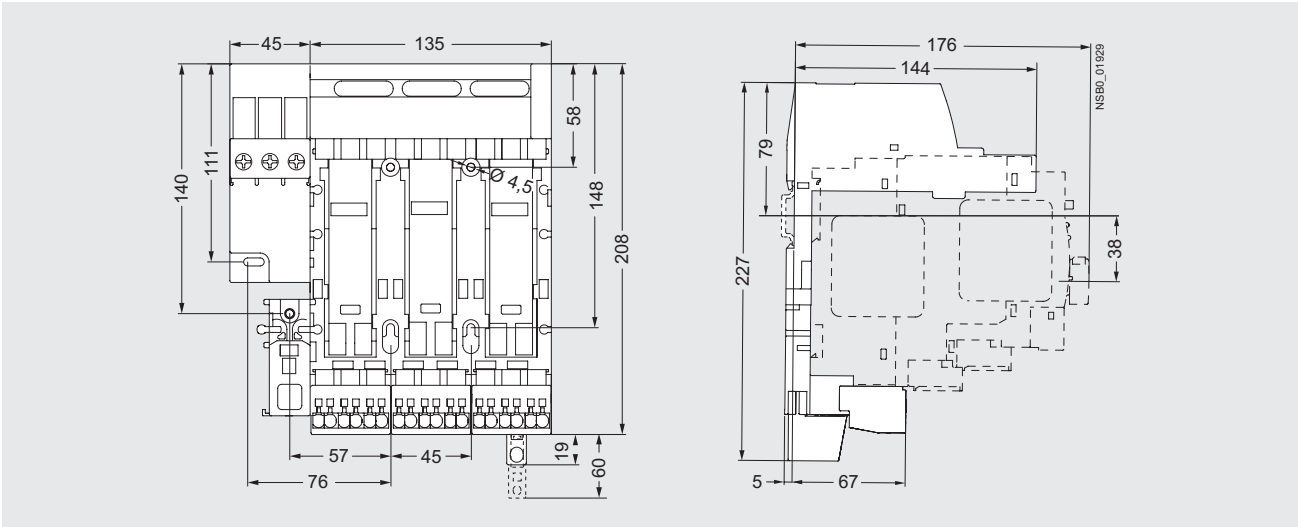
# SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6 – up to 100 A

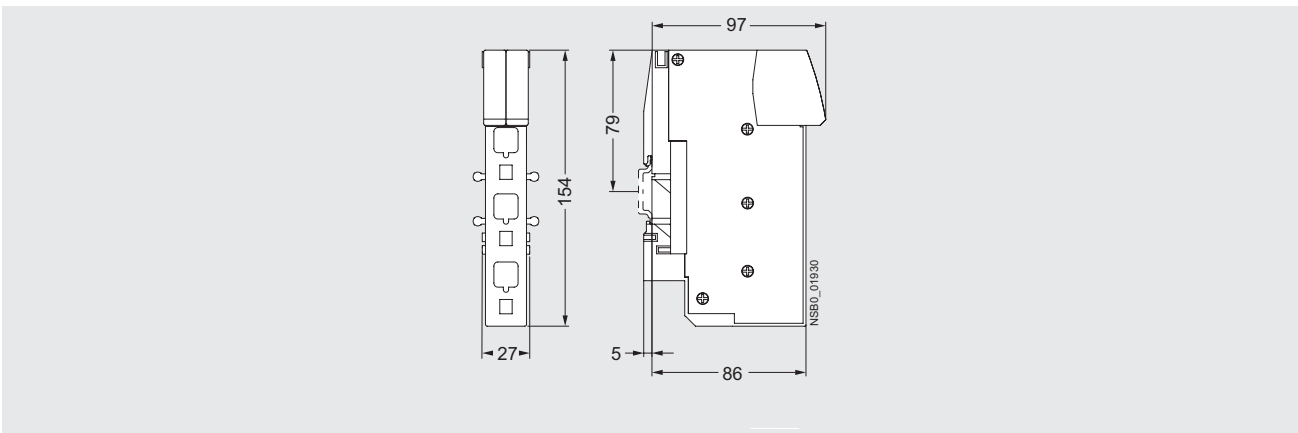
4  
COMBINATION  
STARTERS



Infeed with screw connection 0-2/0 AWG on left with fixed 3-socket expansion module with outgoing spring-type terminals



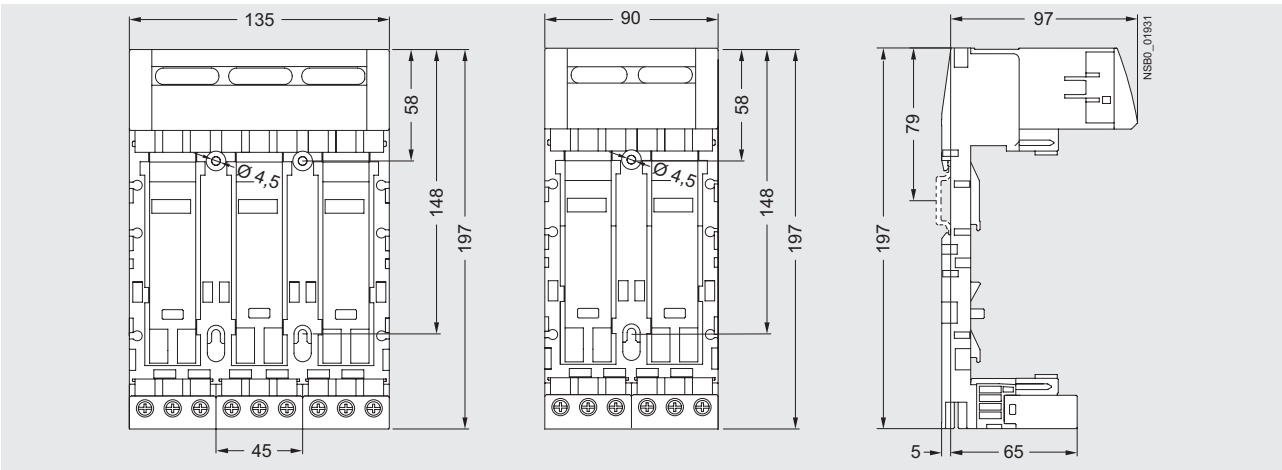
Infeed with screw connection 4-2 AWG on left with fixed 3-socket expansion module with outgoing spring-type terminals



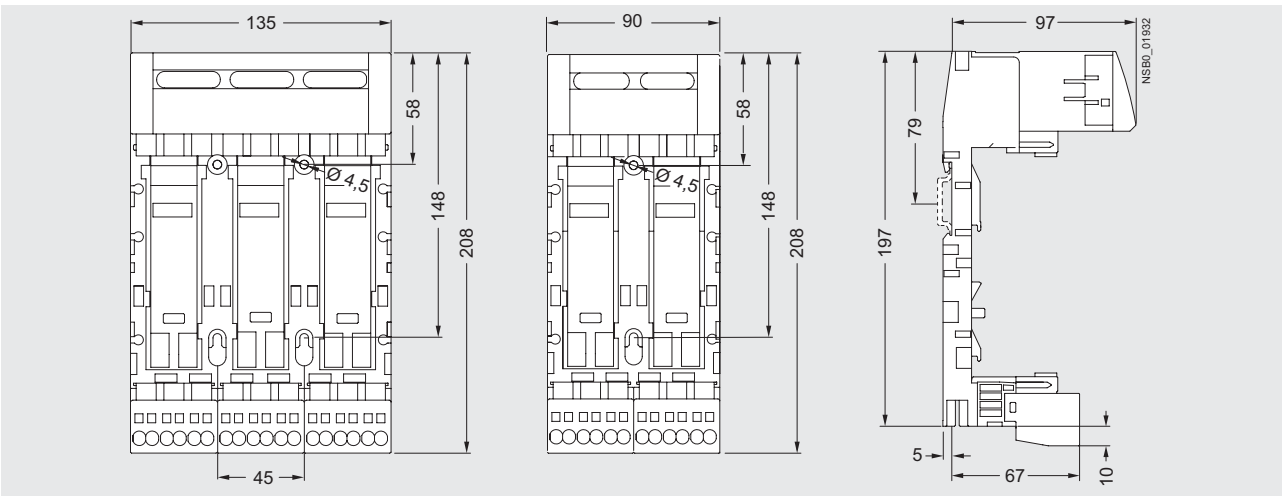
Infeed with spring-type terminals

# SIRIUS 3RA6 Compact Starters

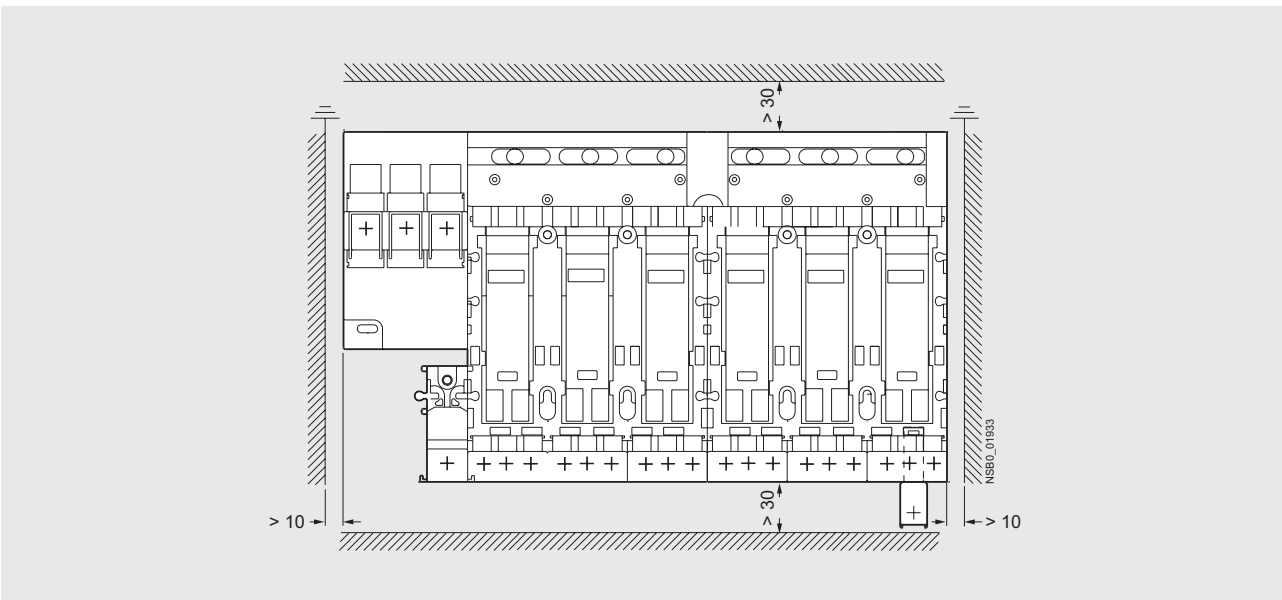
Infeed systems for 3RA6 – up to 100 A



3-socket expansion module and 2-socket expansion module with outgoing screw terminals



3-socket expansion module and 2-socket expansion module with outgoing spring-type terminals

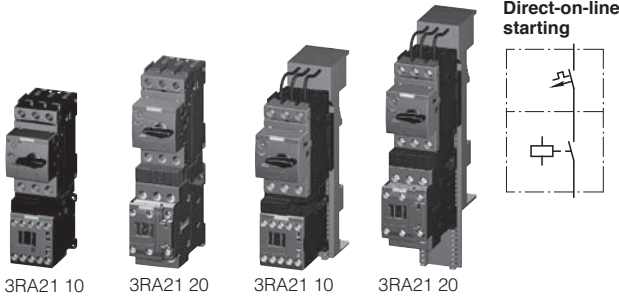


Minimum clearances to adjacent components when using infeed system for 3RA6

# 3RA2 Starters

Non-Reversing, AC Coil – up to 22 A

## Selection and ordering data



**Rated control supply voltage 50/60 Hz 110/120 V AC**  
**With screw connections**

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches<sup>1)</sup> on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
  - Contactor size S00: 1 NO;
  - Contactor size S0: 1 NO + 1 NC

### Combination Starter, UL508 Type F

All size S00 and S0 devices can be applied as Combination Starters with the addition of either of these line side connectors: 3RV29 28-1H, 3RV29 25-5EB or 3RV29 28-1K.

Size	UL Data						FLA setting range inverse-time delayed overload release	Consisting of the following single devices			Assembled starter		Weight approx. kg
	Single-phase HP ratings		Three-phase <sup>2)</sup> HP ratings		SCCR at 480 V			Motor starter protector	+ Contactor	+ Link module + Busbar adapter <sup>3)</sup>	Screw terminals	Order No.	
	115 V	230 V	200 V	230 V	460 V	575 V	kA	A					

### Selection depends on motor full load amps

							3RV20			3RT20	3RA		
<b>S00</b>	--	--	--	--	--	--	65	0.11...0.16	11-0AA10	15-1AK61	1921-1DA00	<b>3RA21 1□-0A□15-1AK6</b>	0.575
	--	--	--	--	--	--	65	0.14...0.2	11-0BA10		+ 8US1251-5DS10	<b>3RA21 1□-0B□15-1AK6</b>	0.575
	--	--	--	--	--	--	65	0.18...0.25	11-0CA10			<b>3RA21 1□-0C□15-1AK6</b>	0.575
	--	--	--	--	--	--	65	0.22...0.32	11-0DA10			<b>3RA21 1□-0D□15-1AK6</b>	0.575
	--	--	--	--	--	--	65	0.28...0.4	11-0EA10			<b>3RA21 1□-0E□15-1AK6</b>	0.575
	--	--	--	--	--	--	65	0.35...0.5	11-0FA10			<b>3RA21 1□-0F□15-1AK6</b>	0.575
	--	--	--	--	--	--	65	0.45...0.63	11-0GA10			<b>3RA21 1□-0G□15-1AK6</b>	0.575
	--	--	--	--	--	--	65	0.55...0.8	11-0HA10			<b>3RA21 1□-0H□15-1AK6</b>	0.575
	--	--	--	--	--	1/2	65	0.7... 1	11-0JA10			<b>3RA21 1□-0J□15-1AK6</b>	0.575
	--	--	--	--	1/2	1/2	65	0.9... 1.25	11-0KA10			<b>3RA21 1□-0K□15-1AK6</b>	0.575
	--	1/10	--	--	3/4	3/4	65	1.1... 1.6	11-1AA10			<b>3RA21 1□-1A□15-1AK6</b>	0.575
	--	1/8	--	--	3/4	1	65	1.4... 2	11-1BA10			<b>3RA21 1□-1B□15-1AK6</b>	0.575
	--	1/6	1/2	1/2	1	1 1/2	65	1.8... 2.5	11-1CA10			<b>3RA21 1□-1C□15-1AK6</b>	0.575
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2... 3.2	11-1DA10			<b>3RA21 1□-1D□15-1AK6</b>	0.575
	1/8	1/3	3/4	3/4	2	3	65	2.8... 4	11-1EA10			<b>3RA21 1□-1E□15-1AK6</b>	0.575
	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10			<b>3RA21 1□-1F□15-1AK6</b>	0.575
1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			<b>3RA21 1□-1G□15-1AK6</b>	0.575	
1/3	1	2	2	5	5	65	5.5... 8	11-1HA10	16-1AK61		<b>3RA21 1□-1H□16-1AK6</b>	0.575	
1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			<b>3RA21 1□-1J□16-1AK6</b>	0.575	
1/2	2	3	3	7 1/2	10	65	9... 12	11-1KA10	17-1AK61		<b>3RA21 1□-1K□17-1AK6</b>	0.575	
1	2	3	5	10	--	65	11... 16	11-4AA10	18-1AK61		<b>3RA21 1□-4A□18-1AK6</b>	0.575	
<b>S0</b>	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10	24-1AK60	2921-1AA00	<b>3RA21 2□-1F□24-0AK6</b>	0.761
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10		+ 8US1251-5NT10	<b>3RA21 2□-1G□24-0AK6</b>	0.761
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10			<b>3RA21 2□-1H□24-0AK6</b>	0.761
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			<b>3RA21 2□-1J□24-0AK6</b>	0.761
	1/2	2	3	3	7 1/2	10	65	9... 12.5	11-1KA10			<b>3RA21 2□-1K□24-0AK6</b>	0.761
	1	2	3	5	10	--	65	11... 16	21-4AA10	26-1AK60		<b>3RA21 2□-4A□26-0AK6</b>	0.761
	1 1/2	3	5	5	10	--	65	14... 20	21-4BA10			<b>3RA21 2□-4B□26-0AK6</b>	0.761
	1 1/2	3	5	7 1/2	15	--	50	17... 22	21-4CA10	27-1AK60		<b>3RA21 2□-4C□27-0AK6</b>	0.761
	2	3	5	7 1/2	15	--	50	20... 25	21-4DA10			<b>3RA21 2□-4D□27-0AK6</b>	0.761
	2	5	7 1/2	10	20	--	50	27... 32	21-4EA10			<b>3RA21 2□-4E□27-0AK6</b>	0.761

### Order No. supplement for:

- Standard DIN rail or screw mounting with no additional auxiliaries
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S00 frame contactor has 1NO auxiliary and S0 frame contactor has 1NO/1NC auxiliary)
- With Fast Bus adaptor and no additional auxiliaries
- With Fast Bus adaptor and 1 SPDT NO/NC MSP auxiliary (S00 frame contactor has 1NO auxiliary and S0 frame contactor has 1NO/1NC auxiliary)

0	A
5	A
0	D
5	D

1) For auxiliary switches see Accessories page 4/44.

2) Selection depends on the motor full load amps. HP ratings for reference only.

3) Used only for mounting starter on 8US Fast Bus busbar systems.

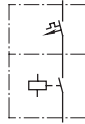
# 3RA2

Non-Reversing, AC and DC Coil – up to 100 A

## Selection and ordering data



### Direct-on-line starting



### For 35 mm standard mounting rail or screw mounting

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches<sup>1)</sup> on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
  - Contactor size S2: 1 NO & 1 NC
  - Contactor size S3: 1 NO & 1 NC

### Combination Starter, UL508 Type F

- Size S2 devices can be applied as Combination Starters. For versions of 50A or higher, the addition of a 3RV2938-1K line side phase barrier is required.
- Size S3 devices can be applied as Combination Starters with the addition of a 3RT2946-4GA07 line side terminal kit

Single-Phase HP Ratings		Three-Phase <sup>2)</sup> HP ratings				SCCR at 480Y/277V kA	FLA setting range Inverse-time delayed overload release A	Starter Order No.	Size	Consisting of the following individual devices		
115V	230V	200V	230V	460V	575V					Motor starter protector	+ Contactor	+ Link module + Adapter for standard mounting rail <sup>3)</sup>
<b>110VAC 50Hz / 120VAC 60 Hz</b>												
3	7.5	10	15	30	40	65	22... 32	<b>3RA21 3□-4EA35-□AK6</b>	<b>S2</b>	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 3RA2932-1AA00 (must be ordered separately)
3	10	15	15	40	50	65	28... 36	<b>3RA21 3□-4PA36-□AK6</b>	3RV20 31-4PA10	3RT2036-1AK60	3RA2931-1AA00 + 3RA2932-1AA00 (must be ordered separately)	
3	10	15	15	40	50	65	32... 40	<b>3RA21 3□-4UA36-□AK6</b>				
3	10	15	15	40	50	65	35... 45	<b>3RA21 3□-4VA36-□AK6</b>	3RV20 31-4VA10	3RT2038-1AK60		
5	10	20	20	50	50	65	42... 52	<b>3RA21 3□-4WA37-□AK6</b>	3RV20 31-4WA10			
5	15	20	25	50	60	20	49... 59	<b>3RA21 3□-4XA38-□AK6</b>	3RV20 31-4XA10	3RT2038-1AK60		
5	15	20	25	50	60	20	54... 65	<b>3RA21 3□-4JA38-□AK6</b>	3RV20 31-4JA10		3RT2038-1AK60	
7.5	15	25	30	60	60	65	28... 40	<b>3RA21 4□-4FB45-□AK6</b>	<b>S3</b>	3RV20 41-4FA10		3RT2045-1AK60
7.5	15	25	30	60	60	65	36... 50	<b>3RA21 4□-4HB45-□AK6</b>	3RV20 41-4HA10	3RT2045-1AK60		
7.5	15	25	30	60	60	65	45... 63	<b>3RA21 4□-4JB45-□AK6</b>			3RV20 41-4JA10	3RT2046-1AK60
10	20	30	30	75	75	65	57... 75	<b>3RA21 4□-4KB46-□AK6</b>	3RV20 41-4KA10	3RT2046-1AK60		
10	20	30	30	75	75	65	65... 84	<b>3RA21 4□-4RB46-□AK6</b>	3RV20 41-4RA10		3RT2047-1AK60	
10	20	30	30	75	-	65	75... 93	<b>3RA21 4□-4YB46-□AK6</b>	3RV20 41-4YA10	3RT2047-1AK60		
10	20	30	40	75	-	65	80...100	<b>3RA21 4□-4MB47-□AK6</b>	3RV20 41-4MA10		3RT2047-1AK60	

<b>24V UC</b>												
3	7.5	10	15	30	40	65	22... 32	<b>3RA21 3□-4EA35-□NB3</b>	<b>S2</b>	3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 3RA2932-1AA00 (must be ordered separately)
3	10	15	15	40	50	65	28... 36	<b>3RA21 3□-4PA36-□NB3</b>	3RV20 31-4PA10	3RT2036-1NB30		
3	10	15	15	40	50	65	32... 40	<b>3RA21 3□-4UA36-□NB3</b>			3RV20 31-4UA10	
3	10	15	15	40	50	65	35... 45	<b>3RA21 3□-4VA36-□NB3</b>	3RV20 31-4VA10	3RT2038-1NB30		
5	10	20	20	50	50	65	42... 52	<b>3RA21 3□-4WA37-□NB3</b>	3RV20 31-4WA10		3RT2038-1NB30	
5	15	20	25	50	60	20	49... 59	<b>3RA21 3□-4XA38-□NB3</b>	3RV20 31-4XA10	3RT2038-1NB30		
5	15	20	25	50	60	20	54... 65	<b>3RA21 3□-4JA38-□NB3</b>	3RV20 31-4JA10		3RT2038-1NB30	
7.5	15	25	30	60	60	65	28... 40	<b>3RA21 4□-4FB45-□NB3</b>	<b>S3</b>	3RV20 41-4FA10		3RT2045-1NB30
7.5	15	25	30	60	60	65	36... 50	<b>3RA21 4□-4HB45-□NB3</b>	3RV20 41-4HA10	3RT2045-1NB30		
7.5	15	25	30	60	60	65	45... 63	<b>3RA21 4□-4JB45-□NB3</b>			3RV20 41-4JA10	3RT2046-1NB30
10	20	30	30	75	75	65	57... 75	<b>3RA21 4□-4KB46-□NB3</b>	3RV20 41-4KA10	3RT2046-1NB30		
10	20	30	30	75	75	65	65... 84	<b>3RA21 4□-4RB46-□NB3</b>	3RV20 41-4RA10		3RT2047-1NB30	
10	20	30	30	75	-	65	70... 90	<b>3RA21 4□-4YB46-□NB3</b>	3RV20 41-4YA10	3RT2047-1NB30		
10	20	30	40	75	-	65	80...100	<b>3RA21 4□-4MB47-□NB3</b>	3RV20 41-4MA10		3RT2047-1NB30	

### Order No. supplement for:

- Standard DIN rail or screw mounting with no additional auxiliaries **0** **0**
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S2 frame contactor has 1NO/1NC integrated auxiliary) **5** **0 (S2)**
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S3 frame contactor has 1NO top mounted auxiliary) **5** **1 (S3)**

- 1) For auxiliary switches, see accessories page 4/44.
- 2) Selection depends on motor full load amps. Horsepower ratings for reference only.
- 3) Adapters for standard mounting rail are included for all S3 starters and optional to be ordered as accessories for S2 non-reversing starters.

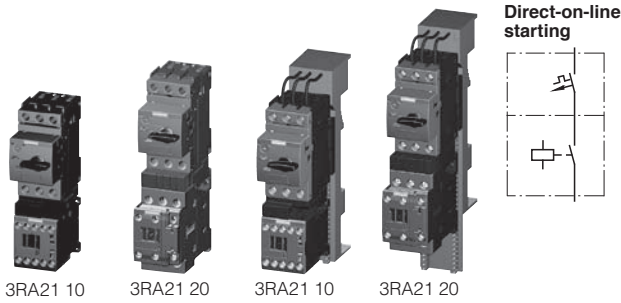
### Note:

In the S2 frame, for 100kA SCCR versions, replace the prefix 3RA213x with 3RA215x. Rating exceptions would be the 59A and 65A versions having a 30kA SCCR at 480Y/277V. For UL 508 type E/F, order 3RV2938-1K Phase Barrier for field installation on all versions.



# 3RA2

Non-Reversing, DC Coil – up to 22 A



**Rated control supply voltage 24 V DC**  
**With screw connections**

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches<sup>1)</sup> on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
  - Contactor size S00: 1 NO;
  - Contactor size S0: 1 NO + 1 NC

**Combination Starter, UL508 Type F**

All size S00 and S0 devices can be applied as Combination Starters with the addition of either of these line side connectors: 3RV29 28-1H, 3RV29 25-5EB or 3RV29 28-1K.

Size	UL Data		SCCR at 480 V	FLA setting range inverse-time delayed overload release	Consisting of the following single devices			Assembled starter		Weight approx. kg
	Single-phase HP ratings	Three-phase <sup>2)</sup> HP ratings			Motor starter protector	+ Contactor	+ Link module + Busbar adapter <sup>3)</sup>	Screw terminals	Order No.	
	115 V	230 V	200 V	230 V	460 V	575 V	kA	A		

Selection depends on motor full load amps													
									3RV20	3RT20	3RA		
<b>S00</b>	--	--	--	--	--	--	65	0.11...0.16	11-0AA10	15-1BB41	1921-1DA00	<b>3RA21</b> 1□-0A□15-1BB4	0.630
	--	--	--	--	--	--	65	0.14...0.2	11-0BA10		+ 8US1251-5DS10	<b>3RA21</b> 1□-0B□15-1BB4	0.630
	--	--	--	--	--	--	65	0.18...0.25	11-0CA10			<b>3RA21</b> 1□-0C□15-1BB4	0.630
	--	--	--	--	--	--	65	0.22...0.32	11-0DA10			<b>3RA21</b> 1□-0D□15-1BB4	0.630
	--	--	--	--	--	--	65	0.28...0.4	11-0EA10			<b>3RA21</b> 1□-0E□15-1BB4	0.630
	--	--	--	--	--	--	65	0.35...0.5	11-0FA10			<b>3RA21</b> 1□-0F□15-1BB4	0.630
	--	--	--	--	--	--	65	0.45...0.63	11-0GA10			<b>3RA21</b> 1□-0G□15-1BB4	0.630
	--	--	--	--	--	--	65	0.55...0.8	11-0HA10			<b>3RA21</b> 1□-0H□15-1BB4	0.630
	--	--	--	--	1/2	1/2	65	0.7... 1	11-0JA10			<b>3RA21</b> 1□-0J□15-1BB4	0.630
	--	--	--	--	1/2	1/2	65	0.9... 1.25	11-0KA10			<b>3RA21</b> 1□-0K□15-1BB4	0.630
	--	1/10	--	--	3/4	3/4	65	1.1... 1.6	11-1AA10			<b>3RA21</b> 1□-1A□15-1BB4	0.630
	--	1/8	--	--	3/4	1	65	1.4... 2	11-1BA10			<b>3RA21</b> 1□-1B□15-1BB4	0.630
	--	1/6	1/2	1/2	1	1 1/2	65	1.8... 2.5	11-1CA10			<b>3RA21</b> 1□-1C□15-1BB4	0.630
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2... 3.2	11-1DA10			<b>3RA21</b> 1□-1D□15-1BB4	0.630
	1/8	1/3	3/4	3/4	2	3	65	2.8... 4	11-1EA10			<b>3RA21</b> 1□-1E□15-1BB4	0.630
	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10			<b>3RA21</b> 1□-1F□15-1BB4	0.630
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			<b>3RA21</b> 1□-1G□15-1BB4	0.630
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10	16-1BB41		<b>3RA21</b> 1□-1H□16-1BB4	0.630
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			<b>3RA21</b> 1□-1J□16-1BB4	0.630
	1/2	2	3	3	7 1/2	10	65	9... 12	11-1KA10	17-1BB41		<b>3RA21</b> 1□-1K□17-1BB4	0.630
	1	2	3	5	10	--	65	11...16	11-4AA10	18-1BB41		<b>3RA21</b> 1□-4A□18-1BB4	0.630
<b>S0</b>	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10	24-1BB40	2921-1BA00	<b>3RA21</b> 2□-1F□24-0BB4	0.948
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10		+ 8US1251-5NT10	<b>3RA21</b> 2□-1G□24-0BB4	0.948
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10			<b>3RA21</b> 2□-1H□24-0BB4	0.948
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			<b>3RA21</b> 2□-1J□24-0BB4	0.948
	1/2	2	3	3	7 1/2	10	65	9... 12.5	11-1KA10			<b>3RA21</b> 2□-1K□24-0BB4	0.948
	1	2	3	5	10	--	65	11... 16	21-4AA10	26-1BB40		<b>3RA21</b> 2□-4A□26-0BB4	0.948
	1 1/2	3	5	5	10	--	65	14... 20	21-4BA10			<b>3RA21</b> 2□-4B□26-0BB4	0.948
	1 1/2	3	5	7 1/2	15	--	50	17... 22	21-4CA10	27-1BB40		<b>3RA21</b> 2□-4C□27-0BB4	0.948
	2	3	5	7 1/2	15	--	50	20... 25	21-4DA10			<b>3RA21</b> 2□-4D□27-0BB4	0.948
	2	5	7 1/2	10	20	--	50	27... 32	21-4EA10			<b>3RA21</b> 2□-4E□27-0BB4	0.948

**Order No. supplement for:**

- Standard DIN rail or screw mounting with no additional auxiliaries
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S00 frame contactor has 1NO auxiliary and S0 frame contactor has 1NO/1NC auxiliary)
- With Fast Bus adaptor and no additional auxiliaries
- With Fast Bus adaptor and 1 SPDT NO/NC MSP auxiliary (S00 frame contactor has 1NO auxiliary and S0 frame contactor has 1NO/1NC auxiliary)

0	A
5	A
0	D
5	D

1) For auxiliary switches, see Accessories page 4/44.  
 2) Selection depends on the concrete motor full load amps. HP ratings for reference only.  
 3) Use only for mounting starter on 8US Fast Bus busbar systems.

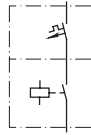
# 3RA2 Starters

## Non-Reversing Fast Bus® – AC and DC Coil

### Selection and ordering data



#### Direct-on-line starting




#### For 60mm Fast Bus busbar systems

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches<sup>1)</sup> on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
  - Contactor size S2: 1 NO & 1 NC
  - Contactor size S3: 1 NO & 1 NC

#### Combination Starter, UL508 Type F

- Size S2 devices can be applied as Combination Starters. For versions of 50A or higher, the addition of a 3RV2938-1K line side phase barrier is required.
- Size S3 devices can be applied as Combination Starters with the addition of a 3RT1946-4GA07 line side terminal kit

Single-Phase HP Ratings		Three-Phase <sup>2)</sup> HP ratings				SCCR at 480Y/277V kA	FLA setting range Inverse-time delayed overload release	Starter Order No.	Size	Consisting of the following individual devices				
115V	230V	200V	230V	460V	575V				Motor starter protector	+ Contactor	+ Link module + Adapter for standard mounting rail <sup>3)</sup>			
<b>110VAC 50Hz / 120 VAC 60Hz</b>														
3	7.5	10	15	30	40	65	22... 32	<b>3RA21 3□-4ED35-□AK6</b>	<b>S2</b>	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 8US1261-6MT10		
3	10	15	15	40	50	65	28... 36	<b>3RA21 3□-4PD36-□AK6</b>		3RV20 31-4PA10	3RT2036-1AK60			
3	10	15	15	40	50	65	32... 40	<b>3RA21 3□-4UD36-□AK6</b>		3RV20 31-4UA10				
3	10	15	15	40	50	65	35... 45	<b>3RA21 3□-4VD36-□AK6</b>		3RV20 31-4VA10	3RT2037-1AK60			
5	10	20	20	50	50	65	42... 52	<b>3RA21 3□-4WD37-□AK6</b>		3RV20 31-4WA10				
5	15	20	25	50	60	20	49... 59	<b>3RA21 3□-4XD38-□AK6</b>		3RV20 31-4XA10	3RT2038-1AK60			
5	15	20	25	50	60	20	54... 65	<b>3RA21 3□-4JD38-□AK6</b>		3RV20 31-4JA10				
7.5	15	25	30	60	60	65	28... 40	<b>3RA21 4□-4FD45-□AK6</b>	<b>S3</b>	3RV20 41-4FA10	3RT2045-1AK60	3RA1941-1AA00 + 8US1211-4TR00		
7.5	15	25	30	60	60	65	36... 50	<b>3RA21 4□-4HD45-□AK6</b>		3RV20 41-4HA10				
7.5	15	25	30	60	60	65	45... 63	<b>3RA21 4□-4JD45-□AK6</b>		3RV20 41-4JA10	3RT2046-1AK60			
10	20	30	30	75	75	65	57... 75	<b>3RA21 4□-4KD46-□AK6</b>		3RV20 41-4KA10				
10	20	30	30	75	75	65	65... 84	<b>3RA21 4□-4RD46-□AK6</b>		3RV20 41-4RA10	3RT2047-1AK60			
10	20	30	30	75	-	65	75... 93	<b>3RA21 4□-4YD46-□AK6</b>		3RV20 41-4YA10				
10	20	30	40	75	-	65	80...100	<b>3RA21 4□-4MD47-□AK6</b>		3RV20 41-4MA10				

<b>24V UC</b>														
3	7.5	10	15	30	40	65	22... 32	<b>3RA21 3□-4ED35-□NB3</b>	<b>S2</b>	3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 8US1261-6MT10		
3	10	15	15	40	50	65	28... 36	<b>3RA21 3□-4PD35-□NB3</b>		3RV20 31-4PA10	3RT2036-1NB30			
3	10	15	15	40	50	65	32... 40	<b>3RA21 3□-4UD35-□NB3</b>		3RV20 31-4UA10				
3	10	15	15	40	50	65	35... 45	<b>3RA21 3□-4VD36-□NB3</b>		3RV20 31-4VA10	3RT2037-1NB30			
5	10	20	20	50	50	65	42... 52	<b>3RA21 3□-4WD36-□NB3</b>		3RV20 31-4WA10				
5	15	20	25	50	60	20	49... 59	<b>3RA21 3□-4XD37-□NB3</b>		3RV20 31-4XA10	3RT2038-1NB30			
5	15	20	25	50	60	20	54... 65	<b>3RA21 3□-4JD37-□NB3</b>		3RV20 31-4JA10				
7.5	15	25	30	60	60	65	28... 40	<b>3RA21 4□-4FD44-□NB3</b>	<b>S3</b>	3RV20 41-4FA10	3RT2045-1NB30	3RA1941-1BA00 + 8US1211-4TR00		
7.5	15	25	30	60	60	65	36... 50	<b>3RA21 4□-4HD44-□NB3</b>		3RV20 41-4HA10				
7.5	15	25	30	60	60	65	45... 63	<b>3RA21 4□-4JD44-□NB3</b>		3RV20 41-4JA10	3RT2046-1NB30			
10	20	30	30	75	75	65	57... 75	<b>3RA21 4□-4KD45-□NB3</b>		3RV20 41-4KA10				
10	20	30	30	75	75	65	65... 84	<b>3RA21 4□-4RD45-□NB3</b>		3RV20 41-4RA10	3RT2047-1NB30			
10	20	30	30	75	-	65	75... 93	<b>3RA21 4□-4YD46-□NB3</b>		3RV20 41-4YA10				
10	20	30	40	75	-	65	80...100	<b>3RA21 4□-4MD46-□NB3</b>		3RV20 41-4MA10				

#### Order No. supplement for:

- Standard DIN rail or screw mounting with no additional auxiliaries **0 0**
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S2 frame contactor has 1NO/1NC integrated auxiliary) (S3 frame contactor has 1NO top mounted auxiliary) **5 0 (S2)**  
**5 1 (S3)**

1) For auxiliary switches, see Accessories page 4/44.  
2) Selection depends on motor full load amps. Horsepower ratings for reference only.

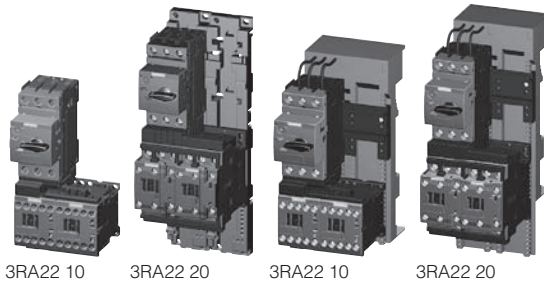
#### Note:

In the S2 frame, for 100kA SCCR versions, replace the prefix 3RA213x with 3RA215x. Rating exceptions would be the 59A and 65A versions having a 30kA SCCR at 480Y/277V. For UL 508 type E/F, order 3RV2938-1K Phase Barrier for field installation on all versions.

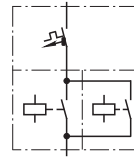
# 3RA2 Starters

Reversing, AC Coil – up to 22 A

## Selection and ordering data



Reversing duty



### Rated control supply voltage 50/60 Hz 110/120 V AC With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches<sup>1)</sup> on the motor starter protector and the contactor can be easily fitted due to the modular system.
- With the contactor S0, an integrated NO contact is available for free use.

### Combination Starter, UL508 Type F

All size S00 and S0 devices can be applied as Combination Starters with the addition of either of these line side connectors: 3RV29 28-1H, 3RV29 25-5EB or 3RV29 28-1K.

Size	UL Data		SCCR at 480 V kA	FLA setting range inverse-time delayed overload release A	Consisting of the following single devices			Assembled starter	Weight approx. kg
	Single-phase HP ratings	Three-phase <sup>2)</sup> HP ratings			Motor starter protector	+ 2 contactors	+ Link module + Assembly kit RH/RS <sup>3)</sup>		
	115 V	230 V	200 V	230 V	460 V	575 V			
								Order No.	

### Selection depends on motor full load amps

							3RV20	3RT20	3RA				
S00	--	--	--	--	--	65	0.11...0.16	11-0AA10	15-1AK62	1921-1DA00	<b>3RA22 10-0A</b> □15-2AK6	0.824	
	--	--	--	--	--	65	0.14...0.2	11-0BA10		+ 2913-2AA1 <sup>4)</sup>	<b>3RA22 10-0B</b> □15-2AK6	0.824	
	--	--	--	--	--	65	0.18...0.25	11-0CA10		+ 2913-1DB1 (RS)	<b>3RA22 10-0C</b> □15-2AK6	0.824	
	--	--	--	--	--	65	0.22...0.32	11-0DA10			<b>3RA22 10-0D</b> □15-2AK6	0.824	
	--	--	--	--	--	65	0.28...0.4	11-0EA10			<b>3RA22 10-0E</b> □15-2AK6	0.824	
	--	--	--	--	--	65	0.35...0.5	11-0FA10			<b>3RA22 10-0F</b> □15-2AK6	0.824	
	--	--	--	--	--	65	0.45...0.63	11-0GA10			<b>3RA22 10-0G</b> □15-2AK6	0.824	
	--	--	--	--	--	65	0.55...0.8	11-0HA10			<b>3RA22 10-0H</b> □15-2AK6	0.824	
	--	--	--	--	1/2	1/2	65	0.7... 1	11-0JA10			<b>3RA22 10-0J</b> □15-2AK6	0.824
	--	--	--	1/2	1/2	65	0.9... 1.25	11-0KA10			<b>3RA22 10-0K</b> □15-2AK6	0.824	
	--	1/10	--	--	3/4	3/4	65	1.1... 1.6	11-1AA10			<b>3RA22 10-1A</b> □15-2AK6	0.824
	--	1/8	--	--	3/4	1	65	1.4... 2	11-1BA10			<b>3RA22 10-1B</b> □15-2AK6	0.824
	--	1/6	1/2	1/2	1	1 1/2	65	1.8... 2.5	11-1CA10			<b>3RA22 10-1C</b> □15-2AK6	0.824
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2... 3.2	11-1DA10			<b>3RA22 10-1D</b> □15-2AK6	0.824
	1/8	1/3	3/4	3/4	2	3	65	2.8... 4	11-1EA10			<b>3RA22 10-1E</b> □15-2AK6	0.824
	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10			<b>3RA22 10-1F</b> □15-2AK6	0.824
1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			<b>3RA22 10-1G</b> □15-2AK6	0.824	
1/3	1	2	2	5	5	65	5.5... 8	11-1HA10	16-1AK62		<b>3RA22 10-1H</b> □16-2AK6	0.824	
1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			<b>3RA22 10-1J</b> □16-2AK6	0.824	
1/2	2	3	3	7 1/2	10	65	9... 12	11-1KA10	17-1AK62		<b>3RA22 10-1K</b> □17-2AK6	0.824	
1	2	3	5	10	--	65	11...16	11-4AA10	18-1AK62		<b>3RA22 10-4A</b> □18-2AK6	0.824	
S0	1/6	1/2	1	1	3	65	3.5... 5	11-1FA10	24-1AK60	2921-1AA00	<b>3RA22 20-1F</b> □24-0AK6	1.434	
	1/4	1/2	1	1 1/2	3	65	4.5... 6.3	11-1GA10		+ 2923-1BB1 (RH)	<b>3RA22 20-1G</b> □24-0AK6	1.434	
	1/3	1	2	2	5	65	5.5... 8	11-1HA10		+ 2923-1DB1 (RS)	<b>3RA22 20-1H</b> □24-0AK6	1.434	
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10		<b>3RA22 20-1J</b> □24-0AK6	1.434	
	1/2	2	3	3	7 1/2	10	65	9... 12.5	11-1KA10		<b>3RA22 20-1K</b> □24-0AK6	1.434	
	1	2	3	5	10	--	65	11... 16	21-4AA10	26-1AK60	<b>3RA22 20-4A</b> □26-0AK6	1.434	
	1 1/2	3	5	5	10	--	65	14... 20	21-4BA10		<b>3RA22 20-4B</b> □26-0AK6	1.434	
	1 1/2	3	5	7 1/2	15	--	50	17... 22	21-4CA10	27-1AK60	<b>3RA22 20-4C</b> □27-0AK6	1.434	
	2	3	5	7 1/2	15	--	50	20... 25	21-4DA10		<b>3RA22 20-4D</b> □27-0AK6	1.434	
	2	5	7 1/2	10	20	--	50	27... 32	21-4EA10		<b>3RA22 20-4E</b> □27-0AK6	1.434	

Add. weight

### Order No. supplement for mounting onto standard mounting rail or screw fixing

- Without standard mounting rail adapter for size S00<sup>4)</sup>
  - With 2 standard mounting rail adapters for size S0
- Screw fixing with 2 push-in lugs each per motor starter is possible

### Order No. supplement for mounting onto Fastbus 60mm busbar system

With 8US Fast Bus busbar adapter

for size S00  
for size S0

1  
2

A  
B

1  
2

D  
D

0.486  
0.293

- 1) For push-in lugs and auxiliary switches, see Accessories on pages 4/44 and 4/52.
- 2) Selection depends on the motor full load amps. HP ratings for reference only.
- 3) According to ordering option:  
RH = assembly kit for reversing duty with standard rail mounting adapter in size S0.  
RS = assembly kit for reversing duty with 8US Fast Bus busbar mounting.
- 4) With standard rail mounting or screw fixing, the 3RA29 13-2AA1 wiring kit is required for size S00.

# 3RA2

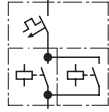
Reversing, AC Coil – up to 100 A

### Selection and ordering data

3RA12 40



### Reversing duty



### For 35 mm standard mounting rail or screw mounting

- All starters are suitable for use in Group Installation applications per NEC 430-53 (c)
- Motor starter protector and contactor are linked electrically and mechanically by means of a link module and adapter plate
- Starter includes both electrical and mechanical interlocks
- Auxiliary switches <sup>1)</sup> can be added easily to the MSP and the contactor

### Combination Starter, UL508 Type F

- Size S2 devices can be applied as Combination Starters. For versions of 50A or higher, the addition of a 3RV2938-1K line side phase barrier is required.
- Size S3 devices can be applied as Combination Starters with the addition of a 3RT1946-4GA07 line side terminal kit
- SCCR: 65kA at 480V

Single-Phase HP Ratings		Three-Phase <sup>2)</sup> HP ratings				FLA setting range	Starter Order No.	Size	Consisting of the following individual devices			
115V	230V	200V	230V	460V	575V	Inverse-time delayed overload			Motor starter protector	+ 2 Contactors +	Link module + assembly kit RH <sup>3)</sup>	
<b>110VAC 50Hz / 120VAC 60Hz</b>												
3	5	10	10	25	30	22... 32	For customer assembly	S2	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 3RA2933-1BB1	
3	7.5	15	15	30	40	28... 36			3RV20 31-4PA10			
3	7.5	15	15	30	40	32... 40			3RV20 31-4UA10			
3	10	15	15	40	50	35... 45			3RV20 31-4VA10			3RT2036-1AK60
5	10	15	20	40	50	42... 52			3RV20 31-4WA10			3RT2036-1AK60
5	15	20	25	50	50	49... 59			3RV20 31-4XA10			3RT2037-1AK60
5	15	20	25	50	50	54... 65	3RV20 31-4JA10	3RT2037-1AK60				
3	7 1/2	15	15	30	40	28 ... 40	For customer assembly	S3	3RV20 41-4FA10	3RT2045-1AK60	3RA1941-1AA00 + 3RA1943-1B <sup>4)</sup>	
5	10	15	20	40	50	36 ... 50			3RV20 41-4HA10			
5	15	20	25	50	60	45 ... 63			3RV20 41-4JA10			
7 1/2	15	25	25	60	75	57 ... 75			3RV20 41-4KA10			3RT2046-1AK60
7 1/2	15	25	30	60	75	65 ... 84			3RV20 41-4RA10			3RT2047-1AK60
10	20	30	30	75	-	75 ... 93			3RV20 41-4YA10			
10	20	30	30	75	-	80 ... 100	3RV20 41-4MA10					
<b>24VDC</b>												
3	5	10	10	25	30	22... 32	For customer assembly	S2	3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 3RA2933-1BB1	
3	7.5	15	15	30	40	28... 36			3RV20 31-4PA10			
3	7.5	15	15	30	40	32... 40			3RV20 31-4UA10			
3	10	15	15	40	50	35... 45			3RV20 31-4VA10			3RT2036-1NB30
5	10	15	20	40	50	42... 52			3RV20 31-4WA10			3RT2036-1NB30
5	15	20	25	50	50	49... 59			3RV20 31-4XA10			3RT2037-1NB30
5	15	20	25	50	50	54... 65	3RV20 31-4JA10	3RT2037-1NB30				
3	7 1/2	15	15	30	40	28 ... 40	For customer assembly	S3	3RV20 41-4FA10	3RT2045-1NB30	3RA1941-1BA00 + 3RA1943-1B <sup>4)</sup>	
5	10	15	20	40	50	36 ... 50			3RV20 41-4HA10			
5	15	20	25	50	60	45 ... 63			3RV20 41-4JA10			
7 1/2	15	25	25	60	75	57 ... 75			3RV20 41-4KA10			3RT2046-1NB30
7 1/2	15	25	30	60	75	65 ... 84			3RV20 41-4RA10			3RT2047-1NB30
10	20	30	30	75	-	75 ... 93			3RV20 41-4YA10			
10	20	30	30	75	-	80 ... 100	3RV20 41-4MA10					

RH = Reversing duty for rail mounting.

1) For auxiliary switches, see Accessories page 4/44.

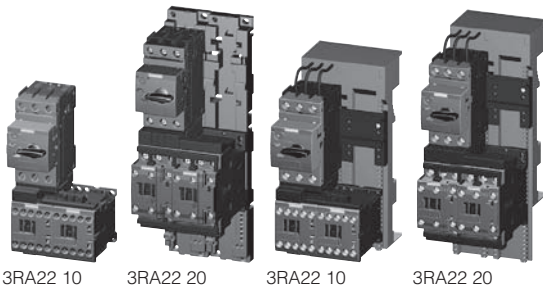
2) Selection depends on motor full load amps. Horse power ratings for reference only.

3) Adapters for standard mounting rail are also suitable for screw mounting.

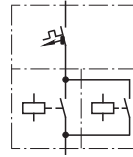
4) Mechanical interlock must be ordered separately; see Accessories page 4/50

# 3RA2

Reversing, DC Coil – up to 22 A



Reversing duty



**Rated control supply voltage 24 V DC**  
With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches<sup>1)</sup> on the motor starter protector and the contactor can be easily fitted due to the modular system.
- With the contactor S0, an integrated NO contact is available for free use.

**Combination Starter, UL508 Type F**

All size S00 and S0 devices can be applied as Combination Starters with the addition of either of these line side connectors: 3RV29 28-1H, 3RV29 25-5EB or 3RV29 28-1K.

Size	UL Data						FLA setting range inverse-time delayed overload release	Consisting of the following single devices			Assembled starter	Weight approx.	
	Single-phase HP ratings		Three-phase <sup>2)</sup> HP ratings		SCCR at 480 V			Motor starter protector	+ 2 contactors	+ Link module + Assembly kit RH/RS <sup>3)</sup>			Screw terminals
	115 V	230 V	200 V	230 V	460 V	575 V	kA	A			Order No.	kg	
<b>Selection depends on motor full load amps</b>													
									<b>3RV20</b>	<b>3RT20</b>	<b>3RA</b>		
<b>S00</b>	--	--	--	--	--	--	65	0.11...0.16	11-0AA10	15-1BB42	1921-1DA00 '+ 2913-2AA1 <sup>4)</sup> '+ 2913-1DB1 (RS)	<b>3RA22 10-0A□15-2BB4</b>	0.934
	--	--	--	--	--	--	65	0.14...0.2	11-0BA10			<b>3RA22 10-0B□15-2BB4</b>	0.934
	--	--	--	--	--	--	65	0.18...0.25	11-0CA10			<b>3RA22 10-0C□15-2BB4</b>	0.934
	--	--	--	--	--	--	65	0.22...0.32	11-0DA10			<b>3RA22 10-0D□15-1BB4</b>	0.934
	--	--	--	--	--	--	65	0.28...0.4	11-0EA10			<b>3RA22 10-0E□15-2BB4</b>	0.934
	--	--	--	--	--	--	65	0.35...0.5	11-0FA10			<b>3RA22 10-0F□15-1BB4</b>	0.934
	--	--	--	--	--	--	65	0.45...0.63	11-0GA10			<b>3RA22 10-0G□15-2BB4</b>	0.934
	--	--	--	--	--	--	65	0.55...0.8	11-0HA10			<b>3RA22 10-0H□15-2BB4</b>	0.934
	--	--	--	--	--	1/2	65	0.7... 1	11-0JA10			<b>3RA22 10-0J□15-2BB4</b>	0.934
	--	--	--	--	1/2	1/2	65	0.9... 1.25	11-0KA10			<b>3RA22 10-0K□15-2BB4</b>	0.934
	--	1/10	--	--	3/4	3/4	65	1.1... 1.6	11-1AA10			<b>3RA22 10-1A□15-2BB4</b>	0.934
	--	1/8	--	--	3/4	1	65	1.4... 2	11-1BA10			<b>3RA22 10-1B□15-2BB4</b>	0.934
	--	1/6	1/2	1/2	1	1 1/2	65	1.8... 2.5	11-1CA10			<b>3RA22 10-1C□15-2BB4</b>	0.934
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2... 3.2	11-1DA10			<b>3RA22 10-1D□15-2BB4</b>	0.934
	1/8	1/3	3/4	3/4	2	3	65	2.8... 4	11-1EA10			<b>3RA22 10-1E□15-2BB4</b>	0.934
	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10			<b>3RA22 10-1F□15-2BB4</b>	0.934
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			<b>3RA22 10-1G□15-2BB4</b>	0.934
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10	16-1BB42		<b>3RA22 10-1H□16-2BB4</b>	0.934
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			<b>3RA22 10-1J□16-2BB4</b>	0.934
	1/2	2	3	3	7 1/2	10	65	9... 12	11-1KA10	17-1BB42		<b>3RA22 10-1K□17-2BB4</b>	0.934
	1	2	3	5	10	--	65	11...16	11-4AA10	18-1BB42		<b>3RA22 10-4A□18-2BB4</b>	0.934
<b>S0</b>	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10	24-1BB40	2921-1BA00 '+ 2923-1BB1 (RH) '+ 2923-1DB1 (RS)	<b>3RA22 20-1F□24-0BB4</b>	1.811
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			<b>3RA22 20-1G□24-0BB4</b>	1.811
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10			<b>3RA22 20-1H□24-0BB4</b>	1.811
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			<b>3RA22 20-1J□24-0BB4</b>	1.811
	1/2	2	3	3	7 1/2	10	65	9... 12.5	11-1KA10			<b>3RA22 20-1K□24-0BB4</b>	1.811
	1	2	3	5	10	--	65	11... 16	21-4AA10	26-1BB40		<b>3RA22 20-4A□26-0BB4</b>	1.811
	1 1/2	3	5	5	10	--	65	14... 20	21-4BA10			<b>3RA22 20-4B□26-0BB4</b>	1.811
	1 1/2	3	5	7 1/2	15	--	50	17... 22	21-4CA10	27-1BB40		<b>3RA22 20-4C□27-0BB4</b>	1.811
	2	3	5	7 1/2	15	--	50	20... 25	21-4DA10			<b>3RA22 20-4D□27-0BB4</b>	1.811
	2	5	7 1/2	10	20	--	50	27... 32	21-4EA10			<b>3RA22 20-4E□27-0BB4</b>	1.811

**Order No. supplement for mounting onto standard mounting rail or screw fixing**

- Without standard mounting rail adapter for size S00<sup>4)</sup>
  - With 2 standard mounting rail adapters for size S0
- Screw fixing with 2 push-in lugs each per motor starter is possible

**Order No. supplement for mounting onto Fastbus 60mm busbar system**  
With 8US Fast Bus busbar adapter

for size S00  
for size S0

		1	A	2	B	1	D	2	D	0.486	0.306

1) For push-in lugs and auxiliary switches, see Accessories on pages 4/44 and 4/52.  
 2) Selection depends on the motor full load amps. HP ratings for reference only.  
 3) Code for abbreviations:  
 RH = assembly kit for reversing duty with standard rail mounting adapter in size S0.  
 RS = assembly kit for reversing duty with 8US Fast Bus busbar mounting.  
 4) With standard rail mounting or screw fixing, the 3RA29 13-2AA1 wiring kit and link module are required for size S00.

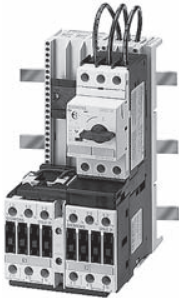


# 3RA2

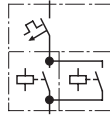
## Reversing Fast Bus®, AC and DC Coil – up to 100 A

### Selection and ordering data

Representative image of assembled starter



### Reversing duty



### For 60 mm Fast Bus busbar systems

- All starters are suitable for use in Group Installation applications per NEC 430-53 (c)
- Motor starter protector and contactor are linked electrically and mechanically by means of a link module and mounted on a Fast-bus Shoe
- Starter includes both electrical and mechanical interlocks
- Auxiliary switches<sup>1)</sup> can be added easily to the MSP and the contactor
- Size S3 is kit form only - assembly required

### Combination Starter, UL508 Type F

- Size S2 devices can be applied as Combination Starters
- Size S3 devices can be applied as Combination Starters with the addition of a 3RT2946-4GA07 line side terminal kit
- SCCR: 65kA at 480V

Single-Phase HP Ratings		Three-Phase <sup>2)</sup> HP ratings				FLA setting range	Starter Order No.	Size	Consisting of the following individual devices			
115V	230V	200V	230V	460V	575V	Motor starter protector			+ Contactor	+ Link module + Adapter shoe for Fastbus		
<b>110VAC 50Hz / 120VAC 60Hz</b>												
3	5	10	10	25	30	22... 32	For customer assembly	S2	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 3RA2933-1DB1	
3	7.5	15	15	30	40	28... 36			3RV20 31-4PA10			
3	7.5	15	15	30	40	32... 40			3RV20 31-4UA10			
3	10	15	15	40	50	35... 45			3RV20 31-4VA10			3RT2036-1AK60
5	10	15	20	40	50	42... 52			3RV20 31-4WA10			3RT2036-1AK60
5	15	20	25	50	50	49... 59		3RV20 31-4XA10	3RT2037-1AK60			
5	15	20	25	50	50	54... 65		3RV20 31-4JA10	3RT2037-1AK60			
3	7 1/2	15	15	30	40	28... 40		For customer assembly	S3	3RV20 41-4FA10	3RT2045-1AK60	3RA1941-1AA00 + 3RA1943-2A <sup>3)</sup>
5	10	15	20	40	50	36... 50				3RV20 41-4HA10		
5	15	20	25	50	60	45... 63				3RV20 41-4JA10		
7 1/2	15	25	25	60	75	57... 75	3RV20 41-4KA10					
7 1/2	15	25	25	60	75	65... 84	3RV20 41-4RA10			3RT2046-1AK60		
10	20	30	30	75	-	75... 93	3RV20 41-4YA10			3RT2047-1AK60		
10	20	30	30	75	-	80... 100	3RV20 41-4MA10			3RT2047-1AK60		
<b>24VDC</b>												
3	5	10	10	25	30	22... 32	For customer assembly	S2	3RV20 31-4AA10	3RT2033-1NB30	3RA2931-1AA00 + 3RA2933-1DB1	
3	7.5	15	15	30	40	28... 36			3RV20 31-4BA10			
3	7.5	15	15	30	40	32... 40			3RV20 31-4DA10			
3	10	15	15	40	50	35... 45			3RV20 31-4EA10			3RT2034-1NB30
5	10	15	20	40	50	42... 52			3RV20 31-4FA10			3RT2035-1NB30
5	15	20	25	50	50	49... 59		3RV20 31-4GA10	3RT2036-1NB30			
5	15	20	25	50	50	54... 65		3RV20 31-4HA10	3RT2036-1NB30			
3	7 1/2	15	15	30	40	28... 40		For customer assembly	S3	3RV20 41-4FA10	3RT2045-1NB30	3RA1941-1BA00 + 3RA1943-2A <sup>3)</sup>
5	10	15	20	40	50	36... 50				3RV20 41-4HA10		
5	15	20	25	50	60	45... 63				3RV20 41-4JA10		
7 1/2	15	25	25	60	75	57... 75	3RV20 41-4KA10					
7 1/2	15	25	25	60	75	65... 84	3RV20 41-4RA10			3RT2046-1NB30		
10	20	30	30	75	-	75... 93	3RV20 41-4YA10			3RT2047-1NB30		
10	20	30	30	75	-	80... 100	3RV20 41-4MA10			3RT2047-1NB30		

RH = Reversing duty for rail mounting.

1) For auxiliary switches, see [Accessories page 4/44](#).

2) Selection depends on motor full load amps. Horsepower ratings for reference only.

3) Mechanical interlock must be ordered separately; see [Accessories page 4/50](#).

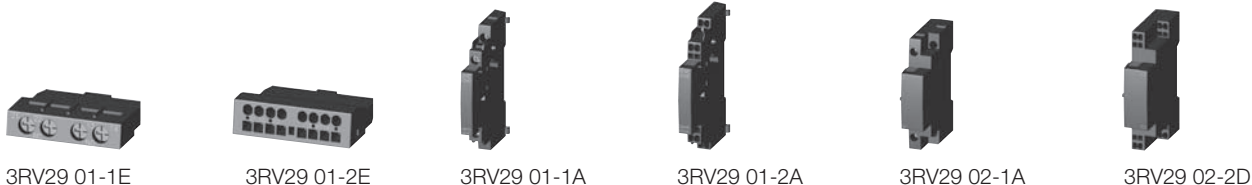
# 3RA2 Accessories

## Auxiliary switches

### Overview

The accessories listed here are parts and add-ons for the 3RA2 direct-on-line and reversing starters as well as components for the customer assembly of motor starters

### Selection and ordering data



	For MSPs	Screw Terminals	⊕	Weight approx.	Spring-type Terminals	⊕	Weight approx.
	Size	Order No.		kg	Order No.		kg

### Auxiliary switches for motor starter protectors <sup>1</sup>

#### Transverse auxiliary switches

For front mounting

1 CO	S00 ... S3	<b>3RV29 01-1D</b>	0.014	—		
1 NO + 1 NC	S00 ... S3	<b>3RV29 01-1E</b>	0.016	<b>3RV29 01-2E</b>	0.016	

#### Lateral auxiliary switches

Mountable on the left

1 NO + 1 NC	S00 ... S3	<b>3RV29 01-1A</b>	0.036	<b>3RV29 01-2A</b>	0.035	
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<sup>1</sup> One transverse auxiliary switch and one lateral auxiliary switch can be attached per motor starter protector.  
When the lateral auxiliary switch with 2 NO + 2 NC is used, a transverse auxiliary switch is not allowed.

Rated control supply voltage Us				For MSPs	Screw Terminals	⊕	Weight approx.	Spring-type Terminals	⊕	Weight approx.
AC 50 Hz	AC 60 Hz	AC 50/60 Hz 100% ON period <sup>1</sup>	AC/DC 50/60 Hz, DC 5s ON period <sup>2</sup>	Size	Order No.		kg	Order No.		kg

### Auxiliary releases for motor starter protectors <sup>3</sup>

#### Undervoltage releases

415	480	—	—	S00 ... S3	<b>3RV29 02-1AV1</b>	0.117	—			
-----	-----	---	---	------------	----------------------	-------	---	--	--	--

#### Shunt releases

—	—	20...24	20...70	S00 ... S3	<b>3RV29 02-1DB0</b>	0.119	<b>3RV29 02-2DB0</b>	0.115		
—	—	90...110	70...190		<b>3RV29 02-1DF0</b>	0.119	<b>3RV29 02-2DF0</b>	0.115		

<sup>1</sup> The voltage range is valid for 100% (infinite) ON period. The response voltage lies at 0.9 of the lower limit of the voltage range.

<sup>2</sup> The voltage range is valid for 5s ON period at AC 50 Hz/60 Hz and DC. The response voltage lies at 0.85 of the lower limit of the voltage range.

<sup>3</sup> One auxiliary release can be mounted on the right per motor starter protector (does not apply to 3RV21 motor starter protectors with overload reset function).

# 3RA2 Accessories

## Auxiliary switches, terminals

### Selection and ordering data

	For Conductors Size	Version	Screw Terminals Order No.	Weight approx. kg	Spring-type Terminals Order No.	Weight approx. kg
<b>Auxiliary switch blocks for snapping on the front for contactors</b>						
<b>Cable entry from below</b>  3RH29 11-1BA10  3RH29 11-1MA20	S00 ... S3	1-pole 1 NC	<b>3RH29 11-1BA10</b>	0.020	—	
	S00 ... S3	1-pole 1 NO	<b>3RH29 11-1BA01</b>	0.020	—	
	S00 ... S3	2-pole 1 NO + 1 NC	<b>3RH29 11-1MA11</b>	0.050	—	
	S00 ... S3	2-pole 2 NO	<b>3RH29 11-1MA20</b>	0.050	—	
<b>Cable entry from two sides</b>  3RH29 11-1FA22	S00 ... S3	4-pole 2 NO + 2 NC	<b>3RH29 11-1FA22</b>	0.060	<b>3RH29 11-2FA22</b>	0.049
	S00	2-pole 1 NO + 1 NC	<b>3RH29 11-1DA11</b>	0.039	<b>3RH29 11-2DA11</b>	0.050
	S00	2-pole 2 NC	<b>3RH29 11-1DA02</b>	0.039	<b>3RH29 11-2DA02</b>	0.050
	S0 ... S3	2-pole 1 NO + 1 NC	<b>3RH29 21-1DA11</b>	0.039	<b>3RH29 21-2DA11</b>	0.050
	S0 ... S3	2-pole 2 NC	<b>3RH29 21-1DA02</b>	0.041	<b>3RH29 21-2DA02</b>	0.050
	S0 ... S3	2-pole 2 NO	<b>3RH29 21-1DA20</b>	0.041	<b>3RH29 21-2DA20</b>	0.050
<b>Laterally mountable auxiliary switch blocks for contactors</b>						
 3RH29 11-1DA11	S00	2 NC	<b>3RH29 11-1DA02</b>	0.020	<b>3RH29 11-2DA02</b>	0.050
	S00	1 NO + 1 NC	<b>3RH29 11-1DA11</b>	0.040	<b>3RH29 11-2DA11</b>	0.050
	S00	1 NO	<b>3RH29 11-1DA20</b>	0.040	<b>3RH29 11-2DA20</b>	0.050
	S0 ... S3	2 NC	<b>3RH29 21-1DA02</b>	0.050	<b>3RH29 21-2DA02</b>	0.050
	S0 ... S3	1 NO + 1 NC	<b>3RH29 21-1DA11</b>	0.050	<b>3RH29 21-2DA11</b>	0.050
	S0 ... S3	2 NO	<b>3RH29 21-1DA20</b>	0.050	<b>3RH29 21-2DA20</b>	0.050
<b>Connection modules for contactors with screw terminals</b>						
<b>Adaptors for contactors</b>  3RT19 26-4RD01	Ambient temperature $T_{u \max} = 60 \text{ }^\circ\text{C}$					
	S00	Rated operational current $I_e$ at AC-3/400 V: 20A	<b>3RT19 16-4RD01</b>	0.020	—	
	S0	Rated operational current $I_e$ at AC-3/400 V: 25A	<b>3RT19 26-4RD01</b>	0.020	—	
<b>Plugs for contactors</b>  3RT19 00-4RE01	S00, S0		<b>3RT19 00-4RE01</b>	0.025	—	



# 3RA2 Accessories

## Terminals

### Selection and ordering data

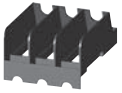
For Conductors Size	Version	Screw Terminals	Weight approx.
		⊕	kg
		Order No.	

### Auxillary switch blocks for snapping on the front for contactors



3RV29 28-1H

Note: UL 508 demands for "Combination Motor Controller Type E" 1" air gaps and 2" creepage distances at lineside. The following terminal blocks must be used in S3 MSP's 3RV10. The S2 MSP 3RV10 conforms with stipulated air gaps and creepage distances without terminal block. Terminal blocks are not required for use according to CSA. With size S0 these terminal blocks cannot be used in combination with 3-phase busbars 3RV19.5. This also applies to size S3 in combination with transverse auxiliary switches.



3RV29 28-1K

**Terminal block type E**  
for extended air/creepage distance (1" and 2")

S00, S0	<b>3RV29 28-1H</b>	0.120
S00, S0	<b>3RV29 28-1K</b>	0.120
S2	<b>3RV29 38-1K</b>	0.120
S3	<b>3RT29 46-4GA07</b>	0.120



3RT19 46-4GA07

# 3RA2 Accessories


## Surge suppressors

### Selection and ordering data


For Conductors Size	Version	Rated control supply voltage $U_s$		Surge Suppressors Order No.	Weight approx. kg
		AC V	DC V		

### Auxiliary switch blocks for snapping on the front for contactors



#### Size S00 — For plugging onto the front side of the contactors with and without auxiliary switch blocks

 3RT29 16-1EH00	3RT2.1	Varistors	24 ... 48 AC	24 ... 70 DC	<b>3RT29 16-1BB00</b>	0.010
			48 ... 127 AC	70 ... 150 DC	<b>3RT29 16-1BC00</b>	0.010
	3RT2.1	RC elements	24 ... 48 AC	24 ... 70 DC	<b>3RT29 16-1CB00</b>	0.010
			48 ... 127 AC	70 ... 150 DC	<b>3RT29 16-1CC00</b>	0.010
	3RT2.1	Noise suppression		12 ... 250 DC	<b>3RT29 16-1DG00</b>	0.010
	3RT2.1	Diode assemblies (diode and Zener diode) for DC operation and short break times		12 ... 250 DC	<b>3RT29 16-1EH00</b>	0.010


#### Size S0 — For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)

 3RT29 26-1BB00	3RT2.2	Varistors	24 ... 48 AC	24 ... 70 DC	<b>3RT29 26-1BB00</b>	0.010
			48 ... 127 AC	70 ... 150 DC	<b>3RT29 26-1BC00</b>	0.010
	3RT2.2	RC elements	24 ... 48 AC	24 ... 70 DC	<b>3RT29 26-1CB00</b>	0.010
			48 ... 127 AC	70 ... 150 DC	<b>3RT29 26-1CC00</b>	0.010
	3RT2.2	Diode assemblies for DC operation and short break times		24 DC	<b>3RT29 26-1ER00</b>	0.010
				30 ... 250 DC	<b>3RT29 26-1ES00</b>	0.010

#### Sizes S2

 3RT2936-1B.00	3RT2.3	Varistors	24 ... 48 AC	24 ... 70 DC	<b>3RT29 36-1BB00</b>	0.010
			127 ... 240 AC	150 ... 250 DC	<b>3RT29 36-1BD00</b>	0.010
			48 ... 127 AC	70 ... 150 DC	<b>3RT29 36-1BC00</b>	0.010
 3RT2936-1E.00	3RT2.3	RC elements	24 ... 48 AC	24 ... 70 DC	<b>3RT29 36-1CB00</b>	0.010
			127 ... 240 AC	150 ... 250 DC	<b>3RT29 36-1CD00</b>	0.010
			48 ... 127 AC	70 ... 150 DC	<b>3RT29 36-1CC00</b>	0.010
3RT2.3	Diode assemblies	--	24 DC	<b>3RT29 36-1ER00</b>	0.010	
		--	30 ... 250 DC	<b>3RT29 36-1ES00</b>	0.010	

#### Sizes S3


 3RT2936-1CC00	3RT20 4.	Varistors	24 ... 48 AC	24 ... 70 DC	<b>3RT29 36-1BB00</b>	0.025
			48 ... 127 AC	70 ... 150 DC	<b>3RT29 36-1BC00</b>	0.025
	3RT20 4.	RC elements	24 ... 48 AC	24 ... 70 DC	<b>3RT29 36-1CB00</b>	0.040
			48 ... 127 AC	70 ... 150 DC	<b>3RT29 36-1CC00</b>	0.040
	3RT20 4.	Diode assemblies for DC operation and short break times, can be plugged in at bottom		24 DC	<b>3RT29 36-1ER00</b>	0.025
				30 ... 250 DC	<b>3RT29 36-1ES00</b>	0.025

For additional surge suppression, [see page 2/73](#)

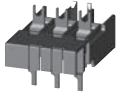
# 3RA2 Accessories

## Surge suppressors, link modules

### Selection and ordering data

	For MSP Size	For contactors	Actuating voltage of contactor	Screw Terminals Order No.		Pack Qty.	Weight approx. kg
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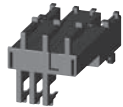
#### Auxiliary switch blocks for snapping on the front for contactors



3RA29 11-2AA00


Electrical and mechanical link between motor starter protector and contactor

Single-unit packaging	S00, S0	S00	AC and DC	<b>3RA19 21-1DA00</b>			
	S00, S0	S0	AC	<b>3RA29 21-1AA00</b>	1 unit	0.055	
	S00, S0	S0	DC	<b>3RA29 21-1BA00</b>	1 unit	0.068	
	S2	S2	AC and DC	<b>3RA29 31-1AA00</b>	1 unit	0.104	
	S3	S3	AC and DC	<b>3RA19 41-1AA00</b>	1 unit	0.090	
Multi-unit packaging	S00, S0	S00	AC and DC	<b>3RA19 21-1D</b>	10 unit	0.021	
	S00, S0	S0	AC	<b>3RA29 21-1A</b>	10 unit	0.001	
	S00, S0	S0	DC	<b>3RA29 21-1B</b>	10 unit	0.001	
	S2	S2	AC and DC	<b>3RA29 31-1A</b>	5 unit	0.104	
	S3	S3	AC and DC	<b>3RA19 41-1A</b>	5 unit	0.073	

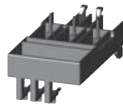


3RA29 11-2AA00

Electrical and mechanical link between motor starter protector and contactor

				Spring-type Terminals Order No.			
Single-unit packaging	S00	S00	AC and DC	<b>3RA29 11-2AA00</b>			
	S0	S0	AC <sup>1)</sup> and DC	<b>3RA29 21-2AA00</b>	1 unit	0.040	
Multi-unit packaging	S00	S00	AC and DC	<b>3RA29 11-2A</b>	10 unit	0.400	
	S0	S0	AC <sup>1)</sup> and DC	<b>3RA29 21-2A</b>	10 unit	0.770	


#### Hybrid link modules from motor starter protector to contactor



3RA29 11-2FA00

For mechanical and electrical connection between motor starter protector with screw terminals and contactor with spring-type terminals

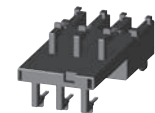
Single-unit packaging	S00	S00	AC and DC	<b>3RA29 11-2FA00</b>	1 unit	0.029	
	S0	S0	AC <sup>1)</sup> and DC	<b>3RA29 21-2FA00</b>	1 unit	0.056	
Multi-unit packaging	S00	S00	AC and DC	<b>3RA29 11-2F</b>	10 unit	0.290	
	S0	S0	AC <sup>1)</sup> and DC	<b>3RA29 21-2F</b>	10 unit	0.560	

	For MSPs Size	For soft starters Size	Screw Terminals Order No.		Pack Qty.	Weight approx. kg
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#### Link modules from motor starter protector to soft starters


Electrical and mechanical link between motor starter protector and soft starter

Single-unit packaging	S00/S0		S00/S0	<b>3RA29 21-1BA00</b>	1 unit	0.001
	S00/S0		S00/S0	<b>3RA29 21-1B</b>	10 unit	0.001



3RA29 11-2GA00

Electrical and mechanical link between motor starter protector and soft starter

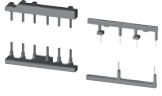

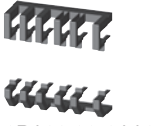

				Spring-type Terminals Order No.			
Single-unit packaging	S00		S00	<b>3RA29 11-2GA00</b>	1 unit	0.038	
	S0		S0	<b>3RA29 21-2GA00</b>	1 unit	0.072	
Multi-unit packaging	S00		S00	<b>3RA29 11-2G</b>	10 unit	0.380	
	S0		S0	<b>3RA29 21-2G</b>	10 unit	0.720	

<sup>1)</sup> A spacer for height compensation on AC contactors with spring-type terminals, size S0 is optionally available, [see page 4/52](#).

# 3RA2 Accessories

## Mounting kits for Fast Bus






### Accessories

	For Conductors Size	Version	Screw Terminals Order No.	Pack Qty.	Weight approx. kg
<b>Wiring kits for contactors</b>					
 3RA29 23-2AA1	<b>Reversing</b>				
	S00	Electrical and mechanical connection for reversing contactors, optionally with integrated electrical and mechanical interlock	<b>3RA29 13-2AA1</b>	1 unit	0.001
	S0		<b>3RA29 23-2AA1</b>	1 unit	0.001
	S2	The kit contains: 2 connecting pins for 2 contactors, wiring modules on the top and bottom • for main and auxiliary circuits	<b>3RA29 33-2AA1</b>	1 unit	0.120
 3RA29 23-2BB1	<b>Wye-delta starting</b>				
	S00	Electrical and mechanical link for three contactors of same size	<b>3RA29 13-2BB1</b>	1 unit	0.001
	S0		<b>3RA29 23-2BB1</b>	1 unit	0.001
	S2-S2-S0		<b>3RA29 33-2C</b>	1 unit	0.070
	S2-S2-S2		<b>29RA2933-2BB1</b>	1 unit	0.160
<b>Spring-type Terminals</b>					
 3RA29 23-2AA2	<b>Reversing Duty</b>				
	S00	Electrical and mechanical connection for reversing contactors, optionally with integrated electrical and mechanical interlock	<b>3RA29 13-2AA2</b>	1 unit	0.001
	S0		<b>3RA29 23-2AA2</b>	1 unit	0.001
	S2	The kit contains: 2 connecting pins for 2 contactors, wiring modules on the top and bottom • for main circuits only	<b>3RA29 33-2AA2</b>	1 unit	0.001
	<b>Wye-delta starting</b>				
	S00	Electrical and mechanical link for three contactors of same size	<b>3RA29 13-2BB2</b>	1 unit	0.001
	S0		<b>3RA29 23-2BB2</b>	1 unit	0.001
	S2-S2-S0		<b>3RA29 33-2C</b>	1 unit	0.001
	S2-S2-S2		<b>3RA29 33-2BB2</b>	1 unit	0.001
<b>Screw Terminals</b>					
<b>Wiring kits for contactors</b>					
 3RA29 16-1A	<b>Reversing</b>				
	S00	Switches 2 contactors in series	<b>3RA29 16-1A</b>	1 unit	0.001
	S0		<b>3RA29 26-1A</b>	1 unit	0.001
	S2		<b>3RA29 36-1A</b>	1 unit	0.001

# 3RA2 Accessories

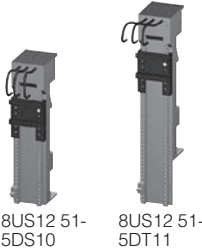


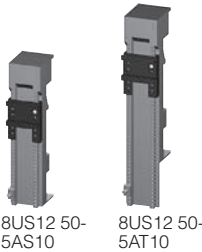


## Mounting kits for Fast Bus

### Accessories

	For Conductors Size	For MSPs Size	Version	Screw Terminals Order No.	⊕	Pack Qty.	Weight approx. kg
<b>Mechanical interlocks</b>							
	S2/S3	--	For reversing contactors, laterally mounted, no electrical connections (each contactor has 1NO/1NC auxiliaries)	<b>3RA29 34-2B</b>			0.010
3RA29 34-2B							
<b>Terminals for contactor coil</b>							
	S3	--	For A1 and A2 of reversing contactors (includes 2 x A1 and 1 x A2)	<b>3RA19 23-3B</b>			0.020
3RA19 23-3B							
<b>Standard mounting rail adaptors</b>							
			For mechanical fixing of motor start protector and contactor; for snapping onto standard mounting rail or for screw fixing.				
	S00, S0	S00, S0	Single-unit packaging	<b>3RA29 22-1AA00</b>		1 unit	0.001
	S2	S2		<b>3RA19 31-1AA00</b>		1 unit	0.020
	S3	S3		<b>3RA19 41-1AA00</b>		1 unit	0.250
	S00, S0	S00, S0	Multi-unit packaging	<b>3RA29 22-1A</b>		5 units	0.001
3RA29 22-1AA00							
<b>Side modules for standard mounting rail adaptors</b>							
	S00 ...S3	S00 ...S3	For standard mounting rail adaptors 10 mm wide, 96 mm long, for widening standard mounting rail adaptors when using lateral auxiliary switches, For size S00 to S2: 2 units required. For size S3: 3 units required	<b>3RA19 02-1B</b>		10 units	0.009
3RA19 02-1B							
<b>RH assembly kits for reversing duty and standard rail mounting</b>							
RH assembly kits for screw terminals							
	S0	S0	Comprising: <ul style="list-style-type: none"> <li>• Wiring kits</li> <li>• 2 standard mounting rail adaptors</li> <li>• 2 connecting wedges</li> </ul> Link modules may be ordered separately.	<b>3RA29 23-1BB1</b>		1 unit	0.001
	S2	S2		<b>3RA29 33-1BB1</b>		1 unit	0.560
	S3	S3		<b>3RA29 43-1BB1</b>		1 unit	0.810
RH assembly kits for spring-type terminals							
	S0	S0	Comprising: <ul style="list-style-type: none"> <li>• Wiring kits</li> <li>• 2 standard mounting rail adaptors</li> <li>• 2 connecting wedges</li> <li>• Spacers</li> </ul> Link modules may be ordered separately.	<b>3RA29 23-1BB2</b>	⊕	1 unit	0.001
3RA29 23-1BB1							

# 3RA2 Accessories

## Busbar adapters

For motor starter protector Size	For contactors Size	Version	Order No.	Std. pack qty.	Weight approx. kg
<b>Busbar adapters for 60 mm systems</b>					
 <p>For flat copper profiles according to DIN 46433 Width: 12 mm and 30 mm Thickness: 5 mm and 10 mm also for T and double-T special profiles</p>					
<b>For motor starter protectors and contactors with screw terminals</b>			<b>Screw terminals</b> 		
S00	S00	Rated current 16 A, 45 mm wide, 200 mm long	<b>8US12 51-5DS10</b>	1 unit	0.183
S0	S0	Rated current 32 A, 45 mm wide, 260 mm long	<b>8US12 51-5NT10</b>	1 unit	0.183
S2	S2	Up to 65A, 55mm wide, 260mm long	<b>8US12 61-6MT10</b>	1 unit	0.572
<b>For motor starter protectors and contactors with spring-type terminals</b>			<b>Spring-type terminals</b> 		
S00	S00	Rated current 16 A, 45 mm wide, 260 mm long	<b>8US12 51-5DT11</b>	1 unit	0.183
S0	S0	Rated current 32 A, 45 mm wide, 260 mm long	<b>8US12 51-5NT11</b>	1 unit	0.183
<b>Device holders for lateral mounting onto busbar adapters for 60 mm system</b>					
					
S00, S0	S00, S0	Up to 25 A, 45 mm wide, 200 mm long	<b>8US12 50-5AS10</b>	1 unit	0.183
S0	S0	Up to 40 A, 45 mm wide, 260 mm long	<b>8US12 50-5AT10</b>	1 unit	0.183
S2	S2	Up to 65A, 118mm wide, 260mm long (includes 8US1261-6MT10 adapter)	<b>8US12 11-6MT10</b>	1 unit	0.873
<b>Side modules for widening busbar adapters</b>					
--	--	Including connecting wedges, for widening busbar adapters or device holders, 9 mm wide, 200 mm long	<b>8US19 98-2BJ10</b>	1 unit	0.023
<b>Spacers for fixing the motor starter onto the busbar adapter</b>					
--	S00, S0	(1 pack = 100 units)	<b>8US19 98-1BA10</b>	1 pack	0.183
<b>Vibration and shock kits for high vibration and shock loads</b>					
--	S00, S0		<b>8US19 98-1CA10</b>	1 unit	0.183
<b>RS assembly kits for reversing duty for 60 mm busbar systems</b>					
<b>RS assembly kits for screw terminals</b>			<b>Screw terminals</b> 		
S00, S0	S00	Comprising: • Wiring kits • Busbar adapters • Device holders • 2 connecting wedges • Side modules  Link modules must be ordered separately.	<b>3RA29 13-1DB1</b>	1 unit	0.001
S0	S0		<b>3RA29 23-1DB1</b>	1 unit	0.001
S00	S0		<b>3RA29 23-1EB1</b>	1 unit	0.001
S2	S2		<b>3RA29 33-1DB1</b>	1 unit	1.235
<b>RS assembly kits for spring-type terminals</b>			<b>Spring-type terminals</b> 		
S00	S00	Comprising: • Wiring kits • Busbar adapters • Device holders • 2 connecting wedges • Spacers • Side modules  Link modules must be ordered separately.	<b>3RA29 13-1DB2</b>	1 unit	0.001
S0	S0		<b>3RA29 23-1DB2</b>	1 unit	0.001

3RA29 23-1DB1 only Busbar adapter pictured

3RA29 23-1DB2 only Busbar adapter pictured

# 3RA2 Accessories

## Connecting wedges, spaces, and tools

For motor starter protector Size	For contactors Size	Version	Order No.	Std. pack qty.	Weight approx. kg
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### Connecting wedges



8US19 98-1AA00

For mechanical linking of busbar adapters and device holders or of standard mounting rail adapters (2 units per combination required)

8US19 98-1AA00	100 units	0.100
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### Spacers



3RA29 11-1CA00

For height compensation on AC contactors size S0 with spring-type terminals

S0	S0	Single-unit packaging
S0	S0	Multi-unit packaging

### Spring-type terminals

3RA29 11-1CA00	1 unit	0.001
3RA29 11-1C	5 units	0.001

Version	Order No.	Std. pack qty.	Weight approx. kg
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### Tools for opening spring-type terminals by hand



3RA29 08-1A

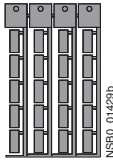
**Screwdrivers** for all SIRIUS devices with spring-type terminals

Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated

### Spring-type terminals

3RA29 08-1A	1 unit	0.045
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### Blank labels



3RT19 00-1SB20

**Unit labeling plates<sup>1)</sup>** for SIRIUS devices 20 mm x 7 mm, pastel turquoise

3RT19 00-1SB20	340 units	0.200
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<sup>1)</sup> PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systems, Inc. [www.murrplastik.com](http://www.murrplastik.com)

### Selection and ordering data

For MSPs Size	For Conductors Size	Version	Order No.	Std. Pack Qty.	Weight approx. kg
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### Push-in lugs for screw fixing



3RV29 28-0B

S00 -- For screwing the motor starter protector onto mounting plates; for each motor starter protector, 2 units are required.

3RV29 28-0B	10 units	0.100
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Components for IEC types of coordination 1 and 2 at AC 500 V

Technical data

Three-phase standard motor <sup>1)</sup> 4-pole at AC 500 V		Setting range Inverse-time delayed overload release	Motor starter protector	Contactor <sup>2)</sup>	Size
Standard output <i>P</i> kW	Motor current (guide value) <i>I</i> A		Type	Type	
<b>IEC Type of coordination 1 at <math>I_q = 50</math> kA/AC 400 V Normal starting Class 10</b>					
1.5	3.6	3.5 ... 5	3RV20 11-1FA10	3RT20 15-1AP00	<b>S00</b>
2.2	4.9	4.5 ... 6.3	3RV20 11-1GA10		
3	6.5	5.5 ... 8	3RV20 11-1HA10		
4	8.5	7 ... 10	3RV20 11-1JA10	3RT20 16-1AP01	
5.5	11.5	9 ... 12.5	3RV20 11-1KA10	3RT20 17-1AP01	
7.5	15.5	11 ... 16	3RV20 11-4AA10	3RT20 18-1AP01	
<b>IEC Type of coordination 2 at <math>I_q = 50</math> kA/AC 400 V Normal starting Class 10</b>					
0.06	0.2	0.14 ... 0.2	3RV20 11-0BA10	3RT20 15-1AP01	<b>S00</b>
0.06	0.2	0.18 ... 0.25	3RV20 11-0CA10		
0.09	0.3	0.22 ... 0.32	3RV20 11-0DA10		
0.09	0.3	0.28 ... 0.4	3RV20 11-0EA10		
0.12	0.4	0.35 ... 0.5	3RV20 11-0FA10		
0.18	0.6	0.45 ... 0.63	3RV20 11-0GA10		
0.18	0.6	0.55 ... 0.8	3RV20 11-0HA10		
0.25	0.85	0.7 ... 1	3RV20 11-0JA10		
0.37	1.1	0.9 ... 1.25	3RV20 11-0KA10		
0.55	1.5	1.1 ... 1.6	3RV20 11-0AA10		
0.75	1.9	1.4 ... 2	3RV20 11-1BA10		
0.75	1.9	1.8 ... 2.5	3RV20 11-1CA10		
1.1	2.7	2.2 ... 3.2	3RV20 11-1DA10		
1.5	3.6	2.8 ... 4	3RV20 11-1EA10		
1.5	3.6	3.5 ... 5	3RV20 11-1FA10	3RT20 24-1AP01	<b>S0</b>
2.2	4.9	4.5 ... 6.3	3RV20 11-1GA10		
3	6.5	5.5 ... 8	3RV20 11-1HA10		
4	8.5	7 ... 10	3RV20 11-1JA10		
5.5	11.5	9 ... 12.5	3RV20 11-1KA10		
7.5	15.5	11 ... 16	3RV20 21-4AA10	3RT20 26-1AP01	
7.5	15.5	14 ... 20	3RV20 21-4BA10		
11	22	17 ... 22	3RV20 21-4CA10	3RT20 27-1AP01	
11	22	20 ... 35	3RV20 21-4DA10		
15	29	27 ... 32	3RV20 21-4EA10		

1) Selection depends on the actual startup and rated data of the protected motor.

2) Rated control supply voltage 120 V AC. Other voltages are possible.

Components for IEC types of coordination 1 and 2 at AC 500 V

Technical data

Three-phase standard motor <sup>1)</sup> 4-pole at AC 500 V		Setting range Inverse-time delayed overload release	Motor starter protector	Contactor <sup>2)</sup>	Size
Standard output <i>P</i> kW	Motor current (guide value) <i>I</i> A		Type	Type	

**IEC Type of coordination 1 at  $I_q = 50$  kA/AC 500 V  
Normal starting Class 10**

On request			3RV2031-4DA10	3RT20 35-1AK60	<b>S2</b>
On request			3RV2031-4EA10	3RT20 35-1AK60	
On request			3RV2031-4FA10	3RT20 35-1AK60	
On request			3RV2031-4GA10	3RT20 36-1AK60	
On request			3RV2031-4HA10	3RT20 36-1AK60	
On request			3RV2041-4JA10	3RT20 45-1AK60	<b>S3</b>
On request			3RV2041-4KA10	3RT20 45-1AK60	
On request			3RV2041-4LA10	3RT20 46-1AK60	

**IEC Type of coordination 2 at  $I_q = 50$  kA/AC 500 V  
Normal starting Class 10**

On request			3RV20 31-4AA10	3RT20 35-1AK60	<b>S2</b>
On request			3RV20 31-4BA10	3RT20 35-1AK60	
On request			3RV20 31-4DA10	3RT20 35-1AK60	
On request			3RV20 31-4EA10	3RT20 35-1AK60	
On request			3RV20 31-4FA10	3RT20 35-1AK60	
On request			3RV20 31-4GA10	3RT20 36-1AK60	
On request			3RV20 31-4HA10	3RT20 36-1AK60	
On request			3RV20 31-4JA10	3RT20 45-1AK60	<b>S3</b>
On request			3RV20 31-4KA10	3RT20 45-1AK60	
On request			3RV20 31-4LA10	3RT20 46-1AK60	

1) Selection depends on the actual startup and rated data of the protected motor.

2) Rated control supply voltage 120 V AC. Other voltages are possible.

Components for IEC types of coordination 1 and 2 at AC 690 V

Technical data

Three-phase standard motor 4-pole at AC 690 V <sup>3)</sup>		Setting range MSP	Standard IEC circuit-breaker with limiting function	Subsequent MSP	Contactor <sup>1)</sup>	Size	Short-circuit switching capacity $I_q$ at 690 V
Standard output	Motor current (guide value)		Type	Type	Type		
$P$ kW	$I$ A	A					kA

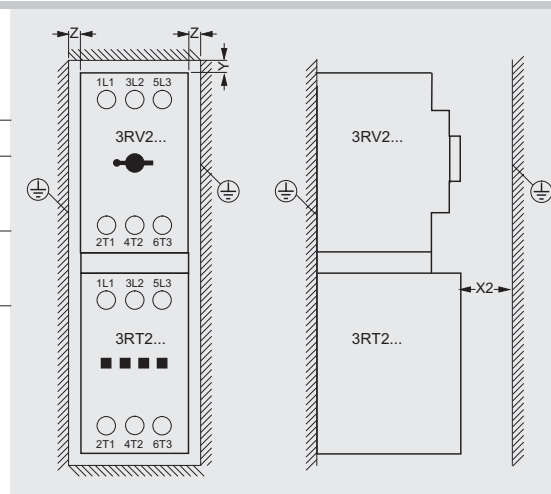
IEC Types of coordination 1 and 2 at AC 690 V  
Normal starting Class 10

On request	11 ... 16	3RV13 31-4HC10	3RV20 31-4AA10	3RT20 35-1AK60	<b>S2</b>	50
On request	14 ... 20	Size S2	3RV20 31-4BA10	3RT20 35-1AK60		
On request	18 ... 25	$I_n = 50$ A	3RV20 31-4DA10	3RT20 35-1AK60		
On request	22 ... 32		3RV20 31-4EA10	3RT20 35-1AK60		
On request	28 ... 40		3RV20 31-4FA10	3RT20 45-1AK60 <sup>2)</sup>	<b>S2/S3</b>	50
On request	36 ... 45		3RV20 31-4GA10	3RT20 45-1AK60 <sup>2)</sup>		
On request	40 ... 50		3RV20 31-4HA10	3RT20 46-1AK60 <sup>2)</sup>		

Installation guidelines for AC 400/500 V

The following distances from earthed components must be observed when installing combinations:

Motor starter protectors in combination with contactors			Distances from earthed or live parts		
MSP	Contactor	Rated operational voltage	Y mm	X2 <sup>4)</sup> mm	Z mm
3RV2. 1 with	3RT20 1	400/500 V	20	10	9
3RV2. 2 with	3RT20 1	400/500 V	30	10	9
	3RT2. 2	400/500 V	30	10	9
	3RT2. 3	400/500 V	30	10	9
3RV2. 3 with	3RT20 2	400/500 V	50	10	10
	3RT2. 3	400/500 V	50	10	10
	3RT20 4	400/500 V	50	10	10
3RV2. 4 with	3RT20 4	400 V	90	10	12
	3RT20 4	500 V	220	10	20



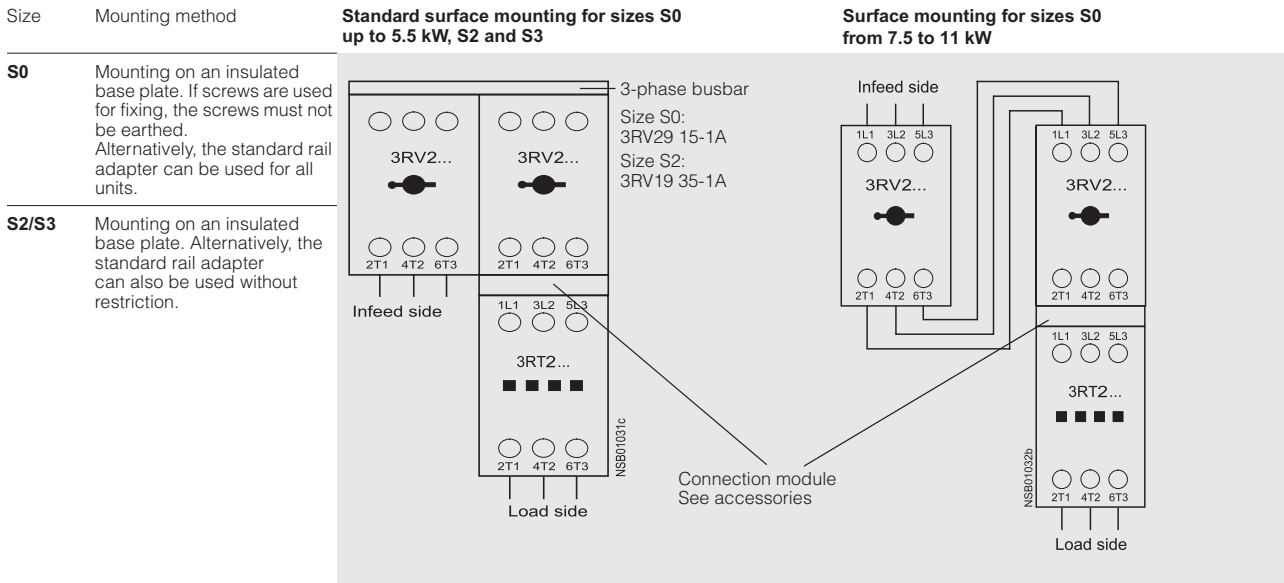
- No upstream circuit-breaker required; short-circuit proof up to 100 kA.

- Rated control supply voltage 120 V AC. Other voltages are possible.
- With these combinations, the distance between the subsequent MSP and the contactor must be at least 10 cm.
- Selection depends on the specific startup and rated data of the protected motor.
- Minimum distance to contactor at front. For the MSP, no minimum distance at the front must be maintained.

3RA2 – up to 100 A

Technical data

Installation guidelines for AC 690 V

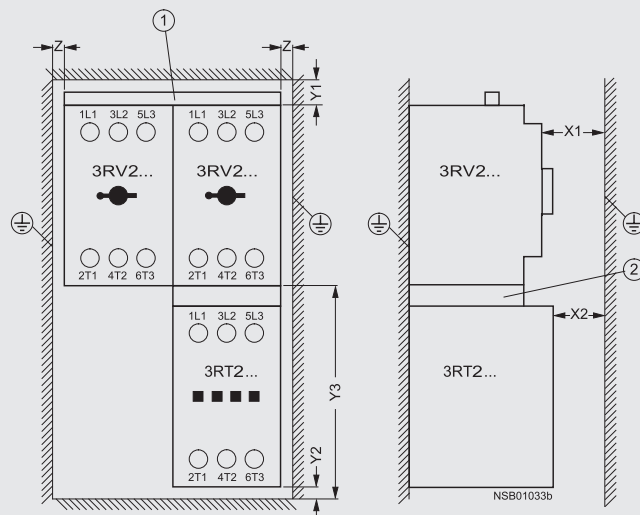


4 COMBINATION STARTERS

The following distances from earthed components must be observed when installing combinations:

Two MSPs in combination with contactors			Distances from earthed or live components					
MSP	Contactor	Rated operational voltage	Y1 mm	Y2 mm	Y3 mm	X1 mm	X2 mm	Z mm
3RV2. 2 with	3RT20 2	690 V	80	10	95	20	14	20
3RV2. 3 with	3RT20 3	690 V	50	10	120	10	32	10
	3RT20 4	690 V	50	10	120	10	40	10

a 3-phase busbar:  
Size S0: 3RV29 15-1A  
Size S2: 3RV19 35-1A



b In combination with size S2 MSPs and size S3 contactors, a spacing of 100 mm must be maintained.

3RA2 – up to 100 A

Technical data						
General data						
Specifications	IEC 60 947-1, EN 60 947-1 (VDE 0660 Part 100) IEC 60 947-2, EN 60 947-2 (VDE 0660 Part 101) IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)					
<b>Type</b> Size Number of poles	<b>3RA2. 1</b> <b>S00</b>	<b>3RA2. 2</b> <b>S0</b>	<b>3RA2. 3</b> <b>S2</b>	<b>3RA2.4</b> <b>S3</b>		
	3	3	3	3		
<b>Max. rated current <math>I_{nmax}</math></b> (= max. rated operational current $I_e$ )	A	16	32	65	100	
<b>Permissible ambient temperature</b>	°C for storage/transport °C for operation	-55 ... +80 -20 ... +60 (restrictions apply at more than +60 °C)		-50 ... +80 -20 ... +60		
<b>Rated operational voltage <math>U_o</math></b>	V	690				
<b>Rated frequency</b>	Hz	50/60				
<b>Rated insulation voltage <math>U_i</math></b>	V	690				
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6				
<b>Release class (CLASS)</b>	acc. to IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)	10				
<b>Rated fused short-circuit current <math>I_{cs}</math> at 50/60 Hz AC 400 V</b> acc. to IEC 60 947-4-1, DIN EN 60 947-4-1 (VDE 0660 Part 102)	kA	150		100	50	
<b>Types of coordination to IEC 60 947-4-1, EN 60 947-4-1</b> (VDE 0660 Part 102)		1)				
<b>Power losses <math>P_{vmax}</math> of all main conducting paths</b> depending on the rated current $I_n$ (upper current setting range)	<ul style="list-style-type: none"> <li>• Up to 1.25 A W</li> <li>• 1.6 - 6.3 A W</li> <li>• 8 - 12 A W</li> <li>• 16 A W</li> <li>• 5 - 6.3 A W</li> <li>• 8 - 12 A W</li> <li>• 16 - 32 A W</li> <li>• 25 - 32 A W</li> <li>• 40 A W</li> <li>• 45 - 50 A W</li> <li>• 63 A W</li> <li>• 75 - 90 A W</li> <li>• 100 A W</li> </ul>		2 2.3 3.5 4.3	2.3 3.5 4.3	16.2 17.2 21	29 45 60
<b>Power consumption of solenoid coils</b> (with cold coil and $U_s$ , 50 Hz)						
• AC operation	closing p.f. closed p.f.	VA	27 0.8 4.2 0.25	65 0.82 8.5 0.25	190 0.72 16 0.37	270 0.68 22 0.27
• DC operation	closing = closed	W	4	5.9	-	15
<b>Coil voltage tolerance for contactors</b>	low limit	at 55 °C at 60 °C	0.8 - 1.1 x $U_s$ 0.8 x $U_s$ 0.85 x $U_s$			
<b>Endurance of MSP</b>	• Mechanical endurance • Electrical endurance • Max. switching frequency per hour (motor starts)	operating cycles operating cycles 1/h	100 000 100 000 15		Up to 52A: 50 000 from 65A: On request 15	50 000 50 000 15
<b>Endurance of contactor</b>	• Mechanical endurance • Electrical endurance	operating cycles operating cycles	30 million See endurance curves of contactors in Part 3.	10 million		
<b>Shock resistance</b> (sine-wave acc. to IEC 60 068 Part 2-27 pulse)		g	up to 6	up to 6	up to 6	up to 6
<b>Degree of protection</b>	acc. to IEC 60 947-1		IP 20		IP 20	
<b>Shock-hazard protection</b>	acc. to DIN VDE 0106 Part 100		Finger-safe			
<b>Phase failure sensitivity of MSP</b>	acc. to IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)		Yes			
<b>Isolating characteristics of MSP</b>	acc. to IEC 60 947-2, EN 60 947-2 (VDE 0660 Part 101)		Yes			
<b>Main and EMERGENCY-STOP switch characteristics of MSP and accessories</b>	acc. to IEC 60 204-1, EN 60 204-1 (VDE 0113 Part 1)		Yes (with overvoltage releases of category 1 under conditions of proper use)			
<b>Safe isolation between main and auxiliary circuits</b>	acc. to DIN VDE 0160 Part 101		up to 400 V			
<b>Positively driven operation at contactors</b>			Yes	Yes, from main contact to auxiliary NC contact		

1) See selection and ordering data on pages 4/36 to 4/43.

3RA2 – up to 100 A

Technical data

Conductor cross-sections of main circuit

Specifications	IEC 60 947-1, EN 60 947-1 (VDE 0660 Part 100) IEC 60 947-2, EN 60 947-2 (VDE 0660 Part 101) IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)			
<b>Type</b> Size Number of poles	<b>3RA2. 1</b> <b>S00</b> 3	<b>3RA2. 2</b> <b>S0</b> 3	<b>3RA2.3</b> <b>S2</b> 3	<b>3RA21 4</b> <b>S3</b> 3
<b>Connection type</b>	Screw terminal M3 Posidrive size 2	Screw terminal M3 Posidrive size 2	Screw Terminals M6 Pozidriv size 2	Box terminals Allen screw
<b>Terminal screw</b>				
<b>Conductor cross-sections (min./max)</b> 1 or 2 conductors can be connected				
• Solid and stranded	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>2)</sup> only for contactors 2 x (0.75 ... 2.5) <sup>2)</sup> max. 2 x 4	2 x (1 ... 25) <sup>2)</sup> 1 x (1 ... 35) <sup>2)</sup> 2 x (1 ... 35) <sup>2)</sup> 1 x (1 ... 50) <sup>2)</sup>	
• Finely stranded without end sleeve	mm <sup>2</sup>	–		
• Finely stranded with end sleeves (DIN 46 228 T1)	mm <sup>2</sup>	2 x (0.5 ... 1.5) <sup>2)</sup> 2 x (0.75 ... 2.5) <sup>2)</sup>	2 x (1 ... 16) <sup>2)</sup> 1 x (1 ... 25) <sup>2)</sup> 2 x (1 ... 25) <sup>2)</sup> 1 x (1 ... 35) <sup>2)</sup>	
• AWG cables, solid or stranded	AWG AWG AWG	2 x (20 ... 16) <sup>2)</sup> 2 x (18 ... 14) 2 x 12	2 x (18 ... 3) <sup>2)</sup> 1 x (18 ... 2) <sup>2)</sup> 2 x (18 ... 2) <sup>2)</sup> 1 x (18 ... 1) <sup>2)</sup>	
<b>Minimum/maximum conductor cross-sections</b>				
• flexible with ferrule - 1 conductor	mm <sup>2</sup>		0.75/25	2.5/50 <sup>1)</sup>
- 2 conductors	mm <sup>2</sup>		0.75/16	2.5/35 <sup>1)</sup>
• solid or stranded - 1 conductor	mm <sup>2</sup>		0.75/35	2.5/70 <sup>1)</sup>
- 2 conductors	mm <sup>2</sup>		0.75/25	2.5/50 <sup>1)</sup>
<b>Ribbon cable</b>			yes	yes
<b>Bus connection</b>			–	yes
• solid or stranded	AWG		2 x (30 ... 2)	–
• stranded	AWG		–	2 x (10 ... 1/0)
<b>Connection type</b>		Spring Loaded connection		
• Solid and stranded	mm <sup>2</sup>	2 x (0.5 ... 2.5)	–	2 x (0.5 ... 2.5)
• Finely stranded without end sleeve	mm <sup>2</sup>			2 x (0.5 ... 2.5)
• Finely stranded with end sleeves	mm <sup>2</sup>			2 x (0.5 ... 2.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)		2 x (20 ... 14)
<b>Permissible mounting position</b>	<p>Attention: acc. to DIN 43 602 Start command "I" right-hand or above</p>			

1) Cable-lug and busbar connection possible after removing the box terminals.

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

3RA2 – up to 100 A

**Overview**

The 3RA combination starters consist of the 3RV MSP and the 3RT contactor. MSP and contactor are prewired and mechanically connected with preassembled kits (link modules, connection assembly kits and mounting rail or busbar adapters).

As the 3RA combination starters are constructed from 3RV MSPs and 3RT contactors, the same accessories can be used for the combination starter as for these MSPs and contactors.

Pre-assembled link modules are available as accessories for the power spectrum up to 75 HP. The desired combination starter can thus be assembled quickly and economically by the customer. A time saving is also achieved with the link modules as – unlike with conventional wiring systems – there is no need to rectify possible wiring errors.

As a combination starter rated for tap conductor protection for group installation the 3RV MSP is responsible for overload and short-circuit protection in the motor circuit. Back-up protective devices, such as fuses or SIEMENS Sentron circuit breakers are required as per NEC 430-53 guidelines for group installations for multiple motor applications

The 3RT contactor is ideal for extremely complex switching tasks requiring durable components.

The permissible ambient temperature is 60 °C with butt-mounting and without derating (70 °C possible subject to certain restrictions).

3RA combination starters are available for motors up to 75 Hp at 460 V AC and setting ranges from 0.14 A to 100 A.

3RA combination starters are supplied in four different sizes:

Size	Overall width mm	Max. rated current $I_{n\ max}$ A	For three-phase motors up to HP
S00	45	8	5
S0	45	22	15
S2	55	50	40
S3	70	100	75

**Operating conditions**

3RA combination starters are climate-proof. They are intended for use in enclosed rooms in which no severe conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable enclosures must be provided for installation in dusty and damp locations.

**Accessories**

The accessories for the special equipment, such as auxiliary contacts and undervoltage trips, can also be used for the 3RA combination starters.

In addition, certain accessories have been optimized for the combination starters. They include the top-connected, transverse auxiliary contact on the MSP with one changeover contact or one NO contact + one NC contact. Special auxiliary contact blocks that can be snapped on from below are available for the contactor.

These two accessories enable the combination starters to be wired easily without having to route cables via the equipment.

The special accessories for 3RA combination starters take the form of link modules for 3RV MSPs and 3RT contactors.

**Technical data**

For technical data, see pages 4/56-4/58. Additional details are contained in the respective tables for the 3RV MSPs and 3RT contactors.

**Configuration**

**Overload tripping times**

All the 3RA combination starters described here are designed for normal starting, in other words for overload tripping times of less than 10 s (CLASS 10). At rated-load operating temperature the tripping times are shorter, depending on the particular equipment and the setting range. The exact values can be derived from the tripping characteristics of the MSPs.

**Classification types**

DIN VDE 0660 Part 102 and IEC 60 947-4-1 make a distinction between two different types of coordination (types 1 and 2). Any short-circuits that occur are cleared safely by both types of coordination. The only differences concern the extent of the damage caused to the equipment by a short-circuit.

**IEC Type of coordination 1**

The combination starter may be non-operational after a short-circuit has been cleared. Damage to the contactor or to the overload relay is permissible. In 3RA load feeders, the MSP itself always achieves type of coordination 2.

**IEC Type of coordination 2**

There must be no damage to the overload trip or to any other components after a short-circuit has been cleared. The 3RA combination starter can resume operation without needing to be renewed. At most, it is permissible to weld the contactor contacts if they can be disconnected easily without any significant deformation.

**Mounting**

**Complete equipment**

The 3RA combination starters can be ordered as complete equipment for direct starting or for reversing mode. Control supply voltages of 50 Hz AC 230 V or DC 24 V and assembly on a 35 mm standard mounting rail or in a 40 or 60 mm busbar system are possible.

Special equipment for customer assembly can be ordered if other rated control supply voltages are required. The link modules simplify customer assembly of the load feeders.

The corresponding distances from earthed or live parts, as detailed in the technical data, must be observed.

**Customer assembly**

The standard devices can be combined optimally in terms of both technical data and dimensions, thanks to the modular system of the SIRIUS series.

The combination starters can thus be assembled easily by the customer. It is simply necessary to assemble the standard 3RV MSP and 3RT contactor and the appropriate link module together.

For the order numbers for special equipment and link modules, see the selection and ordering data.

For the link modules for direct starting or reversing mode and assembly on a standard mounting rail or busbar, see accessories.

If a MSP with a rotary operating mechanism is required for the lower setting ranges up to 12 A, the S0 MSP can also be assembled with an S00 contactor. A special connecting module is available for this purpose.

For the installation of feeders, it is imperative to use standard rail adapters, as from size S2 for direct starting and as from size S0 for reversing, to ensure the necessary mechanical strength. A standard rail adapter is not necessary if a busbar adapter is used.

**Assembly**

3RA combination starters are available for assembly on standard mounting rails in accordance with EN 50 022-35 x 15 or on busbar adapters with a busbar centre-line spacing of 40 or 60 mm and a busbar thickness of 5 or 10 mm.

The combination starters are also suitable for screw fixing.

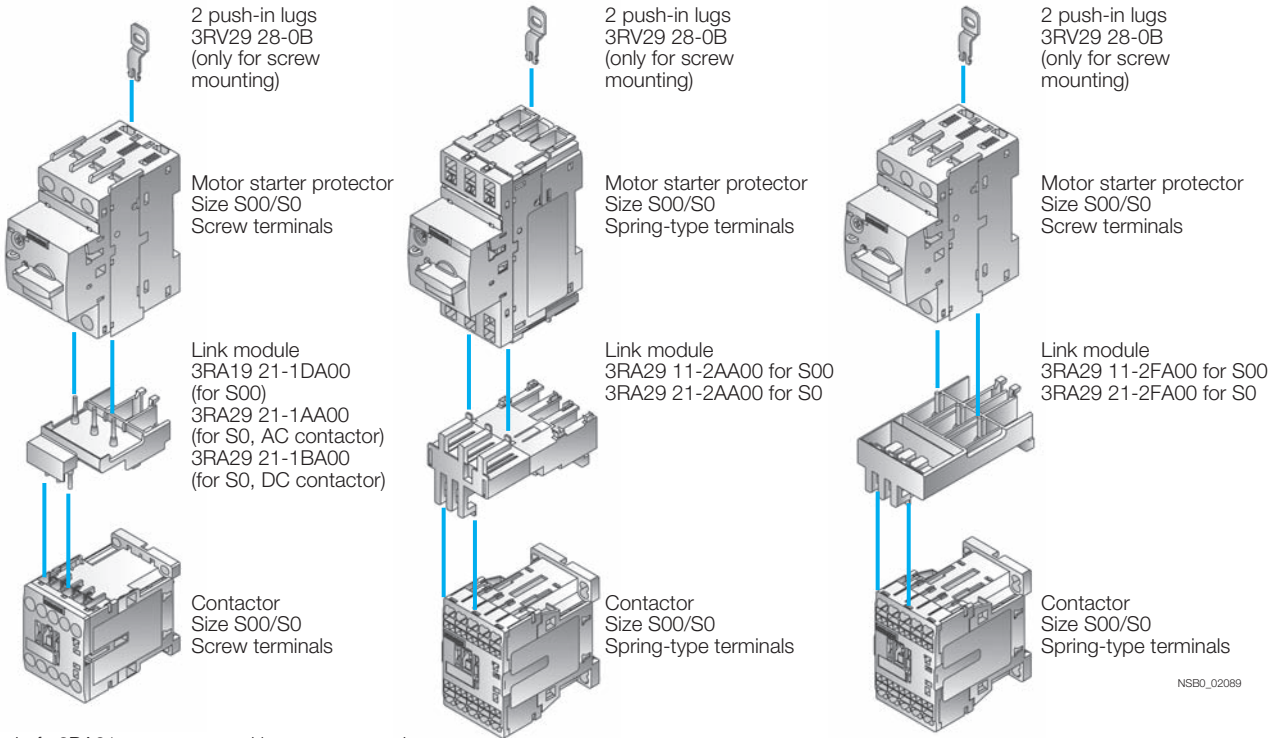
Size S00 and S0 can be screwed on with the aid of plug-in clips (see accessories on page 4/47).



3RA2 – up to 100 A

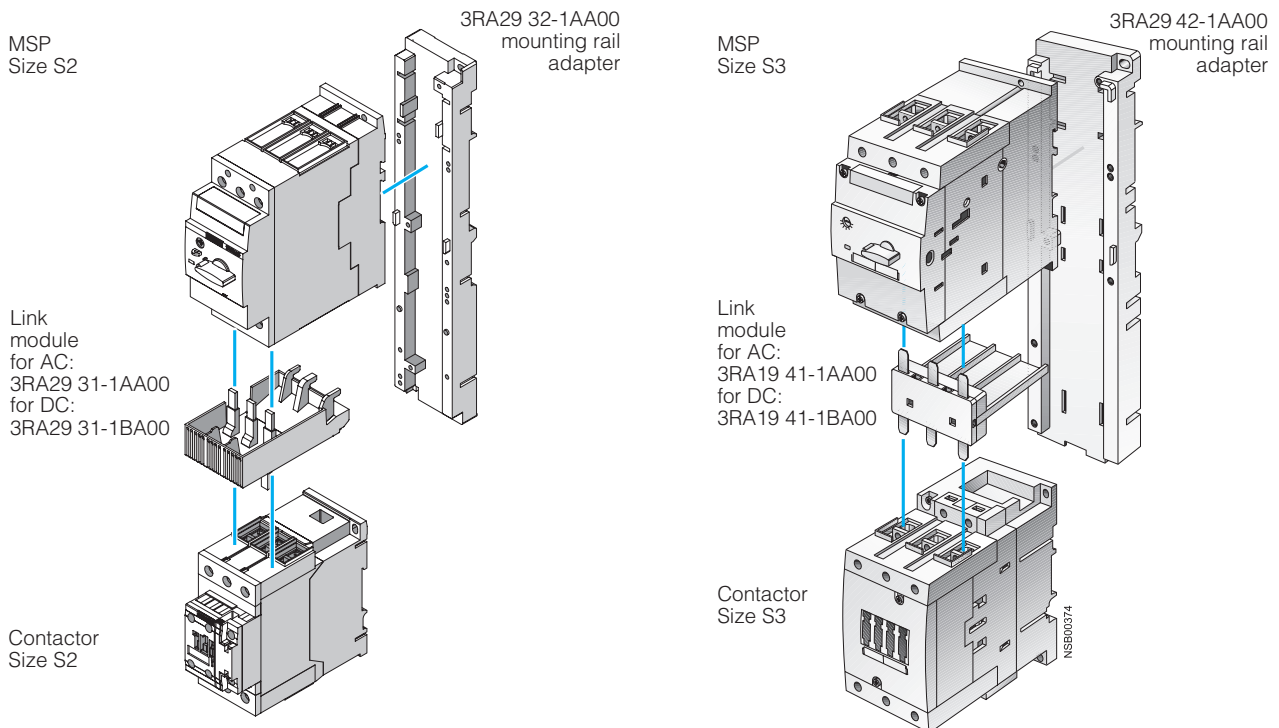
Mounting

Direct-on-line starting · For standard rail mounting or screw fixing · Sizes S00 and S0



Left: 3RA21 motor starter with screw connection  
Center: 3RA21 motor starter with spring-type connection  
Right: Motor starter protector combination with screw connection, with contactor with spring-type connection

Direct-on-line starting · for standard rail mounting · size S2 and S3



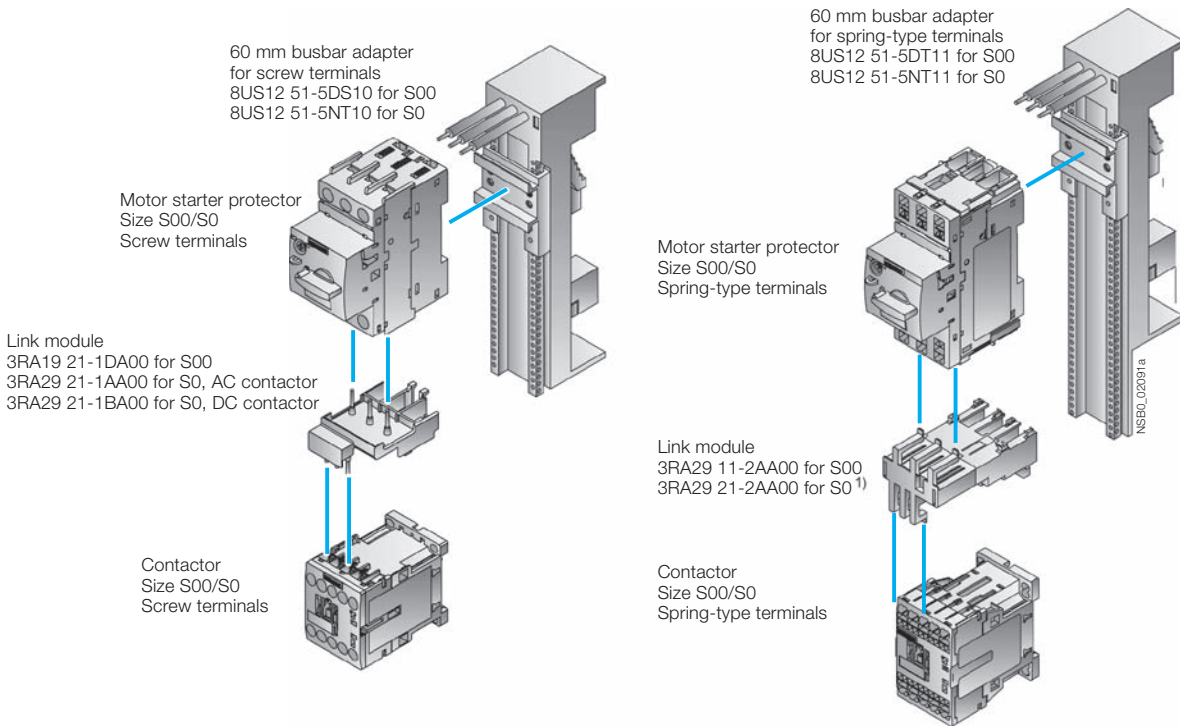
These graphical overviews are shown without small mounting hardware (screws etc.).



3RA2 – up to 100 A

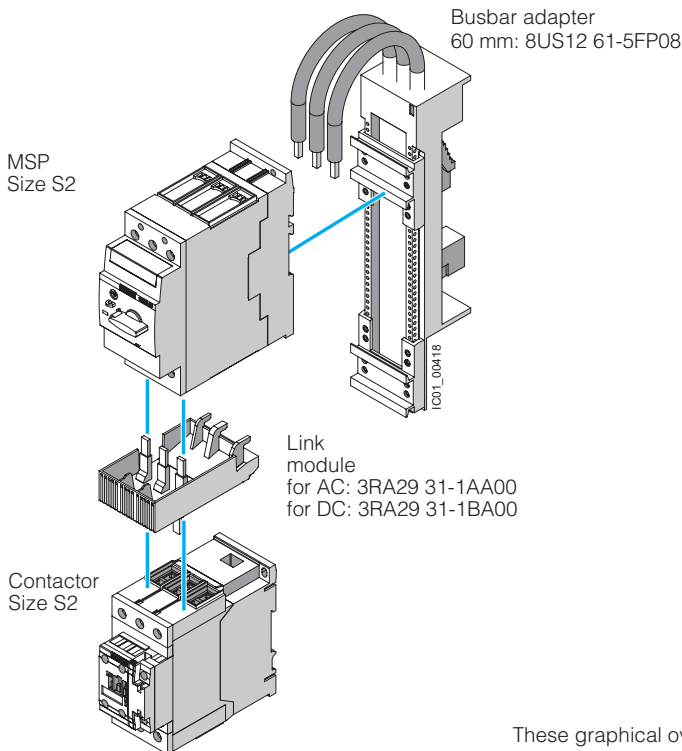
**Mounting**

*DOL starting · for 60 mm busbar systems · size S00 and S0*



<sup>1)</sup> Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

*DOL starting · for 40 mm and 60 mm busbar systems · size S2*



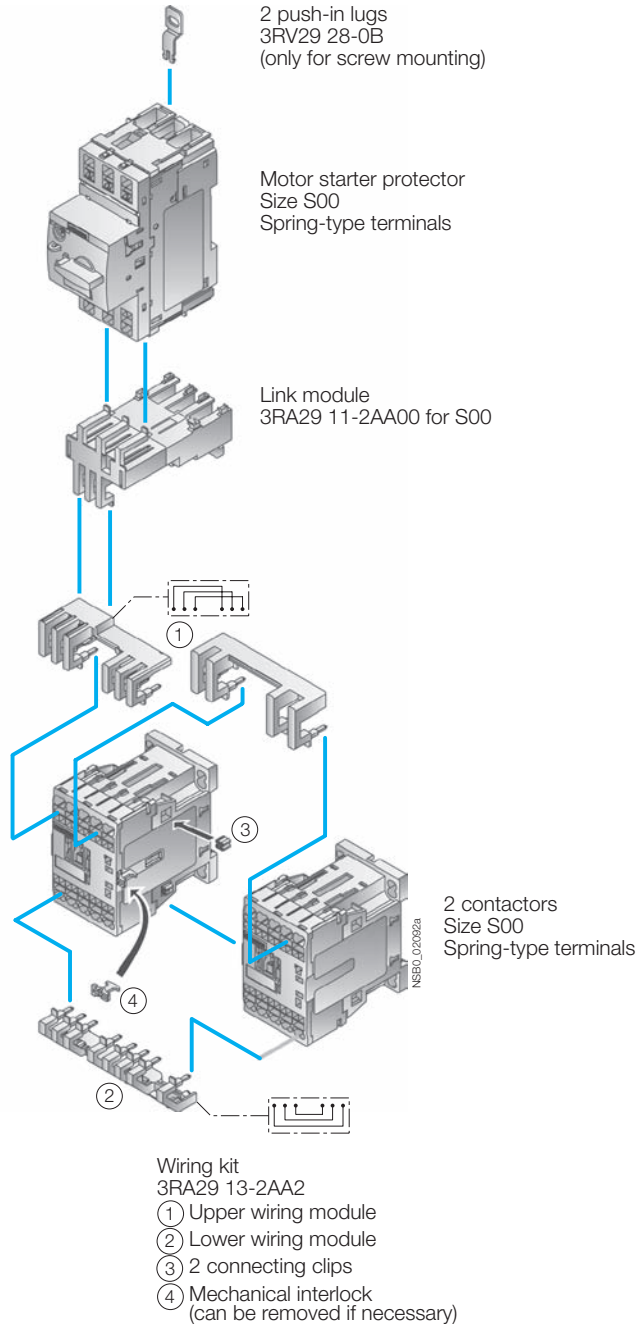
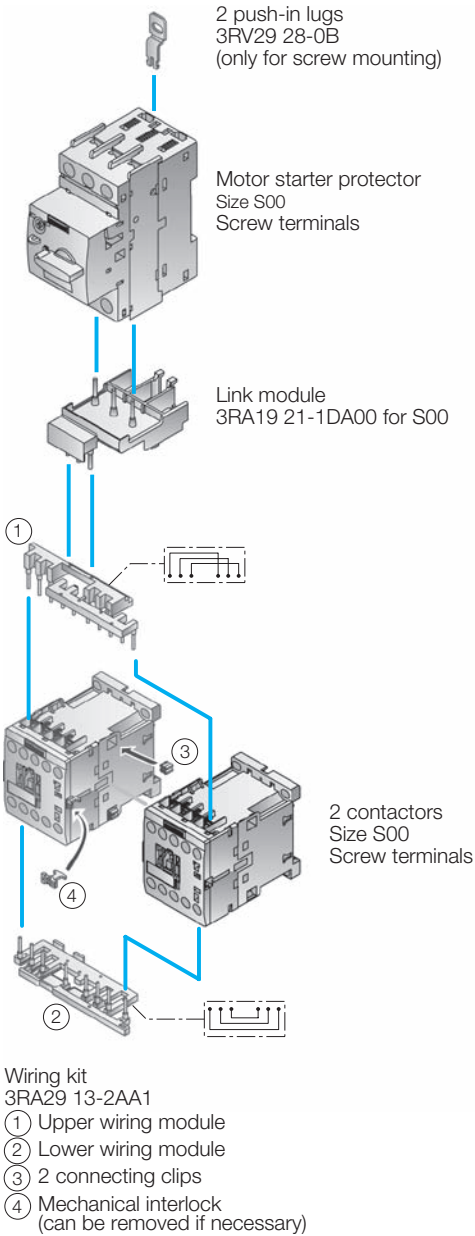
These graphical overviews are shown without small mounting hardware (screws etc.).

3RA2 – up to 100 A

**Mounting**

*Reversing duty · For standard rail mounting or screw fixing · Size S00*

4  
COMBINATION  
STARTERS



Left: 3RA22 motor starter with screw connection, push-in lugs, 2 contactors for reversing duty and 3RA29 13-2AA1 wiring kit for connecting the contactors (incl. mechanical interlocking and connecting clips)

Right: 3RA22 motor starter with spring-type connection, push-in lugs, 2 contactors for reversing duty and 3RA29 13-2AA2 wiring kit (incl. mechanical interlocking and connecting clips)

3RA2 – up to 100 A

**Mounting**

*Reversing duty · For standard rail mounting · Size S0*

RH assembly kit for reversing duty and standard rail mounting in size S0

For screw terminals:

3RA29 23-1BB1

For spring-type terminals:

3RA29 23-1BB2<sup>1)</sup>

Comprising:

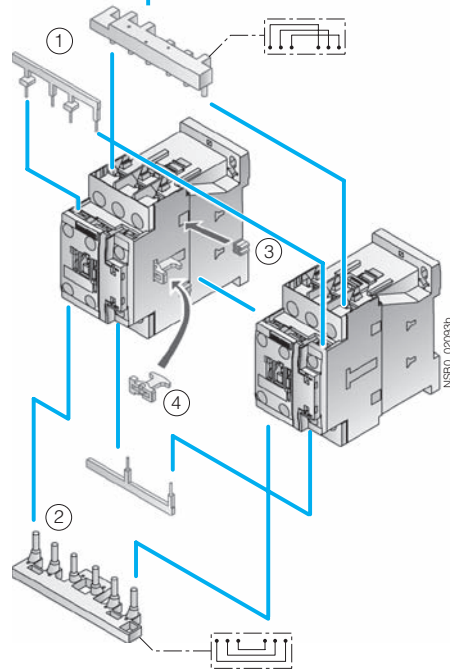
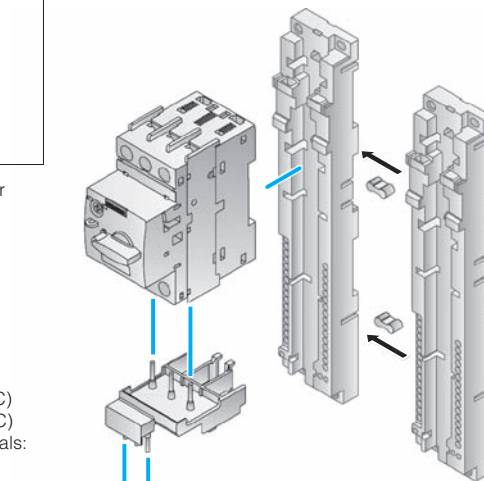
- 1 wiring kit
- 2 standard mounting rail adapters
- 2 connecting wedges

<sup>1)</sup>Also includes 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

Motor starter protector  
Size S0  
Screw terminals/  
spring-type terminals

Link module  
For screw terminals:  
3RA29 21-1AA00 (AC)  
3RA29 21-1BA00 (DC)  
For spring-type terminals:  
3RA29 21-2AA00<sup>2)</sup>

2 standard mounting  
rail adapters  
3RA29 22-1AA00  
with 2 connecting wedges  
8US19 98-1AA00



2 contactors  
Size S0  
Screw terminals/  
spring-type terminals

Wiring kit  
For screw terminals:  
3RA29 23-2AA1  
For spring-type terminals:  
3RA29 23-2AA2

- ① Upper wiring module
- ② Lower wiring module
- ③ 2 connecting clips
- ④ Mechanical interlock  
(can be removed if necessary)

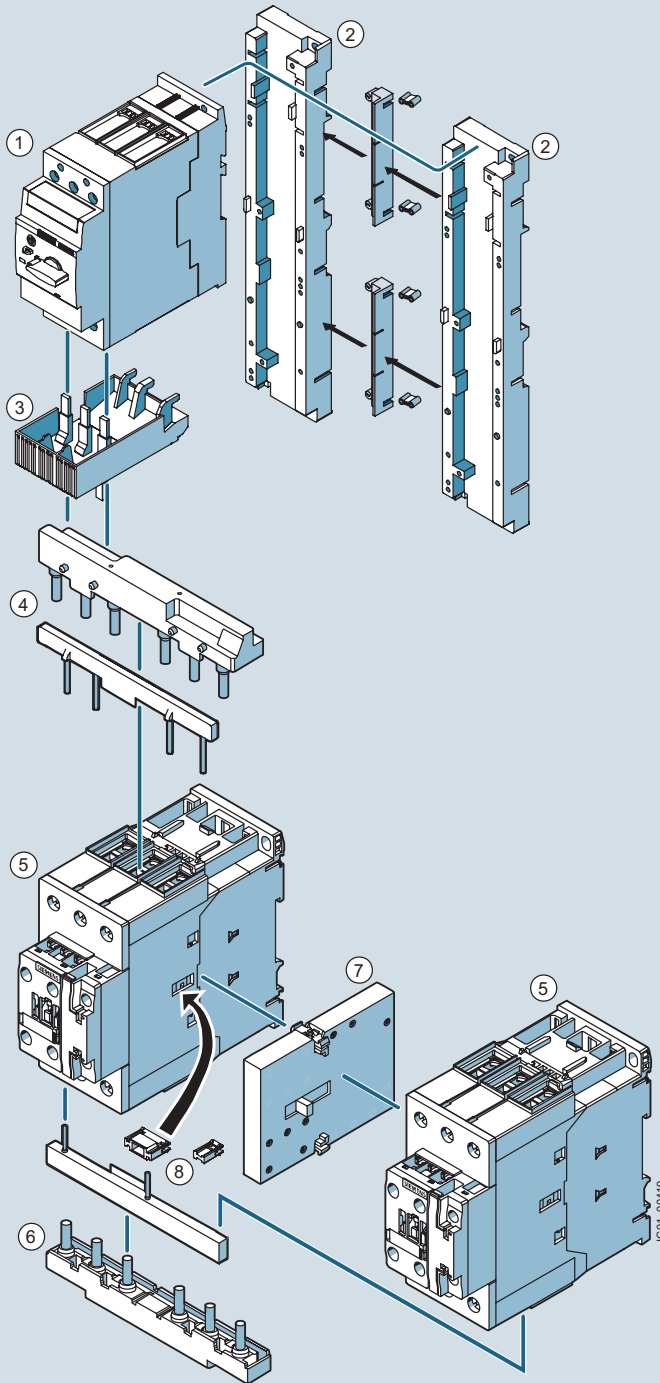
<sup>2)</sup>Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals

3RA22 motor starter for reversing duty and standard rail mounting in size S0 (the version with screw connection is shown in the picture)

3RA2 – up to 100 A

Reversing duty • For standard rail mounting • Size S2

4  
COMBINATION  
STARTERS



**RH assembly kit for reversing duty and standard rail mounting in size S2**

**3RA2933-1BB1**

Comprising:

- 1 Wiring kit for main and auxiliary circuits
- 2 Rail adapters
- 2 Side modules
- 4 Connecting wedges
- 1 Mechanical locking device
- 2 Connecting pins for 2 contactors
- Fixing screws

① **Motor starter protector**

Size S2  
Screw terminals

② **Standard mounting rail adapter**

3RA2932-1AA00  
with 4 connecting wedges  
8US1998-1AA00  
and 2 side modules  
3RA1902-1B

③ **Link module**

3RA2931-1AA00  
Screw terminals

⑤ **Contactors size S2**

Screw terminals

**Wiring kit**

For screw terminals  
3RA2933-2AA1

④ **Upper wiring module**

⑥ **Lower wiring module**

⑦ **Mechanical interlock**  
3RA2934-2B

⑧ **2 Connecting pins**

Load feeder for reversing duty and standard rail mounting in size S2  
(the version with screw terminals is shown in the picture)

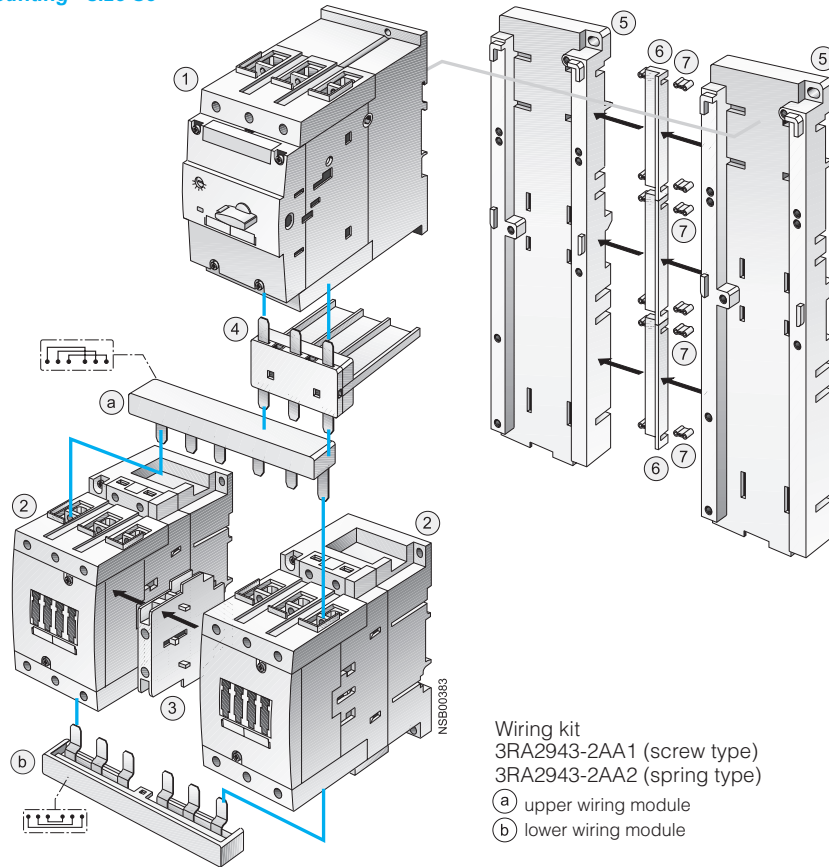
3RA2 – up to 100 A

Reversing duty · for standard rail mounting · size S3

Assembly kit (RH)  
for reversing duty  
for rail mounting  
3RA2943-1BB1  
consisting of:  
1 wiring kit  
2 adapters for rail  
mounting (5)  
3 side modules (6)  
6 link wedges (7)

- ① MSP size S3
- ② 2 contactors size S3
- ③ Mechanical interlock 3RA29342B
- ④ Link module for AC: 3RA19 41-1AA00 for DC: 3RA19 41-1BA00
- ⑤ Adapters for rail mounting 3RA29 42-1AA00
- ⑥ 3RA29 02-1B side modules for adapter for rail mounting
- ⑦ Link wedges 8US19 98-1AA00

These graphical overviews are shown without small mounting hardware (screws etc.).



- Wiring kit  
3RA2943-2AA1 (screw type)  
3RA2943-2AA2 (spring type)
- (a) upper wiring module
  - (b) lower wiring module

3RA2 – up to 100 A

Mounting

Reversing duty • For 60 mm busbar systems • Sizes S00 and S0

RS assembly kit for reversing duty and busbar mounting  
 Screw connection:  
 3RA29 13-1DB1 for S00  
 3RA29 23-1DB1 for S0  
 For spring-type connection:  
 3RA29 13-1DB2 for S00  
 3RA29 23-1DB2 for S0  
 Comprising:  
 1 wiring kit  
 1 busbar adapter  
 1 device holder  
 2 connecting wedges

<sup>1)</sup>Also includes 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

60 mm busbar adapter  
 For screw terminals:  
 8US12 51-5DS10 for S00  
 8US12 51-5NT10 for S0  
 For spring-type terminals:  
 8US12 51-5DT11 for S00  
 8US12 51-5NT11 for S0

2 connecting wedges  
 8US19 98-1AA00

60 mm device holder  
 8US12 50-5AS10

Motor starter protector  
 Size S00/S0  
 Screw terminals/  
 spring-type terminals

Link module  
 For screw terminals:  
 3RA19 21-1DA00 for S00  
 3RA29 21-1AA00 for S0, AC contactor  
 3RA29 21-1BA00 for S0, DC contactor  
 For spring-type terminals:<sup>2)</sup>  
 3RA29 11-2AA00 for S00  
 3RA29 21-2AA00 for S0

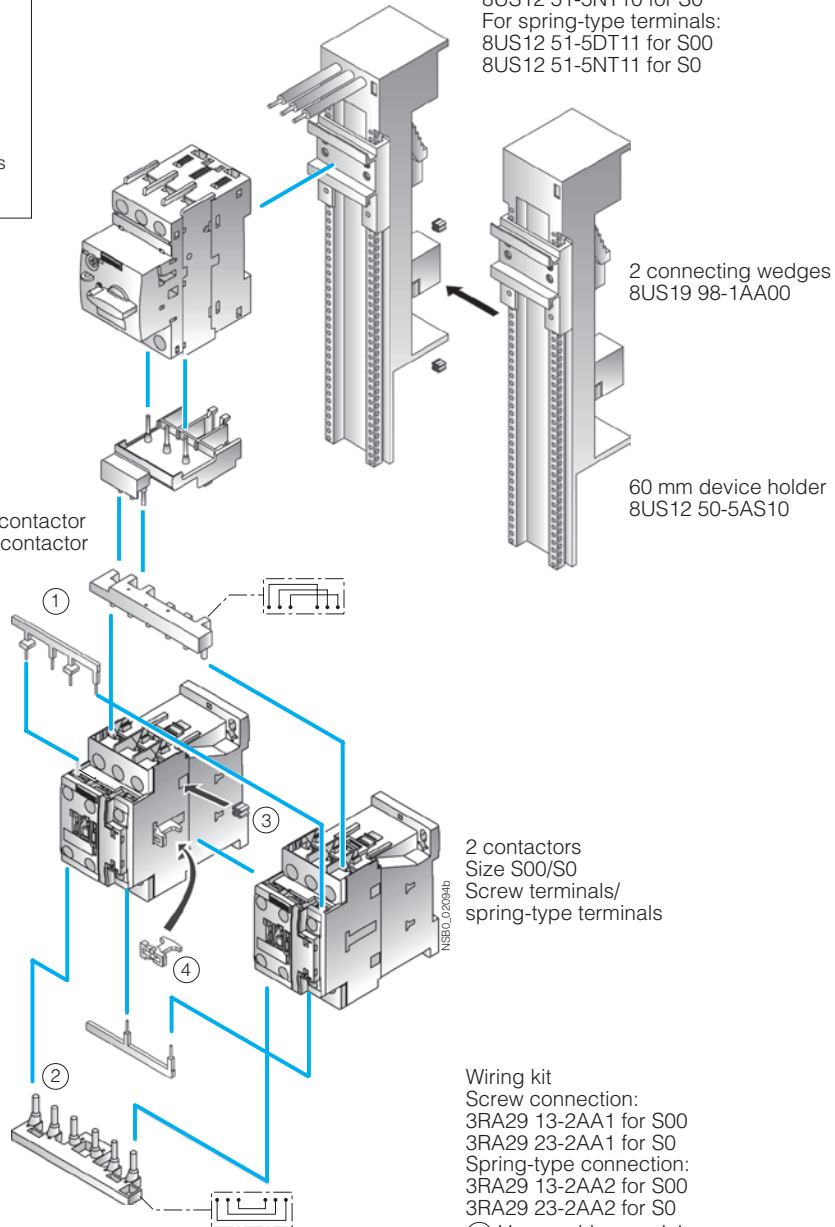
2 contactors  
 Size S00/S0  
 Screw terminals/  
 spring-type terminals

Wiring kit  
 Screw connection:  
 3RA29 13-2AA1 for S00  
 3RA29 23-2AA1 for S0  
 Spring-type connection:  
 3RA29 13-2AA2 for S00  
 3RA29 23-2AA2 for S0

<sup>2)</sup>Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

3RA22 motor starter for reversing duty and 60 mm standard mounting rail in size S00/S0 (the version with screw connection is shown in the picture)

- ① Upper wiring module
- ② Lower wiring module
- ③ 2 connecting clips
- ④ Mechanical interlock (can be removed if necessary)

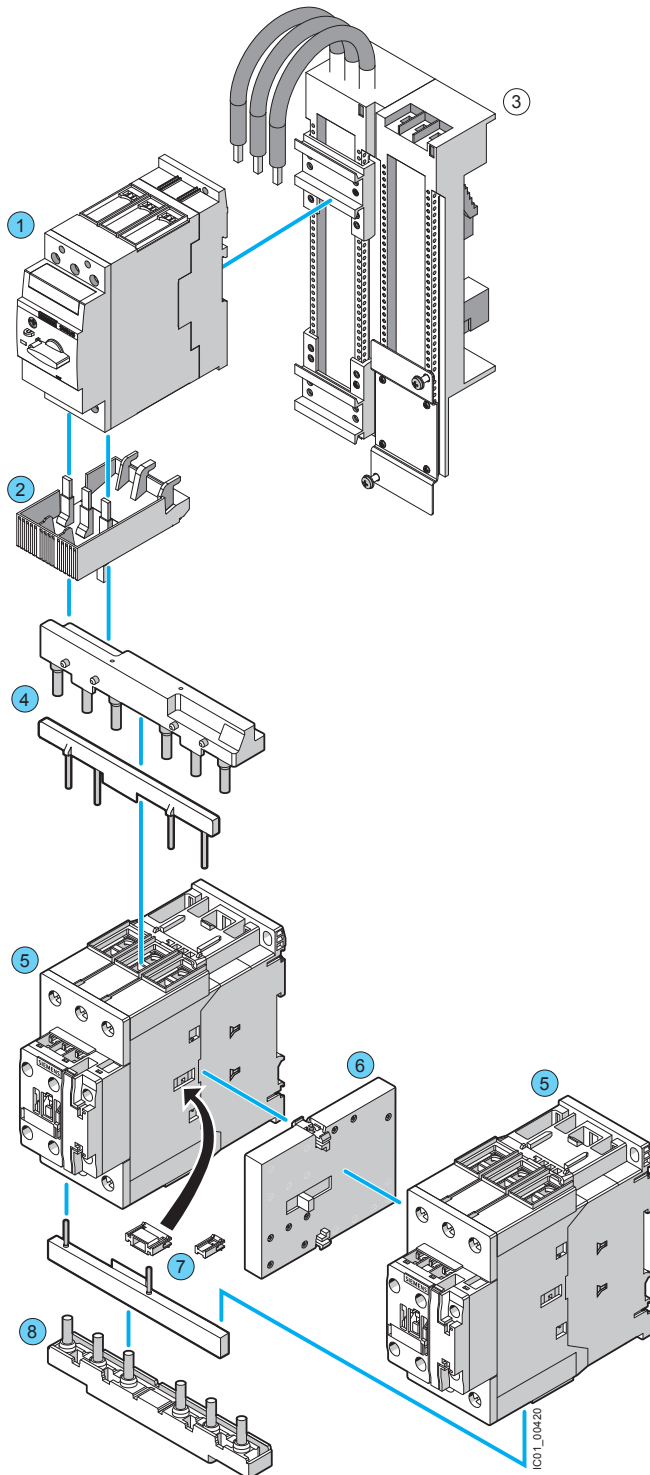




3RA2 – up to 100 A

Mounting

Reversing duty · For 60 mm busbar systems · Size S2



**RS assembly kit for reversing duty for busbar mounting**

**3RA2933-1DB1**

Comprising:

- 1 Wiring kit for main and auxiliary circuits
- 1 busbar adapter and device holder
- 1 mechanical locking device
- 2 connecting pins for 2 contactors
- Fixing screws

- ① **Motor starter protector**  
Size S2  
Screw terminals
- ② **Link module**  
3RA2931-1AA00  
Screw terminals
- ③ **Busbar adapter 60 mm**  
8US1211-6MT10
- ⑤ **Contactor**  
Size S2  
Screw terminals

- Wiring kit**  
For screw terminals  
3RA2933-2AA1
- ④ Upper wiring module
  - ⑧ Lower wiring module
  - ⑦ 2 connecting pins
  - ⑥ Mechanical interlock  
3RA2934-2B

Load feeder for reversing duty and 60 mm busbar in size S2  
(the version with screw terminals is shown in the picture)

3RA2 – up to 100 A

Components for Fast Bus mounting

- ① Link module  
for AC: 3RA19 41-1A  
for DC: 3RA19 41-1B
- ② Mechanical interlock  
3RA19 24-2B

3RV204 with Reversing 3RT204

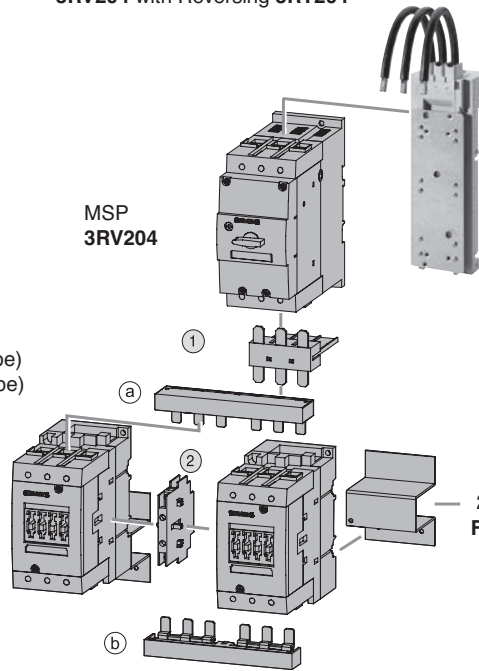
Adapter shoe  
8US1211-4TR00

MSP  
3RV204

3RA2943-2AA1 Wiring kit (screw type)  
3RA2943-2AA2 Wiring kit (spring type)  
a) Upper wiring module  
b) Lower wiring module

2 Contactors  
3RT204

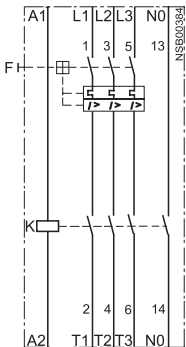
2 Brackets  
FBS0070B



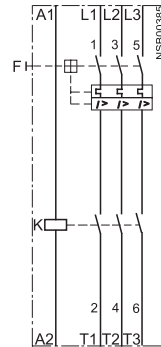
Circuit diagrams

Direct-on-line starting

Size S00: 3RA21.1

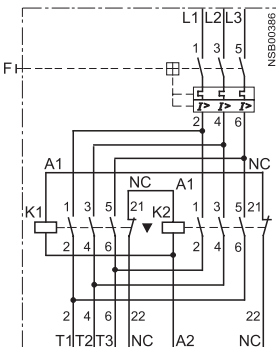


Sizes S0, S2 and S3: 3RA21 2, 3RA21 3

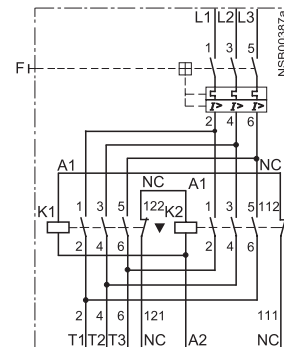


Reversing duty

Size S00: 3RA22



Size S0: 3RA22

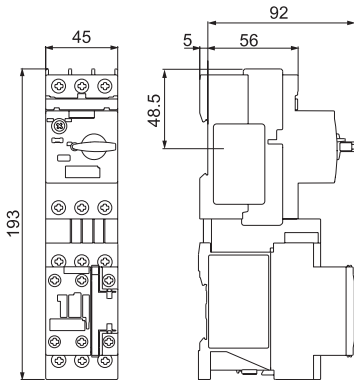




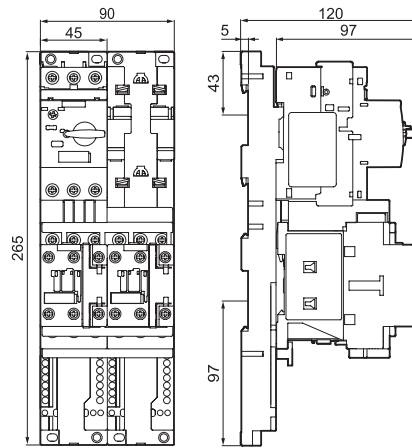
3RA2 – up to 100 A

Dimension drawings

Size S00 · for standard rail mounting

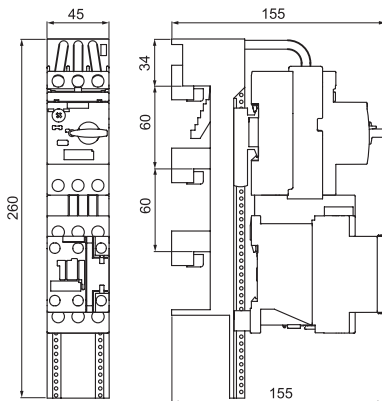


S0 direct-on-line starter,  
AC, screw-type connection system  
3RA2120-..A

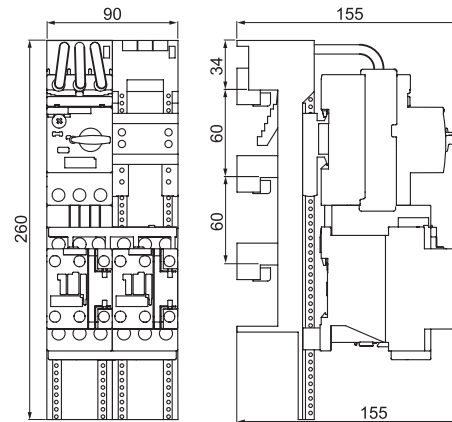


S0/S0 and S00/S0 reversing starters,  
AC, screw-type connection system  
3RA2220-..B...0AP0

Size S00 · for 40 mm and 60 mm busbar systems



S0/S0 and S00/S0 direct-on-line starters,  
AC, screw-type connection system  
3RA2120-..D...0AP0



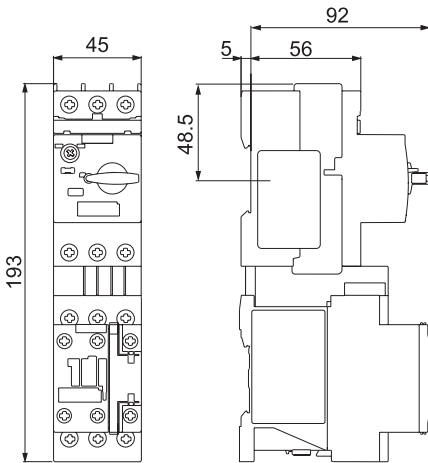
S0/S0 and S00/S0 reversing starters,  
AC, screw-type connection system  
3RA2220-..D...0AP0

When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

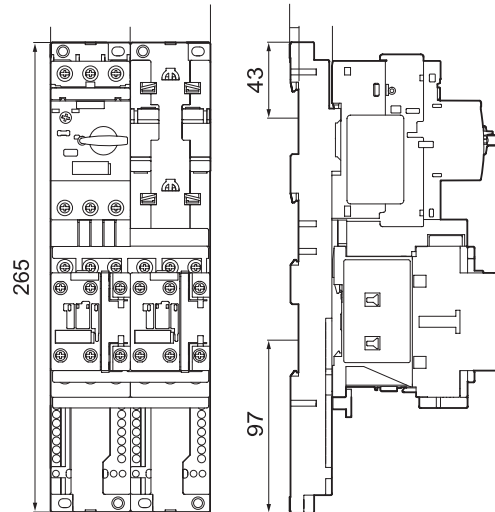
3RA2 – up to 50 A

Dimension drawings

Size S0 · for standard rail mounting

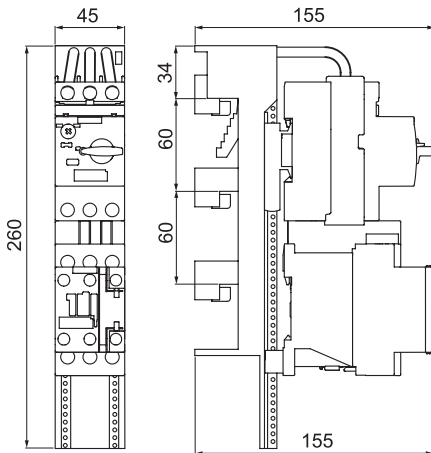


S0 direct-on-line starter, AC, screw-type connection system  
3RA2120-..A

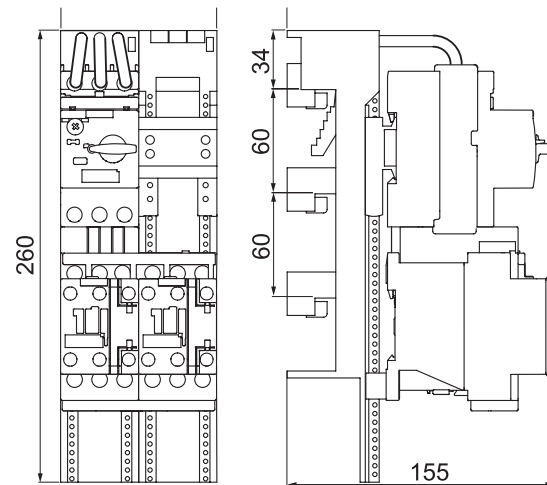


S0/S0 and S00/S0 reversing starters,  
AC, screw-type connection system  
3RA2220-..B..-0AP0

Size S0 · for 40 mm and 60 mm busbar systems



S0/S0 and S00/S0 direct-on-line starters, AC,  
screw-type connection system  
3RA2120-..D..-0AP0



S0/S0 and S00/S0 reversing starters,  
AC, screw-type connection system  
3RA2220-..D..-0AP0

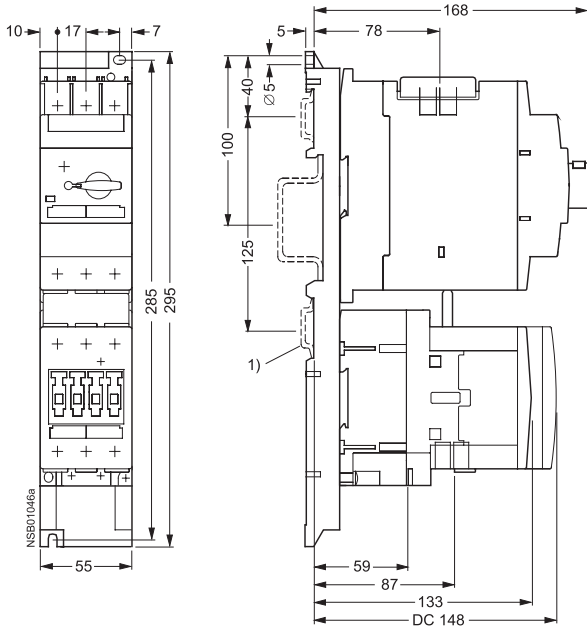
When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

3RA2 – up to 50 A

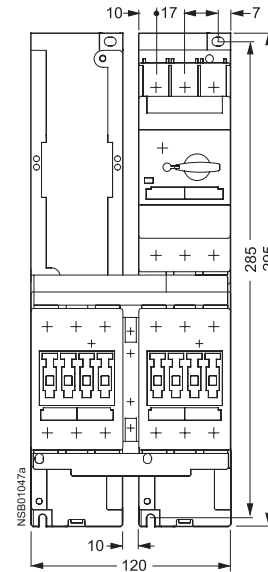
Dimension drawings

Size S2 · for standard rail mounting

Direct-on-line starting



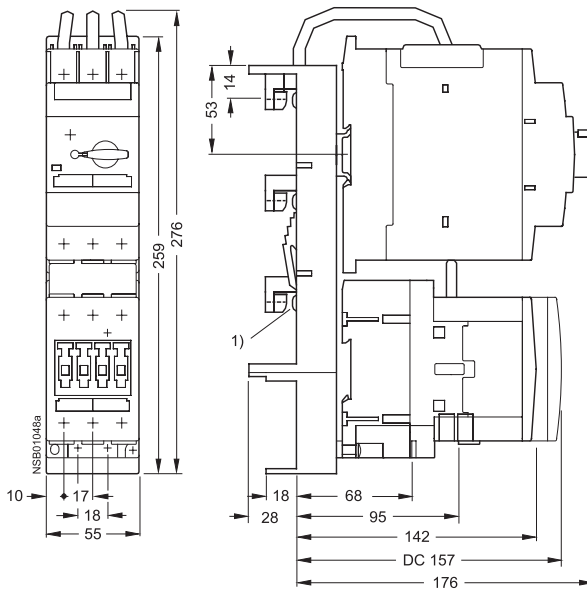
Reversing duty



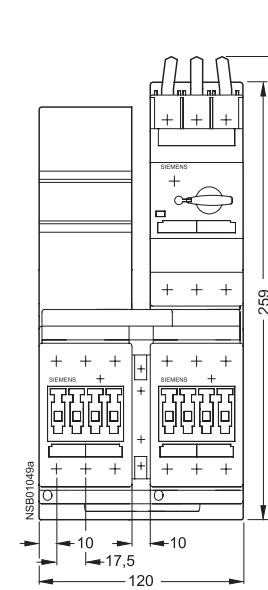
- 1) Alternative fixing methods  
 a) 2 35 mm mounting rails acc. to DIN EN 50022  
 Spacing: 125 mm  
 Depth: 7.5 or 15 mm.  
 b) 1 75 mm mounting rail acc. to DIN EN 50 023.

Size S2 · for 40 mm and 60 mm busbar systems

Direct-on-line starting



Reversing duty



- 1) Busbar adapter suitable for rail thicknesses of 5 and 10 mm with chamfered edges.

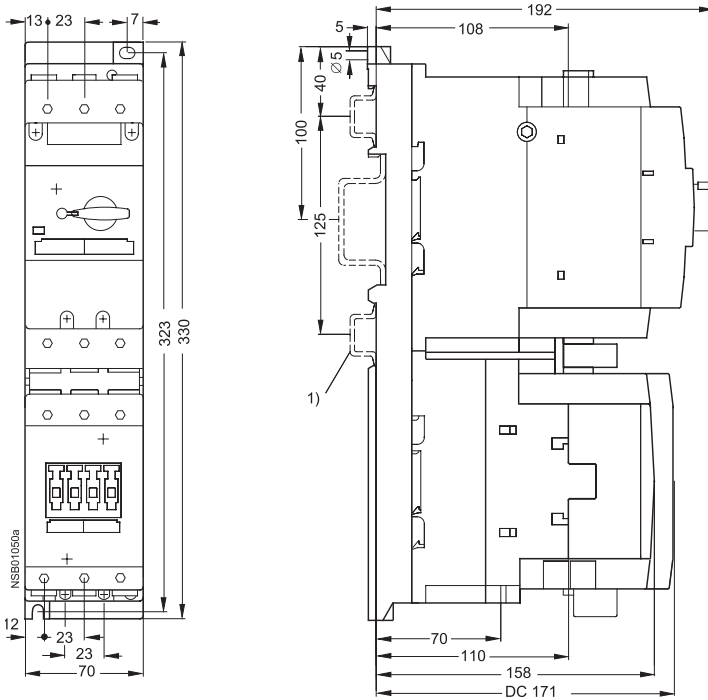
When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

3RA2 – up to 100 A

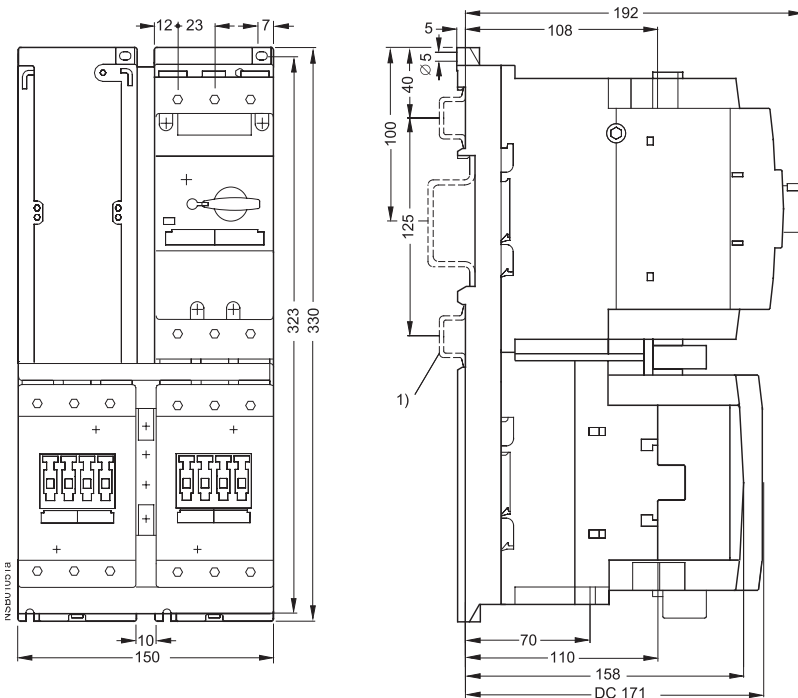
Dimension drawings

Size S3 · for standard rail mounting

Direct-on-line starting



Reversing duty

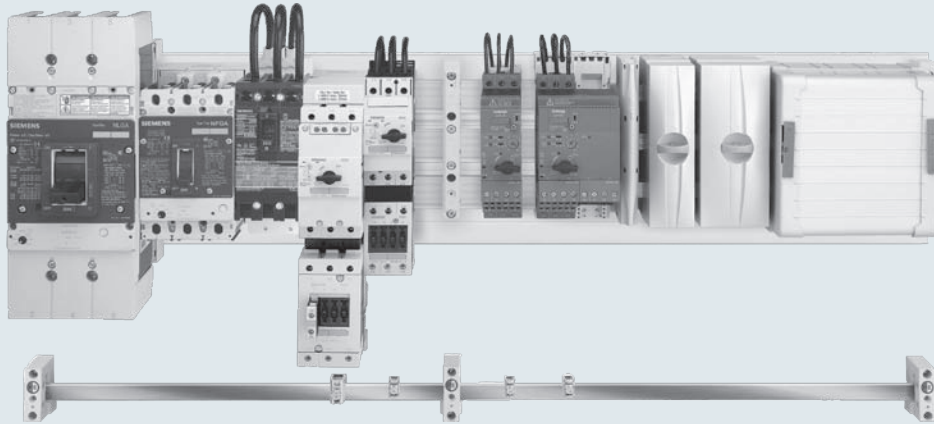


- 1) Alternative fixing methods
- a) 2 35 mm mounting rails acc. to DIN EN 50 022 Spacing: 125 mm Depth: 7.5 or 15 mm.
  - b) 1 75 mm mounting rail acc. to DIN EN 50 023.

When mounting the combinations, observe the installation guidelines (page guidelines 4/60-4/64).

## contents

### Fast Bus busbar adapter system



#### 60 mm system

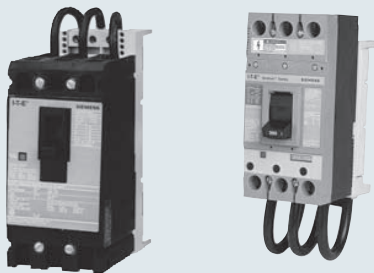
Page

#### Selection and ordering data

• Busbar holders	5/9
• Fast Bus adapter shoes	5/11
• Incoming supply terminals	5/6
• Copper busbar	5/6
• Busbar covers	5/6
• Other accessories	5/6

Overview	5/2
Introduction	5/3
Technical Data	5/3
Dimension drawings	5/10-5/15

### FBCB Fast Bus circuit breakers



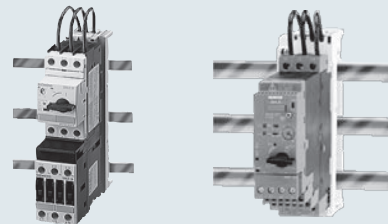
#### FBCB Fast Bus main and feeder circuit breakers

Page

#### Selection and ordering data

• Fast Bus circuit breakers assemblies and kits	5/7
• Fast Bus adapter shoes for VL breakers	5/8

### Fast Bus combination starters



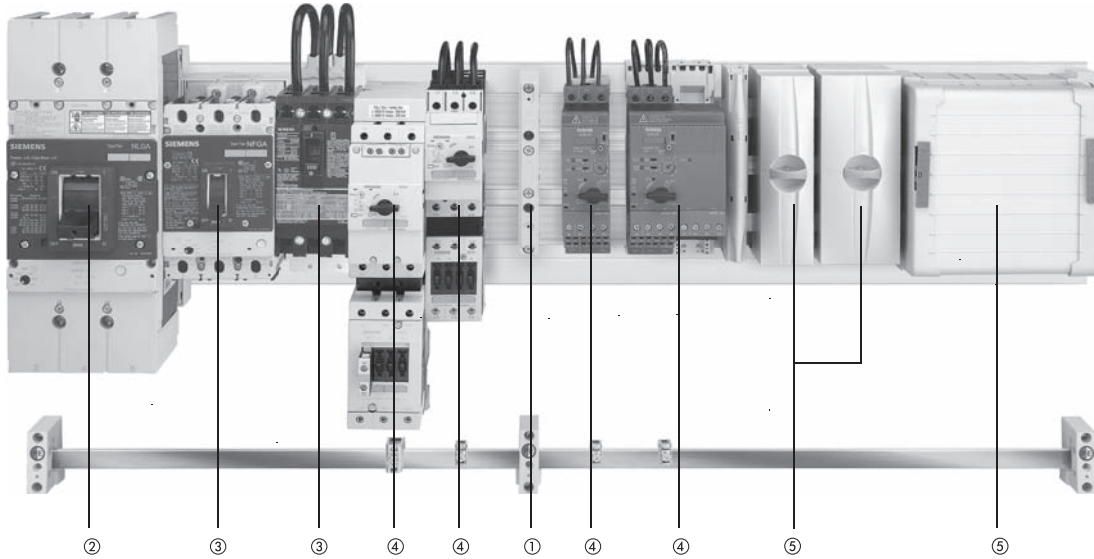
#### 3RA2 Fast Bus combinations starters 3RA6 Fast Bus compact starters

#### Selection and ordering data

- See Section 4

## Busbar adapter systems

Busbar adapter systems  
with busbar centerline spacing of 60 mm



### 60 mm busbar system

for sharp-edged copper busbars to DIN 46 433, width 20 mm to 30 mm, thickness 5 mm and 10 mm

	Page	Page	Page
① <b>Busbar holder</b> End and intermediate holders for flat copper profiles	5/6	③ <b>Fast Bus circuit breakers</b> from 15 to 600A	5/7
② <b>Fast Bus main circuit breakers</b> from 50 to 500A	5/7	④ <b>3RA2 Combination Starters</b> see section 4	
		⑤ <b>Incoming supply terminals</b>	5/6

# Fast Bus Busbar Adapter System

## Introduction

### General

The Fast Bus Multi-Motor Control system is a 3-phase insulated busbar system and is ideal for space saving in panel designs. The system saves considerable line side wiring and space for multi-motor panels. It is also ideal for panels where several feeder breakers are used and will save significant wiring space and wiring labor. The system is also ideal for future expansion planning, when building control panels. SIRIUS 3RV/3RT starter combinations and Siemens circuit breakers are all adaptable to Fast Bus for convenient mounting and faster replacement times.

Fast Bus is ideal for industrial applications where system availability is important.

### How to Select Fast Bus

- 1) Determine the required load.
- 2) Select method to power Fastbus.
  - Main lug up to 800A using a single set of lugs or up to 1400A using a double set of lugs.
  - Circuit breakers, 15A to 500A

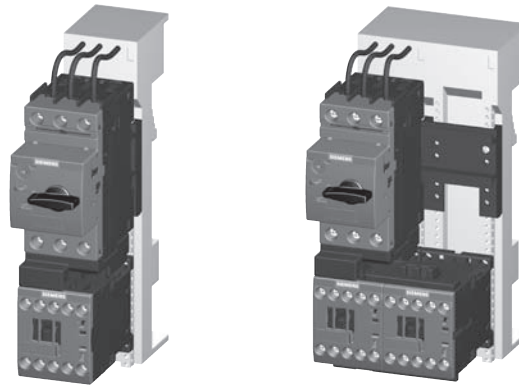
If load exceeds 500A, the CB must be separately panel mounted and fed to a main lug infeed module.
- 3) Select 3RV MSP & 3RT contactor components and appropriate adapter shoe or select preassembled 3RA starters. See section 4.
- 4) Select appropriate length busbar, busbar holders, insulation covers and any other required components.

### Features

- Simple economical installation
- Compact design
- Requires fewer mounting holes
- Domestic and International approvals
- Touch safe
- Modular design
- Provision for system expansion
- Clip-on shoes provide mechanical and electrical connections to panel mounted busbars
- Main and Feeder breakers mount to busbars

### Benefits

- Saves installation time
- Reduces space requirements
- Minimizes layout time
- Allows flexibility for domestic and export business
- Protection for maintenance personnel
- Improves equipment mounting density
- Reduces time and costs associated with system expansion
- Reduces mounting and wiring time and provides trouble free connections
- Allows for quick retrofitting of breakers



### General Ratings of Fastbus System

	IEC	Domestic
Rated operating voltage	690V	600V
Rated insulation voltage, IEC VDE	AC 1000V	N/A
Temperature stability	Up to 105 degrees C	N/A
Busbar support and adapter shoe material	Glass-reinforced polyamide	Same
Color	RAL 7035, light gray	Same

### Ampacity

#### Busbar thickness and width

5 x 20 mm	3/16" x 3/4"	362A
5 x 25 mm	3/16" x 1"	432A
5 x 30 mm	3/16" x 1 1/8"	500A
10 x 20 mm	3/8" x 3/4"	564A
10 x 25 mm	3/8" x 1"	660A
10 x 30 mm	3/8" x 1 1/8"	756A
720mm <sup>2</sup>	---	1400A

For technical information on E and F frame circuit breakers used as main and feeder breakers, see section 17

*Thermal busbar currents, E-Cu, bare, at 35 °C ambient temperature in accordance with DIN 43 6711*

Busbar dimensions	System mm	Thermal current at Busbar temperature		
		65 °C A	85 °C A	105 °C A
20 x 5	60	274	362	430
25 x 5	60	327	432	513
30 x 5	60	379	500	595
20 x 10	60	427	564	670
30 x 10	60	573	756	900





### Fast Bus set-up

The Fast Bus system is designed to be easy to use and to save set up time.

#### 8US Busbar holders

The 8US busbar holders are designed to accommodate ampacities up to 1400A. In some cases, the busbar holder will accept busbars in either 5mm or 10mm widths. Refer to page 5/6 for selection details.

#### High quality material

Busbar supports and fuse bases are manufactured from glass-fiber reinforced, thermoplastic polyester with the color RAL 7035, light gray. The material ensures excellent mechanical, chemical and electrical properties. Furthermore, the material has an extremely low flammability and meets the requirements of UL 94 V0.

#### 8WC Busbar and busbar systems

The most common size busbar for applications in the US is the 8WC5053 (20 mm x 5 mm), however there are other styles available depending on your application.

Busbar systems with 60 mm busbar center-to-center clearance have now become firmly established in the US market.

The permissible busbar temperature is a decisive factor when dimensioning the busbars. The busbar temperature is dependent on the current, the current distribution, the busbar cross-section, the busbar surface, the position of the busbar, the convection and the ambient temperature. The values stated in the table on page 5/3 can only be considered as reference values because the conditions vary with each location. The values are based on constant current over the whole busbar length.

The trend toward busbars proves most advantageous when the incoming supply is centrally located and the load is distributed symmetrically on both sides.

For the assemblies of a busbar system in the feeder circuit the UL directives specify components with large clearance in air and creepage distances (see the table below). Components of the 8US1 busbar system which meet this requirement can be found in this chapter.

#### Note:

*The design of an 8US1 busbar system for use in the feeder circuit always presumes the use of the UL base plate (8US19 22-2UA01) so that the clearance in air and creepage distance requirements are met.*

### Feeder/branch circuit according to UL 508A

The feeder circuit is that part of a circuit which comes in front of the last short circuit protection device (SCPD). The branch circuit is that part of the circuit which follows after the last short circuit protection device. When the 8US1 busbar system is used in a switchgear which must comply with UL directives, it is important to establish whether it is to be used in the feeder circuit or the branch circuit. Components used in the feeder circuit require larger clearance in air and creepage distances than in the branch circuit.

#### Simple Fast Bus system

The two illustrations above show the very basic items needed when setting up a Fastbus system.

- ① 8US1 Busbar holder (5/6)
- ② 8US1 Ground busbar support (shown attached however can be mounted separately 5/6)
- ③ Ground busbar available in 5 x 20 mm to 10 x 30 mm
- ④ 8WC Busbar (8WC5053 shown) FBB36 Busbar (5/6)

### Short-circuit strength

The short-circuit strength of the busbar system is dependent on the spacing of the busbar holders and on the busbar cross-section.

The short-circuit strength of the whole system is dependent on the short-circuit strength of the busbar system and the components that are mounted to the system.

### Applications

The 8US Fast Bus distribution system is ideal for control panel builders with multiple motor applications. These applications are most common in the material handling, automotive, food processing, pharmaceutical and paper processing industries.

	Clearance in air	Creepage distance
Between live parts	25.4 mm (1 inch)	50.8 mm (2 inch)
Between live parts and grounded, non-insulated metal parts	25.4 mm (1 inch)	25.4 mm (1 inch)

# Fast Bus Busbar Adapter System

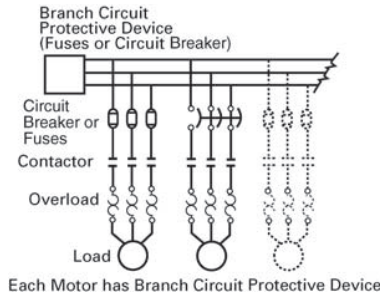
## Introduction

### Fast Bus combination starters and group installation assemblies

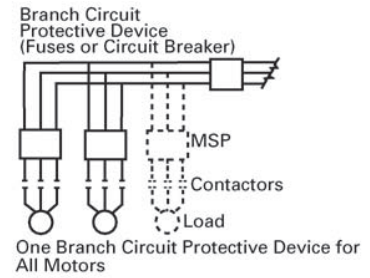
#### Ratings for Group Installations per NEC 430-53

Group Installation is an approach to building multiple motor control systems in accordance with Section 430-53 of the National Electrical Code. In Group installation, multiple motor starters can be grouped under one short circuit protective device. The 3RV MSPs have been UL listed for use in Group Installations both with and without 3RT contactors when mounted on the Fast Bus system. A 3RT contactor is added when remote operation of the motor is required.

#### Standard Installation, NEC 430-52



#### Group Installation, NEC 430-53



MSP Type	FLA Amp Range	FLA Amp Range	Maximum rating of Group Branch Circuit Protective Device		Short Circuit Current Ratings <sup>1) 2)</sup>		
			Fuse	Circuit Breaker	240V	480V	600V
3RV201	S00	0.11-12.5	The main fuse should be selected based on the FUSE selection procedure listed below.	The main CB should be selected based on the CIRCUIT BREAKER selection procedure listed below.	65kA	—	30kA
3RV201	S00	0.11-16			65kA	65kA	—
3RV202	S0	3.5-12.5			65kA	—	30kA
3RV202	S0	3.5-25			65kA	65kA	—
3RV202	S0	28-32			65kA	50kA	—
3RV202	S0	36-40			65kA	12kA	—
3RV203	S2	11-50			65kA	65kA	25kA
3RV204	S3	28-100			65kA	65kA	30kA

#### The selection of components for Group Installation is a simple process of the following three steps:

1. Selection of the Branch Circuit Protective Device, fuse or circuit breaker.
2. Selection of the 3RA Motor Starter based on the motor Full Load Amps.

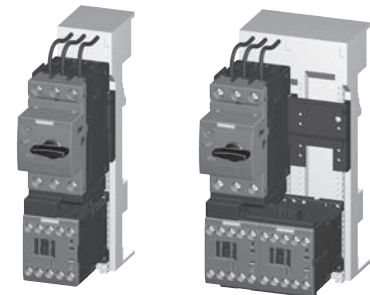
#### Circuit Breaker Selection

Select a circuit breaker (CB) between:  
 Minimum CB size (per NEC430-110):  
 Sum of all motor FLC (per NEC table 430-150) x 115%.  
 Maximum CB size (per NEC430-53c):  
 250% x FLC of the largest motor + FLC of all other motors.

#### Fuse Selection

Calculate the maximum fuse size per NEC430-53c.  
 Max Fuse Size = 175% x FLC of largest motor + FLC of all other motors (FLC's from NEC table 430-150).

Assembled Starter Type	Starter Frame Size	FLA Amp Range	Short Circuit Current Ratings (Type E) <sup>1)</sup>		
			240V	480Y/277V	600Y/347V
3RA201	S00	0.11-12.5	—	—	30kA
3RA201	S00	0.11-16	65kA	65kA	—
3RA202	S0	0.45-12.5	—	—	30kA
3RA202	S0	0.45-25	65kA	65kA	—
3RA202	S0	28-32	50kA	50kA	—
3RA203	S2	11-50	65kA	65kA	25kA
3RA204	S3	28-75	—	—	30kA
3RA204	S3	28-100	65kA	65kA	—



<sup>1)</sup> Branch Circuit Protective Device for 480V-Ratings: The appropriate BCPD need to be determined in accordance with the National Electrical Code, Article 430-53 and the application. The following devices are permitted:

Fuses: Classes RK1, RK5, J, G, T, CC or Circuit breakers: Listed Siemens type, with a marked short-circuit rating equal or larger than the available short-circuit current rating. These devices were tested for group installation use at the above levels without any upstream branch circuit device.

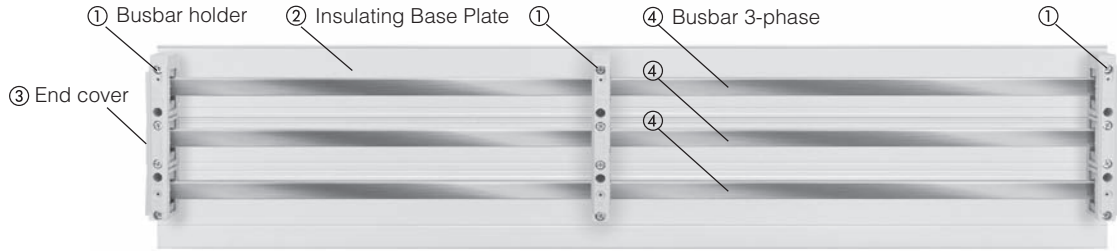
<sup>2)</sup> 3RA2 used as Manual Motor Controller; Branch Circuit Protective Device for 600V-Ratings: Max. Class J 50A

<sup>3)</sup> Starter sizes S00,S0 and S3 require additional type E line side terminal adaptors on the MSP for type F applications. See section 1 accessories

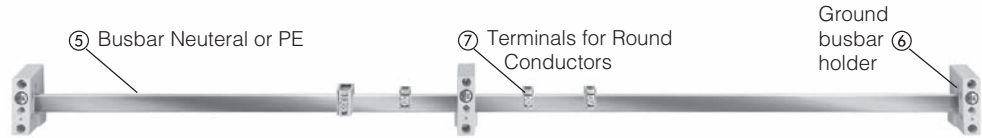
# Fast Bus Busbar Adapter System











60 mm system

## Selection and ordering data



- ① Busbar holder
- ② Insulating Base Plate
- ③ End cover
- ④ Busbar 3-phase
- ⑤ Busbar Neutral or PE
- ⑥ Ground busbar holder
- ⑦ Terminals for Round Conductors



	Description	UL Current rating	UL508A Compliance <sup>1)</sup>	Order No.	Pack Units
	<b>Base plate ②</b>				
8US1922-2UA01	3-pole system flat 230 mm x 1100 mm	—	required	<b>8US19 22-2UA01</b>	
	<b>Copper Busbar with tin plating</b>				
8WC5	20 mm x 5 mm x 914 mm (36") 20 mm x 5 mm x 1524 mm (60")	362A	yes	<b>FBB36</b> <b>FBB60</b>	3 pcs 3 pcs
	20 mm x 5 mm x 2000 mm (78.74") 25 mm x 5 mm x 2000 mm (78.74") 30 mm x 5 mm x 2000 mm (78.74") 20 mm x 10 mm x 2000 mm (78.74") 30 mm x 10 mm x 2000 mm (78.74") 720 mm <sup>2</sup> x 2400 mm (94.49")	362A 362A 432A 500A 564A 756A 1400A	yes yes yes yes yes yes	<b>8WC5053</b> <b>8WC5054</b> <b>8WC5055</b> <b>8WC5063</b> <b>8WC5065</b> <b>8US19 48-2AA00</b>	
8US1948-2AA00	for 60 mm systems for 60 mm systems for 60 mm systems <sup>4)</sup> for 60 mm systems for 60 mm systems for 60 mm systems Twin T (TT) Busbar				
	<b>Busbar holder (end and intermediate) ①</b>				
8US1922-1AC00	3-pole with inside mounting 3-pole with inside mounting	— —	yes —	<b>8US19 23-3UA01</b> <b>8US19 23-3AA00</b>	
8US1923-3UA01	3-pole with inside mounting	—	yes	<b>8US19 43-3AA01</b>	
	<b>Busbar holder end cover ③</b>				
	3-pole end cover		required	<b>8US19 22-1AC00</b>	
	<b>Ground Busbar holder ⑥</b>				
8US1923-1AA01	1-pole with inside mounting	for 20 mm - 30 mm x 5 mm or 10 mm <sup>2)</sup>	n/a	<b>8US19 23-1AA01</b>	
	<b>Cover profiles for Busbars</b>				
8US1922-2AA00	for 5 mm busbars up to 30 mm wide for 10 mm busbars up to 30 mm for Twin T (TT) busbar	1000 mm length 1000 mm length 1000 mm length	— — —	required required required	<b>8US19 22-2AA00</b> <b>8US19 22-2BA00</b> <b>8US19 22-2DA00</b>
	<b>Reserve Space Cover (for covering round terminals placed on 3-phase busbar)</b>				
8US1922-2EB00	Holder for reserve space cover Holder for reserve space cover Reserve space cover	32mm height 107 mm length 195mm height / 700mm length	— — —	required required required	<b>8US1922-2EA00</b> 4 pcs <b>8US1922-2EA01</b> 8 pcs <b>8US1922-2EB00</b>
	<b>Feeder Lugs (mounts to all busbar sizes on this page)</b>				
5SH3538	3-pole terminal plate with cover	20 mm x 200 mm 16-4 AWG	80A	yes	<b>5SH3538</b>
8US1921-1BA00	3-pole terminal plate with cover	54 mm x 200 mm 10-2/0 AWG	300A	yes	<b>8US19 21-1BA00</b>
	3-pole terminal plate with cover	81 mm x 200 mm 2 AWG-250 MCM	440A	yes	<b>8US19 21-1AA00</b>
	3-pole terminal plate with cover	180 mm x 200 mm 250-600 MCM	560A	yes	<b>FBT600F</b>
	3-pole terminal plate	154 mm x 184 mm 300-600 MCM	560A	yes	<b>8US19 41-2AA03</b>
	3-pole terminal plate	160 mm x 184 mm for flat bars up to 32 mm x 20 mm	800A	yes	<b>8US19 41-2AA04</b>
	Cover for 8US19 41-2AA03 and 04	180 mm x 200 mm x 90 mm	—	yes	<b>8US19 22-1GC00</b>

1) UL 508A labeled panels require the use of components that meet the creepage and air distances of 1" air clearance and 2" creepage distance. N/A = not applicable for given item.  
2) Current rating dependent on size of busbar used. Refer to busbar selection data.

# Fast Bus Busbar Adapter System

60 mm system – Circuit breaker assemblies and kits

## Selection and ordering data


Description


### FBCB Fast Bus circuit breakers

Offer a full range of feeder circuit breakers from 15A to 250A. All kits 125A and under are pre-assembled on 60 mm Fast Bus adaptor shoes and ready to place on the busbar. Circuit breakers

150A and higher are pre-packaged kits for fast user assembly and must be torqued down to the busbar prior to assembly. For VL breakers, adaptors are available for up to 500A breakers

(both main and feeder orientation). See page 5/8.

		Available in 2017 <sup>2)</sup>						
Design	UL Current Rating	Breaker Frame (SCCR Rating <sup>1)</sup> )						
<b>Feeders Circuit Breakers</b>		ED (25kA)	HHED (65kA)	FXD (35kA)	NGG (25kA)	HGG (35kA)	LGG (65kA)	
 <p>FBCB100</p>	3 pole/600V fully assembled breakers and adaptors that quickly snap onto the Busbar.	15A	FBCB015	—	—	FBCB015NGG	FBCB015HGG	FBCB015LGG
	20A	FBCB020	FBCB020H	—	—	FBCB020NGG	FBCB020HGG	FBCB020LGG
	25A	FBCB025	FBCB025H	—	—	FBCB025NGG	FBCB025HGG	FBCB025LGG
	30A	FBCB030	FBCB030H	—	—	FBCB030NGG	FBCB030HGG	FBCB030LGG
	35A	FBCB035	FBCB035H	—	—	FBCB035NGG	FBCB035HGG	FBCB035LGG
	40A	FBCB040	FBCB040H	—	—	FBCB040NGG	FBCB040HGG	FBCB040LGG
	45A	FBCB045	FBCB045H	—	—	FBCB045NGG	FBCB045HGG	FBCB045LGG
	50A	FBCB050	FBCB050H	—	—	FBCB050NGG	FBCB050HGG	FBCB050LGG
	60A	FBCB060	—	—	—	FBCB060NGG	FBCB060HGG	FBCB060LGG
	70A	FBCB070	—	—	—	FBCB070NGG	FBCB070HGG	FBCB070LGG
	80A	FBCB080	—	—	—	FBCB080NGG	FBCB080HGG	FBCB080LGG
	90A	FBCB090	—	—	—	FBCB090NGG	FBCB090HGG	FBCB090LGG
	100A	FBCB100	—	—	—	FBCB100NGG	FBCB100HGG	FBCB100LGG
	110A	FBCB110	—	—	—	FBCB110NGG	FBCB110HGG	FBCB110LGG
125A	FBCB125	—	—	—	FBCB125NGG	FBCB125HGG	FBCB125LGG	
<p>3 pole/600V kitted components for customer assembly that require the adaptor to be torqued down to the Busbars prior to assembly.</p>	150A	—	—	FBCB150	—	—	—	
	175A	—	—	FBCB175	—	—	—	
	200A	—	—	FBCB200	—	—	—	
	225A	—	—	FBCB225	—	—	—	
	250A	—	—	FBCB250	—	—	—	

Design	UL Current Rating	Breaker Frame (SCCR Rating)			
<b>Main Circuit Breakers</b>		FXD (25kA) <sup>3)</sup>	HFXD (65kA)		
 <p>FBCB250M</p>	3 pole/600V kitted components for customer assembly that require the adaptor to be torqued down to the Busbars prior to assembly.	100A	FBCB100M	FBCB100M-HB	—
	125A	FBCB125M	FBCB125M-HB	—	—
	150A	FBCB150M	FBCB150M-HB	—	—
	175A	FBCB175M	FBCB175M-HB	—	—
	200A	FBCB200M	FBCB200M-HB	—	—
	225A	FBCB225M	FBCB225M-HB	—	—
	250A	FBCB250M	FBCB250M-HB	—	—

1) UL Short Circuit Current ratings are based on 480V. Contact Siemens for 600 V ratings.


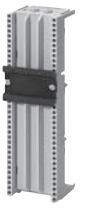



2) Check Industry Mall for availability.

3) FBCB100M -125M SCCR = 25kA @ 480V  
FBCB150M -250M SCCR = 65kA @ 480V

## Fast Bus Busbar Adapter System

60 mm system – Busbar adapters and device holders

## Selection and ordering data

Busbar device adapters	Number of mounting rails (35 mm)	Rated current	Con-necting cables	Adapter length	Adapter width	Rated voltage UL	UL508A <sup>1)</sup> compliance	Order No.	Pack units	Weight per PU approx . kg
		A	AWG	mm	mm	V				
<b>For SIRIUS</b>										
<b>Size S00/S0</b>										
 8US21 51-5DM07	MSPs	1	25	12	182	45	600	yes	<b>8US12 51-5DM07</b>	0.183
	Contactors + Overload relays	1	25	12	182	45	600	yes		
	Direct start load feeders	1	25	12	182	45	600	yes		
	Reversing feeders									
	Busbar adapters	1	25	12	182	45	600	yes		
+ Device holders	1	--	--	182	45	600	yes	<b>8US12 50-5AM00</b>	0.158	
+ Connecting plates	--	--	--	--	--	--	yes	<b>8US19 98-1AA00</b>	100 units	0.100
<b>Size S00/S0 Cage Clamp</b>										
 8US21 60-5AM00	Direct start load feeders	1	12	14	182	45	600	yes	<b>8US12 51-5CM47</b>	0.190
	<b>Size S2</b>									
 8US12 11-4TR00	MSPs	1	50	8	182	55	600	yes	<b>8US12 61-5FM08</b>	0.263
	Contactors + Overload relays	1	50	8	182	55	600	yes		
	Direct start load feeders	1	50	8	245	55	600	yes		
	Reversing feeders									
	Busbar adapters	1	50	8	242	55	600	yes		
Busbar adapters	1	--	--	242	55	600	yes	<b>8US12 60-5AM00</b>	0.202	
+ Device holders	--	--	--	242	55	600	yes	<b>8US12 60-5AP00</b>	0.243	
+ Connecting plates	--	--	--	--	--	--	yes	<b>8US19 98-1AA00</b>	100 units	0.100
<b>Size S3</b>										
		80	4	215	72	600	yes	<b>8US12 11-4TR00<sup>4)</sup></b>		0.659
	1	100	--	200	72	600	yes	<b>FBS100723R</b>		0.590
	--	100	--	200	72	600	yes	<b>FBS100722</b>		0.610
<b>For VL UL circuit breakers<sup>2)</sup></b>										
 8US12 13-4AQ03	VL150 UL, DG frame	--	150	Tubular contacts	190	105	600	yes	<b>8US12 13-4AQ03</b>	1.020
	VL250 UL, FG frame	--	250	Tubular contacts	190	105	600	yes	<b>8US12 13-4AQ03</b>	1.020
	VL400 UL, JG frame	--	400	Tubular contacts	296	140	600	yes	<b>8US12 13-4AH00</b>	1.900
	VL400X UL, LG frame	--	540 <sup>3)</sup>	Tubular contacts	296	140	600	yes	<b>8US12 13-4AH00</b>	1.900
 8US12 13-4AH00										











<sup>1)</sup> UL 508A labeled panels require the use of components that meet the creepage and air distances of 1" air clearance and 2" creepage distance. N/A = not applicable for given item.

<sup>2)</sup> For use with 10mm x 30mm and twin T (TT) busbars only. Adaptors can be configured for main or feeder breakers applications.

<sup>3)</sup> For use with maximum 500A circuit breaker. Circuit breakers greater than 500A must be panel mounted off the busbar system and fed to the busbars via an infeed module. See page 5/6.

<sup>4)</sup> Rated 100A @ 480V. Rated 100A @ 600V with Class J Fuses.

## Selection and ordering data

Description	Max Amps	Width	UL508A Compliance <sup>1)</sup>	Order No.	List Price \$	Pack Units
<b>Terminals for round conductors</b>						
<b>5 mm busbar thickness<sup>3)</sup></b>						
 Terminals	12 mm x 5 mm	180	16 - 6 AWG	<b>8US19 21-2AA00</b>		100
	15 mm x 5 mm	270	12 - 2 AWG	<b>8US19 21-2AB00</b>		50
	20 mm x 5 mm	400	6 - 2/0 AWG	<b>8US19 21-2AD00</b>		50
	25 mm x 5 mm	440	6 - 250 MCM	<b>8US19 21-2AC00</b>		50
	30 mm x 5 mm	180	16 - 6 AWG	<b>8US19 21-2AA01</b>		15
		270	12 - 2 AWG	<b>8US19 21-2AB01</b>		15
		400	6 - 2/0 AWG	<b>8US19 21-2AD01</b>		15
		440	6 - 250 MCM	<b>8US19 21-2AC01</b>		15
	20 mm x 5 mm, 25 mm x 5 mm	500	3/0 - 350 MCM	<b>8US19 41-2AA01</b>		6
	30 mm x 5 mm	600	300 - 600 MCM	<b>8US19 41-2AA02</b>		3
<b>10 mm bar thickness</b>						
 Terminals	12 mm x 10 mm <sup>3)</sup>	180	16 - 6 AWG	<b>8US19 21-2BA00</b>		100
	15 mm x 10 mm <sup>3)</sup> , 20 mm x 10 mm	270	12 - 2 AWG	<b>8US19 21-2BB00</b>		50
	25 mm x 10 mm, 30 mm x 10 mm	400	6 - 2/0 AWG	<b>8US19 21-2BD00</b>		50
		440	6 - 250 MCM	<b>8US19 21-2BC00</b>		50
		180	16 - 6 AWG	<b>8US19 21-2BA01</b>		15
		270	12 - 2 AWG	<b>8US19 21-2BB01</b>		15
		400	6 - 2/0 AWG	<b>8US19 21-2BD01</b>		15
		440	6 - 250 MCM	<b>8US19 21-2BC01</b>		15
	20 mm x 10 mm, 25 mm x 10 mm	500	3/0 - 600 MCM	<b>8US19 41-2AA01</b>		6
	30 mm x 10 mm	600	300 - 600 MCM	<b>8US19 41-2AA02</b>		3
<b>Terminal covers for circular conductors (mounts to busbars)</b>						
 8US19 22-1GA00	For terminals up to 250 MCM 200 mm long, 84 mm wide			<b>8US19 22-1GA00</b>		10
	For terminals up to 600 MCM 200 mm long, 270 mm wide			<b>8US19 22-1GA02</b>		1
	For terminals up to 600 MCM 200 mm long, 135 mm wide			<b>FBC135</b>		
<b>Accessories for busbar adapters and device holders</b>						
 Mounting Rail	Mounting rail (35 mm) - plastic complete with mounting screws	45 mm	n/a	<b>8US1998-7CA15</b>		10
		55 mm	n/a	<b>8US1998-7CA16</b>		10
		70 mm	n/a	<b>8US1998-4AA00</b>		10
		90 mm	n/a	<b>8US1998-7CA08</b>		10
		110 mm	n/a	<b>8US1998-7CA10</b>		10
 Connection holder (for vertical busbar assembly) fixes the MSP to the mounting rail <sup>3)</sup> (for SIRIUS sizes S00/S0)		-	n/a	<b>8US1998-1DA00</b>		20
	 Screw holder for supplementary screw fixing of the feeder (for SIRIUS sizes S00/S0)		-	n/a	<b>8US1998-1CA00</b>	
 Spacer fixes the busbar adapter to the device holder (for SIRIUS sizes S00/S0)			-	n/a	<b>8US1998-1BA00</b>	
		-	n/a	<b>8US1998-1BA01</b>		1
 Connection wedges for mechanical linking of adapters and switching device holders (2 units required per combination)		-	n/a	<b>FBC20</b>		20
<b>Outgoing terminal rail for busbar adapters</b>						
 Load Side Terminal	<b>Plug-type terminal</b> (complete with supporting element for attaching to busbar adapter and switching device holder. Spring loaded terminals.)					
	3 x 14 AWG (400 V) and 4 x 16AWG (250 V)	91 mm	45 mm	n/a	<b>8US1998-8AM07</b>	
	7 x 14 AWG (400 V)	91 mm	54 mm	n/a	<b>8US1998-8AA10</b>	
<b>Accessories for busbar adapters and device holders</b>						
 8US1998-2BM00	Side module for busbar adapter expansion For adapters w/182 mm	182 mm	10 mm	n/a	<b>8US1998-2BM00</b>	
	Side module for busbar adapter expansion For adapters w/200 mm	200 mm	9 mm	n/a	<b>8US1998-2BJ10</b>	

<sup>1)</sup> UL508A labeled panels require the use of components that meet the creepage and air distances of 1" air clearance and 2" creepage distance.

N/A = not applicable for given item.

<sup>2)</sup> Terminals must be manually spaced on the busbar to comply with UL508A distances of 1" air clearance and 2" creepage distance.

<sup>3)</sup> Cannot be used on Twin T (TT) profile up to 1400 A.

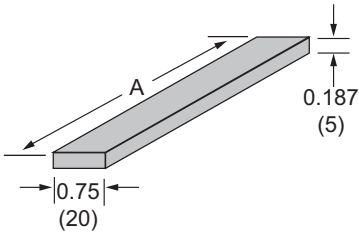


# Fast Bus Busbar Adapter System

60 mm system

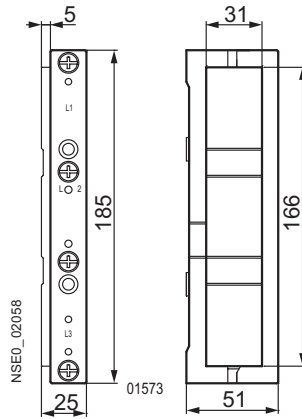
## Dimension drawings

FBB36/FBB60 Copper Busbar

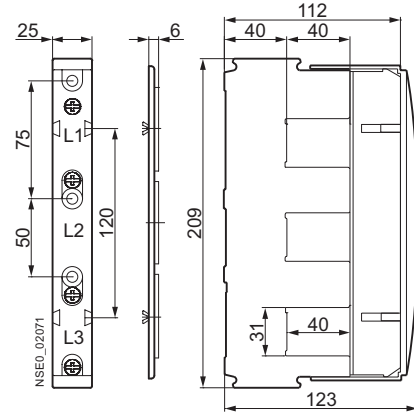


Dimension	A
FBB36	36 (914)
FBB60	60 (1524)

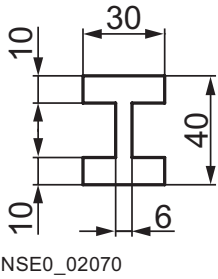
8US19 23-3UA01



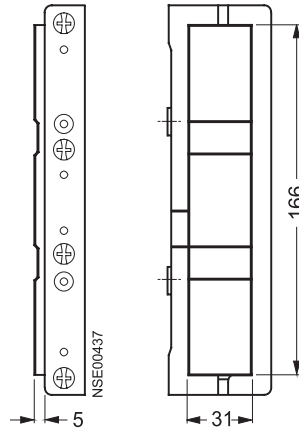
8US19 43-3AA00



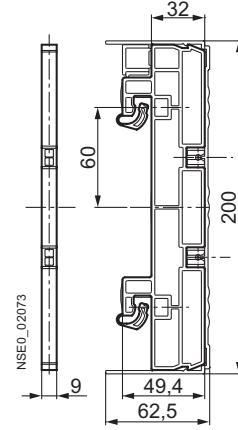
Copper Busbar/TT profile, 8US19 48-2AA00



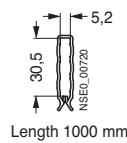
8US19 22-1AC00 with 8US19 23-3UA01  
8US19 22-1AC00 with 8US19 23-3AA01



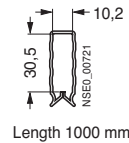
Support for blanking covers, 8US1922-2EA00



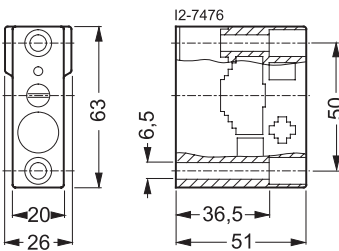
8US19 22-2AA00



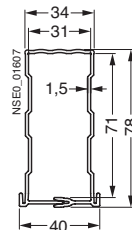
8US19 22-2BA00



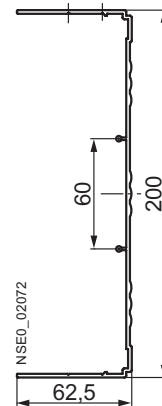
8US19 23-1AA01



8US19 22-2DA00

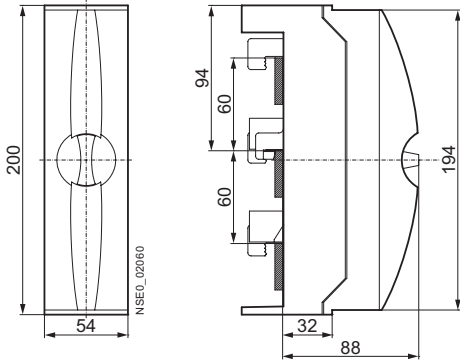


Blanking cover, 8US1922-2EB00

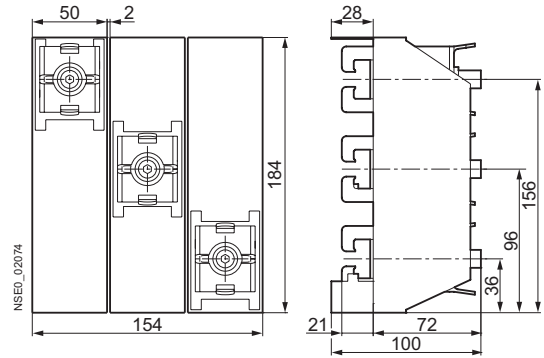


## Dimension drawings

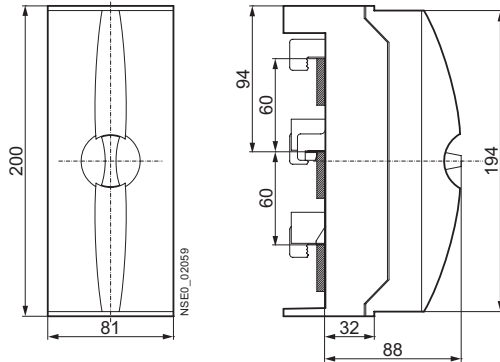
**Infeed, 8US19 21-1BA00**



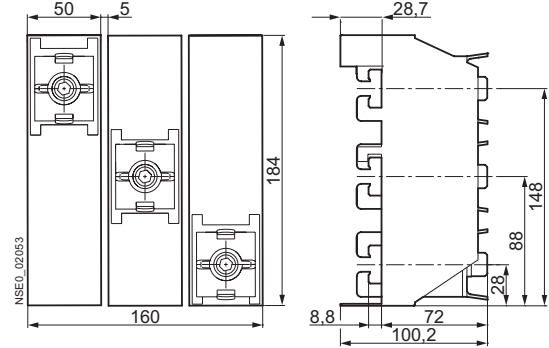
**Infeed, 8US19 41-2AA03**



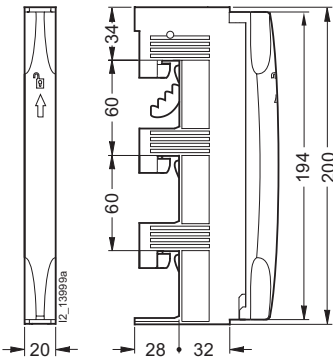
**Infeed, 8US19 21-1AA00**



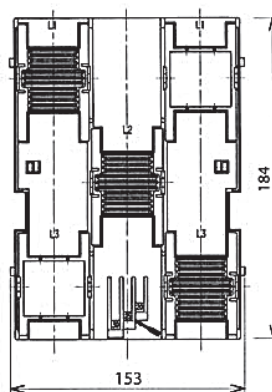
**Infeed, 8US19 41-2AA04**



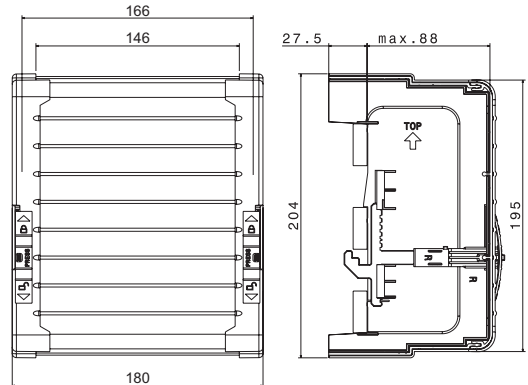
**Infeed 5SH3538**



**FBT600F (supplied with cover)**



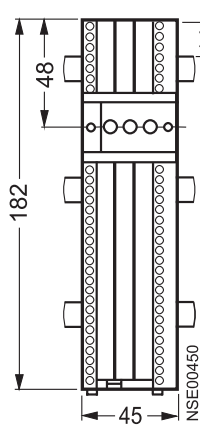
**FBT600F Cover**



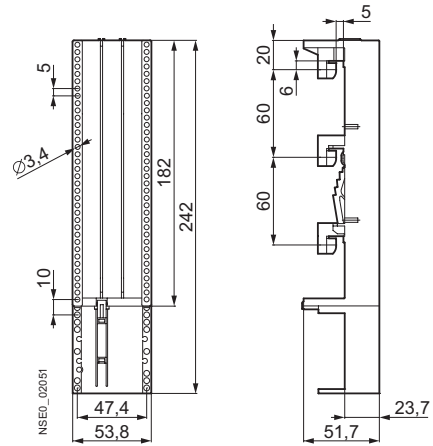


## Dimension drawings

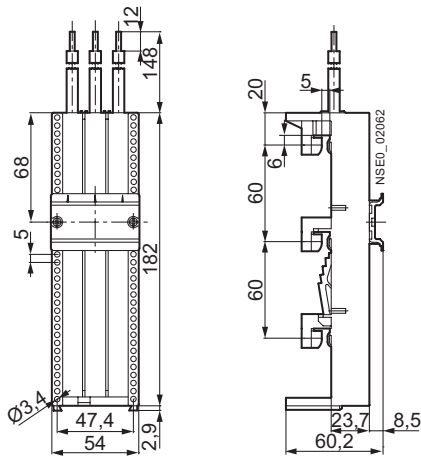
Busbar device adapter, 8US12 50-5AM00



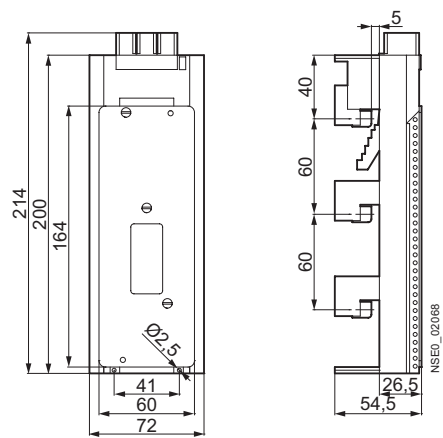
Busbar device adapter, 8US12 60-5AP00



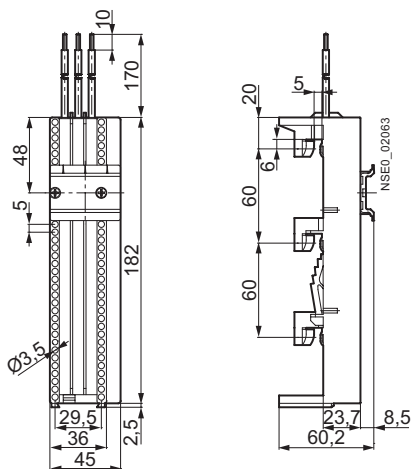
Busbar device adapter, 8US12 61-5FM08



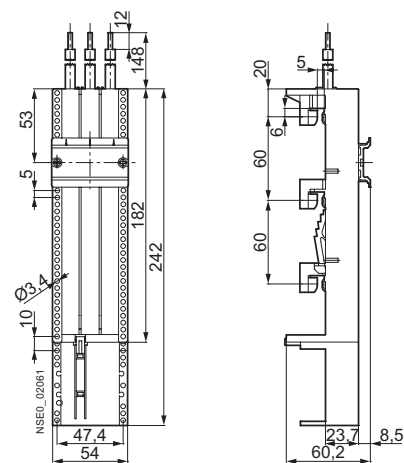
Busbar device adapter, 8US12 11-4TR00



Busbar device adapter, 8US12 51-5DM07

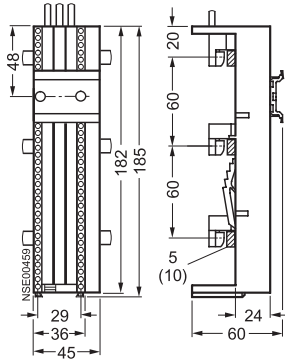


Busbar device adapter, 8US12 61-5FP08

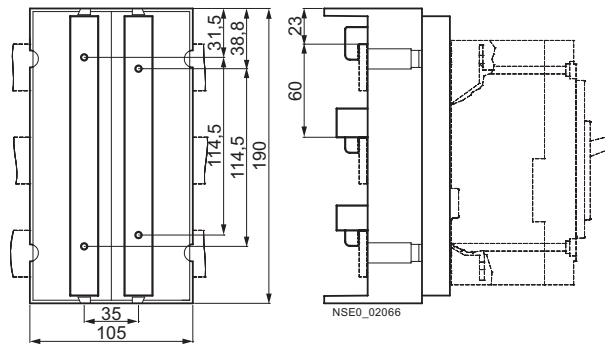


## Dimension drawings

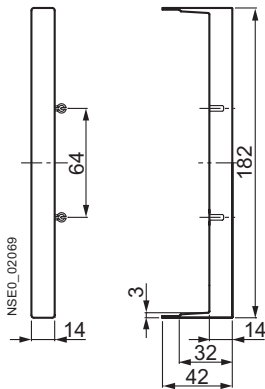
Busbar device adapter, 8US12 51-5CM47



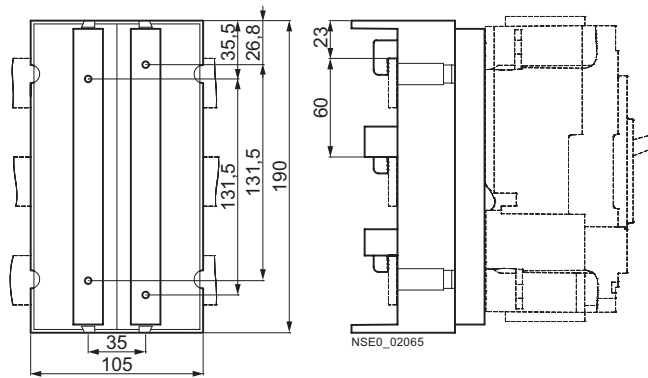
Busbar device adapter, 8US12 13-4AQ01



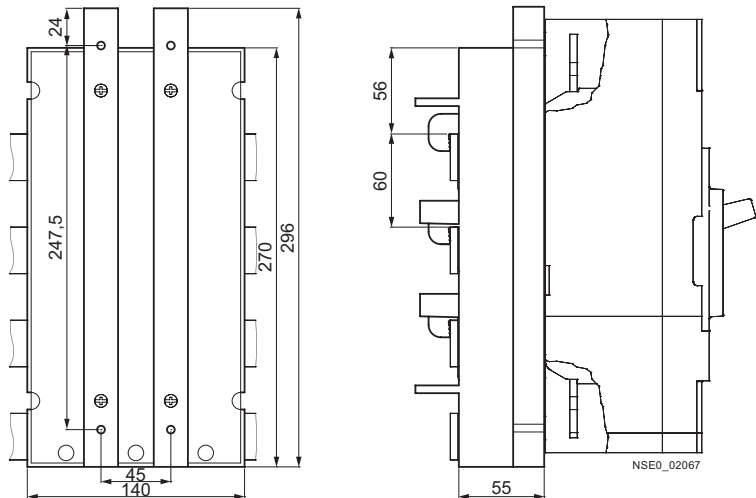
8US19 98-2BM00



Busbar device adapter, 8US12 13-4AQ03



Busbar device adapter, 8US12 13-4AH00



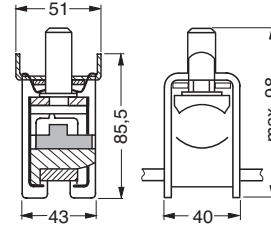
# Fast Bus Busbar Adapter System

60 mm system

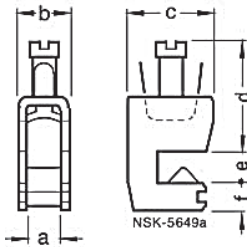
## Dimension drawings

Type	a	b	c	d	e	f	Max tightening torque	
5mm	8US1921-2AA0.	7.5	11.5	22.5	25	5	10	4 Nm
	8US1921-2AB0.	10.5	15.5	29	35	5	10	6 Nm
	8US1921-2AC0.	17	23.5	36	55	5	12	15 Nm
	8US1921-2AD0.	14.5	20.5	32	42	5	12	10 Nm
10mm	8US1921-2BA0.	7.5	11.5	22.5	25	10	10	4 Nm
	8US1921-2BB0.	10.5	15.5	29	35	10	10	6 Nm
	8US1921-2BC0.	17	23.5	36	55	10	12	15 Nm
	8US1921-2BD0.	14.5	20.5	32	42	10	12	10 Nm

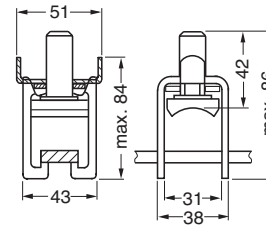
8US1941-2AA01



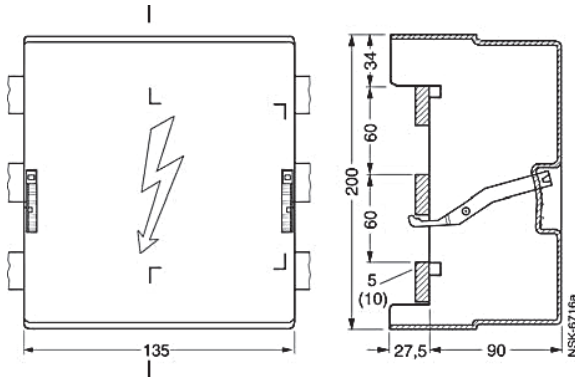
8US1921-2A / -2B



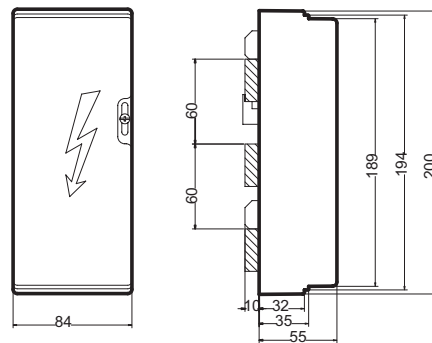
8US1941-2AA02



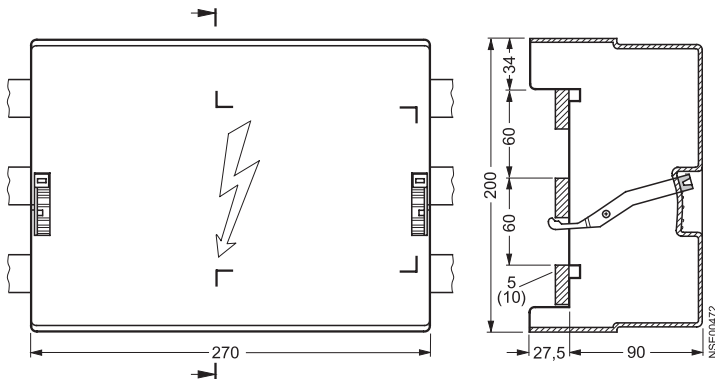
FBC135



8US1922-1GA00

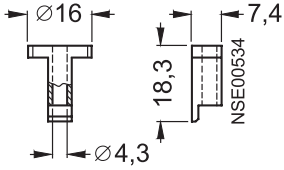


8US19 22-1GA02

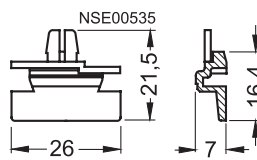


Dimension drawings

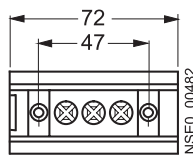
8US19 98-1CA00



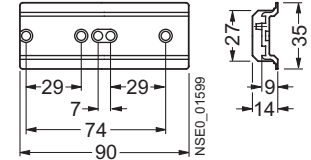
8US19 98-1DA00



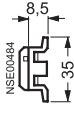
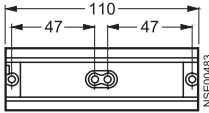
8US19 98-4AA00



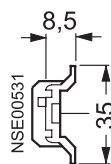
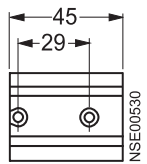
8US19 98-7CA08



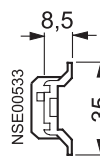
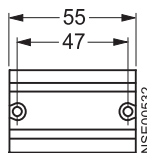
8US19 98-7CA10



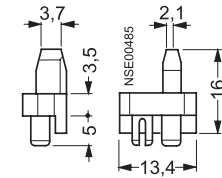
8US19 98-7CA15



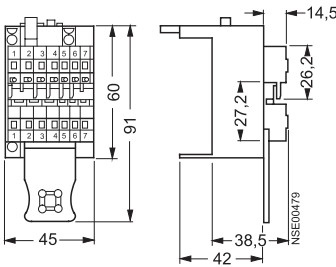
8US19 98-7CA16



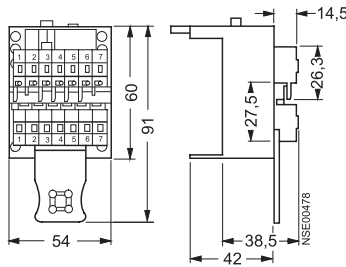
8US19 98-1BA00



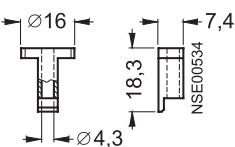
8US19 98-8AM07



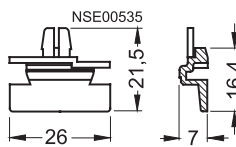
8US19 98-8AA10



8US19 98-1CA00



8US19 98-1DA00



## General data

### Order No. scheme

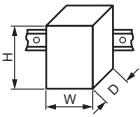
Digit of the Order No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th
	□□□	□	□	□	0	-	□	□	□	□	-	□	□	□
<b>SIRIUS starters</b>	<b>3 R A</b>													
<b>SIRIUS 2nd generation</b>	<b>2</b>													
<b>Type of starter (direct-on-line starter = 1, reversing starter = 2)</b>	□													
<b>Size (S00 = 1, S0 = 2)</b>	□													
<b>Setting range for overload release</b>	□ □													
<b>Design type and connection method</b>	□													
<b>Rated power at 460 V AC</b>	□ □													
<b>Integrated auxiliary switches of the contactor</b>	□													
<b>Operating range / solenoid coil circuit (contactor)</b>	□													
<b>Rated control supply voltage (contactor)</b>	□ □													
<b>Example</b>	<b>3 R A 2 1 1 0 - 0 B A 1 5 - 1 A K 6</b>													

**Note:**

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers. For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

### Technical specifications

Direct-on-line starters/ reversing starters	Size	Connection methods	Mounting	Control voltage	Width W	Height H	Depth D		
					mm	mm	mm		
<b>Mounting dimensions</b>									
Direct-on-line starters 3RA21.	S00	Screw terminals	Standard mounting rails	AC/DC	45	167	97		
			Busbar adapters	AC/DC	45	200	155		
		Spring-type terminals	Standard mounting rails	AC/DC	45	198	97		
			Busbar adapters	AC/DC	45	260	155		
		S0	Screw terminals	Standard mounting rails	AC	45	193	97	
				Busbar adapters	AC	45	260	155	
	Spring-type terminals		Standard mounting rails	AC/DC	45	243	107		
			Busbar adapters	AC/DC	45	260	165		
	Reversing starters 3RA22.		S00	Screw terminals	Standard mounting rails	AC/DC	90	170	97
					Busbar adapters	AC/DC	90	200	155
		Spring-type terminals		Standard mounting rails	AC/DC	90	204	97	
			Busbar adapters	AC/DC	90	260	155		
S0		Screw terminals	Standard mounting rail adapters	AC	90	265	120.3		
			Busbar adapters	AC	90	260	155		
	Spring-type terminals	Standard mounting rail adapters	AC/DC	90	270	131			
Busbar adapters		AC/DC	90	260	165				

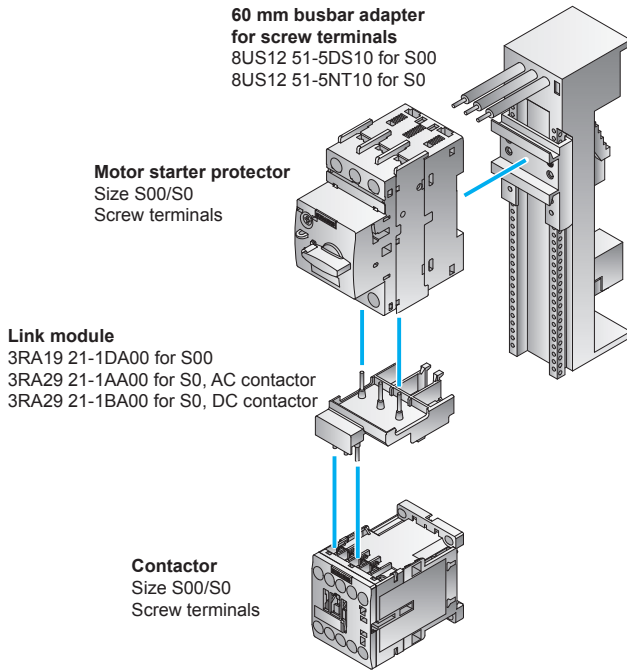


<b>Type</b>		<b>3RA2. 1</b>	<b>3RA2. 2</b>
Size		<b>S00</b>	<b>S0</b>
Number of poles		<b>3</b>	<b>3</b>
<b>Mechanics and environment</b>			
<b>Permissible ambient temperature</b>			
• During operation	°C	-20 ... +60	
• Storage and transport	°C	-55 ... +80	
<b>Weight</b>	kg	0.6 ... 1.5	0.8 ... 2.3
<b>Permissible mounting positions</b>			
		Important: Acc. to DIN 43602 start command "I" at the right or top	
<b>Shock resistance</b> (sine-wave pulse)	Acc. to IEC 60086 Part 2-27	g	Up to 6
<b>Degree of protection</b>	Acc. to IEC 60947-1		IP20

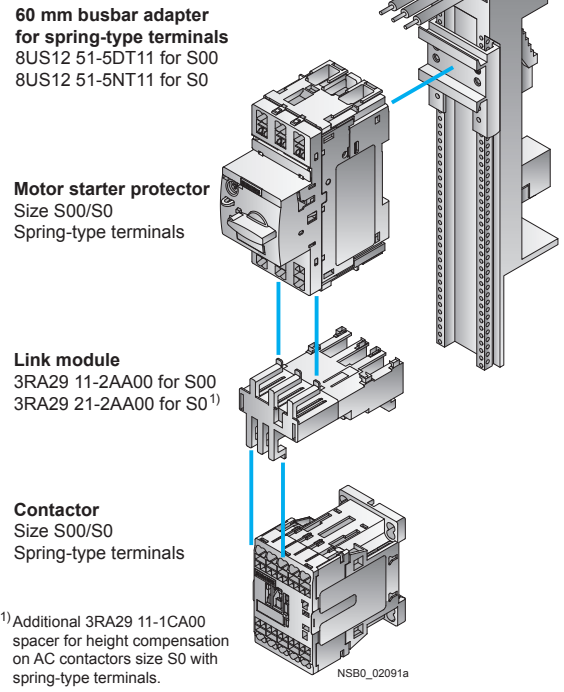
# SIRIUS 3RA Motor Starters

## General data

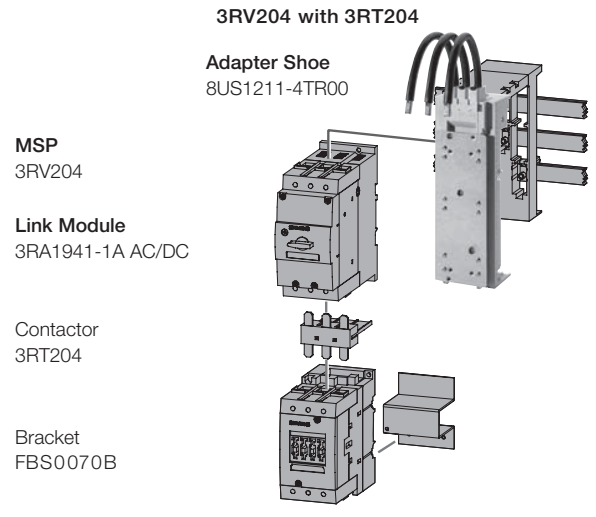
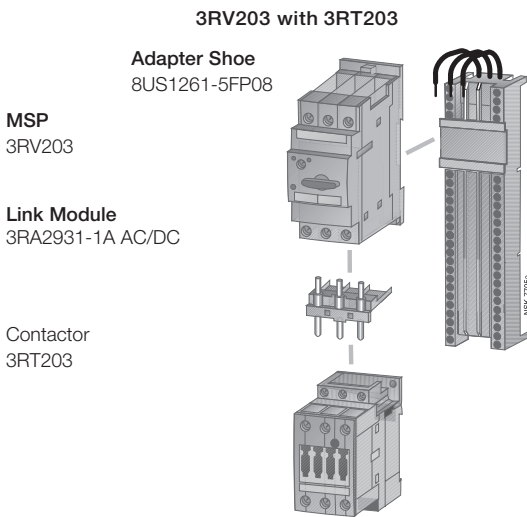
### Direct-on-line starting · For 60 mm busbar systems · Sizes S00 and S0



Left: 3RA21 motor starter for direct-on-line starting with busbar adapters with screw connection



Right: 3RA21 motor starter for direct-on-line starting with busbar adapters with spring-type connection



Reversing duty • For 60 mm busbar systems • Sizes S00 and S0

**RS assembly kit for reversing duty and busbar mounting**

Screw connection:  
 3RA29 13-1DB1 for S00  
 3RA29 23-1DB1 for S0

For spring-type connection:  
 3RA29 13-1DB2 for S00  
 3RA29 23-1DB2 for S0<sup>1)</sup>

Comprising:  
 1 wiring kit  
 1 busbar adapter  
 1 device holder  
 2 connecting wedges

<sup>1)</sup>Also includes 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

**Motor starter protector**

Size S00/S0  
 Screw terminals/  
 spring-type terminals

**Link module**

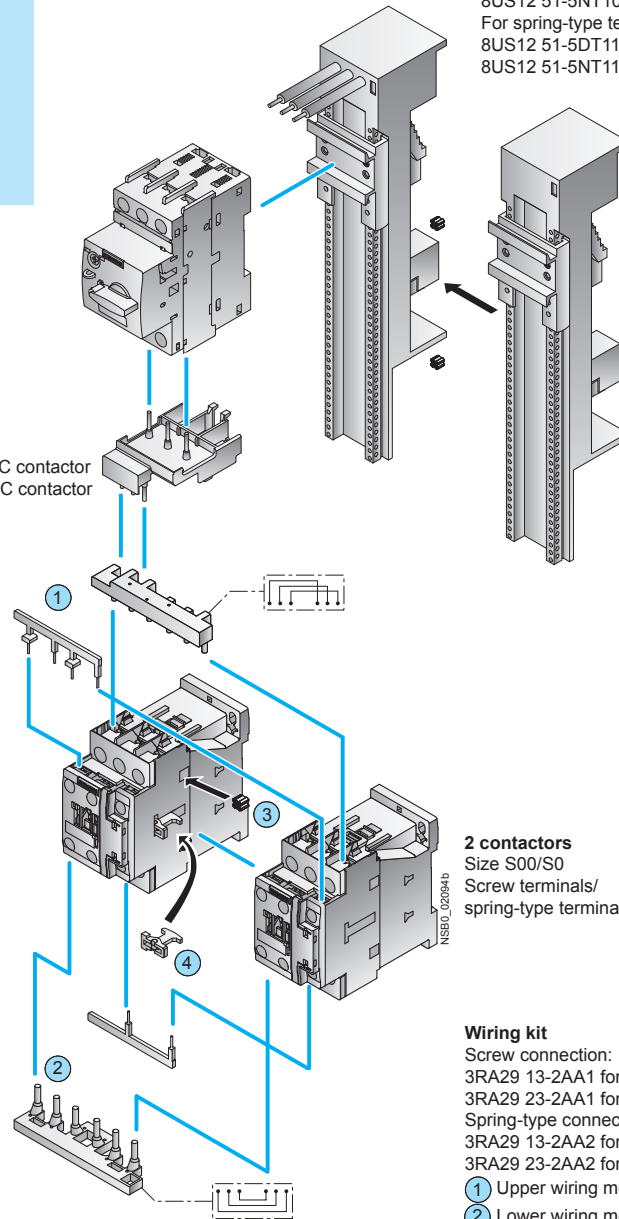
For screw terminals:  
 3RA19 21-1DA00 for S00  
 3RA29 21-1AA00 for S0, AC contactor  
 3RA29 21-1BA00 for S0, DC contactor  
 For spring-type terminals:  
 3RA29 11-2AA00 for S00  
 3RA29 21-2AA00 for S0<sup>2)</sup>

**60 mm busbar adapter**

For screw terminals:  
 8US12 51-5DS10 for S00  
 8US12 51-5NT10 for S0  
 For spring-type terminals:  
 8US12 51-5DT11 for S00  
 8US12 51-5NT11 for S0

**2 connecting wedges**  
 8US19 98-1AA00

**60 mm device holder**  
 8US12 51-5AS10



**2 contactors**  
 Size S00/S0  
 Screw terminals/  
 spring-type terminals

**Wiring kit**

Screw connection:  
 3RA29 13-2AA1 for S00  
 3RA29 23-2AA1 for S0

Spring-type connection:  
 3RA29 13-2AA2 for S00  
 3RA29 23-2AA2 for S0

- ① Upper wiring module
- ② Lower wiring module
- ③ 2 connecting clips
- ④ Mechanical interlock (can be removed if necessary)

<sup>2)</sup>Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

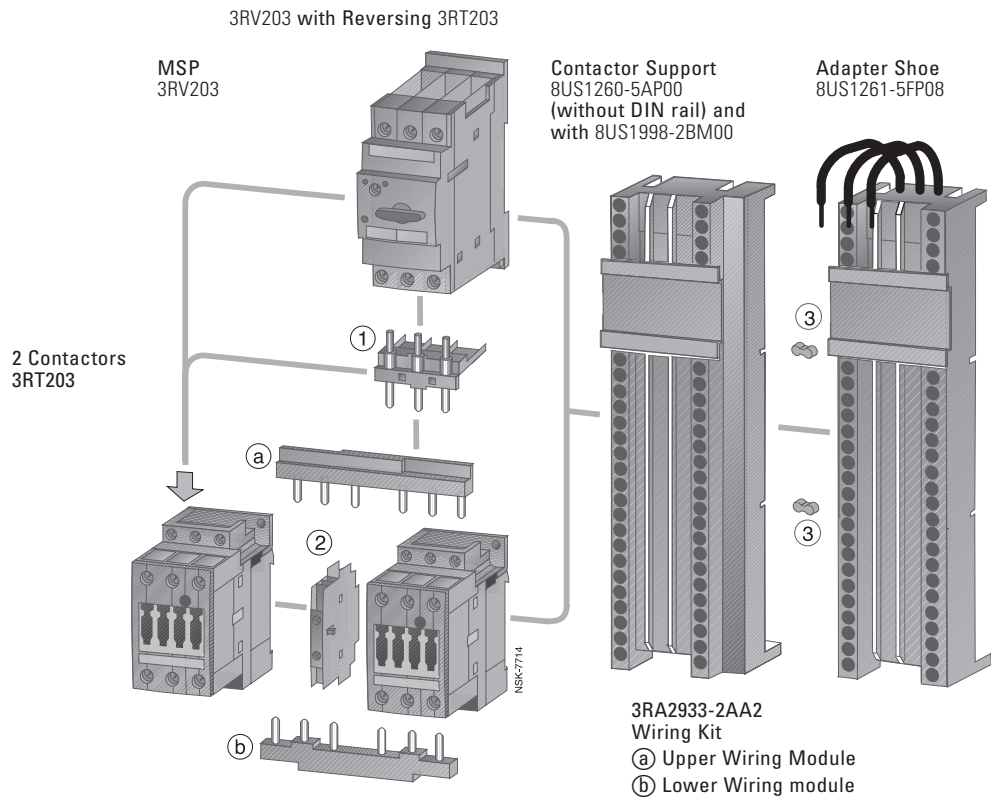
3RA22 motor starter for reversing duty and 60 mm standard mounting rail in size S00/S0 (the version with screw connection is shown in the picture)



## Selection

Required Components for Fast Bus Mounting

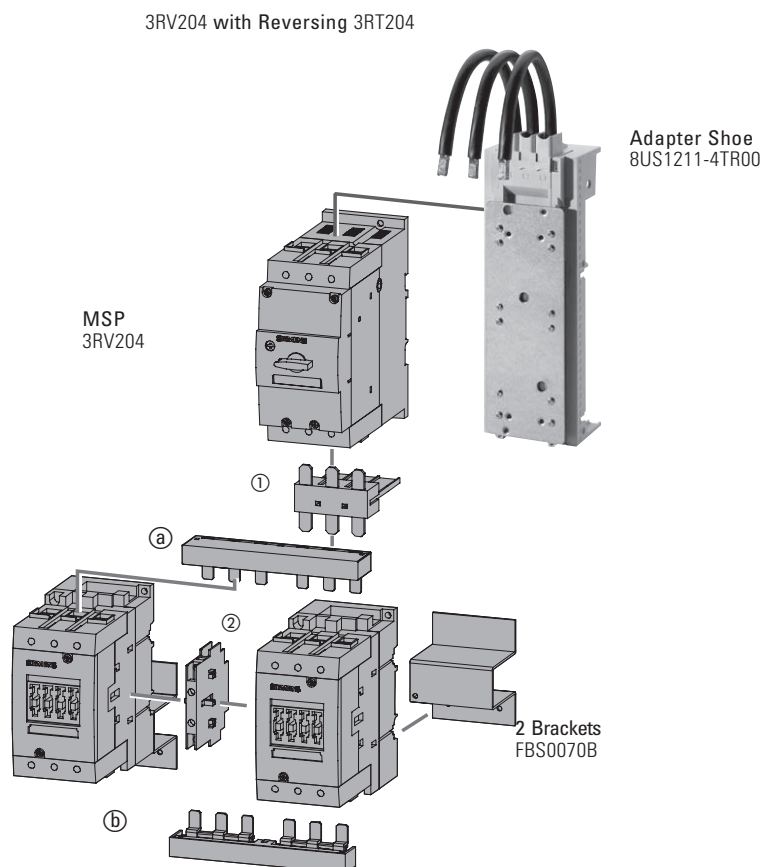
- ① Link Module  
3RA2931-1A AC/DC
- ② Mechanical Interlock  
3RA2934-2B
- ③ Fast Clips  
FBC20



- ① Link Module  
3RA1941-1A AC/DC
- ② Mechanical Interlock  
3RA2934-2B

- 3RA2943-2AA1  
Wiring Kit  
a Upper Wiring Module  
b Lower Wiring Module

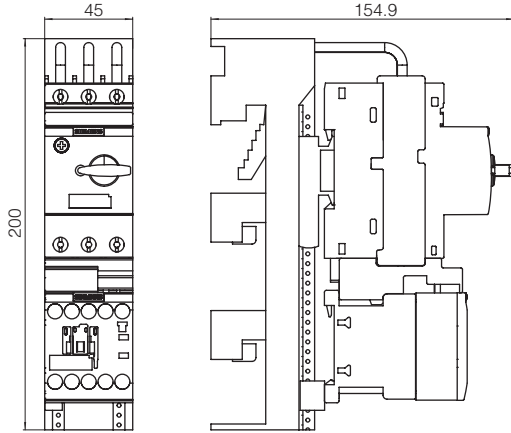
2 Contactors  
3RT204



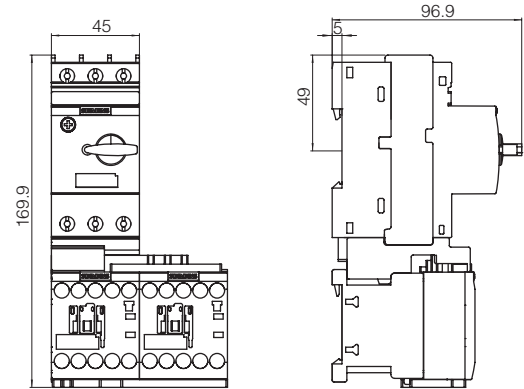
## Dimensions

Dimensions, 3RV201 with 3RT201

**3RA2110**  
Fast Bus Non-reversing



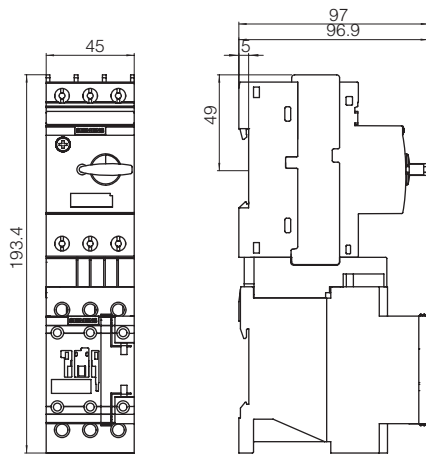
**3RA2210**  
Fast Bus Reversing



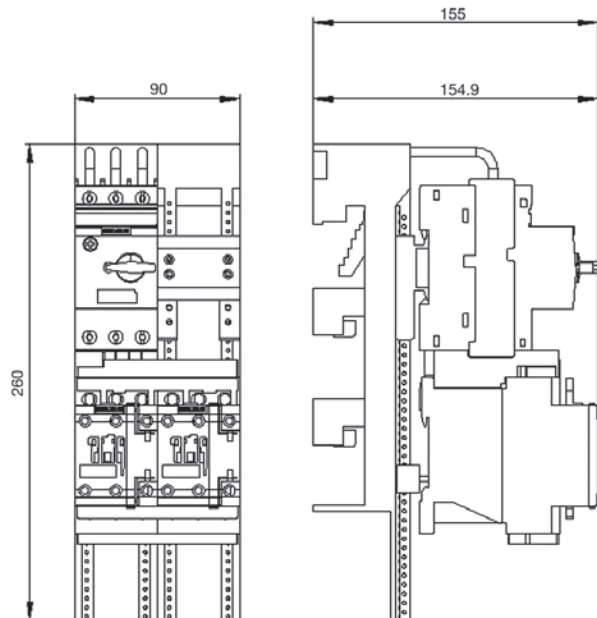
- 1) Lockable in OFF position. Padlock diameter 5 mm.
- 2) When a front auxiliary is installed on the contactor, add 44 mm to the depth of the contactor.

Dimensions, 3RV202 with 3RT201

**3RA2120**  
Fast Bus Non-reversing



**3RA2220**  
Fast Bus Reversing



- 1) Lockable in OFF position. Padlock diameter 5 mm.
- 2) When a front mount auxiliary is installed on the contactor, add 44 mm to the depth of the contactor.

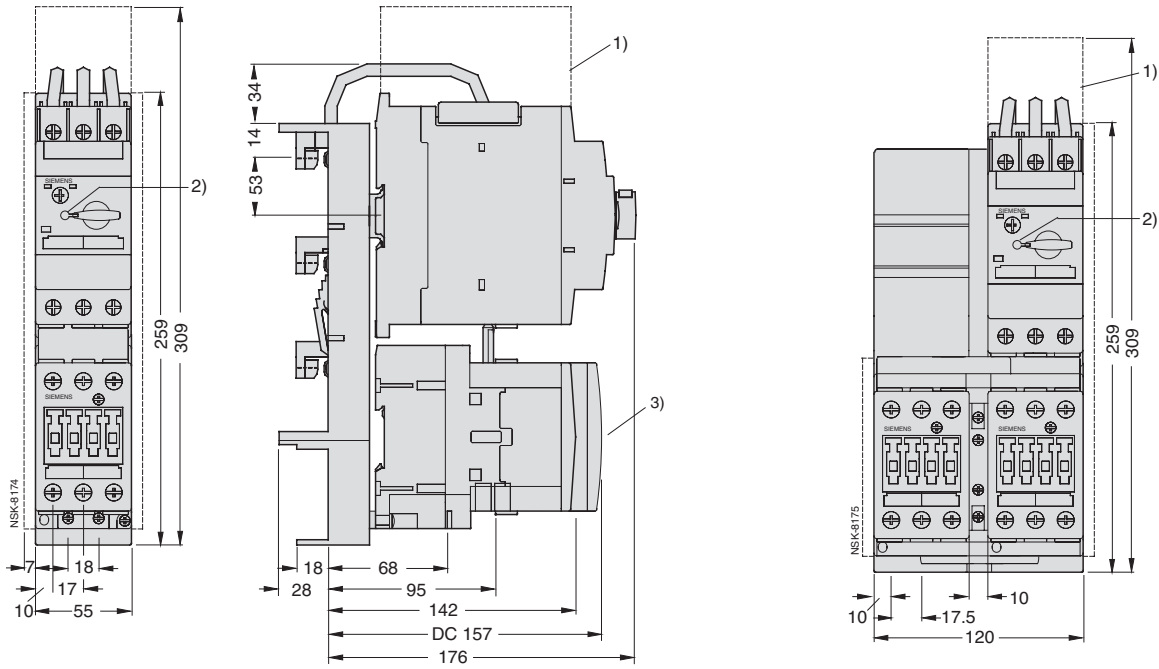
All dimensions shown in millimeters. For reference purposes only. Not to be used for design or construction purposes.

Dimensions

3RV203 with 3RT203

3RA2130  
Fast Bus Non-reversing

3RA2230  
Fast Bus Reversing



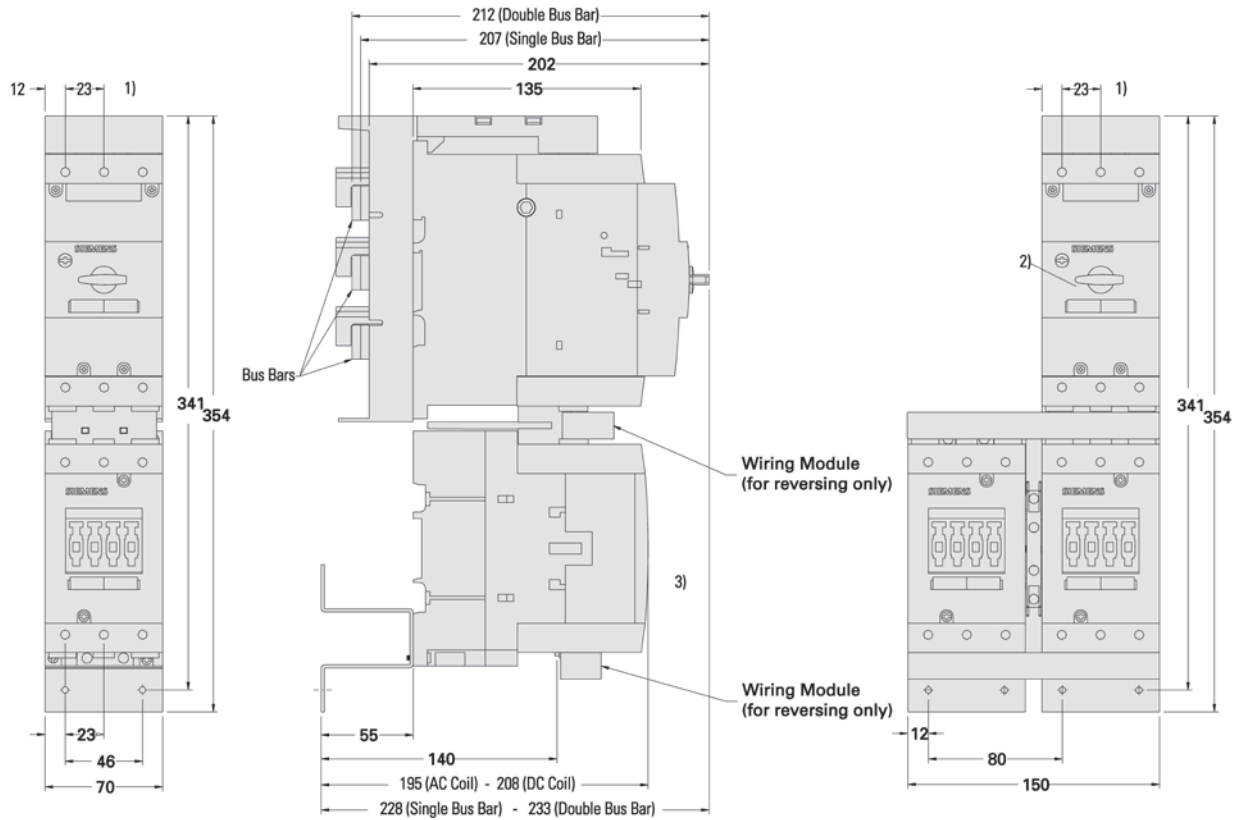
Lateral clearance to grounded components minimum 6 mm.

- 1) Arcing space
- 2) Lockable in OFF position with padlock diameter 5 mm.
- 3) When a front mount auxiliary is installed on the contactor, add 49 mm to the depth of the contactor.

All dimensions shown in millimeters. For reference purposes only. Not to be used for design or construction purposes.

Dimensions

3RV204 with 3RT204



Lateral clearance to grounded components minimum 6 mm.

- 1) Arcing space
- 2) Lockable in OFF position with padlock diameter 5 mm.
- 3) When a front mount auxiliary is installed on the contactor, add 49 mm to the depth of the contactor.

All dimensions shown in millimeters. For reference purposes only. Not to be used for design or construction purposes.

# 3RM1 Hybrid Starters

Industrial Controls Product Catalog 2017

6  
Section



## contents

### 3RM1 Compact - Hybrid Starters

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General Data	6/3
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Technical Data	6/9 - 6/10



6  
HYBRID MOTOR  
STARTERS

## SIRIUS 3RM1 Motor Starters

## Overview

## Overview



3RM12 motor starter with reversing functionality and electronic overload protection

SIRIUS 3RM1 motor starters are compact devices with a width of 22.5 mm, combining a large number of functions in a single enclosure. They consist of combinations of relay contacts, power semiconductors (hybrid technology), and a solid-state overload relay for operational switching of three-phase motors up to 3 HP (at 480 V).

Feature	Value
Rated current (wide setting range of the electronic overload release)	0.1 ... 0.5 A 0.4 ... 2.0 A 1.6 ... 7.0 A (UL=6.1A)
Rated operational voltage	48 ... 500 V
Rated frequency	50/60 Hz
Rated control supply voltage	24 V DC, 110 V DC, 110 ... 230 V AC
Trip class	CLASS 10A

The 3RM1 motor starters with overload protection with wide setting range are offered as 3RM10 direct-on-line starters and 3RM12 reversing starters and as versions with safety-related shutdown.

Characteristic	3RM10	3RM11	3RM12	3RM13
Direct-on-line starters	✓	✓	--	--
Reversing starters	--	--	✓	✓
Overload protection with wide setting range	✓	✓	✓	✓
ATEX certification overload protection	--	✓	--	✓
Safety-related shutdown up to SIL 3 / PLc	--	✓	--	✓

## Hybrid technology

The 3RM1 motor starters combine the benefits of semiconductor technology and relay technology. This combination is also known as hybrid technology. The hybrid technology in the motor starter is characterized by the following features:

- The inrush current is conducted briefly via the semiconductors.  
Advantage: protection of relay contacts, long service life due to low wear
- The continuous current is conducted via relay contacts.  
Advantage: lower heat losses compared with the semiconductor.
- Shutdown is implemented again via the semiconductor.  
Advantage: the contacts are only slightly exposed to arcs, and this results in a longer service life.

## Functional density/space savings

The 3RM1 motor starters combine the functions direct/reversing starting and overload protection and safety-related shutdown in a single device, without changing the 22.5mm width.

For simple applications (such as starting and reversing three-phase loads with overload protection), motor starter combinations of power contactors and a solid-state overload relay, for example, can be replaced by a single 3RM1 starter. The more functions are required, the more devices can be replaced. The footprint area required for each motor starter in the control cabinet is reduced by values of 64 to 82%.

In the case of assemblies and grouped starter units there are further advantages.

## Wiring overhead

By combining various functions in a single device, wiring overhead is reduced. The greater the number of starters, the greater the saving in wiring. Savings can be made in:

- mains wiring and space reduction with the use of the 3RM19 three phase infeed system
- wiring of the reversing contactor assembly thanks to the integrated design
- reduction of control cables for the coils in group applications with the 3ZY12 device connectors

These savings reduce the time required for the wiring itself, while at the same time reducing both the risk of wiring errors and the amount of testing required after control cabinets have been completed.

## Configuration and inventory

The wide setting range of the electronic overload release (up to 1:5) reduces the cost of inventory and the considerations involved in configuration where the actual motor current to be expected is concerned. Compared with protection equipment with thermal overload protection, only 3 versions are now required to cover a current range of 0.1 to 7 A with 3RM1, instead of 17 versions.

## Connection methods

The 3RM1 is available with screw terminal, push-in terminals or a combination of both..

Push-in terminals are a form of spring-type connection allowing fast wiring without tools for rigid conductors or conductors equipped with end sleeves.

Fine-stranded or stranded conductors with no end finishing are wired using a screwdriver (with a 3.0 x 0.5 mm blade).

As with other spring-type terminals, a screwdriver is also required to release the conductor. The same tool as above can be used for this purpose.

The advantages of the push-in terminals are found, as with all spring-type terminals, in speed of assembly and disassembly and vibration-proof connection. There is no need for the checking and tightening required with screw terminals.

 Screw terminals

 Spring-type terminals

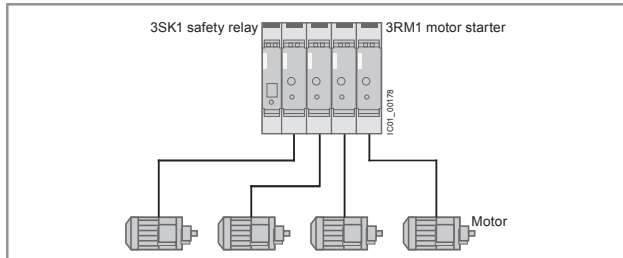
The terminals are indicated in the corresponding tables by the symbols shown on blue backgrounds.

# SIRIUS 3RM1 Motor Starters

## General Data

### Safety-related shutdown/safety integration

Thanks to the redundant design of the main circuit and internal monitoring, safety-related shutdown in accordance with SIL 3 / PLe is possible by shutting down the control supply voltage with 3RM11 Failsafe and 3RM13 Failsafe motor starters. Additional safety relays are not required in the main circuit.



Combination of four SIRIUS 3RM1 Failsafe motor starters with SIRIUS 3SK1 safety relay to allow safety-related collective disconnection of connected motors

3RM1 motor starters are ideal for combining with the 3SK1 safety relay (see Chapter 13 "Safety Technology" → "SIRIUS 3SK1 Safety Relays"). They can be combined by means of:

- conventional wiring
- a special device connector

This makes it very simple to shut down connected motors collectively. The wiring, and ultimately the shutting down of the control supply voltage in Emergency Stop situations, is performed via the device connector. There is no further need for complex looping of the connecting cables.

### Feedback to the control system

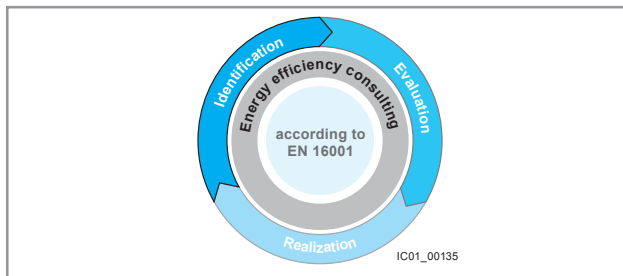
The electronic output in the 24 V DC control voltage version of the 3RM10 and 3RM12 motor starters allows the status of the connected motor to be reported to the higher-level control system. If the motor starter is controlled via inputs IN1 to 2, once the motor has been switched on and has started up correctly the output "OUT" is set.

### Infeed system for the main circuit

The 3RM19 infeed system available as an accessory for the main circuit with three-phase busbars allows fast, virtually error-free wiring of motor starters on the mains connection side and may reduce the number of short-circuit protective devices.

## Benefits

### Advantages through energy efficiency



Overview of the energy management process

We offer you a unique portfolio for efficient industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – identify, evaluate, and realize – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative products of the SIRIUS Industrial Controls portfolio can also make a substantial contribution to a plant's energy efficiency (see [www.siemens.com/sirius/energysaving](http://www.siemens.com/sirius/energysaving)).

With 3RM1 motor starters, control cabinets warm up less because power losses have been reduced by operation:

- Lower intrinsic power loss (than comparable motor starters with thermal overload trips) thanks to electronic current analysis
- Lower control circuit power losses (compared with conventional switching devices) as a result of electronic control of switching points
- Thanks to the above advantages, additional energy savings are possible because less cooling is required and a more compact design is possible

### Product advantages

The SIRIUS 3RM1 motor starters offer a number of benefits:

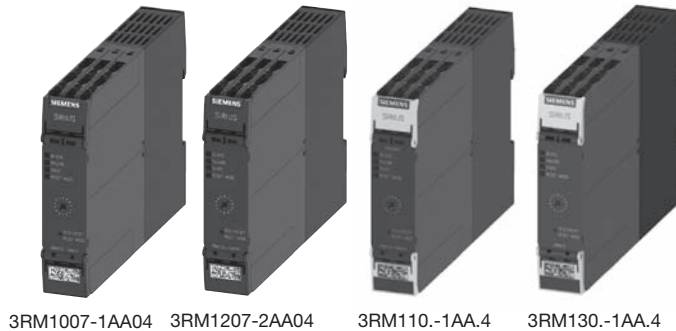
- Greater endurance and reduced heat losses thanks to hybrid technology
- Less space required in the control cabinet (64 to 82%) as a result of higher functional density
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower costs for stock keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:5)
- Fast wiring without tools for rigid conductors or conductors equipped with end sleeves thanks to push-in spring-type connections
- Motor status feedback to the higher-level control system in the case of 3RM10 and 3RM12 motor starters in the 24 V DC version
- Virtually error-free wiring on the mains connection side and reduction in short-circuit protective devices by means of 3RM19 comb busbar and infeed system

# Hybrid Starters

3RM1 up to 3HP

### Selection and ordering data

- Direct and reversing starters in 22.5mm width
- Electronic overload protection — class 10
- Coil voltages 24VDC, 110-230VAC and 110VDC
- Screw Terminals or Spring Loaded Terminals
- Group Installation possible with fuse or UL489 breaker
- SCCR up to 100kA with J fuses
- Comb busbar accessories for easy group assembly
- Removeable terminals



### 3RM10 motor starter for direct-on-line starting with electronic overload protection

with

UL ratings at 480VAC		Amp ratings		Single-phase HP ratings <sup>①</sup>			Three-phase HP ratings <sup>①</sup>			Signaling contacts		All Screw Terminals	All Spring Loaded Terminals	Mixed <sup>②</sup> Spring Loaded & Screw Terminals
FLA	LRA	AC53	AC51	115V	200V	230V	200V	230V	460V	NO	NC	Order No.	Order No.	Order No.
<b>Rated control supply voltage <math>U_s = 24</math> VDC</b>														
0.5	3.5	0.5	—	—	—	—	—	—	—	1	1	3RM1□01-1AA04	3RM1□01-2AA04	3RM1□01-3AA04
2	14	2	—	—	—	1/8	1/8	1/8	3/4	1	1	3RM1□02-1AA04	3RM1□02-2AA04	3RM1□02-3AA04
6.1	43	7	10	1/4	1/2	1/2	1	1 1/2	3	1	1	3RM1□07-1AA04	3RM1□07-2AA04	3RM1□07-3AA04
<b>Rated control supply voltage <math>U_s = 110-230</math> VAC 50/60 Hz and 110 VDC</b>														
0.5	3.5	0.5	—	—	—	—	—	—	—	1	1	3RM1□01-1AA14	3RM1□01-2AA14	3RM1□01-3AA14
2	14	2	—	—	—	1/8	1/8	1/8	3/4	1	1	3RM1□02-1AA14	3RM1□02-2AA14	3RM1□02-3AA14
6.1	43	7	10	1/4	1/2	1/2	1	1 1/2	3	1	1	3RM1□07-1AA14	3RM1□07-2AA14	3RM1□07-3AA14
												0	0	0
Standard DOL Starter												1	1	1
Safety DOL Starter														

### 3RM12 motor starter for reversing with electronic overload protection

with

UL ratings at 480VAC		Amp ratings		Single-phase HP ratings <sup>①</sup>			Three-phase HP ratings <sup>①</sup>			Signaling contacts		All Screw Terminals	All Spring Loaded Terminals	Mixed <sup>②</sup> Spring Loaded & Screw Terminals
FLA	LRA	AC53	AC51	115V	200V	230V	200V	230V	460V	NO	NC	Order No.	Order No.	Order No.
<b>Rated control supply voltage <math>U_s = 24</math> VDC</b>														
0.5	3.5	0.5	—	—	—	—	—	—	—	1	1	3RM1□01-1AA04	3RM1□01-2AA04	3RM1□01-3AA04
2	14	2	—	—	—	1/8	1/8	1/8	3/4	1	1	3RM1□02-1AA04	3RM1□02-2AA04	3RM1□02-3AA04
6.1	43	7	10	1/4	1/2	1/2	1	1 1/2	3	1	1	3RM1□07-1AA04	3RM1□07-2AA04	3RM1□07-3AA04
<b>Rated control supply voltage <math>U_s = 110-230</math> VAC 50/60 Hz and 110 VDC</b>														
0.5	3.5	0.5	—	—	—	—	—	—	—	1	1	3RM1□01-1AA14	3RM1□01-2AA14	3RM1□01-3AA14
2	14	2	—	—	—	1/8	1/8	1/8	3/4	1	1	3RM1□02-1AA14	3RM1□02-2AA14	3RM1□02-3AA14
6.1	43	7	10	1/4	1/2	1/2	1	1 1/2	3	1	1	3RM1□07-1AA14	3RM1□07-2AA14	3RM1□07-3AA14
												2	2	2
Standard Reversing Starter												3	3	3
Safety Reversing Starter														

For detail product manuals, schematics and CAD files:  
<http://www.usa.siemens.com/3RM1>

① Selection depends on motor full load amps.  
 Horsepower ratings are for reference only.

② Mixed terminal versions have spring loaded terminals for the control wiring and screw terminals on the mains.

This offers faster control wiring while still being able to use the 3RM19 comb busbar system on the mains.

For accessories, see page 6/6 and 6/8

For technical data, see page 6/9 and 6/10

For additional Compact Starters up to 25HP at 480V, see the 3RA6 series located in section 4



# SIRIUS 3RM1 Motor Starters

## Accessories

### Overview

#### Accessories for 3RM1 motor starters

The following accessories are available for the 3RM1 motor starter:

- 3-phase infeed system for the main circuit
- Device connectors for the control circuit
- Spare terminals for main and control circuits
  - With screw terminals
  - With push-in spring-type terminals
- Push-in lugs for wall mounting the motor starters
- Sealable cover as protection against unauthorized access

#### Three-phase infeed system (3RM19 three-phase busbar system)

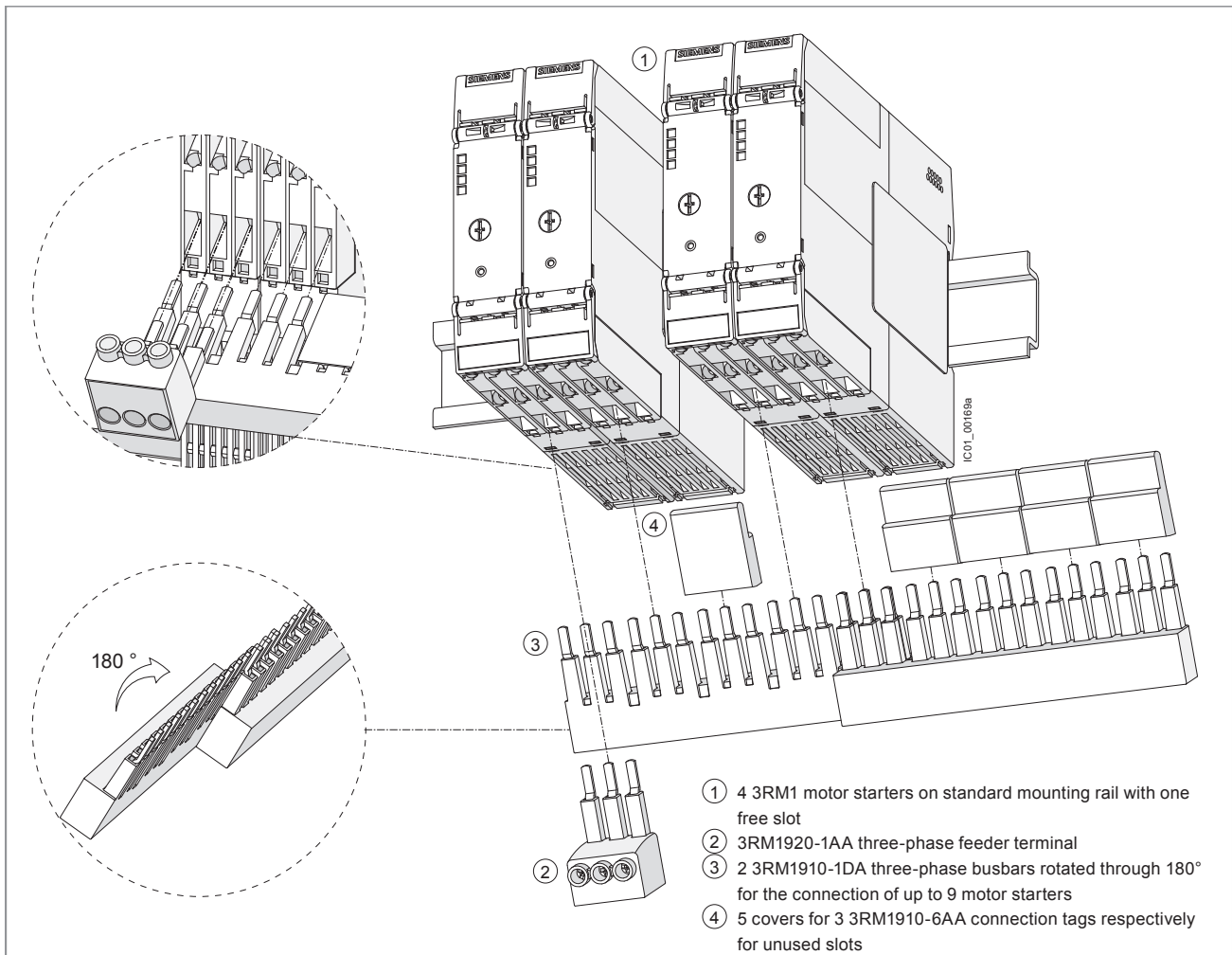
Special three-phase busbar systems can be used to provide an easy, time-saving and safe means of feeding two or more 3RM1 motor starters with screw terminals.

These busbars are available in three lengths, thus allowing 2, 3 or 5 motor starters (arranged side-by-side) to be connected at the same time. More than 5 devices can be connected by clamping the connection tags of an additional busbar rotated by 180° (e.g. 6 devices using one 5-pole busbar and one 2-pole busbar).

A single motor starter can be removed from the assembly without loosening the terminal screws of neighboring motor starters.

The maximum summation current must not exceed 25 A. Primary infeed is connected via a three-phase infeed terminal.

The three-phase busbars are finger-safe but empty connection tags must be fitted with covers.



3RM19 infeed system with three-phase infeed terminal: In the above example, two three-phase busbars (5-pole busbars) rotated through 180° allow up to 9 3RM1 motor starters to be connected. Contact with the unused connection tags in unoccupied positions is prevented safely by the covers.

# SIRIUS 3RM1 Motor Starters

## Accessories

### Device connectors for the control circuit

The outlay for cabling between the devices is reduced using device connectors snapped onto a mounting rail, or screwed onto a level mounting panel (one device connector per motor starter).

#### Using the device connectors only for feeding in the control supply voltage

By using device connectors, several motor starters can be jointly supplied with a control supply voltage of 24 V DC. This requires the control supply voltage to be applied to the A1 and A2 terminals of only one motor starter.

Up to ten motor starters can be connected with device connectors. The 24 V DC control supply voltage must be within the operating range of 0.9 to 1.1 for this purpose. If the full operating range of 0.8 to 1.25 is to be used, no more than five motor starters can be used.

If the motor starters are not to be interconnected side-by-side, device daisy chain connectors must be used for the gaps.

When removing a motor starter, the corresponding device connector must be replaced by a device daisy chain connector if the control voltage is not to be interrupted for motor starters on the right.

The last motor starter in a row can be placed on a device termination connector. Flush termination of the configuration is thus possible.

#### Using device connectors in conjunction with 3SK1 safety relays

Interconnection of several Standard or Failsafe version motor starters into a group can also be used for joint disconnection by a 3SK1 safety relay.

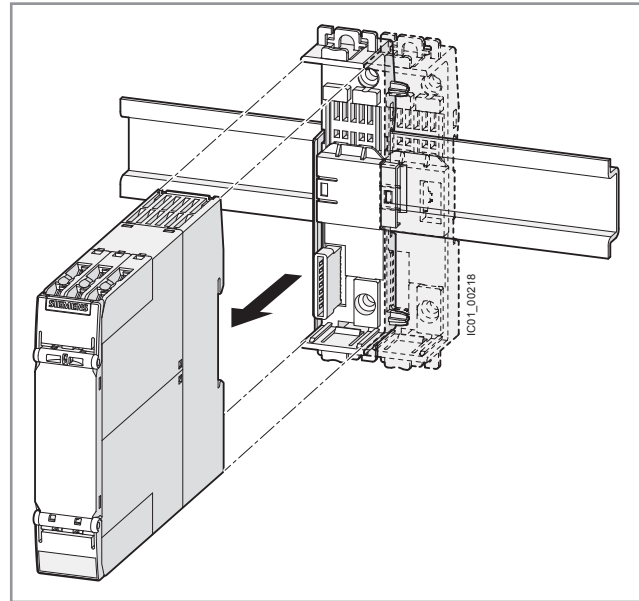
To provide for the simultaneous and safe shutdown of several motor starters via a SIRIUS 3SK1 Safety Relay, you can simply interconnect the devices without additional wiring using a device connector.

The motors can then also be shut down safely according to SIL 3 / PLe with the motor starters.

Up to five motor starters can be operated on one safety relay with device connectors. If the motor starters are not to be interconnected side-by-side, device loop through connectors must be used for the gaps.

The last motor starter in a row must be placed on a device termination connector. This closes the circuits that were built up with the connectors.

For 3SK1 safety relays and associated device connectors see Chapter 13 "Safety Technology" → "SIRIUS 3SK1 Safety Relays"



Device connectors snapped onto a standard mounting rail to allow the joint connection of the control supply voltage for 3RM1 motor starters or connection to the 3SK1 safety relays

#### **Usage restrictions for accessories**

- The 3RM19 3-phase infeed system for the main circuit can only be used with 3RM1 motor starters with screw terminals.
- The device connectors are only suitable for 3RM1 motor starters with a control supply voltage of 24 V DC.

Selection and ordering data

		Order No.	Pack Units
<b>Device connectors for busing the control supply connection to 3RM1 Starters</b>			
	<b>Device connector type 2, 7-pole, 22.5mm</b> Use for: <ul style="list-style-type: none"> <li>• Beginning left hand connector</li> <li>• Subsequent positions where a starter is present</li> <li>• Maximum of five starters per system</li> </ul>	3ZY1212-2EA00	1
	<b>Device loop through connector type 2, 7-pole, 22.5mm</b> Use for: <ul style="list-style-type: none"> <li>• When 22.5mm spacing is required and no starter is present</li> </ul>	3ZY1212-2AB00	1
	<b>Device termination connector type 2, 7-pole, 22.5mm</b> Use for: <ul style="list-style-type: none"> <li>• Terminating connector for the right hand position</li> <li>• Terminating cover is assembled to 3ZY1212-2EA00</li> </ul>	3ZY1212-2FA00	1



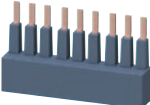
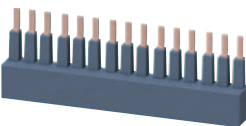




		Screw Terminals	Spring Terminals	Pack Units
		Order No.	Order No.	
<b>Removable terminals for 3RM1 Starters</b>				
	<b>Power Terminals (Line and Load)</b> 2-pole, 12-20 AWG	3ZY1122-1BA00	3ZY1122-2BA00	6
	<b>Control Terminals</b> 3-pole, 14-20 AWG (Screw) 3-pole, 14-16 AWG (Spring)	3ZY1131-1BA00	3ZY1131-2BA00	6

<b>Further accessories</b>		Order No.	Pack Units
	<b>Push-in lugs for wall mounting</b> 2 lugs per starter are required. Standard pack quantity is sufficient for 5 starters	3ZY1311-0AA00	10
	<b>Seal covers for 3RM1 starters</b> Protection of current setting dial. - lockable	3ZY1321-2AA00	5
	<b>Cooling pins for removable terminals</b> For mechanical coding of removable terminals	3ZY1440-1AA00	

For detail product manuals, schematics and CAD files:  
<http://www.usa.siemens.com/3RM1>

## 3RM1 Hybrid Starters

## 3RM1 Accessories

Product designation	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Three-phase infeed system for 3RM1 with screw terminals</b>					
 3RM1920-1AA	2	<b>3RM1920-1AA</b>		1	1 unit
<b>Three-phase infeed terminals</b>					
• For three-phase busbars					
 3RM1910-1AA	2	<b>3RM1910-1AA</b>		1	1 unit
<b>Three-phase busbars</b>					
• For 2 motor starters					
 3RM1910-1BA	2	<b>3RM1910-1BA</b>		1	1 unit
• For 3 motor starters					
 3RM1910-1DA	2	<b>3RM1910-1DA</b>		1	1 unit
• For 5 motor starters					
 3RM1910-6AA	2	<b>3RM1910-6AA</b>		1	10 units
<b>Covers</b>					
For 3 connection tags of the three-phase busbars					
<b>Fuse modules for 3RM1 for use on busbars or mounting rails</b>					
 3RM1932-1AB	2	<b>3RM1932-1AB</b>		1	1 unit
<b>Fuse module with 3NW6007-1 fuse</b>					
	2	<b>3RM1930-1AA</b>		1	1 unit
<b>Fuse module without fuse<sup>1)</sup></b>					
<b>Adapters</b>					
 8US1216-0AS00	5	<b>8US1216-0AS00</b>		1	1 unit
<b>Adapters for busbar systems</b>					
22.5 mm x 200 mm x 41.5 mm					
 8US1616-0AK02	5	<b>8US1616-0AK02</b>		1	1 unit
<b>Adapters for compact busbar systems</b>					
22.5 mm x 160 mm x 41.5 mm					

<sup>1)</sup> For details of alternative fuses, see Manual  
<https://support.industry.siemens.com/cs/ww/en/view/66295730>.

## Technical Data

## Application

3RM1 motor starters are designed for applications in which small motors have to be connected in the most confined spaces.

## Main areas of use

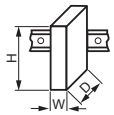
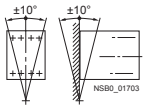
- Conveyor systems
- Logistics systems
- Production machines
- Machine tools
- Small elevators

## Standards and approvals

The motor starter complies with the following standards:

- IEC/EN 60947-4-2
- UL 508
- ATEX (available soon)
- IEC 61508-1: SIL 3 (available soon)
- ISO 13849: PLe (available soon)

## Technical specifications

Type	3RM1	
<b>Mechanical components and environment</b>		
<b>Dimensions (W x H x D)</b>		
• Width	mm	22.5
• Height	mm	100
• Depth	mm	136.5 (from the standard mounting rail) 141.6 (entire enclosure depth)
		
<b>Ambient temperature</b>		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +70
• During transport	°C	-40 ... +70
<b>Installation altitude at height above sea level maximum</b>	m	4 000
<b>Shock resistance</b>		6g/11 ms
<b>Vibration resistance</b>		1 ... 6 Hz, 15 mm; 20 m/s <sup>2</sup> , 500 Hz
<b>IP degree of protection</b>		IP20
<b>Mounting position</b>		
		
<b>Electromagnetic compatibility (EMC)</b>		
<b>Emitted interference</b>		
• Conducted RF interference emission according to CISPR11		Class A for Industrial applications. Class B for residential, business and commercial applications.
• Non-conducted RF interference emission according to CISPR11		Class A for industrial applications. Class B for residential, business and commercial applications.
<b>Interference immunity</b>		
• Electrostatic discharge according to IEC 61000-4-2		4 kV contact discharge / 8 kV air discharge
• Conducted interference injection as high frequency interference according to IEC 61000-4-6		10 V
• Conducted interference BURST according to IEC 61000-4-4		2 kV / 5 kHz
• Conducted interference - phase-to-ground SURGE according to IEC 61000-4-5		2 kV
• Conducted interference - phase-to-phase SURGE according to IEC 61000-4-5		1 kV

Type	3RM1 .01	3RM1 .02	3RM1 .07
<b>Main circuit</b>			
<b>Rated operational voltage</b> maximum	V	500	
<b>Operating frequency</b>			
• 1 rated value	Hz	50	
• 2 rated value	Hz	60	
<b>Rated insulation voltage</b>	V	600	
<b>Rated impulse withstand voltage</b>	kV	6	
<b>Rated operational current at 400 V at AC</b>	A	0.5	2
<b>Active power loss, typical</b>	W	0.02	0.3
<b>Minimum load in % of I<sub>M</sub></b>	%	20	7 <sup>1)</sup>
<b>Adjustable current response value</b>			
• of the inverse-time delayed overload release	A	0.1 ... 0.5	0.4 ... 2
			1.6 ... 7 <sup>1)</sup>

<sup>1)</sup> UL rating is 6.1A at 480V

## Technical data

Type		3RM1 ...-AA04	3RM1 ...-AA14
<b>Control circuits</b>			
<b>Type of voltage of the control supply voltage</b>		DC	AC/DC
<b>Control supply voltage 1</b>			
• At DC	V	24	110
• At 50 Hz			
- At AC	V	—	110 ... 230
<b>Frequency of the control supply voltage</b>			
• 1 rated value	Hz	—	50
• 2 rated value	Hz	—	60
<b>Operating range factor of the control supply voltage rated value</b>			
• At DC		0.8 ... 1.25	0.85 ... 1.1
• At 50 Hz			
- At AC		—	0.85 ... 1.1
<b>Control current</b>		A	0.08
<b>Input voltage at the digital input</b>			
• At DC	V	24	110
• At AC	V	—	110 ... 230
- Rated value			
<b>Input voltage at the digital input with signal &lt;1&gt;</b>			
• At DC	V	19.2 ... 30	93 ... 121
• At AC	V	—	93 ... 253
<b>Input current at the digital input with signal &lt;1&gt; typical</b>		A	0.01

Type		3RM1...-14	3RM1...-24
<b>Connection methods</b>			
<b>Connectable conductor cross-section for main contacts</b>			
• Solid	mm <sup>2</sup>	0.5 ... 4	
• Finely stranded			
- With end sleeves	mm <sup>2</sup>	0.5 ... 2.5	
- Without end sleeves	mm <sup>2</sup>	—	0.5 ... 4
<b>Connectable conductor cross-section for auxiliary contacts</b>			
• Solid	mm <sup>2</sup>	0.5 ... 2.5	0.5 ... 1.5
• Finely stranded			
- With end sleeves	mm <sup>2</sup>	0.5 ... 2.5	0.5 ... 1
- Without end sleeves	mm <sup>2</sup>	—	0.5 ... 1.5
<b>AWG number as coded connectable conductor cross-section</b>			
• For main contacts		20 ... 12	
• For auxiliary contacts		20 ... 14	20 ... 16

## Note:

All the above technical specifications are relevant for selecting the motor starters. Details about installation conditions and the use of the motor starters, and particularly about the derating of the rated current, can be found in the manual and the data sheets located at [www.usa.siemens.com/3RM1](http://www.usa.siemens.com/3RM1).

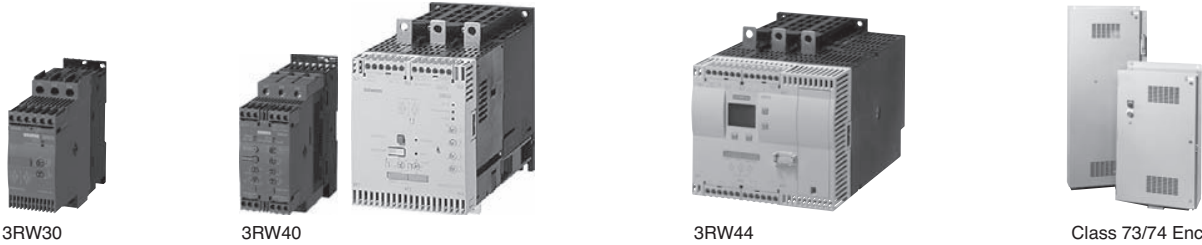


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Introduction

Overview



3RW30

3RW40

3RW44

Class 73/74 Enclosed

Order No. Page

For operation in the control cabinet

3RW soft starters for standard applications

- Application areas
  - Fans
  - Building/construction machines
  - Escalators
  - Air conditioning systems
  - Assembly lines
  - Operating mechanisms
- Pumps
- Presses
- Transport systems
- Fans
- Compressors and coolers

3RW30 soft starters

- SIRIUS 3RW30 soft starters for soft starting and smooth ramp-down of three-phase asynchronous motors
- Performance range of up to 75 Hp (at 460 V)

3RW30 7/4

3RW40 soft starters

- SIRIUS 3RW40 soft starters with the integral functions
  - Solid-state motor overload and intrinsic device protection and
  - Adjustable current limiting
- Performance range of up to 300 Hp (at 460 V)

3RW40 7/8

3RW soft starters for high-feature applications

- Application areas
  - Pumps
  - Compressors
  - Industrial refrigerating systems
  - Conveying systems
  - Machine tools
- Fans
- Cooling systems
- Water transport
- Hydraulics
- Mills

3RW44 soft starters

- In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements
- Performance range
  - Up to 900 Hp (at 460 V) in inline circuit and
  - Up to 1600 Hp (at 460 V) in inside-delta circuit

3RW44 7/16

For enclosed applications

Enclosures in NEMA 1, 3, 4, & 12 types  
UL/CSA listed

- Complete starter includes 3RW40 or 3RW44 and CPT
- Performance Range of up to 600 Hp (at 460 V)
- Combination options include circuit breaker or fusible disconnect

Class 73/74 7/83

- Application areas:
  - Compressors
  - Pumps
  - Stamping presses
  - Cooling towers
  - Molding and extruding
  - Chippers and debarkers
- Lumber processing
- Pulp & paper processing
- Conveyors
- Textiles
- HVAC



# 3RW Soft Starters

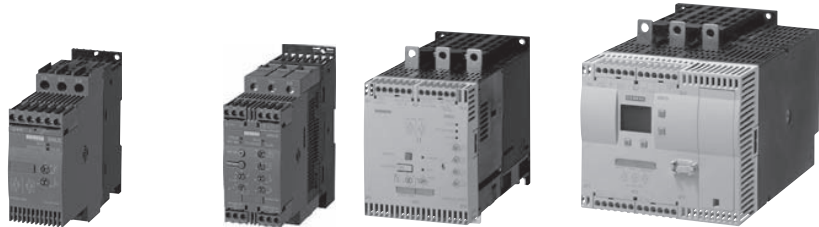
## General Data

### Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and smooth ramp-down<sup>1)</sup>
- Stepless starting
- Reduction of current peaks
- Avoidance of mains voltage fluctuations during starting
- Reduced load on the power supply network

- Reduction of the mechanical load in the operating mechanism
- Considerable space savings and reduced wiring compared with conventional starters
- Maintenance-free switching
- Very easy handling
- Fits perfectly in the SIRIUS modular system



		SIRIUS 3RW30 Standard applications	SIRIUS 3RW40 Standard applications	SIRIUS 3RW44 High-Feature applications
Rated current up to 50 °C	A	3 ... 98	11 ... 385	26 ... 1076
Rated operational voltage	V	200 ... 480	200 ... 600	200 ... 690
Motor rating at 460 V				
• Inline circuit	Hp	1.5 ... 75	7.5 ... 300	15 ... 900
• Inside-delta circuit	Hp	--	--	22 ... 1600
Ambient temperature	°C	-25 ... +60	-25 ... +60	0 ... +60
Soft starting/ramp-down		✓ <sup>1)</sup>	✓	✓
Voltage ramp		✓	✓	✓
Starting/stopping voltage	%	40 ... 100	40 ... 100	20 ... 100
Starting and ramp-down time <sup>7)</sup>	s	0 ... 20	0 ... 20	1 ... 360
Torque control		--	--	✓
Starting/stopping torque	%	--	--	20 ... 100
Torque limit	%	--	--	20 ... 200
Ramp time	s	--	--	1 ... 360
Integral bypass contact system		✓	✓	✓
Intrinsic device protection		--	✓	✓
Motor overload protection		--	✓	✓
Thermistor motor protection		--	✓ <sup>2)</sup>	✓
Integrated remote RESET		--	✓ <sup>3)</sup>	✓
Adjustable current limiting		--	✓	✓
Inside-delta circuit		--	--	✓
Breakaway pulse		--	--	✓
Creep speed in both directions of rotation		--	--	✓
Pump ramp-down		--	--	✓ <sup>4)</sup>
DC braking		--	--	✓ <sup>4) 5)</sup>
Combined braking		--	--	✓ <sup>4) 5)</sup>
Motor heating		--	--	✓
Communication		--	--	With PROFIBUS DP (optional)
External display and operator module		--	--	(optional)
Operating measured value display		--	--	✓
Error logbook		--	--	✓
Event list		--	--	✓
Slave pointer function		--	--	✓
Trace function		--	--	✓ <sup>6)</sup>
Programmable control inputs and outputs		--	--	✓
Number of parameter sets		1	1	3
Parameterization software (Soft Starter ES)		--	--	✓
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases	3 controlled phases
Screw terminals		✓	✓	✓
Spring-type terminals		✓	✓	✓
UL/CSA		✓	✓	✓
CE marking		✓	✓	✓
Soft starting under heavy starting conditions		--	--	✓ <sup>4)</sup>

#### Configuring support

Win-Soft Starter, Electronic Application Selector, Technical Assistance Tel.: 1-800-333-7421

✓ Function is available; -- Function is not available.

<sup>1)</sup> Only soft starting available for 3RW30.

<sup>2)</sup> Optional up to size S3 (device variant).

<sup>3)</sup> Available for 3RW40 2.. to 3RW40 4., optional for 3RW40 5. and 3RW40 7..

<sup>4)</sup> Calculate soft starter and motor with size allowance where required.

<sup>5)</sup> Not possible in inside-delta circuit.

<sup>6)</sup> Trace function with Soft Starter ES software.

<sup>7)</sup> Actual motor start times are load dependent.

You can find further information on the Internet at:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters)

# 3RW Soft Starters

## 3RW30 for standard applications

### Overview

The SIRIUS 3RW30 soft starters reduce the motor voltage through variable phase control and increase it in ramp-like mode from a selectable starting voltage up to mains voltage. During starting, these devices limit the torque as well as the current and prevent the shocks which arise during direct starts or wye-delta starts. In this way, mechanical loads and mains voltage dips can be reliably reduced.

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.<sup>1)</sup>

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that minimal power loss is used at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

Various versions of the SIRIUS 3RW30 soft starters are available:

- Standard version for fixed-speed three-phase motors, sizes S00, S0, S2 and S3, with integrated bypass contact system
- Version for fixed-speed three-phase motors in a 22.5 mm enclosure without bypass

Soft starters rated up to 75 Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of this soft starter.

<sup>1)</sup> Actual motor start times are load dependent.

### Application

The 3RW30 soft starters are suitable for soft starting of three-phase asynchronous motors.

Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time. Due to continuous voltage influencing, current and torque peaks, which are unavoidable in the case of wye-delta starters, for instance, do not occur.

#### Application areas

- Pumps
- Heat pumps
- Hydraulic pumps
- Presses
- Conveyors
- Roller conveyor
- Screw conveyors

# 3RW Soft Starters

## 3RW30 for standard applications

### Selection and ordering data



Ambient temperature 40 °C				Ambient temperature 50 °C				Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage $U_e$			Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage $U_e$							
A	230 V	400 V	500 V	A	200 V	230 V	460 V	575 V				
	kW	kW	kW		hp	hp	hp	hp				
<b>Rated operational voltage <math>U_e</math> 200 ... 480 V</b>												
• With screw terminals												
3.6	0.75	<b>1.5</b>	--	3	0.5	0.5	<b>1.5</b>	--	<b>S00</b>	<b>3RW30 13-1BB□4</b>	1 unit	0.580
6.5	1.5	<b>3</b>	--	4.8	1	1	<b>3</b>	--	<b>S00</b>	<b>3RW30 14-1BB□4</b>	1 unit	0.580
9	2.2	<b>4</b>	--	7.8	2	2	<b>5</b>	--	<b>S00</b>	<b>3RW30 16-1BB□4</b>	1 unit	0.580
12.5	3	<b>5.5</b>	--	11	3	3	<b>7.5</b>	--	<b>S00</b>	<b>3RW30 17-1BB□4</b>	1 unit	0.580
17.6	4	<b>7.5</b>	--	17	3	3	<b>10</b>	--	<b>S00</b>	<b>3RW30 18-1BB□4</b>	1 unit	0.580
• With spring-type terminals												
3.6	0.75	<b>1.5</b>	--	3	0.5	0.5	<b>1.5</b>	--	<b>S00</b>	<b>3RW30 13-2BB□4</b>	1 unit	0.580
6.5	1.5	<b>3</b>	--	4.8	1	1	<b>3</b>	--	<b>S00</b>	<b>3RW30 14-2BB□4</b>	1 unit	0.580
9	2.2	<b>4</b>	--	7.8	2	2	<b>5</b>	--	<b>S00</b>	<b>3RW30 16-2BB□4</b>	1 unit	0.580
12.5	3	<b>5.5</b>	--	11	3	3	<b>7.5</b>	--	<b>S00</b>	<b>3RW30 17-2BB□4</b>	1 unit	0.580
17.6	4	<b>7.5</b>	--	17	3	3	<b>10</b>	--	<b>S00</b>	<b>3RW30 18-2BB□4</b>	1 unit	0.580
• With screw terminals												
25	5.5	<b>11</b>	--	23	5	5	<b>15</b>	--	<b>S0</b>	<b>3RW30 26-1BB□4</b>	1 unit	0.690
32	7.5	<b>15</b>	--	29	7.5	7.5	<b>20</b>	--	<b>S0</b>	<b>3RW30 27-1BB□4</b>	1 unit	0.690
38	11	<b>18.5</b>	--	34	10	10	<b>25</b>	--	<b>S0</b>	<b>3RW30 28-1BB□4</b>	1 unit	0.690
• With spring-type terminals												
25	5.5	<b>11</b>	--	23	5	5	<b>15</b>	--	<b>S0</b>	<b>3RW30 26-2BB□4</b>	1 unit	0.690
32	7.5	<b>15</b>	--	29	7.5	7.5	<b>20</b>	--	<b>S0</b>	<b>3RW30 27-2BB□4</b>	1 unit	0.690
38	11	<b>18.5</b>	--	34	10	10	<b>25</b>	--	<b>S0</b>	<b>3RW30 28-2BB□4</b>	1 unit	0.690
• With screw-type or spring-type terminals												
45	11	<b>22</b>	--	42	10	15	<b>30</b>	--	<b>S2</b>	<b>3RW30 36-□BB□4</b>	1 unit	1.200
63	18.5	<b>30</b>	--	58	15	20	<b>40</b>	--	<b>S2</b>	<b>3RW30 37-□BB□4</b>	1 unit	1.200
72	22	<b>37</b>	--	62	20	20	<b>40</b>	--	<b>S2</b>	<b>3RW30 38-□BB□4</b>	1 unit	1.200
• With screw-type or spring-type terminals												
80	22	<b>45</b>	--	73	20	25	<b>50</b>	--	<b>S3</b>	<b>3RW30 46-□BB□4</b>	1 unit	1.710
106	30	<b>55</b>	--	98	30	30	<b>75</b>	--	<b>S3</b>	<b>3RW30 47-□BB□4</b>	1 unit	1.710
<b>Order No. supplement for connection types</b>												
• With screw terminals												
• With spring-type terminals <sup>2)</sup>												
<b>Order No. supplement for rated control supply voltage <math>U_s</math></b>												
• 24 V AC/DC												
• 110 ... 230 V												

### Soft starters for easy starting conditions and high switching frequency, rated operational voltage $U_e$ 200 ... 400 V, rated control supply voltage $U_s$ 24 ... 230 V AC/DC

3	0.55	<b>1.1</b>	--	2.6	0.5	<b>0.5</b>	--	--	22.5 mm	<b>3RW30 03-1CB54</b>	1 unit	0.207
										<b>3RW30 03-2CB54</b>	1 unit	0.188

1) Stand-alone installation.  
2) Power connection: screw terminals.



*Note:*  
Selection of the soft starter depends on the rated motor current.

The SIRIUS 3RW30 solid-state soft starters are designed for easy starting conditions.  $J_{Load} < 10 \times J_{Motor}$ . In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see technical specifications (see technical information on page 7/44).

# 3RW Soft Starters

## 3RW30 for standard applications

### Accessories

For soft starters		Motor starter protectors		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Size	Size				
<b>Auxiliary terminals</b>							
<b>Auxiliary terminals, 3-pole</b>							
3RW30 4.	S3			3RT19 46-4F		1 unit	0.035
<b>Covers for soft starters</b>							
<b>Terminal covers for box terminals</b>							
Additional touch protection to be fitted at the box terminals (2 units required per device)							
3RW30 3.	S2			3RT19 36-4EA2		1 unit	0.020
3RW30 4.	S3			3RT19 46-4EA2		1 unit	0.025
<b>Terminal covers for cable lugs and busbar connections</b>							
For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)							
3RW30 4.	S3			3RT19 46-4EA1		1 unit	0.040
<b>Link modules to motor starter protectors</b>							
	3RW30 13,	S00	S0	3RA19 21-1A		10 units	0.028
	3RW30 14,						
	3RW30 16,			3RA19 21-1A		10 units	0.028
	3RW30 17,						
	3RW30 18			3RA19 31-1A		5 units	0.033
	3RW30 26	S0	S0	3RA19 41-1A		5 units	0.072
	3RW30 36	S2	S2				
	3RW30 46,	S3	S3				
	3RW30 47						
<b>Operating instructions<sup>1)</sup></b>							
For soft starters							
3RW30 1.	S00			3ZX10 12-0RW30-2DA1			
3RW30 2.	S0						
3RW30 3.	S2						
3RW30 4.	S3						

<sup>1)</sup> The operating instructions are included in the scope of supply.

Version		Functionality Functions		Order No.	List Price \$ per PU	Weight per PU approx. kg	
<b>Covers and push-in lugs (only for 3RW30 03)</b>							
<b>Sealable covers</b>							
For securing against unauthorized adjustment of setting knobs							
3RP1 902				3RP1 902		5 units	0.004
<b>Push-in lugs</b>							
For screw fixing							
3RP1 903				3RP1 903		10 units	0.002

# 3RW Soft Starters

## 3RW30 for standard applications

### More information

#### Application examples for normal starting (Class 10)

**Normal starting Class 10** (up to 20 s with 300 %  $I_{n, motor}$ ).  
The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
<b>Starting parameters</b>						
• Voltage ramp and current limiting						
- Starting voltage	% 70	60	50	40	40	40
- Starting time	s 10	10	20	20	10	10

**Note:**

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up. Actual start times are load dependent.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

#### Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

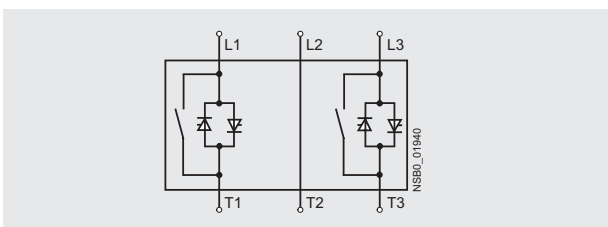
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses, controls and overload relays) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

**Note:**

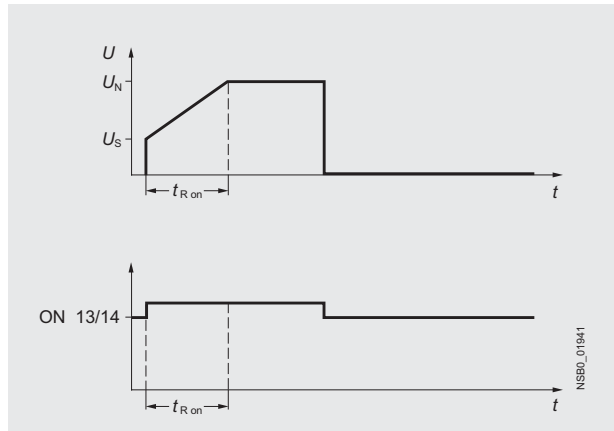
When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

#### Power electronics schematic circuit diagram



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

#### Status graphs



#### Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

<http://www.siemens.de/sanftstarter> > Software

More information can be found on the Internet at:

<http://www.sea.siemens.com/softstarters>

# 3RW Soft Starters

## 3RW40 for standard applications

### Overview

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30 soft starters.

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that minimal power is used at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection on some models.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also be protected by semiconductor fuses from short-circuiting.

Thanks to integrated status monitoring and fault monitoring, this compact soft starter offers many different diagnostics options. Up to four LEDs and relay outputs permit differentiated monitoring and diagnostics of the operating mechanism by indicating the operating state as well as for example mains or phase failure, missing load, non-permissible tripping time/class setting, thermal overloading or device faults.

Soft starters rated up to 300 Hp (at 460 V) for standard applications in three-phase systems are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of the SIRIUS 3RW40 soft starters.

### **"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC**

The 3RW40 soft starter sizes S0 to S12 are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.

See "Appendix" → "Standards and approvals" → "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

### Application

The SIRIUS 3RW40 solid-state soft starters are suitable for soft starting and stopping of three-phase asynchronous motors.

Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time and disturbing direct current components are eliminated in addition. This not only enables the two-phase starting of motors up to 300 Hp (at 460 V) but also avoids the current and torque peaks which occur e. g. with wye-delta starters.

### Application areas

- Pumps
- Heat pumps
- Hydraulic pumps
- Presses
- Conveyors
- Roller conveyor
- Screw conveyors
- Escalators
- Small fans
- Centrifugal blowers
- Bow thrusters
- Stirrers
- Extruders
- Lathes
- Milling machines

# 3RW Soft Starters

## 3RW40 for standard applications

### Selection and ordering data



3RW40 28-1BB14



3RW40 38-1BB14



3RW40 47-1BB14

Ambient temperature 50 °C		Rated power of induction motors for rated operational voltage $U_e$				Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e^{(1)}$					A					kg
	200 V	230 V	460 V	575 V						
	hp	hp	hp	hp						
<b>Rated operational voltage <math>U_e</math> 200 ... 480 V</b>										
• With screw terminals										
11	3	3	7.5	--	S0	3RW40 24-1BB□4		1 unit	0.770	
23	5	5	15	--	S0	3RW40 26-1BB□4		1 unit	0.770	
29	7.5	7.5	20	--	S0	3RW40 27-1BB□4		1 unit	0.770	
34	10	10	25	--	S0	3RW40 28-1BB□4		1 unit	0.770	
• With spring-type terminals										
11	3	3	7.5	--	S0	3RW40 24-2BB□4		1 unit	0.770	
23	5	5	15	--	S0	3RW40 26-2BB□4		1 unit	0.770	
29	7.5	7.5	20	--	S0	3RW40 27-2BB□4		1 unit	0.770	
34	10	10	25	--	S0	3RW40 28-2BB□4		1 unit	0.770	
• With screw or spring-type terminals										
42	10	15	30	--	S2	3RW40 36-□BB□4		1 unit	1.350	
58	15	20	40	--	S2	3RW40 37-□BB□4		1 unit	1.350	
62	20	20	40	--	S2	3RW40 38-□BB□4		1 unit	1.350	
• With screw or spring-type terminals										
73	20	25	50	--	S3	3RW40 46-□BB□4		1 unit	1.900	
98	30	30	75	--	S3	3RW40 47-□BB□4		1 unit	1.900	
<b>Rated operational voltage <math>U_e</math> 400 ... 600 V</b>										
• With screw terminals										
11	--	--	7.5	10	S0	3RW40 24-1BB□5		1 unit	0.770	
23	--	--	15	20	S0	3RW40 26-1BB□5		1 unit	0.770	
29	--	--	20	25	S0	3RW40 27-1BB□5		1 unit	0.770	
34	--	--	25	30	S0	3RW40 28-1BB□5		1 unit	0.770	
• With spring-type terminals										
11	--	--	7.5	10	S0	3RW40 24-2BB□5		1 unit	0.770	
23	--	--	15	20	S0	3RW40 26-2BB□5		1 unit	0.770	
29	--	--	20	25	S0	3RW40 27-2BB□5		1 unit	0.770	
34	--	--	25	30	S0	3RW40 28-2BB□5		1 unit	0.770	
• With screw or spring-type terminals										
42	--	--	30	40	S2	3RW40 36-□BB□5		1 unit	1.350	
58	--	--	40	50	S2	3RW40 37-□BB□5		1 unit	1.350	
62	--	--	40	60	S2	3RW40 38-□BB□5		1 unit	1.350	
• With screw or spring-type terminals										
73	--	--	50	60	S3	3RW40 46-□BB□5		1 unit	1.900	
98	--	--	75	75	S3	3RW40 47-□BB□5		1 unit	1.900	

#### Order No. supplement for connection types

- With screw terminals
- With spring-type terminals<sup>2)</sup>

#### Order No. supplement for rated control supply voltage $U_s$

- 24 V AC/DC
- 110 ... 230 V AC/DC

<sup>1)</sup> Stand-alone installation without auxiliary fan.

<sup>2)</sup> Power connection: screw terminals.

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#### Note:

*Selection of the soft starter depends on the rated motor current. The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions.  $J_{Load} < 10 \times J_{Motor}$ . In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures other than 50°C, see technical information on page 7/56*



# 3RW Soft Starters

## 3RW40 for standard applications



3RW40 28-1TB04



3RW40 38-1TB04



3RW40 47-1TB04

Ambient temperature 50 °C					Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e$ <sup>1)</sup>	Rated power of induction motors for rated operational voltage $U_e$				A				kg
	200 V	230 V	460 V	575 V					
	hp	hp	hp	hp					
<b>Rated operational voltage <math>U_e</math> 200 ... 480 V, with thermistor motor protection, rated control supply voltage <math>U_s</math> 24 V AC/DC</b>									
• With screw terminals									
11	3	3	7.5	--	S0	3RW40 24-1TB04		1 unit	0.770
23	5	5	15	--	S0	3RW40 26-1TB04		1 unit	0.770
29	7.5	7.5	20	--	S0	3RW40 27-1TB04		1 unit	0.770
34	10	10	25	--	S0	3RW40 28-1TB04		1 unit	0.770
• With spring-type terminals									
11	3	3	7.5	--	S0	3RW40 24-2TB04		1 unit	0.770
23	5	5	15	--	S0	3RW40 26-2TB04		1 unit	0.770
29	7.5	7.5	20	--	S0	3RW40 27-2TB04		1 unit	0.770
34	10	10	25	--	S0	3RW40 28-2TB04		1 unit	0.770
• With screw or spring-type terminals									
42	10	15	30	--	S2	3RW40 36-□TB04		1 unit	1.350
58	15	20	40	--	S2	3RW40 37-□TB04		1 unit	1.350
62	20	20	40	--	S2	3RW40 38-□TB04		1 unit	1.350
• With screw or spring-type terminals									
73	20	25	50	--	S3	3RW40 46-□TB04		1 unit	1.900
98	30	30	75	--	S3	3RW40 47-□TB04		1 unit	1.900
<b>Rated operational voltage <math>U_e</math> 400 ... 600 V, with thermistor motor protection, rated control supply voltage <math>U_s</math> 24 V AC/DC</b>									
• With screw terminals									
11	--	--	7.5	10	S0	3RW40 24-1TB05		1 unit	0.770
23	--	--	15	20	S0	3RW40 26-1TB05		1 unit	0.770
29	--	--	20	25	S0	3RW40 27-1TB05		1 unit	0.770
34	--	--	25	30	S0	3RW40 28-1TB05		1 unit	0.770
• With spring-type terminals									
11	--	--	7.5	10	S0	3RW40 24-2TB05		1 unit	0.770
23	--	--	15	20	S0	3RW40 26-2TB05		1 unit	0.770
29	--	--	20	25	S0	3RW40 27-2TB05		1 unit	0.770
34	--	--	25	30	S0	3RW40 28-2TB05		1 unit	0.770
• With screw or spring-type terminals									
42	--	--	30	40	S2	3RW40 36-□TB05		1 unit	1.350
58	--	--	40	50	S2	3RW40 37-□TB05		1 unit	1.350
62	--	--	40	60	S2	3RW40 38-□TB05		1 unit	1.350
• With screw or spring-type terminals									
73	--	--	50	60	S3	3RW40 46-□TB05		1 unit	1.900
98	--	--	75	75	S3	3RW40 47-□TB05		1 unit	1.900

**Order No. supplement for connection types**

- With screw terminals
- With spring-type terminals<sup>2)</sup>

1) Stand-alone installation without auxiliary fan.

2) Power connection: screw terminals.

1  
2

**Note:**

*Selection of the soft starter depends on the rated motor current. The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions.  $J_{Load} < 10 \times J_{Motor}$ . In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40° C, see technical information on page 7/56*



# 3RW Soft Starters

## 3RW40 for standard applications



3RW40 56-6BB44



3RW40 76-6BB44

Ambient temperature 50 °C		Rated power of induction motors for rated operational voltage $U_e$				Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e$ <sup>1)</sup>	Rated power of induction motors for rated operational voltage $U_e$				A	Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
	200 V	230 V	460 V	575 V						
	hp	hp	hp	hp						kg
<b>Rated operational voltage <math>U_e</math> 200 ... 460 V</b>										
• With screw or spring-type terminals										
117	30	40	<b>75</b>	--	<b>S6</b>	<b>3RW40 55-□BB□4</b> <b>3RW40 56-□BB□4</b>			1 unit	4.900
145	40	50	<b>100</b>	--					1 unit	6.900
• With screw or spring-type terminals										
205	60	75	<b>150</b>	--	<b>S12</b>	<b>3RW40 73-□BB□4</b> <b>3RW40 74-□BB□4</b> <b>3RW40 75-□BB□4</b> <b>3RW40 76-□BB□4</b>			1 unit	8.900
248	75	100	<b>200</b>	--					1 unit	8.900
315	100	125	<b>250</b>	--					1 unit	8.900
385	125	150	<b>300</b>	--					1 unit	8.900
<b>Rated operational voltage <math>U_e</math> 400 ... 600 V</b>										
• With screw or spring-type terminals										
117	--	--	75	<b>100</b>	<b>S6</b>	<b>3RW40 55-□BB□5</b> <b>3RW40 56-□BB□5</b>			1 unit	4.900
145	--	--	100	<b>150</b>					1 unit	6.900
• With screw or spring-type terminals										
205	--	--	150	<b>200</b>	<b>S12</b>	<b>3RW40 73-□BB□5</b> <b>3RW40 74-□BB□5</b> <b>3RW40 75-□BB□5</b> <b>3RW40 76-□BB□5</b>			1 unit	8.900
248	--	--	200	<b>250</b>					1 unit	8.900
315	--	--	250	<b>300</b>					1 unit	8.900
385	--	--	300	<b>400</b>					1 unit	8.900

**Order No. supplement for connection types<sup>2)</sup>**

- With screw terminals
- With spring-type terminals

**Order No. supplement for the rated control supply voltage  $U_s$ <sup>3)</sup>**

- 115 V AC
- 230 V AC

1) Stand-alone installation.

2) Power connection: busbar connection.

3) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

**Note:**

*Selection of the soft starter depends on the rated motor current.*

*The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions.  $J_{Load} < 10 \times J_{Motor}$ . In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see technical information on page 7/56*


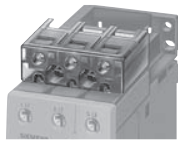





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# 3RW Soft Starters

## 3RW40 for standard applications



### Accessories

For soft starters Type	Version Size		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
<b>Box terminal blocks for soft starters</b>						
<b>For round and flat wires</b>						
	3RW40 5. <b>S6</b>	<ul style="list-style-type: none"> <li>• Up to 70 mm<sup>2</sup></li> <li>• Up to 120 mm<sup>2</sup></li> </ul>	<b>3RT19 55-4G</b>		1 unit	0.230
	3RW40 7. <b>S12</b>	<ul style="list-style-type: none"> <li>• Up to 240 mm<sup>2</sup></li> </ul>	<b>3RT19 56-4G</b>		1 unit	0.260
			<b>3RT19 66-4G</b>		1 unit	0.676
<b>Auxiliary terminals</b>						
<b>Auxiliary terminals, 3-pole</b>						
	3RW40 4. <b>S3</b>		<b>3RT19 46-4F</b>		1 unit	0.035
<b>Covers for soft starters</b>						
<b>Terminal covers for box terminals</b>						
Additional touch protection to be fitted at the box terminals (2 units required per device)						
	3RW40 3. <b>S2</b>		<b>3RT19 36-4EA2</b>		1 unit	0.020
	3RW40 4. <b>S3</b>		<b>3RT19 46-4EA2</b>		1 unit	0.025
	3RW40 5. <b>S6</b>		<b>3RT19 56-4EA2</b>		1 unit	0.030
	3RW40 7. <b>S12</b>		<b>3RT19 66-4EA2</b>		1 unit	0.040
<b>Terminal covers for cable lugs and busbar connections</b>						
	3RW40 4. <b>S3</b>	For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)	<b>3RT19 46-4EA1</b>		1 unit	0.040
	3RW40 5. <b>S6</b>		<b>3RT19 56-4EA1</b>		1 unit	0.070
	3RW40 7. <b>S12</b>		<b>3RT19 66-4EA1</b>		1 unit	0.130
<b>Sealing covers</b>						
	3RW40 2. to 3RW40 4. <b>S0, S2, S3</b>		<b>3RW49 00-0PB10</b>		1 unit	0.005
	3RW40 5. and 3RW40 7. <b>S6, S12</b>		<b>3RW49 00-0PB00</b>		1 unit	0.010
<b>Modules for RESET<sup>1)</sup></b>						
<b>Modules for remote RESET, electrical</b>						
Operating range 0.85 ... 1.1 x U <sub>N</sub> , power consumption 80 VA AC, 70 W DC, ON period 0.2 s ... 4 s, switching frequency 60/h						
	3RW40 5. and 3RW40 7. <b>S6, S12</b>	<ul style="list-style-type: none"> <li>• 24 ... 30 V AC/DC</li> <li>• 110 ... 127 V AC/DC</li> <li>• 220 ... 250 V AC/DC</li> </ul>	<b>3RU19 00-2AB71</b>		1 unit	0.066
			<b>3RU19 00-2AF71</b>		1 unit	0.067
			<b>3RU19 00-2AM71</b>		1 unit	0.066
<b>Mechanical RESET comprising</b>						
	3RW40 5. and 3RW40 7. <b>S6, S12</b>	<ul style="list-style-type: none"> <li>• Resetting plungers, holders and formers</li> <li>• Suitable pushbutton IP65, Ø 22 mm, 12 mm stroke</li> <li>• Extension plunger</li> </ul>	<b>3RU19 00-1A</b>		1 unit	0.038
			<b>3SB30 00-0EA11</b>		1 unit	0.020
			<b>3SX13 35</b>		1 unit	0.004
<b>Cable releases with holder for RESET</b>						
For Ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm						
	3RW40 5. and 3RW40 7. <b>S6, S12</b>	<ul style="list-style-type: none"> <li>• Length 400 mm</li> <li>• Length 600 mm</li> </ul>	<b>3RU19 00-1B</b>		1 unit	0.063
			<b>3RU19 00-1C</b>		1 unit	0.073

<sup>1)</sup> Remote RESET already integrated in the 3RW40 2. to 3RW40 4. soft starters.

# 3RW Soft Starters

## 3RW40 for standard applications


For soft starters		Motor starter protectors		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Size	Size				
<b>Link modules to motor starter protectors</b>							
	3RW40 24, 3RW40 26	<b>S0</b>	<b>S0</b>	<b>3RA19 21-1A</b>		10 units	0.028
	3RW40 36	<b>S2</b>	<b>S2</b>	<b>3RA19 31-1A</b>		5 units	0.033
	3RW40 46, 3RW40 47	<b>S3</b>	<b>S3</b>	<b>3RA19 41-1A</b>		5 units	0.072
<b>Fans (to increase switching frequency and for device mounting in positions different from the normal position)</b>							
	3RW40 2.	<b>S0</b>		<b>3RW49 28-8VB00</b>		1 unit	0.010
	3RW40 3., 3RW40 4.	<b>S2,</b> <b>S3</b>		<b>3RW49 47-8VB00</b>		1 unit	0.020
<b>Operating instructions<sup>1)</sup></b>							
For soft starters							
3RW40 2.	<b>S0</b>			<b>3ZX10 12-0RW40-1AA1</b>			
3RW40 3.	<b>S2</b>						
3RW40 4.	<b>S3</b>						
3RW40 5.	<b>S6</b>			<b>3ZX10 12-0RW40-2DA1</b>			
3RW40 7.	<b>S12</b>						

<sup>1)</sup> The operating instructions are included in the scope of supply.

They are also available on the Internet at:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters)

### Spare parts

For soft starters		Version		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Size	Rated control supply voltage $U_s$				
<b>Fans</b>							
	<b>Fans</b>						
	3RW40 5.-. BB3.	<b>S6</b>	115 V AC	<b>3RW49 36-8VX30</b>		1 unit	0.300
	3RW40 5.-. BB4.	<b>S6</b>	230 V AC	<b>3RW49 36-8VX40</b>		1 unit	0.300
	3RW40 7.-. BB3.	<b>S12</b>	115 V AC	<b>3RW49 47-8VX30</b>		1 unit	0.500
3RW40 7.-. BB4.	<b>S12</b>	230 V AC	<b>3RW49 47-8VX40</b>		1 unit	0.500	

# 3RW Soft Starters

## 3RW40 for standard applications

### More information

#### Application examples for normal starting (Class 10)

**Normal starting Class 10** (up to 20 s with 350 %  $I_{n\ motor}$ ).

The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Small fan	Pump	Hydraulic pump
<b>Starting parameters</b>					
• Voltage ramp and current limiting					
- Starting voltage	%	70	60	40	40
- Starting time	s	10	10	10	10
- Current limit value		$5 \times I_M$	$5 \times I_M$	$4 \times I_M$	$4 \times I_M$
<b>Ramp-down time</b>	s	5	5	0	10

#### Application examples for heavy starting (Class 20)

**Heavy starting Class 20** (up to 40 s with 350 %  $I_{n\ motor}$ ).

The soft starter has to be selected at least one rating class higher than the motor used.

Application	Stirrer	Centrifuge
<b>Starting parameters</b>		
• Voltage ramp and current limiting		
- Starting voltage	%	40
- Starting time	s	20
- Current limit value		$4 \times I_M$
<b>Ramp-down time</b>	s	0

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up. Actual start times are load dependent.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

# 3RW Soft Starters

## 3RW40 for standard applications

### Configuration

The 3RW solid-state soft starters are designed for easy starting conditions. In the event of severe conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

Where long starting times are involved, the integrated solid-state overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Industrial Controls catalog Chapter 11 "Function Relays, Interfaces and Converters".

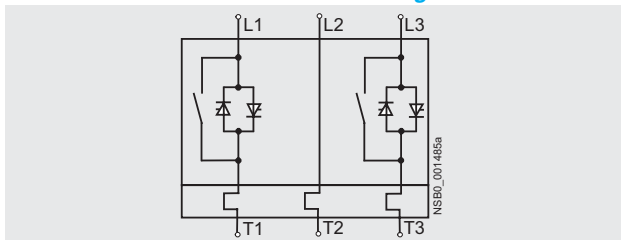
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment, PFC capacitors). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

**Note:**

*When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.*

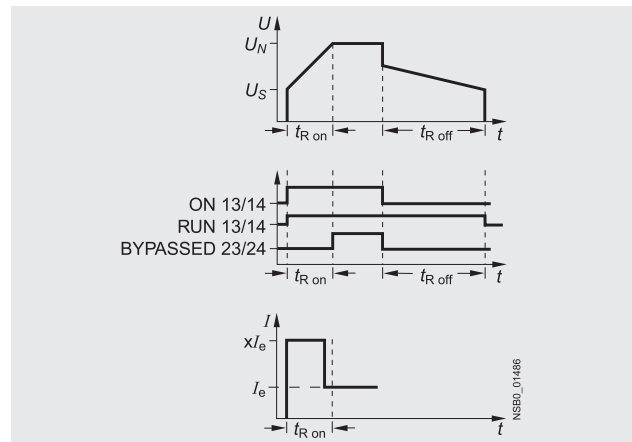
### Power electronics schematic circuit diagram



A bypass contact system and solid-state overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

- 1)  $U_n$  = Full Voltage
- 2)  $U_s$  = Starting (Initial) Voltage
- 3)  $t_{R}$  = Time Running
- 4)  $I_e$  = Rated operational current

### Status graphs<sup>1)</sup>



### Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters) > Software

More information can be found on the Internet at:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters)

# 3RW Soft Starters

## 3RW44 for high-feature applications

### Overview

In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a performance range up to 900 Hp (at 460 V) in the inline circuit and up to 1600Hp (at 460 V) in the inside-delta circuit.

The SIRIUS 3RW44 soft starters are characterized by a compact design for space-saving and clearly arranged control cabinet layouts. For optimized motor starting and stopping the innovative SIRIUS 3RW44 soft starters are an attractive alternative with considerable savings potential compared to applications with a frequency converter. The new torque control and adjustable current limiting enable the High-Feature soft starters to be used in nearly every conceivable task. They guarantee the reliable avoidance of sudden torque applications and current peaks during motor starting and stopping. This creates savings potential when calculating the size of the switchgear and when servicing the machinery installed. Whether it's for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

The bypass contacts already integrated in the soft starter bypass the thyristors after a motor ramp-up is detected. This results in a further reduction in the heat loss occurring during operation of the soft starter.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements. Operation and commissioning can be performed with the menu-controlled keypad and a menu-prompted, multi-line graphical display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a previously selected language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation.

#### Applicable standards

- IEC 60947-4-2
- UL/CSA

#### Soft Starter ES parameterization software

Soft Starter ES software is used for the parameterization, monitoring and service diagnostics of SIRIUS 3RW44 High Feature soft starters.

### Application

The SIRIUS 3RW44 solid-state soft starters are suitable for the torque-controlled soft starting and smooth ramp-down as well as braking of three-phase asynchronous motors.

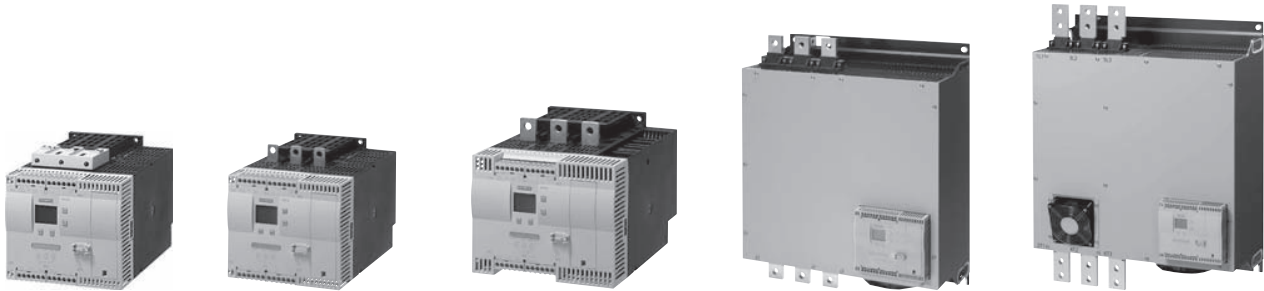
#### Application areas, e. g.

- Pumps
- Fans
- Compressors
- Water transport
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills
- Saws
- Crushers
- Mixers
- Centrifuges
- Industrial cooling and refrigerating systems

# 3RW Soft Starters

## 3RW44 for high-feature applications

### Selection and ordering data



3RW44 27-1BC44

3RW44 36-6BC44

3RW44 47-6BC44

3RW44 58-6BC44

3RW44 66-6BC44

Ambient temperature 50 °C				Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Rated operational current $I_e$	Rated power of induction motors for rated operational voltage $U_e$						
A	200 V hp	230 V hp	460 V hp	575 V hp			
<b>Inline circuits<sup>2)</sup>, rated operational voltage 200 ... 460 V</b>							
26	7.5	7.5	15	--	3RW44 22-□BC□4	1 unit	6.500
32	10	10	20	--	3RW44 23-□BC□4	1 unit	6.500
42	10	15	25	--	3RW44 24-□BC□4	1 unit	6.500
51	15	15	30	--	3RW44 25-□BC□4	1 unit	6.500
68	20	20	50	--	3RW44 26-□BC□4	1 unit	6.500
82	25	25	60	--	3RW44 27-□BC□4	1 unit	6.500
<b>Order No. supplement for connection types</b>							
<ul style="list-style-type: none"> <li>• With spring-type terminals</li> <li>• With screw terminals</li> </ul>							
100	30	30	75	--	3RW44 34-□BC□4	1 unit	7.900
117	30	40	75	--	3RW44 35-□BC□4	1 unit	7.900
145	40	50	100	--	3RW44 36-□BC□4	1 unit	7.900
180	50	60	125	--	3RW44 43-□BC□4	1 unit	11.500
215	60	75	150	--	3RW44 44-□BC□4	1 unit	11.500
280	75	100	200	--	3RW44 45-□BC□4	1 unit	11.500
315	100	125	250	--	3RW44 46-□BC□4	1 unit	11.500
385	125	150	300	--	3RW44 47-□BC□4	1 unit	11.500
494	150	200	400	--	3RW44 53-□BC□4	1 unit	50.000
551	150	200	450	--	3RW44 54-□BC□4	1 unit	50.000
615	200	250	500	--	3RW44 55-□BC□4	1 unit	50.000
693	200	250	550	--	3RW44 56-□BC□4	1 unit	50.000
780	250	300	600	--	3RW44 57-□BC□4	1 unit	50.000
850	300	350	700	--	3RW44 58-□BC□4	1 unit	50.000
970	350	400	800	--	3RW44 65-□BC□4	1 unit	78.000
1076	350	400	900	--	3RW44 66-□BC□4	1 unit	78.000

### Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

2  
6

### Order No. supplement for the rated control supply voltage $U_s$ <sup>1)</sup>

- 115 V AC
- 230 V AC

3  
4

<sup>1)</sup> Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

<sup>2)</sup> For inside delta selection, see page 7/76.

### Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism  $J_{Load} < 10 \times J_{Motor}$ ; starting current 350 %  $\times I_e$  for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

# 3RW Soft Starters

## 3RW44 for high-feature applications

Ambient temperature 50 °C					Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e$	Rated power of induction motors for rated operational voltage $U_e$							
	200 V	230 V	460 V	575 V				
A	hp	hp	hp	hp				kg
<b>Inline circuits<sup>2)</sup>, rated operational voltage 400 ... 600 V</b>								
26	--	--	15	<b>20</b>	3RW44 22-□BC□5		1 unit	6.500
32	--	--	20	<b>25</b>	3RW44 23-□BC□5		1 unit	6.500
42	--	--	25	<b>30</b>	3RW44 24-□BC□5		1 unit	6.500
51	--	--	30	<b>40</b>	3RW44 25-□BC□5		1 unit	6.500
68	--	--	50	<b>50</b>	3RW44 26-□BC□5		1 unit	6.500
82	--	--	60	<b>75</b>	3RW44 27-□BC□5		1 unit	6.500
<b>Order No. supplement for connection types</b>								
• With spring-type terminals					3			
• With screw terminals					1			
100	--	--	75	<b>75</b>	3RW44 34-□BC□5		1 unit	7.900
117	--	--	75	<b>100</b>	3RW44 35-□BC□5		1 unit	7.900
145	--	--	100	<b>125</b>	3RW44 36-□BC□5		1 unit	7.900
180	--	--	125	<b>150</b>	3RW44 43-□BC□5		1 unit	11.500
215	--	--	150	<b>200</b>	3RW44 44-□BC□5		1 unit	11.500
280	--	--	200	<b>250</b>	3RW44 45-□BC□5		1 unit	11.500
315	--	--	250	<b>300</b>	3RW44 46-□BC□5		1 unit	11.500
385	--	--	300	<b>400</b>	3RW44 47-□BC□5		1 unit	11.500
494	--	--	400	<b>500</b>	3RW44 53-□BC□5		1 unit	50.000
551	--	--	450	<b>550</b>	3RW44 54-□BC□5		1 unit	50.000
615	--	--	500	<b>600</b>	3RW44 55-□BC□5		1 unit	50.000
693	--	--	550	<b>700</b>	3RW44 56-□BC□5		1 unit	50.000
780	--	--	600	<b>800</b>	3RW44 57-□BC□5		1 unit	50.000
850	--	--	700	<b>850</b>	3RW44 58-□BC□5		1 unit	50.000
970	--	--	800	<b>1000</b>	3RW44 65-□BC□5		1 unit	78.000
1076	--	--	900	<b>1100</b>	3RW44 66-□BC□5		1 unit	78.000
<b>Order No. supplement for connection types</b>								
• With spring-type terminals					2			
• With screw terminals					6			
<b>Order No. supplement for the rated control supply voltage <math>U_s</math><sup>1)</sup></b>								
• 115 V AC								
• 230 V AC								

1) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

2) For inside delta selection, see page 7/76.

**Note:**

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism  $J_{Load} < 10 \times J_{Motor}$ ; starting current 350 %  $\times I_e$  for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.



# 3RW Soft Starters

## 3RW44 for high-feature applications

Ambient temperature 50 °C					Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e$	Rated power of induction motors for rated operational voltage $U_e$							
	200 V	230 V	460 V	575 V				
A	hp	hp	hp	hp				kg
<b>Inline circuits, rated operational voltage 400 ... 690 V</b>								
26	--	--	15	<b>20</b>	3RW44 22-□BC□6		1 unit	6.500
32	--	--	20	<b>25</b>	3RW44 23-□BC□6		1 unit	6.500
42	--	--	25	<b>30</b>	3RW44 24-□BC□6		1 unit	6.500
51	--	--	30	<b>40</b>	3RW44 25-□BC□6		1 unit	6.500
68	--	--	50	<b>50</b>	3RW44 26-□BC□6		1 unit	6.500
82	--	--	60	<b>75</b>	3RW44 27-□BC□6		1 unit	6.500
<b>Order No. supplement for connection types</b>								
<ul style="list-style-type: none"> <li>• With spring-type terminals</li> <li>• With screw terminals</li> </ul>					3	1		
100	--	--	75	<b>75</b>	3RW44 34-□BC□6		1 unit	7.900
117	--	--	75	<b>100</b>	3RW44 35-□BC□6		1 unit	7.900
145	--	--	100	<b>125</b>	3RW44 36-□BC□6		1 unit	7.900
180	--	--	125	<b>150</b>	3RW44 43-□BC□6		1 unit	11.500
215	--	--	150	<b>200</b>	3RW44 44-□BC□6		1 unit	11.500
280	--	--	200	<b>250</b>	3RW44 45-□BC□6		1 unit	11.500
315	--	--	250	<b>300</b>	3RW44 46-□BC□6		1 unit	11.500
385	--	--	300	<b>400</b>	3RW44 47-□BC□6		1 unit	11.500
494	--	--	400	<b>500</b>	3RW44 53-□BC□6		1 unit	50.000
551	--	--	450	<b>550</b>	3RW44 54-□BC□6		1 unit	50.000
615	--	--	500	<b>600</b>	3RW44 55-□BC□6		1 unit	50.000
693	--	--	550	<b>700</b>	3RW44 56-□BC□6		1 unit	50.000
780	--	--	600	<b>800</b>	3RW44 57-□BC□6		1 unit	50.000
850	--	--	700	<b>850</b>	3RW44 58-□BC□6		1 unit	50.000
970	--	--	800	<b>1000</b>	3RW44 65-□BC□6		1 unit	78.000
1076	--	--	900	<b>1100</b>	3RW44 66-□BC□6		1 unit	78.000

**Order No. supplement for connection types**

- With spring-type terminals
- With screw terminals

**Order No. supplement for the rated control supply voltage  $U_s$  1)**

- 115 V AC
- 230 V AC

1) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism  $J_{Load} < 10 \times J_{Motor}$ ; starting current 350 %  $\times I_e$  for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

Introduction

Overview



SIRIUS ES engineering software (E-SW)

The programs of the SIRIUS ES software family enable:

- Clearly arranged configuring of device functions and their parameters – online and offline
- Efficient diagnostics functions and display of the most important measured values
- Time savings through shorter startup times.

The SIRIUS ES programs such as Motor Starter ES, Soft Starter ES and SIMOCODE ES are available in three versions which differ in user-friendliness, scope of functions and price (for details see the descriptions of the individual products).

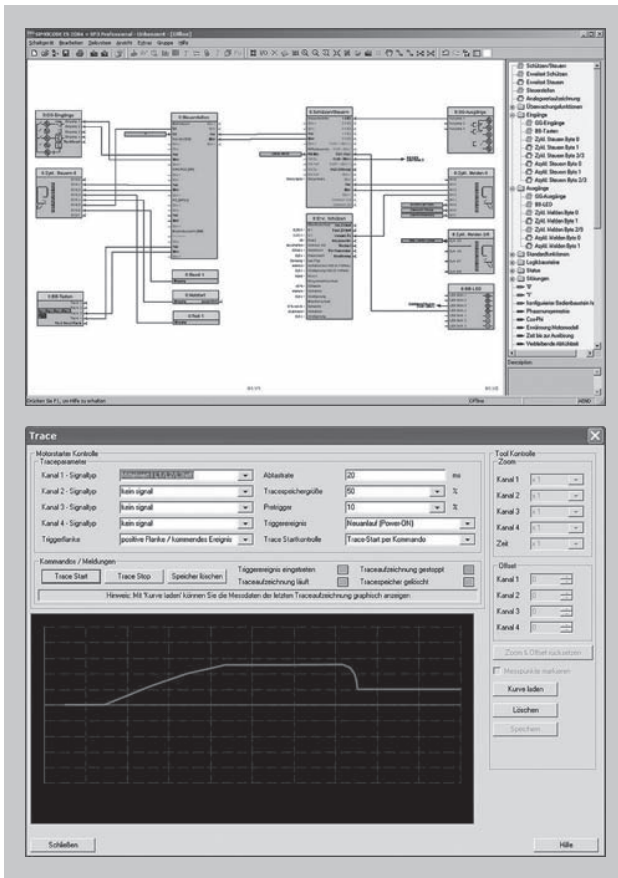
SIRIUS ES	Basic	Standard	Premium
Local interface on the device (system interface)	✓	✓	✓
Basic functions for parameterizing the devices			
• Parameter assignment	✓	✓	✓
• Operating	✓	✓	✓
• Diagnostics	✓	✓	✓
• Test	✓	✓	✓
Standard functionality			
• Parameterizing with the integrated graphics editor <sup>1)</sup>	--	✓	✓
• Creating typicals	--	✓	✓
• Exporting parameters	--	✓	✓
Complete functionality			
• Group functions	--	--	✓
• S7 Routing	--	--	✓
• Teleservice through MPI	--	--	✓
• STEP7 Object Manager	--	--	✓
• PROFIBUS interface	--	--	✓

<sup>1)</sup> Depending on SIRIUS ES program.

Application

In addition to device-specific parameterization, the programs of the SIRIUS ES software family also provide the following functionality in a uniform look and feel. These functions are available in many SIRIUS ES programs.

- Standards-conform printouts  
The programs of the SIRIUS ES software family greatly simplify machine documentation. Parameterization printouts according to EN ISO 7200 are possible. The elements to be printed are easy to select and compile as required.
- Easy creation of parameter templates  
Parameter templates can be created for devices and applications with only minimum differences in their parameters. These templates contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be customized, e. g. by the startup engineer.
- Group function  
For the user-friendly parameterization of numerous devices or applications of the same type, the programs of the SIRIUS ES software family offer a group function which enables the parameterization of several devices to be read out or written through PROFIBUS. In conjunction with templates it is even possible to selectively adapt the same parameters in any number of parameterizations.
- Teleservice through MPI  
The premium versions of the SIRIUS ES software families support the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance and it shortens response times for service purposes.



Efficient engineering and startup with graphic interfaces and diagnostics options

**Types of delivery and license**

The programs of the SIRIUS ES software family are available as follows:

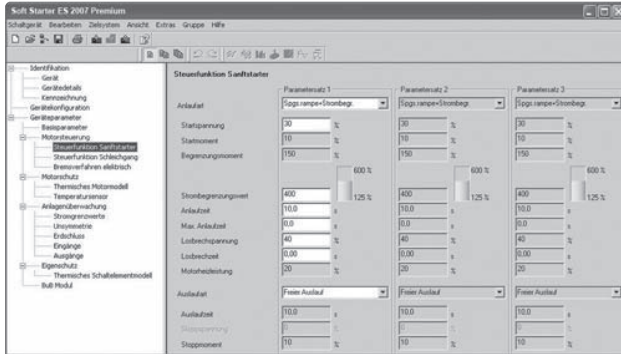
- Floating license – the license for any one user at any one time
  - Authorizes any one user
  - Independent of the number of installations (unlike the single license which is allowed to be installed once only)
  - Only the actual use of the program has to be licensed
  - Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal).

Following delivery versions are available in addition for the programs of the SIRIUS ES software family:

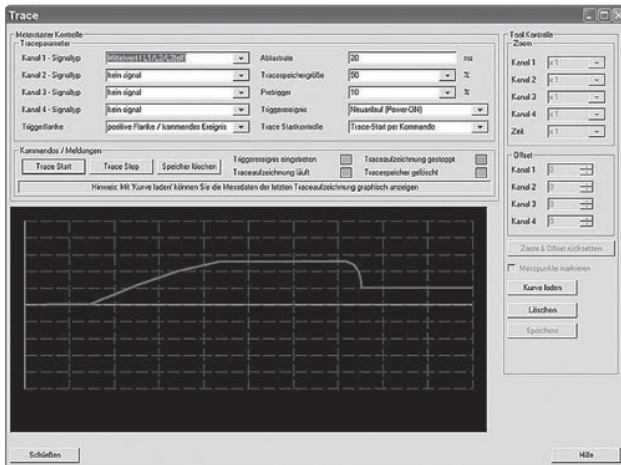
- Upgrade
  - Upgrade from an old to a new version with expanded functions, e. g. upgrade from Motor Starter ES 2006 to Motor Starter ES 2007
- Powerpack
  - Special pack for switching within the same software version to a more powerful version with more functionality, e. g. Powerpack Motor Starter ES 2007 for switching from Standard to Premium
- Software Update Service
  - To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades

Soft Starter ES

Overview



Easy and clearly arranged parameter setting of the 3RW44 soft starter with Soft Starter ES 2007



Graphic presentation of measured values with the trace function (oscilloscope function) of Soft Starter ES 2007 Standard and Premium

Soft Starter ES 2007

The Soft Starter ES software permits the quick and easy parameterization, monitoring and diagnostics of SIRIUS 3RW44 High Feature soft starters for service purposes. The device parameters can be configured directly on the PC and transferred to the soft starter through a serial cable or an optional PROFIBUS interface.

The advantages of Soft Starter ES:

- Clearly arranged configuring of device functions and their parameters – online and offline
- Effective diagnostics functions on the soft starter and display of the most important measured values
- Trace function (oscilloscope function) for recording measured values and events (in the Soft Starter ES Standard and Premium software versions).

Efficient engineering with new program versions

The Soft Starter ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Soft starters ES	Basic	Standard	Premium
Access through the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	✓	✓	✓
Creating templates	--	✓ <sup>1)</sup>	✓
Exporting parameters	--	✓	✓
Comparison functions	--	✓	✓
Standards-conform printout according to EN ISO 7200	--	✓	✓
Service data (slave pointer, statistics data)	--	✓	✓
Access through PROFIBUS	--	--	✓
Group functions	--	--	✓
Teleservice through MPI	--	--	✓
S7 Routing	--	--	✓
STEP7 Object Manager	--	--	✓

<sup>1)</sup> Templates with Service Pack 1 and higher.

More functions

- Standards-conform printouts  
The software tool greatly simplifies machine documentation. Parameterization printouts according to EN ISO 7200 are possible. The elements to be printed are easy to select and compile as required.
- Easy creation of parameter templates  
Parameter templates can be created for devices and applications with only minimum differences in their parameters. These templates contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be adapted, e. g. by the startup engineer.
- Group function  
For the user-friendly parameterization of numerous devices or applications of the same type, the programs of the SIRIUS ES software family offer a group function which enables the parameterization of several devices to be read out or written through PROFIBUS. In conjunction with typical it is even possible to selectively adapt the same parameters in any number of parameterizations.
- Teleservice through MPI  
The Soft Starter ES Premium version supports the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance, and it shortens response times for service purposes.

Soft Starter ES

**Types of delivery and license**

Soft Starter ES is available as follows:

- Floating license – the license for any one user at any one time
  - Authorizes any one user
  - Independent of the number of installations (unlike the single license which is allowed to be installed once only)
  - Only the actual use of the program has to be licensed
  - Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal).

Following delivery versions are available in addition for Soft Starter ES 2007:

- Upgrade  
Upgrade from an old to a new version with expanded functions, e. g. upgrade from Soft Starter ES 2006 to Soft Starter ES 2007

- Powerpack  
Special pack for switching within the same software version to a more powerful version with more functionality, e. g. Powerpack Soft Starter ES 2007 for switching from Standard to Premium
- Software Update Service  
To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades

**New licensing procedure**

To make licensing easier, the three versions of Soft Starter ES are available with immediate effect with the following license:

14 day trial license for Premium functions: for test and evaluation purposes, included on every product CD, available also in the download file of the SIRIUS Soft Starter ES 2007 program at [www.sea.siemens.com/softstarters](http://www.sea.siemens.com/softstarters).

**System requirements**

Soft Starter ES 2007 parameterization, start-up and diagnostics software for the SIRIUS 3RW44 soft starter	Basic/Standard	Premium
	Firmware version ≥ *E04* <sup>1)</sup>	Firmware version ≥ *E06* <sup>2)</sup>
Operating system	Windows 2000 (Service Pack 3 or 4), Windows XP Professional (Service Pack 2), Windows Vista Ultimate 32/ Business 32 <sup>3)</sup>	
Processor	≥ Pentium 800 MHz/≥ 1 GHz (Windows Vista)	
RAM	≥ 512 MB/≥ 1 GB (Windows Vista)	
Free space on hard disk	≥ 150 MB	
CD-ROM/DVD drive	Yes (only when installing from CD)	
Serial interface (COM)	Yes	
PC cable/parameterization cable/connection cable	Yes	
PROFIBUS communication module (optional)	--	Yes

<sup>1)</sup> SIRIUS 3RW44 with firmware version ≥ \*E04\*. Installed in starters delivered after December 2005.  
<sup>2)</sup> SIRIUS 3RW44 with firmware version ≥ \*E06\*. Installed in starters delivered after May 2006.  
<sup>3)</sup> Windows Vista Ultimate 32/ Business 32 from Soft Starter ES 2007+SP1.

**Selection and ordering data**

Parameterization and service software for SIRIUS 3RW44 soft starters

- Can be run under WIN 2000/WIN XP PROF/Windows Vista Ultimate 32/Business 32
- Without PC cable

Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
<b>Soft Starter ES 2007 Basic</b> Floating license for one user E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface • License key on USB stick, Class A, including CD	<b>3ZS1 313-4CC10-0YA5</b>		1 unit	0.230
<b>Soft Starter ES 2007 Standard</b> Floating license for one user E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface • License key on USB stick, Class A, including CD	<b>3ZS1 313-5CC10-0YA5</b>		1 unit	0.230

Soft Starter ES

Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
<b>Upgrade for Soft Starter ES 2006</b> Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface	<b>3ZS1 313-5CC10-0YE5</b>		1 unit	0.230
<b>Powerpack for Soft Starter ES 2007 Basic</b> Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface	<b>3ZS1 313-5CC10-0YD5</b>		1 unit	0.230
<b>Software Update Service</b> For 1 year with automatic extension, assuming the current software version is in use, E-SW, software and documentation on CD, communication through the system interface	<b>3ZS1 313-5CC10-0YL5</b>		1 unit	0.230

Soft Starter ES 2007 Premium

<b>Floating license for one user</b> E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface or PROFIBUS • License key on USB stick, Class A, including CD	<b>3ZS1 313-6CC10-0YA5</b>		1 unit	0.230
<b>Upgrade for Soft Starter ES 2006</b> Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface or PROFIBUS	<b>3ZS1 313-6CC10-0YE5</b>		1 unit	0.230
<b>Powerpack for Soft Starter ES 2007 Standard</b> Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface or PROFIBUS	<b>3ZS1 313-6CC10-0YD5</b>		1 unit	0.230
<b>Software Update Service</b> For 1 year with automatic extension, assuming the current software version is in use, E-SW, software and documentation on CD, communication through the system interface or PROFIBUS	<b>3ZS1 313-6CC10-0YL5</b>		1 unit	0.230

PC cables



3UF7 940-0AA00-0

<b>For PC/PG communication with SIRIUS 3RW44 soft starters</b> Through the system interface, for connecting to the serial interface of the PC/PG	<b>3UF7 940-0AA00-0</b>		1 unit	0.150
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Serial/USB




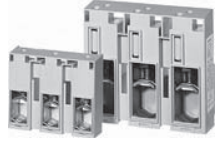


<b>For PC/PG communication with SIRIUS 3RW44 soft starters</b> Through the system interface, for connecting to the USB interface of the PC/PG	<b>3UF7 946-0AA00-0</b>		1 unit	0.150
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# 3RW Soft Starters

## 3RW44 for high-feature applications



### Accessories

For soft starters	Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type					
<b>PROFIBUS communication modules</b>					
	<p>Modules can be plugged into the soft starters for integrating the starters in the PROFIBUS network with DPV1 slave functionality.</p> <p>On Y-link the soft starter has only DPV0 slave functionality.</p>	<b>3RW49 00-0KC00</b>		1 unit	0.320
3RW49 00-0KC00					
<b>PROFINET communication modules</b>					
	<p>For 3RW44 soft starter integration in the PROFINET network, suitable for devices with firmware version E12 or higher</p>	<b>3RW49 00-0NC00</b>		1 unit	0.320
3RW49 00-0NC00					
<b>External display and operator modules</b>					
	<p>For indicating and operating the functions provided by the soft starter using an externally mounted display and operator module in degree of protection IP54, N1, N12 (e. g. in the control cabinet door)</p>	<b>3RW49 00-0AC00</b>		1 unit	0.320
3RW49 00-0AC00					
<b>Connection cables</b>					
<p>From the device interface (serial) of the 3RW44 soft starter to the external display and operator module</p> <ul style="list-style-type: none"> <li>• Length 0.5 m, flat</li> <li>• Length 0.5 m, round</li> <li>• Length 1.0 m, round</li> <li>• Length 2.5 m, round</li> </ul>		<b>3UF7 932-0AA00-0</b>		1 unit	0.020
		<b>3UF7 932-0BA00-0</b>		1 unit	0.050
		<b>3UF7 937-0BA00-0</b>		1 unit	0.100
		<b>3UF7 933-0BA00-0</b>		1 unit	0.150
<b>Box terminal blocks for soft starters</b>					
	<p><b>Box terminal blocks</b></p> <p>3RW44 2. Included in the scope of supply</p> <p>3RW44 3. <ul style="list-style-type: none"><li>• Up to 70 mm<sup>2</sup></li><li>• Up to 120 mm<sup>2</sup></li></ul></p> <p>3RW44 4. <ul style="list-style-type: none"><li>• Up to 240 mm<sup>2</sup></li></ul></p>	<b>3RT19 55-4G</b>		1 unit	0.230
3RT19					
		<b>3RT19 56-4G</b>		1 unit	0.260
		<b>3RT19 66-4G</b>		1 unit	0.676

# 3RW Soft Starters

## 3RW44 for high-feature applications

### Spare parts

For soft starters	Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
<b>Covers for soft starters</b>					
<b>Terminal covers for box terminals</b>					
Additional touch protection to be fitted at the box terminals (2 units required per device)					
3RW44 2. and 3RW44 3.		<b>3RT19 56-4EA2</b>		1 unit	0.030
3RW44 4.		<b>3RT19 66-4EA2</b>		1 unit	0.040
<b>Terminal covers for cable lugs and busbar connections</b>					
3RW44 2. and 3RW44 3.		<b>3RT19 56-4EA1</b>		1 unit	0.070
3RW44 4.		<b>3RT19 66-4EA1</b>		1 unit	0.130
 <p>3RT19 .6-4EA1</p>					
<b>Operating instructions<sup>1)</sup></b>					
For 3RW44 soft starters		<b>3ZX10 12-0RW44-1AA1</b>			
<b>Fans</b>					
 <p>3RW49</p>		<b>Fans</b>			
3RW44 2. and 3RW44 3.	115 V AC 230 V AC	<b>3RW49 36-8VX30</b> <b>3RW49 36-8VX40</b>		1 unit 1 unit	0.300 0.300
3RW44 4.	115 V AC 230 V AC	<b>3RW49 47-8VX30</b> <b>3RW49 47-8VX40</b>		1 unit 1 unit	0.500 0.500
3RW44 5. and 3RW44 6. <sup>2)</sup>	115 V AC 230 V AC	<b>3RW49 57-8VX30</b> <b>3RW49 57-8VX40</b>		1 unit 1 unit	0.800 0.800
3RW44 6. <sup>3)</sup>	115 V AC 230 V AC	<b>3RW49 66-8VX30</b> <b>3RW49 66-8VX40</b>		1 unit 1 unit	0.300 0.300

<sup>1)</sup> The operating instructions are included in the scope of supply.

<sup>2)</sup> 3RW44 6. mounting on output side.

<sup>3)</sup> For mounting on front side.



# 3RW Soft Starters

## 3RW44 for high-feature applications

### More information

#### Application examples for normal starting (Class 10)

**Normal starting Class 10** (up to 20 s with 350 %  $I_{n \text{ motor}}$ ).  
The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
<b>Starting parameters<sup>1)</sup></b>						
• Voltage ramp and current limiting						
- Starting voltage	% 70	60	50	30	30	30
- Starting time	s 10	10	10	10	10	10
- Current limit value	Deactivated	Deactivated	4 × $I_M$	4 × $I_M$	Deactivated	Deactivated
• Torque ramp						
- Starting torque	60	50	40	20	10	10
- End torque	150	150	150	150	150	150
- Starting time	10	10	10	10	10	10
• Breakaway pulse	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
<b>Ramp-down mode</b>	Smooth ramp-down	Smooth ramp-down	Free ramp-down	Free ramp-down	Pump ramp-down	Free ramp-down

#### Application examples for heavy starting (Class 20)

**Heavy starting Class 20** (up to 40 s with 350 %  $I_{n \text{ motor}}$ ).  
The soft starter has to be selected one rating class higher than the motor used.

Application	Mixer	Centrifuge	Milling machine
<b>Starting parameters<sup>1)</sup></b>			
• Voltage ramp and current limiting			
- Starting voltage	% 30	30	30
- Starting time	s 30	30	30
- Current limit value	4 × $I_M$	4 × $I_M$	4 × $I_M$
• Torque ramp			
- Starting torque	30	30	30
- End torque	150	150	150
- Starting time	30	30	30
• Breakaway pulse	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
<b>Ramp-down mode</b>	Free ramp-down	Free ramp-down	Free ramp-down or DC braking

#### Application examples for very heavy starting (Class 30)

**Very heavy starting Class 30** (up to 60 s with 350 %  $I_{n \text{ motor}}$ ).  
The soft starter has to be selected two rating classes higher than the motor used.

Application	Large fan	Mill	Crushers	Circular saw/bandsaw
<b>Starting parameters<sup>1)</sup></b>				
• Voltage ramp and current limiting				
- Starting voltage	% 30	50	50	30
- Starting time	s 60	60	60	60
- Current limit value	4 × $I_M$	4 × $I_M$	4 × $I_M$	4 × $I_M$
• Torque ramp				
- Starting torque	20	50	50	20
- End torque	150	150	150	150
- Starting time	60	60	60	60
• Breakaway pulse	Deactivated (0 ms)	80 %, 300 ms	80 %, 300 ms	Deactivated (0 ms)
<b>Ramp-down mode</b>	Free ramp-down	Free ramp-down	Free ramp-down	Free ramp-down

**Note:**

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up. The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

<sup>1)</sup> Actual motor starting times are load dependent.

# 3RW Soft Starters

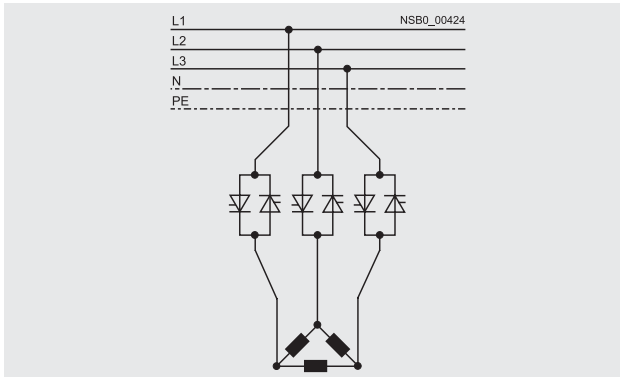
## 3RW44 for high-feature applications

### Circuit concept

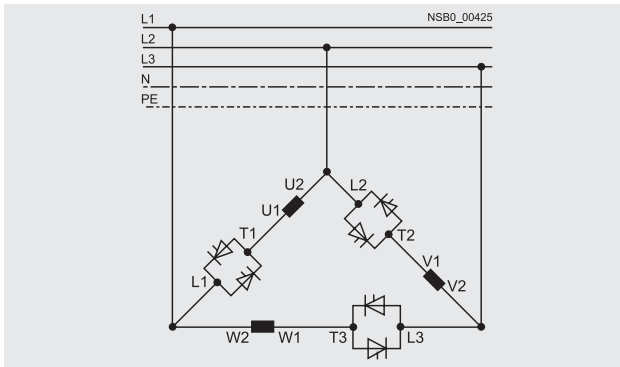
The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

- **Inline circuit**  
The controls for isolating and protecting the motor are simply connected in series with the soft starter. The motor is connected to the soft starter with three cables.
- **Inside-delta circuit**  
The wiring is similar to that of wye-delta starters. The phases of the soft starter are connected in series with the individual motor windings. The soft starter then only has to carry the phase current, amounting to about 58 % of the rated motor current (conductor current).

Comparison of the types of circuit



Inline circuit:  
Rated current  $I_e$  corresponds to the rated motor current  $I_n$ , 3 cables to the motor



Inside-delta circuit:  
Rated current  $I_e$  corresponds to approx. 58 % of the rated motor current  $I_n$ , 6 cables to the motor (as with wye-delta starters)

### Which circuit?

Using the inline circuit involves the lowest wiring outlay. If the soft starter to motor connections are long, this circuit is preferable. With the inside-delta circuit there is double the wiring complexity but a smaller size of device can be used at the same rating. It is also recommended to use an isolating contactor in series with each motor winding.

Thanks to the choice of operating mode between the inline circuit and inside-delta circuit, it is always possible to select the most favorable solution.

The braking function is possible only in the inline circuit.

### Configuration

The 3RW44 solid-state soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger device must be selected.

For long starting times it is recommended to have a PTC sensor in the motor. This also applies for the ramp-down modes smooth ramp-down, pump ramp-down and DC braking, because during the ramp-down time in these modes, an additional current load applies in contrast to free ramp-down.

In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately.

A bypass contact system and solid-state overload relay are already integrated in the 3RW44 soft starter and therefore do not have to be ordered separately.

The harmonic component load for starting currents must be taken into consideration for the selection of motor starter protector (selection of release).

#### Note:

*When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.*

### Device interface, PROFIBUS DP communication module, Soft Starter ES parameterizing and operating software

The 3RW44 electronic soft starters have a PC interface for communicating with the Soft Starter ES software or for connecting the external display and operator module. If the optional PROFIBUS communication module is used, the 3RW44 soft starter can be integrated in the PROFIBUS network and communicate using the GSD file or Soft Starter ES Premium software.

# 3RW Soft Starters

## 3RW44 for high-feature applications

### **System Manual for SIRIUS 3RW44**

Besides containing all important information on configuring, commissioning and servicing, the manual also contains example circuits and the technical specifications for all devices. This manual can be downloaded off the internet.

### **Win-Soft Starter selection and simulation program**

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded free of charge from:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters) > Software

More information can be found on the Internet at:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters)

# 3RW Soft Starters

## Soft starters for enclosed applications

### Overview

The family of 3RW40 and 3RW44 softstarters are available in stand alone enclosed control designs for smooth starting and stopping of standard NEMA design B three phase inductive motors, thus eliminating physical stresses to the system and load while minimizing starting current. These pre-engineered enclosed designs offer convenience and flexibility in and UL/CSA certified offering. Enclosed styles are available in combination and non-combination configurations through 600HP and system voltages of 200V, 230V, 480V, and 600V.

The Class 73 offers either the 3RW40 or 3RW44 in a non-combination style offering. These non-combination styles come standard with a choice of Type 1, 3R, 12, 4 NEMA rated enclosure, a control transformer, Sirius softstarter with built-in overload and bypass, line side power terminal block, and a reset pushbutton. The enclosed offering can be powerfully matched with a wide variety of factory modified options such as pushbutton control, pilot lights, metering and other control options such as isolation contactors and emergency start bypass starters. 3RW44 enclosed styles are also available with optional through the door keypad and Profibus communication.

The Class 74 offering includes all of the features of the Class 73 in a combination style design. Standard options are either a circuit breaker or fusible disconnect providing short circuit protection and soft starting in one package.

### Application

The Class 73/74 product is a fully enclosed solid state reduced voltage starter designed for a wide variety of industrial applications. The enclosed softstarter offerings are ideal for new as well as existing applications where total motor controls is required.

Proper selection based on application data is made simple following these easy steps:

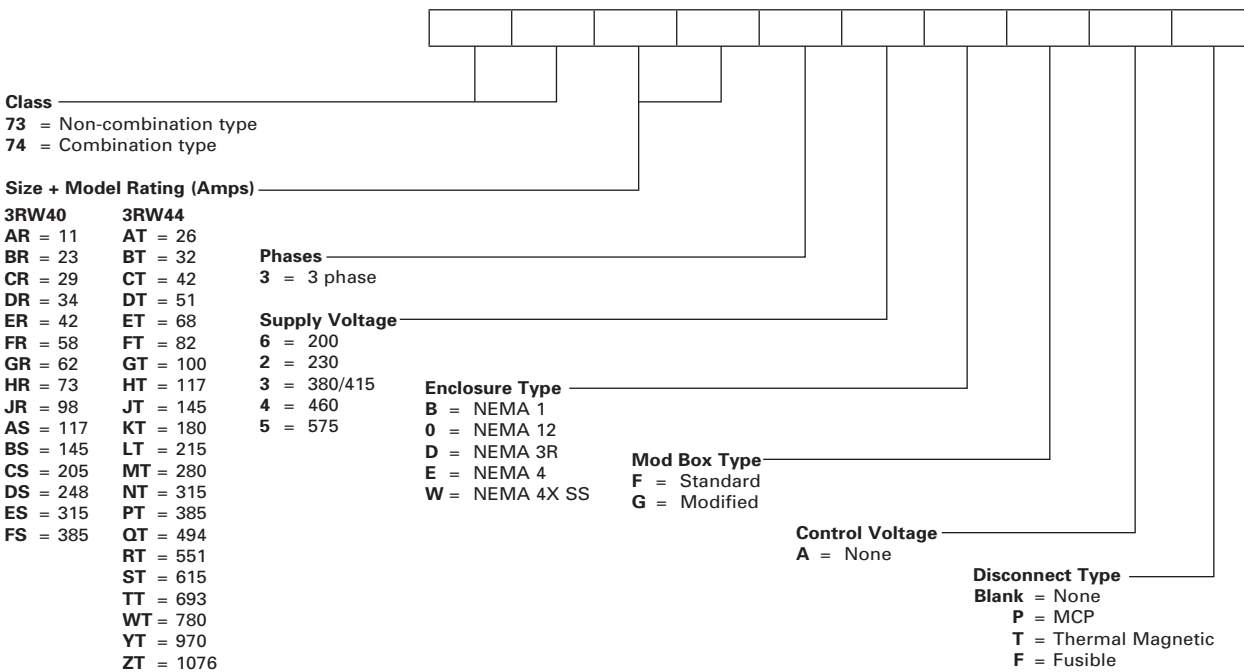
- Select proper RVSS by application
  - Select the 3RW40 versus the 3RW44 using the application info provided in the open section of the catalog
- Select the rating chart for normal starting or sever duty starting
  - Normal starting is rated at 350% of rated motor current IM for 10 seconds and based on starts per hour – representative of a class 20 application.
  - Severe starting is rated at 350% of rated motor current Im for 20 seconds and based on starts per hour – representative of a Class 20 application
- Select model using Motor nameplate data
  - Identify correct motor voltage column
  - Select rate current or HP row
  - Find ordering number under desired enclosure type column (e.g. NEMA 1)
  - Select appropriate system voltage
- Select factory modification on page 6/40<sup>1)</sup>

Example:  
3RW44, N12, CB disconnect, 460V, 200HP with a start/stop and red run light

Order No.  
74MT34BFAP A1 FC

## Product Nomenclature

### Class 73 and 74 Enclosed Soft Starters



<sup>1)</sup> Some modifications will require a larger 'Modified' box than the standard box e.g. Isolation contactor, space heater, etc. See page 7/43 for instructions.

# 3RW Soft Starters

## 3RW40 Size S0-S3 Non-Combo



**3RW40 Enclosed features:**

- Available in NEMA 1,12,3R,4, and 4 stainless steel
- Compact size
- Built-in Bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10,15,or 20
- Internal self protection
- Fault monitoring
- Isolation Contactor

### Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
- ▶ The 3RW40 is designed for normal starting applications.
- ▶ For factory modifications see page 7/43.
- ▶ For complete derating and application info see page 7/59
- ▶ For dimensional drawings see page 7/95.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control Circuit Transformer
- Line side power terminal block
- Reset button
- Isolation Contactor

Ideal applications for 3RW40 enclosed softstarters

- Fans
- Pumps
- Easy starting loads starting in less than 10 seconds

Class 73 starters are built to UL and CSA standards

## 3RW40 for Standard Applications

### Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty (350% * I <sub>e</sub> for 10s) <sup>②</sup>									
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$
11	3	3	7.5	—	6	3RW4024-1BB14	73AR3_BFA		73AR3_DFA		73AR3_OFA		73AR3_EFA		73AR3_WFA
23	5	7.5	15	—	13	3RW4026-1BB14	73BR3_BFA		73BR3_DFA		73BR3_OFA		73BR3_EFA		73BR3_WFA
29	7.5	10	20	—	16	3RW4027-1BB14	73CR3_BFA		73CR3_DFA		73CR3_OFA		73CR3_EFA		73CR3_WFA
34	10	10	25	—	18	3RW4028-1BB14	73DR3_BFA		73DR3_DFA		73DR3_OFA		73DR3_EFA		73DR3_WFA
42	10	15	30	—	23	3RW4036-1BB14	73ER3_BFA		73ER3_DFA		73ER3_OFA		73ER3_EFA		73ER3_WFA
58	15	20	40	—	31	3RW4037-1BB14	73FR3_BFA		73FR3_DFA		73FR3_OFA		73FR3_EFA		73FR3_WFA
62	20	20	40	—	33	3RW4038-1BB14	73GR3_BFA		73GR3_DFA		73GR3_OFA		73GR3_EFA		73GR3_WFA
73	20	25	50	—	39	3RW4046-1BB14	73HR3_BFA		73HR3_DFA		73HR3_OFA		73HR3_EFA		73HR3_WFA
98	30	30	75	—	52	3RW4047-1BB14	73JR3_BFA		73JR3_DFA		73JR3_OFA		73JR3_EFA		73JR3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C

② Starter selection is dependent on type of application. I<sub>e</sub> = FLA rating of motor

# 3RW Soft Starters

## Enclosed 3RW40



**3RW40 Enclosed features:**

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10, 15, or 20
- Internal self protection
- Fault monitoring

### Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
- ▶ The 3RW40 is designed for normal starting applications (Class 10 applications).
- ▶ For factory modifications see page 7/43.
- ▶ For complete derating and application info see page 7/59.
- ▶ For dimensional drawings see page 7/95.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Line side power terminal block
- Reset button

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 73 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

## 3RW40 for Standard Applications

### Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP <sup>①</sup>				kW	Class 10 Light Duty (350% * Im for 10s) <sup>②</sup>									
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$
117	30	40	75	—	56	3RW4055-6BB34	73AS3_BFA		73AS3_DFA		73AS3_OFA		73AS3_EFA		73AS3_WFA
145	40	50	100	—	75	3RW4056-6BB34	73BS3_BFA		73BS3_DFA		73BS3_OFA		73BS3_EFA		73BS3_WFA
205	60	75	150	—	112	3RW4073-6BB34	73CS3_BFA		73CS3_DFA		73CS3_OFA		73CS3_EFA		73CS3_WFA
248	75	100	200	—	149	3RW4074-6BB34	73DS3_BFA		73DS3_DFA		73DS3_OFA		73DS3_EFA		73DS3_WFA
315	100	125	250	—	186	3RW4075-6BB34	73ES3_BFA		73ES3_DFA		73ES3_OFA		73ES3_EFA		73ES3_WFA
385	125	150	300	—	224	3RW4076-6BB34	73FS3_BFA		73FS3_DFA		73FS3_OFA		73FS3_EFA		73FS3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
117	—	—	75	100	—	3RW4055-6BB35	73AS35BFA		73AS35DFA		73AS350FA		73AS35EFA		73AS35WFA
145	—	—	100	150	—	3RW4056-6BB35	73BS35BFA		73BS35DFA		73BS350FA		73BS35EFA		73BS35WFA
205	—	—	150	200	—	3RW4073-6BB35	73CS35BFA		73CS35DFA		73CS350FA		73CS35EFA		73CS35WFA
248	—	—	200	250	—	3RW4074-6BB35	73DS35BFA		73DS35DFA		73DS350FA		73DS35EFA		73DS35WFA
315	—	—	250	300	—	3RW4075-6BB35	73ES35BFA		73ES35DFA		73ES350FA		73ES35EFA		73ES35WFA
385	—	—	300	400	—	3RW4076-6BB35	73FS35BFA		73FS35DFA		73FS350FA		73FS35EFA		73FS35WFA

### Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP <sup>①</sup>				kW	Class 20 Severe Duty (350% * Ie for 20s) <sup>②</sup>									
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$
112	30	40	75	—	56	3RW4055-6BB34	73AS3_BFA		73AS3_DFA		73AS3_OFA		73AS3_EFA		73AS3_WFA
132	40	50	100	—	75	3RW4056-6BB34	73BS3_BFA		73BS3_DFA		73BS3_OFA		73BS3_EFA		73BS3_WFA
185	60	60	125	—	93	3RW4073-6BB34	73CS3_BFA		73CS3_DFA		73CS3_OFA		73CS3_EFA		73CS3_WFA
205	60	75	150	—	112	3RW4074-6BB34	73DS3_BFA		73DS3_DFA		73DS3_OFA		73DS3_EFA		73DS3_WFA
280	75	100	200	—	149	3RW4075-6BB34	73ES3_BFA		73ES3_DFA		73ES3_OFA		73ES3_EFA		73ES3_WFA
340	100	125	250	—	186	3RW4076-6BB34	73FS3_BFA		73FS3_DFA		73FS3_OFA		73FS3_EFA		73FS3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
112	—	—	75	75	—	3RW4055-6BB35	73AS35BFA		73AS35DFA		73AS350FA		73AS35EFA		73AS35WFA
132	—	—	100	125	—	3RW4056-6BB35	73BS35BFA		73BS35DFA		73BS350FA		73BS35EFA		73BS35WFA
185	—	—	125	150	—	3RW4073-6BB35	73CS35BFA		73CS35DFA		73CS350FA		73CS35EFA		73CS35WFA
205	—	—	150	200	—	3RW4074-6BB35	73DS35BFA		73DS35DFA		73DS350FA		73DS35EFA		73DS35WFA
280	—	—	200	250	—	3RW4075-6BB35	73ES35BFA		73ES35DFA		73ES350FA		73ES35EFA		73ES35WFA
340	—	—	250	300	—	3RW4076-6BB35	73FS35BFA		73FS35DFA		73FS350FA		73FS35EFA		73FS35WFA

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

# 3RW Soft Starters

## 3RW40 – Size S0-S3 Circuit Breaker



**3RW40 Enclosed features:**

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in Bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10, 15, or 20
- Internal self protection
- Fault monitoring
- Isolation Contactor

### Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
- ▶ The 3RW40 is designed for normal starting applications.
- ▶ For factory modifications see page 7/43.
- ▶ For complete derating and application info see page 7/59
- ▶ For dimensional drawings see page 7/95.

Class 74 non-combination starters include:

- NEMA rated enclosure
- Circuit Breaker disconnect with shunt trip
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control Circuit Transformer
- Isolation Contactor

Ideal applications for 3RW40 enclosed softstarters

- Fans
- Pumps
- Easy starting loads starting in less than 10 seconds

Class 74 starters are built to UL and CSA standards

## 3RW40 for Standard Applications

### Enclosed Circuit Breaker Combination (Starter With Circuit Breaker Disconnect)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty (350% * Ie for 10s) <sup>②</sup>										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
11	3	3	7.5	—	6	3RW4024-1BB14	74AR3_BFAP		74AR3_DFAP		74AR3_OFAP		74AR3_EFAP		74AR3_WFAP	
23	5	7.5	15	—	13	3RW4026-1BB14	74BR3_BFAP		74BR3_DFAP		74BR3_OFAP		74BR3_EFAP		74BR3_WFAP	
29	7.5	10	20	—	16	3RW4027-1BB14	74CR3_BFAP		74CR3_DFAP		74CR3_OFAP		74CR3_EFAP		74CR3_WFAP	
34	10	10	25	—	18	3RW4028-1BB14	74DR3_BFAP		74DR3_DFAP		74DR3_OFAP		74DR3_EFAP		74DR3_WFAP	
42	10	15	30	—	23	3RW4036-1BB14	74ER3_BFAP		74ER3_DFAP		74ER3_OFAP		74ER3_EFAP		74ER3_WFAP	
58	15	20	40	—	31	3RW4037-1BB14	74FR3_BFAP		74FR3_DFAP		74FR3_OFAP		74FR3_EFAP		74FR3_WFAP	
62	20	20	40	—	33	3RW4038-1BB14	74GR3_BFAP		74GR3_DFAP		74GR3_OFAP		74GR3_EFAP		74GR3_WFAP	
73	20	25	50	—	39	3RW4046-1BB14	74HR3_BFAP		74HR3_DFAP		74HR3_OFAP		74HR3_EFAP		74HR3_WFAP	
98	30	30	75	—	52	3RW4047-1BB14	74JR3_BFAP		74JR3_DFAP		74JR3_OFAP		74JR3_EFAP		74JR3_WFAP	
							200V	6		6		6		6		6
							230V	2		2		2		2		2
							380V	3		3		3		3		3
							460V	4		4		4		4		4

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C

② Starter selection is dependent on type of application. Ie = FLA rating of motor



Enclosed 3RW44



- 3RW40 Enclosed features:
- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
  - Compact size
  - Built-in bypass contactor
  - Voltage ramp up and ramp down
  - Current limit adjustment of 125 - 550%
  - Internal overload class 10, 15, or 20
  - Internal self protection
  - Fault monitoring

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications (Class 10 applications).
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

- Class 74 non-combination starters include:
- NEMA rated enclosure
  - Circuit breaker disconnect with shunt trip
  - 3RW40 Sirius softstarter with built-in OL and bypass
  - Control circuit transformer

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW40 for Standard Applications

Enclosed Circuit Breaker Combination (Starter with Circuit Breaker Disconnect)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty (350% * Im for 10s) <sup>②</sup>											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
117	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAP		74AS3_DFAP		74AS3_OFAP		74AS3_EFAP		74AS3_WFAP		
145	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP		74BS3_DFAP		74BS3_OFAP		74BS3_EFAP		74BS3_WFAP		
205	60	75	150	—	112	3RW4073-6BB34	74CS3_BFAP		74CS3_DFAP		74CS3_OFAP		74CS3_EFAP				
248	75	100	200	—	149	3RW4074-6BB34	74DS3_BFAP		74DS3_DFAP		74DS3_OFAP		74DS3_EFAP				
315	100	125	250	—	186	3RW4075-6BB34	74ES3_BFAP		74ES3_DFAP		74ES3_OFAP		74ES3_EFAP				
385	125	150	300	—	224	3RW4076-6BB34	74FS3_BFAP		74FS3_DFAP		74FS3_OFAP		74FS3_EFAP				
						200V	6		6		6		6		6		
						230V	2		2		2		2		2		
						380V	3		3		3		3		3		
						460V	4		4		4		4		4		
117	—	—	75	100	—	3RW4055-6BB35	74AS35BFAP		74AS35DFAP		74AS350FAP		74AS35EFAP		74AS35WFAP		
145	—	—	100	150	—	3RW4056-6BB35	74BS35BFAP		74BS35DFAP		74BS350FAP		74BS35EFAP		74BS35WFAP		
205	—	—	150	200	—	3RW4073-6BB35	74CS35BFAP		74CS35DFAP		74CS350FAP		74CS35EFAP				
248	—	—	200	250	—	3RW4074-6BB35	74DS35BFAP		74DS35DFAP		74DS350FAP		74DS35EFAP				
315	—	—	250	300	—	3RW4075-6BB35	74ES35BFAP		74ES35DFAP		74ES350FAP		74ES35EFAP				
385	—	—	300	400	—	3RW4076-6BB35	74FS35BFAP		74FS35DFAP		74FS350FAP		74FS35EFAP				

Enclosed Circuit Breaker Combination (Starter with Circuit Breaker Disconnect)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 20 Severe Duty (350% * Ie for 20s) <sup>②</sup>											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
112	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAP		74AS3_DFAP		74AS3_OFAP		74AS3_EFAP		74AS3_WFAP		
132	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP		74BS3_DFAP		74BS3_OFAP		74BS3_EFAP		74BS3_WFAP		
185	60	60	125	—	93	3RW4073-6BB34	74CS3_BFAP		74CS3_DFAP		74CS3_OFAP		74CS3_EFAP				
205	60	75	150	—	112	3RW4074-6BB34	74DS3_BFAP		74DS3_DFAP		74DS3_OFAP		74DS3_EFAP				
280	75	100	200	—	149	3RW4075-6BB34	74ES3_BFAP		74ES3_DFAP		74ES3_OFAP		74ES3_EFAP				
340	100	125	250	—	186	3RW4076-6BB34	74FS3_BFAP		74FS3_DFAP		74FS3_OFAP		74FS3_EFAP				
						200V	6		6		6		6		6		
						230V	2		2		2		2		2		
						380V	3		3		3		3		3		
						460V	4		4		4		4		4		
112	—	—	75	75	—	3RW4055-6BB35	74AS35BFAP		74AS35DFAP		74AS350FAP		74AS35EFAP		74AS35WFAP		
132	—	—	100	125	—	3RW4056-6BB35	74BS35BFAP		74BS35DFAP		74BS350FAP		74BS35EFAP		74BS35WFAP		
185	—	—	125	150	—	3RW4073-6BB35	74CS35BFAP		74CS35DFAP		74CS350FAP		74CS35EFAP				
205	—	—	150	200	—	3RW4074-6BB35	74DS35BFAP		74DS35DFAP		74DS350FAP		74DS35EFAP				
280	—	—	200	250	—	3RW4075-6BB35	74ES35BFAP		74ES35DFAP		74ES350FAP		74ES35EFAP				
340	—	—	250	300	—	3RW4076-6BB35	74FS35BFAP		74FS35DFAP		74FS350FAP		74FS35EFAP				

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



# 3RW Soft Starters

## 3RW40 – Size S0-S3 Fusible



- 3RW40 Enclosed features:
- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
  - Compact size
  - Built-in Bypass contactor
  - Voltage ramp up and ramp down
  - Current limit adjustment of 125 - 550%
  - Internal overload class 10,15, or 20
  - Internal self protection
  - Fault monitoring
  - Isolation Contactor

### Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
  - ▶ The 3RW40 is designed for normal starting applications.
  - ▶ For factory modifications see page 7/43.
  - ▶ For complete derating and application info see page 7/59
  - ▶ For dimensional drawings see page 7/95.
- Ideal applications for 3RW40 enclosed softstarters
- Fans
  - Pumps
  - Easy starting loads starting in less than 10 seconds
- Class 74 starters are built to UL and CSA standards

- Class 73 non-combination starters include:
- NEMA rated enclosure
  - Fusible Disconnect
  - 3RW40 Sirius softstarter with built-in OL and bypass
  - Control Circuit Transformer
  - Isolation Contactor

## 3RW40 for Standard Applications

### Enclosed Fusible Combination (Starter With Fusible Disconnect)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty (350% * I <sub>e</sub> for 10s) <sup>②</sup>										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
11	3	3	7.5	—	6	3RW4024-1BB14	74AR3_BFAF		74AR3_DFAF		74AR3_OFAF		74AR3_EFAF		74AR3_WFAF	
23	5	7.5	15	—	13	3RW4026-1BB14	74BR3_BFAF		74BR3_DFAF		74BR3_OFAF		74BR3_EFAF		74BR3_WFAF	
29	7.5	10	20	—	16	3RW4027-1BB14	74CR3_BFAF		74CR3_DFAF		74CR3_OFAF		74CR3_EFAF		74CR3_WFAF	
34	10	10	25	—	18	3RW4028-1BB14	74DR3_BFAF		74DR3_DFAF		74DR3_OFAF		74DR3_EFAF		74DR3_WFAF	
42	10	15	30	—	23	3RW4036-1BB14	74ER3_BFAF		74ER3_DFAF		74ER3_OFAF		74ER3_EFAF		74ER3_WFAF	
58	15	20	40	—	31	3RW4037-1BB14	74FR3_BFAF		74FR3_DFAF		74FR3_OFAF		74FR3_EFAF		74FR3_WFAF	
62	20	20	40	—	33	3RW4038-1BB14	74GR3_BFAF		74GR3_DFAF		74GR3_OFAF		74GR3_EFAF		74GR3_WFAF	
73	20	25	50	—	39	3RW4046-1BB14	74HR3_BFAF		74HR3_DFAF		74HR3_OFAF		74HR3_EFAF		74HR3_WFAF	
98	30	30	75	—	52	3RW4047-1BB14	74JR3_BFAF		74JR3_DFAF		74JR3_OFAF		74JR3_EFAF		74JR3_WFAF	
							200V	6		6		6		6		6
							230V	2		2		2		2		2
							380V	3		3		3		3		3
							460V	4		4		4		4		4

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C

② Starter selection is dependent on type of application. I<sub>e</sub> = FLA rating of motor

Enclosed 3RW44



- 3RW40 Enclosed features:
- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
  - Compact size
  - Built-in bypass contactor
  - Voltage ramp up and ramp down
  - Current limit adjustment of 125 - 550%
  - Internal overload class 10, 15, or 20
  - Internal self protection
  - Fault monitoring

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications (Class 10 applications).
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 74 combination starters include:

- NEMA rated enclosure
- Fusible disconnect
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW40 for Standard Applications

Enclosed Fusible Combination (Starter with Fusible Disconnect)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty (350% * I <sub>m</sub> for 10s) <sup>②</sup>											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
117	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAF		74AS3_DFAF		74AS3_0FAF		74AS3_EFAF		74AS3_WFAF		
145	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAF		74BS3_DFAF		74BS3_0FAF		74BS3_EFAF		74BS3_WFAF		
205	60	75	150	—	112	3RW4073-6BB34	74CS3_BFAF		74CS3_DFAF		74CS3_0FAF		74CS3_EFAF				
248	75	100	200	—	149	3RW4074-6BB34	74DS3_BFAF		74DS3_DFAF		74DS3_0FAF		74DS3_EFAF				
315	100	125	250	—	186	3RW4075-6BB34	74ES3_BFAF		74ES3_DFAF		74ES3_0FAF		74ES3_EFAF				
385	125	150	300	—	224	3RW4076-6BB34	74FS3_BFAF		74FS3_DFAF		74FS3_0FAF		74FS3_EFAF				
							200V	6		6		6		6		6	
							230V	2		2		2		2		2	
							380V	3		3		3		3		3	
							460V	4		4		4		4		4	
117	—	—	75	100	—	3RW4055-6BB35	74AS35BFAF		74AS35DFAF		74AS350FAF		74AS35EFAF		74AS35WFAF		
145	—	—	100	150	—	3RW4056-6BB35	74BS35BFAF		74BS35DFAF		74BS350FAF		74BS35EFAF		74BS35WFAF		
205	—	—	150	200	—	3RW4073-6BB35	74CS35BFAF		74CS35DFAF		74CS350FAF		74CS35EFAF				
248	—	—	200	250	—	3RW4074-6BB35	74DS35BFAF		74DS35DFAF		74DS350FAF		74DS35EFAF				
315	—	—	250	300	—	3RW4075-6BB35	74ES35BFAF		74ES35DFAF		74ES350FAF		74ES35EFAF				
385	—	—	300	400	—	3RW4076-6BB35	74FS35BFAF		74FS35DFAF		74FS350FAF		74FS35EFAF				

Enclosed Fusible Combination (Starter with Fusible Disconnect)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 20 Severe Duty (350% * I <sub>e</sub> for 20s) <sup>②</sup>											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
112	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAF		74AS3_DFAF		74AS3_0FAF		74AS3_EFAF		74AS3_WFAF		
132	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAF		74BS3_DFAF		74BS3_0FAF		74BS3_EFAF		74BS3_WFAF		
185	60	60	125	—	93	3RW4073-6BB34	74CS3_BFAF		74CS3_DFAF		74CS3_0FAF		74CS3_EFAF				
205	60	75	150	—	112	3RW4074-6BB34	74DS3_BFAF		74DS3_DFAF		74DS3_0FAF		74DS3_EFAF				
280	75	100	200	—	149	3RW4075-6BB34	74ES3_BFAF		74ES3_DFAF		74ES3_0FAF		74ES3_EFAF				
340	100	125	250	—	186	3RW4076-6BB34	74FS3_BFAF		74FS3_DFAF		74FS3_0FAF		74FS3_EFAF				
							200V	6		6		6		6		6	
							230V	2		2		2		2		2	
							380V	3		3		3		3		3	
							460V	4		4		4		4		4	
112	—	—	75	75	—	3RW4055-6BB35	74AS35BFAF		74AS35DFAF		74AS350FAF		74AS35EFAF		74AS35WFAF		
132	—	—	100	125	—	3RW4056-6BB35	74BS35BFAF		74BS35DFAF		74BS350FAF		74BS35EFAF		74BS35WFAF		
185	—	—	125	150	—	3RW4073-6BB35	74CS35BFAF		74CS35DFAF		74CS350FAF		74CS35EFAF				
205	—	—	150	200	—	3RW4074-6BB35	74DS35BFAF		74DS35DFAF		74DS350FAF		74DS35EFAF				
280	—	—	200	250	—	3RW4075-6BB35	74ES35BFAF		74ES35DFAF		74ES350FAF		74ES35EFAF				
340	—	—	250	300	—	3RW4076-6BB35	74FS35BFAF		74FS35DFAF		74FS350FAF		74FS35EFAF				

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. I<sub>m</sub> = FLA rating of motor.

Enclosed 3RW44



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 73 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

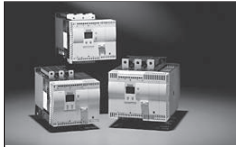
Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty (350% * Im for 10s) <sup>②</sup>										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	73AT3_BFA		73AT3_DFA		73AT3_OFA		73AT3_EFA		73AT3_WFA	
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_OFA		73BT3_EFA		73BT3_WFA	
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_OFA		73CT3_EFA		73CT3_WFA	
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_OFA		73DT3_EFA		73DT3_WFA	
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_OFA		73ET3_EFA		73ET3_WFA	
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_OFA		73FT3_EFA		73FT3_WFA	
100	30	30	75	—	56	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_OFA		73GT3_EFA		73GT3_WFA	
117	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_OFA		73HT3_EFA		73HT3_WFA	
145	40	50	100	—	75	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_OFA		73JT3_EFA		73JT3_WFA	
180	60	60	125	—	93	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_OFA		73KT3_EFA		73KT3_WFA	
215	60	75	150	—	112	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_OFA		73LT3_EFA		73LT3_WFA	
280	75	100	200	—	149	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_OFA		73MT3_EFA		73MT3_WFA	
315	100	125	250	—	186	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_OFA		73NT3_EFA		73NT3_WFA	
385	125	150	300	—	224	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_OFA		73PT3_EFA		73PT3_WFA	
494	150	200	400	—	298	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_OFA		73QT3_EFA		73QT3_WFA	
551	150	200	450	—	336	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_OFA		73RT3_EFA		73RT3_WFA	
615	200	250	500	—	373	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_OFA		73ST3_EFA		73ST3_WFA	
693	200	250	550	—	410	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_OFA		73TT3_EFA		73TT3_WFA	
780	200	250	600	—	447	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_OFA		73WT3_EFA		73WT3_WFA	
970	350	350	800	—	597	3RW4465-6BC34	73YT3_BFA		73YT3_DFA		73YT3_OFA		73YT3_EFA		73YT3_WFA	
1076	350	400	900	—	972	3RW4466-6BC34	73ZT3_BFA		73ZT3_DFA		73ZT3_OFA		73ZT3_EFA		73ZT3_WFA	
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
26	—	—	15	20	—	3RW4422-1BC35	73AT35BFA		73AT35DFA		73AT35OFA		73AT35EFA		73AT35WFA	
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT35OFA		73BT35EFA		73BT35WFA	
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT35OFA		73CT35EFA		73CT35WFA	
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT35OFA		73DT35EFA		73DT35WFA	
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET35OFA		73ET35EFA		73ET35WFA	
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT35OFA		73FT35EFA		73FT35WFA	
100	—	—	75	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT35OFA		73GT35EFA		73GT35WFA	
117	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT35OFA		73HT35EFA		73HT35WFA	
145	—	—	100	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT35OFA		73JT35EFA		73JT35WFA	
180	—	—	125	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT35OFA		73KT35EFA		73KT35WFA	
215	—	—	150	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT35OFA		73LT35EFA		73LT35WFA	
280	—	—	200	250	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT35OFA		73MT35EFA		73MT35WFA	
315	—	—	250	300	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT35OFA		73NT35EFA		73NT35WFA	
385	—	—	300	400	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT35OFA		73PT35EFA		73PT35WFA	
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT35OFA		73QT35EFA		73QT35WFA	
551	—	—	450	600	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT35OFA		73RT35EFA		73RT35WFA	
615	—	—	500	700	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST35OFA		73ST35EFA		73ST35WFA	
693	—	—	550	750	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT35OFA		73TT35EFA		73TT35WFA	
780	—	—	600	850	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT35OFA		73WT35EFA		73WT35WFA	
970	—	—	800	1000	—	3RW4465-6BC35	73YT35BFA		73YT35DFA		73YT35OFA		73YT35EFA		73YT35WFA	
1076	—	—	900	1100	—	3RW4466-6BC35	73ZT35BFA		73ZT35DFA		73ZT35OFA		73ZT35EFA		73ZT35WFA	

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

Enclosed 3RW44



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 10, 15, or 20
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Line side power terminal block
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 73 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 20 Severe Duty (350% * Im for 20s) <sup>②</sup>										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	73AT3_BFA		73AT3_DFA		73AT3_OFA		73AT3_EFA		73AT3_WFA	
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_OFA		73BT3_EFA		73BT3_WFA	
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_OFA		73CT3_EFA		73CT3_WFA	
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_OFA		73DT3_EFA		73DT3_WFA	
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_OFA		73ET3_EFA		73ET3_WFA	
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_OFA		73FT3_EFA		73FT3_WFA	
97	30	30	60	—	45	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_OFA		73GT3_EFA		73GT3_WFA	
113	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_OFA		73HT3_EFA		73HT3_WFA	
134	40	50	75	—	56	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_OFA		73JT3_EFA		73JT3_WFA	
175	50	60	100	—	75	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_OFA		73KT3_EFA		73KT3_WFA	
195	60	75	125	—	93	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_OFA		73LT3_EFA		73LT3_WFA	
243	75	75	150	—	112	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_OFA		73MT3_EFA		73MT3_WFA	
263	75	100	200	—	149	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_OFA		73NT3_EFA		73NT3_WFA	
326	100	125	250	—	186	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_OFA		73PT3_EFA		73PT3_WFA	
494	150	150	400	—	224	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_OFA		73QT3_EFA		73QT3_WFA	
551	150	200	450	—	298	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_OFA		73RT3_EFA		73RT3_WFA	
615	200	200	500	—	336	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_OFA		73ST3_EFA		73ST3_WFA	
634	200	250	500	—	373	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_OFA		73TT3_EFA		73TT3_WFA	
650	200	250	550	—	410	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_OFA		73WT3_EFA		73WT3_WFA	
880	300	350	700	—	522	3RW4465-6BC34	73YT3_BFA		73YT3_DFA		73YT3_OFA		73YT3_EFA		73YT3_WFA	
940	300	350	750	—	559	3RW4466-6BC34	73ZT3_BFA		73ZT3_DFA		73ZT3_OFA		73ZT3_EFA		73ZT3_WFA	
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
26	—	—	15	20	—	3RW4422-1BC35	73AT35BFA		73AT35DFA		73AT35OFA		73AT35EFA		73AT35WFA	
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT35OFA		73BT35EFA		73BT35WFA	
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT35OFA		73CT35EFA		73CT35WFA	
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT35OFA		73DT35EFA		73DT35WFA	
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET35OFA		73ET35EFA		73ET35WFA	
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT35OFA		73FT35EFA		73FT35WFA	
97	—	—	60	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT35OFA		73GT35EFA		73GT35WFA	
113	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT35OFA		73HT35EFA		73HT35WFA	
134	—	—	75	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT35OFA		73JT35EFA		73JT35WFA	
175	—	—	100	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT35OFA		73KT35EFA		73KT35WFA	
195	—	—	125	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT35OFA		73LT35EFA		73LT35WFA	
243	—	—	150	200	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT35OFA		73MT35EFA		73MT35WFA	
263	—	—	200	250	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT35OFA		73NT35EFA		73NT35WFA	
326	—	—	250	300	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT35OFA		73PT35EFA		73PT35WFA	
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT35OFA		73QT35EFA		73QT35WFA	
551	—	—	450	550	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT35OFA		73RT35EFA		73RT35WFA	
615	—	—	500	600	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST35OFA		73ST35EFA		73ST35WFA	
693	—	—	500	650	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT35OFA		73TT35EFA		73TT35WFA	
780	—	—	550	700	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT35OFA		73WT35EFA		73WT35WFA	
880	—	—	700	850	—	3RW4465-6BC35	73YT35BFA		73YT35DFA		73YT35OFA		73YT35EFA		73YT35WFA	
940	—	—	750	900	—	3RW4466-6BC35	73ZT35BFA		73ZT35DFA		73ZT35OFA		73ZT35EFA		73ZT35WFA	

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

Enclosed 3RW44



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.
- For stocked versions see page 7/89.

Class 74 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Circuit breaker with disconnect
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Combination with Circuit Breaker Disconnect

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty (350% * Im for 10s) <sup>②</sup>											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAP		74AT3_DFAP		74AT3_OFAP		74AT3_EFAP		74AT3_WFAP		
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_OFAP		74BT3_EFAP		74BT3_WFAP		
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_OFAP		74CT3_EFAP		74CT3_WFAP		
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_OFAP		74DT3_EFAP		74DT3_WFAP		
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_OFAP		74ET3_EFAP		74ET3_WFAP		
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_OFAP		74FT3_EFAP		74FT3_WFAP		
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_OFAP		74GT3_EFAP		74GT3_WFAP		
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_OFAP		74HT3_EFAP		74HT3_WFAP		
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_OFAP		74JT3_EFAP		74JT3_WFAP		
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_OFAP		74KT3_EFAP		74KT3_WFAP		
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_OFAP		74LT3_EFAP		74LT3_WFAP		
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_OFAP		74MT3_EFAP		74MT3_WFAP		
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_OFAP		74NT3_EFAP		74NT3_WFAP		
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_OFAP		74PT3_EFAP		74PT3_WFAP		
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_OFAT		74QT3_EFAT		74QT3_WFAT		
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_OFAT		74RT3_EFAT		74RT3_WFAT		
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_OFAT		74ST3_EFAT		74ST3_WFAT		
693	200	250	550	—	410	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_OFAT		74TT3_EFAT		74TT3_WFAT		
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_OFAT		74WT3_EFAT		74WT3_WFAT		
970	350	350	800	—	597	3RW4465-6BC34	74YT3_BFAT		74YT3_DFAT		74YT3_OFAT		74YT3_EFAT		74YT3_WFAT		
1076	350	400	900	—	672	3RW4466-6BC34	74ZT3_BFAT		74ZT3_DFAT		74ZT3_OFAT		74ZT3_EFAT		74ZT3_WFAT		
						200V	6		6		6		6		6		
						230V	2		2		2		2		2		
						380V	3		3		3		3		3		
						460V	4		4		4		4		4		
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAP		74AT35DFAP		74AT35OFAP		74AT35EFAP		74AT35WFAP		
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT35OFAP		74BT35EFAP		74BT35WFAP		
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT35OFAP		74CT35EFAP		74CT35WFAP		
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT35OFAP		74DT35EFAP		74DT35WFAP		
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET35OFAP		74ET35EFAP		74ET35WFAP		
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT35OFAP		74FT35EFAP		74FT35WFAP		
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT35OFAP		74GT35EFAP		74GT35WFAP		
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT35OFAP		74HT35EFAP		74HT35WFAP		
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT35OFAP		74JT35EFAP		74JT35WFAP		
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT35OFAP		74KT35EFAP		74KT35WFAP		
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT35OFAP		74LT35EFAP		74LT35WFAP		
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT35OFAP		74MT35EFAP		74MT35WFAP		
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT35OFAP		74NT35EFAP		74NT35WFAP		
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT35OFAP		74PT35EFAP		74PT35WFAP		
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT35OFAT		74QT35EFAT		74QT35WFAT		
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT35OFAT		74RT35EFAT		74RT35WFAT		
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST35OFAT		74ST35EFAT		74ST35WFAT		
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT35OFAT		74TT35EFAT		74TT35WFAT		
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT35OFAT		74WT35EFAT		74WT35WFAT		
970	—	—	800	1000	—	3RW4465-6BC35	74YT35BFAT		74YT35DFAT		74YT35OFAT		74YT35EFAT		74YT35WFAT		
1076	—	—	900	1100	—	3RW4466-6BC35	74ZT35BFAT		74ZT35DFAT		74ZT35OFAT		74ZT35EFAT		74ZT35WFAT		

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



Enclosed 3RW44



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.
- For stocked versions see page 7/89.

Class 74 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Circuit breaker with disconnect
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Combination with Circuit Breaker Disconnect

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 20 Severe Duty (350% * Im for 20s) <sup>②</sup>									
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAP		74AT3_DFAP		74AT3_OFAP		74AT3_EFAP		74AT3_WFAP
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_OFAP		74BT3_EFAP		74BT3_WFAP
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_OFAP		74CT3_EFAP		74CT3_WFAP
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_OFAP		74DT3_EFAP		74DT3_WFAP
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_OFAP		74ET3_EFAP		74ET3_WFAP
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_OFAP		74FT3_EFAP		74FT3_WFAP
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_OFAP		74GT3_EFAP		74GT3_WFAP
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_OFAP		74HT3_EFAP		74HT3_WFAP
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_OFAP		74JT3_EFAP		74JT3_WFAP
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_OFAP		74KT3_EFAP		74KT3_WFAP
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_OFAP		74LT3_EFAP		74LT3_WFAP
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_OFAP		74MT3_EFAP		74MT3_WFAP
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_OFAP		74NT3_EFAP		74NT3_WFAP
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_OFAP		74PT3_EFAP		74PT3_WFAP
494	150	150	400	—	224	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_OFAT		74QT3_EFAT		74QT3_WFAT
551	150	200	450	—	298	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_OFAT		74RT3_EFAT		74RT3_WFAT
615	200	200	500	—	336	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_OFAT		74ST3_EFAT		74ST3_WFAT
634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_OFAT		74TT3_EFAT		74TT3_WFAT
650	200	250	550	—	410	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_OFAT		74WT3_EFAT		74WT3_WFAT
880	300	350	700	—	522	3RW4465-6BC34	74YT3_BFAT		74YT3_DFAT		74YT3_OFAT		74YT3_EFAT		74YT3_WFAT
940	300	350	750	—	559	3RW4466-6BC34	74ZT3_BFAT		74ZT3_DFAT		74ZT3_OFAT		74ZT3_EFAT		74ZT3_WFAT
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAP		74AT35DFAP		74AT35OFAP		74AT35EFAP		74AT35WFAP
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT35OFAP		74BT35EFAP		74BT35WFAP
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT35OFAP		74CT35EFAP		74CT35WFAP
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT35OFAP		74DT35EFAP		74DT35WFAP
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET35OFAP		74ET35EFAP		74ET35WFAP
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT35OFAP		74FT35EFAP		74FT35WFAP
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT35OFAP		74GT35EFAP		74GT35WFAP
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT35OFAP		74HT35EFAP		74HT35WFAP
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT35OFAP		74JT35EFAP		74JT35WFAP
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT35OFAP		74KT35EFAP		74KT35WFAP
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT35OFAP		74LT35EFAP		74LT35WFAP
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT35OFAP		74MT35EFAP		74MT35WFAP
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT35OFAP		74NT35EFAP		74NT35WFAP
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT35OFAP		74PT35EFAP		74PT35WFAP
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT35OFAT		74QT35EFAT		74QT35WFAT
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT35OFAT		74RT35EFAT		74RT35WFAT
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST35OFAT		74ST35EFAT		74ST35WFAT
693	—	—	500	650	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT35OFAT		74TT35EFAT		74TT35WFAT
780	—	—	550	700	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT35OFAT		74WT35EFAT		74WT35WFAT
880	—	—	700	850	—	3RW4465-6BC35	74YT35BFAT		74YT35DFAT		74YT35OFAT		74YT35EFAT		74YT35WFAT
940	—	—	750	900	—	3RW4466-6BC35	74ZT35BFAT		74ZT35DFAT		74ZT35OFAT		74ZT35EFAT		74ZT35WFAT

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

Enclosed 3RW44



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 74 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Fusible disconnect
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW44 For High Feature Applications

Enclosed Combination with Fusible Disconnect

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty <sup>②</sup> (350% * Im for 10s)										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAF		74AT3_DFAF		74AT3_OFAF		74AT3_EFAF		74AT3_WFAF	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_OFAF		74BT3_EFAF		74BT3_WFAF	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_OFAF		74CT3_EFAF		74CT3_WFAF	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_OFAF		74DT3_EFAF		74DT3_WFAF	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_OFAF		74ET3_EFAF		74ET3_WFAF	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_OFAF		74FT3_EFAF		74FT3_WFAF	
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_OFAF		74GT3_EFAF		74GT3_WFAF	
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_OFAF		74HT3_EFAF		74HT3_WFAF	
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_OFAF		74JT3_EFAF		74JT3_WFAF	
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_OFAF		74KT3_EFAF		74KT3_WFAF	
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_OFAF		74LT3_EFAF		74LT3_WFAF	
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_OFAF		74MT3_EFAF		74MT3_WFAF	
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_OFAF		74NT3_EFAF		74NT3_WFAF	
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_OFAF		74PT3_EFAF		74PT3_WFAF	
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAF				74QT3_OFAF					
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF				74RT3_OFAF					
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAF				74ST3_OFAF					
693	200	250	550	—		3RW4456-6BC34	74TT3_BFAF				74TT3_OFAF					
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAF				74WT3_OFAF					
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAF		74AT35DFAF		74AT35OFAF		74AT35EFAF		74AT35WFAF	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT35OFAF		74BT35EFAF		74BT35WFAF	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT35OFAF		74CT35EFAF		74CT35WFAF	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT35OFAF		74DT35EFAF		74DT35WFAF	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET35OFAF		74ET35EFAF		74ET35WFAF	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT35OFAF		74FT35EFAF		74FT35WFAF	
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT35OFAF		74GT35EFAF		74GT35WFAF	
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT35OFAF		74HT35EFAF		74HT35WFAF	
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT35OFAF		74JT35EFAF		74JT35WFAF	
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT35OFAF		74KT35EFAF		74KT35WFAF	
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT35OFAF		74LT35EFAF		74LT35WFAF	
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT35OFAF		74MT35EFAF		74MT35WFAF	
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT35OFAF		74NT35EFAF		74NT35WFAF	
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT35OFAF		74PT35EFAF		74PT35WFAF	
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF				74QT35OFAF					
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAF				74RT35OFAF					
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAF				74ST35OFAF					
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAF				74TT35OFAF					
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAF				74WT35OFAF					

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Enclosed 3RW44



3RW44 Enclosed features:

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- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

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- Reset button

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- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

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3RW44 For High Feature Applications  
Enclosed Combination with Fusible Disconnect

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 20 Severe Duty (350% * Im for 20s) <sup>②</sup>										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAF		74AT3_DFAF		74AT3_OFAF		74AT3_EFAF		74AT3_WFAF	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_OFAF		74BT3_EFAF		74BT3_WFAF	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_OFAF		74CT3_EFAF		74CT3_WFAF	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_OFAF		74DT3_EFAF		74DT3_WFAF	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_OFAF		74ET3_EFAF		74ET3_WFAF	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_OFAF		74FT3_EFAF		74FT3_WFAF	
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_OFAF		74GT3_EFAF		74GT3_WFAF	
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_OFAF		74HT3_EFAF		74HT3_WFAF	
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_OFAF		74JT3_EFAF		74JT3_WFAF	
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_OFAF		74KT3_EFAF		74KT3_WFAF	
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_OFAF		74LT3_EFAF		74LT3_WFAF	
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_OFAF		74MT3_EFAF		74MT3_WFAF	
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_OFAF		74NT3_EFAF		74NT3_WFAF	
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_OFAF		74PT3_EFAF		74PT3_WFAF	
494	150	150	400	—	298	3RW4453-6BC34	74QT3_BFAF		74QT3_DFAF		74QT3_OFAF		74QT3_EFAF		74QT3_WFAF	
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF		74RT3_DFAF		74RT3_OFAF		74RT3_EFAF		74RT3_WFAF	
615	200	200	500	—	373	3RW4455-6BC34	74ST3_BFAF		74ST3_DFAF		74ST3_OFAF		74ST3_EFAF		74ST3_WFAF	
634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAF		74TT3_DFAF		74TT3_OFAF		74TT3_EFAF		74TT3_WFAF	
650	200	250	550	—	373	3RW4457-6BC34	74WT3_BFAF		74WT3_DFAF		74WT3_OFAF		74WT3_EFAF		74WT3_WFAF	
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAF		74AT35DFAF		74AT35OFAF		74AT35EFAF		74AT35WFAF	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT35OFAF		74BT35EFAF		74BT35WFAF	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT35OFAF		74CT35EFAF		74CT35WFAF	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT35OFAF		74DT35EFAF		74DT35WFAF	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET35OFAF		74ET35EFAF		74ET35WFAF	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT35OFAF		74FT35EFAF		74FT35WFAF	
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT35OFAF		74GT35EFAF		74GT35WFAF	
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT35OFAF		74HT35EFAF		74HT35WFAF	
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT35OFAF		74JT35EFAF		74JT35WFAF	
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT35OFAF		74KT35EFAF		74KT35WFAF	
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT35OFAF		74LT35EFAF		74LT35WFAF	
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT35OFAF		74MT35EFAF		74MT35WFAF	
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT35OFAF		74NT35EFAF		74NT35WFAF	
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT35OFAF		74PT35EFAF		74PT35WFAF	
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF		74QT35DFAF		74QT35OFAF		74QT35EFAF		74QT35WFAF	
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAF		74RT35DFAF		74RT35OFAF		74RT35EFAF		74RT35WFAF	
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAF		74ST35DFAF		74ST35OFAF		74ST35EFAF		74ST35WFAF	
693	—	—	550	650	—	3RW4456-6BC35	74TT35BFAF		74TT35DFAF		74TT35OFAF		74TT35EFAF		74TT35WFAF	
780	—	—	600	700	—	3RW4457-6BC35	74WT35BFAF		74WT35DFAF		74WT35OFAF		74WT35EFAF		74WT35WFAF	

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



Factory Modifications

Modification Available modifications in STANDARD enclosure	3RW Version	Enclosed Style	Enclosure NEMA Type	Mod Suffix	List Price Adder \$
<b>Push Buttons</b>					
Start/Stop	3RW40/44	73/74	ALL	A1	
Emergency Stop	3RW40/44	73/74	ALL	ES	
<b>Selector Switches</b>					
Hand-Off-Auto	3RW40/44	73/74	ALL	A3	
Hand-Off-Auto w/ start pushbutton	3RW40/44	73/74	ALL	S3	
Off-On	3RW40/44	73/74	ALL	A4	
<b>Pilot Light</b>					
Red 'On'	3RW40/44	73/74	ALL	FA	
Green 'On'	3RW40/44	73/74	ALL	FB	
Red 'Run'	3RW40/44	73/74	ALL	FC	
Green 'Run'	3RW40/44	73/74	ALL	FD	
LED Bulb Upgrade ③	3RW40/44	73/74	ALL	FE	
Red 'Off'	3RW40/44	73/74	ALL	FJ	
Green 'Off'	3RW40/44	73/74	ALL	FK	
Amber 'Fault'	3RW40/44	73/74	ALL	FL	
White 'Control Power On'	3RW40/44	73/74	ALL	FW	
Red, 'On' Push-to-Test	3RW40/44	73/74	ALL	FS	
Green 'On' Push-to-Test	3RW40/44	73/74	ALL	FT	
Green 'Off' Push-to-Test	3RW40/44	73/74	ALL	FU	
Custom pilot light (state color and nameplate text)	3RW40/44	73/74	ALL	FZ	
<b>Through the Door Metering</b>					
External keypad for 3RW44	3RW44	73/74	1,12	K1	
Elapse time meter	3RW40/44	73/74	1,12 (120V)	M5	
<b>Control Options</b>					
Profibus Communication Module (installed-connection cable not supplied)	3RW44	73/74	ALL	P1	
Profinet Communication Module (installed-connection cable not supplied)	3RW44	73/74	ALL	P2	
Ground Lug - 1 Conductor	3RW40/44	73/74	ALL	L10	
Alarm Package (horn, light, relay & push button)	3RW40/44	73/74	1,3R,12	M7	
Electronic 8 function timing relay (.05s - 100h) 24V/100-127V supplied mounted and unwired	3RW40/44	73/74	ALL	TR	
Control Relay supplied mounted and unwired (4 pole max)	3RW40/44	73/74	ALL	R04 R22 R40	
Circuit Breaker Shunt Trip (included std in 3RW40 versions)	3RW44	74	ALL	L6	
Function identification plate w/ marking as specified	3RW40/44	73/74	ALL	N1	
Service Entrance Labeled	3RW40/44	74	ALL	N3	
Terminal Block 3 point	3RW40/44	73/74	ALL	TC3	
Terminal Block 6 point	3RW40/44	73/74	ALL	TC6	
Terminal Block 9 point	3RW40/44	73/74	ALL	TC9	
Terminal Block 12 point	3RW40/44	73/74	ALL	TC12	

Emergency HP Rated Bypass Starter	3RW Version	Class	Enclosure NEMA Type	Mod Suffix	Amp Rating (3rd character of catalog number)									
					List price Adder \$									
3RW40 new	73/74	1/12/3R/4	A12	A,B	C,D,E	FGH	J	—	—	—	—	—	—	—
				—	—	A	B,C	D	E,F	—	—	—		
	3RW44	73	1/12/3R/4	A12	A,B,C ④	D,E ④	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ①	
					—	—	—	—	—	—	—	—		
3RW44	74	1/12/3R/4	A12	A,B,C	D,E	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ①		

Available Modifications Requiring the MODIFIED OPTIONS Box Size (to be used with the selections ending in GA*)	3RW Version	Class	Enclosure NEMA Type	Mod Suffix	Amp Rating (3rd character of catalog number)									
					List price Adder \$									
Isolation Contactor ③	3RW40				—	—	A	B,C	D	E,F	—	—	—	
	3RW44				A,B,C	D,E	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ①	
100 VA Extra CPT Capacity	3RW40/44	73/74	1/12/3R/4	IC										
Space Heater (120V separate control)	3RW40/44	73/74	ALL	CA										
Space Heater w/ T-stat (120V separate control)	3RW40/44	73/74	ALL	SH										
Lightning Arrestor	3RW40/44	73/74	ALL	ST										
				L										

① (A) For sizes 73YT & 73ZT, mods IC & A12 are available and can have both either individually or both at the same time; (B) For sizes 74YT & 74ZT (combination w/ICB), mods IC & A12 are only available individually (NOT both at the same time); (C) For sizes 74YT & 74ZT (combination w/ fusible disc), mods IC & A12 are NOT available individually or both.  
 ② An isolation contactor is included for 3RW40 version with bypass.

③ An isolation contactor is standard on all 3RW40 new styles  
 ④ Includes mod box price, change 8th character to G.  
 ⑤ Pilot lights are transformer type as standard. For LED type bulbs, order suffix FE in addition to the standard device suffix(es). For example, to order red "ON" and green "OFF" pilot lights with LED bulbs, order FA, FK and FE.

# 3RW Soft Starters

## 3RW30 for standard applications

### Overview

The SIRIUS 3RW30 soft starters reduce the motor voltage through variable phase control and increase it in ramp-like mode from a selectable starting voltage up to mains voltage. During starting, these devices limit the torque as well as the current and prevent the shocks which arise during direct starts or wye-delta starts. In this way, mechanical loads and mains voltage dips can be reliably reduced.

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power loss has to be taken into the bargain at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

Various versions of the SIRIUS 3RW30 soft starters are available:

- Standard version for fixed-speed three-phase motors, sizes S00, S0, S2 and S3, with integrated bypass contact system
- Version for fixed-speed three-phase motors in a 22.5 mm enclosure without bypass

Soft starters rated up to 75Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple commissioning are just three of the many advantages of this soft starter.

### Function

The space required by the compact SIRIUS 3RW30 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e. g. brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The new series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this unbalance, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %. The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause.

It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the on-going dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

- Soft starting with voltage ramp; the starting voltage setting range  $U_s$  is 40 % to 100 % and the ramp time  $t_R$  can be set from 0 s to 20 s
- Integrated bypass contact system to minimize power loss
- Setting with two potentiometers
- Simple mounting and commissioning
- Mains voltages at 50/60 Hz, 200 to 480 V
- Two control voltage versions 24 V AC/DC and 110 to 230 V AC/DC
- Wide temperature range from -25 °C to +60 °C
- The built-in auxiliary contact ensures user-friendly control and possible further processing within the system ([for status graphs see page 7/54](#))

# 3RW Soft Starters

## 3RW30 for standard applications

### Technical specifications

Type	3RW30 1., 3RW30 2.		3RW30 3., 3RW30 4.			
<b>Control electronics</b>						
<b>Rated values</b>	Terminal A1/A2	V	24	110 ... 230	24	110 ... 230
Rated control supply voltage		%	±20	-15/+10	±20	-15/+10
• Tolerance						
Rated control supply current		mA	< 50	6	20	< 50
• STANDBY		mA	< 100	15	< 4000	< 500
• During pick-up		mA	< 100	15	20	< 50
• ON						
Rated frequency		Hz	50/60			
• Tolerance		%	±10			
<b>Control input</b>						
IN			ON/OFF			
Power consumption with version		mA	Approx. 12			
• 24 V DC		mA	AC: 3/6; DC: 1.5/3			
• 110/230 V AC						
<b>Relay outputs</b>						
Output 1	ON	13/14	Operating indication (NO)			
Rated operational current		A	3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V			
Protection against overvoltages		A	Protection by means of varistor through contact			
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)			
<b>Operating indications</b>						
		LEDs	<b>DEVICE</b>	<b>STATE/BYPASSED/FAILURE</b>	<b>DEVICE</b>	<b>STATE/BYPASSED/FAILURE</b>
Off			Green	Off	Green	Off
Start			Green	Green flashing	Green	Green flashing
Bypass			Green	Green	Green	Green
<b>Error signals</b>						
• 24 V DC:	$U < 0.75 \times U_s$ or $U > 1.25 \times U_s$		Off	Red	Off	Red
• 110 ... 230 V AC:	$U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Red	Off	Red
Electrical overloading of bypass (reset by removing IN command)			Yellow	Red	--	--
Missing mains voltage, phase failure, missing load			Green	Red	Green	Red
Device fault			Red	Red	Red	Red

Type	3RW30 1. ... 3RW30 4.		Factory default
<b>Control times and parameters</b>			
<b>Control times</b>			
Closing time (with connected control voltage)	ms	< 50	
Closing time (automatic/mains contactor mode)	ms	< 300	
<b>Mains failure bridging time</b>			
Control supply voltage	ms	50	
<b>Mains failure response time<sup>1)</sup></b>			
Load circuit	ms	500	
<b>Starting parameters</b>			
• Starting time	s	0 ... 20	7.5
• Starting voltage	%	40 ... 100	40
<b>Start-up detection</b>			
		No	
<b>Operating mode output 13/14</b>			
Rising edge at	Start command	ON	
Falling edge at	Off command		

<sup>1)</sup> Mains failure detection only in standby state, not during operation.

# 3RW Soft Starters

## 3RW30 for standard applications

Type	3RW30 1.-.BB.4 ... 3RW30 4.-.BB.4	
<b>Power electronics</b>		
<b>Rated operational voltage</b>	V AC	200 ... 480
Tolerance	%	-15/+10
<b>Rated frequency</b>	Hz	50/60
Tolerance	%	±10
<b>Uninterrupted duty</b> at 40 °C (% of $I_e$ )	%	115
<b>Minimum load</b> (% of $I_e$ )	%	10 (at least 2 A)
<b>Maximum cable length</b> between soft starter and motor	m	300
<b>Permissible installation height</b>	m	5000 (derating from 1000, see characteristic curves); higher on request
<b>Permissible mounting position</b> (auxiliary fan not available)		
<b>Permissible ambient temperature</b>	°C	-25 ... +60; (derating from +40)
Operation	°C	-40 ... +80
Storage		
<b>Degree of protection</b>	IP20 for 3RW30 1. and 3RW30 2.; IP00 for 3RW30 3. and 3RW30 4.	

Type	3RW30 13    3RW30 14    3RW30 16    3RW30 17    3RW30 18					
<b>Power electronics</b>						
40 °C/50 °C/60 °C						
<b>Load rating with rated operational current <math>I_e</math></b>						
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	3.6/ <b>3.3</b> /3	6.5/ <b>6</b> /5.5	9/ <b>8</b> /7	12.5/ <b>12</b> /11	17.6/ <b>17</b> /14
<b>Power loss</b>						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	0.25	0.5	1	2	4
• During starting with 300 % $I_M$ (40 °C)	W	6	13	20	20	29
<b>Permissible rated motor current and starts per hour for normal starting (Class 10)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 10 s	A	3.6/ <b>3.3</b> /3	6.5/ <b>6</b> /5.5	9/ <b>8</b> /7	12.5/ <b>12</b> /11	17.6/ <b>17</b> /14
- Starts per hour <sup>3)</sup>	1/h	200/ <b>150</b> /70	87/ <b>60</b> /50	50	85/ <b>70</b> /60	62/ <b>46</b> /60
- Rated motor current $I_M^{(2)}$ , starting time 20 s	A	3.6/ <b>3.3</b> /3	6.5/ <b>6</b> /5.5	9/ <b>8</b> /7	12.5/ <b>12</b> /11	17.6/ <b>17</b> /14
- Starts per hour <sup>3)</sup>	1/h	150/ <b>100</b> /50	64/ <b>46</b> /28	35	62/ <b>47</b> /37	45/ <b>32</b> /43

<sup>1)</sup> Measurement at 60 °C according to UL/CSA not required.  
<sup>2)</sup> With 300 %  $I_M$ .

<sup>3)</sup> For intermittent duty S4 with ON period = 30 %,  $T_U = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type	3RW30 26    3RW30 27    3RW30 28			
<b>Power electronics</b>				
40 °C/50 °C/60 °C				
<b>Load rating with rated operational current <math>I_e</math></b>				
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	25.3/ <b>23</b> /21	32.2/ <b>29</b> /26	38/ <b>34</b> /31
<b>Power loss</b>				
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	8	13	19
• During starting with 300 % $I_M$ (40 °C)	W	47	55	64
<b>Permissible rated motor current and starts per hour for normal starting (Class 10)</b>				
- Rated motor current $I_M^{(2)}$ , starting time 10 s	A	25/ <b>23</b> /21	32/ <b>29</b> /26	38/ <b>34</b> /31
- Starts per hour <sup>3)</sup>	1/h	23	23	19
- Rated motor current $I_M^{(2)}$ , starting time 20 s	A	25/ <b>23</b> /21	32/ <b>29</b> /26	38/ <b>34</b> /31
- Starts per hour <sup>3)</sup>	1/h	15	16	12

<sup>1)</sup> Measurement at 60 °C according to UL/CSA not required.  
<sup>2)</sup> With 300 %  $I_M$ .  
<sup>3)</sup> For intermittent duty S4 with ON period = 30 %,  $T_U = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

# 3RW Soft Starters

## 3RW30 for standard applications

Type		3RW30 36	3RW30 37	3RW30 38	3RW30 46	3RW30 47
<b>Power electronics</b>		40 °C/50 °C/60 °C				
<b>Load rating with rated operational current <math>I_e</math></b>						
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
<b>Power loss</b>						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6	12	15	12	21
• During starting with 300 % $I_M$ (40 °C)	W	79	111	125	144	192
<b>Permissible rated motor current and starts per hour for normal starting (Class 10)</b>						
- Rated motor current $I_M$ <sup>2)</sup> , starting time 10 s	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour <sup>3)</sup>	1/h	38	23	22	22	15
- Rated motor current $I_M$ <sup>2)</sup> , starting time 20 s	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour <sup>3)</sup>	1/h	26	15	15	15	10





1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 %  $I_M$ .

3) For intermittent duty S4 with ON period = 30 %,  $T_U = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

# 3RW Soft Starters

## 3RW30 for standard applications

Soft starters	Type		3RW30 1.	3RW30 2.	3RW30 3.	3RW30 4.
<b>Conductor cross-sections</b>						
<b>Screw terminals</b>						
<b>Front clamping point connected</b>						
	• Solid	mm <sup>2</sup>	2 x (1 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947	2 x (1 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	2 x (1 ... 2.5); 2 x (2.5 ... 6)	1 x (0.75 ... 25)	1 x (2.5 ... 35)
	• Stranded	mm <sup>2</sup>	--	--	1 x (0.75 ... 35)	1 x (4 ... 70)
	• AWG cables - Solid - Solid or stranded - Stranded	AWG	2 x (16 ... 12) 2 x (14 ... 10) 1 x 8	2 x (16 ... 12) 2 x (14 ... 10) 1 x 8	1 x (18 ... 2) --	1 x (10 ... 2/0) --
	• Solid	mm <sup>2</sup>	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Finely stranded with end sleeve	mm <sup>2</sup>	--	--	1 x (1.5 ... 25)	1 x (2.5 ... 50)
	• Stranded	mm <sup>2</sup>	--	--	1 x (1.5 ... 35)	1 x (10 ... 70)
	• AWG cables - Solid or stranded	AWG	--	--	1 x (16 ... 2)	1 x (10 ... 2/0)
	• Solid	mm <sup>2</sup>	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Stranded	mm <sup>2</sup>	--	--	2 x (1.5 ... 25)	2 x (10 ... 50)
	• Finely stranded with end sleeve	mm <sup>2</sup>	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 35)
	• AWG cables - Solid or stranded	AWG	--	--	2 x (16 ... 2)	2 x (10 ... 1/0)
	• Tightening torque	NM lb.in	2 ... 2.5 18 ... 22	2 ... 2.5 18 ... 22	4.5 40	6.5 58
	Tools		PZ 2	PZ 2	PZ 2	Allen screw 4 mm
	Degree of protection		IP20	IP20	IP20 (IP00 terminal compartment)	IP20 (IP00 terminal compartment)
<b>Spring-type terminals</b>						
<b>Main conductors</b>						
	• Solid	mm <sup>2</sup>	1 ... 4	1 ... 10	--	--
	• Finely stranded with end sleeve	mm <sup>2</sup>	1 ... 2.5	1 ... 6, end sleeves without plastic collar	--	--
	• AWG cables - Solid or stranded (finely stranded) - Stranded	AWG	16 ... 14 16 ... 12	16 ... 10 1 x 8	-- --	-- --
	Tools		DIN ISO 2380-1A0; 5 x 3	DIN ISO 2380-1A0; 5 x 3	--	--
	Degree of protection		IP20	IP20	--	--
<b>Busbar connections</b>						
<b>Main conductors</b>						
	• With cable lug acc. to DIN 46234 or max. 20 mm wide					
	- Stranded	mm <sup>2</sup>	--	--	--	2 x (10 ... 70)
	- Finely stranded	mm <sup>2</sup>	--	--	--	2 x (10 ... 50)
	• AWG cables, solid or stranded	AWG	--	--	--	2 x (7 ... 1/0)

Soft starters	Type		3RW30 1. ... 3RW30 4.			
<b>Conductor cross-sections</b>						
<b>Auxiliary conductors</b> (1 or 2 conductors can be connected):						
<b>Screw terminals</b>						
	• Solid	mm <sup>2</sup>	2 x (0.5 ... 2.5)			
	• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)			
	• AWG cables - Solid or stranded - Finely stranded with end sleeve	AWG	2 x (20 ... 14) 2 x (20 ... 16)			
	• Terminal screws - Tightening torque	NM lb.in	0.8 ... 1.2 7 ... 10.3			
<b>Spring-type terminals</b>						
	• Solid	mm <sup>2</sup>	2 x (0.25 ... 2.5)			
	• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.25 ... 1.5)			
	• AWG cables, solid or stranded	AWG	2 x (24 ... 14)			

# 3RW Soft Starters

## 3RW30 for standard applications

Type		3RW30 03
<b>Control electronics</b>		
<b>Rated values</b>		
Rated control supply voltage	V	24 ... 230 AC/DC
• Tolerance	%	± 10
Rated control supply current	mA	25 ... 4
Rated frequency at AC	Hz	50/60
• Tolerance	%	± 10
<b>Starting time</b>	s	0.1 ... 20 (adjustable)
<b>Starting voltage</b>	%	40 ... 100 (adjustable)
<b>Ramp-down time</b>	s	0 ... 20 (adjustable)
<b>Power electronics</b>		
<b>Rated operational voltage</b>	V AC	200 ... 400
Tolerance	%	± 10
<b>Rated frequency</b>	Hz	50/60
Tolerance	%	± 10
<b>Uninterrupted duty (% of <math>I_e</math>)</b>	%	100
<b>Minimum load<sup>1)</sup> (% of <math>I_e</math>); at 40 °C</b>	%	9
<b>Maximum conductor length</b> between soft starter and motor	m	100 <sup>2)</sup>
<b>Degree of protection</b> acc. to IEC 60529		IP20 (IP00 terminal compartment)
<b>Permissible installation height</b>	m	5000 (derating from 1000, see characteristic curves); higher on request
<b>Permissible mounting position</b>		
<b>Permissible ambient temperature</b>		
Operation	°C	-25 ... +60; (derating from +40)
Storage	°C	-40 ... +80
<b>Load rating with rated operational current <math>I_e</math></b>		
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting, AC-53a		
- At 40 °C	A	3
- At 50 °C	A	2.6
- At 60 °C	A	2.2
• Acc. to IEC and UL/CSA <sup>1)</sup> , for butt-mounting, AC-53a		
- At 40 °C	A	2.6
- At 50 °C	A	2.2
- At 60 °C	A	1.8
<b>Power loss</b>		
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6.5
• At utilization of max. switching frequency	W	3
<b>Permissible starts per hour</b>		
• For intermittent duty S4, $T_u = 40$ °C, stand-alone installation vertical	1/h	1500
• ON period = 70 %	% $I_e$ /s	300/0.2
<b>Conductor cross-sections</b>		
<b>Screw terminals</b> (1 or 2 conductors connectable) For standard screwdriver size 2 and Pozidriv 2	<b>• Main conductors</b>	
	- Solid	mm <sup>2</sup> 1 x (0.5 ... 4); 2 x (0.5 ... 2.5)
	- Finely stranded with end sleeve	mm <sup>2</sup> 1 x (0.5 ... 2.5); 2 x (0.5 ... 1.5)
	- Stranded	mm <sup>2</sup> -
	- AWG cables, solid or stranded	AWG 2 x (20 ... 14)
	- Terminal screws	M3, PZ2 0.8 ... 1.2
	- Tightening torque	lb.in 7.1 ... 8.9
	<b>• Auxiliary conductors</b>	
	- Solid	mm <sup>2</sup> 1 x (0.5 ... 4); 2 x (0.5 ... 2.5)
	- Finely stranded with end sleeve	mm <sup>2</sup> 1 x (0.5 ... 2.5); 2 x (0.5 ... 1.5)
	- AWG cables, solid or stranded	AWG 2 x (20 ... 14)
	- Terminal screws	M3, PZ2 0.8 ... 1.2
	- Tightening torque	lb.in 7 ... 8.9
<b>Spring-type terminals</b>	<b>Main and auxiliary conductors</b>	
	• Solid	mm <sup>2</sup> 2 x (0.25 ... 1.5)
	• Finely stranded with end sleeve	mm <sup>2</sup> 2 x (0.25 ... 1)
	• AWG cables, solid or stranded	mm <sup>2</sup> 2 x (24 ... 16)

<sup>1)</sup> The rated motor current (specified on the motor's name plate) should at least amount to the specified percentage of the SIRIUS soft starter unit's rated operational current  $I_e$ .

<sup>2)</sup> If this value is exceeded, problems with line capacities may arise, which can result in false firing.



# 3RW Soft Starters

## 3RW30 for standard applications

	Standard	Parameters
<b>Electromagnetic compatibility Acc. to EN 60947-4-2</b>		
<i>EMC interference immunity</i>		
<b>Electrostatic discharge (ESD)</b>	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
<b>Electromagnetic RF fields</b>	EN 61000-4-3	Frequency range: 80 ... 2000 MHz with 80 % at 1 kHz Degree of severity 3: 10 V/m
<b>Conducted RF interference</b>	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
<b>RF voltages and RF currents on cables</b>		
• Burst	EN 61000-4-4	±2 kV/5 kHz
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to earth
<i>EMC interference emission</i>		
<b>EMC interference field strength</b>	EN 55011	Limit value of Class A at 30 ... 1000 MHz, limit value of Class B for 3RW30 2.; 24 V AC/DC
<b>Radio interference voltage</b>	EN 55011	Limit value of Class A at 0.15 ... 30 MHz, limit value of Class B for 3RW30 2.; 24 V AC/DC
<i>Radio interference suppression filters</i>		
<b>Degree of noise suppression A</b> (industrial applications)	Not required	
<b>Degree of noise suppression B</b> (applications for residential areas) Control voltage	Not available <sup>1)</sup>	
• 230 V AC/DC	Not required for 3RW30 1. and 3RW30 2.;	
• 24 V AC/DC	required for 3RW30 3. and 3RW30 4. (see Table)	

<sup>1)</sup> Degree of noise suppression B cannot be obtained through the use of filters as the strength of the electromagnetic field is not attenuated by the filter.

Soft starter type	Rated current Soft starters A	Recommended filters <sup>1)</sup>		
		Voltage range 200 ... 480 V		
		Filter type	Rated current filters A	Terminals mm <sup>2</sup>
3RW30 36	45	4EF1512-1AA10	50	16
3RW30 37	63	4EF1512-2AA10	66	25
3RW30 38	72	4EF1512-3AA10	90	25
3RW30 46	80	4EF1512-3AA10	90	25
3RW30 47	106	4EF1512-4AA10	120	50

<sup>1)</sup> The radio interference suppression filter is used to remove the conducted interference from the main circuit. The field-related emissions comply with degree of noise suppression B. Filter selection applies under standard conditions: 10 starts per hour, start time 4 s at 300 %  $I_G$ .

Type Number	Max. Fuse Class K5, RK5, RK1	Max. Fuse Class J	Short Voltage Circuit	Voltage
<i>Standard short circuit ratings 3RW30</i>				
3RW30 13	--	15 A	5 kA	480 V
3RW30 14	--	25 A	5 kA	480 V
3RW30 16	--	36 A	5 kA	480 V
3RW30 17	--	50 A	5 kA	480 V
3RW30 18	--	60 A	5 kA	480 V
3RW30 26	100 A	100 A	5 kA	480 V
3RW30 27	125 A	125 A	5 kA	480 V
3RW30 28	125 A	125 A	5 kA	480 V
3RW30 36	175 A	175 A	10 kA	480 V
3RW30 37	250 A	250 A	10 kA	480 V
3RW30 38	250 A	250 A	10 kA	480 V
3RW30 46	--	300 A	10 kA	480 V
3RW30 47	--	350 A	10 kA	480 V

### High capacity short circuit ratings 3RW30

3RW30 13	--	15 A	42 kA	480 V
3RW30 14	--	25 A	42 kA	480 V
3RW30 16	--	25 A	42 kA	480 V
3RW30 17	--	25 A	42 kA	480 V
3RW30 18	--	25 A	42 kA	480 V
3RW30 26	60 A	100 A	42 kA	480 V
3RW30 27	60 A	125 A	42 kA	480 V
3RW30 28	60 A	125 A	42 kA	480 V
3RW30 36	100 A	175 A	30 kA	480 V
3RW30 37	100 A	200 A	30 kA	480 V
3RW30 38	100 A	200 A	30 kA	480 V
3RW30 46	110 A	200 A	42 kA	480 V
3RW30 47	110 A	200 A	42 kA	480 V

For solid-state motor controller, Type 3RW301: Applicable in an enclosure with minimum overall dimensions of 200 by 120 by 200 mm.

For solid-state motor controller, Type 3RW302: Applicable in an enclosure with minimum overall dimensions of 370 by 175 by 195 mm.

For solid-state motor controller, Type 3RW303: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.

For solid-state motor controller, Type 3RW304: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.

# 3RW Soft Starters

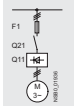
## 3RW30 for standard applications

### Fuse assignment

The type of coordination to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting (combination of motor starter protector/circuit breaker and soft starter) is sufficient.

If type of coordination "2" is to be fulfilled, semiconductor fuses must be fitted in the motor feeder.

### Fused version (line protection only)



Soft starters TOC 1 Q11 Type	Rated current A	Line protection, maximum		Size	Line contactors (optional) Q21
		F1 Type	Rated current A		
<b>Type of coordination "1"<sup>1)</sup>: <math>I_q = 65 \text{ kA at } 480 \text{ V } 10 \%</math></b>					
3RW30 03 <sup>2)</sup>	3	3NA3 805 <sup>3)</sup>	20	000	3RT10 15
3RW30 13	3.6	3NA3 803-6	10	000	3RT10 15
3RW30 14	6.5	3NA3 805-6	16	000	3RT10 15
3RW30 16	9	3NA3 807-6	20	000	3RT10 16
3RW30 17	12.5	3NA3 810-6	25	000	3RT10 24
3RW30 18	17.6	3NA3 814-6	35	000	3RT10 26
3RW30 26	25	3NA3 822-6	63	00	3RT10 26
3RW30 27	32	3NA3 824-6	80	00	3RT10 34
3RW30 28	38	3NA3 824-6	80	00	3RT10 35
3RW30 36	45	3NA3 130-6	100	1	3RT10 36
3RW30 37	63	3NA3 132-6	125	1	3RT10 44
3RW30 38	72	3NA3 132-6	125	1	3RT10 45
3RW30 46	80	3NA3 136-6	160	1	3RT10 45
3RW30 47	106	3NA3 136-6	160	1	3RT10 46

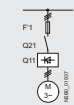
<sup>1)</sup> The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

The type of coordination "1" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

<sup>2)</sup>  $I_q = 50 \text{ kA at } 400 \text{ V}$ .

<sup>3)</sup> 3NA3 805-1 (LV HRC00), 5SB2 61 (DIAZED), 5SE2 201-6 (NEOZED)

### Fused version with 3NE1 SITOR fuses (semiconductor and line protection)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to [www.siemens.com/sitor](http://www.siemens.com/sitor) —> "Products" —> "BETA Protecting" —> "SITOR"

Soft starters TOC 2 Q11 Type	Rated current A	All-range fuses		Size	Line contactors (optional) Q21
		F1 Type	Rated current A		
<b>Type of coordination "2"<sup>1)</sup>: <math>I_q = 65 \text{ kA at } 480 \text{ V } 10 \%</math></b>					
3RW30 03 <sup>2)</sup>	3	3NE1 813-0 <sup>3)</sup>	16	000	3RT10 15
3RW30 13	3.6	3NE1 813-0	16	000	3RT10 15
3RW30 14	6.5	3NE1 813-0	16	000	3RT10 15
3RW30 16	9	3NE1 813-0	16	000	3RT10 16
3RW30 17	12.5	3NE1 813-0	16	000	3RT10 24
3RW30 18	17.6	3NE1 814-0	20	000	3RT10 26
3RW30 26	25	3NE1 803-0	35	000	3RT10 26
3RW30 27	32	3NE1 020-2	80	00	3RT10 34
3RW30 28	38	3NE1 020-2	80	00	3RT10 35
3RW30 36	45	3NE1 020-2	80	00	3RT10 36
3RW30 37	63	3NE1 820-0	80	000	3RT10 44
3RW30 38	72	3NE1 820-0	80	000	3RT10 45
3RW30 46	80	3NE1 021-0	100	00	3RT10 45
3RW30 47	106	3NE1 022-0	125	00	3RT10 46

<sup>1)</sup> The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

<sup>2)</sup>  $I_q = 50 \text{ kA at } 400 \text{ V}$ .

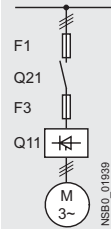
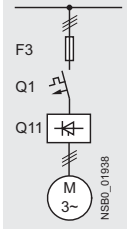
<sup>3)</sup> No SITOR fuse required!  
Alternatively: 3NA3 803 (LV HRC00), 5SB2 21 (DIAZED), 5SE2 206 (NEOZED).

TOC 1	Type of coordination "1"
TOC 2	Type of coordination "2"
The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".	
These types of coordination are indicated in the Technical specifications by gray backgrounds.	

# 3RW Soft Starters

## 3RW30 for standard applications

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by motor starter protector; alternatively, installation with contactor and overload relay possible)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to [www.siemens.com/sitor](http://www.siemens.com/sitor) → "Products" → "BETA Protecting" → "SITOR"

Soft starters Toc 2 Q11 Type	Rated current A	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses, minimum		
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
<b>Type of coordination "2"<sup>1)</sup>: I<sub>q</sub> = 65 kA at 480 V 10 %</b>										
3RW30 03 <sup>2)</sup>	3	--	--	--	--	--	--	--	--	--
3RW30 13	3.6	--	--	--	--	--	--	3NE4 101	32	0
3RW30 14	6.5	--	--	--	--	--	--	3NE4 101	32	0
3RW30 16	9	--	--	--	--	--	--	3NE4 101	32	0
3RW30 17	12.5	--	--	--	--	--	--	3NE4 101	32	0
3RW30 18	17.6	--	--	--	3NE3 221	100	1	3NE4 101	32	0
3RW30 26	25	--	--	--	3NE3 221	100	1	3NE4 102	40	0
3RW30 27	32	--	--	--	3NE3 222	125	1	3NE4 118	63	0
3RW30 28	38	--	--	--	3NE3 222	125	1	3NE4 118	63	0
3RW30 36	45	--	--	--	3NE3 224	160	1	3NE4 120	80	0
3RW30 37	63	--	--	--	3NE3 225	200	1	3NE4 121	100	0
3RW30 38	72	3NE3 221	100	1	3NE3 227	250	1	--	--	--
3RW30 46	80	3NE3 222	125	1	3NE3 225	200	1	--	--	--
3RW30 47	106	3NE3 224	160	1	3NE3 231	350	1	--	--	--

Soft starters Toc 2 Q11 Type	Rated current A	Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A
<b>Type of coordination "2"<sup>1)</sup>: I<sub>q</sub> = 65 kA at 480 V 10 %</b>												
3RW30 03 <sup>2)</sup>	3	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC1 010	10
3RW30 13	3.6	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 14	6.5	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 16	9	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 17	12.5	--	--	--	3NE8 015-1	25	00	3NE8 018-1	63	00	3NC2 250	50
3RW30 18	17.6	--	--	--	3NE8 003-1	35	00	3NE8 021-1	100	00	3NC2 263	63
3RW30 26	25	3NE4 117	50	0	3NE8 017-1	50	00	3NE8 021-1	100	00	3NC2 263	63
3RW30 27	32	3NE4 118	63	0	3NE8 018-1	63	00	3NE8 022-1	125	00	3NC2 280	80
3RW30 28	38	3NE4 118	63	0	3NE8 020-1	80	00	3NE8 022-1	125	00	3NC2 280	80
3RW30 36	45	3NE4 120	80	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW30 37	63	3NE4 121	100	0	3NE8 021-1	100	00	3NE8 024-1	160	00	--	--
3RW30 38	72	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW30 46	80	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW30 47	106	--	--	--	3NE8 024-1	160	00	3NE8 024-1	160	00	--	--

Soft starters Toc 2 Q11 Type	Rated current A	Line contactors	Motor starter protectors		Line protection, maximum		
		(optional) Q21	400 V +10 % Q1 Type	Rated current A	F1 Type	Rated current A	Size
<b>Type of coordination "2"<sup>1)</sup>: I<sub>q</sub> = 65 kA at 480 V 10 %</b>							
3RW30 03 <sup>2)</sup>	3	3RT10 15	3RV10 11-1EA10	4	3NA3 805 <sup>3)</sup>	20	000
3RW30 13	3.6	3RT10 15	3RV10 21-1FA10	5	3NA3 803-6	10	000
3RW30 14	6.5	3RT10 15	3RV10 21-1HA10	8	3NA3 805-6	16	000
3RW30 16	9	3RT10 16	3RV10 21-1JA10	10	3NA3 807-6	20	000
3RW30 17	12.5	3RT10 24	3RV10 21-1KA10	12.5	3NA3 810-6	25	000
3RW30 18	17.6	3RT10 26	3RV10 21-1BA10	20	3NA3 814-6	35	000
3RW30 26	25	3RT10 26	3RV10 31-4DA10	25	3NA3 822-6	63	00
3RW30 27	32	3RT10 34	3RV10 31-4EA10	32	3NA3 824-6	80	00
3RW30 28	38	3RT10 35	3RV10 31-4FA10	40	3NA3 824-6	80	00
3RW30 36	45	3RT10 36	3RV10 31-4GA10	45	3NA3 130-6	100	1
3RW30 37	63	3RT10 44	3RV10 41-4JA10	63	3NA3 132-6	125	1
3RW30 38	72	3RT10 45	3RV10 41-4KA10	75	3NA3 132-6	125	1
3RW30 46	80	3RT10 45	3RV10 41-4LA10	90	3NA3 136-6	160	1
3RW30 47	106	3RT10 46	3RV10 41-4MA10	100	3NA3 136-6	160	1

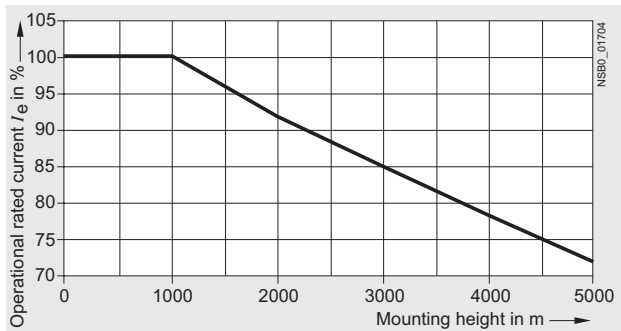
<sup>1)</sup> The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.  
<sup>2)</sup> I<sub>q</sub> = 50 kA at 400 V.  
<sup>3)</sup> 3NA3 805-1 (LV HRC00), 5SB2 61 (DIAZED).

# 3RW Soft Starters

## 3RW30 for standard applications

### Characteristic curves

#### Permissible installation height



At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

### More information

#### Application examples for normal starting (Class 10)

**Normal starting Class 10** (up to 20 s with 300 %  $I_{n \text{ motor}}$ ).  
 The soft starter rating can be selected to be as high as the rating of the motor used

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
<b>Starting parameters</b>						
• Voltage ramp and current limiting						
- Starting voltage	% 70	60	50	40	40	40
- Starting time	s 10	10	20	20	10	10

*Note:*  
 These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning.  
 The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

# 3RW Soft Starters

## 3RW30 for standard applications

### Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

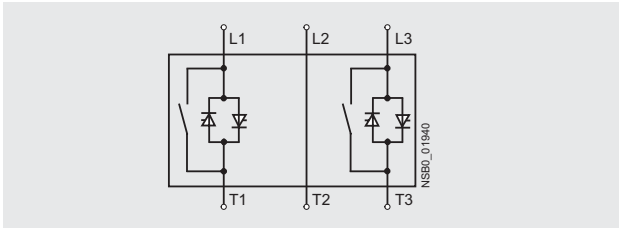
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses, controls and overload relays) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

**Note:**

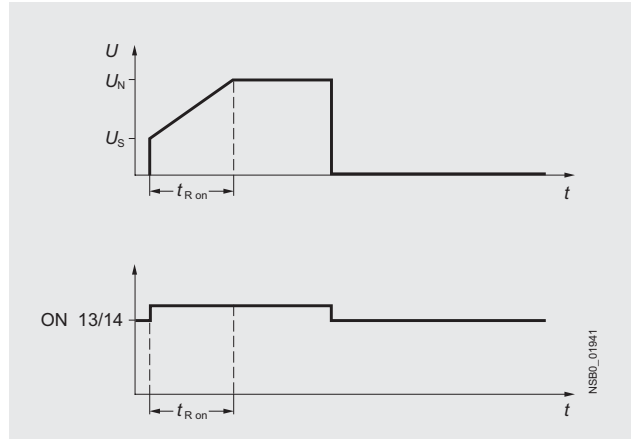
*When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.*

### Schematic circuit diagram



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

### Status graphs



### Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters) > Software

More information can be found on the Internet at:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters)

# 3RW Soft Starters

## 3RW40 for standard applications

### Overview

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30 soft starters.

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power loss has to be taken into the bargain at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection. The higher the motor rating, the more important these functions because they make it unnecessary to purchase and install protection equipment such as overload relays.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also be protected by semiconductor fuses from short-circuiting.

Thanks to integrated status monitoring and fault monitoring, this compact soft starter offers many different diagnostics options. Up to four LEDs and relay outputs permit differentiated monitoring and diagnostics of the operating mechanism by indicating the operating state as well as for example mains or phase failure, missing load, non-permissible tripping time/class setting, thermal overloading or device faults.

Soft starters rated up to 300 Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of the SIRIUS 3RW40 soft starters.

#### **"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC**

The 3RW40 soft starter sizes S0 to S12 are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.

See "Appendix" -> "Standards and approvals" -> "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

### Function

The space required by the compact SIRIUS 3RW40 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e. g. brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The starting current of particularly powerful operating mechanisms can place an unjustifiable load on the local supply system. Soft starters reduce this starting current by means of their voltage ramp. Thanks to the adjustable current limiting, the SIRIUS 3RW40 soft starter takes even more pressure off the supply system. It leaves the set start ramp during the ramp-up – the ramp gradient is fixed by the starting voltage and the ramp time – as soon as the selected current limit is reached. From this moment the voltage of the soft starter is controlled so that the current supplied to the motor remains constant. This process is ended either by completion of the motor ramp-up or by tripping by the intrinsic device protection or the motor overload protection. As the result of this function the actual motor ramp-up can well take longer than the ramp time selected on the soft starter.

Thanks to the integrated motor overload protection according to IEC 60947-4-2 there is no need of an additional overload relay on the new soft starters. The rated motor current, the setting of the overload tripping time (Class times) and the reset of the motor overload protection function can be adjusted easily and quickly. Using a 4-step rotary potentiometer it is possible to set different overload tripping times on the soft starter. In addition to Class 10, 15 and 20 it is also possible to switch off the motor overload protection if a different motor management control device is to be used for this function, e. g. with connection to PROFIBUS.

Device versions with thermistor motor protection evaluation are available up to a rating of 55 kW (at 400 V). A "Thermoclick" measuring probe can be connected directly, as can a PTC of type A. Thermal overloading of the motor, open circuits and short-circuits in the sensor circuit all result in the direct disconnection of the soft starter. And if ever the soft starter trips, various reset options are available the same as with intrinsic device protection and motor load protection: manually with the reset button, automatically or remotely through brief disconnection of the control voltage.

The new series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this unbalance, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %.

The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause. It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the on-going dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

# 3RW Soft Starters

## 3RW40 for standard applications

As an option the thyristors can also be protected by SITOR semiconductor fuses from short-circuiting so that the soft starter is still functional after a short-circuit (type of coordination 2). Three LEDs are used to indicate the operating state as well as possible errors, e. g. non-permissible tripping time (CLASS setting), mains or phase failure, missing load, thermal overloading or device faults.

- Soft starting with voltage ramp; the starting voltage setting range  $U_s$  is 40 to 100 % and the ramp time  $t_R$  can be set from 0 to 20 s.<sup>3)</sup>
- Smooth ramp-down with voltage ramp; the running down time  $t_{off}$  can be set between 0 s to 20 s.<sup>3)</sup>
- Solid-state motor overload and intrinsic device protection
- Optional thermistor motor protection (up to size S3)
- Remote reset (integrated up to size S3, optional for size S6 and larger)
- Adjustable current limiting

- Integrated bypass contact system to minimize power loss
- Setting with potentiometers
- Simple mounting and commissioning
- Integrated status monitoring and fault monitoring
- Mains voltages 50/60 Hz, 200 to 600 V
- Various control voltage versions
  - Sizes S0 to S3: 24 V AC/DC and 110 to 230 V AC/DC
  - Sizes S6 to S12: 115 V AC and 230 V AC.
 Control by way of the internal 24 V DC supply and direct control by means of PLC are possible.
- Wide temperature range from -25 to +60 °C
- Built-in auxiliary contacts ensure user-friendly control and possible further processing within the system (for status graphs see page 7/69)

### Technical specifications

Type	3RW40 2.		3RW40 3., 3RW40 4.			
<b>Control electronics</b>						
<b>Rated values</b>	Terminal A1/A2	V	24 ±20	110 ... 230 -15/+10	24 ±20	110 ... 230 -15/+10
Rated control supply voltage		%				
• Tolerance						
Rated control supply current		mA	< 150	< 50	< 200	< 50
• STANDBY		mA	< 200	< 100	< 5000	< 1500
• During pick-up		mA	< 250	< 50	< 200	< 50
• ON without fan		mA	< 300	< 70	< 250	< 70
• ON with fan		mA				
Rated frequency		Hz	50/60			
• Tolerance		%	±10			
<b>Control inputs</b>						
IN			ON/OFF			
Rated operational current		mA	Approx. 12	3/6	Approx. 12	3/6
• AC		mA	Approx. 12	1.5/3	Approx. 12	1.5/3
• DC		mA				
<b>Relay outputs</b>						
Output 1	ON/RUN mode <sup>1)</sup>	13/14	Operating indication (NO)			
Output 2	BYPASSED	23/24	Bypass indication (NO)			
Output 3	OVERLOAD/FAILURE	95/96/98	Overload/error indication (NC/NO)			
Rated operational current		A	3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V			
Protection against overvoltages		A	Protection by means of varistor through contact			
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)			

<sup>1)</sup> Factory default: ON mode.

Type	3RW40 5.		3RW40 7.			
<b>Control electronics</b>						
<b>Rated values</b>	Terminal A1/A2	V AC	115 -15/+10	230	115 -15/+10	230
Rated control supply voltage		%				
• Tolerance						
Rated control supply current STANDBY		mA	15		15	
Rated control supply current ON <sup>1)</sup>		mA	440	200	660	360
Rated frequency		Hz	50/60		50/60	
• Tolerance		%	±10		±10	
<b>Control inputs</b>						
IN			ON/OFF			
Rated operational current		mA	Approx. 10 acc. to DIN 19240			
Rated operational voltage		V DC	24 from internal supply dc+ or external DC supply (acc. to DIN 19240) through terminals and IN			
<b>Relay outputs</b>						
Output 1	ON/RUN mode <sup>2)</sup>	13/14	Operating indication (NO)			
Output 2	BYPASSED	23/24	Bypass indication (NO)			
Output 3	OVERLOAD/FAILURE	95/96/98	Overload/error indication (NC/NO)			
Rated operational current		A	3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V			
Protection against overvoltages		A	Protection by means of varistor through contact			
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)			

<sup>1)</sup> Values for the coil power consumption at +10 %  $U_n$ , 50 Hz.

<sup>2)</sup> Factory default: ON mode.

<sup>3)</sup> Actual motor start times are load dependent.



# 3RW Soft Starters

## 3RW40 for standard applications

Type	3RW40 2., 3RW40 3., 3RW40 4.				
<b>Control electronics</b>					
<b>Operating indications</b>	LEDs	<b>DEVICE</b>	<b>STATE/BYPASSED/FAILURE</b>	<b>OVERLOAD</b>	
Off		Green	Off	Off	
Start		Green	Green flashing	Off	
Bypass		Green	Green	Off	
Ramp-down		Green	Green flashing	Off	
<b>Alarm signals</b>					
$I_e$ /Class setting not permissible		Green	Not relevant	Red flashing	
Start inhibited/thyristors too hot		Yellow flashing	Not relevant	Off	
<b>Error signals</b>					
• 24 V: $U < 0.75 \times U_s$ or $U > 1.25 \times U_s$		Off	Red	Off	
• 110 ... 230 V: $U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Red	Off	
Non-permissible $I_e$ /Class setting for edge 0 → 1 on input IN		Green	Red	Red flashing	
Motor protection shut-down (overload thermistor)		Green	Off	Red	
Thermistor defective (open circuit, short-circuit)		Green	Off	Red flickering	
Thermal overloading of the thyristors		Yellow	Red	Off	
Missing mains voltage, phase failure, missing load		Green	Red	Off	
Device fault		Red	Red	Off	
Type	3RW40 5. and 3RW40 7.				
<b>Control electronics</b>					
<b>Operating indications</b>	LEDs	<b>DEVICE</b>	<b>STATE/BYPASSED</b>	<b>FAILURE</b>	<b>OVERLOAD</b>
Off		Green	Off	Off	Off
Start		Green	Green flashing	Off	Off
Bypass		Green	Green	Off	Off
Ramp-down		Green	Green flashing	Off	Off
<b>Alarm signals</b>					
$I_e$ /Class setting not permissible		Green	Not relevant	Not relevant	Red flashing
Start inhibited/thyristors too hot		Yellow flashing	Not relevant	Not relevant	Off
<b>Error signals</b>					
$U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Off	Red	Off
Non-permissible $I_e$ /Class setting for edge 0 → 1 on input IN		Green	Off	Red	Red flashing
Motor protection shut-down		Green	Off	Off	Red
Thermal overloading of the thyristors		Yellow	Off	Red	Off
Missing mains voltage, phase failure, missing load		Green	Off	Red	Off
Device fault		Red	Off	Red	Off

# 3RW Soft Starters

Type	3RW40 ..		Factory default
<b>Protection functions</b>			
<b>Motor protection functions</b>			
Trips in the event of		Thermal overloading of the motor	
Trip class to IEC 60947-4-1	Class	10/15/20	10
Phase failure sensitivity	%	> 40	
Overload warning		No	
Thermistor protection acc. to IEC 60947-8, type A/IEC 60947-5-1		Yes <sup>1)</sup>	
Reset option after tripping		Manual/automatic/remote reset <sup>2)</sup>	
		(MAN/AUTO/REMOTE <sup>2)</sup> )	
Recovery time	min	5	
<b>Device protection functions</b>			
Trips in the event of		Thermal overloading of the thyristors or bypass <sup>3)</sup>	
Reset option after tripping		Manual/automatic/remote reset <sup>2)</sup>	
		(MAN/AUTO/REMOTE <sup>2)</sup> )	
Recovery time			
• During overloading of the thyristors	s	30	
• During overloading of the bypass	s	60	
<b>Control times and parameters</b>			
<b>Control times</b>			
Closing time (with connected control voltage)	ms	< 50	
Closing time (automatic/mains contactor mode)	ms	<300	
Recovery time (closing command in active ramp-down)	ms	100	
<b>Mains failure bridging time</b>			
Control supply voltage	ms	50	
<b>Mains failure response time</b>			
Load circuit	ms	500	
<b>Reclosing lockout after overload trip</b>			
Motor protection trip	min	5	
Device protection trip			
• During overloading of the thyristors	s	30	
• During overloading of the bypass	s	60	
<b>Starting parameters</b>			
Starting time	s	0 ... 20	7.5
Starting voltage	%	40 ... 100	40
Starting current limit		1.3 ... 5 x I <sub>e</sub>	5 x I <sub>e</sub>
<b>Ramp-down parameters</b>			
Ramp-down time	s	0 ... 20	0
<b>Reset mode parameters (for motor/device protection shut-down)</b>			
Manual reset	LEDs	Off	Off
Automatic reset	LEDs	Yellow	
Remote reset (REMOTE) <sup>2)</sup>	LEDs	Green	
<b>Start-up detection</b>			
Yes			
<b>Operating mode output 13/14</b>			
Rising edge at	Start command		
Falling edge at	Off command		
	Ramp-down end	ON	ON

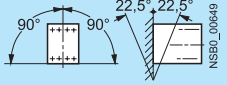
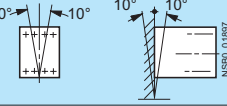
<sup>1)</sup> Optional up to size S3 (device variant).

<sup>2)</sup> Integrated remote reset (REMOTE) available only for 3RW40 2. to 3RW40 4.; remote reset with 3RU19 accessory module available for 3RW40 5. and 3RW40 7..

<sup>3)</sup> Bypass protection up to size S3.

# 3RW Soft Starters

## 3RW40 for standard applications

Type		3RW40 2.-.B.4, 3RW40 3.-.B.4, 3RW40 4.-.B.4	3RW40 2.-.B.5, 3RW40 3.-.B.5, 3RW40 4.-.B.5	3RW40 5.-.BB.4, 3RW40 7.-.BB.4	3RW40 5.-.BB.5, 3RW40 7.-.BB.5
<b>Power electronics</b>					
<b>Rated operational voltage</b>	V AC	200 ... 480	400 ... 600	200 ... 460	400 ... 600
Tolerance	%	-15/+10	-15/+10	-15/+10	-15/+10
<b>Maximum blocking voltage (thyristor)</b>	V AC	1600		1400	1800
<b>Rated frequency</b>	Hz	50/60			
Tolerance	%	±10			
<b>Uninterrupted duty</b> at 40 °C (% of $I_e$ )	%	115			
<b>Minimum load</b> (% of minimum selectable rated motor current $I_M$ )	%	20 (at least 2 A)			
<b>Maximum cable length</b> between soft starter and motor	m	300			
<b>Permissible installation height</b>	m	5000	(derating from 1000, see characteristic curves); higher on request		
<b>Permissible mounting position</b>					
<ul style="list-style-type: none"> <li>• With auxiliary fan (for 3RW40 2. ... 3RW40 4.)</li> </ul> 					
<ul style="list-style-type: none"> <li>• Without auxiliary fan (for 3RW40 2. ... 3RW40 4.)</li> </ul> 					
-- (fan integrated in the soft starter)					
<b>Permissible ambient temperature</b>					
Operation	°C	-25 ... +60; (derating from +40)			
Storage	°C	-40 ... +80			
<b>Degree of protection</b>					
IP20 for 3RW40 2.;				IP00	
IP00 for 3RW40 3. and 3RW40 4.					

Type		3RW40 24	3RW40 26	3RW40 27	3RW40 28
<b>Power electronics</b>					
40 °C/50 °C/60 °C					
<b>Load rating with rated operational current <math>I_e</math></b>					
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
<b>Smallest adjustable rated motor current <math>I_M</math></b>					
For the motor overload protection	A	5	10	17	23
<b>Power loss</b>					
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	2	8	13	19
• During starting with 300 % $I_M$ (40°C)	W	17	47	55	64
<b>Permissible rated motor current and starts per hour</b>					
<b>• Normal starting (Class 10)</b>					
- Rated motor current $I_M$ <sup>2)</sup> , starting time 3 s	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour <sup>3)</sup>	1/h	50	23	23	19
- Rated motor current $I_M$ <sup>2)4)</sup> , starting time 4 s	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour <sup>3)</sup>	1/h	36	15	16	12
<b>• Normal starting (Class 15)</b>					
- Rated motor current $I_M$ <sup>2)</sup> , starting time 4.5 s	A	11/10/9	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour <sup>3)</sup>	1/h	49	21	18	18
- Rated motor current $I_M$ <sup>2)4)</sup> , starting time 6 s	A	11/10/9	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour <sup>3)</sup>	1/h	36	14	13	13
<b>• Normal starting (Class 20)</b>					
- Rated motor current $I_M$ <sup>2)</sup> , starting time 6 s	A	10/9/8	21/19/17	27/24/21	31/28/25
- Starts per hour <sup>3)</sup>	1/h	47	21	20	18
- Rated motor current $I_M$ <sup>2)4)</sup> , starting time 8 s	A	10/9/8	21/19/17	27/24/21	31/28/25
- Starts per hour <sup>3)</sup>	1/h	34	15	14	13

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 %  $I_M$ .

3) For intermittent duty S4 with ON period = 30 %,  $T_u = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current  $I_M$ , dependent on CLASS setting.

# 3RW Soft Starters

## 3RW40 for standard applications

Type		3RW40 36	3RW40 37	3RW40 38	3RW40 46	3RW40 47
<b>Power electronics</b>		40 °C/50 °C/60 °C				
<b>Load rating with rated operational current <math>I_e</math></b>						
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
<b>Smallest adjustable rated motor current <math>I_M</math></b>						
For the motor overload protection	A	23	26	35	43	46
<b>Power loss</b>						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6	12	15	12	21
• During starting with 300 % $I_M$ (40°C)	W	79	111	125	144	192
<b>Permissible rated motor current and starts per hour</b>						
• <b>Normal starting (Class 10)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 3 s	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour <sup>3)</sup>	1/h	38	23	22	22	15
- Rated motor current $I_M^{(2)(4)}$ , starting time 4 s	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour <sup>3)</sup>	1/h	26	15	15	15	10
• <b>Normal starting (Class 15)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 4.5 s	A	42/38/34	50/46/42	56/52/46	70/64/58	84/77/70
- Starts per hour <sup>3)</sup>	1/h	30	34	34	24	23
- Rated motor current $I_M^{(2)(4)}$ , starting time 6 s	A	42/38/34	50/46/42	56/52/46	70/64/58	84/77/70
- Starts per hour <sup>3)</sup>	1/h	21	24	24	16	17
• <b>Normal starting (Class 20)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 6 s	A	38/34/30	46/42/38	50/46/42	64/58/52	77/70/63
- Starts per hour <sup>3)</sup>	1/h	30	31	34	23	23
- Rated motor current $I_M^{(2)(4)}$ , starting time 8 s	A	38/34/30	46/42/38	50/46/42	64/58/52	77/70/63
- Starts per hour <sup>3)</sup>	1/h	21	22	24	16	16




1) Measurement at 60 °C according to UL/CSA not required.  
 2) With 300 %  $I_M$ .  
 3) For intermittent duty S4 with ON period = 30 %,  $T_U = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.  
 4) Maximum adjustable rated motor current  $I_M$ , dependent on CLASS setting.

Type		3RW40 55	3RW40 56	3RW40 73	3RW40 74	3RW40 75	3RW40 76
<b>Power electronics</b>		40 °C/50 °C/60 °C					
<b>Load rating with rated operational current <math>I_e</math></b>							
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
<b>Smallest adjustable rated motor current <math>I_M</math></b>							
For the motor overload protection	A	59	87	80	130	131	207
<b>Power loss</b>							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	60	75	75	90	125	165
• During starting with 300 % <sup>2)</sup> $I_M$ (40°C)	W	1043	1355	2448	3257	3277	3600
<b>Permissible rated motor current and starts per hour</b>							
• <b>Normal starting (Class 10)</b>							
- Rated motor current $I_M^{(2)}$ , starting time 10 s	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
- Starts per hour <sup>3)</sup>	1/h	20	8	20	20	16	17
- Rated motor current $I_M^{(2)(4)}$ , starting time 20 s	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
- Starts per hour <sup>3)</sup>	1/h	7	1.4	9	8	5	5
• <b>Normal starting (Class 15)</b>							
- Rated motor current $I_M^{(2)}$ , starting time 15 s	A	134/117/100	152/140/125	210/200/180	250/220/190	341/315/280	402/385/335
- Starts per hour <sup>3)</sup>	1/h	11	8	11	13	11	12
- Rated motor current $I_M^{(2)(4)}$ , starting time 30 s	A	134/117/100	152/140/125	210/200/180	250/220/190	341/315/280	402/385/335
- Starts per hour <sup>3)</sup>	1/h	1.2	1.7	1	6	2	2
• <b>Normal starting (Class 20)</b>							
- Rated motor current $I_M^{(2)}$ , starting time 20 s	A	124/112/100	142/132/120	200/185/168	230/205/180	311/280/250	372/340/305
- Starts per hour <sup>3)</sup>	1/h	12	9	10	10	10	10
- Rated motor current $I_M^{(2)(4)}$ , starting time 40 s	A	124/112/100	142/132/120	200/185/168	230/205/180	311/280/250	372/340/305
- Starts per hour <sup>3)</sup>	1/h	3	3	1	5	1	1

1) Measurement at 60 °C according to UL/CSA not required.  
 2) With 300 %  $I_M$ .  
 3) For intermittent duty S4 with ON period = 30 %,  $T_U = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.  
 4) Maximum adjustable rated motor current  $I_M$ , dependent on CLASS setting.







# 3RW Soft Starters

## 3RW40 for standard applications

Soft starters	Type		3RW40 2.	3RW40 3.	3RW40 4.
<b>Conductor cross-sections</b>					
<b>Screw terminals</b>					
<b>Front clamping point connected</b>					
 NSB00479	• Solid	mm <sup>2</sup>	2 x (1.5 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm <sup>2</sup>	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	1 x (0.75 ... 25)	1 x (2.5 ... 35)
	• Stranded	mm <sup>2</sup>	--	1 x (0.75 ... 35)	1 x (4 ... 70)
	• AWG cables				
	- Solid	AWG	2 x (16 ... 12)		
- Solid or stranded	AWG	2 x (14 ... 10)	1 x (18 ... 2)	2 x (10 ... 1/0)	
- Stranded	AWG	1 x 8	--	--	
<b>Rear clamping point connected</b>					
 NSB00480	• Solid	mm <sup>2</sup>	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm <sup>2</sup>	--	1 x (1.5 ... 25)	1 x (2.5 ... 50)
	• Stranded	mm <sup>2</sup>	--	1 x (1.5 ... 35)	1 x (10 ... 70)
	• AWG cables				
	- Solid or stranded	AWG	--	1 x (16 ... 2)	2 x (10 ... 1/0)
<b>Both clamping points connected</b>					
 NSB00481	• Solid	mm <sup>2</sup>	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm <sup>2</sup>	--	2 x (1.5 ... 16)	2 x (2.5 ... 35)
	• Stranded	mm <sup>2</sup>	--	2 x (1.5 ... 25)	2 x (10 ... 50)
	• AWG cables				
	- Solid or stranded	AWG	--	2 x (16 ... 2)	1 x (10 ... 2/0)
	• Tightening torque	NM lb.in	2 ... 2.5 18 ... 22	4.5 40	6.5 58
	Tools		PZ 2	PZ 2	Allen screw 4 mm
	Degree of protection		IP20	IP20 (IP00 terminal compartment)	IP20 (IP00 terminal compartment)
<b>Spring-type terminals</b>					
<b>Main conductors</b>					
	• Solid	mm <sup>2</sup>	1 ... 10	--	
	• Finely stranded with end sleeve	mm <sup>2</sup>	1 ... 6 end sleeves without plastic collar	--	
	• AWG cables				
	- Solid or stranded (finely stranded)	AWG	16 ... 10	--	
	- Stranded	AWG	1 x 8	--	
	Tools		DIN ISO 2380-1A0; 5 x 3	--	
	Degree of protection		IP20	--	
<b>Busbar connections</b>					
<b>Main conductors</b>					
	• With cable lug acc. to DIN 46234 or max. 20 mm wide				
	- Stranded	mm <sup>2</sup>	--		2 x (10 ... 70)
	- Finely stranded	mm <sup>2</sup>	--		2 x (10 ... 50)
	• AWG cables, solid or stranded	AWG	--		2 x (7 ... 1/0)

# 3RW Soft Starters

## 3RW40 for standard applications

Soft starters	Type		3RW40 5.	3RW40 7.
<b>Conductor cross-sections</b>				
<b>Screw terminals</b>	<b>Main conductors</b>			
<b>With box terminal</b>			3RT19 55-4G (55 kW)	3RT19 66-4G
<b>Front clamping point connected</b>	<ul style="list-style-type: none"> <li>• Finely stranded with end sleeve</li> <li>• Finely stranded without end sleeve</li> <li>• Stranded</li> <li>• Ribbon cable conductors (number x width x thickness)</li> <li>• AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm AWG	16 ... 70 16 ... 70 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	70 ... 240 70 ... 240 95 ... 300 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 3/0 ... 600 kcmil
				
<b>Rear clamping point connected</b>	<ul style="list-style-type: none"> <li>• Finely stranded with end sleeve</li> <li>• Finely stranded without end sleeve</li> <li>• Stranded</li> <li>• Ribbon cable conductors (number x width x thickness)</li> <li>• AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm AWG	16 ... 70 16 ... 70 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	120 ... 185 120 ... 185 120 ... 240 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 250 ... 500 kcmil
				
<b>Both clamping points connected</b>	<ul style="list-style-type: none"> <li>• Finely stranded with end sleeve</li> <li>• Finely stranded without end sleeve</li> <li>• Stranded</li> <li>• Ribbon cable conductors (number x width x thickness)</li> <li>• AWG cables, solid or stranded</li> <li>• Terminal screws</li> <li>- Tightening torque</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm AWG NM lb.in	Max. 1 x 50, 1 x 70 Max. 1 x 50, 1 x 70 Max. 2 x 70 Max. 2 x (6 x 15.5 x 0.8) Max. 2 x 1/0 M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	Min. 2 x 50; max. 2 x 185 Min. 2 x 50; max. 2 x 185 Max. 2 x 70; max. 2 x 240 Max. 2 x (20 x 24 x 0.5) Min. 2 x 2/0 Max. 2 x 500 kcmil M12 (hexagon socket, A/F5) 20 ... 22 180 ... 195
				
<b>Screw terminals</b>	<b>Main conductors</b>			
<b>With box terminal</b>			3RT19 56-4G	
<b>Front or rear clamping point connected</b>	<ul style="list-style-type: none"> <li>• Finely stranded with end sleeve</li> <li>• Finely stranded without end sleeve</li> <li>• Stranded</li> <li>• Ribbon cable conductors (number x width x thickness)</li> <li>• AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm AWG	16 ... 120 16 ... 120 16 ... 120 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 250 kcmil	
 				
<b>Both clamping points connected</b>	<ul style="list-style-type: none"> <li>• Finely stranded with end sleeve</li> <li>• Finely stranded without end sleeve</li> <li>• Stranded</li> <li>• Ribbon cable conductors (number x width x thickness)</li> <li>• AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm AWG	Max. 1 x 95, 1 x 120 Max. 1 x 95, 1 x 120 Max. 2 x 120 Max. 2 x (10 x 15.5 x 0.8) Max. 2 x 3/0	
				
<b>Screw terminals</b>	<b>Main conductors</b>			
	<u>Without box terminal/busbar connection</u>			
	<ul style="list-style-type: none"> <li>• Finely stranded with cable lug</li> <li>• Stranded with cable lug</li> <li>• AWG cables, solid or stranded</li> <li>• Connecting bar (max. width)</li> <li>• Terminal screws</li> <li>- Tightening torque</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> AWG mm NM lb.in	16 ... 95 <sup>1)</sup> 25 ... 120 <sup>1)</sup> 4 ... 250 kcmil 17 M8 x 25 (A/F13) 10 ... 14 89 ... 124	50 ... 240 <sup>2)</sup> 70 ... 240 <sup>2)</sup> 2/0 ... 500 kcmil 25 M10 x 30 (A/F17) 14 ... 24 124 ... 210

<sup>1)</sup> When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm<sup>2</sup> to ensure phase spacing.

<sup>2)</sup> When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for cond. cross-sections of 240 mm<sup>2</sup> and more as well as DIN 46235 for cond. cross-sections of 185 mm<sup>2</sup> and more to keep the phase clearance.

Soft starters	Type		3RW40 ..
<b>Conductor cross-sections</b>			
<b>Auxiliary conductors</b> (1 or 2 conductors can be connected):			
	<b>Screw terminals</b>		
	<ul style="list-style-type: none"> <li>• Solid</li> <li>• Finely stranded with end sleeve</li> <li>• AWG cables</li> <li>- Solid or stranded</li> <li>- Finely stranded with end sleeve</li> <li>• Terminal screws</li> <li>- Tightening torque</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> AWG AWG NM lb.in	2 x (0.5 ... 2.5) 2 x (0.5 ... 1.5) 2 x (20 ... 14) 2 x (20 ... 16) 0.8 ... 1.2 7 ... 10.3
	<b>Spring-type terminals</b>		
	<ul style="list-style-type: none"> <li>• Solid</li> <li>- 3RW40 2. ... 3RW40 4.</li> <li>- 3RW40 5., 3RW40 7.</li> <li>• Finely stranded with end sleeve</li> <li>• AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> AWG	2 x (0.25 ... 2.5) 2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (24 ... 14) for 3RW40 2. ... 3RW40 4.; 2 x (24 ... 16) for 3RW40 5. and 3RW40 7.

# 3RW Soft Starters

	Standard	Parameters
<b>Electromagnetic compatibility acc. to EN 60947-4-2</b>		
<b>EMC interference immunity</b>		
<b>Electrostatic discharge (ESD)</b>	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
<b>Electromagnetic RF fields</b>	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3: 10 V/m
<b>Conducted RF interference</b>	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
<b>RF voltages and RF currents on cables</b>		
• Burst	EN 61000-4-4	±2 kV/5 kHz
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to earth
<b>EMC interference emission</b>		
<b>EMC interference field strength</b>	EN 55011	Limit value of Class A at 30 ... 1000 MHz, limit value of Class B with 3RW40 2, 24 V AC/DC
<b>Radio interference voltage</b>	EN 55011	Limit value of Class A at 0.15 ... 30 MHz, limit value of Class B with 3RW40 2, 24 V AC/DC
<b>Radio interference suppression filters</b>		
<b>Degree of noise suppression A</b> (industrial applications)	Not required	
<b>Degree of noise suppression B</b> (applications for residential areas) Control voltage • 110 ... 230 V AC/DC • 115/230 V AC • 24 V AC/DC	Not available <sup>1)</sup> Not available <sup>1)</sup> Not required for 3RW40 2 ; required for 3RW40 3. and 3RW40 4. (see table)	

<sup>1)</sup> Degree of noise suppression B cannot be obtained through the use of filters as the strength of the electromagnetic field is not attenuated by the filter.

Soft starter type	Rated current Soft starters A	Recommended filters <sup>1)</sup>		
		Voltage range 200 ... 480 V		
		Filter type	Rated current filters A	Terminals mm <sup>2</sup>
3RW40 36	45	4EF1512-1AA10	50	16
3RW40 37	63	4EF1512-2AA10	66	25
3RW40 38	72	4EF1512-3AA10	90	25
3RW40 46	80	4EF1512-3AA10	90	25
3RW40 47	106	4EF1512-4AA10	120	50

<sup>1)</sup> The radio interference suppression filter is used to remove the conducted interference from the main circuit. The field-related emissions comply with degree of noise suppression B. Filter selection applies under standard conditions: 10 starts per hour, start time 4 s at 300 % I<sub>e</sub>.

Type Number	Max. Fuse Class K5, RK5, RK1	Max. Fuse Class J	Short Voltage Circuit	Voltage
<b>Standard short circuit ratings 3RW40</b>				
3RW40 24	50 A	60 A	5 kA	600 V
3RW40 26	100 A	100 A	5 kA	600 V
3RW40 27	125 A	125 A	5 kA	600 V
3RW40 28	125 A	125 A	5 kA	600 V
3RW40 36	175 A	175 A	10 kA	600 V
3RW40 37	250 A	250 A	10 kA	600 V
3RW40 38	250 A	250 A	10 kA	600 V
3RW40 46	450 A <sup>1)</sup>	300 A	10 kA	600 V
3RW40 47	450 A <sup>1)</sup>	350 A	10 kA	600 V

<sup>1)</sup> Special purpose fuse Type 3N81333-2 manufactured by Siemens covered in File E167357.

### High capacity short circuit ratings 3RW40

3RW40 24	50 A	50 A	42 kA	600 V
3RW40 26	60 A	100 A	42 kA	600 V
3RW40 27	60 A	125 A	42 kA	600 V
3RW40 28	60 A	125 A	42 kA	600 V
3RW40 36	100 A	175 A	30 kA	600 V
3RW40 37	100 A	200 A	30 kA	600 V
3RW40 38	100 A	200 A	30 kA	600 V
3RW40 46	110 A	200 A	42 kA	600 V
3RW40 47	110 A	200 A	42 kA	600 V

For solid-state motor controller, Type 3RW402: Applicable in an enclosure with minimum overall dimensions of 370 by 190 by 190 mm.

For solid-state motor controller, Type 3RW403: Applicable in an enclosure with minimum overall dimensions of 450 by 210 by 225 mm.

For solid-state motor controller, Type 3RW404: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.



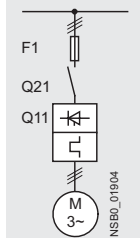
# 3RW Soft Starters

## 3RW40 for standard applications

### Circuit Breaker SCCR

Q11 Type	Rated current	Circuit Breakers														
		Thermal Magnetic						Instantaneous Trip						Fuse		
		480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A
3RW40 24	11															
3RW40 26	23															
3RW40 27	29															
3RW40 28	34															
3RW40 36	42															
3RW40 37	58															
3RW40 38	62															
3RW40 46	73															
3RW40 47	98															
3RW40 55	117	FD63B	100	150	FD63B	50	150	FXD63A	100	150	FXD63A	50	150	RK5	100	200
3RW40 56	145	JD63B	100	200	JD63B	50	250	FXD63A	100	250	FXD63A	50	250	RK5	100	250
3RW40 73	205	JD63B	100	300	JD63B	50	300	JXD63A	100	300	JXD63A	50	300	RK5	100	250
3RW40 74	248	JD63B	100	400	JD63B	50	400	JXD63A	100	400	JXD63A	50	400	RK5	100	450
3RW40 75	315	LD63B	100	500	LD63B	50	450	JXD63A	100	400	JXD63A	50	400	RK5	100	600
3RW40 76	385	LD63B	100	600	LD63B	50	600	LXD63H	100	600	LXD63H	50	600	L	100	700

### Fused version (line protection only)



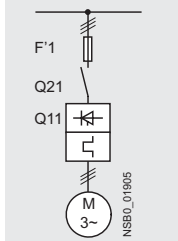
Soft starters Q11 Type	Rated current A	Line protection, maximum F1 Type	Rated current A	Size	Line contactors (optional) Q21
<b>Type of coordination "1"<sup>1)</sup>: I<sub>q</sub> = 65 kA at 600 V +5 %</b>					
3RW40 24	12.5	3NA3 820-6	50	00	3RT10 24
3RW40 26	25	3NA3 822-6	63	00	3RT10 26
3RW40 27	32	3NA3 824-6	80	00	3RT10 34
3RW40 28	38	3NA3 824-6	80	00	3RT10 35
3RW40 36	45	3NA3 130-6	100	1	3RT10 36
3RW40 37	63	3NA3 132-6	125	1	3RT10 44
3RW40 38	72	3NA3 132-6	125	1	3RT10 45
3RW40 46	80	3NA3 136-6	160	1	3RT10 45
3RW40 47	106	3NA3 136-6	160	1	3RT10 46
3RW40 55	134	3NA3 244-6	250	2	3RT10 55-6A.36
3RW40 56	162	3NA3 244-6	250	2	3RT10 56-6A.36
3RW40 73	230	2 x 3NA3 354-6	2 x 355	3	3RT10 65-6A.36
3RW40 74	280	2 x 3NA3 354-6	2 x 355	3	3RT10 66-6A.36
3RW40 75	356	2 x 3NA3 365-6	2 x 500	3	3RT10 75-6A.36
3RW40 76	432	2 x 3NA3 365-6	2 x 500	3	3RT10 76-6A.36

<sup>1)</sup> The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "1" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

# 3RW Soft Starters

## 3RW40 for standard applications

### Fused version with 3NE1 SITOR fuses (semiconductor and line protection)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" -> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" -> "SITOR Semiconductor Fuses" or go to [www.siemens.com/sitor](http://www.siemens.com/sitor) -> "Products" -> "BETA Protecting" -> "SITOR"

Soft starters Q11 Type	Rated current A	All-range fuses F'1 Type			Size	Line contactors (optional) Q21
		Rated current A	Rated current A	Size		
<b>Type of coordination "2"<sup>1)</sup>: <math>I_q = 65 \text{ kA at } 600 \text{ V } +5 \%</math></b>						
<b>3RW40 24</b>	12.5	3NE1 814-0	20	000	3RT10 24	
<b>3RW40 26</b>	25	3NE1 803-0	35	000	3RT10 26	
<b>3RW40 27</b>	32	3NE1 020-2	80	00	3RT10 34	
<b>3RW40 28</b>	38	3NE1 020-2	80	00	3RT10 35	
<b>3RW40 36</b>	45	3NE1 020-2	80	00	3RT10 36	
<b>3RW40 37</b>	63	3NE1 820-0	80	000	3RT10 44	
<b>3RW40 38</b>	72	3NE1 820-0	80	000	3RT10 45	
<b>3RW40 46</b>	80	3NE1 021-0	100	00	3RT10 45	
<b>3RW40 47</b>	106	3NE1 022-0	125	00	3RT10 46	
<b>3RW40 55</b>	134	3NE1 227-2	250	1	3RT10 55-6A.36	
<b>3RW40 56</b>	162	3NE1 227-2	250	1	3RT10 56-6A.36	
<b>3RW40 73</b>	230	3NE1 331-2	350	2	3RT10 65-6A.36	
<b>3RW40 74</b>	280	3NE1 333-2	450	2	3RT10 66-6A.36	
<b>3RW40 75</b>	356	3NE1 334-2	500	2	3RT10 75-6A.36	
<b>3RW40 76</b>	432	3NE1 435-2	560	3	3RT10 76-6A.36	

<sup>1)</sup> The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".  
The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (circuit breaker/fuse), not to any additional components in the feeder.

**ToC 1** Type of coordination "1"

**ToC 2** Type of coordination "2"

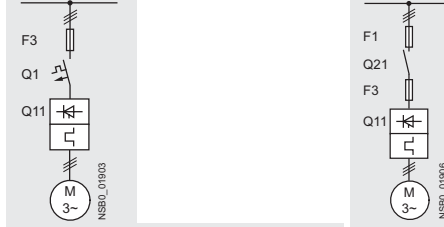
The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

These types of coordination are indicated in the Technical specifications by gray backgrounds.

# 3RW Soft Starters

## 3RW40 for standard applications

**Fused version with 3NE3 SITOR fuses** (semiconductor protection by fuse, line and overload protection by motor starter protector; alternatively, installation with contactor and overload relay possible)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" -> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" -> "SITOR Semiconductor Fuses" or go to [www.siemens.com/sitor](http://www.siemens.com/sitor) -> "Products" -> "BETA Protecting" -> "SITOR"

Soft starters Q11 Type	Rated current A	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses, minimum		
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size

Type of coordination "2" <sup>1)</sup> : I <sub>q</sub> = 65 kA at 600 V +5 %										
3RW40 24	12.5	--	--	--	--	--	--	3NE4 101	32	0
3RW40 26	25	--	--	--	3NE3 221	100	1	3NE4 102	40	0
3RW40 27	32	--	--	--	3NE3 224	160	1	3NE4 118	63	0
3RW40 28	38	--	--	--	3NE3 224	160	1	3NE4 118	63	0
3RW40 36	45	--	--	--	3NE3 224	160	1	3NE4 120	80	0
3RW40 37	63	--	--	--	3NE3 225	200	1	3NE4 121	100	0
3RW40 38	72	3NE3 221	100	1	3NE3 227	250	1	--	--	--
3RW40 46	80	3NE3 222	125	1	3NE3 225	200	1	--	--	--
3RW40 47	106	3NE3 224	160	1	3NE3 231	350	1	--	--	--
3RW40 55	134	3NE3 227	250	1	3NE3 335	560	2	--	--	--
3RW40 56	162	3NE3 227	250	1	3NE3 335	560	2	--	--	--
3RW40 73	230	3NE3 232-0B	400	1	3NE3 333	450	2	--	--	--
3RW40 74	280	3NE3 233	450	1	3NE3 336	630	2	--	--	--
3RW40 75	356	3NE3 335	560	2	3NE3 336	630	2	--	--	--
3RW40 76	432	3NE3 337-8	710	2	3NE3 340-8	900	2	--	--	--

Soft starters Q11 Type	Rated current A	Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A

Type of coordination "2" <sup>1)</sup> : I <sub>q</sub> = 65 kA at 600 V +5 %												
3RW40 24	12.5	3NE4 117	50	0	3NE8 015-1	25	00	3NE8 017-1	50	00	3NC2 240	40
3RW40 26	25	3NE4 117	50	0	3NE8 017-1	50	00	3NE8 021-1	100	00	3NC2 263	63
3RW40 27	32	3NE4 118	63	0	3NE8 018-1	63	00	3NE8 022-1	125	00	3NC2 280	80
3RW40 28	38	3NE4 118	63	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW40 36	45	3NE4 120	80	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW40 37	63	3NE4 121	100	0	3NE8 021-1	100	00	3NE8 024-1	160	00	--	--
3RW40 38	72	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW40 46	80	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW40 47	106	--	--	--	3NE8 024-1	160	00	3NE8 024-1	160	00	--	--
3RW40 55	134	--	--	--	--	--	--	--	--	--	--	--
3RW40 56	162	--	--	--	--	--	--	--	--	--	--	--
3RW40 73	230	--	--	--	--	--	--	--	--	--	--	--
3RW40 74	280	--	--	--	--	--	--	--	--	--	--	--
3RW40 75	356	--	--	--	--	--	--	--	--	--	--	--
3RW40 76	432	--	--	--	--	--	--	--	--	--	--	--

Soft starters Q11 Type	Rated current A	Line contactors (optional) Q21	Motor starter protectors/circuit breakers				Line protection, maximum		
			400 V +10 % Q1 Type	Rated current A	575 V +10 % Q1 Type	Rated current A	F1 Type	Rated current A	Size

Type of coordination "2" <sup>1)</sup> : I <sub>q</sub> = 65 kA at 600 V +5 %										
3RW40 24	12.5	3RT10 24	3RV1 021-4KA10	55	--	--	--	3NA3 820-6	50	00
3RW40 26	25	3RT10 26	3RV1 021-4DA10	55	--	--	--	3NA3 822-6	63	00
3RW40 27	32	3RT10 34	3RV1 031-4EA10	55	--	--	--	3NA3 824-6	80	00
3RW40 28	38	3RT10 35	3RV1 031-4FA10	55	--	--	--	3NA3 824-6	80	00
3RW40 36	45	3RT10 36	3RV1 031-4GA10	20	--	--	--	3NA3 130-6	100	1
3RW40 37	63	3RT10 44	3RV1 041-4JA10	20	--	--	--	3NA3 132-6	125	1
3RW40 38	72	3RT10 45	3RV1 041-4KA10	20	--	--	--	3NA3 132-6	125	1
3RW40 46	80	3RT10 45	3RV1 041-4LA10	11	--	--	--	3NA3 136-6	160	1
3RW40 47	106	3RT10 46	3RV1 041-4MA10	11	--	--	--	3NA3 136-6	160	1
3RW40 55	134	3RT10 55-6A.36	3VL3 720	200	3VL3 720	200	3NA3 244-6	250	2	
3RW40 56	162	3RT10 56-6A.36	3VL3 720	200	3VL3 720	200	3NA3 244-6	250	2	
3RW40 73	230	3RT10 65-6A.36	3VL4 731	315	3VL5 731	315	2 x 3NA3 354-6	2 x 355	3	
3RW40 74	280	3RT10 66-6A.36	3VL4 731	315	3VL5 731	315	2 x 3NA3 354-6	2 x 355	3	
3RW40 75	356	3RT10 75-6A.36	3VL4 740	400	3VL5 740	400	2 x 3NA3 365-6	2 x 500	3	
3RW40 76	432	3RT10 76-6A.36	3VL5 750	500	3VL5 750	500	2 x 3NA3 365-6	2 x 500	3	

<sup>1)</sup> The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "2" refers only to soft starters in combination

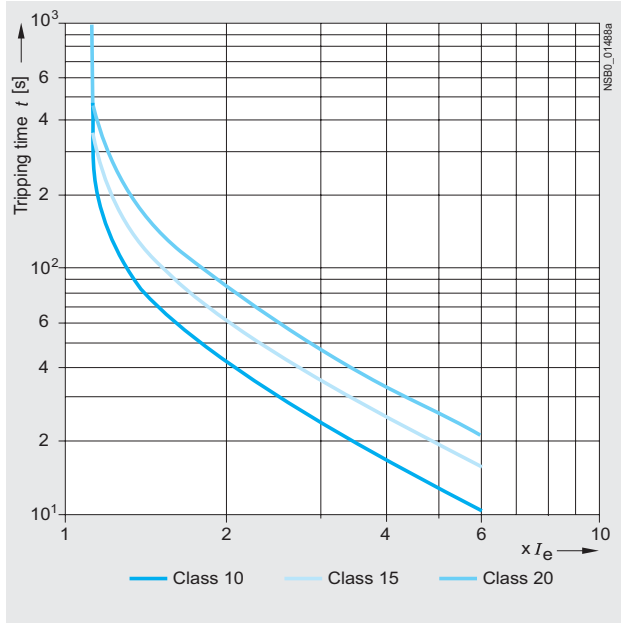
with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

# 3RW Soft Starters

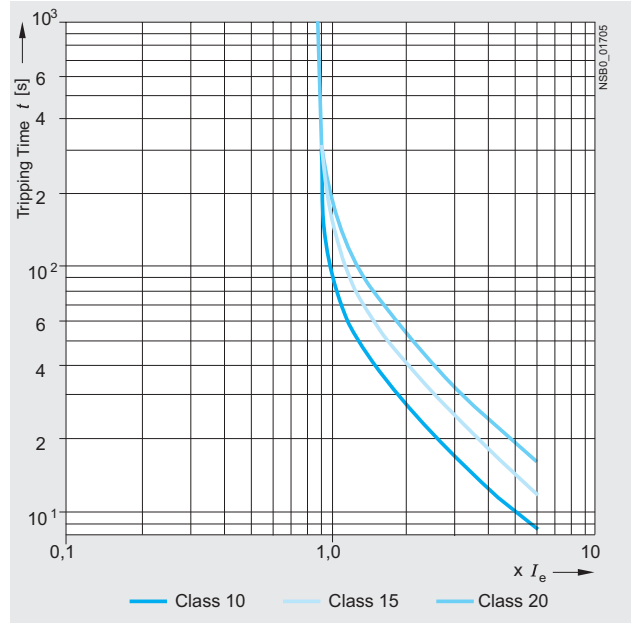
3RW40 for standard applications

## Characteristic curves

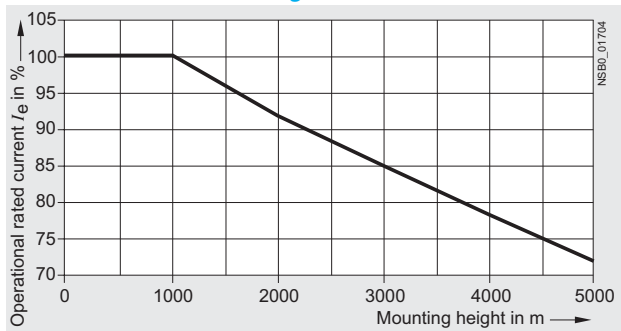
Motor protection tripping characteristics for 3RW40 (with symmetry)



Motor protection tripping characteristics for 3RW40 (with asymmetry)



Permissible installation height



At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

# 3RW Soft Starters

## 3RW40 for standard applications

### More information

#### Application examples for normal starting (Class 10)

**Normal starting Class 10** (up to 20 s with 350 %  $I_{n, motor}$ ).

The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Small fan	Pump	Hydraulic pump
<b>Starting parameters</b>					
• Voltage ramp and current limiting					
- Starting voltage	%	70	60	40	40
- Starting time	s	10	10	10	10
- Current limit value		$5 \times I_M$	$5 \times I_M$	$4 \times I_M$	$4 \times I_M$
<b>Ramp-down time</b>	s	5	5	0	10

#### Application examples for heavy starting (Class 20)

**Heavy starting Class 20** (up to 40 s with 350 %  $I_{n, motor}$ ).

The soft starter has to be selected at least one performance class higher than the motor used.

Application	Stirrer	Compressor	Centrifuge
<b>Starting parameters</b>			
• Voltage ramp and current limiting			
- Starting voltage	%	40	50
- Starting time	s	20	10
- Current limit value		$4 \times I_M$	$4 \times I_M$
<b>Ramp-down time</b>		0	0

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

# 3RW Soft Starters

## 3RW40 for standard applications

### Configuration

The 3RW solid-state soft starters are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

Where long starting times are involved, the integrated solid-state overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Catalog LV 1.

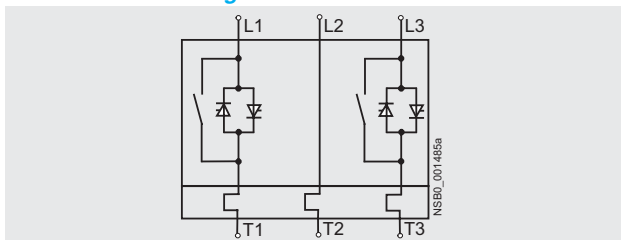
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

**Note:**

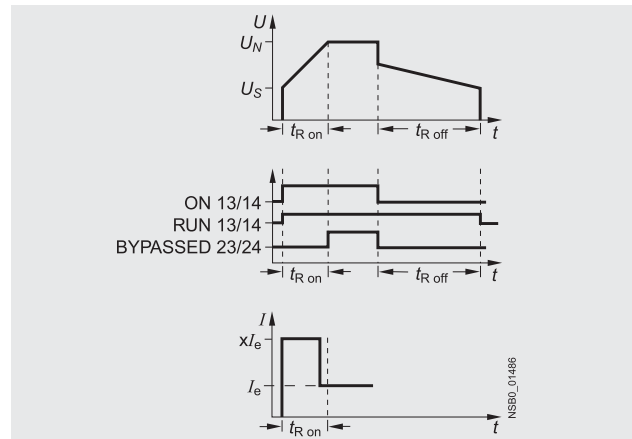
*When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.*

### Schematic circuit diagram



A bypass contact system and solid-state overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

### Status graphs



### Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

[www.usa.siemens.com](http://www.usa.siemens.com) > Software

More information can be found on the Internet at:

[www.usa.siemens.com](http://www.usa.siemens.com).

# 3RW Soft Starters

## 3RW44 for high-feature applications

### Overview

In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a performance range up to 900 Hp (at 460 V) in the inline circuit and up to 1600 Hp (at 460 V) in the inside-delta circuit.

The SIRIUS 3RW44 soft starters are characterized by a compact design for space-saving and clearly arranged control cabinet layouts. For optimized motor starting and stopping the innovative SIRIUS 3RW44 soft starters are an attractive alternative with considerable savings potential compared to applications with a frequency converter. The new torque control and adjustable current limiting enable the High-Feature soft starters to be used in nearly every conceivable task. They reliably mitigate the sudden torque applications and current peaks during motor starting and stopping. This creates savings potential when calculating the size of the controlgear and when servicing the machinery installed. Be it for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

The bypass contacts already integrated in the soft starter bypass the thyristors after a motor ramp-up is detected. This results in a further great reduction in the heat loss occurring during operation of the soft starter at rated value.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements. Operation and commissioning can be performed with the menu-controlled keypad and a menu-prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a previously selected language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation.

#### Applicable standards

- IEC 60947-4-2
- UL/CSA

#### Soft Starter ES parameterization software

Soft Starter ES software is used for the parameterization, monitoring and service diagnostics of SIRIUS 3RW44 High Feature soft starters.

See Catalog LV 1, Chapter 12 "Planning and Configuration with SIRIUS".

### Function

Equipped with modern, ergonomic user prompting the SIRIUS 3RW44 soft starters can be commissioned quickly and easily using a keypad and a menu-prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a selectable language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation. During operation and when control voltage is applied, the display field continuously presents measured values and operating values as well as warnings and fault messages. An external display and operator module can be connected by means of a connection cable to the soft starter, thus enabling active indications and the like to be read directly from the control cabinet door.

The SIRIUS 3RW44 soft starters are equipped with optimum functionality. An integral bypass contact system reduces the power loss of the soft starter during operation.

This reliably prevents heating of the switchgear environment. The SIRIUS 3RW44 soft starters have internal intrinsic device protection. This prevents thermal overloading of the power section's thyristors, e. g. due to unacceptably high closing operations.

Wiring outlay for installing an additional motor overload relay is no longer needed as the SIRIUS 3RW44 soft starters perform this function too. In addition they offer adjustable trip classes and a thermistor motor protection function. As an option the thyristors can also be protected by SITOR semiconductor fuses from short-circuiting so that the soft starter is still functional after a short-circuit (type of coordination 2). And even inrush current peaks are reliably avoided thanks to adjustable current limiting.

As a further option the SIRIUS 3RW44 soft starters can be upgraded with a PROFIBUS DP module. Thanks to their communication capability and their programmable control inputs and relay outputs the SIRIUS 3RW44 soft starters can be very easily and quickly integrated in higher-level controllers.

In addition a creep speed function is available for positioning and setting jobs. With this function the motor can be controlled in both directions of rotation with reduced torque and an adjustable, low speed.

On the other hand the SIRIUS 3RW44 soft starters offer a new, combined DC braking function for the fast stopping of driving loads.

#### Highlights

- Soft starting with breakaway pulse, torque control or voltage ramp, adjustable torque or current limiting as well as any combination of these, depending on load type
- Integrated bypass contact system to minimize power loss
- Various setting options for the starting parameters such as starting torque, starting voltage, ramp-up and ramp-down time, and much more in three separate parameter sets
- Start-up detection
- Inside-delta circuit for savings in terms of size and equipment costs
- Various ramp-down modes selectable: free ramp-down, torque-controlled pump ramp-down, combined DC braking
- Solid-state motor overload and intrinsic device protection
- Thermistor motor protection
- Keypad with a menu-prompted, multi-line graphic display with background lighting
- Interface for communication with the PC for more accurate setting of the parameters as well as for control and monitoring
- Simple adaptation to the motor feeder
- Simple mounting and commissioning
- Display of operating states and fault messages
- Connection to PROFIBUS with optional PROFIBUS DP module
- External display and operator module
- Mains voltages from 200 to 690 V, 50 to 60 Hz
- Applicable up to 60 °C (derating from 40 °C)



# 3RW Soft Starters

## 3RW44 for high-feature applications

Type		3RW44 ...BC.4	3RW44 ...BC.5	3RW44 ...BC.6
<b>Power electronics</b>				
<b>Rated operational voltage for inline circuit</b>	V AC	200 ... 460	400 ... 600	400 ... 690
Tolerance	%	-15/+10	-15/+10	-15/+10
<b>Maximum blocking voltage (thyristor)</b>	V AC	1400	1800	1800
<b>Rated operational voltage for inside-delta circuit</b>	V AC	200 ... 460	400 ... 600	400 ... 600
Tolerance	%	-15/+10	-15/+10	-15/+10
<b>Rated frequency</b>	Hz	50 ... 60		
Tolerance	%	±10		
<b>Uninterrupted duty at 40 °C (% of I<sub>e</sub>)</b>	%	115		
<b>Minimum load (% of set motor current I<sub>M</sub>)</b>	%	8		
<b>Maximum cable length</b> between soft starter and motor	m	500 <sup>1)</sup>		
<b>Permissible installation height</b>	m	5000 (derating from 1000, see characteristic curves); higher on request		
<b>Permissible mounting position</b>				
<b>Installation type</b>		Stand-alone installation		
<b>Permissible ambient temperature</b>		Operation °C: 0 ... +60; (derating from +40) Storage °C: -25 ... +80		
<b>Degree of protection</b>		IP00		

1) At the project configuration stage, it is important to make allowance for the voltage drop on the motor cable up to the motor connection. If necessary,

higher values for the rated operational voltage or current must be calculated accordingly for the soft starter.

Type		3RW44 22	3RW44 23	3RW44 24	3RW44 25	3RW44 26	3RW44 27
<b>Power electronics</b>							
40 °C/50 °C/60 °C							
<b>Load rating with rated operational current I<sub>e</sub></b>							
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
<b>Smallest adjustable rated motor current I<sub>M</sub></b>	A	5	7	9	11	15	18
For the motor overload protection							
<b>Power loss</b>							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	8	10	32	36	45	55
• During starting with 300 % I <sub>M</sub> (40 °C)	W	400	470	600	725	940	1160
<b>Permissible rated motor current and starts per hour</b>							
• <b>Normal starting (Class 5)</b>							
- Rated motor current I <sub>M</sub> <sup>2)</sup> , starting time 5 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour <sup>3)</sup>	1/h	41	34	41	42	43	44
- Rated motor current I <sub>M</sub> <sup>2)4)</sup> , starting time 10 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour <sup>3)</sup>	1/h	20	15	20	20	20	20
• <b>Normal starting (Class 10)</b>							
- Rated motor current I <sub>M</sub> <sup>2)</sup> , starting time 10 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour <sup>3)</sup>	1/h	20	15	20	20	20	20
- Rated motor current I <sub>M</sub> <sup>2)4)</sup> , starting time 20 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour <sup>3)</sup>	1/h	10	6	10	10	8	8
• <b>Normal starting (Class 15)</b>							
- Rated motor current I <sub>M</sub> <sup>2)</sup> , starting time 15 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour <sup>3)</sup>	1/h	13	9	13	13	13	13
- Rated motor current I <sub>M</sub> <sup>2)4)</sup> , starting time 30 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour <sup>3)</sup>	1/h	6	4	6	6	6	6
• <b>Normal starting (Class 20)</b>							
- Rated motor current I <sub>M</sub> <sup>2)</sup> , starting time 20 s	A	29/26/23	36/33/29	47/42/37	57/51/45	73/66/59	88/80/72
- Starts per hour <sup>3)</sup>	1/h	10	6	10	10	10	10
- Rated motor current I <sub>M</sub> <sup>2)4)</sup> , starting time 30 s	A	29/26/23	36/33/29	47/42/37	57/51/45	73/66/59	88/80/72
- Starts per hour <sup>3)</sup>	1/h	4	2	4	5	1.8	0.8
• <b>For very heavy starting (Class 30)</b>							
- Rated motor current I <sub>M</sub> <sup>2)</sup> , starting time 30 s	A	29/26/23	36/33/29	44/42/37	57/51/45	65/60/54	77/70/63
- Starts per hour <sup>3)</sup>	1/h	6	4	6	6	6	6
- Rated motor current I <sub>M</sub> <sup>2)3)</sup> , starting time 60 s	A	29/26/23	36/33/29	44/42/37	57/51/45	65/60/54	77/70/63
- Starts per hour <sup>3)</sup>	1/h	1.8	0.8	3.3	1.5	2	1

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I<sub>M</sub>.

3) For intermittent duty S4 with ON period = 30 %, T<sub>0</sub> = 40 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I<sub>M</sub>, dependent on CLASS setting.

# 3RW Soft Starters

## 3RW44 for high-feature applications

Type		3RW44 34	3RW44 35	3RW44 36
<b>Power electronics</b>		40 °C/50 °C/60 °C		
<b>Load rating with rated operational current <math>I_e</math></b>				
<ul style="list-style-type: none"> <li>• Acc. to IEC and UL/CSA<sup>1)</sup>, for individual mounting at 40/50/60 °C, AC-53a</li> </ul>	A	113/100/88	134/117/100	162/145/125
<b>Smallest adjustable rated motor current <math>I_M</math></b>				
For the motor overload protection	A	22	26	32
<b>Power loss</b>				
<ul style="list-style-type: none"> <li>• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.</li> <li>• During starting with 300 % <math>I_M</math> (40 °C)</li> </ul>	W	64	76	95
	W	1350	1700	2460
<b>Permissible rated motor current and starts per hour</b>				
<b>• Normal starting (Class 5)</b>				
- Rated motor current $I_M^{(2)}$ , starting time 5 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour <sup>3)</sup>	1/h	41	39	41
- Rated motor current $I_M^{(2)(4)}$ , starting time 10 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour <sup>3)</sup>	1/h	20	15	20
<b>• Normal starting (Class 10)</b>				
- Rated motor current $I_M^{(2)}$ , starting time 10 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour <sup>3)</sup>	1/h	20	15	20
- Rated motor current $I_M^{(2)(4)}$ , starting time 20 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour <sup>3)</sup>	1/h	9	6	7
<b>• Normal starting (Class 15)</b>				
- Rated motor current $I_M^{(2)}$ , starting time 15 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour <sup>3)</sup>	1/h	13	9	12
- Rated motor current $I_M^{(2)(4)}$ , starting time 30 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour <sup>3)</sup>	1/h	6	6	1
<b>• Normal starting (Class 20)</b>				
- Rated motor current $I_M^{(2)}$ , starting time 20 s	A	106/97/88	125/113/100	147/134/122
- Starts per hour <sup>3)</sup>	1/h	9	9	10
- Rated motor current $I_M^{(2)(4)}$ , starting time 30 s	A	106/97/88	125/113/100	147/134/122
- Starts per hour <sup>3)</sup>	1/h	1.5	2	1
<b>• For very heavy starting (Class 30)</b>				
- Rated motor current $I_M^{(2)}$ , starting time 30 s	A	91/84/76	110/100/90	120/110/100
- Starts per hour <sup>3)</sup>	1/h	6	6	6
- Rated motor current $I_M^{(2)(4)}$ , starting time 60 s	A	91/84/76	110/100/90	120/110/100
- Starts per hour <sup>3)</sup>	1/h	2	2	2

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 %  $I_M$ .

3) For intermittent duty S4 with ON period = 30 %,  $T_u = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current  $I_M$ , dependent on CLASS setting.

# 3RW Soft Starters

## 3RW44 for high-feature applications

Type		3RW44 43	3RW44 44	3RW44 45	3RW44 46	3RW44 47
<b>Power electronics</b>						
40 °C/50 °C/60 °C						
<b>Load rating with rated operational current <math>I_e</math></b> • Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
<b>Smallest adjustable rated motor current <math>I_M</math></b> For the motor overload protection	A	40	50	62	71	86
<b>Power loss</b>						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	89	110	145	174	232
• During starting with 300 % $I_M$ (40 °C)	W	3350	4000	4470	5350	5860
<b>Permissible rated motor current and starts per hour</b>						
<b>• Normal starting (Class 5)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 5 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour <sup>3)</sup>	1/h	41	41	41	41	39
- Rated motor current $I_M^{(2)4)}$ , starting time 10 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour <sup>3)</sup>	1/h	20	20	19	17	16
<b>• Normal starting (Class 10)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 10 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour <sup>3)</sup>	1/h	20	20	19	17	16
- Rated motor current $I_M^{(2)4)}$ , starting time 20 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour <sup>3)</sup>	1/h	9	10	6	4	5
<b>• Normal starting (Class 15)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 15 s	A	203/180/156	240/215/185	313/280/250	325/295/265	402/385/335
- Starts per hour <sup>3)</sup>	1/h	13	13	10	13	11
- Rated motor current $I_M^{(2)4)}$ , starting time 30 s	A	203/180/156	240/215/185	313/280/250	325/295/265	402/385/335
- Starts per hour <sup>3)</sup>	1/h	3	6	1	2	1
<b>• Normal starting (Class 20)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 20 s	A	195/175/155	215/195/180	275/243/221	285/263/240	356/326/295
- Starts per hour <sup>3)</sup>	1/h	10	10	10	10	10
- Rated motor current $I_M^{(2)4)}$ , starting time 30 s	A	195/175/155	215/195/180	275/243/221	285/263/240	356/326/295
- Starts per hour <sup>3)</sup>	1/h	1	5	1	3	1
<b>• For very heavy starting (Class 30)</b>						
- Rated motor current $I_M^{(2)}$ , starting time 30 s	A	162/148/134	180/165/150	220/201/182	240/223/202	285/260/235
- Starts per hour <sup>3)</sup>	1/h	6	6	6	6	6
- Rated motor current $I_M^{(2)4)}$ , starting time 60 s	A	162/148/134	180/165/150	220/201/182	240/223/202	285/260/235
- Starts per hour <sup>3)</sup>	1/h	3	3	3	2	1

<sup>1)</sup> Measurement at 60 °C according to UL/CSA not required.

<sup>2)</sup> With 300 %  $I_M$ .

<sup>3)</sup> For intermittent duty S4 with ON period = 30 %,  $T_u = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

<sup>4)</sup> Maximum adjustable rated motor current  $I_M$ , dependent on CLASS setting.

# 3RW Soft Starters

## 3RW44 for high-feature applications

Type		3RW44 53	3RW44 54	3RW44 55	3RW44 56	3RW44 57	3RW44 58
<b>Power electronics</b>		40 °C/50 °C/60 °C					
<b>Load rating with rated operational current <math>I_e</math></b>							
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
<b>Smallest adjustable rated motor current <math>I_M</math></b>	A	110	123	138	156	176	194
For the motor overload protection							
<b>Power loss</b>							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	159	186	220	214	250	270
• During starting with 300 % $I_M$ (40 °C)	W	7020	8100	9500	11100	13100	15000
<b>Permissible rated motor current and starts per hour</b>							
<b>• Normal starting (Class 5)</b>							
- Rated motor current $I_M^{(2)}$ , starting time 5 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour <sup>3)</sup>	1/h	41	41	37	33	22	17
- Rated motor current $I_M^{(2/4)}$ , starting time 10 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour <sup>3)</sup>	1/h	20	20	16	13	8	5
<b>• Normal starting (Class 10)</b>							
- Rated motor current $I_M^{(2)}$ , starting time 10 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour <sup>3)</sup>	1/h	20	20	16	13	8	5
- Rated motor current $I_M^{(2/4)}$ , starting time 20 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour <sup>3)</sup>	1/h	10	9	6	4	0.3	0.3
<b>• Normal starting (Class 15)</b>							
- Rated motor current $I_M^{(2)}$ , starting time 15 s	A	551/494/438	615/551/489	666/615/551	723/693/615	780/710/650	821/755/693
- Starts per hour <sup>3)</sup>	1/h	13	13	11	9	8	8
- Rated motor current $I_M^{(2/4)}$ , starting time 30 s	A	551/494/438	615/551/489	666/615/551	723/693/615	780/710/650	821/755/693
- Starts per hour <sup>3)</sup>	1/h	6	4	3	1	0.4	0.5
<b>• Normal starting (Class 20)</b>							
- Rated motor current $I_M^{(2)}$ , starting time 20 s	A	551/494/438	591/551/489	633/615/551	670/634/576	710/650/590	740/685/630
- Starts per hour <sup>3)</sup>	1/h	10	10	7	8	7	9
- Rated motor current $I_M^{(2/4)}$ , starting time 30 s	A	551/494/438	591/551/489	633/615/551	670/634/576	710/650/590	740/685/630
- Starts per hour <sup>3)</sup>	1/h	4	2	1	1	0.4	1
<b>• For very heavy starting (Class 30)</b>							
- Rated motor current $I_M^{(2)}$ , starting time 30 s	A	500/480/438	525/489/455	551/520/480	575/540/490	600/550/500	630/580/530
- Starts per hour <sup>3)</sup>	1/h	6	6	6	6	6	6
- Rated motor current $I_M^{(2/4)}$ , starting time 60 s	A	500/480/438	525/489/455	551/520/480	575/540/490	600/550/500	630/580/530
- Starts per hour <sup>3)</sup>	1/h	2	1	1	1	1.5	1

<sup>1)</sup> Measurement at 60 °C according to UL/CSA not required.

<sup>2)</sup> With 300 %  $I_M$ .

<sup>3)</sup> For intermittent duty S4 with ON period = 30 %,  $T_U = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

<sup>4)</sup> Maximum adjustable rated motor current  $I_M$ , dependent on CLASS setting.

# 3RW Soft Starters

## 3RW44 for high-feature applications

Type		3RW44 65	3RW44 66
<b>Power electronics</b>		40 °C/50 °C/60 °C	
<b>Load rating with rated operational current <math>I_e</math></b>			
• Acc. to IEC and UL/CSA <sup>1)</sup> , for individual mounting at 40/50/60 °C, AC-53a	A	1076/ <b>970</b> /880	1214/ <b>1076</b> /970
<b>Smallest adjustable rated motor current <math>I_M</math></b> For the motor overload protection			
	A	215	242
<b>Power loss</b>			
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	510	630
• During starting with 300 % $I_M$ (40 °C)	W	15000	17500
<b>Permissible rated motor current and starts per hour</b>			
<b>• Normal starting (Class 5)</b>			
- Rated motor current $I_M^{(2)}$ , starting time 5 s	A	1076/ <b>970</b> /880	1214/ <b>1076</b> /970
- Starts per hour <sup>3)</sup>	1/h	30	20
- Rated motor current $I_M^{(2)(4)}$ , starting time 10 s	A	1076/ <b>970</b> /880	1214/ <b>1076</b> /970
- Starts per hour <sup>3)</sup>	1/h	10	6
<b>• Normal starting (Class 10)</b>			
- Rated motor current $I_M^{(2)}$ , starting time 10 s	A	1076/ <b>970</b> /880	1214/ <b>1076</b> /970
- Starts per hour <sup>3)</sup>	1/h	11	6
- Rated motor current $I_M^{(2)(4)}$ , starting time 20 s	A	1076/ <b>970</b> /880	1214/ <b>1076</b> /970
- Starts per hour <sup>3)</sup>	1/h	3	0.5
<b>• Normal starting (Class 15)</b>			
- Rated motor current $I_M^{(2)}$ , starting time 15 s	A	1020/ <b>950</b> /850	1090/ <b>1000</b> /920
- Starts per hour <sup>3)</sup>	1/h	7	5
- Rated motor current $I_M^{(2)(4)}$ , starting time 30 s	A	1020/ <b>950</b> /850	1090/ <b>1000</b> /920
- Starts per hour <sup>3)</sup>	1/h	1	1
<b>• Normal starting (Class 20)</b>			
- Rated motor current $I_M^{(2)}$ , starting time 20 s	A	970/ <b>880</b> /810	1030/ <b>940</b> /860
- Starts per hour <sup>3)</sup>	1/h	7	5
- Rated motor current $I_M^{(2)(4)}$ , starting time 30 s	A	970/ <b>880</b> /810	1030/ <b>940</b> /860
- Starts per hour <sup>3)</sup>	1/h	1	1
<b>• For very heavy starting (Class 30)</b>			
- Rated motor current $I_M^{(2)}$ , starting time 30 s	A	880/ <b>810</b> /740	920/ <b>850</b> /780
- Starts per hour <sup>3)</sup>	1/h	6	6
- Rated motor current $I_M^{(2)(4)}$ , starting time 60 s	A	880/ <b>810</b> /740	920/ <b>850</b> /780
- Starts per hour <sup>3)</sup>	1/h	1	1

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 %  $I_M$ .

3) For intermittent duty S4 with ON period = 30 %,  $T_u = 40$  °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current  $I_M$ , dependent on CLASS setting.

# 3RW Soft Starters

## 3RW44 for high-feature applications



3RW44 27-1BC44

3RW44 36-6BC44

3RW44 47-6BC44

3RW44 58-6BC44

3RW44 66-6BC44

Ambient temperature 40 °C					Ambient temperature 50 °C					DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg	
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage $U_e$					Rated operational current $I_e$	Rated power of induction motors for rated operational voltage $U_e$										
A	230 V	400 V	500 V	690 V	1000 V	A	200 V	230 V	460 V	575 V							
	kW	kW	kW	kW	kW		hp	hp	hp	hp							
<b>Inside-delta circuits, rated operational voltage 200 ... 460 V<sup>2)</sup></b>																	
50	15	<b>22</b>	--	--	--	45	10	15	<b>30</b>	--	▶	3RW44 22-□BC□4		1	1 unit	131	6.500
62	18.5	<b>30</b>	--	--	--	55	15	20	<b>40</b>	--	▶	3RW44 23-□BC□4		1	1 unit	131	6.500
81	22	<b>45</b>	--	--	--	73	20	25	<b>50</b>	--	▶	3RW44 24-□BC□4		1	1 unit	131	6.500
99	30	<b>55</b>	--	--	--	88	25	30	<b>60</b>	--	▶	3RW44 25-□BC□4		1	1 unit	131	6.500
133	37	<b>75</b>	--	--	--	118	30	40	<b>75</b>	--	▶	3RW44 26-□BC□4		1	1 unit	131	6.500
161	45	<b>90</b>	--	--	--	142	40	50	<b>100</b>	--	▶	3RW44 27-□BC□4		1	1 unit	131	6.500
<b>Order No. supplement for connection types</b>																	
<ul style="list-style-type: none"> <li>• With spring-type terminals</li> <li>• With screw terminals</li> </ul>																	
196	55	<b>110</b>	--	--	--	173	50	60	<b>125</b>	--	B	3RW44 34-□BC□4		1	1 unit	131	7.900
232	75	<b>132</b>	--	--	--	203	60	75	<b>150</b>	--	B	3RW44 35-□BC□4		1	1 unit	131	7.900
281	90	<b>160</b>	--	--	--	251	75	100	<b>200</b>	--	B	3RW44 36-□BC□4		1	1 unit	131	7.900
352	110	<b>200</b>	--	--	--	312	100	125	<b>250</b>	--	B	3RW44 43-□BC□4		1	1 unit	131	11.500
433	132	<b>250</b>	--	--	--	372	125	150	<b>300</b>	--	B	3RW44 44-□BC□4		1	1 unit	131	11.500
542	160	<b>315</b>	--	--	--	485	150	200	<b>400</b>	--	B	3RW44 45-□BC□4		1	1 unit	131	11.500
617	200	<b>355</b>	--	--	--	546	150	200	<b>450</b>	--	B	3RW44 46-□BC□4		1	1 unit	131	11.500
748	250	<b>400</b>	--	--	--	667	200	250	<b>600</b>	--	B	3RW44 47-□BC□4		1	1 unit	131	11.500
954	315	<b>560</b>	--	--	--	856	300	350	<b>750</b>	--	C	3RW44 53-□BC□4		1	1 unit	131	50.000
1065	355	<b>630</b>	--	--	--	954	350	400	<b>850</b>	--	C	3RW44 54-□BC□4		1	1 unit	131	50.000
1200	400	<b>710</b>	--	--	--	1065	350	450	<b>950</b>	--	C	3RW44 55-□BC□4		1	1 unit	131	50.000
1351	450	<b>800</b>	--	--	--	1200	450	500	<b>1050</b>	--	C	3RW44 56-□BC□4		1	1 unit	131	50.000
1524	500	<b>900</b>	--	--	--	1351	450	600	<b>1200</b>	--	C	3RW44 57-□BC□4		1	1 unit	131	50.000
1680	560	<b>1000</b>	--	--	--	1472	550	650	<b>1300</b>	--	C	3RW44 58-□BC□4		1	1 unit	131	50.000
1864	630	<b>1100</b>	--	--	--	1680	650	750	<b>1500</b>	--	C	3RW44 65-□BC□4		1	1 unit	131	78.000
2103	710	<b>1200</b>	--	--	--	1864	700	850	<b>1700</b>	--	C	3RW44 66-□BC□4		1	1 unit	131	78.000
<b>Order No. supplement for connection types</b>																	
<ul style="list-style-type: none"> <li>• With spring-type terminals</li> <li>• With screw terminals</li> </ul>																	
<b>Order No. supplement for the rated control supply voltage <math>U_s^{3)}</math></b>																	
<ul style="list-style-type: none"> <li>• 115 V AC</li> <li>• 230 V AC</li> </ul>																	

**Order No. supplement for connection types**

- With spring-type terminals
- With screw terminals

**Order No. supplement for the rated control supply voltage  $U_s^{3)}$**

- 115 V AC
- 230 V AC

<sup>1)</sup> In the selection table, the unit rated current  $I_e$  refers to the induction motor's rated operational current in the inside-delta circuit. The actual current of the device is approx. 58 % of this value.

<sup>2)</sup> 3RW44 2 ... 3RW44 4. soft starters with screw terminals: delivery times ▶ (preferred type),

<sup>3)</sup> Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

**Note:**

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism  $J_{Load} < 10 \times J_{Motor}$ ; starting current 350 %  $\times I_e$  for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

# 3RW Soft Starters

## 3RW44 for high-feature applications

Ambient temperature 40 °C					Ambient temperature 50 °C				DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg		
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage $U_e$					Rated operational current $I_e$	Rated power of induction motors for rated operational voltage $U_e$										
A	230 V	400 V	500 V	690 V	1000 V	A	200 V	230 V	460 V	575 V							
	kW	kW	kW	kW	kW		hp	hp	hp	hp							
<b>Inside-delta circuits, rated operational voltage 400 ... 600 V<sup>2)</sup></b>																	
50	--	22	<b>30</b>	--	--	45	--	--	30	<b>40</b>	A	<b>3RW44 22-□BC□5</b>		1	1 unit	131	6.500
62	--	30	<b>37</b>	--	--	55	--	--	40	<b>50</b>	A	<b>3RW44 23-□BC□5</b>		1	1 unit	131	6.500
81	--	45	<b>45</b>	--	--	73	--	--	50	<b>60</b>	A	<b>3RW44 24-□BC□5</b>		1	1 unit	131	6.500
99	--	55	<b>55</b>	--	--	88	--	--	60	<b>75</b>	A	<b>3RW44 25-□BC□5</b>		1	1 unit	131	6.500
133	--	75	<b>90</b>	--	--	118	--	--	75	<b>100</b>	A	<b>3RW44 26-□BC□5</b>		1	1 unit	131	6.500
161	--	90	<b>110</b>	--	--	142	--	--	100	<b>125</b>	A	<b>3RW44 27-□BC□5</b>		1	1 unit	131	6.500
<b>Order No. supplement for connection types</b>																	
<ul style="list-style-type: none"> <li>• With spring-type terminals</li> <li>• With screw terminals</li> </ul>																	
196	--	110	<b>132</b>	--	--	173	--	--	125	<b>150</b>	B	<b>3RW44 34-□BC□5</b>		1	1 unit	131	7.900
232	--	132	<b>160</b>	--	--	203	--	--	150	<b>200</b>	B	<b>3RW44 35-□BC□5</b>		1	1 unit	131	7.900
281	--	160	<b>200</b>	--	--	251	--	--	200	<b>250</b>	B	<b>3RW44 36-□BC□5</b>		1	1 unit	131	7.900
352	--	200	<b>250</b>	--	--	312	--	--	250	<b>300</b>	B	<b>3RW44 43-□BC□5</b>		1	1 unit	131	11.500
433	--	250	<b>315</b>	--	--	372	--	--	300	<b>350</b>	B	<b>3RW44 44-□BC□5</b>		1	1 unit	131	11.500
542	--	315	<b>355</b>	--	--	485	--	--	400	<b>500</b>	B	<b>3RW44 45-□BC□5</b>		1	1 unit	131	11.500
617	--	355	<b>450</b>	--	--	546	--	--	450	<b>600</b>	B	<b>3RW44 46-□BC□5</b>		1	1 unit	131	11.500
748	--	400	<b>500</b>	--	--	667	--	--	600	<b>750</b>	B	<b>3RW44 47-□BC□5</b>		1	1 unit	131	11.500
954	--	560	<b>630</b>	--	--	856	--	--	750	<b>950</b>	C	<b>3RW44 53-□BC□5</b>		1	1 unit	131	50.000
1065	--	630	<b>710</b>	--	--	954	--	--	850	<b>1050</b>	C	<b>3RW44 54-□BC□5</b>		1	1 unit	131	50.000
1200	--	710	<b>800</b>	--	--	1065	--	--	950	<b>1200</b>	C	<b>3RW44 55-□BC□5</b>		1	1 unit	131	50.000
1351	--	800	<b>900</b>	--	--	1200	--	--	1050	<b>1350</b>	C	<b>3RW44 56-□BC□5</b>		1	1 unit	131	50.000
1524	--	900	<b>1000</b>	--	--	1351	--	--	1200	<b>1500</b>	C	<b>3RW44 57-□BC□5</b>		1	1 unit	131	50.000
1680	--	1000	<b>1200</b>	--	--	1472	--	--	1300	<b>1650</b>	C	<b>3RW44 58-□BC□5</b>		1	1 unit	131	50.000
1864	--	1100	<b>1350</b>	--	--	1680	--	--	1500	<b>1900</b>	C	<b>3RW44 65-□BC□5</b>		1	1 unit	131	78.000
2103	--	1200	<b>1500</b>	--	--	1864	--	--	1700	<b>2100</b>	C	<b>3RW44 66-□BC□5</b>		1	1 unit	131	78.000

**Order No. supplement for connection types**

- With spring-type terminals
- With screw terminals

**Order No. supplement for the rated control supply voltage  $U_s^{3)}$**

- 115 V AC
- 230 V AC

<sup>1)</sup> In the selection table, the unit rated current  $I_e$  refers to the induction motor's rated operational current in the inside-delta circuit. The actual current of the device is approx. 58 % of this value.

<sup>2)</sup> Soft starter with screw terminals:  
 3RW44 2. ... 3RW44 4. Delivery time A  
 3RW44 5. ... 3RW44 6. Delivery time B.

<sup>3)</sup> Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

**Note:**

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism  $J_{Load} < 10 \times J_{Motor}$ ; starting current 350 %  $\times I_e$  for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.



# 3RW Soft Starters

## 3RW44 for high-feature applications

### Technical specifications

Type	Terminal		3RW44 ...-BC3.	3RW44 ...-BC4.
<b>Control electronics</b>				
<b>Rated values</b>				
Rated control supply voltage	A1/A2/PE	V	115 AC	230 AC
• Tolerance		%	-15/+10	-15/+10
Rated control supply current STANDBY		mA	30	20
Rated control supply current ON				
• 3RW44 2.		mA	300	170
• 3RW44 3.		mA	500	250
• 3RW44 4.		mA	750	400
• 3RW44 5.		mA	450	200
• 3RW44 6.		mA	650	300
Maximum current (pickup bypass)				
• 3RW44 2.		mA	1000	500
• 3RW44 3.		mA	2500	1250
• 3RW44 4.		mA	6000	3000
• 3RW44 5.		mA	4500	2500
• 3RW44 6.		mA	4500	2500
Rated frequency		Hz	50 ... 60	50 ... 60
• Tolerance		%	±10	±10

Type	Terminal		3RW44 ..	Factory default
<b>Control electronics</b>				
<b>Control inputs</b>				
Input 1	IN1			Start motor right parameter set 1
Input 2	IN2			No action
Input 3	IN3			No action
Input 4	IN4			Trip reset
Supply	L+/L-			
• Rated operational current	L+	mA	Approx. 10 per input to DIN 19240	
• Rated operational voltage	L-		Internal voltage: 24 V DC from internal supply through terminal L+ to IN1 ... IN4. Maximum load at L+ approx. 55 mA	
			External voltage: DC external voltage (acc. to DIN 19240) through terminals L- and IN1 ... IN4 (min. 12 V DC, max. 30 V DC)	
<b>Thermistor motor protection input</b>				
Input	T1/T2		PTC type A or Thermoclick	Deactivated
<b>Relay outputs (floating auxiliary contacts)</b>				
Output 1	13/14			ON period
Output 2	23/24			No action
Output 3	33/34			No action
Output 4	95/96/98			Group fault
<b>Switching capacity of the relay outputs (auxiliary contacts)</b>				
230 V/AC-15		A	3 at 240 V	
24 V/DC-13		A	1 at 24 V	
Protection against overvoltages			Protection by means of varistor through relay contact	
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)	
<b>Protection functions</b>				
<b>Motor protection functions</b>				
Trips in the event of			Thermal overloading of the motor	
Trip class acc. to IEC 60947-4-1		Class	5/10/15/20/30	10
Phase failure sensitivity		%	>40	
Overload warning			Yes	
Reset and recovery			Manual/Automatic	Manual
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	1 ... 30	1
<b>Device protection functions</b>				
Trips in the event of			Thermal overloading of the thyristors	
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	0.5	
<b>Bypass protection functions</b>				
Trips in the event of			Thermal overloading of the bypass contacts	
Reset option after tripping			Manual	
Recovery time		min.	1	

# 3RW Soft Starters

## 3RW44 for high-feature applications

Type	3RW44..	Factory default
<b>Control times and parameters</b>		
<b>Control times</b>		
Closing time (with connected control voltage)	ms	<50
Closing time (automatic mode)	ms	<4000
Recovery time (closing command in active ramp-down)	ms	<100
<b>Mains failure bridging time</b>		
Control supply voltage	ms	100
<b>Mains failure response time</b>		
Load circuit	ms	100
<b>Reclosing lockout after overload trip</b>		
Motor protection trip	min.	1 ... 30
Device protection trip	s	30
<b>Setting options for starting</b>		
Voltage ramp for starting voltage	%	20 ... 100
Torque control for starting torque	%	10 ... 100
Torque control for limit torque	%	20 ... 200
Starting time	s	0 ... 360 <sup>3)</sup>
Maximum starting time	s	1 ... 1000
Current limit value	%	125 ... 550 <sup>1)</sup>
Breakaway voltage	%	40 ... 100
Breakaway time	s	0 ... 2
Motor heat output	%	1 ... 100
<b>Creep mode Left/Right running</b>		
Speed factor as function of rated speed ( $n = n_{rated}/factor$ )	%	3 ... 21
Creep torque <sup>2)</sup>	%	20 ... 100
<b>Setting options for ramp-down</b>		
Torque control for stopping torque	%	10 ... 100
Ramp-down time	s	0 ... 360 <sup>3)</sup>
Dynamic braking torque	%	20 ... 100
DC braking torque	%	20 ... 100
<b>Operating indications</b>		
		Test voltage Test mains phases Ready to start Start active Motor running Ramp-down active Emergency start active
<b>Warnings/error signals</b>		
		Mains voltage missing Leading-edge phase error Phase failure • L1 • L2 • L3 Missing load phase • T1 • T2 • T3 Failure • Contact element 1 (thyristor) • Contact element 2 (thyristor) • Contact element 3 (thyristor) Flash memory faulty Supply voltage • Below 75 % • Below 85 % • Over 110 % Current unbalance exceeded Thermal motor model overload Prewarning limit exceeded • Motor heating • Time-related trip reserve Bypass element defective Mains voltage too high Device not named Wrong naming version Current measuring range exceeded Bypass element protection disconnection Power section • Overheated • Overheating

<sup>1)</sup> Max. current limit value for 3RW44 53 ... 3RW44 57: 500 % and for 3RW44 58 ... 3RW44 66: 450 %.

<sup>2)</sup> Reference variable depends on the motor used but is always smaller than the rated torque of the motor.

<sup>3)</sup> Actual motor start times are load dependent.

# 3RW Soft Starters







## 3RW44 for high-feature applications

Type	3RW44 ..	Factory default
<b>Control times and parameters</b>		
<b>Warnings/error signals</b> (continued)		
	Temperature sensor <ul style="list-style-type: none"> <li>• Overload</li> <li>• Open circuit</li> <li>• Short-circuit</li> </ul> Ground fault <ul style="list-style-type: none"> <li>• Detected</li> </ul> Connection abort in manual operating mode Max. number of starts exceeded $I_g$ limit value overshoot/undershoot Heat sink sensor <ul style="list-style-type: none"> <li>• Open circuit</li> <li>• Short-circuit</li> </ul> Quick-stop active Switching block defective $I_g$ /class setting not permissible No external start-up parameters received PAA fault	
<b>Control inputs</b> Input 1 Input 2 Input 3 Input 4 Parameterizing options for control inputs 1 ... 4	No action Local manual mode Emergency start Creep speed Quick-stop Trip reset Motor right parameter set 1 Motor left parameter set 1 <sup>1)</sup> Motor right parameter set 2 Motor left parameter set 2 <sup>1)</sup> Motor right parameter set 3 Motor left parameter set 3 <sup>1)</sup>	Motor right parameter set 1 No action No action Trip reset
<b>Relay outputs</b> Output 1 Output 2 Output 3 Output 4 Parameterizing options for relay outputs 1 ... 3	No action PAA output 1 PAA output 2 Input 1 Input 2 Input 3 Input 4 Starting Operation/Bypass Ramp-down ON period Command motor on DC braking contactor Group warning Group fault Bus fault Device fault Power on Ready to start	ON period No action No action Group fault
<b>Motor temperature sensor</b>	Deactivated Thermoclick PTC type A	

<sup>1)</sup> Parameter motor left possible only in conjunction with creep mode.

# 3RW Soft Starters

## 3RW44 for high-feature applications

Type		3RW44 2.	3RW44 3.	3RW44 4.	3RW44 5. 3RW44 6.
<b>Conductor cross-sections</b>					
<b>Screw terminals</b>	<b>Main conductors</b>				
<b>With box terminal</b>			3RT19 55-4G (55 kW)	3RT19 66-4G	--
<b>Front clamping point connected</b>	<ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Solid</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> 2.5 ... 35 mm <sup>2</sup> 4 ... 50 mm <sup>2</sup> 2.5 ... 16 mm <sup>2</sup> 4 ... 70 mm 6 x 9 x 0.8 AWG 10 ... 2/0	16 ... 70 16 ... 70 -- 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	70 ... 240 70 ... 240 -- 95 ... 300 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 3/0 ... 600 kcmil	--
					
<b>Rear clamping point connected</b>	<ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Solid</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> 2.5 ... 50 mm <sup>2</sup> 10 ... 50 mm <sup>2</sup> 2.5 ... 16 mm <sup>2</sup> 10 ... 70 mm 6 x 9 x 0.8 AWG 10 ... 2/0	16 ... 70 16 ... 70 -- 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	120 ... 185 120 ... 185 -- 120 ... 240 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 250 ... 500 kcmil	--
					
<b>Both clamping points connected</b>	<ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Solid</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG cables, solid or stranded</li> <li>Terminal screws</li> <li>- Tightening torque</li> </ul>	mm <sup>2</sup> 2 x (2.5 ... 35) mm <sup>2</sup> 2 x (4 ... 35) mm <sup>2</sup> 2 x (2.5 ... 16) mm <sup>2</sup> 2 x (4 ... 50) mm 2 x (6 x 9 x 0.8) AWG 2 x (10 ... 1/0) M6 (hexagon socket, A/F4) 4 ... 6 36 ... 53 NM lb.in	Max. 1 x 50, 1 x 70 Max. 1 x 50, 1 x 70 -- Max. 2 x 70 Max. 2 x (6 x 15.5 x 0.8) Max. 2 x 1/0 M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	Min. 2 x 50 Max. 2 x 185 Min. 2 x 50 Max. 2 x 185 -- Max. 2 x 70 Max. 2 x 240 Max. 2 x (20 x 24 x 0.5) Min. 2 x 2/0 Max. 2 x 500 kcmil M12 (hexagon socket, A/F4) 20 ... 22 180 ... 195	--
					
<b>Screw terminals</b>	<b>Main conductors</b>				
<b>With box terminal</b>		--	3RT19 56-4G	--	--
<b>Front or rear clamping point connected</b>	<ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> -- mm <sup>2</sup> -- mm <sup>2</sup> -- mm -- AWG --	16 ... 120 16 ... 120 16 ... 120 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 250 kcmil	--	--
					
<b>Both clamping points connected</b>	<ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> -- mm <sup>2</sup> -- mm <sup>2</sup> -- mm -- AWG --	Max. 1 x 95, 1 x 120 Max. 1 x 95, 1 x 120 Max. 2 x 120 Max. 2 x (10 x 15.5 x 0.8) Max. 2 x 3/0	--	--
					
<b>Screw terminals</b>	<b>Main conductors</b>				
	<u>Without box terminal/busbar connection</u>				
	<ul style="list-style-type: none"> <li>Finely stranded with cable lug</li> <li>Stranded with cable lug</li> <li>AWG cables, solid or stranded</li> <li>Connecting bar (max. width)</li> <li>Terminal screws</li> <li>- Tightening torque</li> </ul>	mm <sup>2</sup> -- mm <sup>2</sup> -- AWG -- mm -- -- NM -- lb.in --	16 ... 95 <sup>1)</sup> 25 ... 120 <sup>1)</sup> 4 ... 250 kcmil 17 M8 x 25 (A/F13) 10 ... 14 89 ... 124	50 ... 240 <sup>2)</sup> 70 ... 240 <sup>2)</sup> 2/0 ... 500 kcmil 25 M10 x 30 (A/F17) 14 ... 24 124 ... 210	50 ... 240 <sup>2)</sup> 70 ... 240 <sup>2)</sup> 2/0 ... 500 kcmil 60 M12 x 40 20 ... 35 177 ... 310

<sup>1)</sup> When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm<sup>2</sup> to ensure phase spacing.

<sup>2)</sup> When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for conductor cross-sections of 240 mm<sup>2</sup> and more as well as DIN 46235 for conductor cross-sections of 185 mm<sup>2</sup> and more to keep the phase clearance.

# 3RW Soft Starters

## 3RW44 for high-feature applications

Soft starters	Type	3RW44..	
<b>Conductor cross-sections</b>			
<b>Auxiliary conductors</b> (1 or 2 conductors can be connected):			
<b>Screw terminals</b>			
• Solid	mm <sup>2</sup>	2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)	
• AWG cables			
- Solid or stranded	AWG	2 x (20 ... 14)	
- Finely stranded with end sleeve	AWG	2 x (20 ... 16)	
• Terminal screws			
- Tightening torque	NM lb.in	0.8 ... 1.2 7 ... 10.3	
<b>Spring-type terminals</b>			
• Solid	mm <sup>2</sup>	2 x (0.25 ... 1.5)	
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.25 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)	
		<b>Standard</b>	<b>Parameters</b>
<b>Electromagnetic compatibility acc. to EN 60947-4-2</b>			
<b>EMC interference immunity</b>			
<b>Electrostatic discharge (ESD)</b>	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge	
<b>Electromagnetic RF fields</b>	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3, 10 V/m	
<b>Conducted RF interference</b>	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V	
<b>RF voltages and RF currents on cables</b>			
• Burst	EN 61000-4-4	±2 kV/5 kHz	
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to ground	
<b>EMC interference emission</b>			
<b>EMC interference field strength</b>	EN 55011	Limit value of Class A at 30 ... 1000 MHz	
<b>Radio interference voltage</b>	EN 55011	Limit value of Class A at 0.15 ... 30 MHz	
<b>Is an RI suppression filter necessary?</b>			
<b>Degree of noise suppression A</b> (industrial applications)		No	

# 3RW Soft Starters

## Circuit Breaker SCCR

Soft starters ToC 1	Rated current	Circuit Brakers																	
		Thermal Magnetic						Instantaneous Trip						Fuse					
Q11 Type		480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A
<b>3RW44 22</b>	11	ED63B, HEG3G	100	40				ED63A, HEM3M	100	40	ED63A, HEM3M	50	40	RK5	100	50	J	100	100
<b>3RW44 23</b>	23	ED63B, HEG3G	100	50				ED63A, HEM3M	100	50	ED63A, HEM3M	50	50	RK5	100	60	J	100	120
<b>3RW44 24</b>	29	ED63B, HEG3G	100	70				ED63A, HEM3M	100	100	ED63A, HEM3M	50	50	RK5	100	80	J	100	160
<b>3RW44 25</b>	29	ED63B, HEG3G	100	70				ED63A, HEM3M	100	50	ED63A, HEM3M	50	50	RK5	100	80			
<b>3RW44 26</b>	29	ED63B, HEG3G	100	100				ED63A, HEM3M	100	100	ED63A, HEM3M	50	100	RK5	100	125	J	100	250
<b>3RW44 27</b>	34	ED63B, HEG3G, FD63B	100	150				ED63A, HEM3M	100	100	ED63A, HEM3M	50	125	RK5	100	150	J	100	300
<b>3RW44 34</b>	42	FD63B	100	150	FD63B	50	150	ED63A, HEM3M	100	125	FXD63A	50	150	RK5	100	200	J	100	400
<b>3RW44 35</b>	58	FD63B	100	150	FD63B	50	150	FXD63A	100	150	FXD63A	50	150	RK5	100	200	J	100	400
<b>3RW44 36</b>	62	JD63B	100	200	JD63B	50	250	FXD63A	100	250	FXD63A	50	250	RK5	100	250	J	100	500
<b>3RW44 43</b>	73	JD63B	100	300	JD63B	50	250	FXD63A	100	250	JXD63A	50	300	RK5	100	300	J	100	600
<b>3RW44 44</b>	98	JD63B	100	300	JD63B	50	300	JXD63A	100	300	JXD63A	50	300	RK5	100	350			
<b>3RW44 45</b>	98	JD63B	100	400	JD63B	50	400	JXD63A	100	400	JXD63A	50	400	RK5	100	450			
<b>3RW44 46</b>	98	LD63B	100	500	LD63B	50	450	LXD63H	100	400	JXD63A	50	400	RK5	100	600			
<b>3RW44 47</b>	98	LD63B	100	600	LD63B	50	600	LXD63H	100	600	LXD63H	50	600	L	100	700			
<b>3RW44 53</b>	117	HMD6	65	800/800	HMD6	50	800/800							L	100	1000			
<b>3RW44 54</b>	145	HND6	100	1200/900	HND6	50	1200/900							L	100	1000			
<b>3RW44 55</b>	145	HND6	100	1200/900	HND6	50	1200/900							L	100	1000			
<b>3RW44 56</b>	145	HND6	100	1200/1000	HND6	50	1200/1000							L	100	1000			
<b>3RW44 57</b>	145	HND6	100	1200/1000	HND6	50	1200/1000							L	100	1000			
<b>3RW44 58</b>	145	CND6	65	1200	CND6	65	1200												
<b>3RW44 65</b>	205	CND6	42	1600	CND6	42	1600												
<b>3RW44 66</b>	248	CND6	42	1600	CND6	42	1600												

**Specified Type**

ED63A  
FXD63A  
JXD63A  
ED63B  
FD63B  
JD63B  
HND6

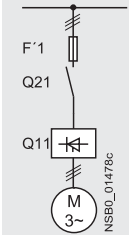
**Others permitted**

HED63A, HHED63A or CED63A  
HFXD63A or CFD63A  
HJXD63A or CJD63A  
HED63B, HHED63B or CED63B  
HFD63B, HHFD63B or CFD63B  
HJ63B, HHJD63B or CJD63B  
HNXD6 or CND6

# 3RW Soft Starters

## 3RW44 for high-feature applications

Inline circuit fused version with 3NE1 SITOR all-range fuse (semiconductor and line protection)



For matching fuse bases see Catalog LV 1 under "SETRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to [www.siemens.com/sitor](http://www.siemens.com/sitor) → "Products" → "BETA Protecting" → "SITOR"

Soft starters Q11 Type	Rated current A	All-range fuses			Line contactors up to 400 V (optional) Q21 Type	Braking contactors <sup>1)2)</sup> (for example circuit see page 7/70)		
		F'1 Type	Rated current A	Voltage V		Size	Q91 Type	Q92 Type
<b>Type of coordination "2"<sup>n3)</sup>; I<sub>q</sub> = 65 kA</b>								
3RW44 22	29	3NE1 020-2	80	690 +5 %	00	3RT10 34	3RT15 26	--
3RW44 23	36	3NE1 020-2	80	690 +5 %	00	3RT10 35	3RT15 26	--
3RW44 24	47	3NE1 021-2	100	690 +5 %	00	3RT10 36	3RT15 35	--
3RW44 25	57	3NE1 022-2	125	690 +5 %	00	3RT10 44	3RT15 35	--
3RW44 26	77	3NE1 022-2	125	690 +5 %	00	3RT10 45	3RT10 24	3RT10 35
3RW44 27	93	3NE1 024-2	160	690 +5 %	1	3RT10 46	3RT10 25	3RT10 36
3RW44 34	113	3NE1 225-2	200	690 +5 %	1	3RT10 54	3RT10 34	3RT10 44
3RW44 35	134	3NE1 227-2	250	690 +5 %	1	3RT10 55	3RT10 36	3RT10 45
3RW44 36	162	3NE1 227-2	250	690 +5 %	1	3RT10 56	3RT10 44	3RT10 45
3RW44 43	203	3NE1 230-2	315	600 +10 %	1	3RT10 64	3RT10 44	3RT10 54
3RW44 44	250	3NE1 331-2	350	460 +10 %	2	3RT10 65	3RT10 44	3RT10 55
3RW44 45	313	3NE1 333-2	450	690 +5 %	2	3RT10 75	3RT10 54	3RT10 56
3RW44 46	356	3NE1 334-2	500	690 +5 %	2	3RT10 75	3RT10 54	3RT10 56
3RW44 47	432	3NE1 435-2	560	690 +5 %	3	3RT10 76	3RT10 55	3RT10 64
3RW44 53	551	2 x 3NE1 334-2	500	690 +10 %	2	3TF68	3RT10 64	3RT10 66
3RW44 54	615	2 x 3NE1 334-2	500	690 +10 %	2	3TF68	3RT10 64	3RT10 75
3RW44 55	693	2 x 3NE1 334-2	500	690 +10 %	2	3TF69	3RT10 65	3RT10 75
3RW44 56	780	2 x 3NE1 435-2	560	690 +10 %	3	3TF69	3RT10 65	3RT10 75
3RW44 57	880	2 x 3NE1 435-2	560	690 +10 %	3		3RT10 75	3RT10 76
3RW44 58	970	2 x 3NE1 435-2	560	690 +10 %	3		3RT10 75	3RT10 76
3RW44 65	1076	3 x 3NE1 334-2	500	690 +10 %	2		3RT10 75	3TF68
3RW44 66	1214	3 x 3NE1 435-2	560	690 +10 %	3		3RT10 76	3TF68

1) If the ramp-down function "Combined braking" is selected, no braking contactor is required.  
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type).  
For applications with large centrifugal masses ( $J_{Load} > J_{Motor}$ ) we recommend the function "DC braking".

2) Additional auxiliary relay K4:  
LZX:RT4A4T30  
(3RW44 soft starter with rated control supply voltage 230 V AC),  
LZX:RT4A4S15  
(3RW44 soft starter with rated control supply voltage 115 V AC).

3) The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.  
[The types of coordination are explained under "3RA1 Fuseless Load Feeders".](#)

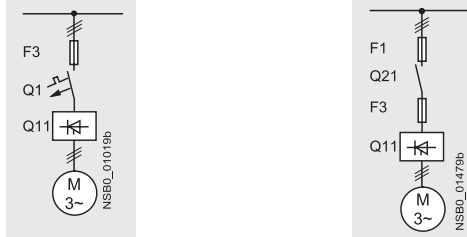


# 3RW Soft Starters

## 3RW44 for high-feature applications

### Inline circuit fused version with 3NE or 3NC SITOR semiconductor fuse

(semiconductor protection by fuse, line and overload protection by motor starter protector/circuit breaker)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to [www.siemens.com/sitor](http://www.siemens.com/sitor) → "Products" → "BETA Protecting" → "SITOR"

Soft starters Q11 Type	Rated current A	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
		690 V +10 % F3 Type	Rated current A	Size	690 V +10 % F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
<b>Type of coordination "2"<sup>3)</sup>: I<sub>q</sub> = 65 kA</b>										
3RW44 22	29	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	36	3NE4 121	100	0	3NE4 121	100	0	3NC2 200	100	22 x 58
3RW44 24	47	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	57	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	77	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	93	3NE3 224	160	1	3NE3 332-0B	400	2			
3RW44 34	113	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	134	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	162	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	203	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	250	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	313	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	356	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	432	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	551	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	615	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	693	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	780	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	880	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 58	970	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 65	1076	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			
3RW44 66	1214	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			

Soft starters Q11 Type	Rated current A	Line contactors up to 400 V (optional) Q21 Type	Braking contactors <sup>1)2)</sup> (for example circuit see page 7/64) Q91 Type		Motor starter protectors/ circuit breakers Q1 Type	Line protection, maximum			
			Q92 Type	Rated current A		690 V +5 % F1 Type	Rated current A	Size	
<b>Type of coordination "2"<sup>3)</sup>: I<sub>q</sub> = 65 kA</b>									
3RW44 22	29	3RT10 34	3RT15 26	--	3RV10 41-4HA10	50	3NA3 820-6	50	00
3RW44 23	36	3RT10 35	3RT15 26	--	3RV10 41-4JA10	63	3NA3 822-6	63	00
3RW44 24	47	3RT10 36	3RT15 35	--	3RV10 41-4KA10	75	3NA3 824-6	80	00
3RW44 25	57	3RT10 44	3RT15 35	--	3RV10 41-4LA10	90	3NA3 830-6	100	00
3RW44 26	77	3RT10 45	3RT10 24	3RT10 35	3RV10 41-4MA10	100	3NA3 132-6	125	1
3RW44 27	93	3RT10 46	3RT10 25	3RT10 36	3RV10 41-4MA10	100	3NA3 136-6	160	1
3RW44 34	113	3RT10 54	3RT10 34	3RT10 44	3VL17 16	160	3NA3 244-6	250	2
3RW44 35	134	3RT10 55	3RT10 36	3RT10 45	3VL17 16	160	3NA3 244-6	250	2
3RW44 36	162	3RT10 56	3RT10 44	3RT10 45	3VL37 25	250	3NA3 365-6	500	3
3RW44 43	203	3RT10 64	3RT10 44	3RT10 54	3VL47 31	315	2 x 3NA3 354-6	2 x 355	3
3RW44 44	250	3RT10 65	3RT10 44	3RT10 55	3VL47 31	315	2 x 3NA3 354-6	2 x 355	3
3RW44 45	313	3RT10 75	3RT10 54	3RT10 56	3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 46	356	3RT10 75	3RT10 54	3RT10 56	3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 47	432	3RT10 76	3RT10 55	3RT10 64	3VL57 50	500	2 x 3NA3 365-6	2 x 500	3
3RW44 53	551	3TF68	3RT10 64	3RT10 66	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 54	615	3TF68	3RT10 64	3RT10 75	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 55	693	3TF69	3RT10 65	3RT10 75	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 56	780	3TF69	3RT10 65	3RT10 75	3VL77 10	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 57	880		3RT10 75	3RT10 76	3VL77 10	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 58	970		3RT10 75	3RT10 76	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 65	1076		3RT10 75	3TF68	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 66	1214		3RT10 76	3TF68	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3

1) If the ramp-down function "Combined braking" is selected, no braking contactor is required. If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type). For applications with large centrifugal masses ( $J_{Load} > J_{Motor}$ ) we recommend the function "DC braking".

2) Additional auxiliary relay K4:  
LZX:RT4A4T30  
(3RW44 soft starter with rated control supply voltage 230 V AC),  
LZX:RT4A4S15  
(3RW44 soft starter with rated control supply voltage 115 V AC).

3) The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder. The types of coordination are explained under "3RA1 Fuseless Load Feeders".

# 3RW Soft Starters

## 3RW44 for high-feature applications

**Inside-delta circuit fused version with 3NE or 3NC SITOR fuses**  
 (semiconductor protection by fuse, lead and overload protection by motor starter protector/circuit breaker)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to [www.siemens.com/sitor](http://www.siemens.com/sitor) → "Products" → "BETA Protecting" → "SITOR"

Soft starters Q11 Type	Rated current A	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
<b>Type of coordination "2"<sup>1)</sup></b>										
3RW44 22	50	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	62	3NE4 121	100	0	3NE4 121	100	0	3NC2 200	100	22 x 58
3RW44 24	81	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	99	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	133	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	161	3NE3 224	160	1	3NE3 332-0B	400	2			
3RW44 34	196	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	232	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	281	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	352	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	433	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	542	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	617	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	748	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	954	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	1065	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	1200	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	1351	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	1524	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			
3RW44 58	1680	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			
3RW44 65	1864	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			
3RW44 66	2103	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			

Soft starters Q11 Type	Rated current A	Line contactors up to 400 V (optional)		Motor starter protectors/circuit breakers		Line protection, maximum		
		Q21 Type		Q1 Type	Rated current A	F1 Type	Rated current A	Size
<b>Type of coordination "2"<sup>1)</sup></b>								
3RW44 22	50	3RT10 36-1AP04		3RV10 42-4KA10	75	3NA3 824-6	80	00
3RW44 23	62	3RT10 44-1AP04		3RV10 42-4LA10	90	3NA3 830-6	100	00
3RW44 24	81	3RT10 46-1AP04		3RV10 42-4MA10	100	3NA3 132-6	125	1
3RW44 25	99	3RT10 54-1AP36		3VL27 16	160	3NA3 136-6	160	1
3RW44 26	133	3RT10 55-6AP36		3VL27 16	160	3NA3 240-6	200	2
3RW44 27	161	3RT10 56-6AP36		3VL37 20	200	3NA3 244-6	250	2
3RW44 34	196	3RT10 64-6AP36		3VL37 25	250	3NA3 360-6	400	3
3RW44 35	232	3RT10 65-6AP36		3VL47 31	315	3NA3 360-6	400	3
3RW44 36	281	3RT10 66-6AP36		3VL47 40	400	2 x 3NA3 360-6	2 x 400	3
3RW44 43	352	3RT10 75-6AP36		3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 44	433	3RT10 76-6AP36		3VL57 50	500	2 x 3NA3 365-6	2 x 500	3
3RW44 45	542	3TF68 44-0CM7		3VL57 63	800	3 x 3NA3 365-6	3 x 500	3
3RW44 46	617	3TF68 44-0CM7		3VL67 80	800	3 x 3NA3 365-6	3 x 500	3
3RW44 47	748	3TF69		3VL67 80	800	3 x 3NA3 365-6	3 x 500	3
3RW44 53	954			3VL77 10	1000	3 x 3NA3 365-6	3 x 500	3
3RW44 54	1065			3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 55	1200			3VL87 16	1600	3 x 3NA3 365-6	3 x 500	3
3RW44 56	1351			3VL87 16	1600	3 x 3NA3 372	3 x 630	3
3RW44 57	1524			3VL87 16	1600	3 x 3NA3 372	3 x 630	3
3RW44 58	1680			3WL12 20	2000	2 x 3NA3 480	2 x 1000	4
3RW44 65	1864			3WL12 25	2500	2 x 3NA3 482	2 x 1250	4
3RW44 66	2103			3WL12 25	2500	2 x 3NA3 482	2 x 1250	4

<sup>1)</sup> The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

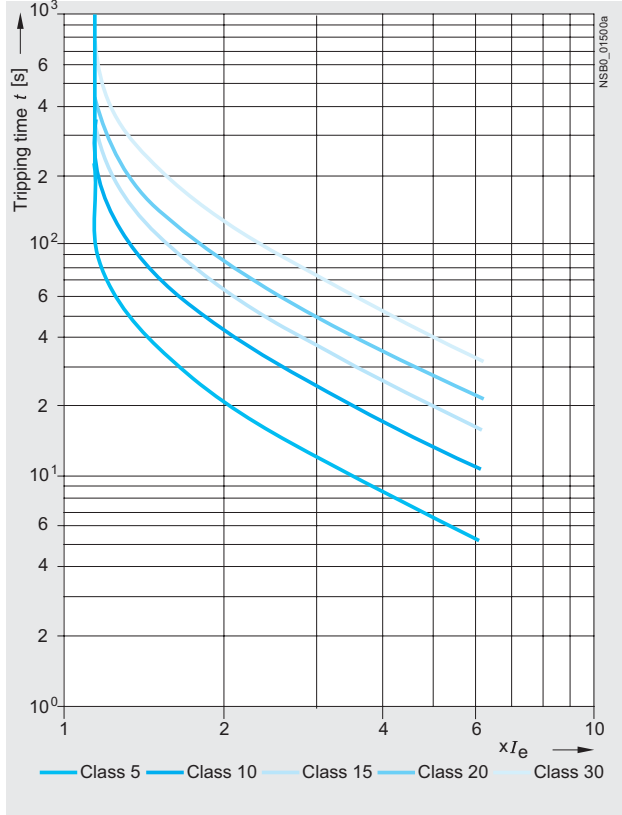
The types of coordination are explained under "3RA1 Fuseless Load Feeders".

# 3RW Soft Starters

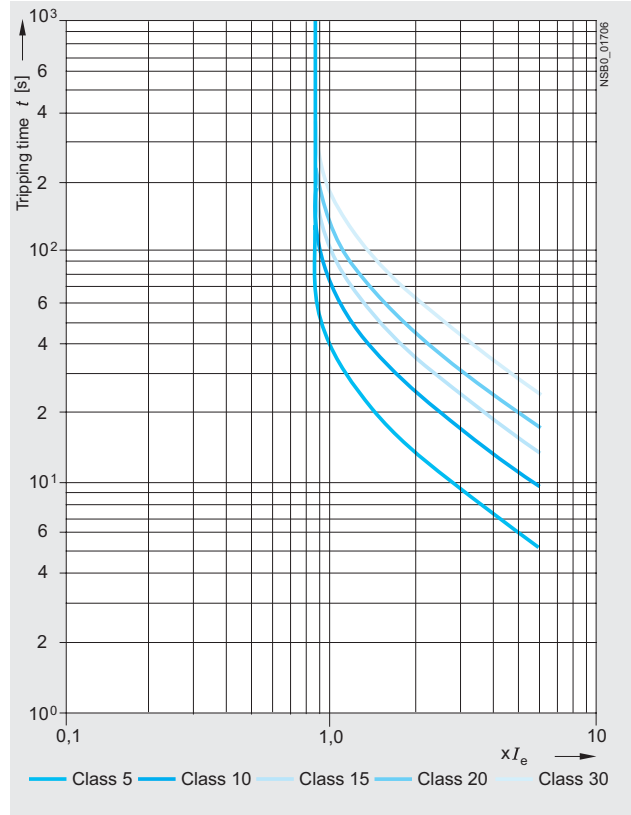
3RW44 for high-feature applications

## Characteristic curves

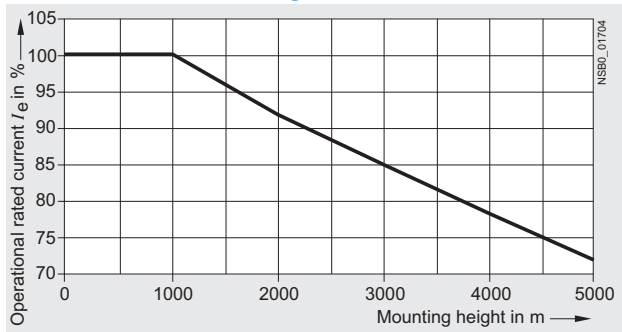
Motor protection tripping characteristics for 3RW44 (with symmetry)



Motor protection tripping characteristics for 3RW44 (with asymmetry)



Permissible installation height



At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

# 3RW Soft Starters

## 3RW44 for high-feature applications

### More information

#### Application examples for normal starting (Class 10)

**Normal starting Class 10** (up to 20 s with 350 %  $I_{n \text{ motor}}$ ).

The soft starter rating can be selected to be as high as the rating of the motor used

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
<b>Starting parameters</b>						
• Voltage ramp and current limiting						
- Starting voltage	%	70	60	50	30	30
- Starting time	s	10	10	10	10	10
- Current limit value		Deactivated	Deactivated	$4 \times I_M$	$4 \times I_M$	Deactivated
• Torque ramp						
- Starting torque		60	50	40	20	10
- End torque		150	150	150	150	150
- Starting time		10	10	10	10	10
• Breakaway pulse						
		Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
<b>Ramp-down mode</b>						
		Smooth ramp-down	Smooth ramp-down	Free ramp-down	Free ramp-down	Pump ramp-down
						Free ramp-down

#### Application examples for heavy starting (Class 20)

**Heavy starting Class 20** (up to 40 s with 350 %  $I_{n \text{ motor}}$ ).

The soft starter has to be selected one performance class higher than the motor used

Application	Stirrer	Centrifuge	Milling machine
<b>Starting parameters</b>			
• Voltage ramp and current limiting			
- Starting voltage	%	30	30
- Starting time	s	30	30
- Current limit value		$4 \times I_M$	$4 \times I_M$
• Torque ramp			
- Starting torque		30	30
- End torque		150	150
- Starting time		30	30
• Breakaway pulse			
		Deactivated (0 ms)	Deactivated (0 ms)
<b>Ramp-down mode</b>			
		Free ramp-down	Free ramp-down or DC braking

#### Application examples for very heavy starting (Class 30)

**Very heavy starting Class 30** (up to 60 s with 350 %  $I_{n \text{ motor}}$ ).

The soft starter has to be selected two performance classes higher than the motor used

Application	Large fan	Mill	Crusher	Circular saw/bandsaw
<b>Starting parameters</b>				
• Voltage ramp and current limiting				
- Starting voltage	%	30	50	30
- Starting time	s	60	60	60
- Current limit value		$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp				
- Starting torque		20	50	20
- End torque		150	150	150
- Starting time		60	60	60
• Breakaway pulse				
		Deactivated (0 ms)	80 %, 300 ms	Deactivated (0 ms)
<b>Ramp-down mode</b>				
		Free ramp-down	Free ramp-down	Free ramp-down

**Note:**

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning. The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

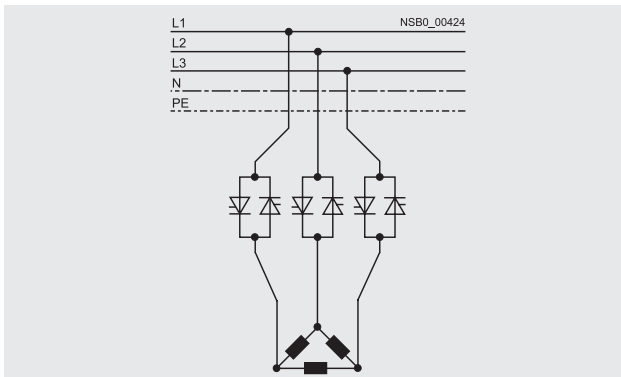
# 3RW Soft Starters

## Circuit concept

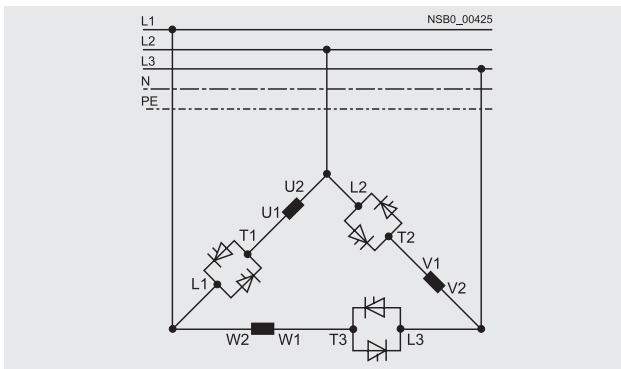
The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

- **Inline circuit**  
The controls for isolating and protecting the motor are simply connected in series with the soft starter. The motor is connected to the soft starter with three cables.
- **Inside-delta circuit**  
The wiring is similar to that of wye-delta starters. The phases of the soft starter are connected in series with the individual motor windings. The soft starter then only has to carry the phase current, amounting to about 58 % of the rated motor current (conductor current).

## Comparison of the types of circuit



Inline circuit:  
Rated current  $I_g$  corresponds to the rated motor current  $I_n$ , 3 cables to the motor



Inside-delta circuit:  
Rated current  $I_g$  corresponds to approx. 58 % of the rated motor current  $I_n$ , 6 cables to the motor (as with wye-delta starters)

## Which circuit?

Using the inline circuit involves the lowest wiring outlay. If the soft starter to motor connections are long, this circuit is preferable.

With the inside-delta circuit there is double the wiring complexity but a smaller size of device can be used at the same rating.

Thanks to the choice of operating mode between the inline circuit and inside-delta circuit, it is always possible to select the most favorable solution.

The braking function is possible only in the inline circuit.

## Configuration

The 3RW44 solid-state soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger device must be selected.

For long starting times it is recommended to have a PTC sensor in the motor. This also applies for the ramp-down modes smooth ramp-down, pump ramp-down and DC braking, because during the ramp-down time in these modes, an additional current load applies in contrast to free ramp-down.

In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately.

A bypass contact system and solid-state overload relay are already integrated in the 3RW44 soft starter and therefore do not have to be ordered separately.

The harmonic component load for starting currents must be taken into consideration for the selection of motor starter protectors (selection of release).

### Note:

*When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.*

## Device interface, PROFIBUS DP communication module, Soft Starter ES parameterizing and operating software

The 3RW44 electronic soft starters have a PC interface for communicating with the Soft Starter ES software or for connecting the external display and operator module. If the optional PROFIBUS communication module is used, the 3RW44 soft starter can be integrated in the PROFIBUS network and communicate using the GSD file or Soft Starter ES Premium software.

The Soft Starter ES parameterizing and operating software can be downloaded from [www.usa.siemens.com](http://www.usa.siemens.com) > Software with a 14-day trial license.

More information about Soft Starter ES can be found in Chapter 12 of Catalog LV 1.

# 3RW Soft Starters

## 3RW44 for high-feature applications

### *Manual for SIRIUS 3RW44*

Besides containing all important information on configuring, commissioning and servicing, the manual also contains example circuits and the technical specifications for all devices.

### *Win-Soft Starter selection and simulation program*

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from: [www.usa.siemens.com](http://www.usa.siemens.com) > Software

More information can be found on the Internet at: [www.usa.siemens.com](http://www.usa.siemens.com)

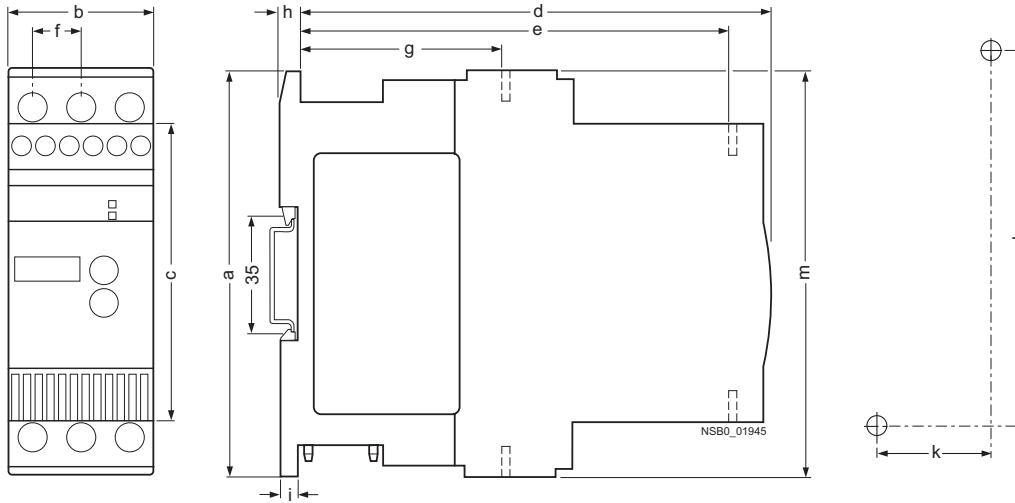
# 3RW Soft Starters

## Project Planning aids

### Dimensional drawings

#### 3RW30 for standard applications

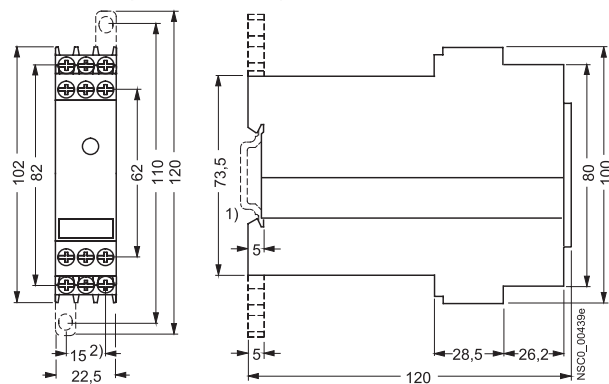
3RW30 1. ... 3RW30 4.



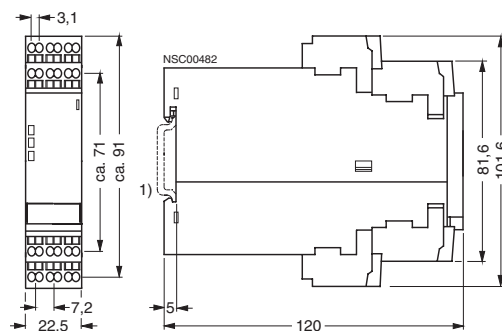
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW30 1.-1.	95	45	62	146	126	14.4	63	5	6.5	35	85	95
3RW30 1.-2.	95	45	62	146	126	14.4	63	5	6.5	35	85	117.2
3RW30 2.-1.	125	45	92	146	126	14.4	63	5	6.5	35	115	125
3RW30 2.-2.	125	45	92	146	126	14.4	63	5	6.5	35	115	150
3RW30 3.	160	55	110	163	140	18	63	5	6.5	30	150	144
3RW30 4.	170	70	110	181	158	22.5	85	5	10	60	160	160

Clearances to grounded parts (mm)	Lateral	Top	Bottom	Fixing screws	Tightening torques (Nm)
3RW30 1.	5	60	40	M4	1
3RW30 2.	5	60	40	M4	1
3RW30 3.	30	60	40	M4	1
3RW30 4.	30	60	40	M4	2

#### 3RW30 03-1. (screw terminals)



#### 3RW30 03-2. (spring-type terminals)



1) For mounting onto standard mounting rail TH 35 according to EN 60715.

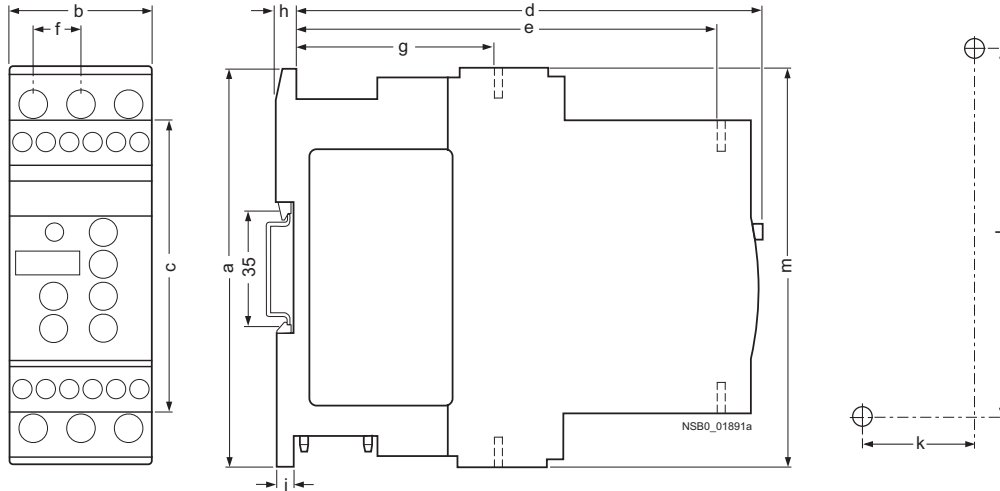
2) Dimension for screw fixing.  
Screw fixing with two 3RP1 903 push-in lugs per 3RW30 03 device.



# 3RW Soft Starters

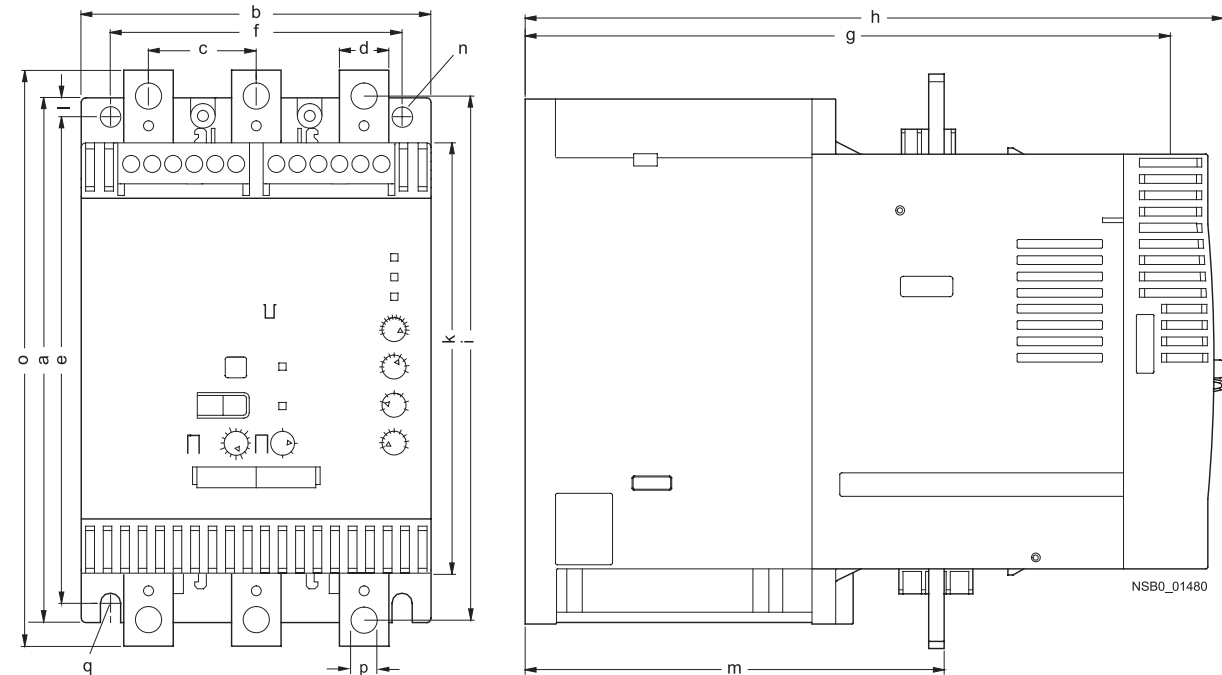
## Project Planning aids

### 3RW40 for standard applications



Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW40 2.-1.	125	45	92	149	126	14.4	63	5	6.5	35	115	125
3RW40 2.-2.	125	45	92	149	126	14.4	63	5	6.5	35	115	150
3RW40 3.	170	55	110	165	140	18	63	5	6.5	30	150	144
3RW40 4.	170	70	110	183	158	22.5	85	5	10	60	160	160

Clearances to grounded parts (mm)	Lateral	Top	Bottom	Fixing screws	Tightening torques (Nm)
3RW40 2.	5	60	40	M4	1
3RW40 3.	30	60	40	M4	1
3RW40 4.	30	60	40	M4	2

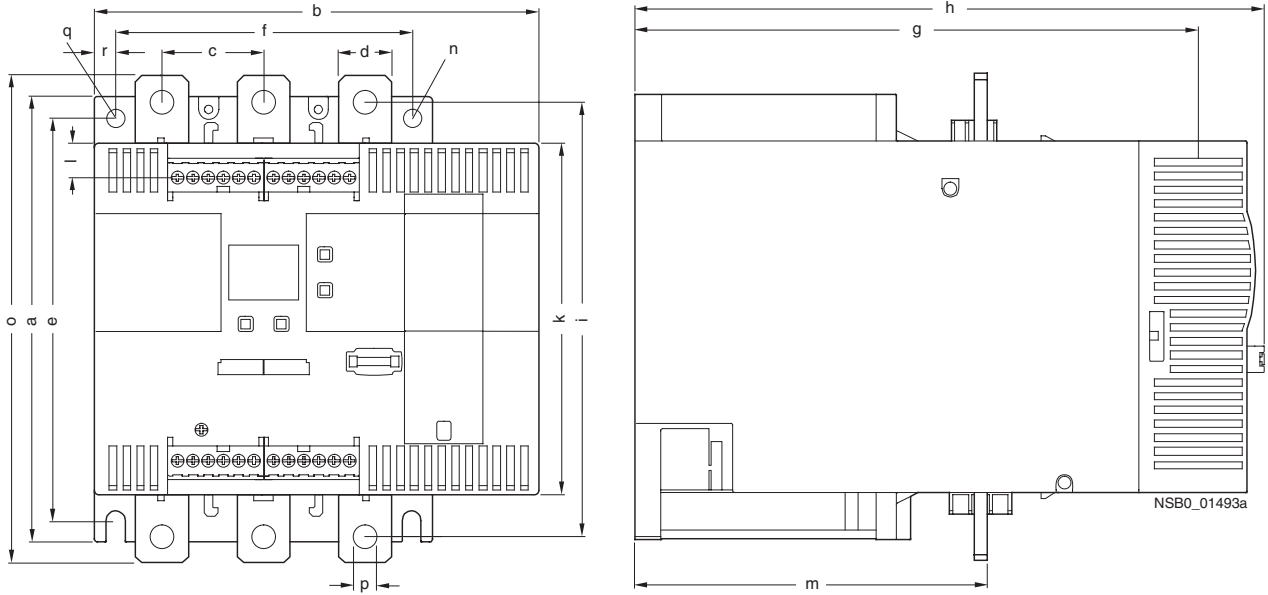


Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q
3RW40 5.	180	120	37	17	167	100	223	250	180	148	6.5	153	7	198	9	M6, 10 Nm
3RW40 7.	210	160	48	25	190	140	240	278	205	166	10	166	9	230	11	M8, 15 Nm

# 3RW Soft Starters

## Project Planning aids

### 3RW44 2., 3RW44 3. and 3RW44 4. for High-Feature applications

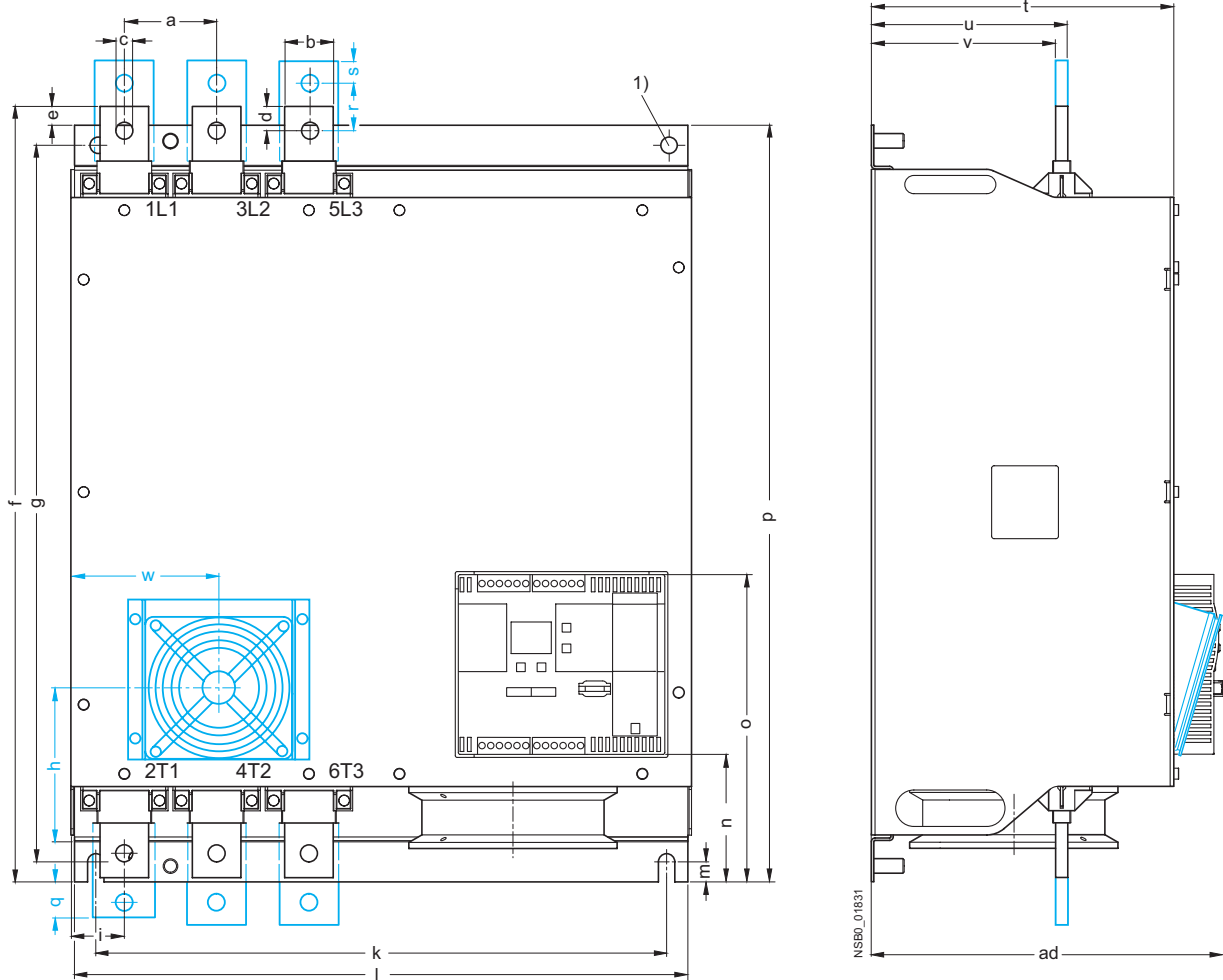


Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r
3RW44 2.	180	170	37	11	167	100	240	270	174	148	7.5	153	7	184	6.6	M6, 10 Nm	10
3RW44 3.	180	170	37	17	167	100	240	270	174	148	7.5	153	7	198	9	M6, 10 Nm	10
3RW44 4.	210	210	48	25	190	140	269	298	205	166	16	166	9	230	11	M8, 15 Nm	10

# 3RW Soft Starters

## Project Planning aids

### 3RW44 5. and 3RW44 6. for High-Feature applications



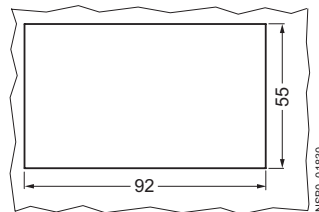
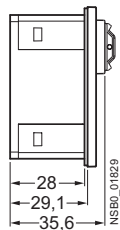
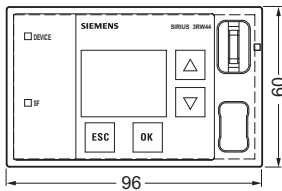
1) For M12 screw, tightening torque max. 35 Nm (310 lb.in).

Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW44 5.	76	40	14	20	15.5	638.5	590	--	44	470	510	16.5
3RW44 6.	85	50	14	--	--	667	660	160	37.5	535	576	16.5

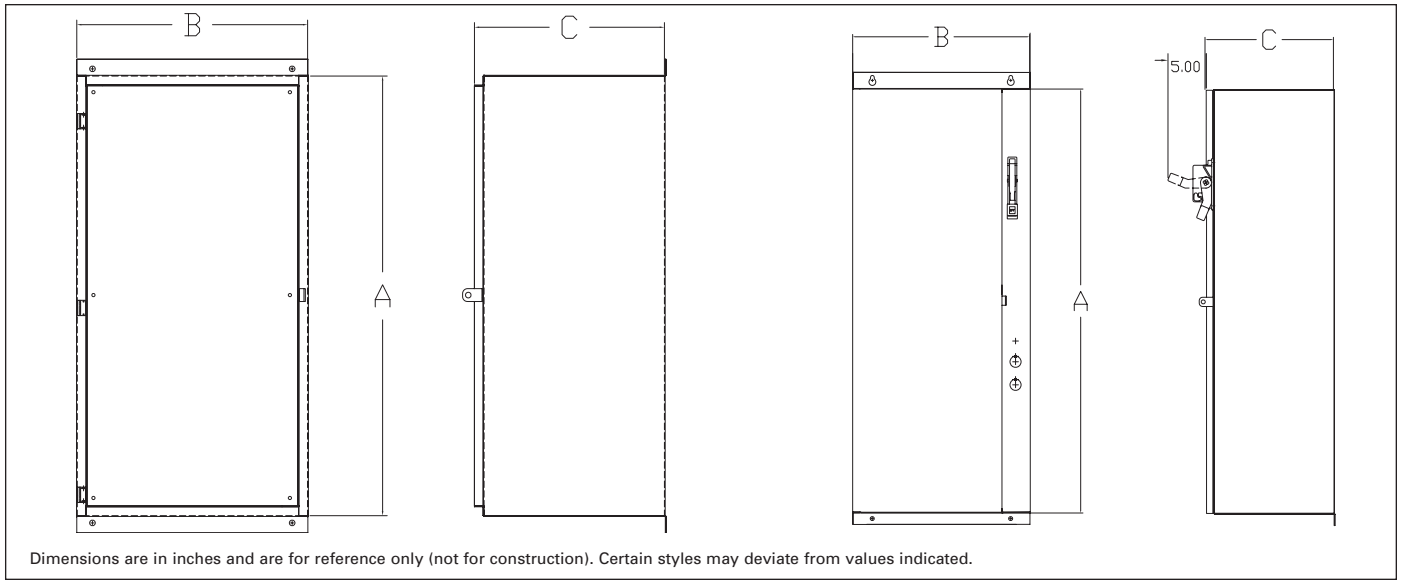
Type/Dimension (mm)	n	o	p	q	r	s	t	u	v	W	ad
3RW44 5.	105	253	623	--	--	--	249	162	152	--	290
3RW44 6.	103	251	693	43.5	40	20	249	162	151.4	123	290

### 3RW49 00-0AC00 external display and operator module

### Installation cutout for 3RW49 00-0AC00 external display and operator module



Class 73, 74



Non-Combination Class 73

N1, N3R, N12, N4 Standard Enclosure

	Amps	A	B	C
3RW40new	11 - 73	25	18	13
	98	36	23	10
3RW40	117-145	36	18	15
	205-315	36	22	20
	385	54	36	20
3RW44	26 - 68	26	12.5	15
	82 - 117	36	18	15
	145 - 215	36	22	20
	280 - 385	54	36	20
	494 - 780	90	40	20
	970 - 1076	90	50	20

N4X Stainless Steel Standard Enclosure

	Amps	A	B	C
3RW40new	11- 98	55	29	11
3RW40	117	36	18	15
	145 - 205A	36	22	20
	248 - 385	54	36	20
3RW44	26 - 51	26	12.5	15
	68 - 82	36	18	15
	100 - 117	36	22	20
	145 - 385	54	36	20

N1, N3R, N12, N4 Modified Enclosure

	Amps	A	B	C
3RW40	117-385	56	36	20
3RW44	26-51	36	22	20
	68-385	54	36	20

N4X Stainless Steel Modified Enclosure

	Amps	A	B	C
3RW40	117-385	54	36	20
3RW44	26-51	36	22	20
	68-385	54	36	20

Combination Type Class 74

N1, N3R, N12, N4 Standard Enclosure

	Amps	A	B	C
3RW40new	11 - 73	36	20	11
	98	46	20	10
3RW40	117	50	25	20
	145 - 205	66	25	20
	248 - 315	90	30	20
	385	90	40	20
3RW44	26 - 68	36	23	15
	82 - 117	50	25	20
	145 - 215	66	25	20
	280	90	30	20
	315 - 384	90	40	20
	494	90	40	20
	551 - 780	90	40 <sup>Ⓞ</sup>	20
	970 - 1076	90	50	20

N1, N12 Fusible

	Amps	A	B	C
3RW44	494-780	90	50	20

N4X Stainless Steel Standard Enclosure

	Amps	A	B	C
3RW40new	11- 98	55	29	11
3RW40	117 - 145	54	36	20
	205 - 300	90	40	20
3RW44	26 - 42	36	23	15
	51 - 100	50	25	20
	117 - 145	54	36	20
	180 - 385	90	40	20

N1, N3R, N12, N4 Modified Enclosure

	Amps	A	B	C
3RW40	117 - 248	76	30	20
	315	90	30	20
	385	90	40	20
3RW44	26 - 215	76	30	20
	280	90	30	20
	315 - 385	90	40	20

N4X Stainless Steel Modified Enclosure

	Amps	A	B	C
3RW40	117-145	76	30	20
3RW44	26-145	76	30	20

Ⓞ Add 4" for N4.

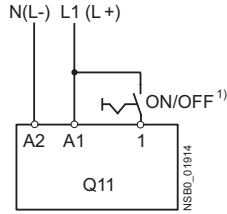
# 3RW Soft Starters

## Project Planning aids

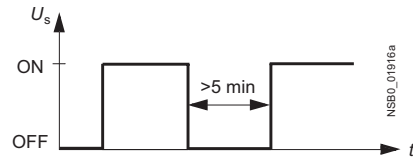
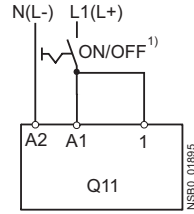
### Schematics

#### 3RW30 .. connection examples for control circuit

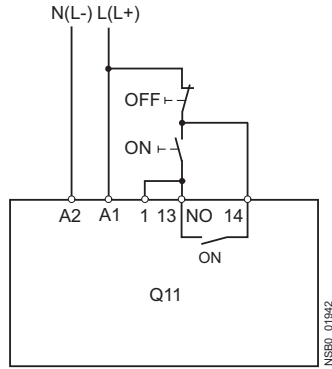
##### Control using switches



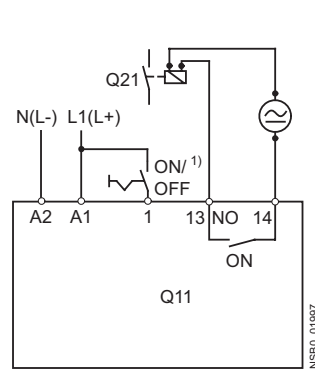
##### Automatic mode



##### Control by pushbutton

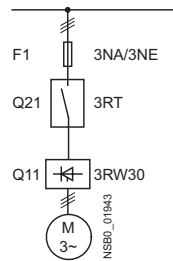


##### Control of a main contactor

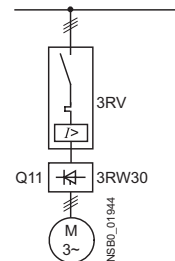


#### 3RW30 connection examples for main circuit<sup>2)</sup>

##### 3RW30 – 3-phase motor with 3NA/3NE fuse



##### 3RV motor starter protector



**1) Caution: Risk of restarting!**

When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

**2)** As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. For fuse and switching device coordination, see "Technical specifications".

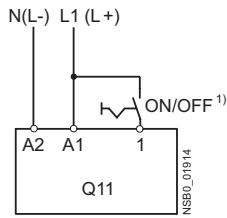
The wiring diagrams are provided only as examples.

# 3RW Soft Starters

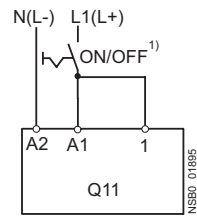
## Project Planning aids

### 3RW40 2. ... 3RW40 4. connection examples for control circuit

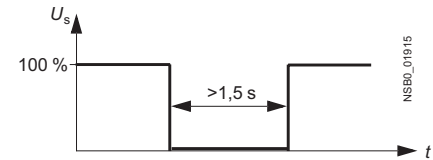
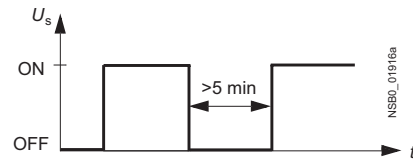
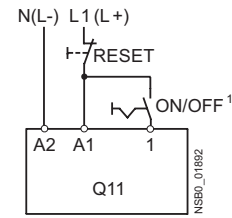
#### Control using switches



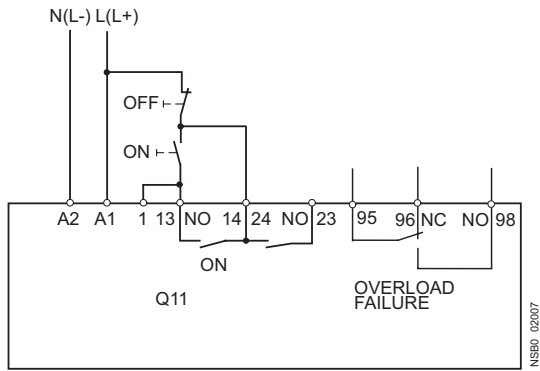
#### Automatic mode



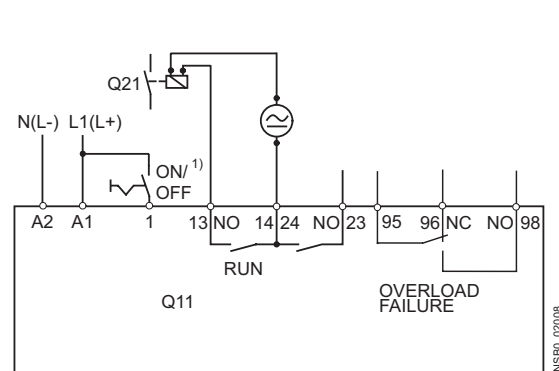
#### Control with remote reset



#### Control of 3RW40 2. ... 3RW40 4. by pushbutton

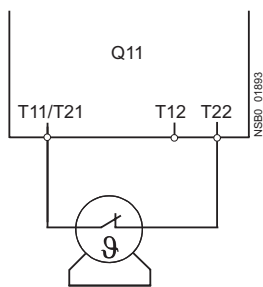


#### Control of a main contactor

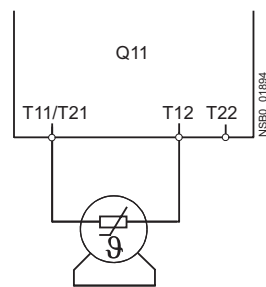


#### Connection example of 3RW40 2. ... 3RW40 4. for PTC sensors (thermistor motor protection)

##### Thermoclick



##### PTC type A



#### 1) Caution: Risk of restarting!

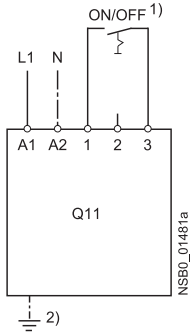
When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

# 3RW Soft Starters

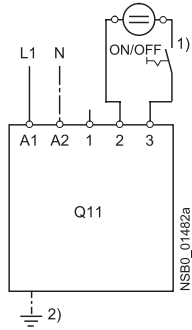
## Project Planning aids

### 3RW40 5. and 3RW40 7. connection examples for control circuit

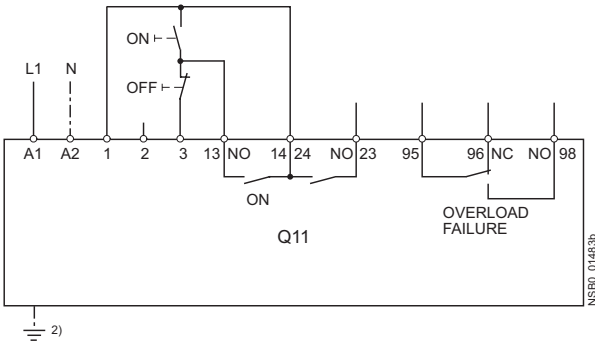
Control by switch using internal 24 V DC supply



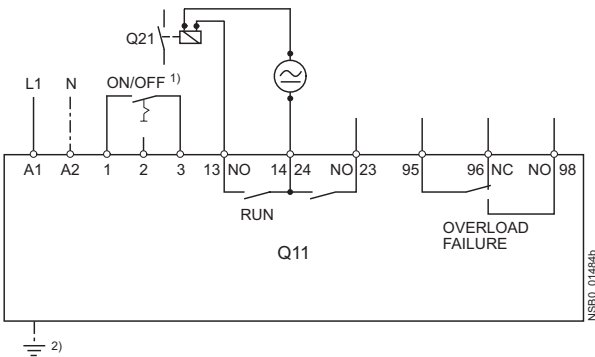
external power supply



Control by pushbutton

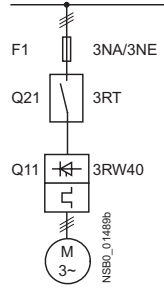


Control of a main contactor

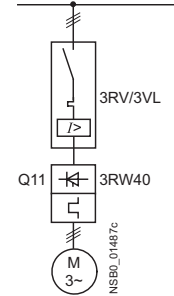


### 3RW40 connection examples for main circuit<sup>3)</sup>

3RW40 – 3-phase motor with 3NA/3NE fuse



3RV motor starter protector/ 3VL circuit breaker



<sup>1)</sup> **Caution: Risk of restarting!**

When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 3.

<sup>2)</sup> Grounding necessary for fan connection to 3RW40 5...

<sup>3)</sup> As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. [For fuse and switching device coordination, see "Technical specifications"](#).

The wiring diagrams are provided only as examples.

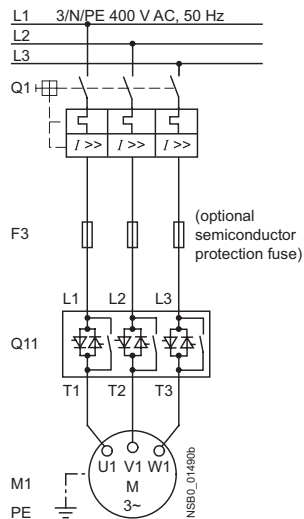
# 3RW Soft Starters

## Project Planning aids

### 3RW44 connection examples for main and control circuits

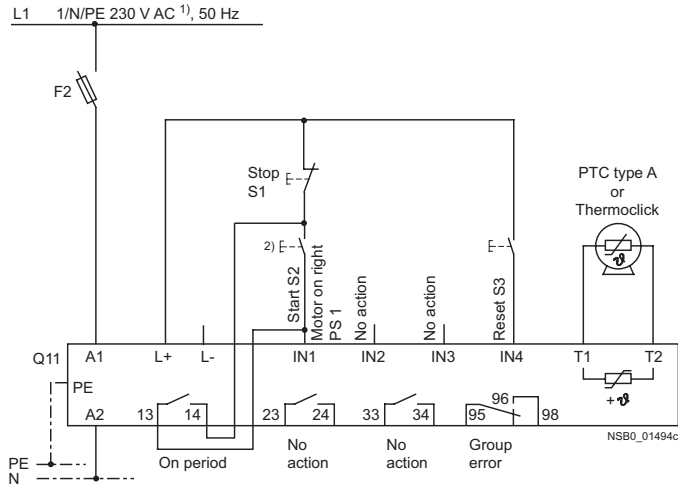
#### Main circuit

Possibility 1a:  
Inline circuit with motor starter protector and SITOR fuse (semiconductor protection only)



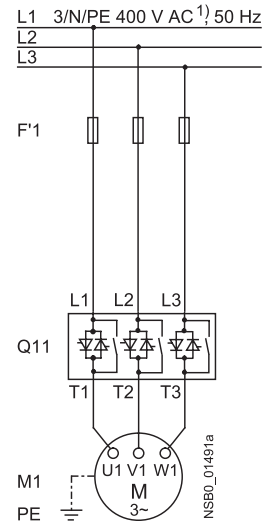
#### Control circuit

Possibility 1:  
Control by pushbutton

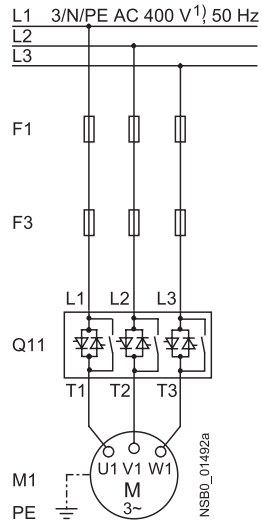


#### Main circuit

Possibility 1b:  
Inline circuit with all-range protection (line and semiconductor protection)



Possibility 1c:  
Inline circuit with line and SITOR fuse (semiconductor protection only)



1) Permissible values for main and control voltage, see "Technical specifications".

2) **Caution: Risk of restarting!**  
Because the output is parameterized to "Motor ON", the start command is automatically active after the reset command and a new, automatic restart will take place. This applies especially in case of motor protection tripping. For safety reasons we recommend connecting the group error output (terminals 95/96) in series with the output parameterized to "Motor ON".

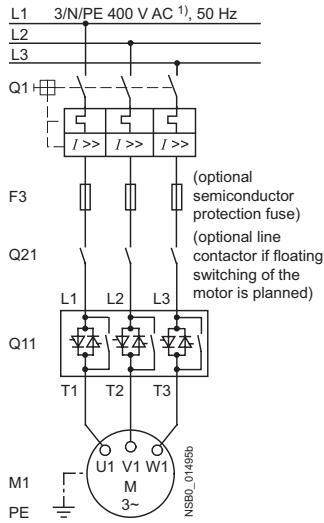


# 3RW Soft Starters

## Project Planning aids

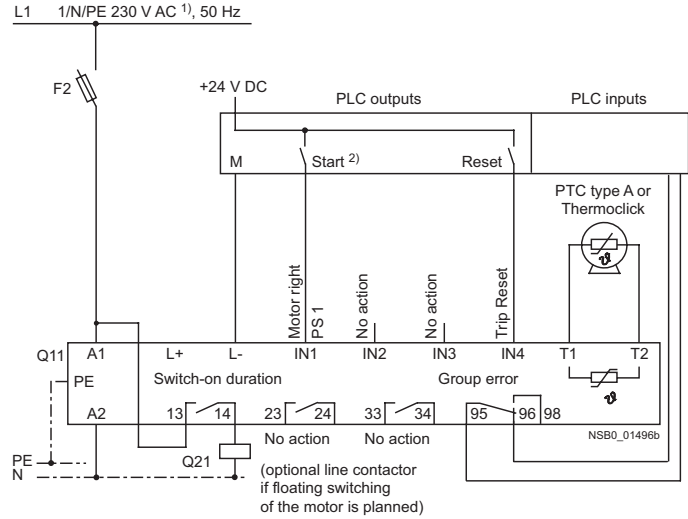
### Main circuit

Possibility 2:  
Inline circuit with main contactor



### Control circuit

Possibility 2:  
Control of a main contactor and control by means of PLC



1) Permissible values for main and control voltage, see "Technical specifications".

2) **Caution: Risk of restarting!**

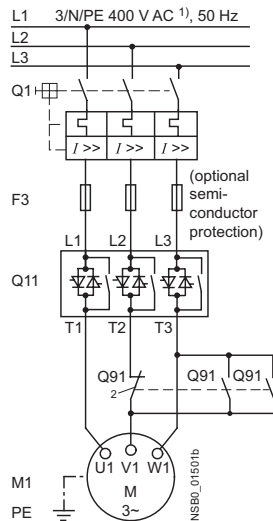
The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping. For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

# 3RW Soft Starters

## Project Planning aids

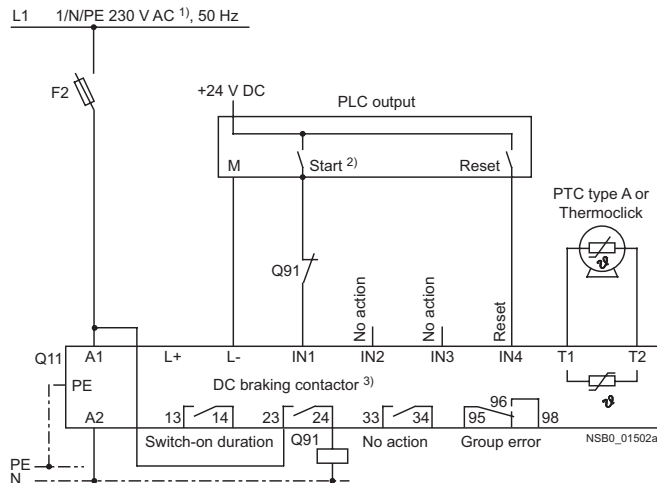
### Main circuit

Possibility 3a:  
 Inline circuit with ramp-down function DC braking<sup>3)</sup>  
 (for device types 3RW44 22 to 3RW44 25)



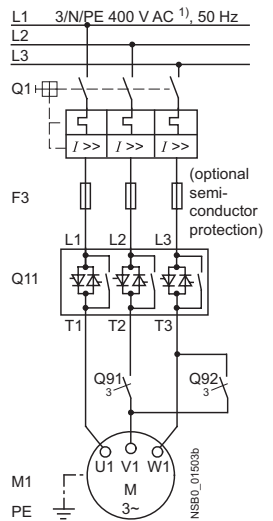
### Control circuit

Possibility 3a:  
 Control of the DC braking contactor<sup>3)</sup>



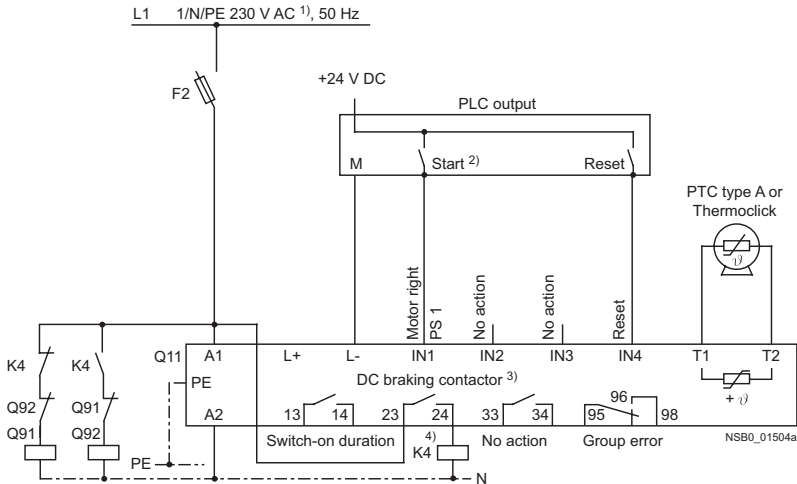
### Main circuit

Possibility 3b:  
 Inline circuit with ramp-down function DC braking<sup>3)</sup>  
 (for device types 3RW44 26 to 3RW44 47)



### Control circuit

Possibility 3b:  
 Control of the DC braking contactor<sup>3)</sup>



<sup>1)</sup> Permissible values for main and control voltage, see "Technical specifications".

<sup>2)</sup> **Caution: Risk of restarting!**

The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping. For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

<sup>3)</sup> If the ramp-down function "Combined braking" is selected, no braking contactor is required.

If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition. For type see "Fuse Assignment (Inline Circuit)" on pages 7/47 to 7/49.

For applications with large centrifugal masses ( $J_{Load} > J_{Motor}$ ) we recommend the function "DC braking".

The output 2 must be switched over to "DC braking contactor".

<sup>4)</sup> Auxiliary relay K4, e. g.:

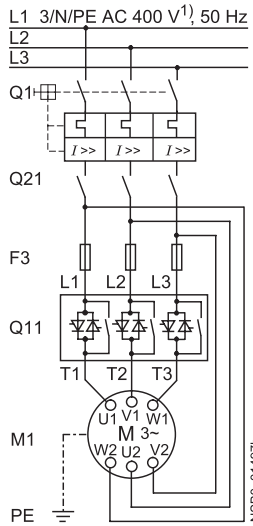
LZX:RT4A4T30 (230 V AC rated control supply voltage),  
 LZX:RT4A4S15 (115 V AC rated control supply voltage).

# 3RW Soft Starters

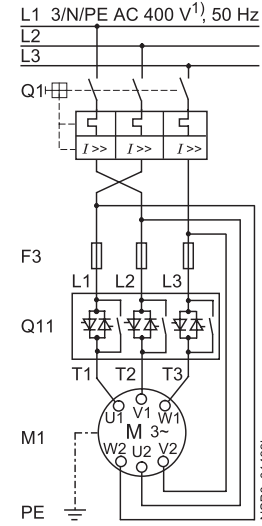
## Project Planning aids

### Main circuit

Possibility 4a:  
Inside-delta circuit

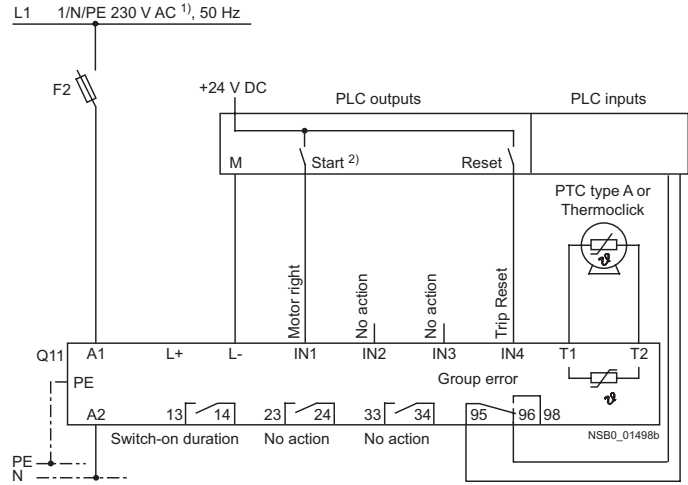


Possibility 4b:  
Change of direction of rotation for  
inside-delta circuit



### Control circuit

Possibility 4:  
Control by means of PLC

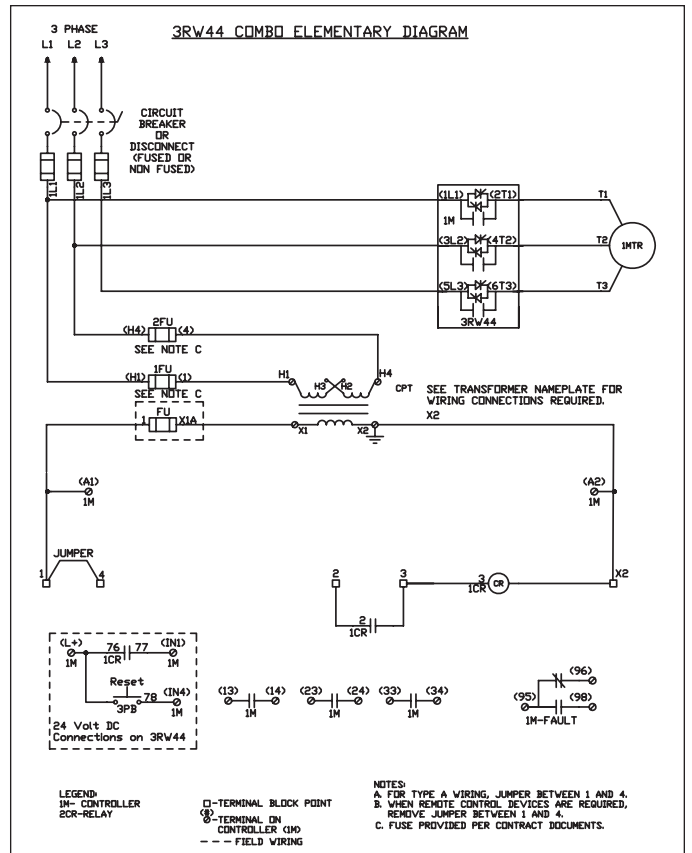
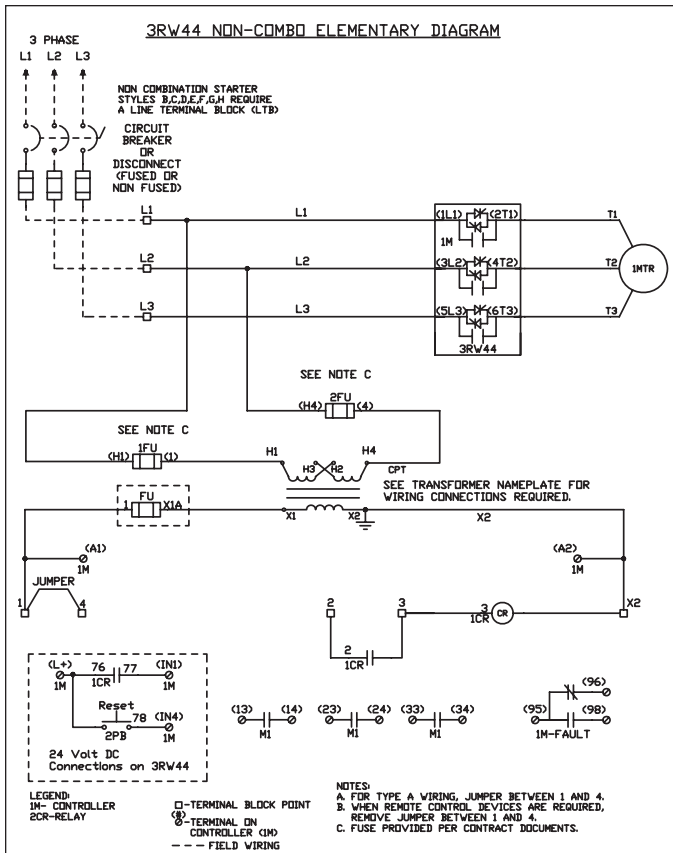
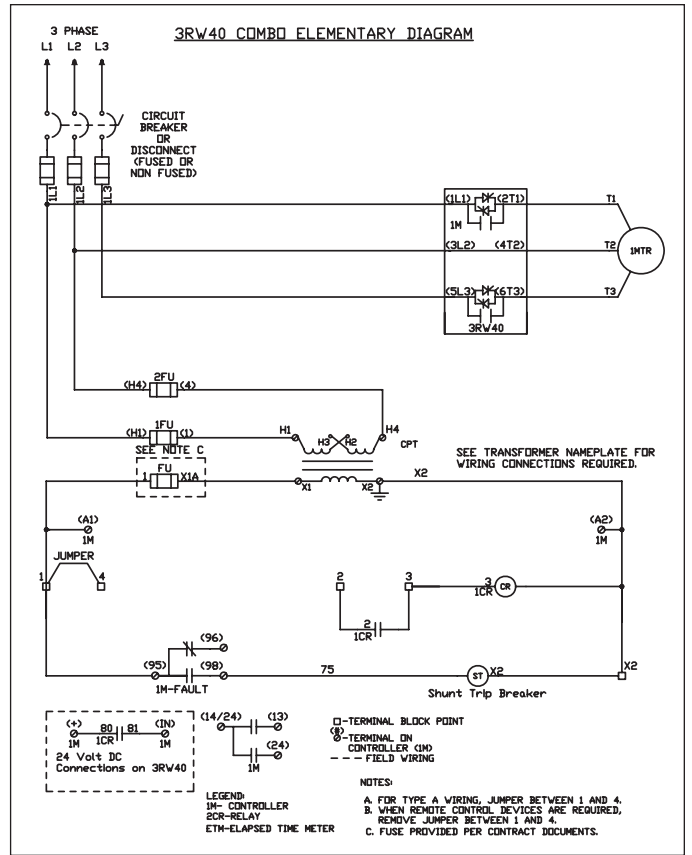
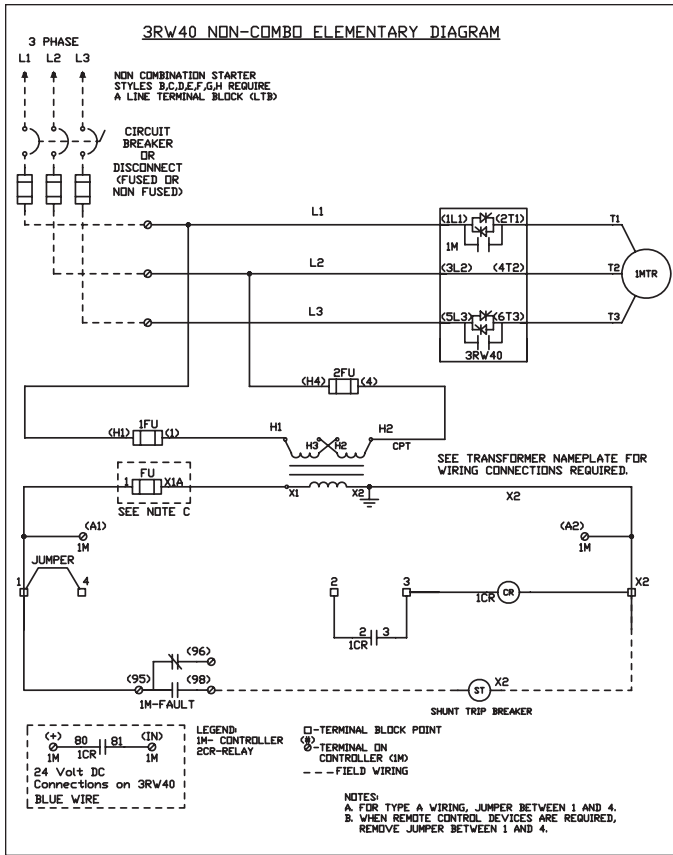


1) Permissible values for main and control voltage, see "Technical specifications".

2) **Caution: Risk of restarting!**

The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping. For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

Class 73, 74



7  
SOFT STARTERS

For Operation in the Control Cabinet

# 3RW Soft Starters

Notes

7

SOFT STARTERS



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3RF20 solid-state relays, single-phase, 45 mm	8/9
3RF22 solid-state relays, three-phase, 45 mm	8/10
<i>Solid-state contactors</i>	
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3RF24 solid-state contactors, 3-phase	8/14
<b>Solid-state switching devices for switching motors</b>	
<i>Solid-state contactors</i>	
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<i>Solid-state contactors</i>	
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Thermal data	8/49
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Introduction

Overview



3RF21      3RF20      3RF22      3RF23      3RF24      3RF34 (Motor)      3RF29

**SIRIUS solid-state switching devices for switching resistive loads**

	Order No.	Page
<b>Solid-state relays</b>		
<b>22.5 mm solid-state relays, 45 mm solid-state relays</b>	3RF21, 3RF20, 3RF22	8/9, 8/10, 8/43

<b>Solid-state contactors</b>		
<b>Solid-state contactors</b>	3RF23, 3RF24	8/24, 8/46
		8/8, 8/12

<b>Function modules</b>		
For extending the functionality of the 3RF21 solid-state relays and the 3RF23 solid-state contactors for many different applications:		
<b>Converters</b>	3RF29 00-0EA18	8/13
<b>Load monitoring</b>	3RF29 20-0FA08, 3RF29 .0-0GA..	8/14
<b>Heating current monitoring</b>	3RF29 ...0JA..	8/14
<b>Power control regulators</b>	3RF29 ...0KA.	8/14
<b>Power controllers</b>	3RF29 .0-0HA..	8/15

**SIRIUS Innovations solid-state switching devices for switching motors**

<b>Solid-state contactors</b>		
<b>Solid-state contactors</b>	3RF34	8/16
<b>Solid-state reversing contactors</b>		
		8/17

**Nomenclature Guide**

3RF2	0	20	-	1	A	A	0	2
<b>SIRIUS SC</b>	Type	Rating		Terminal Type	Switching	Control Phases	Coil Type	Power Voltage
	0 = 45 mm Relay 1 = 22.5 mm Relay 2 = 3-phase 45 mm Relay 3 = Contactor 4 = 3-phase Contactor 9 = Function Module			1 = Screw 2 = Spring 3 = Ring Tongue	A = Zero Point B = Instantaneous C = Low Noise D = Short Circuit	A = 1-phase B = 2-phase C = 3-phase	0 = 24 VDC 2 = 110 - 230 VAC 4 = 4 - 30 VDC 5 = 230 VAC	2 = 24 - 230 VAC 4 = 230 - 460 VAC 5 = 48 - 600 VAC 6 = 400 - 600 VAC

**Note:** This is only a guide to decode the model number. All possible combinations of these are not produced. Character of "3" in position four indicates Sirius Innovations

## Overview

**SIRIUS 3RF2 solid-state switching devices**

Solid-state switching devices for resistive loads

- Solid-state relays
- Solid-state contactors
- Function modules

Solid-state switching devices for switching motors

- Solid-state contactors
- Solid state reversing contactors

**The most reliable solution for any application**

Compared to electro mechanical contactors, our SIRIUS 3RF2 solid-state switching devices stand out due to their considerably longer service life. Thanks to the high product quality, their switching is extremely precise, reliable and, above all, insusceptible to faults. With its variable connection methods and a wide spread of control voltages, the SIRIUS 3RF2 family is universally applicable. Depending on the individual requirements of the application, our modular switchgear can also be quite easily expanded by the addition of standardized function modules.

**Semiconductor relays**

SIRIUS SC semiconductor relays are suitable for surface mounting on existing cooling surfaces. Installation is quick and easy, involving just two screws. Depending on the nature of the heat sink, the capacity reaches up to 88 A on resistive loads. The 3RF21 semiconductor relays can be expanded with various function modules to adapt them to individual applications.

The semiconductor relays are available in 2 different widths:

- 3RF21 semiconductor relay with a width of 22.5 mm
- 3RF20 and 3RF22 semiconductor relay with a width of 45 mm

Both variants are only available in the "zero-point switching" version. This standard version is ideally suited for operation with resistive loads.

**Selecting semiconductor relays**

When selecting semiconductor relays, in addition to information about the power system, the load and the ambient conditions it is also necessary to know details of the planned design. The semiconductor relays can only conform to their specific technical specifications if they are mounted with appropriate care on an adequately dimensioned heat sink. The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select the relay design and choose a semiconductor relay with higher rated current than the load requires
- Determine the thermal resistance of the proposed heat sink
- Check the correct relay size with the aid of the diagram

**Solid-state contactors for switching motors**

The solid-state contactors for switching motors are intended for frequently switching on and off three-phase current operating mechanisms up to 5 HP and reversing up to 3 HP. The

devices are constructed with complete insulation and can be mounted directly to 3RV1 MSPs and SIRIUS overload relays, resulting in a very simple integration into motor feeders.

These three-phase solid-state contactors are equipped with a two-phase control which is particularly suitable for typical motor current circuits without connecting to the neutral conductor.

Important features:

- Insulated enclosure with integrated heat sink
- Degree of protection IP20
- Integrated mounting foot to snap on a standard mounting rail or for assembly onto a support plate
- Variety of connection methods
- Plug-in control connection
- Display via LEDs

**Selecting solid-state contactors**

The solid-state contactors are selected on the basis of details of the network, the load and the ambient conditions. As the solid-state contactors are already equipped with an optimally matched heat sink, the selection process is considerably simpler than that for solid-state relays.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a solid-state contactor with the same or higher rated current than the load
- Testing the maximum permissible switching frequency based on the characteristic curves. To do this, the starting current, the starting time and the motor load in the operating phase must be known.
- If the permissible switching frequency is below the desired frequency, it is possible to achieve an increase by overdimensioning the motor.

**Benefits**

- Devices with integrated heat sink, "ready to use"
- Compact and space-saving design
- Reversing contactors with integrated interlocking

**Application****Standards and approvals**

- IEC 60947-4-3
- UL 508, CSA for North America<sup>1)</sup>
- CE marking for Europe
- C-Tick approval for Australia

<sup>1)</sup> Please note: For reversing motor applications use overvoltage protection device Type 3TX7462-3L; max. cut-off-voltage 6000 V; min. energy handling capability 100 J.



General data

Type	Solid-state relays			Solid-state contactors		Function modules					
	1-phase 22.5 mm	45 mm	3-phase 45 mm	1-phase	3-phase	Converter	Load monitoring Basic	Extended	Heating current monitoring	Power control- lers	Power regula- tors
<b>Usage</b>											
Simple use of existing solid-state relays	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	--	--	--	--	--	--
Complete device "Ready to use"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--	--	--
Space-saving	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--
Can be extended with modular function modules	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--	--	--
Frequent switching and monitoring of loads and solid-state relays/solid-state contactors	--	--	--	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring of up to 6 partial loads	--	--	--	--	--	--	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	--	--
Monitoring of more than 6 partial loads	--	--	--	--	--	--	--	<input checked="" type="checkbox"/>	--	--	--
Control of the heating power through an analog input	--	--	--	--	--	<input checked="" type="checkbox"/>	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Power control	--	--	--	--	--	--	--	--	--	--	<input checked="" type="checkbox"/>
<b>Startup</b>											
Easy setting of setpoints with "Teach" button	--	--	--	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
"Remote Teach" input for setting setpoints	--	--	--	--	--	--	--	--	<input checked="" type="checkbox"/>	--	--
<b>Mounting</b>											
Mounting onto mounting rails or mounting plates	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--	--	--
Can be snapped directly onto a solid-state relay or contactor	--	--	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
For use with "Coolplate" heat sink	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--	--	--	--	--
<b>Cable routing</b>											
Connection of load circuit as for controls	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Connection of load circuit from above	--	<input checked="" type="checkbox"/>	--	--	--	--	--	--	--	--	--

- Function is available
- Function is possible

**Note:** Permissible for use at altitudes of more than 2500 m above sea level with the following derating for 3RF2 Devices:

Site altitude 2500 m above sea level:

- Reduction of rated insulation voltage to  $0,93 \times U_i$
- Reduction of load current to  $0,93 \times I_e$

Site altitude 3000 m above sea level:

- Reduction of rated insulation voltage to  $0,88 \times U_i$
- Reduction of load current to  $0,9 \times I_e$

Site altitude 4000 m above sea level:

- Reduction of rated insulation voltage to  $0,79 \times U_i$
- Reduction of load current to  $0,8 \times I_e$

Site altitude 5000 m above sea level:

- Reduction of rated insulation voltage to  $0,75 \times U_i$
- Reduction of load current to  $0,7 \times I_e$

These ratings apply to a maximum ambient temperature of 40 °C (140 °F).

## General data

**Benefits**

- Considerable space savings thanks to a width of only 22.5 mm
- Variety of connection techniques: screw connection, spring-type connection or ring terminal end, makes for easy terminations
- Flexible for a wide range of applications with function modules for retrofitting
- Possibility of fuseless short-circuit resistant design

**Advantages:**

- Saves time and costs with easy wiring, simple installation and fast commissioning
- Extremely long life, low maintenance, rugged and reliable
- Space-saving and safe thanks to side-by-side mounting up to an ambient temperature of +60 °C
- Modular design: standardized function modules and heat sinks can be used in conjunction with 22.5 mm style semiconductor relays to satisfy unique application requirements
- Vibration-resistant and shock-resistant spring-loaded terminal connection system provides a superior connection even under tough conditions

**Area of application****Applications****Solid-state relays**

SIRIUS solid-state relays are suitable for surface mounting on existing cooling surfaces. Installation is quick and easy, involving just two screws. The special technology of the power semiconductor ensures there is excellent thermal contact with the heat sink. Depending on the nature of the heat sink, the capacity reaches up to 88 A on resistive loads.

The solid-state relays are available in three different versions:

- 3RF21 single-phase solid-state relay with a width of 22.5 mm
- 3RF20 single-phase solid-state relay with a width of 45 mm
- 3RF22 three-phase solid-state relay with a width of 45 mm

The 3RF21 and 3RF22 solid-state relays can be expanded with various function modules to adapt them to individual applications.

**Solid-state contactors**

The complete units consist of a solid-state relay plus optimized heat sink, and are therefore ready to use. They offer defined rated currents to make selection as easy as possible. Depending on the version, current intensities of up to 88 A are achieved. Like all of our solid-state switching devices, one of their particular advantages is their compact and space-saving design.

With their insulated mounting foot they can easily be snapped onto a standard mounting rail, or they can be mounted on carrier plates with fixing screws. This insulation enables them to be used in circuits with protective extra-low voltage (PELV) or safety extra-low voltage (SELV) in building engineering. For other applications, such as for extended personal safety, the heat sink can be grounded through a screw terminal.

The solid-state contactors are available in two different versions:

- 3RF23 single-phase solid-state contactors
- 3RF24 three-phase solid-state contactors

**3RF22 three-phase solid-state relay with a width of 45 mm**

With its compact design, which stays the same even at currents of up to 55 A, the 3RF22 solid-state relay is the ultimate in space-saving construction, at a width of 45 mm. Installation on cooling surfaces is quick and easy, involving just two screws. The logical connection arrangement, with the power infeed from above and connection of the load from below, ensures tidy installation in the control cabinet.

**3RF24 three-phase solid-state contactors**

The compact design enables small compact units with currents up to 50 A. All special features of the solid-state relays for saving time and space are effective here too.

**Example plastic machine industry:**

Thanks to their high switching endurance, SIRIUS SC semiconductor switching devices are ideally suited for use in the control of electroheat. This is because the more precise the temperature regulation process has to be, the higher the switching frequency needs to be. The accurate regulation of electroheat is used for example in many processes in the plastic machine industry:

- Band heaters heat the extrudate to the correct temperature in plastic extruders
- Heat emitters heat plastic blanks to the correct temperature
- Heat drums dry plastic granules
- Heating channels keep molds at the correct temperature in order to manufacture different plastic parts without defects.

The powerful SIRIUS SC semiconductor relays and contactors can be used to control several heating loads at the same time. By using a load monitoring module the individual partial loads can easily be monitored, and in the event of a failure a signal is generated which can be sent to the controller.

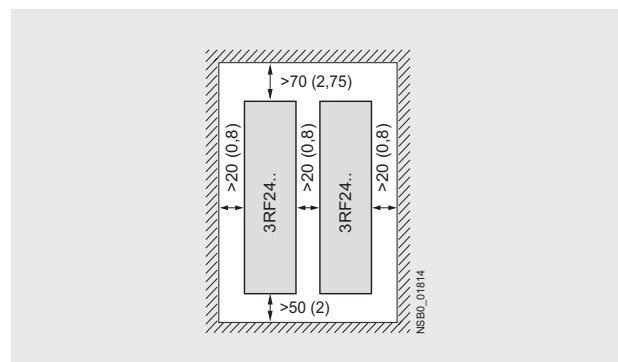
**Protecting the semiconductor relays and semiconductor contactors with 5 SY supplemental protectors.**

Short-circuit protection and line protection with 5 SY supplemental protectors is easy to achieve with SIRIUS SC semiconductor relays and semiconductor contactors in comparison with designing load feeders with fuses. A special version of the semiconductor contactors can be protected against damage in the case of a short-circuit with 5 SY supplementary protector with type B tripping characteristic. This allows the low-cost and simple design of fuseless load feeders with full protection of the switching device.

**Design**

There is no typical design of a load feeder with semiconductor relays or semiconductor contactors; instead, the great variety of connection systems and control voltages offers universal application opportunities. SIRIUS SC semiconductor relays and semiconductor contactors can be installed in fuseless or fused feeders, as required.

There are special versions with which it is even possible to achieve short-circuit strength in a fuseless design.

**Mounting regulations**

Distances for stand-alone installation

## Functions

### Connection

All SIRIUS SC semiconductor switching devices are characterized by the great variety of connection methods. You can choose between the following connection techniques:

#### SIGUT connection system (screw)

The SIGUT connection system is the standard among industrial switching devices. Open terminals and a plus-minus screw are just two features of this technology. Two conductors of up to  $6 \text{ mm}^2$ <sup>1)</sup> can be connected in just one terminal. As a result, loads of up to 50 A can be connected.

#### Spring-loaded connection system

This innovative technology holds the conductor without screw connection. This means that very high vibration resistance is achieved. Two conductors of up to  $2.5 \text{ mm}^2$ <sup>1)</sup> can be connected to each terminal. As a result, loads of up to 20 A can be dealt with.

#### Ring terminal end connection

The ring terminal end connection is equipped with an M5 screw. Ring terminal ends of up to  $25 \text{ mm}^2$  can be connected. In this way it is possible to connect conductors with up to 88 A safely. Additional finger safety can be provided with a special cover.

### Switching types

In order to guarantee an optimized control method for different loads, the functionality of our semiconductor switching devices can be adapted accordingly.

The "**zero-point switching**" method is ideal for resistive loads, i.e. where the power semiconductor is activated at zero voltage.

For inductive loads, on the other hand, for example in the case of valves, it is better to go with "**instantaneous switching**". By distributing the ON point over the entire sine curve of the mains voltage, disturbances are reduced to a minimum.

A special "low noise" version is available due to a special control, this special version can be used in public networks up to 16A without any additional measures such as interference suppressor filters. As a result, it conforms to limit value curve class B according to EN 60947-4-3 in terms of emitted interference.

## Function

### Two-phase controlled version

In many three-phase applications there is no need of a three-phase controller. Loads in a delta circuit or wye circuit, which have no connection to the neutral conductor, can be safely switched on and off using only two phases.

Nevertheless, the 3RF22 and 3RF24 three-phase solid-state switching devices provide the possibility of connecting all three phases to the switching device, with the middle phase looped directly through the device. Thanks to the lower power loss compared to a three-phase controlled device it is possible for the mounted accessories to be more compact.

### Three-phase controlled version

This version is used in three-phase applications which have to switch all phases on and off for system reasons or in the case of loads in a wye circuit with connection to the neutral conductor.

## Performance characteristics

The performance of the semiconductor switching devices are substantially determined by the type of power semiconductors used and the internal design. In the case of the SIRIUS SC semiconductor contactors and semiconductor relays, only thyristors are used instead of less powerful Triacs.

Two of the most important features of thyristors are the blocking voltage and the maximum load integral:

#### Blocking voltage

Thyristors with a high blocking voltage can also be operated without difficulty in power systems with high interference voltages. Separate protective measures, such as a protective circuit with a varistor, are not necessary in most cases.

With SIRIUS SC, for example, thyristors with 800 V blocking voltage are fitted for operation in power systems up to 230 V. Thyristors with up to 1600 V are used for power systems with higher voltages.

#### Maximum load integral

One of the purposes of specifying the maximum load integral ( $Pt$ ) is to determine the rating of the short-circuit protection. Only a large power semiconductor with a correspondingly high  $Pt$  value can be given appropriate protection against destruction from a short-circuit by means of a protective device matched to the application. However, SIRIUS SC is also characterized by the optimum matching of the thyristors ( $Pt$  value) with the rated currents. The rated currents specified on the devices in conformance with EN 60947-4-3 were confirmed by extensive testing.

1) For  $\text{mm}^2$  to AWG conversion see page 19/21 of Industrial Controls catalog.

## General data

## Selection and ordering data

Designation	Labeling area (W x H ) mm x mm	Color	Order No.	Std. Pack Qty	Weight per pack approx. kg
<b>Blank labels</b>					
<b>Unit labeling plates for "SIRIUS"<sup>1)</sup></b>	10 x 7	Pastel turquoise	<b>3RT19 00-1SB10</b>	816 units	0.110
	20 x 7	Pastel turquoise	<b>3RT19 00-1SB20</b>	340 units	0.220
<b>Labels for sticking for "SIRIUS"</b>	19 x 6	Pastel turquoise	<b>3RT19 00-1SB60</b>	3060 unit	0.150
	19 x 6	Zinc yellow	<b>3RT19 00-1SD60</b>	3060 units	0.150

Unit labeling plates  
(1 frame = 20 units)

1) Computer labeling system for individual inscription of unit labeling plates available from:  
murrplastik Systemtechnik GmbH (<http://www.murrplastik.de>).

## Integration

**Notes on integration in the load feeders**

The SIRIUS solid-state switching devices are very easy to integrate into the load feeders thanks to their industrial connection method and design.

Particular attention must however be paid to the circumstances of the installation and ambient conditions, as the performance of the solid-state switching devices is largely dependent on these. Depending on the version, certain restrictions must be observed. Detailed information, for example in relation to solid-state contactors about the minimum spacing and to solid-state relays about the choice of heat sink, is given in the technical specifications (see [Technical Information LV 1 T](#) or our [Mall](#)) and the product data sheets.

Despite the rugged power semiconductors that are used, solid-state switching devices respond more sensitively to short-circuits in the load feeder. Consequently, special precautions have to be taken against destruction, depending on the type of design.

Siemens generally recommends using SITOR semiconductor protection fuses. These fuses also provide protection against destruction in the event of a short-circuit even when the solid-state contactors and solid-state relays are fully utilized.

Alternatively, if there is lower loading, protection can also be provided by standard fuses or miniature circuit breakers. This protection is achieved by overdimensioning the solid-state switching devices accordingly. The technical specifications and the product data sheets contain details both about the solid-state fuse protection itself and about use of the devices with conventional protection equipment.

Semiconductor motor and reversing contactors can be easily combined with the 3RV motor starter protectors and 3RB2 overload relay from the SIRIUS modular system. Thus, fuseless and fuse motor feeders can be designed easily and in a space-saving manner.

The solid-state switching devices for resistive loads are suitable for interference-free operation in industrial networks without further measures. If they are used in public networks, it may be necessary for conducted interference to be reduced by means of filters. This does not include the special solid-state contactors of type 3RF23...-CA.. "Low Noise". These comply with the class B limit values up to a rated current of 16 A. If other versions are used, and at currents of over 16 A, standard filters can be used in order to comply with the limit values. The decisive factors when it comes to selecting the filters are essentially the current loading and the other parameters (operational voltage, design type, etc.) in the load feeder.

Suitable filters can be ordered from EPCOS AG.

You can find more information on the Internet at:

<http://www.epcos.com>

# Solid-State Relays

22.5 mm semiconductor relays

## Selection and ordering data



3RF21 20-1AA02



3RF21 20-2AA02



3RF21 20-3AA02

Type current <sup>1)</sup>	Maximum achievable power for type current and $U_e =$ 115 V 230 V 400 V			Screw connection <sup>2)</sup>	Spring-loaded connection <sup>3)</sup>	Ring cable connection	Std. Pack Qty	Weight per pack approx.
A	kW	kW	kW	Order No.	Order No.	Order No.		kg
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V</b>								
20	2.3	4.6	-	3RF21 20-1AA□2	3RF21 20-2AA□2	3RF21 20-3AA□2	1 unit	0.075
30	3.5	6.9	-	3RF21 30-1AA□2	-	-	1 unit	0.075
50	5.8	11.5	-	3RF21 50-1AA□2	3RF21 50-2AA□2	3RF21 50-3AA□2	1 unit	0.075
70	8.1	16.1	-	3RF21 70-1AA□2	-	-	1 unit	0.075
90	10.4	20.7	-	3RF21 90-1AA□2	3RF21 90-2AA□2	3RF21 90-3AA□2	1 unit	0.075
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V, control DC 4 ... 30 V</b>								
20	2.3	4.6	-	3RF21 20-1AA42	3RF21 20-2AA42	-	1 unit	0.075
30	3.5	6.9	-	3RF21 30-1AA42	-	-	1 unit	0.075
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 460 V</b>								
20	-	4.6	8	3RF21 20-1AA□4	3RF21 20-2AA□4	3RF21 20-3AA□4	1 unit	0.075
30	-	6.9	12	3RF21 30-1AA□4	-	-	1 unit	0.075
50	-	11.5	20	3RF21 50-1AA□4	3RF21 50-2AA□4 <sup>4)</sup>	3RF21 50-3AA□4	1 unit	0.075
70	-	16.1	28	3RF21 70-1AA□4	-	-	1 unit	0.075
90	-	20.7	36	3RF21 90-1AA□4	3RF21 90-2AA□4	3RF21 90-3AA□4	1 unit	0.075
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 600 V, control DC 4 ... 30 V</b>								
20	-	4.6	8	3RF21 20-1AA45	3RF21 20-2AA45	-	1 unit	0.075
30	-	6.9	12	3RF21 30-1AA45	-	-	1 unit	0.075
50	-	11.5	20	3RF21 50-1AA45	-	-	1 unit	0.075
70	-	16.1	28	3RF21 70-1AA45	-	-	1 unit	0.075
90	-	20.7	36	3RF21 90-1AA45	-	3RF21 90-3AA44	1 unit	0.075
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 600 V, blocking voltage 1600 V</b>								
30	-	-	12	3RF21 30-1AA□6	-	-	1 unit	0.075
50	-	-	20	3RF21 50-1AA□6	3RF21 50-2AA□6	3RF21 50-3AA□6	1 unit	0.075
70	-	-	28	3RF21 70-1AA□6	-	-	1 unit	0.075
90	-	-	36	3RF21 90-1AA□6	3RF21 90-2AA□6	3RF21 90-3AA□6	1 unit	0.075
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 600 V, control 24 V DC low power</b>								
70	-	-	28	3RF21 70-1AA05-0KNO	-	-	1 unit	0.075
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V, control 110 V to 230 V</b>								
50	-	-	-	3RF21 50-1BA22	-	-	1 unit	0.075
<b>instantaneous switching, rated operational voltage <math>U_e = 48</math> V to 460 V, control 24 V DC acc. to EN 61131-2</b>								
20	-	-	-	3RF21 20-1BA04	-	-	1 unit	0.075
30	-	-	-	3RF21 30-1BA04	-	-	1 unit	0.075
50	-	-	-	3RF21 50-1BA04	-	-	1 unit	0.075
70	-	-	-	3RF21 70-1BA04	-	-	1 unit	0.075
90	-	-	-	3RF21 90-1BA04	-	-	1 unit	0.075
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 600 V, control 24 V DC acc. to EN 61131-2, blocking voltage 1600 V</b>								
50	-	-	-	3RF21 50-1BA06	-	-	1 unit	0.075
<b>Low noise<sup>3)</sup> - zero-point switching, rated operational voltage <math>U_e = 48</math> V to 460 V, control 24 V DC acc. to EN 61131-2</b>								
70	-	-	-	3RF21 70-1CA04	-	-	1 unit	0.075

Order No. extension for rated control supply voltage  $U_s$

DC 24 V acc. to EN 61131-2  
AC 110 V... 230 V

0  
2

0  
2

0  
2

Other rated control supply voltages on request.

- The type current provides information about the performance of the semiconductor relay. The actual permitted operational current  $I_o$  can be smaller depending on the connection method and cooling conditions.
- Please note that this version can only be used for a rated current of up to 50 A and a conductor cross section of 10 mm<sup>2</sup>.

- Please note that this version can only be used for a rated current of up to 20 A and a conductor cross section of 2.5 mm<sup>2</sup>. See page 19/21 of Industrial controls catalog for mm<sup>2</sup> to AWG conversion chart.
- 50 A version with 24 AC/DC control - 3RF21 50-2AA14.

**Note:** See page 19/21 of Industrial Controls catalog for mm<sup>2</sup> to AWG conversion chart.

# Solid-State Relays

## 45 mm semiconductor relays

### Fused design with semiconductor protection (similar to type of coordination "2")<sup>1)</sup>

The semiconductor protection for the SIRIUS SC control gear can be used with different protective devices. This allows protection by means of LV HRC fuses of operational class gL/gG or supplementary protectors. The table on page 7/21 lists the maximum permissible fuses for each SIRIUS SC controlgear.

If a fuse is used with a higher rated current than specified, semiconductor protection is no longer guaranteed. However, smaller fuses with a lower rated current for the load can be used without problems.

For protective devices with operational class gL/gG and for SITOR full range fuses 3NE1, the minimum cross-sections for the conductor to be connected must be taken into account.

### Selection and ordering data



3RF20 20-1AA02

Type current <sup>1)</sup>	Maximum achievable power for type current and $U_e =$			Screw connection <sup>2)</sup>	Spring-loaded connection <sup>3)</sup>	Ring cable connection	Std. Pack Qty	Weight per pack approx.
	115 V	230 V	400 V					
A	kW	kW	kW	Order No.	Order No.	Order No.		kg
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V</b>								
20	2.3	4.6	-	3RF20 20-1AA□2	-	-	1 unit	0.085
30	3.5	6.9	-	3RF20 30-1AA□2	-	-	1 unit	0.085
50	5.8	11.5	-	3RF20 50-1AA□2	-	-	1 unit	0.085
70	8.1	16.1	-	3RF20 70-1AA□2	-	-	1 unit	0.085
88	10.4	20.7	-	3RF20 90-1AA□2	-	-	1 unit	0.085
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V, control DC 4 ... 30 V</b>								
20	-	-	-	-	3RF21 20-2AA42	-	1 unit	0.075
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 460 V</b>								
20	-	4.6	8	3RF20 20-1AA□4	-	-	1 unit	0.085
30	-	6.9	12	3RF20 30-1AA□4	-	-	1 unit	0.085
50	-	11.5	20	3RF20 50-1AA□4	-	-	1 unit	0.085
70	-	16.1	28	3RF20 70-1AA□4	-	-	1 unit	0.085
88	-	20.7	36	3RF20 90-1AA□4	-	-	1 unit	0.085
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V, control DC 4 ... 30 V</b>								
20	-	-	-	3RF20 20-1AA42	3RF21 20-2AA42	-	1 unit	0.085
30	-	-	-	3RF20 30-1AA42	-	-	1 unit	0.085
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 600 V, control DC 4 ... 30 V</b>								
20	-	4.6	8	3RF20 20-1AA45	-	-	1 unit	0.085
50	-	11.5	20	3RF20 50-1AA45	-	-	1 unit	0.085
70	-	16.1	28	3RF20 70-1AA45	-	-	1 unit	0.085
90	-	20.7	36	3RF20 90-1AA45	-	-	1 unit	0.085
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 600 V, blocking voltage 1600 V</b>								
30	-	-	12	3RF20 30-1AA□6	-	-	1 unit	0.085
50	-	-	20	3RF20 50-1AA□6	-	-	1 unit	0.085
70	-	-	28	3RF20 70-1AA□6	-	-	1 unit	0.085
88	-	-	36	3RF20 90-1AA□6	-	-	1 unit	0.085
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 460 V, control DC 4 ... 30 V switching</b>								
50	-	-	-	3RF20 50-1BA44	-	-	1 unit	0.085
<b>Instantaneous switching, rated operational voltage <math>U_e = 48</math> V to 460 V, control 24 V DC acc. to EN 61131-2</b>								
30	-	-	-	3RF20 30-1BA04	-	-	1 unit	0.085

#### Order No. extension for rated control supply voltage $U_s$

DC 24 V acc. to EN 61131-2      **0 2**

AC 110 V... 230 V      **2**

Other rated control supply voltages on request.

1) The type current provides information about the performance of the semiconductor relay. The actual permitted operational current  $I_o$  can be smaller depending on the connection method and cooling conditions.

2) Please note that this version can only be used for a rated current of up to 50 A and a conductor cross section of 10mm<sup>2</sup>.

3) Screw terminals and spring terminals (control current side).

**Note:** For mm<sup>2</sup> to AWG conversion chart see Industrial Controls catalog page 19/21.



# Solid-State Relays

## 3RF22 solid-state relays, 3-phase, 45 mm

### Selection and ordering data

#### Selecting solid-state relays

When selecting solid-state relays, in addition to information about the power system, the load and the ambient conditions it is also necessary to know details of the planned design. The solid-state relays can only conform to their specific technical specifications if they are mounted with appropriate care on an adequately dimensioned heat sink. The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select the relay design and choose a solid-state relay with higher rated current than the load
- Determine the thermal resistance of the proposed heat sink
- Check the correct relay size with the aid of the diagrams.

Type current <sup>1)</sup>	Rated control supply voltage	Screw terminal <sup>2)</sup>	Weight per pack approx.
A	V	Order No.	kg

#### Zero-point switching Rated operational voltage $U_o$ 48 V ... 600 V



3RF22 30-1AB45

<b>Two-phase controlled</b>			
30	4 ... 30 V DC	3RF22 30-1AB□5	0.150
55		3RF22 55-1AB□5	0.150
<b>Three-phase controlled</b>			
30	4 ... 30 V DC	3RF22 30-1AC□5	0.150
55		3RF22 55-1AC□5	0.150
	110 V AC	3	
	4 ... 30 V DC	4	

Type current <sup>1)</sup>	Rated control supply voltage	Spring-loaded terminals <sup>3)</sup>	Weight per pack approx.
A	V	Order No.	kg

#### Zero-point switching Rated operational voltage $U_o$ 48 V ... 600 V



3RF22 30-2AB45

<b>Two-phase controlled</b>			
30	4 ... 30 V DC	3RF22 30-2AB45	0.150
55		3RF22 55-2AB45	0.150
<b>Three-phase controlled</b>			
30	4 ... 30 V DC	3RF22 30-2AC45	0.150
55		3RF22 55-2AC45	0.150

Type current <sup>1)</sup>	Rated control supply voltage	Ring terminal end connection	Weight per pack approx.
A	V	Order No.	kg

#### Zero-point switching Rated operational voltage $U_o$ 48 V ... 600 V



3RF22 30-3AB45

<b>Two-phase controlled</b>			
30	4 ... 30 V DC	3RF22 30-3AB45	0.150
55		3RF22 55-3AB45	0.150
<b>Three-phase controlled</b>			
30	4 ... 30 V DC	3RF22 30-3AC45	0.150
55		3RF22 55-3AC45	0.150

1) The type current provides information about the performance of the solid-state relay. The actual permitted rated operational current  $I_o$  can be smaller depending on the connection method and cooling conditions.

2) Please note that the version with an M4 screw terminal can only be used for a rated current of up to approx. 50 A and a conductor cross-section of 10 mm<sup>2</sup>.

3) Please note that this version can only be used for a rated current of up to approx. 20 A and a conductor cross-section of 2.5 mm<sup>2</sup>.

## Solid-State Contactors

## General data

## Overview

## Solid-state contactors

The complete units consist of a solid-state relay plus optimized heat sink, and are therefore ready to use. They offer defined rated currents to make selection as easy as possible. Depending on the version, current strengths of up to 88 A are achieved. Like all of our solid-state switching devices, one of their particular advantages is their compact and space-saving design.

With their insulated mounting foot they can easily be snapped onto a standard mounting rail, or they can be mounted on support plates with fixing screws. This insulation enables them to be used in circuits with protective extra-low voltage (PELV) or safety extra-low voltage (SELV) in building management systems. For other applications, such as for extended personal safety, the heat sink can be grounded through a screw terminal.

The solid-state contactors are available in 2 different versions:

- 3RF23 single-phase solid-state contactors,
- 3RF24 three-phase solid-state contactors

## Single-phase versions

The 3RF23 solid-state contactors can be expanded with various function modules to adapt them to individual applications.

## Version for resistive loads, "zero-point switching"

This standard version is often used for switching space heaters on and off.

## Version for inductive loads, "instantaneous switching"

In this version the solid-state contactor is specifically matched to inductive loads. Whether it is a matter of frequent actuation of the valves in a filling plant or starting and stopping small operating mechanisms in packet distribution systems, operation is carried out safely and noiselessly.

## Special "Low noise" version

Thanks to a special control circuit, this special version can be used in public networks up to 16 A without any additional measures such as interference suppressor filters. As a result it conforms to limit value curve class B according to EN 60947-4-3 in terms of emitted interference.

## Special "Short-circuit-proof" version

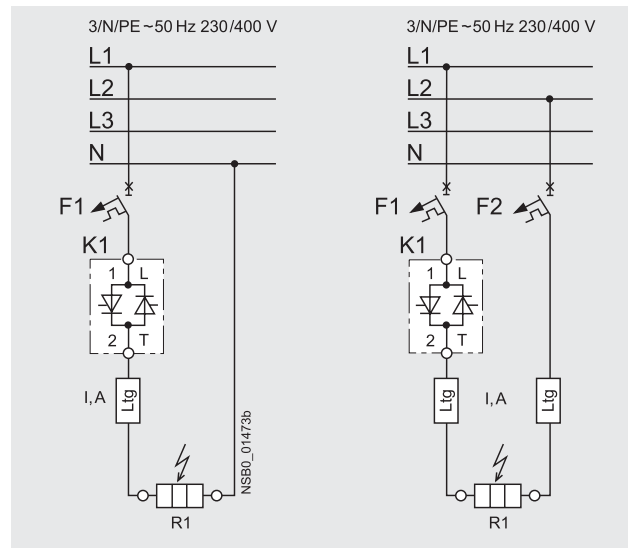
Skilful matching of the power semiconductor with the performance capacity of the solid-state contactor means that "short-circuit strength" can be achieved with a standard miniature circuit breaker. In combination with a B-type MCB or a conventional line protection fuse, the result is a short-circuit resistant feeder.

In order to achieve problem-free short-circuit protection by means of miniature circuit breakers, however, certain boundary conditions must be observed. As the magnitude and duration of the short-circuit current are determined not only by the short-circuit breaking response of the miniature circuit breaker but also the properties of the wiring system, such as the internal resistance of the input to the network and damping by controls and cables, particular attention must also be paid to these parameters. The necessary cable lengths are therefore shown for the main factor, the line resistance, in the table above right.

The following miniature circuit breakers with a type B tripping characteristic and 10 kA or 6 kA breaking capacity protect the 3RF23...DA.. solid-state contactors in the event of short-circuits on the load and the specified conductor cross-sections and lengths:

Rated current of the miniature circuit breaker	Example Type <sup>1)</sup>	Max. conductor cross-section	Minimum cable length from contactor to load
6 A	5SY4 106-6, 5SX2 106-6	1 mm <sup>2</sup>	5 m
10 A	5SY4 110-6, 5SX2 110-6	1.5 mm <sup>2</sup>	8 m
16 A	5SY4 116-6, 5SX2 116-6	1.5 mm <sup>2</sup>	12 m
16 A	5SY4 116-6, 5SX2 116-6	2.5 mm <sup>2</sup>	20 m
20 A	5SY4 120-6, 5SX2 120-6	2.5 mm <sup>2</sup>	20 m
25 A	5SY4 125-6, 5SX2 125-6	2.5 mm <sup>2</sup>	26 m

1) The miniature circuit breakers can be used up to a maximum rated voltage of 480 V!



The setup and installation above can also be used for the solid-state relays with a  $I^2t$  value of at least 6600 A<sup>2</sup>s.

## Three-phase versions

The three-phase solid-state contactors for resistive loads up to 50 A are available with

- two-phase control (suitable in particular for circuits without connection to the neutral conductor) and
- three-phase control (suitable for star circuits with connection to the neutral conductor or for applications in which the system requires all phases to be switched).

The converter function module can be snapped onto both versions for the simple power control of AC loads by means of analog signals.

- Check the correct contactor size with the aid of the rated current diagram, taking account of the design conditions.



# Solid-State Relays

## SIRIUS SC semiconductor contactors – single phase selection

### Selection and ordering data

#### Selecting solid-state contactors

The semiconductor contactors are selected on the basis of details of the power system, the load and the ambient conditions. As the semiconductor contactors are already equipped with an optimally matched heat sink, the selection process is considerably simpler than that for semiconductor relays.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a semiconductor contactor with the same or higher rated current than the load
- Check the correct contactor size with the aid of the rated current diagram, taking account of the design conditions



Type current 1)	Maximum achievable power for $I_{max}$ and $U_e =$			Screw connection	Spring-loaded connection	Ring cable connection	Std. Pack Qty	Weight per pack approx.
$I_{max}$	115 V	230 V	400 V	Order No.	Order No.	Order No.		kg
A	kW	kW	kW					
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V</b>								
10.5	1.2	2.4	-	3RF23 10-1AA□2	3RF23 10-2AA□2	3RF23 10-3AA□2	1 unit	0.136
20	2.3	4.6	-	3RF23 20-1AA□2	3RF23 20-2AA□2	3RF23 20-3AA□2	1 unit	0.204
30	3.5	6.9	-	3RF23 30-1AA□2	-	3RF23 30-3AA□2	1 unit	0.354
40	4.6	9.2	-	3RF23 40-1AA□2	-	3RF23 40-3AA□2	1 unit	0.496
50	6	12	-	3RF23 50-1AA□2	-	3RF23 50-3AA□2	1 unit	0.496
70	8	16	-	-	-	3RF23 70-3AA□2	1 unit	0.944
88	10	20	-	-	-	3RF23 90-3AA□2	1 unit	2.600
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V, control 24 V DC acc. to EN 61131-2<sup>3)</sup></b>								
50	-	-	-	3RF20 50-4AA02	-	-	1 unit	0.085
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V, control 24 V DC low power</b>								
20	-	-	-	3RF23 20-1AA02-0KN0	-	-	1 unit	0.240
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 460 V</b>								
10.5	-	2.4	4.2	3RF23 10-1AA□4	3RF23 10-2AA□4	3RF23 10-3AA□4	1 unit	0.136
20	-	4.6	8	3RF23 20-1AA□4	3RF23 20-2AA□4	3RF23 20-3AA□4	1 unit	0.204
30	-	6.9	12	3RF23 30-1AA□4	-	3RF23 30-3AA□4	1 unit	0.354
40	-	9.2	16	3RF23 40-1AA□4	-	3RF23 40-3AA□4	1 unit	0.496
50	-	12	20	3RF23 50-1AA□4	-	3RF23 50-3AA□4	1 unit	0.496
70	-	16	28	-	-	3RF23 70-3AA□4	1 unit	0.944
88	-	20	35	-	-	3RF23 90-3AA□4	1 unit	2.600
<b>Zero-point switching, rated operational voltage <math>U_e = 24</math> V to 230 V, control 24 V AC/DC</b>								
10.5	-	-	-	3RF23 10-1AA12	-	-	1 unit	0.165
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 460 V, control 24 V DC low power</b>								
50	-	-	-	3RF23 10-1AA04-0KN0	-	-	1 unit	0.165
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 460 V, control 24 V AC/DC</b>								
10.5	-	-	-	3RF23 10-1AA14	-	-	1 unit	0.165
20	-	-	-	3RF23 20-1AA14	-	-	1 unit	0.240
30	-	-	-	3RF23 30-1AA14	-	-	1 unit	0.400
40	-	-	-	3RF23 40-1AA14	-	-	1 unit	0.550
50	-	-	-	3RF23 50-1AA14	-	-	1 unit	0.550
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 600 V, control DC 4 ... 30 V</b>								
10.5	-	2.4	4.2	3RF23 10-1AA45	-	-	1 unit	0.135
20	-	4.6	8	3RF23 20-1AA45	-	-	1 unit	0.204
30	-	6.9	12	3RF23 30-1AA45	-	-	1 unit	0.354
40	-	9.2	16	3RF23 40-1AA45	-	3RF23 40-3AA45	1 unit	0.496
50	-	12	20	3RF23 50-1AA45	-	-	1 unit	0.496
70	-	16	26	-	-	3RF23 70-3AA45	1 unit	0.944
90	-	20	35	-	-	3RF23 90-3AA45	1 unit	2.600
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 460 V, control 4 V ... 30 V DC</b>								
10.5	-	-	-	3RF23 10-1AA44	-	-	1 unit	0.165
20	-	-	-	3RF23 20-1AA44	-	3RF23 20-3AA44	1 unit	0.240
30	-	-	-	3RF23 30-1AA44	-	3RF23 30-3AA44	1 unit	0.400
50	-	-	-	3RF23 50-1AA44	-	3RF23 50-3AA44	1 unit	0.400
<b>Zero-point switching, rated operational voltage <math>U_e = 48</math> V to 600 V, blocking voltage 1600 V</b>								
10.5	-	-	4.2	3RF23 10-1AA□6	3RF23 10-2AA□6	3RF23 10-3AA□6	1 unit	0.136
20	-	-	8	3RF23 20-1AA□6	3RF23 20-2AA□6	3RF23 20-3AA□6	1 unit	0.204
30	-	-	12	3RF23 30-1AA□6	-	3RF23 30-3AA□6	1 unit	0.354
40	-	-	16	3RF23 40-1AA□6	-	3RF23 40-3AA□6	1 unit	0.496
50	-	-	20	3RF23 50-1AA□6	-	3RF23 50-3AA□6	1 unit	0.496
70	-	-	28	-	-	3RF23 70-3AA□6	1 unit	0.944
88	-	-	35	-	-	3RF23 90-3AA□6	1 unit	2.600

Order No. extension for rated control supply voltage  $U_c$   
 DC 24 V acc. to EN 61131-2      0  
 AC 110 V ... 230 V              2

Other rated control supply voltages on request.

1) The type current provides information about the performance of the semiconductor contactor. The actual permitted operational current  $I_b$  can be smaller depending on the connection method and start-up conditions. Derating acc. to curves from page 7/45, 7/46, 7/47.

# Solid-State Contactors

## SIRIUS SC semiconductor contactors – single phase selection

Type current <sup>1)</sup> $I_{max}$	Maximum achievable power for $I_{max}$ and $U_e =$			Screw connection	Spring-loaded connection	Ring cable connection	Std. Pack Qty	Weight per pack approx. kg
	115 V	230 V	400 V	Order No.	Order No.	Order No.		
A	kW	kW	kW					
<b>Instantaneous switching, rated operational voltage <math>U_e = 24\text{ V to }230\text{ V}</math></b>								
10.5	1.2	2.4	-	3RF23 10-1BA□2	-	-	1 unit	0.136
20	2.3	4.6	-	3RF23 20-1BA□2	-	-	1 unit	0.204
30	3.5	6.9	-	3RF23 30-1BA□2	-	-	1 unit	0.354
40	4.6	9.2	-	3RF23 40-1BA□2	-	-	1 unit	0.496
50	6	12	-	3RF23 50-1BA□2	-	-	1 unit	0.496
70	8	16	-	3RF23 70-1BA□2	-	3RF23 70-3BA□2	1 unit	0.944
88	10	20	-	3RF23 90-1BA□2	-	3RF23 90-3BA□2	1 unit	2.600
<b>Instantaneous switching, rated operational voltage <math>U_e = 48\text{ V to }460\text{ V}</math></b>								
10.5	-	2.4	4.2	3RF23 10-1BA□4	-	-	1 unit	0.136
20	-	4.6	8	3RF23 20-1BA□4	-	-	1 unit	0.204
30	-	6.9	12	3RF23 30-1BA□4	-	-	1 unit	0.354
40	-	9.2	16	3RF23 40-1BA□4	-	-	1 unit	0.496
50	-	12	20	3RF23 50-1BA□4	-	-	1 unit	0.496
70	-	16	28	3RF23 70-1BA□4	-	3RF23 70-3BA□4	1 unit	0.944
88	-	20	35	3RF23 90-1BA□4	-	3RF23 90-3BA□4	1 unit	2.600
<b>Zero-point switching, rated operational voltage <math>U_e = 48\text{ V to }600\text{ V}</math>, control 110 V to 230 V</b>								
30	-	-	-	3RF23 30-1AA25	-	-	1 unit	0.400
<b>Instantaneous switching, rated operational voltage <math>U_e = 48\text{ V to }600\text{ V}</math>, blocking voltage 1600 V</b>								
10.5	-	-	4.2	3RF23 10-1BA□6	-	-	1 unit	0.136
20	-	-	8	3RF23 20-1BA□6	-	-	1 unit	0.204
30	-	-	12	3RF23 30-1BA□6	-	-	1 unit	0.354
40	-	-	16	3RF23 40-1BA□6	-	-	1 unit	0.496
50	-	-	20	3RF23 50-1BA□6	-	-	1 unit	0.496
70	-	-	28	3RF23 70-1BA□6	-	3RF23 70-3BA□6	1 unit	0.944
88	-	-	35	3RF23 90-1BA□6	-	3RF23 90-3BA□6	1 unit	2.600
<b>Low noise, zero-point switching, rated operational voltage <math>U_e = 24\text{ V to }230\text{ V}</math></b>								
20	2.3	4.6	-	3RF23 20-1CA□2	3RF23 20-2CA□2	-	1 unit	0.204
30	-	-	-	3RF23 30-1CA□2	-	-	1 unit	0.204
<b>Low noise, zero-point switching, rated operational voltage <math>U_e = 48\text{ V to }460\text{ V}</math></b>								
20	-	4.6	8	3RF23 20-1CA□4	3RF23 20-2CA□4	-	1 unit	0.204
<b>Instantaneous switching, rated operational voltage <math>U_e = 48\text{ V to }460\text{ V}</math>, control DC 4 ... 30 V switching</b>								
20	-	-	-	3RF23 20-1BA44	-	-	1 unit	0.240
30	-	-	-	3RF23 30-1BA44	-	-	1 unit	0.400
50	-	-	-	3RF23 50-1BA44	-	-	1 unit	0.550
<b>Short-circuit resistant with B-automatic device, zero-point switching, rated operational voltage <math>U_e = 24\text{ V to }230\text{ V}</math></b>								
20	2.3	4.6	-	3RF23 20-1DA□2	3RF23 20-2DA22	3RF23 20-3DA□2	1 unit	0.204
<b>Short-circuit resistant with B-automatic device, zero-point switching, rated operational voltage <math>U_e = 48\text{ V to }460\text{ V}</math></b>								
20	-	4.6	8	3RF23 20-1DA□4	3RF23 20-2DA24	3RF23 20-3DA□4	1 unit	0.204
<b>Low noise, zero-point switching, rated operational voltage <math>U_e = 48\text{ V to }460\text{ V}</math>, control 4 V to 30 V DC</b>								
70	-	-	28	3RF21 70-1CA04	-	-	1 unit	0.240
<b>Order No. extension for rated control supply voltage <math>U_c</math></b>								
DC 24 V acc. to EN 61131-2				0	0	0		
AC 110 V ... 230 V				2	2	2		

Other rated control supply voltages on request.

1) The type current provides information about the performance of the semiconductor contactor. The actual permitted operational current  $I_e$  can be smaller depending on the connection method and start-up conditions. Derating acc. to curves from page 7/45, 7/46, 7/47.

Version	Order No.	Std. Pack Qty	Weight per pack approx. kg
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### Accessories



3RF29 00-3PA88




**Terminal cover** for 3RF21 semiconductor relays and 3RF23 semiconductor contactors with ring terminal end (after simple adaptation, this terminal cover can also be used for screw connection).

**3RF29 00-3PA88** 10 units 0.010

## Solid-State Contactors

## 3RF24 solid-state contactors, 3-phase

## Selection and ordering data

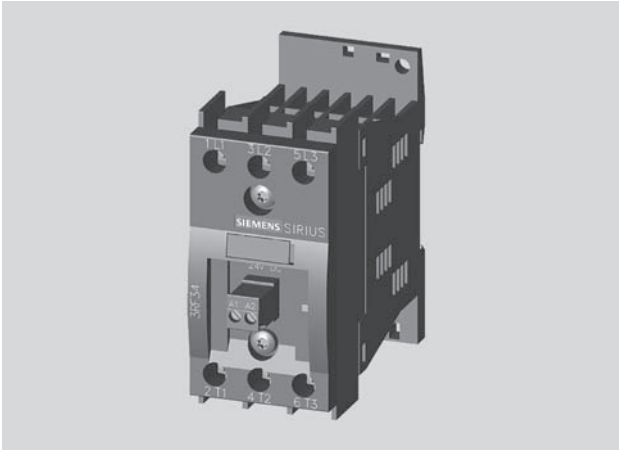
Type current <sup>1)</sup> $I_{max}$	Rated control supply voltage $U_s$	DT	Screw terminals		Std. Pack Qty	Weight per pack approx.
A	V		Order No.	List Price \$ per PU		kg
<b>Zero-point switching</b> Rated operational voltage $U_e$ 48 V ... 600 V						
<b>Two-phase controlled</b>						
 3RF24 20-1AB45	4 ... 30 DC	A	<b>3RF24 10-1AB45</b>		1 unit	0.320
		B	<b>3RF24 20-1AB45</b>		1 unit	0.400
		B	<b>3RF24 30-1AB45</b>		1 unit	0.540
		B	<b>3RF24 40-1AB45</b>		1 unit	0.800
		B	<b>3RF24 50-1AB45</b>		1 unit	1.100
	110 AC	A	<b>3RF24 10-1AB35</b>		1 unit	0.320
		B	<b>3RF24 20-1AB35</b>		1 unit	0.400
		B	<b>3RF24 30-1AB35</b>		1 unit	0.540
		B	<b>3RF24 40-1AB35</b>		1 unit	0.800
		B	<b>3RF24 50-1AB35</b>		1 unit	1.100
	230 AC	B	<b>3RF24 10-1AB55</b>		1 unit	0.320
		B	<b>3RF24 20-1AB55</b>		1 unit	0.400
		B	<b>3RF24 30-1AB55</b>		1 unit	0.540
		B	<b>3RF24 40-1AB55</b>		1 unit	0.800
		B	<b>3RF24 50-1AB55</b>		1 unit	1.100
<b>Three-phase controlled</b>						
 3RF24 10-1AC45	4 ... 30 DC	B	<b>3RF24 10-1AC45</b>		1 unit	0.320
		B	<b>3RF24 20-1AC45</b>		1 unit	0.540
		A	<b>3RF24 30-1AC45</b>		1 unit	0.800
		B	<b>3RF24 40-1AC45</b>		1 unit	1.100
		B	<b>3RF24 50-1AC45</b>		1 unit	1.850
	110 AC	B	<b>3RF24 10-1AC35</b>		1 unit	0.320
		B	<b>3RF24 20-1AC35</b>		1 unit	0.540
		A	<b>3RF24 30-1AC35</b>		1 unit	0.800
		B	<b>3RF24 40-1AC35</b>		1 unit	1.100
		B	<b>3RF24 50-1AC35</b>		1 unit	1.850
	230 AC	B	<b>3RF24 10-1AC55</b>		1 unit	0.320
		B	<b>3RF24 20-1AC55</b>		1 unit	0.540
		B	<b>3RF24 30-1AC55</b>		1 unit	0.800
		B	<b>3RF24 40-1AC55</b>		1 unit	1.100
		B	<b>3RF24 50-1AC55</b>		1 unit	1.850

1) The type current provides information about the performance capacity of the solid-state contactor. The actual permitted rated operational current  $I_e$  can be smaller depending on the connection method and start-up conditions. For derating, see Technical Information on page 7/55, Characteristic Curves.

# Solid-State Contactors for Switching Motors

## General data

### Overview



Solid-state contactor for direct-on-line starting

The solid-state contactors for switching motors are intended for frequently switching on and off three-phase current operating mechanisms up to 7.5 kW and reversing up to 3.0 kW. The devices are constructed with complete insulation and can be mounted directly on SIRIUS motor starter protectors, overload relays and current monitoring relays, resulting in a very simple integration into motor feeders.

These three-phase solid-state contactors are equipped with a two-phase control which is particularly suitable for typical motor current circuits without connecting to the neutral conductor.

Important features:

- Insulated enclosure with integrated heat sink
- Degree of protection IP20
- Integrated mounting foot to snap on a standard mounting rail or for assembly onto a support plate
- Variety of connection methods
- Plug-in control connection
- Display via LEDs
- Wide voltage range for AC control supply voltage

### Switching functions

The solid-state contactors for switching motors are “instantaneous switching” because this method is particularly suited for inductive loads. By distributing the ON point over the entire sine curve of the mains voltage, disturbances are reduced to a minimum

### Selecting solid-state contactors

The solid-state contactors are selected on the basis of details of the network, the load and the ambient conditions.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a solid-state contactor with the same or higher rated current than the load
- Testing the maximum permissible switching frequency based on the characteristic curves (see “Technical Information”). To do this, the starting current, the starting time and the motor loaded in the operating phase must be known.
- If the permissible switching frequency is under the desired frequency, it is possible to achieve an increase only by overdimensioning the motor and the solid-state contactor!

### Benefits

- Units with integrated heat sink, “ready to use”
- Compact and space-saving design
- Reversing contactors with integrated interlocking

### Application

#### Use in load feeders

There is no typical design of a load feeder with solid-state relays or solid-state contactors; instead, the great variety of connection methods and control voltages offers universal application opportunities. SIRIUS solid-state relays and solid-state contactors can be installed in fuseless or fused feeders, as required.

#### Standards and approvals

- IEC 60947-4-2
- UL 508, CSA for North America<sup>1)</sup>
- CE marking for Europe
- C-Tick approval for Australia
- CCC approval for China


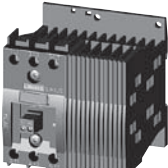

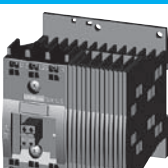
<sup>1)</sup> Please note: Use overvoltage protection device; max. cut-off-voltage 6000 V; min. energy handling capability 100 J.

# Solid-State Contactors for Switching Motors

## 3RF34 solid-state contactors, 3-phase

### Selection and ordering data

#### Motor contactors · Instantaneous switching · Two-phase controlled

Rated operational current $I_e$	Rated power at $I_e$ and $U_e$	Rated control supply voltage $U_s$	DT	Screw terminals		Std. Pack Qty
				Configurator		
A	400 V kW	V		Order No.	Price per PU	
<b>Rated operational voltage <math>U_e</math> 48 ... 480 V AC</b>						
	5.2	2.2	24 DC acc. to IEC 61131-2	A	<b>3RF34 05-1BB04</b>	1 unit
	9.2	4.0		B	<b>3RF34 10-1BB04</b>	1 unit
	12.5	5.5		B	<b>3RF34 12-1BB04</b>	1 unit
	16	7.5		B	<b>3RF34 16-1BB04</b>	1 unit
	5.2	2.2	110 ... 230 AC	B	<b>3RF34 05-1BB24</b>	1 unit
	9.2	4.0		B	<b>3RF34 10-1BB24</b>	1 unit
	12.5	5.5		B	<b>3RF34 12-1BB24</b>	1 unit
	16	7.5		B	<b>3RF34 16-1BB24</b>	1 unit
<b>Rated operational voltage <math>U_e</math> 48 ... 600 V AC, blocking voltage 1600 V</b>						
	5.2	2.2	24 DC acc. to IEC 61131-2	B	<b>3RF34 05-1BB06</b>	1 unit
	9.2	4.0		B	<b>3RF34 10-1BB06</b>	1 unit
	12.5	5.5		B	<b>3RF34 12-1BB06</b>	1 unit
	16	7.5		B	<b>3RF34 16-1BB06</b>	1 unit
	5.2	2.2	110 ... 230 AC	B	<b>3RF34 05-1BB26</b>	1 unit
	9.2	4.0		B	<b>3RF34 10-1BB26</b>	1 unit
	12.5	5.5		B	<b>3RF34 12-1BB26</b>	1 unit
	16	7.5		B	<b>3RF34 16-1BB26</b>	1 unit
<b>Rated operational voltage <math>U_e</math> 48 ... 480 V AC</b>						
	5.2	2.2	24 DC acc. to IEC 61131-2	B	<b>3RF34 05-2BB04</b>	1 unit
	9.2	4.0		B	<b>3RF34 10-2BB04</b>	1 unit
	12.5	5.5		B	<b>3RF34 12-2BB04</b>	1 unit
	16	7.5		B	<b>3RF34 16-2BB04</b>	1 unit
	5.2	2.2	110 ... 230 AC	B	<b>3RF34 05-2BB24</b>	1 unit
	9.2	4.0		B	<b>3RF34 10-2BB24</b>	1 unit
	12.5	5.5		B	<b>3RF34 12-2BB24</b>	1 unit
	16	7.5		B	<b>3RF34 16-2BB24</b>	1 unit
<b>Rated operational voltage <math>U_e</math> 48 ... 600 V AC, blocking voltage 1600 V</b>						
	5.2	2.2	24 DC acc. to IEC 61131-2	B	<b>3RF34 05-2BB06</b>	1 unit
	9.2	4.0		B	<b>3RF34 10-2BB06</b>	1 unit
	12.5	5.5		B	<b>3RF34 12-2BB06</b>	1 unit
	16	7.5		B	<b>3RF34 16-2BB06</b>	1 unit
	5.2	2.2	110 ... 230 AC	B	<b>3RF34 05-2BB26</b>	1 unit
	9.2	4.0		B	<b>3RF34 10-2BB26</b>	1 unit
	12.5	5.5		B	<b>3RF34 12-2BB26</b>	1 unit
	16	7.5		B	<b>3RF34 16-2BB26</b>	1 unit


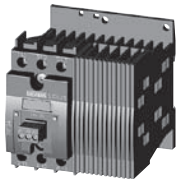
For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

# Solid-State Contactors for Switching Motors

## 3RF34 solid-state – reversing contactors, 3-phase

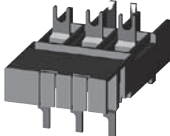

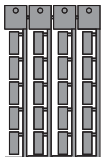
### Selection and ordering data

#### Reversing contactors · Instantaneous switching · Two-phase controlled

Rated operational current $I_e$	Rated power at $I_e$ and $U_e$	Rated control supply voltage $U_s$	DT	Screw terminals	Configurator	Std. Pack Qty
A	400 V kW	V		+	⚙	
Rated operational voltage $U_e$ 48 ... 480 V AC			Order No.	Price per PU		
 3RF34 03-1BD	3.8	<b>1.5</b>	24 DC acc. to IEC 61131-2	B	<b>3RF34 03-1BD04</b>	1 unit
	5.4	<b>2.2</b>		B	<b>3RF34 05-1BD04</b>	1 unit
	7.4	<b>3.0</b>		B	<b>3RF34 10-1BD04</b>	1 unit
 3RF34 10-1BD	3.8	<b>1.5</b>	110 ... 230 AC	B	<b>3RF34 03-1BD24</b>	1 unit
	5.4	<b>2.2</b>		B	<b>3RF34 05-1BD24</b>	1 unit
	7.4	<b>3.0</b>		B	<b>3RF34 10-1BD24</b>	1 unit

⚙ For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

### Accessories

Version	DT	Order No.	Price per PU	Std. Pack Qty
<b>Link modules for solid-state contactor to motor starter protector</b>				
 3RA29 21-1BA00		<b>Screw terminals</b>	+	
	A	<b>3RA29 21-1BA00</b>		1 unit
<b>Link adapters for solid-state contactor to overload relay</b>				
 3RF39 00-0QA88		<b>Link adapters</b>		
	A	<b>3RF39 00-0QA88</b>		1 unit
<b>Blank labels</b>				
 3SB19 00-1SB20		<b>Unit labeling plates<sup>1)</sup></b>		
	D	<b>3RT19 00-1SB20</b>		340 units

<sup>1)</sup> PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH

# 3RF29 Function Modules

## Selection Tables

### Overview

#### Function modules for SIRIUS 3RF2 solid-state switching devices

A great variety of applications demand an expanded range of functionality. With our function modules, these requirements can be met really easily. The modules are mounted simply by clicking them into place; straight away the necessary connections are made with the solid-state relay or contactor. The plug-in connection to control the solid-state switching devices can simply remain in use.

The following function modules are available:

- Converters
- Load monitoring
- Heating current monitoring
- Power controllers
- Power regulators

With the exception of the converter, the function modules can be used only with single-phase solid-state switching devices.

#### Recommended assignment of the function modules to the 3RF21 single-phase solid-state relays

Order No.	Accessories					
	Converters	Load monitoring Basic	Extended	Heating current monitoring	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
<b>Type current = 20 A</b>						
<b>3RF21 20-1A.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF21 20-1A.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF21 20-1A.22</b>	--	--	3RF29 20-0GA33	--	--	--
<b>3RF21 20-1A.24</b>	--	--	3RF29 20-0GA36	--	--	--
<b>3RF21 20-1A.42</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF21 20-1A.45</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF21 20-1B.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF21 20-2A.02</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 20-2A.04</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 20-2A.22</b>	--	--	--	--	--	--
<b>3RF21 20-2A.24</b>	--	--	--	--	--	--
<b>3RF21 20-2A.42</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 20-2A.45</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 20-3A.02</b>	3RF29 00-0EA18	--	3RF29 20-0GA13	--	--	3RF29 20-0HA13
<b>3RF21 20-3A.04</b>	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF21 20-3A.22</b>	--	--	3RF29 20-0GA33	--	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF21 20-3A.24</b>	--	--	3RF29 20-0GA36	--	3RF29 20-0KA16	3RF29 20-0HA16
<b>Type current = 30 A</b>						
<b>3RF21 30-1A.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
<b>3RF21 30-1A.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 30-1A.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 30-1A.22</b>	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
<b>3RF21 30-1A.24</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 30-1A.26</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 30-1A.42</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
<b>3RF21 30-1A.45</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 30-1B.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>Type current = 50 A</b>						
<b>3RF21 50-1A.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
<b>3RF21 50-1A.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 50-1A.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 50-1A.22</b>	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
<b>3RF21 50-1A.24</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 50-1A.26</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 50-1A.45</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 50-1B.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 50-1B.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 50-1B.22</b>	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
<b>3RF21 50-2A.02</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 50-2A.04</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 50-2A.06</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 50-2A.14</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 50-2A.22</b>	--	--	--	--	--	--
<b>3RF21 50-2A.24</b>	--	--	--	--	--	--
<b>3RF21 50-2A.26</b>	--	--	--	--	--	--
<b>3RF21 50-3A.02</b>	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
<b>3RF21 50-3A.04</b>	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 50-3A.06</b>	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 50-3A.22</b>	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
<b>3RF21 50-3A.24</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 50-3A.26</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.



# 3RF29 Function Modules

## Selection Tables

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended			
<b>Type current = 70 A</b>						
<b>3RF21 70-1A.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
<b>3RF21 70-1A.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 70-1A.05</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 70-1A.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 70-1A.22</b>	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
<b>3RF21 70-1A.24</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 70-1A.26</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 70-1A.45</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 70-1B.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 70-1C.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>Type current = 90 A</b>						
<b>3RF21 90-1A.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
<b>3RF21 90-1A.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 90-1A.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 90-1A.22</b>	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
<b>3RF21 90-1A.24</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 90-1A.26</b>	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
<b>3RF21 90-1A.45</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 90-1B.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>3RF21 90-2A.02</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 90-2A.04</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 90-2A.06</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF21 90-2A.22</b>	--	--	--	--	--	--
<b>3RF21 90-2A.24</b>	--	--	--	--	--	--
<b>3RF21 90-2A.26</b>	--	--	--	--	--	--
<b>3RF21 90-3A.02</b>	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
<b>3RF21 90-3A.04</b>	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16
<b>3RF21 90-3A.06</b>	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16
<b>3RF21 90-3A.22</b>	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
<b>3RF21 90-3A.24</b>	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
<b>3RF21 90-3A.26</b>	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
<b>3RF21 90-3A.44</b>	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

### Recommended assignment of the function modules to the 3RF22 three-phase solid-state relays

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
		Basic	Extended			
<b>Type current up to 55 A</b>						
<b>3RF22 ..-1A...</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF22 ..-2A...</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF22 ..-3A...</b>	3RF29 00-0EA18	--	--	--	--	--

### Recommended assignment of the function modules to the 3RF23 single-phase solid-state contactors

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended			
<b>Type current I<sub>e</sub> = 10.5 A</b>						
<b>3RF23 10-1A.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 10-1A.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 10-1A.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 10-1A.12</b>	3RF29 00-0EA18	--	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 10-1A.14</b>	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 10-1A.22</b>	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
<b>3RF23 10-1A.24</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 10-1A.26</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 10-1A.44</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 10-1A.45</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16



# 3RF29 Function Modules

## Selection Tables

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended			
<b>Type current <math>I_e = 10.5</math> A</b>						
<b>3RF23 10-1B.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 10-1B.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 10-1B.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 10-1B.22</b>	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
<b>3RF23 10-1B.24</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 10-1B.26</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 10-2A.02</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF23 10-2A.04</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF23 10-2A.06</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF23 10-2A.22</b>	--	--	--	--	--	--
<b>3RF23 10-2A.24</b>	--	--	--	--	--	--
<b>3RF23 10-2A.26</b>	--	--	--	--	--	--
<b>3RF23 10-3A.02</b>	3RF29 00-0EA18	--	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 10-3A.04</b>	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 10-3A.06</b>	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 10-3A.22</b>	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
<b>3RF23 10-3A.24</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 10-3A.26</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>Type current <math>I_e = 20</math> A</b>						
<b>3RF23 20-1A.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 20-1A.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1A.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1A.14</b>	3RF29 00-0EA18	--	3RF29 20-0GA16	--	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1A.22</b>	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
<b>3RF23 20-1A.24</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 20-1A.26</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 20-1A.44</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1A.45</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1B.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 20-1B.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1B.06</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1B.22</b>	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
<b>3RF23 20-1B.24</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 20-1B.26</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 20-1B.44</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1C.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 20-1C.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1C.22</b>	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
<b>3RF23 20-1C.24</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 20-1C.44</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1D.02</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 20-1D.04</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-1D.22</b>	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
<b>3RF23 20-1D.24</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 20-1D.44</b>	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-2A.02</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF23 20-2A.04</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF23 20-2A.06</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF23 20-2A.22</b>	--	--	--	--	--	--
<b>3RF23 20-2A.24</b>	--	--	--	--	--	--
<b>3RF23 20-2A.26</b>	--	--	--	--	--	--
<b>3RF23 20-2C.02</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF23 20-2C.04</b>	3RF29 00-0EA18	--	--	--	--	--
<b>3RF23 20-2C.22</b>	--	--	--	--	--	--
<b>3RF23 20-2C.24</b>	--	--	--	--	--	--
<b>3RF23 20-2D.22</b>	--	--	--	--	--	--
<b>3RF23 20-2D.24</b>	--	--	--	--	--	--
<b>3RF23 20-3A.02</b>	3RF29 00-0EA18	--	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
<b>3RF23 20-3A.04</b>	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-3A.06</b>	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
<b>3RF23 20-3A.22</b>	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
<b>3RF23 20-3A.24</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 20-3A.26</b>	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>3RF23 20-3A.44</b>	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

# 3RF29 Function Modules

## Selection Tables

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended			
<b>Type current <math>I_e = 20\text{ A}</math></b>						
3RF23 20-3D.02	3RF29 00-0EA18	--	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-3D.04	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-3D.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-3D.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
<b>Type current <math>I_e = 30\text{ A}</math></b>						
3RF23 30-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 30-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.14	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 30-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1A.25	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1A.44	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.45	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1B.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 30-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1B.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 30-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1B.44	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1C.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 30-1D.44	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-3A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 30-3A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-3A.066	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-3A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 30-3A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-3A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-3A.44	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
<b>Type current <math>I_e = 40\text{ A}</math></b>						
3RF23 40-1A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 40-1A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1A.14	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 40-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-1A.45	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 40-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1B.06	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 40-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-3A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 40-3A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-3A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-3A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 40-3A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-3A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-3A.45	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
<b>Type current <math>I_e = 50\text{ A}</math></b>						
3RF23 50-1A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 50-1A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1A.14	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 50-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-1A.45	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

## 3RF29 Function Modules

## Selection Tables

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended			
<b>Type current <math>I_e = 50</math> A</b>						
3RF23 50-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 50-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1B.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 50-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-1B.44	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-3A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 50-3A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-3A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-3A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 50-3A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-3A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-3A.44	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
<b>Type current <math>I_e = 70</math> A</b>						
3RF23 70-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 70-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 70-1B.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 70-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 70-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 70-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 70-3A.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF23 70-3A.04	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3A.06	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3A.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF23 70-3A.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 70-3A.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 70-3A.45	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3B.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF23 70-3B.04	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3B.06	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3B.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF23 70-3B.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 70-3B.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
<b>Type current <math>I_e = 90</math> A</b>						
3RF23 90-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 90-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 90-1B.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 90-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 90-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 90-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 90-3A.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF23 90-3A.04	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3A.06	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3A.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF23 90-3A.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 90-3A.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 90-3A.45	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3B.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF23 90-3B.04	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3B.06	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3B.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF23 90-3B.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 90-3B.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

#### Recommended assignment of the function modules to the 3RF24 three-phase solid-state contactors

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
		Basic	Extended			
<b>Type current up to 50 A</b>						
3RF24 ..-1..4.	3RF29 00-0EA18	--	--	--	--	--
3RF24 ..-2..4.	--	--	--	--	--	--
3RF24 ..-3..4.	3RF29 00-0EA18	--	--	--	--	--
3RF24 ..-4..5.	--	--	--	--	--	--

### Overview

#### Converter for SIRIUS SC semiconductor switching devices

This module is used to convert analog drive signals, such as those output from many temperature controllers, for example, into a pulse-width-modulated digital signal. The connected semiconductor contactors and relays can therefore regulate the output of a load as a percentage.

### Area of application

The device is used for conversion from an analog input signal to an on/off ratio. The function module can only be used in conjunction with a 3RF21 semiconductor relay or a 3RF23 semiconductor contactor.

### Design

#### Mounting

Simply snapping onto the 3RF21 semiconductor relays or 3RF23 semiconductor contactors establishes the connections to the semiconductor switching devices. The connector on the semiconductor switching devices from the control circuit can be used on the converter without rewiring.

### Functions

The analog value from a temperature controller is present at the 0–10 V terminals. This controls the on-to-off period, as a function of voltage. The period duration is predefined at one second. Conversion of the analog voltage is linear in the voltage range from 0.1 to 9.9 V. At voltages below 0.1 V the connected switching device is not activated, while at voltages above 9.9 V the connected switching device is always activated.

### Technical specifications

#### Control input for converter and load monitoring

Type		3RF29 00-0EA18	3RF29 ..-0HA.
<b>Analog input</b>	V	0 ... 10	0 ... 10
Permissible range	V	-1 ... 11	-1 ... 11
<b>Input resistance</b>	kΩ	100	8
<b>Period duration</b>	s	1	1

### Selection and ordering data

Rated operational current $I_e$	Rated operational voltage $U_e$	Rated control supply voltage $U_s$ AC/DC 24 V	Std. Pack Qty.	Weight per pack approx.
A	V	Order No.		kg
—	—	<b>3RF29 00-0EA18</b>	1 unit	0.025



3RF29 00-0EA18

## Function Modules

## Load monitoring

## Overview

**Load monitoring for SIRIUS SC semiconductor switching devices**

With the addition of the load monitoring module many faults can be quickly detected by monitoring a load circuit connected to the semiconductor switching device. Examples include the failure of load elements (up to 6 in the basic version or up to 12 in the extended version), alloyed power semiconductors, a lack of voltage or a break in a load circuit. A fault is indicated by one or more LEDs and reported to the controller via a PLC-compatible output.

The operating principle is based on monitoring of the current. This figure is continuously compared with the reference value stored once during commissioning by the simple press of a button. In order to detect the failure of one of several loads, the current decrease must be 1/6 (in the basic version) or 1/12 (in the extended version) of the reference value. In the event of a fault, a contact (NC) is actuated and one or more LEDs indicate the fault.

## Area of application

The device is used for monitoring one or more loads (partial loads). The function module can only be used in conjunction with a 3RF21 semiconductor relay or a 3RF23 semiconductor contactor. The devices with spring-loaded connections in the load circuit are not suitable for use with load monitoring modules.

## Design

## Mounting

Simply snapping the load monitoring module onto the 3RF21 semiconductor relays or 3RF23 semiconductor contactors establishes the control connections to the semiconductor switching devices. Because of the special design, the straight-through transformer of the load monitoring module covers the lower main power connection. The cable to the load is simply pushed through and secured with the terminal screw.

## Functions

The function module is activated when an "ON" signal is applied (IN terminal). The module constantly monitors the current level and compares this with the setpoint value.

## Start-up

Pressing the "Teach" button switches the device on; the current through the semiconductor switching device is measured and is stored as the setpoint. During this process the two lower (red<sup>1)</sup>) LEDs flash alternately; simultaneous maintained light from the 3 (red<sup>1)</sup>) LEDs indicates the conclusion of the teaching process.

The "Teach" button can also be used to switch on the connected semiconductor switching device briefly for test purposes. In this case the "ON" LED is switched on.

**Partial load faults, "basic" load monitoring**

If a decrease of at least 1/6 of the stored setpoint value is detected, a fault is signaled. The fault is indicated via a "Fault" LED and by activation of the fault signaling output.

LEDs	OK	Fault		
		Partial load failure/ load short-circuit	Thyristor defect	Mains failure/ fuse rupture
ON/OFF	✓	✓	-	✓
Current flowing	✓	✓	✓	-
Group fault	-	✓	✓	✓

✓ Function is available  
- Function not available

**Partial load faults, "extended" load monitoring**

Depending on the setting of the "response time" potentiometer, a decrease of at least 1/12 of the stored setpoint value after a response time of between 100 ms and 3 s is signaled as a fault. The fault is indicated via a "Load" LED and by activation of the fault signaling output.

The potentiometer can also be used to determine the response behavior of the fault signaling output. When delay values are set in the left-hand half, the fault signal is stored. This can only be reset by switching on and off by means of the control supply voltage.

When settings are made on the right-hand side, the fault output is automatically reset after the deviation has been corrected.

**Voltage compensation, "extended" load monitoring**

In addition to the current, the load voltage is also monitored. This makes it possible to compensate for influences on the current strength resulting from voltage fluctuations.

**Thyristor fault**

If a current greater than the residual current of the switching device is measured in the deenergized state, the device triggers a thyristor fault after the set time delay. This means that the fault output is activated and the "Fault" ("Thyristor"<sup>1)</sup>) LED lights up.

**Supply fault**

If no current is measured in the energized state, the device triggers a supply fault after the set time delay. This means that the fault output is activated and the "Fault" ("Supply"<sup>1)</sup>) LED lights up.

1) "Extended" load monitoring

## Selection and ordering data

Rated operational current $I_e$ A	Rated operational voltage $U_e$ V	Rated control supply voltage $U_s$ AC 110 V	Rated control supply voltage $U_s$ AC/DC 24 V	Std. Pack Qty	Weight per pack approx. kg	Rated control supply voltage $U_s$ DC 24 V	Std. Pack Qty	Weight per pack approx. kg
		Order No.	Order No.			Order No.		
<b>Basic load monitoring</b>								
6	-	-	-			3RF29 06-0FA08 <sup>1)</sup>	1 unit	0.050
20	-	-	-			3RF29 20-0FA08		
<b>Extended load monitoring</b>								
20	110 ... 230	3RF29 20-0GA33	3RF29 20-0GA13	1 unit	0.120	-		
20	400 ... 600	3RF29 20-0GA36	3RF29 20-0GA16	1 unit	0.120	-		
50	110 ... 230	3RF29 50-0GA33	3RF29 50-0GA13	1 unit	0.120	-		
50	400 ... 600	3RF29 50-0GA36	3RF29 50-0GA16	1 unit	0.120	-		
90	110 ... 230	3RF29 90-0GA33	3RF29 90-0GA13	1 unit	0.120	-		
90	400 ... 600	3RF29 90-0GA36	3RF29 90-0GA16	1 unit	0.120	-		

1) To order with mounted 3RF29 00-ORA88 cover, add -0KH0 to part number.

# 3RF29 Function Modules

## Heating current monitoring

### Overview

#### Heating current monitoring for 3RF2 single-phase solid-state switching devices

Many faults can be quickly detected by monitoring a load circuit connected to the solid-state switching device, as made possible with this module. Examples include the failure of up to 6 load elements, alloyed power semiconductors, a lack of voltage or a break in a load circuit. A fault is indicated by LEDs and reported to the controller by way of a relay output (NC contact).

The principle of operation is based on permanent monitoring of the current strength. This figure is continuously compared with the reference value stored once during start-up. In order to detect the failure of one of several loads, the current difference must be 1/6 of the reference value. In the event of a fault, an output is actuated and the LEDs indicate the fault.

The heating current monitoring has a teach input and therefore differs from the load monitoring. This remote teaching function enables simple adjustment to changing loads without manual intervention.

#### Special versions: deviations from the standard version

3RF29 ...0JA1.-1KK0

If the current is below 50 % of the lower teach current during the teach routine, the device will go into "Standby" mode; the LOAD LED will flicker. The device thus detects a non-connected load, e. g. channels not required for tool heaters, and does not signal a fault. This mode can be reset by re-teaching.

### Application

The device is used for monitoring one or more loads (partial loads). The function module can only be used in conjunction with a 3RF21 solid-state relay or a 3RF23 solid-state contactor. The devices with spring-loaded connections in the load circuit are not suitable.

### Selection and ordering data

Rated operational current $I_e$	Rated operational voltage $U_e$	Order No.	Std. Pack Qty	Weight per pack approx. kg
A	V			

#### Heating current monitoring<sup>1)</sup>



Rated control supply voltage 24 V AC/DC

16	110 ... 230
16	110 ... 230
16	400 ... 600
32	110 ... 230
32	400 ... 600
32	400 ... 600

<b>3RF29 16-0JA13</b>	1 unit	0.175
<b>3RF29 16-0JA13-1KK0</b>	1 unit	0.175
<b>3RF29 16-0JA16-1KK0</b>	1 unit	0.175
<b>3RF29 32-0JA13-1KK0</b>	1 unit	0.175
<b>3RF29 32-0JA16</b>	1 unit	0.175
<b>3RF29 32-0JA16-1KK0</b>	1 unit	0.175

1) Supplied without control connector. The control connector can be purchased from Phoenix Contact by quoting Order No. 1982 790 (2.5 HC/6-ST-5.08).

Version	Order No.	Std. Pack Qty	Weight per pack approx. kg

#### Optional accessories



3RF29 00-0RA88

**Sealable covers for function modules** (not for converters)

<b>3RF29 00-0RA88</b>	10 units	0.001
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\* You can order this quantity or a multiple thereof.

# 3RF29 Function Modules

## Power controllers

### Overview

#### Power controllers for 3RF2 single-phase solid-state switching devices

The power controller is a function module for the autonomous power control of complex heating systems and inductive loads.

The following functions have been integrated:

- **Power controller** for adjusting the power of the connected load. Here, the setpoint value is set with a rotary knob on the module as a percentage with reference to the 100 % power stored as a setpoint value.
- **Inrush current limitation:** With the aid of an adjustable voltage ramp, the inrush current is limited by means of phase control. This is useful above all with loads such as lamps or infrared lamps which have an inrush transient current.
- **Load circuit monitoring** for detecting load failure, partial load faults, alloyed power semiconductors, lack of voltage or a break in the load circuit.

#### Special versions: deviations from the standard version

##### 3RF29 04-0KA13-0KC0

During the teaching process the connected solid-state relay or contactor is not activated; i. e. no current flow takes place. No current reference value is stored. No part-load monitoring!

##### 3RF29 ...0KA1.-0KT0

No part-load monitoring!

### Application

The power controller can be used for:

- Complex heating systems
- Inductive loads
- Loads with temperature-dependent resistor
- Loads with ageing after long-time service
- Simple indirect control of temperature

The power controller can be used on the instantaneously switching 3RF21 and 3RF23 solid-state switching devices (single-phase). If only the full-wave operating mode is used, the power controller can also be used on the "zero-point switching" solid-state relays and contactors.

#### Power control

The power controller adjusts the power in the connected load by means of a solid-state switching device depending on the setpoint selection. It does not compensate for changes in the mains voltage or load resistance. The setpoint value can be predefined externally as a 0 to 10 V signal or internally by means of a potentiometer. Depending on the setting of the potentiometer ( $t_p$ ), the control is carried out according to the principle of full-wave control or generalized phase control.

#### Full-wave control

In this operating mode the output is adjusted to the required setpoint value changing the on-to-off period. The period duration is predefined at one second.

#### Generalized phase control

In this operating mode the output is adjusted to the required setpoint value by changing the current flow angle. In order to observe the limit values of the conducted interference voltage for industrial networks, the load circuit must include a reactor with a rating of at least 200  $\mu$ H.

### Selection and ordering data

Rated operational current $I_e$	Rated operational voltage $U_e$	Order No.	Std. Pack Qty	Weight per pack approx.
A	V			kg

#### Power controllers

Rated control supply voltage 24 V AC/DC				
4	110 ... 230	<b>3RF29 04-0KA13-0KC0</b>	1 unit	0.175
4		<b>3RF29 04-0KA13-0KT0</b>	1 unit	0.175
20		<b>3RF29 20-0KA13</b>	1 unit	0.175
50		<b>3RF29 50-0KA13</b>	1 unit	0.175
90		<b>3RF29 90-0KA13</b>	1 unit	0.175
20	400 ... 600	<b>3RF29 20-0KA16</b>	1 unit	0.175
50		<b>3RF29 50-0KA16</b>	1 unit	0.175
50		<b>3RF29 50-0KA16-0KT0</b>	1 unit	0.175
90		<b>3RF29 90-0KA16</b>	1 unit	0.175

Version	Order No.	Std. Pack Qty	Weight per pack approx.
			kg

#### Optional accessories



3RF29 00-0RA88

<b>Sealable covers for function modules</b> (not for converters)	<b>3RF29 00-0RA88</b>	10 units	0.001
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## Overview

### Power controllers for SIRIUS SC semiconductor switching devices

This module provides similar functionality to a power control regulator.

The following functions are integrated:

**Power control regulator with proportional-action control** for adjusting the power of the connected load. Here, the setpoint is set with a rotary knob on the module as a percentage with reference to the 100% power stored as a setpoint. In this way the power is kept constant even in the event of voltage fluctuations or a change in load resistance.

**Inrush current limitation:** With the aid of an adjustable voltage ramp, the inrush current is limited by means of phase control. This is useful above all with loads such as lamps which have an inrush transient current.

**Load circuit monitoring** for detecting load failure, alloyed power semiconductors, lack of voltage or a break in the load circuit.

## Area of application

The power controller adjusts the current in the connected load by means of a semiconductor switching device depending on a setpoint. This compensates for changes in the mains voltage or in the load resistance. The setpoint can be predefined externally as a 0 to 10 V signal or internally by means of a potentiometer. Depending on the setting of the potentiometer ( $t_R$ ), the adjustment is carried out according to the principle of full-wave control or generalized phase control.

### Full-wave control

In this operating mode the output is adjusted to the required setpoint by changing the on-to-off period. The period duration is predefined at one second.

### Generalized phase control

In this operating mode the output is adjusted to the required setpoint by changing the current flow angle. In order to observe the limit values of the conducted interference voltage for industrial power systems, a choke rated at at least 200  $\mu$ H must be included in the load circuit.

## Design

### Mounting

Easy snapping onto the 3RF21 semiconductor relays or 3RF23 semiconductor contactors establishes the connections to the semiconductor switching devices. Because of the special design, the straight-through transformer of the power controller module covers the lower main power connection. The cable to the load is simply pushed through and secured with the terminal screw.

## Selection and ordering data

Rated operational current $I_e$	Rated operational voltage $U_e$	Rated control supply voltage $U_s$ AC 110 V	Rated control supply voltage $U_s$ AC/DC 24 V	Std. Pack Qty	Weight per pack approx.
A	V	Order No.	Order No.		kg
<b>Power controllers<sup>1)</sup></b>					
20	110 ... 230	<b>3RF29 20-0HA33</b>	<b>3RF29 20-0HA13</b>	1 unit	0.120
20	400 ... 600	<b>3RF29 20-0HA36</b>	<b>3RF29 20-0HA16</b>	1 unit	0.120
50	110 ... 230	<b>3RF29 50-0HA33</b>	<b>3RF29 50-0HA13</b>	1 unit	0.120
50	400 ... 600	<b>3RF29 50-0HA36</b>	<b>3RF29 50-0HA16</b>	1 unit	0.120
90	110 ... 230	<b>3RF29 90-0HA33</b>	<b>3RF29 90-0HA13</b>	1 unit	0.120
90	400 ... 600	<b>3RF29 90-0HA36</b>	<b>3RF29 90-0HA16</b>	1 unit	0.120

1) Optional sealable cover - 3RF29 00-ORA88 can be used.

## Functions

### Start-up

Pressing the "Teach" button switches the device on; the current through the semiconductor switching device and the mains voltage are detected and stored. The resultant output is taken as the 100% output for the setpoint selection. During this process the two lower red LEDs flash alternately. Simultaneous maintained light from the three red LEDs indicates the completion of the "Teach" process.

The "Teach" button can also be used to switch on the connected semiconductor switching device briefly for test purposes. In this case the "ON" LED is switched on.

### Setpoint selection

The setting on the setpoint potentiometer (P) determines how the setpoint selection is to be made:

#### External setpoint selection

At 0 % the setpoint selection is set via an external 0 – 10 V analog signal (terminals IN / 0 – 10 V). The device is switched on and off via the power supply (terminals A1 / A2).

#### Internal setpoint selection

Above 0 % the setpoint is set using the potentiometer. To allow this, the potential at terminal A1 must additionally be applied at the IN terminal. After removal of the "ON" signal, the switching module is switched off.

#### Inrush current limitation

The ramp time ( $t_R$ ) for a voltage ramp on switching on is set with the potentiometer for the purpose of inrush current limitation. If a time longer than 0 s is set, the device operates according to the phase-angle principle. If 0 s is set, there is no voltage ramp and the device operates according to the principle of full-wave control.

### Load fault

If upon switching on with voltage applied the current flowing is not greater than the residual current of the switching device, the device triggers a load fault. The fault relay is activated and the "Load" LED lights up.

### Thyristor fault

If a current greater than the residual current of the switching device is measured in the deenergized state, the device triggers a thyristor fault. The fault relay is activated and the "Thyristor" LED lights up.

### Supply fault

If no current is measured in the energized state, the device triggers a supply fault. The fault relay is activated and the "Supply" LED lights up.



**Overview****Power control regulators for SIRIUS solid-state switching devices**

The power control regulator is a function module for the autonomous power control regulation of complex heating systems and inductive loads, for the operation of loads with temperature-dependent resistors or long-term aging, and for simple indirect temperature control.

The power control regulator can be used on the 3RF21 and 3RF23 instantaneous switching solid-state switching devices (single-phase). If only the full-wave control mode is used, the power control regulator can also be used on the zero-point-switching solid-state relays and contactors.

**Application**

The power control regulator sets the load current of the solid-state switching device depending on a setpoint value as a percentage. Changes in the mains voltage or in the load resistance are not compensated in this case. The modulation, the On/off ratio or the phase angle, remains unchanged in accordance with the setpoint. The autonomous power control regulation is performed between 0 and 100 % of the setpoint value

**Full-wave control**

If the left potentiometer  $t_R$  is set to 0 s (= far left), the power control regulator works according to the principle of full-wave control. The power set, be it internal or external, is converted into a pulse-width-modulated digital signal. The power control regulator controls the On and Off time of the solid-state switching device within a fixed period duration of 1 s so that the specified power is applied to the load. The "ON" LED flashes in the same rhythm as the solid-state switching device switches on and off.

**Generalized phase control**

If the left potentiometer  $t_R$  is set to higher than 0 s, the power control regulator works according to the principle of generalized phase control. With generalized phase control, a choke rated at at least 200  $\mu\text{H}$  must be included in the load circuit in order to observe the limit values of the conducted interference voltage for industrial networks.

**Design****Mounting**

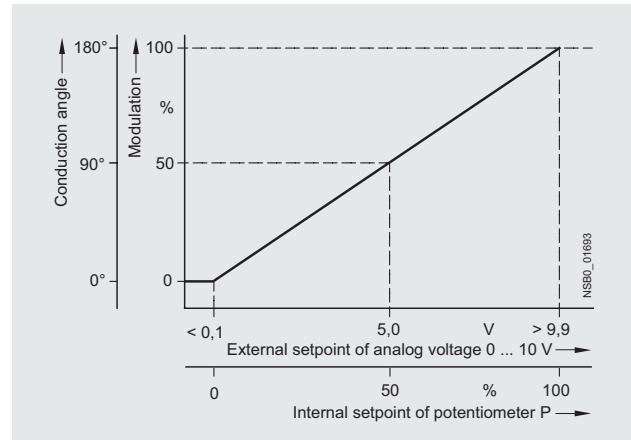
Easy snapping onto the 3RF21 solid-state relays or 3RF23 solid-state contactors establishes the connections to the solid-state switching devices. Because of the special design, the straight-through transformer of the function module covers the lower main power connection. The cable to the load is simply pushed through and secured with the terminal screw.

**Function****Setpoint selection**

The setpoint is selected either internally using the right-hand potentiometer P with 0 ... 100 % on the module or externally through the analog input 0 ... 10 V.

100 % corresponds in full-wave control to permanently On and in generalized phase control to a conduction angle of 180° and hence maximum power.

When the setpoint is selected internally the module is controlled through the IN terminal. The terminal 10 then has no function.



Input characteristic curve

When the setpoint is selected externally (potentiometer P set far left = 0 %) the module is controlled by applying the analog voltage 0 ... 10 V. 0 ... 10 V corresponds to 0 ... 100 % power. Conversion of the voltage is linear between 0.1 and 9.9 V. Below 0.1 V the switching device remains off; at voltages above 9.9 V the power is always set to 100 %.

**Inrush current limitation**

The ramp time ( $t_R$ ) for a voltage ramp on switching on is set with the left potentiometer for the purpose of inrush current limitation. The set time refers to a power of 100 %. If, for example, a ramp time of 10 s is set and the selected power is 60 %, then a power of 60 % is reached after approx. 6 s.

**Line and thyristor monitoring**

The power control regulator recognizes supply failures and thyristor faults. The faults are indicated by the LEDs on the module and the fault output is activated.

## Solid-State Relays

## 3RF21 Solid-state relays – technical data

## Overview

## 22.5 mm semiconductor relays

With its compact design, which stays the same even at currents of up to 88 A, the 3RF21 semiconductor relay is the ultimate in space-saving construction, at a width of 22.5 mm. The logical connection arrangement, with the power infeed from above and connection of the load from below, ensures clean installation in the control cabinet.

## Technical specifications

Type		3RF21 ..-1....	3RF21 ..-2....	3RF21 ..-3....
<b>General data</b>				
<b>Ambient temperature</b>				
during operation, derating from 40 °C	°C	-25 ... +60		
when stored	°C	-55 ... +80		
<b>Site altitude</b>	m	0 ... 1000; derating from 1000		
<b>Shock resistance</b>	g/ms	15/11		
acc. to IEC 60068-2-27				
<b>Vibration resistance</b>	g	2		
acc. to IEC 60068-2-6				
<b>Degree of protection</b>		IP20		
<b>Electromagnetic compatibility (EMC)</b>				
Emitted interference				
• Conducted interference voltage acc. to IEC 60947-4-3				
Class A for industrial applications				
• Emitted, high-frequency interference voltage acc. to IEC 60947-4-3				
Class A for industrial applications				
Noise immunity				
• Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)				
kV				
Contact discharge 4; air discharge 8; behavior criterion 2				
• Induced RF fields acc. to IEC 61000-4-6				
MHz				
0.15 ... 80; 140 dBµV; behavior criterion 1				
• Burst acc. to IEC 61000-4-4				
kV				
2/5.0 kHz; behavior criterion 1				
• Surge acc. to IEC 61000-4-5				
kV				
Conductor - ground 2; conductor - conductor 1; behavior criterion 2				
<b>Connection technique</b>				
		<b>Screw-type connection</b>	<b>Spring-loaded connection</b>	<b>Ring cable connection</b>
<b>Main contact connection</b>				
Conductor cross-section				
Solid				
mm <sup>2</sup>		2 x (1.5 ... 2.5), 2 x (2.5 ... 6)		2 x (0.5 ... 2.5)
mm <sup>2</sup>		2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10		2 x (0.5 ... 1.5)
Finely stranded with end sleeve				
mm <sup>2</sup>		2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10		-
Finely stranded without end sleeves				
mm <sup>2</sup>		2 x (14 ... 10)		2 x (0.5 ... 2.5)
AWG		2 x (14 ... 10)		-
mm		10		-
mm		10		-
Terminal screw		M 4		M 5
Nm		2 ... 2.5		2 ... 2.5
lb.in		18 ... 22		18 ... 22
Cable lug				
• DIN				
-		-		DIN 46234
-		-		-5-2.5, -5-6, -5-10, -5-16, -5-25
-		-		JIS C 2805 R 2-5, 5.5-5, 8-5, 14-5
• JIS				
<b>Auxiliary/control contact connections</b>				
Conductor cross-section				
mm <sup>2</sup>		1x (0.5 ... 2.5); 2x (0.5 ... 1)		1x (0.5 ... 2.5); 2x (0.5 ... 1)
AWG		20 ... 12		20 ... 12
mm		7		7
mm		7		7
Terminal screw		M 3		M 3
Nm		0.5 ... 0.6		0.5 ... 0.6
lb.in		4.5 ... 5.3		4.5 ... 5.3
<b>Main circuit</b>				
<b>Rated operational voltage <math>U_e</math></b>				
V		24 ... 230		230 ... 460
%		-15 / +10		48 ... 600
Hz		50/60		400 ... 600
• Tolerance				
• Rated frequency				
<b>Rated insulation voltage <math>U_i</math></b>				
V		600		600
<b>Blocking voltage</b>				
V		800		1200
		1200		1600
<b>Rate of voltage rise</b>				
V/µs		1000		1000

# Solid-State Relays

## 3RF21 Solid-state – technical data

Order No.	$I_{\max}^{1)}$ at $R_{\text{thha}}/T_U = 40\text{ °C}$		$I_e$ acc. to IEC 60947-4-3 at $R_{\text{thha}}/T_U = 40\text{ °C}$		$I_e$ acc. to UL/CSA at $R_{\text{thha}}/T_U = 50\text{ °C}$		Power loss at $I_{\max}$ W	Minimum load current A	Leakage current mA
	A	K/W	A	K/W	A	K/W			
<b>Main circuit</b>									
3RF21 20-.....	20	2.0	20	1.7	20	1.3	28.6	0.1	10
3RF21 30-1....	30	1.1	30	0.79	30	0.56	44.2	0.5	10
3RF21 50-1....	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF21 50-2....	50	0.68	20	2.6	20	2.9	66	0.5	10
3RF21 50-3....	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF21 70-1....	70	0.40	50	0.77	50	0.6	94	0.5	10
3RF21 90-1....	88	0.33	50	0.94	50	0.85	118	0.5	10
3RF21 90-2....	88	0.33	20	2.8	20	3.5	118	0.5	10
3RF21 90-3....	88	0.33	88	0.22	83	0.19	118	0.5	10

<sup>1)</sup>  $I_{\max}$  provides information about the performance of the solid-state relay. The actual permitted rated operational current  $I_e$  can be smaller depending on the connection method and cooling conditions.

*Note: The required heat sinks for the corresponding load currents can be determined from the characteristic curves, page 4/10. The minimum thickness values for the mounting surface must be observed.*

Order No.	Rated impulse withstand capacity $I_{\text{tsm}}$	$I^2t$ value
	A	A <sup>2</sup> s
<b>Main circuit</b>		
3RF21 20-.....	200	200
3RF21 30-..A.2	300	450
3RF21 30-..A.4	300	450
3RF21 30-..A.5	300	450
3RF21 30-..A.6	400	800
3RF21 50-.....	600	1800
3RF21 70-..A.2	1200	7200
3RF21 70-..A.4	1200	7200
3RF21 70-..A.5	1200	7200
3RF21 70-..A.6	1150	6600
3RF21 90-.....	1150	6600

Type		3RF21 ...-...2	3RF21 ...-...4	3RF21 ...-...5	3RF21 ...-...6
<b>Main circuit</b>					
Rated operational voltage $U_e$	V	24 ... 230	48 ... 460	48 ... 600	48 ... 600
• Operating range	V	20 ... 253	40 ... 506	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %			
Rated insulation voltage $U_i$	V	600			
Blocking voltage	V	800	1200		1600
Rate of voltage rise	V/μs	1000			

Type		3RF21 ...-...0.	3RF21 ...-...1.	3RF21 ...-...2.	3RF21 ...-...4.
<b>Control circuit</b>					
Method of operation		DC operation	AC/DC operation	AC operation	DC operation
Rated control supply voltage $U_s$	V	24 acc. to EN 61131-2	24 AC	24 DC	110 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10 %	--	50/60 ± 10 %
Control supply voltage, max.	V	30	26.5 AC	30 DC	253
Typical actuating current	mA	20 / Low Power: 6.5 <sup>1)</sup>	20	20	15
Response voltage	V	15	14 AC	15 DC	90
Drop-out voltage	V	5	5 AC	5 DC	40
<b>Operating times</b>					
• ON-delay	ms	1 + max. one half-wave <sup>2)</sup>	10 + max. one half-wave <sup>2)</sup>	40 + max. one half-wave <sup>2)</sup>	1 + max. one half-wave <sup>2)</sup>
• OFF-delay	ms	1 + max. one half-wave	15 + max. one half-wave	40 + max. one half-wave	1 + max. one half-wave

<sup>1)</sup> Applies to the version "Low Power" 3RF21 ...-AA...-0KNO.

<sup>2)</sup> Only for zero-point-switching devices.

## Solid-State Relays

## 3RF21 solid-state relays – technical data

**Fused version with semiconductor protection (similar to type of coordination "2")<sup>1)</sup>**

The semiconductor protection for the SIRIUS controls can be used with different protective devices. This allows protection by means of LV HRC fuses of gG operational class or miniature circuit breakers. Siemens recommends the use of special SITOR semiconductor fuses. The table below lists the maximum permissible fuses for each SIRIUS control.

If a fuse is used with a higher rated current than specified, semiconductor protection is no longer guaranteed. However, smaller fuses with a lower rated current for the load can be used without problems.

For protective devices with gG operational class and for SITOR 3NE1 all-range fuses, the minimum cross-sections for the conductor to be connected must be taken into account.

Order No.	All-range fuses		Semiconductor fuses/partial-range fuses			
	LV HRC design gR/SITOR	Cylindrical design gR/NEOZED <sup>2)</sup>	LV HRC design aR/SITOR	Cylindrical design aR/SITOR		aR/SITOR
	3NE1	SILIZED 5SE1	3NE8	10 mm x 38 mm 3NC1 0	14 mm x 51 mm 3NC1 4	22 mm x 58 mm 3NC2 2
<b>3RF21 20-...2</b> <b>3RF21 20-...4</b> <b>3RF21 20-...5<sup>3)</sup></b>	3NE1 814-0 3NE1 813-0 <sup>4)</sup> 3NE1 813-0 <sup>4)</sup>	5SE1 325 5SE1 320 5SE1 320	3NE8 015-1 3NE8 015-1 3NE8 015-1	3NC1 020 3NC1 016 <sup>4)</sup> 3NC1 016 <sup>4)</sup>	3NC1 420 3NC1 420 3NC1 420	3NC2 220 3NC2 220 3NC2 220
<b>3RF21 30-...2</b> <b>3RF21 30-...4</b> <b>3RF21 30-...5<sup>3)</sup></b> <b>3RF21 30-...6</b>	3NE1 815-0 <sup>4)</sup> 3NE1 815-0 <sup>4)</sup> 3NE1 815-0 <sup>4)</sup> 3NE1 815-0 <sup>4)</sup>	5SE1 335 5SE1 325 <sup>4)</sup> 5SE1 325 <sup>4)</sup> --	3NE8 003-1 3NE8 003-1 3NE8 003-1 3NE8 003-1	3NC1 032 3NC1 025 <sup>4)</sup> 3NC1 025 <sup>4)</sup> 3NC1 032	3NC1 432 3NC1 430 3NC1 430 3NC1 432	3NC2 232 3NC2 232 3NC2 232 3NC2 232
<b>3RF21 50-...2</b> <b>3RF21 50-...4</b> <b>3RF21 50-...5<sup>3)</sup></b> <b>3RF21 50-...6</b>	3NE1 817-0 3NE1 802-0 <sup>4)</sup> 3NE1 802-0 <sup>4)</sup> 3NE1 803-0 <sup>4)</sup>	5SE1 350 5SE1 335 <sup>4)</sup> 5SE1 335 <sup>4)</sup> --	3NE8 017-1 3NE8 017-1 3NE8 017-1 3NE8 017-1	-- -- -- --	3NC1 450 3NC1 450 3NC1 450 3NC1 450	3NC2 250 3NC2 250 3NC2 250 3NC2 250
<b>3RF21 70-...2<sup>5)</sup></b> <b>3RF21 70-...4<sup>5)</sup></b> <b>3RF21 70-...5<sup>3)5)</sup></b> <b>3RF21 70-...6<sup>5)</sup></b>	3NE1 820-0 3NE1 020-2 3NE1 020-2 3NE1 020-2	5SE1 363 <sup>4)</sup> 5SE1 363 <sup>4)</sup> -- --	3NE8 020-1 3NE8 020-1 3NE8 020-1 3NE8 020-1	-- -- -- --	-- -- -- --	3NC2 280 3NC2 280 3NC2 280 3NC2 280
<b>3RF21 90-...2<sup>5)</sup></b> <b>3RF21 90-...4<sup>5)</sup></b> <b>3RF21 90-...5<sup>3)5)</sup></b> <b>3RF21 90-...6<sup>5)</sup></b>	3NE1 021-2 3NE1 021-2 3NE1 021-2 3NE1 817-0 <sup>4)</sup>	-- -- -- --	3NE8 021-1 3NE8 021-1 3NE8 021-1 3NE8 021-1	-- -- -- --	-- -- -- --	3NC2 200 3NC2 280 <sup>4)</sup> 3NC2 280 <sup>4)</sup> 3NC2 280 <sup>4)</sup>

Order No.	Cable and line protection fuses				
	LV HRC design <sup>4)</sup> gG	Cylindrical design <sup>4)</sup> gG		DIAZED <sup>4)</sup> quick	
	3NA2	10 mm x 38 mm 3NW6 0	14 mm x 51 mm 3NW6 1	22 mm x 58 mm 3NW6 2	5SB
<b>3RF21 20-...2</b> <b>3RF21 20-...4</b> <b>3RF21 20-...5<sup>3)</sup></b>	3NA2 803 3NA2 801 3NA2 801	3NW6 000-1 -- --	3NW6 101-1 3NW6 101-1 3NW6 101-1	-- -- --	5SB1 41 5SB1 41 5SB1 41
<b>3RF21 30-...2</b> <b>3RF21 30-...4</b> <b>3RF21 30-...5<sup>3)</sup></b> <b>3RF21 30-...6</b>	3NA2 803 3NA2 803 3NA2 803 3NA2 803-6	-- -- -- --	3NW6 103-1 3NW6 101-1 3NW6 101-1 --	-- -- -- --	5SB1 71 5SB1 71 5SB1 71 --
<b>3RF21 50-...2</b> <b>3RF21 50-...4</b> <b>3RF21 50-...5<sup>3)</sup></b> <b>3RF21 50-...6</b>	3NA2 810 3NA2 807 3NA2 807 3NA2 807-6	-- -- -- --	3NW6 107-1 -- -- --	3NW6 207-1 3NW6 205-1 3NW6 205-1 --	5SB3 11 5SB3 11 5SB3 11 --
<b>3RF21 70-...2<sup>5)</sup></b> <b>3RF21 70-...4<sup>5)</sup></b> <b>3RF21 70-...5<sup>3)5)</sup></b> <b>3RF21 70-...6<sup>5)</sup></b>	3NA2 817 3NA2 812 3NA2 812 3NA2 812-6	-- -- -- --	-- -- -- --	3NW6 217-1 3NW6 212-1 3NW6 212-1 --	5SB3 31 5SB3 31 -- --
<b>3RF21 90-...2<sup>5)</sup></b> <b>3RF21 90-...4<sup>5)</sup></b> <b>3RF21 90-...5<sup>3)5)</sup></b> <b>3RF21 90-...6<sup>5)</sup></b>	3NA2 817 3NA2 812 3NA2 812 3NA2 812-6	-- -- -- --	-- -- -- --	3NW6 217-1 3NW6 212-1 3NW6 212-1 --	-- -- -- --

Suitable fuse holders, fuse bases and controls can be found in Catalog LV 1, Chapter 19.

- <sup>1)</sup> Type of coordination "2" according to EN 60947-4-1:  
In the event of a short-circuit, the controls in the load feeder must not endanger persons or the installation. They must be suitable for further operation. For fused configurations, the protective device must be replaced.
- <sup>2)</sup> For use only with operational voltage  $U_o$  up to 400 V.
- <sup>3)</sup> For use only with operational voltage  $U_o$  up to 506 V.
- <sup>4)</sup> These fuses have a smaller rated current than the solid-state relays.
- <sup>5)</sup> These versions can also be protected against short-circuits with miniature circuit breakers as described in the notes on "SIRIUS Solid-State Contactors → Special Version Short-Circuit Resistant".

## Solid-State Relays

## 3RF20 Solid-state relays – technical data

## Overview

## 45 mm semiconductor relays

The semiconductor relays with a width of 45 mm provide for connection of the power supply lead and the load from above. This makes it easy to retrofit existing semiconductor relays. The connection of the control cable also saves space in much the same way as the 22.5 mm design, as it is simply plugged on.

## Technical specifications

Type	3RF20		
<b>General data</b>			
<b>Ambient temperature</b>			
during operation, derating at 40 °C	°C	-25 ... +60	
when stored	°C	-55 ... +80	
<b>Site altitude</b>	m	0 ... 1000; derating from 1000	
<b>Shock resistance</b>	g/ms	15/11	
acc. to IEC 60068-2-27			
<b>Vibration resistance</b>	g	2	
acc. to IEC 60068-2-6			
<b>Degree of protection</b>		IP20	
<b>Electromagnetic compatibility (EMC)</b>			
Emitted interference			
• Conducted interference voltage IEC acc. to 60947-4-3			
Class A for industrial applications			
• Emitted, high-frequency interference voltage acc. to IEC 60947-4-3			
Class A for industrial applications			
Noise immunity			
• Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)			
	kV	Contact discharge 4; air discharge 8; behavior criterion 2	
• Induced RF fields acc. to IEC 61000-4-6			
	MHz	0.15 ... 80; 140 dB $\mu$ V; behavior criterion 1	
• Burst acc. to IEC 61000-4-4			
	kV	2/5.0 kHz; behavior criterion 1	
• Surge acc. to IEC 61000-4-5			
	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2	
<b>Connection, main contacts, screw connection</b>			
Conductor cross-section			
Solid	mm <sup>2</sup>	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	
Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1.5 ... 2.5); 2 x (2.5 ... 6); 1 x 10	
Solid or stranded AWG conductors	AWG	2 x (14 ... 10)	
Insulation stripping length	mm	10	
Terminal screw		M 4	
• Tightening torque			
	Nm	2 ... 2.5	
	lb.in	18 ... 22	
<b>Connection, auxiliary/control contacts, screw connection</b>			
Conductor cross-section			
	mm <sup>2</sup>	1x (0.5 ... 2.5); 2x (0.5 ... 1.0); AWG 20 ... 12	
Insulation stripping length	mm	7	
Terminal screw		M 3	
• Tightening torque			
	Nm	0.5 ... 0.6	
	lb.in	4.5 ... 5.3	

Type	3RF20 .0-1AA.2	3RF20 .0-1AA.4	3RF20..-.....5	3RF20 .0-1AA.6
<b>Main circuit</b>				
<b>Rated operational voltage <math>U_e</math></b>	V	24 ... 230	230 ... 460	48 ... 600
• Tolerance				
	%	-15/+10		
• Rated frequency				
	Hz	50/60		
<b>Rated insulation voltage <math>U_i</math></b>	V	600		
<b>Blocking voltage</b>	V	800	1200	1200
<b>Rate of voltage rise</b>	V/ $\mu$ s	1000		

# Solid-State Relays

## 3RF20 Solid-state relays – technical data

Order No.	$I_{max}^{1)}$ at $R_{thha}/T_u = 40\text{ °C}$		$I_e$ to IEC 60947-4-3 at $R_{thha}/T_u = 40\text{ °C}$		$I_e$ to UL/CSA at $R_{thha}/T_u = 50\text{ °C}$		Power loss for $I_{max}$	Minimum load current	Leakage current mA
	A	K/W	A	K/W	A	K/W			
<b>Main circuit</b>									
3RF20 20-1AA..	20	2.0	20	2.0	20	1.7	28.6	0.5	10
3RF20 30-1AA..	30	1.1	30	1.1	30	0.88	44.2	0.5	10
3RF20 50-1AA..	50	0.68	50	0.68	50	0.53	66	0.5	10
3RF20 70-1AA..	70	0.4	50	0.95	50	0.8	94	0.5	10
3RF20 90-1AA..	88	0.33	50	1.25	50	1.02	118	0.5	10

1)  $I_{max}$  provides information about the performance of the semiconductor relay. The actual permitted operational current  $I_e$  can be smaller depending on the connection method and cooling conditions.

Order No.	Rated impulse withstand capacity $I_{sm}$	$\beta t$ value
<b>Main circuit</b>		
3RF20 20-1AA..	200	200
3RF20 30-1AA.2	300	450
3RF20 30-1AA.4	300	450
3RF20 30-1AA.6	400	800
3RF20 50-1AA..	600	1800
3RF20 70-1AA.2	1200	7200
3RF20 70-1AA.4	1200	7200
3RF20 70-1AA.6	1150	6600
3RF20 90-1AA..	1150	6600

Type	3RF20 .0-1AA0.	3RF20 .0-1AA4.	3RF20 .0-1AA2.
<b>Control circuit</b>			
Method of operation	DC operation	DC operation	AC operation
Rated control supply voltage $U_s$	V 24 acc. to EN 61131-2	4 ... 30V DC	110 ... 230
Max. rated control voltage	V 30	30	253
Rated control current at $U_s$	mA 15	15	6
Rated frequency of the control supply voltage	Hz -	-	50/60
Response voltage current	V 15 mA >2	4 >2	90 2
Drop-out voltage	V 5	1	40
Operating times			
closing time	ms 1 + max. one half wave	1 + max. one half wave	40 + max. one half wave
opening time	ms 1 + max. one half wave	1 + max. one half wave	40 + max. one half wave

### Fused design with semiconductor protection

Order No.	All-range fuse LV design gR/SITOR 3NE1	Semiconductor protection fuse Cylindrical design			Cable and line protection fuse			DIAZED quick 5SB
		10 x 38 mm aR/SITOR 3NC1 0	14 x 51 mm aR/SITOR 3NC1 4	22 x 58 mm aR/SITOR 3NC2 2	LV design gL/gG/3NA	Cylindrical design		
					10 x 38 mm gL/gG 3NW	14 x 51 mm gL/gG 3NW	22 x 58 mm gL/gG 3NW	
3RF20 20-1AA.2	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 803	3NW6 001-1	3NW6 101-1	5SB1 71
3RF20 20-1AA.4	3NE1 813-0	3NC1 016	3NC1 420	3NC2 220	3NA2 801	-	3NW6 101-1	5SB1 41
3RF20 30-1AA.2	3NE1 815-0	3NC1 032	3NC1 432	3NC2 232	3NA2 803	-	3NW6 103-1	5SB3 11
3RF20 30-1AA.4	3NE1 815-0	3NC1 025	3NC1 432	3NC2 232	3NA2 803	-	3NW6 101-1	5SB1 71
3RF20 30-1AA.6	3NE1 815-0	3NC1 032	3NC1 432	3NC2 232	3NA2 803-6	-	-	-
3RF20 50-1AA.2	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 810	-	3NW6 107-1	5SB3 21
3RF20 50-1AA.4	3NE1 802-0	-	3NC1 450	3NC2 250	3NA2 807	-	3NW6 205-1	5SB3 11
3RF20 50-1AA.6	3NE1 803-0	-	3NC1 450	3NC2 250	3NA2 807-6	-	-	-
3RF20 70-1AA.2 <sup>2)</sup>	3NE1 820-0	-	-	3NC2 280	3NA2 817	-	-	5SB3 31
3RF20 70-1AA.4 <sup>2)</sup>	3NE1 020-2	-	-	3NC2 280	3NA2 812	-	3NW6 212-1	5SB3 21
3RF20 70-1AA.6 <sup>2)</sup>	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-
3RF20 90-1AA.2 <sup>2)</sup>	3NE1 021-2	-	-	3NC2 200	3NA2 817	-	3NW6 217-1	5SB3 31
3RF20 90-1AA.4 <sup>2)</sup>	3NE1 021-2	-	-	3NC2 280	3NA2 812	-	3NW6 212-1	5SB3 21
3RF20 90-1AA.6 <sup>2)</sup>	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-

1) Type of coordination "2" acc. to EN 60947-4-1:  
In the event of a short-circuit, the control gear in the load feeder must not endanger persons or the installation. They must be suitable for further operation. For fused configurations, the protective device must be replaced.

2) These versions can also be protected against short-circuit with miniature circuit-breakers as described on page 7/11.

## Solid-State Relays

## 3RF22 Solid-state relays – technical data

## Overview

## 45 mm solid-state relays

The 3RF22 solid-state relays with a width of 45 mm provide space advantages over solutions with single-phase versions. The logical connection arrangement, with the power infeed from above and connection of the load from below, ensures tidy installation in the control cabinet.

Important features:

- LED indicators
- Variety of connection techniques
- Plug-in control connection
- Degree of protection IP20
- Zero-point switching,
- Two or three-phase controlled

## Technical specifications

Type	3RF22 ..-1....	3RF22 ..-2....	3RF22 ..-3....
<b>General data</b>			
<b>Ambient temperature</b>			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
<b>Site altitude</b>	m	0 ... 1000; > 1000 ask Technical Assistance	
<b>Shock resistance</b> acc. to IEC 60068-2-27	g/rms	15/11	
<b>Vibration resistance</b> acc. to IEC 60068-2-6	g	2	
<b>Degree of protection</b>	IP20		
<b>Insulation strength</b> at 50/60 Hz (main/control circuit to ground)	V rms	4000	
<b>Electromagnetic compatibility (EMC)</b>			
• Emitted interference			
- Conducted interference voltage acc. to IEC 60947-4-3	Class A for industrial applications <sup>1)</sup>		
- Emitted, high-frequency interference voltage acc. to IEC 60947-4-3	Class A for industrial applications		
• Interference immunity			
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2	
- Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1	
- Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1	
- Surge acc. to IEC 61000-4-5	kV	Conductor – ground 2; conductor – conductor 1; behavior criterion 2	
<b>Connection technique</b>	<b>Screw terminal</b>	<b>Spring-loaded connection</b>	<b>Ring terminal end connection</b>
<b>Main contact connection</b>			
• Conductor cross-section	mm <sup>2</sup>		
- Solid	mm <sup>2</sup>	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2 x (0.5 ... 2.5)
- Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2 x (0.5 ... 1.5)
- Finely stranded without end sleeve	mm <sup>2</sup>	--	2 x (0.5 ... 2.5)
- Solid or stranded, AWG conductors		2 x (AWG 14 ... 10)	2 x (AWG 18 ... 14)
• Stripped length	mm	10	10
• Terminal screw		M4	--
- Tightening torque, Ø 5 ... 6 mm, PZ 2	Nm	2 ... 2.5	M5
	lb.in	18 ... 22	2.5 ... 2
			18 ... 22
• Cable lug		--	--
- acc. to DIN 46234			5-2.5 ... 5-25
- acc. to JIS C 2805			R 2-5 ... 14-5
<b>Connection, auxiliary/control contacts</b>			
• Conductor cross-section, with or without end sleeve	mm AWG	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12	0.5 ... 2.5 20 ... 12
• Stripped length	mm	7	10
• Terminal screw		M3	--
- Tightening torque, Ø 3.5, PZ 1	Nm	0.5 ... 0.6	M3
	lb.in	4.5 ... 5.3	0.5 ... 0.6
			4.5 ... 5.3

1) These products were built as Class A devices. The use of these devices in residential areas could result in radio interference. In this case they may be required to introduce additional damping measures.

# Solid-State Relays

## 3RF22 Solid-state relays – technical data

Type	3RF22 ...-AB.5		3RF22 ...-AC.5	
<b>Main circuit</b>				
<b>Controlled phases</b>	Two-phase		Three-phase	
<b>Rated operational voltage <math>U_e</math></b>	V	48 ... 600	48 ... 600	
• Operating range	V	40 ... 660	40 ... 660	
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %	
<b>Rated insulation voltage <math>U_i</math></b>	V	600	600	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6	6	
<b>Blocking voltage</b>	V	1200	1200	
<b>Rate of voltage rise</b>	V/μs	1.000	1.000	

Order No.	$I_{max}^{1)}$ at $R_{thha}/T_u = 40\text{ °C}$		$I_e$ acc. to IEC 60947-4-3 at $R_{thha}/T_u = 40\text{ °C}$		$I_e$ acc. to UL/CSA at $R_{thha}/T_u = 50\text{ °C}$		Power loss at $I_{max}$ W	Minimum load current A	Max. leakage current mA
	A	K/W	A	K/W	A	K/W			
<b>Main circuit</b>									
<b>3RF22 30-. AB..</b>	30	0.57	30	0.57	30	0.44	81	0.5	10
<b>3RF22 55-1AB..</b>	55	0.18	50	0.27	50	0.19	151	0.5	10
<b>3RF22 55-2AB..</b>			20	1.83	20	1.58			
<b>3RF22 55-3AB..</b>			50	0.27	50	0.19			
<b>3RF22 30-. AC..</b>	30	0.33	30	0.33	30	0.25	122	0.5	10
<b>3RF22 55-1AC..</b>	55	0.09	50	0.15	50	0.1	226	0.5	10
<b>3RF22 55-2AC..</b>			20	1.19	20	1.02			
<b>3RF22 55-3AC..</b>			88	0.15	83	0.1			

1)  $I_{max}$  provides information about the performance of the solid-state relay.  
The actual permitted rated operational current  $I_e$  can be smaller depending on the connection method and cooling conditions.

Order No.	Rated impulse withstand capacity $I_{tsm}$		$I^2t$ value A <sup>2</sup> s
	A		
<b>Main circuit</b>			
<b>3RF22 30-....5</b>	300		450
<b>3RF22 55-....5</b>	600		1800

Type	3RF22 ...-AB4. / 3RF22 ...-AC4.	
<b>Control circuit</b>		
<b>Method of operation</b>	DC operation	
<b>Rated control supply voltage <math>U_c</math></b>	V	4 ... 30
<b>Response voltage</b>	V	15
• For tripping current	mA	2
<b>Drop-out voltage</b>	V	1
<b>Operating times</b>		
• ON-delay	ms	1 + max. one half-wave
• OFF delay	ms	1 + max. one half-wave



## Solid-State Contactors

## 3RF23 Solid-state contactors- technical data

## Technical specifications

Order No.	3RF23 ..-A...	3RF23 ..-B...	3RF23 ..-C...	3RF23 ..-D...
<b>General data</b>				
<b>Ambient temperature</b>				
during operation, derating at 40 °C	°C	-25 ... +60		
when stored	°C	-55 ... +80		
<b>Site altitude</b>	m	0 ... 1000; derating from 1000		
<b>Shock resistance</b> acc. to IEC 60068-2-27	g/ms	15/11		
<b>Vibration resistance</b> acc. to IEC 60068-2-6	g	2		
<b>Degree of protection</b>		IP20		
<b>Electromagnetic compatibility (EMC)</b>				
Emitted interference acc. to IEC 60947-4-3				
<ul style="list-style-type: none"> <li>Conducted interference voltage</li> <li>Emitted high-frequency interference voltage</li> </ul>				
Noise immunity				
<ul style="list-style-type: none"> <li>Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)</li> <li>Induced RF fields acc. to IEC 61000-4-6</li> <li>Burst acc. to IEC 61000-4-4</li> <li>Surge acc. to IEC 61000-4-5</li> </ul>				
	kV	Contact discharge 4; air discharge 8; behavior criterion 2		
	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
	kV	2/5.0 kHz; behavior criterion 1		
	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2		

Order No.	3RF23 ..-1...	3RF23 ..-2...	3RF23 ..-3...
<b>General data</b>			
<b>Connection technique</b>			
<b>Main contact connection</b>			
Conductor cross-section			
Solid	mm <sup>2</sup>	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2 x (0.5 ... 2.5)
Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2 x (0.5 ... 1.5)
Finely stranded without end sleeves	mm <sup>2</sup>		2 x (0.5 ... 2.5)
Solid or stranded AWG conductors	AWG	2 x (14 ... 10)	2 x (18 ... 14)
Insulation stripping length	mm	10	10
Terminal screw		M 4	M 5
• Tightening torque	Nm	2 ... 2.5	2 ... 2.5
• Tightening torque	lb.in	18 ... 22	18 ... 22
Cable lug			
• DIN			DIN 46234
• JIS			-5-2.5, -5-6, -5-10, -5-16, -5-25 JIS C 2805 R 2-5, 5.5-5, 8-5, 14-5
<b>Auxiliary/control contact connections</b>			
Conductor cross-section			
	mm <sup>2</sup>	1x (0.5 ... 2.5); 2x (0.5 ... 1.0)	1x (0.5 ... 2.5); 2x (0.5 ... 1.0)
	AWG	20 ... 12	20 ... 12
Insulation stripping length	mm	7	7
Terminal screw		M 3	M 3
• Tightening torque	Nm	0.5 ... 0.6	0.5 ... 0.6
	lb.in	4.5 ... 5.3	4.5 ... 5.3

Type	3RF23 ..-...2	3RF23 ..-...4	3RF21 ..-...5	3RF23 ..-...6
<b>Main circuit</b>				
<b>Rated operational voltage <math>U_e</math></b>	V	24 ... 230	230 ... 460	48 ... 600
• Tolerance	%	-15/+10		
• Rated frequency	Hz	50/60 Hz		
<b>Rated insulation voltage <math>U_i</math></b>	V	600		
<b>Blocking voltage</b>	V	800	1200	1200
<b>Rate of voltage rise</b>	V/µs	1000		

Type	3RF23 ..-...0.	3RF23 ..-...2.
<b>Control circuit</b>		
<b>Method of operation</b>		
		DC operation
<b>Rated control supply voltage <math>U_s</math></b>	V	24 to EN 61131-2
<b>Max. rated control voltage</b>	V	30
<b>Rated control current at <math>U_s</math></b>	mA	15
<b>Rated frequency</b> of the control supply voltage	Hz	50/60
<b>Response voltage</b>	V	15
for tripping current	mA	2
<b>Drop-out voltage</b>	V	5
<b>Operating times</b>		
closing time	ms	1 + max. one half-wave
opening time	ms	1 + max. one half-wave
		40 + max. one half-wave
		40 + max. one half-wave

# Solid-State Contactors

## 3RF23 Solid-state contactors – technical data

### Technical specifications

Order No.	Type current AC-51 <sup>1)</sup>			Power loss at $I_{max}$	Minimum load current	Leakage current	Rated impulse withstand capacity $I_{tsm}$	$\beta t$ value
	$I_{max}$ at 40 °C	acc. to IEC 60947-4-3 at 40 °C	UL/CSA at 50 °C					
	A	A	A	W	A	mA	A	A <sup>2</sup> s
<b>Main circuit</b>								
3RF23 1.-.A..2 3RF23 1.-.A..4 3RF23 1.-.A.45 3RF23 1.-.A..6	10.5	7.5	9.6	11	0.5	10	200 200 400	200 200 800
3RF23 2.-.A..2 3RF23 2.-.C..2 3RF23 2.-.D..2 3RF23 2.-.A..4 3RF23 2.-.C..4 3RF23 2.-.D..4 3RF23 2.-.A.45 3RF23 2.-.A..6	20	13.2	17.6	20	0.5	10 25 10 10 25 10	600 600 1150 600 600 1150	1800 1800 6600 1800 1800 6600
3RF23 3.-.A..2 3RF23 3.-.A..4 3RF23 3.-.A.45 3RF23 3.-.A..6	30	22	27	33	0.5	10	600	1800
3RF23 4.-.A..2 3RF23 4.-.A..4 3RF23 4.-.A.45 3RF23 4.-.A..6	40	33	36	44	0.5	10	1200 1200 1150	7200 7200 6600
3RF23 5.-.A..2 3RF23 5.-.A..4 3RF23 5.-.A.45 3RF23 5.-.A..6	50	36	45	54	0.5	10	1150	6600
3RF23 7.-.A..2 3RF23 7.-.A..4 3RF23 7.-.A.45 3RF23 7.-.A..6	70	70	62	83	0.5	10	1150	6600
3RF23 9.-.A..2 3RF23 9.-.A..4 3RF23 9.-.A.45 3RF23 9.-.A..6	88	88	80	117	0.5	10	1150	6600

Order No.	Type current AC-51 <sup>1)</sup>				Power loss at $I_{max}$	Minimum load current	Leakage current	Rated impulse withstand capacity $I_{tsm}$	$\beta t$ value
	$I_{max}$ at 40 °C	acc. to IEC 60947-4-3 at 40 °C	UL/CSA at 50 °C	AC-15 Parameters					
	A	A	A	A	W	A	mA	A	A <sup>2</sup> s
<b>Main circuit</b>									
3RF23 1.-.B..2 3RF23 1.-.B..4 3RF23 1.-.B..6	10.5	7.5	9.6	6	1200 1/h 50 % ED	11	0.5	10 200 400	200 200 800
3RF23 2.-.B..2 3RF23 2.-.B..4 3RF23 2.-.B..6	20	13.2	17.6	12	1200 1/h 50 % ED	20	0.5	10	600
3RF23 3.-.B..2 3RF23 3.-.B..4 3RF23 3.-.B..6	30	22	27	15	1200 1/h 50 % ED	33	0.5	10	600
3RF23 4.-.B..2 3RF23 4.-.B..4 3RF23 4.-.B..6	40	33	36	20	1200 1/h 50 % ED	44	0.5	10	1200 1200 1150
3RF23 5.-.B..2 3RF23 5.-.B..4 3RF23 5.-.B..6	50	36	45	25	1200 1/h 50 % ED	54	0.5	10	1150
3RF23 7.-.B..2 3RF23 7.-.B..4 3RF23 7.-.B..6	70	70	62	27.5	1200 1/h 50 % ED	83	0.5	10	1150
3RF23 9.-.B..2 3RF23 9.-.B..4 3RF23 9.-.B..6	88	88	80	30	1200 1/h 50 % ED	117	0.5	10	1150

1) The type current provides information about the performance of the semi-conductor contactor. The actual permitted operational current  $I_b$  can be smaller depending on the connection method and start-up conditions. Derating acc. to curves from page 7/34, 7/35, 7/36.

## Solid-State Contactors

## 3RF23 Solid-state contactors – technical data

**Fused design with semiconductor protection  
(similar to type of coordination "2")<sup>1)</sup>**

The semiconductor protection for the SIRIUS SC controlgear can be used with different protective devices. This allows protection by means of LV HRC fuses of operational class gL/gG or supplementary protectors. Siemens recommends the use of special SITOR semiconductor fuses. The table below lists the maximum permissible fuses for each SIRIUS SC control gear.

If a fuse is used with a higher rated current than specified, semiconductor protection is no longer guaranteed. However, smaller fuses with a lower rated current for the load can be used without problems.

For protective devices with operational class gL/gG and for SITOR full range fuses 3NE1, the minimum cross-sections for the conductor to be connected must be taken into account.

Order No.	All-range fuse LV HRC design gR/SITOR 3NE1	Semiconductor protection fuse Cylindrical design			Cable and line protection fuse				DIAZED quick 5SB
		10 x 38 mm aR/SITOR 3NC1 0	14 x 51 mm aR/SITOR 3NC1 4	22 x 58 mm aR/SITOR 3NC2 2	LV HRC design gL/gG 3NA	Cylindrical design			
					10 x 38 mm gL/gG 3NW	14 x 51 mm gL/gG 3NW	22 x 58 mm gL/gG 3NW		
<b>3RF23 1-.....2</b>	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 803	3NW6 001-1	3NW6 101-1	-	5SB1 41
<b>3RF23 1-.....4</b>	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 801	3NW6 001-1	3NW6 101-1	-	5SB1 41
<b>3RF23 1-.....6</b>	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 803-6	-	-	-	-
<b>3RF23 2-.....2</b>	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807	3NW6 007-1	3NW6 107-1	3NW6 207-1	5SB1 71
<b>3RF23 2-.....4</b>	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807	3NW6 005-1	3NW6 105-1	3NW6 205-1	5SB1 71
<b>3RF23 2-.....6</b>	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807-6	-	-	-	-
<b>3RF23 3-.....2</b>	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 810	-	3NW6 107-1	3NW6 207-1	5SB3 11
<b>3RF23 3-.....4</b>	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 807	-	3NW6 105-1	3NW6 205-1	5SB3 11
<b>3RF23 3-.....6</b>	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 807-6	-	-	-	-
<b>3RF23 4-.....2</b>	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 817	-	3NW6 117-1	3NW6 217-1	5SB3 21
<b>3RF23 4-.....4</b>	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 812	-	3NW6 112-1	3NW6 212-1	5SB3 21
<b>3RF23 4-.....6</b>	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 812-6	-	-	-	-
<b>3RF23 5-.....2</b>	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 817	-	3NW6 117-1	3NW6 217-1	5SB3 21
<b>3RF23 5-.....4</b>	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 812	-	-	3NW6 210-1	5SB3 21
<b>3RF23 5-.....6</b>	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 812-6	-	-	-	-
<b>3RF23 7-.....2</b>	3NE1 820-0	-	-	3NC2 280	3NA2 817	-	-	3NW6 217-1	5SB3 31
<b>3RF23 7-.....4</b>	3NE1 020-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 210-1	5SB3 21
<b>3RF23 7-.....6</b>	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-	-
<b>3RF23 9-.....2</b>	3NE1 021-2	-	-	3NC2 200	3NA2 817	-	-	3NW6 217-1	5SB3 31
<b>3RF23 9-.....4</b>	3NE1 021-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 210-1	5SB3 21
<b>3RF23 9-.....6</b>	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-	-

1) Type of coordination "2" acc. to EN 60947-4-1:

In the event of a short-circuit, the controlgear in the load feeder must not endanger persons or the installation. They must be suitable for further operation. For fused configurations, the protective device must be replaced.

## Solid-State Contactors

## 3RF24 Solid-state contactors – technical data

## Overview

The complete units consist of a solid-state relay plus optimized heat sink, and are therefore ready to use. They offer defined rated currents to make selection as easy as possible. Depending on the version, current intensities of up to 50 A are achieved. Like all of our solid-state switching devices, one of their particular advantages is their compact and space-saving design. With their insulated mounting foot they can easily be snapped onto a standard mounting rail, or they can be mounted on carrier plates with fixing screws. This insulation enables them to be used in

circuits with protective extra-low voltage (PELV) or safety extra-low voltage (SELV) in building engineering. For other applications, such as for extended personal safety, the heat sink can be grounded through a screw terminal.

**Version for resistive loads, "zero-point switching"**

This standard version is often used for switching space heaters on and off.

## Technical specifications

Order No.	3RF24 ..-1....	3RF24 ..-2....	3RF24 ..-3....
<b>General data</b>			
<b>Ambient temperature</b>			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
<b>Site altitude</b>	m	0 ... 1000; derating from 1000	
<b>Shock resistance</b> acc. to IEC 60068-2-27	g/ms	15/11	
<b>Vibration resistance</b> acc. to IEC 60068-2-6	g	2	
<b>Degree of protection</b>		IP20	
<b>Insulation strength</b> at 50/60 Hz (main/control circuit to ground)	V rms	4000	
<b>Electromagnetic compatibility (EMC)</b>			
• Emitted interference acc. to IEC 60947-4-3 - Conducted interference voltage - Emitted, high-frequency interference voltage		Class A for industrial applications <sup>1)</sup> Class A for industrial applications	
• Interference immunity - Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2	
- Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1	
- Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1	
- Surge acc. to IEC 61000-4-5	kV	Conductor – ground 2; conductor – conductor 1; behavior criterion 2	
<b>Connection technique</b>		<b>Screw terminal</b>	<b>Spring-loaded connection</b>
<b>Main contact connection</b>			
• Conductor cross-section	mm <sup>2</sup>	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2x (0.5 ... 2.5)
- Solid	mm <sup>2</sup>	2 x (1 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2x (0.5 ... 1.5)
- Finely stranded with end sleeve	mm <sup>2</sup>	--	2x (0.5 ... 2.5)
- Finely stranded without end sleeve	mm <sup>2</sup>	2 x (AWG 14 ... 10)	2 x (AWG 18 ... 14)
- Solid or stranded, AWG conductors			
• Stripped length	mm	10	10
• Terminal screw		M4	--
- Tightening torque	NM	2 ... 2.5	
	lb.in	18 ... 22	
• Cable lug		--	--
- acc. to DIN 46234			5-2.5 ... 5-25
- acc. to JIS C 2805			R 2-5 ... 14-5
<b>Connection, auxiliary/control contacts</b>			
• Conductor cross-section	mm	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)	0.5 ... 2.5
	AWG	AWG 20 ... 12	AWG 20 ... 12
• Stripped length	mm	7	10
• Terminal screw		M3	--
- Tightening torque,	NM	0.5 ... 0.6	
∅ 3.5, PZ 1	lb.in	4.5 ... 5.3	
			1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)
			AWG 20 ... 12
			7
			M3
			0.5 ... 0.6
			4.5 ... 5.3

1) These products were built as Class A devices. The use of these devices in residential areas could result in radio interference. In this case they may be required to introduce additional damping measures.

## Solid-State Contactors

## 3RF24 Solid-state contactors – technical data

Type		3RF24 ..-AB.5	3RF24 ..-AC.5
<b>Main circuit</b>			
<b>Controlled phases</b>		Two-phase	Three-phase
<b>Rated operational voltage <math>U_e</math></b>	V	48 ... 600	48 ... 600
• Operating range	V	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
<b>Rated insulation voltage <math>U_i</math></b>	V	600	600
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6	6
<b>Blocking voltage</b>	V	1200	1200
<b>Rate of voltage rise</b>	V/μs	1000	1000

Order No.	Type current	Rated operational current $I_e$		Power loss at	Minimum load current	Max. leakage current	Rated impulse withstand current $I_{tsm}$	$I^2t$ value
	$I_{AC-51}$ at 40 °C	acc. to IEC 60947-4-3 for 40°C	acc. to UL/CSA for 50 °C	$I_{AC-51}$				
<b>Main circuit</b>								
3RF24 10-.AB.5	10.5	7.5	9.5	21	0.1	10	200	200
3RF24 20-.AB.5	20	15	18	39	0.5	10	500	1800
3RF24 30-.AB.5	30	22	26	61	0.5	10	1200	7200
3RF24 40-.AB.5	40	32	35	81	0.5	10	1150	6600
3RF24 50-.AB.5	50	38	45	105	0.5	10	1150	6600
3RF24 10-.AC.5	10.5	7	9	32	0.1	10	300	450
3RF24 20-.AC.5	20	15	18	67	0.5	10	600	1800
3RF24 30-.AC.5	30	22	26	93	0.5	10	1200	7200
3RF24 40-.AC.5	40	29	35	121	0.5	10	1150	6600
3RF24 50-.AC.5	50	38	45	160	0.5	10	1150	6600

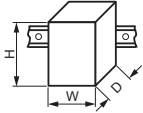
1) The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current  $I_e$  can be smaller depending on the connection method and start-up conditions. For derating see the characteristic curves on page 4/18.

Type		3RF24 ...-4.	3RF24 ...-5.
<b>Control circuit</b>			
<b>Method of operation</b>		DC operation	AC operation
<b>Rated control supply voltage <math>U_c</math></b>	V	4 ... 30	190 ... 230
<b>Rated frequency of the control supply voltage</b>	Hz	--	50/60 ± 10%
<b>Actuating voltage, max.</b>	V	30	253
• For actuating current	mA	15	6
<b>Response voltage</b>	V	4	180
• For tripping current	mA	> 3	> 2
<b>Drop-out voltage</b>	V	< 1	< 40
<b>Operating times</b>			
• ON-delay	ms	1 + max. one half-wave	40 + max. one half-wave
• OFF delay	ms	1 + max. one half-wave	40 + max. one half-wave



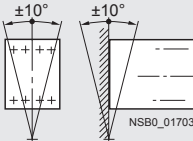
# Solid-State Contactors

## 3RF34 Solid-state contactors – technical data

### Technical specifications

Type		<b>3RF34 05-1BB..</b>	<b>3RF34 10-1BB..</b>	<b>3RF34 05-2BB..</b>	<b>3RF34 10-2BB..</b>
		<b>3RF34 03-1BD..</b>	<b>3RF34 12-1BB..</b>		<b>3RF34 12-2BB..</b>
		<b>3RF34 05-1BD..</b>	<b>3RF34 16-1BB..</b>		<b>3RF34 16-2BB..</b>
		<b>3RF34 10-1BD..</b>			
Dimensions (W x H x D)	mm	45 x 95 x 96.5	90 x 95 x 96.5	45 x 95 x 96.5	90 x 95 x 96.5

### General technical specifications

<b>Ambient temperature</b>			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
<b>Installation altitude</b>		m	0 ... 1000; derating from 1000 on request
<b>Shock resistance</b> acc. to IEC 60068-2-27		g/ms	15/11
<b>Vibration resistance</b> acc. to IEC 60068-2-6		g	2
<b>Degree of protection</b>			IP20
<b>Insulation strength</b> at 50/60 Hz (main/control circuit to floor)		V rms	4000
<b>Electromagnetic compatibility (EMC)</b>			
• Emitted interference according to IEC 60947-4-2			Class A for industrial applications <sup>1)</sup>
- Conducted interference voltage			Class A for industrial applications
- Emitted, high-frequency interference voltage			
• Interference immunity			
- Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)		kV	Contact discharge: 4; Air discharge: 8; Behavior criterion 2
- Induced RF fields according to IEC 61000-4-6		MHz	0.15 ... 80; 140 dBµV; behavior criterion 1
- Burst acc. to IEC 61000-4-4		kV	2; at 5 kHz; behavior criterion 2
- Surge according to IEC 61000-4-5 <sup>2)</sup>		kV	Conductor - Ground: 2; Conductor - Conductor: 1; Behavior criterion 2
<b>Connection type</b>		 <b>Screw terminals</b>	 <b>Spring-type terminals</b>
<b>Operating devices</b>		Standard screwdriver size 2 and Pozidriv 2	3.0 x 0.5 and 3.5 x 0.5
<b>Conductor cross-sections, main contacts</b>			
• Solid	mm <sup>2</sup>	2 x (1.5 ... 2.5) <sup>3)</sup> , 2 x (2.5 ... 6) <sup>3)</sup>	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1 ... 2.5) <sup>3)</sup> ; 2 x (2.5 ... 6) <sup>3)</sup> ; 1 x 10	2 x (0.5 ... 1.5)
• Finely stranded without end sleeve	mm <sup>2</sup>	--	2 x (0.5 ... 2.5)
• AWG cables, solid or stranded		2 x (AWG 14 ... 10)	2 x (AWG 18 ... 14)
<b>Conductor cross-sections, auxiliary/control contacts</b>			
• With/without end sleeve	mm <sup>2</sup>	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)	0.5 ... 2.5
• AWG cables, solid or stranded		AWG 20 ... 12	AWG 20 ... 12
<b>Permissible mounting positions</b>			

<sup>1)</sup> These products were built as Class A devices. The use of these devices in residential areas could result in radio interference. In this case these may be required to introduce additional interference suppression measures.

<sup>2)</sup> The following applies for reversing contactors: To maintain the values, a 3TX7 462-3L surge suppressor (see "3TB Contactors", Chapter 3) should be used between the phases L1 and L3 as close as possible to the reversing contactor.

<sup>3)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

## Solid-State Contactors

## 3RF34 Solid-state contactors – technical data

## Overview

These two-phase controlled, instantaneous switching solid-state contactors in the insulating enclosure are offered in 45 mm width to 5.2 A – and in 90 mm width to 16 A. This means that it is possible to operate motors up to 7.5 kW.

## Technical specifications

Type		3RF34 05-.BB..	3RF34 10-.BB..	3RF34 12-.BB..	3RF34 16-.BB..
<b>Fuseless design with 3RV2 motor starter protector, CLASS 10</b>					
<b>Rated operational current <math>I_{AC-53}</math><sup>1)</sup></b> according to IEC 60947-4-2					
• At 40 °C	A	5.2 (4.5)	9.2	12.5	16
• UL/CSA, at 50 °C	A	4.6 (4.0)	8.4	11.5	14
• At 60 °C	A	4.2 (3.5)	7.6	10.5	12.5
<b>Power loss at <math>I_{AC-53}</math></b>					
• At 40 °C	W	10 (8)	16	22	28
<b>Short-circuit protection with type of coordination "1"</b> at an operational voltage of $U_e$ to 440 V					
• Motor starter protector, type		3RV20 11-1GA10	3RV20 11-1JA10	3RV20 11-1KA10	3RV20 11-4AA10
• Current $I_q$	kA	50	5	5	3

<sup>1)</sup> The reduced values in brackets apply to a directly mounted circuit breaker and simultaneous butt-mounting.

Type		3RF34 05-.BB.4	3RF34 05-.BB.6	3RF34 10-.BB..	3RF34 12-.BB.4	3RF34 12-.BB.6	3RF34 16-.BB..
<b>Fused design with directly connected 3RB3 overload relay</b>							
<b>Rated operational current <math>I_{AC-53}</math></b> according to IEC 60947-4-2							
• At 40 °C	A	4		7.8	9.5		11
• UL/CSA, at 50 °C	A	3.6		7	8.5		10
• At 60 °C	A	3.2		6.2	7.6		9
<b>Power loss at <math>I_{AC-53}</math></b>							
• At 40 °C	W	7		13	16		18
<b>Minimum load current</b>	A	0.5					
<b>Max. off-state current</b>	mA	10					
<b>Rated peak withstand current <math>I_{tsm}</math></b>	A	200	600	600	1200	1150	1150
<b><math>I^2t</math> value</b>	A <sup>2</sup> s	200	1800	1800	7200	6600	6600

Type		3RF34 ..-.BB.4		3RF34 ..-.BB.6	
<b>Main circuit</b>					
<b>Controlled phases</b>		2-phase		2-phase	
<b>Rated operational voltage <math>U_e</math></b>	V AC	48 ... 480		48 ... 600	
• Operating range	V AC	40 ... 506		40 ... 660	
• Rated frequency	Hz	50/60 ± 10 %		50/60 ± 10 %	
<b>Rated insulation voltage <math>U_i</math></b>	V	600		600	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6		6	
<b>Blocking voltage</b>	V	1200		1600	
<b>Rate of voltage rise</b>	V/μs	1000		1000	

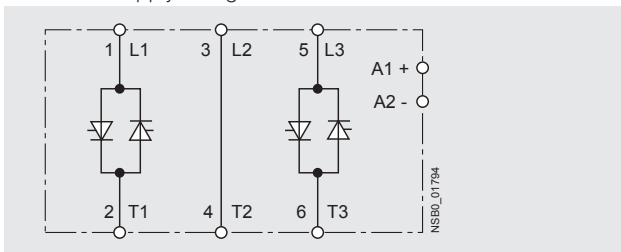
# Solid-State Contactors

## 3RF34 Solid-state contactors – technical data

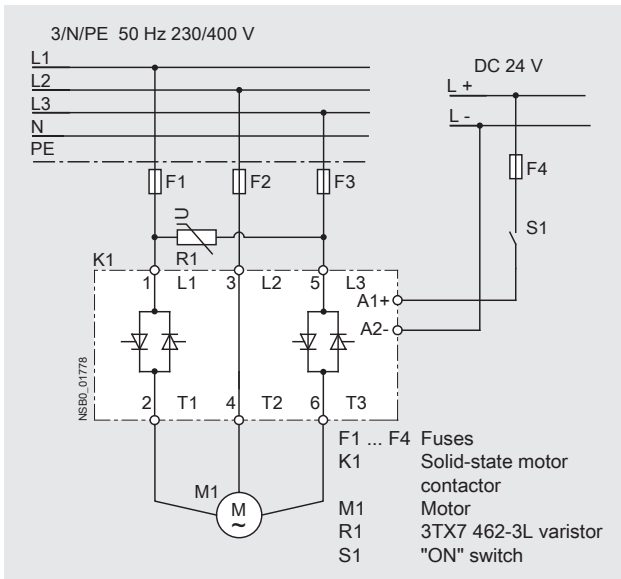
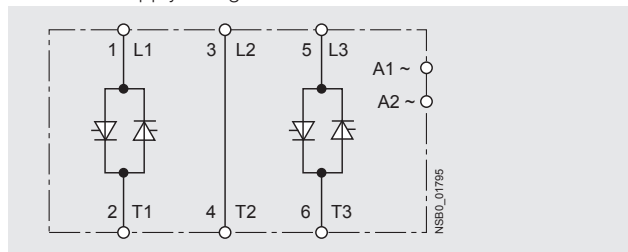
Type	3RF34 ...-BB0.	3RF34 ...-BB2.
<b>Control circuits</b>		
<b>Method of operation</b>	DC operation	AC operation
<b>Rated control supply voltage <math>U_s</math></b>	V 24 acc. to IEC 61131-2	110 ... 230
<b>Rated frequency of the control supply voltage</b>	Hz --	50/60 ± 10 %
<b>Control supply voltage, max.</b>	V 30	253
<b>Typical actuating current</b>	mA 20	15
<b>Response voltage</b>	V 15	90
<b>Drop-out voltage</b>	V 5	< 40
<b>Operating times</b>		
• ON-delay	ms 1	5
• OFF-delay	ms 1 + max. one half-wave	30 + max. one half-wave

### Circuit diagrams

DC control supply voltage



AC control supply voltage





## Solid-State Contactors

## 3RF34 Solid-state reversing contactors – technical data

## Overview

The integration of four conducting paths to a reverse switch, combined in one enclosure makes this device a particularly compact solution. Compared to conventional systems, for which two contactors are required, it is possible to save up to 50 %

width with the three-phase reversing contactors. Devices with 45 mm width cover motors up to 2.2 kW – and those with 90 mm width up to 3 kW.

## Technical specifications

Type		3RF34 03-.BD.4	3RF34 05-.BD.4	3RF34 10-.BD.4
<b>Fuseless design with 3RV2 motor starter protector, CLASS 10</b>				
<b>Rated operational current <math>I_{AC-53}</math><sup>1)</sup></b> according to IEC 60947-4-2				
• At 40 °C	A	3.8 (3.4)	5.4 (4.8)	7.4
• UL/CSA, at 50 °C	A	3.5 (3.1)	5 (4.3)	6.8
• At 60 °C	A	3.2 (2.8)	4.6 (3.8)	6.2
<b>Power loss at <math>I_{AC-53}</math></b>				
• At 40 °C	W	7 (6)	9 (8)	13
<b>Short-circuit protection with type of coordination "1"</b> at an operational voltage of $U_0$ to 440 V				
• Motor starter protector, type		3RV20 11-1FA10	3RV20 11-1GA10	3RV20 11-1JA10
• Current $I_q$	kA	50	50	10

<sup>1)</sup> The reduced values in brackets apply to a directly mounted circuit breaker and simultaneous butt-mounting.

Type		3RF34 03-.BD.4	3RF34 05-.BD.4	3RF34 10-.BD.4
<b>Fused design with directly connected 3RB3 overload relay</b>				
<b>Rated operational current <math>I_{AC-53}</math></b> according to IEC 60947-4-2				
• At 40 °C	A	3.8	5.4	7.4
• UL/CSA, at 50 °C	A	3.5	5	6.8
• At 60 °C	A	3.2	4.6	6.2
<b>Power loss at <math>I_{AC-53}</math></b>				
• At 40 °C	W	6	8	16
<b>Minimum load current</b>	A	0.5		
<b>Max. off-state current</b>	mA	10		
<b>Rated peak withstand current <math>I_{ISM}</math></b>	A	200	600	
<b><math>I^2t</math> value</b>	A <sup>2</sup> s	200	1800	

Type		3RF34 ...-BD.4		
<b>Main circuit</b>				
<b>Controlled phases</b>		2-phase		
<b>Rated operational voltage <math>U_0</math><sup>1)</sup></b>	V AC	48 ... 480		
• Operating range	V AC	40 ... 506		
• Rated frequency	Hz	50/60 ± 10 %		
<b>Rated insulation voltage <math>U_i</math></b>	V	600		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6		
<b>Blocking voltage</b>	V	1 200		
<b>Rate of voltage rise</b>	V/μs	1 000		

<sup>1)</sup> To reduce the risk of a phase short circuit due to overvoltage, we recommend using a varistor type 3TX7 462-3L between the phases L1 and L3 and as close as possible to the switchgear.

We recommend a design with semiconductor protection as short-circuit protection.

# Solid-State Contactors

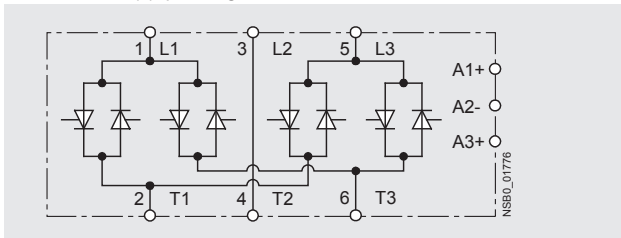
## 3RF34 Solid-state reversing contactors – technical data

Type	3RF34 ...-BD0.	3RF34 ...-BD2.
<b>Control circuits</b>		
<b>Method of operation</b>	DC operation	AC operation
<b>Rated control supply voltage <math>U_s</math></b>	V 24 acc. to IEC 61131-2	110 ... 230
<b>Rated frequency of the control supply voltage</b>	Hz --	50/60 ± 10 %
<b>Control supply voltage, maximum</b>	V 30	253
<b>Typical actuating current</b>	mA 15	10
<b>Response voltage</b>	V 15	90
<b>Drop-out voltage</b>	V 5	< 40
<b>Operating times<sup>1)</sup></b>		
• ON-delay	ms 5	20
• OFF-delay	ms 5 + max. one half-wave	10 + max. one half-wave
• Interlocking time	ms 60 ... 100	50 ... 100

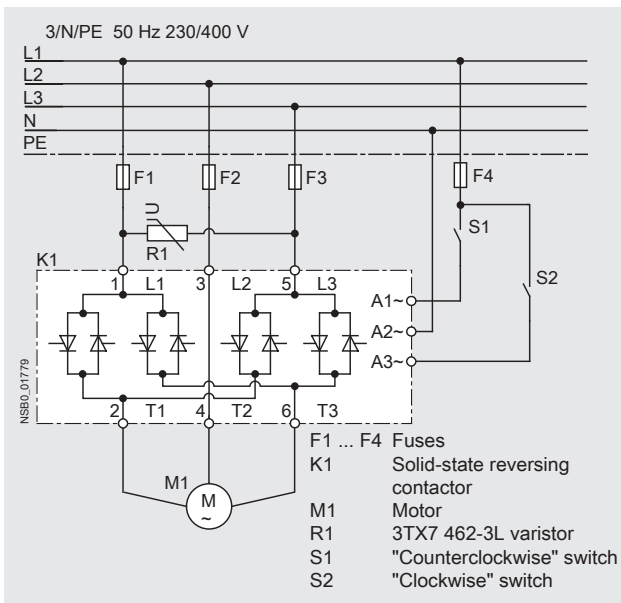
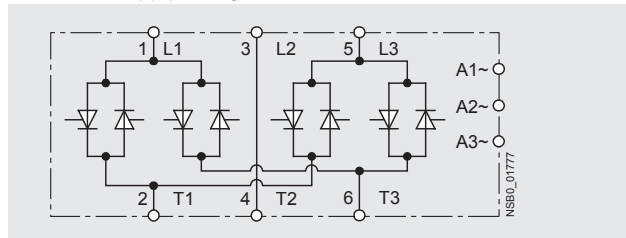
<sup>1)</sup> Caution! Risk of phase short circuit in automatic mode.  
The control inputs must not be actuated until after a delay time of 40 ms after the main voltage is applied

### Circuit diagrams

DC control supply voltage



AC control supply voltage



## Overview

**Function modules for SIRIUS SC semiconductor switching devices**

A great variety of applications demand an expanded range of functionality. These applications can easily be met with Sirius SC function modules. The modules are mounted simply by clicking them into place; straight away the necessary connections are made with the semiconductor relay or contactor.

The plug-in connection to control the semiconductor switching devices can simply remain in use.

The following function modules are available:

- Converter
- Load monitors (basic and enhanced)
- Power controller

## Technical specifications

Type		3RF29 ...E...	3RF29 ...F...	3RF29 ...G...	3RF29 ...H...
<b>General data</b>					
<b>Ambient temperature</b>					
during operation, derating at 40 °C	°C	-25 ... +60			
when stored	°C	-55 ... +80			
<b>Site altitude</b>	m	0 ... 1000; derating from 1000			
<b>Shock resistance</b> acc. to IEC 60068-2-27	g/ms	15/11			
<b>Vibration resistance</b> acc. to IEC 60068-2-6	g	2			
<b>Degree of protection</b>		IP20			
<b>Electromagnetic compatibility (EMC)</b>					
Emitted interference					
• Conducted interference voltage acc. to IEC 60947-4-3					
Class A for industrial applications <sup>1)</sup>					
• Emitted, high-frequency interference voltage acc. to IEC 60947-4-3					
Class A for industrial applications					
Noise immunity					
• Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)					
	kV	Contact discharge 4; air discharge 8; behavior criterion 2			
• Induced RF fields acc. to IEC 61000-4-6					
	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1			
• Burst acc. to IEC 61000-4-4					
		2 kV/5.0 kHz; behavior criterion 1			
• Surge acc. to IEC 61000-4-5					
	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2			
<b>Connection, auxiliary/control contacts, screw connection</b>					
Conductor cross-section	mm <sup>2</sup>	1x (0.5 ... 2.5); 2x (0.5 ... 1) AWG 20 ... 12			
• Insulation stripping length	mm	7			
Terminal screw		M3			
• Tightening torque	Nm	0.5 ... 0.6			
<b>Converter diameter of hole</b>	mm	-	7	17	

1) Note limitations for power controller function module on page 2/31.

Type		3RF29 ...E.8	3RF29 ...F.8	3RF29 ...G.3	3RF29 ...G.6	3RF29 ...H.3	3RF29 ...H.6
<b>Main circuit</b>							
<b>Rated operational voltage <math>U_e</math></b>	V	1 <sup>1)</sup>		110 ... 230	400 ... 600	110 ... 230	400 ... 600
• Tolerance	%			-15 / +10			
• Rated frequency	Hz			50/60			
<b>Rated insulation voltage <math>U_i</math></b>	V			600			
<b>Voltage detection</b>							
Measuring range	V			93.5 ... 253	340 ... 660	93.5 ... 253	340 ... 660
<b>Mains voltage fluctuation compensation</b>	%			20			

1) Versions do not depend on main circuit.

Type		3RF29 ...0.	3RF29 ...1.	3RF29 ...3.
<b>Control circuit</b>				
<b>Method of operation</b>				
		DC operation	AC/DC operation	AC operation
<b>Rated control supply voltage <math>U_s</math></b>	V	24	24	110
Rated operating current	mA	15	15	15
<b>Max. rated control voltage</b>	V	30	30	121
Rated control current at maximum voltage	mA	15	15	15
<b>Rated frequency</b> of the control supply voltage	Hz	-	50/60	50/60
<b>Response voltage</b> for tripping current	V	15	15	90
	mA	2	2	2
<b>Drop-out voltage</b>	V	5	5	-

Type		3RF29 2-.F...	3RF29 2-.G...	3RF29 2-.H...	3RF29 5-.G...	3RF29 5-.H...	3RF29 9-.G...	3RF29 9-.H...
<b>Current detection</b>								
<b>Rated operational current <math>I_e</math></b>	A	20			50	90		
<b>Measuring range</b>	A	4 ... 22			4 ... 55	4 ... 99		
<b>Number of partial loads</b>		6	12	-	12	-	12	-

## 3RF29 Function Modules

## General and technical data

## Overview

**Function modules for SIRIUS SC solid-state switching devices**

A great variety of applications demand an expanded range of functionality. With our function modules, these requirements can be met really easily. The modules are mounted simply by clicking them into place; straight away the necessary connections are made with the solid-state relay or contactor. The plug-in connection to control the solid-state switching devices can simply remain in use.

The following function modules are available:

- Converter
- Load monitoring
- Heating current monitoring
- Power control regulators
- Power controller

## Technical specifications

Type	3RF29 ...K...		
<b>General data</b>			
<b>Ambient temperature</b>			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
<b>Site altitude</b>	m	0 ... 1000; derating from 1000	
<b>Shock resistance</b> acc. to IEC 60068-2-27	g/ms	15/11	
<b>Vibration resistance</b> acc. to IEC 60068-2-27	g	2	
<b>Degree of protection</b>		IP20	
<b>Insulation resistance</b> between load and control circuit	MΩ	1.5	
<b>Electromagnetic compatibility (EMC)</b>			
• Emitted interference			
- Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications <sup>1)</sup>	
- Emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class A for industrial applications	
• Interference immunity			
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2	
- Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBμV; behavior criterion 1	
- Burst acc. to IEC 61000-4-4		2 kV/5.0 kHz; behavior criterion 1	
- Surge acc. to IEC 61000-4-5	kV	Conductor – ground 2; conductor – conductor 1; behavior criterion 2	
<b>Connection, auxiliary/control contacts, screw terminal</b>			
• Conductor cross-section	mm <sup>2</sup>	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0), 1 x (AWG 20 ... 12)	
• Stripped length	mm	7	
• Terminal screw		M3	
- Tightening torque	Nm lb.in	0.5 ... 0.6 4.5 ... 5.3	
<b>Converter, diameter of hole</b>	mm	17	

1) These products were built as Class A devices. The use of these devices in residential areas could result in radio interference. In this case the user may require to introduce additional damping measures.

## 3RF29 Function Modules

## Power control regulators

## Technical specifications

Type	3RF29 ...0KA.3		3RF29 ...0KA.6	
<b>Main circuit</b>				
<b>Rated operational voltage <math>U_e</math></b>	V	110 ... 230	400 ... 600	
• Tolerance	%	-15/+10		
• Rated frequency	Hz	50/60		
<b>Rated insulation voltage <math>U_i</math></b>	V	600		
<b>Voltage detection</b>				
• Measuring/teach range	V	93.5 ... 253	340 ... 660	
<b>Compensation of mains voltage fluctuation</b>	%	20 (only within the measuring range)		

Type	3RF29 04-0KA..		3RF29 20-0KA..		3RF29 50-0KA..		3RF29 90-0KA..	
<b>Current measurement</b>								
<b>Rated operational current <math>I_e</math></b>	A	4	20	50	90			
<b>Current measurement</b>								
• Teach range	A	0.15 ... 4	0.65 ... 20	1.6 ... 50	2.9 ... 90			
• Measuring range	A	0 ... 4	0 ... 22	0 ... 55	0 ... 99			
• Minimum partial load current	A	--	0.65	1.6	2.9			
<b>Number of partial loads</b>		1 ... 6						

Type	3RF29 ...0KA1.		3RF29 ...0KA3.	
<b>Control circuit A1–A2</b>				
<b>General data</b>				
<b>Rated control supply voltage <math>U_s</math></b>	V	24 AC/DC		AC 110
• Operating range	V	20.5 ... 26.5	DC 18 ... 30	90 ... 121
<b>Rated frequency</b> of the control supply voltage	Hz	50/60 ± 10%	--	50/60 ± 10%
<b>Current consumption</b>	mA	< 40		< 20
<b>Control input IN</b>				
<b>Rated control voltage <math>U_c</math></b>	V	24 AC/DC		AC 110
• For actuating current	mA	< 15		< 15
• Actuating voltage, max.	mA	AC 26.5	DC 30	121
<b>Control supply voltage, min./max.</b>	V	AC 20.5 ... 26.5	DC 18 ... 30	90 ... 121
<b>Response voltage</b>	V	AC 14	DC 15	79
• For tripping current	mA	> 2	> 2	> 2
<b>Drop-out voltage</b>	V	5	5	15
<b>Control input 0 ... 10 V</b>				
<b>Input analog</b>	V	0 ... 10		
• Permissible range	V	-1 ... 11		
<b>Input resistance</b>	kΩ	8		
<b>Period duration</b>	s	1		
<b>Auxiliary circuit 11–12</b>				
<b>Switching voltage</b>	V	24 AC/DC		AC 110
• Actuating current (utilization category)	A	0.5 (DC-12)		0.5 (AC-12)
• Switching voltage, min./max.	V	15 ... 30		90 ... 121
<b>Continuous thermal current, max. <math>I_{th}</math></b>	A	1		1

# Semiconductor Relays and Contactors, Function Modules

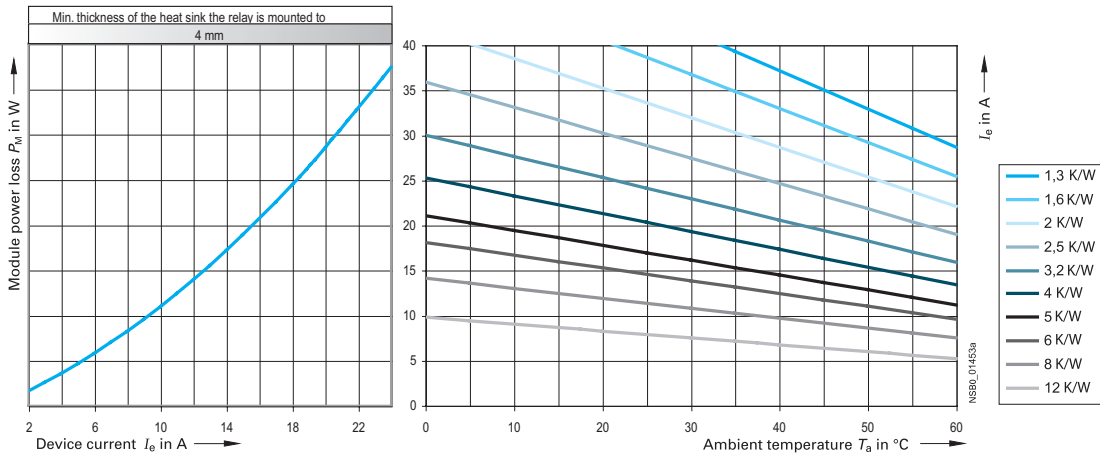
## Project planning aids

### Characteristics

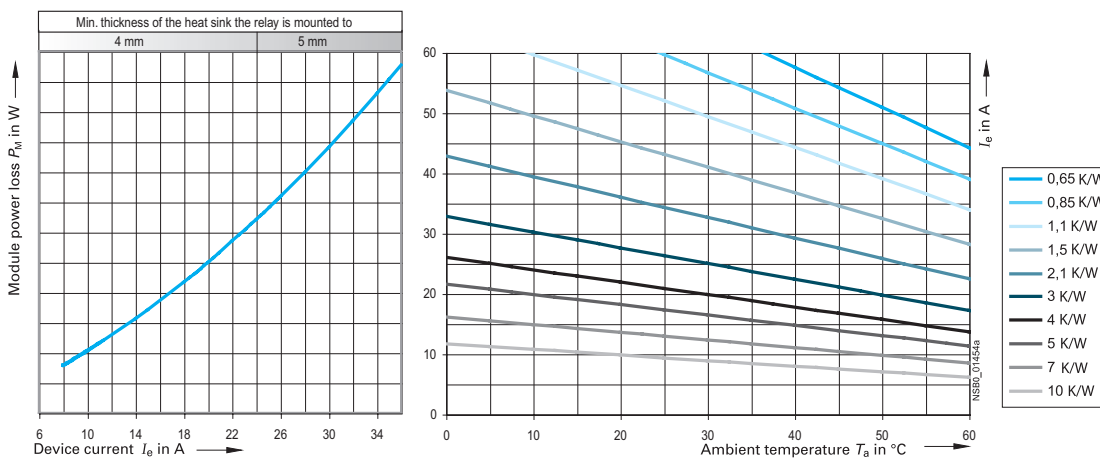
#### SIRIUS SC semiconductor relays

Dependence of the device current  $I_e$  on the ambient temperature  $T_a$  (Chart data for SIRIUS SC relays based on I max)

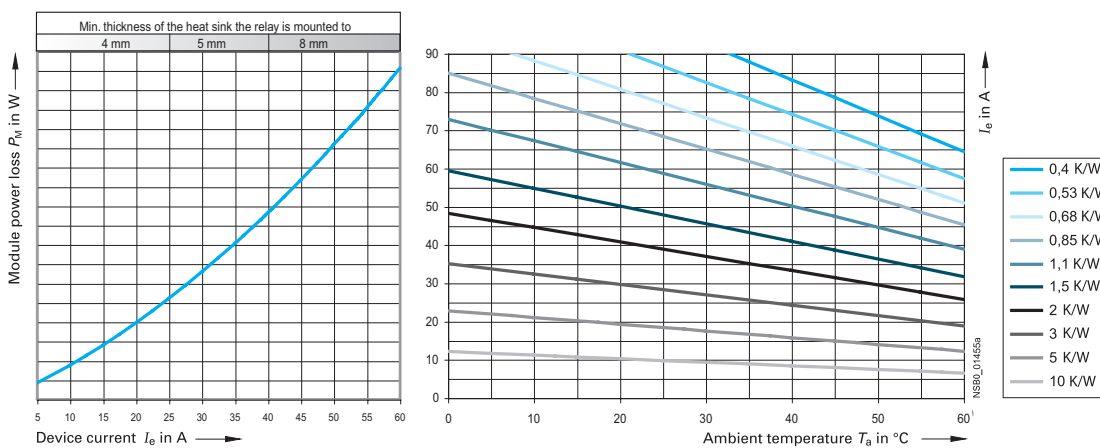
SIRIUS SC semiconductor relay with 20 A type current (3RF21 20/3RF20 20)<sup>1)</sup>



SIRIUS SC semiconductor relay with 30 A type current (3RF21 30/3RF20 30)



SIRIUS SC semiconductor relay with 50 A type current (3RF21 50/3RF20 50)



1) Arrangement example for  $I_e = 20$  A and  $T_a = 40$  C:  
The task is to find the thermal resistance  $R_{thha}$  and the heat-sink overtemperature  $dT_{ha}$ : From the diagram on the left  $\rightarrow P_M = 28$  W, from the diagram on the right  $\rightarrow R_{thha} = 1.7$  K/W.

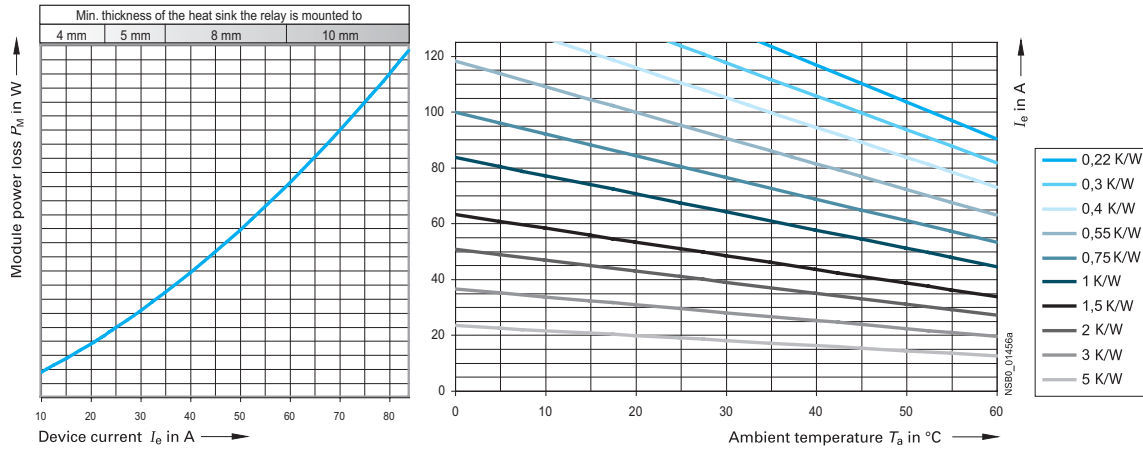
This results in:  $dT_{ha} = R_{thha} \times P_M = 1.7$  K/W  $\times$  28 W = 47.6 K. At  $dT_{ha} = 47.6$  K the heat sink must therefore have an  $R_{thha} = 1.7$  K/W. (Chart data for SIRIUS SC relays based on I max)

# Semiconductor Relays and Contactors, Function Modules

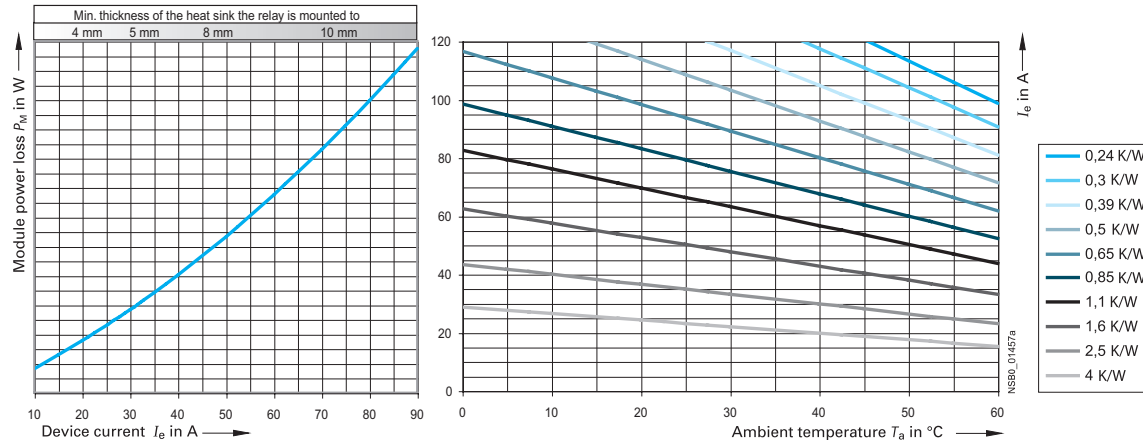
## Project planning aids

Dependence of the device current  $I_e$  on the ambient temperature  $T_a$  (Chart data for SIRIUS SC relays based on  $I_{max}$ )

SIRIUS SC semiconductor relay with 70 A type current (3RF21 70/3RF20 70)



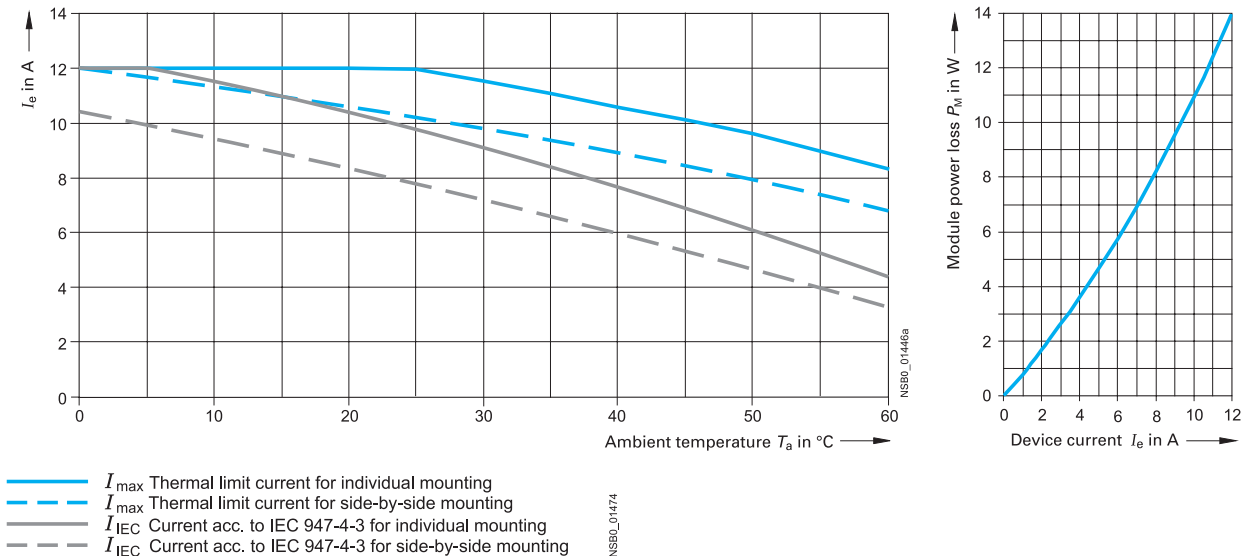
SIRIUS SC semiconductor relay with 88 A type current (3RF21 90/3RF20 90)



### SIRIUS SC semiconductor contactors

#### Derating curves

SIRIUS SC semiconductor contactor with 10 A type current (3RF23 10)

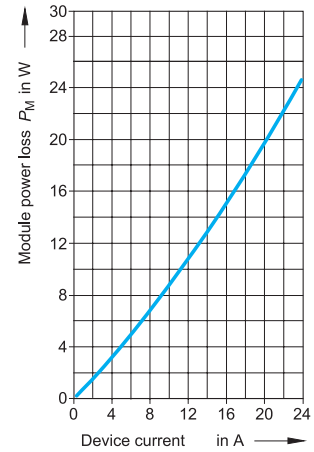
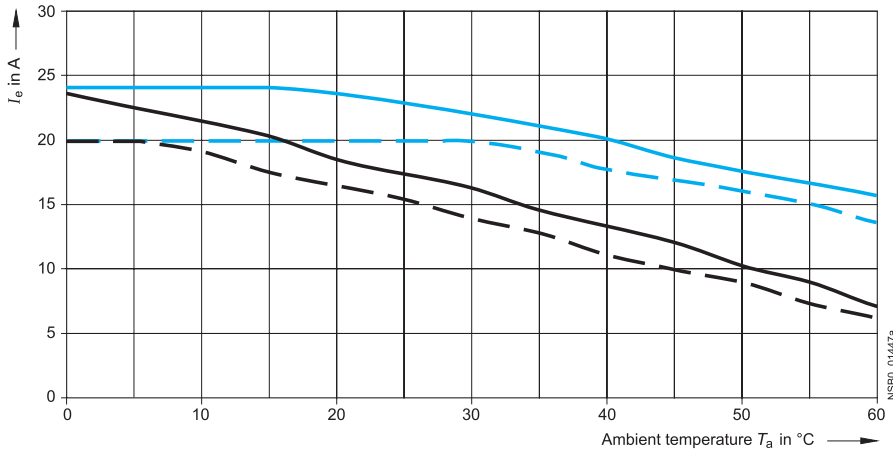


# Semiconductor Relays and Contactors, Function Modules

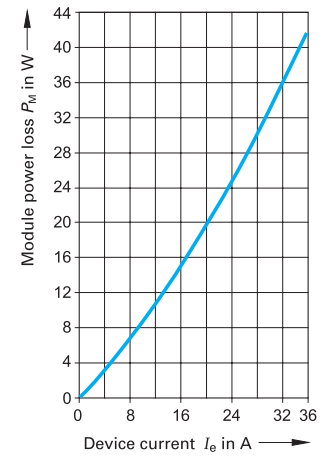
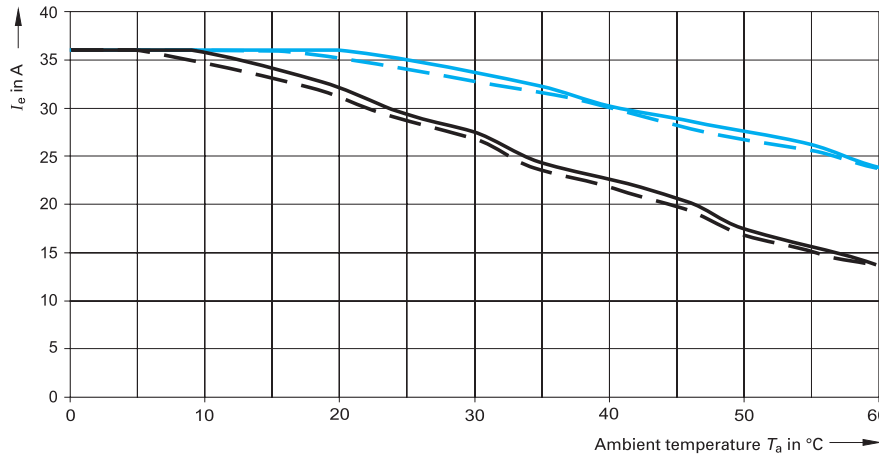
## Project planning aids

### Derating curves

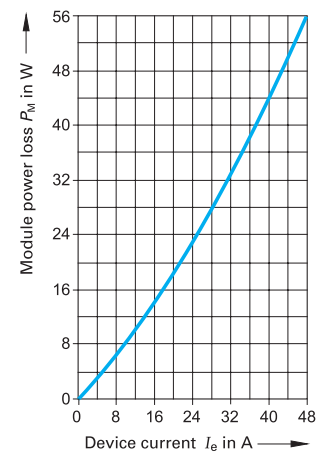
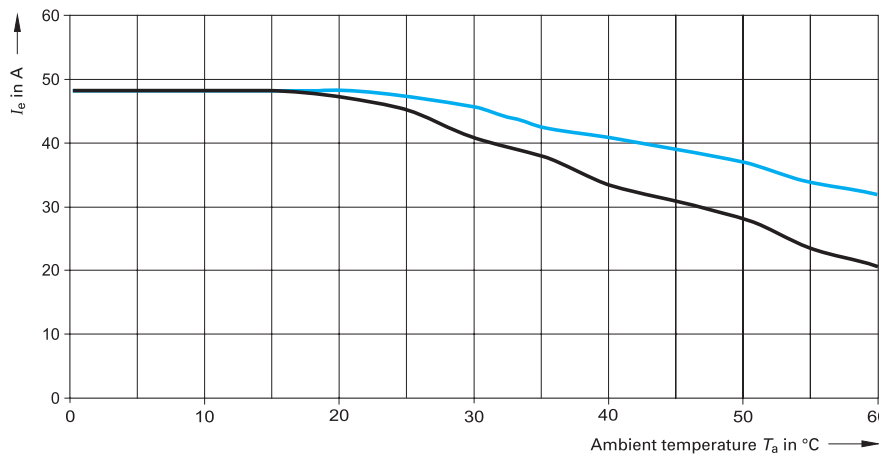
SIRIUS SC semiconductor contactor with 20 A type current (3RF23 20)



SIRIUS SC semiconductor contactor with 30 A type current (3RF23 30)



SIRIUS SC semiconductor contactor with 40 A type current (3RF23 40)<sup>1)</sup>



- $I_{max}$  Thermal limit current for individual mounting
- - -  $I_{max}$  Thermal limit current for side-by-side mounting
- $I_{IEC}$  Current acc. to IEC 947-4-3 for individual mounting
- - -  $I_{IEC}$  Current acc. to IEC 947-4-3 for side-by-side mounting

1) Identical current/temperature curves for individual and side-by-side mounting.

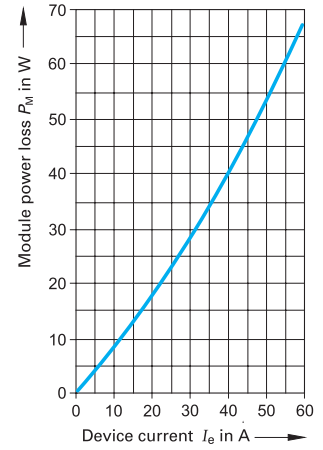
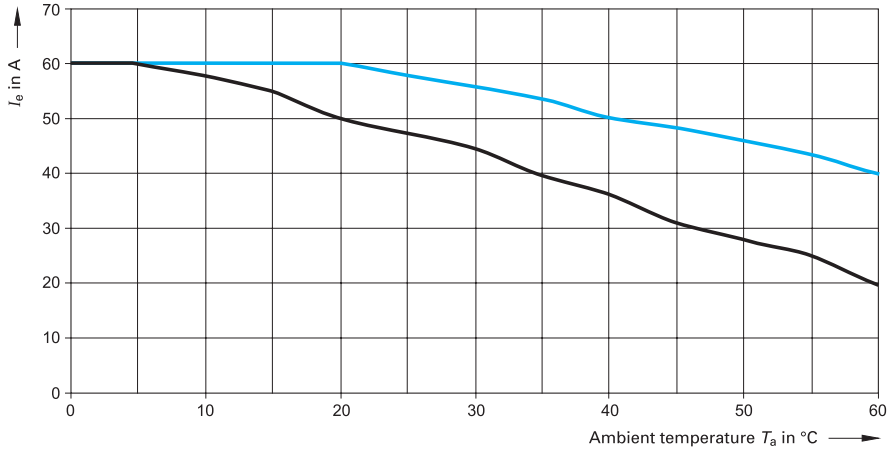


# Semiconductor Relays and Contactors, Function Modules

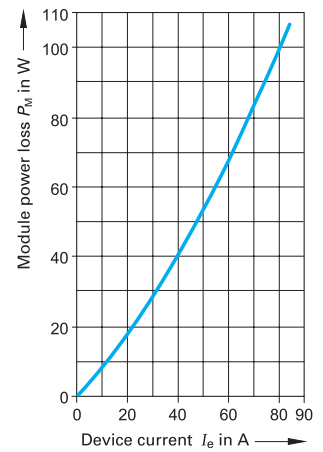
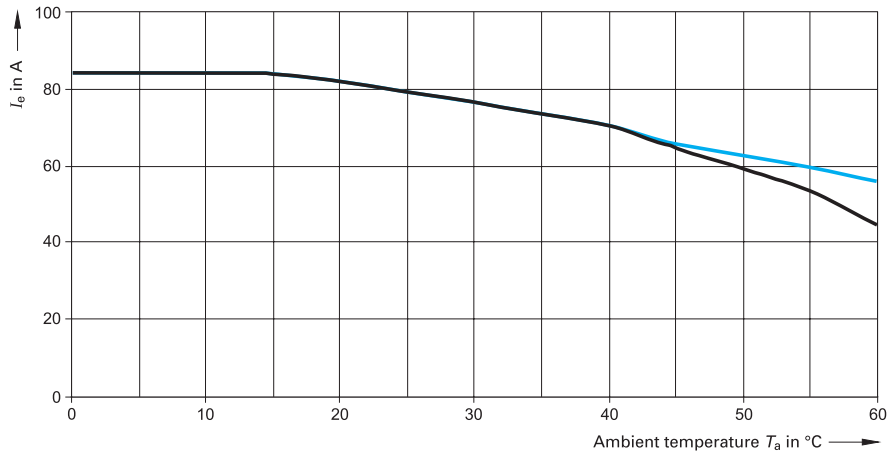
## Project planning aids

### Derating curves

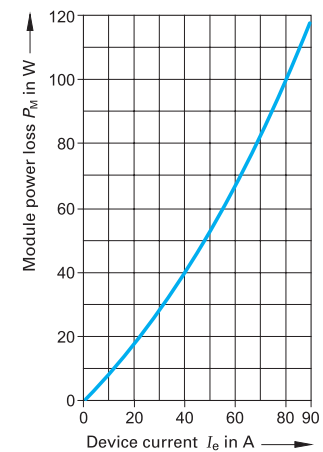
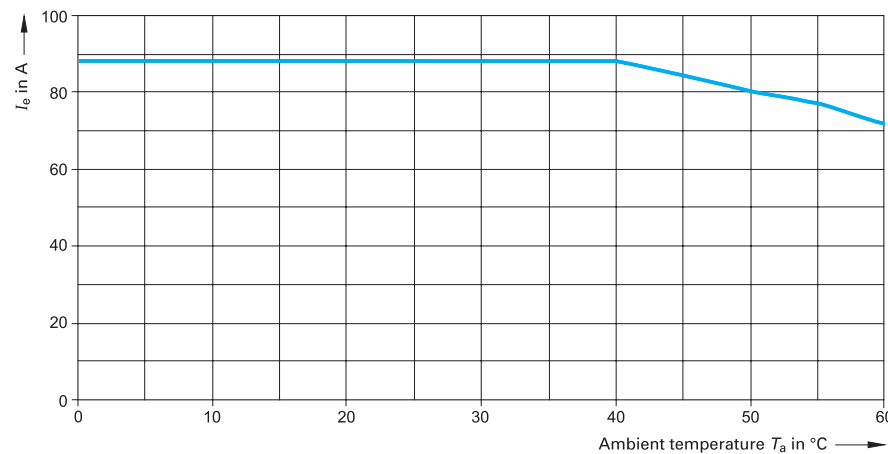
SIRIUS SC semiconductor contactor with 50 A type current (3RF23 50)<sup>1)</sup>



SIRIUS SC semiconductor contactor with 70 A type current (3RF23 70)<sup>1)</sup>



SIRIUS SC semiconductor contactor with 88 A type current (3RF23 90)<sup>1)</sup>



- $I_{max}$  Thermal limit current for individual mounting
- - -  $I_{max}$  Thermal limit current for side-by-side mounting
- $I_{IEC}$  Current acc. to IEC 947-4-3 for individual mounting
- - -  $I_{IEC}$  Current acc. to IEC 947-4-3 for side-by-side mounting

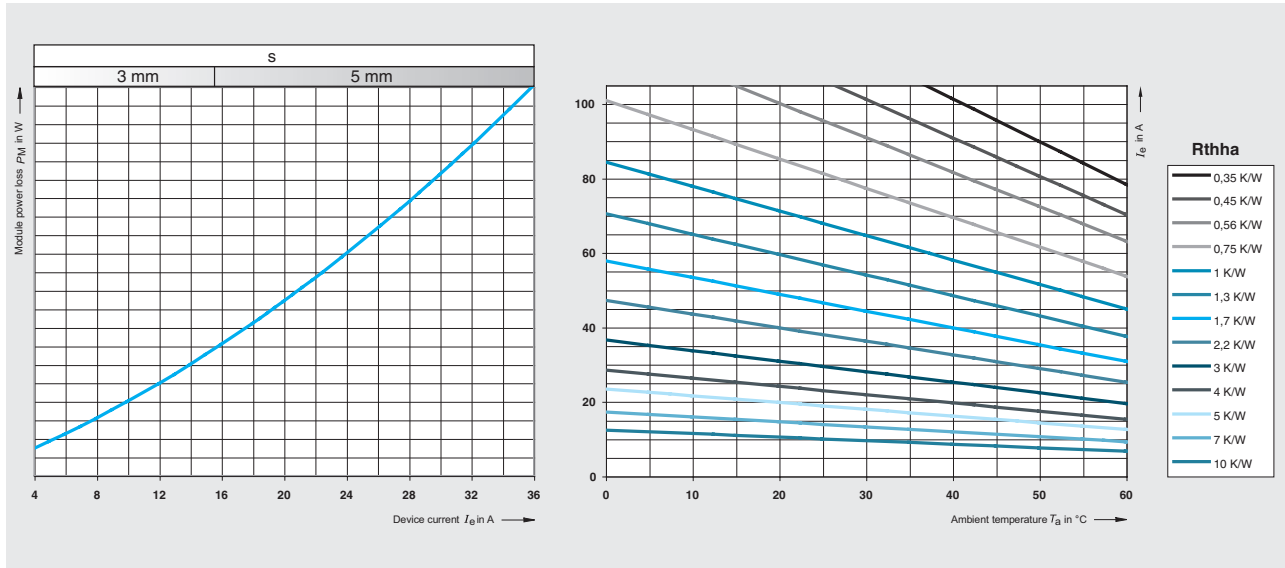
1) Identical current/temperature curves for individual and side-by-side mounting.

# Solid-State Relays

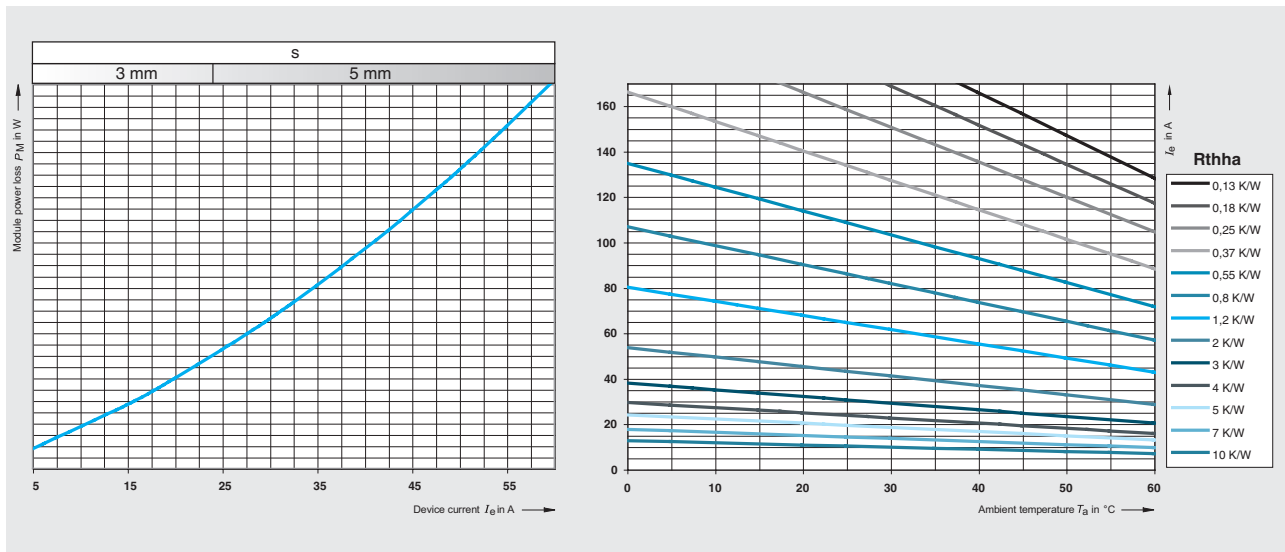
3RF22 solid-state relays, 3-phase, 45 mm

## Characteristic curves

Dependence of the device current  $I_e$  on the ambient temperature  $T_a$  (two-phase controlled)



Type current 30 A (3RF22 30-AB..)

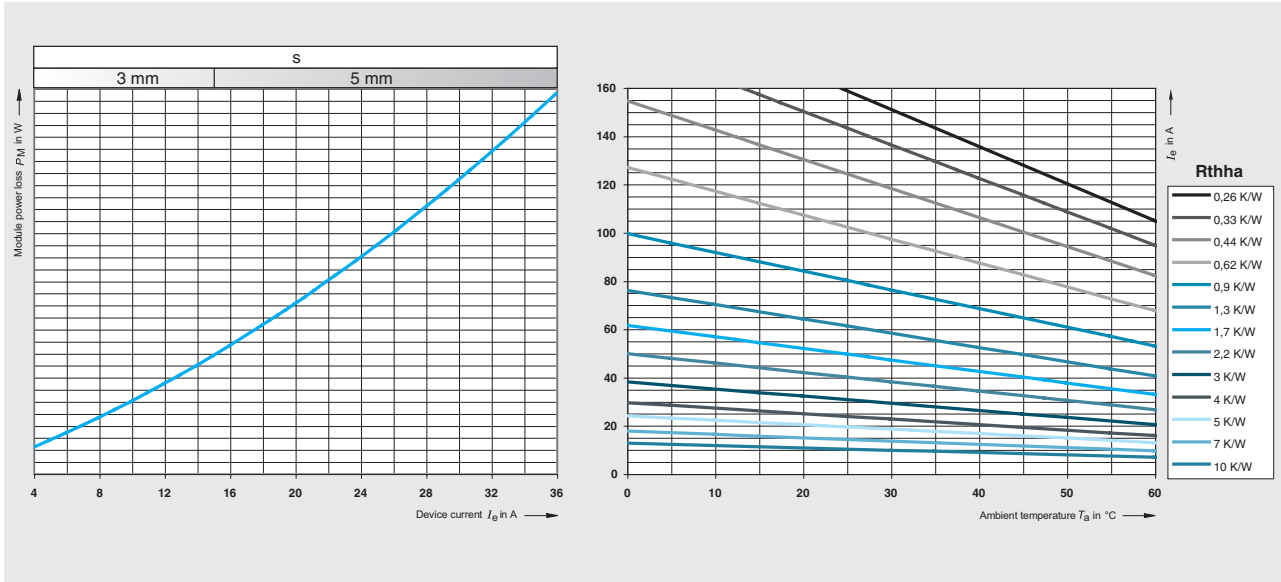


Type current 55 A (3RF22 55-AB..)

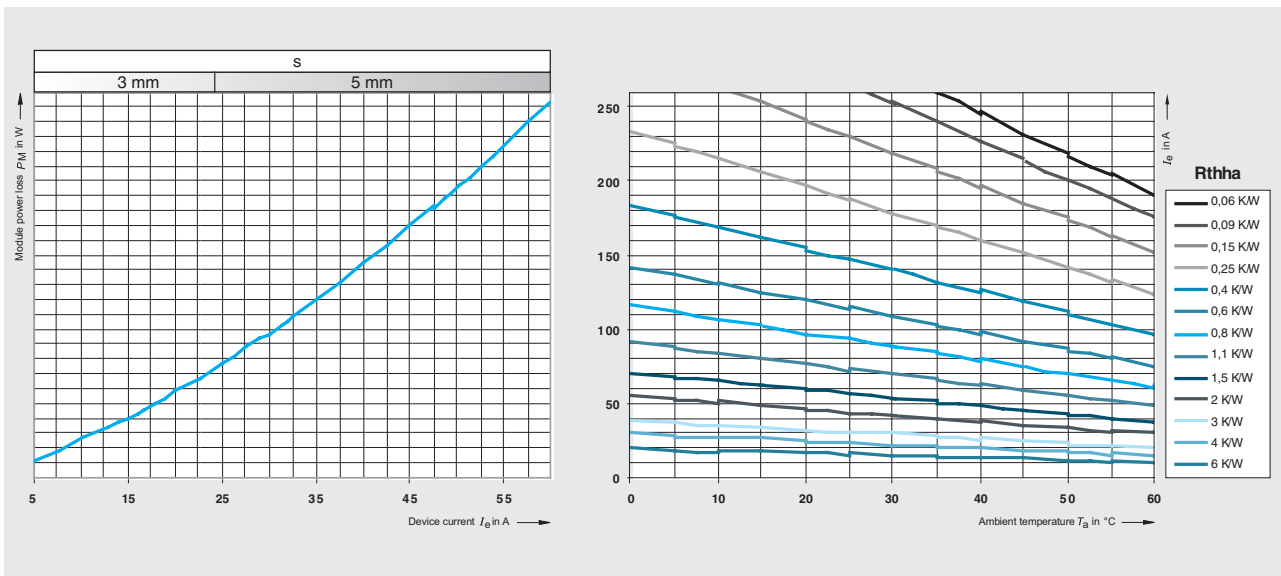
# Solid-State Relays

3RF22 solid-state relays, 3-phase, 45 mm

## Dependence of the device current $I_e$ on the ambient temperature $T_a$ (three-phase controlled)



Type current 30 A (3RF22 30-.AC..)



Type current 55 A (3RF22 55-.AC..)

### Arrangement example

Given conditions:  $I_e = 55$  A and  $T_a = 40$  C.

The task is to find the thermal resistance  $R_{thha}$  and the heat sink overtemperature  $dT_{ha}$ .

From the diagram from the left  $\rightarrow P_M = 227$  W,  
from the diagram from the right  $\rightarrow R_{thha} = 0.09$  K/W.

This results in:

$$dT_{ha} = R_{thha} \times PM = 0.09 \text{ K/W} \times 227 \text{ W} = 20.4 \text{ K.}$$

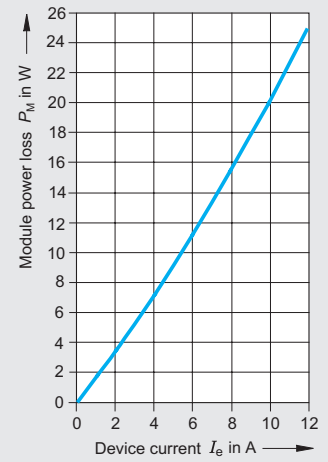
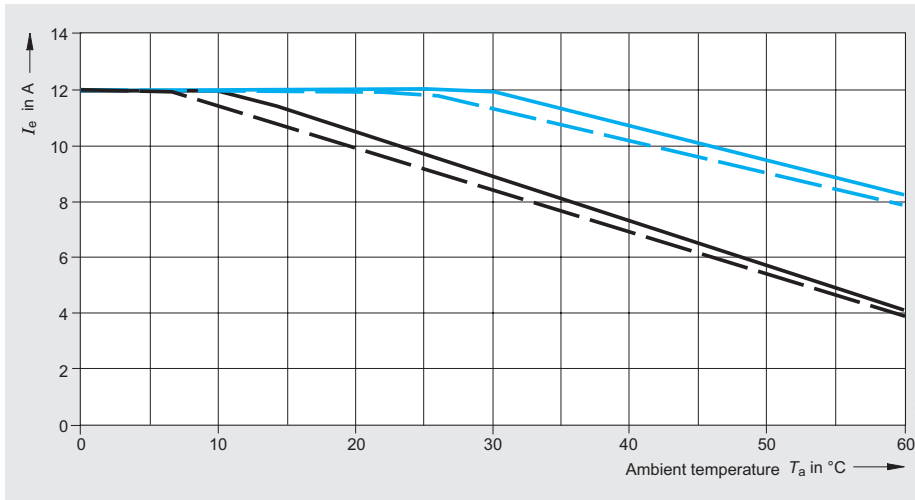
At  $dT_{ha} = 20.4$  K the heat sink must therefore have an  $R_{thha} = 0.09$  K/W.

# Solid-State Contactors

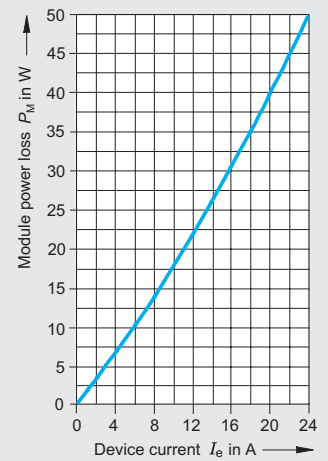
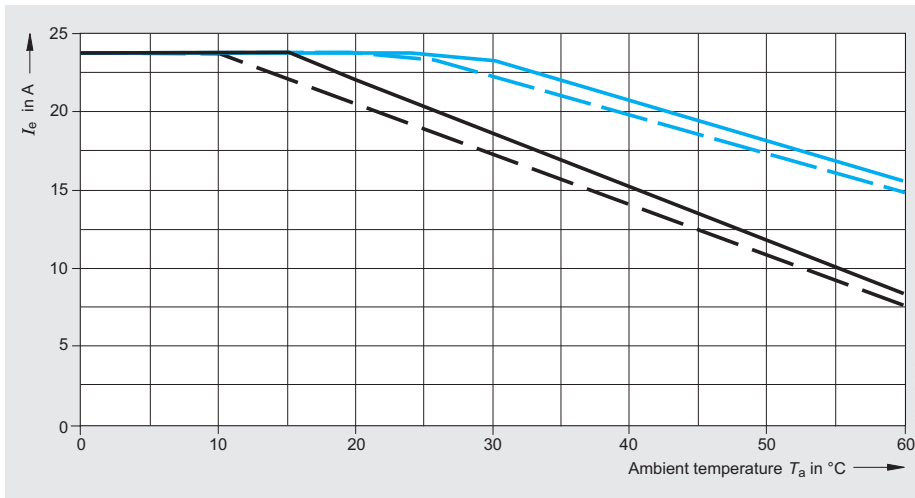
3RF24 solid-state contactors, 3-phase

## Characteristic curves

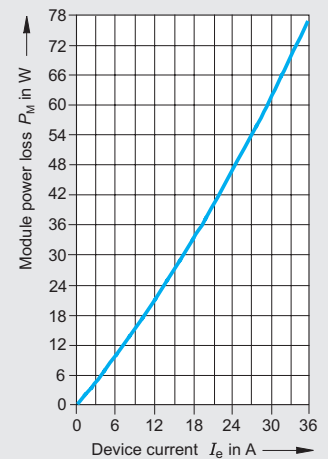
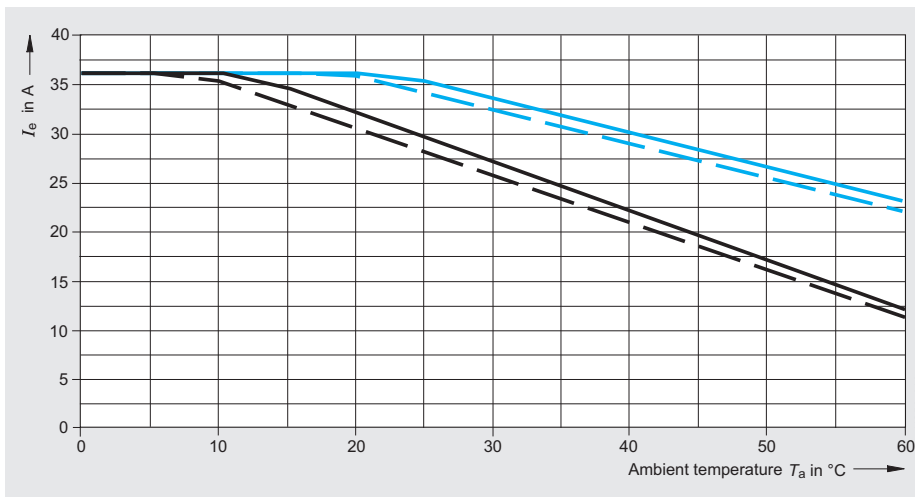
### Derating curves, two-phase controlled



Type current 10.5 A (3RF24 10-AB..)



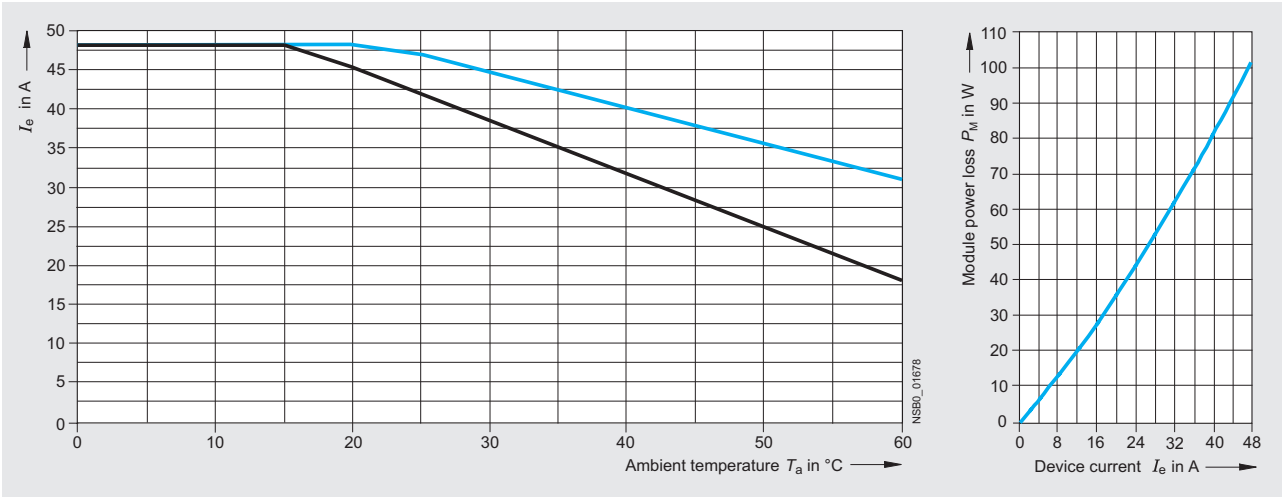
Type current 20 A (3RF24 20-AB..)



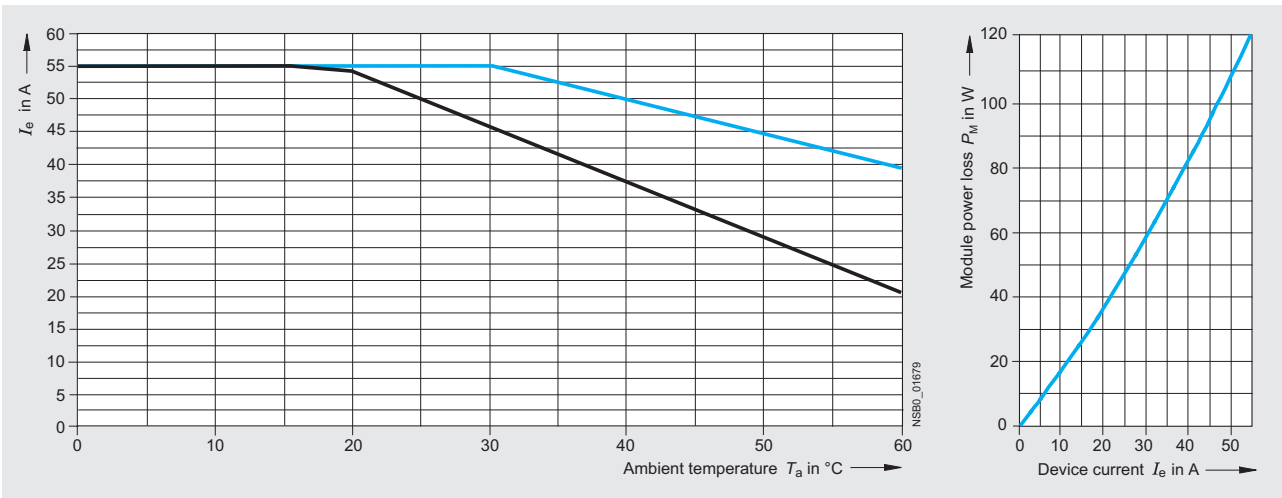
Type current 30 A (3RF24 30-AB..)

# Solid-State Contactors

## 3RF24 solid-state contactors, 3-phase



Type current 40 A (3RF24 40-.AB..)¹)



Type current 50 A (3RF24 50-.AB..)¹)

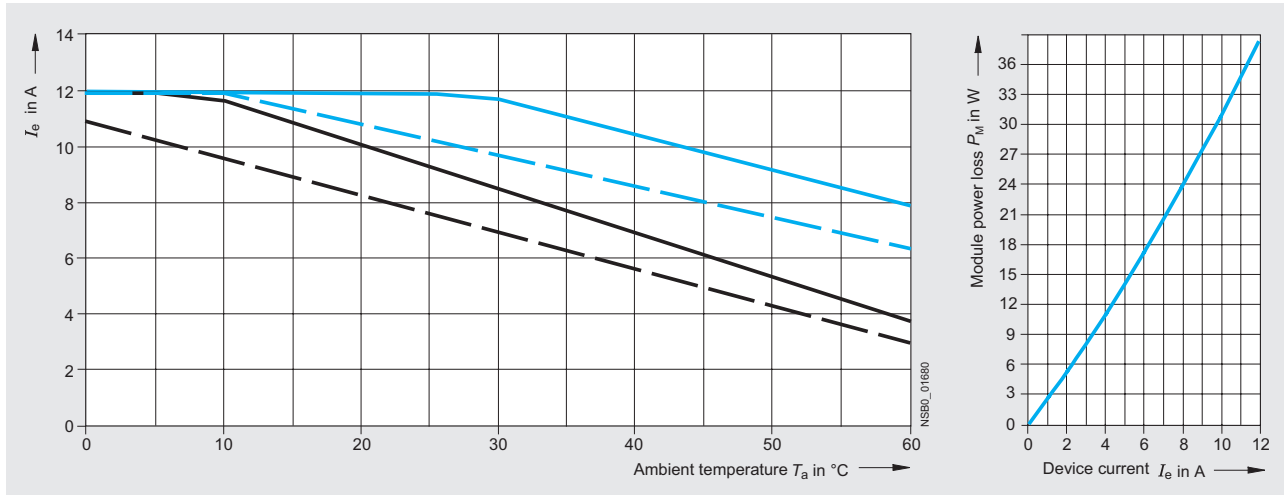
- $I_{max}$  Thermal limit current for individual mounting
- - -  $I_{max}$  Thermal limit current for side-by-side mounting
- $I_{IEC}$  Current acc. to IEC 947-4-3 for individual mounting
- - -  $I_{IEC}$  Current acc. to IEC 947-4-3 for side-by-side mounting

1) Identical current/temperature curves for stand-alone and side-by-side installation.

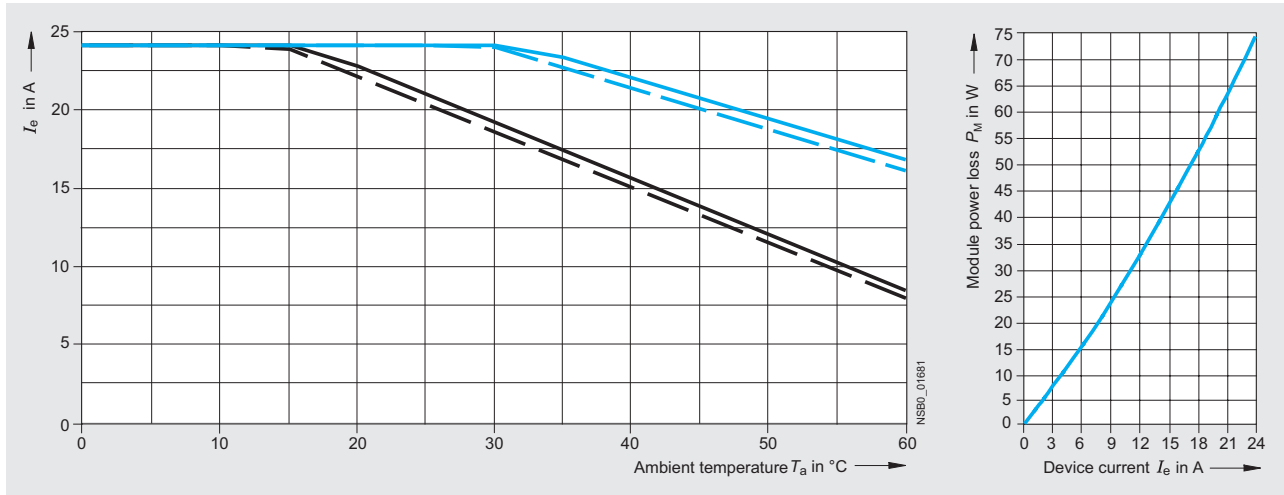
# Solid-State Contactors

3RF24 solid-state contactors, 3-phase

## Derating curves, three-phase controlled

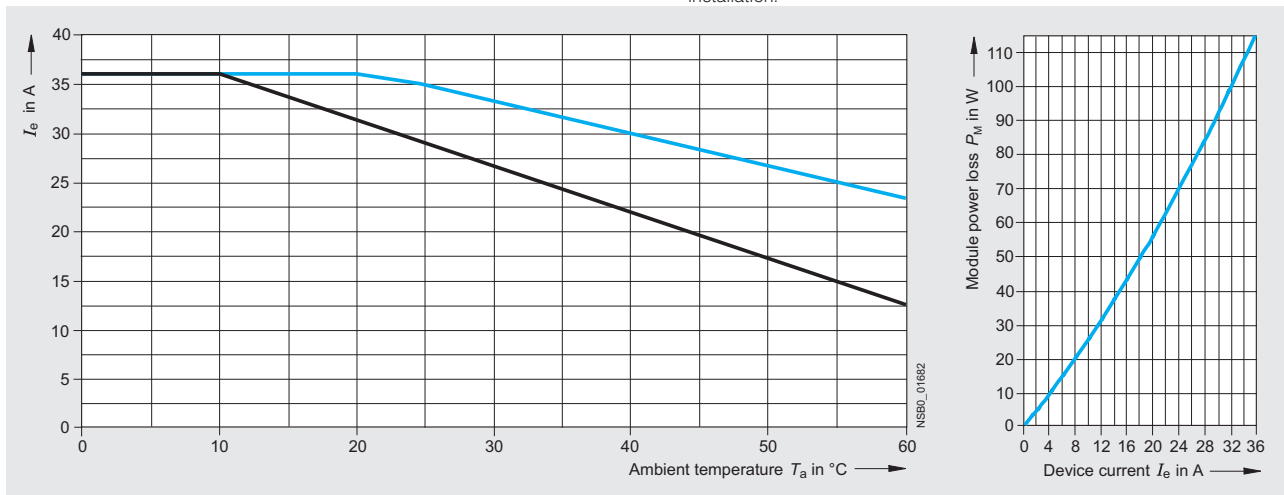


Type current 10.5 A (3RF24 10-.AC..)



Type current 20 A (3RF24 20-.AC..)

1) Identical current/temperature curves for stand-alone and side-by-side installation.

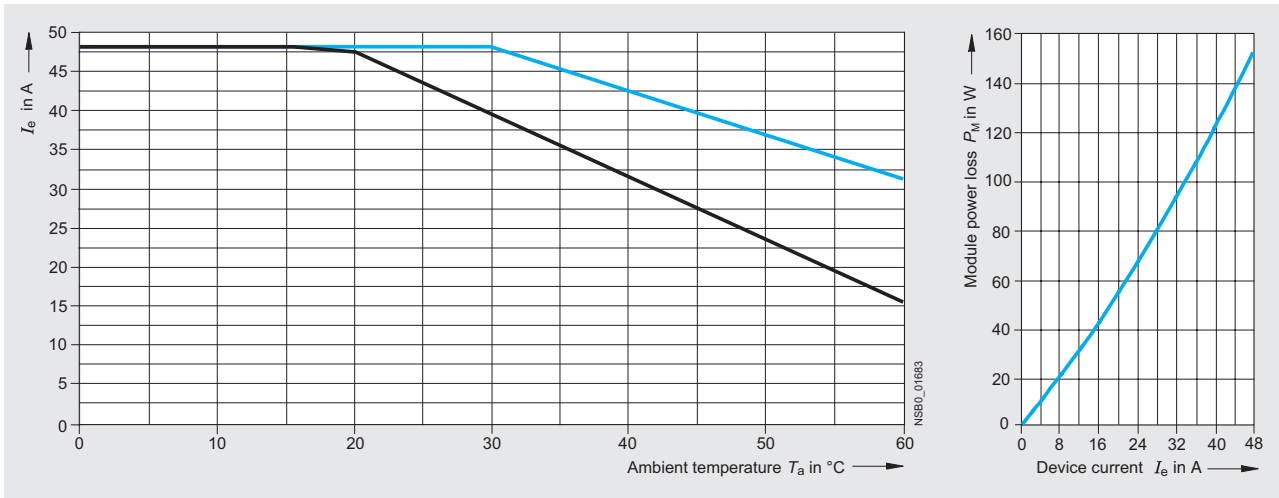


Type current 30 A (3RF24 30-.AC..)<sup>1)</sup>

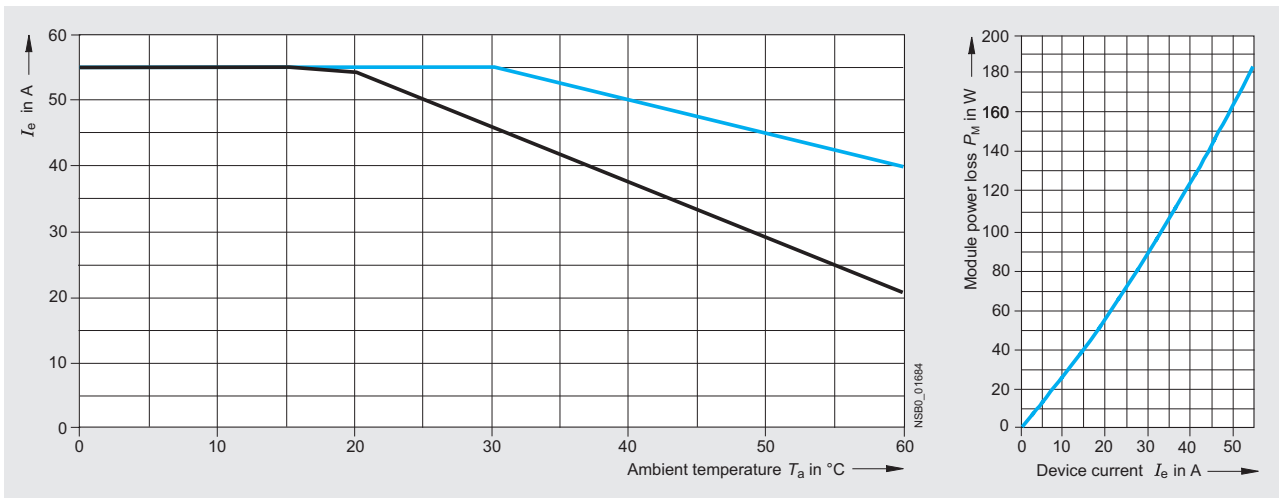
1) Identical current/temperature curves for stand-alone and side-by-side installation.

# Solid-State Contactors

## 3RF24 solid-state contactors, 3-phase



Type current 40 A (3RF24 40-.AC..)¹)



Type current 50 A (3RF24 50-.AC..)¹)

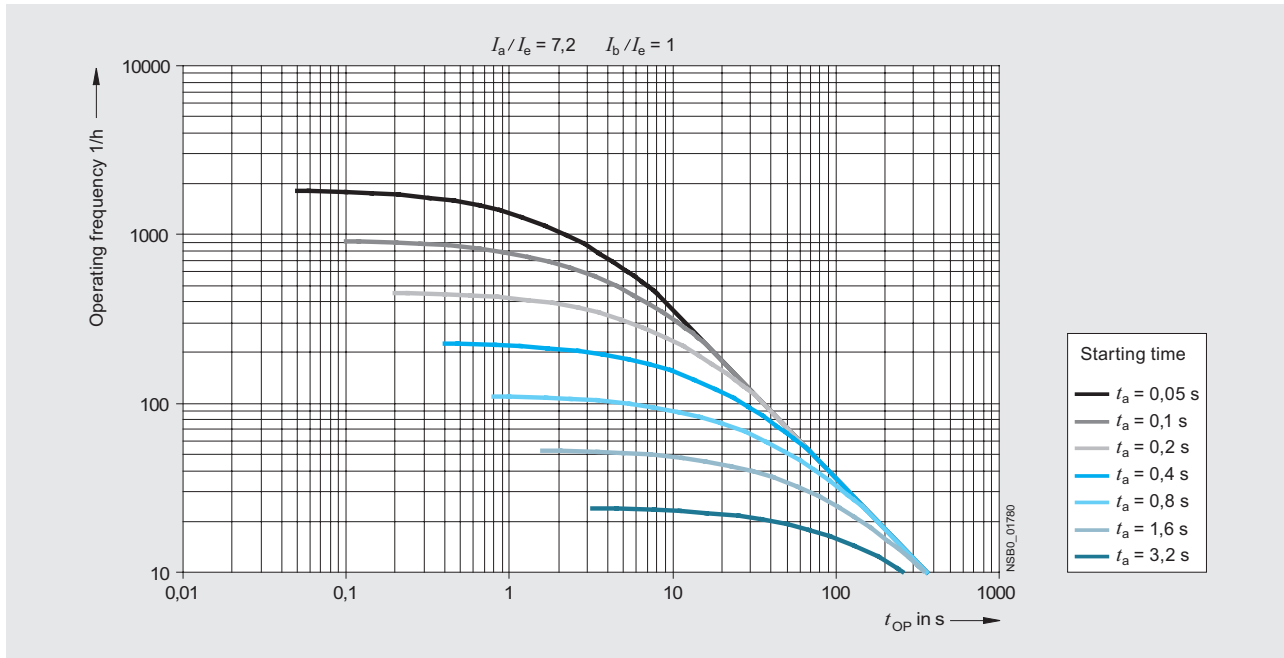
- $I_{max}$  Thermal limit current for individual mounting
- - -  $I_{max}$  Thermal limit current for side-by-side mounting
- $I_{IEC}$  Current acc. to IEC 947-4-3 for individual mounting
- - -  $I_{IEC}$  Current acc. to IEC 947-4-3 for side-by-side mounting

1) Identical current/temperature curves for stand-alone and side-by-side installation.

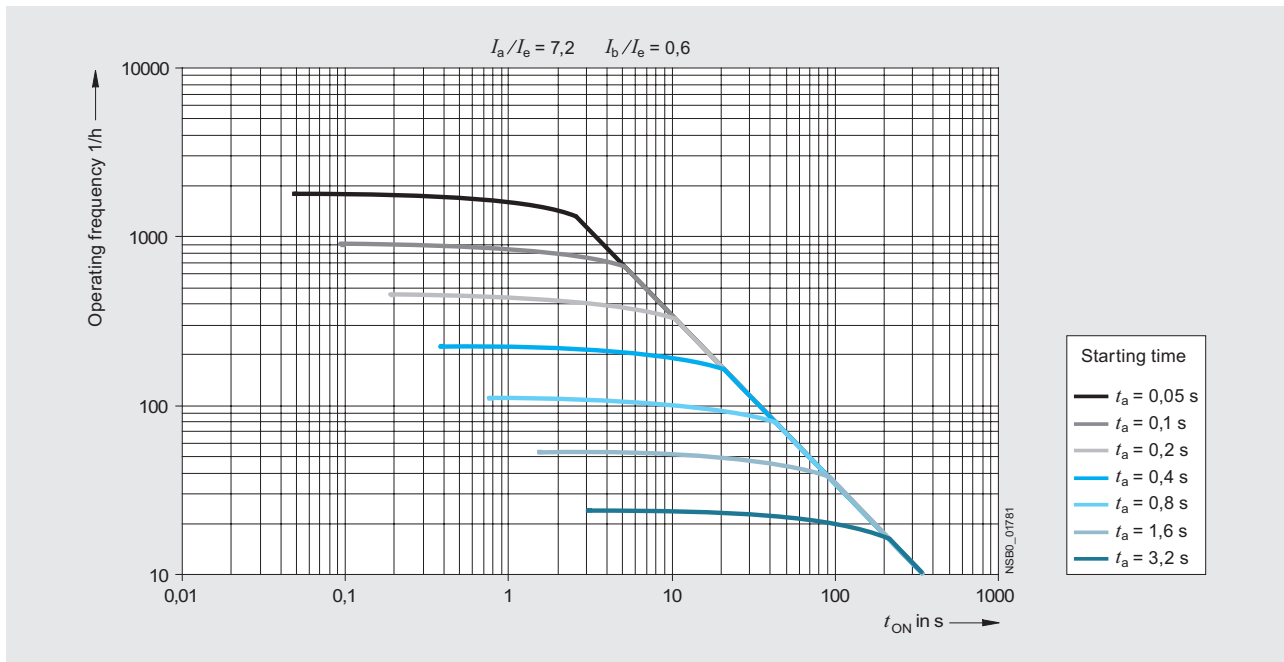
# Solid-State Contactors

3RF34 solid-state contactors, 3-phase

Maximum permissible switching frequency depending on the starting time  $t_a$  and the ON period  $t_{ED}$



For motors with a starting current of 4- to 7.2 times the rated current and with a full load

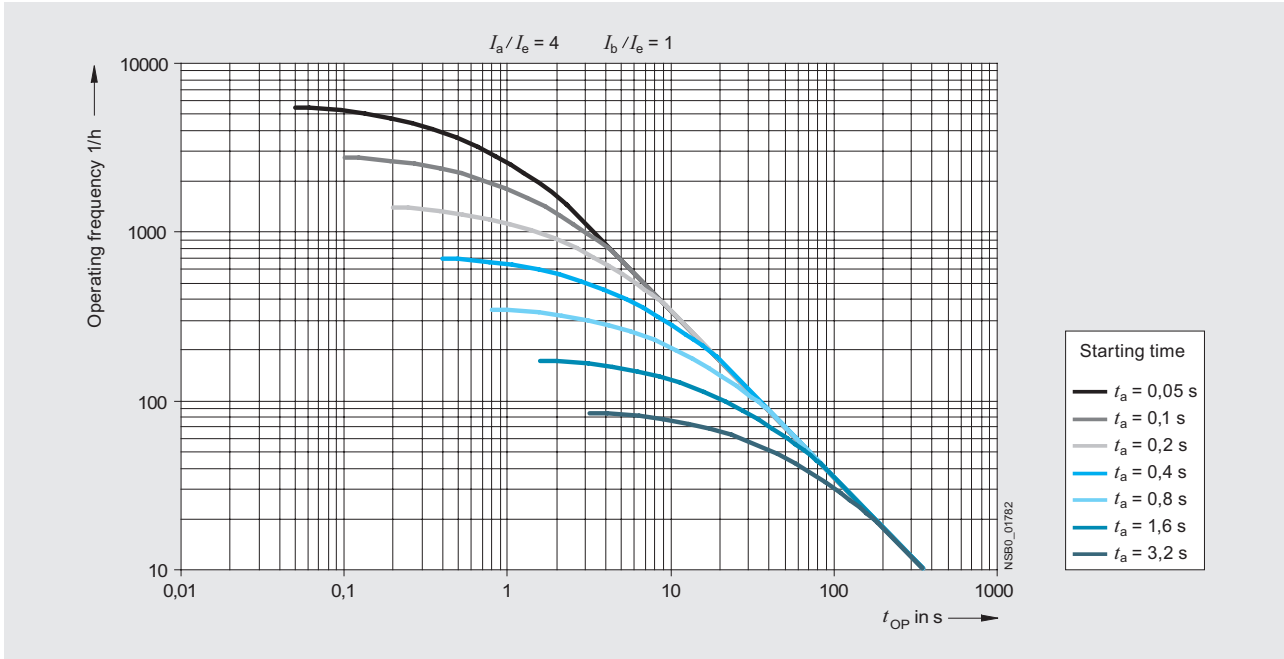


For motors with a starting current of 4- to 7.2 times the rated current and with a 60 % load

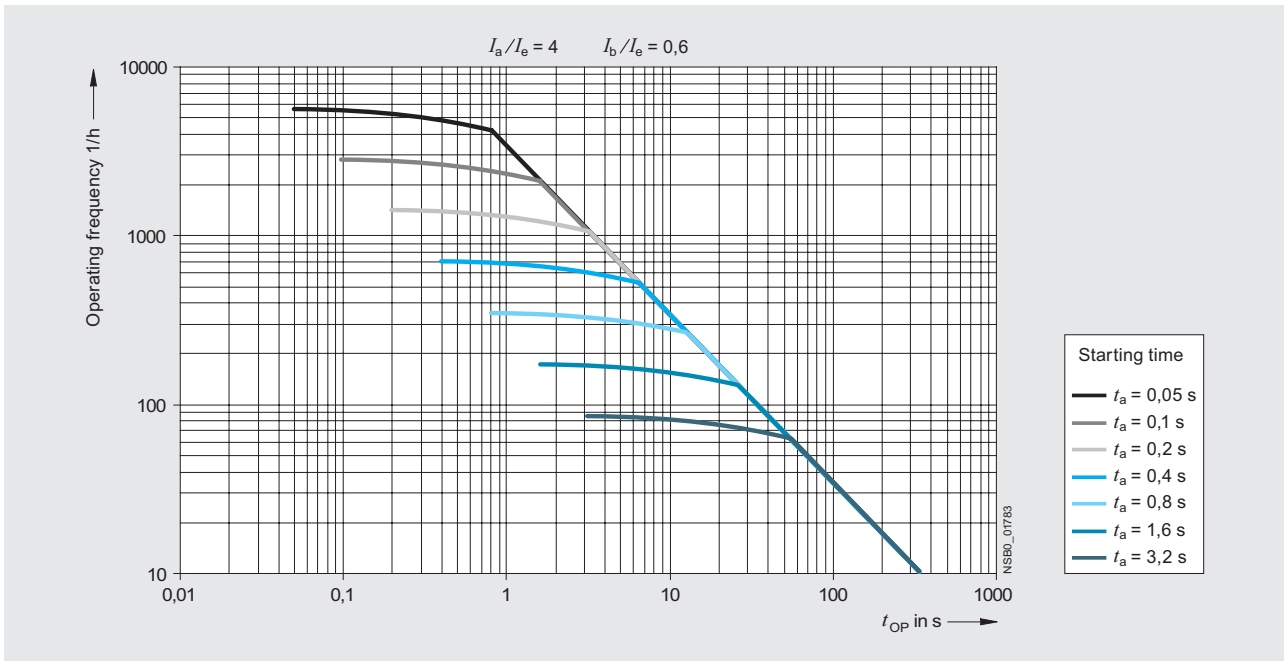


# Solid-State Contactors

3RF34 solid-state contactors, 3-phase



For motors with a starting current of up to 4 times the rated current and with a full load

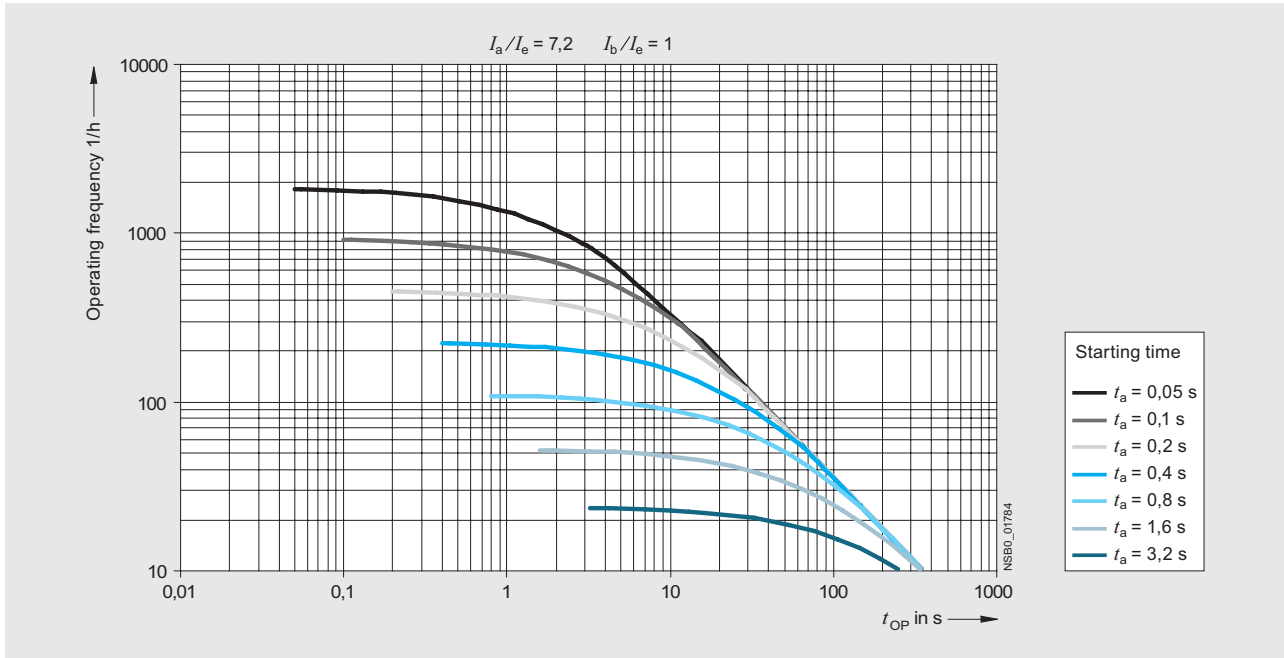


For motors with a starting current of up to 4 times the rated current and with a 60 % load

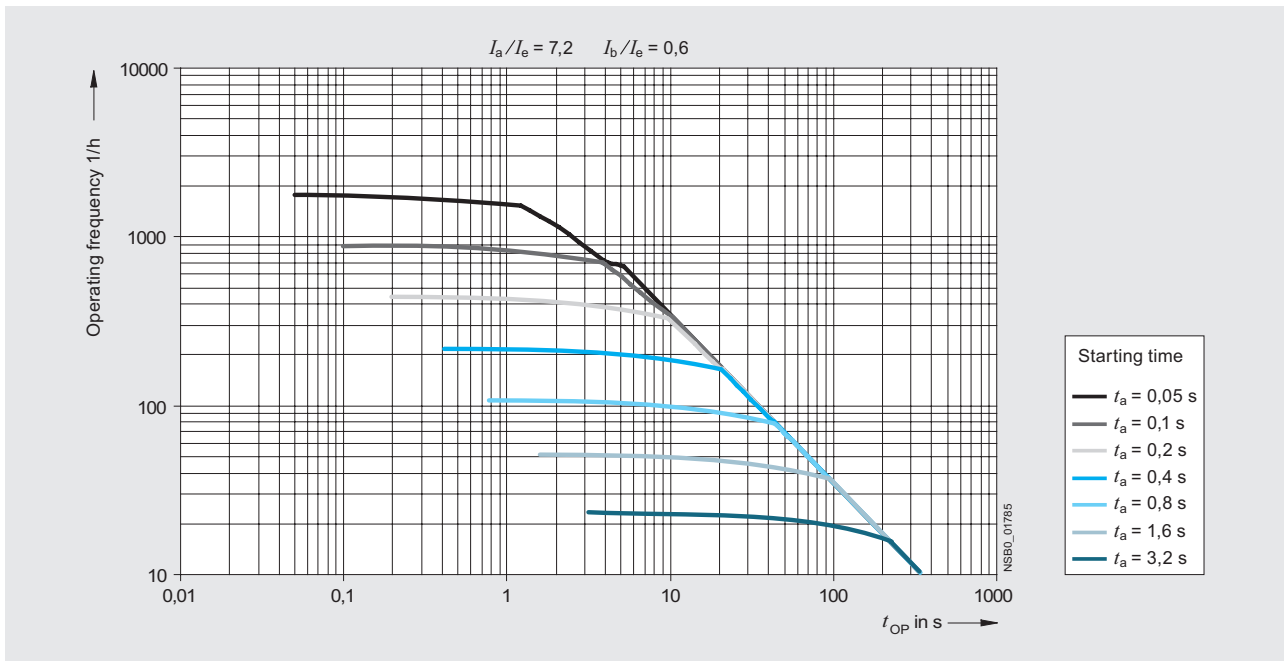
# Solid-State Contactors

3RF34 solid-state reversing contactors, 3-phase

Maximum permissible switching frequency depending on the starting time  $t_a$  and the ON period  $t_{ED}$



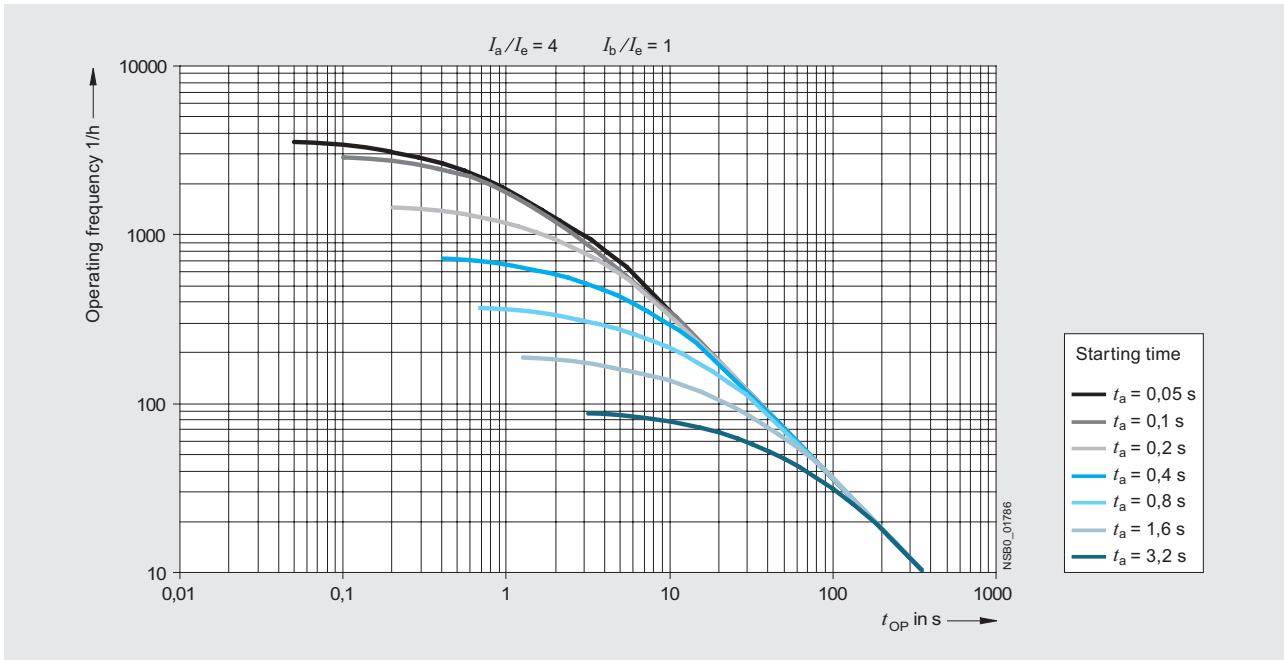
For motors with a starting current of 4- to 7.2 times the rated current and with a full load



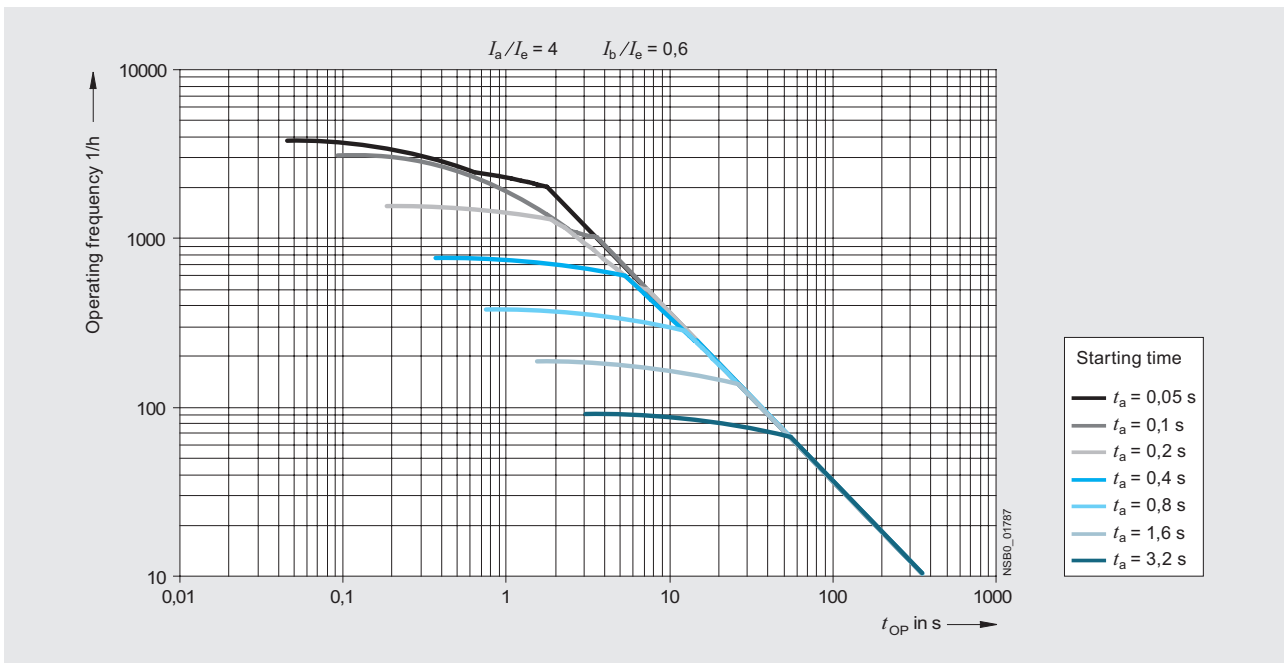
For motors with a starting current of 4- to 7.2 times the rated current and with a 60 % load

# Solid-State Contactors

## 3RF34 solid-state reversing contactors, 3-phase



For motors with a starting current of up to 4 times the rated current and with a full load

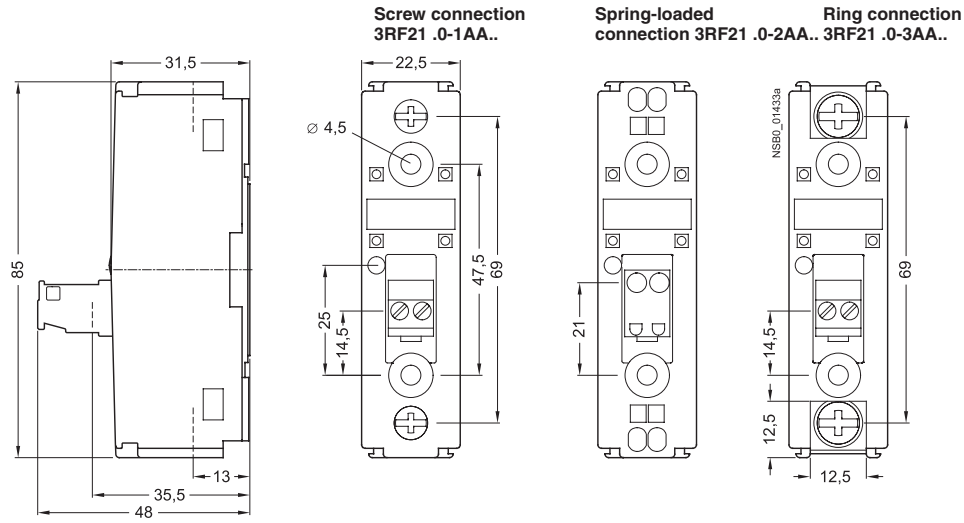


For motors with a starting current of up to 4 times the rated current and with a 60 % load

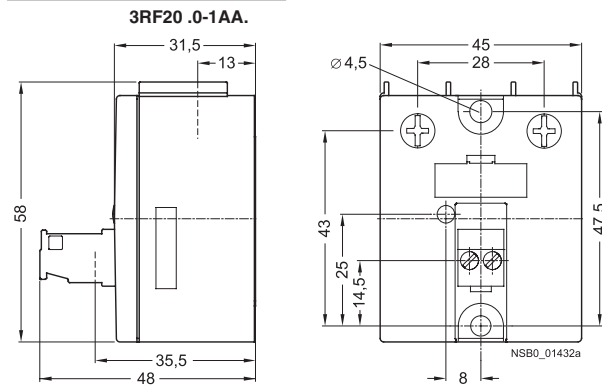
### Dimension drawings

#### SIRIUS SC semiconductor relays

22.5 mm semiconductor relays



45 mm semiconductor relays

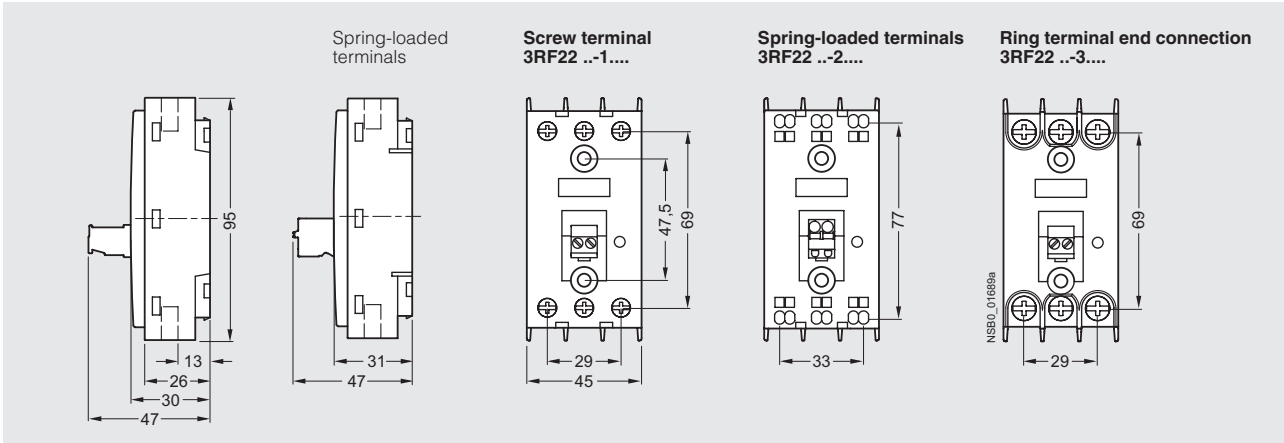


# Solid-State Relays

3RF22 solid-state relays, 3-phase, 45 mm

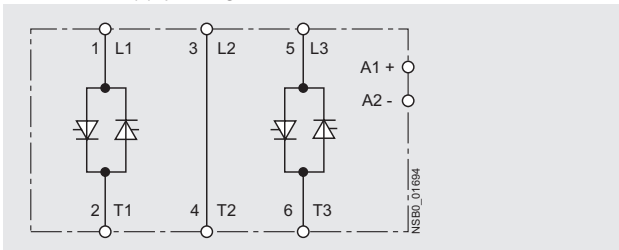
## Dimensional drawings

Solid-state relays

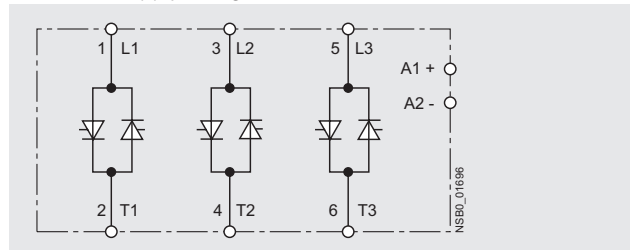


## Schematics

Two-phase controlled DC control supply voltage



Three-phase controlled DC control supply voltage



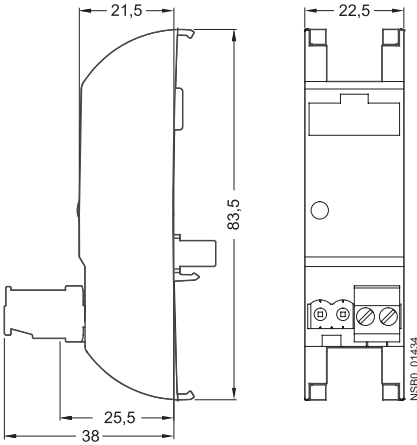
# Semiconductor Relays and Contactors, Function Modules

## Dimensions

### Function modules for SIRIUS SC semiconductor switching devices

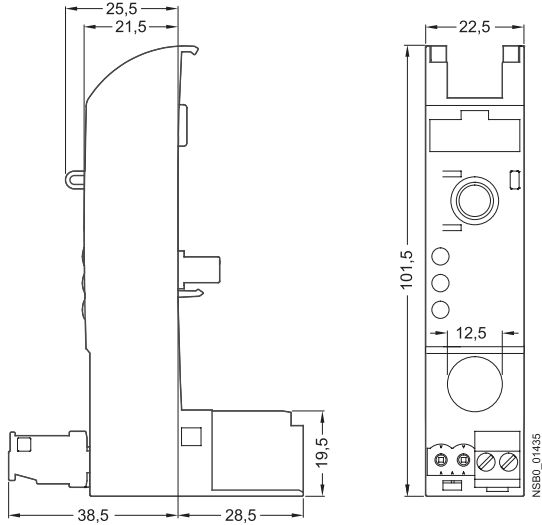
#### Converters

**3RF29 00-0EA18**



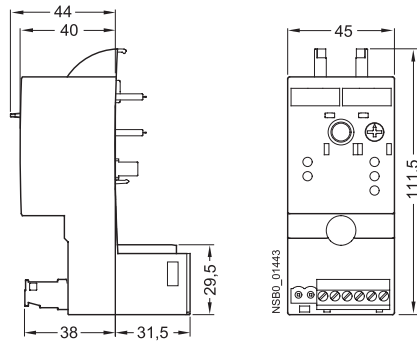
#### Basic load monitoring

**3RF29 00-0FA08**



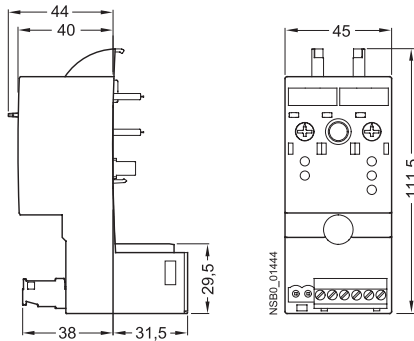
#### Extended load monitoring

**3RF29 .0-0GA..**



#### Power controllers

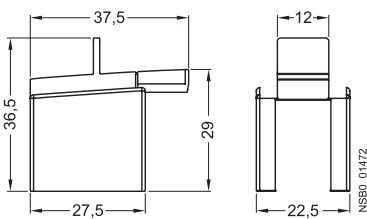
**3RF29 .0-0HA..**



### Accessories for SIRIUS SC semiconductor switching devices

#### Terminal cover for SIRIUS semiconductor switching devices

**3RF29 00-3PA88**

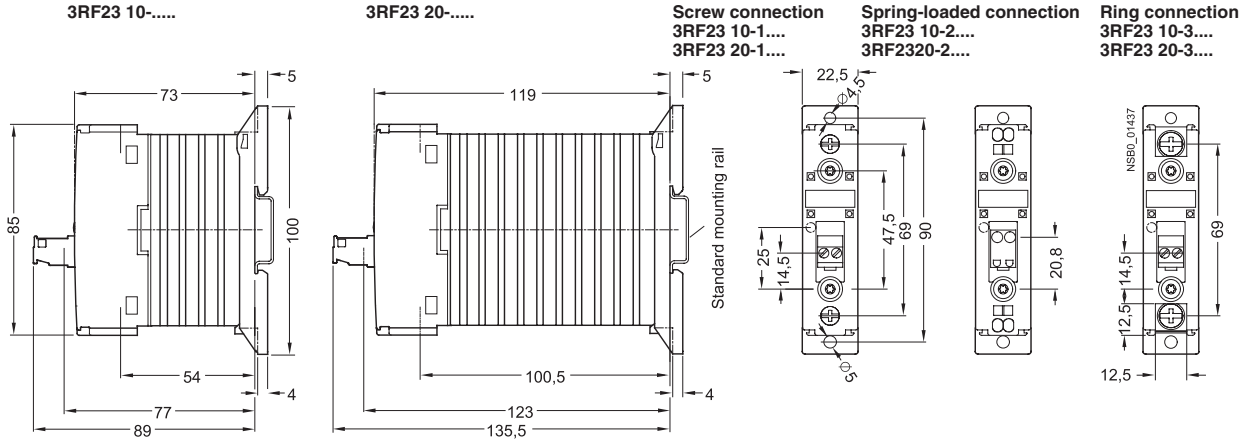


# Semiconductor Relays and Contactors, Function Modules

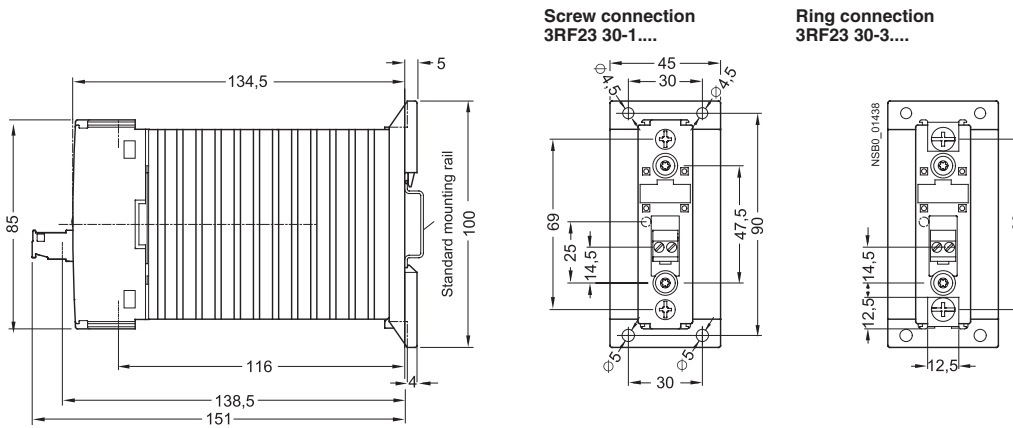
## Dimensions

### SIRIUS SC semiconductor contactors

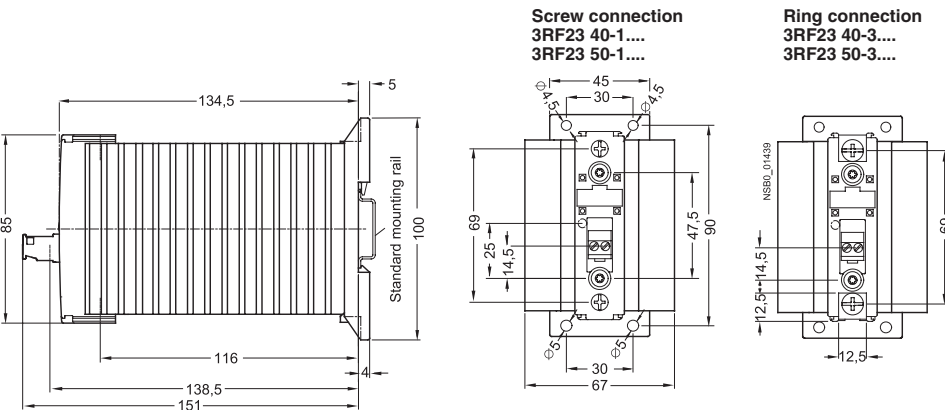
Semiconductor contactors with 10 A and 20 A type current



Semiconductor contactors with 30 A type current



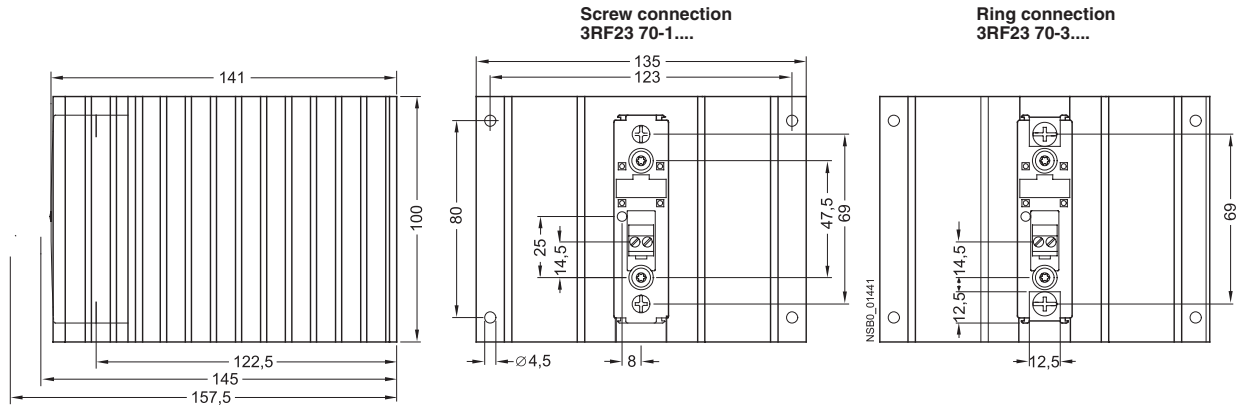
Semiconductor contactors with 40 A and 50 A type current



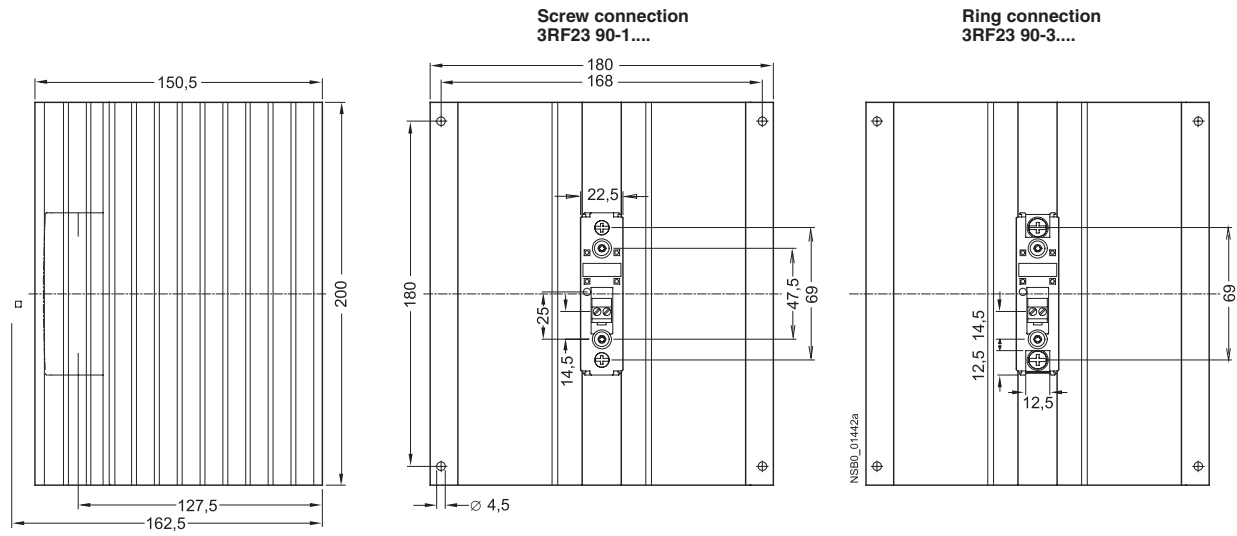
# Semiconductor Relays and Contactors, Function Modules

## Dimensions

Semiconductor contactors with 70 A type current



Semiconductor contactors with 88 A type current



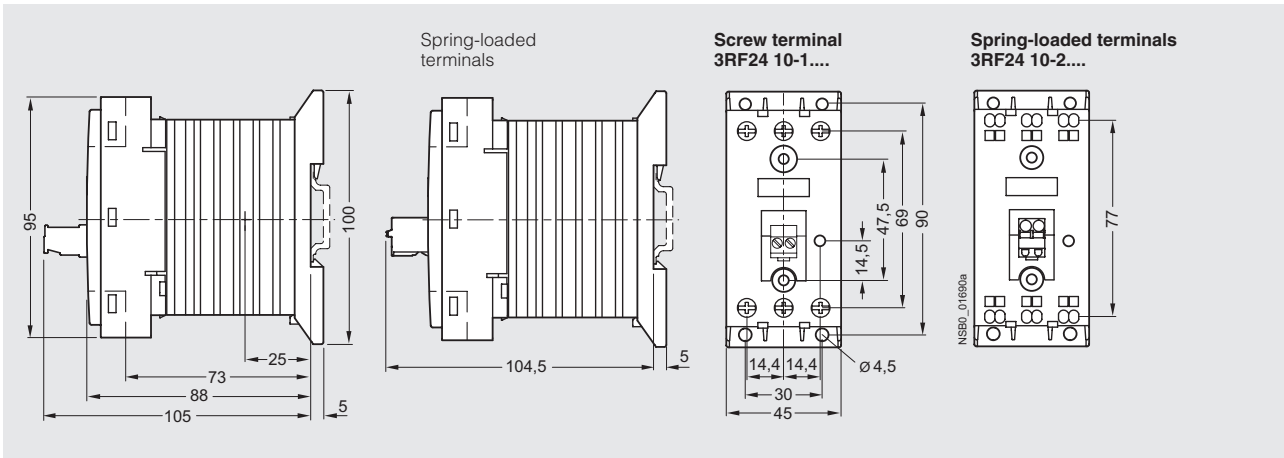


# Solid-State Contactors

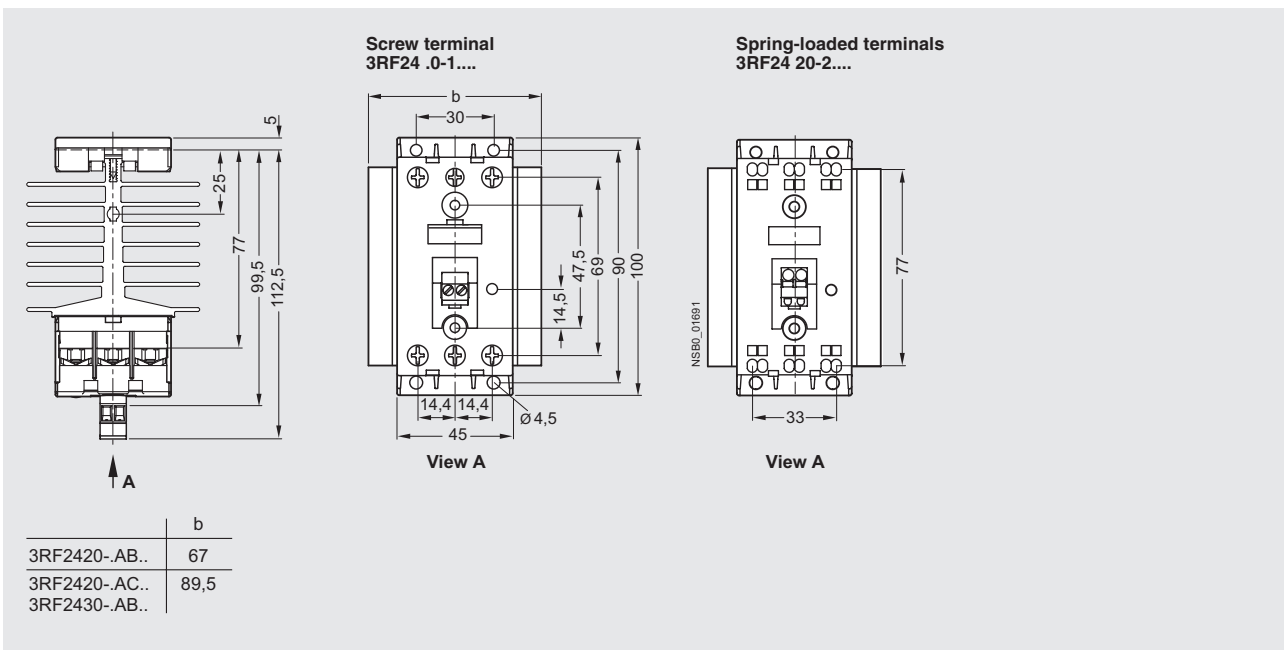
## Dimensions

### Dimensional drawings

Type current 10.5 A



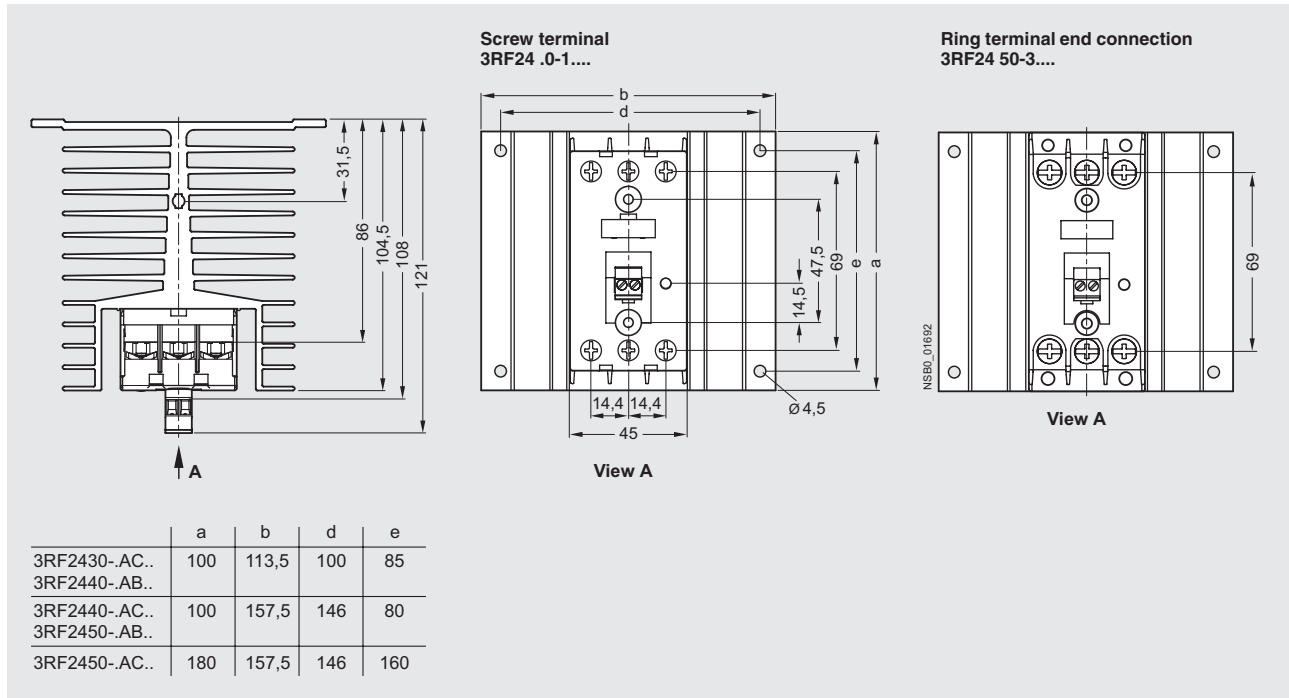
Type current 20 A; 30 A (2-phase controlled)



# Solid-State Contactors

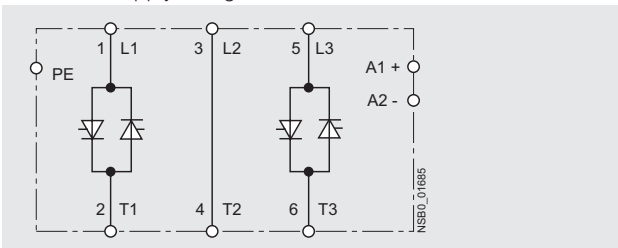
## Dimensions

Type current 30 A (3-phase controlled); 40 A, 50 A

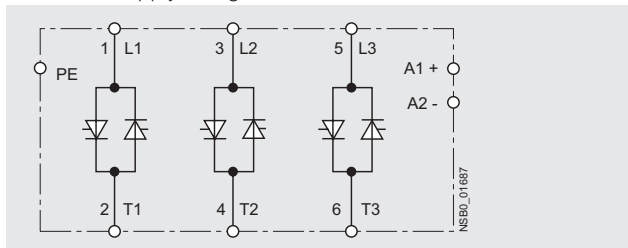


### Schematics

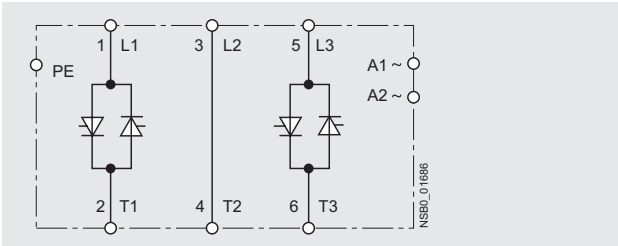
Two-phase controlled  
DC control supply voltage



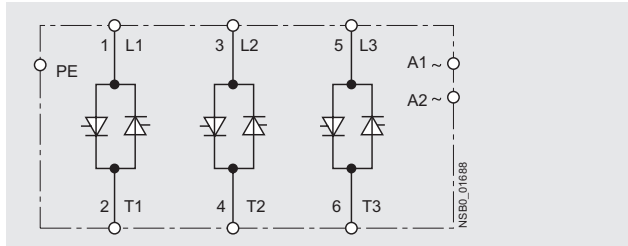
Three-phase controlled  
DC control supply voltage



Two-phase controlled  
AC control supply voltage



Three-phase controlled  
AC control supply voltage

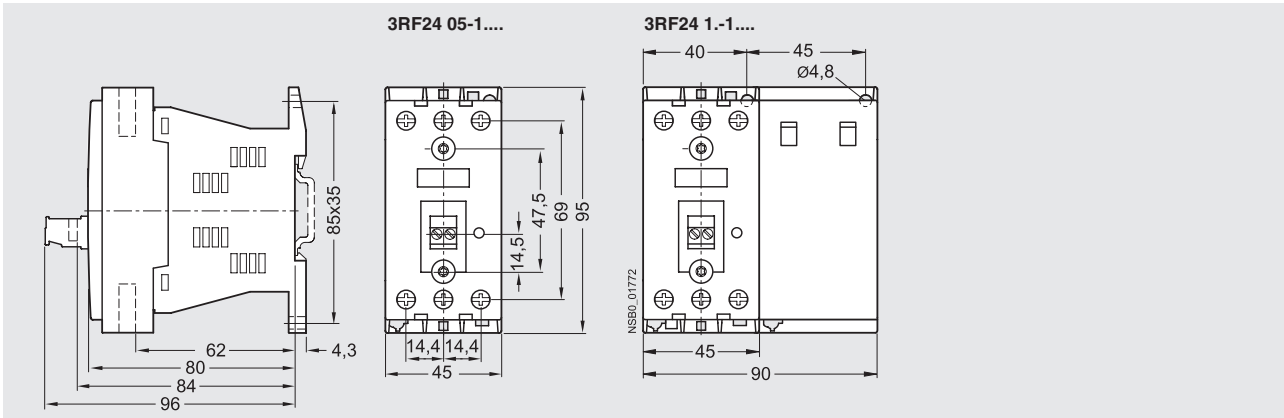


# Solid-State Contactors

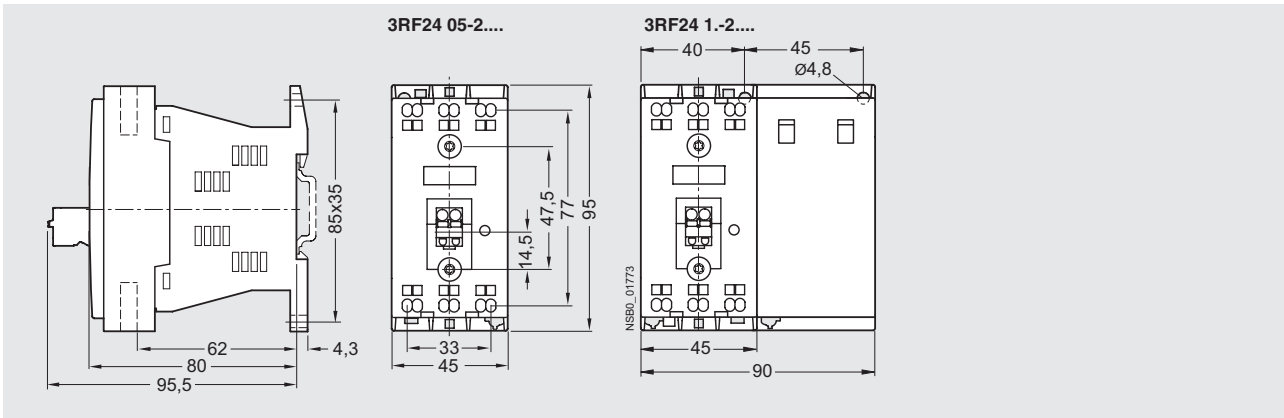
## Dimensions

### Dimensional drawings

#### Screw terminals



#### Spring-loaded terminals

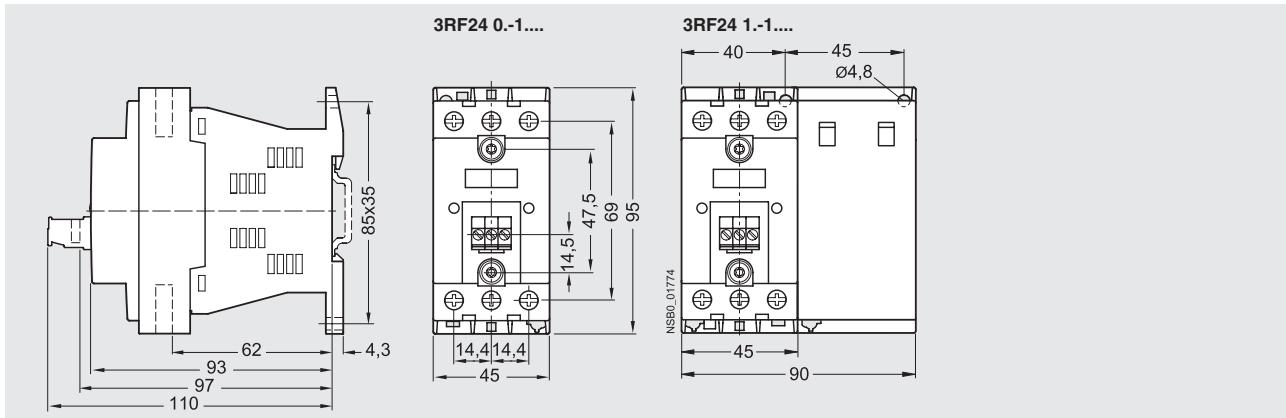


# Solid-State Contactors

## Dimensions

### Dimensional drawings

#### Screw terminals



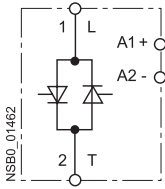
# Semiconductor Relays and Contactors, Function Modules

## Wiring diagrams

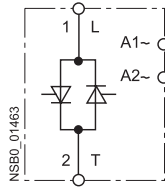
### Circuit diagrams

#### SIRIUS SC semiconductor relays

DC control version

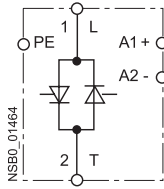


AC control version

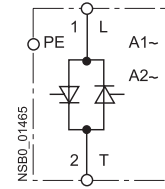


#### SIRIUS SC semiconductor contactors

DC control version

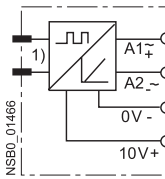


AC control version

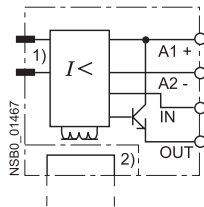


### Function modules for SIRIUS SC semiconductor switching devices

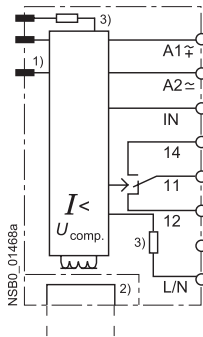
Converters



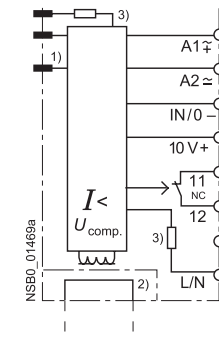
Basic load monitoring



Extended load monitoring



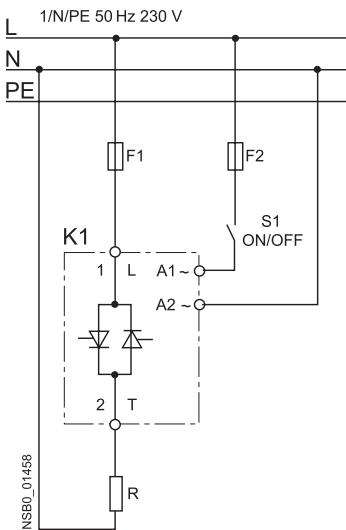
Power controllers



- 1) Internal connection.
- 2) Straight-through transformer.

#### SIRIUS SC semiconductor relays

Typical circuit diagram

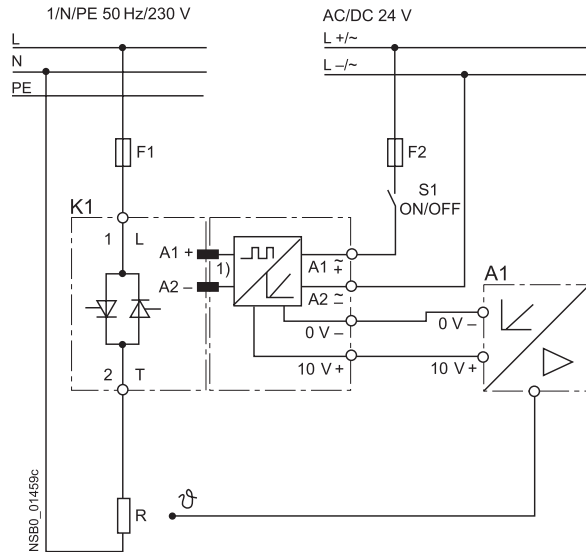


# Semiconductor Relays and Contactors, Function Modules

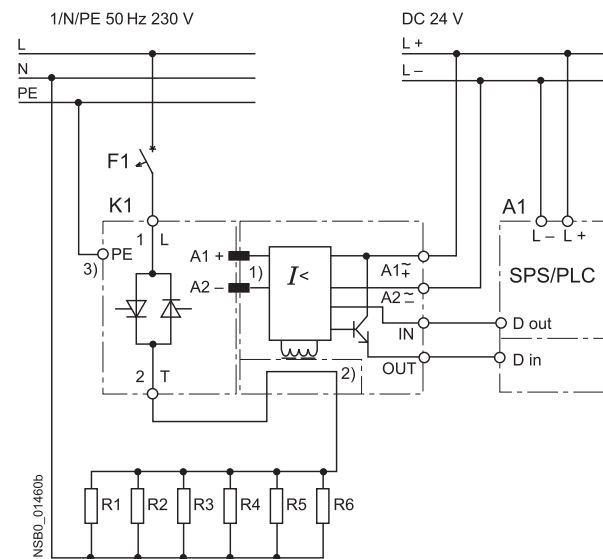
## Wiring diagrams

### Function modules for SIRIUS SC semiconductor switching devices

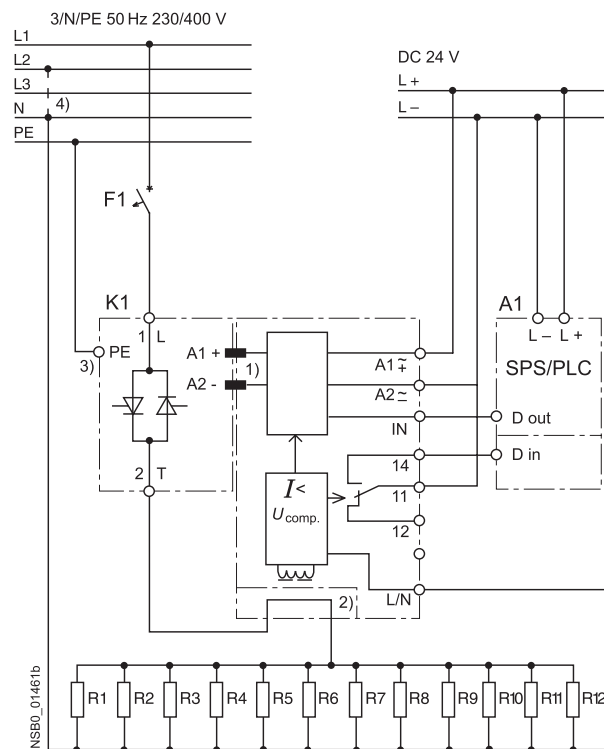
Converters Typical circuit diagram



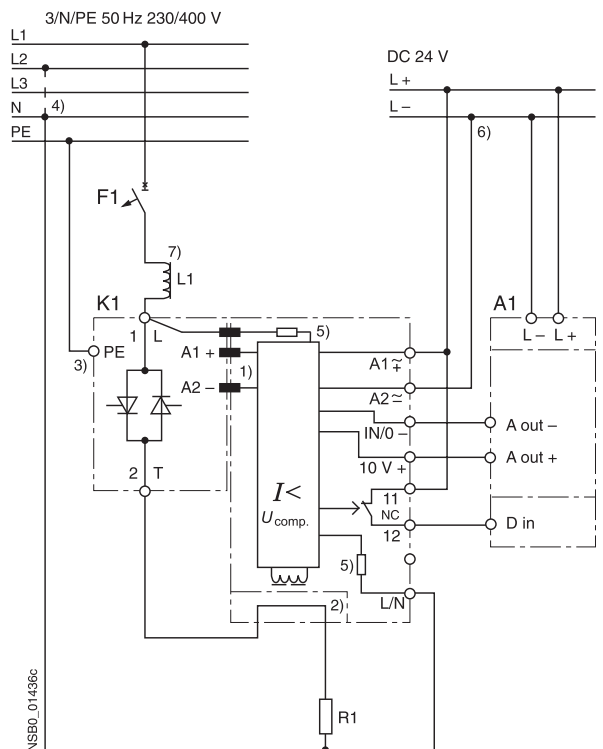
Basic load monitoring Typical circuit diagram



Extended load monitoring Typical circuit diagram



Power controllers Typical circuit diagram



- 1) Internal connection.
- 2) Straight-through transformer.
- 3) PE/ground connection for semiconductor contactors according to installation regulations.
- 4) Connection of contact L/N to N conductor or a second phase according to the rated operational voltage of the function module.
- 5) In order to observe the limit values of the conducted interference voltage for generalized phase control, a choke rated at at least 200  $\mu$ H must be included in the load circuit.

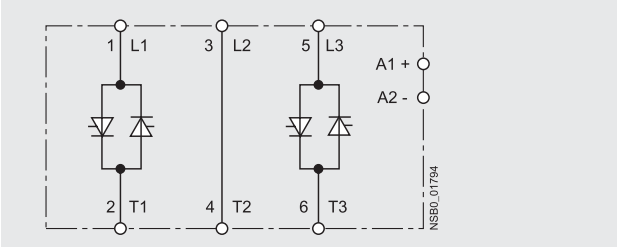
- 1) Internal connection to the solid state relay/contactor.
- 2) Straight-through.
- 3) Make PE/ground connection according to installation regulations.
- 4) Connection of L/N contact with
  - 3RF29 ..-0GA.3 load monitoring on neutral conductor N (e.g. 230 V),
  - 3RF29 ..-0GA.6 load monitoring on a second phase (e.g. 400V).
- 5) Voltage detection not electrically isolated (3M $\Omega$  per path).
- 6) Grounding of connection L- is recommended.
- 7) A200  $\mu$ H choke must be used when operating with leading-edge phase in order to observe the limit values of the conducted interference voltage according to Class A.

# Solid-State Contactors

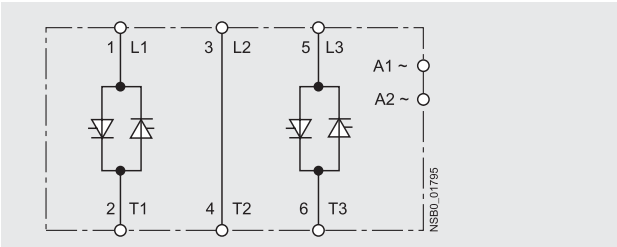
## 3RF24 solid-state contactors, 3-phase

### Schematics

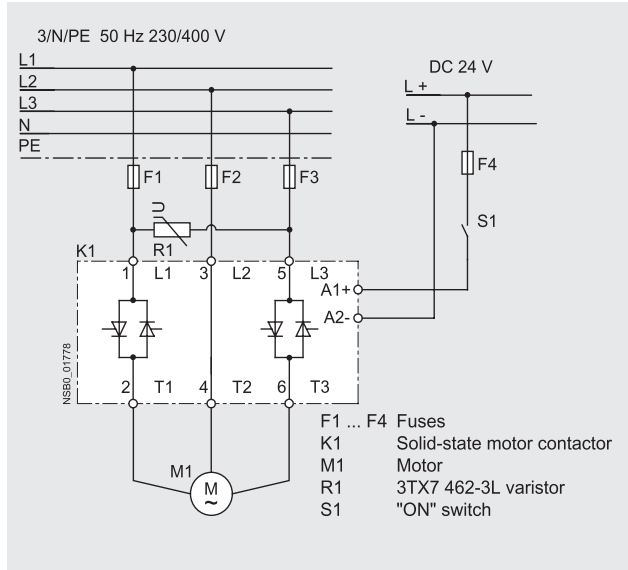
Two-phase controlled,  
DC control supply voltage

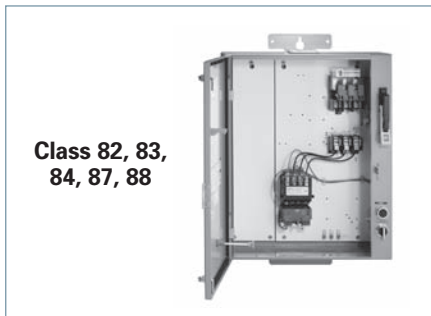
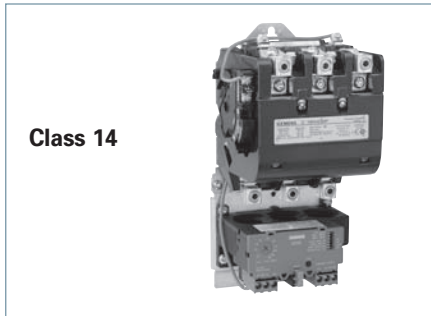


Two-phase controlled,  
AC control supply voltage



Sample schematic





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## NEMA &amp; General Purpose Controls

## Controls Express

## Starters at the speed you need

Siemens NEMA starters, pump panels and lighting contactors are known for their dependability and ruggedness, and now they are delivered faster than ever before through Controls Express.

Controls Express puts our most popular products in your hands faster, because we stock more products across our entire product line. Our Class 14 NEMA starters, Class 87 pump panels, and LC & LE lighting contactors are now available in stock for immediate or next day shipping. In addition, thousands of our open and enclosed starters can now be built-to-order and shipped in 1-3 days through Controls Express.

Siemens is committed to making your job easier by stocking more products, offering more configurations, expediting factory modifications, and delivering industry leading turnaround times on our most requested control products.

To quickly identify products that are part of Controls Express and therefore available in 3 days or less, applicable catalog numbers have a light blue background. See the appropriate selection pages listed below.

**Class 14 NEMA Starters** see pages 9/13 & 9/15

**Class 17 NEMA Combination Starters** see pages 9/17 to 9/22. For quick ship versions with factory modifications see on-line at [www.usa.siemens.com/controls-express](http://www.usa.siemens.com/controls-express)

**Class 18 NEMA Combination Starters** see pages 9/23 & 9/25.

**Class 40 NEMA Contactors** see page 9/60

**Class 87 Pump Panels** see pages 9/78 & 9/79

**LE Lighting Contactors** see page 9/85

**LC Lighting Contactors** see page 9/91 & 9/92

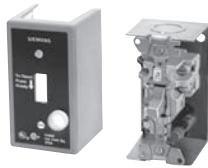


Controls Express lead times apply to orders of up to 6 units of the Class 14, Class 87, LC, or LE. Please contact customer service at 1-866-663-7324 for lead times of larger order volumes.

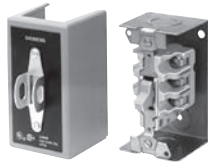
For more information on Controls Express and a complete list of available products, please visit our website at [www.usa.siemens.com/controls-express](http://www.usa.siemens.com/controls-express)

# NEMA & General Purpose Controls

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Manual Switches  
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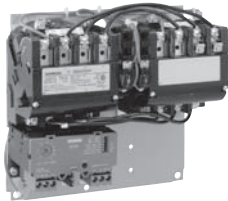
**Class 11**  
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**Class 14**  
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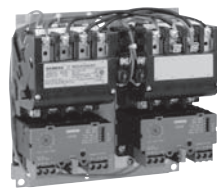
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**Class 25, 26**  
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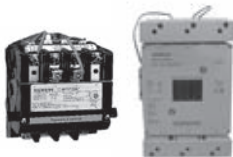
**Class 30**  
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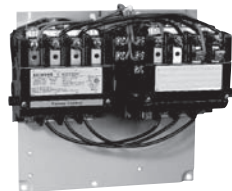
**Class 32**  
NEMA Combination  
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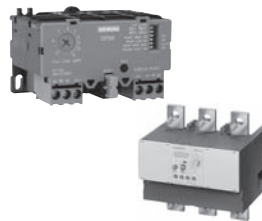
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**Class 40**  
NEMA Contactors  
and Vacuum Contactors  
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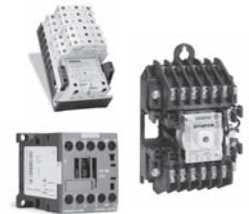
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**Class 48, 958, 3RB20**  
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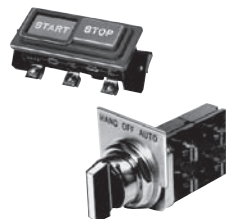
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# Fractional HP Starters, Class SMF

## General

### Class SMF

Class SMF fractional horsepower starters provide overload protection as well as manual on-off control for small horsepower motors in a variety of industrial and commercial applications. Available in one or two pole versions, these devices are suitable for use with AC single phase motors up to 1 HP. Two pole starters can also be used with DC motors up to ¾ HP. Typical applications include fans, conveyors, pumps, and small machine tools.

#### Continuous Current Rating

16 amperes.

#### Overload Trip Assembly

Motor protection is provided by a Class SMFH heater element which must be installed before the starter will operate.

#### Two Speed Starters

Two speed manual starters are designed for control of small single phase AC motors having separate windings for high and low speed operation. Two toggle operated starters are used, with overload protection included for each motor winding. Surface mounting devices, and those with a gray flush plate, utilize a mechanical interlock which allows direct control of the motor by means of the toggle operators.

### Enclosures

Class SMF, NEMA Type 1 surface mounting enclosures are sheet steel with a thermo-plastic wrap-around cover for convenience in wiring. The NEMA Type 1 enclosure is also available in an oversized version which allows more wiring space. A zinc alloy die casting is used for NEMA Type 4 enclosures.

### Pilot Lights

Red or green neon pilot light units are available for flush mounting plates, NEMA Type 1 enclosures, and NEMA Type 4 enclosures. Pilot lights may be either factory or field installed. (For starters that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.)

### Terminals

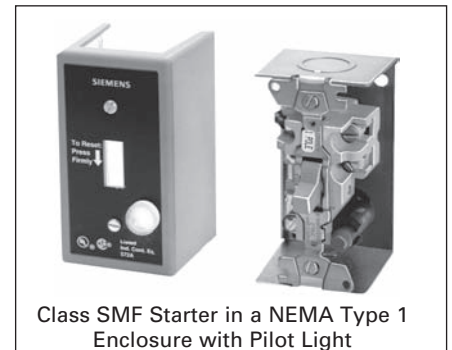
Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

### Mounting

Open types without a pilot light fit standard single gang switch boxes, and can be used with any cover plate having a standard toggle cutout. Single-unit flush mounting types, including those with pilot lights, are suitable for wall mounting in a standard switch box or for machine cavity mounting without a box.

### Operation

Available with toggle handle or with removable key type operator to discourage unauthorized operation.



Class SMF Starter in a NEMA Type 1 Enclosure with Pilot Light

### Emergency Off Actuator

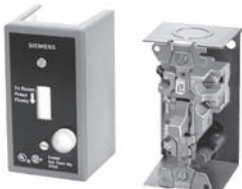
A toggle operator extender is available for Class SMF, NEMA Type 1 surface mounted units. The extender has a red vinyl button that provides a fast and easy method for locating and switching the device's toggle operator into the OFF position. The Emergency Off Actuator is available in kit form only for field installation.

### Handle Guard/Lock-Off

An optional handle guard on Class SMF, NEMA Type 1 enclosed starters prevents accidental operation of the toggle operator and also allows the toggle operator to be padlocked in either the "ON" or "OFF" position. This handle guard can be factory installed on NEMA Type 1 enclosed starters and is also available in kit form for field installation on NEMA Type 1 surface and flush mounting enclosures. Standard NEMA Type 4 metallic enclosures include provisions for padlocking the device in the OFF position.

# Fractional HP Starters with Melting Alloy Overload, Class SMF

## Selection

 <p>Class SMF Starter in a NEMA Type 1 Enclosure with Pilot Light</p>	<b>Ordering Information</b>		<b>Horsepower Ratings</b>																										
	<ul style="list-style-type: none"> <li>▶ Heater Elements see page 9/124.</li> <li>▶ Field Modification Kits see page 9/102.</li> <li>▶ Dimensions see page 9/137.</li> <li>▶ Wiring Diagrams see page 9/172.</li> </ul>		<table border="1"> <tr> <td></td> <td colspan="3"><b>Maximum Horsepower</b></td> </tr> <tr> <td></td> <td colspan="2"><b>AC Single Phase</b></td> <td><b>DC</b></td> </tr> <tr> <td><b>Volts</b></td> <td><b>1-Pole</b></td> <td><b>2-Pole</b></td> <td><b>2-Pole</b></td> </tr> <tr> <td>115</td> <td>1</td> <td>1</td> <td>¾</td> </tr> <tr> <td>230</td> <td>1</td> <td>2</td> <td>¾</td> </tr> <tr> <td>277</td> <td>1</td> <td>1</td> <td>—</td> </tr> </table>				<b>Maximum Horsepower</b>				<b>AC Single Phase</b>		<b>DC</b>	<b>Volts</b>	<b>1-Pole</b>	<b>2-Pole</b>	<b>2-Pole</b>	115	1	1	¾	230	1	2	¾	277	1	1	—
		<b>Maximum Horsepower</b>																											
		<b>AC Single Phase</b>		<b>DC</b>																									
<b>Volts</b>	<b>1-Pole</b>	<b>2-Pole</b>	<b>2-Pole</b>																										
115	1	1	¾																										
230	1	2	¾																										
277	1	1	—																										

### Starter—Class SMF, Single Phase<sup>①</sup>

Type of Operator	No. of Poles	Starter Features <sup>⑤</sup>	General Purpose Flush Mounting Open Starter with Flush Plate (No Enclosure Provided)						NEMA Type 1 General Purpose Enclosure, Surface Mounting				NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosure with Clear Cover		NEMA Type 4 Watertight, Dust-tight Metallic Enclosure		NEMA Type 3R, 7 & 9 Div 1 and Div 2 Class I Groups B, C, D & Class II Groups E, F, G Enclosures			
			Open Type		Gray Flush Plate		Standard Stainless Steel Flush Plate		Jumbo Stainless Steel Flush Plate		Standard		Oversized							
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	1	Standard	SMFF01	—	SMFFF1	—	SMFFS1	—	—	—	SMFFG1	—	SMFFGJ1	—	SMFFWN1	—	—	—	—	—
		Red Pilot Light	SMFF01P	—	SMFFF1P	—	SMFFS1P	—	SMFFSJ1P	—	SMFFG1P	—	SMFFGJ1P	—	SMFFWN1	—	—	—	—	—
Toggle	2	Standard	SMFF02	—	SMFFF2	—	SMFFS2	—	—	—	SMFFG2	—	SMFFGJ2	—	SMFFWN2	—	—	—	—	—
		Red Pilot Light	SMFF02P	—	SMFFF2P	—	SMFFS2P	—	SMFFSJ2P	—	SMFFG2P	—	SMFFGJ2P	—	SMFFWN2	—	—	—	—	—
Key	1	Standard	SMFF03	—	SMFFF3	—	SMFFS3	—	—	—	SMFFG3	—	SMFFGJ3	—	SMFFWN3	—	—	—	—	—
		Red Pilot Light	SMFF03P	—	SMFFF3P	—	SMFFS3P	—	SMFFSJ3P	—	SMFFG3P	—	SMFFGJ3P	—	SMFFWN3	—	—	—	—	—
Key	2	Standard	SMFF04	—	SMFFF4	—	SMFFS4	—	—	—	SMFFG4	—	SMFFGJ4	—	SMFFWN4	—	—	—	—	—
		Red Pilot Light	SMFF04P	—	SMFFF4P	—	SMFFS4P	—	SMFFSJ4P	—	SMFFG4P	—	SMFFGJ4P	—	SMFFWN4	—	—	—	—	—

### Starter With Handle Guard/Lock-Off—Class SMF, Single Phase<sup>①</sup>

Toggle	1	Standard	—	—	④	—	④	—	④	—	SMFFG5	—	SMFFGJ5	—	—	—	SMFFW1 <sup>②</sup>	—	SMFFR1 <sup>②</sup>	—
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG5P	—	SMFFGJ5P	—	—	—	SMFFW1P <sup>②</sup>	—	SMFFR1P <sup>②</sup>	—
		(2) ¾" NPT Outlets	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW1H	—	SMFFR1H	—
		(2) ¾" NPT Outlets and Red Pilot Light	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW1PH	—	SMFFR1PH	—
Toggle	2	Standard	—	—	④	—	④	—	④	—	SMFFG6	—	SMFFGJ6	—	—	—	SMFFW2 <sup>②</sup>	—	SMFFR2 <sup>②</sup>	—
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG6P	—	SMFFGJ6P	—	—	—	SMFFW2P <sup>②</sup>	—	SMFFR2P <sup>②</sup>	—
		(2) ¾" NPT Outlets	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW2H	—	SMFFR2H	—
		(2) ¾" NPT Outlets and Red Pilot Light	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW2PH	—	SMFFR2PH	—

### One Starter in Duplex Enclosure—Class SMF, Single Phase<sup>①</sup>

Type of Operator	Number of Poles	Starter Features <sup>⑤</sup>	General Purpose Flush Mounting Open Starter with Flush Plate - (No Enclosure Provided)				NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Starters	
			Gray Flush Plate For Wall or Cavity Mounting		Stainless Steel Flush Plate for Wall or Cavity Mounting					
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Standard	—	—	—	—	SMFFG02	—	—	—
		Red Pilot Light	—	—	—	—	SMFFG02P	—	—	—
Key	2	Red Pilot Light	—	—	—	—	SMFFG04P	—	—	—

### Two Starters In Duplex Enclosure—Class SMF, Single Phase<sup>①</sup>

Toggle	2 Per Starter	Standard	SMFFF222	—	—	SMFFG222	—	—
		Red Pilot Light on Each Starter	SMFFF222P	—	—	SMFFG222P	—	—
Key	2 Per Starter	Red Pilot Light on Each Starter	SMFFF44P	—	—	SMFFS44P	—	SMFFG44P

### Starter And "Auto-Off-Hand" SPDT Selector Switch (AC Only)—Class SMF, Single Phase<sup>①</sup>

Toggle	1	Standard	SMFFF71	—	—	SMFFG71	—	—
		Red Pilot Light	SMFFF71P	—	—	SMFFS71P	—	—
Toggle	2	Standard	—	—	—	SMFFG72	—	—
		Red Pilot Light	SMFFF72P	—	—	SMFFS72P	—	—
Key	2	Red Pilot Light	SMFFF74P	—	—	SMFFS74P	—	SMFFG74P

### Two Speed Starters (AC Only)—Class SMF, Single Phase<sup>③</sup>

Toggle	1	Mechanical Interlock	SMFFF11	—	—	SMFFG11	—	SMFF01T
		Mechanical Interlock and (2) Red Pilot Lights	SMFFF11P	—	—	SMFFG11P	—	SMFF01PT
		Mechanical Interlock, HIGH-OFF-LOW Selector Switch and (2) Red Pilot Lights	—	—	—	—	—	SMFF01PT
	2	Mechanical Interlock	SMFFF22	—	—	SMFFG22	—	—
		Mechanical Interlock and (2) Red Pilot Lights	SMFFF22P	—	—	SMFFG22P	—	SMFF02PT
		Mechanical Interlock, HIGH-OFF-LOW Selector Switch and (2) Red Pilot Lights	—	—	SMFFS202P	—	—	SMFF02PT

① One heater element required.

② Furnished with (1) ¾" NPT Outlet in bottom (reversible for top feed).

③ Two heater elements required.

④ Order Open Type starter plus separate handle guard kit.

⑤ For starters that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.

# Fractional HP Switches, Class MMS, MRS

## General

### Class MMS, MRS

Class MMS and MRS motor starting switches provide manual "ON-OFF" control of single or three phase AC motors where overload protection is not required or is provided separately. Compact construction and a 600 volt rating make these switches suitable for a wide range of industrial and commercial uses. Typical applications include small machine tools, pumps, fans, conveyors and many other types of electrical machinery. They can also be used on non-motor loads such as resistance heating applications.

#### Continuous Current Rating

**MMS & MRS:** 30 amperes at 250 volts max, 26.4 amperes at 277 volts, 20 amperes at 600 volts max, 30 amperes resistive at 600 volts max.

#### Two Speed—Class MRS

Two speed manual switches may be used with separate winding three phase or single phase AC motors where overload protection is not required or is provided separately. Two switches are employed to give "ON-OFF" control in each speed.

#### Reversing—Class MRS

Reversing manual switches provide a compact means of starting, stopping and reversing AC motors where overload protection is not required or is provided separately. They are suitable for use with three phase squirrel cage motors and for single phase motors which can be reversed by reconnecting motor leads. Two switches are used, one to connect the motor forward rotation and one for reverse.

### Enclosures

Class MMS, MRS, NEMA Type 1 surface mounting enclosures are sheet steel with a thermo-plastic wrap-around cover for convenience in wiring. The NEMA Type 1 enclosure is also available in an oversized version which allows more wiring space. A zinc alloy die casting is used for NEMA Type 4 enclosures.

#### Pilot Lights

Red or green neon pilot light units are available for flush mounting plates, NEMA Type 1 enclosures, and NEMA Type 4 enclosures. Pilot lights may be either factory or field installed. (For switches that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.)

#### Terminals

Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

#### Mounting

Open types without a pilot light fit standard single gang switch boxes, and can be used with any cover plate having a standard toggle cutout. Single-unit flush mounting types, including those with pilot lights, are suitable for wall mounting in a standard switch box or for machine cavity mounting without a box.

#### Operation

Available with toggle handle or with removable key type operator to discourage unauthorized operation.



Class MMS Switch in a NEMA Type 1 Enclosure

### Emergency Off Actuator

A toggle operator extender is available for Class MMS, MRS, NEMA Type 1 surface mounted units. The extender has a red vinyl button that provides a fast and easy method for locating and switching the device's toggle operator into the OFF position. The Emergency Off Actuator is available in kit form only for field installation.

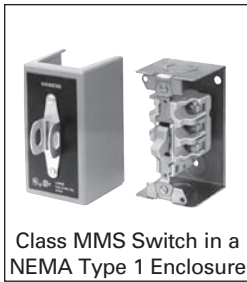
#### Handle Guard/Lock-Off

An optional handle guard on Class MMS, MRS, NEMA Type 1 enclosed switches prevents accidental operation of the toggle operator and also allows the toggle operator to be padlocked in either the "ON" or "OFF" position. This handle guard is available in kit form for field installation on NEMA Type 1 surface and flush mounting enclosures. Standard NEMA Type 4 metallic enclosures include provisions for padlocking the device in the OFF position.



# Switches<sup>①</sup>, Class MMS, MRS

## Selection



**Ordering Information**

- ▶ Heater Elements not Required.
- ▶ Field Modification Kits see page 9/102.
- ▶ Dimensions see page 9/137.
- ▶ Wiring Diagrams see page 9/172.

Device		No of Poles	Motor Type AC	Maximum HP			DC Ratings		
				115V	230V	450–575V	90V	115V	230V
Class MMS	2	3	Single Phase	2	2	3	1	2	1 1/2
	3		3-Phase	2	7 1/2	10	1	2	1 1/2
Class MRS Reversing	2	3	Single Phase	2	2	3	1	2	1 1/2
	3		3-Phase	2	7 1/2	10	1	2	1 1/2
Class MMS Two Speed	2	3	Single Phase	2	2	3	1	2	1 1/2
	3		3-Phase, Constant or Variable Torque	2	7 1/2	10	1	2	1 1/2
			3-Phase, Constant Horsepower	2	7 1/2	10	1	2	1 1/2

### Switch—Class MMS, Single Phase and 3-Phase

Type of Operator	No of Poles	Switch Features <sup>④</sup>	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)				NEMA Type 1 General Purpose Enclosure Surface Mounting				NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosure with Clear Cover	NEMA Type 4 <sup>⑤</sup> Watertight, Dust-tight Metallic Enclosure	NEMA Type 7 & 9 <sup>⑥</sup> Class I Groups B, C & D & Class II Groups E, F, G Enclosures							
			Open Type		Gray Flush Plate	Standard Stainless Steel Flush Plate	Jumbo Stainless Steel Flush Plate	Standard		Oversized										
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
Toggle	2	Standard	MMSK01		MMSKF1		MMSKS1		—		MMSKG1		—		MMSKWN1		MMSKW1		MMSKR1	
		Red Pilot Light 115V AC	MMSK01A <sup>③</sup>		MMSKF1A		MMSKS1A		—		MMSKG1A		MMSKGJ1A				MMSKW1A		—	
	Red Pilot Light 230V AC	MMSK01B <sup>③</sup>		MMSKF1B		MMSKS1B		MMSKSJ1B		MMSKG1B		—				MMSKW1B		—		
	3	Standard	MMSK02		MMSKF2		MMSKS2		—		MMSKG2		MMSKGJ2		MMSKWN2		MMSKW2		MMSKR2	
		Red Pilot Light 208–240V AC	MMSK02B <sup>③</sup>		MMSKF2B		MMSKS2B		—		MMSKG2B		MMSKGJ2B				MMSKW2B		—	
		Red Pilot Light 440–600V AC	MMSK02C <sup>③</sup>		—		MMSKS2C		MMSKSJ2C		MMSKG2C		MMSKGJ2C				MMSKW2C		—	
Key	2	Standard	MMSK03		MMSKF3		MMSKS3		—		MMSKG3		MMSKGJ3		MMSKWN3		—		—	
		Red Pilot Light 115V AC	—		MMSKF3A		MMSKS3A		MMSKSJ3A		MMSKG3A		MMSKGJ3A				—		—	
		Red Pilot Light 230V AC	MMSK03B		MMSKF3B		MMSKS3B		MMSKSJ3B		MMSKG3B		MMSKGJ3B				—		—	
	3	Standard	MMSK04		MMSKF4		MMSKS4		—		MMSKG4		MMSKGJ4		MMSKWN4		—		—	
		Red Pilot Light 208–240V AC	MMSK04B		MMSKF4B		MMSKS4B		MMSKSJ4B		MMSKG4B		MMSKGJ4B				—		—	
		Red Pilot Light 440–600V AC	MMSK04C		MMSKF4C		MMSKS4C		MMSKSJ4C		MMSKG4C		MMSKGJ4C				—		—	

### Reversing Switch—Class MRS, Single Phase and 3-Phase

Type of Operator	Number of Poles	Suitable Motor Types	Switch Features <sup>④</sup> (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)		NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Switch Class MRS	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Single Phase 3-Lead Repulsion-Induction	Standard	MRSKF11		—		MRSK01T	
			Red Pilot Device—115V AC	MRSKF11A		—		MRSK01AT	
			Red Pilot Device—230V AC	MRSKF11B		MRSKG11B		MRSK01BT	
	3	3-Phase; Also Single Phase Capacitor, Split Phase, or 4-Lead Repulsion-Induction	Standard	MRSKF22		MRSKG22		—	
			Red Pilot Light—110–120V AC	MRSKF22A		MRSKG22A		MRSK02AT	
			Red Pilot Light—208–220V AC	MRSKF22B		—		MRSK02BT	
		Red Pilot Light—440–600V AC	MRSKF22C		MRSKG22C		MRSK02CT		

### Two Speed Switch—Class MMS, Single Phase and 3-Phase

Type of Operator	Number of Poles	Suitable Motor Types	Switch Features <sup>④</sup> (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)		NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Switch Class MRS	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Single Phase Two Winding (3-Lead)	Standard	MMSKF11		MMSKG11		MRSK01T	
			(2) Red Pilot Devices—115V AC	MMSKF11A		MMSKG11A		MRSK01AT	
			(2) Red Pilot Devices—230V AC	MMSKF11B		MMSKG11B		MRSK01BT	
	3	3-Phase Separate Winding (Wye-Connected)	Standard	MMSKF22		MMSKG22		MRSK02T	
			(2) Red Pilot Lights—208–240V AC	MMSKF22B		MMSKG22B		MRSK02BT	
			(2) Red Pilot Lights—440–600V AC	MMSKF22C		MMSKG22C		MRSK02CT	

① Manual switches do not include overloads.

② Furnished with (1) 3/4" NPT outlet in bottom (reversible for top feed). In order to obtain a 3/4" NPT outlet in top and bottom, add suffix letter "H" to type number with List Price adder.

③ Do not use as replacement interiors for NEMA Type 4 metallic enclosures. For replacement unit, order Type MMSK01 or MMSK02 and separate pilot light kit.

④ For switches that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.

## Now Available with the New 3RV2 Innovations MSP

## Class 11 - 3RV

Class 11 across the line manual starters and switches provide control for machinery where remote start stop control is not required.

**Class 11 - 3RV** manual starters are used for single and poly-phase motors up to 20HP @ 575V. Starters have bimetallic heater elements to provide class 10 overcurrent protection. Each starter has a fourth bimetallic strip that reacts only to the ambient temperature inside the control panel. This ambient compensation helps prevent the starter from nuisance tripping when the panel temperature is higher than the ambient temperature of the motor.

A built-in differential trip bar causes the starter to trip faster on a phase loss condition to help reduce motor damage.

Magnetic trip elements in each starter take the device off line when it senses current of 13 times the maximum FLA dial setting.

**Class 11 - 3RV** switches provide control for inherently protected motors. Typical applications include metal and woodworking machinery, grinders, power saws, conveyors, fans, pumps, blowers, textile and packaging machinery, and paper cutters.

Each switch is provided with magnetic trip elements which take the device off line when it senses current of 13 times the maximum switch rating.

**Class 11 - 3RV** manual starters can be used as Type E self-protected manual combination starters (up to 22 amps) per UL508 or as components in Group Installation per NEC 430.53. When using the Class 11 - 3RV as a manual combination starter upstream protection is not required.

**Class 11 - 3RV** controllers are available with low voltage protection which will automatically open the power poles when the voltage drops or the power is interrupted.

Controllers with the LVP option provide the OSHA requirements for protecting personnel from potential injury caused by the automatic start-up of machinery following a voltage drop or power interruption when low voltage protection is specified.

**Class 11 - 3RV** is available as Open style, or in NEMA 1, NEMA 7 & 9 or NEMA 7 & 9 / 3 & 4 enclosures.

Standard Features include:

- ON/OFF rotary handle with lockout and visible trip indication
- Adjustment dial for setting to motor FLA (Starters only)
- Low Voltage Protection (LVP) Option
- Short Circuit trip at 13 times the maximum setting of the FLA dial or rated current
- Ambient compensated up to 140°F
- Phase loss sensitivity
- Test trip function
- LVP Option Meets OSHA Requirements
- UL Listed
- CSA Certified



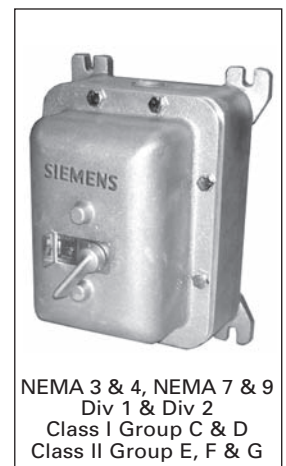
OPEN TYPE  
Starter



NEMA 1  
General Purpose




NEMA 7 & 9  
Div 1 & Div 2  
Class I Group C & D  
Class II Group E, F & G



NEMA 3 & 4, NEMA 7 & 9  
Div 1 & Div 2  
Class I Group C & D  
Class II Group E, F & G

# Starters and Switches, Class 11 - 3RV

## Selection

 <p>Class 11 Manual Motor Starter</p>	<p><b>Ordering Information</b></p> <ul style="list-style-type: none"> <li>▶ No heaters required.</li> <li>▶ Field Modification Kits see page 9/102.</li> <li>▶ Dimensions see page 9/139.</li> <li>▶ Wiring Diagrams see page 9/172.</li> <li>▶ For applications requiring a low voltage protection coil see table at right.</li> </ul>	<p><b>Low Voltage Protection Coil Table</b></p> <table border="1"> <thead> <tr> <th>60 Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr> <td>120V</td> <td>*F</td> </tr> <tr> <td>208V</td> <td>*D</td> </tr> <tr> <td>240V</td> <td>*G</td> </tr> <tr> <td>460V</td> <td>*H</td> </tr> </tbody> </table> <p>*Add corresponding letter to end of base Class 11 catalog number for low voltage protection coil with List Price adder.</p> <p>Note: The LVP option for Open type 3RV is available from the factory, please order separately from the field modification kits on page 9/103.</p> <p>The coil voltage should correspond with the line voltage.</p>	60 Hz Voltage	Letter	120V	*F	208V	*D	240V	*G	460V	*H
	60 Hz Voltage	Letter										
120V	*F											
208V	*D											
240V	*G											
460V	*H											

### Manual Starter—Class 11 - 3RV

FLA Adjustment Range <sup>①</sup>	Max HP						Enclosure							
	Single Phase HP Ratings		3-Phase HP Ratings				Open Type		NEMA 1 General Purpose		NEMA 7 & 9 Class I Groups C & D Class II Groups E, F & G		NEMA 3 & 4, NEMA 7 & 9 Watertight Class I Groups C & D Class II Groups E, F & G	
	115V	230V	200V	230V	460V	575V	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$
0.11-0.16	—	—	—	—	—	—	3RV2011-0AA10 <sup>②</sup>		11AD3B		11AD3H		11AD3W	
0.14-0.2	—	—	—	—	—	—	3RV2011-0BA10 <sup>②</sup>		11BD3B		11BD3H		11BD3W	
0.18-0.25	—	—	—	—	—	—	3RV2011-0CA10 <sup>②</sup>		11CD3B		11CD3H		11CD3W	
0.22-0.32	—	—	—	—	—	—	3RV2011-0DA10 <sup>②</sup>		11DD3B		11DD3H		11DD3W	
0.28-0.4	—	—	—	—	—	—	3RV2011-0EA10 <sup>②</sup>		11ED3B		11ED3H		11ED3W	
0.35-0.5	—	—	—	—	—	—	3RV2011-0FA10 <sup>②</sup>		11FD3B		11FD3H		11FD3W	
0.45-0.63	—	—	—	—	—	—	3RV2021-0GA10 <sup>②</sup>		11GD3B		11GD3H		11GD3W	
0.55-0.8	—	—	—	—	—	½	3RV2021-0HA10 <sup>②</sup>		11HD3B		11HD3H		11HD3W	
0.7-1	—	—	—	—	½	½	3RV2021-0JA10 <sup>②</sup>		11JD3B		11JD3H		11JD3W	
0.9-1.25	—	—	—	—	¾	¾	3RV2021-0KA10 <sup>②</sup>		11KD3B		11KD3H		11KD3W	
1.1-1.6	—	⅓	—	—	¾	1	3RV2021-1AA10 <sup>②</sup>		11LD3B		11LD3H		11LD3W	
1.4-2	—	⅓	—	—	1	1 ½	3RV2021-1BA10 <sup>②</sup>		11MD3B		11MD3H		11MD3W	
1.8-2.5	—	⅓	½	½	1 ½	1 ½	3RV2021-1CA10 <sup>②</sup>		11ND3B		11ND3H		11ND3W	
2.2-3.2	⅓	⅓	¾	¾	1 ½	2	3RV2021-1DA10 <sup>②</sup>		11PD3B		11PD3H		11PD3W	
2.8-4	⅓	⅓	¾	1	2	3	3RV2021-1EA10 <sup>②</sup>		11QD3B		11QD3H		11QD3W	
3.5-5	⅓	½	1	1	3	3	3RV2021-1FA10 <sup>②</sup>		11RD3B		11RD3H		11RD3W	
4.5-6.3	⅓	¾	1 ½	1 ½	5	5	3RV2021-1GA10 <sup>②</sup>		11SD3B		11SD3H		11SD3W	
5.5-8	⅓	1	2	2	5	5	3RV2021-1HA10 <sup>②</sup>		11TD3B		11TD3H		11TD3W	
7-10	½	1 ½	3	3	7 ½	10	3RV2021-1JA10 <sup>②</sup>		11UD3B		11UD3H		11UD3W	
9-12.5	½	2	3	3	7 ½	10	3RV2021-1KA10 <sup>②</sup>		11VD3B		11VD3H		11VD3W	
11-16	1	3	5	5	10	15 <sup>③</sup>	3RV2021-4AA10 <sup>②</sup>		11WD3B		11WD3H		11WD3W	
14-20	1 ½	3	5	7 ½	15	20 <sup>③</sup>	3RV2021-4BA10 <sup>②</sup>		11XD3B		11XD3H		11XD3W	
17-22	2	3	7 ½	7 ½	15	20 <sup>③</sup>	3RV2021-4CA10 <sup>②</sup>		11YD3B		11YD3H		11YD3W	
20-25	2 <sup>③</sup>	5 <sup>③</sup>	7 ½ <sup>③</sup>	7 ½ <sup>③</sup>	15 <sup>③</sup>	20 <sup>③</sup>	3RV2021-4DA10 <sup>②</sup>		11ZD3B		11ZD3H		11ZD3W	

### Manual Switch—Class 11 - 3RV

Rated Current <sup>①</sup>	Max HP						Enclosure							
	Single Phase HP Ratings		3-Phase HP Ratings				Open Type		NEMA 1 General Purpose		NEMA 7 & 9 Class I Groups C & D Class II Groups E, F & G		NEMA 3 & 4, NEMA 7 & 9 Watertight Class I Groups C & D Class II Groups E, F & G	
	115V	230V	200V	230V	460V	575V	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$
1	—	—	—	—	½ <sup>③</sup>	½ <sup>③</sup>	3RV2321-0JC10 <sup>②</sup>		111D3B		111D3H		111D3W	
5	⅓ <sup>③</sup>	⅓ <sup>③</sup>	1 <sup>③</sup>	1 <sup>③</sup>	3 <sup>③</sup>	3 <sup>③</sup>	3RV2321-1FC10 <sup>②</sup>		112D3B		112D3H		112D3W	
10	½ <sup>③</sup>	1 ½ <sup>③</sup>	3 <sup>③</sup>	3 <sup>③</sup>	7 ½ <sup>③</sup>	10 <sup>③</sup>	3RV2321-1JC10 <sup>②</sup>		113D3B		113D3H		113D3W	
20	1 ½ <sup>③</sup>	3 <sup>③</sup>	5 <sup>③</sup>	7 ½ <sup>③</sup>	15 <sup>③</sup>	20 <sup>③</sup>	3RV2321-4BC10 <sup>②</sup>		114D3B		114D3H		114D3W	
25	2 <sup>③</sup>	5 <sup>③</sup>	7 ½ <sup>③</sup>	7 ½ <sup>③</sup>	15 <sup>③</sup>	20 <sup>③</sup>	3RV2321-4DC10 <sup>②</sup>		115D3B		115D3H		115D3W	

① Instantaneous Magnetic Trip will occur at 13 times the maximum FLA dial setting or rated switch current.  
 ② Product Category: IEC

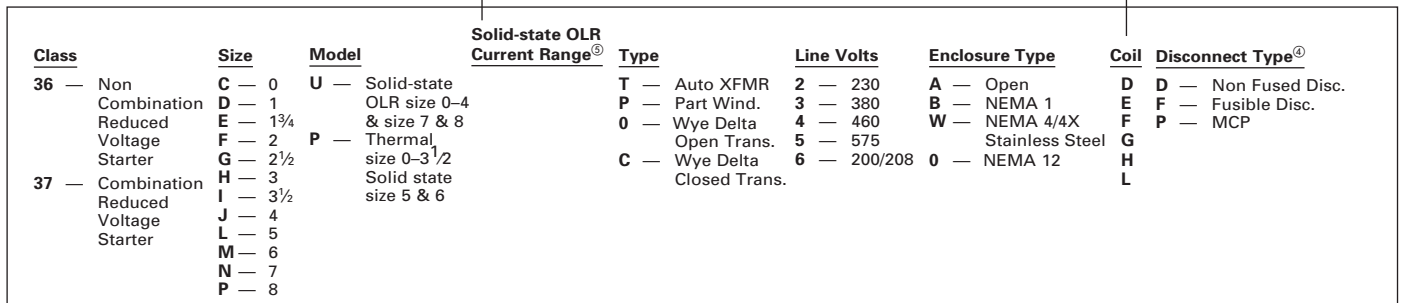
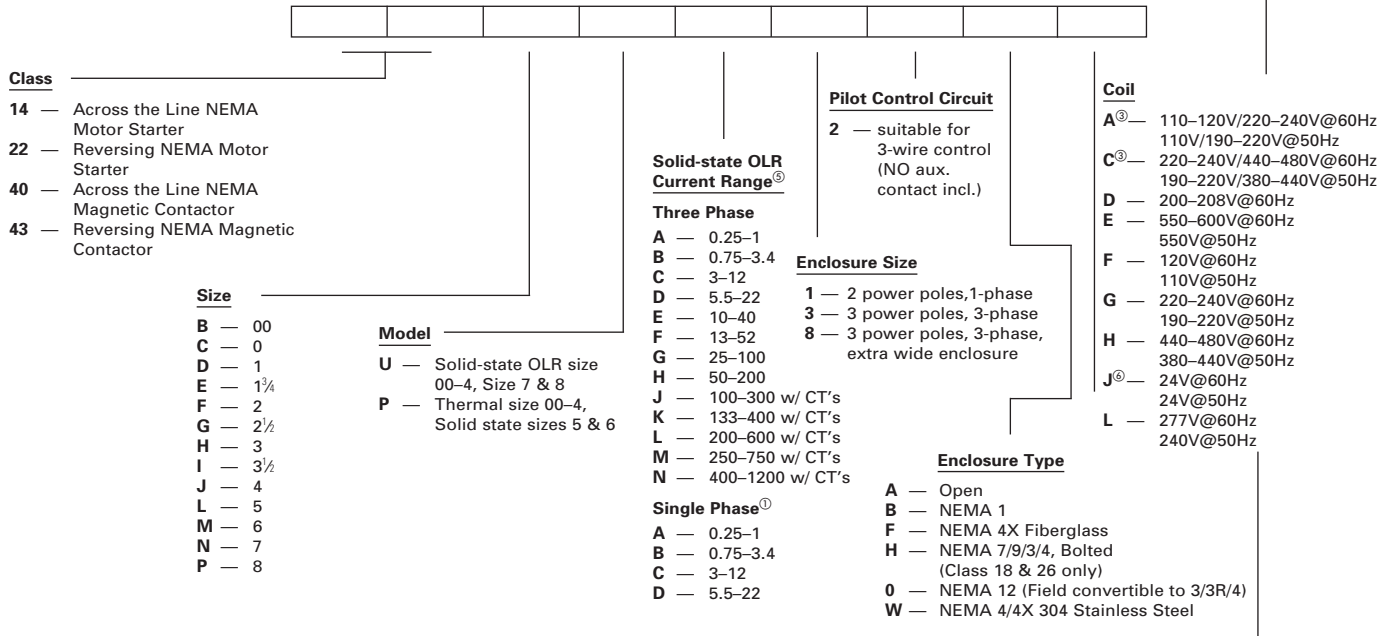
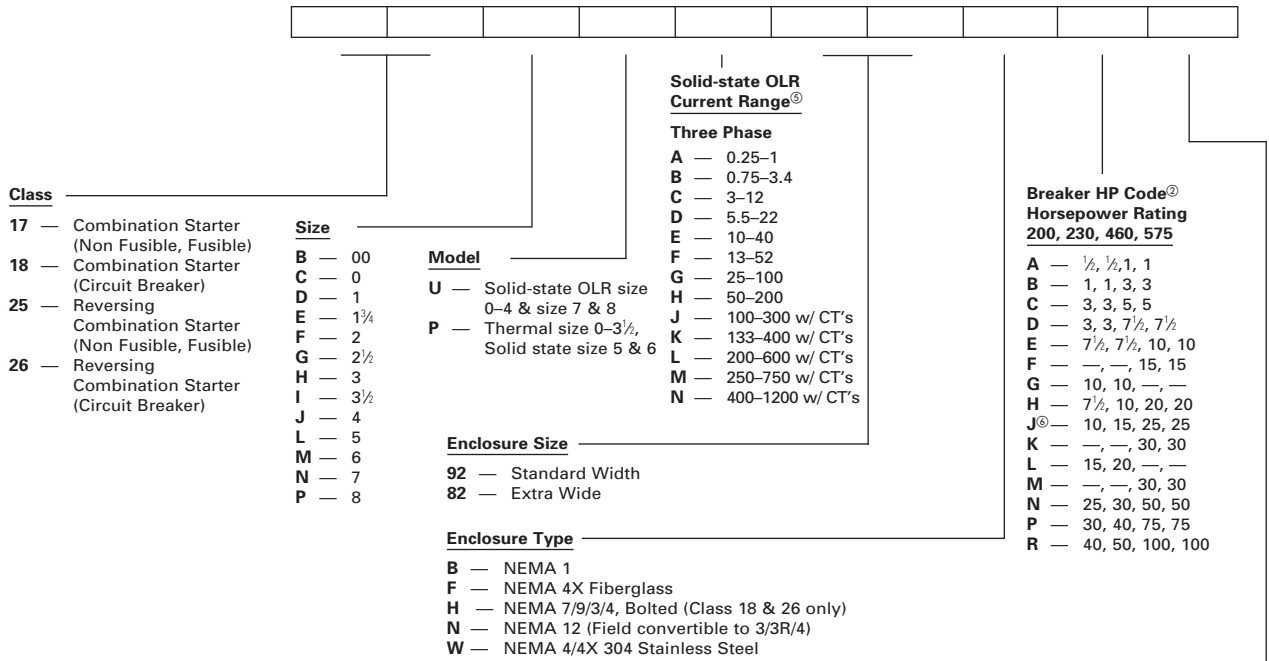
③ Shaded Ratings apply for Manual Motor Controllers Only! These Ratings do not apply as UL Listed Manual Combination Starters.

④ Add 1 to the end of the catalog number for 1/2 inch drain hole with plug and list price adder. Drain fitting not supplied, order separately XDB-2.



# Catalog Numbering System

## General



① Single phase solid-state OLR available on Class 14 Starters only.

② Not used on Class 17, 25 or with solid-state OLR versions.

③ Position used for solid-state OLR only.

④ Not available on sizes 5-8.

⑤ For Class 37 only.

## Features and Benefit

## General



Solid State Starter Class 14

## Standard Features

Size 00–4 magnetic starters include the following standard features:

- Rugged Industrial Design
- Half Sizes for Cost and Space Savings
- Dual Voltage, Dual Frequency Coils
- Solid State or Ambient Compensated Bimetal Overload Protection
- Wide Range of Accessories
- Easy Coil Access
- Overload Test Feature
- Straight Thru Wiring
- Gravity Dropout
- Large Silver Cadmium Contacts
- UL listed file #E14900 (class 14, 22, 30, 40 & 43)
- CSA certified file #LR 6535 (class 14, 22, 30, 40 & 43)

## Application

Heavy Duty starters are designed for across the line starting of single phase and polyphase motors.

These controls are available in NEMA Sizes 00 through 8. In addition to the usual NEMA Starter Sizes, Siemens offers three exclusive Half Sizes; 1¾, 2½ and 3½. These integral sizes offer the same rugged, industrial construction as our NEMA Sizes and ensure efficient operating performance. Half Sizes provide a real cost savings by cutting down on over capacity when NEMA Sizes exceed the motor ratings. All Siemens Heavy Duty controls, including our popular Half Sizes comply with applicable NEMA and UL tests.

All starters are supplied with a NO holding interlock that in conjunction with an appropriate pilot device will provide low voltage protection or release.

NEMA starters are ideal for applications requiring dependability and durability. Typical applications include use with machine tools, air conditioning equipment, material handling equipment, compressors, hoists and various production and industrial equipment as well as in demanding automotive applications.

Starters are available as an open type or in NEMA 1, 12/3/3R, 4 (painted), 4/4X (stainless), 4X (fiberglass), and 7 & 9 enclosures.

### Gravity Dropout

For added reliability, the gravity dropout of the armature and contacts is assisted by stainless steel springs which help provide quick, precise opening of the contacts.

### 45 Degree, Wedge Action Contacts

The 45 degree, wedge action contacts reduce tracking and provide faster arc quenching. The resulting self-cleaning and reduced contact bounce mean cooler operation and longer life for the large silver cadmium oxide contacts.

### Terminal Design

Control terminals are self-rising pressure type.

### Molded Coil

Magnetic coils are carefully wound and then sealed in epoxy. Encapsulation helps seal out moisture, promotes heat transfer and resists electrical, mechanical and thermal stresses.

### Dual Voltage/Frequency Coil

Starters are available with dual voltage, dual frequency coils. They are designed to operate on either 50 or 60 Hertz.

### Molded Stationary Contact Block

Thermoset materials resist arc tracking and the stresses of heat and severe impact.

### Field Modification Kits

All starters can be modified in the field with a complete range of accessories. These include pushbuttons, selector switches, pilot lights, auxiliary contacts and surge suppressors.

## Auxiliary Equipment

- NEMA starters are available with built-in START-STOP push buttons for 3-wire control or a HAND-OFF-AUTO selector switch for 2-wire control
- Field modifications such as auxiliary contacts, pilot lights, push buttons, selector switches, and fuse blocks are available to meet particular application requirements
- Normally opened or normally closed auxiliary power pole kits are available for Sizes 00 through 1¾
- Transformers can be ordered as either factory or field modifications. In some cases these may require a larger enclosure
- A full line of replacement parts are available including contact kits, coils, and overload relays

## Size 5 & 6 Starters Additional Features

- Solid State Overload (3RB type) Standard
- Latest technology in arc quenching to extend contactor life
- Wide variety of enclosures in all starter configurations

## Size 7 & 8 Starters Additional Features

- New Compact Design
- Can be mounted in any position
- Same coil voltage is AC or DC

# Features and Benefits

## Selection



ESP200™ Solid State Starter

ESP200™ starters combine the rugged NEMA contactors with a state of the art solid state overload that provides phase loss, phase unbalance ground fault protection. It offers the user greater motor protection and extended life in heavy duty applications. The ESP200™ ultimately results in a cost savings to the user.

### ESP200™ Solid State Overload Relays

Standard features provide Improved Starter Performance:

- True phase loss protection; trips within 3 seconds
- Phase unbalanced prevents motor running inefficiently
- Ground fault trip when selected
- Selectable trip class 5, 10, 20 or 30
- Reset trip can be selected Auto/Manual restart
- Easy to select and use, Dip Switch selectable
- Overload is self powered, no need for external power source

### Half Size Starters

Half-Size starters feature all the rugged performance characteristics of our NEMA rated starter sizes, but are fractionally sized to more closely match your exact motor rating. As a result, significant economic savings are made possible without sacrificing the reliability you expect from a heavy duty starter.

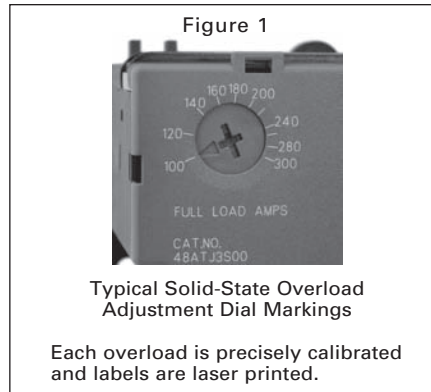
These additional starter sizes have the reserve capacity to handle occasional plugging and jogging applications without derating. Superior operating performance in heavy duty applications is assured by the large current carrying parts, not by derating the device.

Exclusive “half-sizes” save potentially hundreds, even thousands of dollars per project.

Using the table below, simply match the specific size starter to the horsepower rating of your motor. Every half-size starter saves you money—up to 31%.

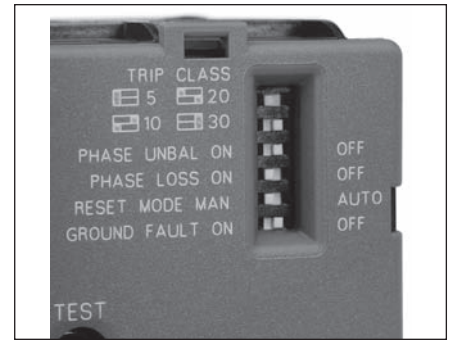
All “half-sizes” comply to applicable NEMA and UL standards.

### ESP200® FLA Adjustment Dial—Set the adjustment dial on the overload to the FLA of the motor.



Typical Solid-State Overload Adjustment Dial Markings

Each overload is precisely calibrated and labels are laser printed.



### DIP Switch Settings

Adjust DIP switch settings to the Trip Class desired 5, 10, 20, or 30.

- Set Phase Unbalance ON or OFF
- Set Phase Loss ON or OFF
- Set Reset to Manual or Automatic
- Set Ground Fault ON or OFF

### Savings for Siemens “Half-Size” Starters in NEMA 1 Enclosures, FVNR

Motor Size		Starter Size	Half Size	List Price \$	“Half-Size” Savings Over Next Full Size
230V	460V				
7½	10	1	—		—
10	15	—	1¾		31%
15	25	2	—		—
20	30	—	2½		20%
30	50	3	—		—
40	75	—	3½		13%
50	100	4	—		—

Standard Auxiliary Contacts			
Type	Size (3rd Character)	Configuration	Internal / External
All FVNR Starters & Contactors	B Thru E	1N.O.	Internal
	F Thru J	1N.O.	External
	L Thru M	2N.O., 2N.C.	External
	N Thru P	1N.O., 1N.C.	External

# Solid State Overload with Auto/Manual Reset, Class 14

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see pages 9/140 open and 9/157 enclosed.
- ▶ Wiring Diagrams see page 9/173.
- ▶ Replacement Parts see page 9/131.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 <sup>Ⓛ</sup>	A
200–208	D
220–240	G
277	L
220–240/440–480 <sup>Ⓛ</sup>	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Overload			Enclosure		NEMA 1		NEMA 4/4X Stainless <sup>Ⓛ</sup>		NEMA 4X Fiberglass		NEMA 7 & 9 NEMA 3 & 4		NEMA 12 NEMA 3/3R <sup>Ⓛ</sup>	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Open Type Standard Auxiliary Contacts <sup>Ⓛ</sup>	General Purpose	Watertight, Dust-tight, Corrosion Resistant Ⓛ = W for 304 Stainless Steel Ⓛ = X for 316 Stainless Steel	Watertight, Dust-tight Corrosion Resistant	Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	Industrial Use Weatherproof (Field Convertible to 3/3R)					
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
1/4	1/4	1/4	1/4	00	—	0.25–1	A	14BUA32A*	14BUB32B*	14BUC32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/2	1/2	1 1/2	2	00	—	0.75–3.4	A	14BUB32A*	14BUB32B*	14BUC32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1 1/2	1 1/2	2	—	00	—	3–12	A1	14BUC32A*	14BUC32B*	14BUC32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/2	1/2	1 1/2	2	0	—	0.25–1	A	14CUA32A*	14CUB32B*	14CUC32B*	14CUA32@*	14CUB32F*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*
1/2	1/2	1 1/2	2	0	—	0.75–3.4	A	14CUB32A*	14CUB32B*	14CUC32B*	14CUB32@*	14CUB32F*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*
2	2	5	5	0	—	3–12	A1	14CUC32A*	14CUC32B*	14CUC32B*	14CUC32@*	14CUC32F*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*	14CUC32H*
3	3	—	—	0	—	5.5–22	A1	14CUD32A*	14CUD32B*	14CUD32B*	14CUD32@*	14CUD32F*	14CUD32H*	14CUD32H*	14CUD32H*	14CUD32H*	14CUD32H*	14CUD32H*
1/2	1/2	1 1/2	2	1	—	0.25–1	A	14DUA32A*	14DUB32B*	14DUC32B*	14DUA32@*	14DUB32F*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*
1/2	1/2	1 1/2	2	1	—	0.75–3.4	A	14DUB32A*	14DUB32B*	14DUC32B*	14DUB32@*	14DUB32F*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*
2	2	5	5	1	—	3–12	A1	14DUC32A*	14DUC32B*	14DUC32B*	14DUC32@*	14DUC32F*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*	14DUC32H*
3	3	10	10	1	—	5.5–22	A1	14DUD32A*	14DUD32B*	14DUE32B*	14DUD32@*	14DUE32F*	14DUE32H*	14DUE32H*	14DUE32H*	14DUE32H*	14DUE32H*	14DUE32H*
7 1/2	7 1/2	—	—	1	—	10–40	A1	14DUE32A*	14DUE32B*	14DUE32B*	14DUE32@*	14DUE32F*	14DUE32H*	14DUE32H*	14DUE32H*	14DUE32H*	14DUE32H*	14DUE32H*
10	10	15	15	—	1 1/2	10–40	A1	14EUE32A*	14EUE32B*	14EUE32B*	14EUE32@*	14EUE32F*	14EUE32H*	14EUE32H*	14EUE32H*	14EUE32H*	14EUE32H*	14EUE32H*
10	15	25	25	2	—	13–52	B	14FUF32A*	14FUF32B*	14FUF32B*	14FUF32@*	14FUF32F*	14FUF32H*	14FUF32H*	14FUF32H*	14FUF32H*	14FUF32H*	14FUF32H*
15	20	30	30	—	2 1/2	25–100	B	14GUG32A*	14GUG32B*	14GUG32B*	14GUG32@*	14GUG32F*	14GUG32H*	14GUG32H*	14GUG32H*	14GUG32H*	14GUG32H*	14GUG32H*
25	30	50	50	3	—	25–100	B	14HUG32A*	14HUG32B*	14HUG32B*	14HUG32@*	14HUG32F*	14HUG32H*	14HUG32H*	14HUG32H*	14HUG32H*	14HUG32H*	14HUG32H*
30	40	75	75	—	3 1/2	50–200	B	14IUH32A*	14IUH32B*	14IUH32B*	14IUH32@*	14IUH32F*	14IUH32H*	14IUH32H*	14IUH32H*	14IUH32H*	14IUH32H*	14IUH32H*
40	50	100	100	4	—	50–200	B	14JUH32A*	14JUH32B*	14JUH32B*	14JUH32@*	14JUH32F*	14JUH32H*	14JUH32H*	14JUH32H*	14JUH32H*	14JUH32H*	14JUH32H*
75	100	200	200	5	—	55–250	—	14LPU32A*	14LPU32B*	14LPU32B*	14LPU32@*	—	—	14LPU32H*	14LPU32H*	14LPU32H*	14LPU32H*	14LPU32H*
150	200	400	400	6	—	160–630	—	14MPX32A*	14MPX32B*	14MPX32B*	14MPX32@*	—	—	—	—	14MPX32H*	14MPX32H*	14MPX32H*
—	300	600	600	7* <sup>Ⓛ</sup>	—	400–1220	A1+CT	14NUN32A*	14NUN32B*	14NUN32B*	14NUN32@*	—	—	—	—	14NUN32H*	14NUN32H*	14NUN32H*
—	450	900	900	8 <sup>Ⓛ</sup>	—	400–1220	A1+CT	14PUN32A*	14PUN32B*	14PUN32B*	14PUN32@*	—	—	—	—	14PUN32H*	14PUN32H*	14PUN32H*

### Open Type & Standard Width Enclosure, Single Phase, 2-Pole<sup>Ⓛ</sup>

Max Hp				Overload			Enclosure		NEMA 1		NEMA 4/4X Stainless <sup>Ⓛ</sup>		NEMA 4X Fiberglass		NEMA 7 & 9 NEMA 3 & 4		NEMA 12 NEMA 3/3R <sup>Ⓛ</sup>	
115 Volts	208/230 Volts	NEMA Size	Amp Range	Frame Size	Open Type Standard Auxiliary Contacts <sup>Ⓛ</sup>	General Purpose	Watertight, Dust-tight, Corrosion Resistant Ⓛ = W for 304 Stainless Steel Ⓛ = X for 316 Stainless Steel	Watertight, Dust-tight Corrosion Resistant	Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	Industrial Use Weatherproof (Field Convertible to 3/3R)								
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
1/4	1/4	0	0.75–3.4	A	14CUB12A*	14CUB12B*	14CUB12@*	14CUB12F*	14CUB12H*	14CUB12H*	14CUB12H*	14CUB12H*	14CUB12H*	14CUB12H*	14CUB12H*	14CUB12H*	14CUB12H*	
1/4	1/4	0	3–12	A1	14CUC12A*	14CUC12B*	14CUC12@*	14CUC12F*	14CUC12H*	14CUC12H*	14CUC12H*	14CUC12H*	14CUC12H*	14CUC12H*	14CUC12H*	14CUC12H*	14CUC12H*	
1	2	0	5.5–22	A1	14CUD12A*	14CUD12B*	14CUD12@*	14CUD12F*	14CUD12H*	14CUD12H*	14CUD12H*	14CUD12H*	14CUD12H*	14CUD12H*	14CUD12H*	14CUD12H*	14CUD12H*	
1/4	1/4	1	0.75–3.4	A	14DUB12A*	14DUB12B*	14DUB12@*	14DUB12F*	14DUB12H*	14DUB12H*	14DUB12H*	14DUB12H*	14DUB12H*	14DUB12H*	14DUB12H*	14DUB12H*	14DUB12H*	
1/4	1/2	1	3–12	A1	14DUC12A*	14DUC12B*	14DUC12@*	14DUC12F*	14DUC12H*	14DUC12H*	14DUC12H*	14DUC12H*	14DUC12H*	14DUC12H*	14DUC12H*	14DUC12H*	14DUC12H*	
1	2	1	5.5–22	A1	14DUD12A*	14DUD12B*	14DUD12@*	14DUD12F*	14DUD12H*	14DUD12H*	14DUD12H*	14DUD12H*	14DUD12H*	14DUD12H*	14DUD12H*	14DUD12H*	14DUD12H*	
3	7 1/2	2	25–100	B	14FUG12A*	14FUG12B*	14FUG12@*	14FUG12F*	14FUG12H*	14FUG12H*	14FUG12H*	14FUG12H*	14FUG12H*	14FUG12H*	14FUG12H*	14FUG12H*	14FUG12H*	
7 1/2	15	3	25–100	B	14HUG12A*	14HUG12B*	14HUG12@*	14HUG12F*	14HUG12H*	14HUG12H*	14HUG12H*	14HUG12H*	14HUG12H*	14HUG12H*	14HUG12H*	14HUG12H*	14HUG12H*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓛ Dual voltage coils not available in size 5–8 starters.

Ⓛ For conduit hubs and conversion instructions, see page 9/110.

Ⓛ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.


Ⓛ Enclosure is NEMA Type 4 (painted steel).

Ⓛ F coil 100–250V AC 50/60Hz, or DC, H coil 150–500V AC 50/60Hz, or DC

Ⓛ Only available F coil 100–250V AC 50/60Hz, or DC

# Solid State Overload with Auto/Manual Reset, Class 14

## Selection

 <p>NEMA 1</p>	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/157.</li> <li>▶ Wiring Diagrams see page 9/173.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
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200–208	D																					
220–240	G																					
277	L																					
220–240/440–480	C																					
440–480	H																					
575–600	E																					

### Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload Amp Range	Frame Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts					NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>Ⓛ</sup> Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel	NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	NEMA 12 NEMA 3/3R <sup>Ⓛ</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)	Catalog Number	List Price \$	Catalog Number	List Price \$
¼	¼	¼	½	00	—	0.25–1	A	14BUA82B*	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
½	¾	1½	2	00	—	0.75–3.4	A	14BUB82B*	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1½	1½	2	—	00	—	3–12	A1	14BUC82B*	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
¼	¼	¼	½	0	—	0.25–1	A	14CUA82B*	—	14CUA82@*	—	14CUA82H*	—	14CUA820*	—
½	¾	1½	2	0	—	0.75–3.4	A	14CUB82B*	—	14CUB82@*	—	14CUB82H*	—	14CUB820*	—
2	2	5	5	0	—	3–12	A1	14CUC82B*	—	14CUC82@*	—	14CUC82H*	—	14CUC820*	—
3	3	—	—	0	—	5.5–22	A1	14CUD82B*	—	14CUD82@*	—	14CUD82H*	—	14CUD820*	—
¼	¼	¼	½	1	—	0.25–1	A	14DUA82B*	—	14DUA82@*	—	14DUA82H*	—	14DUA820*	—
½	¾	1½	2	1	—	0.75–3.4	A	14DUB82B*	—	14DUB82@*	—	14DUB82H*	—	14DUB820*	—
2	2	5	5	1	—	3–12	A1	14DUC82B*	—	14DUC82@*	—	14DUC82H*	—	14DUC820*	—
3	3	10	10	1	—	5.5–22	A1	14DUD82B*	—	14DUD82@*	—	14DUD82H*	—	14DUD820*	—
7½	7½	—	—	1	—	10–40	A1	14DUE82B*	—	14DUE82@*	—	14DUE82H*	—	14DUE820*	—
10	10	15	15	—	1½	10–40	A1	14EUE82B*	—	14EUE82@*	—	14EUE82H*	—	14EUE820*	—
10	15	25	25	2	—	13–52	B	14FUF82B*	—	14FUF82@*	—	14FUF82H*	—	14FUF820*	—
15	20	30	30	—	2½	25–100	B	14GUG82B*	—	14GUG82@*	—	14GUG82H*	—	14GUG820*	—
25	30	50	50	3	—	25–100	B	14HUG82B*	—	14HUG82@*	—	14HUG82H*	—	14HUG820*	—
30	40	75	75	—	3½	50–200	B	14IUH82B*	—	14IUH82@*	—	14IUH82H*	—	14IUH820*	—

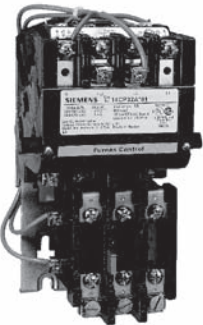
Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓛ For conduit hubs and conversion instructions, see page 9/110.



# Ambient Compensated Bimetal Overload with Manual and Auto Reset, Class 14

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Heater elements see page 9/124. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements.</li> <li>▶ Field Modification Kits page 9/104.</li> <li>▶ Factory Modifications page 9/119.</li> <li>▶ Dimensions see page 9/140 open and 9/157 enclosed.</li> <li>▶ Wiring Diagrams see page 9/173.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
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575–600	E																					

### Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type Standard Auxiliary Contacts <sup>ⓐ</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>ⓐ</sup> Watertight, Dust-tight Corrosion Resistant ⓐ = W for 304 Stainless ⓐ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R <sup>ⓐ</sup> Industrial Use Weatherproof	
							Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$
1½	1½	2	2	9	00	—	14BP32A*81	14BP32B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—		
3	3	5	5	18	0	—	14CP32A*81	14CP32B*81	14CP32@*81	—	14CP32F*81	—	14CP32H*81	—	14CP320*81	—		
7½	7½	10	10	27	1	—	14DP32A*81	14DP32B*81	14DP32@*81	—	14DP32F*81	—	14DP32H*81	—	14DP320*81	—		
10	10	15	15	40	—	1¾	14EP32A*81	14EP32B*81	14EP32@*81	—	14EP32F*81	—	14EP32H*81	—	14EP320*81	—		
10	15	25	25	45	2	—	14FP32A*81	14FP32B*81	14FP32@*81	—	14FP32F*81	—	14FP32H*81	—	14FP320*81	—		
15	20	30	30	60	—	2½	14GP32A*81	14GP32B*81	14GP32@*81	—	14GP32F*81	—	14GP32H*81	—	14GP320*81	—		
25	30	50	50	90	3	—	14HP32A*81	14HP32B*81	14HP32@*81	—	14HP32F*81	—	14HP32H*81	—	14HP320*81	—		
30	40	75	75	115	—	3½	14IP32A*81	14IP32B*81	14IP32@*81	—	14IP32F*81	—	14IP32H*81	—	14IP320*81	—		
40	50	100	100	135	4	—	14JG32A*81	14JG32B*81	14JG32@*81	—	14JG32F*81	—	14JG32H*81	—	14JG320*81	—		

### Open Type & Standard Width Enclosure, Single Phase, 2-Pole<sup>ⓐ</sup>

Max Hp		Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
115 Volts	208/230 Volts				Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>ⓐ</sup> Watertight, Dust-tight Corrosion Resistant ⓐ = W for 304 Stainless Steel ⓐ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups E, F & G Class III Bolted Enclosures		NEMA 12 NEMA 3/3R <sup>ⓐ</sup> Industrial Use Weatherproof	
					Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$
½	1	9	00	—	14BP12A*81	14BP12B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—		
1	2	18	0	—	14CP12A*81	14CP12B*81	14CP12@*81	—	14CP12F*81	—	14CP12H*81	—	14CP120*81	—		
2	3	27	1	—	14DP12A*81	14DP12B*81	14DP12@*81	—	14DP12F*81	—	14DP12H*81	—	14DP120*81	—		
3	5	35	1P	—	14EP12A*81	14EP12B*81	14EP12@*81	—	14EP12F*81	—	14EP12H*81	—	14EP120*81	—		
3	7½	45	2	—	14FP12A*81	14FP12B*81	14FP12@*81	—	14FP12F*81	—	14FP12H*81	—	14FP120*81	—		
5	10	60	—	2½	14GP12A*81	14GP12B*81	14GP12@*81	—	14GP12F*81	—	14GP12H*81	—	14GP120*81	—		

### Extra Wide Enclosure, 3-Phase, 3-Pole<sup>ⓐ</sup>

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>ⓐ</sup> Watertight, Dust-tight Corrosion Resistant ⓐ = W for 304 Stainless Steel ⓐ = X for 316 Stainless Steel		NEMA 7 & 9. NEMA 3 & 4 Div 1 and Div 2 Class II Groups E, F & G Bolted Enclosures		NEMA 12. NEMA 3/3R <sup>ⓐ</sup> Industrial Use Weatherproof Class III	
							Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
1½	1½	2	2	9	00	—	14BP82B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	
3	3	5	5	18	0	—	14CP82B*81	14CP82@*81	—	14CP82H*81	—	14CP820*81	—	
7½	7½	10	10	27	1	—	14DP82B*81	14DP82@*81	—	14DP82H*81	—	14DP820*81	—	
10	10	15	15	40	—	1¾	14EP82B*81	14EP82@*81	—	14EP82H*81	—	14EP820*81	—	
10	15	25	25	45	2	—	14FP82B*81	14FP82@*81	—	14FP82H*81	—	14FP820*81	—	
15	20	30	30	60	—	2½	14GP82B*81	14GP82@*81	—	14GP82H*81	—	14GP820*81	—	
25	30	50	50	90	3	—	14HP82B*81	14HP82@*81	—	14HP82H*81	—	14HP820*81	—	
30	40	75	75	115	—	3½	14IP82B*81	14IP82@*81	—	14IP82H*81	—	14IP820*81	—	

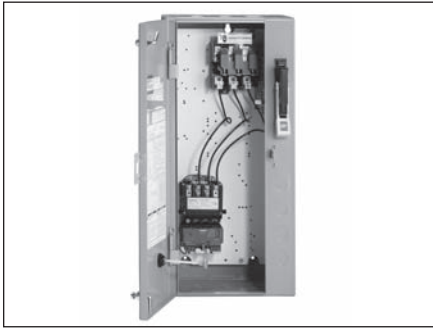
**Note:** Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All Starter Sizes carry one maximum Hp rating. **For higher Hp single phase motors, use 3-phase starters, wire and set per diagram on page 9/173.**

ⓐ To receive a single phase starter in an extra wide enclosure, order the enclosure kit from pg 16-91 and the open style starter from pg 16-14 or 16-16 as separate items.  
 ⓑ For conduit hubs and conversion instructions, see page 9/110.

ⓒ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.  
 ⓓ Standard Auxiliary Contacts, Same as Contactors, refer to page 9/60.

# Features and Benefits

## General



### Combination Starter Features

Combination starters include the following features:

- Manufactured with Cold Forming "TOX" Process
- Solid State Overloads Standard on Sizes 5-8
- Easy to Install
- Wide Range of Enclosure Types Available
- Heavy Duty Quarter Turns
- 100kA Short Circuit Current Rating when Protected with Class R Fuses to 600V or MCP to 480V
- Visible Blade Disconnect
- Industrial Type Disconnect Handle
- UL listed file #E185287 (class 17, 18, 25, 26 & 32)
- CSA certified file #LR 6535 (class 17, 18, 25, 26 & 32)

### Application

A combination starter meets National Electrical Code requirements for:

1. A means of providing short circuit motor protection with fused or breaker disconnection of line voltage.
2. A means of safeguarding personnel from contact with live parts and from accidental starting of machinery by disconnecting the motor and the controller.
3. A motor controller with overload protection.

Prewired combination starters eliminate the cost of wiring between separate disconnect and starter. Factory testing assures field performance. Combination starters also provide a more compact and attractive installation than separate units.

### Enclosure Types

Combination starters are available in NEMA 1, 12/3/3R/4 (painted), 4/4X

(stainless), 4X fiberglass and 7 & 9 enclosures. Enclosures protect personnel from contact with live parts and depending upon the construction, protect the control in varying degrees from physical damage and harmful atmospheres. All enclosures are supplied with corrosion resistant finishes.

### Heavy Duty Disconnect Switches

The disconnect switch that goes the distance in durability, performance and reliability has the following advantages:

- Visible blades for the highest level of safety
- Double break switching action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- More rugged positive action switch
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts
- Higher horsepower rating for design E high efficiency motors
- UL listed for IlSCO, Burndy and T&B crimp type lugs
- The 200A switch accepts up to 300 MCM versus 250 MCM wire size

Its rugged construction - with a high fault withstand rating of 100kA at 600 VAC when fused with class R rated fuses - meets the most stringent industry standards set forth by the automotive, petro-chemical, and pulp and paper industries. UL recognized and CSA certified, our disconnect switches are available either non-fusible or fusible with class R and class J fuse clips.



### Enclosure Kits for NEMA Combination Starters Description

You can assemble a non-stocked combination starter per your unanticipated needs in minutes. Say, for example, your customer needs a fusible combination starter that you don't have in stock. You need in now, but don't sweat it.

Simply start with the enclosure kit which has the handle preinstalled. You install the required starter and fusible disconnect, connect the power wire and you are finished. Within minutes, you have the required combination starter in your hands. No more waiting on the factory. You need it, you got it!

### What Is In It For You!

- **Reduce Lead-time** - What used to take days to get now takes minutes
- **Reduced Inventory** - Instead of stocking scores of various combination starters, simply stock a few enclosure kits, disconnect kits, circuit breaker kits and open starters. With these basic "building blocks" you virtually have hundreds of products on-hand
- **Quality** - The same high level of quality you have been accustomed to with our products will also be found in these new enclosure kits
- **UL Listed** - By correctly following the instructions included with the kits, the product you build is UL/CSA Listed

Refer to page 9/115 for more details.

### Siemens Type ETI Circuit Breaker

The ETI circuit breaker is a device designed specifically for application in motor circuits. The ETI is a magnetic only protective device designed to provide protection against short circuit current.

The instantaneous-only type ETI circuit breaker employs adjustable magnetic trip settings to allow broader application ranges and a higher degree of motor short circuit protection.




### Heavy Duty Starters

These combination starters use the same starters described in the heavy duty starter section of this catalog.

# Non-Fusible with Solid State Overload, Class 17

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ For Fusible Styles see page 9/20.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/159.</li> <li>▶ Wiring Diagrams see page 9/174.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240<sup>ⓐ</sup></td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480<sup>ⓐ</sup></td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 <sup>ⓐ</sup>	A	200–208	D	220–240	G	277	L	220–240/440–480 <sup>ⓐ</sup>	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
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575–600	E																					

### Standard Width Enclosure, 3 Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure								
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>ⓐ</sup> Watertight, Dust-tight, Corrosion Resistant <sup>ⓐ</sup> = W for 304 Stainless Steel <sup>ⓐ</sup> = X for 316 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R <sup>ⓑ</sup> , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight					
										Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/8	1/8	1/8	1/8	0	—	0.25–1	A	30	17CUA92B*		17CUA92@*		17CUA92F*		17CUA92N*		
1/4	3/8	1 1/2	2	0	—	0.75–3.4	A	30	17CUB92B*		17CUB92@*		17CUB92F*		17CUB92N*		
2	2	5	5	0	—	3–12	A1	30	17CUC92B*		17CUC92@*		17CUC92F*		17CUC92N*		
3	3	—	—	0	—	5.5–22	A1	30	17CUD92B*		17CUD92@*		17CUD92F*		17CUD92N*		
1/2	1/2	1/2	1/2	1	—	0.25–1	A	30	17DUA92B*		17DUA92@*		17DUA92F*		17DUA92N*		
1/2	3/4	1 1/2	2	1	—	0.75–3.4	A	30	17DUB92B*		17DUB92@*		17DUB92F*		17DUB92N*		
2	2	5	5	1	—	3–12	A1	30	17DUC92B*		17DUC92@*		17DUC92F*		17DUC92N*		
3	3	10	10	1	—	5.5–22	A1	30	17DUD92B*		17DUD92@*		17DUD92F*		17DUD92N*		
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	17DUE92B*		17DUE92@*		17DUE92F*		17DUE92N*		
10	10	15	15	—	1 1/2	10–40	A1	60	17EUE92B*		17EUE92@*		17EUE92F*		17EUE92N*		
10	15	25	25	2	—	13–52	B	60	17FUF92B*		17FUF92@*		17FUF92F*		17FUF92N*		
15	20	30	30	—	2 1/2	25–100	B	100 <sup>ⓐ</sup>	17GUG92B*		17GUG92@*		17GUG92F*		17GUG92N*		
20 <sup>ⓐ</sup>	25 <sup>ⓐ</sup>	50	50	3	—	25–100	B	100	17HUG92B*		17HUG92@*		17HUG92F*		17HUG92N*		
30	40	75	75	—	3 1/2	50–200	B	200	17IUH92B*		17IUH92@*		17IUH92F*		17IUH92N*		
40	50	100	100	4	—	50–200	B	200	17JUH92B*		17JUH92@*		17JUH92F*		17JUH92N*		
75	100	200	200	5	—	55–250	—	400 <sup>ⓐ</sup>	17LPU92B*		17LPU92E* <sup>ⓑ</sup>		—	—	17LPU92N*		
150	200	400	400	6	—	160–630	—	600	17MPX92B*		17MPX92E* <sup>ⓑ</sup>		—	—	17MPX92N*		
—	300	600	600	7 <sup>ⓐ</sup>	—	400–1220	A1+CT	1200	17NUN92B*		—	—	—	—	17NUN92N*		
—	450	900	900	8 <sup>ⓐ</sup>	—	400–1220	A1+CT	1600	17PUN92B*		—	—	—	—	17PUN92N*		

**Note:** All starter sizes carry one maximum Hp rating (per the National Electric Code).

- ⓐ Dual voltage coils not available in starter sizes 5–8.
- ⓑ For conduit hubs and conversion instructions, see page 9/110.
- ⓒ For 60A disconnect, order fusible cat. no. page 9/20.


- ⓓ For 25 HP and 200A disconnect, order fusible cat. no. page 9/20.
- ⓔ For 30HP and 200A disconnect, order fusible cat. no. page 9/20.
- ⓕ For 600A disconnect, order fusible cat. no. page 9/20.
- ⓖ Enclosure is NEMA Type 4 (painted steel).

- ⓗ F coil 100–250V AC 50/60Hz, or DC, H coil 150–500V AC 50/60Hz, or DC
- ⓙ Only available F coil 100–250V AC 50/60Hz, or DC



# Non-Fusible with Solid State Overload, Class 17

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ For Fusible Styles see page 9/21.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/159.</li> <li>▶ Wiring Diagrams see page 9/174.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil Table</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">60Hz Voltage</th> <th style="text-align: left;">Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240<sup>Ⓢ</sup></td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480<sup>Ⓢ</sup></td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 <sup>Ⓢ</sup>	A	200–208	D	220–240	G	277	L	220–240/440–480 <sup>Ⓢ</sup>	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
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220–240/440–480 <sup>Ⓢ</sup>	C																					
440–480	H																					
575–600	E																					

### Extra Wide Enclosure, 3-Phase, 3-Pole

Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>Ⓢ</sup> Watertight, Dust-tight, Corrosion Resistant Ⓢ = W for 304 Stainless Steel Ⓢ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R <sup>Ⓢ</sup> , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1/2	1/2	0	—	0.25–1	A	30	17CUA82B*		17CUA82@*		17CUA82N*	
1/2	1/2	1 1/2	2	0	—	0.75–3.4	A	30	17CUB82B*		17CUB82@*		17CUB82N*	
2	2	5	5	0	—	3–12	A1	30	17CUC82B*		17CUC82@*		17CUC82N*	
3	3	—	—	0	—	5.5–22	A1	30	17CUD82B*		17CUD82@*		17CUD82N*	
1/2	1/2	1/2	1/2	1	—	0.25–1	A	30	17DUA82B*		17DUA82@*		17DUA82N*	
1/2	1/2	1 1/2	2	1	—	0.75–3.4	A	30	17DUB82B*		17DUB82@*		17DUB82N*	
2	2	5	5	1	—	3–12	A1	30	17DUC82B*		17DUC82@*		17DUC82N*	
3	3	10	10	1	—	5.5–22	A1	30	17DUD82B*		17DUD82@*		17DUD82N*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	17DUE82B*		17DUE82@*		17DUE82N*	
10	10	15	15	—	1 1/4	10–40	A1	60	17EUE82B*		17EUE82@*		17EUE82N*	
10	15	25	25	2	—	13–52	B	60	17FUF82B*		17FUF82@*		17FUF82N*	
15	20	30	30	—	2 1/2	25–100	B	100 <sup>Ⓢ</sup>	17GUG82B*		17GUG82@*		17GUG82N*	
20 <sup>Ⓢ</sup>	25 <sup>Ⓢ</sup>	50	50	3	—	25–100	B	100	17HUG82B*		17HUG82@*		17HUG82N*	

**Note:** All starter sizes carry one maximum Hp rating (per the National Electric Code).

<sup>Ⓢ</sup> For conduit hubs and conversion instructions, see page 9/110.


<sup>Ⓢ</sup> For 60A disconnect, order fusible cat. no. page 9/21.

<sup>Ⓢ</sup> For 25 HP and 200A disconnect, order fusible cat. no. page 9/21.

<sup>Ⓢ</sup> For 30HP and 200A disconnect, order fusible cat. no. page 9/21.

# Non-Fusible with Ambient Compensated Bimetal Overload, Class 17

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Heater elements see page 9/124. (3 required)</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/159.</li> <li>▶ Wiring Diagrams see page 9/174.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240<sup>①</sup></td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480<sup>①</sup></td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 <sup>①</sup>	A	200–208	D	220–240	G	277	L	220–240/440–480 <sup>①</sup>	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
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220–240/440–480 <sup>①</sup>	C																					
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575–600	E																					

### Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant Weatherproof		NEMA 12, NEMA 3/3R, <sup>①</sup> NEMA 4 Painted Industrial Use Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
3	3	5	5	0	—	30	17CP92B*81		17CP92@*81		17CP92F*81		17CP92N*81	
7½ <sup>③</sup>	7½ <sup>③</sup>	10	10	1	—	30	17DP92B*81		17DP92@*81		17DP92F*81		17DP92N*81	
10	10	15	15	—	1¾	60	17EP92B*81		17EP92@*81		17EP92F*81		17EP92N*81	
10	15	25	25	2	—	60	17FP92B*81		17FP92@*81		17FP92F*81		17FP92N*81	
15	20	30	30	—	2½	100	17GP92B*81		17GP92@*81		17GP92F*81		17GP92N*81	
25 <sup>②</sup>	30 <sup>②</sup>	50	50	3	—	100	17HP92B*81		17HP92@*81		17HP92F*81		17HP92N*81	
30	40	75	75	—	3½	200	17IP92B*81		17IP92@*81		17IP92F*81		17IP92N*81	
40	50	100	100	4	—	200	17JP92B*81		17JP92@*81		17JP92F*81		17JP92N*81	

### Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, <sup>①</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight			
Catalog Number	List Price \$	Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
3	3	5	5	0	—	30	17CP82B*81		17CP82@*81		17CP82F*81		17CP82N*81	
7½ <sup>③</sup>	7½ <sup>③</sup>	10	10	1	—	30	17DP82B*81		17DP82@*81		17DP82F*81		17DP82N*81	
10	10	15	15	—	1¾	60	17EP82B*81		17EP82@*81		17EP82F*81		17EP82N*81	
10	15	25	25	2	—	60	17FP82B*81		17FP82@*81		17FP82F*81		17FP82N*81	
15	20	30	30	—	2½	100	17GP82B*81		17GP82@*81		17GP82F*81		17GP82N*81	
25 <sup>②</sup>	30 <sup>②</sup>	50	50	3	—	100	17HP82B*81		17HP82@*81		17HP82F*81		17HP82N*81	

### Standard Width Enclosure, Single Phase, (Catalog Numbers are three phase, wire for single phase in the field)

Max Hp		NEMA Size	Half Size	Disc Amp Rating	Enclosure							
115 Volts	208/230 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R, <sup>①</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1	2	0	—	30	17CP92B*81		17CP92@*81		17CP92F*81		17CP92N*81	
2	3	1	—	30	17DP92B*81		17DP92@*81		17DP92F*81		17DP92N*81	
3	5	1P	—	60	17EP92B*81		17EP92@*81		17EP92F*81		17EP92N*81	
3	7½	2	—	60	17FP92B*81		17FP92@*81		17FP92F*81		17FP92N*81	
5	10	—	2½	100	17GP92B*81		17GP92@*81		17GP92F*81		17GP92N*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① For conduit hubs and conversion instructions, see page 9/110.

② For 60A disc, order fusible cat. no. page 9/22.  
③ For 200A disc, order fusible cat. no. page 9/22.

# Fusible with Solid State Overload, Class 17

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/159.
- ▶ Wiring Diagrams see page 9/174.
- ▶ Replacement Parts see page 9/131.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 <sup>Ⓣ</sup>	A
200–208	D
220–240	G
277	L
220–240/440–480 <sup>Ⓣ</sup>	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Standard Width Enclosure, 3-Phase, 3-Pole<sup>Ⓢ</sup>

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Fuse Clip Amp/Volts	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size			NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>Ⓣ</sup> Watertight, Dust-tight, Corrosion Resistant Ⓣ = W for 304 Stainless Steel Ⓣ = X for 316 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R <sup>Ⓣ</sup> , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight				
										Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	—	—	0	—	0.25–1	A	30	30A/250V	17CUA92B*10		17CUA92@*10		17CUA92F*10		17CUA92N*10	
—	—	1/2	1/2	0	—	0.25–1	A	30	30A/600V	17CUA92B*11		17CUA92@*11		17CUA92F*11		17CUA92N*11	
1/2	3/4	—	—	0	—	0.75–3.4	A	30	30A/250V	17CUB92B*10		17CUB92@*10		17CUB92F*10		17CUB92N*10	
—	—	1 1/2	2	0	—	0.75–3.4	A	30	30A/600V	17CUB92B*11		17CUB92@*11		17CUB92F*11		17CUB92N*11	
2	2	—	—	0	—	3–12	A1	30	30A/250V	17CUC92B*10		17CUC92@*10		17CUC92F*10		17CUC92N*10	
—	—	5	5	0	—	3–12	A1	30	30A/600V	17CUC92B*11		17CUC92@*11		17CUC92F*11		17CUC92N*11	
3	3	—	—	0	—	5.5–22	A1	30	30A/250V	17CUD92B*10		17CUD92@*10		17CUD92F*10		17CUD92N*10	
1/2	1/2	—	—	1	—	0.25–1	A	30	30A/250V	17DUA92B*10		17DUA92@*10		17DUA92F*10		17DUA92N*10	
—	—	1/2	1/2	1	—	0.25–1	A	30	30A/600V	17DUA92B*11		17DUA92@*11		17DUA92F*11		17DUA92N*11	
1/2	3/4	—	—	1	—	0.75–3.4	A	30	30A/250V	17DUB92B*10		17DUB92@*10		17DUB92F*10		17DUB92N*10	
—	—	1 1/2	2	1	—	0.75–3.4	A	30	30A/600V	17DUB92B*11		17DUB92@*11		17DUB92F*11		17DUB92N*11	
2	2	—	—	1	—	3–12	A1	30	30A/250V	17DUC92B*10		17DUC92@*10		17DUC92F*10		17DUC92N*10	
—	—	5	5	1	—	3–12	A1	30	30A/600V	17DUC92B*11		17DUC92@*11		17DUC92F*11		17DUC92N*11	
3	3	—	—	1	—	5.5–22	A1	30	30A/250V	17DUD92B*10		17DUD92@*10		17DUD92F*10		17DUD92N*10	
—	—	10	10	1	—	5.5–22	A1	30	30A/600V	17DUD92B*11		17DUD92@*11		17DUD92F*11		17DUD92N*11	
7 1/2	7 1/2	—	—	1	—	10–40	A1	30	30A/250V	17DUE92B*10		17DUE92@*10		17DUE92F*10		17DUE92N*10	
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	60A/250V	17DUE92B*12		17DUE92@*12		17DUE92F*12		17DUE92N*12	
—	—	15	15	—	1 1/2	10–40	A1	60	60A/600V	17EUE92B*13		17EUE92@*13		17EUE92F*13		17EUE92N*13	
10	10	—	—	—	1 1/2	10–40	A1	60	60A/250V	17EUE92B*12		17EUE92@*12		17EUE92F*12		17EUE92N*12	
10	15	—	—	2	—	13–52	B	60	60A/250V	17FUF92B*12		17FUF92@*12		17FUF92F*12		17FUF92N*12	
—	—	25	25	2	—	13–52	B	60	60A/600V	17FUF92B*13		17FUF92@*13		17FUF92F*13		17FUF92N*13	
—	—	—	30	—	2 1/2	25–100	B	60	60A/600V	17GUG92B*13		17GUG92@*13		17GUG92F*13		17GUG92N*13	
—	—	30	—	—	2 1/2	25–100	B	100	100A/600V	17GUG92B*15		17GUG92@*15		17GUG92F*15		17GUG92N*15	
15	20	—	—	—	2 1/2	25–100	B	100	100A/250V	17GUG92B*14		17GUG92@*14		17GUG92F*14		17GUG92N*14	
20	25	—	—	3	—	25–100	B	100	100A/250V	17HUG92B*14		17HUG92@*14		17HUG92F*14		17HUG92N*14	
—	—	50	50	3	—	25–100	B	100	100A/600V	17HUG92B*15		17HUG92@*15		17HUG92F*15		17HUG92N*15	
25	30	—	—	3	—	25–100	B	200	200A/250V	17HUG92B*16		17HUG92@*16		17HUG92F*16		17HUG92N*16	
30	40	—	—	—	3 1/2	50–200	B	200	200A/250V	17IUH92B*16		17IUH92@*16		17IUH92F*16		17IUH92N*16	
—	—	75	75	—	3 1/2	50–200	B	200	200A/600V	17IUH92B*17		17IUH92@*17		17IUH92F*17		17IUH92N*17	
40	50	—	—	4	—	50–200	B	200	200A/250V	17JUH92B*16		17JUH92@*16		17JUH92F*16		17JUH92N*16	
—	—	100	100	4	—	50–200	B	200	200A/600V	17JUH92B*17		17JUH92@*17		17JUH92F*17		17JUH92N*17	
75	100	—	—	5	—	55–250	—	400	400A/250V	17LPU92B*18		17LPU92@*18		—	—	17LPU92N*18	
—	100	—	—	5	—	55–250	—	600	600A/250V <sup>Ⓣ</sup>	17LPU92B*20		17LPU92@*20		—	—	17LPU92N*20	
—	—	125	5	—	—	55–250	—	200	200A/600V	17LPU92B*17		17LPU92@*17		—	—	17LPU92N*17	
—	—	200	5	—	—	55–250	—	400	400A/600V	17LPU92B*19		17LPU92@*19		—	—	17LPU92N*19	
—	—	200	5	—	—	55–250	—	600	600A/600V <sup>Ⓣ</sup>	17LPU92B*21		17LPU92@*21		—	—	17LPU92N*21	
150	200	—	—	6	—	160–630	—	600	600A/250V	17MPX92B*20		17MPX92@*20		—	—	17MPX92N*20	
—	—	400	400	6	—	160–630	—	600	600A/600V	17MPX92B*21		17MPX92@*21		—	—	17MPX92N*21	
—	—	400	400	6	—	160–630	—	800	800A/600V	17MPX92B*23		17MPX92@*23		—	—	17MPX92N*23	
—	—	600	600	7 <sup>Ⓣ</sup>	—	400–1220	A1+CT	1200	1200A/600V	17NUN92B*24		—	—	—	—	17NUN92N*24	
—	—	900	900	8 <sup>Ⓣ</sup>	—	400–1220	A1+CT	1600	1600A/600V	17PUN92B*25		—	—	—	—	17PUN92N*25	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).


- Ⓣ Dual voltage coils not available in starter sizes 5–8.
- Ⓣ For conduit hubs and conversion instructions, see page 9/110.

- Ⓣ Use Class J fuses only.
- Ⓣ Enclosure is NEMA Type 4 (painted steel).
- Ⓣ Single phase wiring page 9/173.
- Ⓣ F coil 100–250V AC 50/60Hz, or DC, H coil 150–500V AC 50/60Hz, or DC

Ⓣ Only available  
F coil 100–250V AC 50/60Hz, or DC

# Fusible with Solid State Overload, Class 17

## Selection

	<b>Ordering Information</b>	<b>Coil Table</b>																			
	<ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/159.</li> <li>▶ Wiring Diagrams see page 9/174.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600
60Hz Voltage	Letter																				
24	J																				
120	F																				
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200–208	D																				
220–240	G																				
277	L																				
220–240/440–480	C																				
440–480	H																				
575–600	E																				

### Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Fuse Clip Amp/Volts	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size			NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>Ⓞ</sup> Watertight, Dust-tight, Ⓜ = W for 304 Stainless Steel Ⓧ = X for 316 Stainless Steel	NEMA 12, NEMA 3/3R <sup>Ⓞ</sup> , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	Catalog Number	List Price \$	Catalog Number
1/2	1/2	—	—	0	—	0.25–1	A	30	30A/250V	17CUA82B*10		17CUA82@*10		17CUA82N*10	
—	—	1/2	1/2	0	—	0.25–1	A	30	30A/600V	17CUA82B*11		17CUA82@*11		17CUA82N*11	
1/2	3/4	—	—	0	—	0.75–3.4	A	30	30A/250V	17CUB82B*10		17CUB82@*10		17CUB82N*10	
—	—	1 1/2	2	0	—	0.75–3.4	A	30	30A/600V	17CUB82B*11		17CUB82@*11		17CUB82N*11	
2	2	—	—	0	—	3–12	A1	30	30A/250V	17CUC82B*10		17CUC82@*10		17CUC82N*10	
—	—	5	5	0	—	3–12	A1	30	30A/600V	17CUC82B*11		17CUC82@*11		17CUC82N*11	
3	3	—	—	0	—	5.5–22	A1	30	30A/250V	17CUD82B*10		17CUD82@*10		17CUD82N*10	
1/2	1/2	—	—	1	—	0.25–1	A	30	30A/250V	17DUA82B*10		17DUA82@*10		17DUA82N*10	
—	—	1/2	1/2	1	—	0.25–1	A	30	30A/600V	17DUA82B*11		17DUA82@*11		17DUA82N*11	
1/2	3/4	—	—	1	—	0.75–3.4	A	30	30A/250V	17DUB82B*10		17DUB82@*10		17DUB82N*10	
—	—	1 1/2	2	1	—	0.75–3.4	A	30	30A/600V	17DUB82B*11		17DUB82@*11		17DUB82N*11	
2	2	—	—	1	—	3–12	A1	30	30A/250V	17DUC82B*10		17DUC82@*10		17DUC82N*10	
—	—	5	5	1	—	3–12	A1	30	30A/600V	17DUC82B*11		17DUC82@*11		17DUC82N*11	
3	3	—	—	1	—	5.5–22	A1	30	30A/250V	17DUD82B*10		17DUD82@*10		17DUD82N*10	
—	—	10	10	1	—	5.5–22	A1	30	30A/600V	17DUD82B*11		17DUD82@*11		17DUD82N*11	
5	5	—	—	1	—	10–40	A1	30	30A/250V	17DUE82B*10		17DUE82@*10		17DUE82N*10	
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	60A/250V	17DUE82B*12		17DUE82@*12		17DUE82N*12	
—	—	15	15	—	1 1/2	10–40	A1	60	60A/600V	17EUE82B*13		17EUE82@*13		17EUE82N*13	
10	10	—	—	—	1 1/2	10–40	A1	60	60A/250V	17EUE82B*12		17EUE82@*12		17EUE82N*12	
10	15	—	—	2	—	13–52	B	60	60A/250V	17FUF82B*12		17FUF82@*12		17FUF82N*12	
—	—	25	25	2	—	13–52	B	60	60A/600V	17FUF82B*13		17FUF82@*13		17FUF82N*13	
—	—	—	30	—	2 1/2	25–100	B	60	60A/600V	17GUG82B*13		17GUG82@*13		17GUG82N*13	
—	—	30	—	—	2 1/2	25–100	B	100	100A/600V	17GUG82B*15		17GUG82@*15		17GUG82N*15	
15	20	—	—	—	2 1/2	25–100	B	100	100A/250V	17GUG82B*14		17GUG82@*14		17GUG82N*14	
20	25	—	—	3	—	25–100	B	100	100A/250V	17HUG82B*14		17HUG82@*14		17HUG82N*14	
—	—	50	50	3	—	25–100	B	100	100A/600V	17HUG82B*15		17HUG82@*15		17HUG82N*15	
25	30	—	—	3	—	25–100	B	200	200A/250V	17HUG82B*16		17HUG82@*16		17HUG82N*16	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓞ For conduit hubs and conversion instructions, see page 9/110.

# Fusible with Ambient Compensated Bimetal Overload, Class 17

## Selection



Ordering Information	Coil Table																				
<ul style="list-style-type: none"> <li>► Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>► Heater elements see page 9/124. (3 required)</li> <li>► Field Modification Kits see page 9/104.</li> <li>► Factory Modifications see page 9/119.</li> <li>► Dimensions see page 9/159.</li> <li>► Wiring Diagrams see page 9/174.</li> <li>► Replacement Parts see page 9/131.</li> <li>► For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.</li> </ul>	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
60Hz Voltage	Letter																				
24	J																				
120	F																				
110–120/220–240	A																				
200–208	D																				
220–240	G																				
277	L																				
220–240/440–480	C																				
440–480	H																				
575–600	E																				

### Standard Width Enclosure, 3-Phase, 3-Pole<sup>②</sup>

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Size Amps/Volts	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts					NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R, <sup>①</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$					Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
3	3	—	—	0	—	30	30A/250V	17CP92B*1081	17CP92@*1081	17CP92F*1081	17CP92N*1081	17CP92B*1181	17CP92@*1181	17CP92F*1181	17CP92N*1181
—	—	5	5	0	—	30	30A/600V	17CP92B*1181	17CP92@*1181	17CP92F*1181	17CP92N*1181	17CP92B*1181	17CP92@*1181	17CP92F*1181	17CP92N*1181
5	5	—	—	1	—	30	30A/250V	17DP92B*1081	17DP92@*1081	17DP92F*1081	17DP92N*1081	17DP92B*1181	17DP92@*1181	17DP92F*1181	17DP92N*1181
—	—	10	10	1	—	30	30A/600V	17DP92B*1181	17DP92@*1181	17DP92F*1181	17DP92N*1181	17DP92B*1281	17DP92@*1281	17DP92F*1281	17DP92N*1281
7½	7½	—	—	1	—	60	60A/250V	17DP92B*1281	17DP92@*1281	17DP92F*1281	17DP92N*1281	17DP92B*1281	17DP92@*1281	17DP92F*1281	17DP92N*1281
10	10	—	—	—	1¼	60	60A/250V	17EP92B*1281	17EP92@*1281	17EP92F*1281	17EP92N*1281	17EP92B*1381	17EP92@*1381	17EP92F*1381	17EP92N*1381
—	—	15	15	—	1¼	60	60A/600V	17EP92B*1381	17EP92@*1381	17EP92F*1381	17EP92N*1381	17EP92B*1381	17EP92@*1381	17EP92F*1381	17EP92N*1381
10	15	—	—	2	—	60	60A/250V	17FP92B*1281	17FP92@*1281	17FP92F*1281	17FP92N*1281	17FP92B*1381	17FP92@*1381	17FP92F*1381	17FP92N*1381
—	—	25	25	2	—	60	60A/600V	17FP92B*1381	17FP92@*1381	17FP92F*1381	17FP92N*1381	17FP92B*1381	17FP92@*1381	17FP92F*1381	17FP92N*1381
—	—	—	30	—	2½	60	60A/600V	17GP92B*1381	17GP92@*1381	17GP92F*1381	17GP92N*1381	17GP92B*1581	17GP92@*1581	17GP92F*1581	17GP92N*1581
—	—	30	—	—	2½	100	100A/600V	17GP92B*1581	17GP92@*1581	17GP92F*1581	17GP92N*1581	17GP92B*1481	17GP92@*1481	17GP92F*1481	17GP92N*1481
15	20	—	—	—	2½	100	100A/250V	17GP92B*1481	17GP92@*1481	17GP92F*1481	17GP92N*1481	17GP92B*1481	17GP92@*1481	17GP92F*1481	17GP92N*1481
20	25	—	—	3	—	100	100A/250V	17HP92B*1481	17HP92@*1481	17HP92F*1481	17HP92N*1481	17HP92B*1581	17HP92@*1581	17HP92F*1581	17HP92N*1581
—	—	50	50	3	—	100	100A/600V	17HP92B*1581	17HP92@*1581	17HP92F*1581	17HP92N*1581	17HP92B*1681	17HP92@*1681	17HP92F*1681	17HP92N*1681
25	30	—	—	3	—	200	200A/250V	17HP92B*1681	17HP92@*1681	17HP92F*1681	17HP92N*1681	17HP92B*1681	17HP92@*1681	17HP92F*1681	17HP92N*1681
30	40	—	—	—	3½	200	200A/250V	17IP92B*1681	17IP92@*1681	17IP92F*1681	17IP92N*1681	17IP92B*1781	17IP92@*1781	17IP92F*1781	17IP92N*1781
—	—	75	75	—	3½	200	200A/600V	17IP92B*1781	17IP92@*1781	17IP92F*1781	17IP92N*1781	17IP92B*1781	17IP92@*1781	17IP92F*1781	17IP92N*1781
40	50	—	—	4	—	200	200A/250V	17JP92B*1681	17JP92@*1681	17JP92F*1681	17JP92N*1681	17JP92B*1781	17JP92@*1781	17JP92F*1781	17JP92N*1781
—	—	100	100	4	—	200	200A/600V	17JP92B*1781	17JP92@*1781	17JP92F*1781	17JP92N*1781	17JP92B*1781	17JP92@*1781	17JP92F*1781	17JP92N*1781

### Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Size Amps/Volts	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts					NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Industrial Use Weatherproof @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, <sup>①</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight			
Catalog Number	List Price \$	Catalog Number	List Price \$					Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
3	3	—	—	0	—	30	30A/250V	17CP82B*1081	17CP82@*1081	17CP82F*1081	17CP82N*1081	17CP82B*1181	17CP82@*1181	17CP82F*1181	17CP82N*1181
—	—	5	5	0	—	30	30A/600V	17CP82B*1181	17CP82@*1181	17CP82F*1181	17CP82N*1181	17CP82B*1181	17CP82@*1181	17CP82F*1181	17CP82N*1181
5	5	—	—	1	—	30	30A/250V	17DP82B*1081	17DP82@*1081	17DP82F*1081	17DP82N*1081	17DP82B*1181	17DP82@*1181	17DP82F*1181	17DP82N*1181
—	—	10	10	1	—	30	30A/600V	17DP82B*1181	17DP82@*1181	17DP82F*1181	17DP82N*1181	17DP82B*1281	17DP82@*1281	17DP82F*1281	17DP82N*1281
7½	7½	—	—	1	—	60	60A/250V	17DP82B*1281	17DP82@*1281	17DP82F*1281	17DP82N*1281	17DP82B*1281	17DP82@*1281	17DP82F*1281	17DP82N*1281
10	10	—	—	—	1¼	60	60A/250V	17EP82B*1281	17EP82@*1281	17EP82F*1281	17EP82N*1281	17EP82B*1381	17EP82@*1381	17EP82F*1381	17EP82N*1381
—	—	15	15	—	1¼	60	60A/600V	17EP82B*1381	17EP82@*1381	17EP82F*1381	17EP82N*1381	17EP82B*1381	17EP82@*1381	17EP82F*1381	17EP82N*1381
10	15	—	—	2	—	60	60A/250V	17FP82B*1281	17FP82@*1281	17FP82F*1281	17FP82N*1281	17FP82B*1381	17FP82@*1381	17FP82F*1381	17FP82N*1381
—	—	25	25	2	—	60	60A/600V	17FP82B*1381	17FP82@*1381	17FP82F*1381	17FP82N*1381	17FP82B*1381	17FP82@*1381	17FP82F*1381	17FP82N*1381
—	—	—	30	—	2½	60	60A/600V	17GP82B*1381	17GP82@*1381	17GP82F*1381	17GP82N*1381	17GP82B*1581	17GP82@*1581	17GP82F*1581	17GP82N*1581
—	—	30	—	—	2½	100	100A/600V	17GP82B*1581	17GP82@*1581	17GP82F*1581	17GP82N*1581	17GP82B*1481	17GP82@*1481	17GP82F*1481	17GP82N*1481
15	20	—	—	—	2½	100	100A/250V	17GP82B*1481	17GP82@*1481	17GP82F*1481	17GP82N*1481	17GP82B*1481	17GP82@*1481	17GP82F*1481	17GP82N*1481
20	25	—	—	3	—	100	100A/250V	17HP82B*1481	17HP82@*1481	17HP82F*1481	17HP82N*1481	17HP82B*1581	17HP82@*1581	17HP82F*1581	17HP82N*1581
—	—	50	50	3	—	100	100A/600V	17HP82B*1581	17HP82@*1581	17HP82F*1581	17HP82N*1581	17HP82B*1681	17HP82@*1681	17HP82F*1681	17HP82N*1681
25	30	—	—	3	—	200	200A/250V	17HP82B*1681	17HP82@*1681	17HP82F*1681	17HP82N*1681	17HP82B*1681	17HP82@*1681	17HP82F*1681	17HP82N*1681

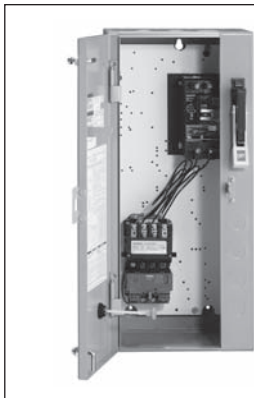
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① For conduit hubs and conversion instructions, see page 9/110.

② Single phase wiring page 9/173.

# MCP Type with Solid State Overload, Class 18

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/159.
- ▶ Wiring Diagrams see page 9/174.
- ▶ Replacement Parts see page 9/131.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240 <sup>Ⓞ</sup>	A
200-208	D
220-240	G
277	L
220-240/440-480 <sup>Ⓞ</sup>	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>Ⓢ</sup> Watertight, Dust-tight, Corrosion Resistant Ⓢ = W for 304 Stainless Steel Ⓢ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12, NEMA 3/3R <sup>Ⓢ</sup> , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	0.75-3.4	A	18CUB92B*	—	18CUB92@*	—	18CUB92F*	—	18CUB92H*	—	18CUB92N*	—
2	2	5	5	0	—	10	3-12	A1	18CUC92B*	—	18CUC92@*	—	18CUC92F*	—	18CUC92H*	—	18CUC92N*	—
3	3	—	—	0	—	25	5.5-22	A1	18CUD92B*	—	18CUD92@*	—	18CUD92F*	—	18CUD92H*	—	18CUD92N*	—
1/2	1/2	1	1	1	—	3	0.75-3.4	A	18DUB92B*	—	18DUB92@*	—	18DUB92F*	—	18DUB92H*	—	18DUB92N*	—
2	2	5	5	1	—	10	3-12	A1	18DUC92B*	—	18DUC92@*	—	18DUC92F*	—	18DUC92H*	—	18DUC92N*	—
3	3	7 1/2	10	1	—	25	5.5-22	A1	18DUD92B*	—	18DUD92@*	—	18DUD92F*	—	18DUD92H*	—	18DUD92N*	—
7 1/2	7 1/2	10	—	1	—	30	10-40	A1	18DUE92B*	—	18DUE92@*	—	18DUE92F*	—	18DUE92H*	—	18DUE92N*	—
—	—	15	15	—	1 1/2	40	10-40	A1	18EUE92B*	—	18EUE92@*	—	18EUE92F*	—	18EUE92H*	—	18EUE92N*	—
10	15	25	25	2	—	50	13-52	B	18FUF92B*	—	18FUF92@*	—	18FUF92F*	—	18FUF92H*	—	18FUF92N*	—
15	20	30	30	—	2 1/2	100	25-100	B	18GUG92B*	—	18GUG92@*	—	18GUG92F*	—	18GUG92H*	—	18GUG92N*	—
25	30	50	50	3	—	125	25-100	B	18HUG92B*	—	18HUG92@*	—	18HUG92F*	—	18HUG92H*	—	18HUG92N*	—
30	40	75	75	—	3 1/2	125	50-200	B	18IUH92B*	—	18IUH92@*	—	18IUH92F*	—	18IUH92H*	—	18IUH92N*	—
40	50	100	100	4	—	150	50-200	B	18JUH92B*	—	18JUH92@*	—	18JUH92F*	—	18JUH92H*	—	18JUH92N*	—
50	75	150	200	5	—	250	55-250	—	18LPT92B*	—	18LPT92E* <sup>Ⓢ</sup>	—	—	—	18LPT92H*	—	18LPT92N*	—
75	100	200	—	5	—	400	55-250	—	18LPU92B*	—	18LPU92E* <sup>Ⓢ</sup>	—	—	—	—	—	18LPU92N*	—
100	125	250	300	6	—	400	160-630	—	18MPW92B*	—	18MPW92E* <sup>Ⓢ</sup>	—	—	—	—	—	18MPW92N*	—
150	200	400	400	6	—	600	160-630	—	18MPX92B*	—	18MPX92E* <sup>Ⓢ</sup>	—	—	—	—	—	18MPX92N*	—
—	250	500	500	7 <sup>Ⓢ</sup>	—	800	400-1220	A1+CT	18NUV92B*	—	—	—	—	—	—	—	18NUV92N*	—
—	300	600	600	7 <sup>Ⓢ</sup>	—	1000	400-1220	A1+CT	18NUY92B*	—	—	—	—	—	—	—	18NUY92N*	—
—	400	800	800	8 <sup>Ⓢ</sup>	—	1200	400-1220	A1+CT	18PUW92B*	—	—	—	—	—	—	—	18PUW92N*	—
—	450	900	900	8 <sup>Ⓢ</sup>	—	1600	400-1220	A1+CT	18PUZ92B*	—	—	—	—	—	—	—	18PUZ92N*	—

**Note:** All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓞ Dual voltage coils not available in starter sizes 5-8.

Ⓢ For conduit hubs and conversion instructions, see page 9/110.

Ⓢ Enclosure is NEMA Type 4 (painted steel).

Ⓢ F coil 100-250V AC 50/60Hz, or DC,  
H coil 150-500V AC 50/60Hz, or DC

Ⓢ Only available

F coil 100-250V AC 50/60Hz, or DC



# MCP Type with Solid State Overload, Class 18

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/159.
- ▶ Wiring Diagrams see page 9/174.
- ▶ Replacement Parts see page 9/131.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Extra Wide Enclosure, 3-Phase, 3-Pole

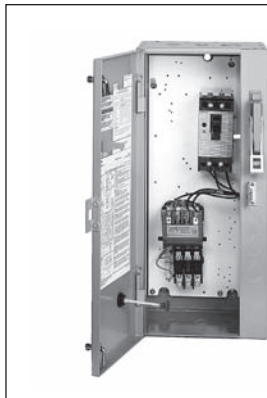
Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>Ⓞ</sup> Watertight, Dust-tight, Corrosion Resistant Ⓞ = W for 304 Stainless Steel Ⓞ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R <sup>Ⓞ</sup> , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	½	1	1	0	—	3	0.75–3.4	A	18CUB82B*		18CUB82@*		18CUB82N*	
2	2	5	5	0	—	10	3–12	A1	18CUC82B*		18CUC82@*		18CUC82N*	
3	3	—	—	0	—	25	5.5–22	A1	18CUD82B*		18CUD82@*		18CUD82N*	
½	½	1	1	1	—	3	0.75–3.4	A	18DUB82B*		18DUB82@*		18DUB82N*	
2	2	5	5	1	—	10	3–12	A1	18DUC82B*		18DUC82@*		18DUC82N*	
3	3	7½	10	1	—	25	5.5–22	A1	18DUD82B*		18DUD82@*		18DUD82N*	
7½	7½	10	—	1	—	30	10–40	A1	18DUE82B*		18DUE82@*		18DUE82N*	
—	—	15	15	—	1½	40	10–40	A1	18EUE82B*		18EUE82@*		18EUE82N*	
10	15	25	25	2	—	50	13–52	B	18FUF82B*		18FUF82@*		18FUF82N*	
15	20	30	30	—	2½	100	25–100	B	18GUG82B*		18GUG82@*		18GUG82N*	
25	30	50	50	3	—	125	25–100	B	18HUG82B*		18HUG82@*		18HUG82N*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓞ For conduit hubs and conversion instructions, see page 9/110.

# MCP Type with Ambient Compensated Bimetal Overload, Class 18

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 9/124. (3 required)
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/159.
- ▶ Wiring Diagrams see page 9/174.
- ▶ Replacement Parts see page 9/131.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose Watertight, Dust-tight		NEMA 4/4X Stainless <sup>Ⓞ</sup> Watertight, Dust-tight Corrosion Resistant Ⓞ = W for 304 Stainless Steel Ⓞ = X for 316 Stainless Steel		NEMA 4X Fiberglass NEMA 3 & 4 Corrosion Resistant Class I Groups C & D Class II Groups E, F & G		NEMA 7 & 9 Div 1 and Div 2 Weatherproof Watertight, Dust-tight Class III Bolted Enclosures Indoor/Outdoor Use	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
1/2	1/2	1	1	0	—	3	18CP92BA*81	18CP92@A*81	18CP92FA*81	18CP92HA*81	18CP92NA*81			
1	1	3	3	0	—	10	18CP92BB*81	18CP92@B*81	18CP92FB*81	18CP92HB*81	18CP92NB*81			
3	3	5	5	0	—	25	18CP92BC*81	18CP92@C*81	18CP92FC*81	18CP92HC*81	18CP92NC*81			
1/2	1/2	1	1	1	—	3	18DP92BA*81	18DP92@A*81	18DP92FA*81	18DP92HA*81	18DP92NA*81			
1	1	3	3	1	—	10	18DP92BB*81	18DP92@B*81	18DP92FB*81	18DP92HB*81	18DP92NB*81			
3	3	7 1/2	7 1/2	1	—	25	18DP92BD*81	18DP92@D*81	18DP92FD*81	18DP92HD*81	18DP92ND*81			
7 1/2	7 1/2	10	10	1	—	30	18DP92BE*81	18DP92@E*81	18DP92FE*81	18DP92HE*81	18DP92NE*81			
—	—	15	15	—	1 1/4	40	18EP92BF*81	18EP92@F*81	18EP92FF*81	18EP92HF*81	18EP92NF*81			
10	10	—	—	—	1 1/4	50	18EP92BG*81	18EP92@G*81	18EP92FG*81	18EP92HG*81	18EP92NG*81			
—	—	20	20	2	—	40	18FP92BH*81	18FP92@H*81	18FP92FH*81	18FP92HH*81	18FP92NH*81			
10	15	25	25	2	—	50	18FP92BJ*81	18FP92@J*81	18FP92FJ*81	18FP92HJ*81	18FP92NJ*81			
10	15	30	30	—	2 1/2	50	18GP92BK*81	18GP92@K*81	18GP92FK*81	18GP92HK*81	18GP92NK*81			
15	20	—	—	—	2 1/2	100	18GP92BL*81	18GP92@L*81	18GP92FL*81	18GP92HL*81	18GP92NL*81			
—	—	30	30	3	—	50	18HP92BM*81	18HP92@M*81	18HP92FM*81	18HP92HM*81	18HP92NM*81			
25	30	50	50	3	—	125	18HP92BN*81	18HP92@N*81	18HP92FN*81	18HP92HN*81	18HP92NN*81			
30	40	75	75	—	3 1/2	125	18IP92BP*81	18IP92@P*81	18IP92FP*81	18IP92HP*81	18IP92NP*81			
40	50	100	100	4	—	150	18JP92BR*81	18JP92@R*81	18JP92FR*81	18JP92HR*81	18JP92NR*81			

### Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>Ⓞ</sup> Watertight, Dust-tight Corrosion Resistant Ⓞ=W for 304 Stainless Steel Ⓞ=X for 316 Stainless Steel	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
1/2	1/2	1	1	0	—	3	18CP82BA*81	18CP82@A*81	18CP82NA*81	
1	1	3	3	0	—	10	18CP82BB*81	18CP82@B*81	18CP82NB*81	
3	3	5	5	0	—	25	18CP82BC*81	18CP82@C*81	18CP82NC*81	
1/2	1/2	1	1	1	—	3	18DP82BA*81	18DP82@A*81	18DP82NA*81	
1	1	3	3	1	—	10	18DP82BB*81	18DP82@B*81	18DP82NB*81	
3	3	7 1/2	7 1/2	1	—	25	18DP82BD*81	18DP82@D*81	18DP82ND*81	
7 1/2	7 1/2	10	10	1	—	30	18DP82BE*81	18DP82@E*81	18DP82NE*81	
—	—	15	15	—	1 1/4	40	18EP82BF*81	18EP82@F*81	18EP82NF*81	
10	10	—	—	—	1 1/4	50	18EP82BG*81	18EP82@G*81	18EP82NG*81	
—	—	20	20	2	—	40	18FP82BH*81	18FP82@H*81	18FP82NH*81	
10	15	25	25	2	—	50	18FP82BJ*81	18FP82@J*81	18FP82NJ*81	
10	15	30	30	—	2 1/2	50	18GP82BK*81	18GP82@K*81	18GP82NK*81	
15	20	—	—	—	2 1/2	100	18GP82BL*81	18GP82@L*81	18GP82NL*81	
—	—	30	30	3	—	50	18HP82BM*81	18HP82@M*81	18HP82NM*81	
25	30	50	50	3	—	125	18HP82BN*81	18HP82@N*81	18HP82NN*81	

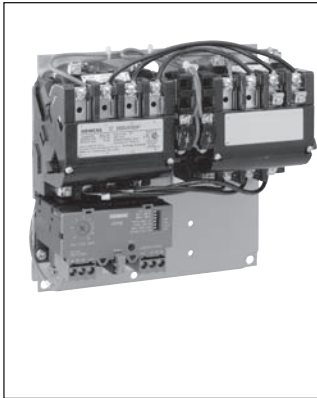
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓞ For conduit hubs and conversion instructions, see page 9/110.



# Solid State Overload, Class 22

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/142 open and 9/162 enclosed.
- ▶ Wiring Diagrams see page 9/176.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 <sup>Ⓛ</sup>	A
200–208	D
220–240	G
277	L
220–240/440–480 <sup>Ⓛ</sup>	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts					Open Type Standard Auxiliary Contacts <sup>Ⓛ</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>Ⓛ</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R <sup>Ⓛ</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)	
200	230	460	575					Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/4	1/4	1/4	1/2	00	—	0.25–1	A	22BUA32A*		22BUA32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/2	3/4	1 1/2	2	00	—	0.75–3.4	A	22BUB32A*		22BUB32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1 1/2	1 1/2	2	—	00	—	3–12	A1	22BUC32A*		22BUC32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/4	1/4	1/2	1/2	0	—	0.25–1	A	22CUA32A*		22CUA32B*		22CUA32W*		22CUA32F*		22CUA32H*		22CUA320*	
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	22CUB32A*		22CUB32B*		22CUB32W*		22CUB32F*		22CUB32H*		22CUB320*	
2	2	5	5	0	—	3–12	A1	22CUC32A*		22CUC32B*		22CUC32W*		22CUC32F*		22CUC32H*		22CUC320*	
3	3	—	—	0	—	5.5–22	A1	22CUD32A*		22CUD32B*		22CUD32W*		22CUD32F*		22CUD32H*		22CUD320*	
1/4	1/4	1/2	1/2	1	—	0.25–1	A	22DUA32A*		22DUA32B*		22DUA32W*		22DUA32F*		22DUA32H*		22DUA320*	
1/2	3/4	1 1/2	2	1	—	0.75–3.4	A	22DUB32A*		22DUB32B*		22DUB32W*		22DUB32F*		22DUB32H*		22DUB320*	
2	2	5	5	1	—	3–12	A1	22DUC32A*		22DUC32B*		22DUC32W*		22DUC32F*		22DUC32H*		22DUC320*	
3	3	10	10	1	—	5.5–22	A1	22DUD32A*		22DUD32B*		22DUD32W*		22DUD32F*		22DUD32H*		22DUD320*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	22DUE32A*		22DUE32B*		22DUE32W*		22DUE32F*		22DUE32H*		22DUE320*	
10	10	15	15	—	1 1/4	10–40	A1	22EUE32A*		22EUE32B*		22EUE32W*		22EUE32F*		22EUE32H*		22EUE320*	
10	15	25	25	2	—	13–52	B	22FUF32A*		22FUF32B*		22FUF32W*		22FUF32F*		22FUF32H*		22FUF320*	
15	20	30	30	—	2 1/2	25–100	B	22GUG32A*		22GUG32B*		22GUG32W*		22GUG32F*		22GUG32H*		22GUG320*	
25	30	50	50	3	—	25–100	B	22HUG32A*		22HUG32B*		22HUG32W*		22HUG32F*		22HUG32H*		22HUG320*	
30	40	75	75	—	3 1/2	50–200	B	22IUH32A*		22IUH32B*		22IUH32W*		22IUH32F*		22IUH32H*		22IUH320*	
40	50	100	100	4	—	50–200	B	22JUH32A*		22JUH32B*		22JUH32W*		22JUH32F*		22JUH32H*		22JUH320*	
75	100	200	200	5	—	55–250	—	22LPU32A*		22LPU32B*		22LPU32E* <sup>Ⓛ</sup>		—	—	—	—	22LPU320*	
150	200	400	400	6	—	160–630	—	22MPX32A*		22MPX32B*		22MPX32E* <sup>Ⓛ</sup>		—	—	—	—	22MPX320*	
—	300	600	600	7 <sup>Ⓛ</sup>	—	400–1220	A1+CT	22NUN32A*		22NUN32B*		—	—	—	—	—	—	22NUN320*	
—	450	900	900	8 <sup>Ⓛ</sup>	—	400–1220	A1+CT	22PUN32A*		22PUN32B*		—	—	—	—	—	—	22PUN320*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓛ Dual voltage coils not available in size 5–8 starters.

Ⓛ For conduit hubs and conversion instructions, see page 9/110.

Ⓛ Enclosure is rated only NEMA 4 (painted steel).

Ⓛ Only available

F coil 100–250V AC 50/60Hz, or DC

H coil 150–500V AC 50/60Hz, or DC

Ⓛ Only available

F coil 100–250V AC 50/60Hz, or DC

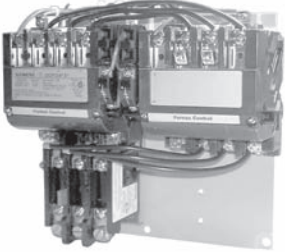
Ⓛ Auxiliary contacts

22B–22E 4th pole built-in

22F–22J 2 NO & 2 NC

# Ambient Compensated Bimetal Overload with Manual and Auto Reset, Class 22

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Heater elements see page 9/124. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see pages 9/142 open and 9/162 enclosed.</li> <li>▶ Wiring Diagrams see page 9/175.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480	C																					
440–480	H																					
575–600	E																					

### Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Enclosure														
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Open Type <sup>③</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant Indoor/Outdoor Use		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures		NEMA 12 <sup>①</sup> NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1 1/2	1 1/2	2	2	9	00	—	22BP32A*81	22BP32B*81	—	—	Use Size 0	—	—	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	22CP32A*81	22CP32B*81	—	—	22CP32W*81	—	22CP32F*81	—	22CP32H*81	—	22CP320*81	—
7 1/2	7 1/2	10	10	27	1	—	22DP32A*81	22DP32B*81	—	—	22DP32W*81	—	22DP32F*81	—	22DP32H*81	—	22DP320*81	—
10	10	15	15	40	—	1 3/4	22EP32A*81	22EP32B*81	—	—	22EP32W*81	—	22EP32F*81	—	22EP32H*81	—	22EP320*81	—
10	15	25	25	45	2	—	22FP32A*81	22FP32B*81	—	—	22FP32W*81	—	22FP32F*81	—	22FP32H*81	—	22FP320*81	—
15	20	30	30	60	—	2 1/2	22GP32A*81	22GP32B*81	—	—	22GP32W*81	—	22GP32F*81	—	22GP32H*81	—	22GP320*81	—
25	30	50	50	90	3	—	22HP32A*81	22HP32B*81	—	—	22HP32W*81	—	22HP32F*81	—	22HP32H*81	—	22HP320*81	—
30	40	75	75	115	—	3 1/2	22IP32A*81	22IP32B*81	—	—	22IP32W*81	—	22IP32F*81	—	22IP32H*81	—	22IP320*81	—
40	50	100	100	135	4	—	22JG32A*81	22JG32B*81	—	—	22JG32W*81	—	22JG32F*81	—	22JG32H*81	—	22JG320*81	—

### Open Type & Standard Width Enclosure, Single Phase, 3-Wire, 2-Pole<sup>②</sup>

Max Hp				Enclosure												
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 <sup>①</sup> NEMA 3/3R Industrial Use Weatherproof		
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
1/2	1	9	00	22BP12A*81	22BP12B*81	—	—	Use Size 0	—	Use Size 0	—	—	Use Size 0	—	Use Size 0	—
1	2	18	0	22CP12A*81	22CP12B*81	—	—	22CP12W*81	—	22CP12F*81	—	—	22CP12H*81	—	22CP120*81	—
2	3	27	1	22DP12A*81	22DP12B*81	—	—	22DP12W*81	—	22DP12F*81	—	—	22DP12H*81	—	22DP120*81	—
3	5	35	1P	22EP12A*81	22EP12B*81	—	—	22EP12W*81	—	22EP12F*81	—	—	22EP12H*81	—	22EP120*81	—

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All Starter Sizes carry one maximum Hp rating.

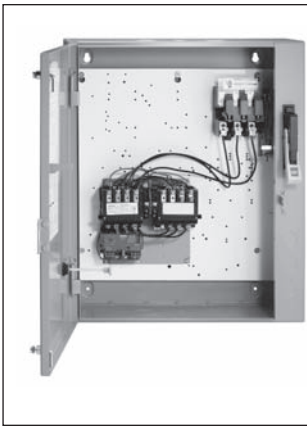
① For conduit hubs and conversion instructions, see page 9/110.

② Coil D, F, or G will be wired for Incoming Voltage. J coil will be wired for 24V separate source. Coils E, H, and L do not apply to single phase starters.

③ Auxiliary contacts  
22B-22E 4th pole built-in  
22F-22J 2 NO & 2 NC

# Non-Fusible, Class 25

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 9/124.
- ▶ Fuse clips see page 9/120.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/164.
- ▶ Wiring Diagrams see page 9/177.
- ▶ Replacement Parts see page 9/131.
- ▶ For NO/NC SPDT contact on overload, replace "81" with "91". "81" indicates one NC contact.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240 <sup>①</sup>	A
200-208	D
220-240	G
277	L
220-240/440-480 <sup>①</sup>	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R <sup>②</sup> , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1/2	1/2	0	—	0.25-1	A	30	25CUA92B*	25CUA92W*	25CUA92F*	25CUA92N*				
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	30	25CUB92B*	25CUB92W*	25CUB92F*	25CUB92N*				
2	2	5	5	0	—	3-12	A1	30	25CUC92B*	25CUC92W*	25CUC92F*	25CUC92N*				
3	3	—	—	0	—	5.5-22	A1	30	25CUD92B*	25CUD92W*	25CUD92F*	25CUD92N*				
1/2	1/2	1/2	1/2	1	—	0.25-1	A	30	25DUA92B*	25DUA92W*	25DUA92F*	25DUA92N*				
1/2	3/4	1 1/2	2	1	—	0.75-3.4	A	30	25DUB92B*	25DUB92W*	25DUB92F*	25DUB92N*				
2	2	5	5	1	—	3-12	A1	30	25DUC92B*	25DUC92W*	25DUC92F*	25DUC92N*				
3	3	10	10	1	—	5.5-22	A1	30	25DUD92B*	25DUD92W*	25DUD92F*	25DUD92N*				
7 1/2	7 1/2	—	—	1	—	10-40	A1	60	25DUE92B*	25DUE92W*	25DUE92F*	25DUE92N*				
10	10	15	15	—	1 1/2	10-40	A1	60	25EUE92B*	25EUE92W*	25EUE92F*	25EUE92N*				
10	15	25	25	2	—	13-52	B	60	25FUF92B*	25FUF92W*	25FUF92F*	25FUF92N*				
15	20	30	30	—	2 1/2	25-100	B	100	25GUG92B*	25GUG92W*	25GUG92F*	25GUG92N*				
20	25	50	50	3	—	25-100	B	100	25HUG92B*	25HUG92W*	25HUG92F*	25HUG92N*				
30	40	75	75	—	3 1/2	50-200	B	200	25IUH92B*	25IUH92W*	25IUH92F*	25IUH92N*				
40	50	100	100	4	—	50-200	B	200	25JUH92B*	25JUH92W*	25JUH92F*	25JUH92N*				
75	100	200	200	5	—	55-250	—	400	25LPU92B*	25LPU92E* <sup>③</sup>	—	25LPU92N*				
150	200	400	400	6	—	160-630	—	600	25MPX92B*	25MPX92E* <sup>③</sup>	—	25MPX92N*				
—	300	600	600	7 <sup>④</sup>	—	400-1220	A1+CT	1200	25NUN92B*	—	—	25NUN92N*				
—	450	900	900	8 <sup>④</sup>	—	400-1220	A1+CT	1600	25PUN92B*	—	—	25PUN92N*				

### Standard Width Enclosure with Ambient Compensated Bimetal Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc. Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 <sup>②</sup> NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	25CP92B*81	25CP92W*81	25CP92F*81	25CP92N*81				
7 1/2	7 1/2	10	10	1	—	30	25DP92B*81	25DP92W*81	25DP92F*81	25DP92N*81				
10	10	15	15	—	1 1/4	60	25EP92B*81	25EP92W*81	25EP92F*81	25EP92N*81				
10	15	25	25	2	—	60	25FP92B*81	25FP92W*81	25FP92F*81	25FP92N*81				
15	20	30	30	—	2 1/2	100	25GP92B*81	25GP92W*81	25GP92F*81	25GP92N*81				
25	30	50	50	3	—	100	25HP92B*81	25HP92W*81	25HP92F*81	25HP92N*81				
30	40	75	75	—	3 1/2	200	25IP92B*81	25IP92W*81	25IP92F*81	25IP92N*81				
40	50	100	100	4	—	200	25JP92B*81	25JP92W*81	25JP92F*81	25JP92N*81				

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in starter sizes 5-8.

② For conduit hubs and conversion instructions, see page 9/110.

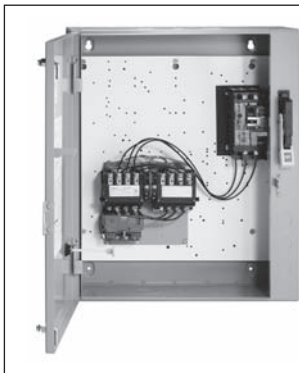
③ Enclosure is NEMA Type 4 (painted steel).

④ F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC

⑤ Only available F coil 100-250V AC 50/60Hz, or DC

# MCP Type, Class 26

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/164.
- ▶ Wiring Diagrams see page 9/177.
- ▶ Replacement Parts see page 9/131.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 <sup>ⓐ</sup>	A
200–208	D
220–240	G
277	L
220–240/440–480 <sup>ⓐ</sup>	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure								
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>ⓐ</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	NEMA 12, NEMA 3/3R <sup>ⓐ</sup> , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight				
1	1	1	1				—	—	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number
1/2	1/2	1	1	0	—	3	0.75–3.4	A	26CUB92B*	26CUB92W*	26CUB92F*	26CUB92H*	26CUB92N*	26CUB92M*	26CUB92P*		
2	2	5	5	0	—	10	3–12	A1	26CUC92B*	26CUC92W*	26CUC92F*	26CUC92H*	26CUC92N*	26CUC92M*	26CUC92P*		
3	3	—	—	0	—	25	5.5–22	A1	26CUD92B*	26CUD92W*	26CUD92F*	26CUD92H*	26CUD92N*	26CUD92M*	26CUD92P*		
1/2	1/2	1	1	1	—	3	0.75–3.4	A	26DUB92B*	26DUB92W*	26DUB92F*	26DUB92H*	26DUB92N*	26DUB92M*	26DUB92P*		
2	2	5	5	1	—	10	3–12	A1	26DUC92B*	26DUC92W*	26DUC92F*	26DUC92H*	26DUC92N*	26DUC92M*	26DUC92P*		
3	3	7 1/2	10	1	—	25	5.5–22	A1	26DUD92B*	26DUD92W*	26DUD92F*	26DUD92H*	26DUD92N*	26DUD92M*	26DUD92P*		
7 1/2	7 1/2	10	—	1	—	30	10–40	A1	26DUE92B*	26DUE92W*	26DUE92F*	26DUE92H*	26DUE92N*	26DUE92M*	26DUE92P*		
—	—	15	15	—	1 1/4	40	10–40	A1	26EUE92B*	26EUE92W*	26EUE92F*	26EUE92H*	26EUE92N*	26EUE92M*	26EUE92P*		
10	15	25	25	2	—	50	13–52	B	26FUF92B*	26FUF92W*	26FUF92F*	26FUF92H*	26FUF92N*	26FUF92M*	26FUF92P*		
15	20	30	30	—	2 1/2	100	25–100	B	26GUG92B*	26GUG92W*	26GUG92F*	26GUG92H*	26GUG92N*	26GUG92M*	26GUG92P*		
25	30	50	50	3	—	125	25–100	B	26HUG92B*	26HUG92W*	26HUG92F*	26HUG92H*	26HUG92N*	26HUG92M*	26HUG92P*		
30	40	75	75	—	3 1/2	125	50–200	B	26IUH92B*	26IUH92W*	26IUH92F*	26IUH92H*	26IUH92N*	26IUH92M*	26IUH92P*		
40	50	100	100	4	—	150	50–200	B	26JUH92B*	26JUH92W*	26JUH92F*	26JUH92H*	26JUH92N*	26JUH92M*	26JUH92P*		
50	75	150	200	5	—	250	55–250	—	26LPT92B*	26LPT92E* <sup>ⓐ</sup>	—	—	—	26LPT92N*	—		
75	100	200	—	5	—	400	55–250	—	26LP92B*	26LP92E* <sup>ⓐ</sup>	—	—	—	26LP92N*	—		
100	125	250	300	6	—	400	160–630	—	26MPW92B*	26MPW92E* <sup>ⓐ</sup>	—	—	—	26MPW92N*	—		
150	200	400	400	6	—	600	160–630	—	26MPX92B*	26MPX92E* <sup>ⓐ</sup>	—	—	—	26MPX92N*	—		
—	250	500	500	7* <sup>ⓐ</sup>	—	800	400–1220	A1+CT	26NUV92B*	—	—	—	—	26NUV92N*	—		
—	300	600	600	7* <sup>ⓐ</sup>	—	1000	400–1220	A1+CT	26NUY92B*	—	—	—	—	26NUY92N*	—		
—	400	800	800	8 <sup>ⓐ</sup>	—	1200	400–1220	A1+CT	26PUW92B*	—	—	—	—	26PUW92N*	—		
—	450	900	900	8 <sup>ⓐ</sup>	—	1600	400–1220	A1+CT	26PUZ92B*	—	—	—	—	26PUZ92N*	—		

### Standard Width Enclosure with Ambient Compensated Bimetal Overload, 3-Phase, 3-Pole

1/2	1/2	1	1	0	—	3	—	—	26CP92BA*81	26CP92WA*81	26CP92FA*81	26CP92HA*81	26CP92NA*81
1	1	3	3	0	—	10	—	—	26CP92BB*81	26CP92WB*81	26CP92FB*81	26CP92HB*81	26CP92NB*81
3	3	5	5	0	—	25	—	—	26CP92BC*81	26CP92WC*81	26CP92FC*81	26CP92HC*81	26CP92NC*81
1/2	1/2	1	1	1	—	3	—	—	26DP92BA*81	26DP92WA*81	26DP92FA*81	26DP92HA*81	26DP92NA*81
1	1	3	3	1	—	10	—	—	26DP92BB*81	26DP92WB*81	26DP92FB*81	26DP92HB*81	26DP92NB*81
3	3	7 1/2	7 1/2	1	—	25	—	—	26DP92BD*81	26DP92WD*81	26DP92FD*81	26DP92HD*81	26DP92ND*81
7 1/2	7 1/2	10	10	1	—	30	—	—	26DP92BE*81	26DP92WE*81	26DP92FE*81	26DP92HE*81	26DP92NE*81
—	—	15	15	—	1 1/4	40	—	—	26EP92BF*81	26EP92WF*81	26EP92FF*81	26EP92HF*81	26EP92NF*81
10	10	—	—	—	1 1/4	50	—	—	26EP92BG*81	26EP92WG*81	26EP92FG*81	26EP92HG*81	26EP92NG*81
—	—	20	20	2	—	40	—	—	26FP92BH*81	26FP92WH*81	26FP92FH*81	26FP92HH*81	26FP92NH*81
10	15	25	25	2	—	50	—	—	26FP92BJ*81	26FP92WJ*81	26FP92FJ*81	26FP92HJ*81	26FP92NJ*81
10	15	30	30	—	2 1/2	50	—	—	26GP92BK*81	26GP92WK*81	26GP92FK*81	26GP92HK*81	26GP92NK*81
15	20	—	—	—	2 1/2	100	—	—	26GP92BL*81	26GP92WL*81	26GP92FL*81	26GP92HL*81	26GP92NL*81
—	—	30	30	3	—	50	—	—	26HP92BM*81	26HP92WM*81	26HP92FM*81	26HP92HM*81	26HP92NM*81
25	30	50	50	3	—	125	—	—	26HP92BN*81	26HP92WN*81	26HP92FN*81	26HP92HN*81	26HP92NN*81
30	40	75	75	—	3 1/2	125	—	—	26IP92BP*81	26IP92WP*81	26IP92FP*81	26IP92HP*81	26IP92NP*81
40	50	100	100	4	—	150	—	—	26JP92BR*81	26JP92WR*81	26JP92FR*81	26JP92HR*81	26JP92NR*81

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

ⓐ Dual voltage coils not available in starter sizes 5–8.

ⓑ For conduit hubs and conversion instructions, see page 9/110.

ⓒ Enclosure is NEMA Type 4 (painted steel).

ⓓ F coil 100–250V AC 50/60Hz, or DC,

H coil 150–500V AC 50/60Hz, or DC

ⓔ Only available

F coil 100–250V AC 50/60Hz, or DC

## Features and Benefits

## General

## Features

- Rugged Industrial Design
- Dual Voltage, Dual Frequency Coils
- Compact Design
- Snap-On Front Removable Auxiliary Contacts
- Electrical and Mechanical Interlocks
- Half Sizes — Space and Cost Savings
- Industrial Type Disconnect Operating Handle
- Visible Blade Disconnect Thru Size 4
- Adjustable Motor Circuit Protector
- 100,000 Amp Fault Protection with MCP or Class R Fuses
- Pilot Device Locations identified on All Enclosures
- UL Listed File #E14900
- CSA Certified File #LR6535

## Applications

Multi-speed magnetic starters automatically reconnect multi-speed motor windings for the desired speed in response to a signal received from push button stations or other pilot devices.

These starters are available for two speed motors.

**Consequent Pole** multi-speed motors having two speeds on a single winding (consequent pole) require a starter which reconnects the motor leads to half the number of effective motor poles at the high speed point. In this type of motor, **the low speed is one half the high speed.**

**Separate Windings** motors having separate windings for each speed provide more varied speed combinations in that the low speed need not be one half the high speed.

**Starters for separate winding motors consist of a starter unit for each speed.**

Multi-speed motor starters are available for constant torque, variable torque and constant horsepower motors.

**Constant Torque** motors maintain constant torque at all speeds. Horsepower varies directly with speed. This type of motor is applicable to conveyors, mills and similar applications.

**Variable Torque** motors produce a torque characteristic which varies as the square of the speed. This type of

motor is applicable to fans, blowers and centrifugal pumps.

**Constant Horsepower** motors maintain constant horsepower at all speeds and therefore torque varies inversely with speed. This type of motor is applicable where the same horsepower is required at all speeds. **The higher current required at low speed requires derating on starters for constant horsepower applications.** This type of motor is applicable to metal working machines such as drills, lathes, mills, bending machines, punch presses, and power wrenches.

**Operation**

Magnetic starters for multi-speed applications select the desired speed in accordance with the pilot control.

The shock to machinery upon the reduction of speed is greater than when the speed is increased. Therefore, the pilot control should be wired so that the stop button must be depressed before dropping to a lower speed or time delays should be used for applications requiring full automatic operations. The multi-speed controls are available with the necessary interlocks or relays to provide this type of operation.

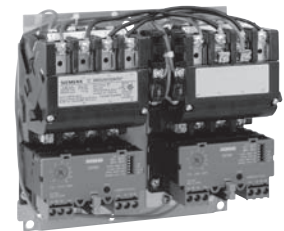
These controls may be modified for compelling or acceleration pilot control.

**Selective Control** permits the operator to start the motor at any speed and to change to a higher speed by merely pushing a button. To change to a lower speed it is necessary to first depress the stop button and to then press the proper speed button. Selective control is a function of the pilot control selected and requires no starter modifications.

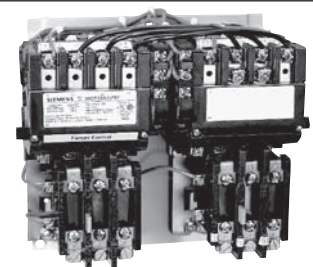
**Compelling Control** requires that the motor always be started at the lower speed and that the push buttons be operated in speed sequence to go to the next higher speed. To change to a lower speed, the stop button must be depressed and then the push buttons operated in speed sequence until the desired speed is reached. Compelling control can be added from the factory modification section page 9/122.

**Acceleration Control** provides that the motor be accelerated automatically with timers by progressively energizing the controls from the push button station from the lowest to highest speed. To change to a lower speed the stop button is depressed and then it is necessary to proceed as if starting from rest. Acceleration control can be added from the factory modification section page 9/122.

**Deceleration Control** provides that the motor be decelerated automatically with a timer when going from high speed to low speed. The timer allows the motor to decelerate from high speed to a lower speed before automatically restarting the motor in low speed. Deceleration control can be added from the factory modification section page 9/122.



Open Style Two Speed Starter  
(ESP100 Overload)



Open Style Two Speed Starter  
(Ambient Compensated Overload)



# Constant or Variable Torque with Solid State Overload, Class 30

## Selection

<p>2S2W Starter (ESP200 Overload)</p>	<p><b>Ordering Information</b></p> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.Ⓢ</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/150.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p><b>Coil Table</b></p> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E	<p><b>Low Speed FLA Table</b></p> <table border="1"> <thead> <tr> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr><td>0,1</td><td>0.25–1</td><td>A</td><td>A</td></tr> <tr><td>0,1</td><td>0.75–3.4</td><td>A</td><td>B</td></tr> <tr><td>0,1</td><td>3–12</td><td>A1</td><td>C</td></tr> <tr><td>0,1</td><td>5.5–22</td><td>A1</td><td>D</td></tr> <tr><td>0-1<sup>3</sup>/<sub>4</sub></td><td>10–40</td><td>A1</td><td>E</td></tr> <tr><td>2-3</td><td>13–52</td><td>B</td><td>F</td></tr> <tr><td>2-3</td><td>25–100</td><td>B</td><td>G</td></tr> <tr><td>3<sup>1</sup>/<sub>2</sub>-4</td><td>50–200</td><td>B</td><td>H</td></tr> </tbody> </table>	Size	FLA	OLR Frame Size	†	0,1	0.25–1	A	A	0,1	0.75–3.4	A	B	0,1	3–12	A1	C	0,1	5.5–22	A1	D	0-1 <sup>3</sup> / <sub>4</sub>	10–40	A1	E	2-3	13–52	B	F	2-3	25–100	B	G	3 <sup>1</sup> / <sub>2</sub> -4	50–200	B	H
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### One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload Amp Range	Frame Size	Enclosure		NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>Ⓢ</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12 NEMA 3/3R <sup>Ⓢ</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)				
200 Volts	230 Volts	460 Volts	575 Volts					Open Type Standard Auxiliary Contacts <sup>Ⓢ</sup>	List Price \$					Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	30CUB†32A2V*		30CUB†32B2V*		30CUB†32W2V*		30CUB†32F2V*		30CUB†32O2V*	
2	2	5	5	0	—	3–12	A1	30CUC†32A2V*		30CUC†32B2V*		30CUC†32W2V*		30CUC†32F2V*		30CUC†32O2V*	
3	3	—	—	0	—	5.5–22	A1	30CUD†32A2V*		30CUD†32B2V*		30CUD†32W2V*		30CUD†32F2V*		30CUD†32O2V*	
1/2	3/4	1 1/2	1 1/2	1	—	0.75–3.4	A	30DUB†32A2V*		30DUB†32B2V*		30DUB†32W2V*		30DUB†32F2V*		30DUB†32O2V*	
2	2	5	5	1	—	3–12	A1	30DUC†32A2V*		30DUC†32B2V*		30DUC†32W2V*		30DUC†32F2V*		30DUC†32O2V*	
3	3	10	10	1	—	5.5–22	A1	30DUD†32A2V*		30DUD†32B2V*		30DUD†32W2V*		30DUD†32F2V*		30DUD†32O2V*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	30DUE†32A2V*		30DUE†32B2V*		30DUE†32W2V*		30DUE†32F2V*		30DUE†32O2V*	
10	10	15	15	—	1 1/2	10–40	A1	30EUE†32A2V*		30EUE†32B2V*		30EUE†32W2V*		30EUE†32F2V*		30EUE†32O2V*	
10	15	25	25	2	—	13–52	B	30FUF†32A2V*		30FUF†32B2V*		30FUF†32W2V*		30FUF†32F2V*		30FUF†32O2V*	
15	20	30	30	—	2 1/2	25–100	B	30GUG†32A2V*		30GUG†32B2V*		30GUG†32W2V*		30GUG†32F2V*		30GUG†32O2V*	
25	30	50	50	3	—	25–100	B	30HUG†32A2V*		30HUG†32B2V*		30HUG†32W2V*		30HUG†32F2V*		30HUG†32O2V*	
30	40	75	75	—	3 1/2	50–200	B	30IUH†32A2V*		30IUH†32B2V*		30IUH†32W2V*		30IUH†32F2V*		30IUH†32O2V*	
40	50	100	100	4	—	50–200	B	30JUH†32A2V*		30JUH†32B2V*		30JUH†32W2V*		30JUH†32F2V*		30JUH†32O2V*	

### Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload Amp Range	Frame Size	Enclosure		NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>Ⓢ</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel 316 Stainless Steel (Optional)	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12 NEMA 3/3R <sup>Ⓢ</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)				
200 Volts	230 Volts	460 Volts	575 Volts					Open Type <sup>Ⓢ</sup> Standard Auxiliary Contacts	List Price \$					Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	30CUB†32A1V*		30CUB†32B1V*		30CUB†32W1V*		30CUB†32F1V*		30CUB†32O1V*	
2	2	5	5	0	—	3–12	A1	30CUC†32A1V*		30CUC†32B1V*		30CUC†32W1V*		30CUC†32F1V*		30CUC†32O1V*	
3	3	—	—	0	—	5.5–22	A1	30CUD†32A1V*		30CUD†32B1V*		30CUD†32W1V*		30CUD†32F1V*		30CUD†32O1V*	
1/2	3/4	1 1/2	1 1/2	1	—	0.75–3.4	A	30DUB†32A1V*		30DUB†32B1V*		30DUB†32W1V*		30DUB†32F1V*		30DUB†32O1V*	
2	2	5	5	1	—	3–12	A1	30DUC†32A1V*		30DUC†32B1V*		30DUC†32W1V*		30DUC†32F1V*		30DUC†32O1V*	
3	3	10	10	1	—	5.5–22	A1	30DUD†32A1V*		30DUD†32B1V*		30DUD†32W1V*		30DUD†32F1V*		30DUD†32O1V*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	30DUE†32A1V*		30DUE†32B1V*		30DUE†32W1V*		30DUE†32F1V*		30DUE†32O1V*	
10	10	15	15	—	1 1/2	10–40	A1	30EUE†32A1V*		30EUE†32B1V*		30EUE†32W1V*		30EUE†32F1V*		30EUE†32O1V*	
10	15	25	25	2	—	13–52	B	30FUF†32A1V*		30FUF†32B1V*		30FUF†32W1V*		30FUF†32F1V*		30FUF†32O1V*	
15	20	30	30	—	2 1/2	25–100	B	30GUG†32A1V*		30GUG†32B1V*		30GUG†32W1V*		30GUG†32F1V*		30GUG†32O1V*	
25	30	50	50	3	—	25–100	B	30HUG†32A1V*		30HUG†32B1V*		30HUG†32W1V*		30HUG†32F1V*		30HUG†32O1V*	
30	40	75	75	—	3 1/2	50–200	B	30IUH†32A1V*		30IUH†32B1V*		30IUH†32W1V*		30IUH†32F1V*		30IUH†32O1V*	
40	50	100	100	4	—	50–200	B	30JUH†32A1V*		30JUH†32B1V*		30JUH†32W1V*		30JUH†32F1V*		30JUH†32O1V*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

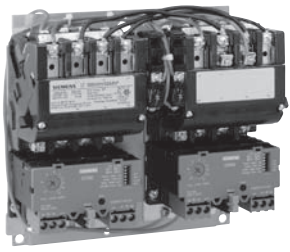
Ⓢ For conduit hubs and conversion instructions, see page 9/110.

Ⓢ If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Ⓢ Auxiliary contacts 30C-30E 4th pole built-in 30F-30J 2 NO & 2 NC

# Constant HP with Solid State Overload, Class 30

## Selection

 <p>2S2W Starter (ESP200 Overload)</p>	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Replace the (t) with the letter that corresponds to the correct FLA in High/Low Speed FLA Table.<sup>®</sup></li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/150.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E	<b>High/Low Speed FLA Table<sup>®</sup></b> <table border="1"> <thead> <tr> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>t</th> </tr> </thead> <tbody> <tr><td>0,1</td><td>0.25–1</td><td>A</td><td>A</td></tr> <tr><td>0,1</td><td>0.75–3.4</td><td>A</td><td>B</td></tr> <tr><td>0,1</td><td>3–12</td><td>A1</td><td>C</td></tr> <tr><td>0,1</td><td>5.5–22</td><td>A1</td><td>D</td></tr> <tr><td>0-1<sup>3</sup>/<sub>4</sub></td><td>10–40</td><td>A1</td><td>E</td></tr> <tr><td>2-3</td><td>13–52</td><td>B</td><td>F</td></tr> <tr><td>2-3</td><td>25–100</td><td>B</td><td>G</td></tr> <tr><td>3<sup>1</sup>/<sub>2</sub>-4</td><td>50–200</td><td>B</td><td>H</td></tr> </tbody> </table> <p>* First (t) for high speed, second (t) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.</p>	Size	FLA	OLR Frame Size	t	0,1	0.25–1	A	A	0,1	0.75–3.4	A	B	0,1	3–12	A1	C	0,1	5.5–22	A1	D	0-1 <sup>3</sup> / <sub>4</sub>	10–40	A1	E	2-3	13–52	B	F	2-3	25–100	B	G	3 <sup>1</sup> / <sub>2</sub> -4	50–200	B	H
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### One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp							Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size		Open Type Standard Auxiliary Contacts <sup>③</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R <sup>②</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
2	2	3	3	0	—	30CU††32A2H*		30CU††32B2H*		30CU††32W2H*		30CU††32F2H*		30CU††32O2H*		
5	5	7½	7½	1	—	30DU††32A2H*		30DU††32B2H*		30DU††32W2H*		30DU††32F2H*		30DU††32O2H*		
7½	7½	10	10	—	1½	30EU††32A2H*		30EU††32B2H*		30EU††32W2H*		30EU††32F2H*		30EU††32O2H*		
7½	10	20	20	2	—	30FU††32A2H*		30FU††32B2H*		30FU††32W2H*		30FU††32F2H*		30FU††32O2H*		
10	15	25	25	—	2½	30GU††32A2H*		30GU††32B2H*		30GU††32W2H*		30GU††32F2H*		30GU††32O2H*		
20	25	40	40	3	—	30HU††32A2H*		30HU††32B2H*		30HU††32W2H*		30HU††32F2H*		30HU††32O2H*		
25	30	50	50	—	3½	30IU††32A2H*		30IU††32B2H*		30IU††32W2H*		30IU††32F2H*		30IU††32O2H*		
30	40	75	75	4	—	30JU††32A2H*		30JU††32B2H*		30JU††32W2H*		30JU††32F2H*		30JU††32O2H*		

### Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp							Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size		Open Type Standard Auxiliary Contacts <sup>③</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R <sup>②</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
2	2	3	3	0	—	30CU††32A1H*		30CU††32B1H*		30CU††32W1H*		30CU††32F1H*		30CU††32O1H*		
5	5	7½	7½	1	—	30DU††32A1H*		30DU††32B1H*		30DU††32W1H*		30DU††32F1H*		30DU††32O1H*		
7½	7½	10	10	—	1¾	30EU††32A1H*		30EU††32B1H*		30EU††32W1H*		30EU††32F1H*		30EU††32O1H*		
7½	10	20	20	2	—	30FU††32A1H*		30FU††32B1H*		30FU††32W1H*		30FU††32F1H*		30FU††32O1H*		
10	15	25	25	—	2½	30GU††32A1H*		30GU††32B1H*		30GU††32W1H*		30GU††32F1H*		30GU††32O1H*		
20	25	40	40	3	—	30HU††32A1H*		30HU††32B1H*		30HU††32W1H*		30HU††32F1H*		30HU††32O1H*		
25	30	50	50	—	3½	30IU††32A1H*		30IU††32B1H*		30IU††32W1H*		30IU††32F1H*		30IU††32O1H*		
30	40	75	75	4	—	30JU††32A1H*		30JU††32B1H*		30JU††32W1H*		30JU††32F1H*		30JU††32O1H*		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① For conduit hubs and conversion instructions, see page 9/110.

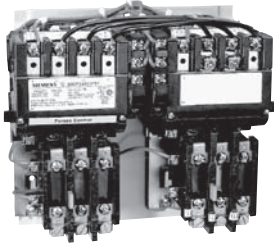
② First (t) for high speed, second (t) for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

③ Auxiliary contacts  
30C-30E 4th pole built-in  
30F-30J 2 NO & 2 NC

Two Speed Heavy Duty Starters

Constant or Variable Torque with Ambient Compensated Bimetal Overload, Class 30

Selection

 <p>2S2W starter (Amb. Comp. Bimetal OL)</p>	<p><b>Ordering Information</b></p> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Heater elements see page 9/124 (6 required)<sup>②</sup></li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see pages 9/143 open and 9/150 enclosed.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.</li> </ul>	<p><b>Coil Table</b></p> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
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575–600	E																					

One Winding Consequent Pole, 3 Phase (Constant or Variable Torque)

Max Hp					Contact Amp Rating	NEMA Size	Half Size	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	Open Type <sup>③</sup>				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 <sup>②</sup> NEMA 3/3R Industrial Use Weatherproof			
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	18	0	—	30CP32A2V*81		30CP32B2V*81		30CP32W2V*81		30CP32F2V*81		30CP32O2V*81		
7½	7½	10	10	27	1	—	30DP32A2V*81		30DP32B2V*81		30DP32W2V*81		30DP32F2V*81		30DP32O2V*81		
10	10	15	15	40	—	1¾	30EP32A2V*81		30EP32B2V*81		30EP32W2V*81		30EP32F2V*81		30EP32O2V*81		
10	15	25	25	45	2	—	30FP32A2V*81		30FP32B2V*81		30FP32W2V*81		30FP32F2V*81		30FP32O2V*81		
15	20	30	30	60	—	2½	30GP32A2V*81		30GP32B2V*81		30GP32W2V*81		30GP32F2V*81		30GP32O2V*81		
25	30	50	50	90	3	—	30HP32A2V*81		30HP32B2V*81		30HP32W2V*81		30HP32F2V*81		30HP32O2V*81		
30	40	75	75	115	—	3½	30IP32A2V*81		30IP32B2V*81		30IP32W2V*81		30IP32F2V*81		30IP32O2V*81		
40	50	100	100	135	4	—	30JG32A2V*81		30JG32B2V*81		30JG32W2V*81		30JG32F2V*81		30JG32O2V*81		

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp					Contact Amp Rating	NEMA Size	Half Size	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	Open Type <sup>③</sup>				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 <sup>②</sup> NEMA 3/3R Industrial Use Weatherproof			
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	18	0	—	30CP32A1V*81		30CP32B1V*81		30CP32W1V*81		30CP32F1V*81		30CP32O1V*81		
7½	7½	10	10	27	1	—	30DP32A1V*81		30DP32B1V*81		30DP32W1V*81		30DP32F1V*81		30DP32O1V*81		
10	10	15	15	40	—	1¾	30EP32A1V*81		30EP32B1V*81		30EP32W1V*81		30EP32F1V*81		30EP32O1V*81		
10	15	25	25	45	2	—	30FP32A1V*81		30FP32B1V*81		30FP32W1V*81		30FP32F1V*81		30FP32O1V*81		
15	20	30	30	60	—	2½	30GP32A1V*81		30GP32B1V*81		30GP32W1V*81		30GP32F1V*81		30GP32O1V*81		
25	30	50	50	90	3	—	30HP32A1V*81		30HP32B1V*81		30HP32W1V*81		30HP32F1V*81		30HP32O1V*81		
30	40	75	75	115	—	3½	30IP32A1V*81		30IP32B1V*81		30IP32W1V*81		30IP32F1V*81		30IP32O1V*81		
40	50	100	100	135	4	—	30JG32A1V*81		30JG32B1V*81		30JG32W1V*81		30JG32F1V*81		30JG32O1V*81		

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① For conduit hubs and conversion instructions, see page 9/110.

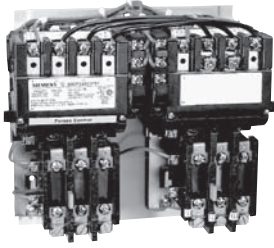
② If motor FLA are unknown, select heater elements on the basis that low speed FLA will be no greater than 50% of high speed FLA.

③ Auxiliary contacts  
30C-30E 4th pole built-in  
30F-30J 2 NO & 2 NC



# Constant HP with Ambient Compensated Bimetal Overload, Class 30

## Selection

 <p>2S2W starter (Amb. Comp. Bimetal OL)</p>	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Heater elements see page 9/124 (6 required)<sup>②</sup></li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see pages 9/143 open and 9/150 enclosed.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
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### One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp								Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size		Open Type <sup>③</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 <sup>①</sup> NEMA 3/3R Industrial Use Weatherproof	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	18	0	—		30CP32A2H*81		30CP32B2H*81		30CP32W2H*81		30CP32F2H*81		30CP3202H*81	
5	5	7½	7½	27	1	—		30DP32A2H*81		30DP32B2H*81		30DP32W2H*81		30DP32F2H*81		30DP3202H*81	
7½	7½	10	10	40	—	1¼		30EP32A2H*81		30EP32B2H*81		30EP32W2H*81		30EP32F2H*81		30EP3202H*81	
7½	10	20	20	45	2	—		30FP32A2H*81		30FP32B2H*81		30FP32W2H*81		30FP32F2H*81		30FP3202H*81	
10	15	25	25	60	—	2½		30GP32A2H*81		30GP32B2H*81		30GP32W2H*81		30GP32F2H*81		30GP3202H*81	
20	25	40	40	90	3	—		30HP32A2H*81		30HP32B2H*81		30HP32W2H*81		30HP32F2H*81		30HP3202H*81	
25	30	50	50	115	—	3½		30IP32A2H*81		30IP32B2H*81		30IP32W2H*81		30IP32F2H*81		30IP3202H*81	
30	40	75	75	135	4	—		30JG32A2H*81		30JG32B2H*81		30JG32W2H*81		30JG32F2H*81		30JG3202H*81	

### Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp								Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size		Open Type <sup>③</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 <sup>①</sup> NEMA 3/3R Industrial Use Weatherproof	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
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5	5	7½	7½	27	1	—		30DP32A1H*81		30DP32B1H*81		30DP32W1H*81		30DP32F1H*81		30DP3201H*81	
7½	7½	10	10	40	—	1¼		30EP32A1H*81		30EP32B1H*81		30EP32W1H*81		30EP32F1H*81		30EP3201H*81	
7½	10	20	20	45	2	—		30FP32A1H*81		30FP32B1H*81		30FP32W1H*81		30FP32F1H*81		30FP3201H*81	
10	15	25	25	60	—	2½		30GP32A1H*81		30GP32B1H*81		30GP32W1H*81		30GP32F1H*81		30GP3201H*81	
20	25	40	40	90	3	—		30HP32A1H*81		30HP32B1H*81		30HP32W1H*81		30HP32F1H*81		30HP3201H*81	
25	30	50	50	115	—	3½		30IP32A1H*81		30IP32B1H*81		30IP32W1H*81		30IP32F1H*81		30IP3201H*81	
30	40	75	75	135	4	—		30JG32A1H*81		30JG32B1H*81		30JG32W1H*81		30JG32F1H*81		30JG3201H*81	

**Note:** Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

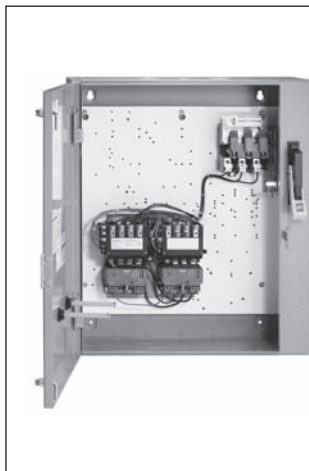
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② If motor FLA are unknown, select heater element on the basis that low speed FLA will be no greater than 50% of high speed FLA.

③ Auxiliary contacts  
30C-30E 4th pole built-in  
30F-30J 2 NO & 2 NC

# Non-Fusible, Constant or Variable Torque with Solid State Overload, Class 32

## Selection



Ordering Information	Coil Table	Low Speed FLA Table																																																												
<ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Replace the (t) with the letter that corresponds to the correct low speed FLA in the FLA table.<sup>③</sup></li> <li>▶ Fuse clips see page 9/120.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/166.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td><td>0,1</td><td>0.25-1</td><td>A</td><td>A</td></tr> <tr><td>120</td><td>F</td><td>0,1</td><td>0.75-3.4</td><td>A</td><td>B</td></tr> <tr><td>110-120/220-240<sup>①</sup></td><td>A</td><td>0,1</td><td>3-12</td><td>A1</td><td>C</td></tr> <tr><td>200-208</td><td>D</td><td>0,1</td><td>5.5-22</td><td>A1</td><td>D</td></tr> <tr><td>220-240</td><td>G</td><td>0-1<sup>3/4</sup></td><td>10-40</td><td>A1</td><td>E</td></tr> <tr><td>277</td><td>L</td><td>2-3</td><td>13-52</td><td>B</td><td>F</td></tr> <tr><td>220-240/440-480<sup>①</sup></td><td>C</td><td>2-3</td><td>25-100</td><td>B</td><td>G</td></tr> <tr><td>440-480</td><td>H</td><td>3<sup>1/2</sup>-4</td><td>50-200</td><td>B</td><td>H</td></tr> <tr><td>575-600</td><td>E</td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	24	J	0,1	0.25-1	A	A	120	F	0,1	0.75-3.4	A	B	110-120/220-240 <sup>①</sup>	A	0,1	3-12	A1	C	200-208	D	0,1	5.5-22	A1	D	220-240	G	0-1 <sup>3/4</sup>	10-40	A1	E	277	L	2-3	13-52	B	F	220-240/440-480 <sup>①</sup>	C	2-3	25-100	B	G	440-480	H	3 <sup>1/2</sup> -4	50-200	B	H	575-600	E					
60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†																																																									
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220-240/440-480 <sup>①</sup>	C	2-3	25-100	B	G																																																									
440-480	H	3 <sup>1/2</sup> -4	50-200	B	H																																																									
575-600	E																																																													

### One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R <sup>②</sup> , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight				
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	30	32CUB†92B2V2*		32CUB†92W2V2*		32CUB†92F2V2*		32CUB†92N2V2*	
2	2	5	5	0	—	3-12	A1	30	32CUC†92B2V2*		32CUC†92W2V2*		32CUC†92F2V2*		32CUC†92N2V2*	
3	3	—	—	0	—	5.5-22	A1	30	32CUD†92B2V2*		32CUD†92W2V2*		32CUD†92F2V2*		32CUD†92N2V2*	
1/2	3/4	1 1/2	1 1/2	1	—	0.75-3.4	A	30	32DUB†92B2V2*		32DUB†92W2V2*		32DUB†92F2V2*		32DUB†92N2V2*	
2	2	5	5	1	—	3-12	A1	30	32DUC†92B2V2*		32DUC†92W2V2*		32DUC†92F2V2*		32DUC†92N2V2*	
3	3	10	10	1	—	5.5-22	A1	30	32DUD†92B2V2*		32DUD†92W2V2*		32DUD†92F2V2*		32DUD†92N2V2*	
7 1/2	7 1/2	—	—	1	—	10-40	A1	60	32DUE†92B2V2*		32DUE†92W2V2*		32DUE†92F2V2*		32DUE†92N2V2*	
10	10	15	15	—	1 1/2	10-40	A1	60	32EUE†92B2V2*		32EUE†92W2V2*		32EUE†92F2V2*		32EUE†92N2V2*	
10	15	25	25	2	—	13-52	B	60	32FUF†92B2V2*		32FUF†92W2V2*		32FUF†92F2V2*		32FUF†92N2V2*	
15	20	30	30	—	2 1/2	25-100	B	100	32GUG†92B2V2*		32GUG†92W2V2*		32GUG†92F2V2*		32GUG†92N2V2*	
20	25	50	50	3	—	25-100	B	100	32HUG†92B2V2*		32HUG†92W2V2*		32HUG†92F2V2*		32HUG†92N2V2*	
30	40	75	75	—	3 1/2	50-200	B	200	32IUH†92B2V2*		32IUH†92W2V2*		32IUH†92F2V2*		32IUH†92N2V2*	
40	50	100	100	4	—	50-200	B	200	32JUH†92B2V2*		32JUH†92W2V2*		32JUH†92F2V2*		32JUH†92N2V2*	

### Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R <sup>②</sup> , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight				
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	30	32CUB†92B1V2*		32CUB†92W1V2*		32CUB†92F1V2*		32CUB†92N1V2*	
2	2	5	5	0	—	3-12	A1	30	32CUC†92B1V2*		32CUC†92W1V2*		32CUC†92F1V2*		32CUC†92N1V2*	
3	3	—	—	0	—	5.5-22	A1	30	32CUD†92B1V2*		32CUD†92W1V2*		32CUD†92F1V2*		32CUD†92N1V2*	
1/2	3/4	1 1/2	1 1/2	1	—	0.75-3.4	A	30	32DUB†92B1V2*		32DUB†92W1V2*		32DUB†92F1V2*		32DUB†92N1V2*	
2	2	5	5	1	—	3-12	A1	30	32DUC†92B1V2*		32DUC†92W1V2*		32DUC†92F1V2*		32DUC†92N1V2*	
3	3	10	10	1	—	5.5-22	A1	30	32DUD†92B1V2*		32DUD†92W1V2*		32DUD†92F1V2*		32DUD†92N1V2*	
7 1/2	7 1/2	—	—	1	—	10-40	A1	60	32DUE†92B1V2*		32DUE†92W1V2*		32DUE†92F1V2*		32DUE†92N1V2*	
10	10	15	15	—	1 1/2	10-40	A1	60	32EUE†92B1V2*		32EUE†92W1V2*		32EUE†92F1V2*		32EUE†92N1V2*	
10	15	25	25	2	—	13-52	B	60	32FUF†92B1V2*		32FUF†92W1V2*		32FUF†92F1V2*		32FUF†92N1V2*	
15	20	30	30	—	2 1/2	25-100	B	100	32GUG†92B1V2*		32GUG†92W1V2*		32GUG†92F1V2*		32GUG†92N1V2*	
20	25	50	50	3	—	25-100	B	100	32HUG†92B1V2*		32HUG†92W1V2*		32HUG†92F1V2*		32HUG†92N1V2*	
30	40	75	75	—	3 1/2	50-200	B	200	32IUH†92B1V2*		32IUH†92W1V2*		32IUH†92F1V2*		32IUH†92N1V2*	
40	50	100	100	4	—	50-200	B	200	32JUH†92B1V2*		32JUH†92W1V2*		32JUH†92F1V2*		32JUH†92N1V2*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).


① Dual voltage coils not available in modified starters.

② For conduit hubs and conversion instructions, see page 9/110.

③ If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

# Non-Fusible, Constant Horsepower with Solid State Overload, Class 32

## Selection

	<p><b>Ordering Information</b></p> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Replace the (†) with the letter that corresponds to the correct FLA in the High/Low Speed FLA Table.®</li> <li>▶ Fuse clips see page 9/120.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/166.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p><b>Coil Table</b></p> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240®</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480®</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table>		60Hz Voltage	Letter	24	J	120	F	110–120/220–240®	A	200–208	D	220–240	G	277	L	220–240/440–480®	C	440–480	H	575–600	E	<p><b>High/Low Speed FLA Table®</b></p> <table border="1"> <thead> <tr> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr><td>0,1</td><td>0.25–1</td><td>A</td><td>A</td></tr> <tr><td>0,1</td><td>0.75–3.4</td><td>A</td><td>B</td></tr> <tr><td>0,1</td><td>3–12</td><td>A1</td><td>C</td></tr> <tr><td>0,1</td><td>5.5–22</td><td>A1</td><td>D</td></tr> <tr><td>0-1<sup>3/4</sup></td><td>10–40</td><td>A1</td><td>E</td></tr> <tr><td>2-3</td><td>13–52</td><td>B</td><td>F</td></tr> <tr><td>2-3</td><td>25–100</td><td>B</td><td>G</td></tr> <tr><td>3<sup>1/2</sup>-4</td><td>50–200</td><td>B</td><td>H</td></tr> </tbody> </table>				Size	FLA	OLR Frame Size	†	0,1	0.25–1	A	A	0,1	0.75–3.4	A	B	0,1	3–12	A1	C	0,1	5.5–22	A1	D	0-1 <sup>3/4</sup>	10–40	A1	E	2-3	13–52	B	F	2-3	25–100	B	G	3 <sup>1/2</sup> -4	50–200	B	H
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<p>For other voltages and frequencies see Factory Modifications page 9/119.</p>		<p>* First (†) for high speed, second (†) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.</p>																																																													

### One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts						NEMA 1 General Purpose	NEMA 4/4X Stainless® Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R®, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$			
2	2	3	3	0	—	—	30	32CU††92B2H2*	32CU††92W2H2*	4054.00	32CU††92F2H2*	32CU††92N2H2*
5	5	7½	7½	1	—	—	30	32DU††92B2H2*	32DU††92W2H2*	4173.00	32DU††92F2H2*	32DU††92N2H2*
7½	7½	10	10	—	1½	—	60	32EU††92B2H2*	32EU††92W2H2*	4873.00	32EU††92F2H2*	32EU††92N2H2*
7½	10	20	20	2	—	—	60	32FU††92B2H2*	32FU††92W2H2*	6146.00	32FU††92F2H2*	32FU††92N2H2*
10	15	25	25	—	2½	—	100	32GU††92B2H2*	32GU††92W2H2*	7219.00	32GU††92F2H2*	32GU††92N2H2*
20	25	40	40	3	—	—	100	32HU††92B2H2*	32HU††92W2H2*	9321.00	32HU††92F2H2*	32HU††92N2H2*
25	30	50	50	—	3½	—	200	32IU††92B2H2*	32IU††92W2H2*	18079.00	32IU††92F2H2*	32IU††92N2H2*
30	40	75	75	4	—	—	200	32JU††92B2H2*	32JU††92W2H2*	19263.00	32JU††92F2H2*	32JU††92N2H2*

### Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts						NEMA 1 General Purpose	NEMA 4/4X Stainless® Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R®, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$			
2	2	3	3	0	—	—	30	32CU††92B1H2*	32CU††92W1H2*	32CU††92F1H2*	32CU††92N1H2*	
5	5	7½	7½	1	—	—	30	32DU††92B1H2*	32DU††92W1H2*	32DU††92F1H2*	32DU††92N1H2*	
7½	7½	10	10	—	1½	—	60	32EU††92B1H2*	32EU††92W1H2*	32EU††92F1H2*	32EU††92N1H2*	
7½	10	20	20	2	—	—	60	32FU††92B1H2*	32FU††92W1H2*	32FU††92F1H2*	32FU††92N1H2*	
10	15	25	25	—	2½	—	100	32GU††92B1H2*	32GU††92W1H2*	32GU††92F1H2*	32GU††92N1H2*	
20	25	40	40	3	—	—	100	32HU††92B1H2*	32HU††92W1H2*	32HU††92F1H2*	32HU††92N1H2*	
25	30	50	50	—	3½	—	200	32IU††92B1H2*	32IU††92W1H2*	32IU††92F1H2*	32IU††92N1H2*	
30	40	75	75	4	—	—	200	32JU††92B1H2*	32JU††92W1H2*	32JU††92F1H2*	32JU††92N1H2*	

**Note:** All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in modified starters.

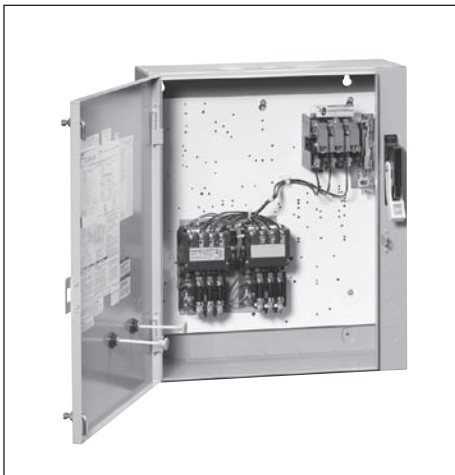
② For conduit hubs and conversion instructions, see page 9/110.

③ First † for high speed, second † for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant or Variable Torque with Ambient Compensated Bimetal Overload, Class 32

Selection



Ordering Information	Coil Table																				
<ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Heater elements see page 9/124. (6 required)</li> <li>▶ Fuse clips see page 9/120.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/166.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.</li> </ul>	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240<sup>①</sup></td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480<sup>①</sup></td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 <sup>①</sup>	A	200–208	D	220–240	G	277	L	220–240/440–480 <sup>①</sup>	C	440–480	H	575–600	E
	60Hz Voltage	Letter																			
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One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Disc Half Size	Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R <sup>②</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	32CP92B2V2*81		32CP92W2V2*81		32CP92F2V2*81		32CP92N2V2*81	
7½	7½	10	10	1	—	30	32DP92B2V2*81		32DP92W2V2*81		32DP92F2V2*81		32DP92N2V2*81	
10	10	15	15	—	1¼	60	32EP92B2V2*81		32EP92W2V2*81		32EP92F2V2*81		32EP92N2V2*81	
10	15	25	25	2	—	60	32FP92B2V2*81		32FP92W2V2*81		32FP92F2V2*81		32FP92N2V2*81	
15	20	30	30	—	2½	100	32GP92B2V2*81		32GP92W2V2*81		32GP92F2V2*81		32GP92N2V2*81	
20	25	50	50	3	—	100	32HP92B2V2*81		32HP92W2V2*81		32HP92F2V2*81		32HP92N2V2*81	
30	40	75	75	—	3½	200	32IP92B2V2*81		32IP92W2V2*81		32IP92F2V2*81		32IP92N2V2*81	
40	50	100	100	4	—	200	32JP92B2V2*81		32JP92W2V2*81		32JP92F2V2*81		32JP92N2V2*81	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Disc Half Size	Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R <sup>②</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	32CP92B1V2*81		32CP92W1V2*81		32CP92F1V2*81		32CP92N1V2*81	
7½	7½	10	10	1	—	30	32DP92B1V2*81		32DP92W1V2*81		32DP92F1V2*81		32DP92N1V2*81	
10	10	15	15	—	1¼	60	32EP92B1V2*81		32EP92W1V2*81		32EP92F1V2*81		32EP92N1V2*81	
10	15	25	25	2	—	60	32FP92B1V2*81		32FP92W1V2*81		32FP92F1V2*81		32FP92N1V2*81	
15	20	30	30	—	2½	100	32GP92B1V2*81		32GP92W1V2*81		32GP92F1V2*81		32GP92N1V2*81	
20	25	50	50	3	—	100	32HP92B1V2*81		32HP92W1V2*81		32HP92F1V2*81		32HP92N1V2*81	
30	40	75	75	—	3½	200	32IP92B1V2*81		32IP92W1V2*81		32IP92F1V2*81		32IP92N1V2*81	
40	50	100	100	4	—	200	32JP92B1V2*81		32JP92W1V2*81		32JP92F1V2*81		32JP92N1V2*81	

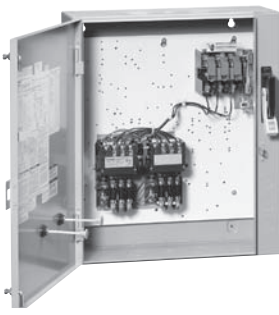
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in modified starters.  
② For conduit hubs and conversion instructions, see page 9/110.

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant Horsepower with Ambient Compensated Bimetal Overload, Class 32

Selection

	<p><b>Ordering Information</b></p> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Heater elements see page 9/124. (6 Required)</li> <li>▶ Fuse clips see page 9/120.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/166.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.</li> </ul>	<p><b>Coil Table</b></p> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240<sup>①</sup></td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480<sup>①</sup></td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 <sup>①</sup>	A	200–208	D	220–240	G	277	L	220–240/440–480 <sup>①</sup>	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
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575–600	E																					

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Disc Half Size	Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R <sup>③</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30	32CP92B2H2*81		32CP92W2H2*81		32CP92F2H2*81		32CP92N2H2*81	
5	5	7½	7½	1	—	30	32DP92B2H2*81		32DP92W2H2*81		32DP92F2H2*81		32DP92N2H2*81	
7½	7½	10	10	—	1¼	60	32EP92B2H2*81		32EP92W2H2*81		32EP92F2H2*81		32EP92N2H2*81	
7½	10	20	20	2	—	60	32FP92B2H2*81		32FP92W2H2*81		32FP92F2H2*81		32FP92N2H2*81	
10	15	25	25	—	2½	100	32GP92B2H2*81		32GP92W2H2*81		32GP92F2H2*81		32GP92N2H2*81	
20	25	40	40	3	—	100	32HP92B2H2*81		32HP92W2H2*81		32HP92F2H2*81		32HP92N2H2*81	
25	30	50	50	—	3½	200	32IP92B2H2*81		32IP92W2H2*81		32IP92F2H2*81		32IP92N2H2*81	
30	40	75	75	4	—	200	32JP92B2H2*81		32JP92W2H2*81		32JP92F2H2*81		32JP92N2H2*81	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R <sup>③</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30	32CP92B1H2*81		32CP92W1H2*81		32CP92F1H2*81		32CP92N1H2*81	
5	5	7½	7½	1	—	30	32DP92B1H2*81		32DP92W1H2*81		32DP92F1H2*81		32DP92N1H2*81	
7½	7½	10	10	—	1¼	60	32EP92B1H2*81		32EP92W1H2*81		32EP92F1H2*81		32EP92N1H2*81	
7½	10	20	20	2	—	60	32FP92B1H2*81		32FP92W1H2*81		32FP92F1H2*81		32FP92N1H2*81	
10	15	25	25	—	2½	100	32GP92B1H2*81		32GP92W1H2*81		32GP92F1H2*81		32GP92N1H2*81	
20	25	40	40	3	—	100	32HP92B1H2*81		32HP92W1H2*81		32HP92F1H2*81		32HP92N1H2*81	
25	30	50	50	—	3½	200	32IP92B1H2*81		32IP92W1H2*81		32IP92F1H2*81		32IP92N1H2*81	
30	40	75	75	4	—	200	32JP92B1H2*81		32JP92W1H2*81		32JP92F1H2*81		32JP92N1H2*81	


Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in modified starters.  
② For conduit hubs and conversion instructions, see page 9/110.



# MCP Type, Constant or Variable Torque with Solid State Overload, Class 32

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.<sup>③</sup></li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/166.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>J</td> <td>0,1</td> <td>0.25-1</td> <td>A</td> <td>A</td> </tr> <tr> <td>120</td> <td>F</td> <td>0,1</td> <td>0.75-3.4</td> <td>A</td> <td>B</td> </tr> <tr> <td>110-120/220-240<sup>①</sup></td> <td>A</td> <td>0,1</td> <td>3-12</td> <td>A1</td> <td>C</td> </tr> <tr> <td>200-208</td> <td>D</td> <td>0,1</td> <td>5.5-22</td> <td>A1</td> <td>D</td> </tr> <tr> <td>220-240</td> <td>G</td> <td>0-1<sup>3/4</sup></td> <td>10-40</td> <td>A1</td> <td>E</td> </tr> <tr> <td>277</td> <td>L</td> <td>2-3</td> <td>13-52</td> <td>B</td> <td>F</td> </tr> <tr> <td>220-240/440-480<sup>②</sup></td> <td>C</td> <td>2-3</td> <td>25-100</td> <td>B</td> <td>G</td> </tr> <tr> <td>440-480</td> <td>H</td> <td>3<sup>1/2</sup>-4</td> <td>50-200</td> <td>B</td> <td>H</td> </tr> <tr> <td>575-600</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	24	J	0,1	0.25-1	A	A	120	F	0,1	0.75-3.4	A	B	110-120/220-240 <sup>①</sup>	A	0,1	3-12	A1	C	200-208	D	0,1	5.5-22	A1	D	220-240	G	0-1 <sup>3/4</sup>	10-40	A1	E	277	L	2-3	13-52	B	F	220-240/440-480 <sup>②</sup>	C	2-3	25-100	B	G	440-480	H	3 <sup>1/2</sup> -4	50-200	B	H	575-600	E					<b>Low Speed FLA Table</b> <table border="1"> <thead> <tr> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr> <td>0,1</td> <td>0.25-1</td> <td>A</td> <td>A</td> </tr> <tr> <td>0,1</td> <td>0.75-3.4</td> <td>A</td> <td>B</td> </tr> <tr> <td>0,1</td> <td>3-12</td> <td>A1</td> <td>C</td> </tr> <tr> <td>0,1</td> <td>5.5-22</td> <td>A1</td> <td>D</td> </tr> <tr> <td>0-1<sup>3/4</sup></td> <td>10-40</td> <td>A1</td> <td>E</td> </tr> <tr> <td>2-3</td> <td>13-52</td> <td>B</td> <td>F</td> </tr> <tr> <td>2-3</td> <td>25-100</td> <td>B</td> <td>G</td> </tr> <tr> <td>3<sup>1/2</sup>-4</td> <td>50-200</td> <td>B</td> <td>H</td> </tr> </tbody> </table>	Size	FLA	OLR Frame Size	†	0,1	0.25-1	A	A	0,1	0.75-3.4	A	B	0,1	3-12	A1	C	0,1	5.5-22	A1	D	0-1 <sup>3/4</sup>	10-40	A1	E	2-3	13-52	B	F	2-3	25-100	B	G	3 <sup>1/2</sup> -4	50-200	B	H
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### One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure				
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R <sup>②</sup> , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	3	0.75-3.4	A	32CUB†92B2V*	32CUB†92W2V*	32CUB†92F2V*	32CUB†92N2V*	
2	2	5	5	0	—	10	3-12	A1	32CUC†92B2V*	32CUC†92W2V*	32CUC†92F2V*	32CUC†92N2V*	
3	3	—	—	0	—	25	5.5-22	A1	32CUD†92B2V*	32CUD†92W2V*	32CUD†92F2V*	32CUD†92N2V*	
1/2	3/4	1 1/2	1 1/2	1	—	3	0.75-3.4	A	32DUB†92B2V*	32DUB†92W2V*	32DUB†92F2V*	32DUB†92N2V*	
2	2	5	5	1	—	10	3-12	A1	32DUC†92B2V*	32DUC†92W2V*	32DUC†92F2V*	32DUC†92N2V*	
3	3	10	10	1	—	25	5.5-22	A1	32DUD†92B2V*	32DUD†92W2V*	32DUD†92F2V*	32DUD†92N2V*	
7 1/2	7 1/2	—	—	1	—	30	10-40	A1	32DUE†92B2V*	32DUE†92W2V*	32DUE†92F2V*	32DUE†92N2V*	
—	—	15	15	—	1 1/2	40	10-40	A1	32EUE†92B2V*	32EUE†92W2V*	32EUE†92F2V*	32EUE†92N2V*	
10	15	25	25	2	—	50	13-52	B	32FUF†92B2V*	32FUF†92W2V*	32FUF†92F2V*	32FUF†92N2V*	
15	20	30	30	—	2 1/2	100	25-100	B	32GUG†92B2V*	32GUG†92W2V*	32GUG†92F2V*	32GUG†92N2V*	
25	30	50	50	3	—	125	25-100	B	32HUG†92B2V*	32HUG†92W2V*	32HUG†92F2V*	32HUG†92N2V*	
30	40	75	75	—	3 1/2	125	50-200	B	32IUH†92B2V*	32IUH†92W2V*	32IUH†92F2V*	32IUH†92N2V*	
40	50	100	100	4	—	150	50-200	B	32JUH†92B2V*	32JUH†92W2V*	32JUH†92F2V*	32JUH†92N2V*	

### Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure				
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R <sup>②</sup> , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	3	0.75-3.4	A	32CUB†92B1V*	32CUB†92W1V*	32CUB†92F1V*	32CUB†92N1V*	
2	2	5	5	0	—	10	3-12	A1	32CUC†92B1V*	32CUC†92W1V*	32CUC†92F1V*	32CUC†92N1V*	
3	3	—	—	0	—	25	5.5-22	A1	32CUD†92B1V*	32CUD†92W1V*	32CUD†92F1V*	32CUD†92N1V*	
1/2	3/4	1 1/2	1 1/2	1	—	3	0.75-3.4	A	32DUB†92B1V*	32DUB†92W1V*	32DUB†92F1V*	32DUB†92N1V*	
2	2	5	5	1	—	10	3-12	A1	32DUC†92B1V*	32DUC†92W1V*	32DUC†92F1V*	32DUC†92N1V*	
3	3	10	10	1	—	25	5.5-22	A1	32DUD†92B1V*	32DUD†92W1V*	32DUD†92F1V*	32DUD†92N1V*	
7 1/2	7 1/2	—	—	1	—	30	10-40	A1	32DUE†92B1V*	32DUE†92W1V*	32DUE†92F1V*	32DUE†92N1V*	
—	—	15	15	—	1 1/2	40	10-40	A1	32EUE†92B1V*	32EUE†92W1V*	32EUE†92F1V*	32EUE†92N1V*	
10	15	25	25	2	—	50	13-52	B	32FUF†92B1V*	32FUF†92W1V*	32FUF†92F1V*	32FUF†92N1V*	
15	20	30	30	—	2 1/2	100	25-100	B	32GUG†92B1V*	32GUG†92W1V*	32GUG†92F1V*	32GUG†92N1V*	
25	30	50	50	3	—	125	25-100	B	32HUG†92B1V*	32HUG†92W1V*	32HUG†92F1V*	32HUG†92N1V*	
30	40	75	75	—	3 1/2	125	50-200	B	32IUH†92B1V*	32IUH†92W1V*	32IUH†92F1V*	32IUH†92N1V*	
40	50	100	100	4	—	150	50-200	B	32JUH†92B1V*	32JUH†92W1V*	32JUH†92F1V*	32JUH†92N1V*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

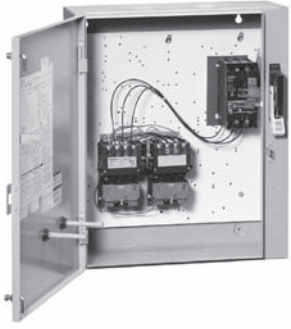
① Dual voltage coils not available in modified starters.

② For conduit hubs and conversion instructions, see page 9/110.

③ If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

# MCP Type, Constant Horsepower with Solid State Overload, Class 32

## Selection

	<p>► Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</p> <p>► Replace the (†) with the letter that corresponds to the correct FLA in the High/Low Speed FLA table.®</p> <p>► Field Modification Kits see page 9/104.</p> <p>► Factory Modifications see page 9/119.</p> <p>► Dimensions see page 9/166.</p> <p>► Wiring Diagrams see page 9/178.</p> <p>► Replacement Parts see page 9/131.</p>	<b>Coil Table</b>		<b>High/Low Speed FLA Table®</b>																																																														
		<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>J</td> <td>0,1</td> <td>0.25-1</td> <td>A</td> <td>A</td> </tr> <tr> <td>120</td> <td>F</td> <td>0,1</td> <td>0.75-3.4</td> <td>A</td> <td>B</td> </tr> <tr> <td>110-120/220-240<sup>ⓐ</sup></td> <td>A</td> <td>0,1</td> <td>3-12</td> <td>A1</td> <td>C</td> </tr> <tr> <td>200-208</td> <td>D</td> <td>0,1</td> <td>5.5-22</td> <td>A1</td> <td>D</td> </tr> <tr> <td>220-240</td> <td>G</td> <td>0-1<sup>3/4</sup></td> <td>10-40</td> <td>A1</td> <td>E</td> </tr> <tr> <td>277</td> <td>L</td> <td>2-3</td> <td>13-52</td> <td>B</td> <td>F</td> </tr> <tr> <td>220-240/440-480<sup>ⓐ</sup></td> <td>C</td> <td>2-3</td> <td>25-100</td> <td>B</td> <td>G</td> </tr> <tr> <td>440-480</td> <td>H</td> <td>3<sup>1/2</sup>-4</td> <td>50-200</td> <td>B</td> <td>H</td> </tr> <tr> <td>575-600</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	24	J	0,1	0.25-1	A	A	120	F	0,1	0.75-3.4	A	B	110-120/220-240 <sup>ⓐ</sup>	A	0,1	3-12	A1	C	200-208	D	0,1	5.5-22	A1	D	220-240	G	0-1 <sup>3/4</sup>	10-40	A1	E	277	L	2-3	13-52	B	F	220-240/440-480 <sup>ⓐ</sup>	C	2-3	25-100	B	G	440-480	H	3 <sup>1/2</sup> -4	50-200	B	H	575-600	E					<p>For other voltages and frequencies see Factory Modifications page 9/119.</p>		<p>* First (†) for high speed, second (†) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.</p>	
60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†																																																													
24	J	0,1	0.25-1	A	A																																																													
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110-120/220-240 <sup>ⓐ</sup>	A	0,1	3-12	A1	C																																																													
200-208	D	0,1	5.5-22	A1	D																																																													
220-240	G	0-1 <sup>3/4</sup>	10-40	A1	E																																																													
277	L	2-3	13-52	B	F																																																													
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440-480	H	3 <sup>1/2</sup> -4	50-200	B	H																																																													
575-600	E																																																																	

### One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp							Motor Circuit Interrupter ETI Amps	Amp Range	Frame Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	NEMA 1 General Purpose				NEMA 4/4X Stainless <sup>ⓐ</sup>		NEMA 4X Fiberglass		NEMA 12, NEMA 3/3R <sup>ⓐ</sup> , NEMA 4 Painted			
2	3	7½	10	1	1½					Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
2	2	3	3	0	—	10	—	A or A1	32CU††92B2H*		32CU††92W2H*		32CU††92F2H*		32CU††92N2H*		
5	5	7½	7½	1	—	25	—	A or A1	32DU††92B2H*		32DU††92W2H*		32DU††92F2H*		32DU††92N2H*		
7½	7½	10	10	—	1½	40	—	A1	32EU††92B2H*		32EU††92W2H*		32EU††92F2H*		32EU††92N2H*		
7½	10	20	20	2	—	50	—	B	32FU††92B2H*		32FU††92W2H*		32FU††92F2H*		32FU††92N2H*		
10	15	25	25	—	2½	100	—	B	32GU††92B2H*		32GU††92W2H*		32GU††92F2H*		32GU††92N2H*		
20	25	40	40	3	—	100	—	B	32HU††92B2H*		32HU††92W2H*		32HU††92F2H*		32HU††92N2H*		
25	30	50	50	—	3½	125	—	B	32IU††92B2H*		32IU††92W2H*		32IU††92F2H*		32IU††92N2H*		
30	40	75	75	4	—	150	—	B	32JU††92B2H*		32JU††92W2H*		32JU††92F2H*		32JU††92N2H*		

### Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp							Motor Circuit Interrupter ETI Amps	Amp Range	Frame Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	NEMA 1 General Purpose				NEMA 4/4X Stainless <sup>ⓐ</sup>		NEMA 4X Fiberglass		NEMA 12, NEMA 3/3R <sup>ⓐ</sup> , NEMA 4 Painted			
2	3	7½	10	1	1½					Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
2	2	3	3	0	—	10	—	A or A1	32CU††92B1H*		32CU††92W1H*		32CU††92F1H*		32CU††92N1H*		
5	5	7½	7½	1	—	25	—	A or A1	32DU††92B1H*		32DU††92W1H*		32DU††92F1H*		32DU††92N1H*		
7½	7½	10	10	—	1½	40	—	A1	32EU††92B1H*		32EU††92W1H*		32EU††92F1H*		32EU††92N1H*		
7½	10	20	20	2	—	50	—	B	32FU††92B1H*		32FU††92W1H*		32FU††92F1H*		32FU††92N1H*		
10	15	25	25	—	2½	100	—	B	32GU††92B1H*		32GU††92W1H*		32GU††92F1H*		32GU††92N1H*		
20	25	40	40	3	—	100	—	B	32HU††92B1H*		32HU††92W1H*		32HU††92F1H*		32HU††92N1H*		
25	30	50	50	—	3½	125	—	B	32IU††92B1H*		32IU††92W1H*		32IU††92F1H*		32IU††92N1H*		
30	40	75	75	4	—	150	—	B	32JU††92B1H*		32JU††92W1H*		32JU††92F1H*		32JU††92N1H*		

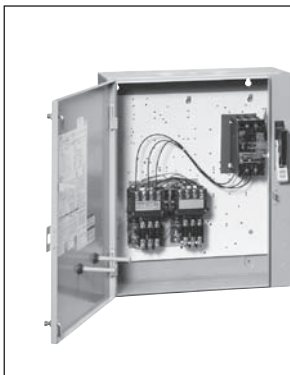
Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

ⓐ Dual voltage coils not available in modified starters.

ⓑ For conduit hubs and conversion instructions, see page 9/110.

ⓐ First † for high speed, second † for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Selection



Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 9/124. (6 Required)
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/166.
- ▶ Wiring Diagrams see page 9/178.
- ▶ Replacement Parts see page 9/131.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 <sup>Ⓛ</sup>	A
200–208	D
220–240	G
277	L
220–240/440–480 <sup>Ⓛ</sup>	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>Ⓛ</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R <sup>Ⓛ</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
1/2	1/2	1	1	0	—	3	32CP92B2VA*81	32CP92W2VA*81	32CP92F2VA*81	32CP92N2VA*81
1	1	3	3	0	—	10	32CP92B2VB*81	32CP92W2VB*81	32CP92F2VB*81	32CP92N2VB*81
3	3	5	5	0	—	25	32CP92B2VC*81	32CP92W2VC*81	32CP92F2VC*81	32CP92N2VC*81
1 1/2	1 1/2	1	1	1	—	3	32DP92B2VA*81	32DP92W2VA*81	32DP92F2VA*81	32DP92N2VA*81
1	1	3	3	1	—	10	32DP92B2VB*81	32DP92W2VB*81	32DP92F2VB*81	32DP92N2VB*81
3	3	7 1/2	7 1/2	1	—	25	32DP92B2VD*81	32DP92W2VD*81	32DP92F2VD*81	32DP92N2VD*81
7 1/2	7 1/2	10	10	1	—	30	32DP92B2VE*81	32DP92W2VE*81	32DP92F2VE*81	32DP92N2VE*81
—	—	15	15	—	1 1/4	40	32EP92B2VF*81	32EP92W2VF*81	32EP92F2VF*81	32EP92N2VF*81
10	10	—	—	—	1 1/4	50	32EP92B2VG*81	32EP92W2VG*81	32EP92F2VG*81	32EP92N2VG*81
—	—	20	20	2	—	40	32FP92B2VH*81	32FP92W2VH*81	32FP92F2VH*81	32FP92N2VH*81
10	15	25	25	2	—	50	32FP92B2VJ*81	32FP92W2VJ*81	32FP92F2VJ*81	32FP92N2VJ*81
10	15	30	30	—	2 1/2	50	32GP92B2VK*81	32GP92W2VK*81	32GP92F2VK*81	32GP92N2VK*81
15	20	—	—	—	2 1/2	100	32GP92B2VL*81	32GP92W2VL*81	32GP92F2VL*81	32GP92N2VL*81
—	—	30	30	3	—	50	32HP92B2VM*81	32HP92W2VM*81	32HP92F2VM*81	32HP92N2VM*81
25	30	50	50	3	—	125	32HP92B2VN*81	32HP92W2VN*81	32HP92F2VN*81	32HP92N2VN*81
30	40	75	75	—	3 1/2	125	32IP92B2VP*81	32IP92W2VP*81	32IP92F2VP*81	32IP92N2VP*81
40	50	100	100	4	—	150	32JP92B2VR*81	32JP92W2VR*81	32JP92F2VR*81	32JP92N2VR*81

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>Ⓛ</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R <sup>Ⓛ</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
1/2	1/2	1	1	0	—	3	32CP92B1VA*81	32CP92W1VA*81	32CP92F1VA*81	32CP92N1VA*81
1	1	3	3	0	—	10	32CP92B1VB*81	32CP92W1VB*81	32CP92F1VB*81	32CP92N1VB*81
3	3	5	5	0	—	25	32CP92B1VC*81	32CP92W1VC*81	32CP92F1VC*81	32CP92N1VC*81
1/2	1/2	1	1	1	—	3	32DP92B1VA*81	32DP92W1VA*81	32DP92F1VA*81	32DP92N1VA*81
1	1	3	3	1	—	10	32DP92B1VB*81	32DP92W1VB*81	32DP92F1VB*81	32DP92N1VB*81
3	3	7 1/2	7 1/2	1	—	25	32DP92B1VD*81	32DP92W1VD*81	32DP92F1VD*81	32DP92N1VD*81
7 1/2	7 1/2	10	10	1	—	30	32DP92B1VE*81	32DP92W1VE*81	32DP92F1VE*81	32DP92N1VE*81
—	—	15	15	—	1 1/4	40	32EP92B1VF*81	32EP92W1VF*81	32EP92F1VF*81	32EP92N1VF*81
10	10	—	—	—	1 1/4	50	32EP92B1VG*81	32EP92W1VG*81	32EP92F1VG*81	32EP92N1VG*81
—	—	20	20	2	—	40	32FP92B1VH*81	32FP92W1VH*81	32FP92F1VH*81	32FP92N1VH*81
10	15	25	25	2	—	50	32FP92B1VJ*81	32FP92W1VJ*81	32FP92F1VJ*81	32FP92N1VJ*81
10	15	30	30	—	2 1/2	50	32GP92B1VK*81	32GP92W1VK*81	32GP92F1VK*81	32GP92N1VK*81
15	20	—	—	—	2 1/2	100	32GP92B1VL*81	32GP92W1VL*81	32GP92F1VL*81	32GP92N1VL*81
—	—	30	30	3	—	50	32HP92B1VM*81	32HP92W1VM*81	32HP92F1VM*81	32HP92N1VM*81
25	30	50	50	3	—	125	32HP92B1VN*81	32HP92W1VN*81	32HP92F1VN*81	32HP92N1VN*81
30	40	75	75	—	3 1/2	125	32IP92B1VP*81	32IP92W1VP*81	32IP92F1VP*81	32IP92N1VP*81
40	50	100	100	4	—	150	32JP92B1VR*81	32JP92W1VR*81	32JP92F1VR*81	32JP92N1VR*81

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

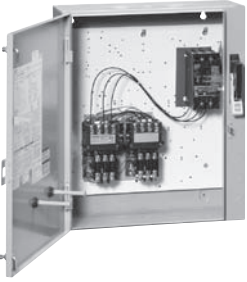
Ⓛ Dual voltage coils not available in modified starters.

Ⓛ For conduit hubs and conversion instructions, see page 9/110.



# MCP, Constant Horsepower w/ Ambient Compensated Bimetal Overload, Class 32

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Heater elements see page 9/124. (6 Required)</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/166.</li> <li>▶ Wiring Diagrams see page 9/178.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact..</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110-120/220-240<sup>①</sup></td><td>A</td></tr> <tr><td>200-208</td><td>D</td></tr> <tr><td>220-240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220-240/440-480<sup>①</sup></td><td>C</td></tr> <tr><td>440-480</td><td>H</td></tr> <tr><td>575-600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110-120/220-240 <sup>①</sup>	A	200-208	D	220-240	G	277	L	220-240/440-480 <sup>①</sup>	C	440-480	H	575-600	E
	60Hz Voltage	Letter																				
24	J																					
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### One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp						Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R <sup>②</sup> NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
1/2	1/2	1	1	0	—	3	32CP92B2HA*81		32CP92W2HA*81		32CP92F2HA*81		32CP92N2HA*81	
1 1/2	1 1/2	3	3	0	—	10	32CP92B2HB*81		32CP92W2HB*81		32CP92F2HB*81		32CP92N2HB*81	
2	2	—	—	0	—	25	32CP92B2HC*81		32CP92W2HC*81		32CP92F2HC*81		32CP92N2HC*81	
1/2	1/2	1	1	1	—	3	32DP92B2HA*81		32DP92W2HA*81		32DP92F2HA*81		32DP92N2HA*81	
1 1/2	1 1/2	3	3	1	—	10	32DP92B2HB*81		32DP92W2HB*81		32DP92F2HB*81		32DP92N2HB*81	
3	3	7 1/2	7 1/2	1	—	25	32DP92B2HD*81		32DP92W2HD*81		32DP92F2HD*81		32DP92N2HD*81	
5	5	—	—	1	—	30	32DP92B2HE*81		32DP92W2HE*81		32DP92F2HE*81		32DP92N2HE*81	
—	—	10	10	—	1 3/4	40	32EP92B2HF*81		32EP92W2HF*81		32EP92F2HF*81		32EP92N2HF*81	
7 1/2	7 1/2	—	—	—	1 3/4	50	32EP92B2HG*81		32EP92W2HG*81		32EP92F2HG*81		32EP92N2HG*81	
—	7 1/2	15	20	2	—	40	32FP92B2HH*81		32FP92W2HH*81		32FP92F2HH*81		32FP92N2HH*81	
7 1/2	10	20	—	2	—	50	32FP92B2HJ*81		32FP92W2HJ*81		32FP92F2HJ*81		32FP92N2HJ*81	
—	—	30	30	—	2 1/2	50	32GP92B2HK*81		32GP92W2HK*81		32GP92F2HK*81		32GP92N2HK*81	
10	15	30	40	3	—	50	32HP92B2HM*81		32HP92W2HM*81		32HP92F2HM*81		32HP92N2HM*81	
20	25	40	—	3	—	100	32HP92B2HN*81		32HP92W2HN*81		32HP92F2HN*81		32HP92N2HN*81	
25	30	50	50	—	3 1/2	125	32IP92B2HP*81		32IP92W2HP*81		32IP92F2HP*81		32IP92N2HP*81	
30	40	75	75	4	—	150	32JP92B2HR*81		32JP92W2HR*81		32JP92F2HR*81		32JP92N2HR*81	

### Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp						Motor Circuit Interrupter ETI Amps	Enclosure							
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							Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
1/2	1/2	1	1	0	—	3	32CP92B1HA*81		32CP92W1HA*81		32CP92F1HA*81		32CP92N1HA*81	
1 1/2	1 1/2	3	3	0	—	10	32CP92B1HB*81		32CP92W1HB*81		32CP92F1HB*81		32CP92N1HB*81	
2	2	—	—	0	—	25	32CP92B1HC*81		32CP92W1HC*81		32CP92F1HC*81		32CP92N1HC*81	
1/2	1/2	1	1	1	—	3	32DP92B1HA*81		32DP92W1HA*81		32DP92F1HA*81		32DP92N1HA*81	
1 1/2	1 1/2	3	3	1	—	10	32DP92B1HB*81		32DP92W1HB*81		32DP92F1HB*81		32DP92N1HB*81	
3	3	7 1/2	7 1/2	1	—	25	32DP92B1HD*81		32DP92W1HD*81		32DP92F1HD*81		32DP92N1HD*81	
5	5	—	—	1	—	30	32DP92B1HE*81		32DP92W1HE*81		32DP92F1HE*81		32DP92N1HE*81	
—	—	10	10	—	1 3/4	40	32EP92B1HF*81		32EP92W1HF*81		32EP92F1HF*81		32EP92N1HF*81	
7 1/2	7 1/2	—	—	—	1 3/4	50	32EP92B1HG*81		32EP92W1HG*81		32EP92F1HG*81		32EP92N1HG*81	
—	7 1/2	15	20	2	—	40	32FP92B1HH*81		32FP92W1HH*81		32FP92F1HH*81		32FP92N1HH*81	
7 1/2	10	20	—	2	—	50	32FP92B1HJ*81		32FP92W1HJ*81		32FP92F1HJ*81		32FP92N1HJ*81	
—	—	30	30	—	2 1/2	50	32GP92B1HK*81		32GP92W1HK*81		32GP92F1HK*81		32GP92N1HK*81	
10	15	30	40	3	—	50	32HP92B1HM*81		32HP92W1HM*81		32HP92F1HM*81		32HP92N1HM*81	
20	25	40	—	3	—	100	32HP92B1HN*81		32HP92W1HN*81		32HP92F1HN*81		32HP92N1HN*81	
25	30	50	50	—	3 1/2	125	32IP92B1HP*81		32IP92W1HP*81		32IP92F1HP*81		32IP92N1HP*81	
30	40	75	75	4	—	150	32JP92B1HR*81		32JP92W1HR*81		32JP92F1HR*81		32JP92N1HR*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in modified starters.

② For conduit hubs and conversion instructions, see page 9/110.

# Features and Benefits

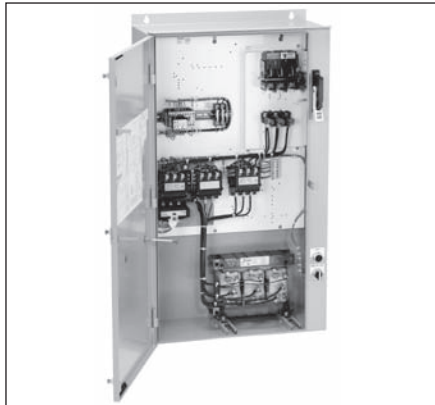
## General

Siemens manufactures the three commonly used electromechanical reduced voltage starters. Each one is designed for specific application requirements and consists of auto transformer, wye-delta and partwinding starters.

The reduced voltage starter:

- Reduces inrush current
- Provides smoother acceleration of the load
- Reduces starting torque
- Reduces stresses on mechanical linkages

Combination and non-combination reduced voltage starter sizes range from 0 to 6 including Siemens exclusive motormatched half-sizes. Enclosure types include 1, 3R/12, 4 painted and 4/4X stainless steel. UL listed file #E14900 (class 36); file #E185287 (class 37). CSA certified file #LR 6535 (class 36 & 37).



### Auto Transformer Starter

- Maximum torque per amp
- Three coil auto transformer for balanced starting currents
- 50, 65 and 80% voltage taps
- Closed circuit transition
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications



### Wye-Delta Starter

- Lowest starting torque
- Closed or open circuit transition
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications



### Part-Winding Starter


- Simplest design – most economical
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications

## Various Methods of Electro-Mechanical Reduced Voltage Motor Starting —A General Comparison

Characteristic	Autotransformer			Part-Winding 2 step	Wye-Delta
	50% Tap	65% Tap	80% Tap		
Starting current drawn from line as % of that which would be drawn upon full voltage starting	25%	42%	64%	65%	33%
Starting current drawn by the motor	50%	65%	80%	65%	58%
Starting torque developed as % of that which would be developed on full voltage starting	25%	42%	64%	40%	33%
Smoothness of acceleration	First in order of Smoothness			Third in order of Smoothness	Second in order of Smoothness
Allowable accelerating times (typical)	15 seconds at 200HP max. or 30 seconds on 200HP based on NEMA medium duty transformers			5 seconds max. Limited by motor design	5-60 seconds Limited by motor design
Starting current and torque and adjustments	Adjustable within limits of various taps			Fixed	Fixed

# Auto Transformer with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/181.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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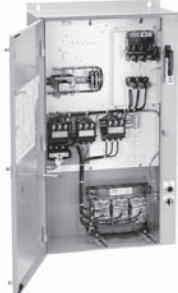
### NEMA 1 General Purpose Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EUNET6BD		60	37EUNET6BDD		60A/250V	37EUNET6BDF		50	37EUNET6BDP	
	10	2	13-52	B	36FUFT6BD		60	37FUFT6BDD		60A/250V	37FUFT6BDF		50	37FUFT6BDP	
	15	(2½)	25-100	B	36GUGT6BD		100	37GUGT6BDD		100A/250V	37GUGT6BDF		100	37GUGT6BDP	
	25	3	25-100	B	36HUGT6BD		100	37HUGT6BDD		100A/250V	37HUGT6BDF		100	37HUGT6BDP	
	30	(3½)	50-200	B	36IUHT6BD		200	37IUHT6BDD		200A/250V	37IUHT6BDF		125	37IUHT6BDP	
	40	4	50-200	B	36JUHT6BD		200	37JUHT6BDD		200A/250V	37JUHT6BDF		150	37JUHT6BDP	
	50	5	55-250	—	—		—	—		—	—		250	37LPST6BDP	
	75	5	55-250	—	—	36LPUT6BD		400	37LPUT6BDD		400A/250V	37LPUT6BDF		400	37LPUT6BDP
150	6	160-630	—	—	36MPXT6BD		600	37MPXT6BDD		600A/250V	37MPXT6BDF		600	37MPXT6BDP	
230	10	(1¼)	10-40	A1	36EUNET2BG		60	37EUNET2BGD		60A/250V	37EUNET2BGF		50	37EUNET2BGP	
	15	2	13-52	B	36FUFT2BG		60	37FUFT2BGD		60A/250V	37FUFT2BGF		50	37FUFT2BGP	
	20	(2½)	25-100	B	36GUGT2BG		100	37GUGT2BGD		100A/250V	37GUGT2BGF		100	37GUGT2BGP	
	30	3	25-100	B	36HUGT2BG		100	37HUGT2BGD		100A/250V	37HUGT2BGF		100	37HUGT2BGP	
	40	(3½)	50-200	B	36IUHT2BG		200	37IUHT2BGD		200A/250V	37IUHT2BGF		125	37IUHT2BGP	
	50	4	50-200	B	36JUHT2BG		200	37JUHT2BGD		200A/250V	37JUHT2BGF		150	37JUHT2BGP	
	75	5	55-250	—	—		—	—		—	—		250	37LPST2BGP	
	100	5	55-250	—	—	36LPUT2BG		400	37LPUT2BGD		400A/250V	37LPUT2BGF		400	37LPUT2BGP
200	6	160-630	—	—	36MPXT2BG		600	37MPXT2BGD		600A/250V	37MPXT2BGF		600	37MPXT2BGP	
460	15	(1¼)	10-40	A1	36EUNET4BH		60	37EUNET4BHD		60A/600V	37EUNET4BHF		50	37EUNET4BHP	
	25	2	13-52	B	36FUFT4BH		60	37FUFT4BHD		60A/600V	37FUFT4BHF		50	37FUFT4BHP	
	30	(2½)	13-52	B	36GUGT4BH		100	37GUGT4BHD		100A/600V	37GUGT4BHF		100	37GUGT4BHP	
	50	3	25-100	B	36HUGT4BH		100	37HUGT4BHD		100A/600V	37HUGT4BHF		100	37HUGT4BHP	
	75	(3½)	50-200	B	36IUHT4BH		200	37IUHT4BHD		200A/600V	37IUHT4BHF		125	37IUHT4BHP	
	100	4	50-200	B	36JUHT4BH		200	37JUHT4BHD		200A/600V	37JUHT4BHF		150	37JUHT4BHP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST4BHP	
	200	5	55-250	—	—	36LPUT4BH		400	37LPUT4BHD		400A/600V	37LPUT4BHF		400	37LPUT4BHP
400	6	160-630	—	—	36MPXT4BH		600	37MPXT4BHD		600A/600V	37MPXT4BHF		600	37MPXT4BHP	
575	15	(1¼)	10-40	A1	36EUNET5BE		60	37EUNET5BED		60A/600V	37EUNET5BEF		50	37EUNET5BEP	
	25	2	13-52	B	36FUFT5BE		60	37FUFT5BED		60A/600V	37FUFT5BEF		50	37FUFT5BEP	
	30	(2½)	13-52	B	36GUGT5BE		100	37GUGT5BED		100A/600V	37GUGT5BEF		100	37GUGT5BEP	
	50	3	25-100	B	36HUGT5BE		100	37HUGT5BED		100A/600V	37HUGT5BEF		100	37HUGT5BEP	
	75	(3½)	50-200	B	36IUHT5BE		200	37IUHT5BED		200A/600V	37IUHT5BEF		125	37IUHT5BEP	
	100	4	50-200	B	36JUHT5BE		200	37JUHT5BED		200A/600V	37JUHT5BEF		150	37JUHT5BEP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST5BEP	
	200	5	55-250	—	—	36LPUT5BE		400	37LPUT5BED		400A/600V	37LPUT5BEF		400	37LPUT5BEP
400	6	160-630	—	—	36MPXT5BE		600	37MPXT5BED		600A/600V	37MPXT5BEF		600	37MPXT5BEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# Auto Transformer with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/181.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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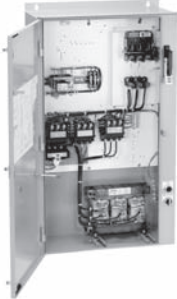
### NEMA 4 Painted Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EUT6ED		60	37EUT6EDD		60A/250V	37EUT6EDF		50	37EUT6EDP	
	10	2	13-52	B	36FUF6ED		60	37FUF6EDD		60A/250V	37FUF6EDF		50	37FUF6EDP	
	15	(2½)	25-100	B	36GUG6ED		100	37GUG6EDD		100A/250V	37GUG6EDF		100	37GUG6EDP	
	25	3	25-100	B	36HUG6ED		100	37HUG6EDD		100A/250V	37HUG6EDF		100	37HUG6EDP	
	30	(3½)	50-200	B	36IUH6ED		200	37IUH6EDD		200A/250V	37IUH6EDF		125	37IUH6EDP	
	40	4	50-200	B	36JUHT6ED		200	37JUHT6EDD		200A/250V	37JUHT6EDF		150	37JUHT6EDP	
	50	5	55-250	—	—		—	—		—	—		250	37LPST6EDP	
	75	5	55-250	—	—	36LPUT6ED		400	37LPUT6EDD		400A/250V	37LPUT6EDF		400	37LPUT6EDP
	150	6	160-630	—	36MPXT6ED		600	37MPXT6EDD		600A/250V	37MPXT6EDF		600	37MPXT6EDP	
230	10	(1¼)	10-40	A1	36EUT2EG		60	37EUT2EGD		60A/250V	37EUT2EGF		50	37EUT2EGP	
	15	2	13-52	B	36FUF2EG		60	37FUF2EGD		60A/250V	37FUF2EGF		50	37FUF2EGP	
	20	(2½)	25-100	B	36GUG2EG		100	37GUG2EGD		100A/250V	37GUG2EGF		100	37GUG2EGP	
	30	3	25-100	B	36HUG2EG		100	37HUG2EGD		100A/250V	37HUG2EGF		100	37HUG2EGP	
	40	(3½)	50-200	B	36IUH2EG		200	37IUH2EGD		200A/250V	37IUH2EGF		125	37IUH2EGP	
	50	4	50-200	B	36JUHT2EG		200	37JUHT2EGD		200A/250V	37JUHT2EGF		150	37JUHT2EGP	
	75	5	55-250	—	—		—	—		—	—		250	37LPST2EGP	
	100	5	55-250	—	—	36LPUT2EG		400	37LPUT2EGD		400A/250V	37LPUT2EGF		400	37LPUT2EGP
	200	6	160-630	—	36MPXT2EG		600	37MPXT2EGD		600A/250V	37MPXT2EGF		600	37MPXT2EGP	
460	15	(1¼)	10-40	A1	36EUT4EH		60	37EUT4EHD		60A/600V	37EUT4EHF		50	37EUT4EHP	
	25	2	13-52	B	36FUF4EH		60	37FUF4EHD		60A/600V	37FUF4EHF		50	37FUF4EHP	
	30	(2½)	13-52	B	36GUG4EH		100	37GUG4EHD		100A/600V	37GUG4EHF		100	37GUG4EHP	
	50	3	25-100	B	36HUG4EH		100	37HUG4EHD		100A/600V	37HUG4EHF		100	37HUG4EHP	
	75	(3½)	50-200	B	36IUH4EH		200	37IUH4EHD		200A/600V	37IUH4EHF		125	37IUH4EHP	
	100	4	50-200	B	36JUHT4EH		200	37JUHT4EHD		200A/600V	37JUHT4EHF		150	37JUHT4EHP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST4EHP	
	200	5	55-250	—	—	36LPUT4EH		400	37LPUT4EHD		400A/600V	37LPUT4EHF		400	37LPUT4EHP
	400	6	160-630	—	36MPXT4EH		600	37MPXT4EHD		600A/600V	37MPXT4EHF		600	37MPXT4EHP	
575	15	(1¼)	10-40	A1	36EUT5EE		60	37EUT5EED		60A/600V	37EUT5EEF		50	37EUT5EEP	
	25	2	13-52	B	36FUF5EE		60	37FUF5EED		60A/600V	37FUF5EEF		50	37FUF5EEP	
	30	(2½)	13-52	B	36GUG5EE		100	37GUG5EED		100A/600V	37GUG5EEF		100	37GUG5EEP	
	50	3	25-100	B	36HUG5EE		100	37HUG5EED		100A/600V	37HUG5EEF		100	37HUG5EEP	
	75	(3½)	50-200	B	36IUH5EE		200	37IUH5EED		200A/600V	37IUH5EEF		125	37IUH5EEP	
	100	4	50-200	B	36JUHT5EE		200	37JUHT5EED		200A/600V	37JUHT5EEF		150	37JUHT5EEP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST5EEP	
	200	5	55-250	—	—	36LPUT5EE		400	37LPUT5EED		400A/600V	37LPUT5EEF		400	37LPUT5EEP
	400	6	160-630	—	36MPXT5EE		600	37MPXT5EED		600A/600V	37MPXT5EEF		600	37MPXT5EEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# Auto Transformer with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b>	<b>Coil and Control Voltage</b>
	<ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/181.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>


### NEMA 4/4X Stainless Steel Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EUET6WD		60	37EUET6WDD		60A/250V	37EUET6WDF		50	37EUET6WDP	
	10	2	13-52	B	36FUFT6WD		60	37FUFT6WDD		60A/250V	37FUFT6WDF		50	37FUFT6WDP	
	15	(2½)	25-100	B	36GUGT6WD		100	37GUGT6WDD		100A/250V	37GUGT6WDF		100	37GUGT6WDP	
	25	3	25-100	B	36HUGT6WD		100	37HUGT6WDD		100A/250V	37HUGT6WDF		100	37HUGT6WDP	
	30	(3½)	50-200	B	36IUHT6WD		200	37IUHT6WDD		200A/250V	37IUHT6WDF		125	37IUHT6WDP	
	40	4	50-200	B	36JUHT6WD		200	37JUHT6WDD		200A/250V	37JUHT6WDF		150	37JUHT6WDP	
230	10	(1¼)	10-40	A1	36EUET2WG		60	37EUET2WGD		60A/250V	37EUET2WGF		50	37EUET2WGP	
	15	2	13-52	B	36FUFT2WG		60	37FUFT2WGD		60A/250V	37FUFT2WGF		50	37FUFT2WGP	
	20	(2½)	25-100	B	36GUGT2WG		100	37GUGT2WGD		100A/250V	37GUGT2WGF		100	37GUGT2WGP	
	30	3	25-100	B	36HUGT2WG		100	37HUGT2WGD		100A/250V	37HUGT2WGF		100	37HUGT2WGP	
	40	(3½)	50-200	B	36IUHT2WG		200	37IUHT2WGD		200A/250V	37IUHT2WGF		125	37IUHT2WGP	
	50	4	50-200	B	36JUHT2WG		200	37JUHT2WGD		200A/250V	37JUHT2WGF		150	37JUHT2WGP	
460	15	(1¼)	10-40	A1	36EUET4WH		60	37EUET4WHD		60A/600V	37EUET4WHF		50	37EUET4WHP	
	25	2	13-52	B	36FUFT4WH		60	37FUFT4WHD		60A/600V	37FUFT4WHF		50	37FUFT4WHP	
	30	(2½)	13-52	B	36GUGT4WH		100	37GUGT4WHD		100A/600V	37GUGT4WHF		100	37GUGT4WHP	
	50	3	25-100	B	36HUGT4WH		100	37HUGT4WHD		100A/600V	37HUGT4WHF		100	37HUGT4WHP	
	75	(3½)	50-200	B	36IUHT4WH		200	37IUHT4WHD		200A/600V	37IUHT4WHF		125	37IUHT4WHP	
	100	4	50-200	B	36JUHT4WH		200	37JUHT4WHD		200A/600V	37JUHT4WHF		150	37JUHT4WHP	
575	15	(1¼)	10-40	A1	36EUET5WE		60	37EUET5WED		60A/600V	37EUET5WEF		50	37EUET5WEP	
	25	2	13-52	B	36FUFT5WE		60	37FUFT5WED		60A/600V	37FUFT5WEF		50	37FUFT5WEP	
	30	(2½)	13-52	B	36GUGT5WE		100	37GUGT5WED		100A/600V	37GUGT5WEF		100	37GUGT5WEP	
	50	3	25-100	B	36HUGT5WE		100	37HUGT5WED		100A/600V	37HUGT5WEF		100	37HUGT5WEP	
	75	(3½)	50-200	B	36IUHT5WE		200	37IUHT5WED		200A/600V	37IUHT5WEF		125	37IUHT5WEP	
	100	4	50-200	B	36JUHT5WE		200	37JUHT5WED		200A/600V	37JUHT5WEF		150	37JUHT5WEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# Auto Transformer with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/181.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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### NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)<sup>①</sup>

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EUET6ND		60	37EUET6NDD		60A/250V	37EUET6NDF		50	37EUET6NDP	
	10	2	13-52	B	36FUFT6ND		60	37FUFT6NDD		60A/250V	37FUFT6NDF		50	37FUFT6NDP	
	15	(2½)	25-100	B	36GUGT6ND		100	37GUGT6NDD		100A/250V	37GUGT6NDF		100	37GUGT6NDP	
	25	3	25-100	B	36HUGT6ND		100	37HUGT6NDD		100A/250V	37HUGT6NDF		100	37HUGT6NDP	
	30	(3½)	50-200	B	36IUHT6ND		200	37IUHT6NDD		200A/250V	37IUHT6NDF		125	37IUHT6NDP	
	40	4	50-200	B	36JUHT6ND		200	37JUHT6NDD		200A/250V	37JUHT6NDF		150	37JUHT6NDP	
	50	5	55-250	—	—		—	—		—	—		250	37LPST6NDP	
	75	5	55-250	—	—	36LPUT6ND		400	37LPUT6NDD		400A/250V	37LPUT6NDF		400	37LPUT6NDP
	150	6	160-630	—	36MPXT6ND		600	37MPXT6NDD		600A/250V	37MPXT6NDF		600	37MPXT6NDP	
230	10	(1¼)	10-40	A1	36EUET2NG		60	37EUET2NGD		60A/250V	37EUET2NGF		50	37EUET2NGP	
	15	2	13-52	B	36FUFT2NG		60	37FUFT2NGD		60A/250V	37FUFT2NGF		50	37FUFT2NGP	
	20	(2½)	25-100	B	36GUGT2NG		100	37GUGT2NGD		100A/250V	37GUGT2NGF		100	37GUGT2NGP	
	30	3	25-100	B	36HUGT2NG		100	37HUGT2NGD		100A/250V	37HUGT2NGF		100	37HUGT2NGP	
	40	(3½)	50-200	B	36IUHT2NG		200	37IUHT2NGD		200A/250V	37IUHT2NGF		125	37IUHT2NGP	
	50	4	50-200	B	36JUHT2NG		200	37JUHT2NGD		200A/250V	37JUHT2NGF		150	37JUHT2NGP	
	75	5	55-250	—	—		—	—		—	—		250	37LPST2NGP	
	100	5	55-250	—	—	36LPUT2NG		400	37LPUT2NGD		400A/250V	37LPUT2NGF		400	37LPUT2NGP
	200	6	160-630	—	36MPXT2NG		600	37MPXT2NGD		600A/250V	37MPXT2NGF		600	37MPXT2NGP	
460	15	(1¼)	10-40	A1	36EUET4NH		60	37EUET4NHD		60A/600V	37EUET4NHF		50	37EUET4NHP	
	25	2	13-52	B	36FUFT4NH		60	37FUFT4NHD		60A/600V	37FUFT4NHF		50	37FUFT4NHP	
	30	(2½)	13-52	B	36GUGT4NH		100	37GUGT4NHD		100A/600V	37GUGT4NHF		100	37GUGT4NHP	
	50	3	25-100	B	36HUGT4NH		100	37HUGT4NHD		100A/600V	37HUGT4NHF		100	37HUGT4NHP	
	75	(3½)	50-200	B	36IUHT4NH		200	37IUHT4NHD		200A/600V	37IUHT4NHF		125	37IUHT4NHP	
	100	4	50-200	B	36JUHT4NH		200	37JUHT4NHD		200A/600V	37JUHT4NHF		150	37JUHT4NHP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST4NHP	
	200	5	55-250	—	—	36LPUT4NH		400	37LPUT4NHD		400A/600V	37LPUT4NHF		400	37LPUT4NHP
	400	6	160-630	—	36MPXT4NH		600	37MPXT4NHD		600A/600V	37MPXT4NHF		600	37MPXT4NHP	
575	15	(1¼)	10-40	A1	36EUET5NE		60	37EUET5NED		60A/600V	37EUET5NEF		50	37EUET5NEP	
	25	2	13-52	B	36FUFT5NE		60	37FUFT5NED		60A/600V	37FUFT5NEF		50	37FUFT5NEP	
	30	(2½)	13-52	B	36GUGT5NE		100	37GUGT5NED		100A/600V	37GUGT5NEF		100	37GUGT5NEP	
	50	3	25-100	B	36HUGT5NE		100	37HUGT5NED		100A/600V	37HUGT5NEF		100	37HUGT5NEP	
	75	(3½)	50-200	B	36IUHT5NE		200	37IUHT5NED		200A/600V	37IUHT5NEF		125	37IUHT5NEP	
	100	4	50-200	B	36JUHT5NE		200	37JUHT5NED		200A/600V	37JUHT5NEF		150	37JUHT5NEP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST5NEP	
	200	5	55-250	—	—	36LPUT5NE		400	37LPUT5NED		400A/600V	37LPUT5NEF		400	37LPUT5NEP
	400	6	160-630	—	36MPXT5NE		600	37MPXT5NED		600A/600V	37MPXT5NEF		600	37MPXT5NEP	


Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① See page 9/110 for conduit hubs and conversion instructions.



# 2 Step Part Winding with Solid State Overload, Class 36 & 37

## Selection

	Ordering Information	Coil and Control Voltage
	<ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page page 9/167.</li> <li>▶ Wiring Diagrams see page 9/180.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>


### NEMA 1 General Purpose Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect		Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number
200	7½	0	5.5-22	A1	36CUDP6BD		60	37CUDP6BDD		60A/250V	37CUDP6BDF	30	37CUDP6BDP	
	10	1	5.5-22	A1	36DUDP6BD		60	37DUDP6BDD		60A/250V	37DUDP6BDF	50	37DUDP6BDP	
	15	(1¼)	10-40	A1	36EUEP6BD		100	37EUEP6BDD		100A/250V	37EUEP6BDF	100	37EUEP6BDP	
	20	2	13-52	B	36FUF6BD		100	37FUF6BDD		100A/250V	37FUF6BDF	100	37FUF6BDP	
	30	(2½)	25-100	B	36GUGP6BD		200	37GUGP6BDD		200A/250V	37GUGP6BDF	125	37GUGP6BDP	
	40	3	25-100	B	36HUGP6BD		200	37HUGP6BDD		200A/250V	37HUGP6BDF	150	37HUGP6BDP	
	50	(3½)	50-200	B	36IUHP6BD		200	37IUHP6BDD		200A/250V	37IUHP6BDF	250	37IUHP6BDP	
	75	4	50-200	B	36JUHP6BD		400	37JUHP6BDD		400A/250V	37JUHP6BDF	400	37JUHP6BDP	
100	5	55-250	—	—	—	—	—	—	—	—	600	37LPS6BDP		
150	5	55-250	—	—	36LPUP6BD		600	37LPUP6BDD		600A/250V	37LPUP6BDF	600	37LPUP6BDP	
230	7½	0	5.5-22	A1	36CUDP2BG		60	37CUDP2BGD		60A/250V	37CUDP2BGF	30	37CUDP2BGP	
	10	1	5.5-22	A1	36DUDP2BG		60	37DUDP2BGD		60A/250V	37DUDP2BGF	50	37DUDP2BGP	
	20	(1½)	10-40	A1	36EUEP2BG		100	37EUEP2BGD		100A/250V	37EUEP2BGF	100	37EUEP2BGP	
	25	2	13-52	B	36FUF2BG		100	37FUF2BGD		100A/250V	37FUF2BGF	100	37FUF2BGP	
	30	(2½)	25-100	B	36GUGP2BG		200	37GUGP2BGD		200A/250V	37GUGP2BGF	100	37GUGP2BGP	
	50	3	25-100	B	36HUGP2BG		200	37HUGP2BGD		200A/250V	37HUGP2BGF	150	37HUGP2BGP	
	60	(3½)	50-200	B	36IUHP2BG		200	37IUHP2BGD		200A/250V	37IUHP2BGF	250	37IUHP2BGP	
	75	4	50-200	B	36JUHP2BG		400	37JUHP2BGD		400A/250V	37JUHP2BGF	250	37JUHP2BGP	
125	5	55-250	—	—	—	—	—	—	—	—	400	37LPS2BGP		
150	5	55-250	—	—	36LPUP2BG		600	37LPUP2BGD		600A/250V	37LPUP2BGF	600	37LPUP2BGP	
300	6	160-630	—	—	36MPXP2BG		1200	37MPXP2BGD		1200A/250V	37MPXP2BGF	1200	37MPXP2BGP	
460	10	0	5.5-22	A1	36CUDP4BH		30	37CUDP4BHD		30A/600V	37CUDP4BHF	30	37CUDP4BHP	
	15	1	5.5-22	A1	36DUDP4BH		60	37DUDP4BHD		60A/600V	37DUDP4BHF	30	37DUDP4BHP	
	30	(1¼)	10-40	A1	36EUEP4BH		60	37EUEP4BHD		60A/600V	37EUEP4BHF	50	37EUEP4BHP	
	40	2	13-52	B	36FUF4BH		100	37FUF4BHD		100A/600V	37FUF4BHF	100	37FUF4BHP	
	60	(2½)	25-100	B	36GUGP4BH		200	37GUGP4BHD		200A/600V	37GUGP4BHF	100	37GUGP4BHP	
	75	3	25-100	B	36HUGP4BH		200	37HUGP4BHD		200A/600V	37HUGP4BHF	125	37HUGP4BHP	
	100	(3½)	50-200	B	36IUHP4BH		200	37IUHP4BHD		200A/600V	37IUHP4BHF	150	37IUHP4BHP	
	150	4	50-200	B	36JUHP4BH		400	37JUHP4BHD		400A/600V	37JUHP4BHF	250	37JUHP4BHP	
250	5	55-250	—	—	—	—	—	—	—	—	400	37LPS4BHP		
350	5	55-250	—	—	36LPUP4BH		600	37LPUP4BHD		600A/600V	37LPUP4BHF	600	37LPUP4BHP	
600	6	160-630	—	—	36MPXP4BH		1200	37MPXP4BHD		1200A/600V	37MPXP4BHF	1200	37MPXP4BHP	
575	10	0	5.5-22	A1	36CUDP5BE		30	37CUDP5BED		30A/600V	37CUDP5BEF	30	37CUDP5BEP	
	15	1	5.5-22	A1	36DUDP5BE		60	37DUDP5BED		60A/600V	37DUDP5BEF	30	37DUDP5BEP	
	30	(1¼)	10-40	A1	36EUEP5BE		60	37EUEP5BED		60A/600V	37EUEP5BEF	50	37EUEP5BEP	
	40	2	13-52	B	36FUF5BE		60	37FUF5BED		60A/600V	37FUF5BEF	50	37FUF5BEP	
	60	(2½)	25-100	B	36GUGP5BE		100	37GUGP5BED		100A/600V	37GUGP5BEF	100	37GUGP5BEP	
	75	3	25-100	B	36HUGP5BE		200	37HUGP5BED		200A/600V	37HUGP5BEF	125	37HUGP5BEP	
	100	(3½)	50-200	B	36IUHP5BE		400	37IUHP5BED		400A/600V	37IUHP5BEF	150	37IUHP5BEP	
	150	4	50-200	B	36JUHP5BE		400	37JUHP5BED		400A/600V	37JUHP5BEF	250	37JUHP5BEP	
250	5	55-250	—	—	—	—	—	—	400A/600V	37LPS5BEF	—	—		
350	5	55-250	—	—	36LPUP5BE		600	37LPUP5BED		600A/600V	37LPUP5BEF	400	37LPUP5BEP	
600	6	160-630	—	—	36MPXP5BE		1200	37MPXP5BED		1200A/600V	37MPXP5BEF	1200	37MPXP5BEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# 2 Step Part Winding with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/180.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

### NEMA 4 Painted Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	7½	0	5.5–22	A1	36CUDP6ED		60	37CUDP6EDD		60A/250V	37CUDP6EDF		30	37CUDP6EDP	
	10	1	5.5–22	A1	36DUDP6ED		60	37DUDP6EDD		60A/250V	37DUDP6EDF		50	37DUDP6EDP	
	15	(1¼)	10–40	A1	36EUEP6ED		100	37EUEP6EDD		100A/250V	37EUEP6EDF		100	37EUEP6EDP	
	20	2	13–52	B	36FUF6ED		100	37FUF6EDD		100A/250V	37FUF6EDF		100	37FUF6EDP	
	30	(2½)	25–100	B	36GUGP6ED		200	37GUGP6EDD		200A/250V	37GUGP6EDF		125	37GUGP6EDP	
	40	3	25–100	B	36HUGP6ED		200	37HUGP6EDD		200A/250V	37HUGP6EDF		150	37HUGP6EDP	
	50	(3½)	50–200	B	36IUHP6ED		200	37IUHP6EDD		200A/250V	37IUHP6EDF		250	37IUHP6EDP	
	75	4	50–200	B	36JUHP6ED		400	37JUHP6EDD		400A/250V	37JUHP6EDF		400	37JUHP6EDP	
	150	5	55–250	—	—	—	—	—	—	—	—	—	600	37LSP6EDP	
	150	5	55–250	—	36LPUP6ED		600	37LPUP6EDD		600A/250V	37LPUP6EDF		600	37LPUP6EDP	
230	7½	0	5.5–22	A1	36CUDP2EG		60	37CUDP2EGD		60A/250V	37CUDP2EGF		30	37CUDP2EGP	
	10	1	5.5–22	A1	36DUDP2EG		60	37DUDP2EGD		60A/250V	37DUDP2EGF		50	37DUDP2EGP	
	20	(1½)	10–40	A1	36EUEP2EG		100	37EUEP2EGD		100A/250V	37EUEP2EGF		100	37EUEP2EGP	
	25	2	13–52	B	36FUF2EG		100	37FUF2EGD		100A/250V	37FUF2EGF		100	37FUF2EGP	
	30	(2½)	25–100	B	36GUGP2EG		200	37GUGP2EGD		200A/250V	37GUGP2EGF		100	37GUGP2EGP	
	50	3	25–100	B	36HUGP2EG		200	37HUGP2EGD		200A/250V	37HUGP2EGF		150	37HUGP2EGP	
	60	(3½)	50–200	B	36IUHP2EG		200	37IUHP2EGD		200A/250V	37IUHP2EGF		250	37IUHP2EGP	
	75	4	50–200	B	36JUHP2EG		400	37JUHP2EGD		400A/250V	37JUHP2EGF		250	37JUHP2EGP	
	125	5	55–250	—	—	—	—	—	—	—	—	—	400	37LSP2EGP	
	150	5	55–250	—	36LPUP2EG		600	37LPUP2EGD		600A/250V	37LPUP2EGF		600	37LPUP2EGP	
	300	6	160–630	—	36MPXP2EG		1200	37MPXP2EGD		1200A/250V	37MPXP2EGF		1200	37MPXP2EGP	
460	10	0	5.5–22	A1	36CUDP4EH		30	37CUDP4EHD		30A/600V	37CUDP4EHF		30	37CUDP4EHP	
	15	1	5.5–22	A1	36DUDP4EH		60	37DUDP4EHD		60A/600V	37DUDP4EHF		30	37DUDP4EHP	
	30	(1¼)	10–40	A1	36EUEP4EH		60	37EUEP4EHD		60A/600V	37EUEP4EHF		50	37EUEP4EHP	
	40	2	13–52	B	36FUF4EH		100	37FUF4EHD		100A/600V	37FUF4EHF		100	37FUF4EHP	
	60	(2½)	25–100	B	36GUGP4EH		200	37GUGP4EHD		200A/600V	37GUGP4EHF		100	37GUGP4EHP	
	75	3	25–100	B	36HUGP4EH		200	37HUGP4EHD		200A/600V	37HUGP4EHF		125	37HUGP4EHP	
	100	(3½)	50–200	B	36IUHP4EH		200	37IUHP4EHD		200A/600V	37IUHP4EHF		150	37IUHP4EHP	
	150	4	50–200	B	36JUHP4EH		400	37JUHP4EHD		400A/600V	37JUHP4EHF		250	37JUHP4EHP	
	250	5	55–250	—	—	—	—	—	—	—	—	—	400	37LSP4EHP	
	350	5	55–250	—	36LPUP4EH		600	37LPUP4EHD		600A/600V	37LPUP4EHF		600	37LPUP4EHP	
	600	6	160–630	—	36MPXP4EH		1200	37MPXP4EHD		1200A/600V	37MPXP4EHF		1200	37MPXP4EHP	
575	10	0	5.5–22	A1	36CUDP5EE		30	37CUDP5EED		30A/600V	37CUDP5EEF		30	37CUDP5EEP	
	15	1	5.5–22	A1	36DUDP5EE		60	37DUDP5EED		60A/600V	37DUDP5EEF		30	37DUDP5EEP	
	30	(1¼)	10–40	A1	36EUEP5EE		60	37EUEP5EED		60A/600V	37EUEP5EEF		50	37EUEP5EEP	
	40	2	13–52	B	36FUF5EE		60	37FUF5EED		60A/600V	37FUF5EEF		50	37FUF5EEP	
	60	(2½)	25–100	B	36GUGP5EE		100	37GUGP5EED		100A/600V	37GUGP5EEF		100	37GUGP5EEP	
	75	3	25–100	B	36HUGP5EE		200	37HUGP5EED		200A/600V	37HUGP5EEF		125	37HUGP5EEP	
	100	(3½)	50–200	B	36IUHP5EE		400	37IUHP5EED		400A/600V	37IUHP5EEF		150	37IUHP5EEP	
	150	4	50–200	B	36JUHP5EE		400	37JUHP5EED		400A/600V	37JUHP5EEF		250	37JUHP5EEP	
	250	5	55–250	—	—	—	—	—	—	400A/600V	37LSP5EEF		—	—	
	350	5	55–250	—	36LPUP5EE		600	37LPUP5EED		600A/600V	37LPUP5EEF		400	37LPUP5EEP	
	600	6	160–630	—	36MPXP5EE		1200	37MPXP5EED		1200A/600V	37MPXP5EEF		1200	37MPXP5EEP	


Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

6 GENERAL PURPOSE CONTROL



# 2 Step Part Winding with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page page 9/167.</li> <li>▶ Wiring Diagrams see page 9/180.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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### NEMA 4/4X Stainless Steel Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect		Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	Circuit Breaker Amps	Catalog Number	List Price \$
200	7½	0	5.5-22	A1	36CUDP6WD		60	37CUDP6WDD		60A/250V	37CUDP6WDF	30	37CUDP6WDP	
	10	1	5.5-22	A1	36DUDP6WD		60	37DUDP6WDD		60A/250V	37DUDP6WDF	50	37DUDP6WDP	
	15	(1¼)	10-40	A1	36EUEP6WD		100	37EUEP6WDD		100A/250V	37EUEP6WDF	100	37EUEP6WDP	
	20	2	13-52	B	36FUEP6WD		100	37FUEP6WDD		100A/250V	37FUEP6WDF	100	37FUEP6WDP	
	30	(2½)	25-100	B	36GUGP6WD		200	37GUGP6WDD		200A/250V	37GUGP6WDF	125	37GUGP6WDP	
	40	3	25-100	B	36HUGP6WD		200	37HUGP6WDD		200A/250V	37HUGP6WDF	150	37HUGP6WDP	
	50	(3½)	50-200	B	36IUHP6WD		200	37IUHP6WDD		200A/250V	37IUHP6WDF	250	37IUHP6WDP	
230	7½	0	5.5-22	A1	36CUDP2WG		60	37CUDP2WGD		60A/250V	37CUDP2WGF	30	37CUDP2WGP	
	10	1	5.5-22	A1	36DUDP2WG		60	37DUDP2WGD		60A/250V	37DUDP2WGF	50	37DUDP2WGP	
	20	(1½)	10-40	A1	36EUEP2WG		100	37EUEP2WGD		100A/250V	37EUEP2WGF	100	37EUEP2WGP	
	25	2	13-52	B	36FUEP2WG		100	37FUEP2WGD		100A/250V	37FUEP2WGF	100	37FUEP2WGP	
	30	(2½)	25-100	B	36GUGP2WG		200	37GUGP2WGD		200A/250V	37GUGP2WGF	100	37GUGP2WGP	
	50	3	25-100	B	36HUGP2WG		200	37HUGP2WGD		200A/250V	37HUGP2WGF	150	37HUGP2WGP	
	60	(3½)	50-200	B	36IUHP2WG		200	37IUHP2WGD		200A/250V	37IUHP2WGF	250	37IUHP2WGP	
460	10	0	5.5-22	A1	36CUDP4WH		30	37CUDP4WHD		30A/600V	37CUDP4WHF	30	37CUDP4WHP	
	15	1	5.5-22	A1	36DUDP4WH		60	37DUDP4WHD		60A/600V	37DUDP4WHF	30	37DUDP4WHP	
	30	(1¼)	10-40	A1	36EUEP4WH		60	37EUEP4WHD		60A/600V	37EUEP4WHF	50	37EUEP4WHP	
	40	2	13-52	B	36FUEP4WH		100	37FUEP4WHD		100A/600V	37FUEP4WHF	100	37FUEP4WHP	
	60	(2½)	25-100	B	36GUGP4WH		200	37GUGP4WHD		200A/600V	37GUGP4WHF	100	37GUGP4WHP	
	75	3	25-100	B	36HUGP4WH		200	37HUGP4WHD		200A/600V	37HUGP4WHF	125	37HUGP4WHP	
	100	(3½)	50-200	B	36IUHP4WH		200	37IUHP4WHD		200A/600V	37IUHP4WHF	150	37IUHP4WHP	
575	10	0	5.5-22	A1	36CUDP5WE		30	37CUDP5WED		30A/600V	37CUDP5WEF	30	37CUDP5WEP	
	15	1	5.5-22	A1	36DUDP5WE		60	37DUDP5WED		60A/600V	37DUDP5WEF	30	37DUDP5WEP	
	30	(1¼)	10-40	A1	36EUEP5WE		60	37EUEP5WED		60A/600V	37EUEP5WEF	50	37EUEP5WEP	
	40	2	13-52	B	36FUEP5WE		60	37FUEP5WED		60A/600V	37FUEP5WEF	50	37FUEP5WEP	
	60	(2½)	25-100	B	36GUGP5WE		100	37GUGP5WED		100A/600V	37GUGP5WEF	100	37GUGP5WEP	
	75	3	25-100	B	36HUGP5WE		200	37HUGP5WED		200A/600V	37HUGP5WEF	125	37HUGP5WEP	
	100	(3½)	50-200	B	36IUHP5WE		400	37IUHP5WED		400A/600V	37IUHP5WEF	150	37IUHP5WEP	
150	4	50-200	B	36JUHP5WE		400	37JUHP5WED		400A/600V	37JUHP5WEF	250	37JUHP5WEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# 2 Step Part Winding with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page page 9/167.</li> <li>▶ Wiring Diagrams see page 9/180.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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### NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)<sup>①</sup>


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Call Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	7½	0	5.5-22	A1	36CUDP6ND		60	37CUDP6NDD		60A/250V	37CUDP6NDF	30	37CUDP6NDP		
	10	1	5.5-22	A1	36DUDP6ND		60	37DUDP6NDD		60A/250V	37DUDP6NDF	50	37DUDP6NDP		
	15	(1¼)	10-40	A1	36EUEP6ND		100	37EUEP6NDD		100A/250V	37EUEP6NDF	100	37EUEP6NDP		
	20	2	13-52	B	36FUF6ND		100	37FUF6NDD		100A/250V	37FUF6NDF	100	37FUF6NDP		
	30	(2½)	25-100	B	36GUGP6ND		200	37GUGP6NDD		200A/250V	37GUGP6NDF	125	37GUGP6NDP		
	40	3	25-100	B	36HUGP6ND		200	37HUGP6NDD		200A/250V	37HUGP6NDF	150	37HUGP6NDP		
	50	(3½)	50-200	B	36IUHP6ND		200	37IUHP6NDD		200A/250V	37IUHP6NDF	250	37IUHP6NDP		
	75	4	50-200	B	36JUHP6ND		400	37JUHP6NDD		400A/250V	37JUHP6NDF	400	37JUHP6NDP		
100	5	55-250	—	—	—	—	—	—	—	—	600	37LPS6NDP			
150	5	55-250	—	—	36LPUP6ND		600	37LPUP6NDD		600A/250V	37LPUP6NDF	600	37LPUP6NDP		
230	7½	0	5.5-22	A1	36CUDP2NG		60	37CUDP2NGD		60A/250V	37CUDP2NGF	30	37CUDP2NGP		
	10	1	5.5-22	A1	36DUDP2NG		60	37DUDP2NGD		60A/250V	37DUDP2NGF	50	37DUDP2NGP		
	20	(1½)	10-40	A1	36EUEP2NG		100	37EUEP2NGD		100A/250V	37EUEP2NGF	100	37EUEP2NGP		
	25	2	13-52	B	36FUF2NG		100	37FUF2NGD		100A/250V	37FUF2NGF	100	37FUF2NGP		
	30	(2½)	25-100	B	36GUGP2NG		200	37GUGP2NGD		200A/250V	37GUGP2NGF	100	37GUGP2NGP		
	50	3	25-100	B	36HUGP2NG		200	37HUGP2NGD		200A/250V	37HUGP2NGF	150	37HUGP2NGP		
	60	(3½)	50-200	B	36IUHP2NG		200	37IUHP2NGD		200A/250V	37IUHP2NGF	250	37IUHP2NGP		
	75	4	50-200	B	36JUHP2NG		400	37JUHP2NGD		400A/250V	37JUHP2NGF	250	37JUHP2NGP		
125	5	55-250	—	—	—	—	—	—	—	—	400	37LPS2NGP			
150	5	55-250	—	—	36LPUP2NG		600	37LPUP2NGD		600A/250V	37LPUP2NGF	600	37LPUP2NGP		
300	6	160-630	—	—	36MPXP2NG		1200	37MPXP2NGD		1200A/250V	37MPXP2NGF	1200	37MPXP2NGP		
460	10	0	5.5-22	A1	36CUDP4NH		30	37CUDP4NHD		30A/600V	37CUDP4NHF	30	37CUDP4NHP		
	15	1	5.5-22	A1	36DUDP4NH		60	37DUDP4NHD		60A/600V	37DUDP4NHF	30	37DUDP4NHP		
	30	(1¼)	10-40	A1	36EUEP4NH		60	37EUEP4NHD		60A/600V	37EUEP4NHF	50	37EUEP4NHP		
	40	2	13-52	B	36FUF4NH		100	37FUF4NHD		100A/600V	37FUF4NHF	100	37FUF4NHP		
	60	(2½)	25-100	B	36GUGP4NH		200	37GUGP4NHD		200A/600V	37GUGP4NHF	100	37GUGP4NHP		
	75	3	25-100	B	36HUGP4NH		200	37HUGP4NHD		200A/600V	37HUGP4NHF	125	37HUGP4NHP		
	100	(3½)	50-200	B	36IUHP4NH		200	37IUHP4NHD		200A/600V	37IUHP4NHF	150	37IUHP4NHP		
	150	4	50-200	B	36JUHP4NH		400	37JUHP4NHD		400A/600V	37JUHP4NHF	250	37JUHP4NHP		
250	5	55-250	—	—	—	—	—	—	—	—	400	37LPS4NHP			
350	5	55-250	—	—	36LPUP4NH		600	37LPUP4NHD		600A/600V	37LPUP4NHF	600	37LPUP4NHP		
600	6	160-630	—	—	36MPXP4NH		1200	37MPXP4NHD		1200A/600V	37MPXP4NHF	1200	37MPXP4NHP		
575	10	0	5.5-22	A1	36CUDP5NE		30	37CUDP5NED		30A/600V	37CUDP5NEF	30	37CUDP5NEP		
	15	1	5.5-22	A1	36DUDP5NE		60	37DUDP5NED		60A/600V	37DUDP5NEF	30	37DUDP5NEP		
	30	(1¼)	10-40	A1	36EUEP5NE		60	37EUEP5NED		60A/600V	37EUEP5NEF	50	37EUEP5NEP		
	40	2	13-52	B	36FUF5NE		60	37FUF5NED		60A/600V	37FUF5NEF	50	37FUF5NEP		
	60	(2½)	25-100	B	36GUGP5NE		100	37GUGP5NED		100A/600V	37GUGP5NEF	100	37GUGP5NEP		
	75	3	25-100	B	36HUGP5NE		200	37HUGP5NED		200A/600V	37HUGP5NEF	125	37HUGP5NEP		
	100	(3½)	50-200	B	36IUHP5NE		400	37IUHP5NED		400A/600V	37IUHP5NEF	150	37IUHP5NEP		
	150	4	50-200	B	36JUHP5NE		400	37JUHP5NED		400A/600V	37JUHP5NEF	250	37JUHP5NEP		
250	5	55-250	—	—	—	—	—	—	—	—	400	37LPS5NEP			
350	5	55-250	—	—	36LPUP5NE		600	37LPUP5NED		600A/600V	37LPUP5NEF	400	37LPUP5NEP		
600	6	160-630	—	—	36MPXP5NE		1200	37MPXP5NED		1200A/600V	37MPXP5NEF	1200	37MPXP5NEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① See page 9/110 for conduit hubs and conversion instructions.

# Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/182.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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### NEMA 1 General Purpose Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06BD		60	37DUE06BDD		60A/250V	37DUE06BDF		50	37DUE06BDP	
	15	(1¾)	10-40	A1	36EUE06BD		100	37EUE06BDD		100A/250V	37EUE06BDF		100	37EUE06BDP	
	20	2	13-52	B	36FUF06BD		100	37FUF06BDD		100A/250V	37FUF06BDF		100	37FUF06BDP	
	30	(2½)	25-100	B	36GUG06BD		200	37GUG06BDD		200A/250V	37GUG06BDF		125	37GUG06BDP	
	40	3	25-100	B	36HUG06BD		200	37HUG06BDD		200A/250V	37HUG06BDF		150	37HUG06BDP	
	50	(3½)	50-200	B	36IUH06BD		200	37IUH06BDD		200A/250V	37IUH06BDF		250	37IUH06BDP	
	60	4	50-200	B	36JUH06BD		400	37JUH06BDD		400A/250V	37JUH06BDF		250	37JUH06BDP	
	75	5	55-250	—	36LPS06BD		400	37LPS06BDD		400A/250V	37LPS06BDF		400	37LPS06BDP	
150	5	55-250	—	36LPU06BD		600	37LPU06BDD		600A/250V	37LPU06BDF		600	37LPU06BDP		
300	6	160-630	—	36MPX06BD		1200	37MPX06BDD		1200A/250V	37MPX06BDF		1200	37MPX06BDP		
230	10	1	10-40	A1	36DUE02BG		60	37DUE02BGD		60A/250V	37DUE02BGF		50	37DUE02BGP	
	15	(1¾)	10-40	A1	36EUE02BG		60	37EUE02BGD		60A/250V	37EUE02BGF		50	37EUE02BGP	
	25	2	13-52	B	36FUF02BG		100	37FUF02BGD		100A/250V	37FUF02BGF		100	37FUF02BGP	
	30	(2½)	25-100	B	36GUG02BG		200	37GUG02BGD		200A/250V	37GUG02BGF		100	37GUG02BGP	
	50	3	25-100	B	36HUG02BG		200	37HUG02BGD		200A/250V	37HUG02BGF		150	37HUG02BGP	
	60	(3½)	50-200	B	36IUH02BG		200	37IUH02BGD		200A/250V	37IUH02BGF		250	37IUH02BGP	
	75	4	50-200	B	36JUH02BG		400	37JUH02BGD		400A/250V	37JUH02BGF		250	37JUH02BGP	
	100	5	55-250	—	36LPS02BG		400	37LPS02BGD		400A/250V	37LPS02BGF		400	37LPS02BGP	
150	5	55-250	—	36LPU02BG		600	37LPU02BGD		600A/250V	37LPU02BGF		600	37LPU02BGP		
350	6	160-630	—	36MPX02BG		1200	37MPX02BGD		1200A/250V	37MPX02BGF		1200	37MPX02BGP		
460	15	1	5.5-22	A1	36DUD04BH		30	37DUD04BHD		30A/600V	37DUD04BHF		30	37DUD04BHP	
	30	(1¾)	10-40	A1	36EUE04BH		60	37EUE04BHD		60A/600V	37EUE04BHF		50	37EUE04BHP	
	40	2	13-52	B	36FUF04BH		100	37FUF04BHD		100A/600V	37FUF04BHF		100	37FUF04BHP	
	60	(2½)	25-100	B	36GUG04BH		200	37GUG04BHD		200A/600V	37GUG04BHF		100	37GUG04BHP	
	75	3	25-100	B	36HUG04BH		200	37HUG04BHD		200A/600V	37HUG04BHF		125	37HUG04BHP	
	100	(3½)	50-200	B	36IUH04BH		200	37IUH04BHD		200A/600V	37IUH04BHF		150	37IUH04BHP	
	150	4	50-200	B	36JUH04BH		400	37JUH04BHD		400A/600V	37JUH04BHF		250	37JUH04BHP	
	200	5	55-250	—	36LPS04BH		400	37LPS04BHD		400A/600V	37LPS04BHF		400	37LPS04BHP	
300	5	55-250	—	36LPU04BH		600	37LPU04BHD		600A/600V	37LPU04BHF		600	37LPU04BHP		
700	6	160-630	—	36MPX04BH		1600	37MPX04BHD		1600A/600V	37MPX04BHF		1200	37MPX04BHP		
575	15	1	5.5-22	A1	36DUD05BE		30	37DUD05BED		30A/600V	37DUD05BEF		30	37DUD05BEP	
	30	(1¾)	10-40	A1	36EUE05BE		60	37EUE05BED		60A/600V	37EUE05BEF		50	37EUE05BEP	
	40	2	13-52	B	36FUF05BE		100	37FUF05BED		100A/600V	37FUF05BEF		50	37FUF05BEP	
	60	(2½)	25-100	B	36GUG05BE		100	37GUG05BED		100A/600V	37GUG05BEF		100	37GUG05BEP	
	75	3	25-100	B	36HUG05BE		200	37HUG05BED		200A/600V	37HUG05BEF		125	37HUG05BEP	
	100	(3½)	50-200	B	36IUH05BE		200	37IUH05BED		200A/600V	37IUH05BEF		150	37IUH05BEP	
	150	4	50-200	B	36JUH05BE		400	37JUH05BED		400A/600V	37JUH05BEF		250	37JUH05BEP	
	200	5	55-250	—	36LPS05BE		400	37LPS05BED		400A/600V	37LPS05BEF		250	37LPS05BEP	
300	5	55-250	—	36LPU05BE		600	37LPU05BED		600A/600V	37LPU05BEF		400	37LPU05BEP		
700	6	160-630	—	36MPX05BE		1600	37MPX05BED		1600A/600V	37MPX05BEF		1600	37MPX05BEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/182.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>


### NEMA 4 Painted Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06ED		60	37DUE06EDD		60A/250V	37DUE06EDF		50	37DUE06EDP	
	15	(1¼)	10-40	A1	36EUE06ED		100	37EUE06EDD		100A/250V	37EUE06EDF		100	37EUE06EDP	
	20	2	13-52	B	36FUF06ED		100	37FUF06EDD		100A/250V	37FUF06EDF		100	37FUF06EDP	
	30	(2½)	25-100	B	36GUG06ED		200	37GUG06EDD		200A/250V	37GUG06EDF		125	37GUG06EDP	
	40	3	25-100	B	36HUG06ED		200	37HUG06EDD		200A/250V	37HUG06EDF		150	37HUG06EDP	
	50	(3½)	50-200	B	36IUH06ED		200	37IUH06EDD		200A/250V	37IUH06EDF		250	37IUH06EDP	
	60	4	50-200	B	36JUH06ED		400	37JUH06EDD		400A/250V	37JUH06EDF		250	37JUH06EDP	
	75	5	55-250	—	36LPS06ED		400	37LPS06EDD		400A/250V	37LPS06EDF		400	37LPS06EDP	
150	5	55-250	—	36LPU06ED		600	37LPU06EDD		600A/250V	37LPU06EDF		600	37LPU06EDP		
300	6	160-630	—	36MPX06ED		1200	37MPX06EDD		1200A/250V	37MPX06EDF		1200	37MPX06EDP		
230	10	1	10-40	A1	36DUE02EG		60	37DUE02EGD		60A/250V	37DUE02EGF		50	37DUE02EGP	
	15	(1¼)	10-40	A1	36EUE02EG		60	37EUE02EGD		60A/250V	37EUE02EGF		50	37EUE02EGP	
	25	2	13-52	B	36FUF02EG		100	37FUF02EGD		100A/250V	37FUF02EGF		100	37FUF02EGP	
	30	(2½)	25-100	B	36GUG02EG		200	37GUG02EGD		200A/250V	37GUG02EGF		100	37GUG02EGP	
	50	3	25-100	B	36HUG02EG		200	37HUG02EGD		200A/250V	37HUG02EGF		150	37HUG02EGP	
	60	(3½)	50-200	B	36IUH02EG		200	37IUH02EGD		200A/250V	37IUH02EGF		250	37IUH02EGP	
	75	4	50-200	B	36JUH02EG		400	37JUH02EGD		400A/250V	37JUH02EGF		250	37JUH02EGP	
	100	5	55-250	—	36LPS02EG		400	37LPS02EGD		400A/250V	37LPS02EGF		400	37LPS02EGP	
150	5	55-250	—	36LPU02EG		600	37LPU02EGD		600A/250V	37LPU02EGF		600	37LPU02EGP		
350	6	160-630	—	36MPX02EG		1200	37MPX02EGD		1200A/250V	37MPX02EGF		1200	37MPX02EGP		
460	15	1	5.5-22	A1	36DUD04EH		30	37DUD04EHD		30A/600V	37DUD04EHF		30	37DUD04EHP	
	30	(1¼)	10-40	A1	36EUE04EH		60	37EUE04EHD		60A/600V	37EUE04EHF		50	37EUE04EHP	
	40	2	13-52	B	36FUF04EH		100	37FUF04EHD		100A/600V	37FUF04EHF		100	37FUF04EHP	
	60	(2½)	25-100	B	36GUG04EH		200	37GUG04EHD		200A/600V	37GUG04EHF		100	37GUG04EHP	
	75	3	25-100	B	36HUG04EH		200	37HUG04EHD		200A/600V	37HUG04EHF		125	37HUG04EHP	
	100	(3½)	50-200	B	36IUH04EH		200	37IUH04EHD		200A/600V	37IUH04EHF		150	37IUH04EHP	
	150	4	50-200	B	36JUH04EH		400	37JUH04EHD		400A/600V	37JUH04EHF		250	37JUH04EHP	
	200	5	55-250	—	36LPS04EH		400	37LPS04EHD		400A/600V	37LPS04EHF		400	37LPS04EHP	
300	5	55-250	—	36LPU04EH		600	37LPU04EHD		600A/600V	37LPU04EHF		600	37LPU04EHP		
700	6	160-630	—	36MPX04EH		1600	37MPX04EHD		1600A/600V	37MPX04EHF		1200	37MPX04EHP		
575	15	1	5.5-22	A1	36DUD05EE		30	37DUD05EED		30A/600V	37DUD05EEF		30	37DUD05EEP	
	30	(1¼)	10-40	A1	36EUE05EE		60	37EUE05EED		60A/600V	37EUE05EEF		50	37EUE05EEP	
	40	2	13-52	B	36FUF05EE		100	37FUF05EED		100A/600V	37FUF05EEF		50	37FUF05EEP	
	60	(2½)	25-100	B	36GUG05EE		100	37GUG05EED		100A/600V	37GUG05EEF		100	37GUG05EEP	
	75	3	25-100	B	36HUG05EE		200	37HUG05EED		200A/600V	37HUG05EEF		125	37HUG05EEP	
	100	(3½)	50-200	B	36IUH05EE		200	37IUH05EED		200A/600V	37IUH05EEF		150	37IUH05EEP	
	150	4	50-200	B	36JUH05EE		400	37JUH05EED		400A/600V	37JUH05EEF		250	37JUH05EEP	
	200	5	55-250	—	36LPS05EE		400	37LPS05EED		400A/600V	37LPS05EEF		250	37LPS05EEP	
300	5	55-250	—	36LPU05EE		600	37LPU05EED		600A/600V	37LPU05EEF		400	37LPU05EEP		
700	6	160-630	—	37MPX05EF		1600	37MPX05EED		1600A/600V	37MPX05EEF		1600	37MPX05EEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/182.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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### NEMA 4/4X Stainless Steel Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06WD		60	37DUE06WDD		60A/250V	37DUE06WDF		50	37DUE06WDP	
	15	(1¾)	10-40	A1	36EUE06WD		100	37EUE06WDD		100A/250V	37EUE06WDF		100	37EUE06WDP	
	20	2	13-52	B	36FUF06WD		100	37FUF06WDD		100A/250V	37FUF06WDF		100	37FUF06WDP	
	30	(2½)	25-100	B	36GUG06WD		200	37GUG06WDD		200A/250V	37GUG06WDF		125	37GUG06WDP	
	40	3	25-100	B	36HUG06WD		200	37HUG06WDD		200A/250V	37HUG06WDF		150	37HUG06WDP	
	50	(3½)	50-200	B	36IUH06WD		200	37IUH06WDD		200A/250V	37IUH06WDF		250	37IUH06WDP	
	60	4	50-200	B	36JUH06WD		400	37JUH06WDD		400A/250V	37JUH06WDF		250	37JUH06WDP	
230	10	1	10-40	A1	36DUE02WG		60	37DUE02WGD		60A/250V	37DUE02WGF		50	37DUE02WGP	
	15	(1¾)	10-40	A1	36EUE02WG		60	37EUE02WGD		60A/250V	37EUE02WGF		50	37EUE02WGP	
	25	2	13-52	B	36FUF02WG		100	37FUF02WGD		100A/250V	37FUF02WGF		100	37FUF02WGP	
	30	(2½)	25-100	B	36GUG02WG		200	37GUG02WGD		200A/250V	37GUG02WGF		100	37GUG02WGP	
	50	3	25-100	B	36HUG02WG		200	37HUG02WGD		200A/250V	37HUG02WGF		150	37HUG02WGP	
	60	(3½)	50-200	B	36IUH02WG		200	37IUH02WGD		200A/250V	37IUH02WGF		250	37IUH02WGP	
	75	4	50-200	B	36JUH02WG		400	37JUH02WGD		400A/250V	37JUH02WGF		250	37JUH02WGP	
460	15	1	5.5-22	A1	36DUD04WH		30	37DUD04WHD		30A/600V	37DUD04WHF		30	37DUD04WHP	
	30	(1¾)	10-40	A1	36EUE04WH		60	37EUE04WHD		60A/600V	37EUE04WHF		50	37EUE04WHP	
	40	2	13-52	B	36FUF04WH		100	37FUF04WHD		100A/600V	37FUF04WHF		100	37FUF04WHP	
	60	(2½)	25-100	B	36GUG04WH		200	37GUG04WHD		200A/600V	37GUG04WHF		100	37GUG04WHP	
	75	3	25-100	B	36HUG04WH		200	37HUG04WHD		200A/600V	37HUG04WHF		125	37HUG04WHP	
	100	(3½)	50-200	B	36IUH04WH		200	37IUH04WHD		200A/600V	37IUH04WHF		150	37IUH04WHP	
	150	4	50-200	B	36JUH04WH		400	37JUH04WHD		400A/600V	37JUH04WHF		250	37JUH04WHP	
575	15	1	5.5-22	A1	36DUD05WE		30	37DUD05WED		30A/600V	37DUD05WEF		30	37DUD05WEP	
	30	(1¾)	10-40	A1	36EUE05WE		60	37EUE05WED		60A/600V	37EUE05WEF		50	37EUE05WEP	
	40	2	13-52	B	36FUF05WE		100	37FUF05WED		100A/600V	37FUF05WEF		50	37FUF05WEP	
	60	(2½)	25-100	B	36GUG05WE		100	37GUG05WED		100A/600V	37GUG05WEF		100	37GUG05WEP	
	75	3	25-100	B	36HUG05WE		200	37HUG05WED		200A/600V	37HUG05WEF		125	37HUG05WEP	
	100	(3½)	50-200	B	36IUH05WE		200	37IUH05WED		200A/600V	37IUH05WEF		150	37IUH05WEP	
	150	4	50-200	B	36JUH05WE		400	37JUH05WED		400A/600V	37JUH05WEF		250	37JUH05WEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).



# Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/182.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil and Control Voltage</b> <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

### NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)<sup>①</sup>

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06ND		60	37DUE06NDD		60A/250V	37DUE06NDF		50	37DUE06NDP	
	15	(1¾)	10-40	A1	36EUE06ND		100	37EUE06NDD		100A/250V	37EUE06NDF		100	37EUE06NDP	
	20	2	13-52	B	36FUF06ND		100	37FUF06NDD		100A/250V	37FUF06NDF		100	37FUF06NDP	
	30	(2½)	25-100	B	36GUG06ND		200	37GUG06NDD		200A/250V	37GUG06NDF		125	37GUG06NDP	
	40	3	25-100	B	36HUG06ND		200	37HUG06NDD		200A/250V	37HUG06NDF		150	37HUG06NDP	
	50	(3½)	50-200	B	36IUH06ND		200	37IUH06NDD		200A/250V	37IUH06NDF		250	37IUH06NDP	
	60	4	50-200	B	36JUH06ND		400	37JUH06NDD		400A/250V	37JUH06NDF		250	37JUH06NDP	
	75	5	55-250	—	36LPS06ND		400	37LPS06NDD		400A/250V	37LPS06NDF		400	37LPS06NDP	
230	10	1	10-40	A1	36DUE02NG		60	37DUE02NGD		60A/250V	37DUE02NGF		50	37DUE02NGP	
	15	(1¾)	10-40	A1	36EUE02NG		60	37EUE02NGD		60A/250V	37EUE02NGF		50	37EUE02NGP	
	25	2	13-52	B	36FUF02NG		100	37FUF02NGD		100A/250V	37FUF02NGF		100	37FUF02NGP	
	30	(2½)	25-100	B	36GUG02NG		200	37GUG02NGD		200A/250V	37GUG02NGF		100	37GUG02NGP	
	50	3	25-100	B	36HUG02NG		200	37HUG02NGD		200A/250V	37HUG02NGF		150	37HUG02NGP	
	60	(3½)	50-200	B	36IUH02NG		200	37IUH02NGD		200A/250V	37IUH02NGF		250	37IUH02NGP	
	75	4	50-200	B	36JUH02NG		400	37JUH02NGD		400A/250V	37JUH02NGF		250	37JUH02NGP	
	100	5	55-250	—	36LPS02NG		400	37LPS02NGD		400A/250V	37LPS02NGF		400	37LPS02NGP	
460	15	1	5.5-22	A1	36DUD04NH		30	37DUD04NHD		30A/600V	37DUD04NHF		30	37DUD04NHP	
	30	(1¾)	10-40	A1	36EUE04NH		60	37EUE04NHD		60A/600V	37EUE04NHF		50	37EUE04NHP	
	40	2	13-52	B	36FUF04NH		100	37FUF04NHD		100A/600V	37FUF04NHF		100	37FUF04NHP	
	60	(2½)	25-100	B	36GUG04NH		200	37GUG04NHD		200A/600V	37GUG04NHF		100	37GUG04NHP	
	75	3	25-100	B	36HUG04NH		200	37HUG04NHD		200A/600V	37HUG04NHF		125	37HUG04NHP	
	100	(3½)	50-200	B	36IUH04NH		200	37IUH04NHD		200A/600V	37IUH04NHF		150	37IUH04NHP	
	150	4	50-200	B	36JUH04NH		400	37JUH04NHD		400A/600V	37JUH04NHF		250	37JUH04NHP	
	200	5	55-250	—	36LPS04NH		400	37LPS04NHD		400A/600V	37LPS04NHF		400	37LPS04NHP	
575	15	1	5.5-22	A1	36DUD05NE		30	37DUD05NED		30A/600V	37DUD05NEF		30	37DUD05NEP	
	30	(1¾)	10-40	A1	36EUE05NE		60	37EUE05NED		60A/600V	37EUE05NEF		50	37EUE05NEP	
	40	2	13-52	B	36FUF05NE		100	37FUF05NED		100A/600V	37FUF05NEF		50	37FUF05NEP	
	60	(2½)	25-100	B	36GUG05NE		100	37GUG05NED		100A/600V	37GUG05NEF		100	37GUG05NEP	
	75	3	25-100	B	36HUG05NE		200	37HUG05NED		200A/600V	37HUG05NEF		125	37HUG05NEP	
	100	(3½)	50-200	B	36IUH05NE		200	37IUH05NED		200A/600V	37IUH05NEF		150	37IUH05NEP	
	150	4	50-200	B	36JUH05NE		400	37JUH05NED		400A/600V	37JUH05NEF		250	37JUH05NEP	
	200	5	55-250	—	36LPS05NE		400	37LPS05NED		400A/600V	37LPS05NEF		250	37LPS05NEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① See page 9/110 for conduit hubs and conversion instructions.

# Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

## Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/183.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

### NEMA 1 General Purpose Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6BD		60	37DUEC6BDD		60A/250V	37DUEC6BDF		50	37DUEC6BDP	
	15	(1¾)	10-40	A1	36EUEC6BD		100	37EUEC6BDD		100A/250V	37EUEC6BDF		100	37EUEC6BDP	
	20	2	13-52	B	36FUTC6BD		100	37FUTC6BDD		100A/250V	37FUTC6BDF		100	37FUTC6BDP	
	30	(2½)	25-100	B	36GUGC6BD		200	37GUGC6BDD		200A/250V	37GUGC6BDF		125	37GUGC6BDP	
	40	3	25-100	B	36HUGC6BD		200	37HUGC6BDD		200A/250V	37HUGC6BDF		150	37HUGC6BDP	
	50	(3½)	50-200	B	36IUHC6BD		200	37IUHC6BDD		200A/250V	37IUHC6BDF		250	37IUHC6BDP	
	60	4	50-200	B	36JUHC6BD		400	37JUHC6BDD		400A/250V	37JUHC6BDF		250	37JUHC6BDP	
	75	5	55-250	—	36LPSC6BD		400	37LPSC6BDD		400A/250V	37LPSC6BDF		400	37LPSC6BDP	
230	100	5	55-250	—	36LPUC6BD		600	37LPUC6BDD		600A/250V	37LPUC6BDF		600	37LPUC6BDP	
	300	6	160-630	—	36MPXC6BD		1200	37MPXC6BDD		1200A/250V	37MPXC6BDF		1200	37MPXC6BDP	
	10	1	10-40	A1	36DUEC2BG		60	37DUEC2BGD		60A/250V	37DUEC2BGF		50	37DUEC2BGP	
	15	(1¾)	10-40	A1	36EUEC2BG		60	37EUEC2BGD		60A/250V	37EUEC2BGF		50	37EUEC2BGP	
	25	2	13-52	B	36FUTC2BG		100	37FUTC2BGD		100A/250V	37FUTC2BGF		100	37FUTC2BGP	
	30	(2½)	25-100	B	36GUGC2BG		200	37GUGC2BGD		200A/250V	37GUGC2BGF		100	37GUGC2BGP	
	50	3	25-100	B	36HUGC2BG		200	37HUGC2BGD		200A/250V	37HUGC2BGF		150	37HUGC2BGP	
	60	(3½)	50-200	B	36IUHC2BG		200	37IUHC2BGD		200A/250V	37IUHC2BGF		250	37IUHC2BGP	
460	75	4	50-200	B	36JUHC2BG		400	37JUHC2BGD		400A/250V	37JUHC2BGF		250	37JUHC2BGP	
	100	5	55-250	—	36LPSC2BG		400	37LPSC2BGD		400A/250V	37LPSC2BGF		400	37LPSC2BGP	
	150	5	55-250	—	36LPUC2BG		600	37LPUC2BGD		600A/250V	37LPUC2BGF		600	37LPUC2BGP	
	350	6	160-630	—	36MPXC2BG		1200	37MPXC2BGD		1200A/250V	37MPXC2BGF		1200	37MPXC2BGP	
	15	1	5.5-22	A1	36DUDC4BH		30	37DUDC4BHD		30A/600V	37DUDC4BHF		30	37DUDC4BHP	
	30	(1¾)	10-40	A1	36EUEC4BH		60	37EUEC4BHD		60A/600V	37EUEC4BHF		50	37EUEC4BHP	
	40	2	13-52	B	36FUTC4BH		100	37FUTC4BHD		100A/600V	37FUTC4BHF		100	37FUTC4BHP	
	60	(2½)	25-100	B	36GUGC4BH		200	37GUGC4BHD		200A/600V	37GUGC4BHF		100	37GUGC4BHP	
575	75	3	25-100	B	36HUGC4BH		200	37HUGC4BHD		200A/600V	37HUGC4BHF		125	37HUGC4BHP	
	100	(3½)	50-200	B	36IUHC4BH		200	37IUHC4BHD		200A/600V	37IUHC4BHF		150	37IUHC4BHP	
	150	4	50-200	B	36JUHC4BH		400	37JUHC4BHD		400A/600V	37JUHC4BHF		250	37JUHC4BHP	
	200	5	55-250	—	36LPSC4BH		400	37LPSC4BHD		400A/600V	37LPSC4BHF		400	37LPSC4BHP	
	300	5	55-250	—	36LPUC4BH		600	37LPUC4BHD		600A/600V	37LPUC4BHF		600	37LPUC4BHP	
	700	6	160-630	—	36MPXC4BH		1600	37MPXC4BHD		1600A/600V	37MPXC4BHF		1200	37MPXC4BHP	
	15	1	5.5-22	A1	36DUDC5BE		30	37DUDC5BED		30A/600V	37DUDC5BEF		30	37DUDC5BEP	
	30	(1¾)	10-40	A1	36EUEC5BE		60	37EUEC5BED		60A/600V	37EUEC5BEF		50	37EUEC5BEP	
40	2	13-52	B	36FUTC5BE		100	37FUTC5BED		100A/600V	37FUTC5BEF		50	37FUTC5BEP		
60	(2½)	25-100	B	36GUGC5BE		100	37GUGC5BED		100A/600V	37GUGC5BEF		100	37GUGC5BEP		
75	3	25-100	B	36HUGC5BE		200	37HUGC5BED		200A/600V	37HUGC5BEF		125	37HUGC5BEP		
100	(3½)	50-200	B	36IUHC5BE		200	37IUHC5BED		200A/600V	37IUHC5BEF		150	37IUHC5BEP		
150	4	50-200	B	36JUHC5BE		400	37JUHC5BED		400A/600V	37JUHC5BEF		250	37JUHC5BEP		
200	5	55-250	—	36LPSC5BE		400	37LPSC5BED		400A/600V	37LPSC5BEF		250	37LPSC5BEP		
300	5	55-250	—	36LPUC5BE		600	37LPUC5BED		600A/600V	37LPUC5BEF		400	37LPUC5BEP		
700	6	160-630	—	37MPXC5BF		1600	37MPXC5BED		1600A/600V	37MPXC5BEF		1600	37MPXC5BEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).



# Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

## Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/183.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

### NEMA 4 Painted Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6ED		60	37DUEC6EDD		60A/250V	37DUEC6EDF		50	37DUEC6EDP	
	15	(1¾)	10-40	A1	36EUEC6ED		100	37EUEC6EDD		100A/250V	37EUEC6EDF		100	37EUEC6EDP	
	20	2	13-52	B	36FUTC6ED		100	37FUTC6EDD		100A/250V	37FUTC6EDF		100	37FUTC6EDP	
	30	(2½)	25-100	B	36GUGC6ED		200	37GUGC6EDD		200A/250V	37GUGC6EDF		125	37GUGC6EDP	
	40	3	25-100	B	36HUGC6ED		200	37HUGC6EDD		200A/250V	37HUGC6EDF		150	37HUGC6EDP	
	50	(3½)	50-200	B	36IUHC6ED		200	37IUHC6EDD		200A/250V	37IUHC6EDF		250	37IUHC6EDP	
	60	4	50-200	B	36JUHC6ED		400	37JUHC6EDD		400A/250V	37JUHC6EDF		250	37JUHC6EDP	
	75	5	55-250	—	36LPSC6ED		400	37LPSC6EDD		400A/250V	37LPSC6EDF		400	37LPSC6EDP	
230	10	1	10-40	A1	36DUEC2EG		60	37DUEC2EGD		60A/250V	37DUEC2EGF		50	37DUEC2EGP	
	15	(1¾)	10-40	A1	36EUEC2EG		60	37EUEC2EGD		60A/250V	37EUEC2EGF		50	37EUEC2EGP	
	25	2	13-52	B	36FUTC2EG		100	37FUTC2EGD		100A/250V	37FUTC2EGF		100	37FUTC2EGP	
	30	(2½)	25-100	B	36GUGC2EG		200	37GUGC2EGD		200A/250V	37GUGC2EGF		100	37GUGC2EGP	
	50	3	25-100	B	36HUGC2EG		200	37HUGC2EGD		200A/250V	37HUGC2EGF		150	37HUGC2EGP	
	60	(3½)	50-200	B	36IUHC2EG		200	37IUHC2EGD		200A/250V	37IUHC2EGF		250	37IUHC2EGP	
	75	4	50-200	B	36JUHC2EG		400	37JUHC2EGD		400A/250V	37JUHC2EGF		250	37JUHC2EGP	
	100	5	55-250	—	36LPSC2EG		400	37LPSC2EGD		400A/250V	37LPSC2EGF		400	37LPSC2EGP	
460	15	1	5.5-22	A1	36DUDC4EH		30	37DUDC4EHD		30A/600V	37DUDC4EHF		30	37DUDC4EHP	
	30	(1¾)	10-40	A1	36EUEC4EH		60	37EUEC4EHD		60A/600V	37EUEC4EHF		50	37EUEC4EHP	
	40	2	13-52	B	36FUTC4EH		100	37FUTC4EHD		100A/600V	37FUTC4EHF		100	37FUTC4EHP	
	60	(2½)	25-100	B	36GUGC4EH		200	37GUGC4EHD		200A/600V	37GUGC4EHF		100	37GUGC4EHP	
	75	3	25-100	B	36HUGC4EH		200	37HUGC4EHD		200A/600V	37HUGC4EHF		125	37HUGC4EHP	
	100	(3½)	50-200	B	36IUHC4EH		200	37IUHC4EHD		200A/600V	37IUHC4EHF		150	37IUHC4EHP	
	150	4	50-200	B	36JUHC4EH		400	37JUHC4EHD		400A/600V	37JUHC4EHF		250	37JUHC4EHP	
	200	5	55-250	—	36LPSC4EH		400	37LPSC4EHD		400A/600V	37LPSC4EHF		400	37LPSC4EHP	
575	300	5	55-250	—	36LPUC4EH		600	37LPUC4EHD		600A/600V	37LPUC4EHF		600	37LPUC4EHP	
	700	6	160-630	—	36MPXC4EH		1600	37MPXC4EHD		1600A/600V	37MPXC4EHF		1200	37MPXC4EHP	
	15	1	5.5-22	A1	36DUDC5EE		30	37DUDC5EED		30A/600V	37DUDC5EEF		30	37DUDC5EEP	
	30	(1¾)	10-40	A1	36EUEC5EE		60	37EUEC5EED		60A/600V	37EUEC5EEF		50	37EUEC5EEP	
	40	2	13-52	B	36FUTC5EE		100	37FUTC5EED		100A/600V	37FUTC5EEF		50	37FUTC5EEP	
	60	(2½)	25-100	B	36GUGC5EE		100	37GUGC5EED		100A/600V	37GUGC5EEF		100	37GUGC5EEP	
	75	3	25-100	B	36HUGC5EE		200	37HUGC5EED		200A/600V	37HUGC5EEF		125	37HUGC5EEP	
	100	(3½)	50-200	B	36IUHC5EE		200	37IUHC5EED		200A/600V	37IUHC5EEF		150	37IUHC5EEP	
575	150	4	50-200	B	36JUHC5EE		400	37JUHC5EED		400A/600V	37JUHC5EEF		250	37JUHC5EEP	
	200	5	55-250	—	36LPSC5EE		400	37LPSC5EED		400A/600V	37LPSC5EEF		250	37LPSC5EEP	
	300	5	55-250	—	36LPUC5EE		600	37LPUC5EED		600A/600V	37LPUC5EEF		400	37LPUC5EEP	
700	6	160-630	—	37MPXC5EF		1600	37MPXC5EED		1600A/600V	37MPXC5EEF		1600	37MPXC5EEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

## Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/167.</li> <li>▶ Wiring Diagrams see page 9/183.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

### NEMA 4/4X Stainless Steel Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6WD		60	37DUEC6WDD		60A/250V	37DUEC6WDF		50	37DUEC6WDP	
	15	(1¾)	10-40	A1	36EUEC6WD		100	37EUEC6WDD		100A/250V	37EUEC6WDF		100	37EUEC6WDP	
	20	2	13-52	B	36F UFC6WD		100	37F UFC6WDD		100A/250V	37F UFC6WDF		100	37F UFC6WDP	
	30	(2½)	25-100	B	36GUGC6WD		200	37GUGC6WDD		200A/250V	37GUGC6WDF		125	37GUGC6WDP	
	40	3	25-100	B	36HUGC6WD		200	37HUGC6WDD		200A/250V	37HUGC6WDF		150	37HUGC6WDP	
	50	(3½)	50-200	B	36IUHC6WD		200	37IUHC6WDD		200A/250V	37IUHC6WDF		250	37IUHC6WDP	
	60	4	50-200	B	36JUHC6WD		400	37JUHC6WDD		400A/250V	37JUHC6WDF		250	37JUHC6WDP	
230	10	1	10-40	A1	36DUEC2WG		60	37DUEC2WGD		60A/250V	37DUEC2WGF		50	37DUEC2WGP	
	15	(1¾)	10-40	A1	36EUEC2WG		60	37EUEC2WGD		60A/250V	37EUEC2WGF		50	37EUEC2WGP	
	25	2	13-52	B	36F UFC2WG		100	37F UFC2WGD		100A/250V	37F UFC2WGF		100	37F UFC2WGP	
	30	(2½)	25-100	B	36GUGC2WG		200	37GUGC2WGD		200A/250V	37GUGC2WGF		100	37GUGC2WGP	
	50	3	25-100	B	36HUGC2WG		200	37HUGC2WGD		200A/250V	37HUGC2WGF		150	37HUGC2WGP	
	60	(3½)	50-200	B	36IUHC2WG		200	37IUHC2WGD		200A/250V	37IUHC2WGF		250	37IUHC2WGP	
	75	4	50-200	B	36JUHC2WG		400	37JUHC2WGD		400A/250V	37JUHC2WGF		250	37JUHC2WGP	
460	15	1	5.5-22	A1	36DUDC4WH		30	37DUDC4WHD		30A/600V	37DUDC4WHF		30	37DUDC4WHP	
	30	(1¾)	10-40	A1	36EUEC4WH		60	37EUEC4WHD		60A/600V	37EUEC4WHF		50	37EUEC4WHP	
	40	2	13-52	B	36F UFC4WH		100	37F UFC4WHD		100A/600V	37F UFC4WHF		100	37F UFC4WHP	
	60	(2½)	25-100	B	36GUGC4WH		200	37GUGC4WHD		200A/600V	37GUGC4WHF		100	37GUGC4WHP	
	75	3	25-100	B	36HUGC4WH		200	37HUGC4WHD		200A/600V	37HUGC4WHF		125	37HUGC4WHP	
	100	(3½)	50-200	B	36IUHC4WH		200	37IUHC4WHD		200A/600V	37IUHC4WHF		150	37IUHC4WHP	
	150	4	50-200	B	36JUHC4WH		400	37JUHC4WHD		400A/600V	37JUHC4WHF		250	37JUHC4WHP	
575	15	1	5.5-22	A1	36DUDC5WE		30	37DUDC5WED		30A/600V	37DUDC5WEF		30	37DUDC5WEP	
	30	(1¾)	10-40	A1	36EUEC5WE		60	37EUEC5WED		60A/600V	37EUEC5WEF		50	37EUEC5WEP	
	40	2	13-52	B	36F UFC5WE		100	37F UFC5WED		100A/600V	37F UFC5WEF		50	37F UFC5WEP	
	60	(2½)	25-100	B	36GUGC5WE		100	37GUGC5WED		100A/600V	37GUGC5WEF		100	37GUGC5WEP	
	75	3	25-100	B	36HUGC5WE		200	37HUGC5WED		200A/600V	37HUGC5WEF		125	37HUGC5WEP	
	100	(3½)	50-200	B	36IUHC5WE		200	37IUHC5WED		200A/600V	37IUHC5WEF		150	37IUHC5WEP	
	150	4	50-200	B	36JUHC5WE		400	37JUHC5WED		400A/600V	37JUHC5WEF		250	37JUHC5WEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

## Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> <li>► Field Modification Kits see page 9/104.</li> <li>► Factory Modifications see page 9/119.</li> <li>► Dimensions see page 9/167.</li> <li>► Wiring Diagrams see page 9/183.</li> <li>► Replacement Parts see page 9/131.</li> </ul>	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

### NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)<sup>①</sup>

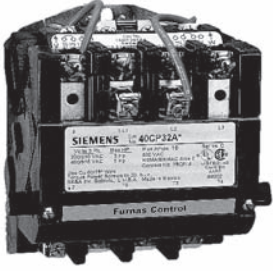
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6ND		60	37DUEC6NDD		60A/250V	37DUEC6NDF		50	37DUEC6NDP	
	15	(1¾)	10-40	A1	36EUEC6ND		100	37EUEC6NDD		100A/250V	37EUEC6NDF		100	37EUEC6NDP	
	20	2	13-52	B	36F UFC6ND		100	37F UFC6NDD		100A/250V	37F UFC6NDF		100	37F UFC6NDP	
	30	(2½)	25-100	B	36GUGC6ND		200	37GUGC6NDD		200A/250V	37GUGC6NDF		125	37GUGC6NDP	
	40	3	25-100	B	36HUGC6ND		200	37HUGC6NDD		200A/250V	37HUGC6NDF		150	37HUGC6NDP	
	50	(3½)	50-200	B	36IUHC6ND		200	37IUHC6NDD		200A/250V	37IUHC6NDF		250	37IUHC6NDP	
	60	4	50-200	B	36JUHC6ND		400	37JUHC6NDD		400A/250V	37JUHC6NDF		250	37JUHC6NDP	
	75	5	55-250	—	36LPSC6ND		400	37LPSC6NDD		400A/250V	37LPSC6NDF		400	37LPSC6NDP	
230	100	5	55-250	—	36LPUC6ND		600	37LPUC6NDD		600A/250V	37LPUC6NDF		600	37LPUC6NDP	
	300	6	160-630	—	36MPXC6ND		1200	37MPXC6NDD		1200A/250V	37MPXC6NDF		1200	37MPXC6NDP	
	10	1	10-40	A1	36DUEC2NG		60	37DUEC2NGD		60A/250V	37DUEC2NGF		50	37DUEC2NGP	
	15	(1¾)	10-40	A1	36EUEC2NG		60	37EUEC2NGD		60A/250V	37EUEC2NGF		50	37EUEC2NGP	
	25	2	13-52	B	36F UFC2NG		100	37F UFC2NGD		100A/250V	37F UFC2NGF		100	37F UFC2NGP	
	30	(2½)	25-100	B	36GUGC2NG		200	37GUGC2NGD		200A/250V	37GUGC2NGF		100	37GUGC2NGP	
	50	3	25-100	B	36HUGC2NG		200	37HUGC2NGD		200A/250V	37HUGC2NGF		150	37HUGC2NGP	
	60	(3½)	50-200	B	36IUHC2NG		200	37IUHC2NGD		200A/250V	37IUHC2NGF		250	37IUHC2NGP	
460	75	4	50-200	B	36JUHC2NG		400	37JUHC2NGD		400A/250V	37JUHC2NGF		250	37JUHC2NGP	
	100	5	55-250	—	36LPSC2NG		400	37LPSC2NGD		400A/250V	37LPSC2NGF		400	37LPSC2NGP	
	150	5	55-250	—	36LPUC2NG		600	37LPUC2NGD		600A/250V	37LPUC2NGF		600	37LPUC2NGP	
	350	6	160-630	—	36MPXC2NG		1200	37MPXC2NGD		1200A/250V	37MPXC2NGF		1200	37MPXC2NGP	
	15	1	5.5-22	A1	36DUDC4NH		30	37DUDC4NHD		30A/600V	37DUDC4NHF		30	37DUDC4NHP	
	30	(1¾)	10-40	A1	36EUEC4NH		60	37EUEC4NHD		60A/600V	37EUEC4NHF		50	37EUEC4NHP	
	40	2	13-52	B	36F UFC4NH		100	37F UFC4NHD		100A/600V	37F UFC4NHF		100	37F UFC4NHP	
	60	(2½)	25-100	B	36GUGC4NH		200	37GUGC4NHD		200A/600V	37GUGC4NHF		100	37GUGC4NHP	
575	75	3	25-100	B	36HUGC4NH		200	37HUGC4NHD		200A/600V	37HUGC4NHF		125	37HUGC4NHP	
	100	(3½)	50-200	B	36IUHC4NH		200	37IUHC4NHD		200A/600V	37IUHC4NHF		150	37IUHC4NHP	
	150	4	50-200	B	36JUHC4NH		400	37JUHC4NHD		400A/600V	37JUHC4NHF		250	37JUHC4NHP	
	200	5	55-250	—	36LPSC4NH		400	37LPSC4NHD		400A/600V	37LPSC4NHF		400	37LPSC4NHP	
	300	5	55-250	—	36LPUC4NH		600	37LPUC4NHD		600A/600V	37LPUC4NHF		600	37LPUC4NHP	
	700	6	160-630	—	36MPXC4NH		1600	37MPXC4NHD		1600A/600V	37MPXC4NHF		1200	37MPXC4NHP	
	15	1	5.5-22	A1	36DUDC5NE		30	37DUDC5NED		30A/600V	37DUDC5NEF		30	37DUDC5NEP	
	30	(1¾)	10-40	A1	36EUEC5NE		60	37EUEC5NED		60A/600V	37EUEC5NEF		50	37EUEC5NEP	
40	2	13-52	B	36F UFC5NE		100	37F UFC5NED		100A/600V	37F UFC5NEF		50	37F UFC5NEP		
60	(2½)	25-100	B	36GUGC5NE		100	37GUGC5NED		100A/600V	37GUGC5NEF		100	37GUGC5NEP		
75	3	25-100	B	36HUGC5NE		200	37HUGC5NED		200A/600V	37HUGC5NEF		125	37HUGC5NEP		
100	(3½)	50-200	B	36IUHC5NE		200	37IUHC5NED		200A/600V	37IUHC5NEF		150	37IUHC5NEP		
150	4	50-200	B	36JUHC5NE		400	37JUHC5NED		400A/600V	37JUHC5NEF		250	37JUHC5NEP		
200	5	55-250	—	36LPSC5NE		400	37LPSC5NED		400A/600V	37LPSC5NEF		250	37LPSC5NEP		
300	5	55-250	—	36LPUC5NE		600	37LPUC5NED		600A/600V	37LPUC5NEF		400	37LPUC5NEP		
700	6	160-630	—	37MPXC5NF		1600	37MPXC5NED		1600A/600V	37MPXC5NEF		1600	37MPXC5NEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① See page 9/110 for conduit hubs and conversion instructions.

# 3-Phase, Class 40

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see pages 9/144 open and 9/157 enclosed.</li> <li>▶ Wiring Diagrams see page 9/184.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil Table</b>																		
		<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240<sup>①</sup></td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480<sup>①</sup></td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 <sup>①</sup>	A	200–208	D	220–240	G	277	L	220–240/440–480 <sup>①</sup>	C	440–480	H
60Hz Voltage	Letter																			
24	J																			
120	F																			
110–120/220–240 <sup>①</sup>	A																			
200–208	D																			
220–240	G																			
277	L																			
220–240/440–480 <sup>①</sup>	C																			
440–480	H																			
575–600	E																			

### Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type <sup>④</sup>	NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	NEMA 12 <sup>②</sup> NEMA 3/3R Industrial Use Weatherproof						
200 Volts	230 Volts	460 Volts	575 Volts	Amp Rating	NEMA Size	Half Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1½	1½	2	2	9	00	—	40BP32A*		40BP32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	40CP32A*		40CP32B*		40CP32W*		40CP32F*		40CP32H*		40CP32O*	
7½	7½	10	10	27	1	—	40DP32A*		40DP32B*		40DP32W*		40DP32F*		40DP32H*		40DP32O*	
10	10	15	15	40	—	1¼	40EP32A*		40EP32B*		40EP32W*		40EP32F*		40EP32H*		40EP32O*	
10	15	25	25	45	2	—	40FP32A*		40FP32B*		40FP32W*		40FP32F*		40FP32H*		40FP32O*	
15	20	30	30	60	—	2½	40GP32A*		40GP32B*		40GP32W*		40GP32F*		40GP32H*		40GP32O*	
25	30	50	50	90	3	—	40HP32A*		40HP32B*		40HP32W*		40HP32F*		40HP32H*		40HP32O*	
30	40	75	75	115	—	3½	40IP32A*		40IP32B*		40IP32W*		40IP32F*		40IP32H*		40IP32O*	
40	50	100	100	135	4	—	40JG32A*		40JG32B*		40JG32W*		40JG32F*		40JG32H*		40JG32O*	
75	100	200	200	270	5	—	40LP32A*		40LP32B*		40LP32E* <sup>③</sup>		—	—	40LP32H*		40LP32O*	
150	200	400	400	540	6	—	40MP32A*		40MP32B*		40MP32E* <sup>③</sup>		—	—	—	—	40MP32O*	
—	300	600	600	810	7 <sup>④</sup>	—	40NH32A*		40NH32B*		40NH32E* <sup>③</sup>		—	—	—	—	40NH32O*	
—	450	900	900	1215	8 <sup>⑤</sup>	—	40PH32A*		40PH32B*		40PH32E* <sup>③</sup>		—	—	—	—	40PH32O*	

### Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Range	NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 <sup>④</sup> General Purpose	NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	NEMA 12 <sup>②</sup> NEMA 3/3R Industrial Use Weatherproof				
200 Volts	230 Volts	460 Volts	575 Volts	Amp Range	NEMA Size	Half Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1½	1½	2	2	9	00	—	40BP82B*		Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	40CP82B*		40CP82W*		40CP82H*		40CP82O*	
7½	7½	10	10	27	1	—	40DP82B*		40DP82W*		40DP82H*		40DP82O*	
10	10	15	15	40	—	1¼	40EP82B*		40EP82W*		40EP82H*		40EP82O*	
10	15	25	25	45	2	—	40FP82B*		40FP82W*		40FP82H*		40FP82O*	
15	20	30	30	60	—	2½	40GP82B*		40GP82W*		40GP82H*		40GP82O*	
25	30	50	50	90	3	—	40HP82B*		40HP82W*		40HP82H*		40HP82O*	
30	40	75	75	115	—	3½	40IP82B*		40IP82W*		40IP82H*		40IP82O*	
40	50	100	100	135	4	—	40JG82B*		40JG82W*		40JG82H*		40JG82O*	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

- ① Dual voltage coils not available in size 5-8 starters.
- ② For conduit hubs and conversion instructions, see page 9/110.

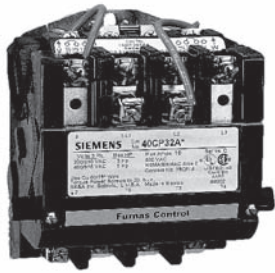
- ③ Enclosure is NEMA Type 4 (painted steel).
- ④ Only available  
F coil 100-250V AC 50/60Hz, or DC  
H coil 150-500V AC 50/60Hz, or DC
- ⑤ Only available  
F coil 100-250V AC 50/60Hz, or DC

Standard Auxiliary Contacts			
Type	Size (3rd Character)	Configuration	Internal / External
All FVNR Starters & Contactors	B Thru E	1N.O.	Internal
	F Thru J	1N.O.	External
	L Thru M	2N.O., 2N.C.	External
	N Thru P	1N.O., 1N.C.	External

⑦ Lugs are not included, refer to page 9/108.

# Single Phase, 4-Pole & Vacuum, Class 40

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see pages 9/144 open and 9/157 enclosed.</li> <li>▶ Wiring Diagrams see page 9/184.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240<sup>①</sup></td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480<sup>①</sup></td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 <sup>①</sup>	A	200–208	D	220–240	G	277	L	220–240/440–480 <sup>①</sup>	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240 <sup>①</sup>	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480 <sup>①</sup>	C																					
440–480	H																					
575–600	E																					


### Open Type & Standard Width Enclosure, Single Phase, 2-Pole<sup>③④</sup>

Max Hp				Enclosure												
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Half Size	Open Type <sup>⑤</sup>		NEMA 1 General Purposes		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosure Indoor/Outdoor Use		NEMA 12 NEMA 3/3R <sup>®</sup> Industrial Use Weatherproof	
					Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
1/2	1	9	00	—	40BP12A*		40BP12B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	—	40CP12A*		40CP12B*		40CP12W*		40CP12F*		40CP12H*		40CP120*	
2	3	27	1	—	40DP12A*		40DP12B*		40DP12W*		40DP12F*		40DP12H*		40DP120*	
3	5	35	1P	—	40EP12A*		40EP12B*		40EP12W*		40EP12F*		40EP12H*		40EP120*	
3	7 1/2	45	2	—	40FP12A*		40FP12B*		40FP12W*		40FP12F*		40FP12H*		40FP120*	
5	10	60	—	2 1/2	40GP12A*		40GP12B*		40GP12W*		40GP12F*		40GP12H*		40GP120*	
7 1/2	15	90	3	—	40HP12A*		40HP12B*		40HP12W*		40HP12F*		40HP12H*		40HP120*	

### Open Type & Standard Width Enclosure, 4-Pole

Max Hp					Enclosure													
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosure Indoor/Outdoor Use		NEMA 12 NEMA 3/3R <sup>®</sup> Industrial Use Weatherproof	
							Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
1/2	1 1/2	2	2	9	00	—	40BP22A*		40BP22B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
2	3	5	5	18	0	—	40CP22A*		40CP22B*		40CP22W*		40CP22F*		40CP22H*		40CP220*	
3	7 1/2	10	10	27	1	—	40DP22A*		40DP22B*		40DP22W*		40DP22F*		40DP22H*		40DP220*	
5	10	15	15	40	—	1 1/4	40EP22A*		40EP22B*		40EP22W*		40EP22F*		40EP22H*		40EP220*	

### Vacuum Contactors, 3-Phase, 3-Pole<sup>①</sup>

	Max Hp				Contactor Amp Rating	NEMA Size	Open Type	
	200V	230V	460V	575V			Catalog Number	List Price \$
	40	50	100	100	135	4	40JV32A*	
	75	100	200	200	270	5	40LV32A*	
	150	200	400	400	540	6	40MV32A*	

**Note:** Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available for vacuum contactors. Refer to Page 9/119 for a complete list of available coil voltages.

② For conduit hubs and conversion instructions, see page 9/110.

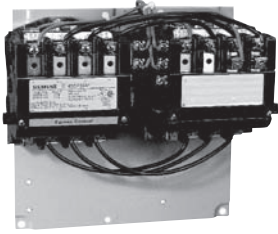
③ To order single phase contactor in an extra wide enclosure, order the enclosure kit from Page 9/113 and the open style contactor as separate items.

④ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.

⑤ 1 NO Auxiliary.

# Class 43

## Selection



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see pages 9/145 open and 9/162 enclosed.
- ▶ Wiring Diagrams see page 9/184.
- ▶ Replacement Parts see page 9/131.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 <sup>①</sup>	A
200–208	D
220–240	G
277	L
220–240/440–480 <sup>①</sup>	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

### Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Cont-actor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type <sup>②</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>③</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 <sup>④</sup> NEMA 3/3R Industrial Use Weatherproof	
Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	
1/2	1/2	2	2	9	00	—	43BP32A*	43BP32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	—	
3	3	5	5	18	0	—	43CP32A*	43CP32B*	43CP32W*	—	43CP32F*	—	43CP32H*	—	43CP320*	—	—	
7 1/2	7 1/2	10	10	27	1	—	43DP32A*	43DP32B*	43DP32W*	—	43DP32F*	—	43DP32H*	—	43DP320*	—	—	
10	10	15	15	40	—	1 1/4	43EP32A*	43EP32B*	43EP32W*	—	43EP32F*	—	43EP32H*	—	43EP320*	—	—	
10	15	25	25	45	2	—	43FP32A*	43FP32B*	43FP32W*	—	43FP32F*	—	43FP32H*	—	43FP320*	—	—	
15	20	30	30	60	—	2 1/2	43GP32A*	43GP32B*	43GP32W*	—	43GP32F*	—	43GP32H*	—	43GP320*	—	—	
25	30	50	50	90	3	—	43HP32A*	43HP32B*	43HP32W*	—	43HP32F*	—	43HP32H*	—	43HP320*	—	—	
30	40	75	75	115	—	3 1/2	43IP32A*	43IP32B*	43IP32W*	—	43IP32F*	—	43IP32H*	—	43IP320*	—	—	
40	50	100	100	135	4	—	43JG32A*	43JG32B*	43JG32W*	—	43JG32F*	—	43JG32H*	—	43JG320*	—	—	
75	100	200	200	270	5	—	43LP32A*	43LP32B*	43LP32E* <sup>⑤</sup>	—	—	—	—	—	43LP320*	—	—	
100	200	400	400	540	6	—	43MP32A*	43MP32B*	43MP32E* <sup>⑤</sup>	—	—	—	—	—	43MP320*	—	—	
—	300	600	600	810	7 <sup>⑥</sup>	—	43NH32A*	43NH32B*	43NH32E* <sup>⑤</sup>	—	—	—	—	—	43NH320*	—	—	
—	450	900	900	1215	8 <sup>⑥</sup>	—	43PH32A*	—	—	—	—	—	—	—	—	—	—	

### Open Type & Standard Width Enclosure, Single Phase, 3-Wire, 2-Pole<sup>④</sup>

Max Hp				Cont-actor Amp Rating	NEMA Size	Enclosure											
115 Volts	208/230 Volts	—	—			Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>③</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 <sup>④</sup> NEMA 3/3R Industrial Use Weatherproof	
Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$	Cat. No.	List Price \$
1/2	1	9	00	43BP12A*	43BP12B*	Use Size 0	—	Use Size 0	—	—	—	Use Size 0	—	Use Size 0	—	—	—
1	2	18	0	43CP12A*	43CP12B*	43CP12W*	—	43CP12F*	—	43CP12H*	—	43CP120*	—	—	—	—	—
2	3	27	1	43DP12A*	43DP12B*	43DP12W*	—	43DP12F*	—	43DP12H*	—	43DP120*	—	—	—	—	—
3	5	35	1P	43EP12A*	43EP12B*	43EP12W*	—	43EP12F*	—	43EP12H*	—	43EP120*	—	—	—	—	—

**Note:** Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

- ① Dual voltage coils not available in size 5–8 starters.
- ② For conduit hubs and conversion instructions, see page 9/110.

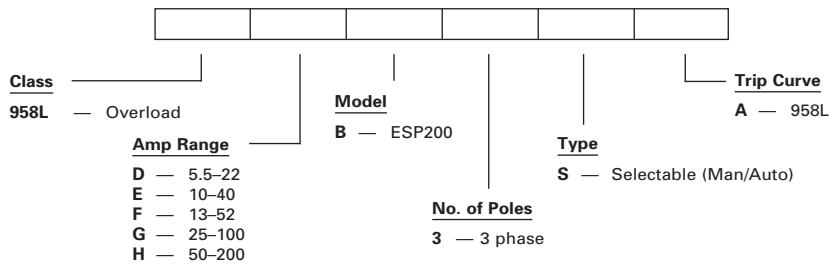
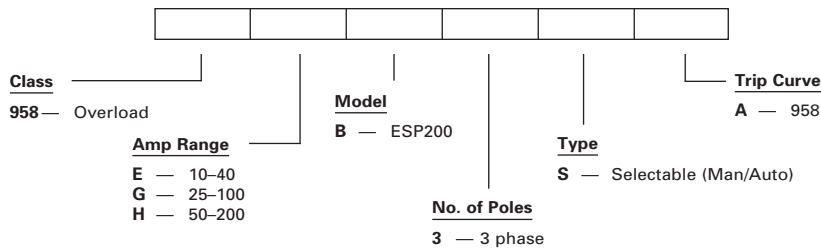
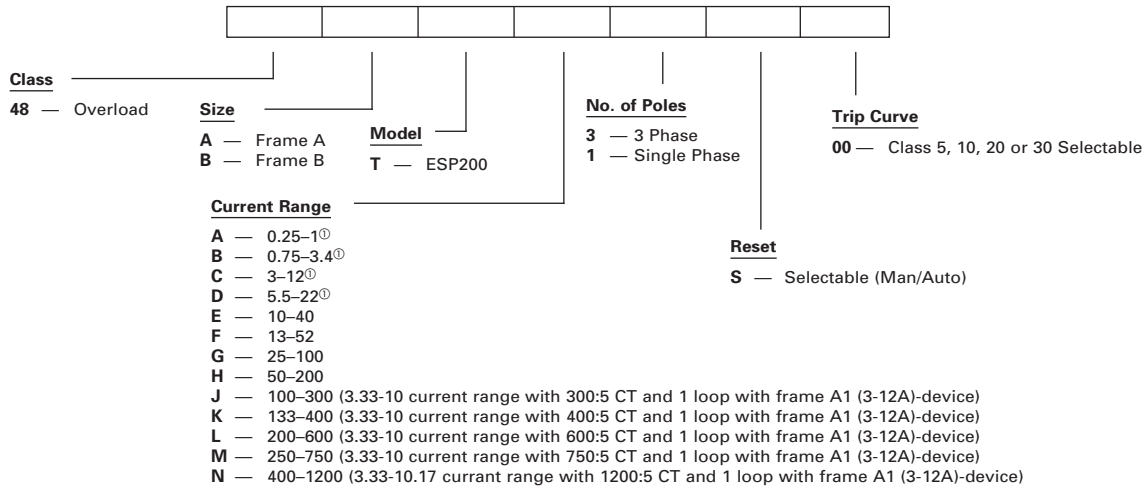
- ③ Enclosure is NEMA Type 4 (painted steel).
- ④ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.
- ⑤ Only available  
F coil 100-250V AC 50/60Hz, or DC  
H coil 150-500V AC 50/60Hz, or DC

- ⑥ Only available  
F coil 100-250V AC 50/60Hz, or DC
- ⑦ Auxiliary contacts  
43B-43E 4th pole built-in  
43F-43J 2 NO & 2 NC



# Catalog Numbering System

## General

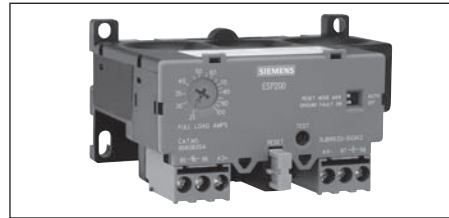


Ⓞ Ranges available in Single or 3-phase.

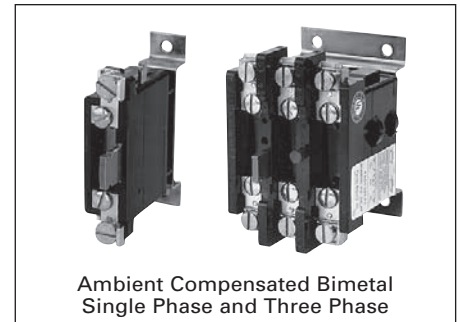
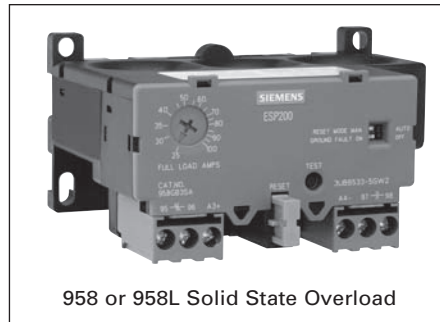


# Solid State ESP200, Class 48, 958 and 958L

## General



Features	Benefits
<ul style="list-style-type: none"> <li>▪ Trip Classes - 5, 10, 20, or 30 Selectable by DIP-switches</li> </ul>	<ul style="list-style-type: none"> <li>▪ Field changeable reduces time and inventory. Suitable for light, normal and heavy starting conditions</li> </ul>
<ul style="list-style-type: none"> <li>▪ Phase Loss Protection - Trips in less than 3 Seconds</li> </ul>	<ul style="list-style-type: none"> <li>▪ Protects motor burn out and minimizes motor heating up</li> </ul>
<ul style="list-style-type: none"> <li>▪ Phase Unbalance - Trips based on Trip Class selected</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minimizes temperature rise of the motor on a asymmetrical three-phase-system</li> </ul>
<ul style="list-style-type: none"> <li>▪ Ground Fault - Trips 60% of Motor Current</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provides optimum system protection of motors against high-resistance short-circuits or ground faults due to moisture, condensation, damage of insulation or any other reason</li> </ul>
<ul style="list-style-type: none"> <li>▪ Trip Indicator - Visible</li> </ul>	<ul style="list-style-type: none"> <li>▪ Save time, faster to identify overload Trip</li> </ul>
<ul style="list-style-type: none"> <li>▪ Ambient Insensitive</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prevents nuisance tripping</li> </ul>
<ul style="list-style-type: none"> <li>▪ No Heaters Required</li> </ul>	<ul style="list-style-type: none"> <li>▪ Saves cost and eliminates time for installation of heaters</li> </ul>
<ul style="list-style-type: none"> <li>▪ Self-Powered - No outside source required</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduce cost for external power supply</li> </ul>
<ul style="list-style-type: none"> <li>▪ FLA dial with wide Adjustment - 4:1 ratio</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provides wide range, reduces inventory</li> </ul>
<ul style="list-style-type: none"> <li>▪ Self Protected in short circuit condition (when used with proper fuses or motor starter protector)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Unlike bimetal overloads, this eliminates replacement of the overload heaters after short circuit</li> </ul>
<ul style="list-style-type: none"> <li>▪ Test Button - Tests Electronics</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tests the complete electronic functions including the trip mechanism. Increases up time</li> </ul>
<ul style="list-style-type: none"> <li>▪ Thermal Memory</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prevents re-starting motor when it is still hot</li> </ul>
<ul style="list-style-type: none"> <li>▪ Conformally coated circuit board</li> </ul>	<ul style="list-style-type: none"> <li>▪ Resists against environmental conditions</li> </ul>
<ul style="list-style-type: none"> <li>▪ 1 NO and 1NC Contacts Standard. B600, R300</li> </ul>	<ul style="list-style-type: none"> <li>▪ Makes it easier for user to wire local contacts</li> </ul>
<ul style="list-style-type: none"> <li>▪ Operating Temperature: -25 °C - 65 °C</li> </ul>	<ul style="list-style-type: none"> <li>▪ Wide operating temperature range prevents nuisance tripping with temperature changes</li> </ul>
<ul style="list-style-type: none"> <li>▪ Repeat Accuracy &lt;1%.</li> </ul>	<ul style="list-style-type: none"> <li>▪ For more precise settings and reduced nuisance tripping</li> </ul>
<ul style="list-style-type: none"> <li>▪ Removable Terminal Block</li> </ul>	<ul style="list-style-type: none"> <li>▪ Terminal Block can be removed without removing wires. Saves time for replacements</li> </ul>
<ul style="list-style-type: none"> <li>▪ Automatic reset</li> </ul>	<ul style="list-style-type: none"> <li>▪ Auto. Reset is 3 minutes after tripping, allowing motor to cool down before re-start. If Manual Reset is selected, overload can be reset immediately</li> </ul>
<ul style="list-style-type: none"> <li>▪ Remote reset</li> </ul>	<ul style="list-style-type: none"> <li>▪ As an alternative to the mechanical RESET options, an electrical remote RESET can be used by applying 24 V DC to terminals A3 and A4</li> </ul>
<ul style="list-style-type: none"> <li>▪ DIN Rail Mounted</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduces installation time</li> </ul>
<ul style="list-style-type: none"> <li>▪ Touch - Safe Terminals</li> </ul>	<ul style="list-style-type: none"> <li>▪ Protects against accidental touching of live circuits</li> </ul>
<ul style="list-style-type: none"> <li>▪ UL listed CSA certified</li> </ul>	<ul style="list-style-type: none"> <li>▪ Third party approval standard</li> </ul>



## Applications

### ESP200 Solid State Overloads

Designed for a wide variety of applications. The field selectable Trip Class 5, 10, 20 or 30 can easily be set by 2 DIP switches. This eliminates the guess factor of an application requirements and provides reduced inventory for multiple applications. The inherent benefits of the ESP200 ultimately results in cost savings for the user.

ESP200 has a 4:1 current adjustment range with a fine adjustment dial labeled in full load amps. The heaterless overload minimizes the heat trapped in the enclosures, reduces cost for ventilation or cooling. Easily accessible Reset button, provides visible and audible indications to ensure the tripped overload is ready to re-start.

Designed to replace thermal, or ESP100 overload relays for any application. It has the same dimensions and footprint of the ESP100 overload relays. It can be directly coupled to the contactors or remotely mounted. In addition to the NEMA contactor applications, it also can be used with other types of controllers for applications requiring DP or IEC contactors. As a retrofit for other brands, it is used with a plate available for retrofitting competitive products.

### 958 ESP200 Special Use Solid State Overloads

This overload is specifically designed for special applications, to provide excellent protection of hermetically sealed and artificially cooled motors that require ambient insensitive and quick trip response times. Combined with a series lockout relay, it provides unsurpassed protection for hermetically sealed compressor motors in air conditioning applications. The combination of high trip speed, current adjustment, and ease of installation makes it suitable for these applications. The trip curves are customized to provide proper overload protection for these loads without causing nuisance tripping.

It has selectable manual or automatic reset mode, and provides ground fault selection to protect equipment from damage in case of a fault.

### 958L ESP200 Oil Field Solid State Overloads

Specifically designed for the oil market and the cycling loads experienced with these types of pumping applications. These overload relays provide protection for standard motors, oil well pump motors, multi-torque connections, and ultra-high slip motors.

Rotors can be damaged in less than 15 seconds during motor stall conditions if electrical power is not removed. To prevent damage during motor stall, the 958L solid state overload removes the power in 7 seconds at 250% lock rotor current. Therefore, the motor casing and the rotor will be protected from being damage saving the user money and time.

### Ambient Compensated Bimetal Overloads

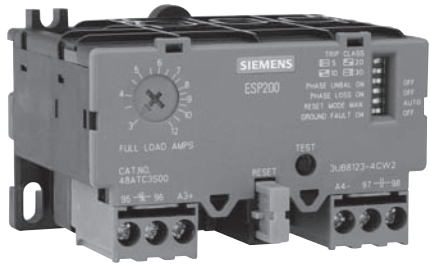
- Automatic or manual reset adjustment
- A manual test button is provided to test the operation of the 3-pole overload relay control contacts
- $\pm 15\%$  nominal trip current adjustment
- Accept either standard Class 20 or Quick Trip (NEMA Class 10) heater elements without any other changes or adjustments
- Available with a normally open contact for an alarm circuit (SPDT) up to 60A
- Compensated bimetal overload relays provide a constant trip time in ambient temperatures from  $-20^{\circ}\text{F}$  to  $+170^{\circ}\text{F}$  for a given heater rating
- UL Listed File #E22655 or Component Recognized
- CSA Certified File #LR6535

### Ambient Compensated Bimetal Overloads

These thermal type overload relays are used to protect motors from excessive heat resulting from sustained motor overloads, rapid motor cycling and stalled rotor conditions. Although these devices function based on thermal principles they are designed to compensate for the ambient air temperature surrounding the overload. This helps prevent the occurrence of nuisance tripping when there are high surrounding ambient temperatures. The percentage of overload determines the length of time required to open the circuit.

# Solid State Class 48, ESP200 and 3RB20

## Selection



3-Phase, 48ATC3S00

### Ordering Information

- ▶ For CT's see Accessories page 9/67.
- ▶ Dimensions see page 9/146.
- ▶ To retrofit or direct mount to a contactor, order 49ASMP1, 2, or 3 separately. See Retrofit Plates below.
- ▶ For remote mounting of frame size A order 49ASMS1 terminals separately, see page 9/108.

### Solid State—Class 48

Current Adjustment Range	Phase	Frame Size	Catalog Number	MRPD/MLFB	List Price \$
0.25–1	3	"A"	48ATA3S00	3UB81134AB2	
0.75–3.4	3	"A"	48ATB3S00	3UB81134BB2	
3–12	3	"A1"	48ATC3S00	3UB81234CW2	
5.5–22	3	"A1"	48ATD3S00	3UB81234DW2	
10–40	3	"A1"	48ATE3S00	3UB81234EW2	
13–52	3	"B"	48BTF3S00	3UB81334FW2	
25–100	3	"B"	48BTG3S00	3UB81334GW2	
50–200	3	"B"	48BTH3S00	3UB81334HW2	
100–300	3	"A1" ②	48ATJ3S00	3UB81234JW2	
133–400	3	"A1" ③	48ATK3S00	3UB81234KW2	
200–600	3	"A1" ④	48ATL3S00	3UB81234LW2	
250–750	3	"A1" ⑤	48ATM3S00	3UB81234MW2	
400–1220	3	"A1" ⑤	48ATN3S00	3UB81234NW2	
0.25–1	1	"A"	48ATA1S00	3UB88134AB2	
0.75–3.4	1	"A"	48ATB1S00	3UB88134BB2	
3–12	1	"A1"	48ATC1S00	3UB88234CW2	
5.5–22	1	"A1"	48ATD1S00	3UB88234DW2	
25–100	1	"B"	48BTG1S00	3UB88334GW2	

### Solid State—3RB206<sup>③④</sup>, 3-Phase, Manual/Auto Reset

For Contactor Size	Setting Range Amps	Class 10 Catalog Number	List Price \$	Class 20 Catalog Number	List Price \$
5	55 - 250	3RB2066-1GC2		3RB2066-2GC2	
6	160 - 630	3RB2066-1MC2		3RB2066-2MC2	

### Retrofit Plates for Contactors, Class 48

Replacement for Starter Sizes	ESP200 Overload Frame Size <sup>①</sup>	Retrofit Plate Suffix	Plate Kit Separate	Price Adder \$
Size 00–1¼ Size 2, 2½	A or A1 B	1P 2P	49ASMP1 49ASMP2	
Size 3, 3½ Size 4	B B	3P 4P	49ASMP3 49ASMP3	

### Ambient Compensated Bimetal—Open Type Class 48 Single Phase, 3-Phase (Panel Mount Only)

Poles	Amp Rating	Auxiliary Contacts	Contact Rating	Catalog Number	List Price \$	
1	25	1 NC	5A (B600) & 5A (P300)	48DA18AA4		
	60	1 NC		48GA18AA4		
	100	1 NC		48HA18AA4		
	180	1 NC		48JA18AA4		
3	30	1 NC	10A (A600) & 5A (P300)	48DC38AA4		
	30	1 NO/NC		48DC39AA4		
	60	1 NC		48GC38AA4		
	60	1 NO/NC		48GC39AA4		
	100	3 NC		5A (B600) & 5A (P300)		48HA38AA4
	180	3 NC				48JA38AA4

① To determine frame size of replacement solid state overload, refer to retrofit plates table above.

② Requires use of 300:5 Current Transformers—3 of 97CT005.

③ Product Category: IEC.

④ Requires use of 600:5 Current Transformers—3 of 97CT008.

⑤ Requires use of 1200:5 Current Transformers—3 of 97CT012.

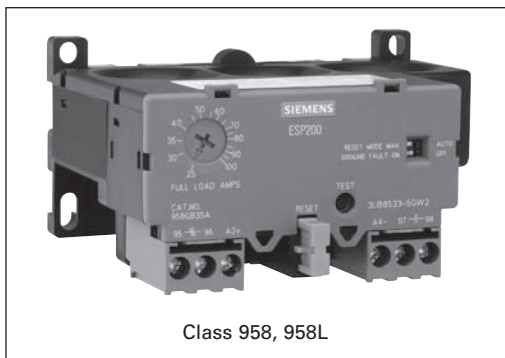
⑥ Overload has busbar connections.

⑦ Requires use of 750:5 Current Transformers—3 of 97CT009.

⑧ Requires use of 400:5 Current Transformers—3 of 97CT006.

# Special Use Solid State Overloads, Class 958 and 958L

## Selection



Class 958, 958L

### Ordering Information

► Dimensions see page 9/146.

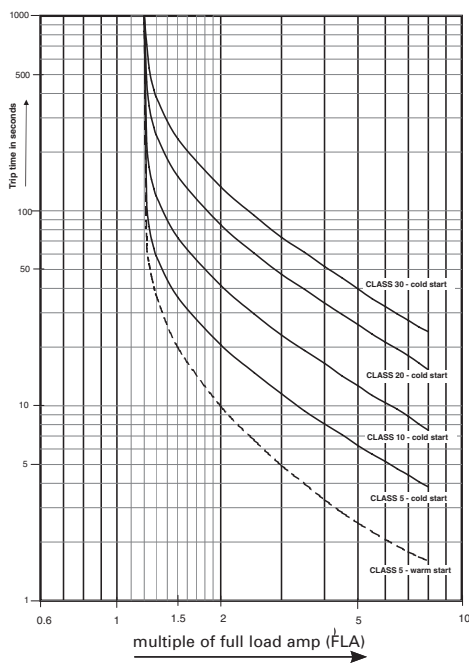
### Current Transformers

Rating	Catalog No.	List Price \$
150:5	97CT002	
200:5	97CT003	
250:5	97CT004	
300:5	97CT005	
400:5	97CT006	
600:5	97CT008	
750:5	97CT009	
1200:5	97CT012	

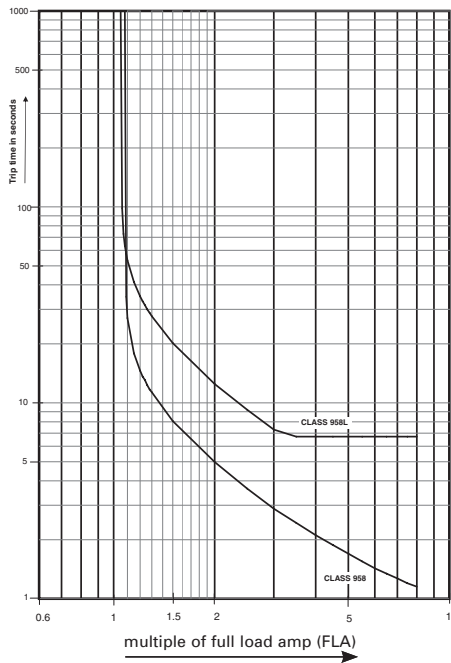
### Solid State—Class 958 and 958L

Current Adjustment Range	Phase	Frame Size	Catalog Number	MRPD/MLFB	List Price \$
10–40	3	"A1"	958EB3SA	3UB85235EW2	
25–100	3	"B"	958GB3SA	3UB85335GW2	
50–200	3	"B"	958HB3SA	3UB85335HW2	
5.5–22	3	"A1"	958LDB3SA	3UB85236DW2	
10–40	3	"A1"	958LEB3SA	3UB85236EW2	
13–52	3	"B"	958LFB3SA	3UB85336FW2	
25–100	3	"B"	958LGB3SA	3UB85336GW2	
50–200	3	"B"	958LHB3SA	3UB85336HW2	

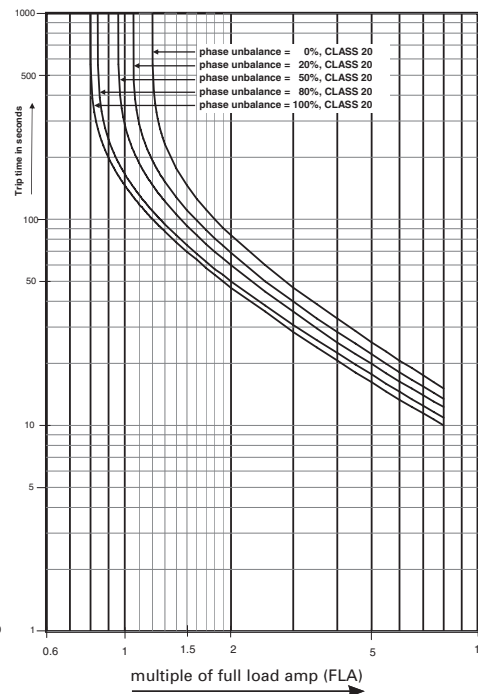
Time - Current - Characteristics CLASS 48



Time - Current - Characteristics CLASS 958, 958L



Trip - curve depending on unbalance CLASS 20



① Temperature rating -25° to +60°C.

# Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

## General

### Features

The Class 82 Slim Line NEMA Pump was designed specifically for the agricultural market. It is well suited for irrigation and similar pumping applications and is built to withstand the harsh elements of the outdoors

#### Typical applications include:

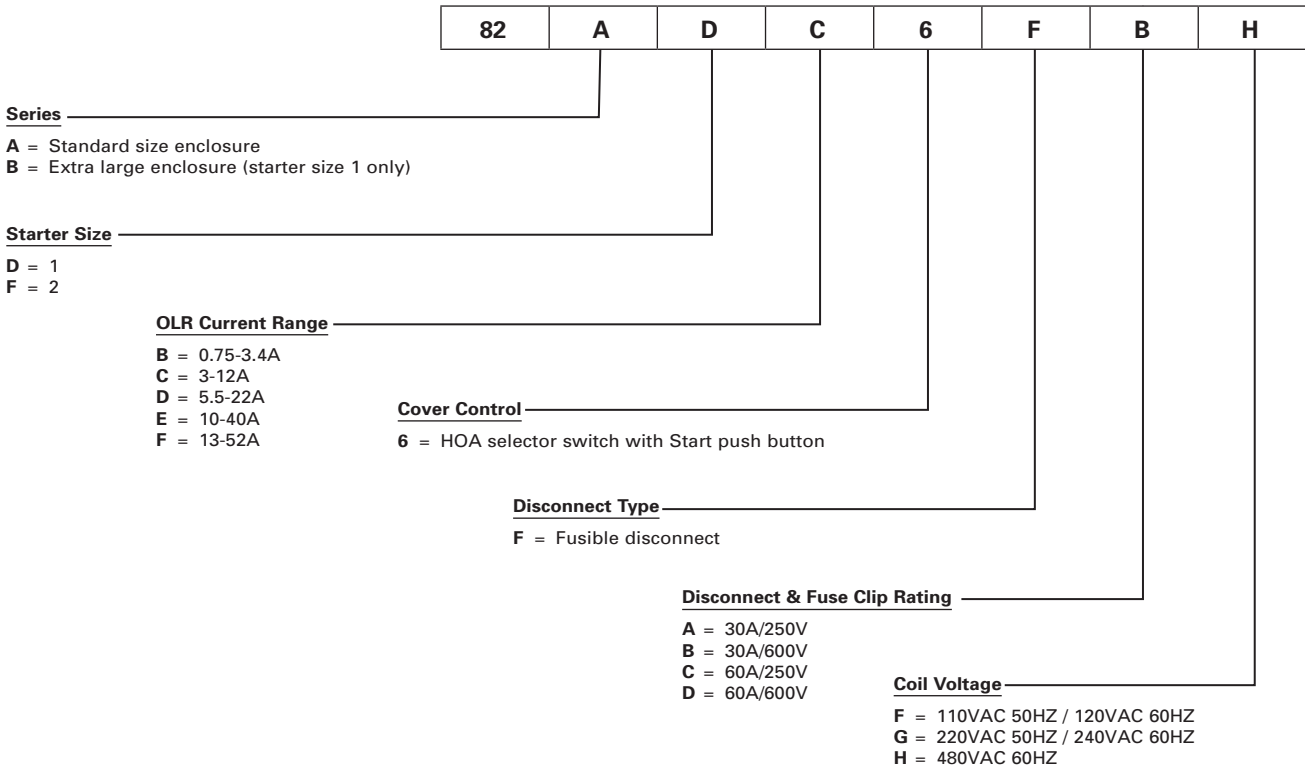
- Crop irrigation
- Sprinklers, misters and soakers
- Watering for livestock and other dairy applications
- Ground dewatering for excavation and construction sites

#### Why you should use the Class 82 Pump Panel

- Simplicity and its compact lightweight design makes this an attractive solution to your budgeting challenges.
- The contactor is NEMA rated to provide reliable motor control and protection expected in the most demanding applications.
- The ESP200 solid-state overload relay has a protective coating on the circuit board which gives it superior protection against high humidity, condensation and corrosive environments.
- Its size and weight is about half that of the Class 87 which increases the ease of installation.




### Catalog Numbering System



# Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

## General

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Field Modification Kits (see accessories on this page)</li> <li>▶ Factory Modifications (NA)</li> <li>▶ Dimensions see page 9/167</li> <li>▶ Wiring Diagram see page 9/187</li> <li>▶ Replacement Parts (refer to instruction sheet A5E35327591A)</li> </ul>	<b>Coil Table</b>	
		50/60Hz Voltage	Letter
		110VAC 50HZ / 120VAC 60HZ	F
		220VAC 50HZ / 240VAC 60HZ	G <sup>①</sup>
		480VAC 60HZ	H <sup>②</sup>

## Product Selection

Max Hp Rating Motor Voltage		NEMA Size	Overload Relay Amp Range	Disc. Amp Rating	Fuse Clip Amp/Volts	HOA & Start Push Button		HOA & Start Push Button (Extra wide Encl)	
230	460					Catalog Number	List Price \$	Catalog Number	List Price \$
—	1	1	0.75–3.4	30	30A/600V	82ADB6FB*		82BDB6FB* <sup>③</sup>	
—	5	1	3–12	30	30A/600V	82ADC6FB*		82BDC6FB* <sup>③</sup>	
—	10	1	5.5–22	30	30A/600V	82ADD6FB*		82BDD6FB* <sup>③</sup>	
—	10	1	10–40	30	30A/600V	—		82BDE6FB* <sup>③</sup>	
2	—	1	3–12	30	30A/250V	82ADC6FA*		82BDC6FA* <sup>③</sup>	
3	—	1	5.5–22	30	30A/250V	82ADD6FA*		82BDD6FA* <sup>③</sup>	
7 1/2	—	1	10–40	30	30A/250V	82ADE6FA*		82BDE6FA* <sup>③</sup>	
—	25	2	13–52	60	60A/600V	82AFF6FD* <sup>③</sup>		—	
15	—	2	13–52	60	60A/250V	82AFF6FC* <sup>③</sup>		—	

Replace the (\*) with a letter from the coil table.

③ Available in May 2017.

## Accessories





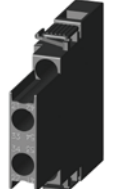

Image	Description	Catalog Number	List Price
	3/4" type 3R conduit hub	ECHS075	
	1" type 3R conduit hub	ECHS100	
	1 1/4" type 3R conduit hub	ECHS125	
	1 1/2" type 3R conduit hub	ECHS150	
	Disconnect switch auxiliary contacts 2 NO/2 NC DPDT (NEMA A600)	HA261234	
	Fuse puller kit for 30A switch (1 kit required per switch)	HP61	
	30A, 240V Class R Fuse Clip Kits	HR21	
	30A, 600V Class R Fuse Clip Kits	HR612	

Image	Description	Catalog Number	List Price
	Contactor auxiliary contacts, side mounted 1 NO/NC (NEMA A300/Q300)	3RH29111DA11	
	ESP200 tamper resistance cover	49ASTC1	

① G coil is not available with a 600v disconnect  
 ② H coil is not available with a 250v disconnect



## Class 82 Technical information

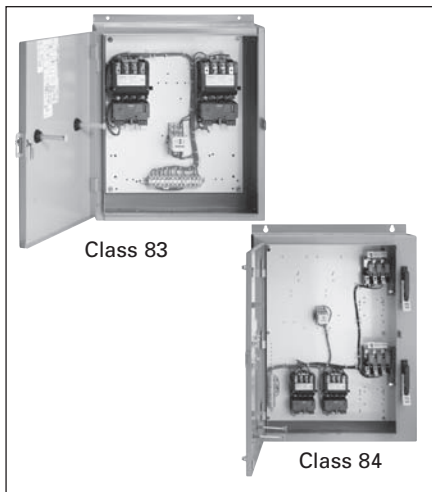
General Technical Data:	
Weight	Size 1 (Standard Encl.) 23lbs. Size 1 (Extra Wide Encl.) 47lbs. Size 2 (Standard Encl.) 47lbs.
Height x Width x Depth	Size 1 (Standard Encl.) 26 x 12 x 5in. Size 1 (Extra Wide Encl.) 35 x 17 x 6in. Size 2 (Standard Encl.) 35 x 17 x 6in.
Maximum altitude	6560 ft.
Ambient (outside enclosure) storage temperature	(-30 to 65)°C / (-22 to 149)°F
Ambient (outside enclosure) operating temperature	(-20 to 40)°C / (-4 to 104)°F
Country of origin	Mexico
Horsepower Rating:	
See selection table above	See selection table above
Contactor:	
Number of NO main contacts	3
Amp rating	32A, 50A
Mechanical operating cycles	10,000,000
Internal / Standard Auxiliary Contact:	
Number of NC / NO auxiliary contacts	1NC / 1NO
NEMA contact rating designation	A600 AC / Q600 DC
Optional auxiliary contacts available	Yes
Coil:	
Voltage	220/230V 50/60Hz, 460V 60Hz, or 110/120V 50/60Hz
Apparent pull-in / holding power	81 VA / 10.5 VA
Normal coil operating limits (% of rated voltage)	80% - 110% at 60Hz
Pick-up time / Drop-out time	8-40 / 4-16 msec
Overload Relay:	
Current range	0.75 - 3.4 or 3 - 12 or 5.5 - 22 or 10 - 40 Amps or 13 - 52 Amps
Trip Class	Class 5 / 10 (factory set) / 20 / 30
Trip detection	Overload, phase failure, phase unbalance, ground fault
Phase failure sensitivity	Trip time after phase loss: < 3 sec
Repeat accuracy	Within 1%
Reset options	Manual, automatic and remote
External reset	Yes
Test function	Electronics and manual actuation
Conformal coating on printed circuit board	Yes
Number of NC / NO auxiliary contacts	1NC /1NO
Rating of auxiliary contacts	B600 AC / R300 DC
Single contact isolation	600 V
Dual contact isolation	300 V differing polarity / 600 V common polarity



## Class 82 Technical information

<b>Disconnect Switch:</b>	
Rating	30 A with 30A/600 or 30A/250 V Class H fuse clips 60 A with 60A/600 or 60A/250 V Class H fuse clips
Fuse type accepted	Class H, J or R
<b>Enclosure:</b>	
Type	NEMA Type 3/3R enclosure
Rating	Weather proof for outdoor use
<b>Standard Control Devices:</b>	
Hand-Off-Auto selector switch	3SU1 30mm, round, metal with matte finish
Start push button	3SU1 30mm, round, metal with matte finish
<b>Mounting / Wiring:</b>	
Mounting orientation	Vertical
Mounting type	Pole and surface
Disconnect line side connection type / torque	Box lug / 35 lb in (14 - 10); 40 lb in (8); 45 lb in (6 - 4) AWG
Disconnect line side solid and stranded conductors	1x(14 - 2 AWG) 60/75°C AL or CU
Power terminal block connection type / torque	Screw / 24 - 32 lb - in
Power terminal block solid and stranded conductors	1x(18 - 2 AWG) 75°C CU
Control terminal block connection type / torque	Screw / 12 - 18 lb - in
Control terminal block solid and stranded conductors	1x(22 - 8 AWG) 75°C CU
Coil connection type / torque	Screw / 7 - 10 lb in
Coil solid and stranded conductors	2x(16 - 12 AWG) CU 60/75°C
Main auxiliary contact connection type / torque	Screw / 7 - 10 lb in
Main auxiliary contact solid and stranded conductors	2x(20 - 16), 2x(18 - 14) 75°C CU
OLR auxiliary contact connection type / torque	Screw / 7 - 10 lb in
OLR auxiliary contact solid and stranded conductors	2x(20 - 14 AWG) CU 60/75°C
<b>Short Circuit Current Rating:</b>	
Fuses	10kA@600V (Class H or K); 85kA@600V (Class R or J)
<b>Certificates / Approvals:</b>	
cULus	UL (file no. E185287)
UL rated Service Entrance Equipment	ISO 9001 certification

General



Features

- Heavy Duty NEMA Starters
- Solid State or Thermal Overload Relays
- Fusible or MCP
- Heavy Duty Disconnect Handle
- Flexibility with Field Modifications
- Alternator Transfer on De-energization
- UL Listed for Outdoor Use
- UL Listed file #E14900 (class 83); file #E185287 (class 84)
- CSA certified file #LR 6535 (class 83 & 84)

Application

Duplex pump controls are designed to perform one or both of two distinct functions: duplexing and alternation. The duplexing function provides capacity for system peaking or above normal demand without having the full motor capacity spinning at all times. It also provides standby capacity for use when one of the motors or pumps is disabled. The duplexing function is also referred to as lead/lag or main/standby. When two pumps or compressors are controlled by a duplex controller, they are started in sequence as necessary to attain preset values of pressure, flow or liquid level.

Two field devices such as pressure switches or float switches provide electrical signals to the duplex controller. One remote device is set to initiate the starting of the lead motor. This motor is rated to handle normal system demand. The second motor is usually the same rating and is referred to as the lag motor. It is only energized when the system demand is greater than the capacity of the lead motor. The lag motor is started when the second remote device is signalling for more output than the lead motor can produce.

The alternation function reverses the lead and lag mode for the two motors in a duplex system. Upon alternation the first motor as described above becomes the lag motor and the second motor assumes the lead function. The alternation is usually programmed to occur at any time both pumps come to rest. The alternation function equalizes wear on the two machines and extends the life of seals and bearings.

Enclosure Types

Duplex controllers are available in NEMA 1, 12/3/3R, 4 (painted) and 4/4X (stainless) enclosures. Enclosures protect personnel from contact with live parts and depending upon the construction, protect the control in varying degrees from physical damage and harmful atmospheres. All enclosures are supplied with corrosion resistant finishes.

Heavy Duty Starters

These Duplex controllers use the same starters described in the heavy duty starter section of this catalog.

Siemens Type ETI Circuit Breaker

The ETI circuit breaker is a device designed specifically for application in motor circuits. The ETI is a magnetic only protective device designed to provide protection against short circuit current.

The instantaneous-only type ETI circuit breaker employs adjustable magnetic trip settings to allow broader application ranges and a higher degree of motor short circuit protection.

Features

Two control transformers may be provided for low voltage control to safeguard personnel from high voltage. One transformer is required for each starter to provide independent control circuits.

A Hand-Off-Auto selector switch for each starter may be mounted in the enclosure door or furnished separately for remote control. Test push buttons or pilot lights may also be installed on the enclosure.

Solid-state or Ambient Compensated Bimetal Overload Relays are supplied as standard.

Heavy Duty Disconnect Switches

The disconnect switch that goes the distance in durability, performance and reliability has the following advantages:

- Visible blades for the highest level of safety
- Double break switching action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- More rugged positive action switch
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts
- Higher horsepower rating for design E high efficiency motors
- UL listed for IlSCO, Burndy and T&B crimp type lugs
- The 200A switch accepts up to 300 MCM versus 250 MCM wire size

Its rugged construction - with a high fault withstand rating of 100kA at 600 VAC when fused with class R rated fuses - meets the most stringent industry standards set forth by the automotive, petro-chemical, and pulp and paper industries. UL recognized and CSA certified, our disconnect switches are available either non-fusible or fusible with class R and class J fuse clips.

# Non-Combination, Class 83

## Selection

Ordering Information	Coil Table	
<ul style="list-style-type: none"> <li>▶ Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator.</li> <li>▶ To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers.</li> <li>▶ To change the coil voltage for non-alternator controllers with a solid-state OLR, change the 9th character in the catalog number with a letter shown in the coil table. To change the coil voltage for non-alternator controllers with a bimetal OLR, change the 8th character in the catalog number with a letter shown in the coil table.</li> <li>▶ Heater elements for bimetal overloads see page 9/124 (6-Required).</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/168.</li> </ul>	<p>60Hz Voltage</p> <p>24<sup>Ⓜ</sup> 120 200–208<sup>Ⓜ</sup> 220–240<sup>Ⓜ</sup> 277<sup>Ⓜ</sup> 440–480<sup>Ⓜ</sup> 550–600<sup>Ⓜ</sup></p>	<p>Letter</p> <p>J F D G L H E</p>
<ul style="list-style-type: none"> <li>▶ Wiring Diagrams see page 9/185.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>		

### Non-Combination (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight, Dust-tight		NEMA 12 NEMA 3/3R <sup>Ⓜ</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1/2	1/2	0	—	0.25–1	A	83CUA92BF		83CUA92WF		83CUA92EF		83CUA920F	
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	83CUB92BF		83CUB92WF		83CUB92EF		83CUB920F	
2	2	5	5	0	—	3–12	A1	83CUC92BF		83CUC92WF		83CUC92EF		83CUC920F	
3	3	—	—	0	—	5.5–22	A1	83CUD92BF		83CUD92WF		83CUD92EF		83CUD920F	
1/2	1/2	1/2	1/2	1	—	0.25–1	A	83DUA92BF		83DUA92WF		83DUA92EF		83DUA920F	
1/2	3/4	1 1/2	2	1	—	0.75–3.4	A	83DUB92BF		83DUB92WF		83DUB92EF		83DUB920F	
2	2	5	5	1	—	3–12	A1	83DUC92BF		83DUC92WF		83DUC92EF		83DUC920F	
3	3	10	10	1	—	5.5–22	A1	83DUD92BF		83DUD92WF		83DUD92EF		83DUD920F	
7 1/2	7 1/2	—	—	1	—	10–40	A1	83DUE92BF		83DUE92WF		83DUE92EF		83DUE920F	
10	10	15	15	—	1 1/4	10–40	A1	83EUE92BF		83EUE92WF		83EUE92EF		83EUE920F	
10	15	25	25	2	—	13–52	B	83FUF92BF		83FUF92WF		83FUF92EF		83FUF920F	
15	20	30	30	—	2 1/4	25–100	B	83GUG92BF		83GUG92WF		83GUG92EF		83GUG920F	
25	30	50	50	3	—	25–100	B	83HUG92BF		83HUG92WF		83HUG92EF		83HUG920F	
30	40	75	75	—	3 1/4	50–200	B	83IUH92BF		83IUH92WF		83IUH92EF		83IUH920F	
40	50	100	100	4	—	50–200	B	83JUH92BF		83JUH92WF		83JUH92EF		83JUH920F	

### Non-Combination (with Ambient Compensated Bimetal Overload)

Max Hp				NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R <sup>Ⓜ</sup> Industrial Use Weatherproof	
						Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	83CP92BF81		83CP92WF81		83CP92EF81		83CP920F81	
7 1/2	7 1/2	10	10	1	—	83DP92BF81		83DP92WF81		83DP92EF81		83DP920F81	
10	10	15	15	—	1 1/4	83EP92BF81		83EP92WF81		83EP92EF81		83EP920F81	
10	15	25	25	2	—	83FP92BF81		83FP92WF81		83FP92EF81		83FP920F81	
15	20	30	30	—	2 1/2	83GP92BF81		83GP92WF81		83GP92EF81		83GP920F81	
25	30	50	50	3	—	83HP92BF81		83HP92WF81		83HP92EF81		83HP920F81	
30	40	75	75	—	3 1/2	83IP92BF81		83IP92WF81		83IP92EF81		83IP920F81	
40	50	100	100	4	—	83JP92BF81		83JP92WF81		83JP92EF81		83JP920F81	

**Note:** Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓜ NEMA 12 is field convertible to NEMA 3/3R. For conduit hubs and conversion instructions, see page 9/110.  
 Ⓜ Not available on standard alternator style ('92' in the catalog number).

Ⓜ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

# Combination Disconnect (Fusible & Non-Fusible), Class 84

## Selection

Ordering Information	Coil Table																
<ul style="list-style-type: none"> <li>▶ Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator.</li> <li>▶ To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers.</li> <li>▶ To change the coil voltage for non-alternator controllers with a solid-state OLR, change the 10th character in the catalog number with a letter shown in the coil table. To change the coil voltage for non-alternator controllers with a bimetal OLR, change the 9th character in the catalog number with a letter shown in the coil table.</li> <li>▶ Heater elements for bimetal overloads see page 9/124 (6-Required).</li> <li>▶ For factory installed fusible disconnect, see page 9/120.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> </ul>	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr> <td>24<sup>Ⓢ</sup></td> <td>J</td> </tr> <tr> <td>120</td> <td>F</td> </tr> <tr> <td>200-208<sup>Ⓢ</sup></td> <td>D</td> </tr> <tr> <td>220-240<sup>Ⓢ</sup></td> <td>G</td> </tr> <tr> <td>277<sup>Ⓢ</sup></td> <td>L</td> </tr> <tr> <td>440-480<sup>Ⓢ</sup></td> <td>H</td> </tr> <tr> <td>550-600<sup>Ⓢ</sup></td> <td>E</td> </tr> </tbody> </table>	60Hz Voltage	Letter	24 <sup>Ⓢ</sup>	J	120	F	200-208 <sup>Ⓢ</sup>	D	220-240 <sup>Ⓢ</sup>	G	277 <sup>Ⓢ</sup>	L	440-480 <sup>Ⓢ</sup>	H	550-600 <sup>Ⓢ</sup>	E
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<ul style="list-style-type: none"> <li>▶ Dimensions see page 9/168.</li> <li>▶ Wiring Diagrams see page 9/185.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>																	

### Two Disconnect Switches with Solid-State Overload

Max Hp				NEMA Size	Half Size	Overload Amp Range	Frame Size	Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts						NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4 Painted Watertight, Dust-tight	NEMA 12 NEMA 3/3R <sup>Ⓢ</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)				
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1/2	1/2	0	—	0.25-1	A	30	84CUA92BDF		84CUA92WDF		84CUA92EDF		84CUA920DF	
1/2	1/2	1 1/2	2	0	—	0.75-3.4	A	30	84CUB92BDF		84CUB92WDF		84CUB92EDF		84CUB920DF	
2	2	5	5	0	—	3-12	A1	30	84CUC92BDF		84CUC92WDF		84CUC92EDF		84CUC920DF	
3	3	—	—	0	—	5.5-22	A1	30	84CUD92BDF		84CUD92WDF		84CUD92EDF		84CUD920DF	
1/2	1/2	1/2	1/2	1	—	0.25-1	A	30	84DUA92BDF		84DUA92WDF		84DUA92EDF		84DUA920DF	
1/2	1/2	1 1/2	2	1	—	0.75-3.4	A	30	84DUB92BDF		84DUB92WDF		84DUB92EDF		84DUB920DF	
2	2	5	5	1	—	3-12	A1	30	84DUC92BDF		84DUC92WDF		84DUC92EDF		84DUC920DF	
3	3	10	10	1	—	5.5-22	A1	30	84DUD92BDF		84DUD92WDF		84DUD92EDF		84DUD920DF	
7 1/2	7 1/2	—	—	1	—	10-40	A1	30	84DUE92BDF		84DUE92WDF		84DUE92EDF		84DUE920DF	
10	10	15	15	—	1 1/2	10-40	A1	60	84EUE92BDF		84EUE92WDF		84EUE92EDF		84EUE920DF	
10	15	25	25	2	—	13-52	B	60	84FUF92BDF		84FUF92WDF		84FUF92EDF		84FUF920DF	
15	20	30	30	—	2 1/2	25-100	B	100	84GUG92BDF		84GUG92WDF		84GUG92EDF		84GUG920DF	
20	25	50	50	3	—	25-100	B	100	84HUG92BDF		84HUG92WDF		84HUG92EDF		84HUG920DF	
30	40	75	75	—	3 1/2	50-200	B	200	84IUH92BDF		84IUH92WDF		84IUH92EDF		84IUH920DF	
40	50	100	100	4	—	50-200	B	200	84JUH92BDF		84JUH92WDF		84JUH92EDF		84JUH920DF	

### Two Disconnect Switches with Ambient Compensated Bimetal Overload

Max Hp				NEMA Size	Half Size	Disc. Amp Range	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 4 Painted Watertight Dust-tight	NEMA 12/3R <sup>Ⓢ</sup> Industrial Use Weatherproof						
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30		30	84CP92BDF81		84CP92WDF81		84CP92EDF81		84CP920DF81	
7 1/2	7 1/2	10	10	1	—	30		30	84DP92BDF81		84DP92WDF81		84DP92EDF81		84DP920DF81	
10	10	15	15	—	1 3/4	60		60	84EP92BDF81		84EP92WDF81		84EP92EDF81		84EP920DF81	
10	15	25	25	2	—	60		60	84FP92BDF81		84FP92WDF81		84FP92EDF81		84FP920DF81	
15	20	30	30	—	2 1/2	100		100	84GP92BDF81		84GP92WDF81		84GP92EDF81		84GP920DF81	
20	25	50	50	3	—	100		100	84HP92BDF81		84HP92WDF81		84HP92EDF81		84HP920DF81	
30	40	75	75	—	3 1/2	200		200	84IP92BDF81		84IP92WDF81		84IP92EDF81		84IP920DF81	
40	50	100	100	4	—	200		200	84JP92BDF81		84JP92WDF81		84JP92EDF81		84JP920DF81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓢ NEMA 12 is field convertible to NEMA 3/3R. For conduit hubs and conversion instructions, see page 9/110.  
 Ⓢ Not available on standard alternator style ('92' in the catalog number).

Ⓢ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

# Combination Circuit Breaker, Class 84

## Selection

Ordering Information	Coil Table																
<ul style="list-style-type: none"> <li>▶ Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator.</li> <li>▶ To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers.</li> <li>▶ To change the coil voltage for non-alternator controllers, change the 10th character in the catalog number with a letter shown in the coil table.</li> <li>▶ Heater elements for bimetal overloads see page 9/124 (6-Required).</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> </ul>	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24<sup>Ⓢ</sup></td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>200-208<sup>Ⓢ</sup></td><td>D</td></tr> <tr><td>220-240<sup>Ⓢ</sup></td><td>G</td></tr> <tr><td>277<sup>Ⓢ</sup></td><td>L</td></tr> <tr><td>440-480<sup>Ⓢ</sup></td><td>H</td></tr> <tr><td>550-600<sup>Ⓢ</sup></td><td>E</td></tr> </tbody> </table>	60Hz Voltage	Letter	24 <sup>Ⓢ</sup>	J	120	F	200-208 <sup>Ⓢ</sup>	D	220-240 <sup>Ⓢ</sup>	G	277 <sup>Ⓢ</sup>	L	440-480 <sup>Ⓢ</sup>	H	550-600 <sup>Ⓢ</sup>	E
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<ul style="list-style-type: none"> <li>▶ Dimensions see page 9/168.</li> <li>▶ Wiring Diagrams see page 9/185.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>																	

### 2 Motor Circuit Protectors (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Motor Circuit Interrupter ETI	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts						NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel,		NEMA 4 Painted Watertight, Dust-tight		NEMA 12 NEMA 3/3R <sup>Ⓢ</sup> Industrial Use, Weatherproof (Field Convertible to 3/3R)	
Catalog Number	List Price \$	Catalog Number	List Price \$						Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
1/2	1/2	1/2	1/2	0	—	0.25-1	A	3	84CUA92BMF	84CUA92WMF	84CUA92EMF	84CUA92OMF				
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	3	84CUB92BMF	84CUB92WMF	84CUB92EMF	84CUB92OMF				
2	2	5	5	0	—	3-12	A1	10	84CUC92BMF	84CUC92WMF	84CUC92EMF	84CUC92OMF				
3	3	—	—	0	—	5.5-22	A1	25	84CUD92BMF	84CUD92WMF	84CUD92EMF	84CUD92OMF				
1/2	3/4	1 1/2	2	1	—	0.25-1	A	3	84DUA92BMF	84DUA92WMF	84DUA92EMF	84DUA92OMF				
1/2	3/4	1 1/2	2	1	—	0.75-3.4	A	3	84DUB92BMF	84DUB92WMF	84DUB92EMF	84DUB92OMF				
2	2	5	5	1	—	3-12	A1	10	84DUC92BMF	84DUC92WMF	84DUC92EMF	84DUC92OMF				
3	3	10	10	1	—	5.5-22	A1	25	84DUD92BMF	84DUD92WMF	84DUD92EMF	84DUD92OMF				
7 1/2	7 1/2	—	—	1	—	10-40	A1	30	84DUE92BMF	84DUE92WMF	84DUE92EMF	84DUE92OMF				
—	—	15	15	—	1 1/2	10-40	A1	40	84EUE92BMF	84EUE92WMF	84EUE92EMF	84EUE92OMF				
10	15	25	25	2	—	13-52	B	50	84FUF92BMF	84FUF92WMF	84FUF92EMF	84FUF92OMF				
15	20	30	30	—	2 1/2	25-100	B	100	84GUG92BMF	84GUG92WMF	84GUG92EMF	84GUG92OMF				
20	25	50	50	3	—	25-100	B	100	84HUG92BMF	84HUG92WMF	84HUG92EMF	84HUG92OMF				
30	40	75	75	—	3 1/2	50-200	B	125	84IUH92BMF	84IUH92WMF	84IUH92EMF	84IUH92OMF				
40	50	100	100	4	—	50-200	B	150	84JUH92BMF	84JUH92WMF	84JUH92EMF	84JUH92OMF				

### 2 Motor Circuit Protectors (with Ambient Compensated Bimetal Overload)

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Motor Circuit Interrupter ETI	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts						NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R <sup>Ⓢ</sup> Industrial Use Weatherproof	
Catalog Number	List Price \$	Catalog Number	List Price \$						Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
1/2	3/4	1 1/2	2	0	—	3		3	84CPB92BMF81	84CPB92WMF81	84CPB92EMF81	84CPB92OMF81				
2	2	5	5	0	—	10		10	84CPD92BMF81	84CPD92WMF81	84CPD92EMF81	84CPD92OMF81				
3	3	—	—	0	—	25		25	84CPE92BMF81	84CPE92WMF81	84CPE92EMF81	84CPE92OMF81				
1/2	3/4	1 1/2	2	1	—	3		3	84DPB92BMF81	84DPB92WMF81	84DPB92EMF81	84DPB92OMF81				
2	2	5	5	1	—	10		10	84DPD92BMF81	84DPD92WMF81	84DPD92EMF81	84DPD92OMF81				
3	3	10	10	1	—	25		25	84DPE92BMF81	84DPE92WMF81	84DPE92EMF81	84DPE92OMF81				
7 1/2	7 1/2	—	—	1	—	30		30	84DPF92BMF81	84DPF92WMF81	84DPF92EMF81	84DPF92OMF81				
—	—	15	15	—	1 1/2	40		40	84EPF92BMF81	84EPF92WMF81	84EPF92EMF81	84EPF92OMF81				
10	10	—	—	—	1 1/2	50		50	84EPG92BMF81	84EPG92WMF81	84EPG92EMF81	84EPG92OMF81				
—	—	15	20	2	—	40		40	84FPF92BMF81	84FPF92WMF81	84FPF92EMF81	84FPF92OMF81				
10	15	25	25	2	—	50		50	84FPH92BMF81	84FPH92WMF81	84FPH92EMF81	84FPH92OMF81				
—	—	30	30	—	2 1/2	50		50	84GPH92BMF81	84GPH92WMF81	84GPH92EMF81	84GPH92OMF81				
15	20	—	—	—	2 1/2	100		100	84GPJ92BMF81	84GPJ92WMF81	84GPJ92EMF81	84GPJ92OMF81				
—	—	30	40	3	—	50		50	84HPJ92BMF81	84HPJ92WMF81	84HPJ92EMF81	84HPJ92OMF81				
20	25	50	50	3	—	100		100	84HPK92BMF81	84HPK92WMF81	84HPK92EMF81	84HPK92OMF81				
30	40	75	75	—	3 1/2	125		125	84IPL92BMF81	84IPL92WMF81	84IPL92EMF81	84IPL92OMF81				
40	50	100	100	4	—	150		150	84JPM92BMF81	84JPM92WMF81	84JPM92EMF81	84JPM92OMF81				

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓢ NEMA 12 is field convertible to NEMA 3/3R. For conduit hubs and conversion instructions, see page 9/110.

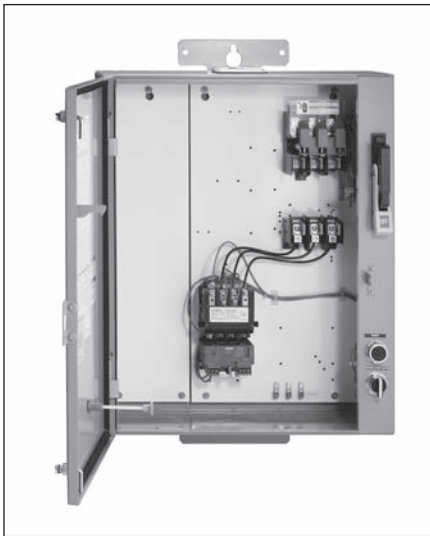
Ⓢ Not available on standard alternator style ('92' in the catalog number).

Ⓢ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.



## Features

- Fully Gasketed NEMA 3R Rainproof Enclosures
- 100,000 Amp Interrupting Capacity with Class R Fuses
- Heavy Duty NEMA Starters
- Solid State or Ambient Compensated Bimetal Overload Relays
- Heavy Duty Disconnect Handle
- Available in Reduced Voltage Versions
- Bold Pilot Legend on Front
- Generous Accessory Space
- Copper Grounding Lug For Three #6 Wires
- UL Listed for Outdoor Use and Service Equipment File #E185287



## Application

Heavy duty pump control panels are designed to withstand the most demanding environments. Typical applications include irrigation, agriculture, petrochemical, wastewater treatment and wherever motor control is challenged by harsh elements.

Rugged pump control panels utilized cold forming "tox" process. They are more rainproof, sleet and ice resistant than in the past.

Installation is easy. Panels are factory wired to provide flexible control and protect against short circuits and overloads. Ample space is provided for field modifications and installation of accessories.

The pump control panels feature a full sized removable auxiliary panel for the mounting of accessories. The fusible version features fuse clips for full sized RK5 or compact class J fuses and accessory mounting space for the most commonly used accessories.

Class 87 pump panels become jockey pump panels with the addition of a pressure switch. The jockey pump's primary function is to maintain water pressure at a preset level and thus compensate for possible shortage of water in the pumping system. When the water pressure drops below the preset level, the pressure switch energizes the starter which in turn activates the jockey pump. The water pressure is then brought back up to the desired level. This insures the maintenance of proper water pressure at all times.

## Features

Specified by Fortune 500 companies, Siemens NEMA starters offer prolonged service under severe duty conditions. NEMA rated, these starters utilize large silver cadmium oxide contacts and wide copper heat sinks to ensure rapid heat dissipation and maximum electrical life.

### ESP200 solid state overload relay

Refer to the section on Class 48 overload relays for features and benefits. Pump panels are factory set at trip Class 10.

### The ambient compensated bimetal overload relays

are designed to parallel thermal characteristics of typical pump motors. They prevent nuisance trips that may result from operation of the control in a higher ambient temperature than that at the pump. These relays are trip-free, tamperproof and can be set to reset automatically or manually.

### HOA and Start Pushbutton

Every pump panel comes with an HOA and a start pushbutton.

### Half Size Starters

Siemens motor matched starters feature all the rugged performance characteristics of our NEMA rated starter sizes, but are fractionally sized to more closely match your exact motor rating. As a result, significant economic savings are made possible without sacrificing the reliability you expect from a heavy duty starter.

These additional starter sizes have the reserve capacity to handle occasional plugging and jogging without de-rating the device.

Siemens motor matched can save hundreds, even thousands of dollars per project.

Siemens motor matched starters comply with NEMA, UL and CSA standards.

## General

Panels are predrilled for easy repositioning of the fuse trailer block to accommodate 250 and 600 volt fuses and full sized RK or compact J fuses. Circuit breakers are also available.

### Heavy Duty Fusible Disconnect Switch

The disconnect switch has the following advantages:

- Visible blades for the highest level of safety
- Double Break Switching Action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts

### Motor Circuit Protector

The motor circuit protector provides fast, accurate fault clearing that will minimize damage to the motor and control apparatus and protect branch circuit conductors. Continuous current ratings and adjustable trip ranges meet NEC requirements for full load and locked rotor currents. The adjustable instantaneous trip point can be set precisely to assure fault protection and eliminate nuisance tripping.

### Removable Door

Enclosure door may be lifted off to make wiring easier.

### Mounting Flanges

Convenient flanges at top and bottom of the enclosure provide easy mounting. They fit pole or flat surfaces using keyhole slots.

### Quarter Turn Latches

Quarter turns are utilized to secure the door.

### Wind Catches

A wind catch is provided to prevent the door from slamming shut (or open) due to high wind conditions.

### Safety Disconnect Handle

Up to three padlocks can be used to lock the disconnect in the OFF position. Maintenance work can be performed without hazard to personnel.

### External Reset

The overload relay may be quickly reset by means of a button on the front of the enclosure.

### Bold Pilot Legend

Provides positive indication of the selector switch position for use to stop the pump motor.

### Ground Lugs

Insures proper connecting of ground wires and lightning arresters.

### UL Listed

Assures proper construction throughout control panel.

### Reduced Voltage

Available in part winding, wye delta and auto transformer types, these controls may be necessary where the power company limits the amount of current drawn from its lines, or where starting torque must be reduced.

### Fully gasketed NEMA 3/12 weather-proof enclosures are supplied with Class 88 reduced voltage starters.

**Part Winding Starters** apply starting current in timed steps to minimize voltage fluctuations.

**Auto Transformer Starters** maintain a closed circuit during transition and eliminate voltage or current surges. They draw less current than part winding starters and are well suited for starting motors over 20 Hp.

**Wye Delta starters** and motors are used in areas where the power supply is inadequate to supply full starting current without objectionable voltage drop or for applications where low starting torque is required. Centrifugal pumps and similar apparatus requiring a low starting torque are typical applications. Both ends of all three windings of the wye delta motor are brought out so that they may be accessible for reconnecting from wye to delta.

### Auxiliary Equipment

**Pilot Lights** are easily installed on the enclosure. Oil Tight and Heavy Duty, they meet NEMA A600 requirements.

**Lightning Arresters** protect the control panel from lightning induced surges.

**Undervoltage and Phase Sensing Relays** protect the pump against low voltage, voltage imbalance, loss of phase and phase reversal.

**Anti-Backspin Timers** prevent the motor from starting during motor/shaft backspin.

### The TOX Box

Siemens uses the TOX process to manufacture the enclosures for the pump panels.

Advantages of the TOX process:

- Joints are 50-70% stronger
- Since the TOX process compresses the metal at the joint, it does not leave the high stresses in the metal
- Increased corrosion resistance. The protective layer on the metal is not damaged in the process, but instead flows with the material

### Class 87 NEMA Vacuum Starter Pump Control Panels

The Siemens vacuum starter pump controllers are designed for the harshest environments. Typical environments include chemical, petrochemical, waste water treatment and mining. Contaminations present in these severe environments are detrimental to conventional air-break contacts decreasing their life expectancy and reliability. The Siemens vacuum starter pump controllers are well suited for these environments because the contacts are contained in hermetically sealed contact tubes. This prevents contamination in the atmosphere from affecting the operation of the contacts. Additionally, neither arcs nor arcing gases are produced which dramatically increases the electrical endurance of the contacts.



# Standard Pump Panel with Solid State Overload, Class 87

## Selection



### Ordering Information

- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/169.
- ▶ Wiring Diagrams see page 9/187.
- ▶ Replacement Parts see page 9/131.
- ▶ Sizes 1-4 will be supplied standard with a 240/480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table.
- ▶ Sizes 5 & 6 will be supplied standard with a 480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table.

### Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240	A <sup>ⓐ</sup>
200-208	D
220-240	G
220-240/440-480	C <sup>ⓑ</sup>
277	L
440-480	H
550-600	E

### Fusible Disconnect

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Fuse Clip Amp / Volts	Catalog Number	List Price \$
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size				
—	—	1	1	1	—	0.75-3.4 <sup>ⓐ</sup>	A	30	30A/600V	87DUB6FC	
—	—	5	5	1	—	3-12	A1	30	30A/600V	87DUC6FC	
—	—	10	10	1	—	5.5-22	A1	30	30A/600V	87DUD6FC	
—	—	10	10	1	—	5.5-22	A1	60	60A/600V	87DUD60C	
—	—	15	15	—	1½	10-40	A1	30	30A/600V	87EUE6FC	
—	—	15	15	—	1½	10-40	A1	60	60A/600V	87EUE60C	
—	—	25	25	2	—	13-52	B	60	60A/600V	87FUF6FC	
—	—	25	25	2	—	13-52	B	100	100A/600V	87FUF60C	
—	—	30	30	—	2½	25-100	B	60	60A/600V	87GUG6FC	
—	—	30	30	—	2½	25-100	B	100	100A/600V	87GUG60C	
—	—	50	50	3	—	25-100	B	100	100A/600V	87HUG6FC	
—	—	50	50	3	—	25-100	B	200	200A/600V	87HUG60C	
—	—	75	75	—	3¾	50-200	B	200	200A/600V	87IUH6FC	
—	—	100	100	4	—	50-200	B	200	200A/600V	87JUH6FC	
—	—	200	200	5	—	55-250	—	400	400A/600V	87LPU6FH	
—	—	250	—	6	—	160-630	—	600	600A/600V	87MSW6FH	
2	2	—	—	1	—	3-12	A1	30	30A/250V	87DUC6LC	
3	3	—	—	1	—	5.5-22	A1	30	30A/250V	87DUD6LC	
7½	7½	—	—	1	—	10-40	A1	30	30A/250V	87DUE6LC	
7½	7½	—	—	1	—	10-40	A1	60	60A/250V	87DUE6PC	
10	10	—	—	—	1½	10-40	A1	60	60A/250V	87EUE6LC	
10	15	—	—	2	—	13-52	B	60	60A/250V	87FUF6LC	
10	15	—	—	2	—	13-52	B	100	100A/250V	87FUF6PC	
15	20	—	—	—	2½	25-100	B	60	60A/250V	87GUG6LC	
15	20	—	—	—	2½	25-100	B	100	100A/250V	87GUG6PC	
20	30	—	—	3	—	25-100	B	100	100A/250V	87HUG6LC	
25	30	—	—	3	—	25-100	B	200	200A/250V	87HUG6PC	
30	40	—	—	—	3¾	50-200	B	200	200A/250V	87IUH6LC	
40	50	—	—	4	—	50-200	B	200	200A/250V	87JUH6LC	
75	100	—	—	5	—	55-250	—	400	400A/250V	87LPU6LG	

### Circuit Breaker

Max Hp				NEMA Size	Half Size	Overload		Motor Circuit Interrupter ETI Amps	Catalog Number	List Price \$
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size			
½	½	1	1	1	—	0.75-3.4 <sup>ⓐ</sup>	A	3	87DUB6MC	
2	2	5	5	1	—	3-12	A1	10	87DUC6MC	
3	3	10	10	1	—	5.5-22	A1	25	87DUD6MC	
7½	7½	10	—	1	—	10-40	A1	30	87DUE6MC	
—	—	15	15	—	1½	10-40	A1	40	87EUE6MC	
10	15	25	25	2	—	13-52	B	50	87FUF6MC	
15	20	30	30	—	2½	25-100	B	100	87GUG6MC	
25	30	50	50	3	—	25-100	B	100	87HUG6MC	
30	40	75	75	—	3¾	50-200	B	125	87IUH6MC	
40	50	100	100	4	—	50-200	B	150	87JUH6MC	
50	75	150	200	5	—	55-250	—	250	87LPT6MH	
75	100	200	200	5	—	55-250	—	400	87LPU6MH	
100	125	250	300	6	—	160-630	—	400	87MSW6MH	
150	200	400	400	6	—	160-630	—	600	87MSX6MH	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

ⓐ Not available on Size 5 and larger.

ⓑ For an overload amp range of 0.25-1A, change the 5th character from a 'B' to an 'A'.

ⓓ A version with coil code A is also stocked via Controls Express.

# Pump Panel with Ambient Compensated Bimetal Overload, Class 87

## Selection

Ordering Information	Coil Table	
<ul style="list-style-type: none"> <li>▶ Heater elements for bimetal overloads see page 9/124 (3-Required).</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/169.</li> <li>▶ Wiring Diagrams see page 9/187.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ Sizes 1-4 will be supplied standard with a 230/480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table.</li> <li>▶ Sizes 5 &amp; 6 will be supplied standard with a 480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table.</li> </ul>	60Hz Voltage	Letter
	24	J
	120	F
	110-120/220-240	A <sup>ⓐ</sup>
	200-208	D
	220-240	G
	220-240/440-480	C <sup>ⓐ</sup>
	277	L
	440-480	H
	550-600	E

### Fusible Disconnect

Max HP				NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Amps/Volts	Catalog Number	List Price \$
200V	230V	460V	575V						
—	—	10	10	1	—	30	30A/600V	87DAE6FC	
—	—	10	10	1	—	60	60A/600V	87DAE60C	
—	—	15	15	—	1¼	30	30A/600V	87EAF6FC	
—	—	15	15	—	1¼	60	60A/600V	87EAF60C	
—	—	25	25	2	—	60	60A/600V	87FAJ6FC	
—	—	25	25	2	—	100	100A/600V	87FAJ60C	
—	—	30	30	—	2½	60	60A/600V	87GAK6FC	
—	—	30	30	—	2½	100	100A/600V	87GAK60C	
—	—	50	50	3	—	100	100A/600V	87HAN6FC	
—	—	50	50	3	—	200	200A/600V	87HAN60C	
—	—	75	75	—	3½	200	200A/600V	87IAP6FC	
—	—	100	100	4	—	200	200A/600V	87JAR6FC	
7½	7½	—	—	1	—	30	30A/250V	87DAE6LC	
7½	7½	—	—	1	—	60	60A/250V	87DAE6PC	
10	10	—	—	—	1¼	60	60A/250V	87EAG6LC	
10	15	—	—	2	—	60	60A/250V	87FAJ6LC	
10	15	—	—	2	—	100	100A/250V	87FAJ6PC	
15	20	—	—	—	2½	100	100A/250V	87GAL6LC	
25	30	—	—	3	—	100	100A/250V	87HAN6LC	
25	30	—	—	3	—	200	200A/250V	87HAN6PC	
30	40	—	—	—	3½	200	200A/250V	87IAP6LC	
40	50	—	—	4	—	200	200A/250V	87JAR6LC	

### Circuit Breaker

Max HP				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Catalog Number	List Price \$
200V	230V	460V	575V					
½	½	1	1	1	—	3	87DAA6MC	
1	1	3	3	1	—	10	87DAB6MC	
3	3	7½	7½	1	—	25	87DAD6MC	
7½	7½	10	10	1	—	30	87DAE6MC	
7½	7½	15	15	—	1¼	40	87EAF6MC	
10	10	—	—	—	1¼	50	87EAG6MC	
—	—	15	20	2	—	40	87FAH6MC	
10	15	25	25	2	—	50	87FAJ6MC	
—	—	30	30	—	2½	50	87GAK6MC	
15	20	—	—	—	2½	100	87GAL6MC	
25	30	50	50	3	—	100	87HAN6MC	
30	40	75	75	—	3½	125	87IAP6MC	
40	50	100	100	4	—	150	87JAR6MC	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

ⓐ Not available on Size 5 or above.

Selection

Ordering Information	Coil Table	
<ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/169.</li> <li>▶ Wiring Diagrams see page 9/187.</li> <li>▶ Replacement Parts see page 9/131.</li> <li>▶ Replace the (*) in the catalog number with a letter from the coil table.</li> <li>▶ Refer to page 9/47 for information on the 958L OLR</li> </ul>	60Hz Voltage	Letter
	24	J
	120	F
	200-208	D
	220-240	G
	277	L
	440-480 550-600	H E

**Vacuum Break Pump Control Panels (Vacuum Contactor with Trip Class 10 Solid-State Overload Relay)**

Max Hp		NEMA Size	Overload Relay Range	Fusible Disconnect			Circuit Breaker		
480 Volts	575 Volts			Fuse Clip Amps/Volts	Catalog Number	List Price \$	MCI Amps	Catalog Number	List Price \$
100	100	4	55-250A	200A/600V	87JCM4F*		250A	87JCM4M*	
200	200	5	55-250A	400A/600V	87LCU4F*		400A	87LCT4M*	
250	300	6	160-630A	—	—		400A	87MCW4M*	
400	400	6	160-630A	—	—		600A	87MCX4M*	

**Oil Well Pump Control Panels (Open Air Contactor with 958L Solid-State Overload Relay)**

Max Hp		NEMA Size	Overload Relay Range	Fusible Disconnect			Circuit Breaker		
480 Volts	575 Volts			Fuse Clip Amps/Volts	Catalog Number	List Price \$	MCI Amps	Catalog Number	List Price \$
25	25	2	13-52	60A/600V	87FPI6F*		50	87FPI6M*	
50	50	3	25-100	100A/600V	87HPK6F*		100	87HPK6M*	
100	100	4	50-200	200A/600V	87JPM6F*		150	87JPM6M*	

**Note:** Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

# Auto Transformer & Part winding (2 Step) with Solid State Overload, Class 88

## Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/169.</li> <li>▶ Wiring Diagrams see pages 9/180 and 9/181.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p>The coil voltage on the contactors will be the motor voltage. A CPT will be supplied to provide the control voltage. The control voltage will be 120V.</p> <p>To change the control voltage to customer supplied (no CPT included), change the 9th character to the following:                      for 24V , use "J"                      for 120V, use "F"</p>

### Auto Transformer Type

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fusible Disconnect			Circuit Breaker		
		Amp Range	Frame Size			Fuse Clip Size Amps/Volts	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
230	15	13-52	B	2	—	60A/250V	88FUFT2FG		50	88FUFT2MG	
	20	25-100	B	—	2½	100A/250V	88GUGT2FG		100	88GUGT2MG	
	30	25-100	B	3	—	100A/250V	88HUGT2FG		100	88HUGT2MG	
	40	50-200	B	—	3½	200A/250V	88IUHT2FG		125	88IUHT2MG	
	50	50-200	B	4	—	200A/250V	88JUHT2FG		150	88JUHT2MG	
	75	55-250	—	5	—	—	—		250	88LPST2MG	
	100	55-250	—	5	—	400A/250V	88LPUT2FG		400	88LPUT2MG	
200	160-630	—	6	—	—	—		600	88MSXT2MG		
460	25	13-52	B	2	—	60A/600V	88FUFT4FH		50	88FUFT4MH	
	30	25-100	B	—	2½	60A/600V	88GUGT4FH		50	88GUGT4MH	
	50	25-100	B	3	—	100A/600V	88HUGT4FH		100	88HUGT4MH	
	75	50-200	B	—	3½	200A/600V	88IUHT4FH		125	88IUHT4MH	
	100	50-200	B	4	—	200A/600V	88JUHT4FH		150	88JUHT4MH	
	150	55-250	—	5	—	—	—		250	88LPST4MH	
	200	55-250	—	5	—	400A/600V	88LPST4FH		400	88LPST4MH	
	250	160-630	—	6	—	—	—		400	88MSVT4MH	
400	160-630	—	6	—	600A/600V	88MSXT4FH		600	88MSXT4MH		

### Part Winding 2 Step

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fusible Disconnect			Circuit Breaker		
		Amp Range	Frame Size			Fuse Clip Size Amps/Volts	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
230	20	10-40	A1	—	1½	100A/250V	88EUEP2FG		100	88EUEP2MG	
	25	13-52	B	2	—	100A/250V	88FUF2FG		100	88FUF2MG	
	40	25-100	B	—	2½	200A/250V	88GUGP2FG		100	88GUGP2MG	
	50	25-100	B	3	—	200A/250V	88HUGP2FG		150	88HUGP2MG	
	60	50-200	B	—	3½	200A/250V	88IUHP2FG		250	88IUHP2MG	
	75	50-200	B	4	—	400A/250V	88JUHP2FG		250	88JUHP2MG	
	125	55-250	—	5	—	—	—		400	88LPSP2MG	
150	55-250	—	5	—	600A/250V	88LPUP2FG		600	88LPUP2MG		
460	30	10-40	A1	—	1½	100A/600V	88EUEP4FH		100	88EUEP4MH	
	40	13-52	B	2	—	100A/600V	88FUF4FH		100	88FUF4MH	
	60	25-100	B	—	2½	200A/600V	88GUGP4FH		100	88GUGP4MH	
	75	25-100	B	3	—	200A/600V	88HUGP4FH		150	88HUGP4MH	
	100	50-200	B	—	3½	200A/600V	88IUHP4FH		250	88IUHP4MH	
	150	50-200	B	4	—	400A/600V	88JUHP4FH		250	88JUHP4MH	
	250	55-250	—	5	—	—	—		400	88LPSP4MH	
350	55-250	—	5	—	600A/600V	88LPUP4FH		600	88LPUP4MH		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

# Wye Delta with Solid State Overload, Class 88

## Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/169.</li> <li>▶ Wiring Diagrams see pages 9/182 and 9/183.</li> <li>▶ Replacement Parts see page 9/131.</li> </ul>	<p>The coil voltage on the contactors will be the motor voltage. A CPT will be supplied to provide the control voltage. The control voltage will be 120V.</p> <p>To change the control voltage to customer supplied (no CPT included), change the 9th character to the following:</p> <p>for 24V , use "J"</p> <p>for 120V, use "F"</p>

## Wye Delta

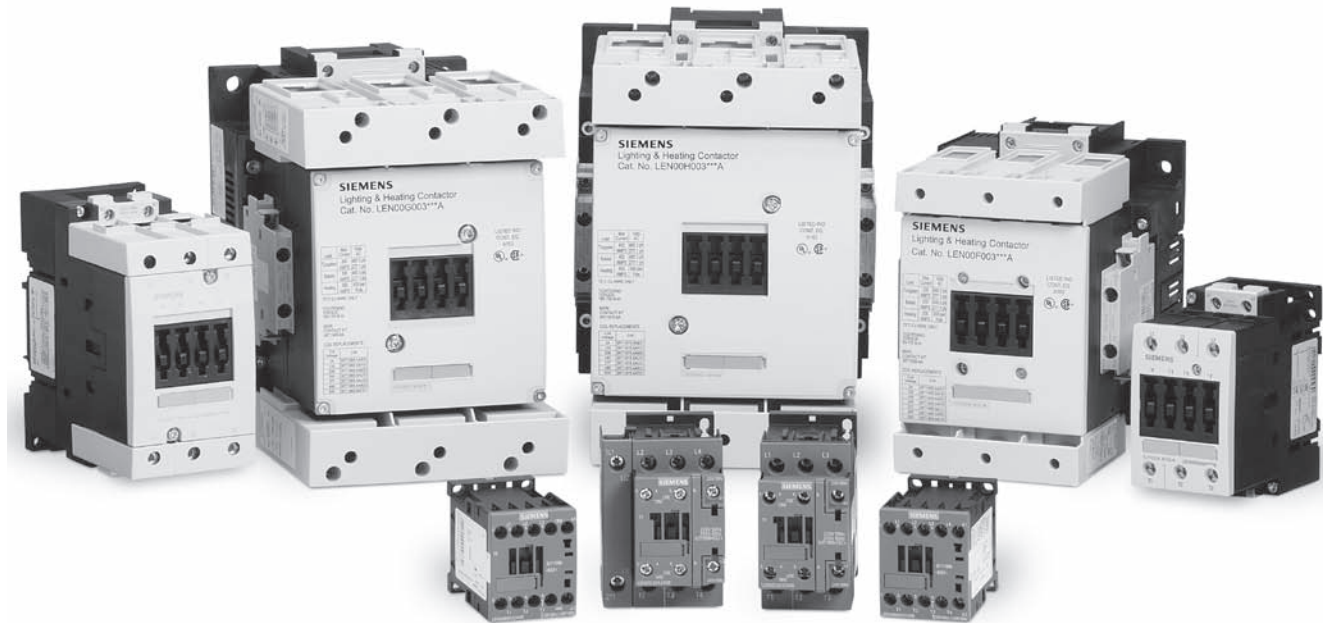
Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fuse Clip Size Amps/Volts	Motor Circuit Interrupter ETI Amps	Open Transition				Closed Transition			
		Amp Range	Frame Size					Fusible Disconnect		Circuit Breaker		Fusible Disconnect		Circuit Breaker	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
200	10	10-40	A1	1	—	60A/250V	50	88DUE06FD	Price	88DUE06MD		88DUEC6FD	Price	88DUEC6MD	
	15	10-40	A1	—	1½	100A/250V	100	88EUE06FD		88EUE06MD		88EUEC6FD		88EUEC6MD	
	20	13-52	B	2	—	100A/250V	100	88FUF06FD		88FUF06MD		88FUF06FD		88FUF06MD	
	30	25-100	B	—	2½	200A/250V	125	88GUG06FD		88GUG06MD		88GUG06FD		88GUG06MD	
	40	25-100	B	3	—	200A/250V	150	88HUG06FD		88HUG06MD		88HUG06FD		88HUG06MD	
	50	50-200	B	—	3½	200A/250V	250	88IUH06FD		88IUH06MD		88IUHC6FD		88IUHC6MD	
	60	50-200	B	4	—	400A/250V	250	88JUH06FD		88JUH06MD		88JUHC6FD		88JUHC6MD	
	75	55-250	—	5	—	400A/250V	400	88LPS06FD		88LPS06MD		88LPSC6FD		88LPSC6MD	
	150	55-250	—	5	—	600A/250V	600	88LPU06FD		88LPU06MD		88LPUC6FD		88LPUC6MD	
300	160-630	—	6	—	—	800	—		88MSX06MD		—		88MSXC6MD		
230	10	10-40	A1	1	—	60A/250V	50	88DUE02FG		88DUE02MG		88DUEC2FG		88DUEC2MG	
	15	10-40	A1	—	1½	60A/250V	50	88EUE02FG		88EUE02MG		88EUEC2FG		88EUEC2MG	
	25	13-52	B	2	—	100A/250V	100	88FUF02FG		88FUF02MG		88FUF02FG		88FUF02MG	
	30	25-100	B	—	2½	200A/250V	100	88GUG02FG		88GUG02MG		88GUG02FG		88GUG02MG	
	50	25-100	B	3	—	200A/250V	150	88HUG02FG		88HUG02MG		88HUG02FG		88HUG02MG	
	60	50-200	B	—	3½	200A/250V	250	88IUH02FG		88IUH02MG		88IUHC2FG		88IUHC2MG	
	75	50-200	B	4	—	400A/250V	250	88JUH02FG		88JUH02MG		88JUHC2FG		88JUHC2MG	
	100	55-250	—	5	—	400A/250V	400	88LPS02FG		88LPS02MG		88LPSC2FG		88LPSC2MG	
	150	55-250	—	5	—	600A/250V	600	88LPU02FG		88LPU02MG		88LPUC2FG		88LPUC2MG	
350	160-630	—	6	—	—	1200	—		88MSX02MG		—		88MSXC2MG		
460	15	5.5-22	A1	1	—	30A/600V	30	88DUD04FH		88DUD04MH		88DUD04FH		88DUD04MH	
	30	10-40	A1	—	1½	60A/600V	50	88EUE04FH		88EUE04MH		88EUEC4FH		88EUEC4MH	
	40	13-52	B	2	—	100A/600V	100	88FUF04FH		88FUF04MH		88FUF04FH		88FUF04MH	
	60	25-100	B	—	2½	200A/600V	100	88GUG04FH		88GUG04MH		88GUG04FH		88GUG04MH	
	75	25-100	B	3	—	200A/600V	125	88HUG04FH		88HUG04MH		88HUG04FH		88HUG04MH	
	100	50-200	B	—	3½	200A/600V	150	88IUH04FH		88IUH04MH		88IUHC4FH		88IUHC4MH	
	150	50-200	B	4	—	400A/600V	250	88JUH04FH		88JUH04MH		88JUHC4FH		88JUHC4MH	
	200	55-250	—	5	—	400A/600V	400	88LPS04FH		88LPS04MH		88LPSC4FH		88LPSC4MH	
	300	55-250	—	5	—	600A/600V	600	88LPU04FH		88LPU04MH		88LPUC4FH		88LPUC4MH	
700	160-630	—	6	—	—	1200	—		88MSX04MH		—		88MSXC4MH		
575	15	5.5-22	A1	1	—	30A/600V	30	88DUD05FE		88DUD05ME		88DUD05FE		88DUD05ME	
	30	10-40	A1	—	1½	60A/600V	50	88EUE05FE		88EUE05ME		88EUEC5FE		88EUEC5ME	
	40	13-52	B	2	—	100A/600V	50	88FUF05FE		88FUF05ME		88FUF05FE		88FUF05ME	
	60	25-100	B	—	2½	200A/600V	100	88GUG05FE		88GUG05ME		88GUG05FE		88GUG05ME	
	75	25-100	B	3	—	200A/600V	125	88HUG05FE		88HUG05ME		88HUG05FE		88HUG05ME	
	100	50-200	B	—	3½	200A/600V	150	88IUH05FE		88IUH05ME		88IUHC5FE		88IUHC5ME	
	150	50-200	B	4	—	400A/600V	250	88JUH05FE		88JUH05ME		88JUHC5FE		88JUHC5ME	
	200	55-250	—	5	—	400A/600V	400	88LPS05FE		88LPS05ME		88LPSC5FE		88LPSC5ME	
	300	55-250	—	5	—	600A/600V	400	88LPU05FE		88LPU05ME		88LPUC5FE		88LPUC5ME	
700	160-630	—	6	—	—	1200	—		88MSX05ME		—		88MSXC5ME		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

## Electrically Held Lighting Contactors, Class LE

## Features

Simplicity and compact lightweight design makes Class LE lighting contactors an attractive solution to your budgeting challenges.

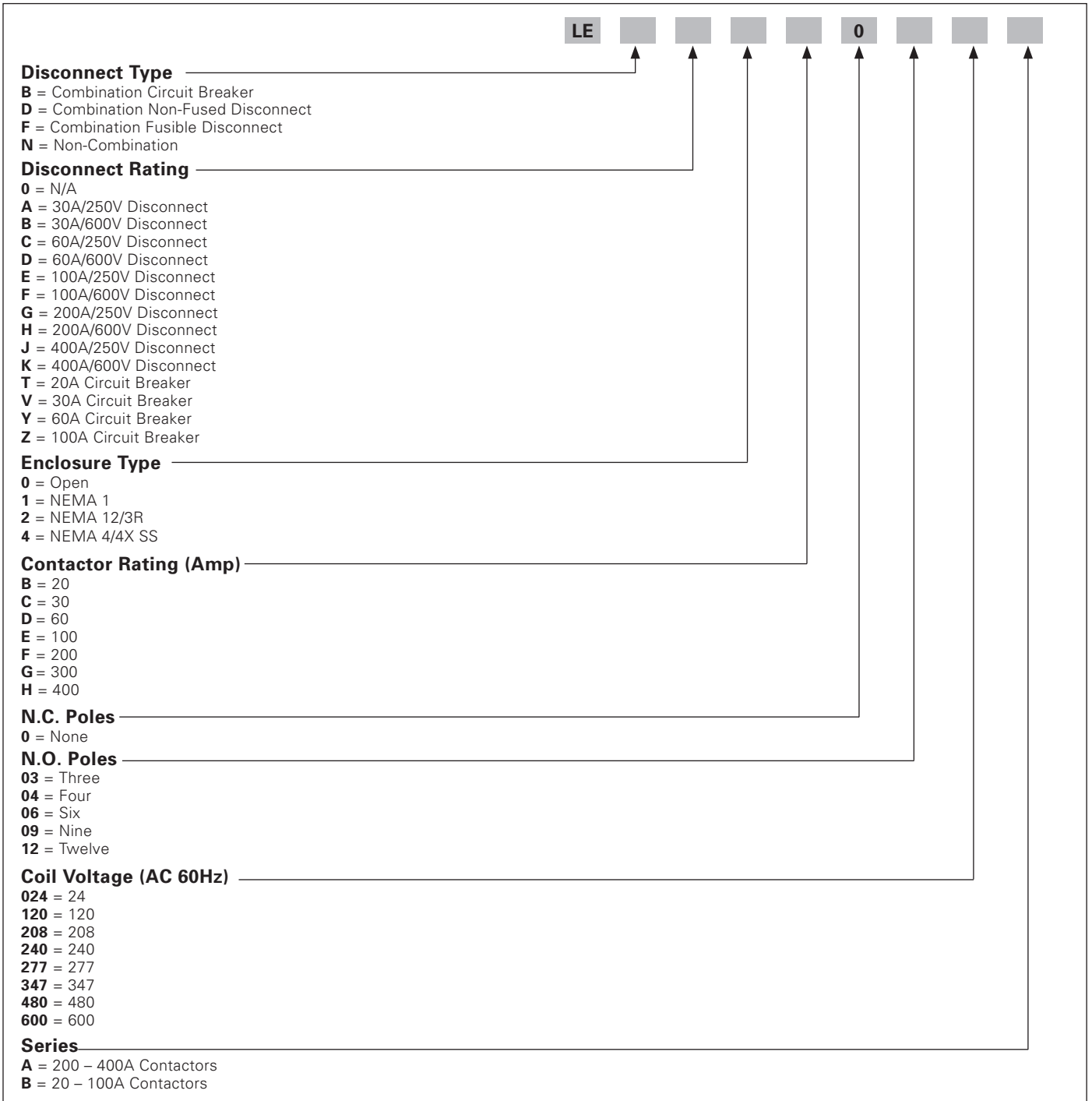


- Used in applications where it is not critical that contacts remain closed if control power is lost
- Rated for tungsten lighting (incandescent filament), ballast lighting (fluorescent, HID, metal halide, mercury vapor, quartz halogen and sodium-lamp), resistive and general use loads
- Contacts are rated 20 - 400 amps at 600 volts
- 3 and 4 pole (up to 12 pole for 30 and 60 amp contactors)
- Most contactors have built-in auxiliary contacts for convenient 3-wire control
- Wide range of coil voltages from 24 to 600 VAC 50/60Hz
- Compact design allows for smaller panels and more wiring room
- Finger and back-of-hand safe terminals
- Panel and DIN rail mounting
- Full line of enclosures including NEMA 1, 3/3R, 4, 4/4X stainless steel and 12
- Available in combination form with choice of non-fusible disconnect, fusible disconnect or circuit breaker
- Full line of factory and field modifications

# Electrically Held Lighting Contactors, Class LE

## Features


### Catalog Numbering System





# Electrically Held Lighting Contactors, Class LE

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace *** with a number from the coil table.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/149 for open, page 9/170 for enclosed.</li> <li>▶ Wiring Diagram see page 9/188.</li> <li>▶ Replacement Parts see page 9/134.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>VAC 60Hz</th> <th>***</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>024</td> </tr> <tr> <td>120</td> <td>120</td> </tr> <tr> <td>208</td> <td>208</td> </tr> <tr> <td>240</td> <td>240</td> </tr> <tr> <td>277</td> <td>277</td> </tr> <tr> <td>347 <sup>1)</sup></td> <td>347</td> </tr> <tr> <td>480</td> <td>480</td> </tr> <tr> <td>600</td> <td>600</td> </tr> </tbody> </table> <p>Replace the (***) with a number from the coil table.</p>	VAC 60Hz	***	24	024	120	120	208	208	240	240	277	277	347 <sup>1)</sup>	347	480	480	600	600
	VAC 60Hz	***																		
24	024																			
120	120																			
208	208																			
240	240																			
277	277																			
347 <sup>1)</sup>	347																			
480	480																			
600	600																			

### Non-Combination Contactor

Max. Amp Rating	Number of Poles	Normally Closed Contacts	Normally Open Contacts	Enclosure Type			
				Open	1	3/3R/12 <sup>2)</sup>	4/4X 304 S.S.
				Catalog Number			
20	3	0	3	LEN00B003***B	LEN01B003***B	LEN02B003***B	LEN04B003***B
	4	0	4	LEN00B004***B	LEN01B004***B	LEN02B004***B	LEN04B004***B
30	3	0	3	LEN00C003***B	LEN01C003***B	LEN02C003***B	LEN04C003***B
	4	0	4	LEN00C004***B	LEN01C004***B	LEN02C004***B	LEN04C004***B
	6	0	6	LEN00C006***B	LEN01C006***B	LEN02C006***B	LEN04C006***B
	9	0	9	LEN00C009***B	LEN01C009***B	LEN02C009***B	LEN04C009***B
	12	0	12	LEN00C012***B	LEN01C012***B	LEN02C012***B	LEN04C012***B
60	3	0	3	LEN00D003***B	LEN01D003***B	LEN02D003***B	LEN04D003***B
	6	0	6	LEN00D006***B	LEN01D006***B	LEN02D006***B	LEN04D006***B
	9	0	9	LEN00D009***B	LEN01D009***B	LEN02D009***B	LEN04D009***B
	12	0	12	LEN00D012***B	LEN01D012***B	LEN02D012***B	LEN04D012***B
100	3	0	3	LEN00E003***B	LEN01E003***B	LEN02E003***B	LEN04E003***B
200	3	0	3	LEN00F003***A	LEN01F003***A	LEN02F003***A	LEN04F003***A
300	3	0	3	LEN00G003***A	LEN01G003***A	LEN02G003***A	LEN04G003***A
400	3	0	3	LEN00H003***A	LEN01H003***A	LEN02H003***A	LEN04H003***A

1) Not available on 200 - 400A contactors.

2) Type 12 field convertible to type 3/3R.

## Electrically Held Lighting Contactors, Class LE

## Technical

Contactor	LEN00B003	LEN00B004	LEN00C003	LEN00C004
<b>General technical data:</b>				
Finger-safe (main circuit / control circuit)	yes / yes	yes / yes	yes / yes	yes / yes
Degree of pollution	3	3	3	3
Altitude (m)	2,000	2,000	2,000	2,000
Ambient storage temperature (°C)	-55 to 80	-55 to 80	-55 to 80	-55 to 80
Ambient operating temperature (°C)	0 to 40	0 to 40	0 to 40	0 to 40
Humidity (% non-condensing)	10 to 95	10 to 95	10 to 95	10 to 95
Shock resistance at rectangular impulse (g/ms)	6.7 / 5, 4.2 / 10	6.7 / 5, 4.2 / 10	7.5 / 5, 4.7 / 10	7.5 / 5, 4.7 / 10
Shock resistance at sine pulse (g/ms)	10.5 / 5, 6.6 / 10	10.5 / 5, 6.6 / 10	11.8 / 5, 7.4 / 10	11.8 / 5, 7.4 / 10
Rated impulse voltage resistance (kV)	no data	no data	no data	no data
Rated insulation voltage (V)	no data	no data	no data	no data
<b>Mechanical operating cycles as operating time:</b>				
of contactor	30,000,000	30,000,000	10,000,000	10,000,000
of contactor with additional aux contacts	10,000,000	10,000,000	10,000,000	10,000,000
<b>Main circuit:</b>				
Number of NC / NO main contacts	0NC / 3NO	0NC / 4NO	0NC / 3NO	0NC / 4NO
Typical power loss per conductor (W)	0.7	0.7	0.9	0.9
Off-load operating frequency (cycles per hour)	10,000	10,000	5,000	5,000
<b>Current ratings:</b>				
<b>Tungsten (poles per phase)</b>	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph	30A @277V 1p 1ph 30A @480V 2p 1ph 30A @480V 3p 3ph	30A @277V 1p 1ph 30A @480V 2p 1ph 30A @480V 3p 3ph
<b>Ballast (poles per phase)</b>	20A @347V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	20A @347V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @660V 3p 3ph	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
<b>General and resistive (poles per phase)</b>	20A @600V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	20A @600V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
<b>Coil ratings:</b>				
Nominal voltage	2)	2)	2)	2)
Inrush / sealed power (VA)	31.7 / 4.8	31.7 / 4.8	87 / 9.4	87 / 9.4
Coil voltage tolerance factor	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1
<b>Internal/standard auxiliary contact:</b>				
Number of NC / NO auxiliary contacts	0NC / 1NO	NA <sup>①</sup>	1NC / 1NO	1NC / 1NO
Rating	A600 / Q600	NA	A600 / Q600	A600 / Q600
<b>Installation/mounting/dimensions:</b>				
Mounting orientation	vertical	vertical	vertical	vertical
Type of mounting: screw / DIN rail	yes / yes	yes / yes	yes / yes	yes / yes
Height x Width x Depth (mm)	57.5 x 45 x 73	57.5 x 45 x 73	85 x 45 x 97	85 x 60 x 97
Minimum clearance to sides (mm)	0	0	0	0
Minimum clearance to earthed parts (mm)	6	6	6	6
Connection type / torque for main circuit terminals	screw / 7-10 lb in	screw / 7-10 lb in	screw / 18-22 lb in	screw / 18-22 lb in
Connection type / torque for control circuit terminals	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in
Solid and stranded conductors for main contacts (AWG)	2x(20-16), 2x(18-14), 2x(12)	2x(20-16), 2x(18-14), 2x(12)	2x(6-12), 2x(14-8)	2x(6-12), 2x(14-8)
Solid and stranded conductors for control circuit (AWG)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)
Conductor type for main and control circuits	75°C CU	75°C CU	75°C CU	75°C CU
<b>Short circuit current rating of main circuit:</b>				
Short circuit current rating	5kA @ 600V	5kA @ 600V	5kA @ 600V	5kA @ 600V
Max fuse / circuit breaker (Amp)	30 / 25	30 / 25	60 / 40	60 / 40
<b>Certificates:</b>	<b>cULus</b>	<b>cULus</b>	<b>cULus</b>	<b>cULus</b>

① Must use an external (optional) auxiliary contact.

② Refer to catalog selection tables for coil voltages.


## Electrically Held Lighting Contactors, Class LE

## Technical

LEN00D003	LEN00E003	LEN00F003	LEN00G003	LEN00H003
no / yes	no / yes	no / yes	no / yes	no / yes
3	3	3	3	3
2,000	2,000	2,000	2,000	2,000
-55 to 80	-55 to 80	-55 to 80	-55 to 80	-55 to 80
0 to 40	0 to 40	0 to 40	0 to 40	0 to 40
10 to 95	10 to 95	10 to 95	10 to 95	10 to 95
10 / 5, 5 / 10	6.8 / 5, 4 / 10	8.5 / 5, 4.2 / 10	8.5 / 5, 4.2 / 10	8.5 / 5, 4.2 / 10
15 / 5, 8 / 10	10.6 / 5, 6.2 / 10	13.4 / 5, 6.5 / 10	13.4 / 5, 6.5 / 10	13.4 / 5, 6.5 / 10
no data	no data	no data	no data	no data
no data	no data	no data	no data	no data
<b>Mechanical operating cycles as operating time:</b>				
10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
<b>Main circuit:</b>				
ONC / 3NO	ONC / 3NO	ONC / 3NO	ONC / 3NO	ONC / 3NO
2.6	7.7	13	18	35
5,000	5,000	2,000	2,000	2,000
<b>Current ratings:</b>				
60A @277V 1p 1ph 60A @480V 2p 1ph 60A @480V 3p 3ph	100A @277V 1p 1ph 100A @480V 2p 1ph 100A @480V 3p 3ph	200A @277V 1p 1ph 200A @480V 2p 1ph 200A @480V 3p 3ph	300A @277V 1p 1ph 300A @480V 2p 1ph 300A @480V 3p 3ph	400A @277V 1p 1ph 400A @480V 2p 1ph 400A @480V 3p 3ph
60A @600V 1p 1ph 60A @600V 2p 1ph 60A @600V 3p 3ph	100A @600V 1p 1ph 100A @600V 2p 1ph 100A @600V 3p 3ph	200A @600V 1p 1ph 200A @600V 2p 1ph 200A @600V 3p 3ph	300A @600V 1p 1ph 300A @600V 2p 1ph 300A @600V 3p 3ph	400A @600V 1p 1ph 400A @600V 2p 1ph 400A @600V 3p 3ph
60A @600V 1p 1ph 60A @600V 2p 1ph 60A @600V 3p 3ph	100A @600V 1p 1ph 100A @600V 2p 1ph 100A @600V 3p 3ph	200A @600V 1p 1ph 200A @600V 2p 1ph 200A @600V 3p 3ph	300A @600V 1p 1ph 300A @600V 2p 1ph 300A @600V 3p 3ph	400A @600V 1p 1ph 400A @600V 2p 1ph 400A @600V 3p 3ph
<b>Coil ratings:</b>				
2)	2)	2)	2)	2)
166 / 12.6	300 / 21	300 / 5.8	590 / 6.7	830 / 9.2
0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1
<b>Internal/standard auxiliary contact:</b>				
NA ⊕	NA ⊕	2NC / 2NO	2NC / 2NO	2NC / 2NO
NA	NA	A300 / Q300	A300 / Q300	A300 / Q300
<b>Installation/mounting/dimensions:</b>				
vertical	vertical	vertical	vertical	vertical
yes / yes	yes / yes	yes / no	yes / no	yes / no
112 x 55 x 115	146 x 70 x 139	172 x 120 x 180	210 x 145 x 202	214 x 160 x 225
6	6	10	10	10
6	6	10	10	10
screw / 27-40 lb in	screw / 36-53 lb in	screw / 90-110 lb in	screw / 180-195 lb in	screw / 180-195 lb in
screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in
2x(18-3), 1x(18-2)	2x(10-1/0), 1x(10-2/0)	2x(6-3/0)	2x(2/0-500MCM)	2x(2/0-500MCM)
2x(18-14)	2x(18-14)	2x(18-14)	2x(18-14)	2x(18-14)
75°C CU	75°C CU	75°C CU	75°C CU	75°C CU
<b>Short circuit current rating of main circuit:</b>				
5kA @ 600V	10kA @ 600V	10kA @ 600V	18kA @ 600V	18kA @ 600V
100 / 80	200 / 125	400 / 250	600 / 400	800 / 500
cULus	cULus	cULus	cULus	cULus

# Electrically Held Lighting Contactors, Class LE

## Selection

	Ordering Information	Coil Table																			
	<ul style="list-style-type: none"> <li>▶ Replace *** with a number from the coil table.</li> <li>▶ Field Modification Kits see page 9/104.</li> <li>▶ Factory Modifications see page 9/119.</li> <li>▶ Dimensions see page 9/170.</li> <li>▶ Wiring Diagram see page 9/188.</li> <li>▶ Replacement Parts see page 9/134.</li> </ul>	<table border="1"> <thead> <tr> <th>VAC 60Hz</th> <th>***</th> </tr> </thead> <tbody> <tr><td>24</td><td>024</td></tr> <tr><td>120</td><td>120</td></tr> <tr><td>208</td><td>208</td></tr> <tr><td>240</td><td>240</td></tr> <tr><td>277</td><td>277</td></tr> <tr><td>347<sup>①</sup></td><td>347</td></tr> <tr><td>480</td><td>480</td></tr> <tr><td>600</td><td>600</td></tr> </tbody> </table>	VAC 60Hz	***	24	024	120	120	208	208	240	240	277	277	347 <sup>①</sup>	347	480	480	600	600	Replace the (***) with a number from the coil table.
VAC 60Hz	***																				
24	024																				
120	120																				
208	208																				
240	240																				
277	277																				
347 <sup>①</sup>	347																				
480	480																				
600	600																				

### Combination Contactor

Disconnect Type	Max. Amp Rating	Number of NO Poles	Disc. Amp Rating	Disc Amp / Fuse Clip Rating	Circuit Breaker Rating	Enclosure Type		
						1	3/3R/12 <sup>②</sup> , 4 <sup>③</sup>	4/4X 304 S.S.
						Catalog Number		
Non-Fusible	20	3	30A	—	—	LEDB1B003***B	LEDB2B003***B	LEDB4B003***B
	30	3	30A	—	—	LEDB1C003***B	LEDB2C003***B	LEDB4C003***B
	60	3	60A	—	—	LEDD1D003***B	LEDD2D003***B	LEDD4D003***B
	100	3	100A	—	—	LEDF1E003***B	LEDF2E003***B	LEDF4E003***B
	200	3	200A	—	—	LEDH1F003***A	LEDH2F003***A	LEDH4F003***A
	300	3	400A	—	—	LEDK1G003***A	LEDK2G003***A	LEDK4G003***A
Fusible	20	3	—	30A/250V	—	LEFA1B003***B	LEFA2B003***B	LEFA4B003***B
		3	—	30A/600V	—	LEFB1B003***B	LEFB2B003***B	LEFB4B003***B
	30	3	—	30A/250V	—	LEFA1C003***B	LEFA2C003***B	LEFA4C003***B
		3	—	30A/600V	—	LEFB1C003***B	LEFB2C003***B	LEFB4C003***B
	60	3	—	60A/250V	—	LEFC1D003***B	LEFC2D003***B	LEFC4D003***B
		3	—	60A/600V	—	LEFD1D003***B	LEFD2D003***B	LEFD4D003***B
	100	3	—	100A/250V	—	LEFE1E003***B	LEFE2E003***B	LEFE4E003***B
		3	—	100A/600V	—	LEFF1E003***B	LEFF2E003***B	LEFF4E003***B
	200	3	—	200A/250V	—	LEFG1F003***A	LEFG2F003***A	LEFG4F003***A
		3	—	200A/600V	—	LEFH1F003***A	LEFH2F003***A	LEFH4F003***A
	300	3	—	400A/250V	—	LEFJ1G003***A	LEFJ2G003***A	LEFJ4G003***A
		3	—	400A/600V	—	LEFK1G003***A	LEFK2G003***A	LEFK4G003***A
Circuit Breaker	20	3	—	—	20A	LEBT1B003***B	LEBT2B003***B	LEBT4B003***B
	30	3	—	—	30A	LEBV1C003***B	LEBV2C003***B	LEBV4C003***B
	60	3	—	—	60A	LEBY1D003***B	LEBY2D003***B	LEBY4D003***B
	100	3	—	—	100A	LEBZ1E003***B	LEBZ2E003***B	LEBZ4E003***B

① Not available on 200 - 400A contactors.

② Type 12 field convertible to type 3/3R.

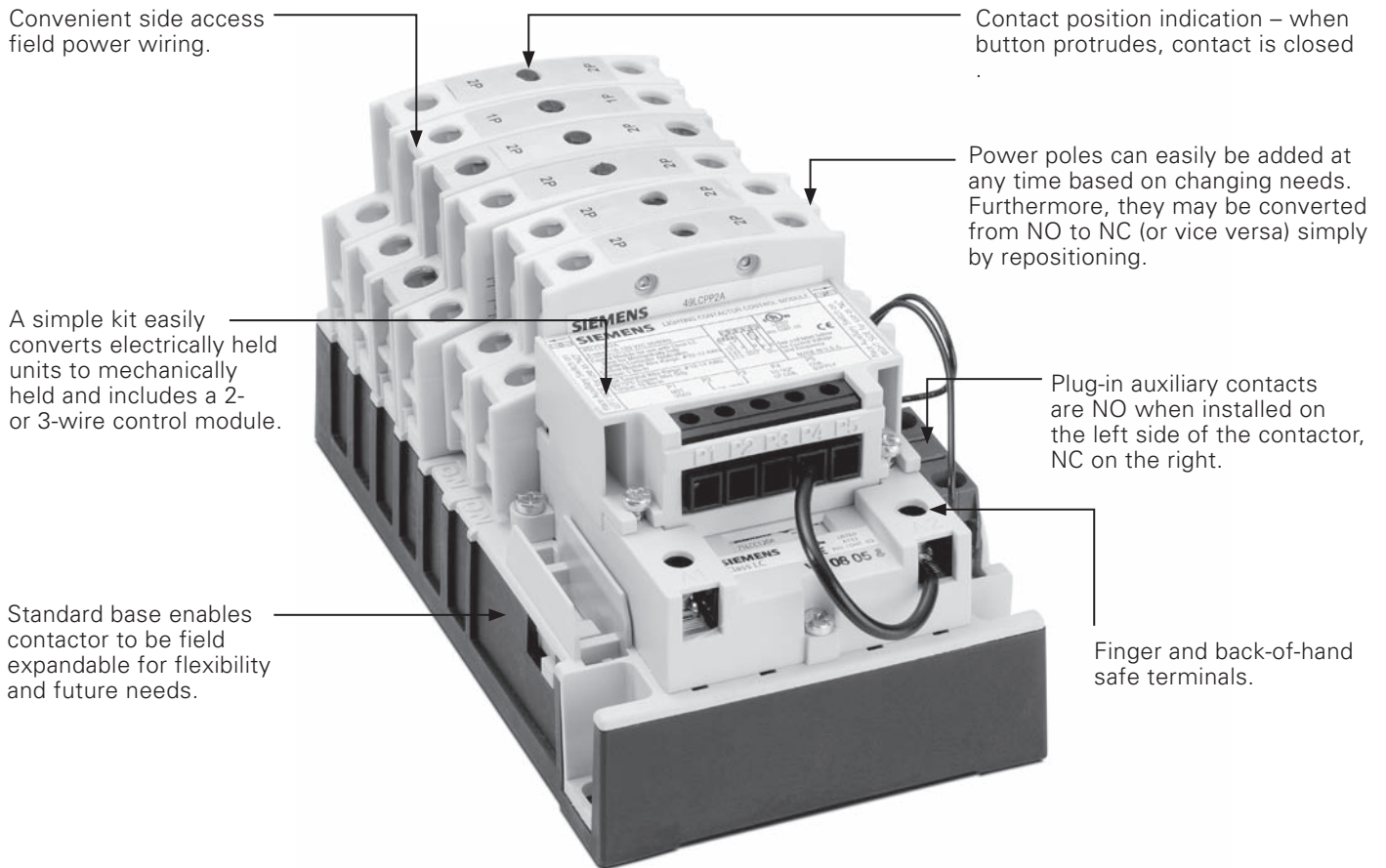
③ Type 4 painted enclosure through 100 Amp only.

# Electrically Held Lighting Contactors, Class LC

## Features

Class LC lighting contactors deliver unprecedented versatility in application, simplicity in configuration and performance in operation. Ingenious design, rugged construction and a host

of truly useful features make them uniquely appealing to all those who use them.



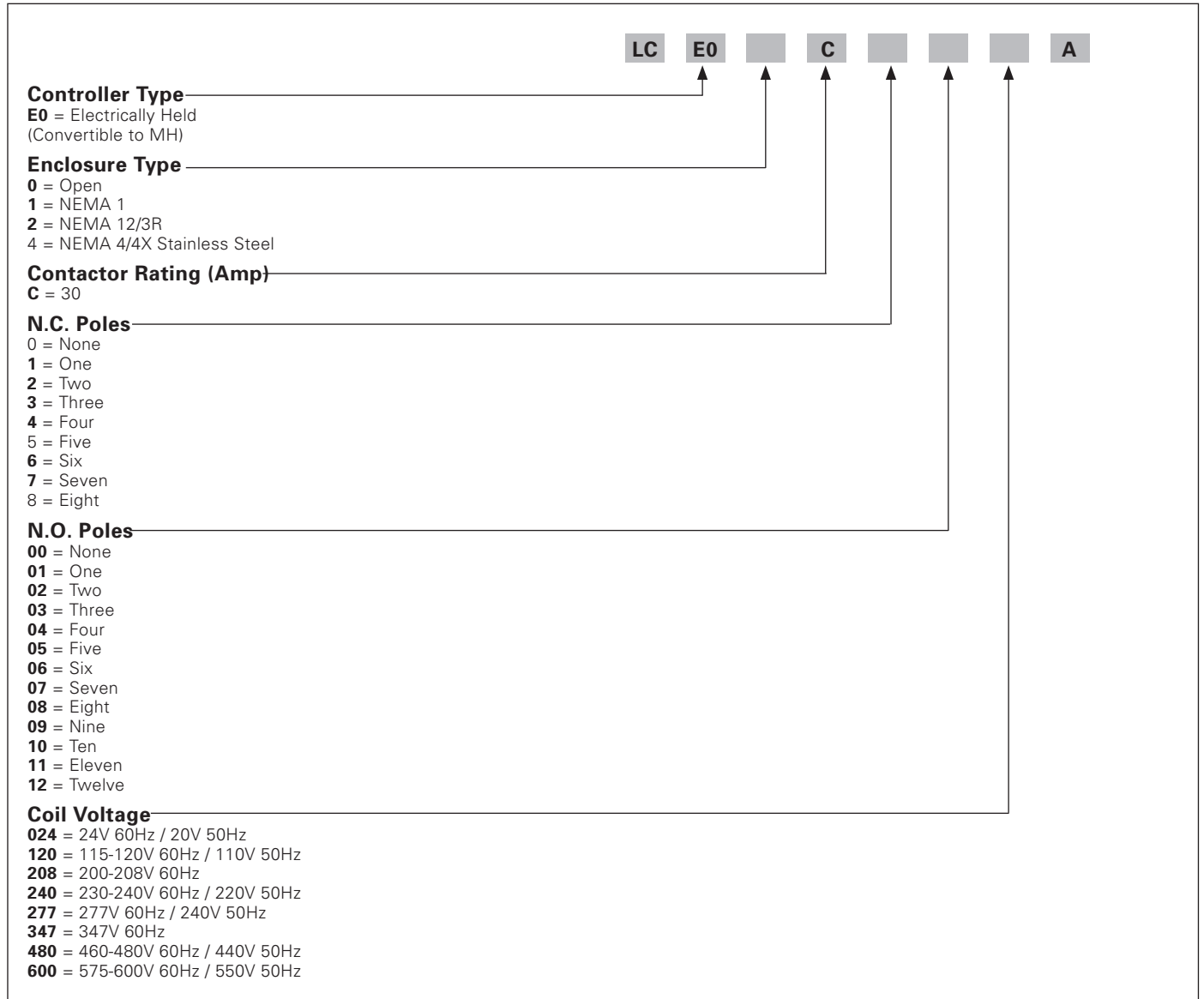
- Used in all applications where either electrically or mechanically held contactors are specifically suited and also ideal for maximum flexibility and future expansion
- Rated for tungsten lighting (incandescent filament), ballast lighting (fluorescent, HID, metal halide, mercury vapor, quartz halogen and sodium-lamp), resistive and general use loads
- Contacts are rated up to 30 amps at 600 volts
- Up to 12 poles (maximum of 8 normally closed)
- Wide range of coil voltages from 24 to 600 VAC 50/60Hz

- Can be ordered as either electrically or mechanically held and can also be converted from electrically to mechanically held in the field with a simple conversion kit
- Modular design enables you to stock the building block components to assemble all configurations of both the electrically and mechanically held contactors thus dramatically reducing inventory
- Full line of enclosures including NEMA 1, 3/3R, 4, 4/4X stainless steel and 12
- Full line of factory and field modifications

# Electrically Held Lighting Contactors, Class LC


## Features

### Catalog Numbering System



# Electrically Held Lighting Contactors, Class LC

## Selection



**Ordering Information**

- ▶ To order standard electrically held contactor, simply select catalog number from tables below.
- ▶ To order mechanically held contactor, select catalog number from tables below and specify conversion module from factory modification section from page 9/122.
- ▶ To convert standard electrically held contactor to mechanically held in the field, select catalog number from tables below and select conversion module kit from field modification section on page 9/106.
- ▶ Replace \*\*\* with a number from the coil table.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/148 open, page 9/170 enclosed.
- ▶ Wiring Diagrams see page 9/188.
- ▶ Replacement Parts see page 9/134.

**Coil Table**

VAC 60Hz	***
24	024
120	120
208	208
240	240
277	277
347	347
480	480
600	600

Replace the (\*\*\*) with a number from the coil table.

### Non-Combination Contactor (30 Amp max.)

No. of Poles		Enclosure Type			
		Open	1	3/3R/12 <sup>①</sup>	4/4X 304 S.S.
N.C.	N.O.	Catalog Number			
2	0	LCE00C200***A	LCE01C200***A	LCE02C200***A	LCE04C200***A
3		LCE00C300***A	LCE01C300***A	LCE02C300***A	LCE04C300***A
4		LCE00C400***A	LCE01C400***A	LCE02C400***A	LCE04C400***A
5		LCE00C500***A	LCE01C500***A	LCE02C500***A	LCE04C500***A
6		LCE00C600***A	LCE01C600***A	LCE02C600***A	LCE04C600***A
7		LCE00C700***A	LCE01C700***A	LCE02C700***A	LCE04C700***A
8		LCE00C800***A	LCE01C800***A	LCE02C800***A	LCE04C800***A
1		1	LCE00C101***A	LCE01C101***A	LCE02C101***A
2	LCE00C201***A		LCE01C201***A	LCE02C201***A	LCE04C201***A
3	LCE00C301***A		LCE01C301***A	LCE02C301***A	LCE04C301***A
4	LCE00C401***A		LCE01C401***A	LCE02C401***A	LCE04C401***A
5	LCE00C501***A		LCE01C501***A	LCE02C501***A	LCE04C501***A
6	LCE00C601***A		LCE01C601***A	LCE02C601***A	LCE04C601***A
7	LCE00C701***A		LCE01C701***A	LCE02C701***A	LCE04C701***A
8	LCE00C801***A		LCE01C801***A	LCE02C801***A	LCE04C801***A
0	2	LCE00C002***A	LCE01C002***A	LCE02C002***A	LCE04C002***A
1		LCE00C102***A	LCE01C102***A	LCE02C102***A	LCE04C102***A
2		LCE00C202***A	LCE01C202***A	LCE02C202***A	LCE04C202***A
3		LCE00C302***A	LCE01C302***A	LCE02C302***A	LCE04C302***A
4		LCE00C402***A	LCE01C402***A	LCE02C402***A	LCE04C402***A
5		LCE00C502***A	LCE01C502***A	LCE02C502***A	LCE04C502***A
6		LCE00C602***A	LCE01C602***A	LCE02C602***A	LCE04C602***A
7		LCE00C702***A	LCE01C702***A	LCE02C702***A	LCE04C702***A
8	LCE00C802***A	LCE01C802***A	LCE02C802***A	LCE04C802***A	
0	3	LCE00C003***A	LCE01C003***A	LCE02C003***A	LCE04C003***A
1		LCE00C103***A	LCE01C103***A	LCE02C103***A	LCE04C103***A
2		LCE00C203***A	LCE01C203***A	LCE02C203***A	LCE04C203***A
3		LCE00C303***A	LCE01C303***A	LCE02C303***A	LCE04C303***A
4		LCE00C403***A	LCE01C403***A	LCE02C403***A	LCE04C403***A
5		LCE00C503***A	LCE01C503***A	LCE02C503***A	LCE04C503***A
6		LCE00C603***A	LCE01C603***A	LCE02C603***A	LCE04C603***A
7		LCE00C703***A	LCE01C703***A	LCE02C703***A	LCE04C703***A
8	LCE00C803***A	LCE01C803***A	LCE02C803***A	LCE04C803***A	

① Type 12 field convertible to Type 3/3R.



## Electrically Held Lighting Contactors, Class LC

## Selection

## Non-Combination Contactor (30 Amp max.)

No. of Poles		Enclosure Type			
		Open	1	3/3R/12 <sup>①</sup>	4/4X 304 S.S.
N.C.	N.O.	Catalog Number			
0	4	LCE00C004***A	LCE01C004***A	LCE02C004***A	LCE04C004***A
1		LCE00C104***A	LCE01C104***A	LCE02C104***A	LCE04C104***A
2		LCE00C204***A	LCE01C204***A	LCE02C204***A	LCE04C204***A
3		LCE00C304***A	LCE01C304***A	LCE02C304***A	LCE04C304***A
4		LCE00C404***A	LCE01C404***A	LCE02C404***A	LCE04C404***A
5		LCE00C504***A	LCE01C504***A	LCE02C504***A	LCE04C504***A
6		LCE00C604***A	LCE01C604***A	LCE02C604***A	LCE04C604***A
7		LCE00C704***A	LCE01C704***A	LCE02C704***A	LCE04C704***A
8		LCE00C804***A	LCE01C804***A	LCE02C804***A	LCE04C804***A
0	5	LCE00C005***A	LCE01C005***A	LCE02C005***A	LCE04C005***A
1		LCE00C105***A	LCE01C105***A	LCE02C105***A	LCE04C105***A
2		LCE00C205***A	LCE01C205***A	LCE02C205***A	LCE04C205***A
3		LCE00C305***A	LCE01C305***A	LCE02C305***A	LCE04C305***A
4		LCE00C405***A	LCE01C405***A	LCE02C405***A	LCE04C405***A
5		LCE00C505***A	LCE01C505***A	LCE02C505***A	LCE04C505***A
6		LCE00C605***A	LCE01C605***A	LCE02C605***A	LCE04C605***A
0	6	LCE00C006***A	LCE01C006***A	LCE02C006***A	LCE04C006***A
1		LCE00C106***A	LCE01C106***A	LCE02C106***A	LCE04C106***A
2		LCE00C206***A	LCE01C206***A	LCE02C206***A	LCE04C206***A
3		LCE00C306***A	LCE01C306***A	LCE02C306***A	LCE04C306***A
4		LCE00C406***A	LCE01C406***A	LCE02C406***A	LCE04C406***A
5		LCE00C506***A	LCE01C506***A	LCE02C506***A	LCE04C506***A
6		LCE00C606***A	LCE01C606***A	LCE02C606***A	LCE04C606***A
0	7	LCE00C007***A	LCE01C007***A	LCE02C007***A	LCE04C007***A
1		LCE00C107***A	LCE01C107***A	LCE02C107***A	LCE04C107***A
2		LCE00C207***A	LCE01C207***A	LCE02C207***A	LCE04C207***A
3		LCE00C307***A	LCE01C307***A	LCE02C307***A	LCE04C307***A
4		LCE00C407***A	LCE01C407***A	LCE02C407***A	LCE04C407***A
0	8	LCE00C008***A	LCE01C008***A	LCE02C008***A	LCE04C008***A
1		LCE00C108***A	LCE01C108***A	LCE02C108***A	LCE04C108***A
2		LCE00C208***A	LCE01C208***A	LCE02C208***A	LCE04C208***A
3		LCE00C308***A	LCE01C308***A	LCE02C308***A	LCE04C308***A
4		LCE00C408***A	LCE01C408***A	LCE02C408***A	LCE04C408***A
0	9	LCE00C009***A	LCE01C009***A	LCE02C009***A	LCE04C009***A
1		LCE00C109***A	LCE01C109***A	LCE02C109***A	LCE04C109***A
2		LCE00C209***A	LCE01C209***A	LCE02C209***A	LCE04C209***A
0	10	LCE00C010***A	LCE01C010***A	LCE02C010***A	LCE04C010***A
1		LCE00C110***A	LCE01C110***A	LCE02C110***A	LCE04C110***A
2		LCE00C210***A	LCE01C210***A	LCE02C210***A	LCE04C210***A
0	11	LCE00C011***A	LCE01C011***A	LCE02C011***A	LCE04C011***A
0	12	LCE00C012***A	LCE01C012***A	LCE02C012***A	LCE04C012***A

① Type 12 field convertible to Type 3/3R.

## Electrically Held Lighting Contactors, Class LC

## Technical

General technical data:	
Finger-safe (main circuit / control circuit)	yes / yes
Degree of pollution	3
Altitude (m)	2,000
Ambient storage temperature (°C)	-30 to 65
Ambient operating temperature (°C)	-25 to 40
Humidity (% non-condensing)	no data
Shock resistance at rectangular impulse (g/ms)	no data
Shock resistance at sine pulse (g/ms)	no data
Rated impulse voltage resistance (kV)	no data
Rated insulation voltage (V)	600
Mechanical operating cycles as operating time:	
of contactor	100,000
of contactor with additional aux contacts	100,000
Main circuit:	
Number of main contacts	2 - 12 (maximum of 8 NC)
Typical power loss per conductor (W)	no data
Off-load operating frequency (cycles per hour)	60 for continued operation
Current ratings:	
Tungsten (poles per phase)	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph
Ballast (poles per phase)	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
General and resistive (poles per phase)	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
Coil ratings:	
Nominal voltage	(refer to coil voltage table)
Inrush / sealed power (VA)	248 / 28
Coil voltage tolerance factor	0.85 - 1.1
External/optional auxiliary contact:	
Number of NC / NO auxiliary contacts	2NC / 2NO max
Rating	A600, 24VDC, 24VAC
Installation/mounting/dimensions:	
Mounting orientation	vertical
Type of mounting: screw / DIN rail	yes / no
Height x Width x Depth (mm)	188 x 106 x 98
Minimum clearance to sides (mm)	12.7
Minimum clearance to earthed parts (mm)	12.7
Connection type / torque:	
Main contact terminals	screw / 35 lb in
Coil terminals	screw / 15 lb in
Auxiliary contact terminals	screw / 7-12 lb in
Control module terminals	screw / 5 lb in
Solid and stranded conductors (AWG):	
Main contact terminals	1x(14-8), #8 solid or stranded 2x(14-8), #8 stranded only
Coil terminals	2x(18-14)
Auxiliary contact terminals	2x(22-12)
Control module terminals	1x(22-12)
Conductor type for main / control circuits	75°C CU / 60-75°C CU
Short circuit current rating of main circuit:	
Short circuit current rating	(see SCCR tables)
Certificates:	
	cUL

Coil voltages:
24V 60Hz / 20V 50Hz
115-120V 60Hz / 110V 50Hz
200-208V 60Hz
230-240V 60Hz / 220V 50Hz
277V 60Hz / 240V 50Hz
347V 60Hz
460-480V 60Hz / 440V 50Hz
575-600V 60Hz / 550V 50Hz

Short circuit current ratings with fuses:			
Max. Volt.	Fuse	Max. Device Rating (Amps)	SCCR (kA)
600	RK fuse	60	5

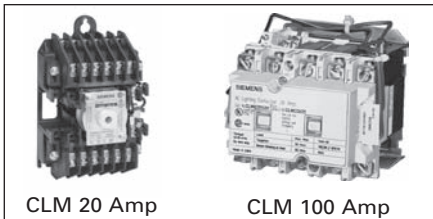
Short circuit current ratings with circuit breakers:			
Max. Volt.	Siemens Listed Circuit Breaker	Max. Device Rating (Amps)	SCCR (kA)
600	NGG3B040L	40	5
480	HEG3B040L	40	5
480	ED63B040L	40	5
480	NGG3B040L	40	5

Conversion module:		
Input Volt. (AC)	Steady State Current @ Rated Volts (mA)	Max. VA
24	80	5
115-120	83	12
200-277	91	30

Conversion module:	
Min. pulse duration (3-wire module)	250ms
Max. allowable leakage current	1.8 mA
EMI	35 V/m
Surge transient peak	6 kV
Frequency range	40-70 Hz

## Mechanically and Magnetically Held Lighting Contactors, Class CLM

## Selection

**Mechanically Latched Lighting and Heating Contactor**

The CLM Lighting Contactors can be used with metal halide, mercury vapor, quartz halogen, tungsten and fluorescent lighting. They provide reliable and convenient lighting control in numerous applications, such as industrial plants, schools, hospitals, office buildings, shopping centers, airports, stadiums . . . literally everywhere lighting is required.

The CLMs are listed under UL 508 with no derating when used open or enclosed. Combination lighting contactors are listed for UL service entrance.

UL listed File #E60310  
CSA Certified File LR 6535

**Type CLM 20 Amp Lighting Contactor Solid State Control Modules**

The CLM 20 amp lighting contactor is an electromagnetically operated, mechanically latched three wire control contactor. The most commonly used method of control is a three position momentary contact switch with a center-off position. The controlling device must be able to make the coil inrush current but need not break it. The coil current is interrupted by the control contacts within the CLM contactor. Power for the control line may come from a separate source or directly from the line side of the CLM contactor. The CLM contactor can also be controlled by devices such as:

- Break-glass control stations
- Timers having single pole, double throw contacts
- Photo-electric cells<sup>Ⓞ</sup>
- Energy management systems<sup>Ⓞ</sup>
- Microprocessors<sup>Ⓞ</sup>
- Occupancy sensors<sup>Ⓞ</sup>

Control modules make it possible to use a controlling device that does not have enough current-carrying capacity to control the CLM contactor directly. Control modules are also used when

the control station is to be located at a distance greater than the allowable contactor line run.

Another use for control modules occurs when the controlling device is only available as a single pole single-throw contact necessitating a two wire control line.

Still another application for control modules is when start-stop three wire control is needed.

Control modules also can make it possible to operate the CLM coil from its own incoming line at one voltage while providing the control at a second, perhaps lower voltage.

**Two Wire Control Module (Accessory 47)**

The advantages of two wire controls are:

1. Control station can have lower ampacity rating.
2. Control station can be located an extended distance from the CLM contactor.
3. Control module can frequently be controlled directly from microprocessor.
4. Control devices can be two wire single pole, single-throw types.
5. Control voltage may be different than the CLM coil circuit and at a lower voltage level.

**Note:** If the control power to the solid state control module is lost while the module is energized the lighting contactor will open. If the line power to the lighting contactor is lost while the contactor is energized the contactor will not change state with return of line voltage. Power will be restored to the load if the control module is still energized. Control station should be the maintained type.

**Three Wire Control Module (Accessory 48)**

1. The accessory 48 consists of two relays with contacts appropriately interconnected which provides for an interlocking that prevents both relays from being energized simultaneously.
2. This module has similar characteristics to the two wire module (Accessory 47) except there is no change of switch contact position upon loss of control line power. Control stations should be the momentary type.

**Stop-Start Control Module (Accessory 49)**

Stop-start three wire maintained control is an arrangement used mostly when controlling motors, but can be used in lighting applications.

Any number of momentary contact control stations consisting of normally open start buttons and normally closed stop buttons can be used. Start buttons are connected in parallel and stop buttons in series.

**Operation (Magnetic Latch)**

A permanent magnet is built into the contactor structure of the 30A, 60A, 100A, and 200A contactors that will maintain the contactor in its energized state indefinitely without using control power. When energized, a DC current is applied that produces a magnetic field that reinforces the polarity of the permanent magnet, and the contactor pulls in immediately. The current to the coil is disconnected by the coil clearing interlock. In order to drop out the contactor, it is necessary to apply a field through the OFF coil in the reverse direction to the permanent magnet. This momentarily cancels the magnetic attraction and the contactor drops out. Coil and module failures are possible when used with solid state relays and PLC outputs. 24-volt systems are ok to use, but 120 volts and above should be discouraged. If higher values cannot be avoided, an interposing relay should be used.

**(Mechanically Latched)**

The 300 & 400A lighting and heating contactors operate using a latching mechanism.

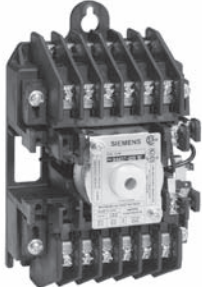
**Closing** – When the “close” pushbutton is operated, the closing coil is energized, closing the contactor. As the contactor closes, the latch lever hooks over the latch pin to mechanically latch the contactor closed. The coil-clearing auxiliary contact de-energizes the closing coil.

**Opening** – When the “Trip” pushbutton is operated, the trip solenoid coil is energized, unhooking the latch lever from the latch pin, which allows the contactor to open. As the contactor opens, the coil-clearing auxiliary contact de-energizes the trip solenoid coil.

<sup>Ⓞ</sup> Operation through control modules.

# Mechanically and Magnetically Held Lighting Contactors, Class CLM

## Selection

	Ordering Information		Coil Table	
	<ul style="list-style-type: none"> <li>▶ Replace *** with a number from the coil table.</li> <li>▶ Field modification kits see page 9/104.</li> <li>▶ Factory modifications see page 9/119.</li> <li>▶ Dimensions see page 9/153 open page 9/170 enclosed.</li> <li>▶ Wiring Diagrams see page 9/191.</li> <li>▶ Replacement parts see page 9/134.</li> </ul>		60Hz Voltage	Number
			24 <sup>②</sup>	024
			120	120
			208	208
			240	240
			277	277
			480	480
			600 <sup>⑤</sup>	600

### Open and Non-combination Enclosed Contactors

Max Amp Rating	Number of Poles	Open Type <sup>④</sup>		Enclosure					
		Catalog Number	List Price \$	NEMA 1 General Purpose		NEMA 12 NEMA 3/3R <sup>③</sup> Industrial Use Weatherproof		NEMA 4/4X Stainless Steel <sup>③</sup> Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
20	2	see table below		CLM1B02***		CLM2B02***		CLMSB02***	
	3			CLM1B03***		CLM2B03***		CLMSB03***	
	4			CLM1B04***		CLM2B04***		CLMSB04***	
	6			CLM1B06***		CLM2B06***		CLMSB06***	
	8			CLM1B08***		CLM2B08***		CLMSB08***	
	10			CLM1B10***		CLM2B10***		CLMSB10***	
30	2	CLM0C02***		CLM1C02***		CLM2C02***		CLMSC02***	
	3	CLM0C03***		CLM1C03***		CLM2C03***		CLMSC03***	
	4	CLM0C04***		CLM1C04***		CLM2C04***		CLMSC04***	
	5	CLM0C05***		CLM1C05***		CLM2C05***		CLMSC05***	
	6	CLM0C06***		CLM1C06***		CLM2C06***		—	—
	8	CLM0C08***		CLM1C08***		CLM2C08***		—	—
60	2	CLM0D02***		CLM1D02***		CLM2D02***		CLMSD02***	
	3	CLM0D03***		CLM1D03***		CLM2D03***		CLMSD03***	
	4	CLM0D04***		CLM1D04***		CLM2D04***		CLMSD04***	
	5	CLM0D05***		CLM1D05***		CLM2D05***		CLMSD05***	
	6	CLM0D06***		CLM1D06***		CLM2D06***		—	—
	8	CLM0D08***		CLM1D08***		CLM2D08***		—	—
100	2	CLM0E02***		CLM1E02***		CLM2E02***		CLMSE02***	
	3	CLM0E03***		CLM1E03***		CLM2E03***		CLMSE03***	
	4	CLM0E04***		CLM1E04***		CLM2E04***		CLMSE04***	
	5	CLM0E05***		CLM1E05***		CLM2E05***		CLMSE05***	
	200	2	CLM0F02***		CLM1F02***		CLM2F02***		CLMSF02***
300	3	CLM0G02***		CLM1G02***		CLM2G02***		—	—
	2	CLM0H02***		CLM1H02***		CLM2H02***		—	—
	3	CLM0H03***		CLM1H03***		CLM2H03***		—	—

### Open 20 Amp Contactors

Max Amp Rating	Number of Poles <sup>①</sup>	110–120V Coil 50/60Hz		208–240V Coil 50/60Hz		265–277V Coil 50/60Hz	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
20	2	CLM22031		CLM22061		CLM22071	
	3	CLM32031		CLM32061		CLM32071	
	4	CLM42031		CLM42061		CLM42071	
	6	CLM62031		CLM62061		CLM62071	
	8	CLM82031		CLM82061		CLM82071	
	10	CLM102031		CLM102061		CLM102071	
	12	CLM122031		CLM122061		CLM122071	

① Contactors with 2–6-poles will be assembled with all poles located in the top portion of the contactor. Contactors with 8–12-poles will be assembled with 6-poles in the top portion and the remaining poles in the bottom portion of the contactor.

② 24 volt coils are not available on 20, 300 and 400 amp contactor sizes. For 24 volt control of 20 amp contactor select solid state control module.


③ For conduit hubs and conversion instructions, see page 9/110.

④ CLM 30 & 60A 6-12-pole can be field assembled. Order mounting kit 49MCMPPMA and the appropriate number of 2-5 pole contactors.

⑤ 24, 480 or 600 volt coils are not available on 20 amp contactors.

# Combination Mechanically and Magnetically Held Lighting Contactors, Class CM

## Selection

	Ordering Information	Coil Table															
	<ul style="list-style-type: none"> <li>▶ Replace *** with a number from the coil table.</li> <li>▶ Field modification kits see page 9/104.</li> <li>▶ Factory modifications see page 9/119.</li> <li>▶ Dimensions see page 9/170.</li> <li>▶ Wiring Diagrams see page 9/191.</li> <li>▶ Replacement parts see page 9/134.</li> </ul>	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>24<sup>ⓐ</sup></td> <td>024</td> </tr> <tr> <td>120</td> <td>120</td> </tr> <tr> <td>208</td> <td>208</td> </tr> <tr> <td>240</td> <td>240</td> </tr> <tr> <td>277</td> <td>277</td> </tr> <tr> <td>480</td> <td>480</td> </tr> <tr> <td>600<sup>ⓑ</sup></td> <td>600</td> </tr> </tbody> </table>	60Hz Voltage	Number	24 <sup>ⓐ</sup>	024	120	120	208	208	240	240	277	277	480	480	600 <sup>ⓑ</sup>
60Hz Voltage	Number																
24 <sup>ⓐ</sup>	024																
120	120																
208	208																
240	240																
277	277																
480	480																
600 <sup>ⓑ</sup>	600																

### Combination Lighting Contactors

Disconnect Type	Contactor Amp Rating	Number of NO Poles	Disc Amp Rating	Disc Amp/Fuse Clip Rating	Circuit Breaker Rating	Enclosure					
						NEMA 1 General Purpose		NEMA 12, NEMA 3/3R <sup>ⓐ</sup> NEMA 4 Painted (thru 100 amps) Industrial Use Weatherproof, Watertight, Dust-tight		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel	
						Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Non-Fusible	20	3	30A	—	—	CMNB14***		CMNB24***		CMNBS4***	
	30	3	30A	—	—	CMNC14***		CMNC24***		CMNCS4***	
	60	3	60A	—	—	CMND15***		CMND25***		CMNDS5***	
	100	3	100A	—	—	CMNE16***		CMNE26***		CMNES6***	
	200	3	200A	—	—	CMNF17***		CMNF27***		CMNFS7***	
	300	3	400A	—	—	CMNG18***		CMNG28***		CMNGS8***	
Fusible	20	3	—	30A/250V	—	CMFB10***		CMFB20***		CMFBS0***	
						CMFB11***		CMFB21***		CMFBS1***	
	30	3	—	30A/600V	—	CMFC10***		CMFC20***		CMFCS0***	
						CMFC11***		CMFC21***		CMFCS1***	
	60	3	—	60A/250V	—	CMFD12***		CMFD22***		CMFDS2***	
						CMFD13***		CMFD23***		CMFDS3***	
	100	3	—	100A/250V	—	CMFE14***		CMFE24***		CMFES4***	
						CMFE15***		CMFE25***		CMFES5***	
	200	3	—	200A/250V	—	CMFF16***		CMFF26***		CMFFS6***	
						CMFF17***		CMFF27***		CMFFS7***	
	300	3	—	400A/250V	—	CMFG18***		CMFG28***		CMFGS8***	
						CMFG19***		CMFG29***		CMFGS9***	
Circuit Breaker	20	3	—	—	20A	CMBB14***		CMBB24***		CMBBS4***	
	30	3	—	—	30A	CMBC15***		CMBC25***		CMBCS5***	
	60	3	—	—	60A	CMBD18***		CMBD28***		CMBDS8***	
	100	3	—	—	100A	CMBE18***		CMBE28***		CMBES8***	
	200	3	—	—	200A	CMBF10***		CMBF20***		CMBFS0***	
300	3	—	—	300A	CMBG11***		CMBG21***		CMBGS1***		

## Lighting & Heating Contactor Ratings CLM

### Maximum AC/DC Voltage and Amp Ratings

Load Type	Amperes Continuous	Poles to Load	
		1 for 1-Phase	2 for 1-Phase 3 for 3-Phase
Tungsten	20	250V AC	250V AC
Ballast	20	347V AC	600V AC
General	30	347V AC	600V AC
General	20	125V DC	250V DC

### Inrush Current Over Fuse Size (amps RMS) at AC Control Voltage 20A CLM

Amps	120V	240V	277V	347V	480V
Inrush	5.0	2.5	2.2	1.8	1.3
Fuse	2.0	1.0	1.0	0.75	0.5

Contactor Ratings			
Load Type	Amperes Continuous	Max Volts Line to Line	Max Volts Line to Neutral
Tungsten	30-400	480	277
Ballast	30-400	600	346
Heating	30-400	600	346

AC Coil Data			
Contactor Amperes	No. Poles	Inrush VA	Dropout VA
20	2-12	625	6
30	2-5	410	40
60	2-3	410	40
60	4-5	600	40
100/200	2-3	900	200
100/200	4-5	1300	130
300/400	2-3	1600	550

ⓐ 24 volt coils are not available on 20 and 300 amp contactors. Use solid state control module on 20 amp size.

ⓑ For conduit hubs and conversion instructions, see page 9/110.

ⓒ 600 volt coils are not available on 20 amp contactors.



## Class MT

## General

## Features

- Enclosed coils (50-5000VA); Completely encloses the transformer coils against moisture, dust, dirt and industrial contaminants for maximum protection in hostile and industrial environments.
- Fuse clips (most models). Factory mounted for integral fusing on the secondary side to save panel space, save wiring time and save the cost of buying an add-on fuse block or kit
- Integrally finger safe terminals. Between terminals and transformer, protect against electrical creepage. Up to 30% greater terminal contact area permits low-loss connections. Extra-deep barriers reduce the chance of shorts from frayed leads or careless wiring
- Terminals. Molded into the transformer, are difficult to break during wiring. A full quarter-inch of thread on the 8-32 terminal screws prevents stripping and pullout
- Jumpers supplied. Two jumper links are standard with all transformers which can be wired for dual primary voltages

## Operation

Industrial control circuits and motor control loads typically require more current when they are initially energized than under normal operating conditions. This period of high current demand, referred to as inrush, may be as great as ten times the current required under steady state (normal) operating conditions, and can last up to 40 milliseconds. A transformer in a circuit subject to inrush will typically attempt to provide the load with the required current during the inrush period. However, it will be at the expense of the secondary voltage stability by allowing the voltage to the load to decrease as the current increases. This period of secondary voltage instability, resulting from increased current, can be of such magnitude that the transformer is unable to supply sufficient voltage to energize the load. The transformer must therefore be designed and constructed to accommodate the high inrush current, while maintaining secondary voltage stability. According to NEMA standards, the secondary voltage would typically be at 85% of the rated voltage.



Industrial Control Power Transformers are specifically designed and built to provide adequate voltage to the load while accommodating the high current levels present at inrush. These transformers deliver excellent secondary voltage regulation and meet or exceed the standards established by NEMA, ANSI, UL and cUL. Their rugged construction and excellent electrical characteristics ensure reliable operation of electromagnetic devices and trouble-free performance.

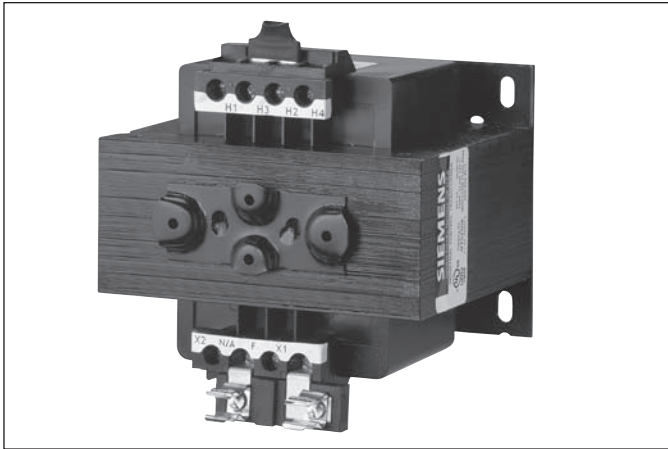
## Specifications

- Laminations are built with silicon steel to minimize core losses and to increase optimum performance and efficiency
- Copper magnet wire of the highest quality assures efficient operation
- Factory mounted type "K" fuse clips are standard on all secondary transformers where possible
- Two jumper links are standard with all transformers which can be wired for dual primary voltages
- cUL Listed and CSA certified

- 50/60 Hz rated
- Insulation materials are of the highest rating available for the temperature class
- Mounting plate is heavy gauge steel to add strength to core construction and provide stable mounting. Slotted mounting feet permit easy installation
- Attractive black finish; easy-to-read nameplate with complete rating data and wiring diagram
- Class 130°C (226°F) insulation system. 80°C (176°F) temperature rise. (50-750VA typical)
- Class 180°C (356°F) insulation system. 120°C (248°F) temperature rise. (1000-5000VA typical)
- Optional field mounted 2-pole primary Class CC fuse block is available

## Class MTG

## Genera



## Features

- Class MTG Industrial Control Transformers are 100% certified for all domestic and International Applications
- The MTG line has full compliance with IEC Safety standards EN 61 558
- CE Mark in accordance with requirements for EN 61 558
- Meets IP-20 specifications per IEC 529 for finger-safe protection when used with Siemens Touch Safe snap on terminal cover kits. Meets IP-00 specifications when covers are not used.
- UL Listed
- Exceeds applicable requirements for control transformers as determined by NEMA and ANSI
- Insulation requirements is twice that of UL5085
- Available in 50 to 750 VA sizes, in all standard voltage combinations
- Class 130°C (226°F) insulation system. 80°C (176°F) temperature rise. (50-750VA typical)
- Class 180°C (356°F) insulation system. 120°C (248°F) temperature rise. (1000-5000VA typical)
- Primary and secondary fusing capability available as field installed kits for domestic or international fusing
- Integrally-molded terminals and barriers between terminals make breakage virtually impossible during wiring. The MTG transformer construction is the same as our high quality Class MT transformers

#### Optional Field Installed Fuse Clip Kits For Panel Mounting

- 2-Pole primary Class CC fuse block
- 1-Pole secondary midget fuse block for  $1\frac{3}{32} \times 1\frac{1}{2}$  fuses
- 2-Pole primary international type fuse blocks
- 1-Pole secondary international type fuse blocks

#### Optional Touch-Safe Snap-On Terminal Cover Kits

The Touch-Safe terminal covers are designed to comply with IEC 742 and IP 20 requirements. When installed, the covers prevent contact with current carrying parts on the transformer and are available for 4 terminal configurations.

The international fuse block kits have inherent touch safe terminals and fuse clips.

#### Siemens Meets International Standards

CSA (Canadian Standards Association) was utilized as a Competent Body in reviewing, interpreting and properly complying with the requirements of IEC-742 to place a CE mark on its MTG Series product. As a National Certification Body, CSA also has the proper documentation and reports on file for MTG Series to utilize the CB Scheme ensuring acceptance throughout the world.

The standard Siemens MTG product is available with terminal covers which meets the requirements of IEC-529, IP20 degree of protection and meets the applicable requirements for covers per IEC-742.

#### IEC-742

The requirements for industrial control circuit transformers to be used in the European Common Market are identified by the International Electrotechnical Commission (IEC) and specified under IEC-742, Non-Short Circuit Proof Isolating Transformers, under the Low Voltage Directive 73/23/EEC. Manufacturers of control transformers indicate compliance with these requirements by placing a CE mark on the product.

- Winding to winding insulation requirements may be twice that for IEC-742 compared to UL506
- The electrical clearances between current carrying parts are one-third greater to comply with IEC-742 requirements for units up to 250VA with voltages up to 440 volts ac
- Transformers manufactured to IEC-742 requirements will have a minimum of 10% higher overload capacity than those manufactured only to UL506 requirements

While no requirement exists in IEC-742 for the electrical connections to be either finger safe or touch proof, the specification does state that IF a transformer is supplied with a cover to prevent incidental contact with current carrying parts, that cover must utilize two separate methods or places of securing it to the component, with neither being dependent upon the other. Additionally, one of these methods MUST require a tool to remove it.

#### IEC-529

The requirements for finger-safe or touch-proof electrical connections are identified by the International Electrotechnical Commission (IEC) under specification 529, Classification of Degrees of Protection Provided by Enclosures. These various degrees of protection are identified and differentiated by IP ratings.

The IP specification which most closely approximates protection to a human finger is IP20. This IP rating would be the most common degree of touch-proof connection for electrical components such as transformers.

#### EN 61 558

The requirements for industrial control transformers to be used in the European Common Market are identified by the IEC and specified in EN 61 558, Safety of Power Control Transformers, under Low Voltage Directive 73/23/EEC. CE mark on the product indicates compliance.



# Class MT, MTG

## General

### Transformer Selection Process

Selecting a transformer for industrial control circuit applications requires knowledge of the following terms:

**Inrush VA** is the product of load voltage (V) multiplied by the current (A) that is required during circuit start-up. It is calculated by adding the inrush VA requirements of all devices (contactors, timers, relays, pilot lights, solenoids, etc.), which will be energized together. Inrush VA requirements are best obtained from the component manufacturer.

**Sealed VA** is the product of load voltage (V) multiplied by the current (A) that is required to operate the circuit after initial start-up or under normal operating conditions. It is calculated by adding the sealed VA requirements of all electrical components of the circuit that will be energized at any given time. Sealed VA requirements are best obtained from the component manufacturer. Sealed VA is also referred to as steady state VA.

**Primary Voltage** is the voltage available from the electrical distribution system and its operational frequency, which is connected to the transformer supply voltage terminals.

**Secondary Voltage** is the voltage required for load operation which is connected to the transformer load voltage terminals.



Fuse Clip Kit KCCFPX2R

### Primary Fuse Kit

In addition to factory installed secondary fusing, Siemens offers a primary fuse kit for class MT transformers size 50–750 VA for field installation. The primary fuse kit includes a 2-pole Class CC fuse block, instructions and all associated mounting and wiring hardware. Additionally, this fuse kit will fit most competitors' units. To order this kit, use catalog number **KCCFPX2R**. The primary fuse kit, when installed, will add a maximum of 0.69 in. (18 mm) to the transformer "A" dimension and 1.94 in. (49 mm) to the "C" dimension.

Once the circuit variables have been determined, transformer selection is a simple 5-step process as follows:

1. Determine the Application Inrush VA by using the following industry accepted formula:  

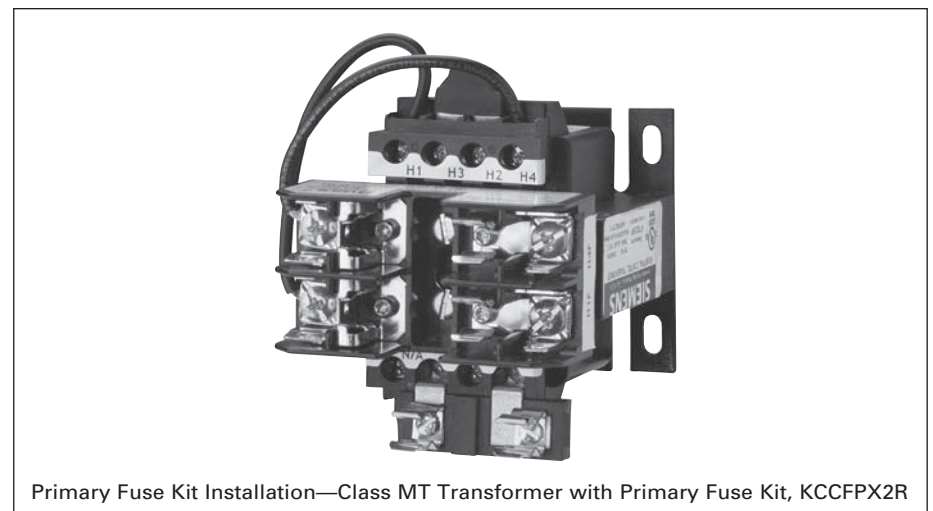
$$\text{Application Inrush VA} = \sqrt{(\text{Inrush VA})^2 + (\text{Sealed VA})^2}$$
2. Refer to the Regulation Data Chart. If the primary voltage is basically stable and does not vary by more than 5% from nominal, the 90% secondary voltage column should be used. If the primary voltage varies between 5% and 10% of nominal, the 95% secondary voltage column should be used.
3. After determining the proper secondary voltage column, read down until a value equal to or greater than the Application Inrush VA is found. In no case should a figure less than the Application Inrush VA be used.
4. Read left to the Transformer VA Rating column to determine the proper transformer for this application. As a final check, make sure that the Transformer VA Rating is equal to or greater than the total sealed requirements. If not, select a transformer with a VA rating equal to or greater than the total sealed VA.
5. Refer to the following pages to determine the proper catalog number based on the transformer VA, and primary and secondary voltage requirements.

### Regulation Data Chart

Transformer VA Ratings	Inrush VA At 20% Power Factor		
	NEMA/IEC 95% Sec Voltage	NEMA/IEC 90% Sec Voltage	NEMA/IEC 85% Sec Voltage
25	100/—	130/—	150/—
50	170/190	200/220	240/270
75	310/350	410/460	540/600
100	370/410	540/600	730/810
150	780/860	930/1030	1150/1270
200	810/900	1150/1270	1450/1600
250	1400/1540	1900/2090	2300/2530
300	1900/2090	2700/2970	3850/4240
350	3100/3410	3650/4020	4800/5280
500	4000/4400	5300/5830	7000/7700
750	8300/9130	11000/12100	14000/15400
1000 <sup>①</sup>	15000/—	21000/—	27000/—
1000 <sup>②</sup>	9000/—	13000/—	18500/—
1500	10500/—	15000/—	205000/—
2000	17000/—	25500/—	34000/—
3000	24000/—	36000/—	47500/—
5000	55000/—	92500/—	115000/—

To comply with NEMA standards, which require all magnetic devices to operate successfully at 85% of rated voltage, the 90% secondary voltage column is most often used in selecting a transformer.

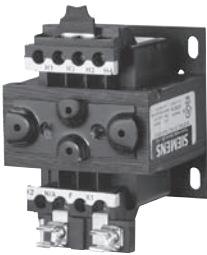
① For units with Class 105°C insulation systems.  
 ② For units with Class 180°C insulation systems.



Primary Fuse Kit Installation—Class MT Transformer with Primary Fuse Kit, KCCFPX2R

# Domestic, Class MT

## Selection



### Ordering Information

- ▶ Use the Voltage Table to determine the primary and secondary voltage required.
- ▶ Field Modifications see page 9/112.
- ▶ Dimensions see page 9/155.
- ▶ Wiring Diagrams see page 9/193.
- ▶ Touchsafe cover chart see page 9/101.

### Voltage Table

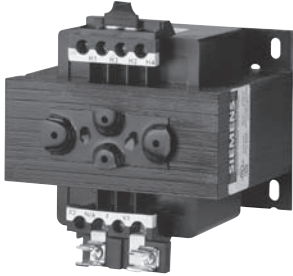
Primary Volts 50/60 Hz	Secondary Volts	Letter
240 X 480, 230 X 460, 220 X 440	120/115/110	A
240 X 480	24	B
120 X 240	24	C
115 X 230	24	D
550/575/600	110/115/120	E
208/277	120	F
208/230/460	115	G
230/460/575	95/115	H
380/400/415	110 X 220	I
208/230/460, 200/220/440,240/480	24 X 115, 23 X 110, 25 X 120	J
240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500	99/120/130, 95/115/125, 91/110/120, 85/100/110	L
240 X 480	120 X 240	M

VA Rating	Voltage Letter A		Voltage Letter B		Voltage Letter C		Voltage Letter D		Voltage Letter E		Voltage Letter F	
	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
50	MT0050A		MT0050B		MT0050C		MT0050D		MT0050E		MT0050F	
75	MT0075A		MT0075B		MT0075C		MT0075D		MT0075E		MT0075F	
100	MT0100A		MT0100B		MT0100C		MT0100D		MT0100E		MT0100F	
150	MT0150A		MT0150B		MT0150C		MT0150D		MT0150E		MT0150F	
200	MT0200A		MT0200B		MT0200C		MT0200D		MT0200E		MT0200F	
250	MT0250A		MT0250B		MT0250C		MT0250D		MT0250E		MT0250F	
300	MT0300A		MT0300B		MT0300C		MT0300D		MT0300E		MT0300F	
350	MT0350A		MT0350B		MT0350C		MT0350D		MT0350E		MT0350F	
500	MT0500A		MT0500B		MT0500C		MT0500D		MT0500E		MT0500F	
750	MT0750A		MT0750B		—	—	—	—	MT0750E		MT0750F	
1000	MT1000A		—	—	—	—	—	—	MT1000E		—	—
1500	MT1500A		—	—	—	—	—	—	—	—	—	—
2000	MT2000A		—	—	—	—	—	—	—	—	—	—
3000	MT3000A		—	—	—	—	—	—	—	—	—	—
5000	MT5000A		—	—	—	—	—	—	—	—	—	—

VA Rating	Voltage Letter G		Voltage Letter H		Voltage Letter I		Voltage Letter J		Voltage Letter L		Voltage Letter M	
	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
50	MT0050G		MT0050H		MT0050I		MT0050J		MT0050L		MT0050M	
75	MT0075G		MT0075H		MT0075I		MT0075J		—	—	MT0075M	
100	MT0100G		MT0100H		MT0100I		MT0100J		MT0100L		MT0100M	
150	MT0150G		MT0150H		MT0150I		MT0150J		MT0150L		MT0150M	
200	MT0200G		MT0200H		MT0200I		MT0200J		—	—	MT0200M	
250	MT0250G		MT0250H		MT0250I		MT0250J		MT0250L		MT0250M	
300	MT0300G		MT0300H		MT0300I		MT0300J		—	—	MT0300M	
350	MT0350G		MT0350H	—	MT0350I		MT0350J		MT0350L		MT0350M	
500	MT0500G		MT0500H		MT0500I		MT0500J		MT0500L		MT0500M	
750	MT0750G		MT0750H		MT0750I		—	—	MT0750L		MT0750M	
1000	MT1000G		MT1000H		MT1000I		—	—	—	—	MT1000M	
1500	MT1500G		MT1500H		MT1500I		—	—	—	—	—	—
2000	MT2000G		MT2000H		MT2000I		—	—	—	—	—	—
3000	MT3000G		MT3000H		MT3000I		—	—	—	—	—	—
5000	MT5000G		MT5000H		—	—	—	—	—	—	—	—

# International, Class MTG

## Selection

	<b>Ordering Information</b> ▶ Use the Voltage Table to determine the primary and secondary voltage required. ▶ Field Modifications see page 9/112. ▶ Dimensions see page 9/155. ▶ Wiring Diagrams see page 9/193. ▶ Touchsafe cover chart see below.	<b>Voltage Table</b>		
		Primary Volts 50/60 Hz 240 X 480, 230 X 460, 220 X 440 240 X 480 120 X 240 550/575/600 380/400/415 208/230/460, 200/220/440, 240/480 380	Secondary Volts 120/115/110 24 24 110/115/120 110 X 220 24 X 115, 23 X 110, 25 X 120 24	Letter A B C E I J P

VA Rating	Voltage Letter A		Voltage Letter B		Voltage Letter C		Voltage Letter E		Voltage Letter I		Voltage Letter J		Voltage Letter P	
	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$
50	MTG0050A		MTG0050B		MTG0050C		MTG0050E		MTG0050I		MTG0050J		MTG0050P	
75	MTG0075A		MTG0075B		MTG0075C		MTG0075E		MTG0075I		MTG0075J		MTG0075P	
100	MTG0100A		MTG0100B		MTG0100C		MTG0100E		MTG0100I		MTG0100J		MTG0100P	
150	MTG0150A		MTG0150B		MTG0150C		MTG0150E		MTG0150I		MTG0150J		MTG0150P	
200	MTG0200A		MTG0200B		MTG0200C		MTG0200E		MTG0200I		MTG0200J		MTG0200P	
250	MTG0250A		MTG0250B		MTG0250C		MTG0250E		MTG0250I		MTG0250J		MTG0250P	
300	MTG0300A		MTG0300B		MTG0300C		MTG0300E		MTG0300I		MTG0300J		MTG0300P	
350	MTG0350A		MTG0350B		MTG0350C		MTG0350E		MTG0350I		MTG0350J		MTG0350P	
500	MTG0500A		MTG0500B		MTG0500C		MTG0500E		MTG0500I		MTG0500J		MTG0500P	
750	MTG0750A		MTG0750B		MTG0750C		MTG0750E		MTG0750I		MTG0750J		MTG0750P	
1000	MTG1000A		MTG1000B		MTG1000C		—	—	—	—	MTG1000J		—	—
1500	MTG1500A		—	—	—	—	—	—	—	—	—	—	—	—
2000	MTG2000A		—	—	—	—	—	—	—	—	—	—	—	—
3000	MTG3000A		—	—	—	—	—	—	—	—	—	—	—	—
5000	MTG5000A		—	—	—	—	—	—	—	—	—	—	—	—

### Touchsafe Covers For MT style CPT

VA Rating	Voltage Letter	Primary Side Touchsafe?	Secondary Side Touchsafe?	Secondary Side Fuse Clips?
50	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes <sup>①</sup>
	I,L,M	Yes	Yes	No <sup>②</sup>
75	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes <sup>①</sup>
	I,M	Yes	Yes	No <sup>②</sup>
100	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes <sup>①</sup>
	I,L,M	Yes	Yes	No <sup>②</sup>
150	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes <sup>①</sup>
	I,L,M	Yes	Yes	No <sup>②</sup>
200	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes <sup>①</sup>
	I,M	Yes	Yes	No <sup>②</sup>
250	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes <sup>①</sup>
	I,L,M	Yes	Yes	No <sup>②</sup>
300	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes <sup>①</sup>
	I,M	Yes	Yes	No <sup>②</sup>
350	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes <sup>①</sup>
	I,L,M	Yes	Yes	No <sup>②</sup>
500	A,B,C,D,E,F,G,H,J	Yes	No <sup>③</sup>	Yes <sup>①</sup>
	I,L,M	Yes	Yes	No <sup>②</sup>
750	A,B,C,D,E,F,G,H	Yes	No <sup>③</sup>	Yes <sup>①</sup>
	I,L,M	Yes	Yes	No <sup>②</sup>
1000	A,E,G,H	Yes	No <sup>③</sup>	Yes <sup>①</sup>
	I,M	Yes	Yes	No <sup>②</sup>
1500	A,G,H	Yes	No <sup>③</sup>	Yes <sup>①</sup>
	I	Yes	Yes	No <sup>②</sup>
2000	A,G,H	Yes	No <sup>③</sup>	Yes <sup>①</sup>
	I	Yes	Yes	No <sup>②</sup>
3000	A,G,H,I	Yes	Yes	No <sup>②</sup>
5000	A,G,H	Yes	Yes	No <sup>②</sup>

### Touchsafe Covers For MTG style CPT

VA Rating	Voltage Letter	Primary Side Touchsafe?	Secondary Side Touchsafe?	Secondary Side Fuse Clips? <sup>④</sup>
50	A,B,C,E,I,J,P	Yes	Yes	No
75	A,B,C,E,I,J,P	Yes	Yes	No
100	A,B,C,E,I,J,P	Yes	Yes	No
150	A,B,C,E,I,J,P	Yes	Yes	No
200	A,B,C,E,I,J,P	Yes	Yes	No
250	A,B,C,E,I,J,P	Yes	Yes	No
300	A,B,C,E,I,J,P	Yes	Yes	No
350	A,B,C,E,I,J,P	Yes	Yes	No
500	A,B,C,E,I,J,P	Yes	Yes	No
750	A,B,C,E,I,J,P	Yes	Yes	No
1000	A,B,C,J	Yes	Yes	No
1500	A	Yes	Yes	No
2000	A	Yes	Yes	No
3000	A	Yes	Yes	No
5000	A	Yes	Yes	No

① Needs US2:KCCSECFVCR to be Touchsafe

② If secondary fuse holder is required, use KCCF1G panel mount fuse holder

③ Needs US2:KCCSECFVCR2

④ International fusing options, see CPT accessory page

# Class SMF, MMS, MRS

## Selection

### Accessories—Class SMF

Description	Catalog Number	List Price \$
Handle Guard Kit with Padlock Provision	SMFFL1	
Emergency Off Actuator	SMFPB1	
Additional Key for Key Operated Devices	SMFFK1	

### Pilot Light Kits—Class MMS, MRS<sup>①</sup>

Device	Voltage Rating	Red Pilot Light		Green Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Class SMF	115–277V AC	SMFPL10		SMFPL10G	

### Enclosures—Class SMF

Enclosure Type	For Use With SMF	Catalog Number	List Price \$
Standard Size NEMA 1 General Purpose	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMFFE2	
Oversized NEMA Type 1 General Purpose	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMFFE1	
NEMA 3R, 4, 12 Watertight Dust-tight	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMF40BC2	

### Nameplates—Class SMF

For Use On	Nameplate Marking	Without Pilot Light		With Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Standard commercial switch box cover including stainless steel plates	None	SMFFN2		—	—
Stainless Steel Plate	None	SMFFSN3		SMFFSN4	
NEMA 1 surface mounted enclosure or gray flush plate	None	SMFFN30		SMFFN40	
	High	SMFFN31		SMFFN41	
	Low	SMFFN32		SMFFN42	

### Replacement Parts—Class SMF, MMS

Description	Catalog Number	List Price \$
Replacement Toggle Kits: Type FW and KW (NEMA 4 Metallic Enclosure)	SMFHW1	

### Accessories—Class MMS, MRS

Description	Catalog Number	List Price \$
Handle Guard Kit with Padlock Provision	SMFFL1	
Emergency Off Actuator	SMFPB1	
Additional Key for Key Operated Devices	SMFFK1	

### Pilot Light Kits—Class MMS, MRS<sup>①</sup>

Device	Voltage Rating	Red Pilot Light		Green Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Class MMS	110–120V AC	SMFPL11		SMFPL11G	
	208–277V AC	SMFPL12		SMFPL12G	
	440–600V AC	SMFPL13		SMFPL13G	

### Enclosures—Class MMS

Enclosure Type	For Use With MMS	Catalog Number	List Price \$
Standard Size NEMA 1 General Purpose	K01, K01P, K01B, K02, K02A, K02B, K03, K03A, K03B, K04, K04A, K04B	MMSKE3	
Oversized NEMA Type 1 General Purpose	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C, K02	SMFKE1	
Jumbo NEMA Type 1 General Purpose	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C, K02	SMFKE2	
NEMA 3R, 4, 12 Watertight Dust-tight	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C	SMF40BC2	

### Nameplates—Class MMS

For Use On	Nameplate Marking	Without Pilot Light		With Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Standard commercial switch box cover including stainless steel plates	None	SMFFN1		—	—
NEMA 1 surface mounted enclosure or gray flush plate	None	SMFFN10		SMFFN20	
	High	SMFFN11		SMFFN21	
	Low	SMFFN12		SMFFN22	
	Forward	SMFFN13		—	—
	Reverse	SMFFN14		SMFFN24	

<sup>①</sup> Pilot lights can be field installed on standard NEMA 1 general purpose surface mount enclosures, and NEMA 3R, 4 and 12 enclosures only. For flush mounting units a complete switch unit with pilot light must be ordered.

# Class 11 - 3RV

## Selection





	Description	Type	Catalog Number	List Price \$	
 <p><b>3RV2901-1D</b></p>	<b>Auxiliary Contact Blocks</b>				
	<b>Plug in contact block</b> 1 block per 3RV mountable at the front	1 SPDT contact, NO/NC 1 NO + 1 NC 1 SPDT contact NO/NC electronic contact <sup>④</sup>	<b>3RV2901-1D</b> <b>3RV2901-1E</b> <b>3RV2901-1G</b>		
 <p><b>3RV2901-1A</b></p>	<b>Side mount auxiliary contact with screw connection</b> 1 side mount auxiliary contact per 3RV mountable on the left-hand side	1 NO + 1 NC 2 NO 2 NC 2 NO + 2 NC	<b>3RV2901-1A</b> <b>3RV2901-1B</b> <b>3RV2901-1C</b> <b>3RV2901-1J</b>		
	<b>Signaling Contact Block</b>				
	<b>Signaling contact</b> 1 signaling contact per 3RV mountable on the left-hand side. Can also be fitted together with side mount auxiliary contact.	1NO + 1NC for any trip + 1NO + 1NC for short circuit trip only.	<b>3RV2921-1M</b>		
 <p><b>3RV2922-1CP0</b></p>	<b>Auxiliary Releases</b>				
	<b>Undervoltage release</b> 1 undervoltage release per 3RV mountable on the right-hand side. Cannot be fitted together with shunt trip.	AC 50Hz — 230V 415V	AC 60Hz 120V 208V 240V 480V	<b>3RV2902-1AF0</b> <b>3RV2902-1AM1</b> <b>3RV2902-1AP0</b> <b>3RV2902-1AV1</b>	
		<b>Undervoltage release with early make contacts (2NO)</b> 1 undervoltage release per 3RV mountable at the right-hand side. Cannot be fitted together with shunt trip.	AC 50Hz 230V 415V	AC 60Hz 240V 480V	<b>3RV2922-1CP0</b> <b>3RV2922-1CV1</b>
	<b>Shunt trip</b> 1 shunt trip per 3RV mountable at the right-hand side. Cannot be fitted together with undervoltage release.	AC 50Hz/60Hz <sup>①</sup> 20–24V 90–110V 200–240V 350–415V	DC <sup>②</sup> 20–70V 70–190V 190–330V 330–500V	<b>3RV2902-1DB0</b> <b>3RV2902-1DF0</b> <b>3RV2902-1DP0</b> <b>3RV2902-1DV0</b>	
 <p><b>3RV2902-1DP0</b></p>	<b>Pilot Lights</b> AC 50Hz/60Hz				
	For NEMA 1 enclosure only. Kit includes Red, Green, and Amber lenses	24V 120V 240V 480V 600V		<b>49SBLBJ<sup>③</sup></b> <b>49SBLBF<sup>③</sup></b> <b>49SBLBG<sup>③</sup></b> <b>49SBLBH<sup>③</sup></b> <b>49SBLBE<sup>③</sup></b>	
 <p><b>3RV2928-1H</b></p>	<b>Lug Kit</b>				
	Required for Type E Manual Combination Starter	For 3RV with amp range: 0.11–22A up to 480V Max. 0.11–12.5A up to 575V Max	<b>3RV2928-1H</b>		
 <p><b>3RV2928-1H</b></p>	<b>Mounting</b>				
	<b>Push-in Mounting Hole Kit</b> For screw panel mounting of the 3RV	Four mounting holes required for each 3RV.	<b>3RV2928-0B</b>		
 <p><b>3RV2901-0H</b></p>	<b>Sealing device</b>				
	<b>Adjustment Dial covers</b>	For sealing the FLA adjustment dial (Kit includes 10 covers)	<b>3RV2908-0P</b>		
	<b>Front mount auxiliary cover</b>	For sealing the front mount auxiliary opening. (Kit includes 10 covers)	<b>3RV2901-0H</b>		
<b>Door Operators</b>					
<b>Thru-the-door operators</b> Rotary operating mechanism, rated NEMA 12, lockable with up to 3 padlocks in the OFF position. Includes extension shift and connecting element for the 3RV.	With Black Handle	130 mm depth	<b>3RV2926-0B</b>		
		330 mm depth with supporting bracket	<b>3RV2926-0K</b>		

① 100% on time.  
 ② 5 sec. max. on time.  
 ③ Product Category: PILO.

④ Compatible for use in dusty atmospheres. Contacts rated for 1-300mA @ 3-60V.

# Pilot Devices

## Selection





Push Buttons and Selector Switches	Class	Enclosure Type	Controller Size or (Lighting Rating)	Type	Catalog Number	List Price \$		
 <b>49SBPB5</b>	14, 40, LC, LEN, CLM <sup>Ⓞ</sup>	Open	00-4	Start, Stop Push Buttons	<b>49SAPB5</b>			
				Hand-Off-Auto Selector Switch	<b>49SASB1</b>			
				Off-On Selector Switch	<b>49SASB4</b>			
		1	00-4 or (20–100A)	12, 4/4X	00-8 or (200–400A)	Start, Stop Push Buttons	<b>49SBPB5</b>	
						Hand-Off-Auto Selector Switch	<b>49SBSB1</b>	
						Off-On Selector Switch	<b>49SBSB4</b>	
			00-8 or (20–400A)	12, 4/4X	00-8 or (20–400A)	Start, Stop Push Buttons	<b>49SAP05</b>	
						Hand-Off-Auto Selector Switch	<b>49SAS01</b>	
						Keyed Hand-Off-Auto (key removable in all positions)	<b>49SAS09</b>	
		22, 43	Open	1	00-4	Off-On Selector Switch	<b>49SAS04</b>	
						Start, Stop Push Buttons	<b>49SAP05</b>	
						Hand-Off-Auto Selector Switch	<b>49SAS01</b>	
12, 4/4X	0-8		00-8 or (20–400A)	Keyed Hand-Off-Auto (key removable in all positions)	<b>49SAS09</b>			
				Off-On Selector Switch	<b>49SAS04</b>			
				Start, Stop Push Buttons	<b>49SAP05</b>			
 <b>49SBSB1</b>	30 (2S1W)	Open	0-4	Forward-Off-Reverse Selector Switch	<b>49SAS02</b>			
				Forward-Off-Reverse Selector Switch	<b>49SAS02</b>			
				Forward, Reverse, Stop Push Buttons	<b>49SAP02</b>			
		1	0-1 3/4	12, 4/4X	0-4	Forward-Off-Reverse Selector Switch	<b>49SAS02</b>	
						Forward, Reverse, Stop Push Buttons	<b>49SAP02</b>	
						Forward-Off-Reverse Selector Switch	<b>49SAS02</b>	
		12, 4/4X	0-4	0-4	0-4	High-Off-Low Selector Switch	<b>49SASB3</b>	
						High-Off-Low Selector Switch	<b>49SBSB3</b>	
						High, Low, Stop Push Buttons	<b>49SAP03</b>	
		30 (2S2W)	Open	1	0-4	High-Off-Low Selector Switch	<b>49SAS03</b>	
						High, Low, Stop Push Buttons	<b>49SAP03</b>	
						High-Off-Low Selector Switch	<b>49SAS03</b>	
12, 4/4X	0-4		0-4	0-4	High-Off-Low Selector Switch	<b>49SASB3</b>		
					High-Off-Low Selector Switch	<b>49SBSB3</b>		
					High, Low, Stop Push Buttons	<b>49SAP03</b>		
 <b>49SAP05</b>	17, 18, 36, 37, 83, 84, LED, LEF, LEB, CMN <sup>Ⓞ</sup> , CMF <sup>Ⓞ</sup> , CMB <sup>Ⓞ</sup>	Open	0-4	High-Off-Low Selector Switch	<b>49SAS03</b>			
				High-Off-Low Selector Switch	<b>49SBSB3</b>			
				High, Low, Stop Push Buttons	<b>49SAP03</b>			
		1	0-4	1, 12, 4/4X	0-8 (20-400A)	High-Off-Low Selector Switch	<b>49SAS03</b>	
						High-Off-Low Selector Switch	<b>49SBSB3</b>	
						High, Low, Stop Push Buttons	<b>49SAP03</b>	
		12, 4/4X	0-4	1, 12, 4/4X	0-8 (20-400A)	Start, Stop Push Buttons	<b>49SAP05</b>	
						Hand-Off-Auto Selector Switch	<b>49SAS01</b>	
						Keyed Hand-Off-Auto (key removable in all positions)	<b>49SAS09</b>	
		25, 26	1, 12, 4/4X	1, 12, 4/4X	0-8	Off-On Selector Switch	<b>49SAS04</b>	
						Forward, Reverse, Stop Push Buttons	<b>49SAP02</b>	
						Forward-Off-Reverse Selector Switch	<b>49SAS02</b>	
32	1, 12, 4/4X		1, 12, 4/4X	0-4	High, Low, Stop Push Buttons	<b>49SAP03</b>		
					High-Off-Low Selector Switch	<b>49SAS03</b>		
					High-Off-Low Selector Switch	<b>49SAS03</b>		
 <b>49SAS01</b>	17, 18, 36, 37, 83, 84, LED, LEF, LEB, CMN <sup>Ⓞ</sup> , CMF <sup>Ⓞ</sup> , CMB <sup>Ⓞ</sup>	Open	0-4	High-Off-Low Selector Switch	<b>49SAS03</b>			
				High-Off-Low Selector Switch	<b>49SBSB3</b>			
				High, Low, Stop Push Buttons	<b>49SAP03</b>			
		1	0-4	1, 12, 4/4X	0-8 (20-400A)	High-Off-Low Selector Switch	<b>49SAS03</b>	
						High-Off-Low Selector Switch	<b>49SBSB3</b>	
						High, Low, Stop Push Buttons	<b>49SAP03</b>	
		12, 4/4X	0-4	1, 12, 4/4X	0-8 (20-400A)	Start, Stop Push Buttons	<b>49SAP05</b>	
						Hand-Off-Auto Selector Switch	<b>49SAS01</b>	
						Keyed Hand-Off-Auto (key removable in all positions)	<b>49SAS09</b>	
		25, 26	1, 12, 4/4X	1, 12, 4/4X	0-8	Off-On Selector Switch	<b>49SAS04</b>	
						Forward, Reverse, Stop Push Buttons	<b>49SAP02</b>	
						Forward-Off-Reverse Selector Switch	<b>49SAS02</b>	
32	1, 12, 4/4X		1, 12, 4/4X	0-4	High, Low, Stop Push Buttons	<b>49SAP03</b>		
					High-Off-Low Selector Switch	<b>49SAS03</b>		
					High-Off-Low Selector Switch	<b>49SAS03</b>		

Ⓞ To be used for replacement of switch only. Does not include relay or extra contact block on 30-400A CLM and CM Lighting Contactors. Class 49SB not available for these devices.



# Pilot Lights

## Selection

Description	Class	Enclosure Type	Controller Size or (Lighting Rating)	Lens Color(s)	Legend(s)	Voltage	Catalog Number	List Price \$						
 <p><b>49SBLBF</b></p>	14, 40, 22 <sup>②</sup> , 43 <sup>②</sup> , 30 (2S2W) <sup>③</sup> , LC, LEN, CLM	1	00-4 or (20-200A)	Red, Green, Amber	ON, RUN, OFF <sup>①</sup> , OL TRIPPED <sup>④</sup> , FORWARD, REVERSE, LOW, HIGH	24 Vac	49SBLBJ							
						120 Vac	49SBLBF							
						208/240/277 Vac	49SBLBG							
						480 Vac	49SBLBH							
						600 Vac	49SBLBE							
						24 Vac (Full Voltage)	49SPLOBRJ							
	12, 4/4X	5-8 or (300-400A) 0-8 or (20-400A)	Red (Transformer Type)	ON	120 Vac	49SPLOBRF								
					240 Vac	49SPLOBRG								
					480 Vac	49SPLOBRH								
					600 Vac	49SPLOBRE								
					24 Vac (Full Voltage)	49SPLOAGJ								
					120 Vac	49SPLOAGF								
12, 4/4X	0-4	Green (Transformer Type)	OFF <sup>①</sup>	240 Vac	49SPLOAGG									
				480 Vac	49SPLOAGH									
				600 Vac	49SPLOAGE									
				24 Vac (Full Voltage)	49SPLOAGJ									
				120 Vac	49SPLOAGF									
				240 Vac	49SPLOAGG									
 <p><b>49SPL0BRF</b></p>	30 (2S1W) <sup>②</sup>	1	0-4	Red, Green, Amber	ON, RUN, OFF <sup>①</sup> , OL TRIPPED <sup>④</sup> , FORWARD, REVERSE, LOW, HIGH	24 Vac	49SBLBJ							
						120 Vac	49SBLBF							
						208/240/277 Vac	49SBLBG							
						480 Vac	49SBLBH							
						600 Vac	49SBLBE							
						24 Vac (Full Voltage)	49SPLOBRJ							
	12, 4/4X	0-4	Red (Transformer Type)	ON	120 Vac	49SPLOBRF								
					240 Vac	49SPLOBRG								
					480 Vac	49SPLOBRH								
					600 Vac	49SPLOBRE								
					24 Vac (Full Voltage)	49SPLOAGJ								
					120 Vac	49SPLOAGF								
1, 12, 4/4X	0-6 (20-400A)	Green (Transformer Type)	OFF <sup>①</sup>	240 Vac	49SPLOAGG									
				480 Vac	49SPLOAGH									
				600 Vac	49SPLOAGE									
				24 Vac (Full Voltage)	49SPLOAGJ									
				120 Vac	49SPLOAGF									
				240 Vac	49SPLOAGG									
1, 12, 4/4X	0-6 (20-400A)	Red (Transformer Type)	ON	480 Vac	49SPLOBRH									
				600 Vac	49SPLOBRE									
				24 Vac (Full Voltage)	49SPLOAGJ									
				120 Vac	49SPLOAGF									
				240 Vac	49SPLOAGG									
				480 Vac	49SPLOAGH									
 <p><b>49SBLBL</b></p>	Lens Kit ONLY (30 (2S1W)) (14, 40, 22, 43, 30 (2S2W), LC, LEN, CLM)	1	0-1 3/4 00-4 or (20-200A)	Red, Green, Amber	—	—	49SBLBL							
 <p>LED bulb BA9s type Used to replace incandescent or LED bulbs<sup>⑤</sup></p>	—	—	—	Red	—	24 V AC/DC	52AED2							
							Green	52AED3						
							Amber	52AED4						
							White	52AEDB						
							Red	52AEB2						
							Green	52AEB3						
	—	—	—	—	Amber	—	120 - 600 V AC/DC	52AEB4						
								White	52AEBB					

① "Off" PL requires: (1) N.C. aux contact, 49AB01 on sizes 00-4.  
 ② Class 22, 25, 26, 30, 32, 43, 83 & 84 requires qty. of (2) pilot light kits. Does not apply to 49SB kits. Select appropriate legend plate as a separate item per

type of starter; either "FORWARD" & "REVERSE" or "LOW" & "HIGH".  
 ③ 2S2W is starter size 0-4.  
 ④ Includes NC aux contact for NEMA starter Size 0-4.

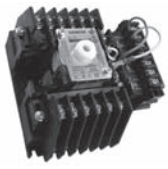
⑤ The "OL TRIPPED" pilot light with a bimetal OLR, requires the OLR to have a N.O. contact as well as a N.C. contact.  
 ⑥ LED bulb applies to only 49SP\* pilot lights. They do not apply to 49SB\* pilot lights.



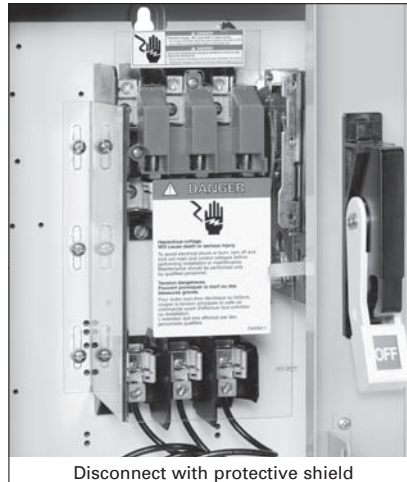
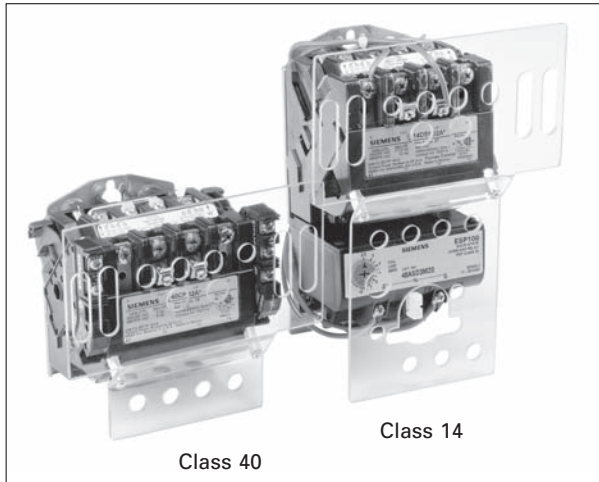
# NEMA, Lighting and Heating Contactors, 20 Amp CLM, CMB, CMF, CMN

## Selection

### Solid State Control Module Kits For Lighting and Heating Contactors<sup>①</sup>

	CLM 20 Amp Contactor Kit Description	Accessory	Catalog Number	List Price \$	Accessory	Catalog Number	List Price \$	Accessory	Catalog Number	List Price \$
	120V AC, 50/60 Hz	47 (2-Wire Control) (2W)	CLM4379771		48 (3-Wire Control) (3W)	CLM4379781		49 (Start/Stop Control) (3WS)	CLM4379791	
	24V AC/DC, 50/60 Hz		CLM4379772			CLM4379782			CLM4379792	
	240/277V AC, 50/60 Hz		CLM4379773			CLM4379783			CLM4379793	

### Protective Shielding for NEMA Products





### Class 14, 22, 30, 40, 43

Contactor or Starter Size	00-1½	List Price \$	2-2½	List Price \$	3-3½	List Price \$	4	List Price \$
Contactor Shield Catalog Number	49PSC1		49PSC2		49PSC3		49PSC4	
Starter Shield Catalog Number	49PSS1		49PSS2		49PSS3		49PSS4	

### Class 17, 25, 32, 87

Disconnect Size	Catalog Number	List Price \$
30A	49PSD5	
60 & 100A	49PSD6	
200A	49PSD7	







Power Pole Kits	Class	Enclosure type	Contactor Size (Amp)	Description	Field Kit Catalog No.
	LC	Open, 1, 12, 4/4X	30	Single power pole Double power pole	49LCPP1A 49LCPP2A
Electrically Held to Mechanically Held Conversion Modules	Class	Enclosure type	Contactor Size (Amp)	Description	Field Kit Catalog No.
	LC	Open, 1, 12, 4/4X	30	2-wire, 24VAC 2-wire, 110-120VAC 2-wire, 200-277VAC 3-wire, 24VAC 3-wire, 110-120VAC 3-wire, 200-277VAC	49LCCM1A 49LCCM2A 49LCCM3A 49LCCM4A 49LCCM5A 49LCCM6A

<sup>①</sup> These kits are only for use with 20A mechanically held lighting contactors.



# NEMA, Reduced Voltage and Lighting

## Selection


### Starter/Contactor Auxiliary Contact Kits

Description	Class	Size	Type	Catalog Number	List Price \$
	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88	00-4	1 NO	49AB10	
			1 NC	49AB01	
			1 NC Early Break	49AB01EB	
			1 NC Late Break	49AB01LB	
			1 NC Extra Late Break	49AB01XLB	
			1 NO Extra Late Make	49AB10XLM	
			1 NO & 1 NC	49AB11	
			2 NO	49AB20	
			4 NO	49AB40	
			3 NO & 1 NC	49AB31	
			2 NO & 2 NC	49AB22	
				14, 17, 18, 22, 25, 26, 36, 37, 40, 43, 87, 88	5, 6
1 NO & 1 NC	3RH1921-1DA11				
2 NC	3RH1921-1EA02				
	14, 17, 18, 22, 25, 26, 40, 43	7, 8	1 NO & 1 NC (Inside L or R)	49CAL18-11	
			1 NO & 1 NC (Outside L or R)	49CAL18-11B	
	LC	30	1 NO/NC	49LCAC1PA	
			2 NO/NC	49LCAC2PA	
	LE	20	Front Mounted 1 NO/NC	3RH2911-1HA11	
		30	Side Mounted 1 NO/NC	3RH2911-1DA11	
		60-400	Side Mounted 1 NO/NC	3RH1921-1EA11	
	CLM, CMN, CMF, CMB	20 Amps	1 NO/NC SPDT	CLM4097291	
			2 NO/NC SPDT	CLM4097292	
		30-200 Amps	1 NO & 1 NC	CLMFCAK11	
			2 NC	CLMFCAK02	
			2 NO	CLMFCAK20	
		300-400 Amps	1 Coil Clearing NO & NC	CLMFCCK11	
			1 NO & 1 NC	CLMHCAK11	
			2 NC	CLMHCAK02	
			2 NO	CLMHCAK20	
			1 Coil Clearing NO & NC	CLMHCCK11	

### Disconnect Auxiliary Switch Kits

Description	Class	Disconnect Amp or CB Rating	Type	Catalog Number	List Price \$
Non-fusible or Fusible Type 	17, 25, 32, 37, 83, 84, 87, 88, LED, LEF, CMN, CMF	30 - 200A	2 NO/2 NC DPDT (NEMA A600)	HA261234	
MCP 	18, 26, 32, 37, 83, 84, 87, 88, LEB, CMB	3A-125A	1 NO/1 NC 240V	A02ED62	
		250A	1 NO/1 NC 480V	A02FD64	
		400A-600A	(2) 1 NO/1 NC SPDT-480V	A02JLD64	

### Control Power Transformer Kits<sup>①③</sup>

Description	Recommended Transformer Size		VA Rating	Catalog Number	List Price \$	Transformer Table			
	Control Size	Transformer VA				Primary Volts	Secondary Volts	Code	
 Transformer 50/60HZ	00-2½	45 or 50 <sup>②</sup>	45 VA	KT*050 <sup>②③</sup>		120	24	1	
	3-3½	75	50 VA	KT*050P <sup>③</sup>		208	24	G	
	4	150	100 VA	KT*100		208	120	H	
	5-6	150	150 VA	KT*150		240/480	24	4	
	7-8	300	200 VA	KT*200		240/480	120	8	
	Lighting Control			300 VA		KT*300	277	24	5
		CLM	20A, 2 - 12P	150		Replace * with code from Transformer table. Kits used with NEMA 1 general purpose lift-off cover type require extra wide enclosure. Class 14 Sizes 0-2½ Class 30 (2S2W) Sizes 0-2½ Class 30 (2S1W) Sizes 0-1½	277	120	7
			30A, 3P	100			600	24	6
	30A, 6 - 12P		200	600			120	9	
	LC & LE	LC 30A, 2-12P	100						
		LE 20, 30, 60A, 3 & 4P	45						
		LE 30A, 6P	45						
		LE 30A, 9-12P	100						
		LE 60A, 6-12P	150						
		LE 100, 200A, 3P	100						
LE 300, 400A, 3P		150							

① Installation of CPTs may require a larger enclosure.  
② 45VA transformer kits will include secondary but not primary fusing. Sizes 50VA and higher include



2-pole primary fusing and 1-pole secondary fusing.

③ For 24VAC control a minimum of 100VA CPT is required.

# ESP200 Accessories

## Selection

### Accessories

Description		Catalog Number	List Price \$
	ESP200 Tamper Resistance Cover	<b>49ASTC1</b> <b>3UB89848</b>	
	ESP100/200 Mounting Plate	<b>Frame Size</b>	<b>Controller Size</b>
		A or A1	00 - 1 3/4
		B	2 -2 1/2
B	3-4	<b>49ASMP1</b>	
B	3-4	<b>49ASMP2</b>	
B	3-4	<b>49ASMP3</b>	
	Mounting Kit	<b>49ASMS1</b>	
	Universal Reset Operator 8" for class 36, 37 and 87 in NEMA 1, 12 and 3/3R	<b>49MARB</b>	
	Overload Relay Reset Operator for Class 14, 22, 30 and 83 non-combination starters in NEMA type 1, 12 and 4/4X enclosures	<b>49MBRS</b>	
	Overload Relay Reset Operator for Class 17, 18, 25, 26, 32 and 84 combination starters in NEMA type 1 enclosures	<b>49MBRS1</b>	
	Overload Relay Reset Operator for Class 17, 18, 25, 26, 32 and 84 combination starters in NEMA type 12 and 4/4X enclosures	<b>49MBRS2</b>	
	Overload Relay Reset Operator with red button for any Class in NEMA type 1, 3R, 4/4X and 12 enclosures with a 30mm hole	<b>49MARSR</b>	
	ESP200 Reset Extender	<b>49ASRE</b>	
	Protective Boot Offers protection from ice and foreign substances from interfering with button operation. For use with 49MARSR reset.	<b>52AABA</b>	
	Current Transformer 300:5 use with <b>3UB81234JW2</b>	<b>97CT005</b>	
	Current Transformer 400:5 use with <b>3UB81234KW2</b>	<b>97CT006</b>	
	Current Transformer 600:5 use with <b>3UB81234LW2</b>	<b>97CT008</b>	
	Current Transformer 750:5 use with <b>3UB81234MW2</b>	<b>97CT009</b>	
	Current Transformer 1200:5 use with <b>3UB81234NW2</b>	<b>97CT012</b>	

## Miscellaneous Kits

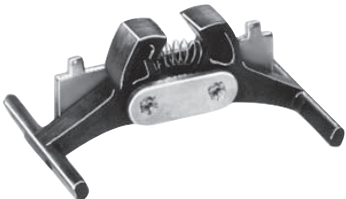




Description	Class	Encl. Type	Controller Size	Catalog Number	List Price \$								
 <p>Mechanical Interlock for Horizontally Mounted Contactors</p>	Includes wire	14, 40	Open	00-1 1 1/4 2, 2 1/2 3, 3 1/2 4	49CCF22H 49EEF22H 49GGF22H 49HHP22H 49JG22H								
	Interlock Only	14, 40	Open	5, 6	3RA1954-2A								
	Wire Kit Only			5 6	3RA1963-2A 3RA1973-2A								
	Base Plate Only	14, 40	Open	5 6	3RA1962-2A 3RA1972-2A								
	Mechanical Interlock			7 8	49VM750H 49VM1650H								
	Includes wire & mounting plate	14, 40	Open	00-1 1 1/4 2, 2 1/2 3, 3 1/2 4	49CCF22HP 49EEF22HP 49GGF22HP 49HHP22HP 49JG22HP								
Includes mounting plate (Different Frame Sizes)	14, 40	Open	Left 2, 2 1/2 3, 3 1/2	Right 3, 3 1/2 2, 2 1/2	49L107944 49L107945								
 <p>Surge Suppressor</p>	Surge Suppressor for 120V AC coil. Limits transient voltage produced by the coil to 220% maximum peak line volts.	All but Class LC, LE, CLM	All	00-4 <sup>①</sup>	49D26344								
 <p>Auxiliary Power Pole</p>	NO 36A at 600V AC Max NC 25A at 600V AC Max	All but Class LC, LE, CLM	All	00-1 1/4	49SAF0 49SAFC								
 <p>Main Contacts Lighting Contactors</p>	Top or Bottom, 2-Pole Top, 3-Pole Top or Bottom, 4-Pole Top or Bottom, 6-Pole	CLM	All	20 Amps	CLM4097331 CLM4097332 CLM4097333 CLM4097334								
 <p>Load Side Power Take Off Kit</p>	Includes 3 power lugs for making extra connections to the load side of the contactor	All but Class LC, LE, CLM	All	00-1 1/4	49SAE								
 <p>Lug Kit for Contactors</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Wire Range</th> </tr> </thead> <tbody> <tr> <td>49SAAF</td> <td>2-14</td> </tr> <tr> <td>49SAAH</td> <td>2/0-14</td> </tr> <tr> <td>75D35994001</td> <td>250MCM-6</td> </tr> </tbody> </table>	Item	Wire Range	49SAAF	2-14	49SAAH	2/0-14	75D35994001	250MCM-6	For AL/CU Wire	14, 40	All	2-2 1/2 3-3 1/2 4 Line 4 Load	49SAAF <sup>③</sup> 49SAAH <sup>③</sup> 75D35994002 <sup>③</sup>
	Item	Wire Range											
	49SAAF	2-14											
49SAAH	2/0-14												
75D35994001	250MCM-6												
For AL/CU Wire	14, 40	All	5, 6	3RT1966-4G <sup>②</sup>									
Use CU Only	14, 40	All	7 8	49ZATK750-3 <sup>②</sup> 49ZATK1650-6 <sup>②</sup>									
 <p>Three Conductor Ground Lug Kit Meets UL 508 and CSA Standard 22.2 No 14-1973</p>	2-14 AWG AL/CU Wire	All	All	All	75D28182001								
 <p>Lightning Arrestor</p>		All	All	All	49D45584002								
 <p>Backspin Timer</p>	On delay timer that reduces risk of starting into a backspin	87, 88	All	All	3RP2025-1AQ30 3RP2025-1AP30								
 <p>Hole Plug</p>	Covers the hole that is typically used for the conduit hub	87	All	1-4	49D41149006								
 <p>Hole Plug</p>	Covers the hole in the enclosure door/cover normally filled by overload reset 49MBRS. Hole plug is used for enclosed contactors.	40, 43, LC, LE, CLM & CM	1	All	49MZPB2								

Illustration	Description	Contactors	Wire Size	Catalog Number	List Price \$
 <p><b>3RT1966-4G</b></p>	<p><b>Lug Kit</b></p> <p>1 Kit = 1 Terminal block. 1 kit necessary for each line and load.</p>	<p>NEMA size 4 (Vacuum)</p> <p>NEMA size 5</p> <p>NEMA size 6</p>	<p>2/0 to 600 MCM, max. one 500MCM &amp; one 600MCM</p>	3RT1966-4G	

① Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil. For size 4 panel mount.

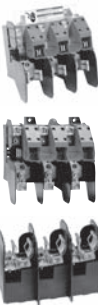




② Only 3 lugs are supplied for line or load. If lugs for line and load are required order 2 kits.

③ Lug Kit for contactors include 3 lugs for line or load. 75D35994001 for line side. 75D35994002 for load side.


# NEMA Accessories

## Selection


### Fused and Non-Fused Disconnect Switch Kits<sup>②</sup>

	Basic Switch Ampere Rating	Switch Catalog Number Non-Fused	List Price \$	Switch Catalog Number Fused	List Price \$	Kit Description	Load Base Catalog Number Class J	List Price \$	Load Base Catalog Number Class H <sup>③</sup>	List Price \$	Lug Wire Size
	30	HNB612		HFB21		30A, 250V	—	—	HBB21		#14-2 AWG (Cu/Al)
				HFB612		30A, 600V	HBB612		HBB612		
	60	HNB623		HFB22		60A, 250V	—	—	HBB22		#14-2 AWG (Cu/Al)
				HFB62		60A, 600V	HBB62		HBB62		
	100	HNB623		HFB63		100A, 250V	—	—	HBB63		#14-1/0 AWG (Cu/Al)
						100A, 600V	HBB63				
	200	HNB64		HFB64		200A, 250V	—	—	HBB64		#6-300 AWG (Cu/Al)
						200A, 600V	HBB64				


### Class R Fuse Conversion Kits

	Catalog Number	Description	List Price \$
	HR21	30A, 240V	
	HR612	30A, 600V	
	HR612	60A, 240V	
	HR62	60A, 600V	
	HR63	100A, 240/600V	
	HR64	200A, 240/600V	

### Hazardous Location Accessories For Enclosure Types 7 & 9

		Description	Conduit Size Inches	Catalog Number	List Price \$
<b>Breather/Drain</b>		Install in bottom as drain. Install in top as breather. Suitable for Class I groups C & D and for Class II groups F & G applications only, for 1/2" NPT.		<b>51AADB</b>	

### Metal Conduit Hubs

Description	Conduit Size	Class	Controller Size	Enclosure Type	Milbank Catalog No. <sup>④</sup>
	1"	87	All	3R	A7514
	1 1/2"				A7516
	2"				A7517
	2 1/2"				A7518

① Product Category: PILO.  
② Product Category: HDSS.



③ For Class R fuses order Class H kit from this table and the Class R conversion kit.

④ Milbank catalog numbers are for reference only. Milbank conduit hubs are not sold by Siemens but can be purchased at a typical electrical hardware and supply distributor.

# NEMA, Overload Relays

## Selection

### Sirius 3RB20

Illustration	Description	For Overload Type	Catalog Number	List Price \$	
 Reset plunger with reset button   Flexible reset	<b>Reset mechanisms</b>				
	<b>Reset plunger</b> Mounts directly to overload relay. Requires separate reset operator in enclosure door. Kit includes reset plunger, holder and funnel.	3RB206	3RU1900-1A		
	<b>Flexible cable reset mechanism</b> Requires a 6.5 mm hole in the enclosure with a maximum enclosure thickness of 8 mm.	Cable length 15.75 in (400mm)	3RB206	3RU1900-1B	
		Cable length 23.62 in (600mm)		3RU1900-1C	
<b>Covers</b> Tamper resistant cover for current setting and manual/automatic reset button.	3RB206	3RB2984-0			






### Competitive Retrofit Overload Plates

Manufacturer	NEMA Size	Plate Part Number	List Price \$
A-B	0, 1	49D57090	
A-B	2	49D57161	
Sq. D	0, 1	49D57091	



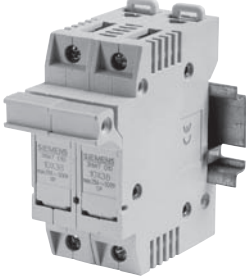


### Electronic Coil System with Remaining Lifetime Indication and 24VDC PLC Output

Class	Size	Model Type	21 - 27V		96 - 127V		200 - 277V	
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
All	5	P	–	–	3RT1965-5PF31		3RT1965-5PP31	
		V	–	–	3RT1966-5PF31		3RT1966-5PP31	
	6	P	–	–	3RT1975-5PF31		3RT1975-5PP31	
		V	–	–	3RT1976-5PF31		3RT1976-5PP31	

### Fuse Blocks, Touch-Safe Terminal Covers

Catalog Number	Description	List Price \$
<b>KCCF1G</b>	SECONDARY FUSE BLOCK, 1P, 250V MAX	
 <b>KCCFBCK</b>	SINGLE POLE FUSE BLOCK COVER KIT	
 <b>KCCFP2RG</b>	2 Pole PRIMARY FUSE BLOCK, 2P, 600V MAX (block only)	
 <b>KCCFPX2R</b>	2 Pole PRIMARY FUSE BLOCK KIT with wire Leads	
<b>US2:49FCCPT</b>	Secondary Fuse Clips, 2 per pack	
<b>US2:49JUCPT</b>	Terminal Jumpers	
 <b>US2:KCCSECFVR</b>	Terminal touchsafe cover Secondary Side: VAs 45 thru 350	
 <b>US2:KCCSECFVR2</b>	Terminal touchsafe cover Secondary Side: VAs 500 thru 2K	
<b>US2:KCCFP3POLE</b>	3 pole fuse blk (2 pole primary and 1 pole secondary)	

### International Fusing<sup>Ⓞ</sup>

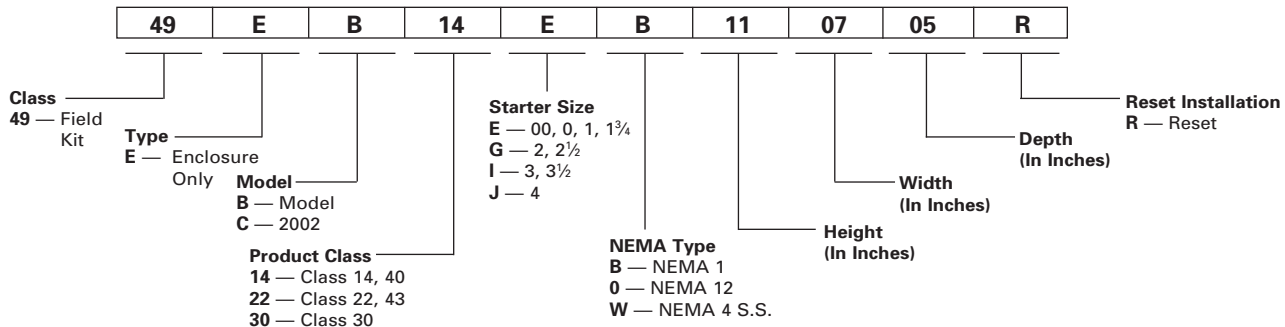
Catalog Number	Description	List Price \$
 <b>8WA1011-1SF12</b>	1-Pole Fuse Block, Touch-Safe. Up to 6.3A for 5 mm × 20 mm or 5 mm × 25 mm (Requires DIN Rail Mounting)	
 <b>3NW7013</b>	1-Pole Fuse Block, Touch-Safe 32A, for 10 × 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 <b>3NW7023</b>	2-Pole Fuse Block, Touch-Safe 32A, for 10 × 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 <b>3NW7111</b>	1-Pole Fuse Block, Touch-Safe 4-50A, for 14 × 51 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 <b>8WA1815</b>	Fuse Block DIN Rail Mounting for separate screw mounting to panel. (Max 2-pole 2-25A size per rail.) (Max 1-pole 4-50A size per rail.)	

<sup>Ⓞ</sup> Product Category: IEC.



# Non-Combination Enclosure Kits, Class 49

## Selection



### Non-Reversing Starters & Contactors Class 14, 40

Size	NEMA 1 General Purpose (Clamshell) <sup>②④</sup>					NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight, Corrosion Resistant <sup>③⑥</sup>					NEMA 12/3/3R <sup>①</sup> Industrial Use, Weatherproof <sup>③⑤</sup>							
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)					
	Model C Enclosure		Model C Enclosure		Max CPT VA	List Price \$	Model B Enclosure		Model B Enclosure		Max CPT VA	List Price \$	Model B Enclosure		Model B Enclosure		Max CPT VA	List Price \$
	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$
00-1 1/4	49EC14EB110705R		49EC14IB201208R	200		49EB14EW130806R		49EB22EW131306R				49EB14E0130806R		49EB22E0131306R				
2, 2 1/2	49EC14GB140807R		49EC14IB201208R	200		49EB14GW160907R		49EB22GW161406R				49EB14G0160907R		49EB22G0161406R				
3, 3 1/2	49EC14IB201208R		49EC14IB201208R	100		49EB14JW261408R		49EB14JW261408R				49EB14J0261408R		49EB14J0261408R				
3, 3 1/2	—	—	49EC14JB251409R	250	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	49EC14JB251409R		49EC14JB251409R	300		49EB14JW261408R		49EB22JW302410R				49EB14J0261408R		49EB22J0302410R				

### Reversing Starters & Reversing Contactors Class 22, 43

Size	NEMA 1 General Purpose (Clamshell) <sup>②④</sup>					NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight, Corrosion Resistant <sup>③⑥</sup>					NEMA 12/3/3R <sup>①</sup> Industrial Use, Weatherproof <sup>③⑤</sup>							
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)					
	Model C Enclosure		Model C Enclosure		Max CPT VA	List Price \$	Model B Enclosure		Model B Enclosure		Max CPT VA	List Price \$	Model B Enclosure		Model B Enclosure		Max CPT VA	List Price \$
	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$
00-1 1/4	49EC14IB201208R		49EC14IB201208R	200		49EB22EW131306R		49EB22EW131306R				49EB22E0131306R		49EB22E0131306R				
2, 2 1/2	49EC14IB201208R		49EC14IB201208R	200		49EB22GW161406R		49EB22GW161406R				49EB22G0161406R		49EB22G0161406R				
3, 3 1/2	49EC14JB251409R		49EC14JB251409R	250		49EB22JW261808R		49EB22JW302410R				49EB22I0261808R		49EB22J0302410R				
4	49EC14JB251409R		49EC14JB251409R	300		49EB22JW302410R		49EB22JW302410R				49EB22J0302410R		49EB22J0302410R				

### Two-Speed Two-Winding Starters Class 30

Size	NEMA 1 General Purpose (Clamshell) <sup>②④</sup>					NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight, Corrosion Resistant <sup>③⑥</sup>					NEMA 12/3/3R <sup>①</sup> Industrial Use, Weatherproof <sup>③⑤</sup>							
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)					
	Model C Enclosure		Model C Enclosure		Max CPT VA	List Price \$	Model B Enclosure		Model B Enclosure		Max CPT VA	List Price \$	Model B Enclosure		Model B Enclosure		Max CPT VA	List Price \$
	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$
0-1 1/4	49EC14IB201208R <sup>②</sup>		49EC14JB251409R <sup>②</sup>	200		49EB30EW131306R		49EB30GW161808R				49EB30E0131306R		49EB30G0161808R				
2, 2 1/2	49EC14IB201208R <sup>②</sup>		49EC14JB251409R <sup>②</sup>	200		49EB30GW161406R		49EB30GW161808R				49EB30G0161406R		49EB30G0161808R				
3, 3 1/2	49EC14JB251409R <sup>②</sup>		49EB22JB302410R <sup>③</sup>	300		49EB30IW261808R		49EB22JW302410R				49EB30I0261808R		49EB22J0302410R				
4	49EC14JB251409R <sup>②</sup>		49EB22JB302410R <sup>③</sup>	300		49EB22JW302410R		49EB22JW302410R				49EB22J0302410R		49EB22J0302410R				

### Two-Speed One-Winding Starters Class 30

Size	NEMA 1 General Purpose (Clamshell) <sup>②④</sup>					NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight, Corrosion Resistant <sup>③⑥</sup>					NEMA 12/3/3R <sup>①</sup> Industrial Use, Weatherproof <sup>③⑤</sup>							
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)					
	Model C Enclosure		Model C Enclosure		Max CPT VA	List Price \$	Model B Enclosure		Model B Enclosure		Max CPT VA	List Price \$	Model B Enclosure		Model B Enclosure		Max CPT VA	List Price \$
	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$	Catalog Number	List Price \$	Catalog Number	Catalog Number	VA	Price \$
0-1 1/4	49EC14IB201208R <sup>②</sup>		49EC14JB251409R <sup>②</sup>	200		49EB30EW131306R		49EB30GW161808R				49EB30E0131306R		49EB30G0161808R				
2, 2 1/2	49EB30GB161808R <sup>③</sup>		49EB22JB302410R <sup>③</sup>	300		49EB30GW161808R		49EB22IW261808R				49EB30G0161808R		49EB22I0261808R				
3, 3 1/2	49EB30IB192208R <sup>③</sup>		49EB22JB302410R <sup>③</sup>	300		49EB22JW302410R		49EB22JW302410R				49EB22J0302410R		49EB22J0302410R				
4	49EB22JB302410R <sup>③</sup>		49EB22JB302410R <sup>③</sup>	300		49EB22JW302410R		49EB22JW302410R				49EB22J0302410R		49EB22J0302410R				

**Note:** Dimensions...See appropriate Product Class Outline Drawing beginning on page 9/157.

① For conduit hubs and conversion instructions, see page 9/110.

② Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 9/104.

③ Hinged cover enclosures, except for 49EB14E0130806R, are suitable for one or more class 52 operating devices and one or more class 52 pilot lights. See Field Mods page 9/100.

④ Install NEMA 1 hole plug cat. no. 3SB1902-0AR (included) when the cover OL reset is not needed.

⑤ Install NEMA 12 hole plug cat. no. 52ABH6 (not included) when the cover OL reset is not needed.

⑥ Install NEMA 4X stainless steel hole plug cat. no. 52ABHS (not included) when the cover OL reset is not needed.

# Lighting Enclosure Tables

## Selection

### Lighting Contactors Class LC and LE

Contactor	Type 1 <sup>1)</sup>			Type 4/4X Stainless Steel <sup>2)</sup>			Type 3/3R/12 <sup>3)</sup>		
	Without CPT	With CPT	Max.	Without CPT	With CPT	Max.	Without CPT	With CPT	Max.
	Catalog Number	Catalog Number	CPT VA	Catalog Number	Catalog Number	CPT VA	Catalog Number	Catalog Number	CPT VA
LC 30A 2-12P	49EC14GB140807R	49EC14IB201208R	200	49EB22GW161406R	49EB30GW161808		49EB22G0161406R	49EB30G0B161808	
LE 20, 30A 3-4P	49EC14EB110705R	49EC14IB201208R	200	49EB22GW161406R	49EB22GW161406R		49EB22G0161406R	49EB22G0161406R	
LE 30A 6-9P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 30A 12P	49EC14IB201208R	49EC14JB251409R	250	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 60A 3P	49EC14GB140807R	49EC14IB201208R	200	49EB22GW161406R	49EB22GW161406R		49EB22G0161406R	49EB22G0161406R	
LE 60A 6-9P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 60A 12P	49EC14IB201208R	49EC14IB201209R	250	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 100A 3P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	

### Lighting & Heating Contactors Class CLM

Size	Pole	NEMA 1 General Purpose (Clamshell) <sup>2)4)</sup>					NEMA 4/4X Stainless <sup>1)</sup> Watertight, Corrosion Resistant <sup>3)4)</sup>					NEMA 12/3/3R <sup>1)</sup> Industrial Use <sup>3)5)</sup>				
		Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
		Model C/B Enclosure	List Price \$	Model C/B Enclosure	Max CPT	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT	List Price \$
		Catalog Number		Catalog Number			Catalog Number		Catalog Number			Catalog Number		Catalog Number		
20A	2-12	49EC14GB140807R		49EC14IB201208R	200VA		49EB22GW161406R		49EB22GW161406R	—		49EB22G0161406R		49EB22G0161406R	—	
30A	2-5	49EC14EB110705R		49EC14IB201208R	200VA		49EB22GW161406R		49EB22GW161406R	—		49EB22G0161406R		49EB22G0161406R	—	
30A	6-12	49EB30GB161808R		49EB30GB161808R	200VA		49ECLXXW161406		49EB30GW161808R	—		49ECLXX0161406		49EB30G0161808R	—	
60A	2-5	49EC14GB140807R		49EC14IB201208R	200VA		—	—	—	—		—	—	—	—	
60A	6-12	49EB30IB192208R		49EB30IB192208R	250VA		—	—	—	—		—	—	—	—	
100A	2-5	49EC14IB201208R		49EC14IB201208R	200VA		—	—	—	—		—	—	—	—	

**Note:** Dimensions...See appropriate Product Class Outline Drawing on page 9/170.

- ① For conduit hubs and conversion instructions, see page 9/110.
- ② Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 9/104.

- ③ Hinged cover enclosure suitable for one or more class 52 operating devices and one or more class 52 pilot lights. See Field Mods page 9/104.
- ④ Install NEMA 1 hole plug cat. no. **3SB1902-0AR** (included) when the cover OL reset is not needed.
- ⑤ Install NEMA 12 hole plug cat. no. **52ABH6** (not included) when the cover OL reset is not needed.

- ⑥ Install NEMA 4X stainless steel hole plug cat. no. **52ABHS** (not included) when the cover OL reset is not needed.

# Features and Benefits

## Features

- Manufactured with a cold forming “TOX” process
- 100kA short circuit rating when protected with class R fuses to 600V or MCP to 480V and when installing listed components from the instruction guide
- Enclosure types available, Nema 1, 12, 3/3R and painted NEMA 4. Nema 12 field convertible to 3/3R/4 with the appropriate conduit hub and drain hole
- Pre-Drilled mounting panels
- Heavy duty quarter turns
- Industrial type disconnect handle

### Disconnect Type Enclosure Kit

- Used to assemble both non-fusible and fusible combination starters
- Accommodates Class 14 full voltage non-reversing (FVNR) NEMA starters 00 – 4 including Siemens exclusive half sizes
- Handle mechanism, power wire, mounting panel, reset assembly, and instruction guide included. Hardware for panel mounted devices and disconnect switch are not included

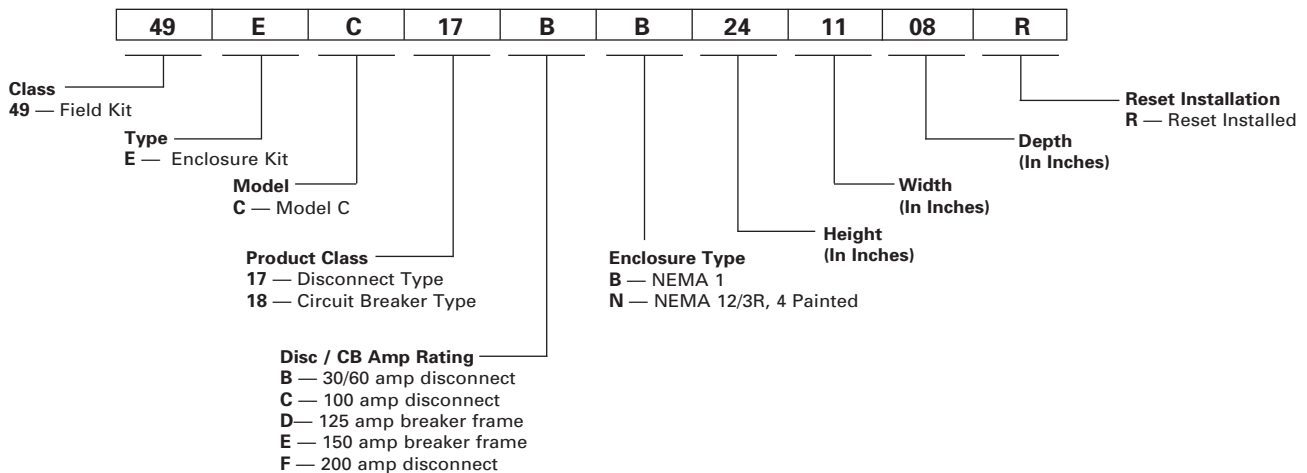
### MCP Type Enclosure Kit

- Used to assemble combination starters with circuit breakers
- Accommodates Class 14 full voltage non-reversing (FVRN) NEMA starters 00 – 4 including Siemens exclusive half sizes
- Handle mechanism, power wire, mounting panel, reset assembly and instruction guide included. Circuit breaker not included however, mounting hardware for the circuit breaker is

### How to Select the Required Kits to Assemble a Combination Starter

1. From the catalog, select a class 14 open type starter with the required starter size and overload relay type.
2. Based on the starter size, select the enclosure kit from table 1a for fusible or non-fusible combination starters or select from table 1b for combination starters with an MCP.
3. For a non-fusible combination starter, select the disconnect switch kit from table 2a. For a fusible combination starter, select the appropriate disconnect switch, fuse clip kit, and class R rejection kit from table 2b (for H fusing, class R rejection kit not required). For combination starters with MCP, select the appropriate circuit breaker kit from table 3.

## Nomenclature for Combination Enclosure Kits



Selection

Table 1a - FVNR Combination Starter Kits for use with Disconnect Devices

Starter Size	Disc. Amp Rating	NEMA 1 General Purpose		NEMA 12, 3/3R, 4 Painted <sup>①</sup> Industrial Use, Weatherproof, Watertight, Dust-tight		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
0 - 2	60	49EC17BB241108R		49EC17BN241108R		49EC17BW241108R	
2 ½ - 3	100	49EC17CB242008R		49EC17CN242008R		49EC17CW242008R	
3 ½ - 4	200	49EC17FB362408R		49EC17FN362408R		49EC17FW362408R	

Table 1b. – FVNR Combination Starter Kits for use with MCP Devices

Starter Size	Max MCP Amps	NEMA 1 General Purpose		NEMA 12, 3/3R, 4 Painted <sup>①</sup> Industrial Use, Weatherproof, Watertight, Dust-tight		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
0 - 2	50	49EC18DB241108R		49EC18DN241108R		49EC18DW241108R	
2 ½ - 3	125	49EC18DB242008R		49EC18DN242008R		49EC18DW242008R	
3 ½	125	49EC18DB362408R		49EC18DN362408R		49EC18DW362408R	
4	150	49EC18EB362408R		49EC18EN362408R		49EC18EW362408R	

Table 2a – Non-Fusible Disconnect Kits

Disconnect Switch		
Switch Rating	Catalog Number	List Price \$
30A	HNB612	
60A	HNB623	
100A	HNB623	
200A	HNB64	



Table 2b – Fusible Disconnect Kits

Fuse Clip Ratings	Class	Disconnect Switch		Load Base for Fuse		Rejection Clips for Class R Fusing	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
30A-250V	H	HFB21		HBB21		HR21	
30A-600V	H	HFB612		HBB612		HR612	
60A-250V	H	HFB22		HBB22		HR612	
60A-600V	H	HFB62		HBB62		HR62	
100A-250V	H	HFB63		HBB63		HR63	
100A-600V	H	HFB63		HBB63		HR63	
200A-250V	H	HFB64		HBB64		HR64	
200A-600V	H	HFB64		HBB64		HR64	


Table 3 – Circuit Breaker Kits

Starter Size	MCP Type Used with Solid State Overload Relay			MCP Type Used with Thermal Overload Relay	
	Overload Amp Range	Motor Circuit Interrupter Amps	Circuit Breaker Kit	Motor Circuit Interrupter Amps	Circuit Breaker Kit
0	0.75-3.4	3	ED63A003	3	ED63A003
	3-12	10	ED63A010	10	ED63A010
	5.5-22	25	ED63A025	25	ED63A025
1	0.75-3.4	3	ED63A003	3	ED63A003
	3-12	10	ED63A010	10	ED63A010
	5.5-22	25	ED63A025	25	ED63A025
	10-40	30	ED63A030	30	ED63A030
1 ½	10-40	40	ED63A040	40	ED63A040
2	13-52	50	ED63A050	50	ED63A050
2 ½	25-100	100	ED63A100	100	ED63A100
3	25-100	100	ED63A100	100	ED63A100
3 ½	50-200	125	ED63A125	125	ED63A125
4	50-200	150	FXD63A150L	150	FXD63A150L

① For conduit hubs and conversion instructions, see page 9/110.

# Class 87 Pump Panel Enclosure Kits

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Refer to Class 87 section of catalog for pump panel ratings and other details.</li> <li>▶ Handle mechanism, power wire, mounting panel, reset assembly and instruction guide are included with the enclosure kit.</li> </ul>	<b>Coil Table</b>																		
		<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A<sup>①</sup></td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>220–240/440–480</td><td>C<sup>①</sup></td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>550–600</td><td>E</td></tr> </tbody> </table>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A <sup>①</sup>	200–208	D	220–240	G	220–240/440–480	C <sup>①</sup>	277	L	440–480	H
60Hz Voltage	Letter																			
24	J																			
120	F																			
110–120/220–240	A <sup>①</sup>																			
200–208	D																			
220–240	G																			
220–240/440–480	C <sup>①</sup>																			
277	L																			
440–480	H																			
550–600	E																			


### Pump Panels with Solid-State Overload Relay Class 87

To Field Assemble This Pump Panel:	Order these components						Enclosure List Price \$
	Enclosure Catalog Number	Starter with Solid-State Overload Relay	Disconnect Switch	Fuse Load Base	Class R Rejection Clips	Motor Circuit Interrupter	
87DUB6F*	49EB87GF242008	14DUB32A*	HFB612	HBB612	HR612	—	
87DUC6F*	49EB87GF242008	14DUC32A*	HFB612	HBB612	HR612	—	
87DUD6F*	49EB87GF242008	14DUD32A*	HFB612	HBB612	HR612	—	
87DUD60*	49EB87GF242008	14DUD32A*	HFB62	HBB62	HR62	—	
87EUE6F*	49EB87GF242008	14EUE32A*	HFB612	HBB612	HR612	—	
87EUE60*	49EB87GF242008	14EUE32A*	HFB62	HBB62	HR62	—	
87FUF6F*	49EB87GF242008	14FUF32A*	HFB62	HBB62	HR62	—	
87FUF60*	49EB87GF242008	14FUF32A*	HFB63	HBB63	HR63	—	
87GUG6F*	49EB87GF242008	14GUG32A*	HFB62	HBB62	HR62	—	
87GUG60*	49EB87GF242008	14GUG32A*	HFB63	HBB63	HR63	—	
87HUG6F*	49EB87JF362408	14HUG32A*	HFB63	HBB63	HR63	—	
87HUG60*	49EB87JM362408	14HUG32A*	MCS620R	FCK620	SSRK34	—	
87IUH6F*	49EB87JM362408	14IUH32A*	MCS620R	FCK620	SSRK34	—	
87JUH6F*	49EB87JM362408	14JUH32A*	MCS620R	FCK620	SSRK34	—	
87DUC6L*	49EB87GF242008	14DUC32A*	HFB21	HBB21	HR21	—	
87DUD6L*	49EB87GF242008	14DUD32A*	HFB21	HBB21	HR21	—	
87DUE6L*	49EB87GF242008	14DUE32A*	HFB21	HBB21	HR21	—	
87DUE6P*	49EB87GF242008	14DUE32A*	HFB22	HBB22	HR612	—	
87EUE6L*	49EB87GF242008	14EUE32A*	HFB22	HBB22	HR612	—	
87FUF6L*	49EB87GF242008	14FUF32A*	HFB22	HBB22	HR612	—	
87FUF6P*	49EB87GF242008	14FUF32A*	HFB63	HBB63	HR63	—	
87GUG6L*	49EB87GF242008	14GUG32A*	HFB22	HBB22	HR612	—	
87GUG6P*	49EB87GF242008	14GUG32A*	HFB63	HBB63	HR63	—	
87HUG6L*	49EB87JF362408	14HUG32A*	HFB63	HBB63	HR63	—	
87HUG6P*	49EB87JM362408	14HUG32A*	MCS620R	FCK620	SSRK34	—	
87IUH6L*	49EB87JM362408	14IUH32A*	MCS620R	FCK620	SSRK34	—	
87JUH6L*	49EB87JM362408	14JUH32A*	MCS620R	FCK620	SSRK34	—	
87DUB6M*	49EB87GB242008	14DUB32A*	—	—	—	ED63A003	
87DUC6M*	49EB87GB242008	14DUC32A*	—	—	—	ED63A010	
87DUD6M*	49EB87GB242008	14DUD32A*	—	—	—	ED63A025	
87DUE6M*	49EB87GB242008	14DUE32A*	—	—	—	ED63A030	
87EUE6M*	49EB87GB242008	14EUE32A*	—	—	—	ED63A040	
87FUF6M*	49EB87GB242008	14FUF32A*	—	—	—	ED63A050	
87GUG6M*	49EB87GB242008	14GUG32A*	—	—	—	ED63A100	
87HUG6M*	49EB87IB362408	14HUG32A*	—	—	—	ED63A100	
87IUH6M*	49EB87IB362408	14IUH32A*	—	—	—	ED63A125	
87JUH6M*	49EB87JB362408	14JUH32A*	—	—	—	FXD63A150L	

① Dual voltage coils not available in size 5-8 starters.

# Class 87 Pump Panel Enclosure Kits

## Selection

	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Refer to Class 87 section of catalog for pump panel ratings and other details.</li> <li>▶ Handle mechanism, power wire, mounting panel, reset assembly and instruction guide are included with the enclosure kit.</li> </ul>	<b>Coil Table</b>	
		60Hz Voltage	Letter
		24	J
		120	F
		110–120/220–240	A <sup>①</sup>
		200–208	D
		220–240	G
		220–240/440–480	C <sup>①</sup>
		277	L
		440–480	H
		550–600	E

### Pump Panels with Bimetal Overload Relay Class 87

To Field Assemble This Pump Panel:	Order these components						Enclosure List Price \$
	Enclosure Catalog Number	Starter with Bimetal Overload Relay	Disconnect Switch	Fuse Load Base	Class R Rejection Clips	Motor Circuit Interrupter	
87DAE6F*	49EB87GF242008	14DP32A*81	HFB612	HBB612	HR612	—	
87DAE60*	49EB87GF242008	14DP32A*81	HFB62	HBB62	HR62	—	
87EAF6F*	49EB87GF242008	14EP32A*81	HFB612	HBB612	HR612	—	
87EAF60*	49EB87GF242008	14EP32A*81	HFB62	HBB62	HR62	—	
87FAJ6F*	49EB87GF242008	14FP32A*81	HFB62	HBB62	HR62	—	
87FAJ60*	49EB87GF242008	14FP32A*81	HFB63	HBB63	HR63	—	
87GAK6F*	49EB87GF242008	14GP32A*81	HFB62	HBB62	HR62	—	
87GAK60*	49EB87GF242008	14GP32A*81	HFB63	HBB63	HR63	—	
87HAN6F*	49EB87JF362408	14HP32A*81	HFB63	HBB63	HR63	—	
87HAN60*	49EB87JM362408	14HP32A*81	MCS620R	FCK620	SSRK34	—	
87IAP6F*	49EB87JM362408	14IP32A*81	MCS620R	FCK620	SSRK34	—	
87JAR6F*	49EB87JM362408	14JG32A*81	MCS620R	FCK620	SSRK34	—	
87DAE6L*	49EB87GF242008	14DP32A*81	HFB21	HBB21	HR21	—	
87DAE6P*	49EB87GF242008	14DP32A*81	HFB22	HBB22	HR612	—	
87EAG6L*	49EB87GF242008	14EP32A*81	HFB22	HBB22	HR612	—	
87FAJ6L*	49EB87GF242008	14FP32A*81	HFB22	HBB22	HR612	—	
87FAJ6P*	49EB87GF242008	14FP32A*81	HFB63	HBB63	HR63	—	
87GAL6L*	49EB87GF242008	14GP32A*81	HFB63	HBB63	HR63	—	
87HAN6L*	49EB87JF362408	14HP32A*81	HFB63	HBB63	HR63	—	
87HAN6P*	49EB87JM362408	14HP32A*81	MCS620R	FCK620	SSRK34	—	
87IAP6L*	49EB87JM362408	14IP32A*81	MCS620R	FCK620	SSRK34	—	
87JAR6L*	49EB87JM362408	14JG32A*81	MCS620R	FCK620	SSRK34	—	
87DAA6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A003	
87DAB6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A010	
87DAD6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A025	
87DAE6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A030	
87EAF6M*	49EB87GB242008	14EP32A*81	—	—	—	ED63A040	
87EAG6M*	49EB87GB242008	14EP32A*81	—	—	—	ED63A050	
87FAH6M*	49EB87GB242008	14FP32A*81	—	—	—	ED63A040	
87FAJ6M*	49EB87GB242008	14FP32A*81	—	—	—	ED63A050	
87GAK6M*	49EB87GB242008	14GP32A*81	—	—	—	ED63A050	
87GAL6M*	49EB87GB242008	14GP32A*81	—	—	—	ED63A100	
87HAN6M*	49EB87IB362408	14HP32A*81	—	—	—	ED63A100	
87IAP6M*	49EB87IB362408	14IP32A*81	—	—	—	ED63A125	
87JAR6M*	49EB87JB362408	14JG32A*81	—	—	—	FXD63A150L	

① Dual voltage coils not available in size 5-8 starters.  
 ② For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

Selection

**Ordering Information**

► All modifications will consist of Siemens standard components as available. Standard equipment dimensions and enclosure construction may not apply when certain modifications and special features are added.

**Pilot Devices**

Description	Modification	Class	Enclosure Type	Modification Code	List Price \$
Push Buttons	Start, Stop	14, 17, 18, 36, 37, 40, 83, 84, CLM, CM, LC, LE	All	A1	Ⓢ
	Forward, Reverse, Stop	22, 25, 26, 43	All	A2	
	High, Low, Stop	30, 32	All		
	E-Stop	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43	All	ES	
Selector Switches	Hand-Off-Auto	14, 17, 18, 36, 37, 40, 83, 84, LC, LE	All	A3	Ⓢ
		CM, CLM	All	A3	
	For 24 volt HOA control, 20 Amp contactor only	CM, CLM	1	EM	
	Off-On	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, CLM, CM, LC, LE	All	A4	Ⓢ
	Auto-Off	14, 17, 18, 40, 83, 84, CM, CLM, LC, LE	All	A6	Ⓢ
	Forward-Off-Reverse	22, 25, 26, 43	All	A5	
	High-Off-Low	30, 32	All		
	Hand-Off-Auto (Keyed)	14, 17, 18, 36, 37, 40, 83, 84, LC, LE, CLM, CM	All	A9	Ⓢ
Auto-Off-Low-High	30, 32	All	A0		

**Pilot Lights**

Class	Enclosure Type	Lens Color →	Red	Green	Red	Green	Red	Green	Amber	White	Red Push-To-Test	Green Push-To-Test	Green Push-To-Test	LED Bulb Upgrade
		Legend→	On For/Rev Low/High	On For/Rev Low/High	Run	Run	Off	Off	OL Tripped	Control Power On	On For/Rev Low/High	On For/Rev Low/High	Off	
		Mod Code →	FA	FB	FC	FD	FJ	FK	FL <sup>④</sup>	FW	FS	FT	FU	FE <sup>①</sup>
14, 40, 17, 18, 36, 37, 87, 88, LC, LE, CLM, CM	All													
22, 25, 26, 30, 32, 43, 83, 84	All				Ⓢ	Ⓢ								

**Coil Options**

Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 <sup>Ⓢ</sup> , 84 <sup>Ⓢ</sup> , 87, 88					
Volts 60 HZ	Volts 50 HZ	Coil Letter Change	Controller Size — List Price \$		
			00-2½	3, 3½	4
24	24	J			
120	110	F			
110-120/220-240	110/190-220	A			
200-208	—	D			
220-240	190-220	G			
277	240	L			
220-240/440-480	190-220/380-440	C			
440-480	380-440	H			
575-600	550	E			
DC Coil <sup>Ⓢ</sup>	24V	S <sup>⑦</sup>			
	48V	U			
	125V	V			
	250V	W			

AC (50-60 HZ) or DC	Coil Letter Change	Controller Size 4 (Vacuum Only) Size 5 & 6 (ALL)
23-26V	J	
42-48V	U	
110-127V	F	
200-220V	D	
220-240V	G	
240-277V	L	
380-420V	K	
440-480V	H	
575-600V	E	

① Pilot lights are transformer type as standard. For LED type bulbs, order suffix FE in addition to the standard device suffix(es). For example, to order red "ON" and green "OFF" pilot lights with LED bulbs, order FA, FK and FE.

② DC coils include 1 NC, late break aux. contact. This aux. contact takes up one side of the starter (00-4 only).

③ Price x 2 for Classes 22, 25, 26, 30, 32, 43, 83, 84.

④ Bimetal OL - Size 00 - 2 1/2 available. Solid-state OL - Size 00 - 4, 7 & 8 available.

⑤ For Class 83, 84 two devices are provided. Price x 2.

⑥ For Class 83, 84 standard enclosure (92) alternating relay available in 24V or 120V control only.

⑦ S coil is not available for size 4 contactors or starters.

⑧ Class 83 and 84 only.



Selection

Ordering Information	Transformer Table		
► Replace (*) with letter from Transformer Table.	Primary Volts	Secondary Volts	Letter
	120	24	B
	208	24	S
	208	120	T
	240	24	J
	240	120	F
	277	24	N
	277	120	P
	380	110	U
	415	100	W
	480	240	R
	480/240	24	D
	480/240	120	A
	600	24	E
600	120	C	

Control Power Transformers<sup>②</sup>

Description	Modification Code	Product Class	Enclosure Type	20-60	100	—	200	300-400	—	—	← Lighting & Heating Ratings (Amps)
				0-2½	3	3½, 4	5	6	7	8	
Standard Capacity <sup>①</sup> with 1-Secondary Fuse	B*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 <sup>③</sup> , 84 <sup>④</sup> , 87, LE	1, 3, 4, 12 7 & 9		—	—	—	—	—	—	
Standard Capacity with 2-Primary and 1-Secondary Fuse	D*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 <sup>③</sup> , 84 <sup>④</sup> , 87, LC, LE, CLM, CM	1, 3, 4, 12 7 & 9								
100VA Extra Capacity with 2-Primary and 1-Secondary Fuse	C*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 <sup>③</sup> , 84 <sup>④</sup> , 87, LC, LE, CLM, CM 36, 37, 88	1, 3, 4, 12 7 & 9 All								
150VA Extra Capacity with 2-Primary and 1-Secondary Fuse	C*1	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 <sup>③</sup> , 84 <sup>④</sup> , 87, LC, LE, CLM, CM 36, 37, 88	1, 3, 4, 12 All								

Factory Assembled Fuse Clips—Class 25, 32, 84<sup>④</sup>

Fuse Clip Amps	Volts	Modification Code	List Price \$
30	250	10	
30	600	11	
60	250	12	
60	600	13	
100	250	14	
100	600	15	
200	250	16	
200	600	17	
400	250	18	
400	600	19	
600	250	20	
600	600	21	
800	600	23	
1200	600	24	
1600	600	25	

**Note:** Factory will furnish the same voltage coils as transformer secondary voltage (except with class 36,37).

① The standard control transformer supplied for starter sizes 0 through 2½ will be rated 45VA and have the appropriate secondary fuse. Primary fuses will not be supplied as standard. For primary fuse option select appropriate suffix from table.

② For 24VAC control a minimum of 100VA CPT required.  
 ③ Price x 2 Class 83 and 84.  
 ④ Class 84 Duplex Controllers require two fusible disconnects thus multiply the price adder by two.

Selection

Additional Auxiliary Contacts

Class	NO Contacts	NC Contacts	Modification Code	Controller Size — List Price \$			
				00-1 <sup>3</sup> / <sub>4</sub>	2-4	5-6	7-8
14, 17, 18, 40, 83 <sup>③</sup> , 84 <sup>③</sup>	—	1	G01			—	—
	—	2	G02			—	—
	1	—	G10			—	—
	1	1	G11			—	—
	1	2	G12			—	—
	2	—	G20			—	—
	2	1	G21			—	—
	2	2	G22			—	—
	2	3	G23			—	—
	3	1	G31			—	—
	3	2	G32			—	—
	3	3	G33		—	—	—
	4	—	G40			—	—
	4	1	G41			—	—
	4	2	G42		—	—	—
	4	4	G44		—	—	—
	5	—	G50			—	—
	5	1	G51			—	—
5	3	G53			—	—	
6	—	G60			—	—	
6	2	G62			—	—	
7	1	G71			—	—	
8	—	G80			—	—	
22, 25, 26, 43 & 30, 32 (2-winding)	—	2	G02 <sup>②</sup>			—	—
	2	—	G20 <sup>②</sup>			—	—
	2	2	G22 <sup>②</sup>			—	—
	4	0	G40 <sup>②</sup>			—	—
	4	4	G44 <sup>②</sup>			—	—
	6	2	G62 <sup>②</sup>			—	—
30, 32 (1-winding)	0	2	G02 <sup>②</sup>	—		—	—
	2	—	G20 <sup>②</sup>	—		—	—
	2	2	G22 <sup>②</sup>	—		—	—
	4	—	G40 <sup>②</sup>	—		—	—
	4	4	G44 <sup>②</sup>	—		—	—
	6	2	G62 <sup>②</sup>	—		—	—
8	—	G80 <sup>②</sup>	—		—	—	
LE, CLM, CM	1	1	G11		—	—	—
LC	0	1	G01				
	1	0	G10				
	1	1	G11				
	0	2	G02				
	2	0	G20				
LE, CLM, CM	0	2	G02 <sup>②</sup>		—	—	—
	2	0	G20 <sup>②</sup>		—	—	—
	2	2	G22 <sup>②</sup>		—	—	—

Description	Class	Modification Code	Controller Size - Price Deduction \$					
			0, 1	1 <sup>3</sup> / <sub>4</sub> - 2 <sup>1</sup> / <sub>2</sub>	3	3 <sup>3</sup> / <sub>4</sub> , 4	5, 6	7, 8
Omit Overload Relay and Reset Button	17, 18, 25, 26	EX1						

① Auxiliary contacts will be added evenly across contactors. (i.e. Class 22, G02 suffix will add 2 NC contacts (one per contactor).

② Double the price addition for Class 30 and 32.

③ For class 83 and 84 contacts will be added to both starters. Price x 2.

Selection

Control Options


Description	Class	Enclosure Type	Modification Code	List Price \$
Lighting Control Modules (does not include pilot devices)	CLM 20 Amp only	All	2W (2-wire control module) 3W (3-wire control module) 3WS (Start/Stop control module)	
Surge Suppression for 120V AC Coil <sup>②</sup>	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 83, 84, 87, 88	All	SS	
Disconnect Switch Interlock 2 NO/2 NC DPDT	17, 25, 32, 37, 84, CM, LE	1, 3, 4, 4X, 12	GY	
Motor Circuit Protector Interlock NO/NC SPDT	18, 26, 32, 37, 84, CM, LE	All	GY	
Lightning Arrestor	All	All	L	
Circuit Breaker Shunt Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L6	
Circuit Breaker Undervoltage Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L7	
Circuit Breaker Alarm Switch Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L8	
Ground Lug – 1 Conductor	All	All	L10	
Control Circuit Fuse and Holder (Transformer Primary Fusing)	All	All	F1 (1 fuse) F2 (2 fuses)	
Control Circuit Circuit Breaker Internally Operated	All	All	F4	
Space Heater (120V separate control)	All	All	SH	
Space Heater with Thermostat (120V separate control)	All	All	ST	
Surge Capacitor	87, 88	All	SC	
Alarm Package (includes horn, light, relay & push-button)	83, 84, 87, 88	All	M7	
Backspin Protection	87, 88	All	T5	
Minimum Run Timer 0.2 sec. - 3 mins.	87, 88	All	T6	
Blown Control Fuse Indicator Light	17, 25, 32, 37, 84, 87, 88, CM, LC, LE	All	L11	
Single Phase 120VAC Combination Starter	17, 18, 25, 26	All	SP1	
Single Phase 240VAC Combination Starter	17, 18, 25, 26	All	SP2	

Reversing Options

Description	Class	Modification Code	Controller Size —List Price \$										
			0	1	1¼	2	2½	3	3½	4	5		
Reversing in one speed only 2 speed 1 winding	30, 32	R6											—
Reversing in one speed only 2 speed 2 winding		R7											—
Reversing in both speeds 2 speed 1 winding		R8											—
Reversing in both speeds 2 speed 2 winding		R9											—
Reversing for Reduced Voltage	36, 37	R											

Motor Management with PROFIBUS DP Communications<sup>③</sup>

Description	Class	Enclosure Type	Modification Code	List Price
SIMOCODE pro C With 0.3-3A Current Module	14, 17, 18, 22, 25, 26	All	MC1	
SIMOCODE pro C With 2.4-25A Current Module			MC2	
SIMOCODE pro C With 10-100A Current Module			MC3	
SIMOCODE pro C With 20-200A Current Module			MC4	
SIMOCODE pro C With 63-630A Current Module			MC5	
SIMOCODE pro V With 0.3-3A Current/Voltage Module			MV1	
SIMOCODE pro V With 2.4-25A Current/Voltage Module			MV2	
SIMOCODE pro V With 10-100A Current/Voltage Module			MV3	
SIMOCODE pro V With 20-200A Current/Voltage Module			MV4	
SIMOCODE pro V With 63-630A Current/Voltage Module			MV5	
Factory Parameterization of SIMOCODE			MM0	

Electrically Held to Mechanically Held Conversion Modules	Class	Enclosure type	Contactors Size (Amp)	Description	Modification Code
	LC	Open, 1, 12, 4/4X	30	2-wire, 24VAC 2-wire, 110-120VAC 2-wire, 200-277VAC 3-wire, 24VAC 3-wire, 110-120VAC 3-wire, 200-277VAC	2W1 2W2 2W3 3W1 3W2 3W3

<sup>①</sup> Supplied as NEMA 12, field convertible to NEMA 3R.  
<sup>②</sup> Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil.

<sup>③</sup> A CPT must also be ordered to power the motor management device. Motor management may be ordered with other product classes as specials.

Selection

Control Relays

Description	Class	Enclosure Type	Modification Code	List Price \$
Control Relay 4-Poles Max	All	1, 3, 4, 7, 9, 12	R40	
			R22	
			R04	
Under/Over Voltage, Phase Failure, Phase Sequence, Phase Unbalance	All	All	R1	
Ground Fault Relay		All	R5	
Electronic On Delay Relay (.15s–100h) 24V/120V	All	1, 3, 4, 7, 9, 12	T1	
Electronic On Delay Relay (.15s–100h) 24V/240V <sup>①</sup>			T2	
Electronic Off Delay Relay (.15s–100s) 120V			T3	
Electronic Off Delay Relay (.15s–100s) 240V <sup>①</sup>			T4	
24 hour time clock	LC, LE, CLM, CM	All	T7	
24 hour time clock with day omission			T8	
7 day time clock			T9	
Compelling Relay	30, 32	1, 4, 12	A6	
Acceleration Control			A7	
Deceleration Control			A8	

Meters—Mounted on Enclosure

Description	Class	Enclosure Type	Modification Code	List <sup>②</sup> Price \$
Ammeter (includes a C.T. if necessary)	14, 17, 18, 22, 25, 26, 30 <sup>③</sup> , 32 <sup>③</sup> , 36, 37, 40, 43, 83, 84, 87, 88	1, 3, 4, 4X, 12	M1	
Ammeter and Switch (3-Phase with 3 C.T.'s)		1, 12	M2	
Voltmeter		1, 3, 4, 4X, 12	M3	
Voltmeter and Switch (3-Phase)		1, 12	M4	
Elapsed Time Meter <sup>③</sup>		1, 3, 4, 4X, 12	M5	

Function Identification Plates

Description	Class	Modification Code	List Price \$
Function identification plate, with marking as specified	All	N1	

Terminal Blocks

Description	Class	Modification Code	List Price \$
3 Point Terminal	All	TC3 <sup>④</sup>	
6 Point Terminal		TC6 <sup>④</sup>	
9 Point Terminal		TC9 <sup>④</sup>	

Special Ratings

Description	Class	Modification Code	List Price \$
Service Entrance Rating	17, 18, 25, 26, 32, 37, 84	N3	

Drawings

Description	Class	Catalog Number	List Price \$
Approval/submittal and as-built drawings for factory modified product may be ordered. The drawing set includes an enclosure outline, a panel layout and a schematic. When entering the order, use the line item notes to reference a product and modifications or an existing order that the drawings are to be engineered for. Specify the contact information and an email address in the ship to address field. Attach any reference drawings to the order or forward to National Customer Support. Once completed, the drawing set will emailed.	All	CONTROLDRAWING	

① Not available on Class 36, 37.  
② Price x 2 Class 83 and 84.

③ ETM available with 120V coil only.  
④ For terminal point more than 9 terminals use additional suffixes. Max 3 suffixes can be selected.

⑤ Class 30 and 32 can be modified with only an elapsed time meter. No other meters apply to class 30 or 32.

# Selection of Heater Elements for Overload Relays

## General

**Use only when motor full load current is not known.** Motor amps will vary depending on the type and manufacturer of the motor. These average values, for motors with service factor of 1.15, are to be used only as a guide. The formulas at the bottom of the page may be used to obtain approximate amps for other motors.

**Note:** RPM shown for 60 cycle motors. For 50 cycle motors, multiply RPM by .83.

**CAUTION:** Actual motor amps may be higher or lower than the values listed below for a particular motor. For more reliable motor protection, select heater elements by using the full load motor nameplate amps.

**Single Phase** motor full load amps of the same horsepower, voltage and speed vary over wide ranges. The following table conforms with table 430.148 of the NEC.

### 1-Phase

Hp	Full Load Current (60Hz)	
	115 Volts	230 Volts
1/8	4.4	2.2
1/4	5.8	2.9
3/8	7.2	3.6
1/2	9.8	4.9
3/4	13.8	6.9
1	16	8
1 1/2	20	10
2	24	12
3	34	17
5	56	28
7 1/2	80	40
10	100	50

### 3-Phase

Hp	Syn Speed RPM	Full Load Current (60Hz)				50 Hz
		200 Volts	230 Volts	460 Volts	575 Volts	380 Volts
1/4	1800	1.09	0.95	0.48	0.38	0.55
	1200	1.61	1.40	0.70	0.56	0.81
	900	1.84	1.60	0.80	0.64	0.93
1/2	1800	1.37	1.19	0.60	0.48	0.64
	1200	1.83	1.59	0.80	0.64	0.92
	900	2.07	1.80	0.90	0.72	1.04
3/4	1800	1.98	1.72	0.86	0.69	0.99
	1200	2.47	2.15	1.08	0.86	1.24
	900	2.74	2.38	1.19	0.95	1.38
1	1800	2.83	2.46	1.23	0.98	1.42
	1200	3.36	2.82	1.46	1.17	—
	900	3.75	3.26	1.63	1.30	1.88
1 1/2	3600	3.22	2.80	1.40	1.12	1.70
	1800	4.09	3.56	1.78	1.42	2.06
	1200	4.32	3.76	1.88	1.50	2.28
2	3600	5.01	4.36	2.18	1.74	2.69
	1800	5.59	4.86	2.43	1.94	2.94
	1200	6.07	5.28	2.64	2.11	3.20
3	3600	6.44	5.60	2.80	2.24	3.39
	1800	7.36	6.40	3.20	2.56	3.84
	1200	7.87	6.84	3.42	2.74	4.14
4	3600	9.09	7.90	3.95	3.16	4.77
	1800	9.59	8.34	4.17	3.34	5.02
	1200	10.8	9.40	4.70	3.76	5.70
5	3600	11.7	10.2	5.12	4.10	6.20
	1800	13.1	11.4	5.70	4.55	6.80
	900	13.1	11.4	5.70	4.55	6.80
7 1/2	3600	15.5	13.5	5.76	5.41	8.20
	1800	16.6	14.4	7.21	5.78	8.74
	1200	18.2	15.8	7.91	6.32	9.59
10	3600	18.3	15.9	7.92	6.33	9.60
	1800	22.4	19.5	9.79	7.81	11.50
	1200	24.7	21.5	10.7	8.55	13.00
15	3600	25.1	21.8	10.9	8.70	13.20
	1800	26.5	23.0	11.5	9.19	13.90
	900	26.5	23.0	11.5	9.19	13.90
20	3600	29.2	25.4	12.7	10.1	15.40
	1800	30.8	25.8	13.4	10.7	16.30
	1200	32.2	28.0	14.0	11.2	16.90
30	3600	35.1	30.5	15.2	12.2	18.50
	1800	41.9	36.4	18.2	14.5	22.00
	1200	45.1	39.2	19.6	15.7	23.70
40	3600	47.6	41.4	20.7	16.5	25.00
	1800	51.2	44.5	22.2	17.8	26.90
	900	51.2	44.5	22.2	17.8	26.90
50	3600	58.0	50.4	25.2	20.1	30.50
	1800	58.9	51.2	25.6	20.5	31.00
	1200	60.7	52.8	26.4	21.1	31.90
75	3600	63.1	54.9	27.4	21.9	33.20
	1800	63.1	54.9	27.4	21.9	33.20
	900	63.1	54.9	27.4	21.9	33.20

### 3-Phase

Hp	Syn Speed RPM	Full Load Current (60Hz)				50 Hz
		200 Volts	230 Volts	460 Volts	575 Volts	380 Volts
25	3600	69.9	60.8	30.4	24.3	36.80
	1800	74.5	64.8	32.4	25.9	39.20
	1200	75.4	65.6	32.8	26.2	39.60
	900	77.4	67.3	33.7	27.0	40.70
30	3600	84.8	73.7	36.8	29.4	—
	1800	86.9	75.6	37.8	30.2	45.70
	1200	90.6	78.8	39.4	31.5	47.60
	900	94.1	81.8	40.9	32.7	49.50
40	3600	111	96.4	48.2	38.5	—
	1800	116	101	50.4	40.3	61.00
	1200	117	102	50.6	40.4	61.20
	900	121	105	52.2	41.7	63.20
50	3600	138	120	60.1	48.2	—
	1800	143	124	62.2	49.7	75.20
	1200	145	126	63.0	50.4	76.20
	900	150	130	65.0	52.0	78.50
60	3600	164	143	71.7	57.3	—
	1800	171	149	74.5	59.4	90.00
	1200	173	150	75.0	60.0	91.10
	900	177	154	77.0	61.5	93.10
75	3600	206	179	89.6	71.7	—
	1800	210	183	91.6	73.2	111.00
	1200	212	184	92.0	73.5	112.00
	900	222	193	96.5	77.5	117.00
100	3600	266	231	115	92.2	—
	1800	271	236	118	94.8	144.00
	1200	275	239	120	95.6	145.00
	900	290	252	126	101	153.00
125	3600	—	292	146	116	—
	1800	—	293	147	117	177.00
	1200	—	298	149	119	180.00
	900	—	305	153	122	186.00
150	3600	—	343	171	137	—
	1800	—	348	174	139	210.00
	1200	—	350	174	139	210.00
	900	—	365	183	146	211.00
200	3600	—	458	229	184	—
	1800	—	452	226	181	274.00
	1200	—	460	230	184	276.00
	900	—	482	241	193	279.00
250	3600	—	559	279	223	—
	1800	—	568	284	227	343.00
	1200	—	573	287	229	345.00
	900	—	600	300	240	347.00
300	1800	—	278	339	271	392.00
	1200	—	684	342	274	395.00
400	1800	—	896	448	358	—
	1200	—	896	448	358	—

**Formula—Approximate Full Load Amps for Other Motors**

208 Volt Full Load Amp  $\approx$  230 Volt current  $\times$  110%  
 2-Phase FLA  $\approx$  0.866  $\times$  the 3-Phase FLA  
 2-Phase, 3-wire current in common wire  $\approx$  1.41  $\times$  that in the other 2 lines

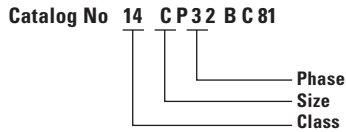
25Hz 1500 RPM, amps  $\approx$  amps of 60Hz, 3600 RPM  
 25Hz 750 RPM, amps  $\approx$  amps of 60Hz, 1800 RPM  
 Service factor 1.0  $\approx$  amps  $\times$  0.9  
 50°C–55°C motor  $\approx$  amps  $\times$  0.9

# Selection of Heater Elements for Overload Relays

## General

To Select Heater Catalog Number Use

- Product Class
- Controller Size
- Motor Amp
- Phase



1. Find heater table number below, using the Product Class, Controller Size and Phase. Heater table number is found in the column under the type of overload and phase.

2. Refer to the specified table and use the controller size and motor amps to select the heater catalog number.

a. If motor amps are not known, an approximate value may be found on the previous page. These values should be used with caution and only when motor amps are not available.

Heaters shown on the following pages provide a maximum trip rating of 125% of minimum motor amperes for 40°C motors (service factor 1.15). For other motors (service factor 1.0), select the next lower listed heater catalog number within the designated table which provides a maximum trip rating of approximately 115%.

Overload relays do not provide protection against short circuits. To ensure proper coordination with short circuit protective device, select heaters from the information packaged with the control device.

Class	Description	Size or Amperage	Controller Size Letter	Heater Table Number			
				Bimetal Standard Trip (Class 20)		Bimetal Quick Trip (Class 10)	
				Compensated E Heaters Green Reset		Compensated K Heaters Green Reset	
				1Ph	3Ph	1Ph	3Ph
SMF	Manual Magnetic	All	—	See Page 9/126			
14, 22	Non-reversing, Reversing	00-4	<b>B-J</b>	213	233	313	332
17, 18 25, 26 30, 32 <sup>ⓐ</sup> 83, 84 87, 89	Combination Reversing Combination Multi Speed Pump Controllers Motor Control Centers	0-4	<b>C-J</b>	—	233	—	332
48	Panel Mounted Overload Relay	25-180A	<b>D-J</b>	216	238	316	335

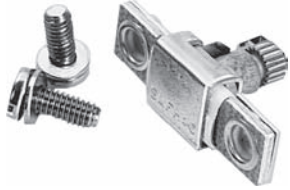
ESP200 starters do not require heater elements.

ⓐ **Overload Relay Selection Multi-Speed**

Each speed requires a separate set of overloads. The adjustment range must be selected on the basis of the full-load current for each particular speed.

# Heater Elements, Class SMF

## General



Heater Elements Class SMF

### Ordering Information

- Determine number of heater elements required from Table A.
- Determine motor full load current and service factor.  
**NOTE: If motor amps are unknown, an approximate value may be found on page 9/124. These values should be used with caution and only when motor amps are not available.**
- If the motor and controller are in the same ambient temperature:
  - For 1.15 to 1.25 service factor motors use 100% of motor full load current for heater element selection.
  - For 1.0 service factor motors use 90% of motor full load current for heater element selection.
  - Heater elements are class 20.
- If the motor and controller are in different ambient temperatures multiply motor full load current by the multiplier in Table B. Use the resultant full load current for heater element selection.
- Select proper heater element from table below.
- All tables are based on the operation of the motor and controller in the same ambient temperature, 40°C (104°F) or less. Always be certain the correct heater element is installed in the starter before operating the motor.

Heater Catalog Number	Motor Full-Load Current (Amps)	List Price \$
SMFH01	0.157-0.173	
SMFH02	0.174-0.192	
SMFH03	0.193-0.212	
SMFH04	0.213-0.235	
SMFH05	0.236-0.261	
SMFH06	0.262-0.289	
SMFH07	0.290-0.321	
SMFH08	0.322-0.355	
SMFH09	0.356-0.399	
SMFH10	0.41-0.44	
SMFH11	0.45-0.49	
SMFH12	0.50-0.53	
SMFH13	0.54-0.58	
SMFH14	0.59-0.65	
SMFH15	0.66-0.71	
SMFH16	0.72-0.78	
SMFH17	0.79-0.85	
SMFH18	0.86-0.96	
SMFH19	0.97-1.04	
SMFH20	1.05-1.16	
SMFH21	1.17-1.25	
SMFH22	1.30-1.39	
SMFH23	1.38-1.54	
SMFH24	1.48-1.63	
SMFH25	1.57-1.75	
SMFH26	1.66-1.86	

Heater Catalog Number	Motor Full-Load Current (Amps)	List Price \$
SMFH27	1.80-1.99	
SMFH28	1.96-2.15	
SMFH29	2.16-2.38	
SMFH30	2.39-2.75	
SMFH31	2.76-2.84	
SMFH32	2.85-3.06	
SMFH33	3.07-3.45	
SMFH34	3.46-3.70	
SMFH35	3.71-4.07	
SMFH36	4.08-4.32	
SMFH37	4.33-4.90	
SMFH38	4.91-5.35	
SMFH39	5.36-5.85	
SMFH40	5.86-6.41	
SMFH41	6.42-6.79	
SMFH42	6.80-7.57	
SMFH43	7.58-8.15	
SMFH44	8.16-8.98	
SMFH45	8.99-9.67	
SMFH46	9.68-9.95	
SMFH47	9.96-10.8	
SMFH48	10.9-12.1	
SMFH49	12.2-13.1	
SMFH50	13.2-13.9	
SMFH51	14.0-15.0	
SMFH52	15.1-16.0	

**Table A**  
Number of Heater Elements

Device	Number of Heater Elements	Notes
SMFF*1 SMFF*2 SMFF*3 SMFF*4 SMFF*5 SMFF*6	1	All single pole and two pole SMF starters require only 1 Heater Element.
SMFF*22 SMFF*44	2	Duplex Unit. One Heater Element per starter.
SMFF*11 SMFF*22	2	Two Speed Starter. One Heater Element per speed.

**Table B—Special Applications**  
Heater Element Selection

Continuous Duty Motor Service Factor	Ambient Temperature of Motor		
	Same as Controller Ambient	Constant 10°C (18°F) Higher Than Controller Ambient	Constant 10°C (18°F) Lower Than Controller Ambient
	Full Load Current Multiplier		
1.15 to 1.25	1.0	0.9	1.05
1.0	0.9	0.8	0.95



# Full Load Motor Amps, Single Phase, Trip Class 20 – Tables 213, 216

Selection

**Table 213 for Class 14, 22 (1-Phase)**

Full Load Amps			Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1P	Size 2, 2½		
0.37-0.40	—	—	E3	
0.41-0.44	0.41-0.44	—	E4	
0.45-0.47	0.45-0.47	—	E5	
0.48-0.52	0.48-0.52	—	E6	
0.53-0.57	0.53-0.57	—	E7	
0.58-0.62	0.58-0.62	—	E8	
0.63-0.69	0.63-0.69	—	E9	
0.70-0.74	0.70-0.74	—	E11	
0.75-0.81	0.75-0.81	—	E12	
0.82-0.85	0.82-0.85	—	E13	
0.86-0.93	0.86-0.93	—	E14	
0.94-1.03	0.94-1.03	—	E16	
1.04-1.11	1.04-1.11	—	E17	
1.12-1.22	1.12-1.22	—	E18	
1.23-1.34	1.23-1.34	—	E23	
1.35-1.53	1.35-1.53	—	E24	
1.54-1.71	1.54-1.71	—	E26	
1.72-1.92	1.72-1.92	—	E27	
1.93-2.12	1.93-2.12	—	E28	
2.13-2.24	2.13-2.24	—	E29	
2.25-2.43	2.25-2.43	—	E31	
2.44-2.57	2.44-2.57	—	E32	
2.58-2.86	2.58-2.86	—	E33	
2.87-3.16	2.87-3.16	—	E34	
3.17-3.35	3.17-3.35	—	E36	
3.36-3.58	3.36-3.58	—	E37	
3.59-3.90	3.59-3.90	—	E38	
3.91-4.25	3.91-4.25	—	E39	
4.26-4.77	4.26-4.77	—	E41	
4.78-5.35	4.78-5.35	—	E42	
5.36-5.76	5.36-5.76	—	E44	
5.77-6.33	5.77-6.33	—	E46	
6.34-6.98	6.34-6.98	—	E47	
6.99-7.37	6.99-7.37	—	E48	
7.38-7.71	7.38-7.71	—	E49	
7.72-8.51	7.72-8.51	—	E50	
8.52-9.31	8.52-9.31	—	E51	
9.32-10.1	9.32-10.1	—	E52	
10.2-10.9	10.2-10.9	—	E53	
11.0-12.2	11.0-12.2	—	E54	
12.3-13.5	12.3-13.5	—	E55	
13.6-15.7	13.6-15.7	—	E56	
15.8-17.3	15.8-17.3	19.4-22.0	E57	
17.4-19.9	17.4-19.9	22.1-23.5	E60	
20.0-21.7	20.0-21.7	23.6-25.0	E61	
21.8-23.4	21.8-23.4	25.1-27.0	E62	
23.5-24.0	23.5-23.7	27.1-28.9	E65	
—	23.8-25.1	29.0-31.0	E66	
—	25.2-27.9	31.1-34.8	E67	
—	28.0-32.2	34.9-36.9	E69	
—	32.3-34.0	37.0-43.9	E70	
—	—	44.0-46.0	E72	
—	—	46.1-48.3	E73	
—	—	48.4-55.0	E74	
—	—	55.1-60.0	E76	

**Table 216 for Class 48**

Full Load Amps			Heater Catalog No	List Price \$
48DA, 48GA	48HA	48JA		
0.34-0.36	—	—	E3	
0.37-0.40	—	—	E4	
0.41-0.43	—	—	E5	
0.44-0.47	—	—	E6	
0.48-0.51	—	—	E7	
0.52-0.56	—	—	E8	
0.57-0.62	—	—	E9	
0.63-0.67	—	—	E11	
0.68-0.73	—	—	E12	
0.74-0.77	—	—	E13	
0.78-0.84	—	—	E14	
0.85-0.93	—	—	E16	
0.94-1.00	—	—	E17	
1.01-1.10	—	—	E18	
—	—	—	E19	
1.11-1.21	—	—	E23	
1.22-1.38	—	—	E24	
1.39-1.54	—	—	E26	
1.55-1.73	—	—	E27	
1.74-1.91	—	—	E28	
1.92-2.02	—	—	E29	
2.03-2.19	—	—	E31	
2.20-2.32	—	—	E32	
2.33-2.58	—	—	E33	
2.59-2.85	—	—	E34	
2.86-3.02	—	—	E36	
3.03-3.23	—	—	E37	
3.24-3.52	—	—	E38	
3.53-3.83	—	—	E39	
3.84-4.30	—	—	E41	
4.31-4.82	—	—	E42	
4.83-5.19	—	—	E44	
5.20-5.71	—	—	E46	
5.72-6.29	—	—	E47	
6.30-6.64	—	—	E48	
6.65-6.95	—	—	E49	
6.96-7.67	—	—	E50	
7.68-8.39	—	—	E51	
8.40-9.19	—	—	E52	
9.20-9.94	—	—	E53	
9.95-10.9	—	—	E54	
11.0-12.2	—	—	E55	
12.3-14.2	—	—	E56	
14.3-15.6	—	—	E57	
—	—	—	E59	
15.7-17.9	—	—	E60	
18.0-19.6	—	—	E61	
19.7-22.3	—	—	E62	
22.4-24.0	—	—	E65	
24.1-25.9	—	—	E66	
26.0-29.5	27.1-30.0	—	E67	
29.6-32.5	30.1-33.2	—	E69	
32.6-33.5	33.3-35.7	—	E70	
33.6-36.9	35.8-39.4	—	E71	
37.0-39.2	39.5-43.4	—	E72	
39.3-43.1	43.5-46.9	—	E73	
43.2-47.4	47.0-51.5	—	E74	
47.5-50.0	51.6-57.0	—	E76	
50.1-55.2	57.1-62.8	—	E77	
55.3-60.0	62.9-69.1	—	E78	
—	69.2-75.0	—	E79	
—	75.1-83.3	—	E80	
—	—	50.0-55.9	E88	
—	—	56.0-60.9	E89	
—	—	61.0-65.9	E91	
—	—	66.0-69.9	E92	
—	—	70.0-75.9	E93	
—	—	76.0-81.9	E94	
—	83.4-86.9	82.0-86.9	E96	
—	87.0-92.9	87.0-92.9	E97	
—	93.0-100.0	93.0-97.9	E98	
—	—	98.0-107.9	E99	
—	—	108.0-113.9	E101	
—	—	114.0-125.0	E102	
—	—	126.0-138.0	E103	
—	—	139.0-153.0	E104	
—	—	154.0-163.0	E106	
—	—	164.0-180.0	E107	

# Full Load Motor Amps, 3-Phase, Trip Class 20 – Tables 233, 238

## Selection

**Table 233 for Class 14, 17, 18, 22, 25, 26, 30, 32, 83, 84, 87 (3-Phase)**

Full Load Amps					Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1¼	Size 2, 2½	Size 3, 3½	Size 4		
0.38-0.40	—	—	—	—	E6	
0.41-0.43	—	—	—	—	E7	
0.44-0.48	—	—	—	—	E8	
0.49-0.53	—	—	—	—	E9	
0.54-0.57	—	—	—	—	E11	
0.58-0.62	—	—	—	—	E12	
0.63-0.66	—	—	—	—	E13	
0.67-0.72	—	—	—	—	E14	
0.73-0.80	—	—	—	—	E16	
0.81-0.85	—	—	—	—	E17	
0.86-0.92	—	—	—	—	E18	
0.93-0.99	—	—	—	—	E19	
1.00-1.08	—	—	—	—	E23	
1.09-1.23	—	—	—	—	E24	
1.24-1.37	—	—	—	—	E26	
1.38-1.54	—	—	—	—	E27	
1.55-1.69	—	—	—	—	E28	
1.70-1.80	—	—	—	—	E29	
1.81-1.94	—	—	—	—	E31	
1.95-2.07	—	—	—	—	E32	
2.08-2.26	—	—	—	—	E33	
2.27-2.54	2.27-2.54	—	—	—	E34	
2.55-2.69	2.55-2.69	—	—	—	E36	
2.70-2.88	2.70-2.88	—	—	—	E37	
2.89-3.14	2.89-3.14	—	—	—	E38	
3.15-3.40	3.15-3.40	—	—	—	E39	
3.41-3.81	3.41-3.81	—	—	—	E41	
3.82-4.26	3.82-4.25	—	—	—	E42	
4.27-4.62	4.26-4.62	—	—	—	E44	
4.63-5.09	4.63-5.09	—	—	—	E46	
5.10-5.61	5.10-5.61	—	—	—	E47	
5.62-5.91	5.62-5.91	—	—	—	E48	
5.92-6.15	5.92-6.15	—	—	—	E49	
6.16-6.70	6.16-6.70	—	—	—	E50	
6.71-7.54	6.71-7.54	—	—	—	E51	
7.55-8.29	7.55-8.29	—	—	—	E52	
8.30-8.99	8.30-8.99	—	—	—	E53	
9.00-9.85	9.00-9.85	—	—	—	E54	
9.86-10.4	9.86-10.4	—	—	—	E55	
10.5-12.0	10.5-12.0	10.5-12.0	—	—	E56	
12.1-13.6	12.1-13.6	12.1-13.6	—	—	E57	
13.7-15.6	13.7-15.6	13.7-15.6	—	—	E60	
15.7-17.0	15.7-17.0	15.7-17.1	—	—	E61	
17.1-18.4	17.1-19.4	17.2-19.4	—	—	E62	
18.5-19.4	19.5-20.9	19.5-20.9	—	—	E65	
19.5-21.3	21.0-22.2	21.0-22.2	—	—	E66	
21.4-24.4	22.3-25.3	22.3-25.3	—	—	E67	
24.5-25.9	25.4-26.9	25.4-26.9	30.0-33.5	—	E69	
26.0-27.0	27.0-30.2	27.0-30.2	33.6-36.4	—	E70	
—	—	—	36.5-39.6	—	E71	
—	30.3-33.3	30.3-33.3	—	—	E72	
—	33.4-36.0	33.4-35.3	39.7-43.6	—	E73	
—	—	—	43.7-46.5	—	E73A	
—	—	35.4-41.5	46.6-51.6	—	E74	
—	—	41.6-45.0	51.7-54.4	—	E76	
—	—	45.1-52.3	54.5-58.0	—	E77	
—	—	52.4-55.7	58.1-63.0	—	E78	
—	—	55.8-60.0	63.1-67.7	—	E79	
—	—	—	67.8-72.4	—	E80	
—	—	—	—	—	E88	
—	—	—	—	56.9-60.9	E89	
—	—	—	—	61.0-63.9	E91	
—	—	—	—	64.0-67.7	E92	
—	—	—	—	67.8-72.4	E93	
—	—	—	—	72.5-77.7	E94	
—	—	—	80.1-88.1	77.8-85.9	E96	
—	—	—	88.2-91.5	86.0-91.9	E97	
—	—	—	91.6-96.8	92.0-96.7	E98	
—	—	—	96.9-99.0	96.8-105	E99	
—	—	—	99.1-108.0	—	E101	
—	—	—	—	—	E102	
—	—	—	—	106-115	E103	
—	—	—	—	116-130	E104	

**Table 238 for Class 48**

Full Load Amps				Heater Catalog No	List Price \$
48DC	48GC	48HA	48JA		
0.30-0.32	—	—	—	E3	
0.33-0.35	—	—	—	E4	
0.36-0.38	—	—	—	E5	
0.39-0.41	—	—	—	E6	
0.42-0.44	—	—	—	E7	
0.45-0.49	—	—	—	E8	
0.50-0.54	—	—	—	E9	
0.55-0.58	—	—	—	E11	
0.59-0.63	—	—	—	E12	
0.64-0.67	—	—	—	E13	
0.68-0.73	—	—	—	E14	
0.74-0.81	—	—	—	E16	
0.82-0.87	—	—	—	E17	
0.88-0.94	—	—	—	E18	
0.95-1.00	—	—	—	E19	
1.01-1.10	—	—	—	E23	
1.11-1.26	—	—	—	E24	
1.27-1.40	—	—	—	E26	
1.41-1.58	—	—	—	E27	
1.59-1.74	—	—	—	E28	
1.75-1.85	—	—	—	E29	
1.86-1.99	—	—	—	E31	
2.00-2.11	—	—	—	E32	
2.12-2.31	—	—	—	E33	
2.32-2.59	—	—	—	E34	
2.60-2.75	—	—	—	E36	
2.76-2.95	—	—	—	E37	
2.96-3.21	—	—	—	E38	
3.22-3.48	—	—	—	E39	
3.49-3.89	—	—	—	E41	
3.90-4.35	—	—	—	E42	
4.36-4.73	—	—	—	E44	
4.74-5.21	—	—	—	E46	
5.22-5.74	—	—	—	E47	
5.75-6.05	—	—	—	E48	
6.06-6.46	—	—	—	E49	
6.47-6.95	—	—	—	E50	
6.96-8.09	—	—	—	E51	
8.10-9.29	—	—	—	E52	
9.30-10.4	—	—	—	E53	
—	—	—	—	E54	
10.5-10.9	—	—	—	E55	
11.0-12.0	—	—	—	E56	
12.1-14.5	—	—	—	E57	
14.6-16.8	—	—	—	E60	
—	16.9-18.4	—	—	E61	
—	18.5-20.9	—	—	E62	
—	21.0-22.5	—	—	E65	
—	22.6-24.3	—	—	E66	
—	24.4-27.2	24.8-27.2	27.1-30.0	E67	
—	27.3-29.2	27.3-29.2	30.1-33.2	E69	
—	29.3-30.0	29.3-32.0	33.3-35.7	E70	
—	—	32.1-34.9	35.8-39.4	E71	
—	—	—	39.5-43.4	E72	
—	—	35.0-37.8	43.5-46.9	E73	
—	37.9-41.7	—	—	E73A	
—	41.8-45.9	47.0-51.5	—	E74	
—	46.0-49.0	51.6-57.0	—	E76	
—	49.1-54.2	57.1-62.8	—	E77	
—	54.3-60.0	62.9-69.1	—	E78	
—	—	69.2-75.0	—	E79	
—	—	75.1-83.3	—	E80	
—	—	—	50.0-55.9	E88	
—	—	—	56.0-60.9	E89	
—	—	—	61.0-65.9	E91	
—	—	—	66.0-69.9	E92	
—	—	—	70.0-75.9	E93	
—	—	—	76.0-81.9	E94	
—	—	83.4-86.9	82.0-86.9	E96	
—	—	87.0-92.9	87.0-92.9	E97	
—	—	93.0-100.0	93.0-97.9	E98	
—	—	—	98.0-107.9	E99	
—	—	—	108-113.9	E101	
—	—	—	114-125.9	E102	
—	—	—	126-138.9	E103	
—	—	—	139-153.9	E104	
—	—	—	154-163.9	E106	
—	—	—	164-180.9	E107	

# Full Load Motor Amps, Single Phase, Trip Class 10 – Tables 313, 316

## Selection

**Table 313 for Class 14, 22 (1-Phase)**

Full Load Amps			Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1P	Size 2, 2½		
1.85-2.05	1.85-2.05	—	<b>K21</b>	
2.06-2.35	2.06-2.35	—	<b>K22</b>	
2.36-2.64	2.36-2.64	—	<b>K24</b>	
2.65-2.96	2.65-2.96	—	<b>K27</b>	
2.97-3.31	2.97-3.31	—	<b>K28</b>	
3.32-3.51	3.32-3.51	—	<b>K29</b>	
3.52-3.87	3.52-3.87	—	<b>K31</b>	
3.88-4.31	3.88-4.31	—	<b>K32</b>	
4.32-4.79	4.32-4.79	—	<b>K33</b>	
4.80-5.21	4.80-5.21	—	<b>K34</b>	
5.22-5.75	5.22-5.75	—	<b>K36</b>	
5.76-6.11	5.76-6.11	—	<b>K37</b>	
6.12-6.95	6.12-6.95	—	<b>K39</b>	
6.96-7.73	6.96-7.73	—	<b>K41</b>	
7.74-8.47	7.74-8.47	—	<b>K42</b>	
8.48-9.52	8.48-9.52	—	<b>K43</b>	
9.53-10.4	9.53-10.4	—	<b>K49</b>	
10.5-11.1	10.5-11.1	—	<b>K50</b>	
11.2-12.4	11.2-12.4	—	<b>K52</b>	
12.5-13.5	12.5-13.5	—	<b>K53</b>	
13.6-15.1	13.6-15.1	—	<b>K54</b>	
15.2-16.6	15.2-16.6	—	<b>K55</b>	
16.7-17.6	16.7-17.6	—	<b>K57</b>	
17.7-18.8	17.7-18.8	18.7-19.7	<b>K58</b>	
18.9-21.6	18.9-21.6	19.8-21.3	<b>K60</b>	
21.7-22.7	21.7-22.7	21.4-22.8	<b>K61</b>	
22.8-25.3	22.8-25.3	22.9-24.2	<b>K62</b>	
—	25.4-26.6	24.3-26.5	<b>K63</b>	
—	26.7-30.1	26.6-29.3	<b>K64</b>	
—	30.2-33.0	29.4-32.0	<b>K67</b>	
—	33.1-34.1	32.1-35.6	<b>K68</b>	
—	—	35.7-37.9	<b>K69</b>	
—	—	38.0-40.3	<b>K70</b>	
—	—	40.4-44.3	<b>K72</b>	
—	—	44.4-49.5	<b>K73</b>	
—	—	49.6-52.1	<b>K74</b>	
—	—	52.2-53.7	<b>K75</b>	
—	—	53.8-60.0	<b>K76</b>	

**Table 316 for Class 48**

Full Load Amps				Heater Catalog No	List Price \$
48DA	48GA	48HA	48JA		
1.69-1.88	—	—	—	<b>K21</b>	
1.89-2.05	—	—	—	<b>K22</b>	
2.06-2.21	—	—	—	<b>K23</b>	
2.22-2.44	—	—	—	<b>K24</b>	
2.45-2.70	—	—	—	<b>K26</b>	
2.71-2.92	—	—	—	<b>K27</b>	
2.93-3.27	—	—	—	<b>K28</b>	
3.28-3.56	—	—	—	<b>K29</b>	
3.57-3.83	—	—	—	<b>K31</b>	
3.84-4.23	—	—	—	<b>K32</b>	
4.24-4.57	—	—	—	<b>K33</b>	
4.58-4.97	—	—	—	<b>K34</b>	
4.98-5.67	—	—	—	<b>K36</b>	
5.68-6.11	—	—	—	<b>K37</b>	
6.12-6.91	—	—	—	<b>K39</b>	
6.92-7.65	—	—	—	<b>K41</b>	
7.66-8.4	—	—	—	<b>K42</b>	
8.5-8.9	—	—	—	<b>K43</b>	
9.0-10.1	9.12-9.6	—	—	<b>K49</b>	
10.2-11.2	9.7-10.4	—	—	<b>K50</b>	
11.3-12.3	10.5-11.4	—	—	<b>K52</b>	
12.4-13.3	11.5-12.1	—	—	<b>K53</b>	
13.4-14.1	12.2-12.9	—	—	<b>K54</b>	
14.2-15.0	13.0-13.7	—	—	<b>K55</b>	
15.1-16.2	13.8-14.8	—	—	<b>K56</b>	
16.3-17.5	14.9-16.4	—	—	<b>K57</b>	
17.6-18.6	16.5-18.2	—	—	<b>K58</b>	
18.7-19.9	18.3-19.5	—	—	<b>K60</b>	
20.0-21.3	19.6-20.9	—	—	<b>K61</b>	
21.4-22.8	21.0-22.8	23.2-25.1	—	<b>K62</b>	
22.9-25.1	22.9-24.7	25.2-27.3	—	<b>K63</b>	
25.2-27.6	24.8-27.6	27.4-30.4	—	<b>K64</b>	
27.7-30.0	27.7-30.5	30.5-33.3	—	<b>K67</b>	
—	30.6-33.9	33.4-36.5	—	<b>K68</b>	
—	34.0-37.3	36.6-39.3	—	<b>K69</b>	
—	37.4-40.2	39.4-43.5	—	<b>K70</b>	
—	40.3-41.9	43.6-46.6	43.0-46.5	<b>K72</b>	
—	42.0-45.9	46.7-51.1	46.6-50.9	<b>K73</b>	
—	46.0-50.9	51.2-56.3	51.0-55.9	<b>K74</b>	
—	51.0-52.9	56.4-61.1	56.0-59.1	<b>K75</b>	
—	53.0-57.7	61.2-64.9	59.2-68.7	<b>K76</b>	
—	57.8-60.0	65.0-71.9	—	<b>K77</b>	
—	—	72.0-80.7	68.8-80.7	<b>K78</b>	
—	—	80.8-92.7	80.8-92.7	<b>K85</b>	
—	—	92.8-100.0	92.8-103.9	<b>K86</b>	
—	—	—	104.0-113.5	<b>K87</b>	
—	—	—	113.6-127.9	<b>K89</b>	
—	—	—	128.0-143.9	<b>K92</b>	
—	—	—	144.0-163.9	<b>K94</b>	
—	—	—	164.0-180.0	<b>K96</b>	

# Full Load Motor Amps, 3-Phase, Trip Class 10 – Tables 332, 335

## Selection

**Table 332 for Class 14, 17, 18, 22, 25, 26, 30, 32, 83, 84, 87 (3-Phase)**

Full Load Amps					Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1¼	Size 2, 2½	Size 3, 3½	Size 4		
1.52-1.65	1.52-1.65	—	—	—	K21	
1.66-1.79	1.66-1.79	—	—	—	K22	
1.80-1.94	1.80-1.94	—	—	—	K23	
1.95-2.15	1.95-2.15	—	—	—	K24	
2.16-2.37	2.16-2.37	—	—	—	K26	
2.38-2.56	2.38-2.56	—	—	—	K27	
2.57-2.87	2.57-2.87	—	—	—	K28	
2.88-3.13	2.88-3.13	—	—	—	K29	
3.14-3.37	3.14-3.37	—	—	—	K31	
3.38-3.72	3.38-3.72	—	—	—	K32	
3.73-4.00	3.73-4.00	—	—	—	K33	
4.01-4.35	4.01-4.35	—	—	—	K34	
4.36-4.99	4.36-4.99	—	—	—	K36	
5.00-5.38	5.00-5.38	—	—	—	K37	
5.39-5.79	5.39-5.79	—	—	—	K39	
5.80-6.43	5.80-6.43	—	—	—	K41	
6.44-6.83	6.44-6.83	—	—	—	K42	
6.84-7.83	6.84-7.83	—	—	—	K43	
7.84-8.23	7.84-8.23	—	—	—	K49	
8.24-9.59	8.24-9.59	—	—	—	K50	
9.60-9.90	9.60-9.90	—	—	—	K52	
10.0-10.7	10.0-10.7	—	—	—	K53	
10.8-11.6	10.8-11.6	12.1-12.7	—	—	K54	
11.7-12.3	11.7-12.3	12.8-13.5	—	—	K55	
12.4-13.4	12.4-13.4	13.6-14.6	—	—	K56	
13.5-14.2	13.5-14.2	14.7-15.9	—	—	K57	
14.3-15.1	14.3-15.1	16.0-16.9	—	—	K58	
15.2-17.5	15.2-17.5	17.0-18.2	—	—	K60	
17.6-18.7	17.6-18.7	18.3-19.5	—	—	K61	
18.8-20.0	18.8-20.0	19.6-20.9	—	—	K62	
20.1-21.5	20.1-21.5	21.0-23.1	—	—	K63	
21.6-23.9	21.6-23.9	23.2-25.4	—	—	K64	
24.0-25.8	24.0-25.8	25.5-27.9	—	—	K67	
—	25.9-29.5	—	—	—	K68	
—	—	28.0-30.5	—	—	K69	
—	29.6-32.7	30.6-33.5	36.8-40.0	—	K70	
—	32.8-36.0	33.6-37.2	40.1-42.4	—	K72	
—	—	37.3-40.7	42.5-46.3	—	K73	
—	—	40.8-43.0	46.4-49.6	—	K74	
—	—	43.1-47.9	49.7-52.3	49.7-52.3	K75	
—	—	48.0-52.7	52.4-57.5	52.4-57.5	K76	
—	—	52.8-58.3	57.6-63.9	57.6-63.0	K77	
—	—	58.4-60.0	64.0-67.9	63.1-68.1	K78	
—	—	—	68.0-74.3	68.2-74.3	K83	
—	—	—	74.4-77.9	74.4-79.9	K85	
—	—	—	78.0-83.1	80.0-87.4	K86	
—	—	—	83.2-91.4	87.5-90.0	K87	
—	—	—	91.5-99.9	90.1-100.0	K88	
—	—	—	100.0-108.0	100.1-108.0	K89	
—	—	—	—	108.1-119.0	K90	
—	—	—	—	119.1-130.0	K92	
—	—	—	—	—	K94	
—	—	—	—	—	K96	

**Table 335 for Class 48**

Full Load Amps				Heater Catalog No	List Price \$
48DC	48GC	48HA	48JA		
1.56-1.69	—	—	—	K21	
1.70-1.84	—	—	—	K22	
1.85-1.98	—	—	—	K23	
1.99-2.19	—	—	—	K24	
2.20-2.43	—	—	—	K26	
2.44-2.63	—	—	—	K27	
2.64-2.95	—	—	—	K28	
2.96-3.21	—	—	—	K29	
3.22-3.45	—	—	—	K31	
3.46-3.81	—	—	—	K32	
3.82-4.10	—	—	—	K33	
4.11-4.46	—	—	—	K34	
4.47-5.10	—	—	—	K36	
5.11-5.49	—	—	—	K37	
5.50-6.21	—	—	—	K39	
6.22-6.76	—	—	—	K41	
6.77-7.62	—	—	—	K42	
7.63-8.07	—	—	—	K43	
8.08-9.19	—	—	—	K49	
9.20-10.0	—	—	—	K50	
10.1-11.0	—	—	—	K52	
11.1-12.0	—	—	—	K53	
12.1-12.7	—	—	—	K54	
12.8-13.5	—	—	—	K55	
13.6-14.5	—	—	—	K56	
14.6-15.7	—	—	—	K57	
15.8-16.7	—	—	—	K58	
16.8-17.9	—	—	—	K60	
18.0-19.2	18.0-19.2	—	—	K61	
19.3-20.5	19.3-20.5	23.2-25.1	—	K62	
20.6-22.5	20.6-22.5	25.2-27.3	—	K63	
22.6-24.8	22.6-24.8	27.4-30.4	—	K64	
24.9-27.6	24.9-27.6	30.5-33.3	—	K67	
27.7-30.0	—	33.4-36.5	—	K68	
—	27.7-30.1	36.6-39.3	—	K69	
—	30.2-33.1	39.4-43.5	—	K70	
—	33.2-36.7	43.6-46.6	43.0-46.5	K72	
—	36.8-40.1	46.7-51.1	46.6-50.9	K73	
—	40.2-45.5	51.2-56.3	51.0-55.9	K74	
—	45.6-47.9	56.4-61.1	56.0-59.1	K75	
—	48.0-52.7	61.2-64.9	59.2-68.7	K76	
—	52.8-55.1	65.0-71.9	—	K77	
—	55.2-60.0	72.0-80.7	68.8-80.7	K78	
—	—	80.8-92.7	80.8-92.7	K85	
—	—	92.8-100.0	92.8-103.9	K86	
—	—	—	104.0-113.5	K87	
—	—	—	113.6-127.9	K89	
—	—	—	128.0-143.9	K92	
—	—	—	144.0-163.9	K94	
—	—	—	164.0-180.0	K96	

# Starters and Contactors – AC Coils

## Selection

### Ordering Information

► 4th character of starter or contactor catalog number indicates model.

### AC Coils — For Class 14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88

	Size	Model	Volts		Catalog Number	List Price \$
			60Hz	50Hz		
	00-2½	P U (ESP200)	24 120 110-120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D73070J 75D73070F 75D73070A 75D73070D 75D73070G 75D73070L 75D73070C 75D73070H 75D73070E	
	3, 3½	P U (ESP200)	24 120 110-120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D73251J 75D73251F 75D73251A 75D73251D 75D73251G 75D73251L 75D73251C 75D73251H 75D73251E	
	4	G U (ESP200)	24 120 120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D70131J 75D70131F 75D70131A 75D70131D 75D70131G 75D70131L 75D70131C 75D70131H 75D70131E	
	4, 5	V (Vacuum)	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1966-5AB31 3RT1966-5AF31 3RT1966-5AM31 3RT1966-5AP31 3RT1966-5AU31 3RT1966-5AV31 3RT1966-5AR31 3RT1966-5AT31	
	5	P	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1965-5AB31 3RT1965-5AF31 3RT1965-5AM31 3RT1965-5AP31 3RT1965-5AU31 3RT1965-5AV31 3RT1965-5AR31 3RT1965-5AT31	
	6	P V (Vacuum)	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1975-5AB31 3RT1975-5AF31 3RT1975-5AM31 3RT1975-5AP31 3RT1975-5AU31 3RT1975-5AV31 3RT1975-5AR31 3RT1975-5AT31	
	7	H	100-250 150-500	100-250 150-500	75ZAF750-70 75ZAF750-71	
	8	H	100-250	100-250	75ZAF1650-70 <sup>①</sup>	

① Set of 2 coils. Recommend to change printed circuit board when changing coils. 49ZP1650 see page 9/132.

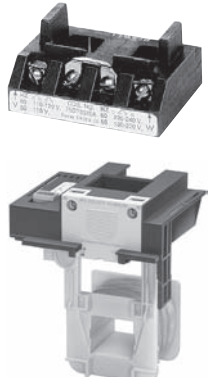
# Starters and Contactors – DC Coils, Late Break Aux Contacts, Rectifiers, Contact Kits

## Selection

### Ordering Information

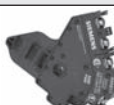
- ▶ 4th character of starter or contactor catalog number indicates model.
- ▶ DC Coils for Size 00-4 require Late Break Interlock.

### DC Coils — For Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43


	Size	Model	Volts DC	Catalog Number	List Price \$
	00-2½	P U (ESP200)	12	75D73070R	
			24	75D73070S	
			32	75D73070T	
			48	75D73070U	
			125	75D73070V	
	3, 3½	P U (ESP200)	12	75D73251R	
			24	75D73251S	
			32	75D73251T	
			48	75D73251U	
			125	75D73251V	
	4	G U (ESP200)	48	75D70131U	
			125	75D70131V	
			250	75D70131W	
	4, 5	V (Vacuum)	23-26	3RT1966-5AB31	
			42-48	3RT1966-5AD31	
			110-127	3RT1966-5AF31	
240-277			3RT1966-5AU31		

Note: For sizes 7 & 8 contactors the AC coils are used for DC see page 9/129.


### Late Break Auxiliary Contacts

	Control Size	Model	Catalog Number	List Price \$
	00-4	P, G, S, T	49AB01LB	

### Board for Size 8 Contactor

	Control Size	Model	Catalog Number	List Price
	8	H	49ZP1650	

### Contact Kits – Single Pole Stationary and Movable Contacts, Contact Spring<sup>①</sup>

Description	Size	Number of Poles in Kit	Model (4th position in part number)	Catalog Number	List Price \$
	Internal Aux Contact (00-1-¾)		P, U	75AF14	
	00		P, U	75BF14	
	0		P, U	75CF14	
	1	1	P, U	75DF14	
	1¼-1P		P, U	75EF14	
	2	1	P, U	75FP14	
	2½	1	P, U	75GP14	
	3		P, U	75HF14	
	3½	1	P, U	75IF14	
	4	1	G, T	75JG14	
4 (Vacuum)	3 (Bottles)	V, C	3RT1964-6V		
Class 14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88	5	3	P	3RT1966-6A	
	5 (Vacuum)	3 (Bottles)	V, C	3RT1966-6V	
14, 40	6	3	P	3RT1976-6A	
	6 (Vacuum)	3 (Bottles)	V, C	3RT1976-6V	
	7	3	H	49ZL750	
	8	3	H	49ZL1650	

### Armature and Magnet Kits

Size	Catalog Number	List Price \$
00-2½	49AMSA2	
3-3½	49AMSA3	
4	49AMSA4	

① On 3-phase controls, all 3-poles should be replaced - 3 kits required.

# Starters and Contactors – Coil VA Ratings and Overload Relays

## Selection

### Coil VA Ratings

Device Type	Contactors Size	Amps	Volts	Number of Poles	Total Inrush VA	Total Sealed VA
NEMA Starter	00 thru 2 1/2	—	—	—	218	25
	3 thru 3 1/2	—	—	—	310	26
	4	—	—	—	510	51
	5	—	—	—	590	6.7
	6	—	—	—	830	9.2
	7	—	—	—	850	12
	8	—	—	—	1900	48
	4,5,6 (Vacuum)	—	—	—	630	7.4
Lighting Contactor Mechanically Held (CLM)	—	20	—	2-12	625	6
	—	30	—	2-5	410	40
	—	60	—	2-3	410	40
	—	60	—	4-5	600	40
	—	100 - 200	—	2-3	900	200
	—	100 - 200	—	4-5	1300	130
	—	300 - 400	—	3	1600	550
Lighting Contactor Electrically Held (LC)	—	30	ALL	2-12	248	28
Lighting Contactor Electrically Held (LE)	—	20	ALL	3 and 4	31.7	4.8
	—	30	ALL	3 and 4	87	9.4
	—	60	ALL	3	166	12.6
	—	100	ALL	3	300	21
	—	200	ALL	3	300	5.6
	—	300	ALL	3	590	6.7
	—	400	ALL	3	830	9.2

### Overload Relays<sup>①②</sup> – For Class 14, 17, 18, 22, 25, 26, 30, 32, 83, 84, 87

Size	Half Size	Model	Number Poles	Ambient Comp Bimetal			
				Catalog Number (1) NC	List Price \$	Catalog Number (1) NO/NC	List Price \$
00-1	—	P	1	48DC18AA3			
			3	48DC38AA3		48DC39AA3	
1P	—	P	1	48EC18AA3			
			3	48EC38AA3		48EC39AA3	
2	—	P	1	48GC18AA3			
			3	48GC38AA3		48GC39AA3	
—	2½	P	1	48GC18AA3			
			3	48GC38AA3		48GC39AA3	
3	—	P	3	48HC38AA3			
			3	48HC38AA3			
4	—	G	3	48JC38AA3			

**For Starter and Contactor replacement parts not found in this section, please refer to Field Modification kits found starting on page 9/103.**





① For replacement Solid State overload relays, please see the Overload Relay section found starting on page 9/64.

② Includes overload mounting plate to be coupled to contactor mounting plate.




# Lighting and Heating Contactors, Type LC, LE, CLM, CMF, CMN


## Selection

Power Pole Kits	Class	Enclosure type	Contactor Size (Amp)	Description	Catalog No.
	LC	Open, 1, 12, 4/4X	30	Single power pole Double power pole	49LCP1A 49LCP2A
Replacement Coil Kits	Class	Enclosure type	Description		Catalog No.
	LC	30	24V 60Hz / 20V 50Hz 115-120V 60Hz / 110V 50Hz 200-208V 60Hz 230-240V 60Hz / 220V 50Hz 277V 60Hz / 240V 50Hz 347V 60Hz 460-480V 60Hz / 440V 50Hz 575-600V 60Hz / 550V 50Hz		75LCC024A 75LCC120A 75LCC208A 75LCC240A 75LCC277A 75LCC347A 75LCC480A 75LCC600A
	LE	20, 30 60 100	NA		NA
	Class	Enclosure type	Description		Catalog No.
	LC	30	NA		NA
	LE	20, 30 60 100 200 300 400	1 contact kit includes 3 moving and 6 fixed contacts.		3RT19355AC21 3RT19355AK61 3RT19355AM21 3RT19355AP61 3RT19355AU61 3RT19355AV61 3RT19355AT61  3RT19455AC21 3RT19455AK61 3RT19455AM21 3RT19455AP61 3RT19455AU61 3RT19455AV61 3RT19455AT61

### AC Coils 20 Amps<sup>②</sup>

 CLM4097341	Type	Contactor Size	Number of Poles	120V, 60Hz 110V, 50Hz	List Price \$	240V, 60Hz 208V, 50Hz	List Price \$	277V 50/60Hz	List Price \$
	CLM	20 Amp	2-12	CLM4097341			CLM4097342		CLM4097343

### AC Coils 30-400 Amps<sup>③</sup>

 CLMC4C120	Type	Contactor Size	Number of Poles	Catalog Number							List Price \$
				24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC	
CLMC4C120	CLM+C	30 Amp	2-3-Pole	CLMC4C024	CLMC4C120	CLMC4C208	CLMC4C240	CLMC4C277	CLMC4C480	CLMC4C600	
			4-Pole	CLMC4C024	CLMC4C120	CLMC4C208	CLMC4C240	CLMC4C277	CLMC4C480	CLMC4C600	
			5-Pole	CLMC5C024	CLMC5C120	CLMC5C208	CLMC5C240	CLMC5C277	CLMC5C480	CLMC5C600	
CLMGU3C120	CLM+D	60 Amp	2-3-Pole	CLMD3C024	CLMD3C120	CLMD3C208	CLMD3C240	CLMD3C277	CLMD3C480	CLMD3C600	
			4-Pole	CLMD5C024	CLMD5C120	CLMD5C208	CLMD5C240	CLMD5C277	CLMD5C480	CLMD5C600	
			5-Pole	CLMD5C024	CLMD5C120	CLMD5C208	CLMD5C240	CLMD5C277	CLMD5C480	CLMD5C600	
CLMGU3C120	CLM+E	100, 200 Amp	2-3-Pole	CLME3C024	CLME3C120	CLME3C208	CLME3C240	CLME3C277	CLME3C480	CLME3C600	
			4-Pole	CLME5C024	CLME5C120	CLME5C208	CLME5C240	CLME5C277	CLME5C480	CLME5C600	
			5-Pole	CLME5C024	CLME5C120	CLME5C208	CLME5C240	CLME5C277	CLME5C480	CLME5C600	
CLMGU3C120	CLM+G Latching Coil	300/400 Amp	2-3-Pole	—	CLMGL3C120	CLMGL3C208	CLMGL3C240	CLMGL3C277	CLMGL3C480	CLMGL3C600	
			2-3-Pole Unlatch Coil	—	CLMGU3C120	CLMGU3C208	CLMGU3C240	CLMGU3C277	CLMGU3C480	CLMGU3C600	

### Control Module Rectifier<sup>③</sup>

Type	Device	Contactor Size	Number of Poles	Catalog Number	List Price \$
CLM	CLM+C to CLM+F	30-200 Amps	All	CLMKCMR	

① Product Category: IEC.

② Coil kits for 20 amp CLM contactors include the coil clearing auxiliary contact.

③ For 30-200 amp CLM contactors, in the event that either the coil or the control module fails, it is recommended that both be replaced.


# Lighting Contactors, CLM, CMB, CMF & CMN

## Selection

### Ordering Information

- ▶ For **CLM**: 5th character of contactor catalog number indicates Frame Size.
- ▶ For **CMB, CMF, CMN**: 4th character of contactor catalog number indicates Frame Size.

### Main Contacts 20 Amp Lighting Contactors

 <p><b>CLM4097334</b></p>	Type	Contactor Size	Number of Poles	Location	Catalog Number	List Price \$
	CLM	20 Amp	2 3 4 6	Top or Bottom Top Top or Bottom Top or Bottom	<b>CLM4097331</b> <b>CLM4097332</b> <b>CLM4097333</b> <b>CLM4097334</b>	


### Main Contacts 30–400 Amp Lighting Contactors

Type	Frame Size	Contactor Size	Number of Poles	Catalog Number	List Price \$
CLM	C	30 Amp	2	<b>CLMCCK02</b>	
			3	<b>CLMCCK03</b>	
			4	<b>CLMCCK04</b>	
			5	<b>CLMCCK05</b>	
	D	60 Amp	2	<b>CLMDCK02</b>	
			3	<b>CLMDCK03</b>	
			4	<b>CLMDCK04</b>	
			5	<b>CLMDCK05</b>	
	E	100 Amp	2	<b>CLMECK02</b>	
			3	<b>CLMECK03</b>	
			4	<b>CLMECK04</b>	
			5	<b>CLMECK05</b>	
	F	200 Amp	2	<b>CLMFCK02</b>	
			3	<b>CLMFCK03</b>	
			4	<b>CLMFCK04</b>	
			5	<b>CLMFCK05</b>	
	G	300 Amp	2	<b>CLMGCK02</b>	
			3	<b>CLMGCK03</b>	
	H	400 Amp	2	<b>CLMHCK02</b>	
			3	<b>CLMHCK03</b>	

### Auxiliary Contact Blocks 20 Amp Lighting Contactors<sup>②</sup>

Type	Contactor Size	Contacts	Catalog Number	List Price \$
CLM	20 Amp	1 Form C NO, NC Contact 2 Form C NO, NC Contacts	<b>CLM4097291</b> <b>CLM4097292</b>	

### Auxiliary Contact Blocks 30–400 Amp Lighting Contactors


 <p><b>CLMFCAK11</b></p>	Type	Frame Size	Contactor Size	Contact Configuration	Catalog Number	List Price \$
	CLM	C to F <sup>②</sup>	30–200 Amps	1 NO and 1 NC 2 NC 2 NO 1 Coil Clearing NO and NC	<b>CLMFCAK11</b> <b>CLMFCAK02</b> <b>CLMFCAK20</b> <b>CLMFCAK11</b>	
		G to H <sup>②</sup>	300–400 Amps	1 NO and 1 NC 2 NC 2 NO 1 Coil Clearing NO and NC	<b>CLMHCAK11</b> <b>CLMHCAK02</b> <b>CLMHCAK20</b> <b>CLMHCAK11</b>	

① Maximum 1 block per contactor.  
② Maximum 2 blocks per contactor.

**Replacement Handle Assemblies and Disconnect Mechanisms  
Enclosure Types 1, 3R, 4, 4X Stainless Steel & 12**

Class	Disconnect (Amps)	Enclosure Size	Handle Assembly Only		Handle Assembly and Disconnect Mechanism	
			Catalog Number	List Price \$	Catalog Number	List Price \$
17, 25, 32, 84, 87, CM, LE	30, 60 & 100	All Standard and Extra-wide Sizes	75D73944015		75D68257103	
37, 88	30 & 60		75D73944018		75D68257048	
17, 25, 32, 84	200		75D73944015		75D68257105	
37, 88, CM, LE	200		75D73944015		75D68257063	
87	200		75D73944023		75D68257068	
17, 25, 37, 87, 88, CM, LE	400 & 600		75D73944027		75D68257078	
Class	Motor Circuit Interrupter (Amps)	Enclosure Size	Handle Assembly Only		Handle Assembly and Disconnect Mechanism	
			Catalog Number	List Price \$	Catalog Number	List Price \$
18, 26, 32, CM, LE	3 - 125	(24"H x 11"W x 8"D), (24"H x 20"W x 8"D)	75D73944025		75D68257080	
18, 26, 32	100 - 125	(36"H x 24"W x 8"D)	75D73944025		75D68257073	
18, 26, 32	150 & 250	All Standard Sizes	75D73944028		75D68257089	
18, 26, 37, 87, 88, CM	300 - 600		75D73944027		75D68257078	
87	3 - 125		75D73944025		75D68257080	
87	150		75D73944028		75D68257089	
87	250		75D73944011		75D68257077	
37, 88	30 - 125		75D73944025		75D68257073	
37, 84, 88, CM	150 - 250		75D73944011		75D68257077	
84	3 - 125		75D73944025		75D68257074	

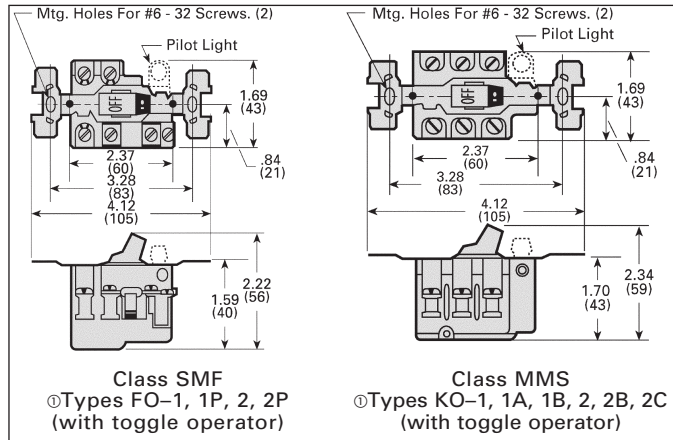
**Quarter Turn Assemblies**

Description	Class	Enclosure Type	Catalog Number	List Price \$
	Quarter-Turn Latch	1, 3/3R & 12	75D46260004	
		4 & 4X	75D46260005	

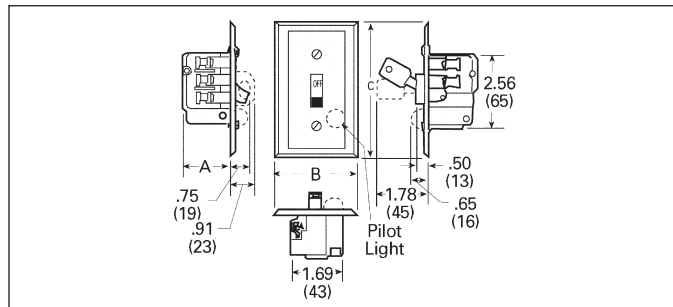
# Class SMF, MMS

## Dimensions

### Class SMF and MMS Open Type

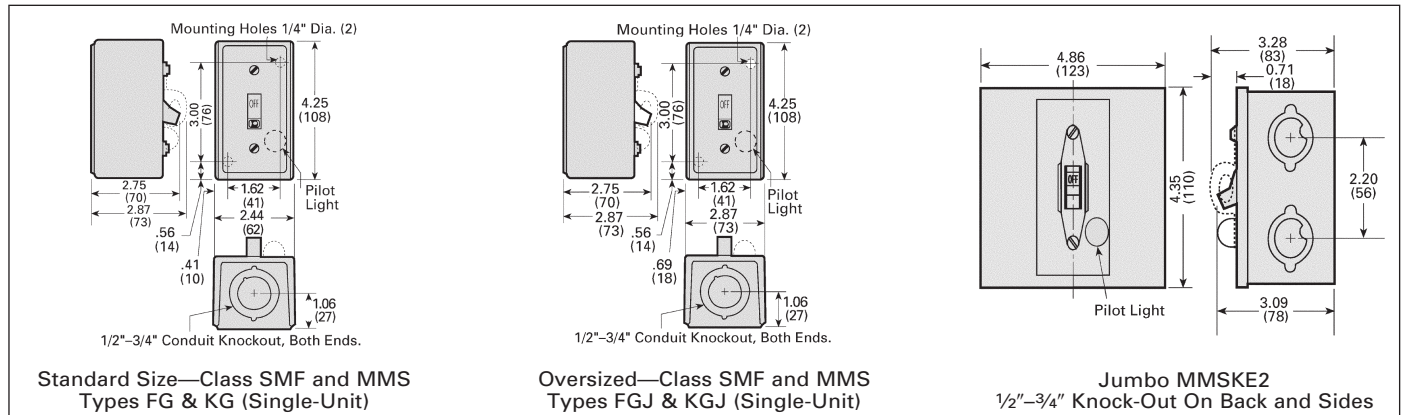


### NEMA Type 1B General Purpose Flush Mounting



Device	Type of Operator	Type	Dimensions in Inches (mm)		
			A	B	C
Class SMF Fractional HP Starter	Toggle	FF1, 1P, 2, 2P	1.44 (37)	2.75 (70)	4.50 (114)
		FS1, 1P, 2, 2P	1.44 (37)	3.50 (89)	5.25 (133)
	Key	FF3, 3P, 4, 4P	1.44 (37)	2.75 (70)	4.50 (114)
		FS3, 3P, 4, 4P	1.44 (37)	3.50 (89)	5.25 (133)
Class MMS Motor Starting Switch	Toggle	KF1, 1A, 1B, 2, 2B, 2C	1.75 (44)	2.75 (70)	4.50 (114)
		KS1, 1A, 1B, 2, 2B, 2C	1.75 (44)	3.50 (89)	5.25 (133)
	Key	KF3, 3A, 3B, 4, 4B, 4C	1.75 (44)	2.75 (70)	4.50 (114)
		KS3, 3A, 3B, 4, 4B, 4C	1.75 (44)	3.50 (89)	5.25 (133)

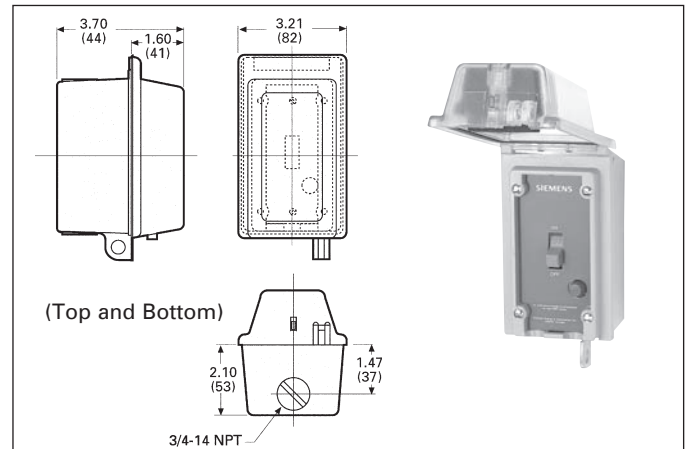
### NEMA Type 1 General Purpose Surface Mounting Enclosures



Note: Dimensions for reference, not for construction. Dimensions are in inches (mm).

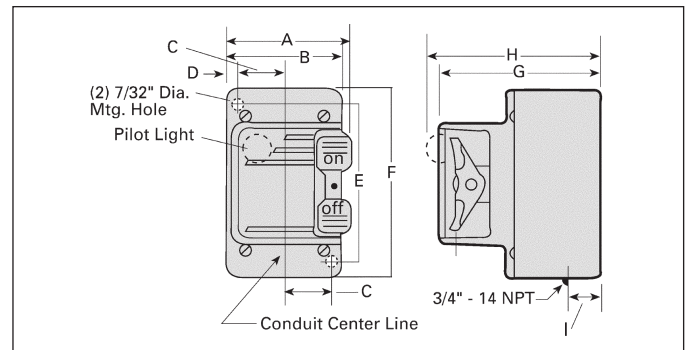
⊙ Dimensions typical for key operator devices.

### NEMA Type 3R, 4 and 12



Device	Class	Type
Fractional HP Starter	SMF	FWN1, 1P, FWN2, 2P FWN3, 3P, FW4, 4P
Motor Starting Switch	MMS	KWN1, 1A, 1B, KWN2, 2B, 2C KWN3, 3A, 3B, KWN4, 4B, 4C

### NEMA Type 4 Watertight Die Cast Zinc Enclosure



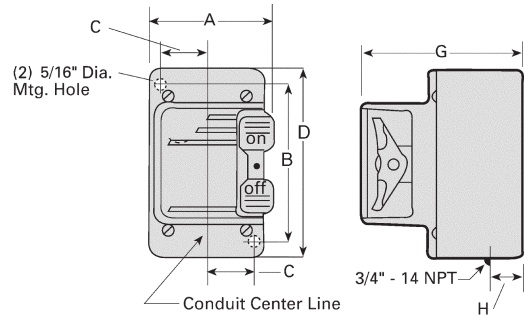
Dimensions in Inches (mm)									
A	B	C	D	E	F	G	H	I	
3.00 (76)	2.75 (70)	1.13 (28)	0.25 (6)	3.75 (95)	4.69 (119)	4.25 (108)	4.56 (116)	0.78 (20)	

Device	Class	Type
Fractional HP Starter	SMF	FW1, 1P, 2, 2P
Motor Starting Switch	MMS	KW1, 1A, 1B, 2, 2B, 2C

### NEMA Type 7 and 9 Cast Aluminum Enclosure

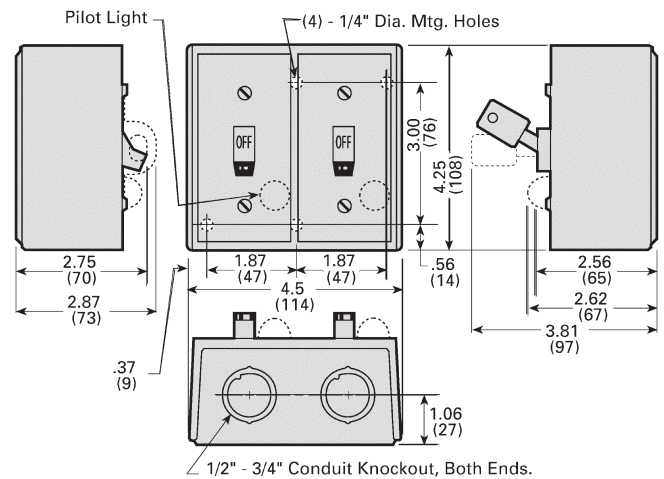
Dimensions in Inches (mm)					
A	B	C	D	G	H
4.00 (101)	5.75 (146)	1.38 (35)	6.36 (161)	4.38 (111)	1.20 (30)

Device	Class	Type
Fractional HP Starter	SMF	FR1, FR2
Motor Starting Switch	MMS	KR1, KR2



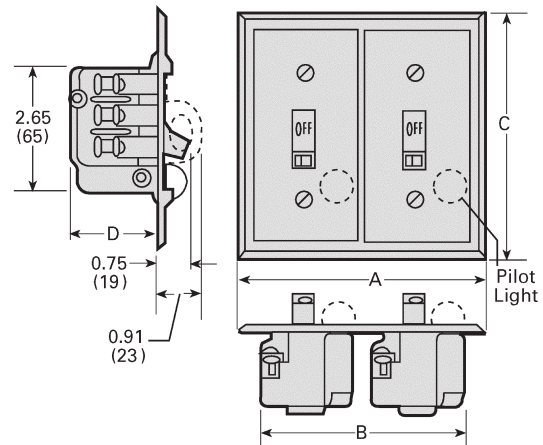
### NEMA Type 1 General Purpose Enclosure For Two Unit Devices

Device	Type of Operator	Class	Type
One Starter	Toggle	SMF	FG02, 02P
	Key	SMF	FG04P
Two Starters	Toggle	SMF	FG222, 222P
	Key	SMF	FG44P
One Starter and One Sel. Switch <sup>①</sup>	Toggle	SMF	FG71, 71P, 72, 72P
	Key	SMF	FG74P
Reversing Switch <sup>②</sup>	Toggle	MRS	KG11, 11A, 11B, 22, 22A, 22B, 22C
Two Speed Starter	Toggle	SMF	FG11, 11P, 22, 22P
Two Speed Switch	Toggle	MMS	KG11, 11A, 11B, 22, 22B, 22C



### NEMA Type 1B General Purpose Flush Mounting For Two Unit Devices

Device <sup>③</sup>	Type of Operator	Class	Type	A	B	C	D
Two Starters	Toggle	SMF	FF22, 22P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS22P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
	Key	SMF	FF44P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS44P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
One Starter and One Selector Switch <sup>④</sup>	Toggle	SMF	FF71, 71P, 72, 72P	5.25 (133)	0.75 (19)	5.25 (133)	2.00 (51)
			FS71P, 72P	4.56 (116)	3.50 (89)	4.50 (114)	2.00 (51)
	Key	SMF	FF74P	5.25 (133)	3.75 (95)	5.25 (133)	2.00 (51)
			FS74P	4.56 (116)	3.50 (89)	4.50 (114)	2.00 (51)
Reversing Switch	Toggle	MRS	KF11, 11A, 11B KF22, 22A 22B, 22C	5.25 (133)	3.75 (95)	5.25 (133)	1.75 (44)
Two Speed Switch	Toggle	SMF	FF11, 11P, 22, 22P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
Two Speed Switch	Toggle	MMS	KF11, 11A, 11B 22, 22B, 22C	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)



**Note:** Dimensions for reference, not for construction. Dimensions are in inches (mm).

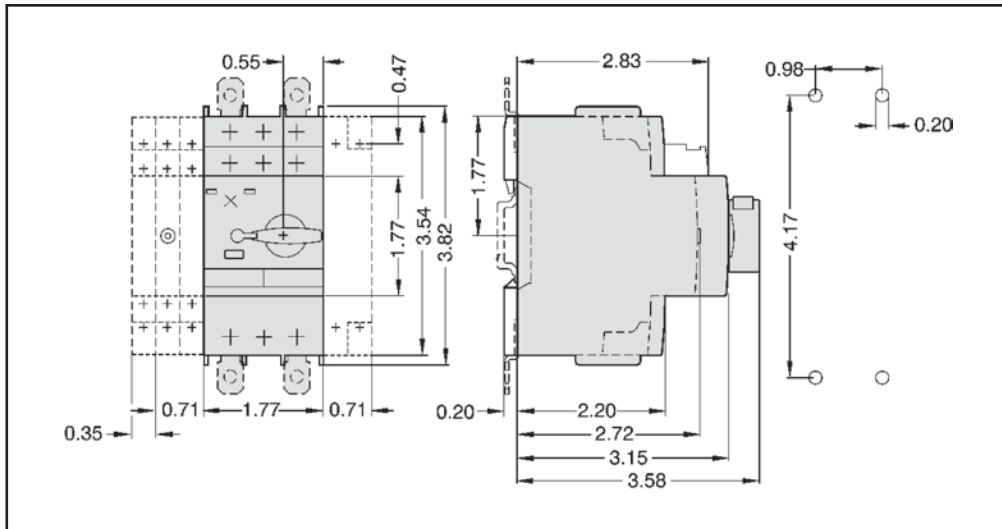
- ① Selector switch is on the left, increases overall depth to 3.50 in. (89 mm).
- ② Only one pilot light (located on right) is used on MRS switches.

- ③ Dimensions include factory wired power connections.
- ④ Selector switch is on the left, extends 1.62 in. (41 mm) from mounting surface.

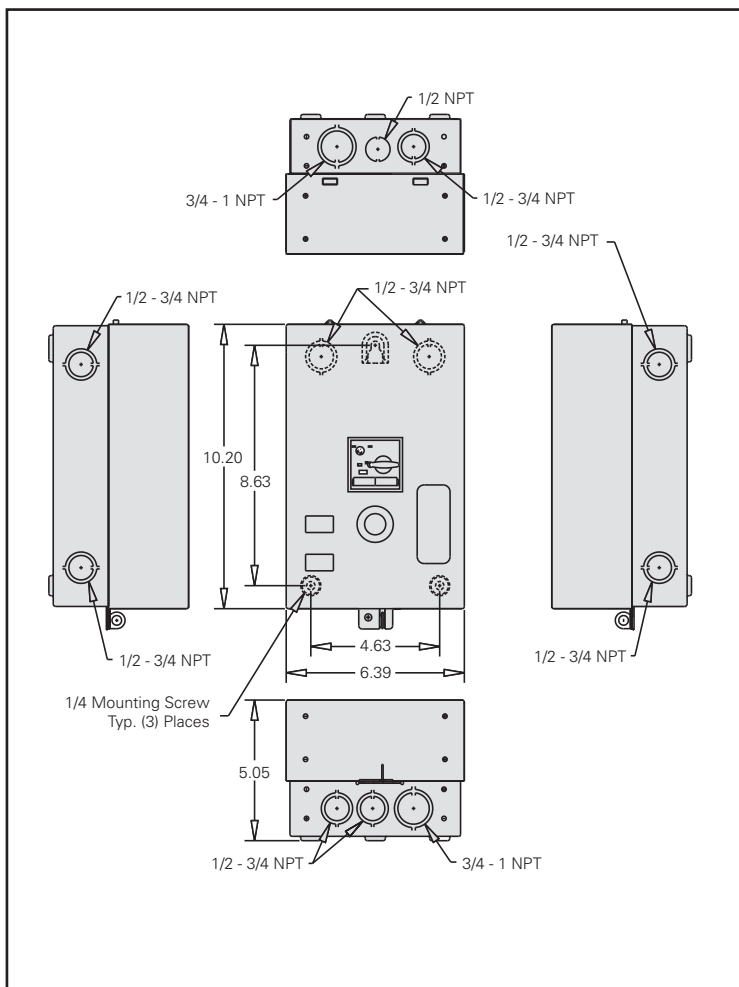
# Class 11 - 3RV

## Dimensions

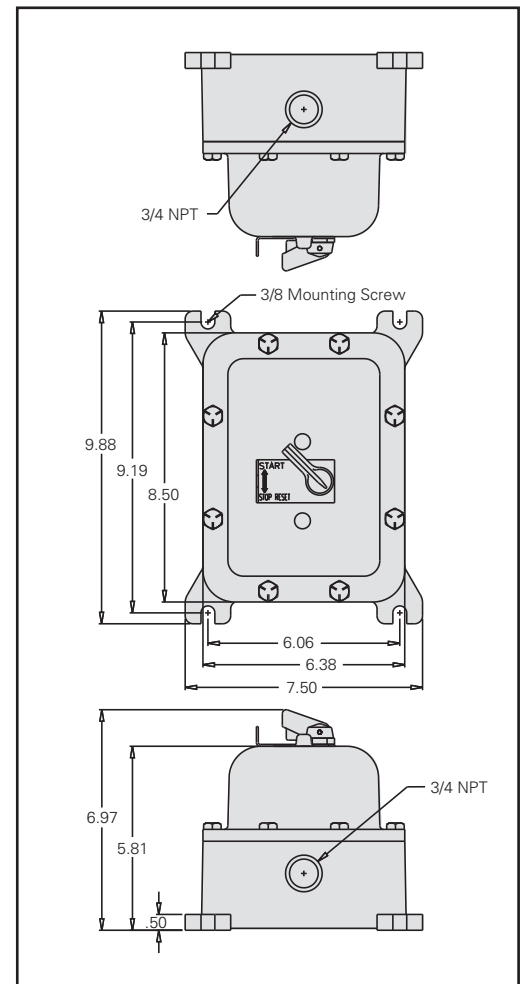
### 3RV102



### Class 11 - NEMA 1 Enclosure



### Class 11 - NEMA 7 & 9, 3 & 4, and NEMA 7 & 9 Enclosure

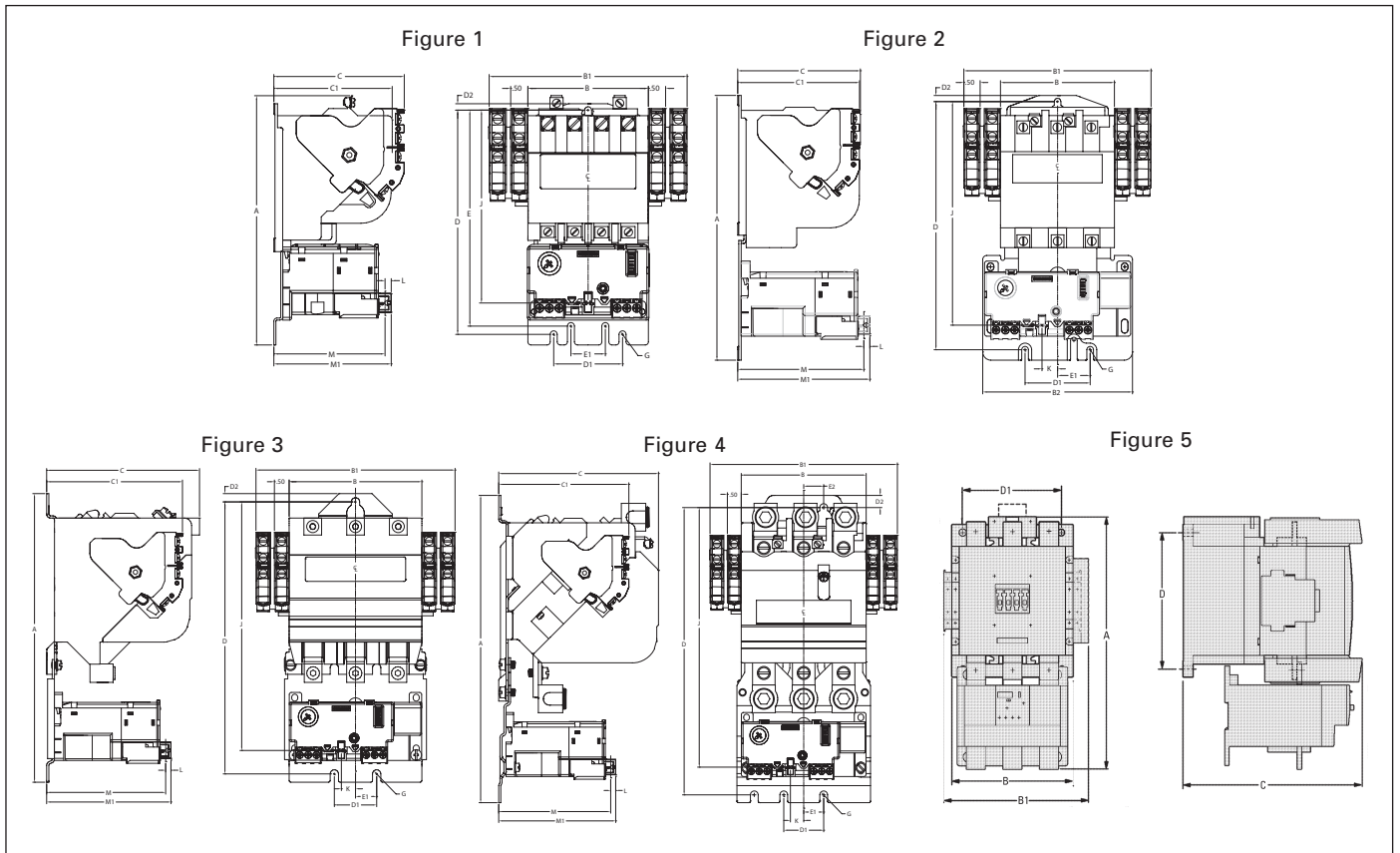


**Note:** Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.



# Solid State Overload, Class 14

## Dimensions



### Open Type Solid State Overload

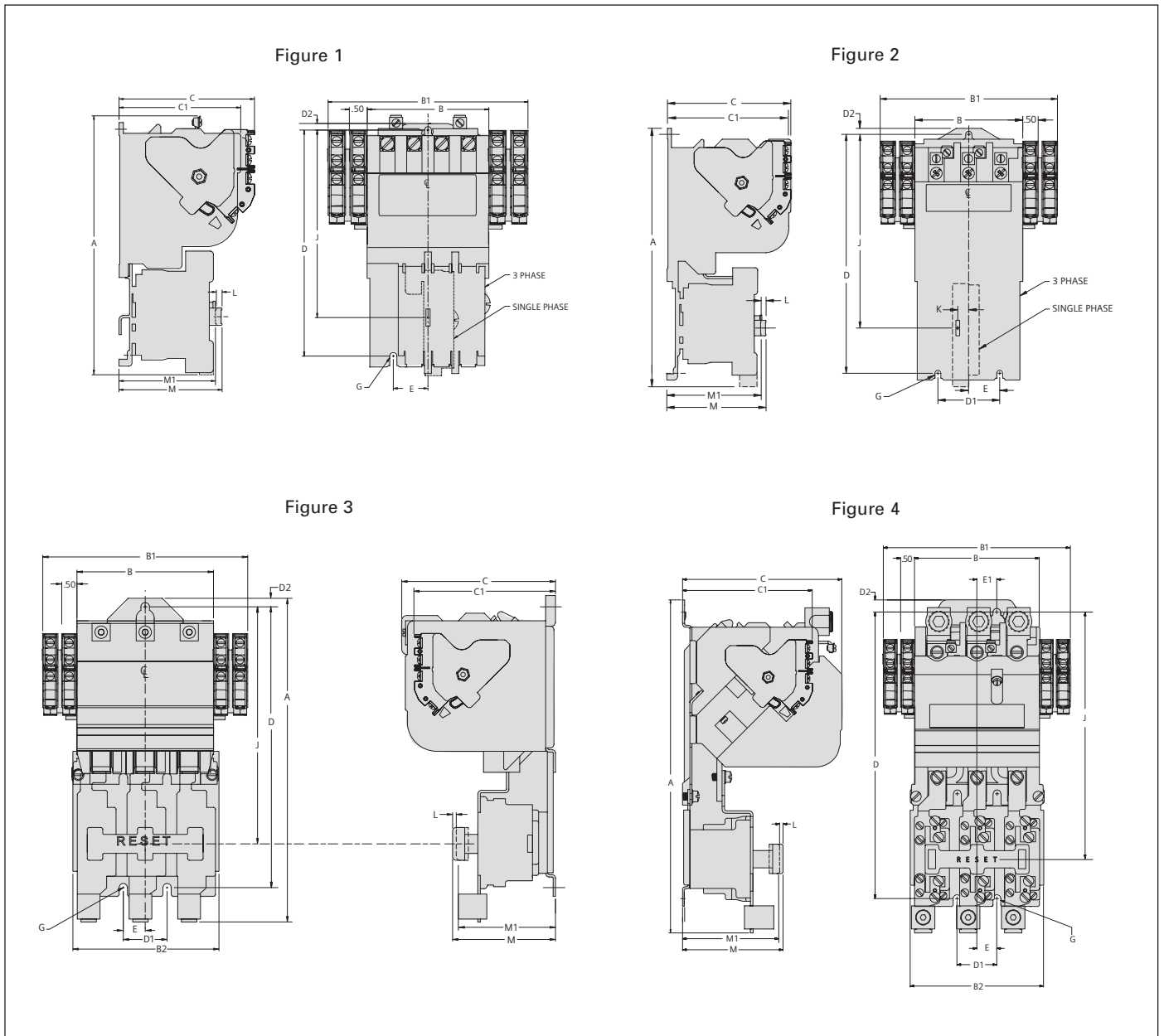
Size	Figure	Outline Dimensions					Mounting Dimensions						Mounting Screw	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	D2	E	E1		E2	G	J	K	L	M
00-1¼	1	7.44 (189)	3.50 (89)	5.75 (146)	—	3.75 (95)	3.50 (89)	6.50 (165)	2.00 (51)	0.19 (5)	6.27 (159)	1.00 (25)	—	#10	5.60 (142)	—	0.18 (5)	3.23 (82)	3.41 (87)
2-2½	2	8.13 (207)	3.50 (89)	5.75 (146)	4.60 (117)	4.00 (102)	3.77 (96)	7.62 (194)	2.00 (51)	0.19 (5)	—	1.00 (25)	—	#10	6.87 (174)	0.48 (12)	0.18 (5)	3.88 (99)	4.06 (103)
3-3½	3	9.78 (248)	4.50 (114)	6.75 (171)	—	5.19 (132)	4.66 (118)	9.22 (234)	1.44 (37)	0.28 (7)	—	0.72 (18)	—	0.25 (6)	8.43 (214)	0.48 (12)	0.18 (5)	4.04 (103)	4.22 (107)
4	4	11.06 (281)	4.50 (114)	6.75 (171)	—	5.75 (146)	4.66 (118)	10.34 (263)	1.44 (37)	0.44 (11)	—	0.72 (18)	0.72 (18)	0.25 (6)	9.35 (237)	0.48 (12)	0.18 (5)	4.04 (103)	4.22 (107)
5	5	12.76 (324)	5.71 (145)	6.89 (175)	—	8.54 (217)	—	7.09 (180)	4.72 (120)	—	—	—	—	0.35 (9)	—	—	—	—	—
6	6	13.03 (331)	6.30 (160)	7.48 (190)	—	9.29 (236)	—	7.09 (180)	5.12 (130)	—	—	—	—	0.35 (9)	—	—	—	—	—

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.



# Ambient Compensated Bimetal Class 14

## Dimensions



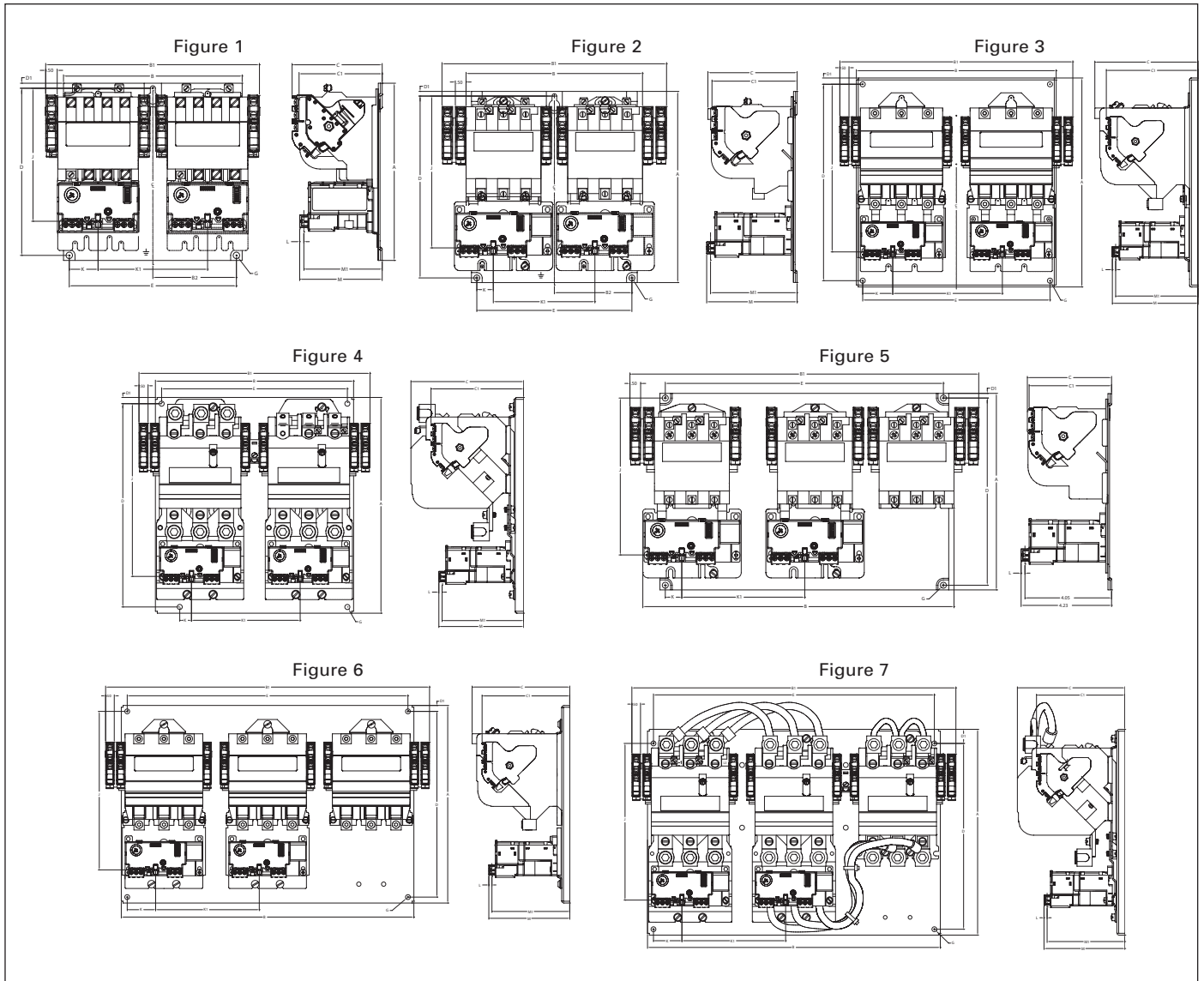
### Open Type Ambient Compensated Bimetal Overload

Size	Figure	Outline Dimensions					Mounting Dimensions					Mounting Screw	Reset Dimensions				
		A	B	B1	C	C1	D	D1	D2	E	E1		G	J	K	L	M
00-1¼	1	7.45 (189)	3.50 (89)	5.75 (146)	3.89 (99)	3.50 (89)	6.50 (165)	—	0.19 (4.8)	1.00 (25)	—	#10	5.39 (137)	—	0.16 (4)	2.97 (75)	2.81 (71)
2-2½	2	8.38 (213)	3.50 (89)	5.75 (146)	4.00 (102)	3.77 (96)	7.75 (197)	2.00 (51)	0.19 (4.8)	1.00 (25)	—	#10	6.28 (160)	0.36 (9)	0.16 (4)	3.22 (82)	3.06 (78)
3-3½	3	10.66 (271)	4.50 (114)	6.75 (171)	5.06 (129)	4.66 (118)	9.25 (235)	1.44 (37)	0.28 (7)	0.72 (18)	—	0.25 (6)	7.81 (198)	—	0.12 (3)	3.39 (86)	3.27 (83)
4	4	12.02 (305)	4.50 (114)	6.75 (171)	5.75 (146)	4.66 (118)	10.34 (263)	1.44 (37)	0.44 (11)	0.72 (18)	0.72 (18)	0.25 (6)	8.78 (223)	—	0.12 (3)	3.63 (92)	3.51 (89)

**Note:** Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

# Solid State Overload Class 22, 30

## Dimensions



### Class 22 Reversing & Class 30 2 Speed/2 Winding

Size	Figure	Outline Dimensions						Mounting Dimensions			Mounting Screw	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	E		J	K	K1	L	M	M1
00-1½	1	7.69	7.75	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.77	1.25	4.75	0.18	3.58	3.40
2-2½	2	8.94	8.25	10.50	3.62	4.17	3.98	8.50	0.22	7.25	#10	7.10	0.77	4.75	0.18	4.23	4.05
3-3½	3	11.44	10.94	12.75	—	5.65	5.03	10.75	0.34	10.25	#10	9.18	1.64	6.00	0.18	4.69	4.51
4	4	11.91	10.94	12.75	—	6.22	5.12	11.22	0.34	10.25	0.25	9.53	0.65	6.00	0.18	4.68	4.50

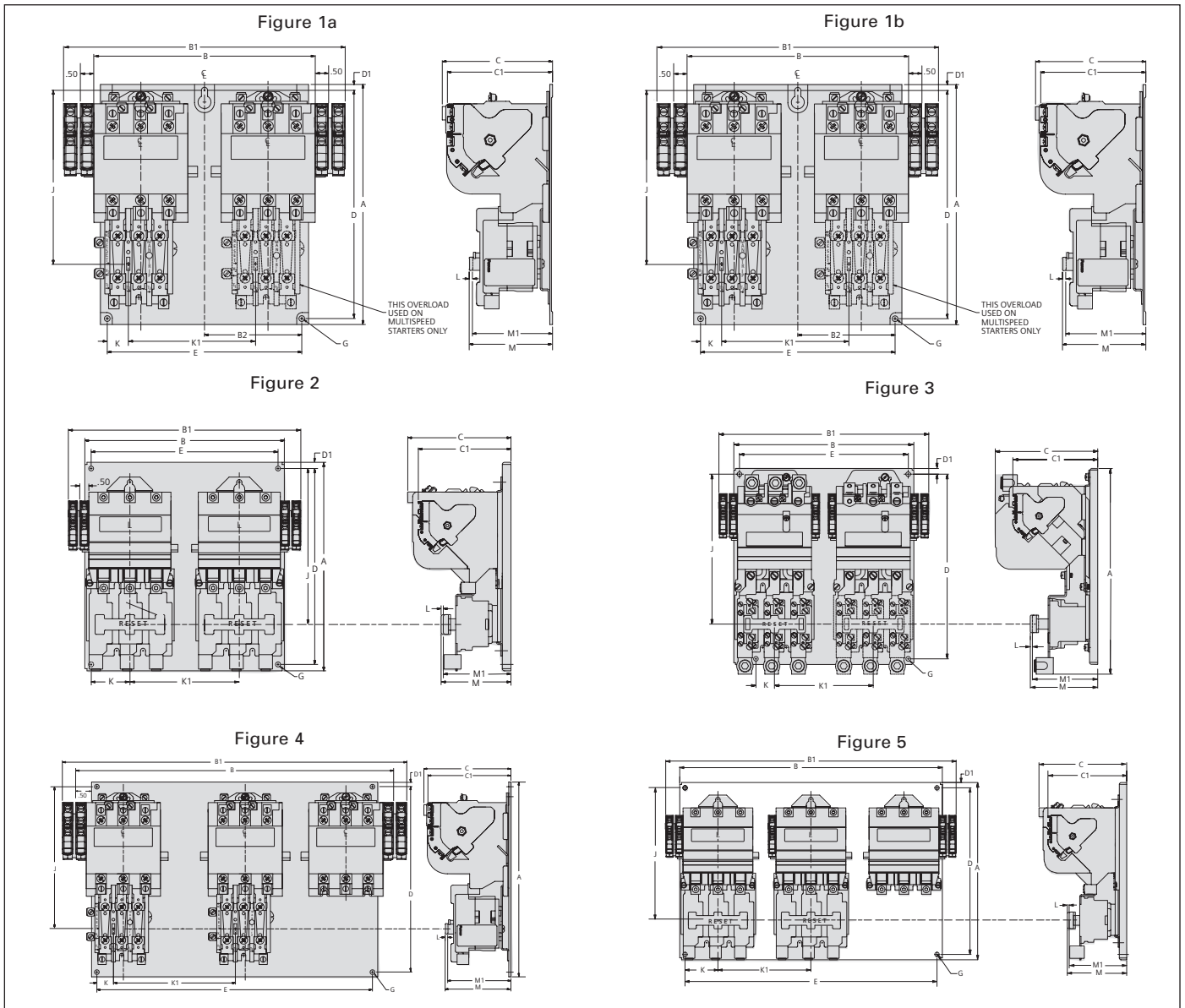
### Class 30 2 Speed/1 Winding

Size	Figure	Outline Dimensions						Mounting Dimensions			Mounting Screw	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	E		J	K	K1	L	M	M1
00-1½	1	7.69	7.75	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.77	1.25	4.75	0.18	3.58	3.40
2-2½	5	9.19	14.55	16.30	—	3.94	3.85	8.75	0.22	13.00	#10	7.33	0.77	5.75	0.18	4.23	4.05
3-3½	6	11.44	16.94	18.75	—	5.65	5.07	10.75	0.34	16.25	#10	9.18	1.64	6.00	0.18	4.68	4.50
4	7	11.91	16.94	17.75	—	6.22	5.12	10.75	0.82	16.25	#10	9.06	1.64	6.00	0.18	4.68	4.50

Note: Dimensions for reference, not for construction.  
 Contact sales office for dimensions not listed.  
 Dimensions are in inches (mm).

# Ambient Compensated Bimetal Overload Class 22, 30

## Dimensions



### Class 22 Reversing & Class 30 2 Speed/2 Winding with Bimetal Overload

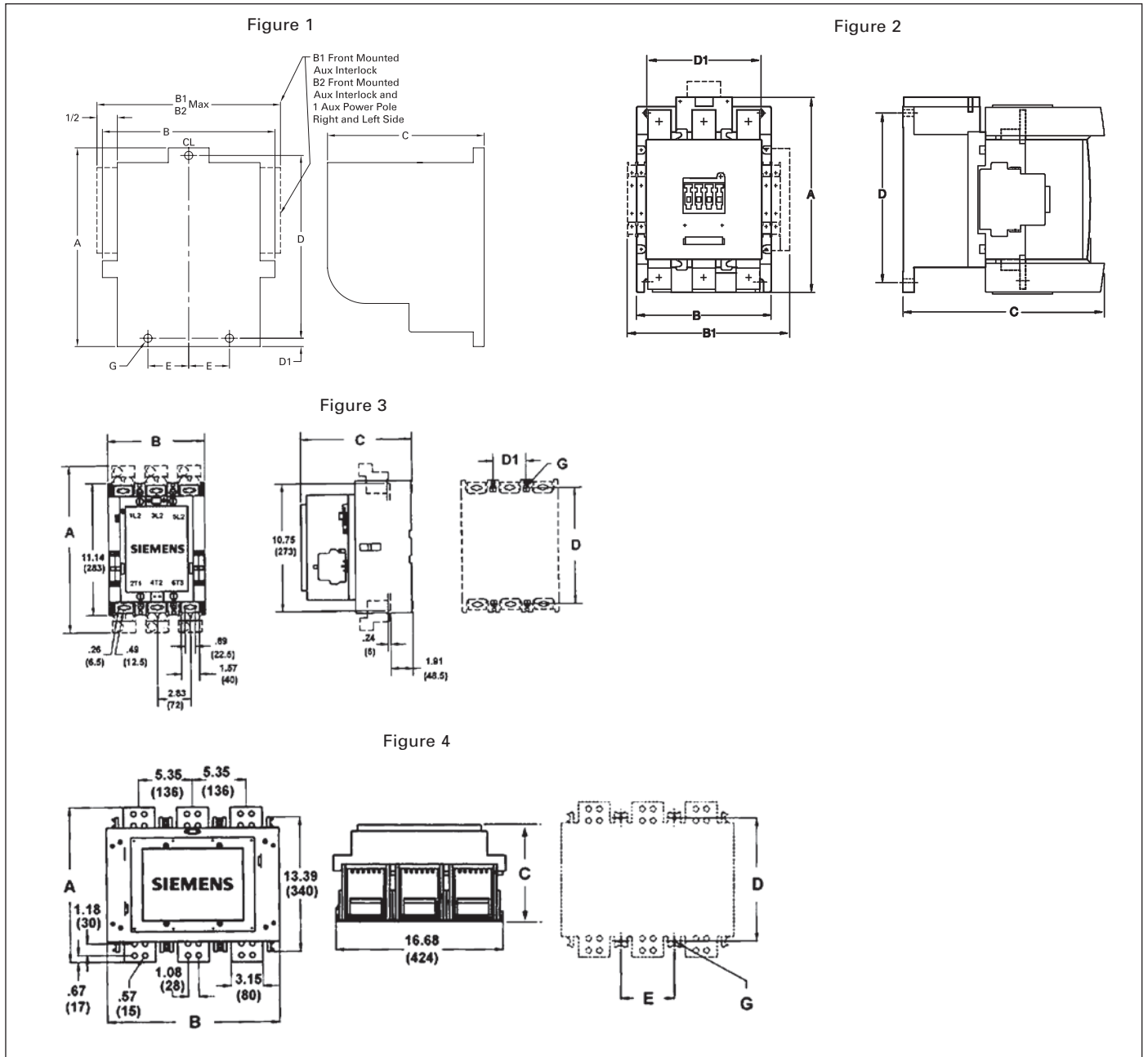
Size	Figure	Outline Dimensions						Mounting Screw			Mounting Dimensions		Reset Dimensions				
		A	B	B1	B2	C	C1	D	D1	E	G	J	K	K1	L	M	M1
00-1/4	1a	7.69	8.25	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.60	1.25	4.75	0.16	3.12	3.07
2-2 1/2	1b	8.94	8.25	10.50	3.62	4.17	3.98	8.50	0.22	7.25	#10	6.46	0.79	4.75	0.16	3.10	3.05
3-3 1/2	2	11.44	10.94	12.94	—	5.66	5.08	10.75	0.34	10.25	#10	8.56	2.12	6.00	0.12	3.83	3.71
4	3	12.50	10.94	12.75	—	6.22	5.16	11.22	0.34	10.25	0.25	9.11	2.12	6.00	0.12	4.09	3.97

### Class 30 2 Speed/1 Winding with Bimetal Overload

Size	Figure	Outline Dimensions						Mounting Screw			Mounting Dimensions		Reset Dimensions				
		A	B	B1	B2	C	C1	D	D1	E	G	J	K	K1	L	M	M1
00-1/4	1a	7.69	8.25	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.60	1.25	4.75	0.16	3.12	3.07
2-2 1/2	4	9.19	14.56	16.25	—	4.11	3.92	8.75	0.22	13.00	0.25	6.71	0.78	5.75	0.16	3.10	3.05
3-3 1/2	5	11.44	16.94	18.75	—	5.66	5.08	10.75	0.34	16.25	0.25	8.56	2.12	6.00	0.12	3.83	3.71

**Note:** Dimensions for reference, not for construction.  
 Contact sales office for dimensions not listed.  
 Dimensions are in inches (mm).

Full Voltage Open Type NEMA Contactor Size 00-8

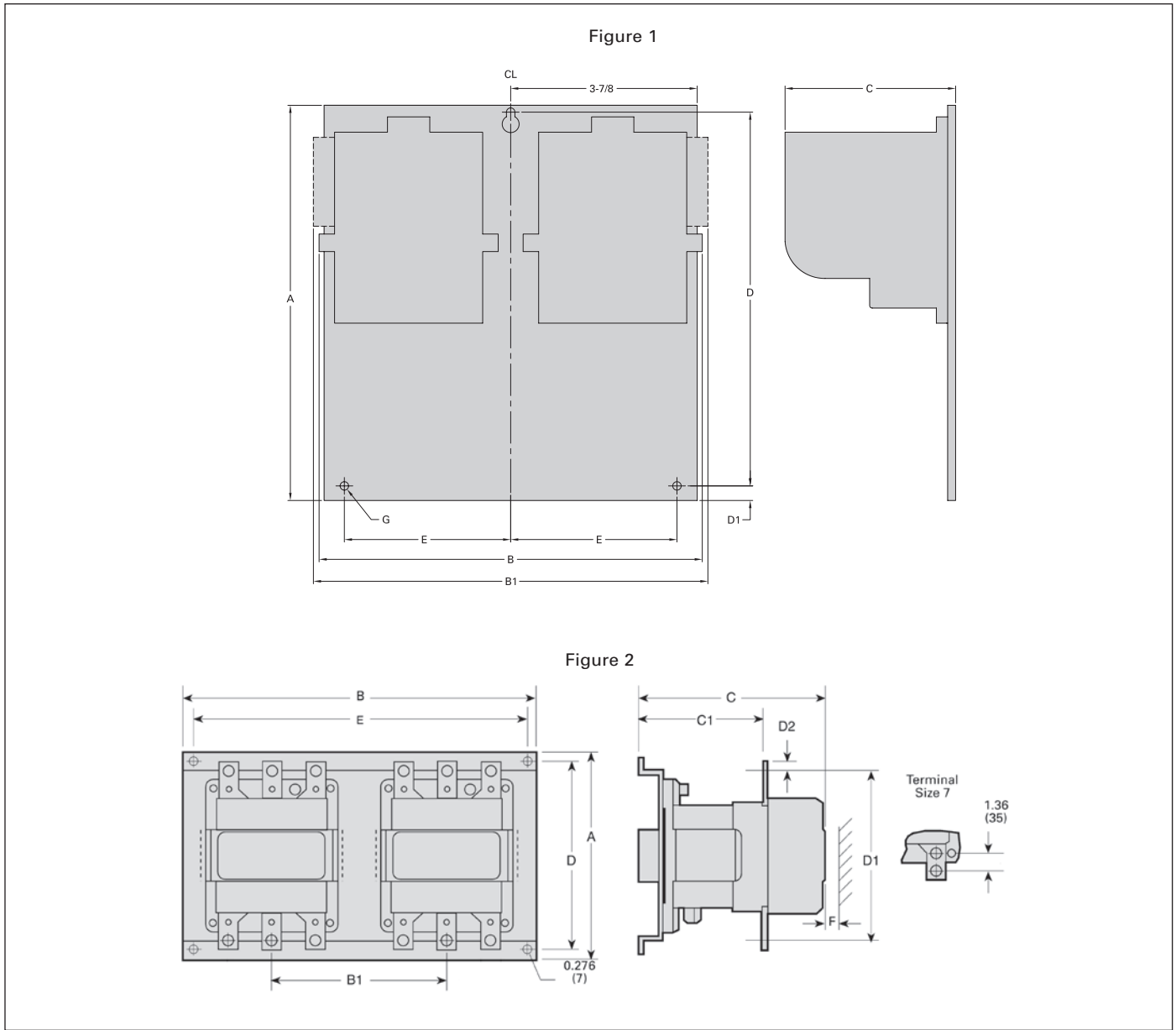


Open Type

Size	3rd Character of Catalog No. ①	Fig	Outline Dimensions					Mounting Dimensions				Mounting Screw
			A	B	B1	B2	C	D	D1	E	G	
00-1/4	C, D, E	1	4.31 (110)	3.94 (100)	4.25 (108)	4.75 (121)	3.75 (70)	3.94 (100)	0.19 (5)	1.00 (25)	#10	
2-2 1/2	F, G	1	4.88 (124)	3.94 (100)	4.25 (108)	—	4.00 (102)	4.50 (114)	0.19 (5)	1.00 (25)	#10	
3-3 1/2	H, I	1	6.13 (156)	5.13 (130)	5.50 (140)	—	5.06 (129)	5.63 (143)	0.25 (6)	0.75 (19)	0.25 (6)	
4	J	1	7.81 (198)	5.19 (132)	5.50 (140)	—	5.75 (146)	6.56 (167)	0.81 (21)	0.75 (19)	0.5 (13)	
5	L	2	8.27 (210)	5.71 (145)	6.89 (175)	—	8.54 (217)	7.09 (180)	4.72 (120)	—	0.35 (9)	
6	M	2	8.43 (214)	6.3 (160)	7.48 (190)	—	9.29 (236)	7.09 (180)	5.12 (130)	—	0.35 (9)	
7	N	3	14.05 (357)	8.27 (210)	—	—	9.53 (242)	9.80 (249)	2.83 (72)	—	0.25 (6)	
8	P	4	15.41 (392)	17.23 (438)	—	—	10.56 (268)	12.28 (312)	—	5.35 (136)	0.35 (9)	

Note: Dimensions for reference, not for construction. Contact sales office for dimensions not listed. Dimensions are in inches (mm).

① 3rd character of catalog number identifies contactor rating.



Open Type Horizontal Mounted

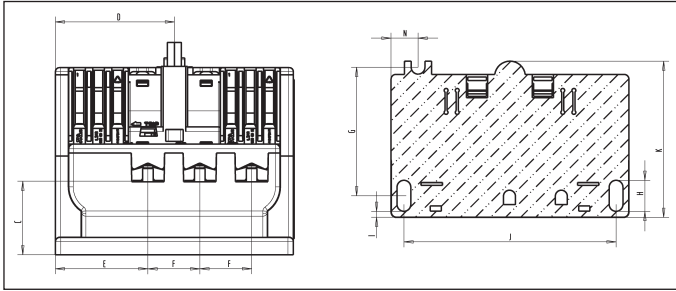
Size	Fig.	Outline Dimensions					Mounting Dimensions					Mounting Screw
		A	B	B1	C	C1	D	D1	E	F	G	
00-1¼	1	7.69 (195)	7.75 (197)	9.25 (235)	3.88 (98)	—	7.25 (184)	0.25 (6)	3.63 (92)	—	#10	
2, 2½	1	8.94 (227)	7.75 (197)	9.25 (235)	4.56 (116)	—	8.5 (216)	0.25 (6)	3.63 (92)	—	#10	
3-3½	1	11.44 (291)	10.94 (278)	11.50 (292)	5.19 (132)	—	10.75 (273)	0.38 (6)	5.13 (130)	—	0.25	
4	1	8.50 (216)	10.94 (278)	11.50 (292)	6.25 (159)	—	7.81 (198)	0.38 (6)	5.13 (130)	—	0.25	
5	2	18.07 (459)	14.20 (361)	—	9.44 (240)	—	17.20 (437)	—	9.61 (244)	—	—	
6	2	11.61 (295)	18.88 (480)	9.45 (240)	10.85 (276)	7.44 (189)	10.44 (265)	10.71 (272)	17.72 (450)	1.18 (30)	—	

**Note:** Dimensions for reference, not for construction.  
 Contact sales office for dimensions not listed.  
 Dimensions are in inches (mm).

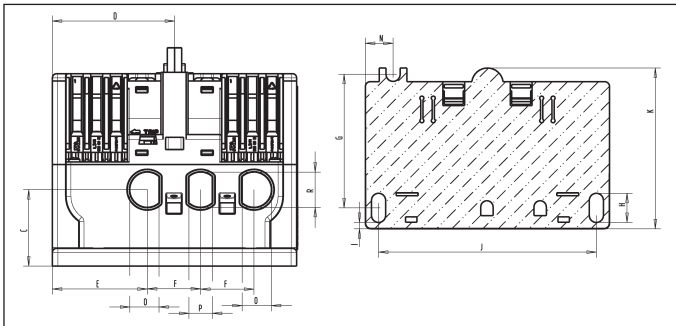
# Solid State Overload

## Dimensions

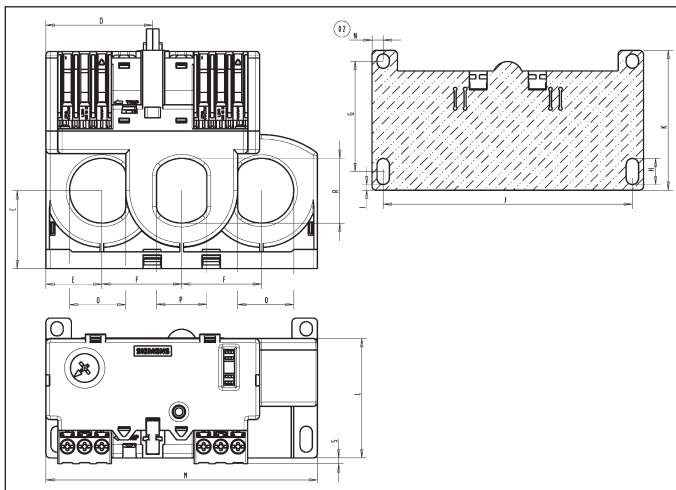
Dimensions "A" Frame—ESP200 Solid State Overload



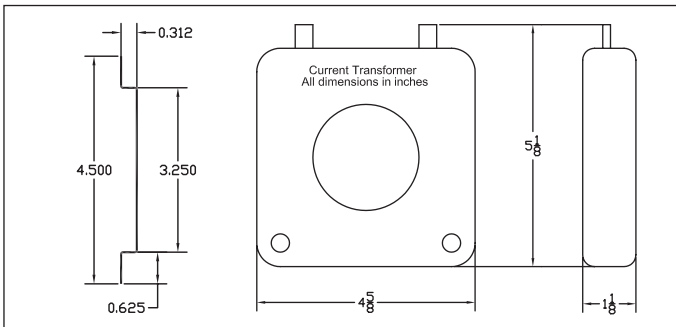
Dimensions "A1" Frame—ESP200 Solid State Overload



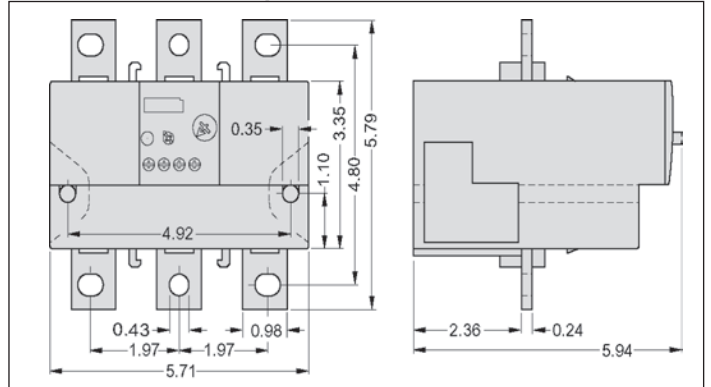
Dimensions "B" Frame—ESP200 Solid State Overload



Current Transformers (all CT's have the same dimensions)



Overload (55 - 630 Amps), SIRIUS 3RB20

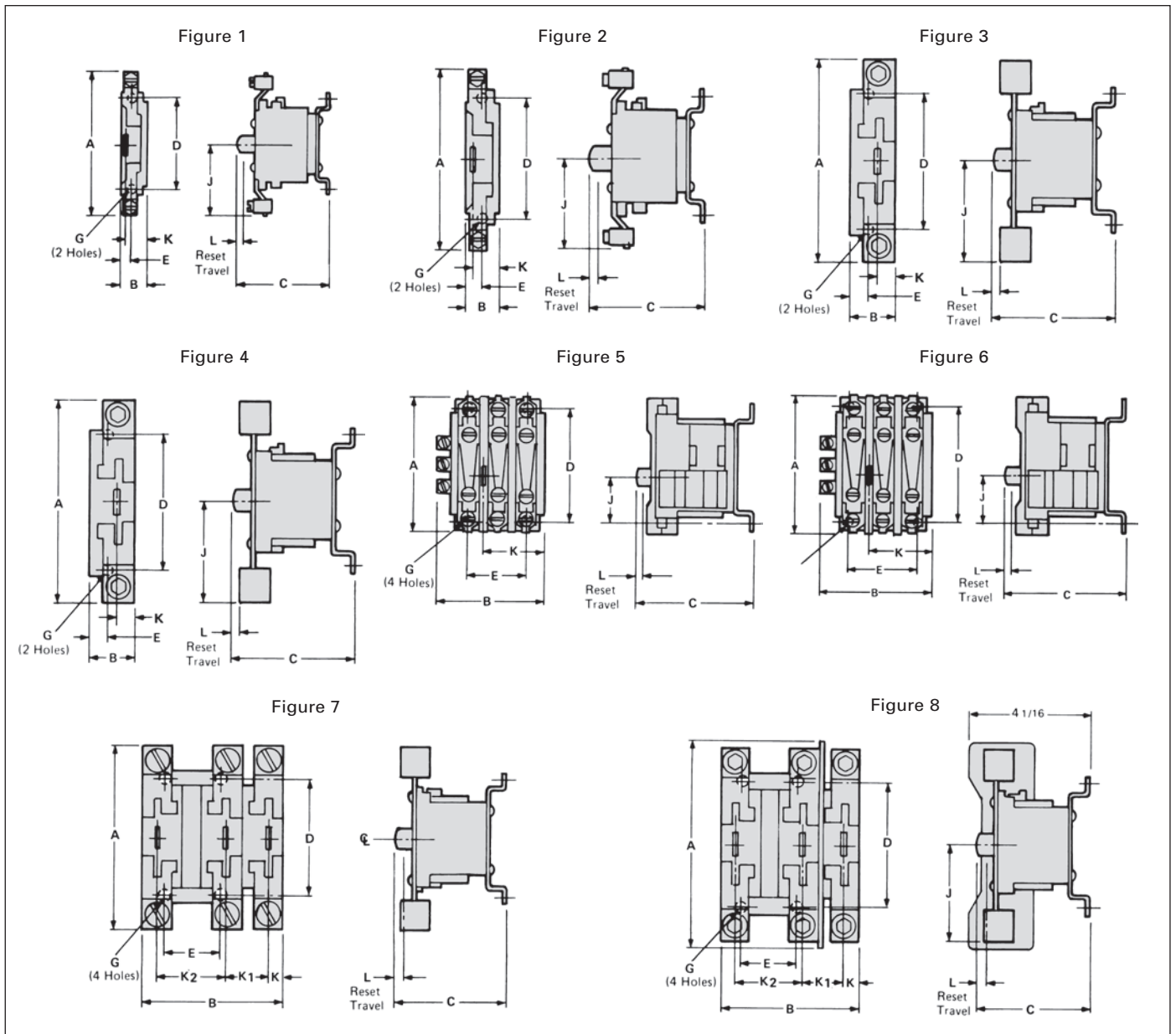


Dimensions	Frame Size A		Frame Size A1		Frame Size B	
	mm	in.	mm	in.	mm	in.
A	80	3.15	80	3.15	100.4	3.95
B	12.6	0.5	12.6	0.5	8.6	0.34
C	27.7	1.1	28	1.10	32.6	1.28
D	44.85	1.77	44.85	1.77	44.85	1.77
E	34.9	1.37	34.9	1.37	23.5	0.93
F	19.6	0.77	19.6	.077	33.5	1.32
G	48.95	1.93	48.95	1.93	46.23	1.82
H	10.7	0.42	10.7	0.42	10.9	0.43
I	2.3	0.09	2.3	0.09	2.4	0.09
J	80	3.15	80	3.15	104.6	4.12
K	53.9	2.12	53.9	2.12	58.6	2.31
L	66.0	2.6	55.9	2.20	50	1.97
M	89.7	3.53	89.7	3.53	114	4.49
N	10.18	0.40	10.18	0.40	4.7	0.19
O	—	—	10.77	0.42	23.6	0.93
P	—	—	8.62	0.34	21.1	0.83
R	—	—	12.9	0.51	27.1	1.07
S	9.5	0.37	—	—	2.45	0.1
T	5.2	0.21	5.2	0.21	5.2	0.21

Note: When mounted on a plate, torque screws to 11 lb.in. (1.2 Nm).

# Panel Mounted Class 48 — Bimetal

## Dimensions



Description	Amp Rating	Fig	Outline Dimensions			Mounting Dimensions		Reset Dimensions			Mounting Screw G	Max Wire Size	Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E	J	K	L				
1-Pole Bimetal	25	1	3 1/2 (89)	7/8 (22)	3 3/8 (81)	3 (76)	1/2 (13)	1 1/4 (44)	3/4 (19)	1/8 (3)	#10	8	2 (1)	D51820
1-Pole Ambient	60	2	4 1/8 (124)	7/8 (22)	3 3/8 (81)	3 (76)	1/2 (13)	2 1/8	3/4 (19)	1/8 (3)	#10	1	2 (1)	D51830
1-Pole Compensated	100	3	4 1/8 (124)	1 1/4 (32)	3 3/8 (90)	3 1/2 (89)	9/16 (14)	2 1/8	1/2 (13)	1/8 (3)	#10	00	3 (1)	D51833
1-Pole Compensated	180	4	5 1/8 (151)	1 1/4 (32)	3 3/8 (90)	3 1/2 (89)	9/16 (14)	3 (76)	1/2 (13)	1/8 (3)	#10	250 MCM	4 (2)	D52206

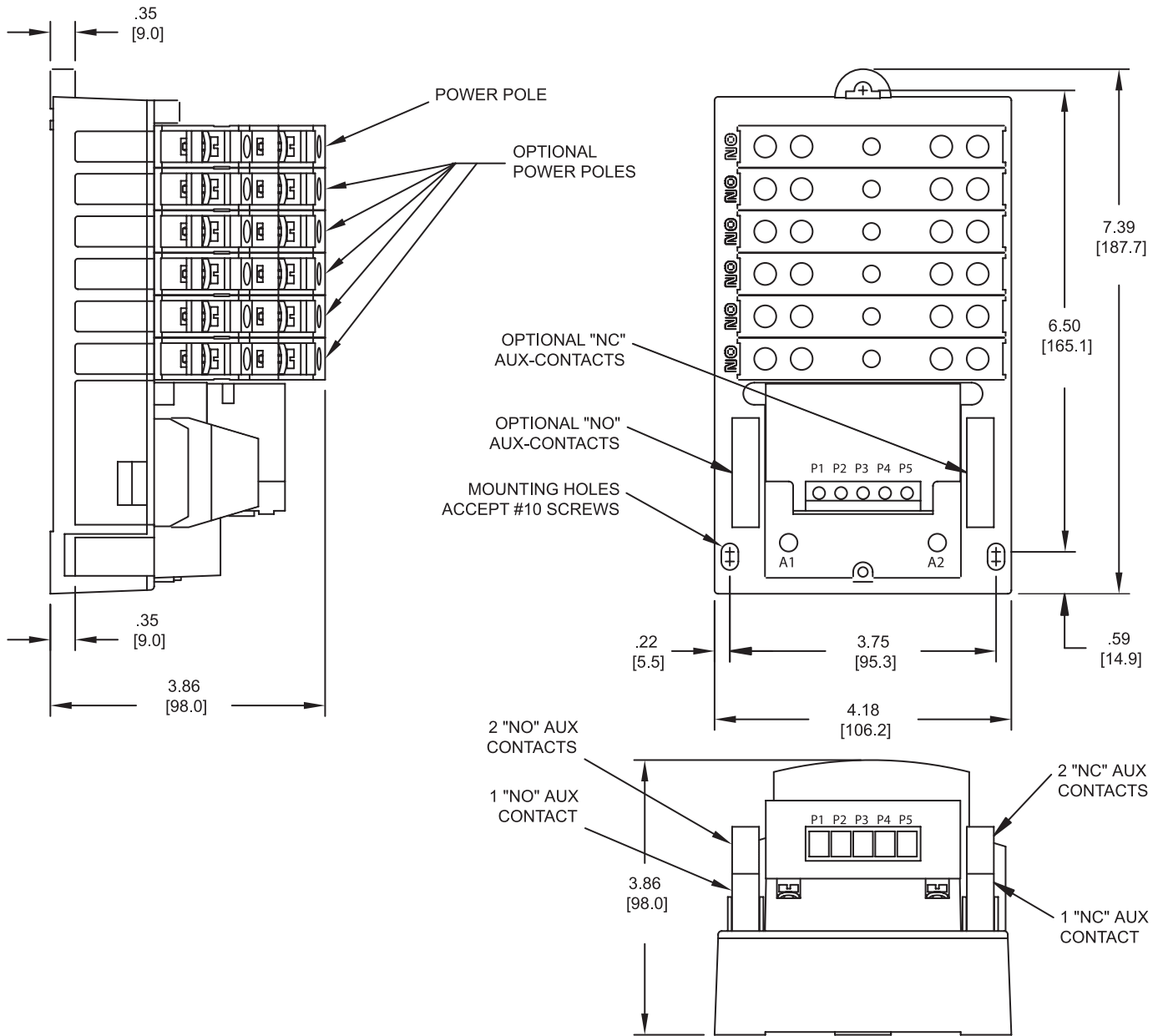
Description	Amp Rating	Fig	Outline Dimensions			Mounting Dimensions		Reset Dimensions			Mtg Screw G	Max Wire Size	Approx Ship Wt Lbs (Kg)	Ref Dwg		
			A	B	C	D	E	J	K	K1					K2	L
3-Pole Bimetal	30	5	3 3/8 (92)	3 3/8 (78)	3 3/8 (79)	3 (76)	1 1/2 (38)	1 1/4 (32)	1 13/16 (46)	—	—	3/16 (5)	#10	8	3 (1)	D54791
3-Pole Ambient	60	6	3 3/8 (98)	3 3/8 (78)	3 3/8 (79)	3 (76)	1 1/2 (38)	1 1/4 (32)	1 13/16 (46)	—	—	3/16 (5)	#10	2	3 (1)	D54823
3-Pole Compensated	100	7	4 1/8 (124)	4 7/8 (113)	3 3/8 (90)	3 1/2 (89)	1 3/4 (41)	2 1/8 (62)	9/16 (14)	1 13/16 (49)	2 (51)	1/8 (3)	#10	00	4 (2)	D51868
3-Pole Compensated	180	8	6 1/2 (165)	4 7/8 (113)	3 3/8 (90)	3 1/2 (89)	1 3/4 (41)	3 (76)	9/16 (14)	1 13/16 (49)	2 (51)	1/8 (3)	#10	250 MCM	5 (2)	D52038

Note: Dimensions for reference, not for construction. Dimensions in inches (mm).



# Class LC Open Contactors

## Dimensions



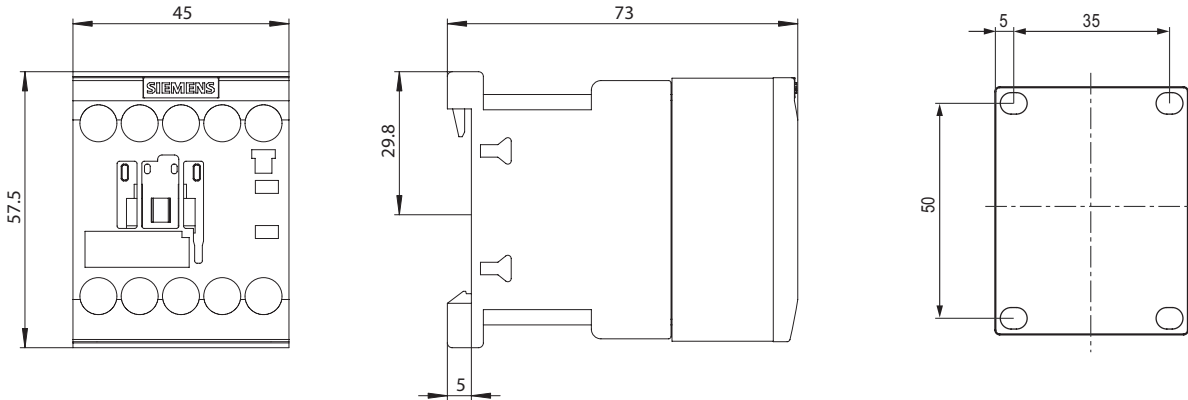
Note:

- 1) Mounting Dimensions remain the same for 1 to 12 Poles
- 2) Line and Load terminals are inter-changeable
- 3) Up to 2NO and 2NC auxiliary contacts can be added onto the base product
- 4) Same Power Pole can be configured as NO type or NC type

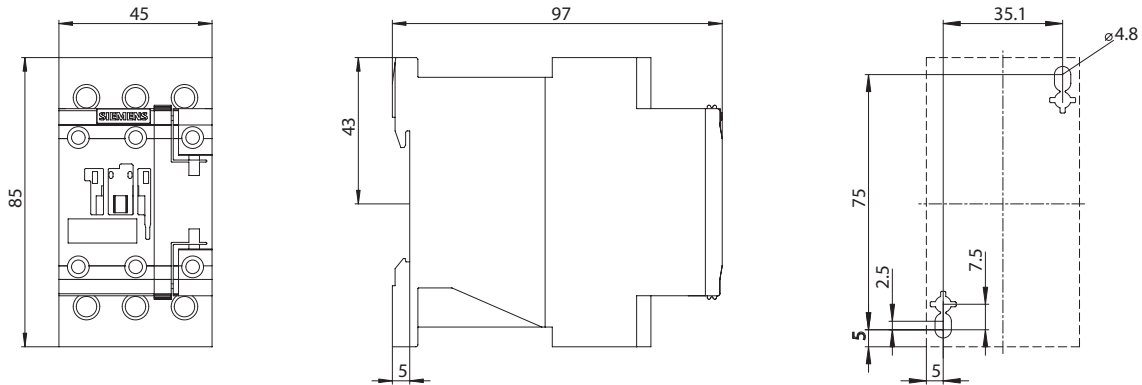
# Open Contactors, Class LE

## Dimensions

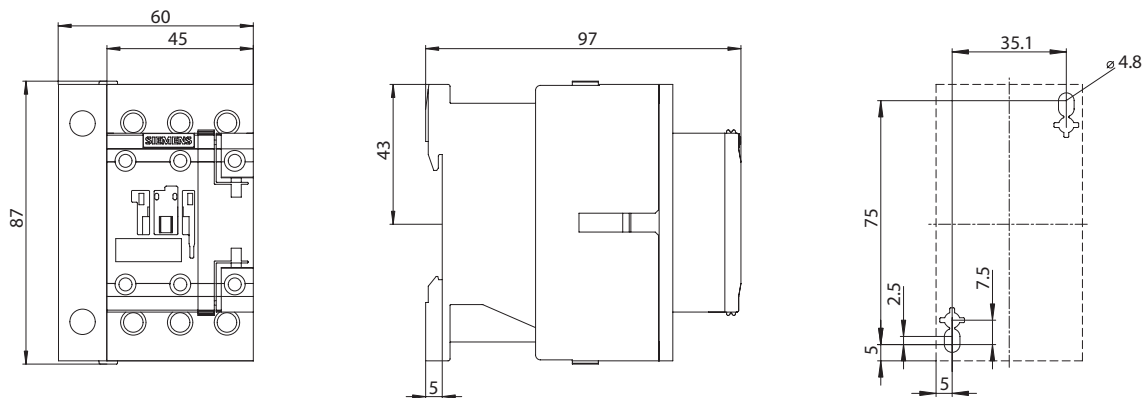
**LEN00B (20A 3 Pole and 4 Pole)**



**LEN00C003 (30A 3 Pole)**



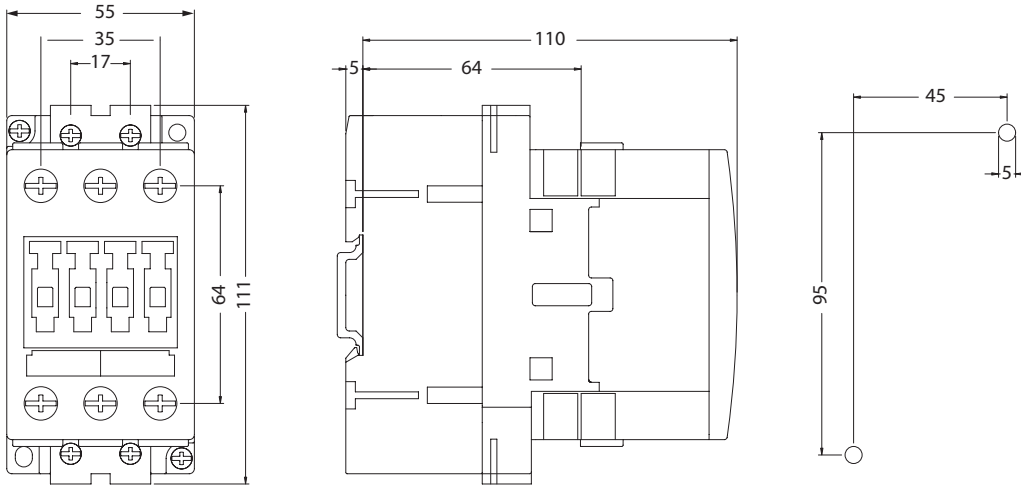
**LEN00C004 (30A 4 Pole)**



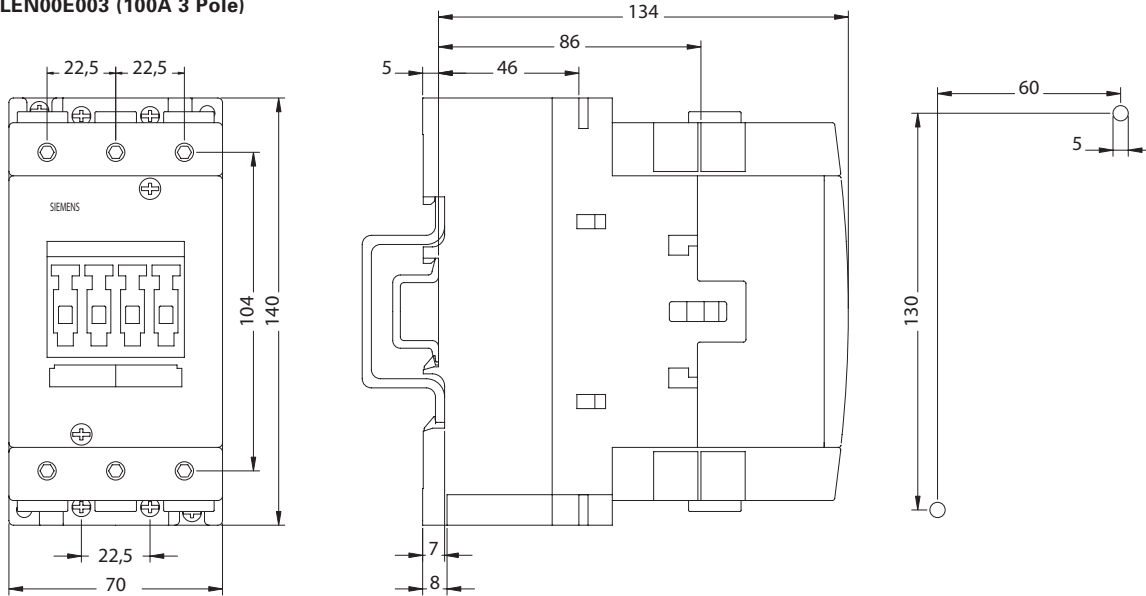
# Open Contactors, Class LE

## Dimensions

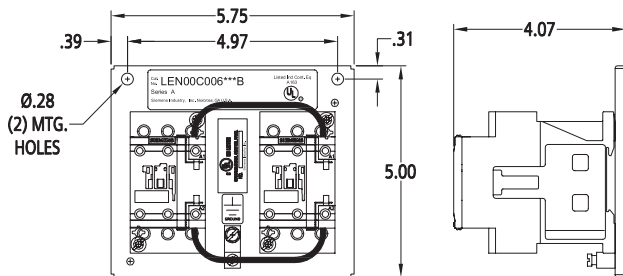
**LEN00D003 (60A 3 Pole)**



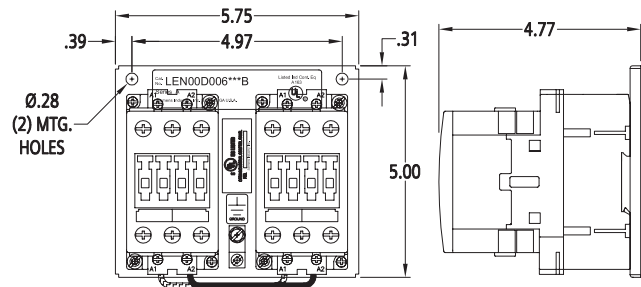
**LEN00E003 (100A 3 Pole)**



**LEN00C006 (30A 6 Pole)**



**LEN00D006 (60A 6 Pole)**

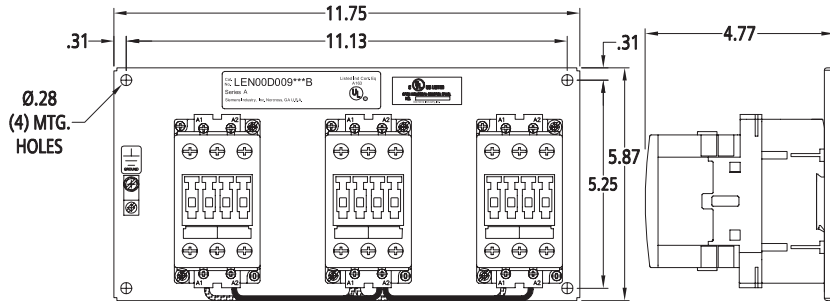


9  
GENERAL PURPOSE CONTROL

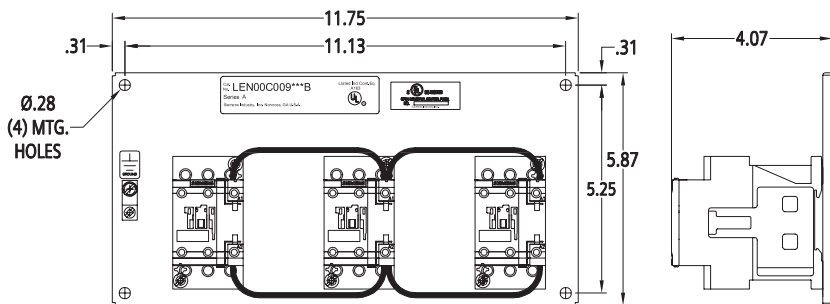
# Open Contactors, Class LE

## Dimensions

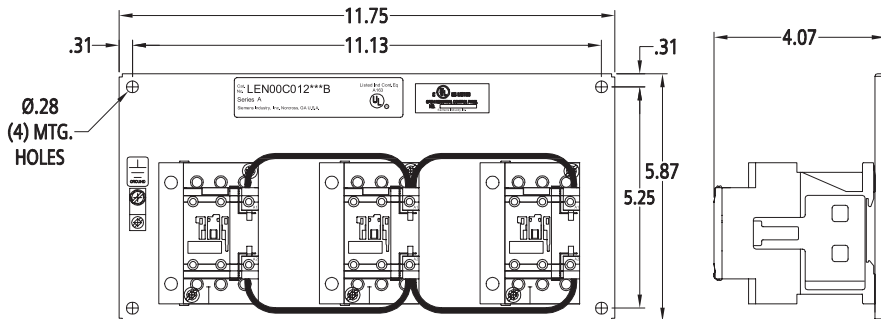
LEN00C009 (30A 9 Pole)



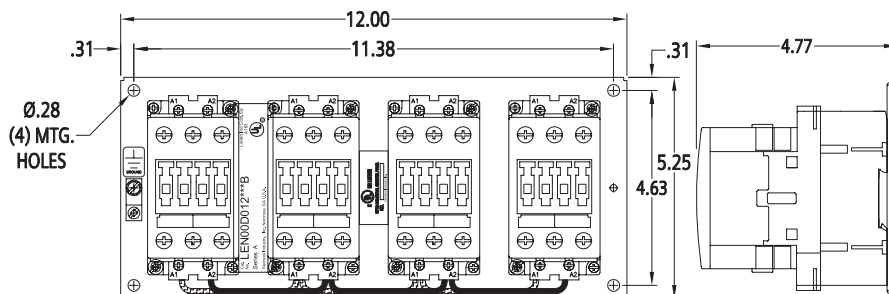
LEN00D009 (60A 9 Pole)



LEN00C012 (30A 12 Pole)



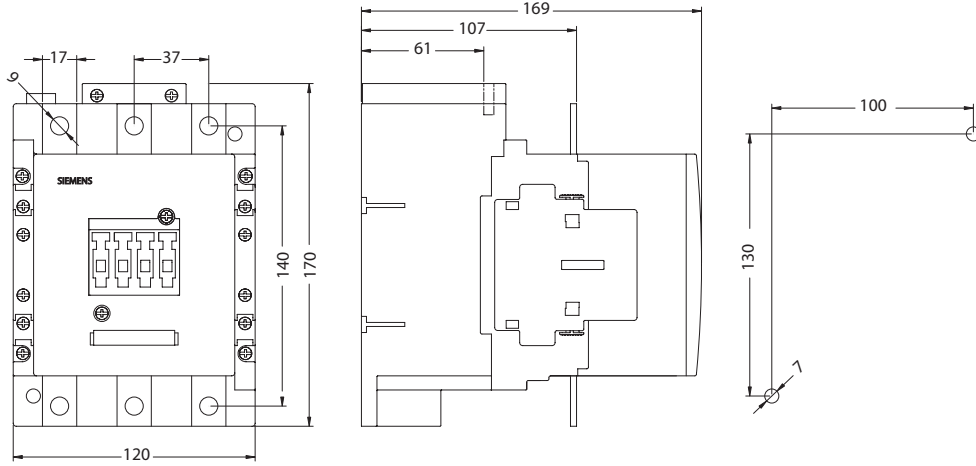
LEN00D012 (60A 12 Pole)



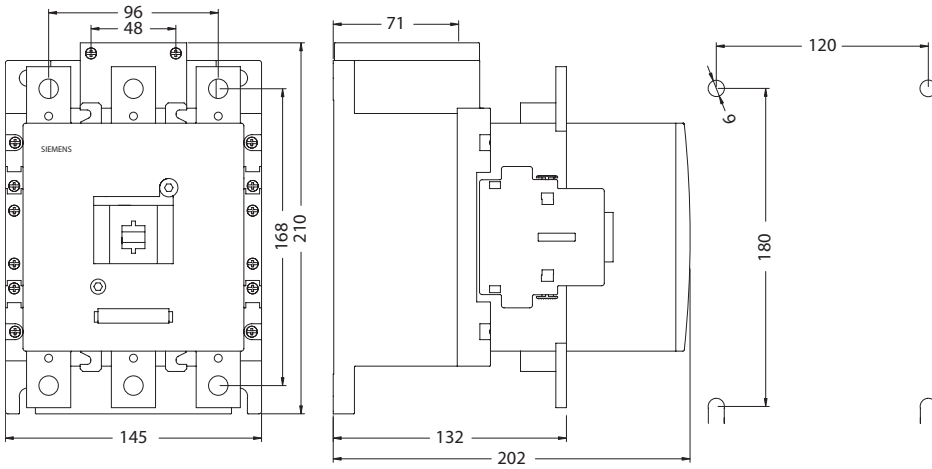
# Open Contactors, Class LE

## Dimensions

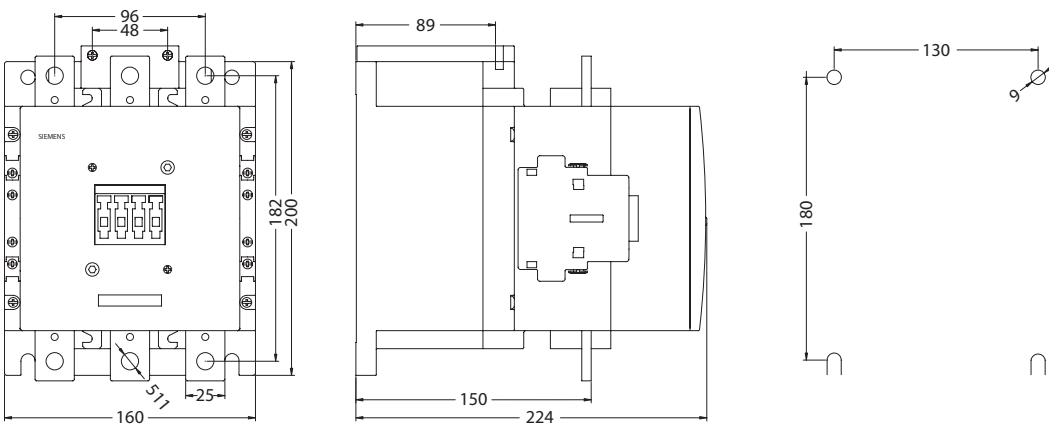
**LEN00F003 (200A 3 Pole)**



**LEN00G003 (300A 3 Pole)**



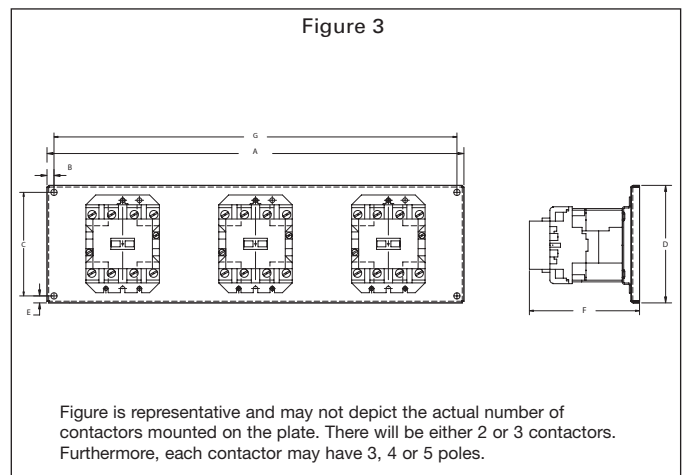
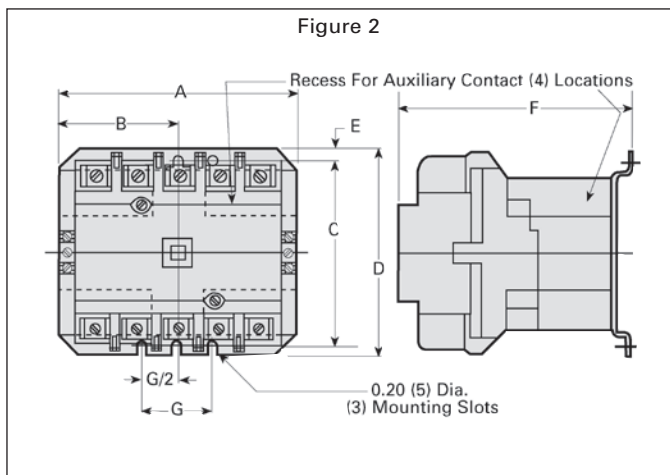
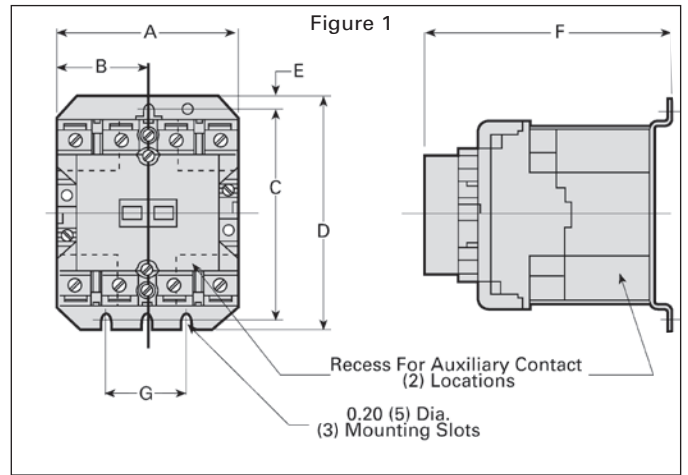
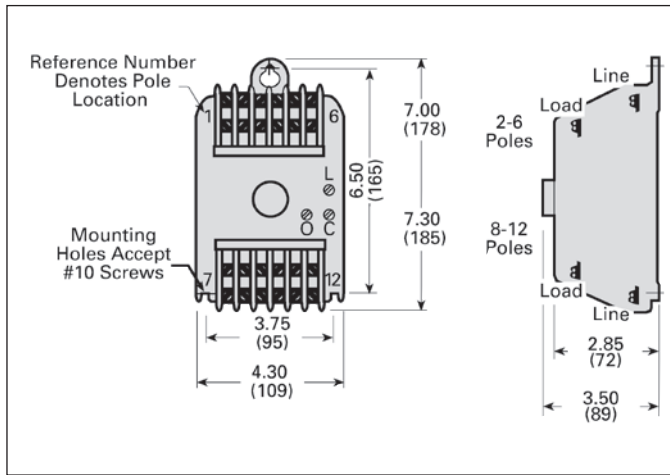
**LEN00H003 (400A 3 Pole)**



# Mechanically / Magnetically Held Lighting Contactors, Class CLM

## Dimensions

### CLM Contactor, 20 Amp



### Open Type Lighting and Heating Contactors

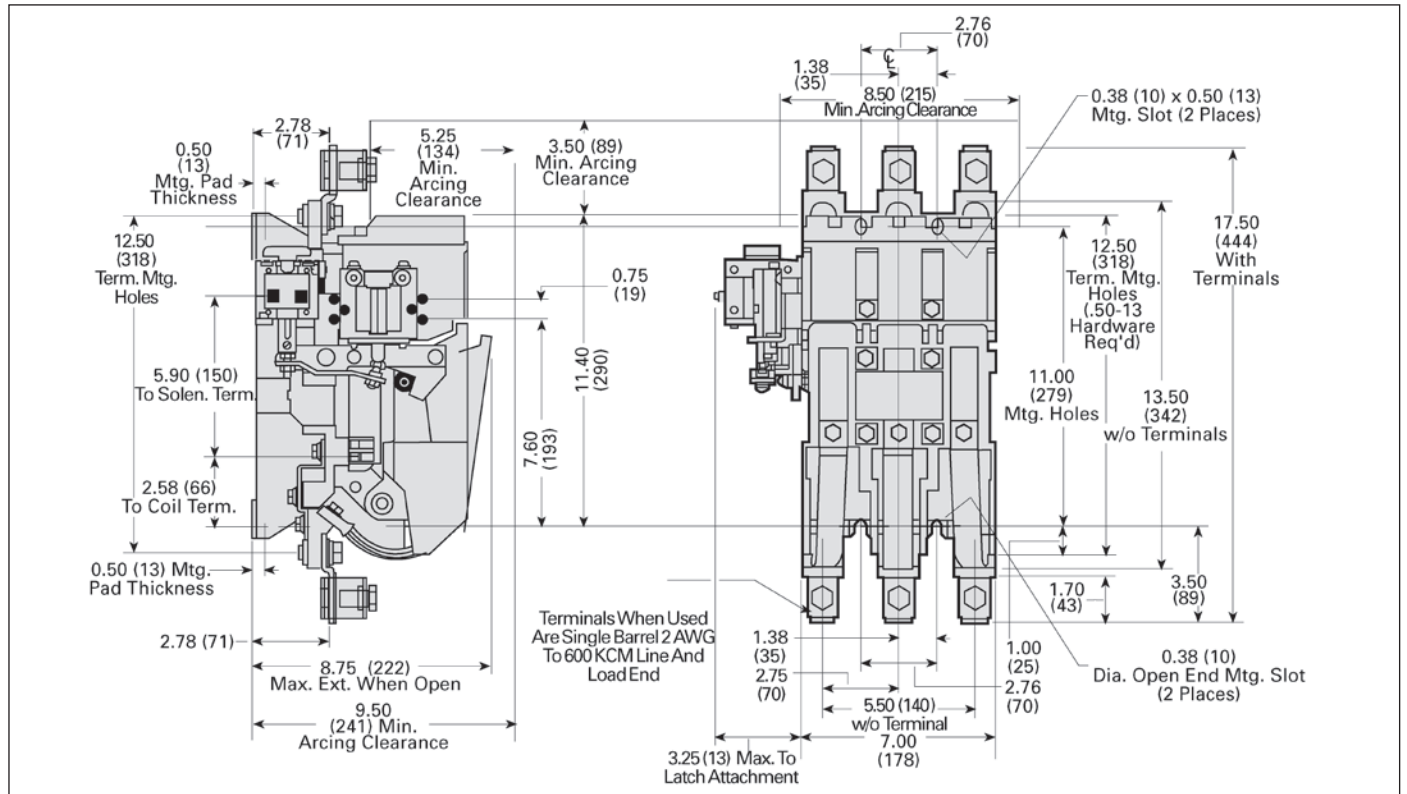
Class	Figure Number	Amp Rating	Number of Poles	A	B	C	D	E	F	G
CLM	1	30	2-4	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
		30	5	4.19 (106)	2.09 (53)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
	2	60	2, 3	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (38)
		60	4, 5	5.06 (129)	2.53 (64)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (38)
		100	2, 3	4.62 (117)	2.31 (59)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		100	4, 5	7.25 (184)	3.62 (92)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		200	2, 3	4.62 (117)	2.31 (59)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		200	4, 5	7.25 (184)	3.62 (92)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
	3	30	6, 8	8.00 (196)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	4.86 (119)	7.38 (181)
		30	9, 10, 12	11.75 (289)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	4.86 (119)	11.13 (273)
		60	6	8.00 (196)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	7.38 (181)
		60	8, 9, 10	11.75 (289)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	11.13 (273)
60		12	16.75 (410)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	16.13 (395)	
60		6	8.00 (196)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	7.38 (181)	

Note: Dimensions for reference, not for construction.  
Dimensions in inches (mm).

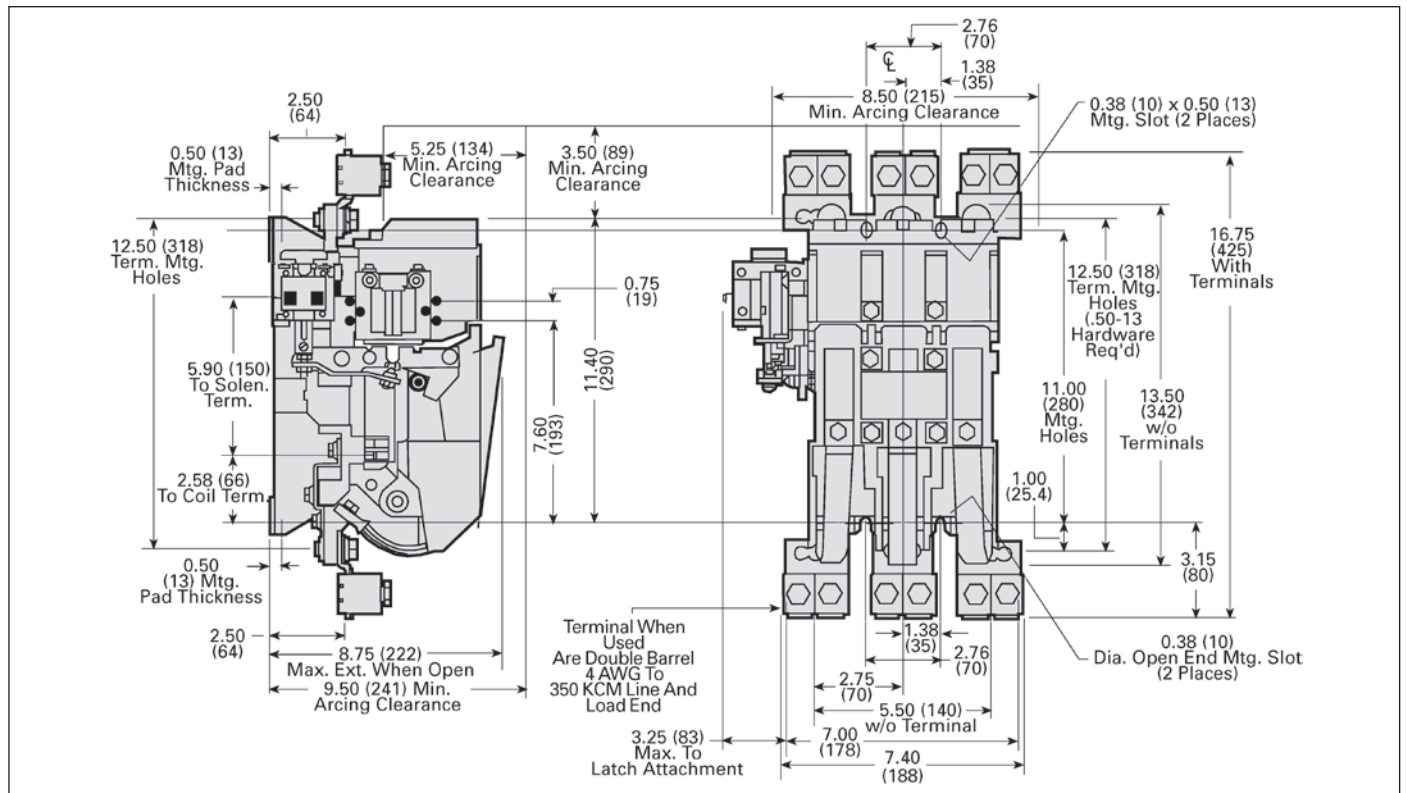
# Mechanically Latched 300 and 400 Amps, Class CLM

## Dimensions

### CLM Contactors 300 Amp



### CLM Contactors 400 Amp



Note: Dimensions for reference, not for construction.  
Dimensions in inches (mm).

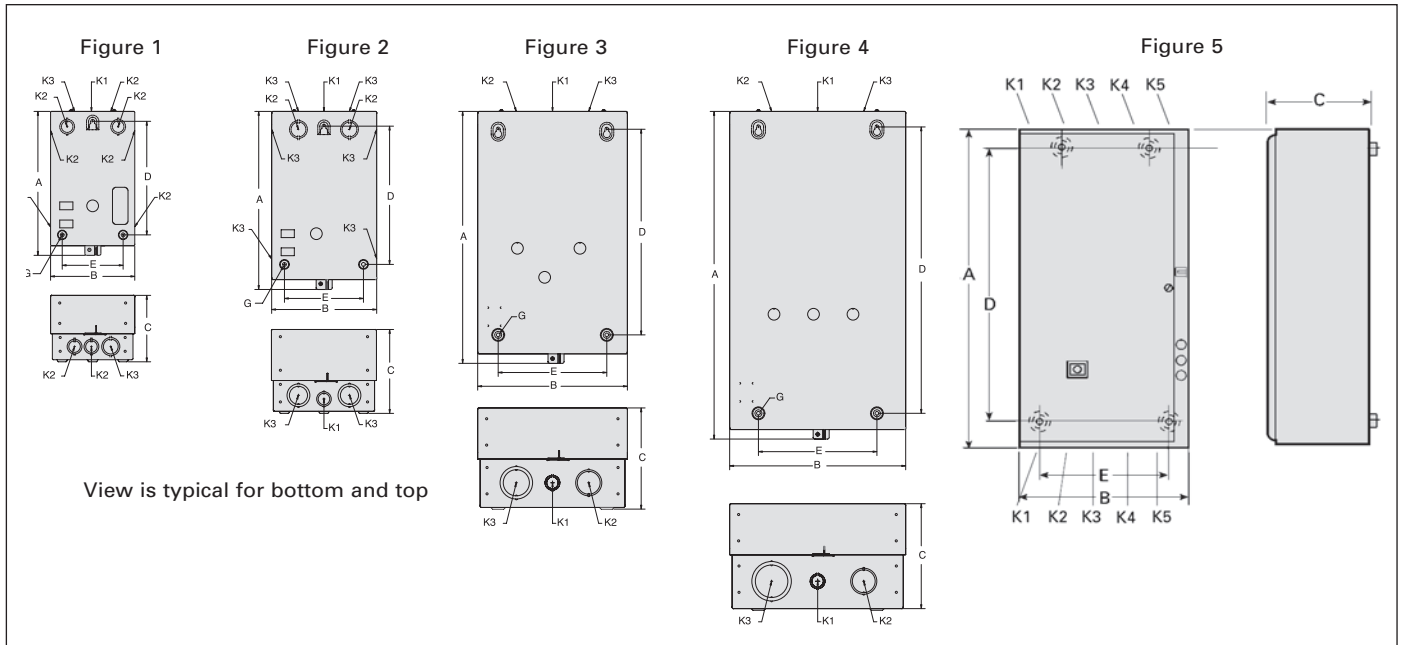


For the latest CAD or PDF dimension drawings, look on our website at  
[http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/  
products/control-circuit-components/control-power-transformers/  
Pages/dimensional-drawings.aspx](http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/products/control-circuit-components/control-power-transformers/Pages/dimensional-drawings.aspx)

For the latest CAD or PDF dimension drawings, look on our website at  
[http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/  
products/control-circuit-components/control-power-transformers/  
Pages/dimensional-drawings.aspx](http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/products/control-circuit-components/control-power-transformers/Pages/dimensional-drawings.aspx)

# Enclosed, Class 14, 40

## Dimensions



### NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)<sup>①</sup>

Size	Max CPT Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E		K1	K2	K3	K4	K5		
00-1¼	w/o CPT	1	10 <sup>3</sup> / <sub>2</sub> (279)	6 <sup>3</sup> / <sub>2</sub> (163)	5 <sup>1</sup> / <sub>2</sub> (128)	8 <sup>1</sup> / <sub>2</sub> (209)	4 <sup>3</sup> / <sub>8</sub> (117)	¼	½	½-¾	¾-1	—	—	10 (5)	D68870
2-2½	w/o CPT	2	13 <sup>1</sup> / <sub>2</sub> (344)	7 <sup>3</sup> / <sub>2</sub> (202)	6 <sup>3</sup> / <sub>8</sub> (162)	10 <sup>1</sup> / <sub>4</sub> (260)	6 (152)	¼	½-¾	¾-1	1-1¼	—	—	15 (7)	D68870
3-3½	(100VA)	3	19 <sup>1</sup> / <sub>8</sub> (486)	11 <sup>3</sup> / <sub>8</sub> (289)	7 <sup>1</sup> / <sub>8</sub> (195)	15 <sup>5</sup> / <sub>8</sub> (397)	8 <sup>1</sup> / <sub>4</sub> (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
4	(300VA)	4	24 <sup>1</sup> / <sub>8</sub> (632)	13 <sup>3</sup> / <sub>8</sub> (340)	8 <sup>3</sup> / <sub>8</sub> (206)	21 <sup>1</sup> / <sub>4</sub> (552)	9 (229)	¼	½-¾	1¼-1½	2-2½	—	—	37 (17)	D68870
5	(300VA)	5	40 (1016)	20 (508)	11 (279)	37 <sup>5</sup> / <sub>8</sub> (956)	15¼ (387)	¼	2-3	1¼-1½	½-¾	1¼-1½	2-3	135 (36)	D65608
6, 7	(300VA)	5	48 (1219)	20 (508)	12½ (317)	45 <sup>1</sup> / <sub>8</sub> (1148)	10 (254)	¼	2-2½	1¼-1½	½-¾	1¼-1½	2-2½	150 (44)	D65608013
8		5	79 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)							275 (125)	D56032006

### NEMA 1 General Purpose Enclosure (Extra wide for use with CPT)<sup>①</sup>

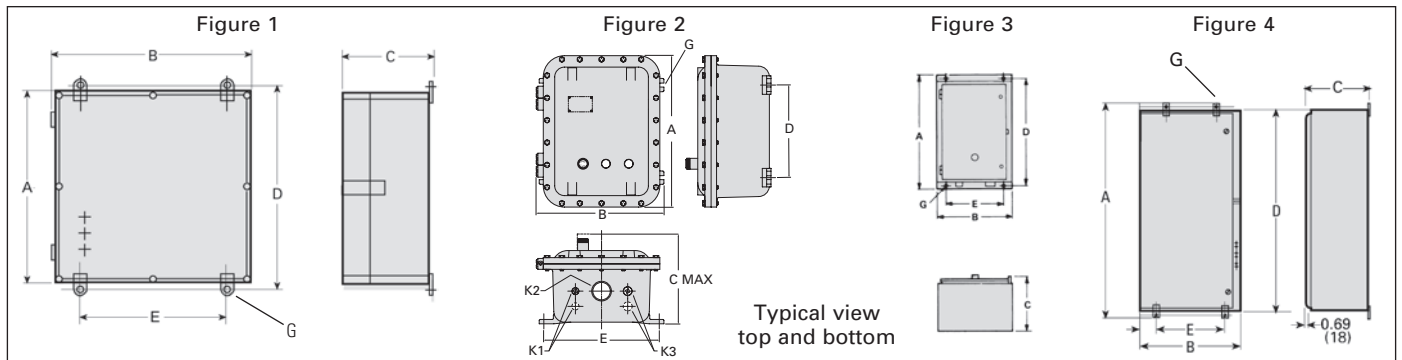
Size	Max CPT Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E		K1	K2	K3	K4	K5		
00-1¼	(200VA)	3	19 <sup>1</sup> / <sub>8</sub> (486)	11 <sup>3</sup> / <sub>8</sub> (289)	7 <sup>1</sup> / <sub>8</sub> (195)	15 <sup>5</sup> / <sub>8</sub> (397)	8 <sup>1</sup> / <sub>4</sub> (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
2-2½	(200VA)	3	19 <sup>1</sup> / <sub>8</sub> (486)	11 <sup>3</sup> / <sub>8</sub> (289)	7 <sup>1</sup> / <sub>8</sub> (195)	15 <sup>5</sup> / <sub>8</sub> (397)	8 <sup>1</sup> / <sub>4</sub> (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
3-3½	(250VA)	4	24 <sup>1</sup> / <sub>8</sub> (632)	13 <sup>3</sup> / <sub>8</sub> (340)	8 <sup>3</sup> / <sub>8</sub> (206)	21 <sup>1</sup> / <sub>4</sub> (552)	9 (229)	¼	½-¾	1-1¼-1½	2-2½	—	—	37 (17)	D68870

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

① Clamshell enclosure Size 00 - 4; Standard width and Extra wide.

# Enclosed, Class 14, 40

## Dimensions



### NEMA 4X Fiberglass Enclosures (Standard width for use with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-2½	1	14.620 (371)	11.880 (302)	6.890 (175)	15.000 (381)	9.750 (248)	¼	—	—	—	11 (4.9)	24-139-861-001
3-4	1	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (612.7)	21.250 (539.7)	¼	—	—	—	28 (12.7)	24-139-861-003

### NEMA 7/9/3/4 Hazardous Location Enclosure (Standard width for use with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼ w/o CPT	2	15.250 (387)	10.688 (272)	10.000 (254)	8.500 (216)	9.125 (132)	¾	½	1½	¾	33 (14.9)	24-139-865-002
2-2½ (0-1¼ w/ CPT)	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003
3	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003
3½-4	2	28.688 (729)	17.750 (451)	11.750 (298)	18.375 (467)	15.750 (400)	½	½	3	¾	140 (63.5)	24-139-865-004
5	2	48.875 (1038)	22.875 (581)	14 7/8 (377)	29 (373)	21¼ (533)	¾	½	3	¾	352 (159)	24-139-865-006

### NEMA 7/9/3/4 Hazardous Location Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-2½ <sup>Ⓞ</sup>	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003

### NEMA 12/3/3R Industrial Use Enclosure (Standard width for use without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13.000 (330)	7.750 (197)	5.438 (138)	12.250 (311)	5.000 (127)	¼	—	—	—	12 (5)	D41547
2-2½	3	16.000 (406)	8.125 (206)	6.063 (154)	15.250 (387)	5.000 (127)	¼	—	—	—	18 (8)	D41547
3-4	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	49 (22)	D41552

### NEMA 12/3/3R Industrial Use Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13.000 (330)	12.625 (321)	5.375 (137)	12.250 (311)	10.000 (254)	¼	—	—	—	30 (14)	D17150
2-2½	3	16.000 (406)	13.250 (337)	6.125 (156)	15.250 (387)	11.000 (279)	¼	—	—	—	33 (15)	D17150
3-3½	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	49 (22)	D41552
4	3	29.063 (738)	23.188 (589)	9.250 (235)	27.563 (700)	20.000 (508)	¾	—	—	—	64 (29)	D17150
5	4	40.000 (1016)	20.000 (508)	11.000 (279)	41.000 (1041)	10.000 (254)	¾	—	—	—	—	D65608007
6, 7	4	48.000 (1219)	20.000 (508)	12.500 (317)	49.000 (1244)	10.000 (254)	¾	—	—	—	—	D65608009
8	5	79.000 (2010)	22.000 (559)	13.000 (330)	78.000 (1981)	18.000 (457)	¾	—	—	—	275 (125)	D65632006

### NEMA 4/4X Stainless Steel Enclosure (Standard width for use without CPT)

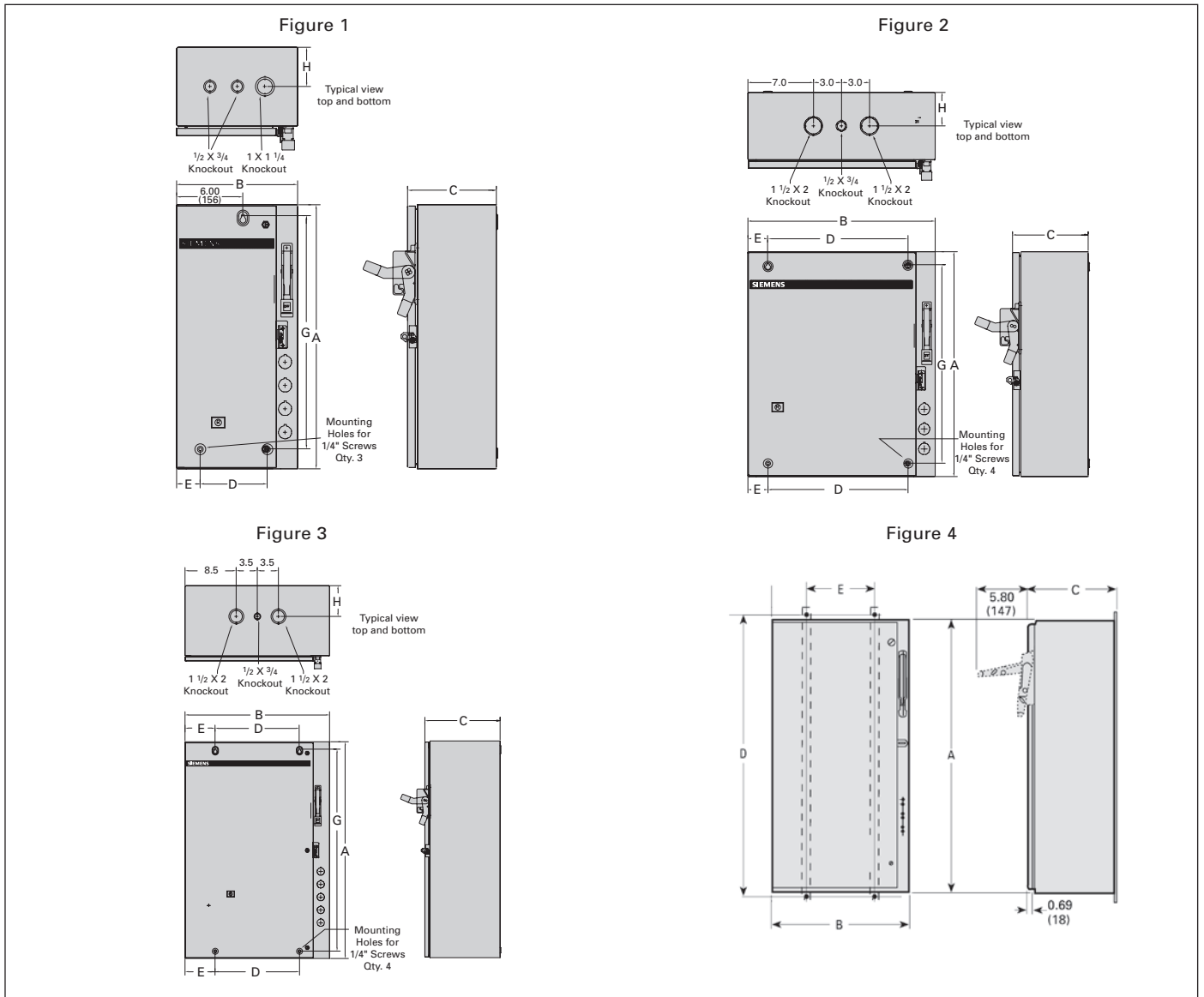
Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13.000 (330)	7.750 (197)	5.438 (138)	12.250 (311)	5.000 (127)	¼	—	—	—	17.5 (8)	D41546
2-2½	3	16.000 (406)	8.125 (206)	6.063 (154)	15.250 (387)	5.000 (127)	¼	—	—	—	36 (16)	D41546
3-4	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	67 (30)	D41551

### NEMA 4/4X Stainless Steel Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13.000 (330)	12.625 (321)	5.375 (137)	12.250 (311)	10.000 (254)	¼	—	—	—	30 (14)	D41917
2-2½	3	16.000 (406)	13.250 (337)	6.000 (152)	15.250 (387)	11.000 (279)	¼	—	—	—	33 (15)	D42935
3-3½	3	26.000 (660)	18.000 (457)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	67 (30)	D41551
4	3	29.000 (737)	23.188 (589)	9.250 (235)	27.500 (699)	20.000 (508)	¾	—	—	—	64 (29)	D43292
5 (Painted)	4	40.000 (1016)	20.000 (508)	11.000 (279)	41.000 (1041)	10.000 (254)	¾	—	—	—	—	D65608007
6, 7 (Painted)	4	48.000 (1219)	20.000 (508)	12.500 (317)	49.000 (1244)	10.000 (254)	¾	—	—	—	—	D65608009
8 (Painted)	5	79.000 (2010)	22.000 (559)	13.000 (330)	78.000 (1981)	18.000 (457)	¾	—	—	—	275 (125)	D65632006

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Ⓞ Used for addition of only CPT on size 2½. If pilot devices are needed, use size 3-3½ enclosure.



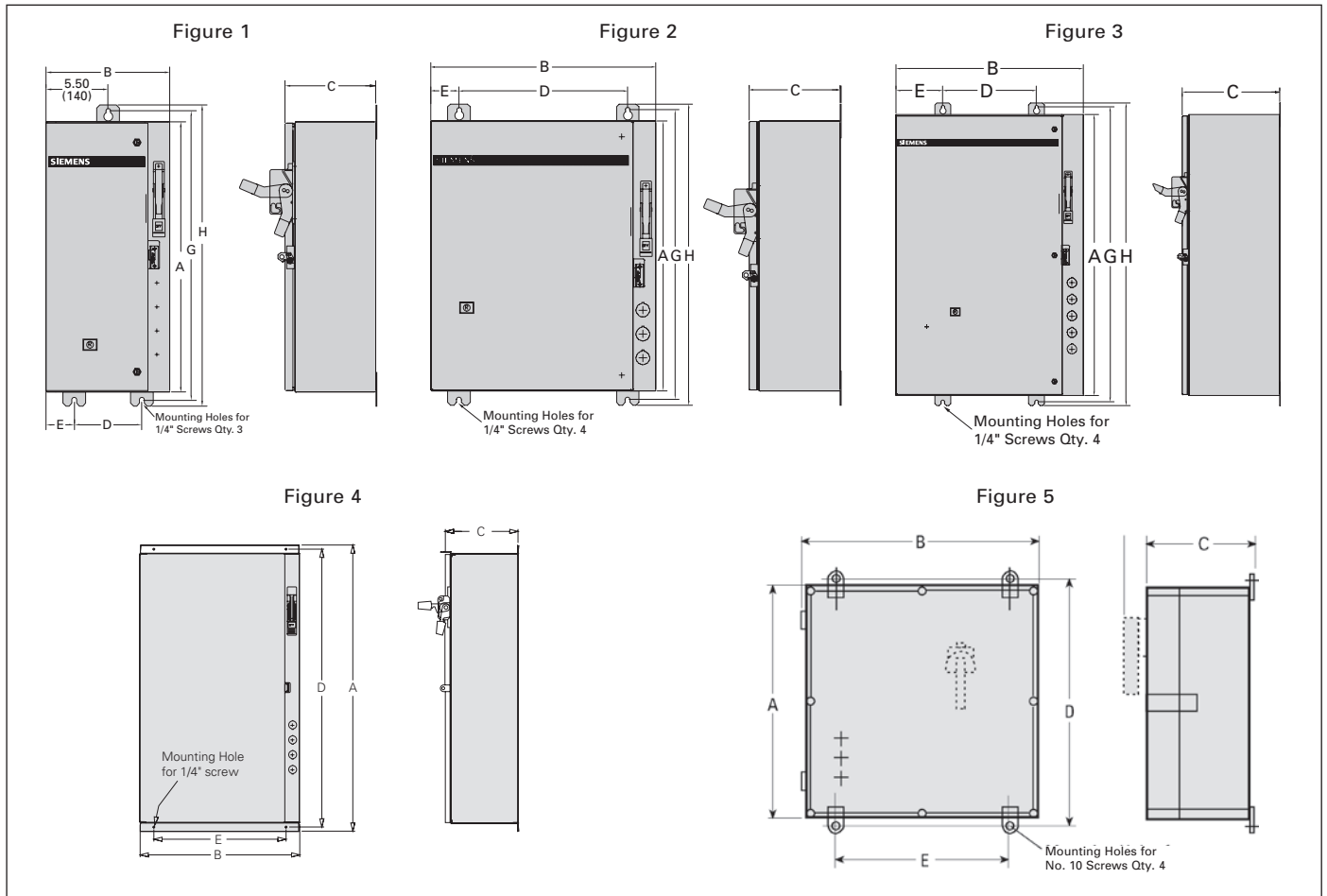
**NEMA 1 Standard Width 0-6**

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	1	24 (610)	11 (279)	8 (203)	6.125 (156)	2.125 (54)	21.00 (533)	3.50 (90)	35 (16)	D68774001
2 1/2, 3 (except 200A Disc)	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	48 (22)	D68774002
3 (200A Disc.), 3 1/2, 4	3	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	101 (46)	D68774003
5	4	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6	4	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

**NEMA 1 Extra Wide 0-3**

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	48 (22)	D68774002
2 1/2, 3	3	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	101 (46)	D68774003

Dimensions



**NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Standard Width 0-6**

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	1	24 (610)	11 (279)	8 (203)	6.00 (152)	2.50 (64)	25.75 (654)	26.75 (680)	35 (16)	D56033
2 1/2, 3 (except 200A Disc)	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	48 (22)	D56033
3 (200A Disc), 3 1/2, 4	3	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	101 (46)	D56033
5 (Painted)	4	72.156 (1833)	20 (508)	11.031 (280)	71 (1830)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	4	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

**NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Extra Wide 0-3**

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (654)	49 (22)	D56033
2 1/2, 3	3	36 (914)	24 (610)	8 (203)	12.00 (305)	6.00 (152)	37.75 (959)	38.75 (984)	102 (46)	D56033

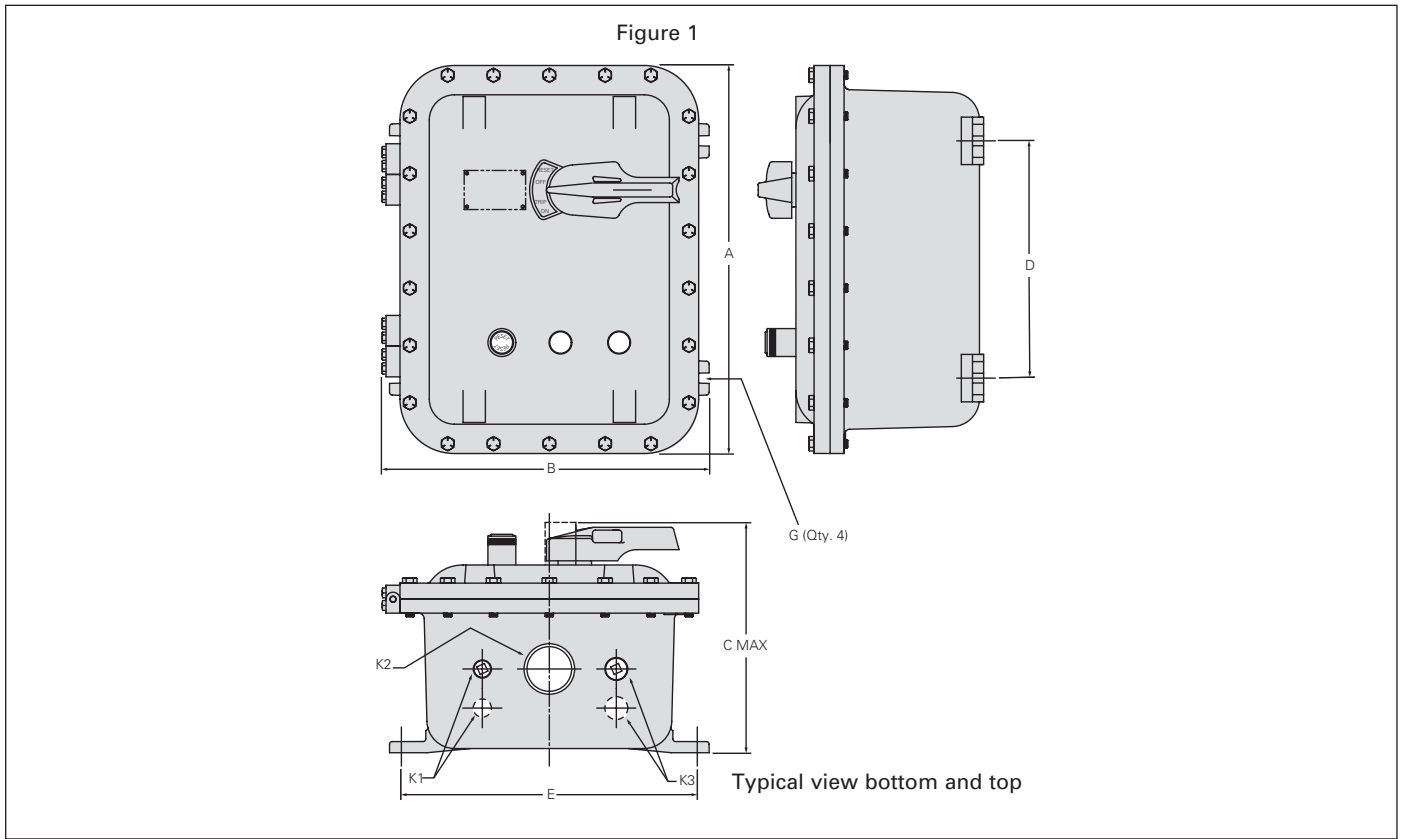
**NEMA 4X Fiberglass Standard Width 0-4**

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-1 1/4	5	23.75 (603)	14.62 (371)	7.12 (181)	24.09 (612)	12.20 (310)	—	—	42 (19)	—
2-3 1/2	5	23.75 (603)	23.75 (603)	8.50 (216)	24.06 (611)	21.30 (541)	—	—	44 (20)	—
4	5	39.37 (1000)	29.52 (750)	12.20 (310)	40.94 (1040)	27.95 (710)	—	—	55 (25)	—

Note: Dimensions in inches (mm).  
 Dimensions for reference, not for construction.  
 Contact sales office for dimensions not listed.

# Enclosed, Class 18

## Dimensions



### NEMA 7 & 9, 3, 4 Standard Width 0-4

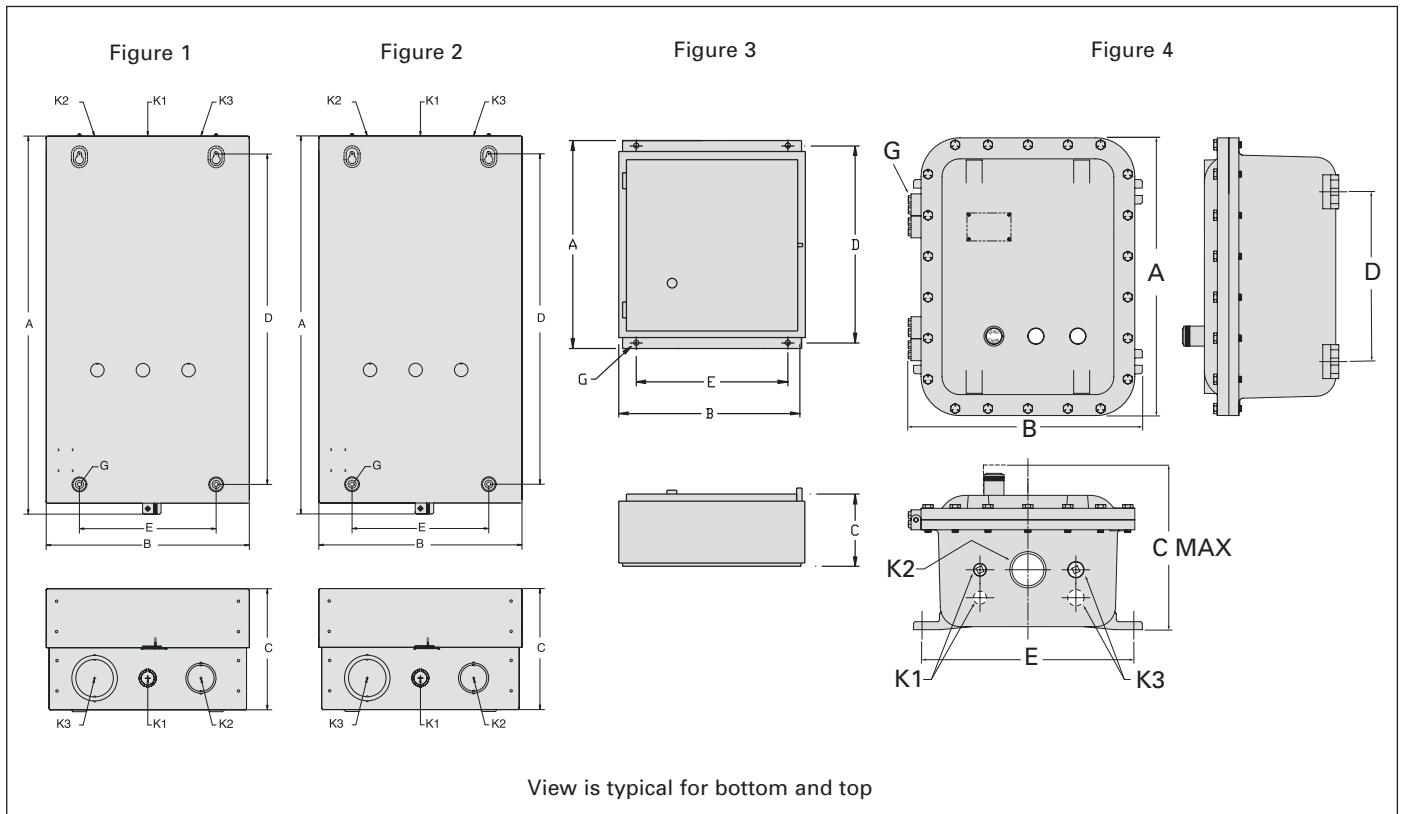
Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1¼	1	17.38 (441)	14.69 (373)	10.38 (264)	10.63 (270)	13.25 (337)	¾	¾	2	½	60 (27)	24-139-865-003
2-3½	1	28.25 (718)	17.75 (451)	11.19 (284)	18.38 (467)	15.75 (400)	¾	¾	2½	½	160 (72)	24-139-865-004
4	1	32.25 (819)	20.00 (508)	11.50 (292)	22.50 (572)	17.75 (451)	¾	¾	2½	½	250 (113)	24-139-865-005
5	1	40.875 (1038)	22.875 (581)	14.875 (378)	29 (737)	21.75 (552)	¾	½	3	¾	360 (163)	—

**Note:** Dimensions in inches (mm). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.



# Enclosed, Class 22, 43

## Dimensions



### NEMA 1 General Purpose Enclosure (Standard width for use with and without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2	K3		
0-2½ (200 VA)	1	19½ (486)	11¾ (289)	7⅞ (195)	15¾ (397)	8¼ (210)	¼	½-¾	1-1½	1½-2	—	30 (14)	D68870
3-4 (300 VA)	2	24¼ (632)	13¾ (340)	8¾ (206)	21¼ (552)	9 (229)	¼	½-¾	1¼-1½	2-2½	—	52 (24)	D68870
5 (300 VA)		40 (1016)	20 (508)	11 (279)	37¾ (956)	15¼ (387)	¼	2-3	1¼-1½	½-¾	1¼-1½	135 (36)	D65608
6, 7 (300 VA)		48 (1219)	20 (508)	12½ (317)	45⅞ (1148)	10 (254)	¼	2-2½	1¼-1½	½-¾	1¼-1½	150 (44)	D65608013

### NEMA 4/4X Stainless Steel Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¾	3	13 (330)	12¾ (321)	5¾ (137)	12¼ (311)	10 (254)	¼	—	—	—	30 (14)	D41917
2-2½	3	16 (406)	13¾ (337)	6 (152)	15¼ (387)	11 (279)	¼	—	—	—	33 (15)	D42935
3-3½ (w/o CPT)	3	25⅞ (637)	17¾ (437)	7¾ (187)	24⅞ (618)	14 (356)	¼	—	—	—	53 (24)	D17423
3-3½ (w/ CPT)	3	29 (737)	23⅞ (589)	9¼ (235)	27½ (699)	20 (508)	⅜	—	—	—	64 (29)	D43292
4												
5 (Painted)		40 (1016)	20 (508)	11 (279)	41 (1041)	10 (254)	¾	—	—	—		D65608007
6, 7 (Painted)		48(1219)	20 (508)	12½ (317)	49 (1244)	10 (254)	¾	—	—	—		65608009

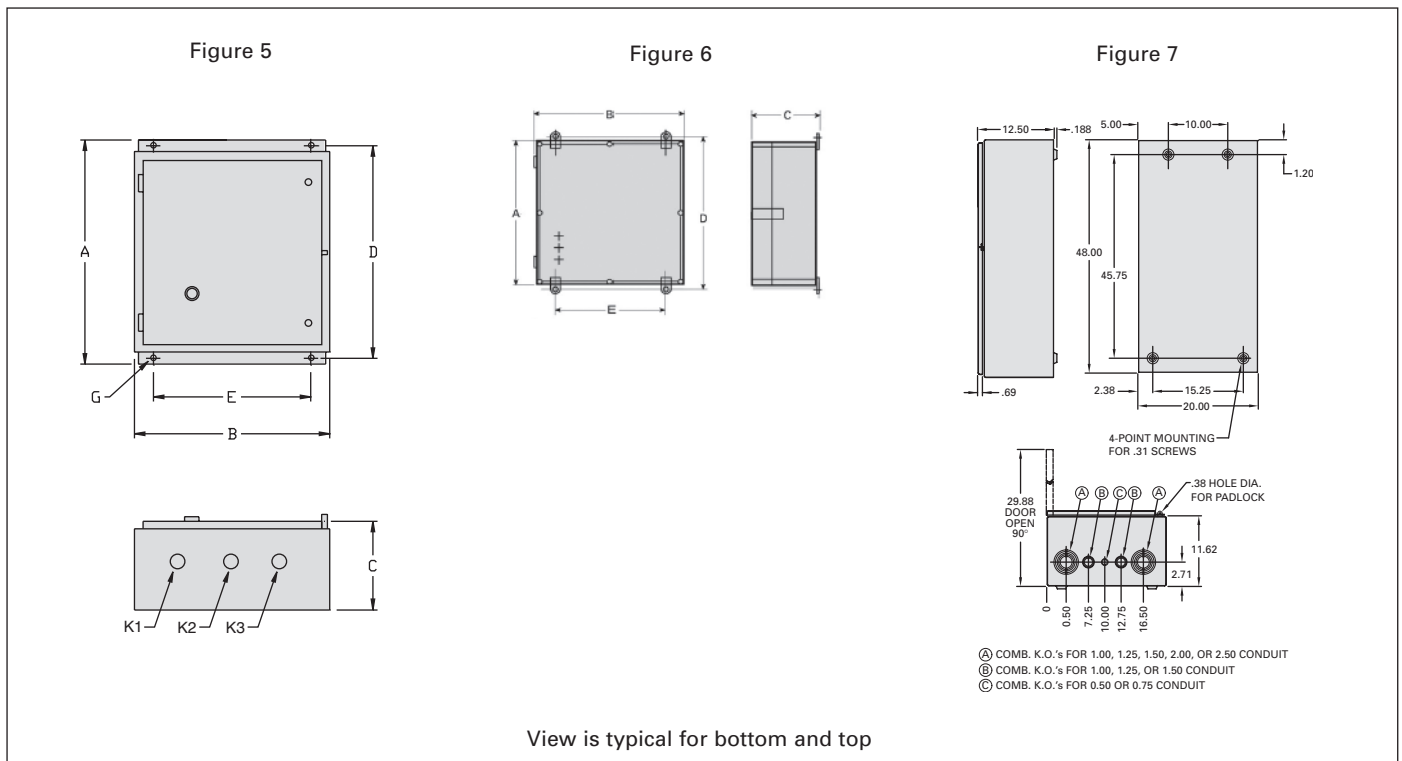
### NEMA 7/9/3/4 Hazardous Location Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-2½	4	28¼ (718)	16¼ (413)	9¼ (235)	18¾ (467)	15¾ (400)	½	½	3	¾	140	24-139-865-004
3-4	4	32¼ (819)	18¼ (464)	9¾ (243)	22½ (572)	17¾ (451)	½	½	3	¾	150	24-139-865-005

Note: Dimensions in inches (mm).  
 Dimensions for reference, not for construction.  
 Contact sales office for dimensions not listed.

# Enclosed, Class 22, 43

## Dimensions



### NEMA 12/3/3R Industrial Use Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1¼	5	13 (330)	12⅞ (321)	5⅞ (137)	12¼ (311)	10 (254)	¼	—	—	—	30 (14)	D17150
2-2½	5	16 (406)	13¼ (337)	6⅞ (156)	15¼ (387)	11 (279)	¼	—	—	—	33 (15)	D17150
3-3½ (w/o CPT)	5	25⅞ (637)	17⅞ (437)	7⅞ (187)	24⅞ (618)	14 (356)	¼	—	—	—	53 (24)	D17150
3-3½ (w/ CPT)	5	29⅞ (738)	23⅞ (589)	9¼ (235)	27⅞ (700)	20 (508)	⅜	—	—	—	64 (29)	D17150
4												
5	7	40 (1016)	20 (508)	11 (279)	41 (1041)	10 (254)	⅜	—	—	—		D65608007
6 (300 VA CPT max.)	7	48 (1219)	20 (508)	12½ (318)	45¼ (1162)	10 (254)	¼	—	—	—		

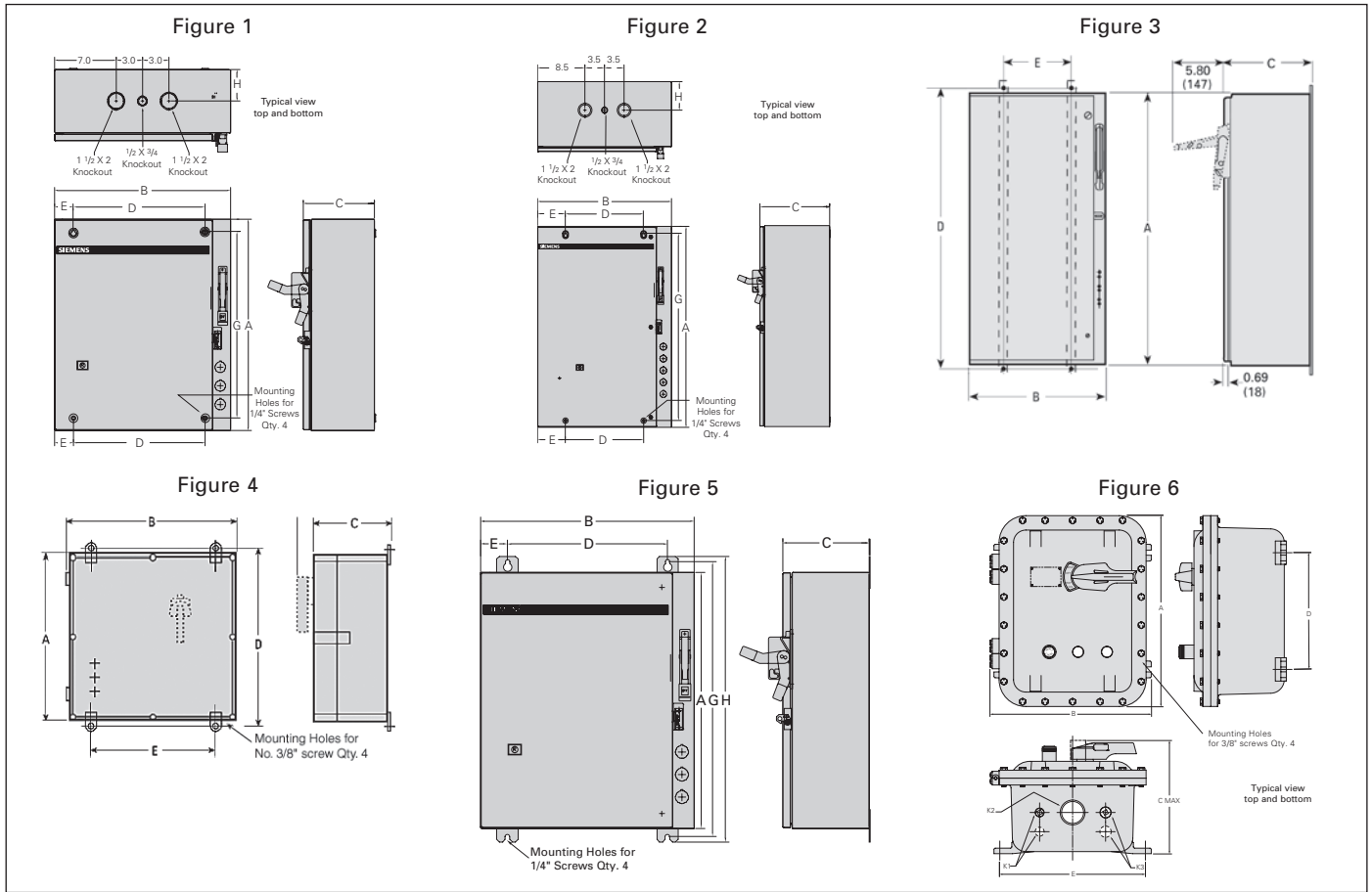
### NEMA 4X Fiberglass Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2½	6	23.78 (604)	14.68 (373)	6.89 (175)	22⅞ (579)	13⅞ (351)	¼	—	—	—	35	—
3-4	6	23.78 (604)	23.78 (604)	6.89 (175)	22⅞ (579)	22⅞ (579)	¼	—	—	—	38	—

Note: Dimensions in inches (mm).  
 Dimensions for reference, not for construction.  
 Contact sales office for dimensions not listed.

# Enclosed, Class 25, 26

## Dimensions



### NEMA 1 Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2½	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	60 (27)	D68774002
3-4	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	121 (55)	D68774003
5 (Painted)	3	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	3	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

### NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2½	5	24 (610)	20 (508)	8 (203)	15.00 (381)	3.50 (90)	25.75 (654)	26.75 (654)	63 (29)	D68774005
3-4	5	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	124 (56)	D68774006
5 (Painted)	3	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	3	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

### NEMA 4X Fiberglass 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2½	4	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (612.7)	12.250 (311)	¾	—	—	—	18 (8)	24-139-861-001
3-4	4	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (612.7)	21.250 (539.7)	¾	—	—	—	28 (12.7)	24-139-861-003

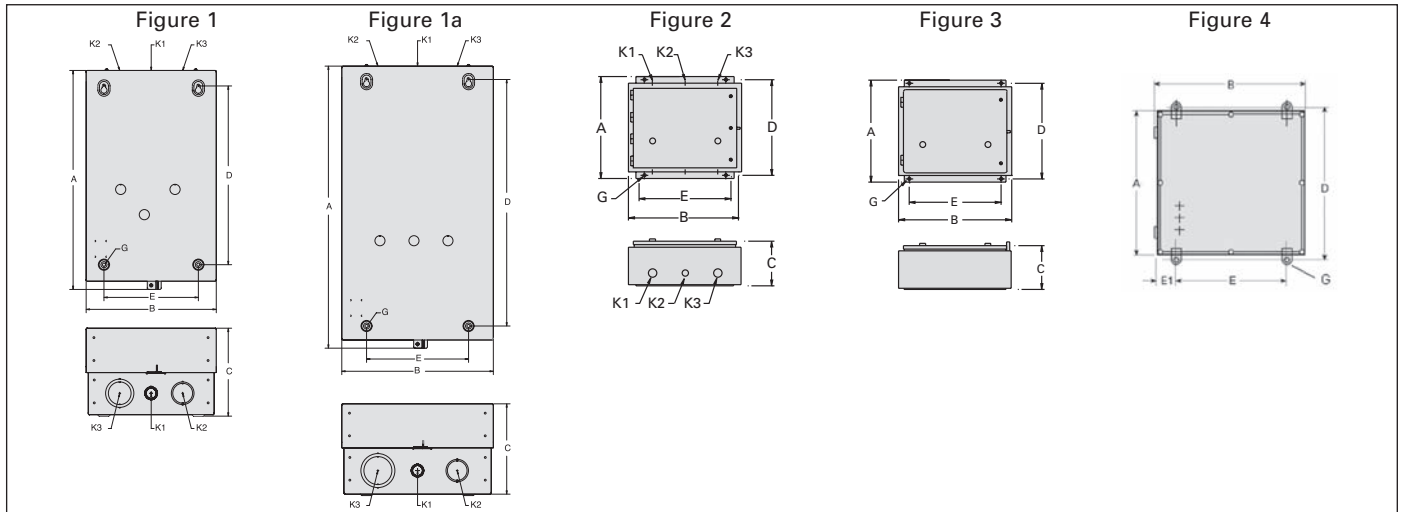
### NEMA 7/9/3/4 Hazardous Location 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2½	6	28.688 (729)	17.750 (451)	11.750 (298)	18.375 (467)	15.750 (400)	¾	½	3	¾	140 (63.5)	24-139-865-004
3-4												Contact Sales Office

Note: Dimensions in inches (mm).  
 Dimensions for reference, not for construction.  
 Contact sales office for dimensions not listed.

# Enclosed, Class 30

## Dimensions



### 2 Speed 1 Winding

NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)													
Size	Fig	Outline Dimensions			Mounting Dimensions			Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G		K1	K2	K3		
0-1 3/4 w/o CPT	1	19 1/8 (486)	11 3/8 (289)	7 1/16 (195)	15 5/8 (397)	8 1/4 (210)	1/4	1/2-3/4	1-1 1/4	1 1/2-2	26 (12)	D68870	
0-1 3/4 (200 VA)	1a	24 1/8 (632)	13 3/8 (340)	8 1/8 (206)	21 3/4 (552)	9 (229)	1/4	1/2-3/4	1 1/4-1 1/2	2-2 1/2	52 (24)	D68870	
2-2 1/2	2	16 (406)	17.13 (435)	7.63 (194)	15.25 (387)	14 (355)	1/4	1/2-3/4	1 1/4-1 1/2	1 1/4-1 1/2	39 (20)	D42932001	
3-3 1/2	2	18.31 (465)	21.19 (538)	7.38 (187)	17.56 (446)	18 (457)	1/4	1 1/4-1 1/2	1/2-3/4	1 1/2-2	60 (27)	D72956002	
4	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
NEMA 4/4X Stainless Steel Enclosure (Standard width for use with or without CPT)													
0-1 3/4 w/o CPT	3	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	34 (15)	D41917000	
0-1 3/4 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	47 (21)		
2-2 1/2 w/o CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	47 (21)		
2-2 1/2 w/ CPT	3	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 5/16 (618)	14 (355)	1/4	—	—	—	55 (25)		
3-3 1/2	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
4	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
NEMA 12/3/3R Industrial Use Enclosure (Standard width for use with or without CPT)													
0-1 3/4 w/o CPT	3	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	34 (15)		
0-1 3/4 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	47 (21)	D17150010	
2-2 1/2 w/o CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	47 (21)	D17150010	
2-2 1/2 w/ CPT	3	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 5/16 (618)	14 (355)	1/4	—	—	—	55 (25)		
3-4	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D19673000	
NEMA 4X Fiberglass Enclosure (Standard width for use with or without CPT)													
0-2 1/2	4	23.780 (604)	23.780 (604)	6.890 (175)	—	—	1/4	—	—	—	28 (13)	24139861003	
3-4	4	39.37 (1000)	29.53 (750)	12.60 (320)	—	—	—	—	—	—	—	24139861004	

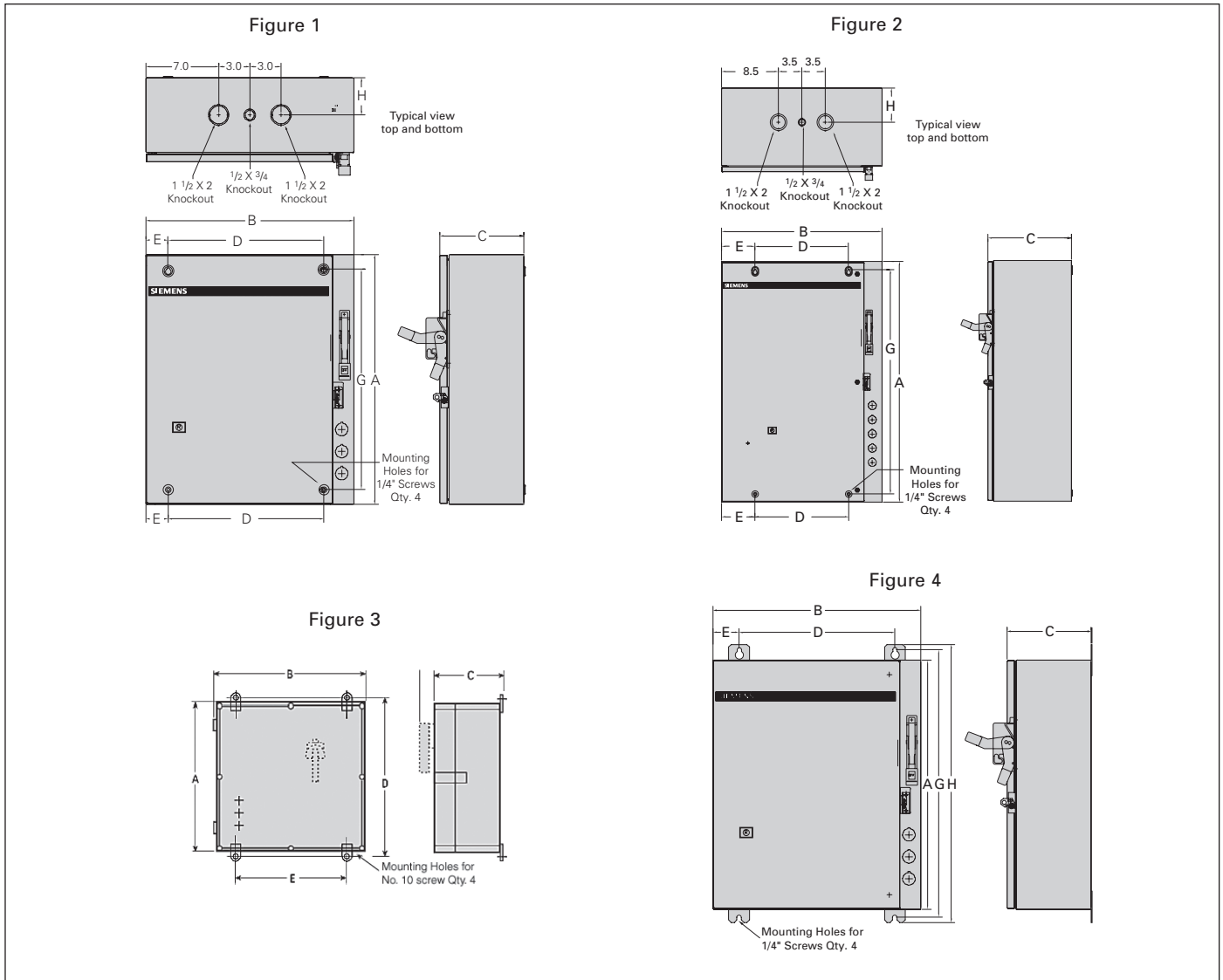
### 2 Speed 2 Winding

NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)													
Size	Fig	Outline Dimensions			Mounting Dimensions			Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G		K1	K2	K3		
0-2 1/2 w/o CPT	1	19 1/8 (486)	11 3/8 (289)	7 1/16 (195)	15 5/8 (397)	8 1/4 (210)	1/4	1/2-3/4	1-1 1/4	1 1/2-2	30 (14)	D68870	
0-2 1/2 (200 VA)	1a	24 1/8 (632)	13 3/8 (340)	8 1/8 (206)	21 3/4 (552)	9 (229)	1/4	1/2-3/4	1 1/4-1 1/2	2-2 1/2	52 (24)	D68870	
3-4 w/o CPT	1a	24 1/8 (632)	13 3/8 (340)	8 1/8 (206)	21 3/4 (552)	9 (229)	1/4	1/2-3/4	1 1/4-1 1/2	2-2 1/2	52 (24)	D68870	
NEMA 4/4X Stainless Steel Enclosure (Standard width for use with or without CPT)													
0-1 3/4 w/o CPT	3	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	34 (15)		
0-1 3/4 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	41 (19)		
2-2 1/2 w/o CPT	3	16 (406)	13 1/4 (337)	6 (152)	15 1/4 (387)	11 (279)	1/4	—	—	—	41 (19)		
2-2 1/2 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	41 (19)		
3-3 1/2 w/o CPT	3	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 5/16 (618)	14 (355)	1/4	—	—	—	55 (25)		
3-3 1/2 w/ CPT	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
4	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
NEMA 12/3/3R Industrial Use Enclosure (Standard width for use with or without CPT)													
0-1 3/4 w/o CPT	3	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	34 (15)		
0-1 3/4 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	41 (19)	D17150010	
2-2 1/2 w/o CPT	3	16 (406)	13 1/4 (337)	6 1/8 (156)	15 1/4 (387)	11 (279)	1/4	—	—	—	41 (19)		
2-2 1/2 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	41 (19)	D17150010	
3-3 1/2 w/o CPT	3	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 5/16 (618)	14 (355)	1/4	—	—	—	55 (25)		
3-4 w/ CPT	3	29 1/16 (738)	23 3/16 (589)	9 1/4 (235)	27 1/2 (700)	20 (508)	5/16	—	—	—	61 (28)	D19673000	
NEMA 4X Fiberglass Enclosure (Standard width for use with or without CPT)													
0-2 1/2	4	23.780 (604)	23.780 (604)	6.890 (175)	—	—	1/4	—	—	—	28 (13)	24139861003	
3-4	4	39.37 (1000)	29.53 (750)	12.60 (320)	—	—	—	—	—	—	—	24139861004	

Note: Dimensions in inches (mm). Dimensions for reference, not for construction. Contact sales office for dimensions not listed.

# Enclosed, Class 32

## Dimensions



### NEMA 1 Standard Width 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-1 $\frac{3}{4}$ (1 Winding)	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	68 (31)	D68774
2-4 (1 Winding)	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	3.50 (90)	71 (32)	D68774
0-2 $\frac{1}{2}$ (2 Winding)	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	135 (61)	D68774
3-4 (2 Winding)	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	3.50 (90)	138 (63)	D68774

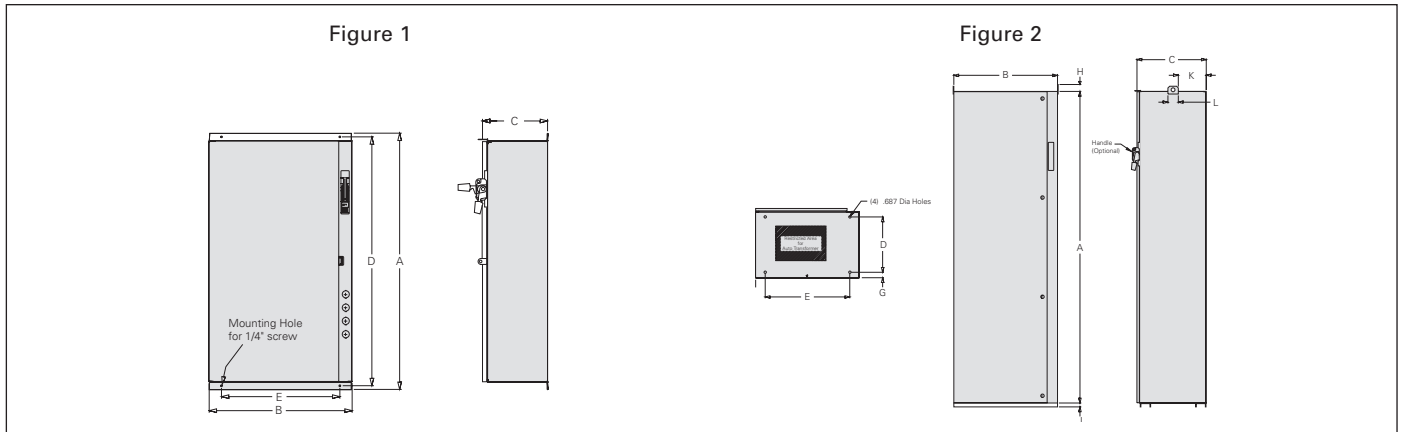
### NEMA 12/3/3R/4 (Painted), 4/4X Stainless Standard Width 0-4

0-1 $\frac{3}{4}$ (1 Winding)	4	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	68 (31)	D68774
2-4 (1 Winding)	4	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	71 (32)	D68774
0-2 $\frac{1}{2}$ (2 Winding)	4	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	135 (61)	D68774
3-4 (2 Winding)	4	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	138 (63)	D68774

### Nema 4X Fiberglass 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1 $\frac{3}{4}$	3	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (613)	12.250 (311)	1/4	—	—	—	18 (8)	—
2-4	3	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (613)	21.250 (540)	1/4	—	—	—	28 (13)	—

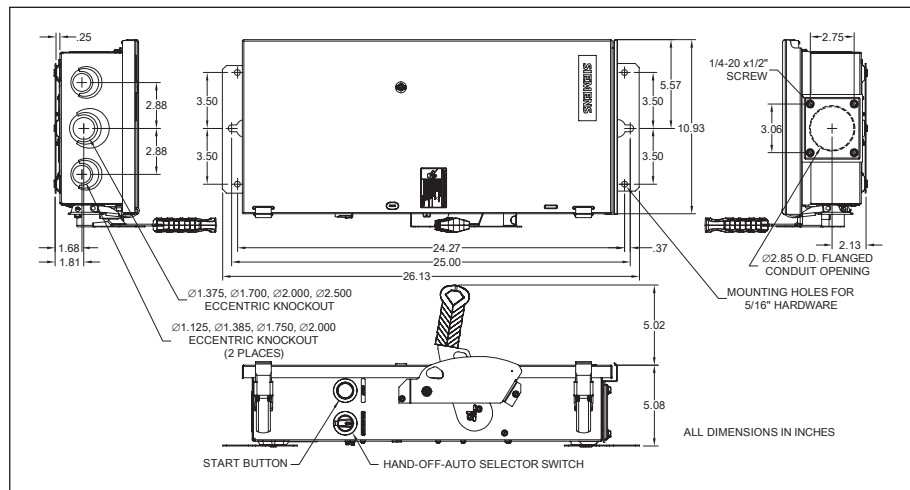
Note: Dimensions in inches (mm).  
 Dimensions for reference, not for construction.  
 Contact sales office for dimensions not listed.



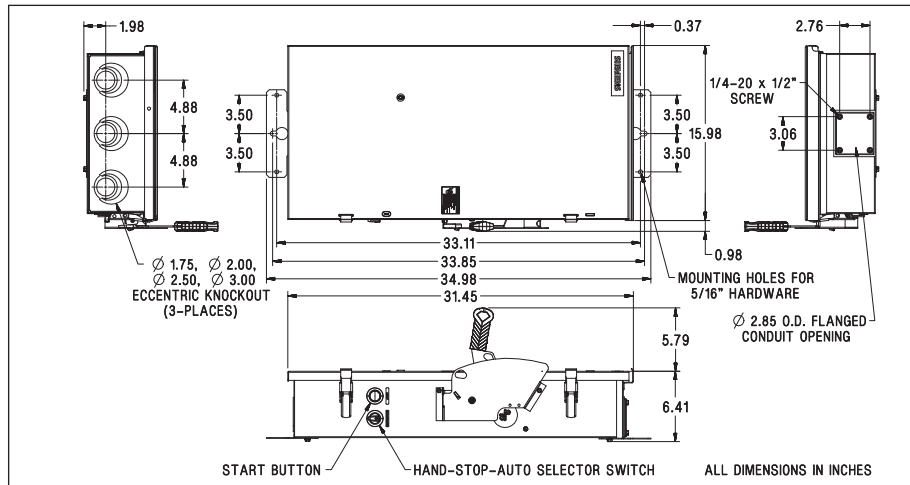
**Class 36, 37, NEMA 1, 4, 4X, 12/3R, Combination and Non-combination**

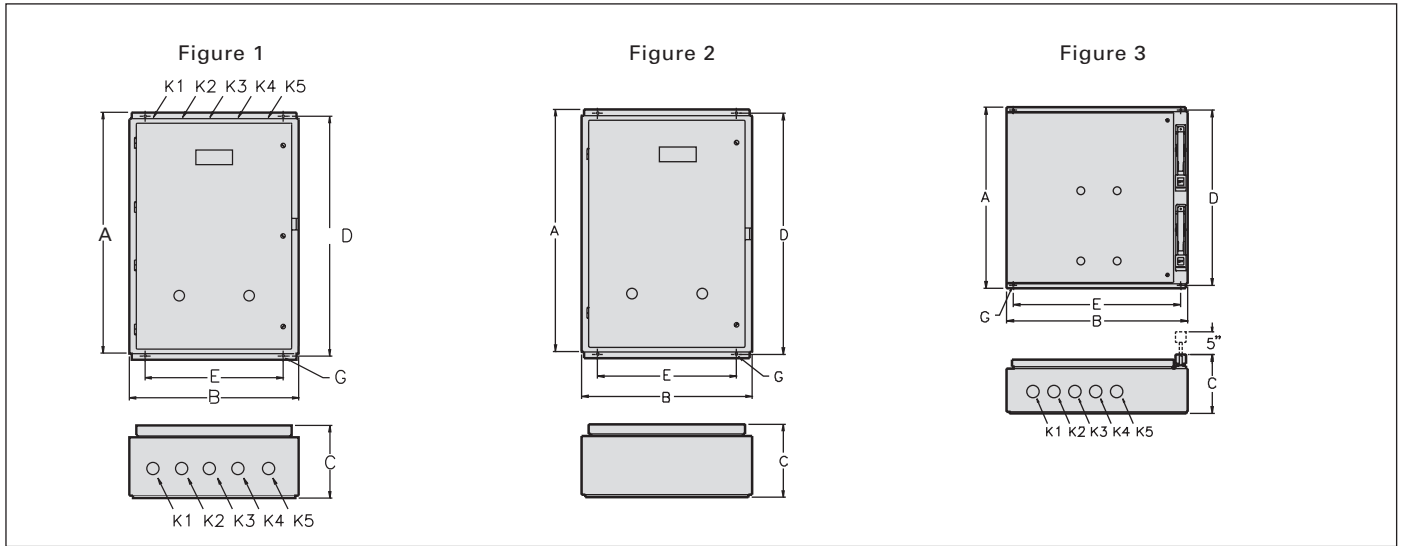
Reduced Voltage AutoTransformer Size	Part Winding & Wye Delta		Figure	A	B	C	D	E	G	H	I	J	K	L
	Disconnect	Circuit Breaker												
1 3/4-2 1/2	0-2	0-2 1/2	1	43 5/16	24 5/32	11	42 11/32	20	—	—	—	—	—	—
3-3 1/2	2 1/2-3 1/2	3-3 1/2	1	55 5/16	28 9/32	11	54 11/32	24	—	—	—	—	—	—
4	4	4	1	74 21/32	28 9/32	11	73 13/32	24	—	—	—	—	—	—
5, 6	5, 6	5, 6	2	90	29 30/31	20	16	24 7/16	2 16/21	1 23/40	—	1 1/8	8 3/40	3

**Class 82 size 1**



**Class 82 Size 1 1/2, 2**





**Class 83 Non-Combination Type**

Enclosure Type	Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs	
			A	B	C	D	E		G	K1	K2	K3	K4		K5
NEMA 1	0-1 1/4	1	19 1/2	16 1/8	6 1/2	18 3/4	13	1/4	1 1/4-1 1/2	1/2-3/4	1/2	1/2-3/4	1 1/4-1 1/2	1 1/2-2	20
	2, 2 1/2	1	25 1/16	17 1/16	7 3/8	24 7/16	14	1/4	1 1/4-1 1/2	1/2-3/4	1/2-3/4	1 1/4-1 1/2	1 1/2-2	57	
	3-4	1	29 11/16	23 3/16	9 1/4	27 9/16	20	5/16	2-2 1/2	1 1/4-1 1/2	1/2-3/4	1 1/4-1 1/2	2-2 1/2-3	93	
NEMA 12	0-1 1/4	2	19 1/2	16 1/8	6 1/2	18 3/4	13	1/4	—	—	—	—	—	20	
	2, 2 1/2	2	25 1/16	17 1/16	7 3/8	24 7/16	14	1/4	—	—	—	—	—	57	
	3-4	2	29 1/16	23 3/16	9 1/4	27 7/16	20	5/16	—	—	—	—	—	93	
NEMA 4/4X <sup>Ⓢ</sup>	0-1 1/4	2	19 1/2	16 1/8	6 1/2	18 3/4	13	1/4	—	—	—	—	—	20	
	2, 2 1/2	2	25 1/16	17 1/16	7 3/8	24 7/16	14	1/4	—	—	—	—	—	57	
	3-4	2	29 1/16	23 3/16	9 1/4	27 7/16	20	5/16	—	—	—	—	—	93	

**Class 84 Combination Type**

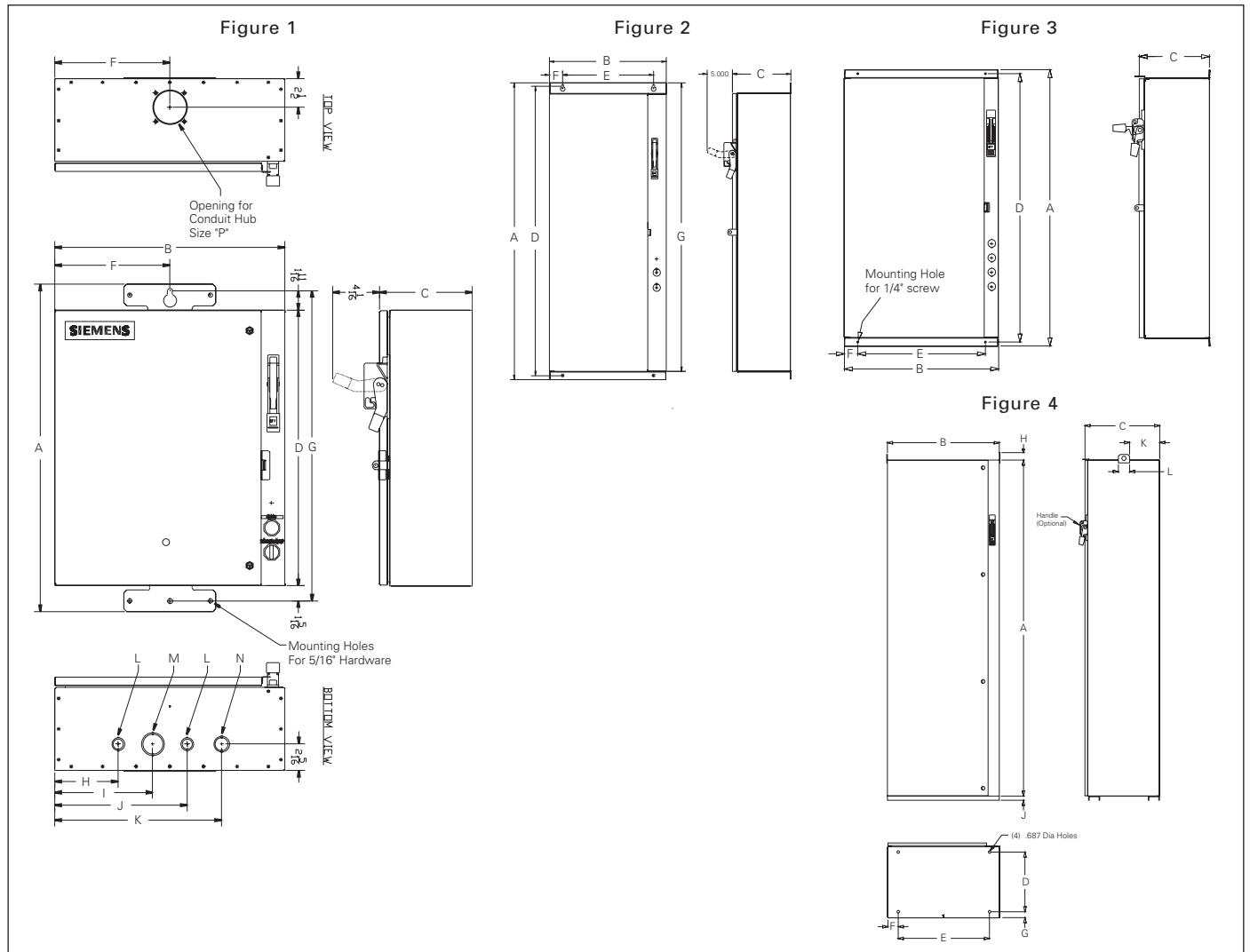
Enclosure Type	Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs
			A	B	C	D	E		G	K1	K2	K3	K4	
NEMA 1	0-1 1/4	3	34 1/8	24 3/8	7 7/16	33	20	3/8	7/8-1 1/8	7/8-1 1/8	1 1/8-1 3/8	1 1/8-1 3/8	1 3/8-1 7/8	70
	2-4	3	56	28 1/2	9 1/16	54 1/16	24 1/4	3/8	—	—	—	—	—	106
NEMA 4(painted) 4X, 12	0-1 1/4	3	34 1/8	24 3/8	7 7/16	33	20	3/8	—	—	—	—	—	70
	2-4	3	56	28 1/2	9 1/16	54 1/16	24 1/4	3/8	—	—	—	—	—	106

Ⓢ Dimensions may vary for size 3 & 4 stainless steel enclosures.

Ⓢ NEMA 4 Painted, 4X Stainless Steel.



Outline Drawings



Class 87 Standard and Vacuum Starter Pump Panel

Size	Figure	A	B	C	D	E	F	G	H	I	J	K	Conduit Knockout				Hub
													L	M	N	P	
1-2½	1	28½	20	8 <sup>1</sup> / <sub>16</sub>	24	—	10	27	5 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>2</sub>	14 <sup>1</sup> / <sub>2</sub>	1/2 x 3/4	1 <sup>1</sup> / <sub>4</sub> x 1	3/4 x 1	1 <sup>1</sup> / <sub>2</sub>	
3-4	1	40½	24	8 <sup>3</sup> / <sub>32</sub>	36	—	12	39	8 <sup>7</sup> / <sub>16</sub>	11 <sup>15</sup> / <sub>16</sub>	15 <sup>7</sup> / <sub>16</sub>	—	1 <sup>3</sup> / <sub>32</sub> x 2 <sup>15</sup> / <sub>32</sub>	7/8 x 1 <sup>1</sup> / <sub>8</sub>	—	2 <sup>1</sup> / <sub>2</sub>	
5	2	72 <sup>5</sup> / <sub>32</sub>	20	11	71	16	2 <sup>1</sup> / <sub>8</sub>	70 <sup>29</sup> / <sub>32</sub>	—	—	—	—	—	—	—	—	
6	2	79 <sup>1</sup> / <sub>8</sub>	22	12 <sup>15</sup> / <sub>16</sub>	78	18	2 <sup>1</sup> / <sub>8</sub>	77 <sup>7</sup> / <sub>8</sub>	—	—	—	—	—	—	—	—	
4 (Vac)	2	55 <sup>3</sup> / <sub>32</sub>	24 <sup>3</sup> / <sub>8</sub>	9 <sup>22</sup> / <sub>32</sub>	54 <sup>26</sup> / <sub>32</sub>	20 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>8</sub>	54 <sup>23</sup> / <sub>32</sub>	26 <sup>3</sup> / <sub>16</sub>	—	5	27 <sup>14</sup> / <sub>32</sub>	—	—	—	—	

Class 88 Reduced Voltage Pump Panels

RVAT Size	Part Winding & Wye Delta		Figure	A	B	C	D	E	F	H	I	J	K	L
	Fusible Disconnect	Circuit Breaker												
2-2½	1-2	1-2½	3	43 <sup>5</sup> / <sub>16</sub>	24 <sup>5</sup> / <sub>32</sub>	11	42 <sup>11</sup> / <sub>32</sub>	20	2 <sup>1</sup> / <sub>16</sub>	—	—	—	—	—
3-3½	2½-3½	3-3½	3	55 <sup>5</sup> / <sub>16</sub>	28 <sup>9</sup> / <sub>32</sub>	11	54 <sup>11</sup> / <sub>32</sub>	24	2 <sup>1</sup> / <sub>8</sub>	—	—	—	—	—
4	4	4	3	74 <sup>21</sup> / <sub>32</sub>	28 <sup>9</sup> / <sub>32</sub>	11	73 <sup>13</sup> / <sub>32</sub>	24	2 <sup>1</sup> / <sub>8</sub>	—	—	—	—	—
5, 6	5, 6	5, 6	4	90	30	20	16	24 <sup>7</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	—	1 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>16</sub>	3

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

# Enclosed Contactors, Class LC and LE

## Dimensions

Figure 1

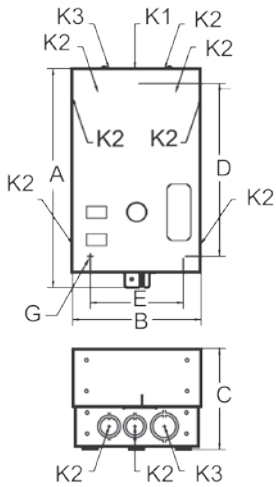


Figure 2

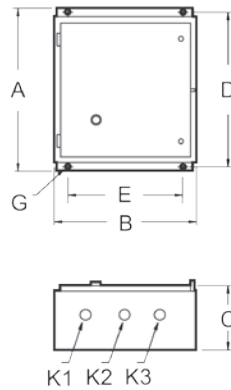
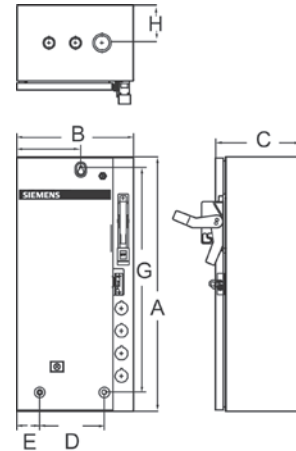


Figure 3



Enclosure Type	Contactor Rating (Class LC and LE)	Fig.	Outline Dimensions			Mounting		Conduit Size				
			A	B	C	D	E	K1	K2	K3	K4	K5
1 without CPT	LE 20/30A 3-4P	1	10.97	6.41	5.03	8.22	4.62	0.5	0.50-0.75	0.75-1	—	—
	LC 30A 2-12P, LE 60A 3P	1	13.53	7.97	6.38	10.25	6.00	0.50-0.75	0.75-1	1-1.25	—	—
	LE 30/60A 6-12P, LE 100A 3P	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	0.50-0.75	1.25-1.5	1.25-1.5	—	—
1 with CPT	LC 30A 2-12P, LE 20A 3-4P, LE 30A 3-9P, LE 60A 3-9P, LE 100A 3P	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	LE 30/60A 12P	1	24.88	13.38	8.12	21.75	9.00	0.50-0.75	1.25-1.5	2-2.5	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	—	1.25-1.5	1.25-1.5	—	—
12/3R & 4/4X without CPT	LE 20A 3-4P, LE 30/60A 3-9P, LE 100A 3P, LC 30A 2-12P	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	LE 30/60A 12P	2	26.00	13.12	7.56	25.25	10.00	—	—	—	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	23.19	15.50	—	—	—	—	—
12/3R & 4/4X with CPT	LE 20/30A 3-4P, LE 60A 3P	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	LC 30A 2-12P	2	16.00	17.13	7.63	15.25	11.00	—	—	—	—	—
	LE 30/60A 6-12P, LE 100A 3P	2	26.00	13.12	7.56	15.25	14.00	—	—	—	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	—	—	—	—	—

Enclosure Type	Type (Class LE)	Contactor Rating	Fig.	Outline Dimensions		
				A	B	C
1, 12 & 4/4X with and without CPT	Fusible and Non-fusible Disconnect	20-60A	3	24	11	8
		100A	3	24	20	8
		200A	3	46	20	10
		300A	3	76	22	13
	Circuit Breaker	20-100A	3	24	11	8

Dimensions are in inches.

1) G designates 0.25" mounting screw.

2) Enclosures shown in figure 1 have lift-off covers. All other enclosures have hinged covers.

# Enclosed Contactors, Class CLM, CM

## Dimensions

Figure 1

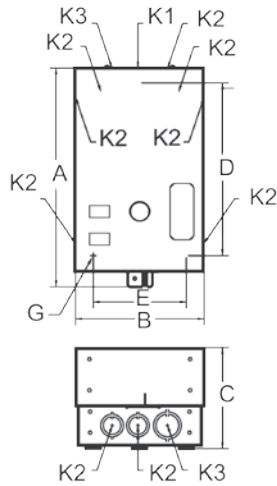


Figure 2

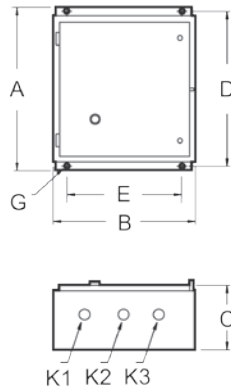
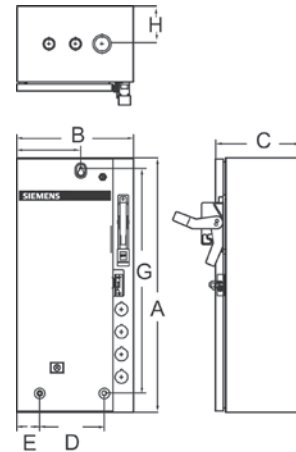


Figure 3



Enclosure Type	Contactor Rating (Class CLM)	Fig.	Outline Dimensions			Mounting		Conduit Size				
			A	B	C	D	E	K1	K2	K3	K4	K5
1 without CPT	30-60A (2-5p)	1	10.97	6.41	5.03	8.22	4.62	0.5	0.50-0.75	0.75-1	—	—
	20A (2-12p)	1	13.53	7.97	6.38	10.25	6.00	0.50-0.75	0.75-1	1-1.25	—	—
	30-60A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	0.50-0.75	1.25-1.5	1.25-1.5	—	—
	100A (2-5p)	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	200A (2-5p)	1	24.88	13.38	8.12	21.75	9.00	0.50-0.75	1.25-1.5	2.5	—	—
1 with CPT	300-400A (2-5p)	2	48.00	20.00	12.50	45.19	10.00	2.00-2.50	1.25-1.5	0.5-0.75	1.25-1.5	2-2.5
	20A (2-12p), 30A (2-5p)	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	30-60A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	0.50-0.75	1.25-1.5	1.25-1.5	—	—
	100-200A (2-5p)	2	26.00	17.62	12.50	25.19	15.50	—	1.25-1.5	1.25-1.5	—	—
12/3R & 4/4X without CPT	300-400A (2-5p)	2	48.00	20.00	12.50	45.19	10.00	2.00-2.50	1.25-1.5	0.5-0.75	1.25-1.5	2-2.5
	20A (2-12p), 30A (2-12p), 60A (2-10p)	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	100A (2-5p)	2	16.00	13.00	9.50	15.12	11.00	—	—	—	—	—
	60A (12p)	2	19.00	22.00	8.00			—	—	—	—	—
	200A (2-5p)	2	26.00	17.62	12.50	23.19	15.50	—	—	—	—	—
12/3R & 4/4X with CPT	300A-400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—
	20A (2-12p), 30A (2-5p)	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	30A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	—	—	—	—	—
	60-100A (2-5p)	2	16.00	13.00	9.50	15.12	11.00	—	—	—	—	—
	60A (6-12p)	2	19.00	22.00	8.00			—	—	—	—	—
	200A (3p)	2	26.00	17.62	12.50	25.19	15.50	—	—	—	—	—
300-400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—	

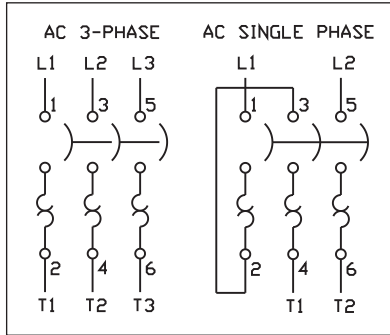
Enclosure Type	Type (Class CM)	Contactor Rating	Fig.	Outline Dimensions		
				A	B	C
1, 12 & 4/4X with and without CPT	Fusible and Non-fusible Disconnect	20-60A	3	24	11	8
		100A	3	24	20	8
		200A	3	46	20	10
		300A	3	76	22	13
	Circuit Breaker	20-100A	3	24	11	8

Dimensions are in inches.

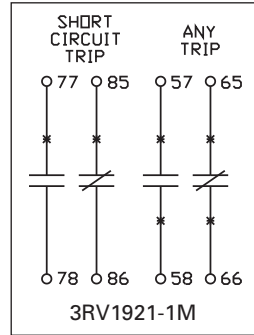
1) G designates 0.25" mounting screw.

2) Enclosures shown in figure 1 have lift-off covers. All other enclosures have hinged covers.

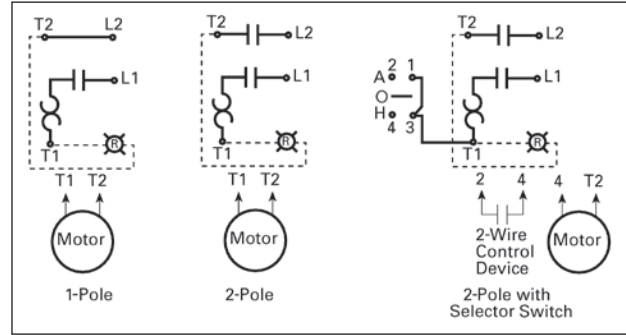
### Class 11 - 3RV



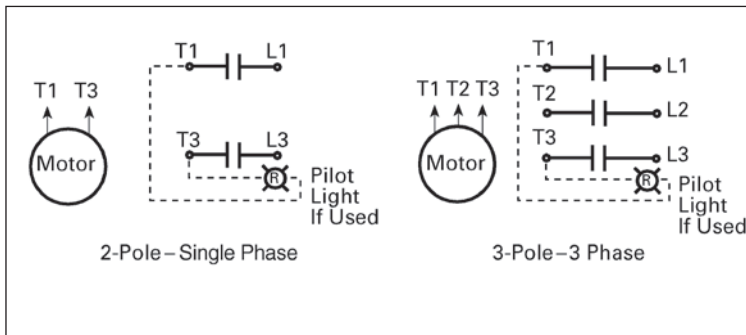
### Signaling Contact for Class 11 - 3RV



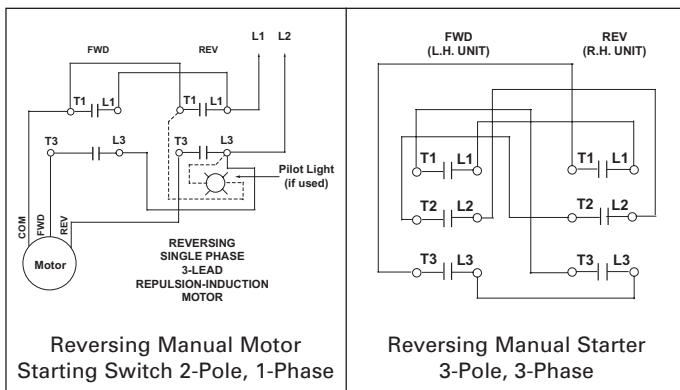
### Typical Wiring Diagrams—Class SMF



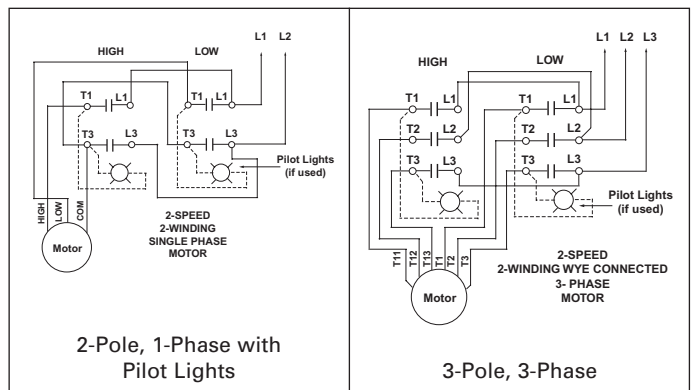
### Typical Wiring Diagrams—MMS



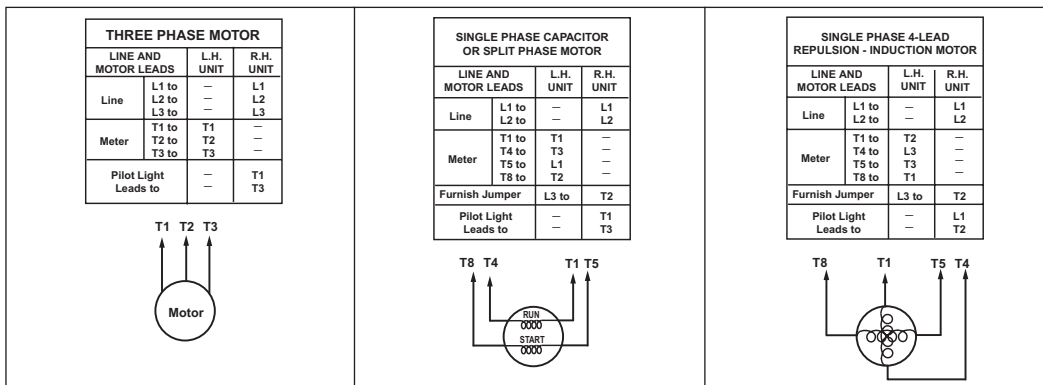
### AC Reversing Manual Starter and Manual Motor Starting Switches



### AC 2-Speed Manual Motor Starting Switches

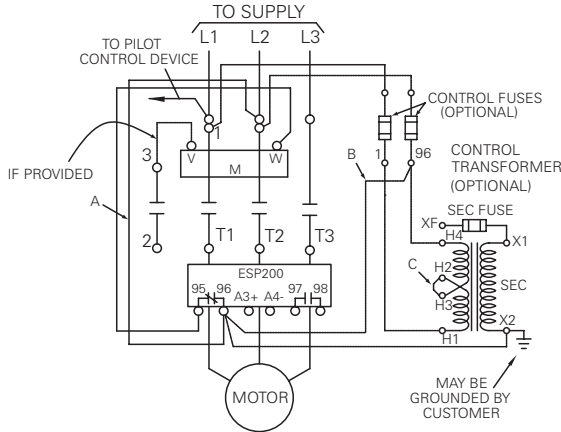


### 3-Pole Reversing Switches

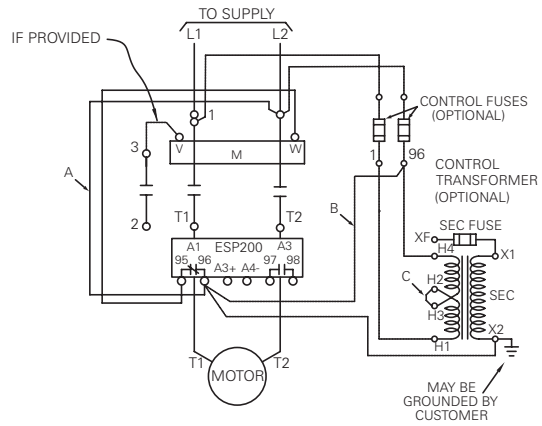


3-Phase and Single Phase Magnetic Starters

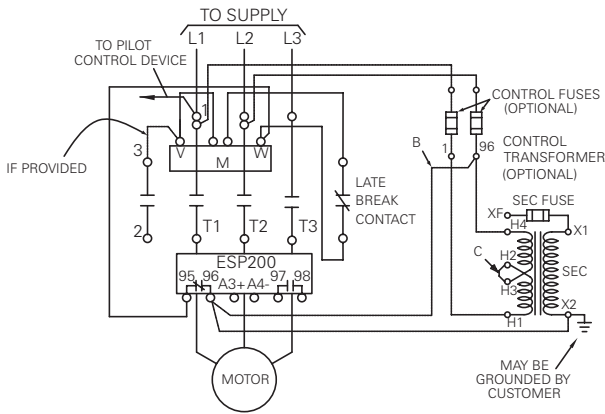
Three Phase Magnetic Starter, Size 00-4



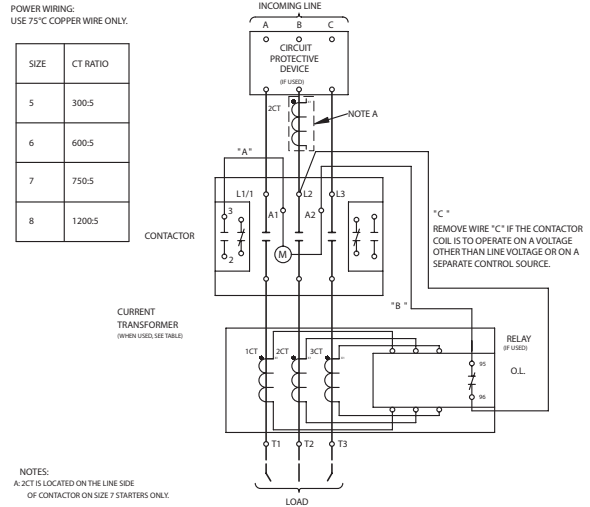
Single Phase Magnetic Starter<sup>Ⓣ</sup>



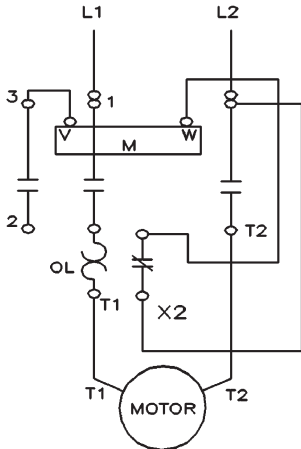
Three Phase Magnetic Starter with DC Coil, Sizes 00-4



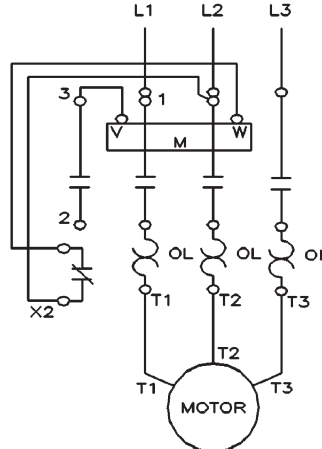
Solid State Overload 3-Phase Sizes 5-8



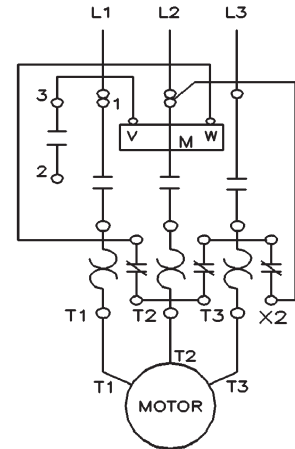
Ambient Compensated Single Phase Sizes 00-2 1/2



Ambient Compensated 3-Phase Sizes 00-2 1/2



Ambient Compensated 3-Phase Sizes 3-4

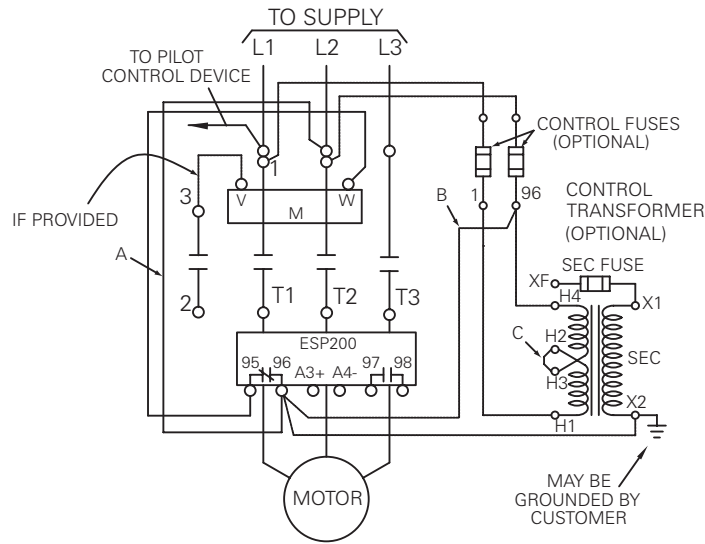


Ⓣ Warning: The ESP200 Starter and Single Phase Motor must be wired as shown above. For L1, L2 do not use the middle terminal or hole.

Ⓣ Full Load Amps (FLA): Adjustment of the ESP200 solid state overload relay accommodates the single phase motor.

3-Phase

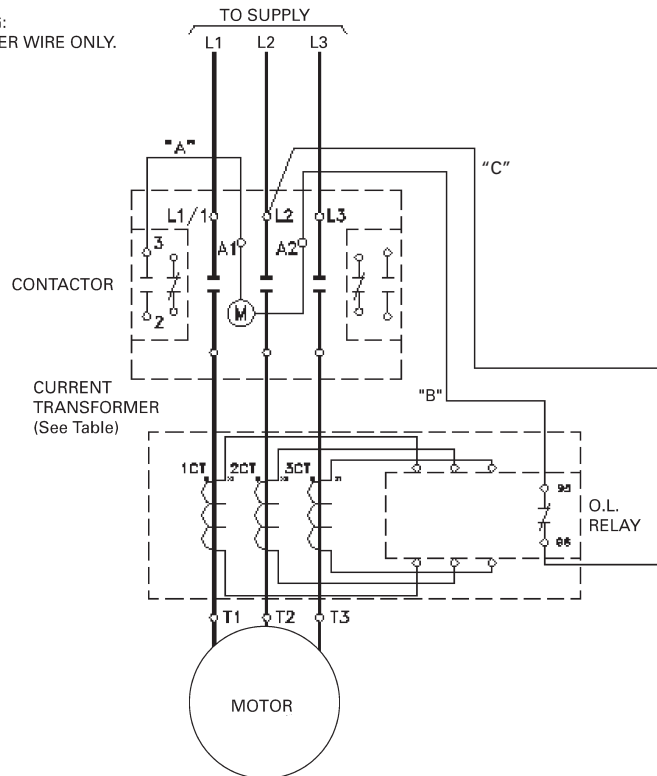
Size 00-4<sup>①</sup>



Size 5-8<sup>②</sup>

POWER WIRING:  
USE 75°C COPPER WIRE ONLY.

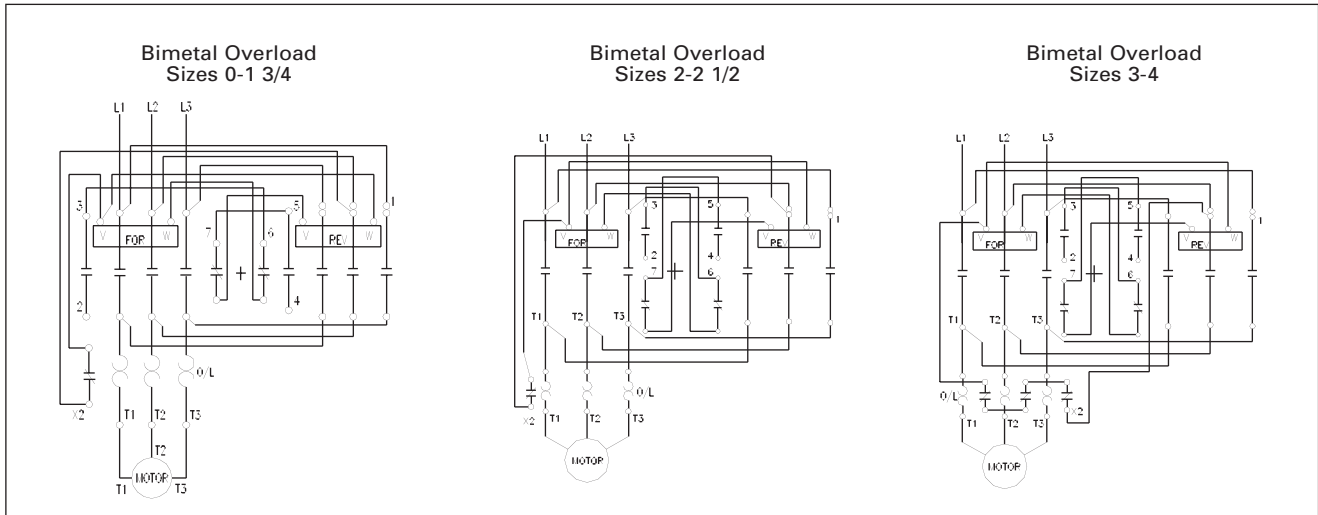
SIZE	CT RATIO
5	300:5
6	600:5
7	750:5
8	1200:5



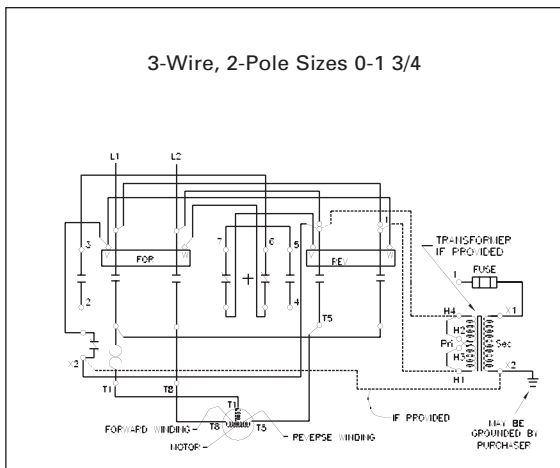
<sup>①</sup> Remove wire "C" if control transformer is used. For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse line terminals.

<sup>②</sup> Remove wire "C" if the contactor coil is to operate on a voltage other than line voltage or in a separate control source.

3-Phase Ambient Compensated Overload



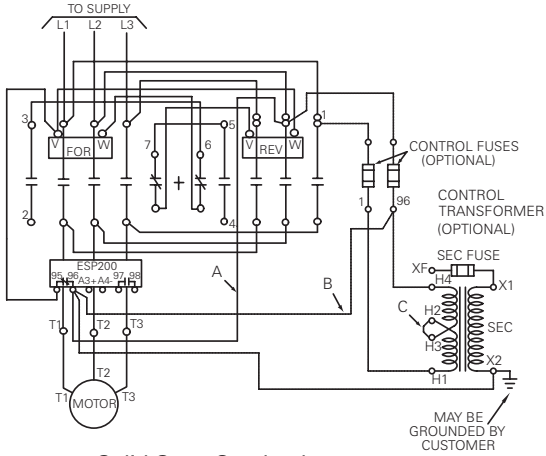
Single Phase Ambient Compensated Overload



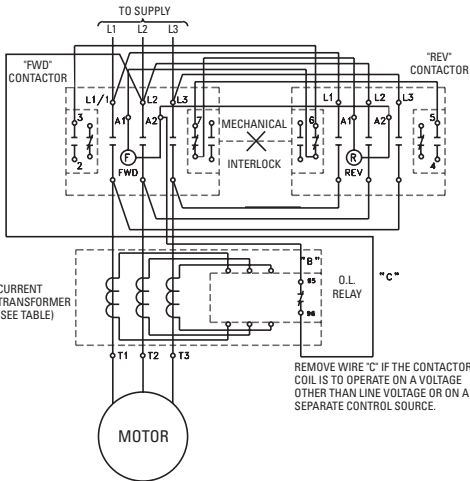


3-Phase Solid State Overload

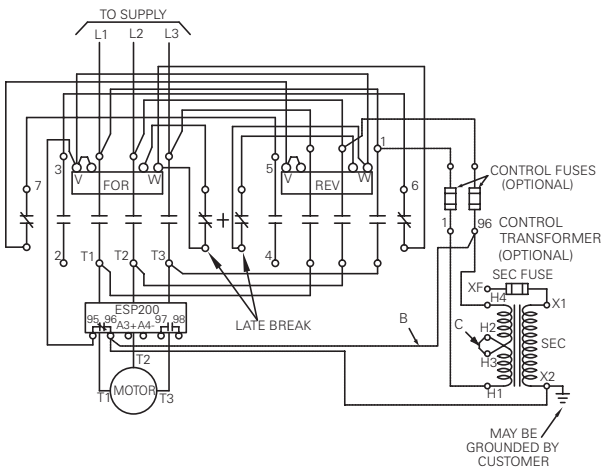
3-Phase Reversing Magnetic Starter  
Sizes 00-1 1/4



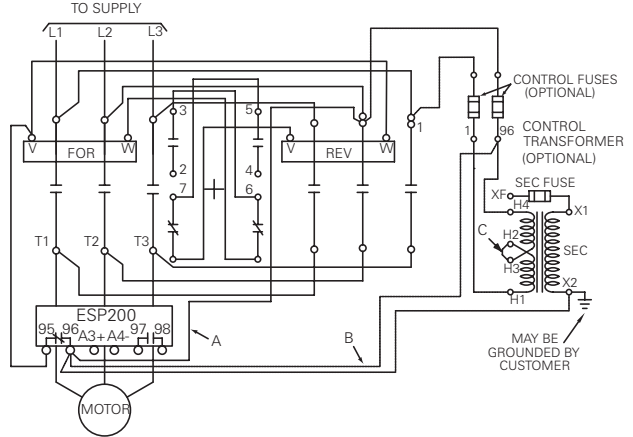
Solid State Overload  
Sizes 5-6



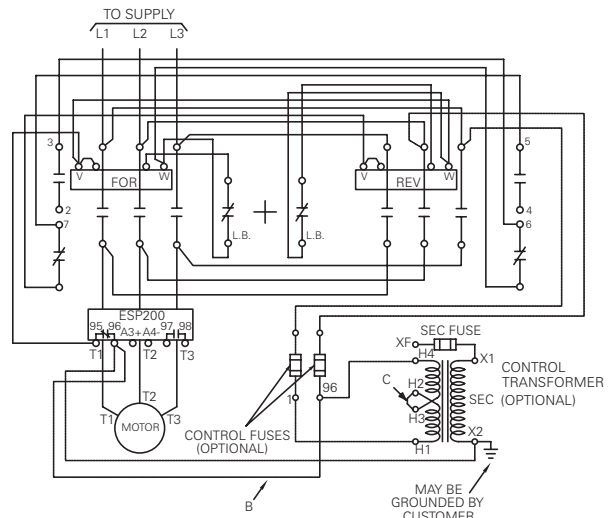
3-Phase Reversing Magnetic Starter  
with DC Coil, Sizes 00-1 1/4



3-Phase Reversing Magnetic Starter  
Sizes 2-4

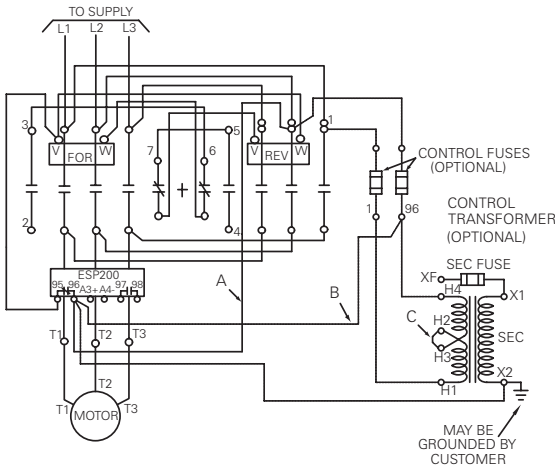


3-Phase Reversing Magnetic Starter  
with DC Coil, Sizes 2-4

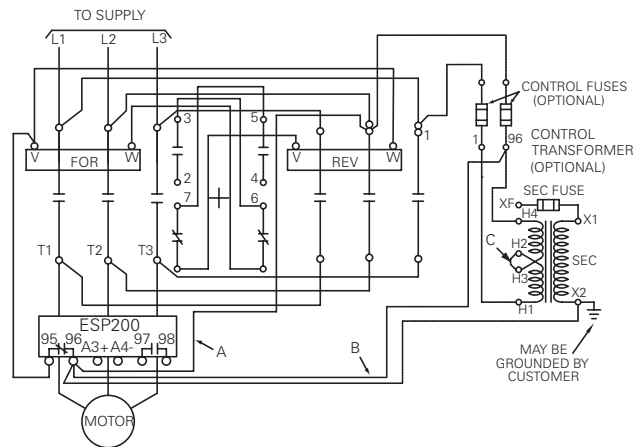


3-Phase

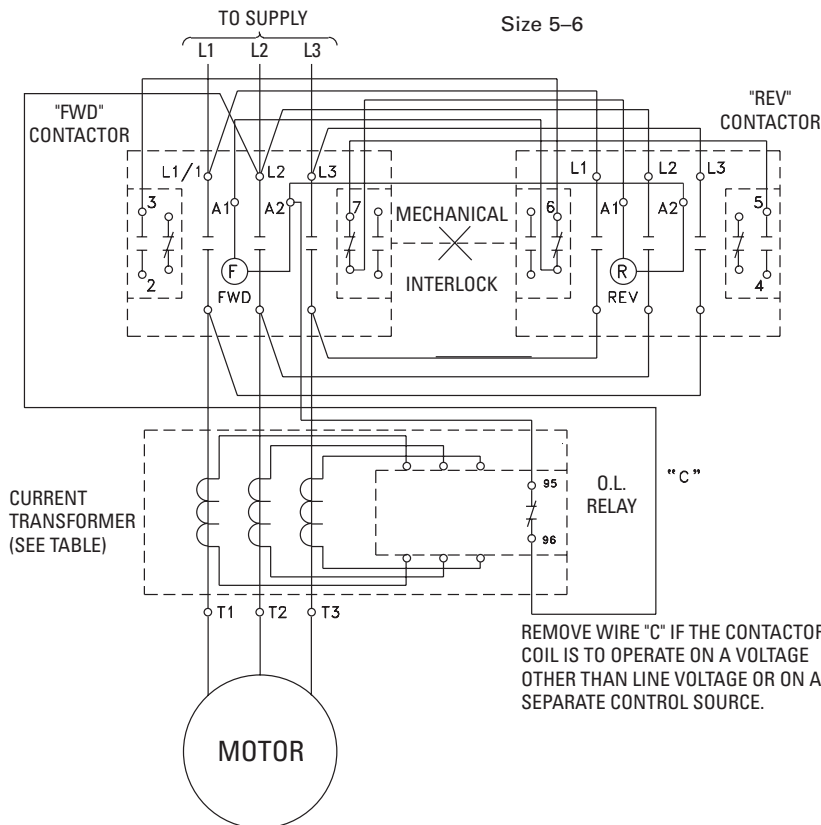
3-Phase Reversing Magnetic Starter  
Sizes 00-1 $\frac{1}{4}$



3-Phase Reversing Magnetic Starter  
Sizes 2-4



Size 5-6

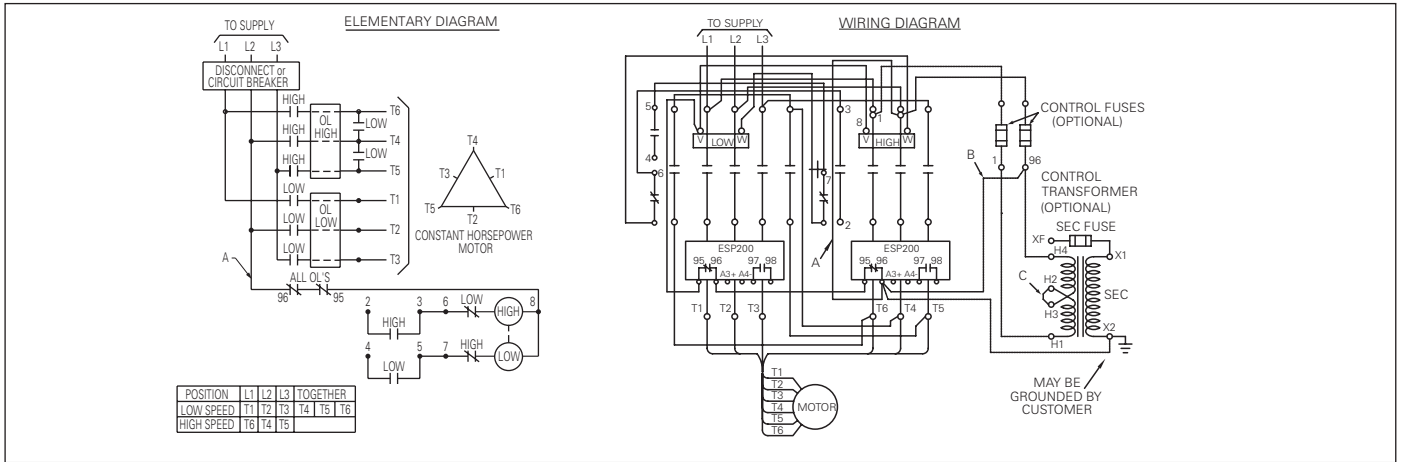


SIZE	CT RATIO
5	300:5
6	600:5

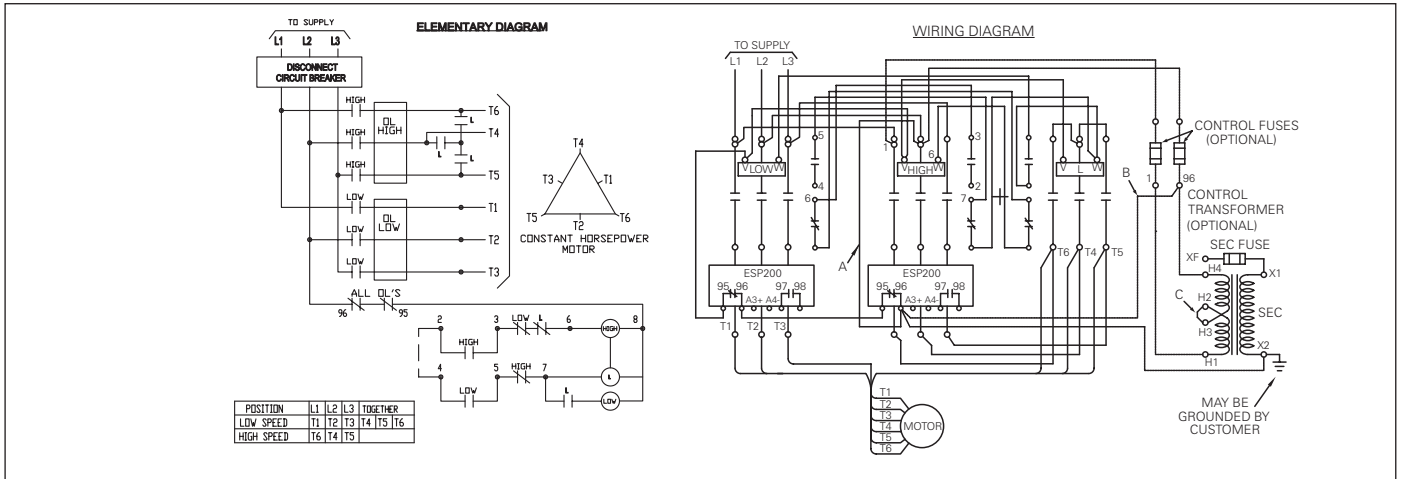
# Class 30 & 32 Non-Combination and Combination Starters

## Wiring Diagrams

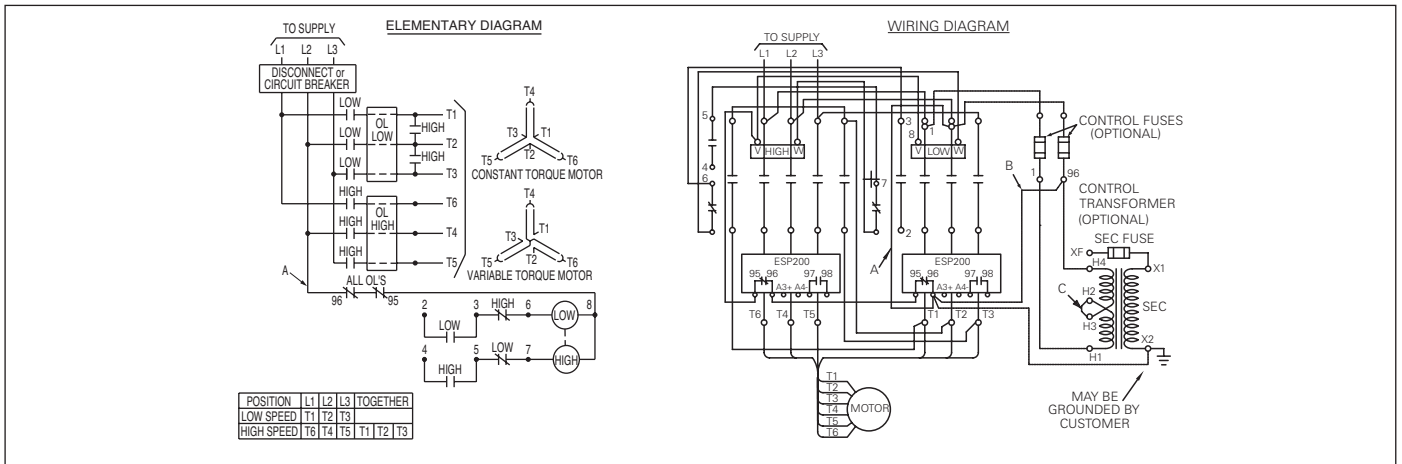
### 1 Winding Constant Horsepower Size 0-1<sup>3</sup>/<sub>4</sub>



### 1 Winding Constant Horsepower Size 2-4



### 1 Winding Constant or Variable Torque Size 0-1<sup>3</sup>/<sub>4</sub>

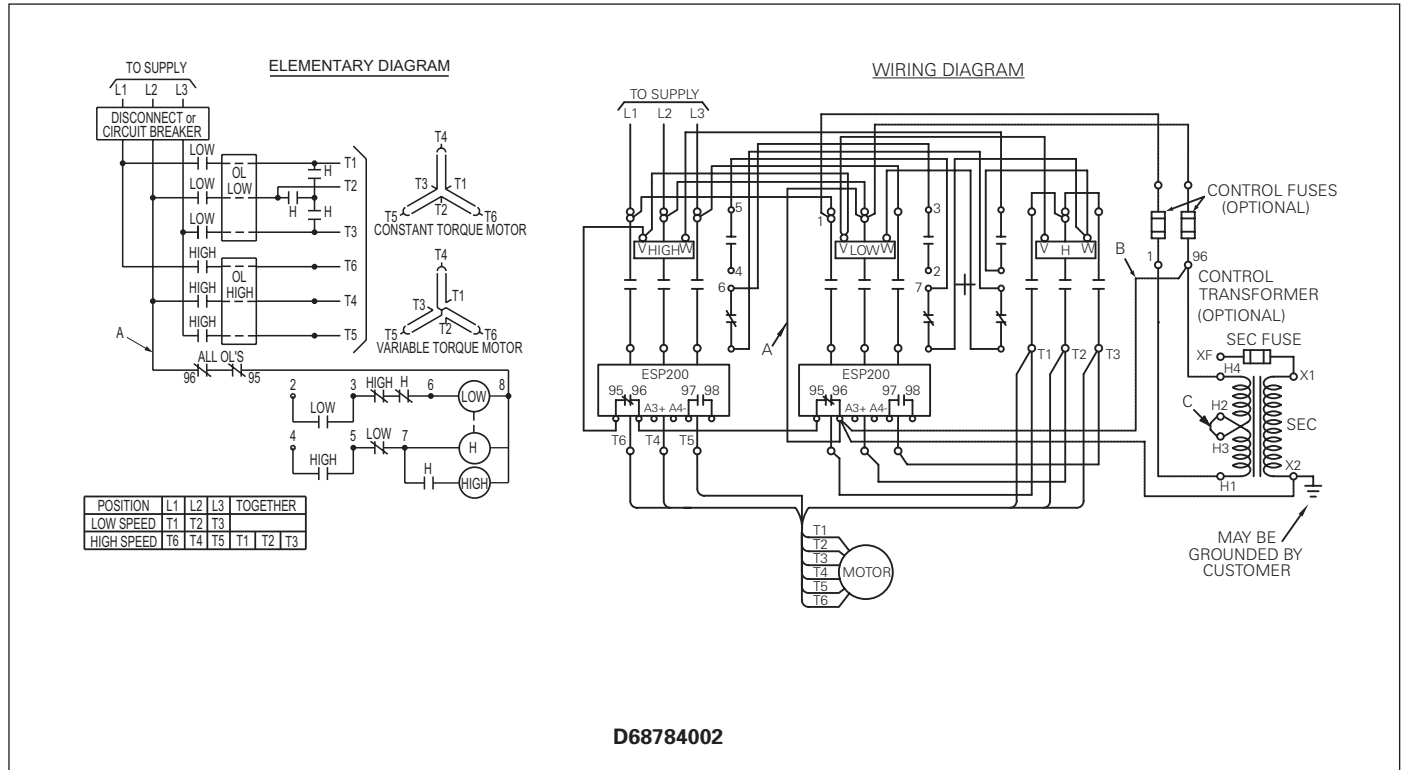


**Note:** For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse terminal. Remove jumper "C" if control transformer is used.

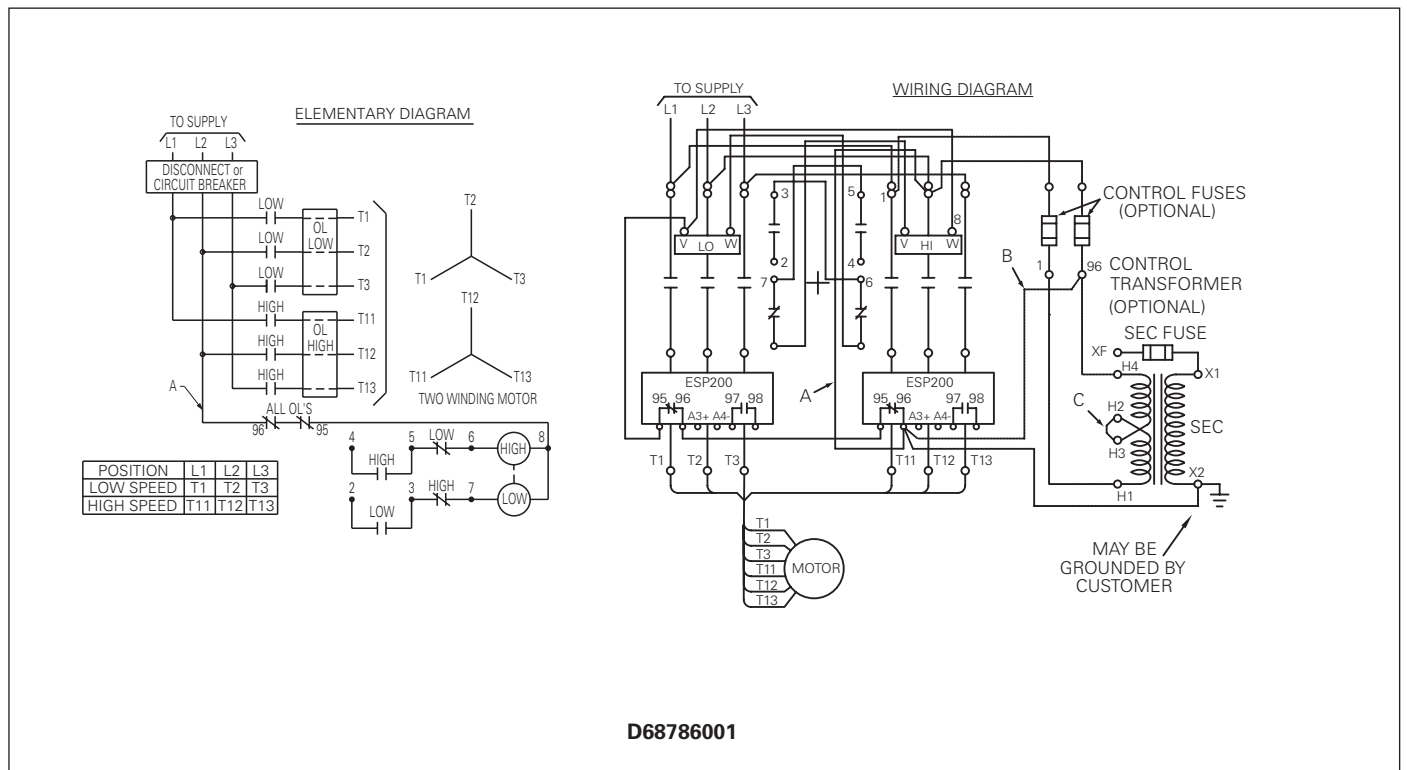
# Class 30 & 32 Non-Combination and Combination Starters

## Wiring Diagrams

### 1 Winding Constant or Variable Torque Size 2-4

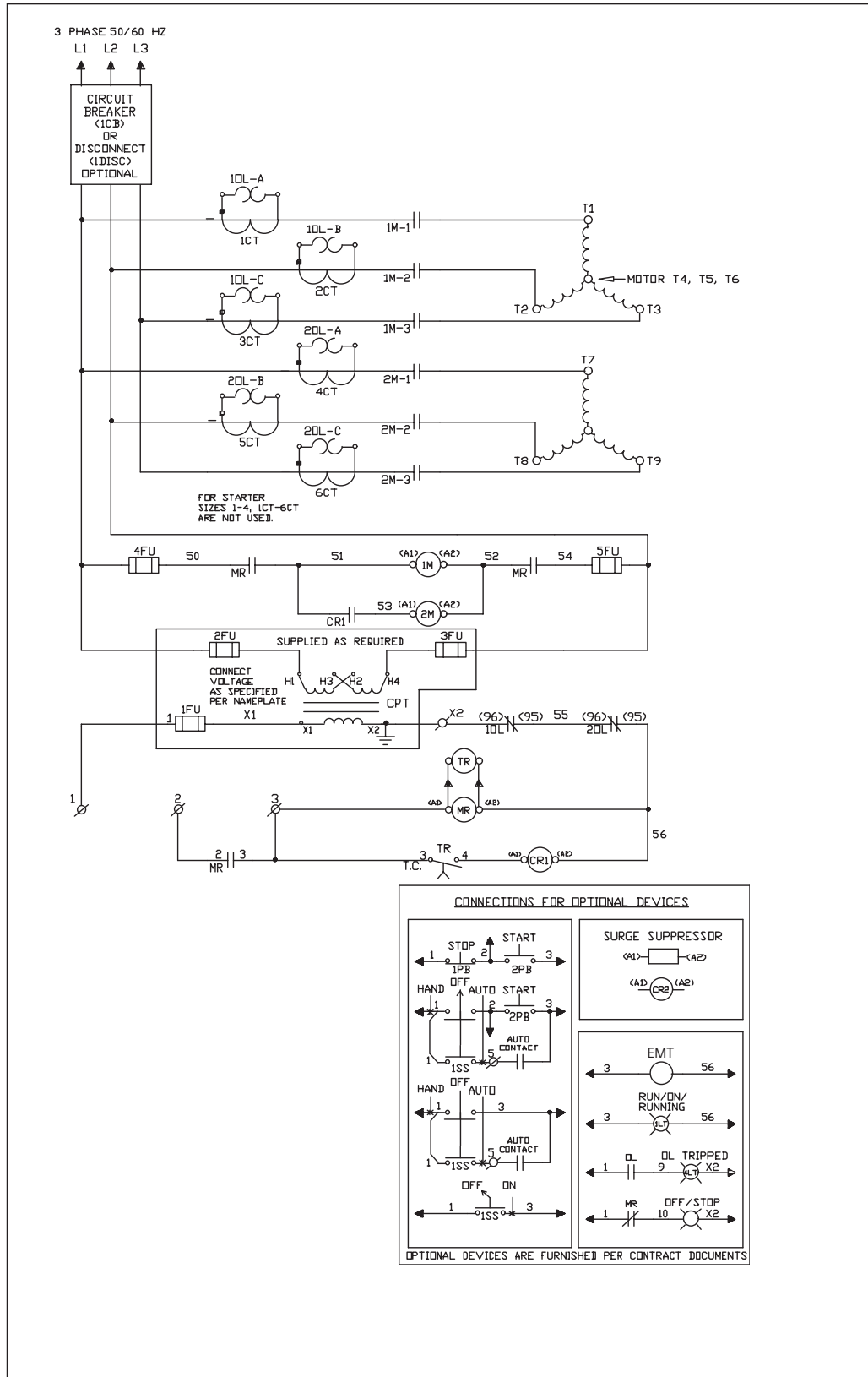


### 2 Winding Constant Horsepower & 2 Winding Constant or Variable Torque Size 0-4

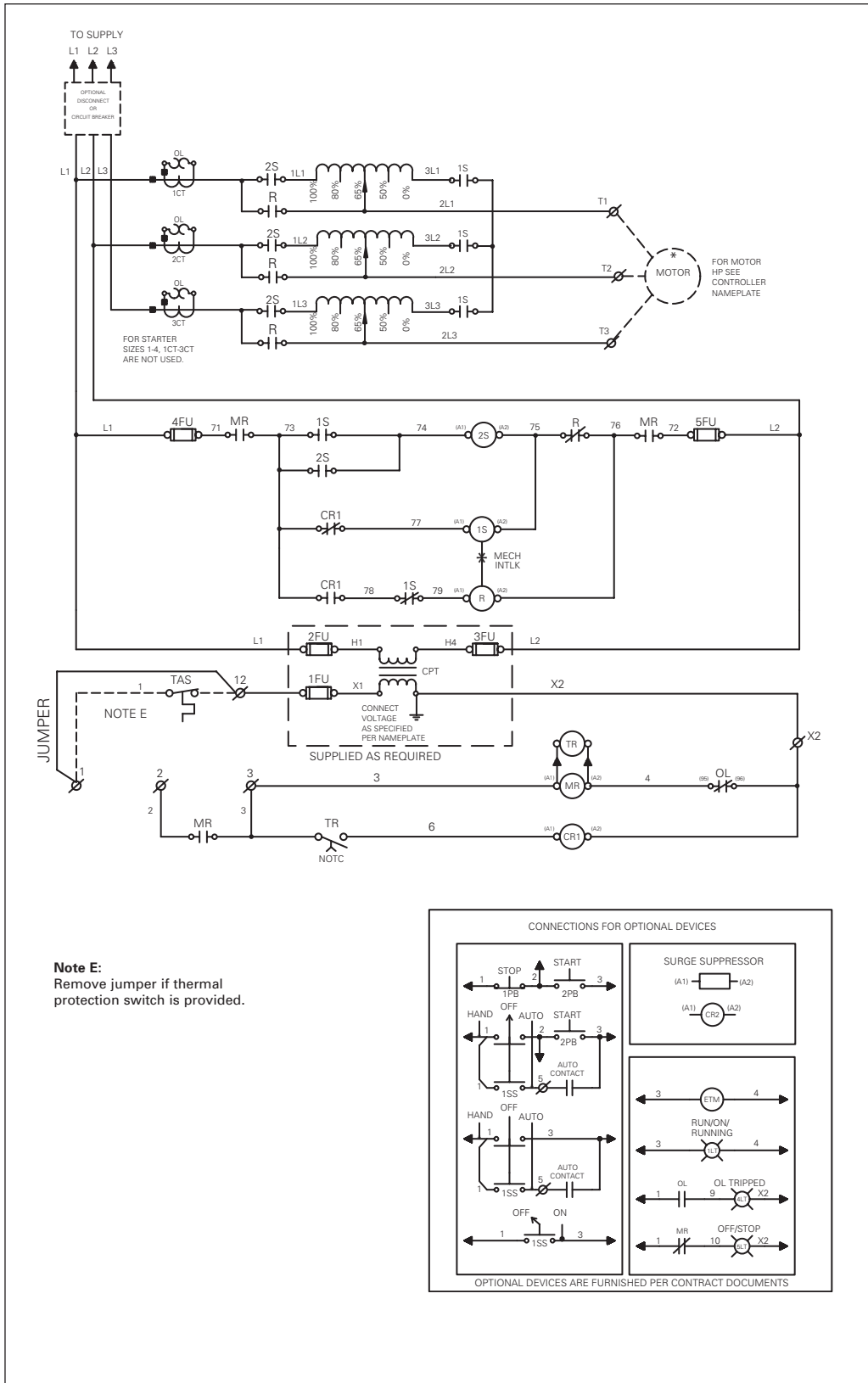


**Note:** For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse terminal. Remove jumper "C" if control transformer is used.

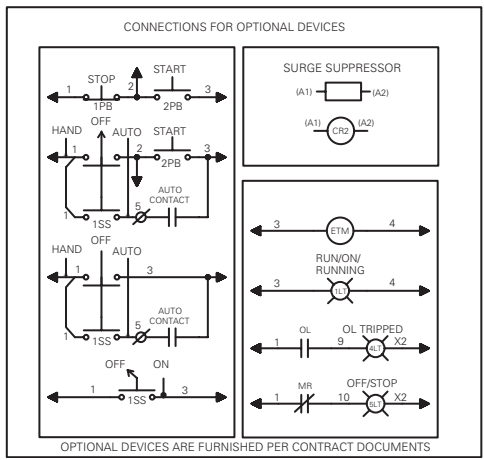
Part Winding



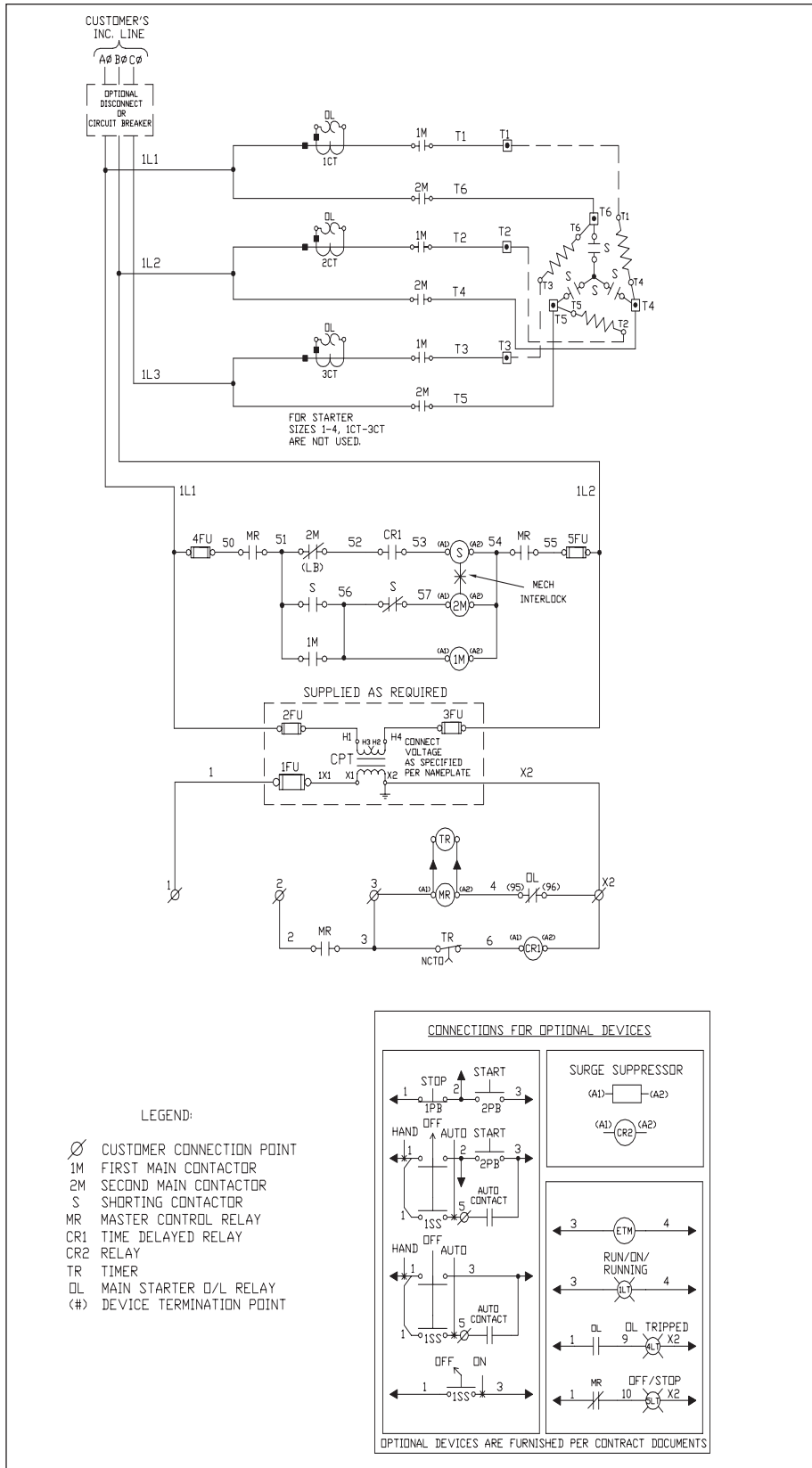
Auto Transformer



**Note E:**  
Remove jumper if thermal protection switch is provided.

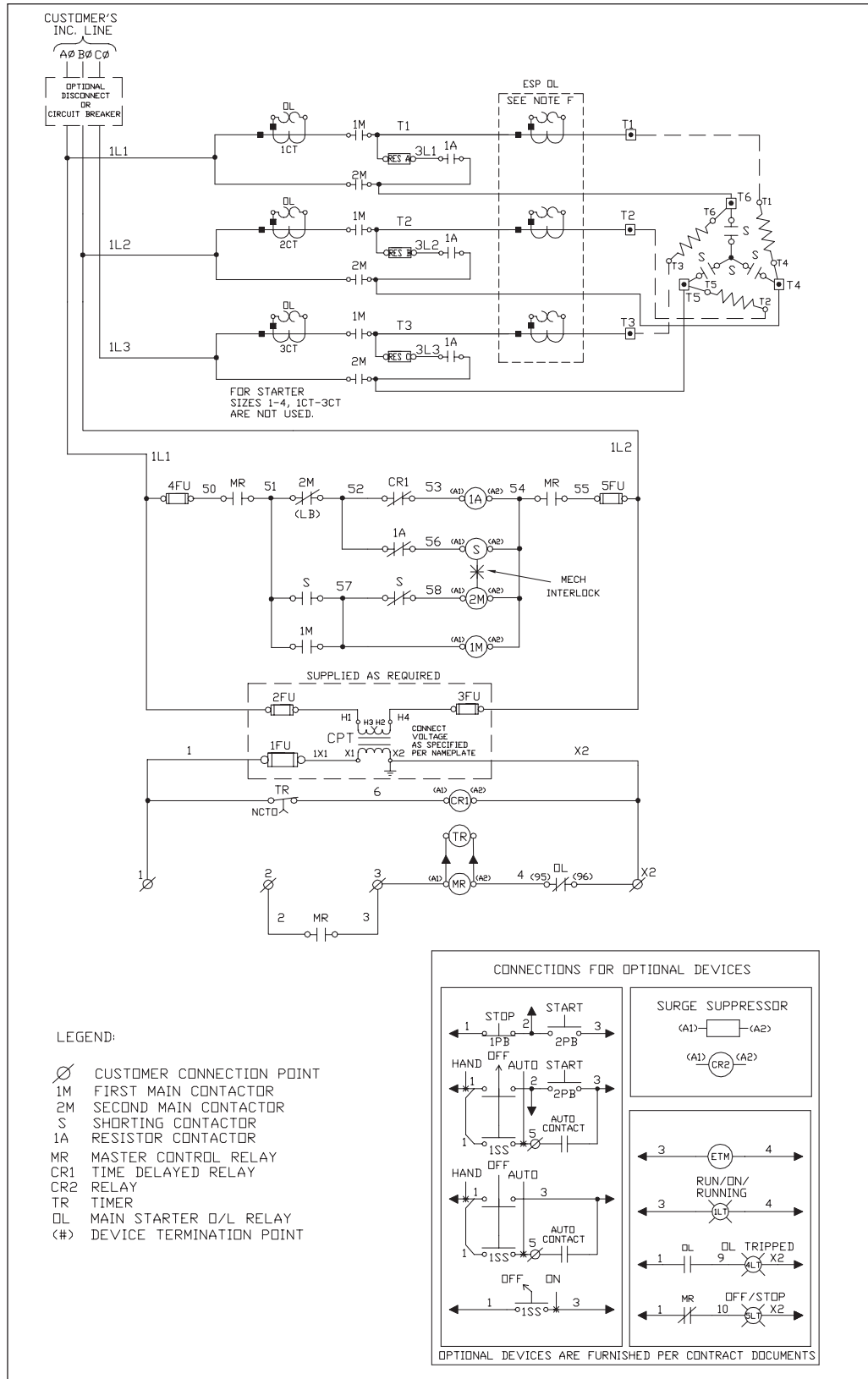


Wye Delta (Open Transition)



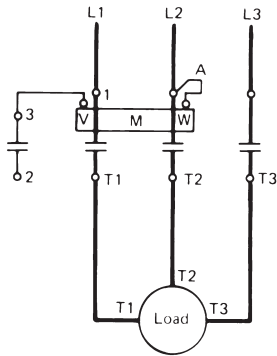


Wye Delta (Closed Transition)

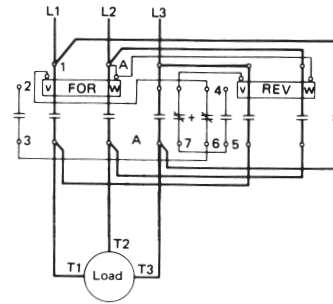


3-Phase Magnetic Contactors and Reversing Contactors

3-Phase Contactors—Size 00–4

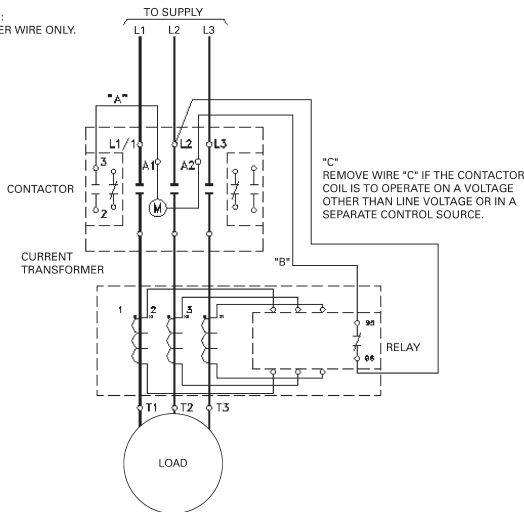


3-Phase Reversing Contactors—Size 00–4

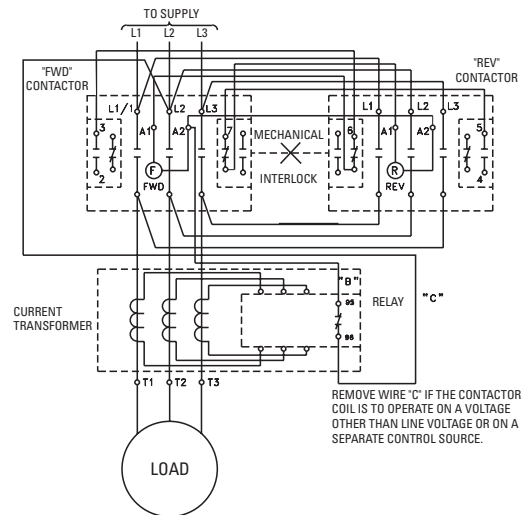


3-Phase Contactors—Size 5, 6

POWER WIRING:  
USE 75°C COPPER WIRE ONLY.

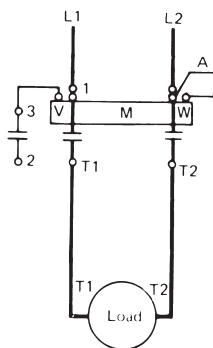


3-Phase Reversing Contactors—Size 5, 6

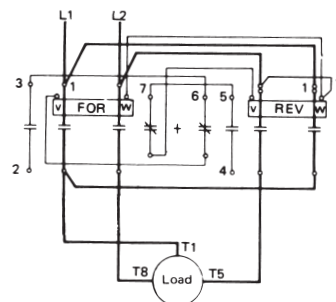


Single Phase Magnetic Contactors and Reversing Contactors

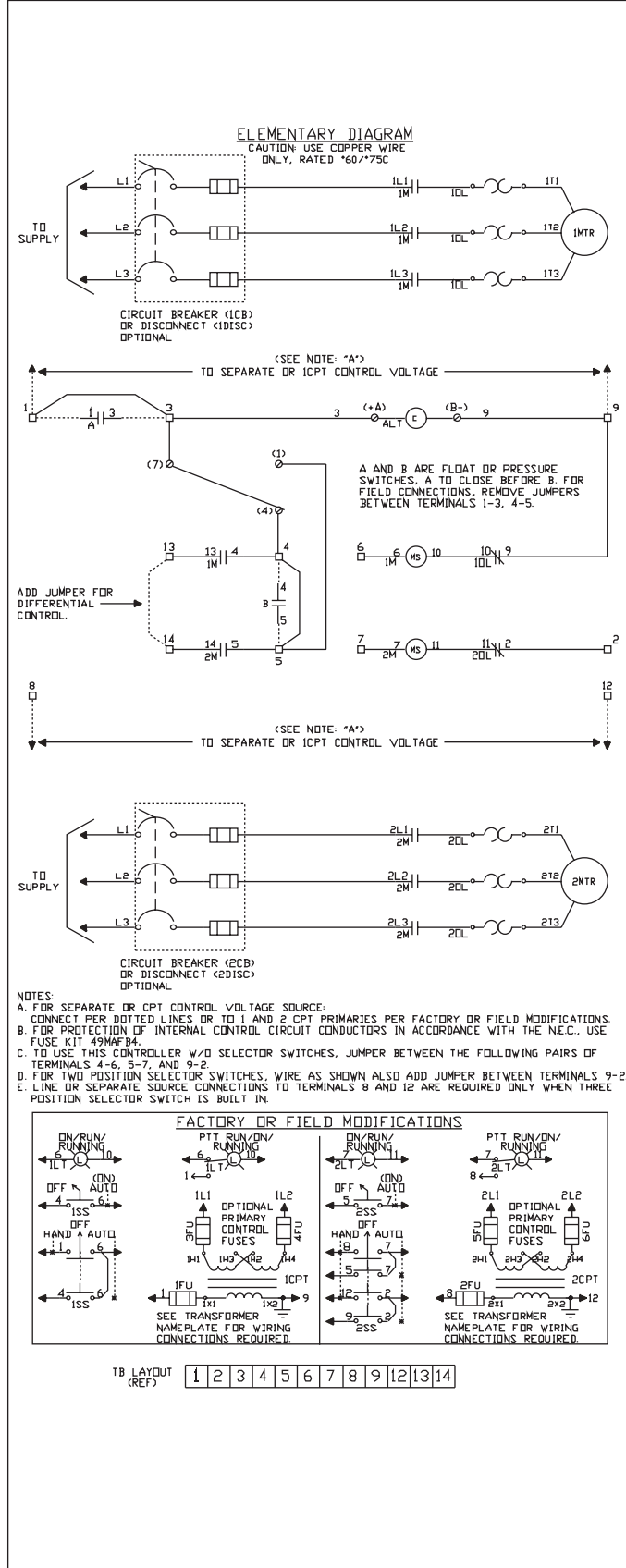
Single Phase Contactors—Size 00–4



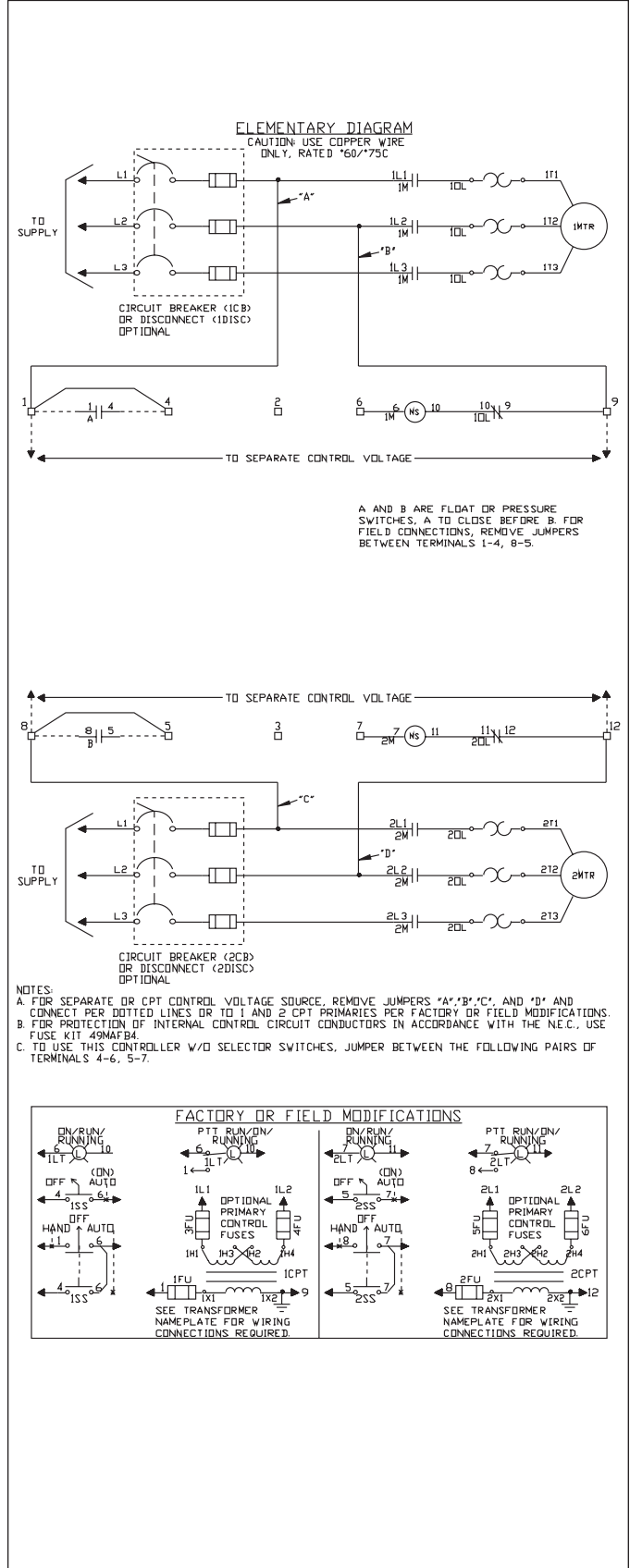
Single Phase Reversing Contactors—Size 00–1P



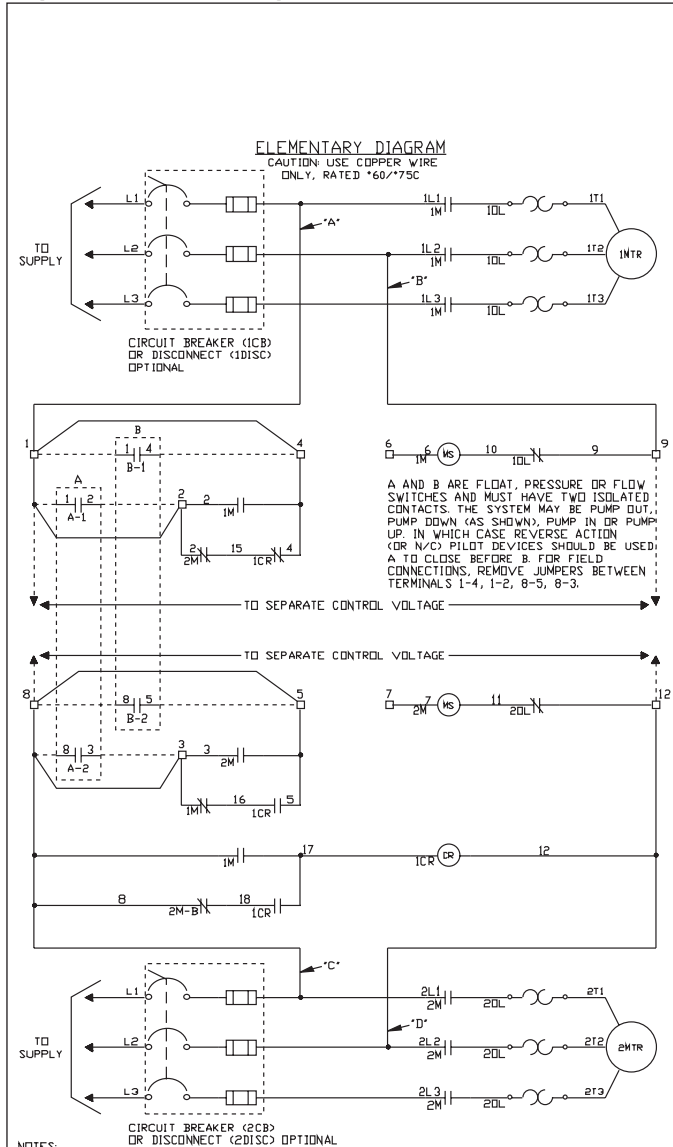
Standard Duplex Pump Panel (92)



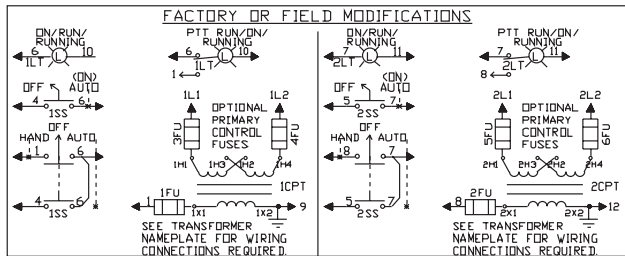
Duplex Panel w/o alternator (95)



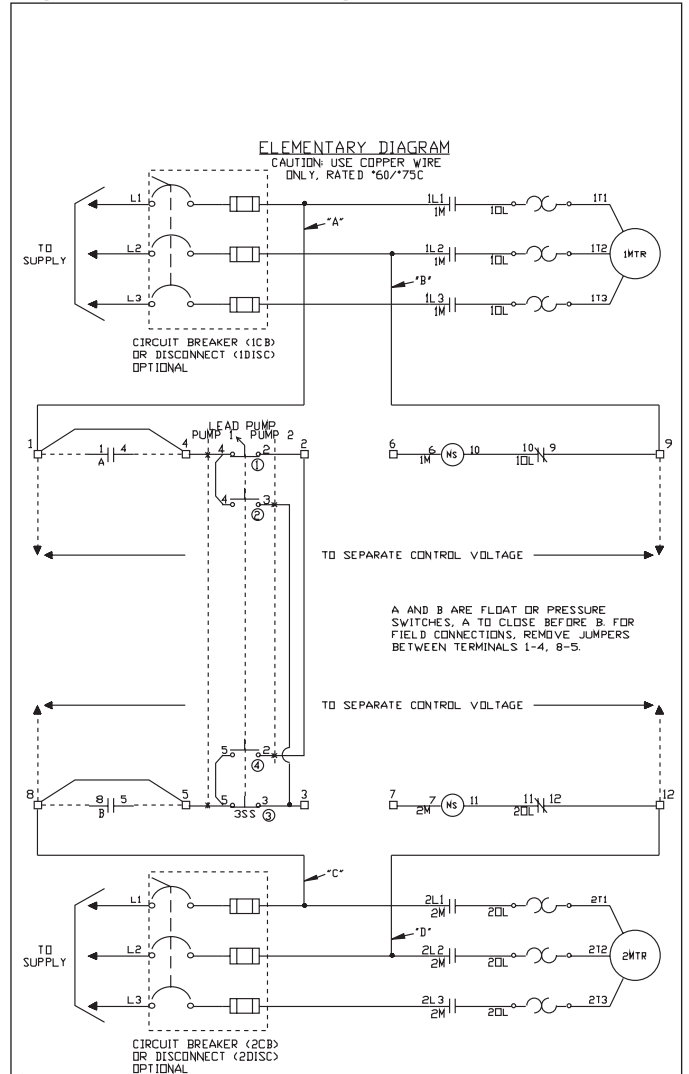
Duplex Panel with Relay Alternation (93)



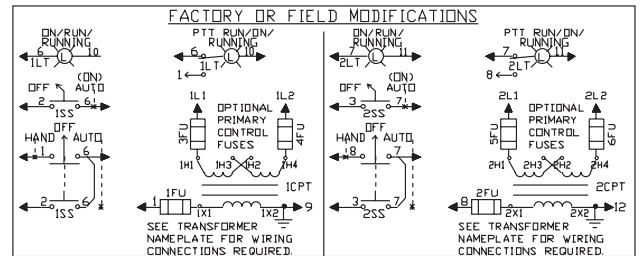
NOTES:  
A. FOR SEPARATE OR CPT CONTROL VOLTAGE SOURCE, REMOVE JUMPERS \*A\*, \*B\*, \*C\*, AND \*D\* AND CONNECT PER DOTTED LINES OR TO 1 AND 2 CPT PRIMARIES PER FACTORY OR FIELD MODIFICATIONS.  
B. FOR PROTECTION OF INTERNAL CONTROL CIRCUIT CONDUCTORS IN ACCORDANCE WITH THE N.E.C., USE FUSE KIT 49MAFB4.  
C. TO USE THIS CONTROLLER W/O SELECTOR SWITCHES, JUMPER BETWEEN THE FOLLOWING PAIRS OF TERMINALS 2-6, 3-7.  
D. ⊕ = SELECTOR SWITCH CONTACT LOCATION



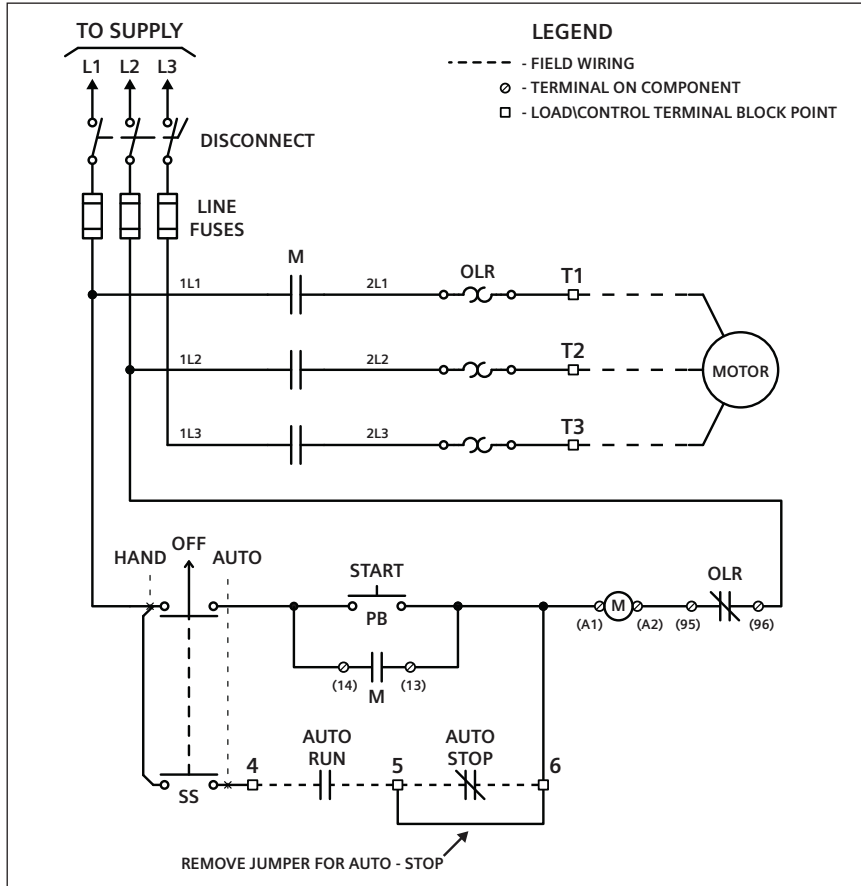
Duplex Panel with Lead Pump Transfer Switch (94)



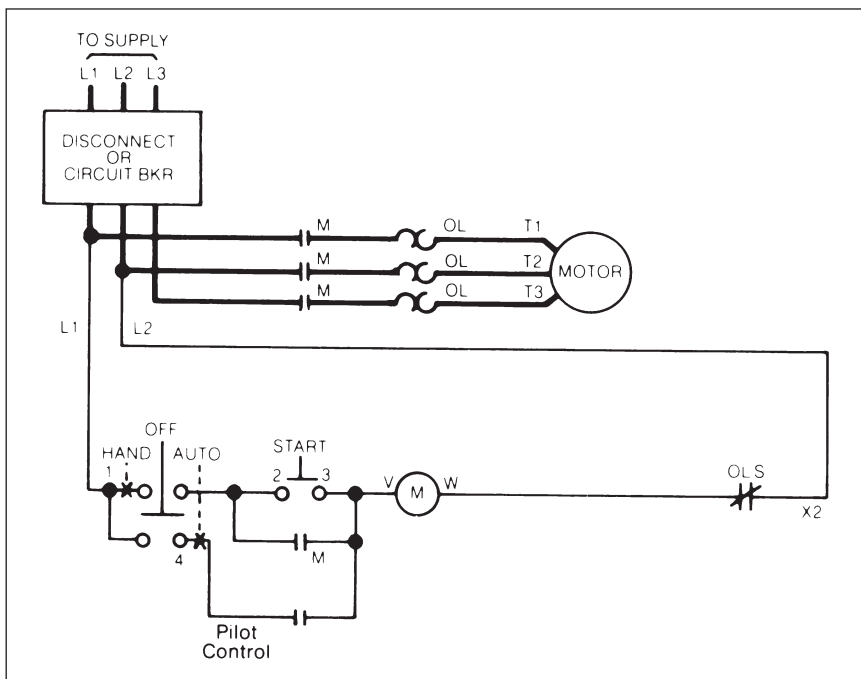
NOTES:  
A. FOR SEPARATE OR CPT CONTROL VOLTAGE SOURCE, REMOVE JUMPERS \*A\*, \*B\*, \*C\*, AND \*D\* AND CONNECT PER DOTTED LINES OR TO 1 AND 2 CPT PRIMARIES PER FACTORY OR FIELD MODIFICATIONS.  
B. FOR PROTECTION OF INTERNAL CONTROL CIRCUIT CONDUCTORS IN ACCORDANCE WITH THE N.E.C., USE FUSE KIT 49MAFB4.  
C. TO USE THIS CONTROLLER W/O SELECTOR SWITCHES, JUMPER BETWEEN THE FOLLOWING PAIRS OF TERMINALS 2-6, 3-7.  
D. ⊕ = SELECTOR SWITCH CONTACT LOCATION



**Class 82 Pump Panel**



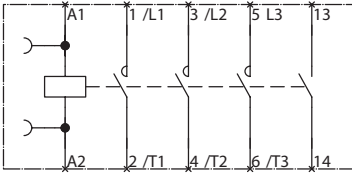
**Standard Class 87 Pump Panel**



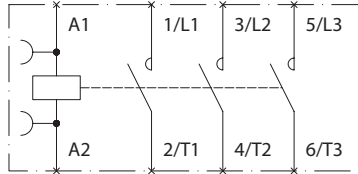
# Class LC and LE Electrically Held Contactors

## Wiring Diagrams

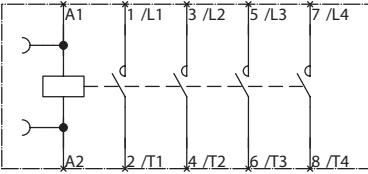
LEN00B003 (20A 3 Pole)



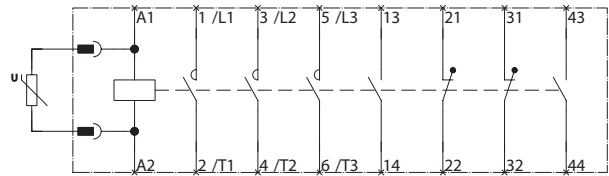
LEN00D003 (60A 3 Pole)  
LEN00E003 (100A 3 Pole)



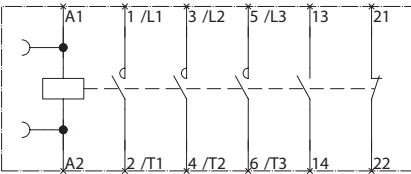
LEN00B004 (20A 4 Pole)



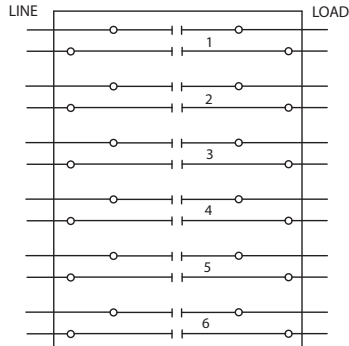
LEN00F003 (200A 3 Pole)  
LEN00G003 (300A 3 Pole)  
LEN00H003 (400A 3 Pole)



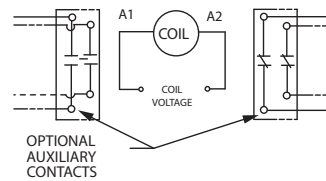
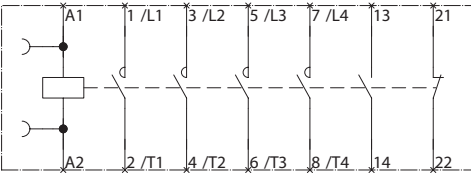
LEN00C003 (30A 3 Pole)



LCE00C (30A 2-12 Pole)



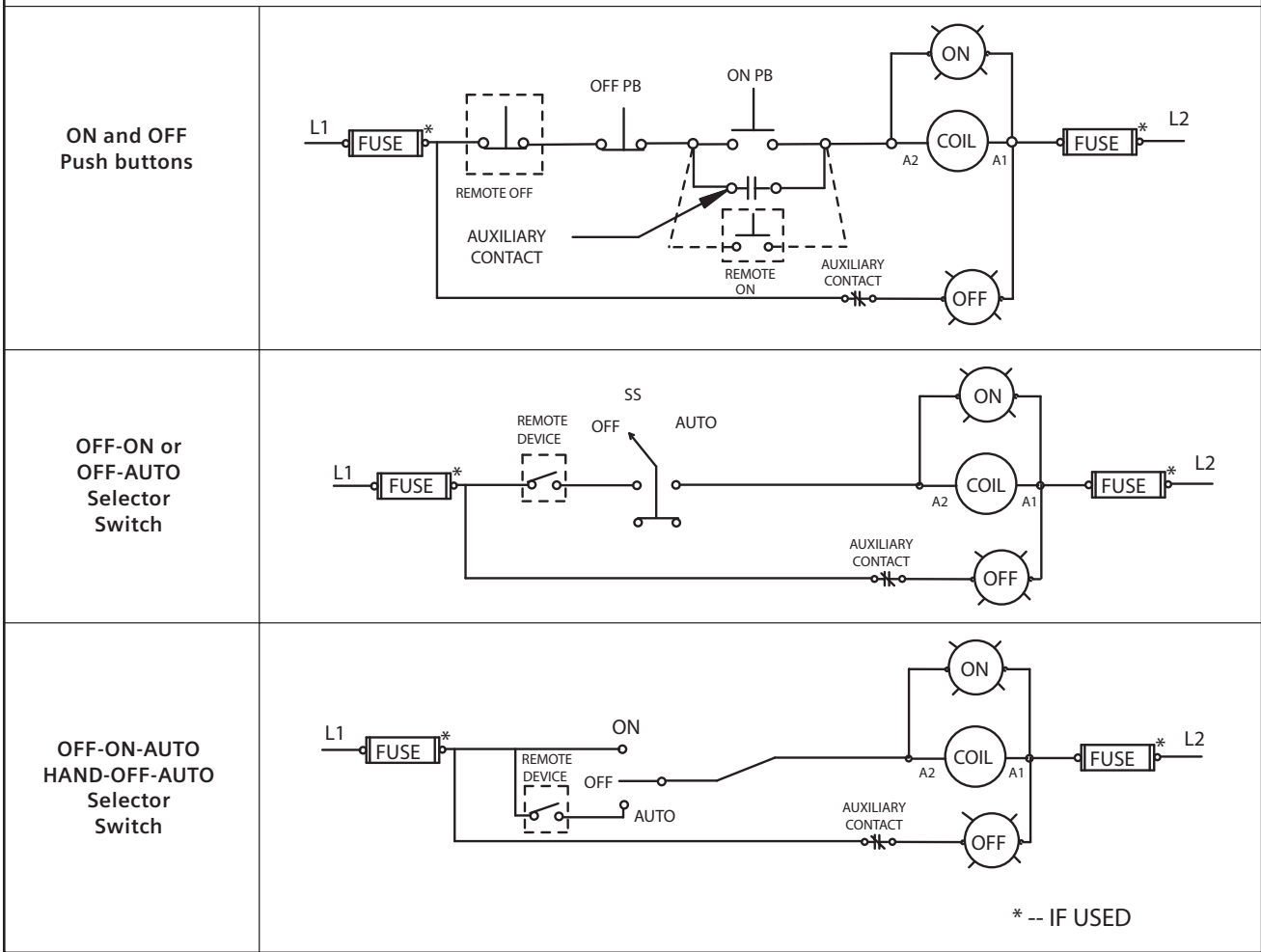
LEN00C004 (30A 4 Pole)



# Class LC and LE Electrically Held Contactors

## Wiring Diagrams

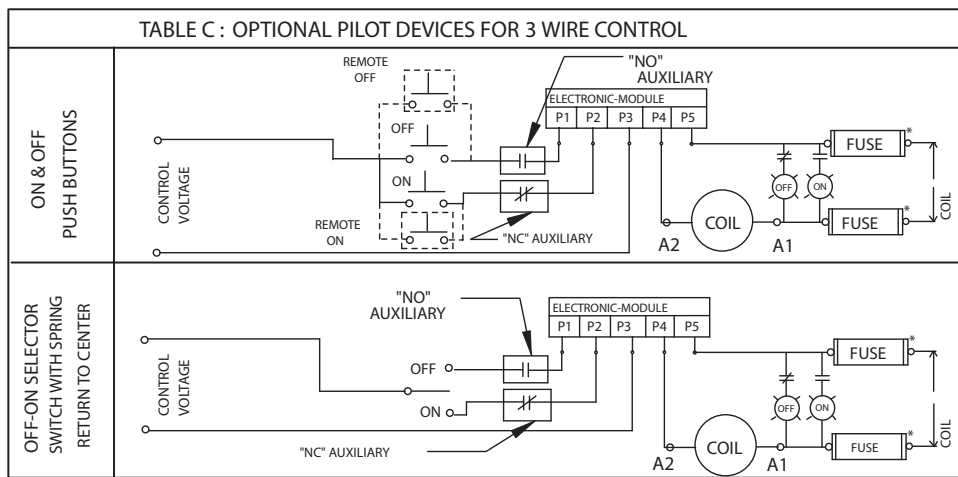
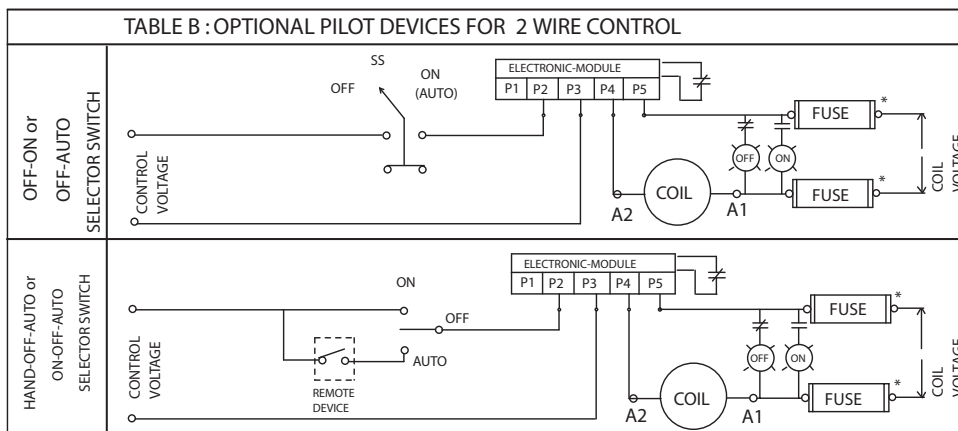
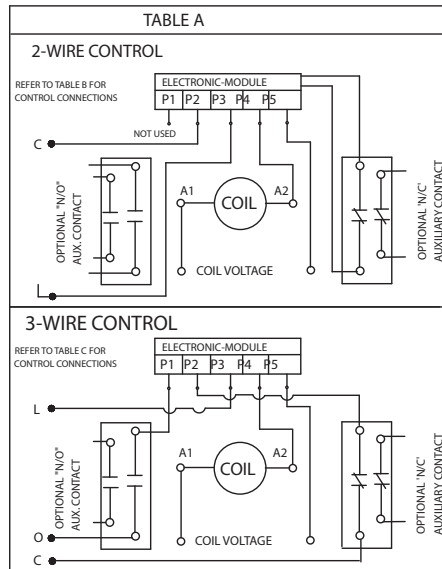
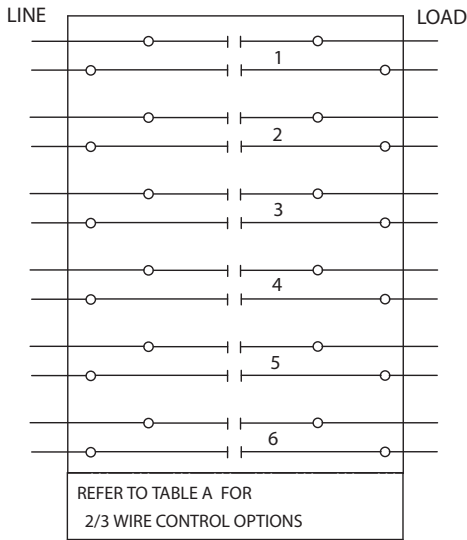
### Optional Pilot Devices for Electrically Held Contactor





# Class LC (converted to mechanically held)

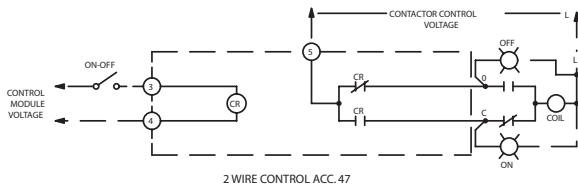
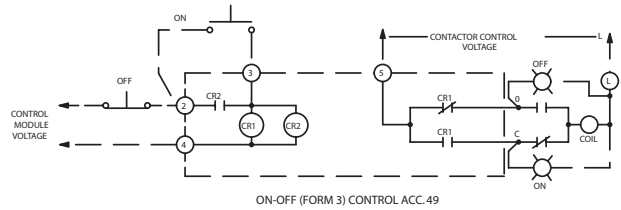
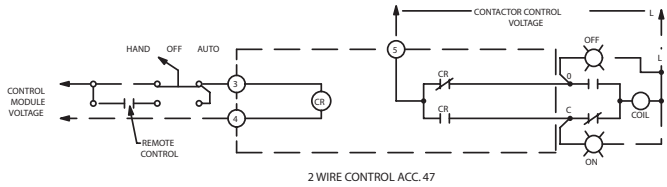
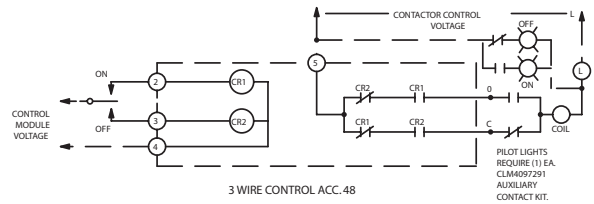
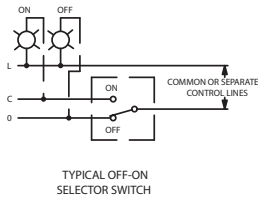
## Wiring Diagrams



\* -- IF USED

# Mechanically Latched 20 Amp, Class CLM

## Wiring Diagrams



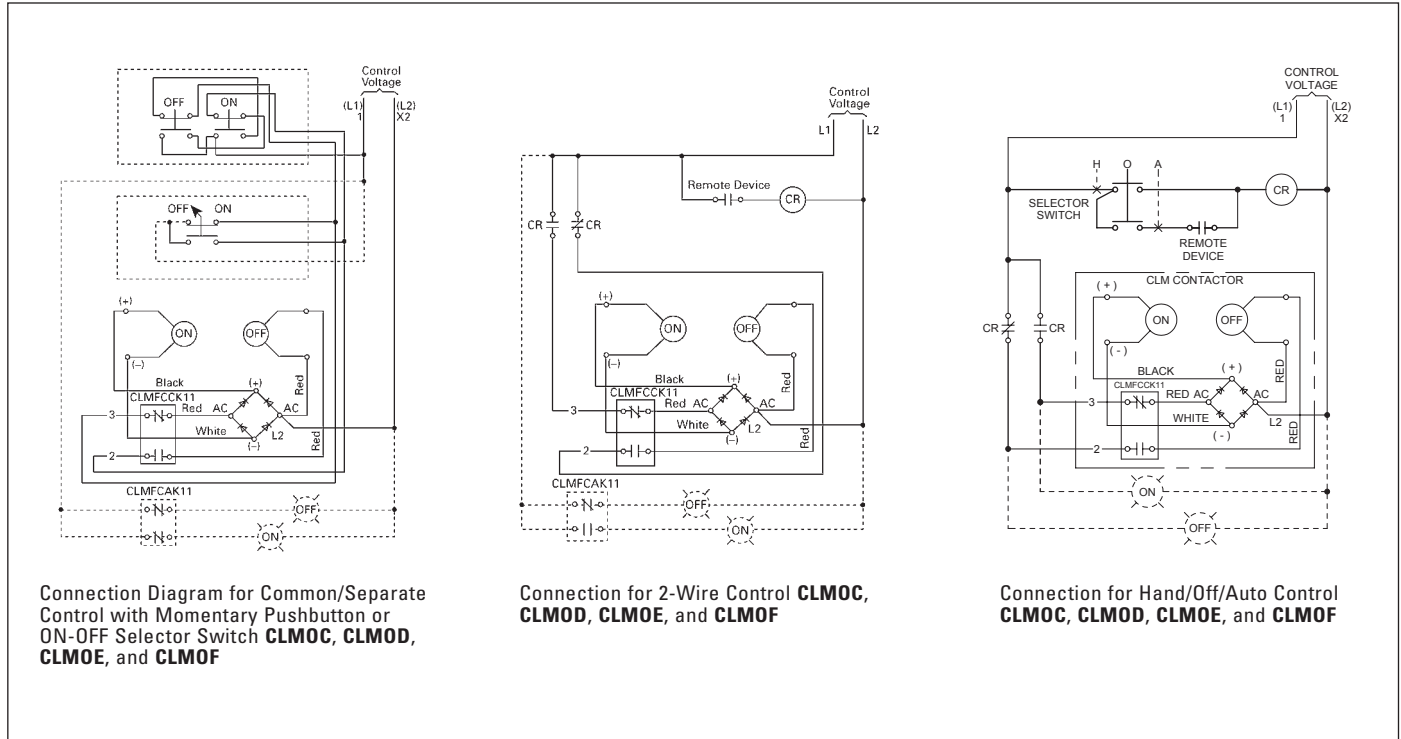
CONNECTIONS TO CONTROL MODULES	
MODULE TERMINAL	CONNECT TO:
1	NOT USED
2	CONT. STATION FOR ACC. 48 & 49
3	CONT. STATION FOR ACC. 47, 48 & 49
4	MODULE CONTROL VOLTAGE *
5	CONTACTOR CONTROL VOLTAGE
O	TERMINAL O ON CONTACTOR
C	TERMINAL C ON CONTACTOR

\* FOR 24VDC CONTROL MODULES  
CONNECT TERMINAL 4 TO NEGATIVE (-)

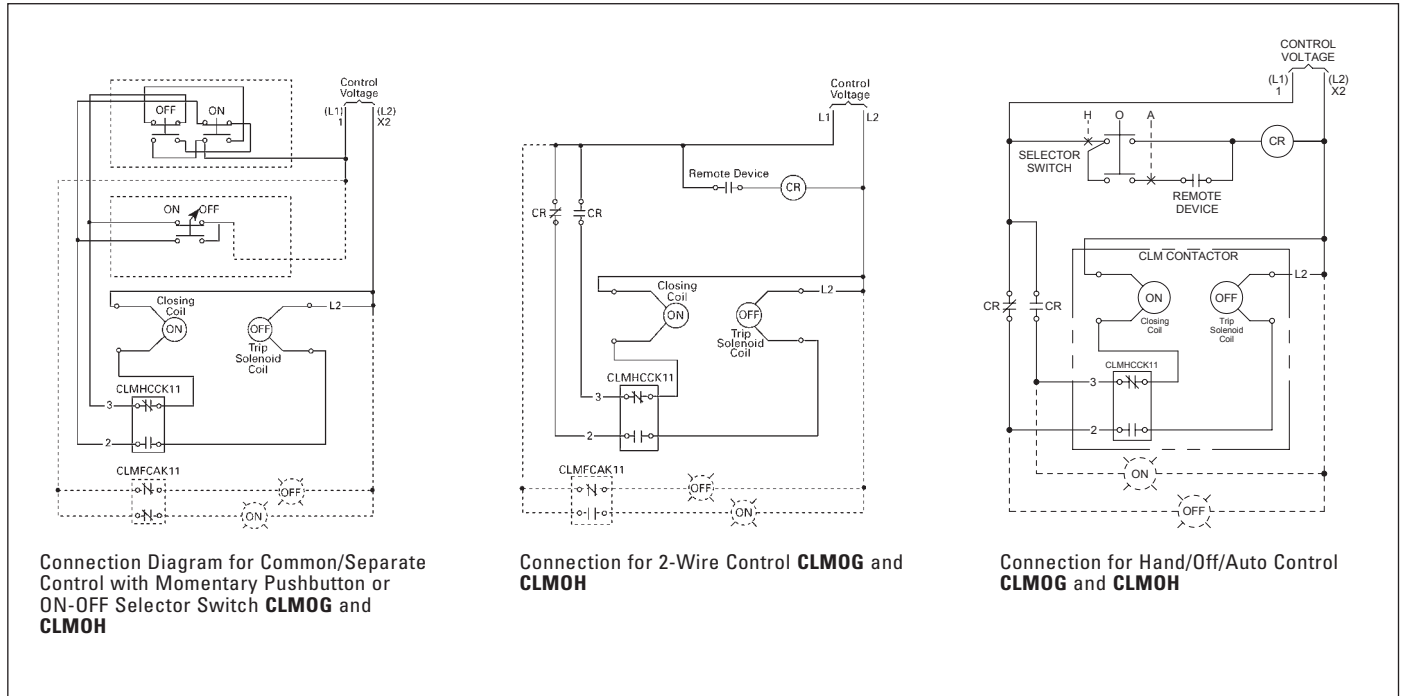
# Mechanically Latched 30-400 Amps, Class CLM

## Wiring Diagrams

### Mechanically Latched, CLM 30-200 Amps<sup>①</sup>



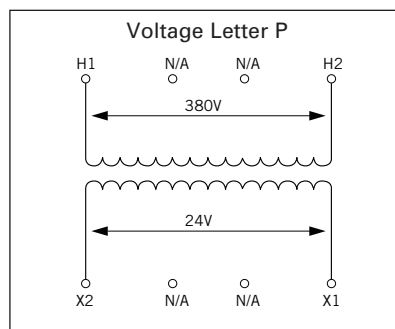
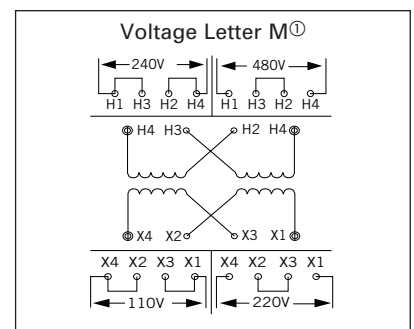
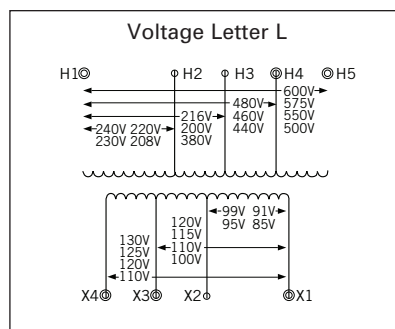
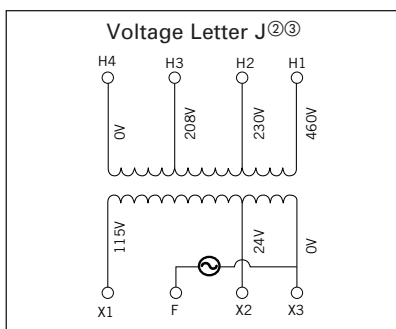
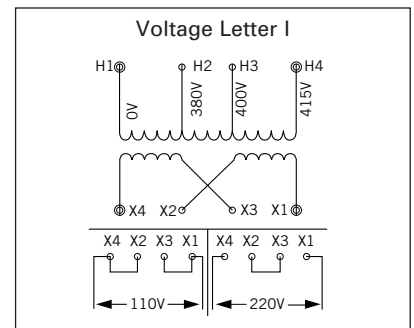
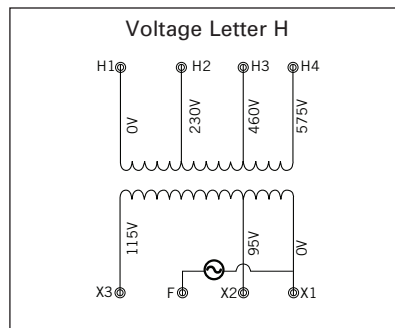
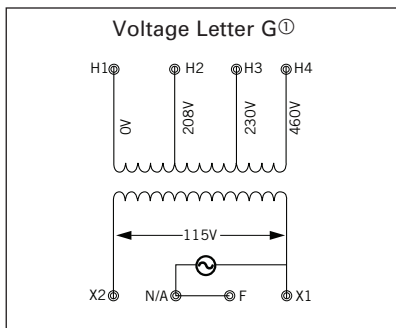
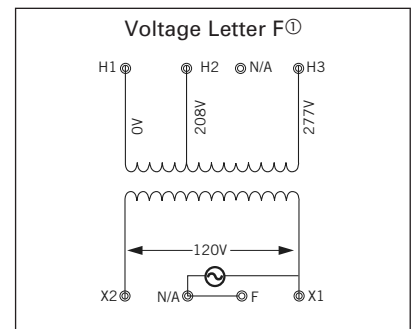
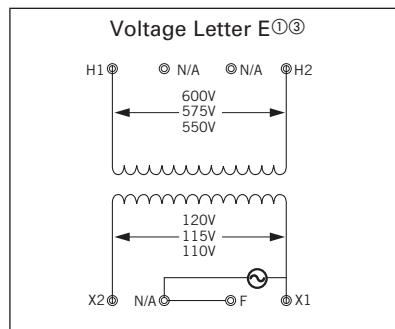
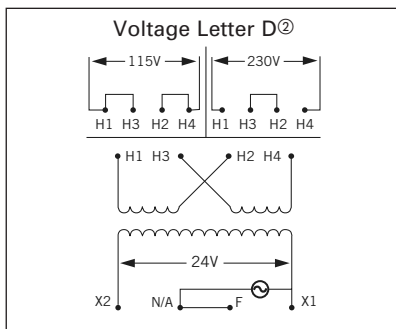
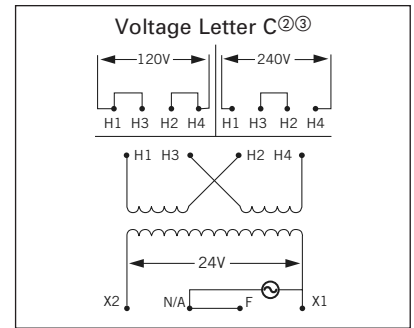
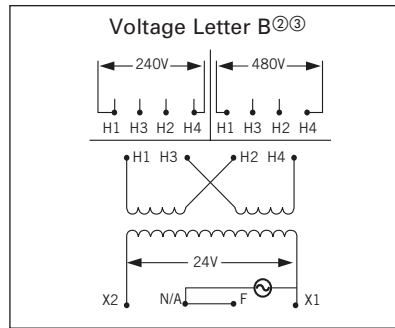
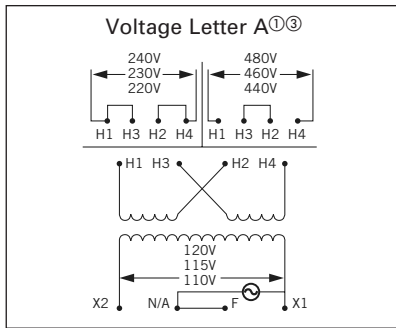
### Mechanically Latched Type CLM 300 and 400 Amp<sup>①</sup>



<sup>①</sup> Control relay is required for 2-wire and Hand/Off/Auto Control, as shown in diagram.

# Class MT, MTG

## Wiring Diagrams



① Includes secondary fuse clips on sizes 50-750VA  
 ② Includes secondary fuse clips on sizes 50-500VA  
 ③ Secondary fuse clips are not included on MTG transformers.



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# Push Button Units and Indicator Lights

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### 16 mm mounting diameter, molded-plastic



#### 3SB2

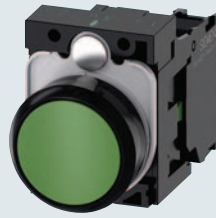
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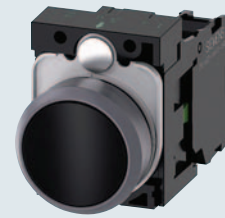
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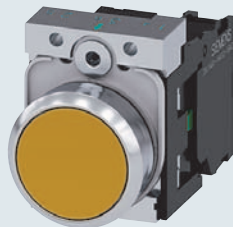
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#### SIRIUS ACT – 3SU1

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#### Selection and ordering data

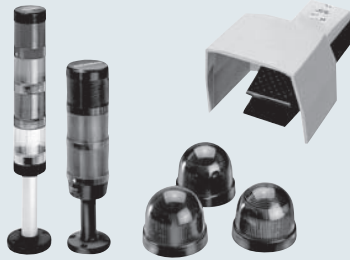
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# Push Button Units and Indicator Lights

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### Standard duty control stations



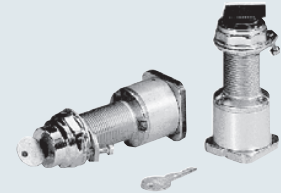
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# 3SB2, Mounting Diameter 16 mm

## General data

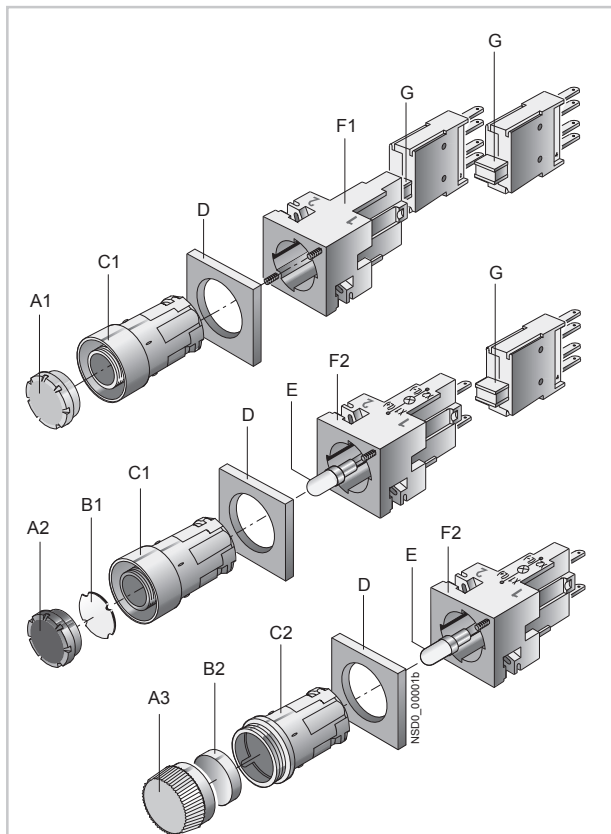
### Overview

The 3SB2 push buttons and indicator lights are provided for front plate mounting and rear connection with flat connectors. For use on printed circuit boards, contact blocks and lamp holders with solder pins are also available.

### Standards

IEC 60947-1, EN 60947-1,  
IEC 60947-5-1, EN 60947-5-1,  
IEC 60947-5-5, EN 60947-5-5 for EMERGENCY-STOP mushroom push buttons.

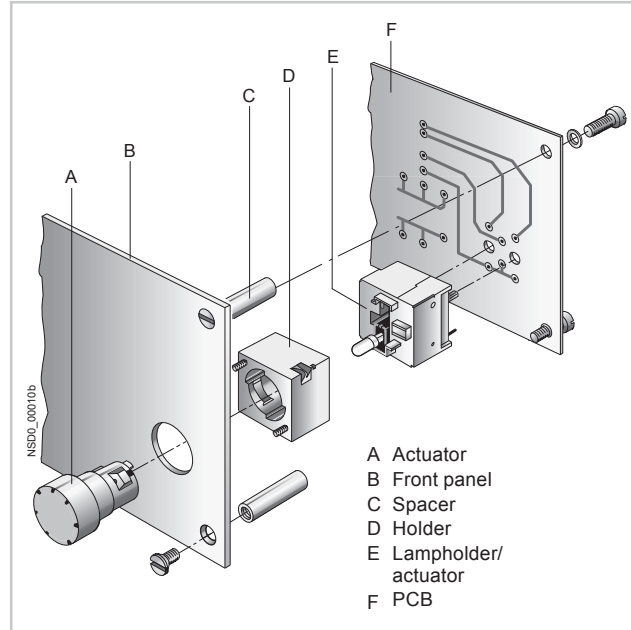
### Version with flat connector



- A1 Button, flat
- A2 Illuminated button, flat
- A3 Screw lens for indicator light
- B1 Insert label, for labeling
- B2 Insert cap, for labeling
- C1 Collar with extruded front ring
- C2 Collar for indicator light
- D Frame for rectangular design
- E Wedge base lamp, W2 x 4.6d
- F1 Holders
- F2 Lampholder with holder
- G Contact blocks (1NO or 1NC) for snapping onto the holder or onto the lampholder



### For PCB mounting

For use on printed circuit boards, special contact blocks and lamp holders for soldering into the printed circuit board are available. For this purpose, the contact blocks and lamp holders are fitted with 0.8 mm x 0.8 mm solder pins of length 3.5 mm.



- A Actuator
- B Front panel
- C Spacer
- D Holder
- E Lampholder/ actuator
- F PCB

### Connection methods

-  Flat connectors
-  Solder pin connections

The terminals are indicated in the corresponding tables by the symbols shown on blue backgrounds.

### Application

The devices are climate-proof and suitable for marine applications.

### Safety EMERGENCY-STOP push buttons according to ISO 13850

For controls according to IEC 60204-1 or EN 60204-1, the mushroom push buttons of the 3SB2 series are suitable for use as safety EMERGENCY-STOP push buttons.

### Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to IEC 60947-5-1 with the symbol ☞.

Category 4 according to EN 954-1 can be attained with the EMERGENCY-STOP mushroom push buttons if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.

# 3SB2, Mounting Diameter 16 mm

## General data

### Technical specifications

Type	3SB2	
<b>Contact blocks and lamp holders</b>		
<b>Standards</b>	IEC 60947-5-1, EN 60947-5-1 IEC 60947-5-5, EN 60947-5-5	
<b>Rated insulation voltage <math>U_i</math></b>	V	250
<b>Conventional thermal current <math>I_{th}</math></b>	A	10
<b>Rated operational current <math>I_e</math> at rated operational voltage <math>U_e</math></b>		
<ul style="list-style-type: none"> <li>• Alternating current AC-12</li> <li>- At <math>U_e = 24 \dots 230</math> V</li> </ul>	A	10
<ul style="list-style-type: none"> <li>• Alternating current AC-15</li> <li>- At <math>U_e = 24 \dots 230</math> V</li> </ul>	A	4
<ul style="list-style-type: none"> <li>• Direct current DC-12</li> <li>- At <math>U_e = 24</math> V</li> <li>- At <math>U_e = 60</math> V</li> <li>- At <math>U_e = 110</math> V</li> <li>- At <math>U_e = 230</math> V</li> </ul>	A	6 5 2.5 1
<ul style="list-style-type: none"> <li>• Direct current DC-13</li> <li>- At <math>U_e = 24</math> V</li> <li>- At <math>U_e = 60</math> V</li> <li>- At <math>U_e = 110</math> V</li> <li>- At <math>U_e = 230</math> V</li> </ul>	A	3 1.5 0.7 0.3
<b>Contact stability</b>	5 V/1 mA	
<ul style="list-style-type: none"> <li>• Test voltage/test current</li> </ul>		
<b>Lamps</b>		
<ul style="list-style-type: none"> <li>• Bases</li> </ul>	Wedge base W2× 4.6 d	
<ul style="list-style-type: none"> <li>• Rated voltage</li> </ul>	V	6, 12, 24, 30, 48, 60
<ul style="list-style-type: none"> <li>• Rated power, max.</li> </ul>	W	1
<b>Short-circuit protection</b> weld-free according to IEC 60947-5-1		
<ul style="list-style-type: none"> <li>• DIAZED fuse links, utilization category gG</li> <li>• Miniature circuit breaker with C characteristic according to IEC 60898</li> </ul>	10 A TDz, 16 A Dz 10 A	
<b>Electrical endurance</b>		
<ul style="list-style-type: none"> <li>• For utilization category AC-15 with 3RT10 15 to 3RT10 26 contactors</li> </ul>	10 × 10 <sup>6</sup> operating cycles	
<b>Mechanical endurance</b>		
10 × 10 <sup>6</sup> operating cycles		
<b>Degree of protection</b> acc. to IEC 60529		
<ul style="list-style-type: none"> <li>• Connection of contact blocks and lamp holders behind the front panel</li> <li>• Contact chambers of the contact blocks behind the front panel</li> </ul>	IP00 IP40	
<b>Finger-safe</b> according to IEC 61140 and BGV A3		
With voltages > 50 V AC or 120 V DC, insulation sleeves must be fitted to the unassigned tab connections.		
<b>Data according to UL and CSA</b>		
<b>Rated voltage</b>		
<ul style="list-style-type: none"> <li>• Contact blocks</li> </ul>	V	250 AC
<ul style="list-style-type: none"> <li>• Indicator light (lamp with wedge base W2× 4.6 d)</li> </ul>	V	60; 1 W
<b>Uninterrupted current</b>		
A 5		
<b>Switching capacity</b>		
B 300, R 300		
<b>Actuators and indicators</b>		
<b>Mechanical endurance</b>		
<ul style="list-style-type: none"> <li>• Push Buttons</li> <li>• Actuators, rotary or maintained</li> <li>• Illuminated push buttons</li> </ul>	10 × 10 <sup>6</sup> operating cycles 3 × 10 <sup>5</sup> operating cycles 3 × 10 <sup>6</sup> operating cycles	
<b>Climatic withstand capability</b>		
Climate-proof; suitable for marine applications		
<b>Ambient temperature</b>		
<ul style="list-style-type: none"> <li>• During operation, non-illuminated devices and complete with LED</li> <li>• During operation, devices with incandescent lamp</li> <li>• During storage, transport</li> </ul>	°C	-25 ... +70 -25 ... +60 -40 ... +80
<b>Degree of protection</b> acc. to IEC 60529		
<ul style="list-style-type: none"> <li>• Actuators and indicators</li> <li>• Actuators and indicators with protective cap</li> </ul>	IP65 IP67	
<b>Protective measures</b>		
<ul style="list-style-type: none"> <li>• For mounting in metal front plates and enclosures</li> </ul>	The actuators and lens assemblies must not be included in the protective measures. The protective measure "Total insulation" is retained.	
<ul style="list-style-type: none"> <li>• For fitting into enclosures with total insulation</li> </ul>		
<b>Shock resistance</b> acc. to IEC 60068-2-27		
<ul style="list-style-type: none"> <li>• Shock amplitude</li> <li>• Shock duration</li> <li>• Shock form</li> </ul>	ms	≤ 50 g 11 Half-sine

More technical information [see Reference manual "Commanding and Signaling Devices"](#).

# 3SB2, Mounting Diameter 16 mm

## General data

### Configuration

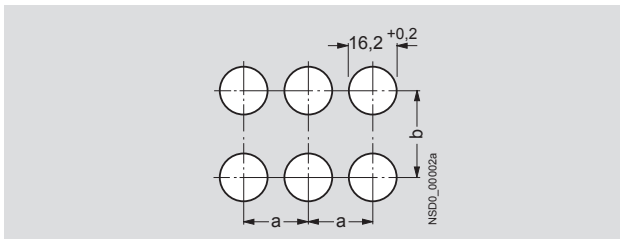
#### Design

Two design versions can be mounted:

- Round design: The 3SB2 push buttons and indicator lights are assembled with the modules – actuator, holder, contact block and lamp holder. Depending on the specific application, various versions can be assembled. Complete units are offered for the most commonly used applications.
- Square design: With square, black frames the round units can be given a square look. The frames are inserted underneath the round actuators. Further mounting is the same as for the round version.

Mounting and fixing:

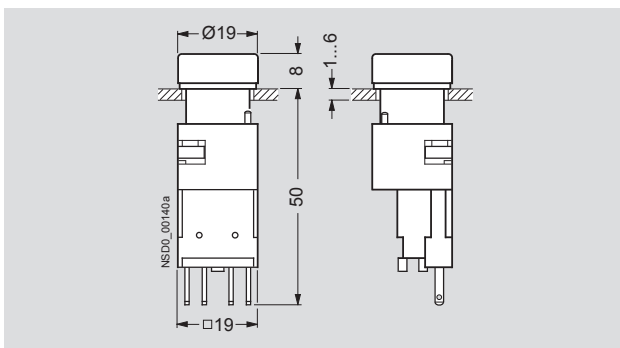
Mounting dimensions according to EN 50007 (not applicable to EMERGENCY-STOP mushroom push buttons)



Minimum clearance	a	b
Round version	19	19
Square version without inscription label	21	21
Round and square version with inscription label	21	32
For 2 selector switches with 3 switch positions, maintained, side by side	21	21

For mounting, the actuator or the lens assembly is inserted from the front into the hole in the front plate. Four small nubs ensure a secure fitting in the hole. The holder is plugged on from the back and snaps automatically into place. The module is fixed to the holder with 2 screws so that it is immune to vibrations.

One or two contact blocks can be mounted on the holder. They are inserted into the holder with slide slots and held down with two snap brackets.



Push button (flat) with holder and contact block

If a command point is fitted with an indicator light or illuminated push button, a lamp socket with lamp holder must be used instead of a holder. It is suitable for incandescent lamps or LEDs with bases of type W2 × 4.6d.

#### For PCB mounting

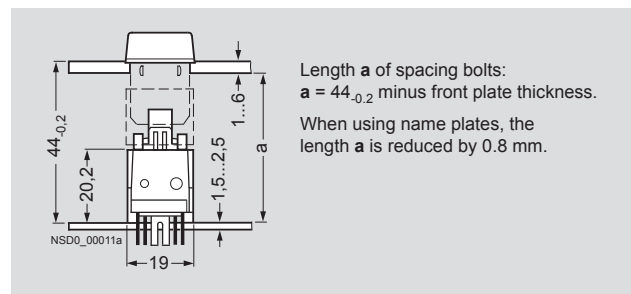
The command point comprises the actuator – e.g. 3SB2 push button, illuminated push button or indicator light –, which is mounted in the front plate, and a contact block and a lamp holder which are soldered to the PCB. For this purpose, the contact blocks and lamp holders are fitted with 0.8 mm × 0.8 mm solder pins of length 3.5 mm.

Mounting and fixing:

Mounting dimensions according to EN 50007.

The actuators are mounted in the same way as 3SB2 front plate mounting devices.

The contact blocks and lamp holders are plugged into the printed circuit board by means of their solder pins and can be flow-soldered. After soldering, the devices must be flush with the board and perpendicular to it. The printed circuit board must be supported on spacing bolts so that it cannot sag or bend more than 0.1 mm.

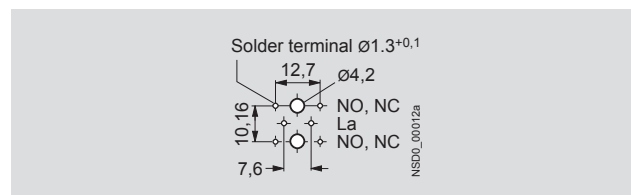


Illuminated push button with solder pin connection

To avoid bending the PCB when the control device is operated, sufficient spacing bolts must be provided as shown in the table below:

PCB thickness	Max. distance between spacing bolts
1.5 mm	80 mm
2.5 mm	150 mm
When using EMERGENCY-STOP push buttons	always 50 mm

These details are based on epoxy resin glass fiber mat.

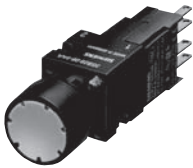


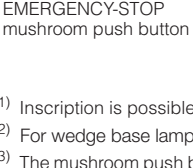


Solder pin spacing

# 3SB2, Mounting Diameter 16 mm

## Complete units

### Selection and ordering data

	Version	Contact blocks	DT	Color of handle	Flat connectors	PS	
	Order No.						
 <p>Pushbutton with flat button</p>	<b>Push buttons with flat button</b>	1 NO		Black	<b>3SB22 02-0AB01</b>	1 unit	
		1 NC		Black	<b>3SB22 03-0AB01</b>	1 unit	
		1 NC		Red	<b>3SB22 03-0AC01</b>	1 unit	
		1 NO		Yellow	<b>3SB22 02-0AD01</b>	1 unit	
		1 NO		Green	<b>3SB22 02-0AE01</b>	1 unit	
		1 NO		Blue	<b>3SB22 02-0AF01</b>	1 unit	
		1 NO		White	<b>3SB22 02-0AG01</b>	1 unit	
		1 NO		Clear <sup>1)</sup>	<b>3SB22 02-0AH01</b>	1 unit	
 <p>Illuminated push button with raised button</p>	<b>Illuminated push buttons with flat button</b> Lamp holder W2 x 4.6 d <sup>2)</sup>	1 NC		Red	<b>3SB22 07-0AC01</b>	1 unit	
		1 NO		Yellow <sup>1)</sup>	<b>3SB22 06-0AD01</b>	1 unit	
		1 NO		Green	<b>3SB22 06-0AE01</b>	1 unit	
		1 NO		Blue	<b>3SB22 06-0AF01</b>	1 unit	
		1 NO		Clear <sup>1)</sup>	<b>3SB22 06-0AH01</b>	1 unit	
 <p>Illuminated push button with raised button</p>	<b>Illuminated push buttons with flat button</b> Lamp holder W2 x 4.6 d with incandescent lamp 24 V	1 NC		Red	<b>3SB22 27-0AC01</b>	1 unit	
		1 NO		Yellow <sup>1)</sup>	<b>3SB22 26-0AD01</b>	1 unit	
		1 NO		Green	<b>3SB22 26-0AE01</b>	1 unit	
		1 NO		Blue	<b>3SB22 26-0AF01</b>	1 unit	
		1 NO		Clear <sup>1)</sup>	<b>3SB22 26-0AH01</b>	1 unit	
 <p>EMERGENCY-STOP mushroom push button</p>	<b>Push buttons with raised button</b>	1 NO		Black	<b>3SB22 02-0LB01</b>	1 unit	
		1 NC		Red	<b>3SB22 03-0LC01</b>	1 unit	
		1 NO		Yellow	<b>3SB22 02-0LD01</b>	1 unit	
		1 NO		Blue	<b>3SB22 02-0LF01</b>	1 unit	
		1 NO		Clear <sup>1)</sup>	<b>3SB22 02-0LH01</b>	1 unit	
		<b>Illuminated push buttons with raised button</b> Lamp holder W2 x 4.6 d <sup>2)</sup>	1 NC		Red	<b>3SB22 07-0LC01</b>	1 unit
			1 NO		Yellow <sup>1)</sup>	<b>3SB22 06-0LD01</b>	1 unit
			1 NO		Green	<b>3SB22 06-0LE01</b>	1 unit
1 NO			Blue	<b>3SB22 06-0LF01</b>	1 unit		
1 NO			Clear <sup>1)</sup>	<b>3SB22 06-0LH01</b>	1 unit		
<b>Illuminated push buttons with raised button</b> Lamp holder W2 x 4.6 d with incandescent lamp 24 V	1 NC		Red	<b>3SB22 27-0LC01</b>	1 unit		
	1 NO		Yellow <sup>1)</sup>	<b>3SB22 26-0LD01</b>	1 unit		
	1 NO		Green	<b>3SB22 26-0LE01</b>	1 unit		
	1 NO		Blue	<b>3SB22 26-0LF01</b>	1 unit		
	1 NO		Clear <sup>1)</sup>	<b>3SB22 26-0LH01</b>	1 unit		
	<b>EMERGENCY-STOP mushroom push buttons acc. to ISO 13850, maintained<sup>3)</sup></b> <b>Latches automatically when pressed; unlatches by turning the mushroom head anticlockwise, with yellow name plate, with inscription "NOT-HALT"</b>	1 NC	↻ <sup>4)</sup>	Red	<b>3SB22 03-1AC01</b>	1 unit	

<sup>1)</sup> Inscription is possible by inserting a label.

<sup>2)</sup> For wedge base lamps see "Accessories", page 10/18.

<sup>3)</sup> The mushroom push button cannot be combined with 3SB29 02-0AB name plate or 3SB29 02-0AA single frame.




<sup>4)</sup> Positive opening according to IEC 60947-5-1, Appendix K.

# 3SB2, Mounting Diameter 16 mm

## Complete units






Selector switch

Version	Contact blocks	Color of handle	DT	Flat connectors	PS
				Order No.	
<b>Selector switches, 2 switch positions</b> Switching sequence O-I, 62° operating angle, maintained 	1 NO	Black		<b>3SB22 02-2AB01</b> <b>3SB22 02-2AC01</b> <b>3SB22 02-2AE01</b> <b>3SB22 02-2AG01</b>	1 unit
	1 NO	Red			1 unit
	1 NO	Green			1 unit
	1 NO	White			1 unit
<b>Selector switches, 3 switch positions</b> Switching sequence I-O-II, 2 × 62° operating angle, maintained 	1 NO, 1 NO	Black		<b>3SB22 10-2DB01</b> <b>3SB22 10-2DC01</b> <b>3SB22 10-2DE01</b> <b>3SB22 10-2DG01</b>	1 unit
	1 NO, 1 NO	Red			1 unit
	1 NO, 1 NO	Green			1 unit
	1 NO, 1 NO	White			1 unit
<b>Selector switches, 3 switch positions</b> Switching sequence I-O-II, 2 × 50° operating angle, momentary, Spring return from left and right 	1 NO, 1 NO	Black		<b>3SB22 10-2EB01</b> <b>3SB22 10-2EC01</b> <b>3SB22 10-2EE01</b> <b>3SB22 10-2EG01</b>	1 unit
	1 NO, 1 NO	Red			1 unit
	1 NO, 1 NO	Green			1 unit
	1 NO, 1 NO	White			1 unit



CES key-operated switch

Version	Contact blocks	Lock No.	Key removal position	DT	Flat connectors	PS
					Order No.	
<b>CES key-operated switches, 2 switch positions</b> Switching sequence O-I, 62° operating angle, maintained 	1 NO	SB2	O		<b>3SB22 02-4LA01</b> <b>3SB22 02-4LB01</b>	1 unit
	1 NO	SB2	O + I			1 unit
<b>CES key-operated switches, 3 switch positions</b> Switching sequence I-O-II, 2 × 62° operating angle, maintained 	1 NO, 1 NO	SB2	O		<b>3SB22 10-4PA01</b> <b>3SB22 10-4PB01</b>	1 unit
	1 NO, 1 NO	SB2	I + O + II			1 unit
<b>CES key-operated switches, 3 switch positions</b> Switching sequence I-O-II, 2 × 50° operating angle, momentary, Spring return from left and right 	1 NO, 1 NO	SB2	O		<b>3SB22 10-4QA01</b>	1 unit



Indicator light




Version	Color of screw lens	DT	Flat connectors	PS
			Order No.	
<b>Indicator lights</b> Lamp holder W2 x 4.6 d without lamp <sup>1)</sup>	Red		<b>3SB22 04-6BC06</b> <b>3SB22 04-6BD06</b> <b>3SB22 04-6BE06</b> <b>3SB22 04-6BG06</b> <b>3SB22 04-6BH06</b>	1 unit
	Yellow			1 unit
	Green			1 unit
	White			1 unit
	Clear			1 unit
<b>Indicator lights</b> Lamp holder W2 x 4.6 d with incandescent lamp 24 V	Red		<b>3SB22 24-6BC06</b> <b>3SB22 24-6BD06</b> <b>3SB22 24-6BE06</b> <b>3SB22 24-6BG06</b> <b>3SB22 24-6BH06</b>	1 unit
	Yellow			1 unit
	Green			1 unit
	White			1 unit
	Clear			1 unit

<sup>1)</sup> For wedge base lamps see "Accessories", page 10/18.

# 3SB2, Mounting Diameter 16 mm

## Actuators and indicators

### Selection and ordering data

Version	Color of handle	DT	Order No.	PS		
<b>Push buttons</b>						
 Push button and illuminated push button with flat button	<b>Push buttons with flat button</b>	Black Red Yellow Green Blue White Clear <sup>1)</sup>	<b>3SB20 00-0AB01</b> <b>3SB20 00-0AC01</b> <b>3SB20 00-0AD01</b> <b>3SB20 00-0AE01</b> <b>3SB20 00-0AF01</b> <b>3SB20 00-0AG01</b> <b>3SB20 00-0AH01</b>	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit		
	<b>Illuminated push buttons with flat button</b>	Red Yellow <sup>1)</sup> Green Blue White Clear <sup>1)</sup>	<b>3SB20 01-0AC01</b> <b>3SB20 01-0AD01</b> <b>3SB20 01-0AE01</b> <b>3SB20 01-0AF01</b> <b>3SB20 00-0AG01</b> <b>3SB20 00-0AH01</b>	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit		
	 Push button and illuminated push button with raised button	<b>Push buttons with raised button</b>	Black Red Yellow Blue White Clear <sup>1)</sup>	<b>3SB20 00-0LB01</b> <b>3SB20 00-0LC01</b> <b>3SB20 00-0LD01</b> <b>3SB20 00-0LF01</b> <b>3SB20 00-0LG01</b> <b>3SB20 00-0LH01</b>	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	
		<b>Illuminated push buttons with raised button</b>	Red Yellow <sup>1)</sup> Green Blue Clear <sup>1)</sup>	<b>3SB20 01-0LC01</b> <b>3SB20 01-0LD01</b> <b>3SB20 01-0LE01</b> <b>3SB20 01-0LF01</b> <b>3SB20 00-0LH01</b>	1 unit 1 unit 1 unit 1 unit 1 unit	
		<b>EMERGENCY-STOP mushroom push buttons acc. to ISO 13850, maintained<sup>2)</sup></b> Latches automatically when pressed; unlatches by turning the mushroom head anticlockwise	Red	<b>3SB20 00-1AC01</b>	1 unit	
		 EMERGENCY-STOP mushroom push button				





<sup>1)</sup> Inscription is possible by inserting a label.

<sup>2)</sup> The mushroom push button cannot be combined with 3SB29 02-0AB name plate or 3SB29 02-0AA single frame.

Version	Color of handle	DT	Order No.	PS
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### Selector switches



<b>Selector switches with 2 switch positions</b> Switching sequence O-I, 62° operating angle, maintained		Black Red Green White	<b>3SB20 00-2AB01</b> <b>3SB20 00-2AC01</b> <b>3SB20 00-2AE01</b> <b>3SB20 00-2AG01</b>	1 unit 1 unit 1 unit 1 unit
		Black Red Green	<b>3SB20 00-2BB01</b> <b>3SB20 00-2BC01</b> <b>3SB20 00-2BE01</b>	1 unit 1 unit 1 unit
<b>Selector switches with 2 switch positions</b> Switching sequence O-I, 90° operating angle, maintained		Black Red Green White	<b>3SB20 00-2HB01</b> <b>3SB20 00-2HC01</b> <b>3SB20 00-2HE01</b> <b>3SB20 00-2HG01</b>	1 unit 1 unit 1 unit 1 unit
		Black Red Green White	<b>3SB20 00-2DB01</b> <b>3SB20 00-2DC01</b> <b>3SB20 00-2DE01</b> <b>3SB20 00-2DG01</b>	1 unit 1 unit 1 unit 1 unit
<b>Selector switches with 3 switch positions</b> Switching sequence I-O-II, 2 x 62° operating angle, maintained		Black Red Green White	<b>3SB20 00-2EB01</b> <b>3SB20 00-2EC01</b> <b>3SB20 00-2EE01</b> <b>3SB20 00-2EG01</b>	1 unit 1 unit 1 unit 1 unit
		Black	<b>3SB20 00-2JB01</b>	1 unit
<b>Selector switches with 3 switch positions</b> Switching sequence I-O-II, 2 x 90° operating angle, maintained		Black		



# 3SB2, Mounting Diameter 16 mm

## Actuators and indicators

### Key-operated switches



CES key-operated switch

Version	Lock No.	Key removal position	DT	Order No.	PS
<b>CES key-operated switches with 2 keys, 2 switch positions</b> Switching sequence O-I, 62° operating angle, maintained	SB2	O+I O	DT	3SB20 00-4LB01	1 unit
				3SB20 00-4LA01	1 unit
				3SB20 00-4MA01	1 unit
					3SB20 00-4PB01
3SB20 00-4PA01	1 unit				
	<b>CES key-operated switches with 2 keys, 2 switch positions</b> Switching sequence O-I, 50° operating angle, momentary, spring return from right	SB2	O	DT	3SB20 00-4MA01
3SB20 00-4PB01					1 unit
					3SB20 00-4PA01
<b>CES key-operated switches with 2 keys, 3 switch positions</b> Switching sequence I-O-II, 2 x 62° operating angle, maintained					
	3SB20 00-4PA01	1 unit			
	3SB20 00-4QA01	1 unit			
		3SB20 00-4QA01	1 unit		
<b>CES key-operated switches with 2 keys, 3 switch positions</b> Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from left and right	SB2		O	DT	3SB20 00-4QA01
		3SB20 00-4QA01			1 unit
		3SB20 00-4QA01			1 unit
		3SB20 00-4QA01			1 unit

Version	Color of screw lens	DT	Order No.	PS
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### Indicator lights



Indicator light




<b>Indicator lights with concentric rings</b> (inscription by inserting a cap is not possible)	Red	3SB20 01-6BC06	1 unit
	Yellow	3SB20 01-6BD06	1 unit
	Green	3SB20 01-6BE06	1 unit
	Blue	3SB20 01-6BF06	1 unit
	White	3SB20 01-6BG06	1 unit
	Clear	3SB20 01-6BH06	1 unit
<b>Indicator lights, smooth</b> for inscription by inserting a cap <sup>1)</sup>	Red	3SB20 01-6CC06	1 unit
	Yellow	3SB20 01-6CD06	1 unit
	Green	3SB20 01-6CE06	1 unit
	Blue	3SB20 01-6CF06	1 unit
	Clear	3SB20 01-6CH06	1 unit

<sup>1)</sup> Insert caps, see "Accessories", page 10/15

# 3SB2, Mounting Diameter 16 mm

## Contact blocks and lampholders

### Selection and ordering data

Version	Diagram	Operating travel  Contact closed  Contact open	DT	Flat connectors 	PS
				Order No.	

### Contact blocks and lamp holders with flat connectors 2 x 2.8 – 0.8 mm according to IEC 60760

#### Holders for fixing the actuator and the contact blocks



Holder

Holders for 2 contact blocks  
 Inscription with identification number 1-2

**3SB29 08-0AA** 5 units

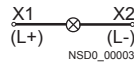
#### Lamp holders with holder for fixing the actuator and the contact blocks



Lamp holder

##### Lamp holders

W2 x 4.6 d  
 without lamp

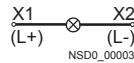


**3SB23 04-2A** 1 unit

##### Lamp holders

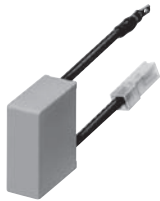
W2 x 4.6 d

- With 6 V incandescent lamp
- With 24 V incandescent lamp



**3SB23 04-2F** 1 unit

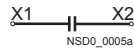
**3SB23 04-2H** 1 unit



Voltage reducer

##### Voltage reducers<sup>1)</sup>

For connecting the 3SB29 08-1AE lamp (48 V) to 230 V AC



**3SB24 04-3D** 1 unit

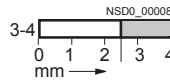
#### Contact blocks for fixing in the holder or lamp holder



Contact block

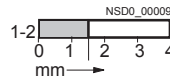
##### Contact blocks with one contact<sup>2)</sup>

1 NO



**3SB24 04-0B** 1 unit

1 NC <sup>3)</sup>



**3SB24 04-0C** 1 unit


<sup>1)</sup> Use fixpoint terminal according to IEC 60439-1.

<sup>2)</sup> For plug-in and insulation sleeves see "Accessories", page 10/19.

<sup>3)</sup> Positive opening according to IEC 60947-5-1, Appendix K.

# 3SB2, Mounting Diameter 16 mm

## Contact blocks and lamp holders

Version	Diagram	Operating travel <input type="checkbox"/> Contact closed <input type="checkbox"/> Contact open	DT	Solder pin connections 	PS
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Order No.

### Contact blocks and lamp holders with solder pins



Holder

#### Holders for contact block with solder pins

For fixing the actuators in the front panel

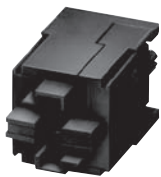
#### Lamp holders

Wedge base W2 x 4.6 d<sup>1)</sup>



**3SB29 08-0AB** 5 units

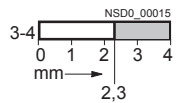
**3SB24 55-2A** 1 unit



Contact block with solder pins

#### Contact blocks

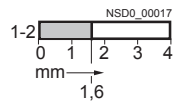
1 NO



**3SB24 55-0B** 1 unit

1 NC

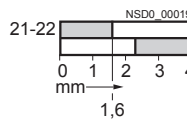
⊖<sup>2)</sup>



**3SB24 55-0C** 1 unit

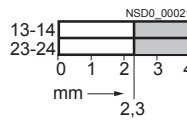
1 NO + 1 NC

⊖<sup>2)</sup>



**3SB24 55-0J** 1 unit

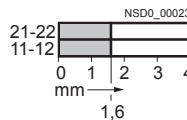
1 NO + 1 NO



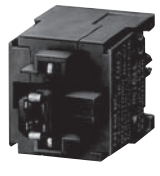
**3SB24 55-0E** 1 unit

1 NC + 1 NC

⊖<sup>2)</sup>



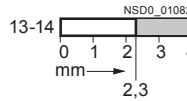
**3SB24 55-0F** 1 unit



Contact block and lamp holder with solder pins

#### Contact blocks and lamp holders, wedge base W2 x 4.6 d<sup>1)</sup>

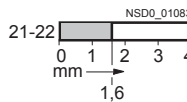
1 NO



**3SB24 55-1B** 1 unit

1 NC

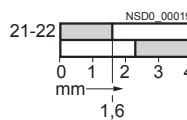
⊖<sup>2)</sup>



**3SB24 55-1C** 1 unit

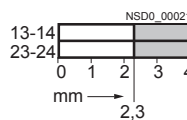
1 NO + 1 NC

⊖<sup>2)</sup>



**3SB24 55-1J** 1 unit

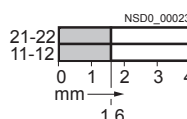
1 NO + 1 NO



**3SB24 55-1E** 1 unit

1 NC + 1 NC

⊖<sup>2)</sup>



**3SB24 55-1F** 1 unit

<sup>1)</sup> The lamp is not included in the scope of supply.

# 3SB2, Mounting Diameter 16 mm

## Insert labels and insert caps

### Overview

Clear push buttons, illuminated push buttons and indicator lights can be fitted with insert labels and caps for identification purposes.

The insert labels and insert caps are made of a milky-transparent plastic with black lettering; they can be fitted in any 90° angle.

### Inscriptions

The inscriptions have upper case initial letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

For customized inscriptions see "Options".


### Selection and ordering data

Inscription/Symbol	Symbol No.	DT	Insert labels For push buttons and illuminated push buttons, flat Order No.	PS
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#### For self-inscription

	Blank		<b>3SB29 01-4AA</b>	10 units
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#### With inscription
























	On		<b>3SB29 01-4EB</b>	10 units
	Start		<b>3SB29 01-4EK</b>	10 units
	Stop		<b>3SB29 01-4EL</b>	10 units
	Reset		<b>3SB29 01-4EM</b>	10 units
	Test		<b>3SB29 01-4EN</b>	10 units
	0		<b>3SB29 01-4RA</b>	10 units
	1		<b>3SB29 01-4RB</b>	10 units
	2		<b>3SB29 01-4RC</b>	10 units
	3		<b>3SB29 01-4RD</b>	10 units
	4		<b>3SB29 01-4RE</b>	10 units
	5		<b>3SB29 01-4RF</b>	10 units
	6		<b>3SB29 01-4RG</b>	10 units
	7		<b>3SB29 01-4RH</b>	10 units
	8		<b>3SB29 01-4RJ</b>	10 units
	9		<b>3SB29 01-4RK</b>	10 units

#### Graphic ON/OFF symbols

	O (Off)		5008 IEC	<b>3SB29 01-4MB</b>	10 units
	I (On)		5007 IEC	<b>3SB29 01-4MC</b>	10 units
	II (On)		--	<b>3SB29 01-4MD</b>	10 units
















# 3SB2, Mounting Diameter 16 mm

## Insert labels and insert caps

Inscription/Symbol	Symbol No.	DT	Insert labels For push buttons and illuminated push buttons, flat Order No.	PS
<b>Graphic equipment symbols</b>				
 Electric motor	 0011 ISO		<b>3SB29 01-4PA</b>	10 units
Horn	 5014 IEC		<b>3SB29 01-4PB</b>	10 units
Pump	 0134 ISO		<b>3SB29 01-4PD</b>	10 units
Coolant pump	 0355 ISO		<b>3SB29 01-4PE</b>	10 units
<b>Graphic motion symbols</b>				
 Motion in direction of arrow (straight)	 5022 IEC		<b>3SB29 01-4NA</b>	10 units
Motion in direction of arrow (diagonal)	 --		<b>3SB29 01-4NB</b>	10 units
Clockwise rotation	 0004 ISO		<b>3SB29 01-4NC</b>	10 units
Anticlockwise rotation	 --		<b>3SB29 01-4ND</b>	10 units
Fast motion	 0266 ISO		<b>3SB29 01-4NE</b>	10 units
Increase (plus)	 5005 IEC		<b>3SB29 01-4NG</b>	10 units
Decrease (minus)	 5006 IEC		<b>3SB29 01-4MC</b>	10 units
<b>Graphic control symbols</b>				
 Clamp	 --		<b>3SB29 01-4QB</b>	10 units
Release	 --		<b>3SB29 01-4QC</b>	10 units
Brake off	 0021 ISO		<b>3SB29 01-4QE</b>	10 units
Lock	 0022 ISO		<b>3SB29 01-4QF</b>	10 units
Unlock	 0023 ISO		<b>3SB29 01-4QG</b>	10 units
On/Off, momentary contact	 5011 IEC		<b>3SB29 01-4QJ</b>	10 units
Manual operation	 0096 ISO		<b>3SB29 01-4QK</b>	10 units
Automatic sequence	 0017 ISO		<b>3SB29 01-4QL</b>	10 units
<b>Customized inscriptions</b>				
 <b>Any inscription</b> 1 line of text with up to 6 characters of 3 mm in height. Please add the appropriate order code to the Order No. and specify the line of text required.			<b>3SB29 01-4AZ</b> <b>K0Y</b> <b>K1Y</b> or <b>K2Y</b> <b>K5Y</b>	1 unit 1 unit 1 unit
<b>Other graphic symbols</b> Please add the order code " <b>K3Y</b> " to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).			<b>3SB29 01-4AZ</b> <b>K3Y</b>	1 unit
<b>Any inscription or symbol</b> Please add the order code " <b>K9Y</b> " to the Order No. and specify the inscription or the symbol required.			<b>3SB29 01-4AZ</b> <b>K9Y</b>	1 unit







# 3SB2, Mounting Diameter 16 mm

Insert labels and insert caps

Inscription/Symbol	Symbol No.	DT	Insert caps For push buttons and illuminated push buttons, raised Order No.	PS
<b>For self-inscription</b>				
 Blank			<b>3SB29 01-5AA</b>	10 units
<b>With inscription</b>				
 On			<b>3SB29 01-5EB</b>	10 units
	0		<b>3SB29 01-5RA</b>	10 units
	1		<b>3SB29 01-5RB</b>	10 units
	2		<b>3SB29 01-5RC</b>	10 units
	3		<b>3SB29 01-5RD</b>	10 units
	4		<b>3SB29 01-5RE</b>	10 units
	5		<b>3SB29 01-5RF</b>	10 units
	6		<b>3SB29 01-5RG</b>	10 units
	7		<b>3SB29 01-5RH</b>	10 units
	8		<b>3SB29 01-5RJ</b>	10 units
	9		<b>3SB29 01-5RK</b>	10 units
<b>Graphic ON/OFF symbols</b>				
 O (Off)		 5008 IEC	<b>3SB29 01-5MB</b>	10 units
I (On)		 5007 IEC	<b>3SB29 01-5MC</b>	10 units
II (On)		 --	<b>3SB29 01-5MD</b>	10 units
<b>Graphic motion symbols</b>				
 Motion in direction of arrow		 5022 IEC	<b>3SB29 01-5NA</b>	10 units
Motion in direction of arrow		 --	<b>3SB29 01-5NB</b>	10 units
Increase (plus)		 5005 IEC	<b>3SB29 01-5NG</b>	10 units
Decrease (minus)		 5006 IEC	<b>3SB29 01-5MC</b>	10 units
<b>Graphic control symbols</b>				
 Clamp		 --	<b>3SB29 01-5QB</b>	10 units
Release		 --	<b>3SB29 01-5QC</b>	10 units
<b>Customized inscriptions</b>				
 <b>Any inscription</b> 1 line of text with up to 6 characters of 3 mm in height. Please add the appropriate order code to the Order No. and specify the line of text required.			<b>3SB29 01-5AZ</b> <b>K0Y</b> <b>K1Y</b> or <b>K2Y</b> <b>K5Y</b>	1 unit 1 unit 1 unit
<b>Other graphic symbols</b> Please add the order code " <b>K3Y</b> " to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).			<b>3SB29 01-5AZ</b> <b>K3Y</b>	1 unit
<b>Any inscription or symbol</b> Please add the order code " <b>K9Y</b> " to the Order No. and specify the inscription or the symbol required.			<b>3SB29 01-5AZ</b> <b>K9Y</b>	1 unit

# 3SB2, Mounting Diameter 16 mm

## Insert labels and insert caps

Inscription/Symbol	Symbol No.	DT	Insert caps For indicator lights Order No.	PS
<b>For self-inscription</b>				
 Blank			<b>3SB29 01-7AA</b>	10 units
<b>Graphic symbols</b>				
 Pump		0134 ISO	<b>3SB29 01-7PD</b>	10 units
 Manual operation		0096 ISO	<b>3SB29 01-7QK</b>	10 units
<b>Customized inscriptions</b>				
	<b>Any inscription</b> 1 line of text with up to 6 characters of 3 mm in height. Please add the appropriate order code to the Order No. and specify the line of text required.		<b>3SB29 01-7AZ</b> <b>K0Y</b> <b>K1Y or K2Y</b> <b>K5Y</b>	1 unit 1 unit 1 unit
	<b>Other graphic symbols</b> Please add the order code " <b>K3Y</b> " to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).		<b>3SB29 01-7AZ</b> <b>K3Y</b>	1 unit
	<b>Any inscription or symbol</b> Please add the order code " <b>K9Y</b> " to the Order No. and specify the inscription or the symbol required.		<b>3SB29 01-7AZ</b> <b>K9Y</b>	1 unit

### Options

#### Customized inscriptions

Labels and caps can be inscribed with text and symbols not listed in the ordering data. Append the following codes to the Order No.:

- Text line in upper/lower case, always upper case for beginning of line (e.g. "Lift"): **K0Y**
- Text line in upper case (e.g. "LIFT"): **K1Y**
- Text line in lower case (e.g. "lift"): **K2Y**
- Text line in upper/lower case, all words begin with upper case letters (e.g. "Lift"): **K5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **K3Y**
- Any inscription or symbols according to order form supplement: **K9Y**

When ordering, specify the required inscription in plain text in addition to the order number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

One line with up to 6 characters with 3 mm letter height is possible for the inscription (see ordering example 1).

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering examples 2 and 3).

For special symbols (order code K9Y), a CAD drawing in DXF format can be submitted.

#### Ordering example 1

3SB29 01-4AZ  
K1Y  
Z = pump

#### Ordering example 2

3SB29 01-4AZ  
K3Y  
Z = 5008 IEC

#### Ordering example 3

3SB29 01-4AZ  
K3Y  
Z = 1118 ISO



# 3SB2, Mounting Diameter 16 mm

## Name plates

### Overview

The name plates consist of a black plastic label holder and an inscription label (silver with black print) for sticking in place.  
Note mounting dimensions!





### Inscriptions

The inscriptions (also special inscriptions) are lower case with upper case initial letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.


### Selection and ordering data

Inscription/Symbol	Symbol No.	DT	Order No.	PS
--------------------	------------	----	-----------	----

#### Inscription labels, self-adhesive, 9.5 mm x 18.5 mm

	Blank		<b>3SB29 01-2AA</b>	10 units	
	On		<b>3SB29 01-2EB</b>	10 units	
	Off		<b>3SB29 01-2EC</b>	10 units	
	Start		<b>3SB29 01-2EL</b>	10 units	
	Reset		<b>3SB29 01-2EM</b>	10 units	
	Fault		<b>3SB29 01-2EW</b>	10 units	
	Hand Auto		<b>3SB29 01-2BA</b>	10 units	
	Manual 0 Auto		<b>3SB29 01-2BE</b>	10 units	
	Man 0 Auto		<b>3SB29 01-2ET</b>	10 units	
<b>Graphic symbols</b>					
	O (Off)		5008 IEC	<b>3SB29 01-2MB</b>	1 unit
	I (On)		5007 IEC	<b>3SB29 01-2MC</b>	1 unit
	O I (horizontal)		--	<b>3SB29 01-2MF</b>	1 unit
	Motion in direction of arrow		5002 IEC	<b>3SB29 01-2NA</b>	1 unit
<b>Customized inscriptions or symbols</b> (see Options)				<b>3SB29 01-2XZ</b>	
				<b>K0Y</b>	1 unit
				<b>K1Y, K2Y or K3Y</b>	1 unit
				<b>K5Y</b>	1 unit
				<b>K9Y</b>	1 unit

#### Label holders

	<b>Label holders for inscription labels</b> The label holders must not be used with the 3SB2...-1AC01 EMERGENCY-STOP mushroom push button.		<b>3SB29 02-0AB</b>	1 unit
---	---	--	---------------------	--------

### Options

#### Customized inscriptions

The labels can be inscribed with text and symbols not listed in the ordering data. Append the following codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift off"): **K0Y**
- Text line(s) in upper case (e.g. "LIFT OFF"): **K1Y**
- Text line(s) in lower case (e.g. "lift off"): **K2Y**
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "Lift Off"): **K5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **K3Y**
- Any inscription or symbols according to order form supplement: **K9Y**

When ordering, specify the required inscription in plain text in addition to the order number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

Two lines of 11 characters are permitted with 4 mm letter height (1 line) or 3 mm (2-line).

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering example).

For special symbols (order code K9Y), a CAD drawing in DXF format can be submitted.












#### Ordering example

3SB29 01-2XZ  
K3Y  
Z = 1118 ISO

# 3SB2, Mounting Diameter 16 mm

## Mounting parts and components

### Selection and ordering data

Version	Lamp voltage	Color	DT	Order No.	PS
V					
<b>Buttons and lenses<sup>1)</sup></b>					
 3SB29 10-0AF	<b>Buttons, flat</b> For push buttons	Black		3SB29 10-0AB	1 unit
		Red		3SB29 10-0AC	1 unit
		Yellow		3SB29 10-0AD	1 unit
		Green		3SB29 10-0AE	1 unit
		Blue		3SB29 10-0AF	1 unit
		White		3SB29 10-0AG	1 unit
		Clear		3SB29 10-0AH	1 unit
 3SB29 10-0CF	<b>Buttons, flat</b> For illuminated push buttons	Red		3SB29 10-0CC	1 unit
		Yellow		3SB29 10-0CD	1 unit
		Green		3SB29 10-0CE	1 unit
		Blue		3SB29 10-0CF	1 unit
		White		3SB29 10-0AG	1 unit
		Clear		3SB29 10-0AH	1 unit
		 3SB29 10-0BD	<b>Buttons, raised</b> For push buttons	Black	
Red				3SB29 10-0BC	1 unit
Yellow				3SB29 10-0BD	1 unit
Clear				3SB29 10-0BH	1 unit
 3SB29 10-0DD	<b>Buttons, raised</b> For illuminated push buttons	Red		3SB29 10-0DC	1 unit
		Yellow		3SB29 10-0DD	1 unit
		Clear		3SB29 10-0BH	1 unit
 3SB29 10-1AD	<b>Screw lenses</b> With concentric rings	Red		3SB29 10-1AC	1 unit
		Yellow		3SB29 10-1AD	1 unit
		Green		3SB29 10-1AE	1 unit
		Blue		3SB29 10-1AF	1 unit
		White		3SB29 10-1AG	1 unit
		Clear		3SB29 10-1AH	1 unit
 3SB29 10-1BE	<b>Screw lenses</b> Smooth, for inscription with insert cap	Red		3SB29 10-1BC	1 unit
		Yellow		3SB29 10-1BD	1 unit
		Green		3SB29 10-1BE	1 unit
		Blue		3SB29 10-1BF	1 unit
		Clear		3SB29 10-1BH	1 unit
		<b>Key for actuators</b>			
 3SB29 08-2AJ	<b>Keys</b> For CES key-operated switch, lock No. SB2			3SB29 08-2AJ	1 unit
<b>Lamps, wedge bases<sup>2)</sup></b>					
 3SB29 08-1AE	<b>Incandescent lamps</b> Wedge base W2 × 4.6 d, 1.0 W	AC/DC	Clear		
		6		3SB29 08-1AA	1 unit
		12		3SB29 08-1AB	1 unit
		24		3SB29 08-1AC	1 unit
		30		3SB29 08-1AD	1 unit
		48		3SB29 08-1AE	1 unit
		60		3SB29 08-1AF	1 unit
 3SB39 01-1SB	<b>LED lamps, super-bright</b> Wedge base W2 × 4.6 d	24 AC/DC	Red	3SB39 01-1SB	1 unit
			Yellow	3SB39 01-1RB	1 unit
			Green	3SB39 01-1TB	1 unit
			White	3SB39 01-1UB	1 unit
			Blue	3SB29 08-1BD	1 unit
		 3SB29 08-1BD		28 AC/DC	Red
	Yellow			3SB39 01-1RE	1 unit
	Green			3SB39 01-1TE	1 unit
	White			3SB39 01-1UE	1 unit
	Blue			3SB39 01-1VE	1 unit
 3SB29 08-1AB	<b>Lamp extractors</b> For lamps with bases W2 × 4.6 d				

<sup>1)</sup> Included in the scope of supply of actuators or indicator lights.

<sup>2)</sup> Included in the scope of supply of some complete units.

# 3SB2, Mounting Diameter 16 mm

## Mounting parts and components

Version	DT	Order No.	PS
<b>Accessories for command points</b>			
	<b>Single frames</b> for square design <sup>1)</sup>	<b>3SB29 02-0AA</b>	1 unit
3SB29 02-0AA			
	<b>Name plates, yellow, Ø 50 mm</b> As backing plate for EMERGENCY-STOP, self-adhesive		
	<ul style="list-style-type: none"> <li>• Blank</li> <li>• With German inscription "NOT-HALT"</li> <li>• With German inscription "NOT-AUS"</li> </ul>	<b>3SB29 08-2AF</b> <b>3SB29 08-2AG</b> <b>3SB29 08-2AK</b>	1 unit 1 unit 1 unit
3SB29 08-2AG			
	<b>Blanking plugs</b> Black plastic (degree of protection IP65)	<b>3SB29 08-3AA</b>	1 unit
3SB29 08-3AA			
	<b>Protective caps, clear</b> Silicone, for push buttons with flat and raised button	<b>3SB29 08-3AB</b>	1 unit
3SB29 08-1			
<b>Flat connectors</b>			
	<b>Plug-in sleeves</b> For flat connectors 2.8 × 0.8 mm, cross-section 0.5 ... 1.5 mm <sup>2</sup>	<b>3SB29 08-8AA</b>	1 unit
3SB29 08-8AA			
	<b>Insulation sleeves</b> For flat connectors, connection from the front	<b>3SB29 08-8AB</b>	1 unit
3SB29 08-8AB			
	<b>Complete connectors<sup>2)</sup></b> For connecting contact blocks and lamp holders (up to 10 connections). Guaranteed finger-safe acc. to IEC 61140 and BGV A3.	<b>3SB29 08-8AD</b>	1 unit
3SB29 08-8AD			
	<b>Plug-in sleeves</b> For flat connectors 2.8 × 0.8 mm, with locating spring for maintained in complete connector	<b>3SB29 08-8AE</b>	250 units
3SB29 08-8AE			
<b>Tools</b>			
	<b>Dismantling tools</b> For holders and lamp holders with holder	<b>3SB29 08-2AA</b>	1 unit
3SB29 08-2AA			
	<b>Mounting tools</b> For buttons and screw lenses	<b>3SB29 08-2AC</b>	1 unit
3SB29 08-2AC			

<sup>1)</sup> Not suitable for EMERGENCY-STOP mushroom push buttons.

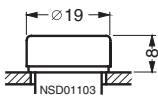
<sup>2)</sup> Required 3SB29 08-8AE plug-in sleeves for flat connectors 2.8 × 0.8 mm are not included in the scope of supply.

# 3SB2, Mounting Diameter 16 mm

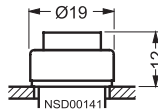
## Dimension drawings (mm)

### Actuators

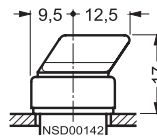
**Pushbutton or illuminated pushbutton with flat button**



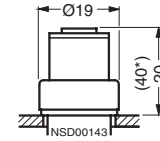
**Pushbutton or illuminated pushbutton with raised button**



**Selector switch**

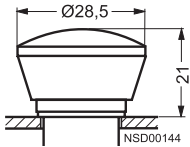


**CES key-operated switch**

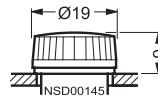


\* with key

**EMERGENCY-STOP mushroom pushbutton**

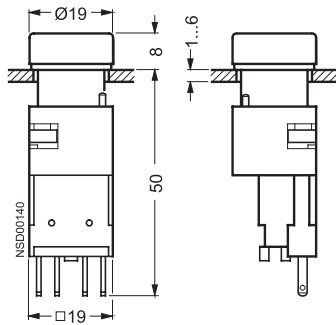


**Indicator light**



### Contact blocks with push-on connection

**Pushbutton and contact block with holder for frontplate mounting**

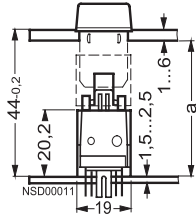


# 3SB2, Mounting Diameter 16 mm

## Dimension drawings (mm)

### Contact blocks with soldering pins for use on printed circuit boards

**Illuminated pushbutton unit**  
with contact block and lamp-  
holder with solder pins



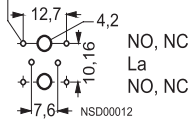
Length **a** of spacers:  $a = 44^{-0.2}$   
minus front plate thickness.  
When using backing plates, the length **a** is  
reduced by 0.8 mm.  
To avoid bending of the PCB when the actuator is  
operated, sufficient spacers must be provided  
spaced as shown in the table below:

Maximum PCB thickness	Max. distance between spacers
1.5 mm	80 mm
2.5 mm	150 mm
When using EMERGENCY-STOP actuators	generally 50 mm

(These details are based on epoxy resin glass fibre mat.)

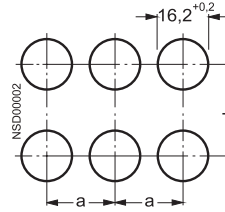
### Solder pin spacing

Solder terminal  $\varnothing 1.3^{+0.1}$



NO, NC  
La  
NO, NC

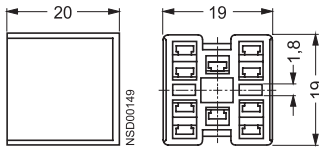
### Mounting dimensions



Minimum clearance	a	b
Round design	19	19
Square design without inscription plate	21	21
Round and square designs with inscription plates	21	32
For 2 selector switches and 3 switching positions, maintained contact, side by side	21	21

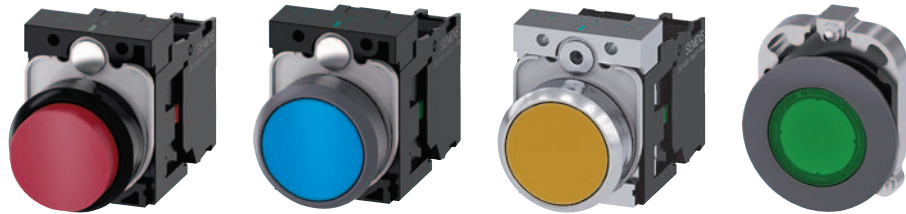
### Accessories

#### Complete connector



# SIRUS ACT 3SU Series

## Overview



	3SU1.0	3SU1.3	3SU1.5	3SU1.6
<b>Pushbuttons and indicator lights</b>				
<b>Designs</b>				
Nominal diameter	22 mm	22 mm	22 mm	30 mm
Version	Plastic	Plastic with metal front ring, matte	Metal, shiny	Metal, matte, flat
<b>Actuators</b>				
Pushbuttons	✓	✓	✓	✓
Illuminated pushbuttons	✓	✓	✓	✓
Mushroom pushbuttons	✓	✓	✓	--
EMERGENCY STOP mushroom pushbuttons	✓	✓	✓	--
Selector switches	✓	✓	✓	✓
Key-operated switches	✓	✓	✓	✓
<b>Special actuators</b>				
Twin pushbuttons	✓	✓	✓	--
Coordinate switches	✓	✓	✓	--
Toggle switches	✓	✓	✓	--
Sensor switches	✓	✓	--	--
ID key-operated switches	✓	✓	--	--
Pushbuttons with extended stroke	✓	✓	✓	--
Potentiometers	✓	✓	✓	--
<b>Indicators</b>				
Indicator lights	✓	✓	✓	✓
Acoustic signaling devices	✓	✓	✓	--
<b>Contact modules</b>				
Single-pole	✓	✓	✓	✓
Two-pole	✓	✓	✓	✓
<b>LED modules</b>				
With integrated LED	✓	✓	✓	✓
<b>Connections</b>				
Screw terminals	✓	✓	✓	✓
Spring-type terminals	✓	✓	✓	✓
Solder pins	✓	✓	✓	✓
AS-Interface	✓	✓	✓	✓
IO-Link	✓	✓	✓	✓

✓ Standard  
 -- Not available

Note:

Safety characteristics (see Appendix on page 10/157).

# SIRIUS ACT 3SU Series

## Overview



	3SU18	3SU18
	Enclosures	Two-hand operation consoles
<b>Enclosures</b>		
Plastic	✓	✓
Metal	✓	✓
<b>Actuators</b>		
Pushbuttons	✓	✓
Illuminated pushbuttons	✓	✓
Mushroom pushbuttons	✓	✓
EMERGENCY STOP mushroom pushbuttons	✓	✓
Selector switches	✓	✓
Key-operated switches	✓	✓
<b>Indicators</b>		
Indicator lights	✓	☐
Acoustic signaling devices	✓	☐
<b>Contact modules</b>		
Single-pole	✓	✓
Two-pole	--	✓
<b>Connections</b>		
Screw terminals	✓	✓
Spring-type terminals	✓	☐
Plug-in connection	☐	☐
AS-Interface	✓	☐

- ✓ Standard
- Not available
- ☐ Optional

### AS-Interface solutions

Pushbuttons and indicator lights of the SIRIUS ACT series can be connected to the AS-Interface communication system quickly and easily with the help of various solutions.

For AS-Interface solutions see [catalog IK PI "Industrial Communication SIMATIC NET"](#).

#### AS-Interface EMERGENCY STOP according to ISO 13850

Using special modules, EMERGENCY STOP devices according to ISO 13850 can be directly connected through the standard AS-Interface with safety-related communication ([see page 10/113](#)).

#### AS-Interface enclosures

Enclosures with standard fittings are listed in this catalog. For customized enclosures, use the SIRIUS ACT Configurator to select the elements for equipping ([see page 10/123](#)).

### PROFINET solutions

SIRIUS ACT devices will be equipped in future with a direct communication interface to PROFINET and PROFIsafe.

### RFID authentication solutions

Groups of employees or individuals can be authenticated by means of the ID key-operated switch. Color-coded keys for easy distinction between users and flexible in application thanks to four function stages.



# SIRIUS ACT 3SU Series

## General data

### Overview



SIRIUS ACT pushbuttons and indicator lights

### SIRIUS ACT – commanding and signaling

SIRIUS ACT is a modular system of pushbuttons and indicator lights for front plate mounting and rear-mounted electrical modules.

#### Extensive portfolio

- Customized variants, e.g. special tumbler arrangements, labeling, equipped enclosures
- Communication-enabled thanks to direct interfacing to AS-Interface, IO-Link or PROFINET

#### Diverse possible applications

- National and international approvals
- Many trade approvals
- Short delivery times thanks to global availability

#### Standards

- IEC 60947-1, EN 60947-1
- IEC 60947-5-1, EN 60947-5-1
- IEC 60947-5-5, EN 60947-5-5 for EMERGENCY STOP devices

#### Further information

Home page, see [www.siemens.com/sirius-act](http://www.siemens.com/sirius-act)  
 Industry Mall, see [www.siemens.com/product?3SU1](http://www.siemens.com/product?3SU1)  
 Configurator, see [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)  
 Conversion tool, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool)  
 Manual, see <https://support.industry.siemens.com/cs/ww/en/view/107542462>

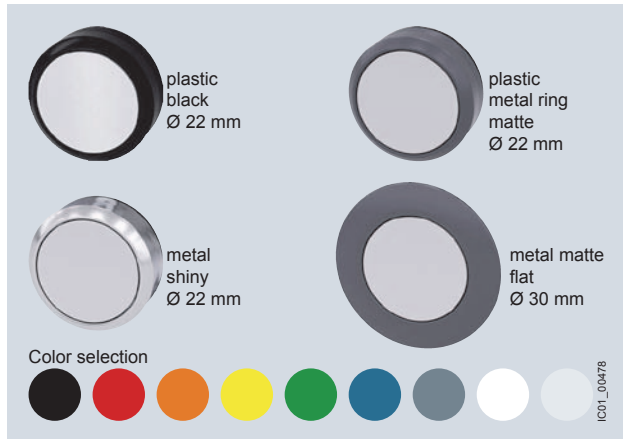
### Configurator



- Fast, simple selection by intuitive navigation through clearly-organized menus using drag & drop
- Image preview of selected components
- Inscription of pushbuttons and labeling plates using the interactive inscription tool
- Once created, a configuration can be ordered as often as required using the customer-specific article number and the CIN (Configuration Identification Number)
- Everything at a glance: Product data sheets, certificates, dimensional drawings, list prices, inscription tool

## Benefits

### Design



SIRIUS ACT is available in four design lines.

### Ruggedness



- Degree of protection IP66, IP67, IP69 (IP69K)

#### IP66

6 = Protection against the ingress of dust

6 = Protection against powerful splash-water

#### IP67

6 = Protection against the ingress of dust

7 = Protection against temporary immersion

#### IP69 (IP69K)

6 = Protection against the ingress of dust

9/9K = Protection against water in high-pressure cleaning (approx. 80 bar) and high water jet temperatures (approx. 80 °C)

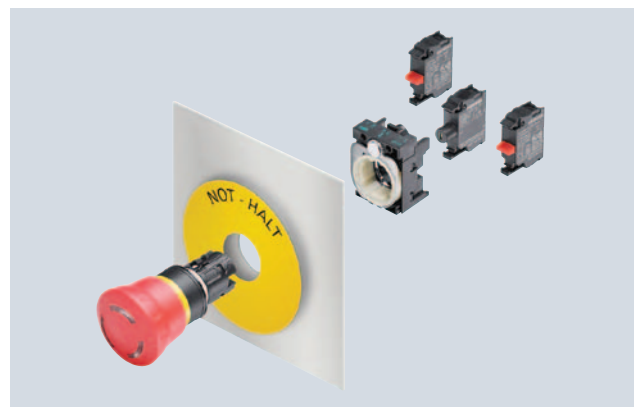
- Service life of 100 000 hours thanks to use of LEDs
- Media resistance (chemicals) thanks to solid stainless steel and high-grade plastics
- Mechanical endurance of  $10 \times 10^6$  switching cycles
- Suitable for use in extreme environments
- Reliable, friction-locked fixing with just one screw
- Design stability according to use
- Simple geometry for mounting holes

### Communication



- Direct connection of the enclosure to AS-Interface or IO-Link
- Direct connection in the control cabinet to PROFINET, IO-Link or AS-Interface
- Can be integrated easily via the TIA Portal

### Easy handling

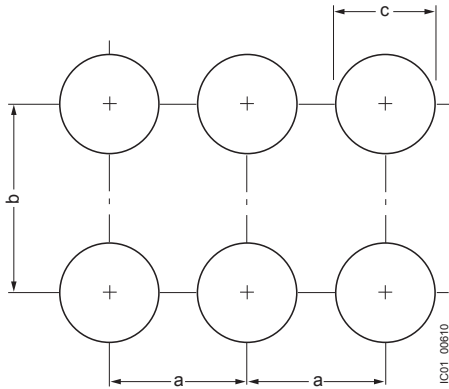


- Self-holding function of the actuator when mounting
- Twist prevention integrated into patented holder design
- Stackable contact modules
- Self-explanatory and fast installation using one hand
- Components can be mounted with holder removed
- No special tools required, simple size 2 screwdriver (cross-tip DIN ISO 87641PZD1, flat-head DIN ISO 2380-1 A/B 1x4.5) is sufficient

# SIRIUS ACT 3SU Series

## General data

### Mounting dimensions



### Versions

SIRIUS ACT is a modular system of pushbuttons and indicator lights with which customized variants can be configured flexibly.

One command point comprises:

- An actuating or signaling element in front of the control panel
- A holder for securing behind the control panel
- Up to six contact modules and/or one LED module (mounted onto the holder), single-pole contacts can be stacked
- A comprehensive range of accessories for inscription/markings

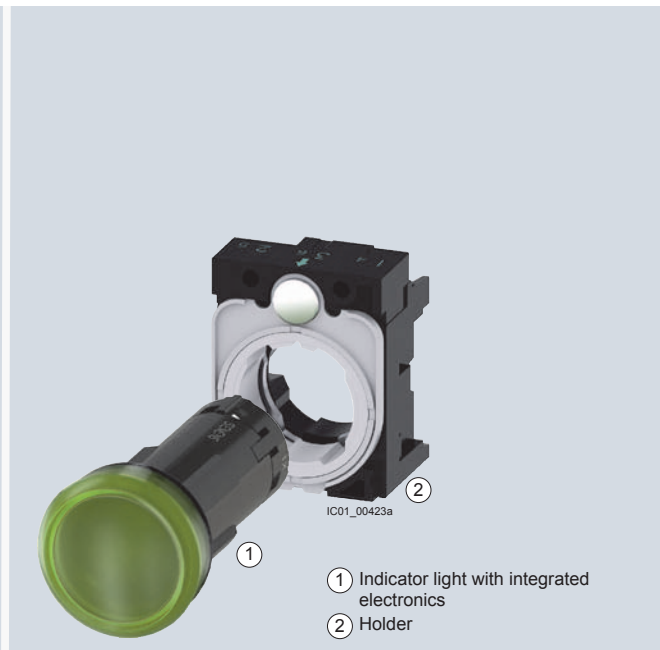
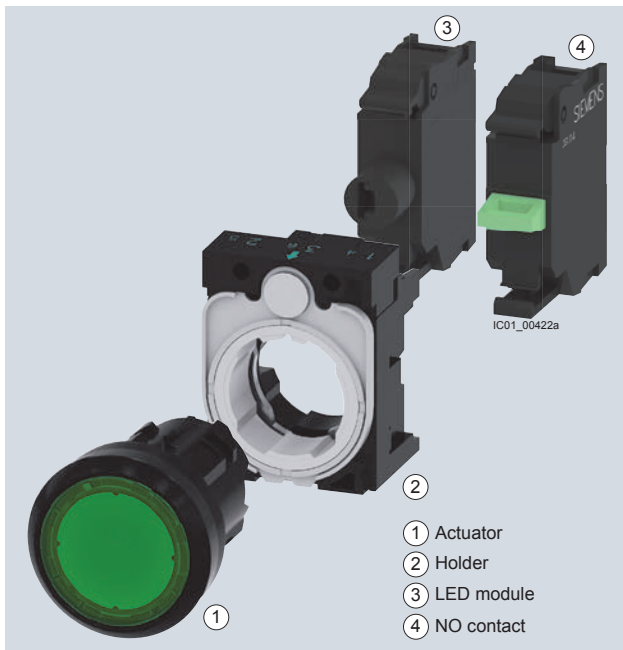
### Complete units

Complete units made up of an actuating or signaling element, holder and contact modules and/or LED modules are offered for the most frequent application cases. The electrical parts are integrated and only have to be wired.

	Minimum clearance		
	a	b	c
	mm	mm	mm
<b>22 mm, plastic with metal front ring, matte</b>			
3-slot holder	30	40	22.3 <sup>+0.4</sup>
4-slot holder	40	40	22.3 <sup>+0.4</sup>
<b>30 mm, metal, matte</b>			
3-slot holder	40	45	30.5 <sup>+0.5</sup>

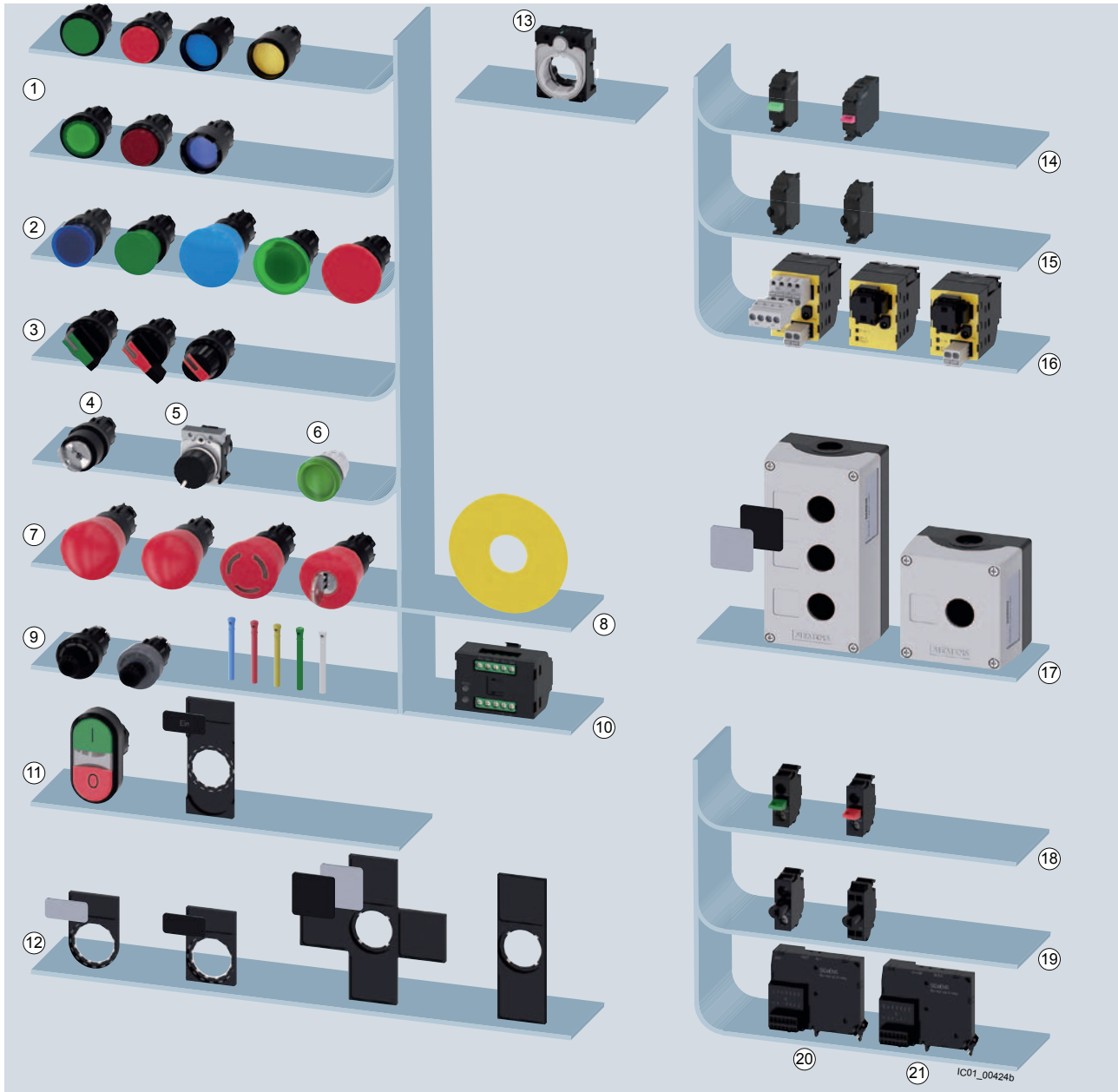
### Compact units

Signaling devices, sensor switches, and pushbuttons with extended stroke are available as compact units. The electronic circuitry is already integrated in these devices, i.e. it is not necessary to snap on a contact or LED module.



Complete units	Pages	Compact units	Pages
Plastic, black	10/38	Plastic, black	10/45
Plastic with metal front ring, matte	10/59	Plastic with metal front ring, matte	10/65
Metal, shiny	10/79	Metal, shiny	10/86

## Actuating and signaling elements



Actuating and signaling elements		Pages	Modules for front plate mounting		Pages
①	Pushbuttons, illuminated pushbuttons	10/38	⑭	Contact modules	10/107
②	Mushroom pushbuttons	10/40	⑮	LED modules	10/111
③	Selector switches	10/41	⑯	AS-Interface modules	10/113
④⑤⑥	Key-operated switches, potentiometers, indicator lights	10/42	<b>Enclosures</b>		<b>Pages</b>
⑦⑧	EMERGENCY STOP mushroom pushbuttons, backing plates	10/40	⑰	Enclosures	10/117
⑨⑩	ID key-operated switches, ID keys, electronic modules	10/57	<b>Modules for base mounting</b>		<b>Pages</b>
⑪	Twin pushbuttons, label holders, labeling plates	10/49	⑱	Contact modules	10/125
⑫	Label holders, labeling plates	10/130	⑲	LED modules	10/125
<b>Holders and labels</b>		<b>Pages</b>	⑳	IO-Link modules	10/128
⑬	Holders	10/130	㉑	AS-Interface modules	10/128

System overview of SIRIUS ACT pushbuttons and indicator lights from the plastic design line. Pushbuttons and indicator lights available in 4 design lines.

# SIRIUS ACT 3SU Series

## General data

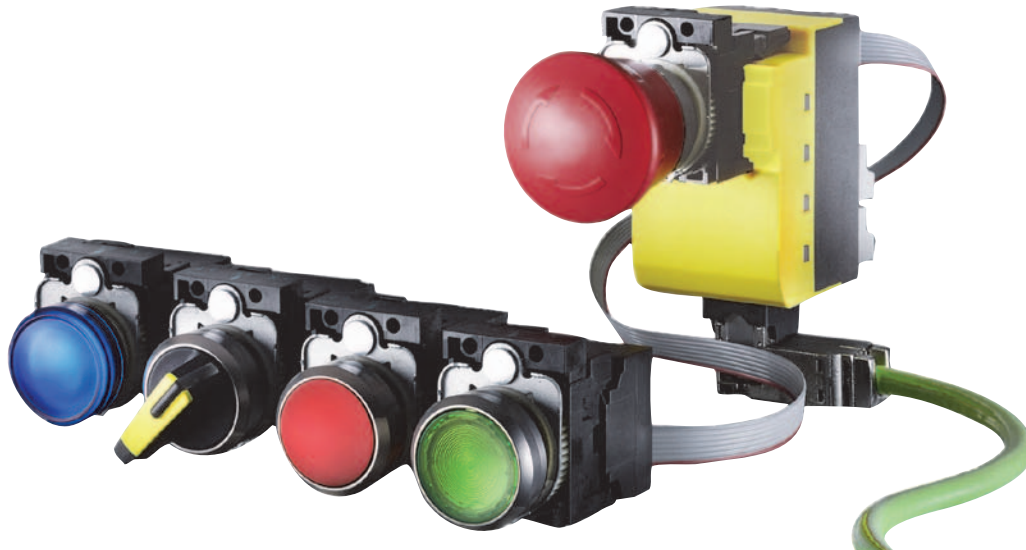
### SIRIUS ACT with PROFINET

SIRIUS ACT with PROFINET connects pushbuttons and indicator lights directly via PROFINET to the controller and HMI devices – including with safety functions.

With this solution designed for the control panel, up to 21 SIRIUS ACT devices can be connected to the controller via PROFINET. Integration of the EMERGENCY STOP mushroom pushbutton (SIL 3, PLe) is possible via PROFIsafe. Non SIRIUS ACT devices, e.g. position switches, can additionally be connected via the open, digital/analog interfaces (DI, DQ, AI).

The system is entirely integrated into TIA Portal and does not require any further addressing apart from the IP address for PROFINET.

Quick and easy installation with flat cables without special tools saves significantly on wiring outlay.



### Interface modules/fail-safe interface modules

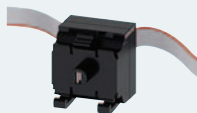


**Interface module for PROFINET, 24 V DC**  
1 ... 20 terminal modules can be connected

**3SU1400-1L□10-□AA1**

[See page 10/116](#)

### Terminal modules



**Terminal modules with 2 contacts**  
**Terminal modules with 2 contacts and integrated LED**  
**Terminal modules with integrated LED**

**3SU1401-1MA□0-1□A1**

**3SU1401-1MC□0-1□A1**

**3SU1401-1ME□0-1□A1**

[See page 10/116](#)

### Accessories



**Memory module**  
For backing up the complete parameterization of the 3SK2 safety system without a PC/PG through the system interface

**3RK3931-0AA00**

[See page 10/116](#)

**LED modules for mounting on printed-circuit boards**

**3SU1401-3BA□0-5AA0**

[See page 10/112](#)

**Flat ribbon cable**  
7 cores, length 10 m  
7 cores, length 5 m

**3SU1900-0KQ80-0AA0**

**3SU1900-0KP80-0AA0**

[See page 10/156](#)



# SIRUS ACT 3SU Series

## General data

### ID key-operated switches

The ID key-operated switch is electronic and has 4 switch positions that are selected by keys with different codes. Using the 4 ID keys with different codes, it is possible to select 1 of 4 positions. The ID keys are color-coded (yellow, blue, red, green, white) so that they can be clearly differentiated at a glance.

Different versions of ID key-operated switches are available depending on the following features:

- Front ring material
- Conventional variant: 1 + 4 non-isolated outputs
- Variant with IO-Link: Option of individual coding

Operation: Insert ID key, turn key to select the position. Standard keys can also be used in conjunction with the electronic module for ID key-operated switches with IO-Link function. The white ID key is supplied without coding.



**3SU1000-4WS10-0AA0**  
Plastic, black



**3SU1030-4WS10-0AA0**  
Plastic with metal front ring, matte

ID key-operated switches		
Number of switching positions	4	4
Operating angle	45°	45°
Operating principle	Latching	Latching
Switch position for key removal	Key removal possible in all 4 positions	Key removal possible in all 4 positions
Color	Black	Black
Pages	<a href="#">10/57</a>	<a href="#">10/77</a>



**3SU1400-1GC10-1AA0**



**3SU1400-1GD10-1AA0**

Electronic modules for ID key-operated switches		
Type of power supply	--	via IO-Link master
Protocol is supported	--	IO-Link protocol
Number of NO contacts	5	5
IO-Link transfer rate	--	COM2 (38.4 Kbaud)
Pages	<a href="#">10/115</a>	<a href="#">10/115</a>



**3SU1900-0FU60-0AA0**

**ID keys ID group individual**



**3SU1900-0FV40-0AA0**  
**3SU1900-0FW30-0AA0**  
**3SU1900-0FX20-0AA0**  
**3SU1900-0FY50-0AA0**

**ID keys**

ID keys		
Material	Plastic	Plastic
Version of RFID coding	Individually coded, programmable several times	ID group 1 ID group 2 ID group 3 ID group 4 Green Yellow Red Blue
Color	White	
Pages	<a href="#">10/152</a>	<a href="#">10/152</a>

# SIRUS ACT 3SU Series

## General data

### Article No. scheme

#### Device types

<b>3SU10</b>	<b>3SU11</b>	<b>3SU12</b>	<b>3SU14</b>	<b>3SU15</b>	<b>3SU18</b>	<b>3SU19</b>
<b>Device types</b>						
<b>Actuating and signaling elements</b>	<b>Complete units</b>	<b>Compact units</b>	<b>Modules for actuators and indicators</b>	<b>Holders with module</b>	<b>Enclosures</b>	<b>Accessories</b>

#### Actuating and signaling elements

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device type	Actuating and signaling elements	0														
Material (front ring)	Plastic, black	0														
	Metal, matte (front ring)/ plastic, black (rosette)	3														
	Metal, shiny	5														
	Metal, matte	6														
Illumination	Non-illuminated	0														
	Illuminated/transparent	1														
	Illuminated/non illuminated	2														
Type of actuator/indicator	Pushbutton	0														
	Mushroom pushbutton/ EMERGENCY STOP mushroom	1														
	pushbutton/sensor switch	2														
	Selector switch	3														
	Twin pushbutton, toggle switch	4/5														
	Key-operated switch	6														
	Indicator light/acoustic signaling device Coordinate switch	7														
Design of the actuator/ acoustic signaling device	e.g. A = Flat								<input type="checkbox"/>							
Function	e.g. B = Momentary contact									<input type="checkbox"/>						
Color/key removal position	e.g. 10 = Black, 20 = Red										<input type="checkbox"/>	<input type="checkbox"/>				
Connection type	0 = None													<input type="checkbox"/>		
Module/holder equipment	e.g. A = without module, without holder Y = without module, with holder														<input type="checkbox"/>	
Marking	e.g. A = None, C = "I", D = "O", R = "R"															<input type="checkbox"/>
Ambient condition	Standard, ATEX															0 1
<b>Example</b>		<b>3SU1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>A</b>	<b>B</b>	<b>1</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>A</b>	<b>A</b>	<b>0</b>

#### Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

# SIRIUS ACT 3SU Series

## General data

### Complete units

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Device type	Complete units	1														
Material (front ring)	Plastic, black	0														
	Metal, matte (front ring)/ plastic, black (rosette)	3														
	Metal, shiny	5														
	Metal, matte	6														
Illumination	Non-illuminated	0														
	Illuminated (with/without LED, various voltages)	1...8														
Type of actuator/indicator	Pushbutton	0														
	Mushroom pushbutton/EMERGENCY	1														
	STOP mushroom pushbutton/ sensor switch	2														
	Selector switch	3														
	Twin pushbutton, toggle switch	4/5														
	Key-operated switch	6														
	Indicator light/acoustic signaling device Coordinate switch	7														
Design of the actuator/acoustic signaling device	e.g. A = Flat						<input type="checkbox"/>									
Function	e.g. B = Momentary contact							<input type="checkbox"/>								
Color/key removal position	e. g. 10 = Black, 20 = Red								<input type="checkbox"/>	<input type="checkbox"/>						
Connection type	Screw terminals	1														
	Spring-type terminals	3														
Module/holder equipment incl. contact material	e. g.												<input type="checkbox"/>			
	A = Without module, with holder															
	B = 1 NO contact with holder															
	C = 1 NC contact with holder															
Marking	e.g. A = None, C = "I", D = "O", R = "R"												<input type="checkbox"/>			
Ambient condition	Standard	0														
	ATEX	1														
<b>Example</b>		<b>3SU1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>A</b>	<b>A</b>	<b>1</b>	<b>0</b>	<b>-</b>	<b>1</b>	<b>B</b>	<b>A</b>	<b>0</b>

### Compact units

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Device type	Compact units	2														
Material (front ring)	Plastic, black	0														
	Metal, matte (front ring)/ plastic, black (rosette)	3														
	Metal, shiny	5														
	Metal, matte	6														
Illumination	Non-illuminated	0														
	Illuminated/non illuminated	1														
Type of actuator/indicator	Pushbutton	0														
	Sensor switch	1														
	Potentiometer	2														
	Indicator light/acoustic signaling device	6														
Design of the actuator/acoustic signaling device	e.g. A = Flat						<input type="checkbox"/>									
Function (voltage/resistance)	e.g. B = 24 V AC/DC							<input type="checkbox"/>								
Color	e. g. 10 = Black, 20 = Red								<input type="checkbox"/>	<input type="checkbox"/>						
Connection type	None	0														
	Screw terminals	1														
	M12 connection, 4-pole	2														
	Spring-type terminals	3														
Module/holder equipment incl. contact material	e. g.												<input type="checkbox"/>			
	A = Without module, without holder															
	B = 1 NO contact with holder															
	C = 1 NC contact with holder															
Marking	e.g. A = none												<input type="checkbox"/>			
Ambient condition	Standard	0														
	ATEX	1														
<b>Example</b>		<b>3SU1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>-</b>	<b>6</b>	<b>A</b>	<b>B</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>1</b>	<b>A</b>	<b>A</b>	<b>0</b>

#### Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.



# SIRIUS ACT 3SU Series

## General data

### Modules for actuators and indicators

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Device type	Modules for actuators and indicators	4														
Material (front ring)	Plastic, black	0														
Illumination	Non-illuminated	0														
	Illuminated	1														
Type of mounting	Front plate mounting						1									
	Base mounting						2									
	Printed circuit board						3									
Module type	Contact module															
	LED module															
	LED test module															
	Support terminal															
	AS-Interface module															
	Electronic module for ID key-operated switches															
Function/voltage	e.g. B = 24 V AC/DC									<input type="checkbox"/>						
Color	e. g. 10 = Black, 20 = Red									<input type="checkbox"/>	<input type="checkbox"/>					
Connection type	Screw terminals														1	
	Screw terminals + insulation piercing method														2	
	Spring-type terminals														3	
	Spring-type terminals + insulation piercing method														4	
	Socket terminals														5	
Module equipment incl. contact material	e. g. A = None B = 1 NO contact, silver C = 1 NC contact, silver													<input type="checkbox"/>		
Marking	None														A	
Ambient condition	Standard ATEX														0 1	
<b>Example</b>		<b>3SU1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>1</b>	<b>A</b>	<b>A</b>	<b>1</b>	<b>0</b>	<b>-</b>	<b>1</b>	<b>B</b>	<b>A</b>	<b>0</b>

### Holders

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Device type	Holder	5														
Material (front ring)	Plastic, black	0														
	Metal, shiny	5														
Illumination	Non-illuminated	0														
	Illuminated	1														
Type of mounting	None						0									
	Front plate mounting						1									
Holder type	3x A														A	
	4x B														B	
Function/voltage	None 6 ... 24 V AC/DC														A G	
Color	e.g. 10 = Black, 20 = Red									<input type="checkbox"/>	<input type="checkbox"/>					
Connection type	None														0	
	Screw terminals														1	
Module equipment incl. contact material and slot	e. g. A = None B = 1 NO contact, silver C = 1 NC contact, silver													<input type="checkbox"/>		
Marking	None														A	
Ambient condition	Standard ATEX														0 1	
<b>Example</b>		<b>3SU1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>A</b>	<b>A</b>	<b>1</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>A</b>	<b>A</b>	<b>0</b>

#### Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

# SIRIUS ACT 3SU Series

## General Data

### Enclosures

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Device type	8 = Enclosure	8														
Material (enclosure/front ring)	Plastic / black plastic Metal, shiny metal	0 5														
Number of command points	1 command point ... 6 command points	1 ... 6														
Type of enclosure	Configuration 4-position selector switches and coordinate switches Palm pushbutton Two-hand operation console	0 1 2 3														
Equipment	e.g. command point, inscription, module						<input type="checkbox"/>	<input type="checkbox"/>								
Communication capability	None AS-i									0 1						
Ambient condition	Standard ATEX										0 1					
Mounting/ connection of modules	None Front plate mounting, screw terminals Base mounting, screw terminals Base mounting, spring-type terminals												0 1 2 3			
Cable exit from enclosure	None Direct entry of AS-i flat cable at top/on right AS-i insulation piercing method at top/ on right													A G H		
Design of enclosure top	Center command point With recess for labeling plate With protective collar 4 additional holes (two-hand operation console) 8 additional premachined breaking points (two-hand operation console)													A B C D E		
Color of enclosure top	Gray Yellow														8	
<b>Example</b>		<b>3SU1</b>	<b>8</b>	<b>0</b>	<b>1</b>	<b>-</b>	<b>0</b>	<b>A</b>	<b>A</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>A</b>	<b>A</b>	<b>2</b>

### Accessories

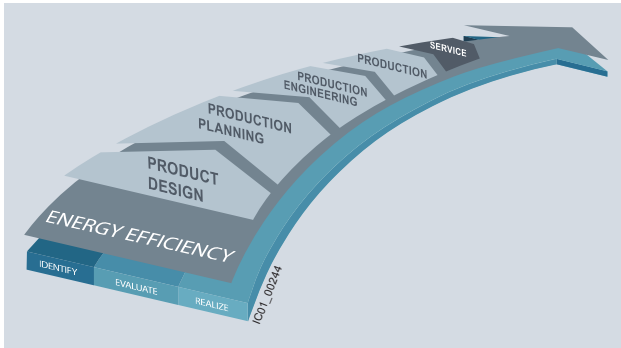
Product versions		Article number														
SIRIUS ACT Pushbuttons and Indicator Lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Device type	Accessories	9														
Material	Plastic, black Metal/plastic Metal, shiny Metal, matte	0 3 5 6														
Illumination	Non-illuminated Illuminated	0 1														
Type of accessory (labels, protection, actuator, enclosure)	e. g. 0AB = Insert label						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Color	e. g. 10 = Black, 20 = Red									<input type="checkbox"/>	<input type="checkbox"/>					
Marking	e. g. 0AA = None 0AB = ON 0AT = EMERGENCY STOP												<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ambient condition	Standard ATEX														0 1	
<b>Example</b>		<b>3SU1</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>A</b>	<b>B</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>A</b>	<b>B</b>	<b>0</b>

**Note:**

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers. For your orders please use the article numbers quoted in the selection and ordering data.

## Benefits

### Advantages through energy efficiency



Energy management in industry

### Overview of the energy management process

We offer you a unique portfolio for efficient energy management in the industry – a process that is used to optimize the energy requirements. We divide operational energy management into the three phases: identification, evaluation and implementation, and support you with suitable hardware and software solutions in each phase of the process.

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency (see [www.siemens.com/sirius/energysaving](http://www.siemens.com/sirius/energysaving)).

SIRIUS ACT pushbuttons and indicator lights contribute to energy efficiency throughout the plant as follows:

- Lower power consumption by means of LED technology
- Long service life

## Application

### Environmental conditions

The pushbuttons and indicator lights are climate-proof (KTW 24) and suitable for standard industrial applications and operation in marine applications.

### Safety EMERGENCY STOP pushbuttons according to ISO 13850

For controls according to IEC 60204-1 or EN 60204-1, the SIRIUS ACT mushroom pushbuttons are suitable for use as safety EMERGENCY STOP pushbuttons.

### Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening. This means that for the purpose of personal safety, the reliable opening of NC contacts in all safety circuits is expressly prescribed for the electrical equipment of machines and is designated according to IEC 60947-5-1 with the symbol (⊖).

Category 4 according to EN ISO 13849-1 can be attained with the EMERGENCY STOP mushroom pushbuttons if the corresponding fail-safe evaluation units are selected and correctly installed, e.g. the 3SK11 safety relays or the 3RK3 Modular Safety System (see page 11/1 onwards) or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.

The SIRIUS ACT pushbuttons and indicator lights can be connected to the AS-Interface communication system quickly and safely.

The following solutions are available:

- AS-Interface modules
- AS-Interface module in safety-related version for EMERGENCY STOP mushroom pushbutton
- Ready-fitted AS-Interface enclosures with 1 to 6 command points

### IO-Link

The SIRIUS ACT pushbuttons and indicator lights can be connected to IO-Link quickly and safely. The connection is made via a special IO-Link-module.

## Technical specifications

Type	3SU1..0-AA 3SU1..0-JA		3SU1..1-AA 3SU1..1-JA		3SU1..0-AB 3SU1..0-BB 3SU1..0-CB 3SU1..0-DB 3SU1..0-JB		3SU1..1-AB 3SU1..1-BB 3SU1..1-JB			
Product version	<b>Pushbuttons</b>									
Operating principle of the actuating element	Latching				Momentary contact					
Optional expansion of product by light source	No		Yes		No		Yes			
Mechanical endurance (operating cycles) typical	500 000				10 000 000		3 000 000			
Switching frequency maximum	1/h	1 800			3 600					
Shock resistance acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms									
Vibration resistance acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g									
IP degree of protection	IP66, IP67, IP69 (IP69K)									
Environmental category during operation according to IEC 60721	3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%)									
Ambient temperature										
• During operation	°C	-25 ... +70								
• During storage	°C	-40 ... +80								
Type	3SU1.00-AA 3SU1.00-BA 3SU1.00-CA 3SU1.30-AA 3SU1.30-BA 3SU1.50-AA 3SU1.50-BA 3SU1.50-CA		3SU1.50-EA		3SU1.01-AA 3SU1.01-BA 3SU1.51-AA 3SU1.51-BA 3SU1.51-CA		3SU1.00-AD 3SU1.00-BD 3SU1.00-CD 3SU1.30-AD 3SU1.30-BD 3SU1.50-AD 3SU1.50-BD 3SU1.50-CD		3SU1.50-ED 3SU1.01-AD 3SU1.01-BD 3SU1.31-AD 3SU1.31-BD	
Product version	<b>Mushroom pushbuttons</b>									
Operating principle of the actuating element	Latching					Momentary contact				
Optional expansion of product by light source	No			Yes		No			Yes	
Mechanical endurance (operating cycles) typical	500 000		300 000		500 000		10 000 000		3 000 000	
Switching frequency maximum	1/h	1 800			3 600			1 800		3 600
Shock resistance acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms									
Vibration resistance acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g									
IP degree of protection	IP66, IP67, IP69 (IP69K)		IP65, IP67, IP69 (IP69K)		IP66, IP67, IP69 (IP69K)			IP65, IP67, IP69 (IP69K)		IP66, IP67, IP69 (IP69K)
Environmental category during operation according to IEC 60721	3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%)									
Ambient temperature										
• During operation	°C	-25 ... +70								
• During storage	°C	-40 ... +80								
Type	3SU1...-J 3SU1...-H 3SU1...-G									
Product version	<b>EMERGENCY STOP mushroom pushbuttons</b>									
Mechanical endurance (operating cycles)	300 000									
Switching frequency maximum	1/h	600								
Shock resistance acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms									
Vibration resistance acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g									
IP degree of protection	IP66, IP67, IP69 (IP69K)									
Environmental category during operation according to EN 60721	3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%)									
Ambient temperature										
• During operation	°C	-25 ... 70								
• During storage	°C	-40 ... 80								

<sup>1)</sup> UL NEMA rating for twin pushbuttons (all types) – NEMA Type: 1, 2, 3, 3R, 4, 4X




# SIRUS ACT 3SU Series




## General data

Type	3SU1.5.-2A 3SU1.5.-2B 3SU1.5.-2C 3SU1.5.-2D 3SU1.5.-2E	3SU1.0.-2A 3SU1.0.-2B 3SU1.0.-2C 3SU1.3.-2A 3SU1.3.-2B 3SU1.3.-2C	3SU1.0.-3E 3SU1.3.-3E 3SU1.5.-3E	3SU1.0.-4B 3SU1.0.-4C 3SU1.0.-4D 3SU1.0.-4F 3SU1.0.-4G 3SU1.0.-4H 3SU1.0.-4J 3SU1.0.-4L 3SU1.0.-5B 3SU1.0.-5H 3SU1.0.-5P 3SU1.0.-5Q 3SU1.0.-5R 3SU1.0.-5S 3SU1.0.-5T 3SU1.0.-5X	3SU1...-4B 3SU1...-4C 3SU1...-4D 3SU1...-4F 3SU1...-4G 3SU1...-4H 3SU1...-4J 3SU1...-4L 3SU1...-5B 3SU1...-5H 3SU1...-5K 3SU1...-5L 3SU1...-5P 3SU1...-5Q 3SU1...-5R 3SU1...-5S 3SU1...-5T 3SU1...-5X	3SU1.0.-7A 3SU1.0.-7B 3SU1.3.-7A 3SU1.3.-7B 3SU1.5.-7A 3SU1.5.-7B
Product version	Selector switches		Toggle switches	Key-operated switches		Coordinate switches
<b>Mechanical endurance (operating cycles)</b>	300 000	1 000 000			300 000	250 000
<b>Switching frequency maximum</b>	1/h	1 800				3 600
<b>Shock resistance</b> acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms					
<b>Vibration resistance</b> acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g					
<b>IP degree of protection</b>	IP66, IP67, IP69 (IP69K)		IP66, IP67, IP69K	IP66, IP67, IP69 (IP69K)		IP65, IP67
<b>Ambient temperature</b>						
• During operation	°C	-25 ... +70				
• During storage	°C	-40 ... +80				
Type	3SU1400- .AA101-.A0	3SU1400- 1AA101-GA0, 3SU1400- 1AA101-RA0	3SU1400- 1AA101-HA0	3SU1400- .AA103-.A0	3SU1400- 1AA103-GA0, 3SU1400- 1AA103-RA0	3SU1400- 1AA103-HA0 3AA105-.A0
Product version	Contact modules					
<b>Rated insulation voltage</b>	V	500				
<b>Pollution degree</b>		3				
<b>Impulse withstand voltage</b> <b>Rated value</b>	kV	6				
<b>Operational voltage type</b>		AC/DC				
<b>Operational voltage, rated value</b>						
• At AC at 50 Hz	V	5 ... 500				
• At DC	V	5 ... 500				
<b>Thermal current</b>	A	10				
<b>Operational current, rated value</b>						
• At AC-12						
- At 24 V	A	10				
- At 230 V	A	8				
• At AC-15						
- At 24 V	A	6				
- At 230 V	A	6	4	6	4	6
- At 400 V	A	3				
- At 500 V	A	1.4				
• At DC-12						
- At 24 V	A	10				
- At 48 V	A	5				
- At 110 V	A	2.5				
- At 230 V	A	1	0.3	1	0.3	1
- At 400 V	A	0.3				
- At 500 V	A	0.3	0.2	0.3		
• At DC-13						
- At 24 V	A	3				
- At 48 V	A	1.5				
- At 110 V	A	0.7	0.6	0.7	0.6	0.7
- At 230 V	A	0.3				
- At 400 V	A	0.1				
- At 500 V	A	0.1				
<b>Contact reliability</b>		One contact failure per 100 million (17 V, 5 mA), one contact failure per 10 million (5 V, 1 mA)				
<b>Mechanical endurance (operating cycles)</b> <b>typical</b>		10 000 000				

# SIRUS ACT 3SU Series

## General data

Type	3SU1400- .AA101-.A0	3SU1400- 1AA101-GA0, 3SU1400- 1AA101-RA0	3SU1400- 1AA101-HA0	3SU1400- .AA103-.A0	3SU1400- 1AA103-GA0, 3SU1400- 1AA103-RA0	3SU1400- 1AA103-HA0	3SU1400- 3AA105-.A0
Product version	<b>Contact modules</b>						
<b>Switching frequency maximum</b>	1/s	3600					
<b>Fuse link version required for short-circuit protection of the auxiliary switch with type of coordination 1</b>	gG / Dz 10 A, quick-response / Dz 10 A						
<b>Continuous current of miniature circuit breaker C characteristic</b>	A	10					
<b>Vibration resistance</b> acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g						
<b>Shock resistance</b> acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms						
<b>Climate class during operation</b> according to EN 60721	3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%, no condensation permitted in operation)						
<b>Ambient temperature</b>		<ul style="list-style-type: none"> <li>• During operation °C -25 ... +70</li> <li>• During storage °C -40 ... +80</li> </ul>					
<b>IP degree of protection</b>		<ul style="list-style-type: none"> <li>• of the enclosure IP40</li> <li>• of the terminal IP20</li> </ul>					
<b>Type of electrical connection</b>	<b>Screw terminals</b> 		<b>Spring-type terminals</b> 		<b>Socket terminals (THT)</b> 		
<b>Type of connectable conductor cross-sections</b>	<ul style="list-style-type: none"> <li>• Solid with end sleeve 2 x (0.5 ... 0.75 mm<sup>2</sup>)</li> <li>• Solid without end sleeve 2 x (1.0 ... 1.5 mm<sup>2</sup>)</li> <li>• Finely stranded with end sleeve 2 x (0.5 ... 1.5 mm<sup>2</sup>)</li> <li>• Finely stranded without end sleeve 2 x (1.0 ... 1.5 mm<sup>2</sup>)</li> <li>• For AWG cables 2 x (18 ... 14)</li> </ul>		<ul style="list-style-type: none"> <li>--</li> <li>2 x (0.25 ... 1.5 mm<sup>2</sup>)</li> <li>2 x (0.25 ... 0.75 mm<sup>2</sup>)</li> <li>2 x (0.25 ... 1.5 mm<sup>2</sup>)</li> <li>2 x (24 ... 16)</li> </ul>		<ul style="list-style-type: none"> <li>--</li> <li>--</li> <li>--</li> <li>--</li> </ul>		
<b>Tightening torque</b> for screw terminals	Nm	0.8 ... 0.9		--			

Type	3SU1401-.....-1	3SU1401-.....-3	3SU1401-.....-5
Product version	<b>LED module</b>		
<b>Light source integrated in product</b>	Yes		
<b>Type of light source</b>	LED		
<b>Rated insulation voltage</b>	V	320	
<b>Pollution degree</b>	3		
<b>Rated impulse withstand voltage</b>	kV	4	
<b>Relative positive tolerance of the operational voltage</b>	%	20	
<b>Relative negative tolerance of the operational voltage</b>	%	20	
<b>Operating time typical</b>	h	100 000	
<b>Vibration resistance</b> acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g		
<b>Shock resistance</b> acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms		
<b>Environmental category during operation</b> according to IEC 60721	3M6, 3S2, 3B2, 3K6 (with a relative air humidity of 10 ... 95%, no condensation permitted in operation)		
<b>Ambient temperature</b>		<ul style="list-style-type: none"> <li>• During operation °C -25 ... +70</li> <li>• During storage °C -40 ... +80</li> </ul>	
<b>IP degree of protection of the terminal</b>	IP20		
<b>Type of electrical connection</b>	<b>Screw terminals</b> 	<b>Spring-type terminals</b> 	<b>Socket terminals (THT)</b> 

For further information in the Manual, see <https://support.industry.siemens.com/cs/ww/en/view/107542462>.

# 3SU1 22 mm, Round, Plastic, Black — Complete Units

## Pushbuttons

### Selection and ordering data

Supply voltage for light source at		Color	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*
AC	DC		Contact modules	NO contacts	NC contacts				
V	V					Article No.	Price per PU		

#### Pushbuttons

#### Pushbuttons with flat button, momentary contact



3SU1100-0AB40-1BA0

--	--	Black	1	1	0	▶	3SU1100-0AB10-1BA0	1	1 unit
			0	0	1	▶	3SU1100-0AB10-1CA0	1	1 unit
			1	1	1	▶	3SU1100-0AB10-1FA0	1	1 unit
		Red	1	1	0	▶	3SU1100-0AB20-1BA0	1	1 unit
			0	0	1	▶	3SU1100-0AB20-1CA0	1	1 unit
			1	1	1	▶	3SU1100-0AB20-1FA0	1	1 unit
		Yellow	1	1	0	3	3SU1100-0AB30-1BA0	1	1 unit
			1	1	1	3	3SU1100-0AB30-1FA0	1	1 unit
		Green	1	1	0	▶	3SU1100-0AB40-1BA0	1	1 unit
			1	1	1	▶	3SU1100-0AB40-1FA0	1	1 unit
		Blue	1	1	0	▶	3SU1100-0AB50-1BA0	1	1 unit
			1	1	1	3	3SU1100-0AB50-1FA0	1	1 unit
		White	1	1	0	▶	3SU1100-0AB60-1BA0	1	1 unit
			1	1	1	3	3SU1100-0AB60-1FA0	1	1 unit
		Clear	1	1	0	5	3SU1100-0AB70-1BA0	1	1 unit
			1	1	1	5	3SU1100-0AB70-1FA0	1	1 unit
		Gray	1	1	1	5	3SU1100-0AB80-1FA0	1	1 unit

#### Pushbuttons with raised button, momentary contact



3SU1100-0BB20-1CA0

--	--	Black	1	0	1	5	3SU1100-0BB10-1CA0	1	1 unit
			1	1	1	5	3SU1100-0BB10-1FA0	1	1 unit
		Red	1	0	1	5	3SU1100-0BB20-1CA0	1	1 unit
			1	1	1	5	3SU1100-0BB20-1FA0	1	1 unit
		Blue	1	1	0	5	3SU1100-0BB50-1BA0	1	1 unit

#### Illuminated pushbuttons with flat button, momentary contact with integrated LED



3SU1102-0AB40-1BA0

24	24	Red	1	1	0	5	3SU1102-0AB20-1BA0	1	1 unit
				0	1	▶	3SU1102-0AB20-1CA0	1	1 unit
				1	1	▶	3SU1102-0AB20-1FA0	1	1 unit
		Yellow	1	1	0	▶	3SU1102-0AB30-1BA0	1	1 unit
				1	1	3	3SU1102-0AB30-1FA0	1	1 unit
		Green	1	1	0	▶	3SU1102-0AB40-1BA0	1	1 unit
				1	1	▶	3SU1102-0AB40-1FA0	1	1 unit
		Blue	1	1	0	▶	3SU1102-0AB50-1BA0	1	1 unit
				1	1	3	3SU1102-0AB50-1FA0	1	1 unit
		White	1	1	0	▶	3SU1102-0AB60-1BA0	1	1 unit
				1	1	▶	3SU1102-0AB60-1FA0	1	1 unit
		Clear	1	1	0	▶	3SU1102-0AB70-1BA0	1	1 unit
				1	1	3	3SU1102-0AB70-1FA0	1	1 unit



3SU1103-0AB20-1CA0

110	--	Red	1	0	1	5	3SU1103-0AB20-1CA0	1	1 unit
				1	1	3	3SU1103-0AB20-1FA0	1	1 unit
		Yellow	1	1	0	5	3SU1103-0AB30-1BA0	1	1 unit
				1	1	5	3SU1103-0AB30-1FA0	1	1 unit
		Green	1	1	0	3	3SU1103-0AB40-1BA0	1	1 unit
				1	1	3	3SU1103-0AB40-1FA0	1	1 unit
		Blue	1	1	0	5	3SU1103-0AB50-1BA0	1	1 unit
				1	1	5	3SU1103-0AB50-1FA0	1	1 unit
		White	1	1	0	5	3SU1103-0AB60-1BA0	1	1 unit
				1	1	5	3SU1103-0AB60-1FA0	1	1 unit
		Clear	1	1	0	5	3SU1103-0AB70-1BA0	1	1 unit
				1	1	5	3SU1103-0AB70-1FA0	1	1 unit



# 3SU1 22 mm, Round, Plastic, Black — Complete Units

## Pushbuttons

Supply voltage for light source		Color	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*
At AC	At DC		Contact modules	NO contacts	NC contacts				
V	V					d	Article No.	Price per PU	

### Pushbuttons

#### Illuminated pushbuttons with flat button, momentary contact With integrated LED



3SU1106-0AB40-1BA0

230	--	Red	1	0	1	5	3SU1106-0AB20-1CA0	1	1 unit
			1	1	1	3	3SU1106-0AB20-1FA0	1	1 unit
		Yellow	1	1	0	5	3SU1106-0AB30-1BA0	1	1 unit
			1	1	1	5	3SU1106-0AB30-1FA0	1	1 unit
		Green	1	1	0	3	3SU1106-0AB40-1BA0	1	1 unit
			1	1	1	3	3SU1106-0AB40-1FA0	1	1 unit
		Blue	1	1	0	5	3SU1106-0AB50-1BA0	1	1 unit
			1	1	1	5	3SU1106-0AB50-1FA0	1	1 unit
		White	1	1	0	5	3SU1106-0AB60-1BA0	1	1 unit
			1	1	1	5	3SU1106-0AB60-1FA0	1	1 unit
		Clear	1	1	0	5	3SU1106-0AB70-1BA0	1	1 unit
			1	1	1	5	3SU1106-0AB70-1FA0	1	1 unit

#### Spring-type terminals

#### Pushbuttons with flat button, momentary contact



3SU1100-0AB30-3BA0

--	--	Black	1	1	0	3	3SU1100-0AB10-3BA0	1	1 unit
			1	0	1	5	3SU1100-0AB10-3CA0	1	1 unit
			1	1	1	5	3SU1100-0AB10-3FA0	1	1 unit
		Red	1	0	1	5	3SU1100-0AB20-3CA0	1	1 unit
			1	1	1	5	3SU1100-0AB20-3FA0	1	1 unit
		Yellow	1	1	0	5	3SU1100-0AB30-3BA0	1	1 unit
			1	1	1	5	3SU1100-0AB30-3FA0	1	1 unit
		Green	1	1	0	5	3SU1100-0AB40-3BA0	1	1 unit
			1	1	1	5	3SU1100-0AB40-3FA0	1	1 unit
		Blue	1	1	0	5	3SU1100-0AB50-3BA0	1	1 unit
			1	1	1	5	3SU1100-0AB50-3FA0	1	1 unit
		White	1	1	0	5	3SU1100-0AB60-3BA0	1	1 unit
			1	1	1	5	3SU1100-0AB60-3FA0	1	1 unit

#### Illuminated pushbuttons with flat button, momentary contact with integrated LED



3SU1102-0AB20-3BA0

24	24	Red	1	0	1	5	3SU1102-0AB20-3CA0	1	1 unit
			1	1	1	5	3SU1102-0AB20-3FA0	1	1 unit
		Yellow	1	1	0	5	3SU1102-0AB30-3BA0	1	1 unit
			1	1	1	5	3SU1102-0AB30-3FA0	1	1 unit
		Green	1	1	0	3	3SU1102-0AB40-3BA0	1	1 unit
			1	1	1	5	3SU1102-0AB40-3FA0	1	1 unit
		Blue	1	1	0	5	3SU1102-0AB50-3BA0	1	1 unit
			1	1	1	5	3SU1102-0AB50-3FA0	1	1 unit
		White	1	1	0	3	3SU1102-0AB60-3BA0	1	1 unit
			1	1	1	5	3SU1102-0AB60-3FA0	1	1 unit
		Clear	1	1	0	5	3SU1102-0AB70-3BA0	1	1 unit
			1	1	1	5	3SU1102-0AB70-3FA0	1	1 unit
110	--	Red	1	0	1	5	3SU1103-0AB20-3CA0	1	1 unit
			1	1	1	5	3SU1103-0AB20-3FA0	1	1 unit
		Yellow	1	1	1	5	3SU1103-0AB30-3FA0	1	1 unit
			Green	1	1	0	5	3SU1103-0AB40-3BA0	1
1	1	1		5	3SU1103-0AB40-3FA0	1	1 unit		
		Blue	1	1	1	5	3SU1103-0AB50-3FA0	1	1 unit
			White	1	1	0	5	3SU1103-0AB60-3BA0	1
1	1	1		5	3SU1103-0AB60-3FA0	1	1 unit		
		Clear	1	1	0	5	3SU1103-0AB70-3BA0	1	1 unit
			1	1	1	5	3SU1103-0AB70-3FA0	1	1 unit
230	--	Red	1	0	1	5	3SU1106-0AB20-3CA0	1	1 unit
			1	1	1	5	3SU1106-0AB20-3FA0	1	1 unit
		Yellow	1	1	1	5	3SU1106-0AB30-3FA0	1	1 unit
			Green	1	1	0	5	3SU1106-0AB40-3BA0	1
1	1	1		5	3SU1106-0AB40-3FA0	1	1 unit		
		Blue	1	1	1	5	3SU1106-0AB50-3FA0	1	1 unit
			White	1	1	0	5	3SU1106-0AB60-3BA0	1
1	1	1		5	3SU1106-0AB60-3FA0	1	1 unit		
		Clear	1	1	0	5	3SU1106-0AB70-3BA0	1	1 unit
			1	1	1	5	3SU1106-0AB70-3FA0	1	1 unit

# 3SU1 22 mm, Round, Plastic, Black — Complete Units

## Mushroom pushbuttons / EMERGENCY STOP mushroom pushbuttons

### Selection and ordering data

Unlatching method	Number of Contact modules	NO contacts	NC contacts	SD	Screw terminals	PU (UNIT, SET, M)	PS*

#### Mushroom pushbuttons

##### With red mushroom, diameter 40 mm, latching



3SU1100-1BA20-3CA0

Pull to unlatch	1	0	1	3	3SU1100-1BA20-1CA0 3SU1100-1BA20-1FA0	1	1 unit
		1	1	3			1
						Spring-type terminals	
Pull to unlatch	1	0	1	5	3SU1100-1BA20-3CA0 3SU1100-1BA20-3FA0	1	1 unit
		1	1	5			1

### Selection and ordering data

Unlatching method	Number of Contact modules	NO contacts	NC contacts	Marking	SD	Screw terminals	PU (UNIT, SET, M)	PS*

#### EMERGENCY STOP mushroom pushbuttons, tamper-proof, in accordance with ISO 13850 and IEC 60947-5-5

##### With red mushroom, diameter 40 mm, with positive latching



3SU1100-1HA20-1CH0

Pull to unlatch	1	0	1	NOT-HALT	⊖ 5	3SU1100-1HA20-1CH0 3SU1100-1HA20-1FG0 3SU1100-1HA20-1FH0	1	1 unit	
		1	1	EMERGENCY STOP	⊖ 5			1	1 unit
		1	1	NOT-HALT	⊖ 5			1	1 unit



3SU1100-1HB20-1CH0

Rotate to unlatch	1	0	1	None	⊖ 5	3SU1100-1HB20-1CF0 3SU1100-1HB20-1CG0	1	1 unit
		0	1	EMERGENCY STOP	⊖ 5			1
		0	1	NOT-HALT	⊖ 5	3SU1100-1HB20-1CH0 3SU1100-1HB20-1PG0	1	1 unit
		0	2	EMERGENCY STOP	⊖ 5			1
		0	2	EMERGENCY STOP	⊖ 5	3SU1100-1HB20-1PA0 3SU1100-1HB20-1FG0	1	1 unit
		1	1	EMERGENCY STOP	⊖ 5			1
		1	1	NOT-HALT	⊖ 5	3SU1100-1HB20-1FH0	1	1 unit
		1	1	NOT-HALT	⊖ 5			1



3SU1100-1HB20-3CH0

Rotate to unlatch	1	0	1	NOT-HALT	⊖ 5	3SU1100-1HB20-3CH0 3SU1100-1HB20-3FH0	1	1 unit
		1	1	NOT-HALT	⊖ 5			1


⊖ Positive opening according to IEC 60947-5-1, Annex K.  
Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System;  
see Section 13.

Certificate:

# 3SU1 22 mm, Round, Plastic, Black — Complete Units

## Selector switches

### Selection and ordering data

Operating principle	Color	Number of			SD	Screw terminals 	PU (UNIT, SET, M)	PS*
		Supply voltage for light source	Contact modules	NO contacts				
						Article No.	Price per PU	

#### Selector switches

#### Short black actuator, 2 switch positions, can be illuminated



3SU1100-2BF60-1BA0

Latching, 90° 	White	1	1	0	▶	<b>3SU1100-2BF60-1BA0</b>	1	1 unit
		2	1	1	▶	<b>3SU1100-2BF60-1MA0</b>	1	1 unit
	White 110 V	1	1	0	5	<b>3SU1103-2BF60-1BA0</b>	1	1 unit

#### Short black actuator, 3 switch positions, can be illuminated


Momentary contact, 2x45°, reset from left + right 	White	2	2	2	3	<b>3SU1100-2BM60-1LA0</b>	1	1 unit
				2	0	▶	<b>3SU1100-2BM60-1NA0</b>	1

Latching, 2x45° 	White	2	2	2	▶	<b>3SU1100-2BL60-1LA0</b>	1	1 unit
				2	0	▶	<b>3SU1100-2BL60-1NA0</b>	1

#### Short black actuator, 2 switch positions, can be illuminated



3SU1100-2BL60-1NA0

						Spring-type terminals 		
Latching, 90° 	White	1	1	0	5	<b>3SU1100-2BF60-3BA0</b>	1	1 unit
		2	1	1	5	<b>3SU1100-2BF60-3MA0</b>	1	1 unit

#### Short black actuator, 3 switch positions, can be illuminated


Momentary contact, 2x45°, reset from left + right 	White	2	2	2	5	<b>3SU1100-2BM60-3LA0</b>	1	1 unit
				2	0	5	<b>3SU1100-2BM60-3NA0</b>	1

Latching, 2x45° 	White	2	2	2	5	<b>3SU1100-2BL60-3LA0</b>	1	1 unit
				2	0	5	<b>3SU1100-2BL60-3NA0</b>	1

# 3SU1 22 mm, Round, Plastic, Black — Complete Units

## Key-operated switches

### Selection and ordering data

Operating principle	Switch position for key removal	Number of			Number of keys	SD	Screw terminals 	PU (UNIT, SET, M)	PS*
		Contact modules	NO contacts	NC contacts					
							Article No.	Price per PU	

### Key-operated switches

#### With RONIS lock, SB30, 2 switch positions



Latching, 90°  
(10:30/1:30 o'clock)



O+I 1 1 0 2 ▶  
1 1 1 2 ▶

3SU1100-4BF11-1BA0  
3SU1100-4BF11-1FA0

1 1 unit  
1 1 unit

#### With RONIS lock, SB30, 3 switch positions

3SU1100-4BF11-1BA0

Latching, 2x45°  
(10:30/1:30 o'clock)



I+O+II 2 2 0 2 5

3SU1100-4BL11-1NA0

1 1 unit

#### With RONIS lock, SB30, 2 switch positions



Latching, 90°  
(10:30/1:30 o'clock)



O+I 1 1 0 2 5  
1 1 1 2 5

#### Spring-type terminals

3SU1100-4BF11-3BA0  
3SU1100-4BF11-3FA0

1 1 unit  
1 1 unit

#### With CES lock, SSG10, 2 switch positions

3SU1100-4BL11-1NA0

Latching, 90°  
(10:30/1:30 o'clock)



O+I 1 1 1 2 5

3SU1100-5BF11-3FA0

1 1 unit

# 3SU1 22 mm, Round, Plastic, Black — Complete Units

## Coordinate switches

### Selection and ordering data

Number of NO contacts (1 per direction)	Operating principle	Direction of actuation	SD	Screw terminals	⊕	PU (UNIT, SET, M)	PS*
				Article No.	Price per PU		

#### Coordinate switches

##### Without mechanical interlock, 2 switch positions



3SU1100-7AC10-1NA0

2		Momentary contact	Horizontal	5	<b>3SU1100-7AC10-1NA0</b>	1	1 unit
			Vertical	5	<b>3SU1100-7AD10-1NA0</b>	1	1 unit
	<b>NEW</b>	Latching	Horizontal	5	<b>3SU1100-7AA10-1NA0</b>	1	1 unit
			Vertical	5	<b>3SU1100-7AB10-1NA0</b>	1	1 unit

##### Without mechanical interlock, 4 switch positions



3SU1100-7AF10-1QA0

4		Momentary contact	Horizontal/Vertical	3	<b>3SU1100-7AF10-1QA0</b>	1	1 unit
		Latching	Horizontal/Vertical	5	<b>3SU1100-7AE10-1QA0</b>	1	1 unit

##### With mechanical interlock, 2 switch positions



3SU1100-7BA10-1NA0

2		Momentary contact	Horizontal	5	<b>3SU1100-7BC10-1NA0</b>	1	1 unit
			Vertical	5	<b>3SU1100-7BD10-1NA0</b>	1	1 unit
	<b>NEW</b>	Latching	Horizontal	5	<b>3SU1100-7BA10-1NA0</b>	1	1 unit
			Vertical	5	<b>3SU1100-7BB10-1NA0</b>	1	1 unit

##### With mechanical interlock, 4 switch positions



3SU1100-7BF10-1QA0

4		Momentary contact	Horizontal/Vertical	5	<b>3SU1100-7BF10-1QA0</b>	1	1 unit
		Latching	Horizontal/Vertical	5	<b>3SU1100-7BE10-1QA0</b>	1	1 unit

# 3SU1 22 mm, Round, Plastic, Black — Complete Units

## Indicator lights

### Selection and ordering data

Operational voltage		Color of actuating element	Color of light source	SD	Screw terminals	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value						
V	V			d	Article No.	Price per PU	

#### Indicator lights

#### With smooth lens and integrated LED

	24	24	Red	Red	▶	3SU1102-6AA20-1AA0	1	1 unit
			Yellow	Yellow	▶	3SU1102-6AA30-1AA0	1	1 unit
			Green	Green	▶	3SU1102-6AA40-1AA0	1	1 unit
			Blue	Blue	▶	3SU1102-6AA50-1AA0	1	1 unit
			White	White	▶	3SU1102-6AA60-1AA0	1	1 unit
			Clear	White	▶	3SU1102-6AA70-1AA0	1	1 unit
	110	--	Amber	Amber	5	3SU1103-6AA00-1AA0	1	1 unit
			Red	Red	▶	3SU1103-6AA20-1AA0	1	1 unit
			Yellow	Yellow	▶	3SU1103-6AA30-1AA0	1	1 unit
			Green	Green	▶	3SU1103-6AA40-1AA0	1	1 unit
			Blue	Blue	3	3SU1103-6AA50-1AA0	1	1 unit
			White	White	▶	3SU1103-6AA60-1AA0	1	1 unit
			Clear	White	3	3SU1103-6AA70-1AA0	1	1 unit
	230	--	Amber	Amber	5	3SU1106-6AA00-1AA0	1	1 unit
			Red	Red	▶	3SU1106-6AA20-1AA0	1	1 unit
			Yellow	Yellow	▶	3SU1106-6AA30-1AA0	1	1 unit
			Green	Green	▶	3SU1106-6AA40-1AA0	1	1 unit
			Blue	Blue	3	3SU1106-6AA50-1AA0	1	1 unit
			White	White	▶	3SU1106-6AA60-1AA0	1	1 unit
			Clear	White	3	3SU1106-6AA70-1AA0	1	1 unit
	24	24	Red	Red	3	3SU1102-6AA20-3AA0	1	1 unit
			Yellow	Yellow	5	3SU1102-6AA30-3AA0	1	1 unit
			Green	Green	3	3SU1102-6AA40-3AA0	1	1 unit
			Blue	Blue	5	3SU1102-6AA50-3AA0	1	1 unit
			White	White	3	3SU1102-6AA60-3AA0	1	1 unit
			Clear	White	5	3SU1102-6AA70-3AA0	1	1 unit
	110	--	Red	Red	5	3SU1103-6AA20-3AA0	1	1 unit
			Yellow	Yellow	5	3SU1103-6AA30-3AA0	1	1 unit
			Green	Green	5	3SU1103-6AA40-3AA0	1	1 unit
			Blue	Blue	5	3SU1103-6AA50-3AA0	1	1 unit
			White	White	5	3SU1103-6AA60-3AA0	1	1 unit
			Clear	White	5	3SU1103-6AA70-3AA0	1	1 unit
				230	--	Red	Red	5
Yellow	Yellow	5				3SU1106-6AA30-3AA0	1	1 unit
Green	Green	5				3SU1106-6AA40-3AA0	1	1 unit
Blue	Blue	5				3SU1106-6AA50-3AA0	1	1 unit
White	White	5				3SU1106-6AA60-3AA0	1	1 unit
Clear	White	5				3SU1106-6AA70-3AA0	1	1 unit

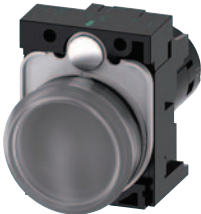
# 3SU1 22 mm, Round, Plastic, Black — Compact Units

## Sensor switches / Potentiometers

### Selection and ordering data

Operational voltage		Color of actuating element	Color of light source	SD	Screw terminals	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value						
V	V			d	Article No.	Price per PU	

#### Indicator lights with "traffic light" LED **NEW**



3SU1201-6AG24-1AA0

6 ... 24	6 ... 24	Clear	Red/Yellow/Green	▶	<b>3SU1201-6AG24-1AA0</b>	1	1 unit
110	--	Clear	Red/Yellow/Green	▶	<b>3SU1201-6AC24-1AA0</b>	1	1 unit
230	--	Clear	Red/Yellow/Green	▶	<b>3SU1201-6AF24-1AA0</b>	1	1 unit

### Selection and ordering data

Operational voltage		Volume level	SD	Screw terminals	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value					
V	V	dB	d	Article No.	Price per PU	

#### Acoustic signaling devices **NEW**



3SU1200-6KB10-1AA0

24	24	90	5	▶	<b>3SU1200-6KB10-1AA0</b>	1	1 unit
110	110	90	5	▶	<b>3SU1200-6KC10-1AA0</b>	1	1 unit
230	230	90	5	▶	<b>3SU1200-6KF10-1AA0</b>	1	1 unit

### Selection and ordering data

Operating principle	Number of NO contacts	Number of NC contacts	Color	SD	M12 connector, 4-pole	PU (UNIT, SET, M)	PS*

#### Sensor switches



3SU1200-1SK10-2SA0

Whether integrated in the two-hand operation console or installed as a door opening contact, the capacitive sensor switch is suitable for many different applications in industrial environments.

The switch is actuated by simple contact with the hand or other part of the body (i.e. without the application of pressure). As a result, these switches are rugged, extremely durable and have the highest possible degree of protection IP66, IP67, IP69 (IP69K).

Without pressure	1	0	Black	▶	<b>3SU1200-1SK10-2SA0</b>	1	1 unit
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Optional accessories:

- "Protection for sensor switches", [see page 13/130](#).
- "Connectors for sensor switches, angled socket with screw terminal connection", [see page 13/138](#).

# 3SU1 22 mm, Round, Plastic, Black — Compact Units




## Pushbuttons with extended stroke

### Selection and ordering data


Version of actuating element	Operating principle	Adjustable resistance	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		kΩ	d	Article No.	Price per PU	
<b>Potentiometers</b>						
 <p>3SU1200-2PQ10-1AA0</p>	Rotary knob	Stepless	▶	1	3SU1200-2PQ10-1AA0	1 1 unit
				2.2	3SU1200-2PW10-1AA0	1 1 unit
				4.7	3SU1200-2PR10-1AA0	1 1 unit
				10	3SU1200-2PS10-1AA0	1 1 unit
				47	3SU1200-2PT10-1AA0	1 1 unit
				100	3SU1200-2PU10-1AA0	1 1 unit
				470	3SU1200-2PV10-1AA0	1 1 unit

Labeling plates for potentiometers, see 13/126.

### Selection and ordering data

Version	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
<b>Pushbuttons with extended stroke</b>						
 <p>3SU1200-0EB20-0AA0</p>	For actuating relays, can only be combined with extension plunger, no contact module or LED module required					
	<b>Pushbuttons with flat button</b>	Red Green	5 5	3SU1200-0EB20-0AA0 3SU1200-0EB40-0AA0		1 1 unit 1 1 unit
 <p>3SU1200-0FB10-0AA0</p>	<b>Pushbuttons with raised button</b>	Black Red	▶ 5	3SU1200-0FB10-0AA0 3SU1200-0FB20-0AA0		1 1 unit 1 1 unit
	<b>Mechanical reset kit - complete</b>			3SU1200-0KB10-0AA0		
 <p>3SU1201-0EB70-0AA0</p>	<b>Pushbuttons with flat transparent button for insertion of insert labels</b>	Red Clear	▶ ▶	3SU1201-0EB20-0AA0 3SU1201-0EB70-0AA0		1 1 unit 1 1 unit

Version	Material	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				

<b>Accessories</b>							
 <p>3SU1900-0KG10-0AA0</p>	<b>Extension plungers</b>	Plastic	Gray	▶	3SU1900-0KG10-0AA0	1 1 unit	
	For compensation of the distance between the pushbutton and the unlatching button of an overload relay						



# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Pushbuttons

### Selection and ordering data

Version of actuating element	Operating principle	Color, marking	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Front ring version	Unlatching method		d				
<b>Pushbuttons</b>							
 3SU1000-0AB20-0AD0	<b>Pushbuttons with flat button</b> Standard	Momentary contact		Black	▶	3SU1000-0AB10-0AA0	1 1 unit
				Black, "O"	▶	3SU1000-0AB10-0AD0	1 1 unit
				Red	▶	3SU1000-0AB20-0AA0	1 1 unit
				Red, "O"	▶	3SU1000-0AB20-0AD0	1 1 unit
				Yellow	▶	3SU1000-0AB30-0AA0	1 1 unit
				Green	▶	3SU1000-0AB40-0AA0	1 1 unit
				Green, "I"	▶	3SU1000-0AB40-0AC0	1 1 unit
				Blue	▶	3SU1000-0AB50-0AA0	1 1 unit
				Blue, "R"	5	3SU1000-0AB50-0AR0	1 1 unit
				White	▶	3SU1000-0AB60-0AA0	1 1 unit
				White, "I"	▶	3SU1000-0AB60-0AC0	1 1 unit
				Clear	▶	3SU1000-0AB70-0AA0	1 1 unit
				Gray	▶	3SU1000-0AB80-0AA0	1 1 unit
		 3SU1000-0AA30-0AA0	<b>Pushbuttons with latching button</b> Push to unlatch	Latching		Black	▶
				Red	▶	3SU1000-0AA20-0AA0	1 1 unit
				Yellow	3	3SU1000-0AA30-0AA0	1 1 unit
				Green	▶	3SU1000-0AA40-0AA0	1 1 unit
				Blue	▶	3SU1000-0AA50-0AA0	1 1 unit
				White	▶	3SU1000-0AA60-0AA0	1 1 unit
 3SU1000-0BB30-0AA0	<b>Pushbuttons with raised button</b> Standard	Momentary contact		Black	▶	3SU1000-0BB10-0AA0	1 1 unit
				Red	▶	3SU1000-0BB20-0AA0	1 1 unit
				Yellow	5	3SU1000-0BB30-0AA0	1 1 unit
				Green	▶	3SU1000-0BB40-0AA0	1 1 unit
				Blue	▶	3SU1000-0BB50-0AA0	1 1 unit
				White	▶	3SU1000-0BB60-0AA0	1 1 unit
 3SU1000-0CB40-0AA0	<b>Pushbuttons with raised button</b> Raised	Momentary contact		Black	3	3SU1000-0CB10-0AA0	1 1 unit
				Red	5	3SU1000-0CB20-0AA0	1 1 unit
				Yellow	5	3SU1000-0CB30-0AA0	1 1 unit
				Green	5	3SU1000-0CB40-0AA0	1 1 unit
				Blue	5	3SU1000-0CB50-0AA0	1 1 unit
				White	5	3SU1000-0CB60-0AA0	1 1 unit
 3SU1000-0DB50-0AA0	<b>Pushbuttons with raised button</b> Raised, castellated	Momentary contact		Black	3	3SU1000-0DB10-0AA0	1 1 unit
				Red	5	3SU1000-0DB20-0AA0	1 1 unit
				Yellow	5	3SU1000-0DB30-0AA0	1 1 unit
				Green	5	3SU1000-0DB40-0AA0	1 1 unit
				Blue	5	3SU1000-0DB50-0AA0	1 1 unit
				White	5	3SU1000-0DB60-0AA0	1 1 unit

# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements





## Pushbuttons

Version of actuating element Front ring version	Operating principle Unlatching method	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Pushbuttons</b>							
 3SU1001-0AB40-0AA0	<b>Illuminated pushbuttons with flat button</b> Standard	Momentary contact	Amber	5	3SU1001-0AB00-0AA0		1 1 unit
			Red	▶	3SU1001-0AB20-0AA0		1 1 unit
			Yellow	▶	3SU1001-0AB30-0AA0		1 1 unit
			Green	▶	3SU1001-0AB40-0AA0		1 1 unit
			Blue	▶	3SU1001-0AB50-0AA0		1 1 unit
			White	▶	3SU1001-0AB60-0AA0		1 1 unit
			Clear	▶	3SU1001-0AB70-0AA0		1 1 unit
			Latching	Red	▶	3SU1001-0AA20-0AA0	
	Push to unlatch	Yellow	▶	3SU1001-0AA30-0AA0		1 1 unit	
		Green	▶	3SU1001-0AA40-0AA0		1 1 unit	
		Blue	▶	3SU1001-0AA50-0AA0		1 1 unit	
		White	▶	3SU1001-0AA60-0AA0		1 1 unit	
		Clear	▶	3SU1001-0AA70-0AA0		1 1 unit	
 3SU1001-0AA20-0AA0	<b>Illuminated pushbuttons with raised button</b> Standard	Momentary contact	Red	▶	3SU1001-0BB20-0AA0		1 1 unit
			Yellow	▶	3SU1001-0BB30-0AA0		1 1 unit
			Green	▶	3SU1001-0BB40-0AA0		1 1 unit
			Blue	▶	3SU1001-0BB50-0AA0		1 1 unit
			Clear	3	3SU1001-0BB70-0AA0		1 1 unit
		 3SU1001-0BB70-0AA0	<b>Illuminated pushbuttons with flat button</b> Raised, castellated	Momentary contact	Blue	5	3SU1001-0DB50-0AA0
 3SU1000-0HC10-0AA0	<b>Stop pushbuttons</b> Standard	Momentary contact, latching by pressing in and turning to the right, rotate-to-unlatch to the left	Black	3	3SU1000-0HC10-0AA0		1 1 unit
			Red	3	3SU1000-0HC20-0AA0		1 1 unit

# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Twin pushbuttons

### Selection and ordering data

Version of actuating element	Operating principle	Color	Marking Symbol No.	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*		
<b>Twin pushbuttons</b>										
 <p>3SU1000-3AB66-0AL0</p>	Twin pushbuttons flat, flat	Momentary contact	Green/Red	--	3	3SU1000-3AB42-0AA0	1	1 unit		
			White/Black	"I"/"O"	▶	3SU1000-3AB42-0AK0			1	1 unit
			White/Black	--	▶	3SU1000-3AB61-0AA0			1	1 unit
			White/Black	"I"/"O"	▶	3SU1000-3AB61-0AK0			1	1 unit
			White/White	--	3	3SU1000-3AB66-0AA0			1	1 unit
			"-"/"+"	5	3SU1000-3AB66-0AL0	1			1 unit	
			Arrows, hor.	5	3SU1000-3AB66-0AM0	1			1 unit	
			Arrows, vert.	5	3SU1000-3AB66-0AN0	1			1 unit	
			Black/Black	--	3	3SU1000-3AB11-0AA0			1	1 unit
			○	3	3SU1000-3AB11-0AQ0	1			1 unit	
			5264/5265 (IEC 60417)							
 <p>3SU1000-3BB42-0AK0</p>	Twin pushbuttons flat, raised	Momentary contact	Green/Red	--	3	3SU1000-3BB42-0AA0	1	1 unit		
			White/Black	"I"/"O"	▶	3SU1000-3BB42-0AK0			1	1 unit
			White/Black	--	▶	3SU1000-3BB61-0AA0			1	1 unit
			White/Black	"I"/"O"	5	3SU1000-3BB61-0AK0			1	1 unit
 <p>3SU1001-3AB42-0AN0</p>	Twin pushbuttons flat, flat, illuminated	Momentary contact	Green/Red	--	▶	3SU1001-3AB42-0AA0	1	1 unit		
			White/Black	"I"/"O"	▶	3SU1001-3AB42-0AK0			1	1 unit
			White/Black	Arrows, vert.	3	3SU1001-3AB42-0AN0			1	1 unit
			White/Black	--	▶	3SU1001-3AB61-0AA0			1	1 unit
			White/Black	"I"/"O"	▶	3SU1001-3AB61-0AK0			1	1 unit
			White/White	--	▶	3SU1001-3AB66-0AA0			1	1 unit
			"-"/"+"	5	3SU1001-3AB66-0AL0	1			1 unit	
			Arrows, vert.	5	3SU1001-3AB66-0AN0	1			1 unit	
			Symbols	5	3SU1001-3AB66-0AP0	1			1 unit	
			"Circular saw blade"/ "Tilt tipper"							
 <p>3SU1001-3BB61-0AK0</p>	Twin pushbuttons flat, raised, illuminated	Momentary contact	Green/Red	--	3	3SU1001-3BB42-0AA0	1	1 unit		
			White/Black	"I"/"O"	▶	3SU1001-3BB42-0AK0			1	1 unit
			White/Black	--	▶	3SU1001-3BB61-0AA0			1	1 unit
			White/Black	"I"/"O"	3	3SU1001-3BB61-0AK0			1	1 unit

# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Mushroom pushbuttons

### Selection and ordering data

Version of actuating element	Operating principle Unlatching method	Color, marking	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Mushroom pushbuttons</b>							
 <p><b>Mushroom pushbuttons</b> 30 mm diameter, 2 positions</p> <p>3SU1000-1AD20-0AA0</p>	Momentary contact	Black	▶	3SU1000-1AD10-0AA0		1	1 unit
		Red	▶	3SU1000-1AD20-0AA0		1	1 unit
		Yellow	▶	3SU1000-1AD30-0AA0		1	1 unit
		Green	▶	3SU1000-1AD40-0AA0		1	1 unit
	Latching Pull to unlatch	Black	▶	3SU1000-1AA10-0AA0		1	1 unit
		Red	▶	3SU1000-1AA20-0AA0		1	1 unit
Yellow		5	3SU1000-1AA30-0AA0		1	1 unit	
 <p><b>Mushroom pushbuttons</b> 40 mm diameter, 2 positions</p> <p>3SU1000-1BD40-0AA0</p>	Momentary contact	Black	▶	3SU1000-1BD10-0AA0		1	1 unit
		Red	▶	3SU1000-1BD20-0AA0		1	1 unit
		Yellow	3	3SU1000-1BD30-0AA0		1	1 unit
		Green	▶	3SU1000-1BD40-0AA0		1	1 unit
	Latching Pull to unlatch	Black	▶	3SU1000-1BA10-0AA0		1	1 unit
		Red	▶	3SU1000-1BA20-0AA0		1	1 unit
Red "O"		▶	3SU1000-1BA20-0AD0		1	1 unit	
		Yellow	3	3SU1000-1BA30-0AA0		1	1 unit
		Green	5	3SU1000-1BA40-0AA0		1	1 unit
 <p><b>Mushroom pushbuttons</b> 60 mm diameter, 2 positions</p> <p>3SU1000-1CD10-0AA0</p>	Momentary contact	Black	3	3SU1000-1CD10-0AA0		1	1 unit
		Red	5	3SU1000-1CD20-0AA0		1	1 unit
		Yellow	5	3SU1000-1CD30-0AA0		1	1 unit
		Green	3	3SU1000-1CD40-0AA0		1	1 unit
	Latching Pull to unlatch	Black	5	3SU1000-1CA10-0AA0		1	1 unit
		Red	5	3SU1000-1CA20-0AA0		1	1 unit
 <p><b>Mushroom pushbuttons</b> 30 mm diameter, 2 positions, illuminated</p> <p>3SU1001-1AD30-0AA0</p>	Momentary contact	Red	5	3SU1001-1AD20-0AA0		1	1 unit
		Yellow	3	3SU1001-1AD30-0AA0		1	1 unit
		Green	3	3SU1001-1AD40-0AA0		1	1 unit
		Blue	5	3SU1001-1AD50-0AA0		1	1 unit
		White	3	3SU1001-1AD60-0AA0		1	1 unit
		Clear	5	3SU1001-1AD70-0AA0		1	1 unit
	Latching Pull to unlatch	Red	▶	3SU1001-1AA20-0AA0		1	1 unit
		Yellow	3	3SU1001-1AA30-0AA0		1	1 unit
		Green	5	3SU1001-1AA40-0AA0		1	1 unit
		Blue	3	3SU1001-1AA50-0AA0		1	1 unit
		Clear	5	3SU1001-1AA70-0AA0		1	1 unit
 <p><b>Mushroom pushbuttons</b> 40 mm diameter, 2 positions, illuminated</p> <p>3SU1001-1BA50-0AA0</p>	Momentary contact	Yellow	3	3SU1001-1BD30-0AA0		1	1 unit
		Green	3	3SU1001-1BD40-0AA0		1	1 unit
		White	3	3SU1001-1BD60-0AA0		1	1 unit
		Clear	3	3SU1001-1BD70-0AA0		1	1 unit
	Latching Pull to unlatch	Red	▶	3SU1001-1BA20-0AA0		1	1 unit
		Yellow	3	3SU1001-1BA30-0AA0		1	1 unit
		Green	5	3SU1001-1BA40-0AA0		1	1 unit
		Blue	3	3SU1001-1BA50-0AA0		1	1 unit
		Clear	5	3SU1001-1BA70-0AA0		1	1 unit
 <p><b>Mushroom pushbuttons</b> 40 mm diameter, 2 positions</p> <p>3SU1000-1HB10-0AA0</p>	With positive latching, tamper-proof Rotate to unlatch	Black	▶	3SU1000-1HB10-0AA0		1	1 unit
		Blue	3	3SU1000-1HB50-0AA0		1	1 unit

# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## EMERGENCY STOP mushroom pushbuttons

### Selection and ordering data

Version of actuating element	Outer diameter of mushroom mm	Make of lock	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5

#### With pull-to-unlatch mechanism

Tamper-proof,  
2 positions

40

--

Red



**3SU1000-1HA20-0AA0**

1

1 unit



3SU1000-1HA20-0AA0

#### With rotate-to-unlatch mechanism

Tamper-proof,  
2 positions

33.8

--

Red



**3SU1000-1GB20-0AA0**

1

1 unit



3SU1000-1GB20-0AA0

40

--

Red



**3SU1000-1HB20-0AA0**

1

1 unit



3SU1000-1HB20-0AA0

60

--

Red



**3SU1000-1JB20-0AA0**

1

1 unit



3SU1000-1JB20-0AA0

#### With rotate-to-unlatch mechanism, can be illuminated

Tamper-proof,  
2 positions

33.8

--

Red



**3SU1001-1GB20-0AA0**

1

1 unit

40

--

Red



**3SU1001-1HB20-0AA0**

1

1 unit

60

--

Red



**3SU1001-1JB20-0AA0**

1

1 unit



3SU1001-1HB20-0AA0

# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## EMERGENCY STOP mushroom pushbuttons

Version of actuating element	Outer diameter of mushroom mm	Make of lock	Color	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5

#### With key-operated release



3SU1000-1HF20-0AA0



3SU1000-1HK20-0AA0



3SU1000-1HQ20-0AA0



3SU1000-1HR20-0AA0

Tamper-proof, 2 positions	40	RONIS SB30	Red	2	▶	<b>3SU1000-1HF20-0AA0</b>		1	1 unit
		RONIS 455	Red	2	3	<b>3SU1000-1HG20-0AA0</b>		1	1 unit
		BKS S1	Red	2	▶	<b>3SU1000-1HK20-0AA0</b>		1	1 unit
		BKS E7	Red	0	3	<b>3SU1000-1HM20-0AA0</b>		1	1 unit
		BKS E9	Red	0	3	<b>3SU1000-1HN20-0AA0</b>		1	1 unit
		O.M.R. 73037	Red	2	▶	<b>3SU1000-1HQ20-0AA0</b>		1	1 unit
		CES SSG10	Red	2	▶	<b>3SU1000-1HR20-0AA0</b>		1	1 unit
		CES SSP9	Red	2	▶	<b>3SU1000-1HS20-0AA0</b>		1	1 unit
		CES SMS1	Red	2	3	<b>3SU1000-1HT20-0AA0</b>		1	1 unit

### Selection and ordering data

Number of switching positions	Number of command points	Color of actuating element	Operating principle of the actuating element	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Toggle switches



3SU1000-3EA10-0AA0

2	1	Black	Latching	3	<b>3SU1000-3EA10-0AA0</b>		1	1 unit
			Momentary contact, reset from above	3	<b>3SU1000-3EC10-0AA0</b>		1	1 unit

# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Selector switches

### Selection and ordering data

Version of actuating element	Operating principle	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Selector switches

#### 2 switch positions, can be illuminated

Selector, short black actuator

Momentary contact, 45° (10:30/12 o'clock), reset from center to left



- ▶ Black
- ▶ Red
- ▶ Yellow
- ▶ Green
- ▶ Blue
- ▶ White

- ▶ **3SU1002-2BC10-0AA0**
- ▶ **3SU1002-2BC20-0AA0**
- ▶ **3SU1002-2BC30-0AA0**
- ▶ **3SU1002-2BC40-0AA0**
- ▶ **3SU1002-2BC50-0AA0**
- ▶ **3SU1002-2BC60-0AA0**

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit



3SU1002-2BC40-0AA0



3SU1002-2BF30-0AA0



3SU1002-2CF20-0AA0



3SU1002-2AF20-0AA0

Latching, 90° (10:30/1:30 o'clock)



- ▶ Black
- ▶ Red
- ▶ Yellow
- ▶ Green
- ▶ Blue
- ▶ White

- ▶ **3SU1002-2BF10-0AA0**
- ▶ **3SU1002-2BF20-0AA0**
- ▶ **3SU1002-2BF30-0AA0**
- ▶ **3SU1002-2BF40-0AA0**
- ▶ **3SU1002-2BF50-0AA0**
- ▶ **3SU1002-2BF60-0AA0**

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit

Selector, long black actuator

Latching, 90° (10:30/1:30 o'clock)



- 3 Black
- 3 Red
- 3 White

- ▶ **3SU1002-2CF10-0AA0**
- ▶ **3SU1002-2CF20-0AA0**
- ▶ **3SU1002-2CF60-0AA0**

- 1 1 unit
- 1 1 unit
- 1 1 unit

Rotary knob

Latching, 90° (10:30/1:30 o'clock)



- 3 Red
- ▶ White

- ▶ **3SU1002-2AF20-0AA0**
- ▶ **3SU1002-2AF60-0AA0**

- 1 1 unit
- 1 1 unit



# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Selector switches

Version of actuating element	Operating principle	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Selector switches

#### 3 switch positions, can be illuminated



3SU1002-2BM20-0AA0

Selector, short black actuator

Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right



- Black ▶ 3SU1002-2BM10-0AA0
- Red ▶ 3SU1002-2BM20-0AA0
- Yellow ▶ 3SU1002-2BM30-0AA0
- Green ▶ 3SU1002-2BM40-0AA0
- Blue ▶ 3SU1002-2BM50-0AA0
- White ▶ 3SU1002-2BM60-0AA0

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit



3SU1002-2BL60-0AA0

Latching, 2x45° (10:30/12/1:30 o'clock)



- Black ▶ 3SU1002-2BL10-0AA0
- Red ▶ 3SU1002-2BL20-0AA0
- Yellow ▶ 3SU1002-2BL30-0AA0
- Green ▶ 3SU1002-2BL40-0AA0
- Blue ▶ 3SU1002-2BL50-0AA0
- White ▶ 3SU1002-2BL60-0AA0

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit



3SU1002-2BP50-0AA0

Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to the right



- Black ▶ 3SU1002-2BP10-0AA0
- Red 5 ▶ 3SU1002-2BP20-0AA0
- Yellow ▶ 3SU1002-2BP30-0AA0
- Green ▶ 3SU1002-2BP40-0AA0
- Blue ▶ 3SU1002-2BP50-0AA0
- White ▶ 3SU1002-2BP60-0AA0

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit



3SU1002-2BN30-0AA0

Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to the left



- Black ▶ 3SU1002-2BN10-0AA0
- Red ▶ 3SU1002-2BN20-0AA0
- Yellow ▶ 3SU1002-2BN30-0AA0
- Green ▶ 3SU1002-2BN40-0AA0
- Blue ▶ 3SU1002-2BN50-0AA0
- White ▶ 3SU1002-2BN60-0AA0

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit

#### 4 switch positions



3SU1000-2AS60-0AA0

Rotary knob

Latching, 4x90° (3/6/9/12 o'clock)



- White ▶ 3SU1000-2AS60-0AA0

- 1 1 unit



# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Key-operated switches

### Selection and ordering data

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Key-operated switches

#### 2 switch positions

Momentary contact, 45° (10:30/12 o'clock), reset from center to left



3SU1000-4JC01-0AA0

Latching, 90° (10:30/1:30 o'clock)



3SU1000-4BF11-0AA0



3SU1000-4GF11-0AA0



3SU1000-5BF11-0AA0



3SU1000-5PF11-0AA0

RONIS, SB30	O	2	▶	<b>3SU1000-4BC01-0AA0</b>	1	1 unit
RONIS, 455	O	2	5	<b>3SU1000-4CC01-0AA0</b>	1	1 unit
O.M.R. 73037, red	O	2	3	<b>3SU1000-4FC01-0AA0</b>	1	1 unit
O.M.R. 73038, light blue	O	2	3	<b>3SU1000-4GC01-0AA0</b>	1	1 unit
O.M.R. 73034, black	O	2	3	<b>3SU1000-4HC01-0AA0</b>	1	1 unit
O.M.R. 73033, yellow	O	2	3	<b>3SU1000-4JC01-0AA0</b>	1	1 unit
CES, SSG10	O	2	▶	<b>3SU1000-5BC01-0AA0</b>	1	1 unit
CES, LSG1		2	3	<b>3SU1000-5HC01-0AA0</b>	1	1 unit
BKS, S1	O	2	▶	<b>3SU1000-5PC01-0AA0</b>	1	1 unit
IKON, 360012K1	O	2	▶	<b>3SU1000-5XC01-0AA0</b>	1	1 unit
RONIS, SB30	O	2	▶	<b>3SU1000-4BF01-0AA0</b>	1	1 unit
	O+l	2	▶	<b>3SU1000-4BF11-0AA0</b>	1	1 unit
	l	2	▶	<b>3SU1000-4BF21-0AA0</b>	1	1 unit
RONIS, 455	O	2	3	<b>3SU1000-4CF01-0AA0</b>	1	1 unit
	O+l	2	3	<b>3SU1000-4CF11-0AA0</b>	1	1 unit
RONIS, 421	O+l	2	5	<b>3SU1000-4DF11-0AA0</b>	1	1 unit
O.M.R. 73037, red	O	2	3	<b>3SU1000-4FF01-0AA0</b>	1	1 unit
	O+l	2	3	<b>3SU1000-4FF11-0AA0</b>	1	1 unit
O.M.R. 73038, light blue	O	2	▶	<b>3SU1000-4GF01-0AA0</b>	1	1 unit
	O+l	2	3	<b>3SU1000-4GF11-0AA0</b>	1	1 unit
O.M.R. 73034, black	O	2	3	<b>3SU1000-4HF01-0AA0</b>	1	1 unit
	O+l	2	3	<b>3SU1000-4HF11-0AA0</b>	1	1 unit
	l	2	5	<b>3SU1000-4HF21-0AA0</b>	1	1 unit
O.M.R. 73033, yellow	O	2	3	<b>3SU1000-4JF01-0AA0</b>	1	1 unit
	O+l	2	3	<b>3SU1000-4JF11-0AA0</b>	1	1 unit
CES, SSG10	O	2	▶	<b>3SU1000-5BF01-0AA0</b>	1	1 unit
	O+l	2	▶	<b>3SU1000-5BF11-0AA0</b>	1	1 unit
	l	2	▶	<b>3SU1000-5BF21-0AA0</b>	1	1 unit
CES, LSG1	O	2	▶	<b>3SU1000-5HF01-0AA0</b>	1	1 unit
	O+l	2	▶	<b>3SU1000-5HF11-0AA0</b>	1	1 unit
BKS, S1	O	2	▶	<b>3SU1000-5PF01-0AA0</b>	1	1 unit
	O+l	2	▶	<b>3SU1000-5PF11-0AA0</b>	1	1 unit
	l	2	3	<b>3SU1000-5PF21-0AA0</b>	1	1 unit
BKS, E1	O	0	3	<b>3SU1000-5QF01-0AA0</b>	1	1 unit
	O+l	0	3	<b>3SU1000-5QF11-0AA0</b>	1	1 unit
BKS, E2	O	0	▶	<b>3SU1000-5RF01-0AA0</b>	1	1 unit
	O+l	0	3	<b>3SU1000-5RF11-0AA0</b>	1	1 unit
BKS, E7	O	0	▶	<b>3SU1000-5SF01-0AA0</b>	1	1 unit
	O+l	0	▶	<b>3SU1000-5SF11-0AA0</b>	1	1 unit
BKS, E9	O	0	▶	<b>3SU1000-5TF01-0AA0</b>	1	1 unit
	O+l	0	3	<b>3SU1000-5TF11-0AA0</b>	1	1 unit
IKON, 360012K1	O	2	▶	<b>3SU1000-5XF01-0AA0</b>	1	1 unit
	O+l	2	▶	<b>3SU1000-5XF11-0AA0</b>	1	1 unit

# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Key-operated switches

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Key-operated switches

#### 3 switch positions

Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right



3SU1000-4BM01-0AA0

Latching, 2x45° (10:30/12/1:30 o'clock)



3SU1000-4FL01-0AA0



3SU1000-5BL01-0AA0



3SU1000-5PL01-0AA0

RONIS, SB30	O	2	▶	<b>3SU1000-4BM01-0AA0</b>	1	1 unit
O.M.R. 73037, red	O	2	5	<b>3SU1000-4FM01-0AA0</b>	1	1 unit
O.M.R. 73034, black	O	2	5	<b>3SU1000-4HM01-0AA0</b>	1	1 unit
CES, SSG10	O	2	▶	<b>3SU1000-5BM01-0AA0</b>	1	1 unit
BKS, S1	O	2	3	<b>3SU1000-5PM01-0AA0</b>	1	1 unit
IKON, 360012K1	O	2	3	<b>3SU1000-5XM01-0AA0</b>	1	1 unit
RONIS, SB30	O	2	3	<b>3SU1000-4BL01-0AA0</b>	1	1 unit
	I+O+II	2	▶	<b>3SU1000-4BL11-0AA0</b>	1	1 unit
	I	2	5	<b>3SU1000-4BL21-0AA0</b>	1	1 unit
	II	2	3	<b>3SU1000-4BL31-0AA0</b>	1	1 unit
	I+II	2	3	<b>3SU1000-4BL41-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1000-4BL51-0AA0</b>	1	1 unit
RONIS, 455	O	2	5	<b>3SU1000-4CL01-0AA0</b>	1	1 unit
	I+O+II	2	3	<b>3SU1000-4CL11-0AA0</b>	1	1 unit
O.M.R. 73037, red	O	2	5	<b>3SU1000-4FL01-0AA0</b>	1	1 unit
	O+I	2	5	<b>3SU1000-4FL51-0AA0</b>	1	1 unit
O.M.R. 73038, light blue	O	2	3	<b>3SU1000-4GL01-0AA0</b>	1	1 unit
	I+O+II	2	3	<b>3SU1000-4GL11-0AA0</b>	1	1 unit
O.M.R. 73034, black	O	2	5	<b>3SU1000-4HL01-0AA0</b>	1	1 unit
	I+O+II	2	3	<b>3SU1000-4HL11-0AA0</b>	1	1 unit
O.M.R. 73033, yellow	I+O+II	2	5	<b>3SU1000-4JL11-0AA0</b>	1	1 unit
CES, SSG10	O	▶	<b>3SU1000-5BL01-0AA0</b>	1	1 unit	
	I+O+II	2	▶	<b>3SU1000-5BL11-0AA0</b>	1	1 unit
	I	2	3	<b>3SU1000-5BL21-0AA0</b>	1	1 unit
	II	2	3	<b>3SU1000-5BL31-0AA0</b>	1	1 unit
	I+II	2	3	<b>3SU1000-5BL41-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1000-5BL51-0AA0</b>	1	1 unit
BKS, S1	O	2	3	<b>3SU1000-5PL01-0AA0</b>	1	1 unit
	I+O+II	2	3	<b>3SU1000-5PL11-0AA0</b>	1	1 unit
	I	2	3	<b>3SU1000-5PL21-0AA0</b>	1	1 unit
	II	2	3	<b>3SU1000-5PL31-0AA0</b>	1	1 unit
	I+II	2	3	<b>3SU1000-5PL41-0AA0</b>	1	1 unit
BKS, E2	I+O+II	0	5	<b>3SU1000-5RL11-0AA0</b>	1	1 unit
BKS, E9	I+O+II	0	3	<b>3SU1000-5TL11-0AA0</b>	1	1 unit
IKON, 360012K1	O	2	3	<b>3SU1000-5XL01-0AA0</b>	1	1 unit
	I+O+II	2	3	<b>3SU1000-5XL11-0AA0</b>	1	1 unit

# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Key-operated switches / ID key-operated switches

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Key-operated switches

#### 3 switch positions



3SU1000-4BP01-0AA0

Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to the right



RONIS, SB30	O	2	3	<b>3SU1000-4BP01-0AA0</b>	1	1 unit
	II	2	3	<b>3SU1000-4BP31-0AA0</b>	1	1 unit
	O+II	2	3	<b>3SU1000-4BP61-0AA0</b>	1	1 unit



3SU1000-5BP01-0AA0

CES, SSG10	O	2	3	<b>3SU1000-5BP01-0AA0</b>	1	1 unit
	II	2	5	<b>3SU1000-5BP31-0AA0</b>	1	1 unit
	O+II	2	3	<b>3SU1000-5BP61-0AA0</b>	1	1 unit
BKS, S1	O	2	3	<b>3SU1000-5PP01-0AA0</b>	1	1 unit



3SU1000-4GN01-0AA0

Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to the left



RONIS, SB30	O	2	3	<b>3SU1000-4BN01-0AA0</b>	1	1 unit
	I	2	3	<b>3SU1000-4BN21-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1000-4BN51-0AA0</b>	1	1 unit
O.M.R. 73038, light blue	O	2	5	<b>3SU1000-4GN01-0AA0</b>	1	1 unit
O.M.R. 73034, black	I	2	5	<b>3SU1000-4HN21-0AA0</b>	1	1 unit
CES, SSG10	O	2	3	<b>3SU1000-5BN01-0AA0</b>	1	1 unit
	I	2	3	<b>3SU1000-5BN21-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1000-5BN51-0AA0</b>	1	1 unit
BKS, S1	I	2	5	<b>3SU1000-5PN21-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1000-5PN51-0AA0</b>	1	1 unit
IKON, 360012K1	O+I	2	5	<b>3SU1000-5XN51-0AA0</b>	1	1 unit

### Selection and ordering data

Operating angle	Operating principle	Switch position for key removal	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### ID key-operated switches

#### 4 switch positions



3SU1000-4WS10-0AA0

45° Latching Key removal possible in all 4 positions Black

<b>3SU1000-4WS10-0AA0</b>	1	1 unit
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For available keys, see page 10/152

For electronic modules for ID key-operated switches, see page 10/115



# 3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

## Indicator lights

### Selection and ordering data

Product function Locking in zero position	Number of switching positions	Operating principle	Direction of actuation	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Coordinate switches</b>								
 3SU1000-7AA10-0AA0   3SU1000-7BA10-0AA0	No	2	Momentary contact	Horizontal Vertical	▶ <b>3SU1000-7AC10-0AA0</b> ▶ <b>3SU1000-7AD10-0AA0</b>		1	1 unit
			<b>NEW</b> Latching	Horizontal Vertical	▶ <b>3SU1000-7AA10-0AA0</b> ▶ <b>3SU1000-7AB10-0AA0</b>		1	1 unit
		4	Momentary contact	Horizontal/ Ver- tical	▶ <b>3SU1000-7AF10-0AA0</b>		1	1 unit
			<b>NEW</b> Latching	Horizontal/ Ver- tical	▶ <b>3SU1000-7AE10-0AA0</b>		1	1 unit
	Yes	2	Momentary contact	Horizontal Vertical	▶ <b>3SU1000-7BC10-0AA0</b> ▶ <b>3SU1000-7BD10-0AA0</b>		1	1 unit
			<b>NEW</b> Latching	Horizontal Vertical	▶ <b>3SU1000-7BA10-0AA0</b> ▶ <b>3SU1000-7BB10-0AA0</b>		1	1 unit
		4	Momentary contact	Horizontal/ Ver- tical	▶ <b>3SU1000-7BF10-0AA0</b>		1	1 unit
			<b>NEW</b> Latching	Horizontal/ Ver- tical	▶ <b>3SU1000-7BE10-0AA0</b>		1	1 unit

### Selection and ordering data

Type of product	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Indicator lights</b>							
 3SU1001-6AA40-0AA0	<b>With smooth lens</b>	3	Amber ▶ <b>3SU1001-6AA00-0AA0</b> ▶ <b>3SU1001-6AA20-0AA0</b> ▶ <b>3SU1001-6AA30-0AA0</b> ▶ <b>3SU1001-6AA40-0AA0</b> ▶ <b>3SU1001-6AA50-0AA0</b> ▶ <b>3SU1001-6AA60-0AA0</b> ▶ <b>3SU1001-6AA70-0AA0</b>		1	1 unit	
			Red	▶ <b>3SU1001-6AA20-0AA0</b>		1	1 unit
			Yellow	▶ <b>3SU1001-6AA30-0AA0</b>		1	1 unit
			Green	▶ <b>3SU1001-6AA40-0AA0</b>		1	1 unit
			Blue	▶ <b>3SU1001-6AA50-0AA0</b>		1	1 unit
			White	▶ <b>3SU1001-6AA60-0AA0</b>		1	1 unit
			Clear	▶ <b>3SU1001-6AA70-0AA0</b>		1	1 unit
	<b>Indicator lights in illuminated pushbutton design</b> <b>NEW</b>						
 3SU1001-0AD50-0AA0	--	3	Red ▶ <b>3SU1001-0AD20-0AA0</b> ▶ <b>3SU1001-0AD30-0AA0</b> ▶ <b>3SU1001-0AD40-0AA0</b> ▶ <b>3SU1001-0AD50-0AA0</b> ▶ <b>3SU1001-0AD70-0AA0</b>		1	1 unit	
			Yellow	▶ <b>3SU1001-0AD30-0AA0</b>		1	1 unit
			Green	▶ <b>3SU1001-0AD40-0AA0</b>		1	1 unit
			Blue	▶ <b>3SU1001-0AD50-0AA0</b>		1	1 unit
			Clear	▶ <b>3SU1001-0AD70-0AA0</b>		1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

## Pushbuttons

### Selection and ordering data

Supply voltage for light source		Color	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*
At AC	At DC		Contact modules	NO contacts	NC contacts				
V	V					Article No.	Price per PU		

#### Pushbuttons

#### Pushbuttons with flat button, momentary contact



3SU1130-0AB10-1BA0

--	--	Black	1	1	0	▶	3SU1130-0AB10-1BA0	1	1 unit
				0	1	3	3SU1130-0AB10-1CA0	1	1 unit
				1	1	▶	3SU1130-0AB10-1FA0	1	1 unit
		Red	1	1	0	5	3SU1130-0AB20-1BA0	1	1 unit
				0	1	▶	3SU1130-0AB20-1CA0	1	1 unit
				1	1	▶	3SU1130-0AB20-1FA0	1	1 unit
		Yellow	1	1	0	5	3SU1130-0AB30-1BA0	1	1 unit
				1	1	5	3SU1130-0AB30-1FA0	1	1 unit
		Green	1	1	0	▶	3SU1130-0AB40-1BA0	1	1 unit
				1	1	▶	3SU1130-0AB40-1FA0	1	1 unit
		Blue	1	1	0	3	3SU1130-0AB50-1BA0	1	1 unit
				1	1	5	3SU1130-0AB50-1FA0	1	1 unit
		White	1	1	0	3	3SU1130-0AB60-1BA0	1	1 unit
				1	1	5	3SU1130-0AB60-1FA0	1	1 unit

#### Pushbuttons with raised button, momentary contact



3SU1130-0BB20-1CA0

--	--	Red	1	0	1	5	3SU1130-0BB20-1CA0	1	1 unit
----	----	-----	---	---	---	---	--------------------	---	--------

#### Illuminated pushbuttons with flat button, momentary contact with integrated LED




3SU1132-0AB40-1BA0

24	24	Red	1	1	0	5	3SU1132-0AB20-1BA0	1	1 unit
				0	1	3	3SU1132-0AB20-1CA0	1	1 unit
				1	1	3	3SU1132-0AB20-1FA0	1	1 unit
		Yellow	1	1	0	3	3SU1132-0AB30-1BA0	1	1 unit
				1	1	5	3SU1132-0AB30-1FA0	1	1 unit
		Green	1	1	0	▶	3SU1132-0AB40-1BA0	1	1 unit
				1	1	3	3SU1132-0AB40-1FA0	1	1 unit
		Blue	1	1	0	3	3SU1132-0AB50-1BA0	1	1 unit
				1	1	5	3SU1132-0AB50-1FA0	1	1 unit
		White	1	1	0	▶	3SU1132-0AB60-1BA0	1	1 unit
				1	1	3	3SU1132-0AB60-1FA0	1	1 unit
		Clear	1	1	0	3	3SU1132-0AB70-1BA0	1	1 unit
				1	1	5	3SU1132-0AB70-1FA0	1	1 unit
110	--	Red	1	0	1	5	3SU1133-0AB20-1CA0	1	1 unit
				1	1	5	3SU1133-0AB20-1FA0	1	1 unit
		Yellow	1	1	0	5	3SU1133-0AB30-1BA0	1	1 unit
				1	1	5	3SU1133-0AB30-1FA0	1	1 unit
		Green	1	1	0	5	3SU1133-0AB40-1BA0	1	1 unit
				1	1	5	3SU1133-0AB40-1FA0	1	1 unit
		Blue	1	1	0	5	3SU1133-0AB50-1BA0	1	1 unit
				1	1	5	3SU1133-0AB50-1FA0	1	1 unit
		White	1	1	0	5	3SU1133-0AB60-1BA0	1	1 unit
				1	1	5	3SU1133-0AB60-1FA0	1	1 unit
		Clear	1	1	0	5	3SU1133-0AB70-1BA0	1	1 unit
				1	1	5	3SU1133-0AB70-1FA0	1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

## Actuators and Indicator

Supply voltage for light source		Color	Number of			SD	Screw terminals 	PU (UNIT, SET, M)	PS*
At AC	At DC		Contact modules	NO contacts	NC contacts				
V	V					Article No.	Price per PU		

### Pushbuttons

#### Illuminated pushbuttons with flat button, momentary contact with integrated LED



3SU1136-0AB40-1BA0

230	--	Red	1	0	1	5	3SU1136-0AB20-1CA0	1	1 unit
			1	1	1	5	3SU1136-0AB20-1FA0	1	1 unit
		Yellow	1	1	0	5	3SU1136-0AB30-1BA0	1	1 unit
			1	1	1	5	3SU1136-0AB30-1FA0	1	1 unit
		Green	1	1	0	5	3SU1136-0AB40-1BA0	1	1 unit
			1	1	1	5	3SU1136-0AB40-1FA0	1	1 unit
		Blue	1	1	0	5	3SU1136-0AB50-1BA0	1	1 unit
			1	1	1	5	3SU1136-0AB50-1FA0	1	1 unit
		White	1	1	0	5	3SU1136-0AB60-1BA0	1	1 unit
			1	1	1	5	3SU1136-0AB60-1FA0	1	1 unit
		Clear	1	1	0	5	3SU1136-0AB70-1BA0	1	1 unit
			1	1	1	5	3SU1136-0AB70-1FA0	1	1 unit

#### Spring-type terminals

#### Pushbuttons with flat button, momentary contact



3SU1130-0AB10-3BA0

--	--	Black	1	1	0	5	3SU1130-0AB10-3BA0	1	1 unit
			1	1	1	5	3SU1130-0AB10-3FA0	1	1 unit
		Red	1	0	1	5	3SU1130-0AB20-3CA0	1	1 unit
			1	1	0	5	3SU1130-0AB40-3BA0	1	1 unit
		White	1	1	1	5	3SU1130-0AB60-3FA0	1	1 unit

#### Illuminated pushbuttons with flat button, momentary contact



3SU1132-0AB30-3BA0

24	24	Red	1	0	1	5	3SU1132-0AB20-3CA0	1	1 unit
			1	1	1	5	3SU1132-0AB20-3FA0	1	1 unit
		Yellow	1	1	0	5	3SU1132-0AB30-3BA0	1	1 unit
			1	1	1	5	3SU1132-0AB30-3FA0	1	1 unit
		Green	1	1	0	5	3SU1132-0AB40-3BA0	1	1 unit
			1	1	1	5	3SU1132-0AB40-3FA0	1	1 unit
		Blue	1	1	0	5	3SU1132-0AB50-3BA0	1	1 unit
			1	1	1	5	3SU1132-0AB50-3FA0	1	1 unit
		White	1	1	0	5	3SU1132-0AB60-3BA0	1	1 unit
			1	1	1	5	3SU1132-0AB60-3FA0	1	1 unit
		Clear	1	1	0	5	3SU1132-0AB70-3BA0	1	1 unit
			1	1	1	5	3SU1132-0AB70-3FA0	1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

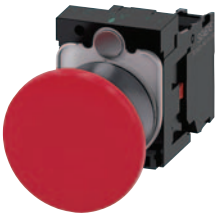
## Mushroom pushbuttons / EMERGENCY STOP mushroom pushbuttons

### Selection and ordering data

Unlatching method	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*
	Contact modules	NO contacts	NC contacts				
				d	Article No.	Price per PU	

#### Mushroom pushbuttons

##### With red mushroom, diameter 40 mm, latching



3SU1130-1BA20-1CA0

Pull to unlatch	1	0	1	5	3SU1130-1BA20-1CA0		1	1 unit
		1	1	5				

### Selection and ordering data

Unlatching method	Number of			Marking	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	Contact modules	NO con-tacts	NC con-tacts					
					d	Article No.	Price per PU	

#### EMERGENCY STOP mushroom pushbuttons, tamper-proof, in accordance with ISO 13850 and IEC 60947-5-5

##### With red mushroom, diameter 40 mm, with positive latching



3SU1100-1HA20-1CH0

Pull to unlatch	1	0	1	NOT-HALT	⊖	5	3SU1100-1HA20-1CH0	1	1 unit
		1	1	EMERGENCY STOP	⊖	5	3SU1100-1HA20-1FG0	1	1 unit
		1	1	NOT-HALT	⊖	5	3SU1100-1HA20-1FH0	1	1 unit



3SU1100-1HB20-1CH0

Rotate to unlatch	1	0	1	None	⊖	5	3SU1100-1HB20-1CF0	1	1 unit
		0	1	EMERGENCY STOP	⊖	5	3SU1100-1HB20-1CG0	1	1 unit
		0	1	NOT-HALT	⊖ ▶	5	3SU1100-1HB20-1CH0	1	1 unit
		0	2	EMERGENCY STOP	⊖	5	3SU1100-1HB20-1PG0	1	1 unit
		0	2	EMERGENCY STOP Less backing plate	⊖	5	3SU1100-1HB20-1PA0	1	1 unit
		1	1	EMERGENCY STOP	⊖	5	3SU1100-1HB20-1FG0	1	1 unit
		1	1	NOT-HALT	⊖ ▶	5	3SU1100-1HB20-1FH0	1	1 unit



3SU1100-1HB20-3CH0

							Spring-type terminals		
Rotate to unlatch	1	0	1	NOT-HALT	⊖	5	3SU1100-1HB20-3CH0	1	1 unit
		1	1	NOT-HALT	⊖	5	3SU1100-1HB20-3FH0	1	1 unit

⊖ Positive opening according to IEC 60947-5-1, Annex K. Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System; see Section 13.

Certificate:





# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

Coordinate switches, complete

## Selection and ordering data

Operating principle	Color	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*
		Contact modules	NO contacts	NC contacts				
						Article No.	Price per PU	

### Selector switches

#### Short black actuator, 2 switch positions, can be illuminated



Latching, 90°	White	1	1	0	▶	3SU1130-2BF60-1BA0 3SU1130-2BF60-1MA0	1	1 unit
			1	1	▶		1	1 unit

#### Short black actuator, 3 switch positions, can be illuminated

Momentary contact, 2x45°	White	2	2	2	5	3SU1130-2BM60-1LA0 3SU1130-2BM60-1NA0	1	1 unit
			2	0	3		1	1 unit

Latching, 2x45°	White	2	2	2	▶	3SU1130-2BL60-1LA0 3SU1130-2BL60-1NA0	1	1 unit
			2	0	▶		1	1 unit

#### Short black actuator, 2 switch positions, can be illuminated



						Spring-type terminals		
Latching, 90°	White	1	1	0	5	3SU1130-2BF60-3BA0 3SU1130-2BF60-3MA0	1	1 unit
			1	1	5		1	1 unit

#### Short black actuator, 3 switch positions, can be illuminated

Momentary contact, 2x45°	White	2	2	0	5	3SU1130-2BM60-3NA0	1	1 unit

Latching, 2x45°	White	2	2	2	5	3SU1130-2BL60-3LA0 3SU1130-2BL60-3NA0	1	1 unit
			2	0	5		1	1 unit



# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

Coordinate switches, complete

## Selection and ordering data

Operating principle	Switch position for key removal	Number of			Number of keys	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		Contact modules	NO contacts	NC contacts					
							Article No.	Price per PU	

### Key-operated switches

#### With RONIS lock, SB30, 2 switch positions



3SU1130-4BF11-1BA0

Latching, 90°  
(10:30/  
1:30 o'clock)



O+I	1	1	0	2	3
	1	1	2	3	

3SU1130-4BF11-1BA0	1	1 unit
3SU1130-4BF11-1FA0	1	1 unit

#### With RONIS lock, SB30, 3 switch positions



3SU1130-4BL11-1NA0

Latching, 2x45°  
(10:30/12/  
1:30 o'clock)



I+O+II	2	2	0	2	5
--------	---	---	---	---	---

3SU1130-4BL11-1NA0	1	1 unit
--------------------	---	--------

#### With RONIS lock, SB30, 2 switch positions



3SU1130-4BF11-3BA0

Latching, 90°  
(10:30/  
1:30 o'clock)



O+I	1	1	0	2	5
-----	---	---	---	---	---

Spring-type terminals		
3SU1130-4BF11-3BA0	1	1 unit

## Selection and ordering data

Number of NO contacts (1 per direction)	Operating principle	Direction of actuation	SD	Screw terminals	PU (UNIT, SET, M)	PS*

### Coordinate switches

#### Without mechanical interlock, 2 switch positions



3SU1130-7AE10-1QA0

2	Momentary contact	Horizontal	5	3SU1130-7AC10-1NA0	1	1 unit
		Vertical	5	3SU1130-7AD10-1NA0	1	1 unit
NEW	Latching	Horizontal	5	3SU1130-7AA10-1NA0	1	1 unit
		Vertical	5	3SU1130-7AB10-1NA0	1	1 unit

#### Without mechanical interlock, 4 switch positions

4	Momentary contact	Horizontal/Vertical	5	3SU1130-7AF10-1QA0	1	1 unit
		Latching	Horizontal/Vertical	5	3SU1130-7AE10-1QA0	1

#### With mechanical interlock, 2 switch positions

2	Momentary contact	Horizontal	5	3SU1130-7BC10-1NA0	1	1 unit
		Vertical	5	3SU1130-7BD10-1NA0	1	1 unit
NEW	Latching	Horizontal	5	3SU1130-7BA10-1NA0	1	1 unit
		Vertical	5	3SU1130-7BB10-1NA0	1	1 unit

#### With mechanical interlock, 4 switch positions

4	Momentary contact	Horizontal/Vertical	5	3SU1130-7BF10-1QA0	1	1 unit
		Latching	Horizontal/Vertical	5	3SU1130-7BE10-1QA0	1



3SU1130-7BE10-1QA0

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

## Indicator Lights – Complete Units

### Selection and ordering data

Operational voltage		Color		SD	Screw terminals	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value	of actuating element	of light source				
V	V			d	Article No.	Price per PU	

#### Indicator lights


#### With smooth lens and integrated LED

	24	24	Red	Red	▶	<b>3SU1102-6AA20-1AA0</b>	1	1 unit
			Yellow	Yellow	▶	<b>3SU1102-6AA30-1AA0</b>	1	1 unit
			Green	Green	▶	<b>3SU1102-6AA40-1AA0</b>	1	1 unit
			Blue	Blue	▶	<b>3SU1102-6AA50-1AA0</b>	1	1 unit
			White	White	▶	<b>3SU1102-6AA60-1AA0</b>	1	1 unit
			Clear	White	▶	<b>3SU1102-6AA70-1AA0</b>	1	1 unit
	110	--	Amber	Amber	5	<b>3SU1103-6AA00-1AA0</b>	1	1 unit
			Red	Red	▶	<b>3SU1103-6AA20-1AA0</b>	1	1 unit
			Yellow	Yellow	▶	<b>3SU1103-6AA30-1AA0</b>	1	1 unit
			Green	Green	▶	<b>3SU1103-6AA40-1AA0</b>	1	1 unit
			Blue	Blue	3	<b>3SU1103-6AA50-1AA0</b>	1	1 unit
			White	White	▶	<b>3SU1103-6AA60-1AA0</b>	1	1 unit
			Clear	White	3	<b>3SU1103-6AA70-1AA0</b>	1	1 unit
	230	--	Amber	Amber	5	<b>3SU1106-6AA00-1AA0</b>	1	1 unit
			Red	Red	▶	<b>3SU1106-6AA20-1AA0</b>	1	1 unit
			Yellow	Yellow	▶	<b>3SU1106-6AA30-1AA0</b>	1	1 unit
			Green	Green	▶	<b>3SU1106-6AA40-1AA0</b>	1	1 unit
			Blue	Blue	3	<b>3SU1106-6AA50-1AA0</b>	1	1 unit
			White	White	▶	<b>3SU1106-6AA60-1AA0</b>	1	1 unit
			Clear	White	3	<b>3SU1106-6AA70-1AA0</b>	1	1 unit
	24	24	Red	Red	3	<b>3SU1102-6AA20-3AA0</b>	1	1 unit
			Yellow	Yellow	5	<b>3SU1102-6AA30-3AA0</b>	1	1 unit
			Green	Green	3	<b>3SU1102-6AA40-3AA0</b>	1	1 unit
			Blue	Blue	5	<b>3SU1102-6AA50-3AA0</b>	1	1 unit
			White	White	3	<b>3SU1102-6AA60-3AA0</b>	1	1 unit
			Clear	White	5	<b>3SU1102-6AA70-3AA0</b>	1	1 unit
	110	--	Red	Red	5	<b>3SU1103-6AA20-3AA0</b>	1	1 unit
			Yellow	Yellow	5	<b>3SU1103-6AA30-3AA0</b>	1	1 unit
			Green	Green	5	<b>3SU1103-6AA40-3AA0</b>	1	1 unit
			Blue	Blue	5	<b>3SU1103-6AA50-3AA0</b>	1	1 unit
			White	White	5	<b>3SU1103-6AA60-3AA0</b>	1	1 unit
	230	--	Red	Red	5	<b>3SU1106-6AA20-3AA0</b>	1	1 unit
			Yellow	Yellow	5	<b>3SU1106-6AA30-3AA0</b>	1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Compact Units

## Sensor switches / potentiometers


### Selection and ordering data

Operational voltage		Color of actuating element	Color of light source	SD	Screw terminals 	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value						
V	V			d	Article No.	Price per PU	
<b>Indicator lights with "traffic light" LED <span style="color: red;">NEW</span></b>							
	6-24	6-24	Clear	Red/Yellow/Green	▶	<b>3SU1201-6AG24-1AA0</b>	1 1 unit
	110	--	Clear	Red/Yellow/Green	▶	<b>3SU1201-6AC24-1AA0</b>	1 1 unit
	230	--	Clear	Red/Yellow/Green	▶	<b>3SU1201-6AF24-1AA0</b>	1 1 unit



3SU1201-6AG24-1AA0

### Selection and ordering data

Operational voltage		Volume level	SD	Screw terminals 	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value					
V	V	dB	d	Article No.	Price per PU	
<b>Acoustic signaling devices <span style="color: red;">NEW</span></b>						
	24	24	90	5	<b>3SU1200-6KB10-1AA0</b>	1 1 unit
	110	110	90	5	<b>3SU1200-6KC10-1AA0</b>	1 1 unit
	230	230	90	5	<b>3SU1200-6KF10-1AA0</b>	1 1 unit



3SU1200-6KB10-1AA0

### Selection and ordering data

Operating principle	Number of NO contacts	Number of NC contacts	Color	SD	M12 connector, 4-pole	PU (UNIT, SET, M)	PS*
				d	Article No.	Price per PU	
<b>Sensor switches</b>							
	Without pressure	1	0	Black	▶	<b>3SU1200-1SK10-2SA0</b>	1 1 unit



3SU1200-1SK10-2SA0


Optional accessories:

- "Protection for sensor switches", [see page 13/130](#).
- "Connectors for sensor switches, angled socket with screw terminal connection", [see page 13/138](#).



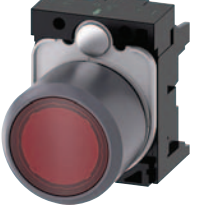

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Compact Units

## Sensor switches / Pushbuttons with extended stroke

### Selection and ordering data

Version of actuating element	Operating principle	Adjustable resistance	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		kΩ	d	Article No.	Price per PU	
<b>Potentiometers</b>						
 <p>3SU1200-2PQ10-1AA0</p>	Rotary knob	Stepless	▶	1	3SU1200-2PQ10-1AA0	1 1 unit
				4.7	3SU1200-2PR10-1AA0	1 1 unit
				10	3SU1200-2PS10-1AA0	1 1 unit
				47	3SU1200-2PT10-1AA0	1 1 unit
				100	3SU1200-2PU10-1AA0	1 1 unit
				470	3SU1200-2PV10-1AA0	1 1 unit
Labeling plates for potentiometers, <a href="#">see page 13/126</a>						

### Selection and ordering data

Version	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
<b>Pushbuttons with extended stroke</b>						
 <p>3SU1230-0EB40-0AA0</p>	For actuating relays, can only be combined with extension plunger, no contact module or LED module required		▶			
	<b>Pushbuttons with flat button</b>	Red				
	Green	5	3SU1230-0EB40-0AA0		1 1 unit	
 <p>3SU1230-0FB10-0AA0</p>	<b>Pushbuttons with raised button</b>		▶			
		Black	3	3SU1230-0FB10-0AA0		1 1 unit
 <p>3SU1231-0EB20-0AA0</p>	<b>Pushbuttons with flat transparent button for insertion of insert labels</b>		▶			
		Red	3	3SU1231-0EB20-0AA0		1 1 unit
	Clear	3	3SU1231-0EB70-0AA0		1 1 unit	
<b>Accessories</b>						
 <p>3SU1900-0KG10-0AA0</p>	<b>Extension plungers</b>		▶			
		Plastic	Gray	3SU1900-0KG10-0AA0		1 1 unit
For compensation of the distance between the pushbutton and the unlatching button of an overload relay						

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements



## Pushbuttons

### Selection and ordering data

Version of actuating element Front ring version	Operating principle Unlatching method	Color, marking	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Pushbuttons</b>								
 3SU1030-0AB50-0AR0	<b>Pushbuttons with flat button</b> Standard	Momentary contact	Black	▶	3SU1030-0AB10-0AA0		1	1 unit
			Black, "O"	▶	3SU1030-0AB10-0AD0		1	1 unit
			Red	▶	3SU1030-0AB20-0AA0		1	1 unit
			Red, "O"	▶	3SU1030-0AB20-0AD0		1	1 unit
			Red, "AUTO"	5	3SU1030-0AB20-0AQ0		1	1 unit
			Yellow	▶	3SU1030-0AB30-0AA0		1	1 unit
			Green	▶	3SU1030-0AB40-0AA0		1	1 unit
			Green, "I"	▶	3SU1030-0AB40-0AC0		1	1 unit
			Blue	▶	3SU1030-0AB50-0AA0		1	1 unit
			Blue, "R"	5	3SU1030-0AB50-0AR0		1	1 unit
			White	▶	3SU1030-0AB60-0AA0		1	1 unit
			White, "I"	▶	3SU1030-0AB60-0AC0		1	1 unit
			Clear	▶	3SU1030-0AB70-0AA0		1	1 unit
			Gray	▶	3SU1030-0AB80-0AA0		1	1 unit
 3SU1030-0AA40-0AA0	Latching Push to unlatch	Black	▶	3SU1030-0AA10-0AA0	1	1 unit		
		Red	▶	3SU1030-0AA20-0AA0	1	1 unit		
		Yellow	▶	3SU1030-0AA30-0AA0	1	1 unit		
		Green	▶	3SU1030-0AA40-0AA0	1	1 unit		
		Blue	▶	3SU1030-0AA50-0AA0	1	1 unit		
		White	▶	3SU1030-0AA60-0AA0	1	1 unit		
 3SU1030-0BB20-0AA0	<b>Pushbuttons with raised button</b> Standard	Momentary contact	Black	▶	3SU1030-0BB10-0AA0	1	1 unit	
			Red	▶	3SU1030-0BB20-0AA0	1	1 unit	
			Yellow	▶	3SU1030-0BB30-0AA0	1	1 unit	
			Green	▶	3SU1030-0BB40-0AA0	1	1 unit	
			Blue	▶	3SU1030-0BB50-0AA0	1	1 unit	
			White	▶	3SU1030-0BB60-0AA0	1	1 unit	
 3SU1030-0CB30-0AA0	<b>Pushbuttons with flat button</b> Raised	Momentary contact	Black	5	3SU1030-0CB10-0AA0	1	1 unit	
			Red	5	3SU1030-0CB20-0AA0	1	1 unit	
			Yellow	5	3SU1030-0CB30-0AA0	1	1 unit	
			Green	5	3SU1030-0CB40-0AA0	1	1 unit	
			Blue	5	3SU1030-0CB50-0AA0	1	1 unit	
			White	5	3SU1030-0CB60-0AA0	1	1 unit	

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

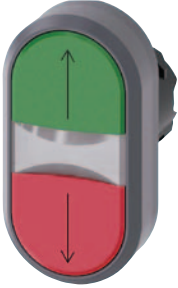
## Pushbuttons

Version of actuating element	Operating principle	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Front ring version	Unlatching method		d				
<b>Pushbuttons</b>							
 3SU1031-0AB20-0AA0	<b>Illuminated pushbuttons with flat button</b> Standard	Momentary contact	Amber	5	3SU1031-0AB00-0AA0		1 1 unit
			Red	▶	3SU1031-0AB20-0AA0		1 1 unit
			Yellow	▶	3SU1031-0AB30-0AA0		1 1 unit
			Green	▶	3SU1031-0AB40-0AA0		1 1 unit
			Blue	▶	3SU1031-0AB50-0AA0		1 1 unit
			White	▶	3SU1031-0AB60-0AA0		1 1 unit
			Clear	▶	3SU1031-0AB70-0AA0		1 1 unit
		Latching	Red	▶	3SU1031-0AA20-0AA0		1 1 unit
		Push to unlatch	Yellow	▶	3SU1031-0AA30-0AA0		1 1 unit
			Green	▶	3SU1031-0AA40-0AA0		1 1 unit
		Blue	▶	3SU1031-0AA50-0AA0		1 1 unit	
		White	▶	3SU1031-0AA60-0AA0		1 1 unit	
		Clear	▶	3SU1031-0AA70-0AA0		1 1 unit	
 3SU1031-0BB40-0AA0	<b>Illuminated pushbuttons with raised button</b> Standard	Momentary contact	Red	▶	3SU1031-0BB20-0AA0		1 1 unit
			Yellow	▶	3SU1031-0BB30-0AA0		1 1 unit
			Green	▶	3SU1031-0BB40-0AA0		1 1 unit
			Blue	▶	3SU1031-0BB50-0AA0		1 1 unit
			Clear	3	3SU1031-0BB70-0AA0		1 1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## Twin pushbuttons

### Selection and ordering data






Version of actuating element	Operating principle	Color	Marking Symbol No.	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Twin pushbuttons</b>									
 <p>3SU1030-3AB66-0AN0</p>	Twin pushbuttons flat, flat	Momentary contact	Green/Red	--	3		1	1 unit	
			"I"/"O"	▶	3SU1030-3AB42-0AA0				
			White/Black	--	3				3SU1030-3AB61-0AA0
			"I"/"O"	▶	3				3SU1030-3AB61-0AK0
			White/White	--	3				3SU1030-3AB66-0AA0
			Arrows, vert.	5	3SU1030-3AB66-0AN0				
Black/Black	--	3	3SU1030-3AB11-0AA0						
○	5	3SU1030-3AB11-0AQ0							
			○						
			5264/5265 (IEC 60417)						
 <p>3SU1030-3BB42-0AK0</p>	Twin pushbuttons flat, raised	Momentary contact	Green/Red	--	3		1	1 unit	
			"I"/"O"	▶	3SU1030-3BB42-0AA0				
 <p>3SU1031-3AB42-0AN0</p>	Twin pushbuttons flat, flat, illuminated	Momentary contact	Green/Red	--	▶		1	1 unit	
			"I"/"O"	▶	3SU1031-3AB42-0AK0				
			Arrows, vert.	5	3SU1031-3AB42-0AN0				
			White/Black	--	▶				3SU1031-3AB61-0AA0
			"I"/"O"	▶	3SU1031-3AB61-0AK0				
			White/White	--	3				3SU1031-3AB66-0AA0
Arrows, vert.	5	3SU1031-3AB66-0AN0							
 <p>3SU1031-3BB61-0AA0</p>	Twin pushbuttons flat, raised, illuminated	Momentary contact	Green/Red	--	3		1	1 unit	
			"I"/"O"	▶	3SU1031-3BB42-0AA0				
			White/Black	--	3				3SU1031-3BB61-0AA0
			"I"/"O"	▶	3	3SU1031-3BB61-0AK0			



# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## Mushroom pushbuttons






### Selection and ordering data

Version of actuating element	Operating principle Unlatching method	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Mushroom pushbuttons</b>							
 3SU1030-1AD20-0AA0	<b>Mushroom pushbuttons</b> 30 mm diameter, 2 positions	Momentary contact	Black ▶	<b>3SU1030-1AD10-0AA0</b>		1	1 unit
			Red ▶	<b>3SU1030-1AD20-0AA0</b>		1	1 unit
			Yellow ▶	<b>3SU1030-1AD30-0AA0</b>		1	1 unit
			Green ▶	<b>3SU1030-1AD40-0AA0</b>		1	1 unit
	Latching Pull to unlatch	Black ▶	<b>3SU1030-1AA10-0AA0</b>		1	1 unit	
	Red ▶	<b>3SU1030-1AA20-0AA0</b>		1	1 unit		
 3SU1030-1BD40-0AA0	<b>Mushroom pushbuttons</b> 40 mm diameter, 2 positions	Momentary contact	Black 3	<b>3SU1030-1BD10-0AA0</b>		1	1 unit
			Red 3	<b>3SU1030-1BD20-0AA0</b>		1	1 unit
			Yellow 3	<b>3SU1030-1BD30-0AA0</b>		1	1 unit
			Green 3	<b>3SU1030-1BD40-0AA0</b>		1	1 unit
	Latching Pull to unlatch	Black ▶	<b>3SU1030-1BA10-0AA0</b>		1	1 unit	
	Red ▶	<b>3SU1030-1BA20-0AA0</b>		1	1 unit		
	Red, "O" 5	<b>3SU1030-1BA20-0AD0</b>		1	1 unit		
 3SU1031-1AD30-0AA0	<b>Mushroom pushbuttons</b> 30 mm diameter, 2 positions, illuminated	Momentary contact	Yellow 5	<b>3SU1031-1AD30-0AA0</b>		1	1 unit
			Green 3	<b>3SU1031-1AD40-0AA0</b>		1	1 unit
			White 3	<b>3SU1031-1AD60-0AA0</b>		1	1 unit
			Clear 5	<b>3SU1031-1AD70-0AA0</b>		1	1 unit
	Latching Pull to unlatch	Red 3	<b>3SU1031-1AA20-0AA0</b>		1	1 unit	
	Yellow 5	<b>3SU1031-1AA30-0AA0</b>		1	1 unit		
 3SU1031-1BD60-0AA0	<b>Mushroom pushbuttons</b> 40 mm diameter, 2 positions, illuminated	Momentary contact	Yellow 5	<b>3SU1031-1BD30-0AA0</b>		1	1 unit
			Green 5	<b>3SU1031-1BD40-0AA0</b>		1	1 unit
			White 3	<b>3SU1031-1BD60-0AA0</b>		1	1 unit
			Clear 5	<b>3SU1031-1BD70-0AA0</b>		1	1 unit
	Latching Pull to unlatch	Red 3	<b>3SU1031-1BA20-0AA0</b>		1	1 unit	
	Yellow 3	<b>3SU1031-1BA30-0AA0</b>		1	1 unit		
 3SU1000-1HB50-0AA0	<b>Mushroom pushbuttons</b> 40 mm diameter, 2 positions	With positive latching, tamper-proof	Black ▶	<b>3SU1000-1HB10-0AA0</b>		1	1 unit
		Rotate to unlatch	Blue 3	<b>3SU1000-1HB50-0AA0</b>		1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## EMERGENCY STOP Mushroom pushbuttons

### Selection and ordering data

Version of actuating element	Outer diameter of mushroom mm	Make of lock	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>EMERGENCY STOP mushroom pushbuttons</b>								
<b>With pull-to-unlatch mechanism</b>								
 3SU1000-1HA20-0AA0	Tamper-proof, 2 positions	40	--	Red	▶	3SU1000-1HA20-0AA0	1	1 unit
<b>With rotate-to-unlatch mechanism</b>								
 3SU1000-1GB20-0AA0	Tamper-proof, 2 positions	33.8	--	Red	▶	3SU1000-1GB20-0AA0	1	1 unit
 3SU1000-1HB20-0AA0		40	--	Red	▶	3SU1000-1HB20-0AA0	1	1 unit
 3SU1000-1JB20-0AA0		60	--	Red	▶	3SU1000-1JB20-0AA0	1	1 unit
<b>With rotate-to-unlatch mechanism, can be illuminated</b>								
 3SU1001-1HB20-0AA0	Tamper-proof, 2 positions	33.8	--	Red	▶	3SU1001-1GB20-0AA0	1	1 unit
		40	--	Red	▶	3SU1001-1HB20-0AA0	1	1 unit
		60	--	Red	▶	3SU1001-1JB20-0AA0	1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## EMERGENCY STOP mushroom pushbuttons / toggle switches

Version of actuating element	Outer diameter of mushroom mm	Make of lock	Color	Number of keys	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### EMERGENCY STOP mushroom pushbuttons

#### With key-operated release



3SU1000-1HF20-0AA0



3SU1000-1HK20-0AA0



3SU1000-1HQ20-0AA0



3SU1000-1HR20-0AA0

Tamper-proof, 2 positions	40	RONIS SB30 RONIS 455	Red Red	2 2	▶ 3	<b>3SU1000-1HF20-0AA0</b> <b>3SU1000-1HG20-0AA0</b>		1 1	1 unit 1 unit
		BKS S1 BKS E7 BKS E9	Red Red Red	2 0 0	▶ 3 3	<b>3SU1000-1HK20-0AA0</b> <b>3SU1000-1HM20-0AA0</b> <b>3SU1000-1HN20-0AA0</b>		1 1 1	1 unit 1 unit 1 unit
		O.M.R. 73037	Red	2	▶	<b>3SU1000-1HQ20-0AA0</b>		1	1 unit
		CES SSG10 CES SSP9 CES SMS1	Red Red Red	2 2 2	▶ ▶ 3	<b>3SU1000-1HR20-0AA0</b> <b>3SU1000-1HS20-0AA0</b> <b>3SU1000-1HT20-0AA0</b>		1 1 1	1 unit 1 unit 1 unit

### Selection and ordering data

Number of switching positions	Number of command points	Color of actuating element	Operating principle of the actuating element	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Toggle switches



3SU1030-3EA10-0AA0

2	1	Black	Latching	3	<b>3SU1030-3EA10-0AA0</b>		1	1 unit
			Momentary contact, reset from above	5	<b>3SU1030-3EC10-0AA0</b>		1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## Selector switches

### Selection and ordering data

Version of actuating element	Operating principle	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Selector switches</b>							
<b>2 switch positions, can be illuminated</b>							
 3SU1032-2BC40-0AA0	Selector, short black actuator  Momentary contact, 45° (10:30/12 o'clock), reset from center to left  	Black	3	<b>3SU1032-2BC10-0AA0</b>		1	1 unit
		Red	▶	<b>3SU1032-2BC20-0AA0</b>		1	1 unit
		Yellow	▶	<b>3SU1032-2BC30-0AA0</b>		1	1 unit
		Green	▶	<b>3SU1032-2BC40-0AA0</b>		1	1 unit
		Blue	▶	<b>3SU1032-2BC50-0AA0</b>		1	1 unit
		White	▶	<b>3SU1032-2BC60-0AA0</b>		1	1 unit
 3SU1032-2BF30-0AA0	Latching, 90° (10:30/1:30 o'clock)  	Black	▶	<b>3SU1032-2BF10-0AA0</b>		1	1 unit
		Red	▶	<b>3SU1032-2BF20-0AA0</b>		1	1 unit
		Yellow	▶	<b>3SU1032-2BF30-0AA0</b>		1	1 unit
		Green	▶	<b>3SU1032-2BF40-0AA0</b>		1	1 unit
		Blue	▶	<b>3SU1032-2BF50-0AA0</b>		1	1 unit
		White	▶	<b>3SU1032-2BF60-0AA0</b>		1	1 unit
 3SU1032-2CF60-0AA0	Selector, long black actuator  Latching, 90° (10:30/1:30 o'clock)  	Black	3	<b>3SU1032-2CF10-0AA0</b>		1	1 unit
		Red	3	<b>3SU1032-2CF20-0AA0</b>		1	1 unit
		White	3	<b>3SU1032-2CF60-0AA0</b>		1	1 unit
 3SU1032-2AF20-0AA0	Rotary knob  Latching, 90° (10:30/1:30 o'clock)  	Red	3	<b>3SU1032-2AF20-0AA0</b>		1	1 unit
		White	▶	<b>3SU1032-2AF60-0AA0</b>		1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## Selector switches

Version of actuating element	Operating principle	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Selector switches

#### 3 switch positions, can be illuminated



3SU1032-2BM60-0AA0

Selector, short black actuator

Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right



- ▶ Black 3SU1032-2BM10-0AA0
- ▶ Red 3SU1032-2BM20-0AA0
- ▶ Yellow 3SU1032-2BM30-0AA0
- ▶ Green 3SU1032-2BM40-0AA0
- ▶ Blue 3SU1032-2BM50-0AA0
- ▶ White 3SU1032-2BM60-0AA0

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit



3SU1032-2BL20-0AA0

Latching, 2x45° (10:30/12/1:30 o'clock)



- ▶ Black 3SU1032-2BL10-0AA0
- ▶ Red 3SU1032-2BL20-0AA0
- ▶ Yellow 3SU1032-2BL30-0AA0
- ▶ Green 3SU1032-2BL40-0AA0
- ▶ Blue 3SU1032-2BL50-0AA0
- ▶ White 3SU1032-2BL60-0AA0

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit



3SU1032-2BP40-0AA0

Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to the right



- ▶ Black 3SU1032-2BP10-0AA0
- ▶ Red 5 3SU1032-2BP20-0AA0
- ▶ Yellow 1 3SU1032-2BP30-0AA0
- ▶ Green 1 3SU1032-2BP40-0AA0
- ▶ Blue 5 3SU1032-2BP50-0AA0
- ▶ White 1 3SU1032-2BP60-0AA0

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit



3SU1032-2BN30-0AA0

Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to the left



- ▶ Black 3 3SU1032-2BN10-0AA0
- ▶ Red 1 3SU1032-2BN20-0AA0
- ▶ Yellow 1 3SU1032-2BN30-0AA0
- ▶ Green 1 3SU1032-2BN40-0AA0
- ▶ Blue 1 3SU1032-2BN50-0AA0
- ▶ White 1 3SU1032-2BN60-0AA0

- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit
- 1 1 unit

#### 4 switch positions



3SU1030-2AS60-0AA0

Rotary knob Latching, 4x90° (3/6/9/12 o'clock)



- ▶ White 3 3SU1030-2AS60-0AA0

- 1 1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## Key-operated switches

### Selection and ordering data

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Key-operated switches

#### 2 switch positions



Momentary contact, 45° (10:30/12 o'clock), reset from center to left



RONIS, SB30	O	2	▶	<b>3SU1030-4BC01-0AA0</b>	1	1 unit
RONIS, 455	O	2	5	<b>3SU1030-4CC01-0AA0</b>	1	1 unit
O.M.R. 73037, red	O	2	3	<b>3SU1030-4FC01-0AA0</b>	1	1 unit
O.M.R. 73038, light blue	O	2	5	<b>3SU1030-4GC01-0AA0</b>	1	1 unit
O.M.R. 73034, black	O	2	5	<b>3SU1030-4HC01-0AA0</b>	1	1 unit
O.M.R. 73033, yellow	O	2	3	<b>3SU1030-4JC01-0AA0</b>	1	1 unit
CES, SSG10	O	2	▶	<b>3SU1030-5BC01-0AA0</b>	1	1 unit
CES, LSG1	O	2	3	<b>3SU1030-5HC01-0AA0</b>	1	1 unit
BKS, S1	O	2	▶	<b>3SU1030-5PC01-0AA0</b>	1	1 unit
IKON, 360012K1	O	2	3	<b>3SU1030-5XC01-0AA0</b>	1	1 unit



Latching, 90° (10:30/1:30 o'clock)



RONIS, SB30	O	2	▶	<b>3SU1030-4BF01-0AA0</b>	1	1 unit
	O+I	2	▶	<b>3SU1030-4BF11-0AA0</b>	1	1 unit
	I	2	3	<b>3SU1030-4BF21-0AA0</b>	1	1 unit
RONIS, 455	O	2	3	<b>3SU1030-4CF01-0AA0</b>	1	1 unit
	O+I	2	5	<b>3SU1030-4CF11-0AA0</b>	1	1 unit



O.M.R. 73037, red	O	2	3	<b>3SU1030-4FF01-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1030-4FF11-0AA0</b>	1	1 unit
O.M.R. 73038, light blue	O	2	3	<b>3SU1030-4GF01-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1030-4GF11-0AA0</b>	1	1 unit
O.M.R. 73034, black	O	2	3	<b>3SU1030-4HF01-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1030-4HF11-0AA0</b>	1	1 unit
	I	2	5	<b>3SU1030-4HF21-0AA0</b>	1	1 unit
O.M.R. 73033, yellow	O	2	3	<b>3SU1030-4JF01-0AA0</b>	1	1 unit
	O+I	2	5	<b>3SU1030-4JF11-0AA0</b>	1	1 unit



CES, SSG10	O	2	▶	<b>3SU1030-5BF01-0AA0</b>	1	1 unit
	O+I	2	▶	<b>3SU1030-5BF11-0AA0</b>	1	1 unit
	I	2	3	<b>3SU1030-5BF21-0AA0</b>	1	1 unit
CES, LSG1	O	2	3	<b>3SU1030-5HF01-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1030-5HF11-0AA0</b>	1	1 unit



BKS, S1	O	2	3	<b>3SU1030-5PF01-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1030-5PF11-0AA0</b>	1	1 unit
	I	2	5	<b>3SU1030-5PF21-0AA0</b>	1	1 unit
BKS, E1	O	0	3	<b>3SU1030-5QF01-0AA0</b>	1	1 unit
	O+I	0	5	<b>3SU1030-5QF11-0AA0</b>	1	1 unit
BKS, E2	O	0	▶	<b>3SU1030-5RF01-0AA0</b>	1	1 unit
	O+I	0	3	<b>3SU1030-5RF11-0AA0</b>	1	1 unit
BKS, E7	O	0	▶	<b>3SU1030-5SF01-0AA0</b>	1	1 unit
	O+I	0	▶	<b>3SU1030-5SF11-0AA0</b>	1	1 unit
BKS, E9	O	0	3	<b>3SU1030-5TF01-0AA0</b>	1	1 unit
	O+I	0	3	<b>3SU1030-5TF11-0AA0</b>	1	1 unit

IKON, 360012K1	O	2	▶	<b>3SU1030-5XF01-0AA0</b>	1	1 unit
	O+I	2	3	<b>3SU1030-5XF11-0AA0</b>	1	1 unit

# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## Key-operated switches

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Key-operated switches

#### 3 switch positions



Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right



3SU1030-4BM01-0AA0

Latching, 2x45° (10:30/12/1:30 o'clock)



3SU1030-4JL11-0AA0



3SU1030-5BL41-0AA0



3SU1030-5PL01-0AA0

RONIS, SB30	O	2	3		<b>3SU1030-4BM01-0AA0</b>		1	1 unit
O.M.R. 73037, red	O	2	5		<b>3SU1030-4FM01-0AA0</b>		1	1 unit
O.M.R. 73034, black	O	2	5		<b>3SU1030-4HM01-0AA0</b>		1	1 unit
CES, SSG10	O	2	▶		<b>3SU1030-5BM01-0AA0</b>		1	1 unit
BKS, S1	O	2	3		<b>3SU1030-5PM01-0AA0</b>		1	1 unit
IKON, 360012K1	O	2	5		<b>3SU1030-5XM01-0AA0</b>		1	1 unit
RONIS, SB30	O	2	3		<b>3SU1030-4BL01-0AA0</b>		1	1 unit
	I+O+II	2	▶		<b>3SU1030-4BL11-0AA0</b>		1	1 unit
	I	2	5		<b>3SU1030-4BL21-0AA0</b>		1	1 unit
	II	2	3		<b>3SU1030-4BL31-0AA0</b>		1	1 unit
	I+II	2	5		<b>3SU1030-4BL41-0AA0</b>		1	1 unit
	O+I	2	3		<b>3SU1030-4BL51-0AA0</b>		1	1 unit
RONIS, 455	O	2	5		<b>3SU1030-4CL01-0AA0</b>		1	1 unit
	I+O+II	2	5		<b>3SU1030-4CL11-0AA0</b>		1	1 unit
O.M.R. 73037, red	O	2	5		<b>3SU1030-4FL01-0AA0</b>		1	1 unit
	O+I	2	5		<b>3SU1030-4FL51-0AA0</b>		1	1 unit
O.M.R. 73038, light blue	O	2	5		<b>3SU1030-4GL01-0AA0</b>		1	1 unit
	I+O+II	2	3		<b>3SU1030-4GL11-0AA0</b>		1	1 unit
O.M.R. 73034, black	O	2	5		<b>3SU1030-4HL01-0AA0</b>		1	1 unit
	I+O+II	2	3		<b>3SU1030-4HL11-0AA0</b>		1	1 unit
O.M.R. 73033, yellow	I+O+II	2	5		<b>3SU1030-4JL11-0AA0</b>		1	1 unit
CES, SSG10	O	2	3		<b>3SU1030-5BL01-0AA0</b>		1	1 unit
	I+O+II	2	▶		<b>3SU1030-5BL11-0AA0</b>		1	1 unit
	I	2	3		<b>3SU1030-5BL21-0AA0</b>		1	1 unit
	II	2	3		<b>3SU1030-5BL31-0AA0</b>		1	1 unit
	I+II	2	3		<b>3SU1030-5BL41-0AA0</b>		1	1 unit
	O+I	2	5		<b>3SU1030-5BL51-0AA0</b>		1	1 unit
BKS, S1	O	2	5		<b>3SU1030-5PL01-0AA0</b>		1	1 unit
	I+O+II	2	3		<b>3SU1030-5PL11-0AA0</b>		1	1 unit
	I	2	3		<b>3SU1030-5PL21-0AA0</b>		1	1 unit
	II	2	5		<b>3SU1030-5PL31-0AA0</b>		1	1 unit
	I+II	2	5		<b>3SU1030-5PL41-0AA0</b>		1	1 unit
BKS, E2	I+O+II	0	5		<b>3SU1030-5RL11-0AA0</b>		1	1 unit
BKS, E9	I+O+II	0	5		<b>3SU1030-5TL11-0AA0</b>		1	1 unit
IKON, 360012K1	O	2	5		<b>3SU1030-5XL01-0AA0</b>		1	1 unit
	I+O+II	2	5		<b>3SU1030-5XL11-0AA0</b>		1	1 unit



# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## Key-operated switches /

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Key-operated switches

#### 3 switch positions



3SU1030-4BP01-0AA0



Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to the right	RONIS, SB30	O	2	5	<b>3SU1030-4BP01-0AA0</b>		1	1 unit
		II	2	5	<b>3SU1030-4BP31-0AA0</b>		1	1 unit
		O+II	2	5	<b>3SU1030-4BP61-0AA0</b>		1	1 unit
	CES, SSG10	O	2	3	<b>3SU1030-5BP01-0AA0</b>		1	1 unit
		II	2	5	<b>3SU1030-5BP31-0AA0</b>		1	1 unit
		O+II	2	3	<b>3SU1030-5BP61-0AA0</b>		1	1 unit
BKS, S1	O	2	3	<b>3SU1030-5PP01-0AA0</b>		1	1 unit	
	RONIS, SB30	O	2	5	<b>3SU1030-4BN01-0AA0</b>		1	1 unit
		I	2	5	<b>3SU1030-4BN21-0AA0</b>		1	1 unit
O+I		2	5	<b>3SU1030-4BN51-0AA0</b>		1	1 unit	
Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to the left	O.M.R. 73038, light blue O.M.R. 73034, black	O	2	5	<b>3SU1030-4GN01-0AA0</b>		1	1 unit
		I	2	5	<b>3SU1030-4HN21-0AA0</b>		1	1 unit
CES, SSG10	O	2	3	<b>3SU1030-5BN01-0AA0</b>		1	1 unit	
	I	2	3	<b>3SU1030-5BN21-0AA0</b>		1	1 unit	
	O+I	2	3	<b>3SU1030-5BN51-0AA0</b>		1	1 unit	
BKS, S1	I	2	5	<b>3SU1030-5PN21-0AA0</b>		1	1 unit	
	O+I	2	5	<b>3SU1030-5PN51-0AA0</b>		1	1 unit	
	IKON, 360012K1	O+I	2	5	<b>3SU1030-5XN51-0AA0</b>		1	1 unit



3SU1030-5BN01-0AA0



### Selection and ordering data

Operating angle	Operating principle	Switch position for key removal	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### ID key-operated switches

#### 4 switch positions



3SU1030-4WS10-0AA0

45°	Latching	Key removal possible in all 4 positions	Black	▶	<b>3SU1030-4WS10-0AA0</b>		1	1 unit
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For available keys, [see page 10/152](#)

For electronic modules for ID key-operated switches, [see page 10/115](#)



# 3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

## Indicator lights

### Selection and ordering data

Product function Locking in zero position	Number of switching positions	Operating principle	Direction of actuation	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Coordinate switches</b>								
 3SU1030-7AA10-0AA0   3SU1030-7BA10-0AA0	No	2	Momentary contact	Horizontal Vertical	▶ ▶	3SU1030-7AC10-0AA0 3SU1030-7AD10-0AA0	1 1	1 unit 1 unit
			<b>NEW</b>	Latching	Horizontal Vertical	▶ ▶	3SU1030-7AA10-0AA0 3SU1030-7AB10-0AA0	1 1
		4	Momentary contact	Horizontal/ Ver- tical	▶	3SU1030-7AF10-0AA0	1	1 unit
			<b>NEW</b>	Latching	Horizontal/ Ver- tical	▶	3SU1030-7AE10-0AA0	1
	Yes	2	Momentary contact	Horizontal Vertical	▶ ▶	3SU1030-7BC10-0AA0 3SU1030-7BD10-0AA0	1 1	1 unit 1 unit
			<b>NEW</b>	Latching	Horizontal Vertical	▶ ▶	3SU1030-7BA10-0AA0 3SU1030-7BB10-0AA0	1 1
		4	Momentary contact	Horizontal/ Ver- tical	▶	3SU1030-7BF10-0AA0	1	1 unit
			<b>NEW</b>	Latching	Horizontal/ Ver- tical	▶	3SU1030-7BE10-0AA0	1

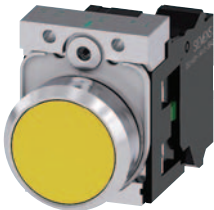



### Selection and ordering data

Type of product	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Indicator lights</b>							
 3SU1001-6AA20-0AA0	<b>With smooth lens</b>		Amber	3	3SU1001-6AA00-0AA0	1	1 unit
			Red	▶	3SU1001-6AA20-0AA0	1	1 unit
			Yellow	▶	3SU1001-6AA30-0AA0	1	1 unit
			Green	▶	3SU1001-6AA40-0AA0	1	1 unit
			Blue	▶	3SU1001-6AA50-0AA0	1	1 unit
			White	▶	3SU1001-6AA60-0AA0	1	1 unit
			Clear	▶	3SU1001-6AA70-0AA0	1	1 unit
	<b>Indicator lights in illuminated pushbutton design <b>NEW</b></b>						
 3SU1031-0AD50-0AA0	--	Red	3	3SU1031-0AD20-0AA0	1	1 unit	
		Yellow	5	3SU1031-0AD30-0AA0	1	1 unit	
		Green	3	3SU1031-0AD40-0AA0	1	1 unit	
		Blue	5	3SU1031-0AD50-0AA0	1	1 unit	
		Clear	3	3SU1031-0AD70-0AA0	1	1 unit	

# 3SU1 22 mm, Metal, Shiny — Complete Units

## Pushbuttons

### Selection and ordering data

Supply voltage for light source	Color	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*			
		At AC	At DC	Contact modules					NO contacts	NC contacts	
V	V					Article No.	Price per PU				
<b>Pushbuttons</b>											
<b>Pushbuttons with flat button, momentary contact</b>											
	--	Black	1	1	0	▶	3SU1150-0AB10-1BA0	1	1 unit		
			0	1	3	▶	3SU1150-0AB10-1CA0	1	1 unit		
			1	1	▶	3SU1150-0AB10-1FA0	1	1 unit			
	Red	1	1	0	5	▶	3SU1150-0AB20-1BA0	1	1 unit		
		0	1	▶	3SU1150-0AB20-1CA0	1	1 unit				
		1	1	▶	3SU1150-0AB20-1FA0	1	1 unit				
	Yellow	1	1	0	3	▶	3SU1150-0AB30-1BA0	1	1 unit		
		1	1	5	▶	3SU1150-0AB30-1FA0	1	1 unit			
	Green	1	1	0	▶	3SU1150-0AB40-1BA0	1	1 unit			
		1	1	▶	3SU1150-0AB40-1FA0	1	1 unit				
	Blue	1	1	0	3	▶	3SU1150-0AB50-1BA0	1	1 unit		
		1	1	5	▶	3SU1150-0AB50-1FA0	1	1 unit			
	White	1	1	0	3	▶	3SU1150-0AB60-1BA0	1	1 unit		
		1	1	3	▶	3SU1150-0AB60-1FA0	1	1 unit			
Clear	1	1	0	5	▶	3SU1150-0AB70-1BA0	1	1 unit			
	1	1	5	▶	3SU1150-0AB70-1FA0	1	1 unit				
<b>Pushbuttons with raised button, momentary contact</b>											
	--	Black	1	1	0	5	3SU1150-0BB10-1BA0	1	1 unit		
			0	1	5	▶	3SU1150-0BB10-1CA0	1	1 unit		
			1	1	5	▶	3SU1150-0BB10-1FA0	1	1 unit		
	Red	1	0	1	3	▶	3SU1150-0BB20-1CA0	1	1 unit		
		1	1	5	▶	3SU1150-0BB20-1FA0	1	1 unit			
	Green	1	1	1	5	▶	3SU1150-0BB40-1FA0	1	1 unit		
		Blue	1	1	0	5	▶	3SU1150-0BB50-1BA0	1	1 unit	
	1		1	5	▶	3SU1150-0BB50-1FA0	1	1 unit			
	<b>Illuminated pushbuttons with flat button, momentary contact, with integrated LED</b>										
		24	24	Amber	1	1	0	5	3SU1152-0AB00-1BA0	1	1 unit
1					1	5	▶	3SU1152-0AB00-1FA0	1	1 unit	
Red			1	0	1	▶	3SU1152-0AB20-1CA0	1	1 unit		
			1	1	▶	3SU1152-0AB20-1FA0	1	1 unit			
Yellow			1	1	0	▶	3SU1152-0AB30-1BA0	1	1 unit		
			1	1	3	▶	3SU1152-0AB30-1FA0	1	1 unit		
Green			1	1	0	▶	3SU1152-0AB40-1BA0	1	1 unit		
			1	1	▶	3SU1152-0AB40-1FA0	1	1 unit			
Blue		1	1	0	▶	3SU1152-0AB50-1BA0	1	1 unit			
		1	1	5	▶	3SU1152-0AB50-1FA0	1	1 unit			
White		1	1	0	▶	3SU1152-0AB60-1BA0	1	1 unit			
		1	1	▶	3SU1152-0AB60-1FA0	1	1 unit				
Clear		1	1	0	▶	3SU1152-0AB70-1BA0	1	1 unit			
		1	1	▶	3SU1152-0AB70-1FA0	1	1 unit				
		110	--	Amber	1	1	0	5	3SU1153-0AB00-1BA0	1	1 unit
					1	1	5	▶	3SU1153-0AB00-1FA0	1	1 unit
	Red		1	0	1	5	▶	3SU1153-0AB20-1CA0	1	1 unit	
			1	1	5	▶	3SU1153-0AB20-1FA0	1	1 unit		
	Yellow		1	1	0	5	▶	3SU1153-0AB30-1BA0	1	1 unit	
			1	1	5	▶	3SU1153-0AB30-1FA0	1	1 unit		
	Green		1	1	0	3	▶	3SU1153-0AB40-1BA0	1	1 unit	
			1	1	5	▶	3SU1153-0AB40-1FA0	1	1 unit		
	Blue	1	1	0	5	▶	3SU1153-0AB50-1BA0	1	1 unit		
		1	1	5	▶	3SU1153-0AB50-1FA0	1	1 unit			
	White	1	1	0	5	▶	3SU1153-0AB60-1BA0	1	1 unit		
		1	1	5	▶	3SU1153-0AB60-1FA0	1	1 unit			
	Clear	1	1	0	5	▶	3SU1153-0AB70-1BA0	1	1 unit		
		1	1	5	▶	3SU1153-0AB70-1FA0	1	1 unit			
	230	--	Amber	1	1	0	5	3SU1156-0AB00-1BA0	1	1 unit	
				1	1	5	▶	3SU1156-0AB00-1FA0	1	1 unit	
Red		1	0	1	5	▶	3SU1156-0AB20-1CA0	1	1 unit		
		1	1	5	▶	3SU1156-0AB20-1FA0	1	1 unit			
Yellow		1	1	0	5	▶	3SU1156-0AB30-1BA0	1	1 unit		
		1	1	5	▶	3SU1156-0AB30-1FA0	1	1 unit			
Green		1	1	0	3	▶	3SU1156-0AB40-1BA0	1	1 unit		
		1	1	5	▶	3SU1156-0AB40-1FA0	1	1 unit			

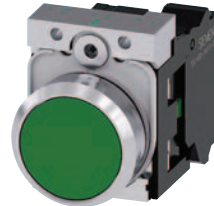
# 3SU1 22 mm, Metal, Shiny — Complete Units

## Pushbuttons

Supply voltage for light source	Color	Number of Contact modules	NO contacts	NC contacts	SD	Screw terminals	PU (UNIT, SET, M)	PS*
V	V				d			
<b>Pushbuttons</b>								
230	Blue	1	1	0	5	3SU1156-0AB50-1BA0 3SU1156-0AB50-1FA0	1	1 unit
		1	1	1	5		1	1 unit
	White	1	1	0	5	3SU1156-0AB60-1BA0 3SU1156-0AB60-1FA0	1	1 unit
		1	1	1	5		1	1 unit
Clear	1	1	0	5	3SU1156-0AB70-1BA0 3SU1156-0AB70-1FA0	1	1 unit	
	1	1	1	5		1	1 unit	
						<b>Spring-type terminals</b>		
<b>Pushbuttons with flat button, momentary contact</b>								
--	Black	1	1	0	5	3SU1150-0AB10-3BA0 3SU1150-0AB10-3CA0 3SU1150-0AB10-3FA0	1	1 unit
		0	1	5	1		1 unit	
		1	1	5	1		1 unit	
	Red	1	1	0	5	3SU1150-0AB20-3CA0 3SU1150-0AB20-3FA0	1	1 unit
		0	1	5	1		1 unit	
	Yellow	1	1	0	5	3SU1150-0AB30-3BA0 3SU1150-0AB30-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Green	1	1	0	5	3SU1150-0AB40-3BA0 3SU1150-0AB40-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Blue	1	1	0	5	3SU1150-0AB50-3BA0 3SU1150-0AB50-3FA0	1	1 unit
		1	1	5	1		1 unit	
	White	1	1	0	5	3SU1150-0AB60-3BA0 3SU1150-0AB60-3FA0	1	1 unit
1		1	5	1	1 unit			
<b>Pushbuttons with raised button, momentary contact</b>								
--	Red	1	0	1	5	3SU1150-0BB20-3CA0	1	1 unit
<b>Illuminated pushbuttons with flat button, momentary contact, with integrated LED</b>								
24	Red	1	0	1	5	3SU1152-0AB20-3CA0 3SU1152-0AB20-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Yellow	1	1	0	5	3SU1152-0AB30-3BA0 3SU1152-0AB30-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Green	1	1	0	5	3SU1152-0AB40-3BA0 3SU1152-0AB40-3FA0	1	1 unit
		1	1	3	1		1 unit	
	Blue	1	1	0	5	3SU1152-0AB50-3BA0 3SU1152-0AB50-3FA0	1	1 unit
		1	1	5	1		1 unit	
	White	1	1	0	3	3SU1152-0AB60-3BA0 3SU1152-0AB60-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Clear	1	1	0	5	3SU1152-0AB70-3BA0 3SU1152-0AB70-3FA0	1	1 unit
		1	1	5	1		1 unit	
110	Red	1	0	1	5	3SU1153-0AB20-3CA0 3SU1153-0AB20-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Yellow	1	1	0	5	3SU1153-0AB30-3BA0 3SU1153-0AB30-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Green	1	1	0	5	3SU1153-0AB40-3BA0 3SU1153-0AB40-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Blue	1	1	0	5	3SU1153-0AB50-3BA0 3SU1153-0AB50-3FA0	1	1 unit
		1	1	5	1		1 unit	
	White	1	1	0	5	3SU1153-0AB60-3BA0 3SU1153-0AB60-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Clear	1	1	0	5	3SU1153-0AB70-3BA0 3SU1153-0AB70-3FA0	1	1 unit
		1	1	5	1		1 unit	
230	Red	1	0	1	5	3SU1156-0AB20-3CA0 3SU1156-0AB20-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Yellow	1	1	0	5	3SU1156-0AB30-3BA0 3SU1156-0AB30-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Green	1	1	0	5	3SU1156-0AB40-3BA0 3SU1156-0AB40-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Blue	1	1	0	5	3SU1156-0AB50-3BA0 3SU1156-0AB50-3FA0	1	1 unit
		1	1	5	1		1 unit	
	White	1	1	0	5	3SU1156-0AB60-3BA0 3SU1156-0AB60-3FA0	1	1 unit
		1	1	5	1		1 unit	
	Clear	1	1	0	5	3SU1156-0AB70-3BA0 3SU1156-0AB70-3FA0	1	1 unit
		1	1	5	1		1 unit	



3SU1156-0AB50-1BA0



3SU1150-0AB40-3BA0



3SU1150-0BB20-3CA0



3SU1152-0AB20-3BA0



3SU1153-0AB60-3BA0



3SU1156-0AB30-3BA0

# 3SU1 22 mm, Metal, Shiny — Complete Units

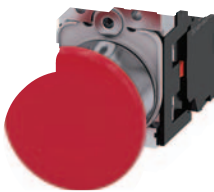
## Mushroom pushbuttons / EMERGENCY STOP mushroom pushbuttons

### Selection and ordering data

Unlatching method	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*
	Contact modules	NO contacts	NC contacts				

#### Mushroom pushbuttons

##### With red mushroom, diameter 40 mm, latching



3SU1150-1BA20-1CA0

Unlatching method	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*
	Contact modules	NO contacts	NC contacts				
Pull to unlatch	1	0	1	▶	3SU1150-1BA20-1CA0 3SU1150-1BA20-1FA0	1	1 unit
		1	1	3			
Pull to unlatch	1	0	1	5	Spring-type terminals 3SU1150-1BA20-3CA0 3SU1150-1BA20-3FA0	1	1 unit
		1	1	5			

Unlatching method	Number of			Marking	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	Contact modules	NO contacts	NC contacts					

#### EMERGENCY STOP mushroom pushbuttons, tamper-proof, in accordance with ISO 13850 and IEC 60947-5-5

##### With red mushroom, diameter 40 mm, with positive latching



3SU1150-1HB20-1CH0

Unlatching method	Number of			Marking	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	Contact modules	NO contacts	NC contacts					
Pull to unlatch	1	0	1	EMERGENCY	⊖	3SU1150-1HA20-1CG0	1	1 unit
		1	1	5				
ATEX	1	0	1	NOT-HALT	⊖	3SU1150-1HA20-1CH0 3SU1150-1HA20-1FG0	1	1 unit
		1	1	5				
Rotate to unlatch	1	0	1	EMERGENCY STOP	⊖	3SU1150-1HA20-1FH0 3SU1150-1HA20-1FF1	1	1 unit
		1	1	5				
Rotate to unlatch	1	0	1	EMERGENCY STOP	⊖	3SU1150-1HB20-1CG0	1	1 unit
		1	1	3				
Rotate to unlatch	1	0	1	NOT-HALT	▶	3SU1150-1HB20-1CH0 3SU1150-1HB20-1FG0	1	1 unit
		1	1	5				
Rotate to unlatch	1	0	1	EMERGENCY STOP	▶	3SU1150-1HB20-1FH0	1	1 unit
		1	1	5				



3SU1150-1HA20-3CH0

Unlatching method	Number of			Marking	SD	Spring-type terminals	PU (UNIT, SET, M)	PS*
	Contact modules	NO contacts	NC contacts					
Pull to unlatch	1	0	1	NOT-HALT	⊖	3SU1150-1HA20-3CH0 3SU1150-1HA20-3FH0 3SU1150-1HA20-3PH0	1	1 unit
		2	2	5				
		2	2	5				
Rotate to unlatch	1	0	1	NOT-HALT	⊖	3SU1150-1HB20-3CH0 3SU1150-1HB20-3FH0 3SU1150-1HB20-3PH0	1	1 unit
		2	2	5				
		2	2	5				

#### Illuminated EMERGENCY STOP with integrated LED light module, Rated 24-240V AC/DC

##### Red button, yellow backing plate, plastic with text:

Rotate to unlatch	2	0	2	EMERGENCY STOP	5	3SU1158-1HB20-1PT0	1	1 unit
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##### Red button, yellow backing plate, self-adhesive label with text:

Rotate to unlatch	2	1	1	EMERGENCY STOP	5	A6X30120577	1	1 unit
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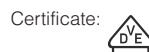
##### Red button, yellow backing plate, self-adhesive label with text:

Rotate to unlatch	2	1	2	EMERGENCY STOP	5	A6X30120587	1	1 unit
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##### Red button, installed-monitoring contact modules, yellow backing plate, self-adhesive label with text

Rotate to unlatch	2	0	2 MC	EMERGENCY STOP	5	A6X30120588	1	1 unit
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⊖ Positive opening according to IEC 60947-5-1, Annex K.  
Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System;  
see Section 13.



# 3SU1 22 mm, Metal, Shiny — Complete Units

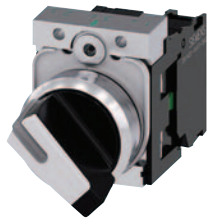
## Selector switches / key-operated switches

### Selection and ordering data

Operating principle	Color	Number of			SD	Screw terminals	PU (UNIT, SET, M)	PS*
		Contact modules	NO contacts	NC contacts				

#### Selector switches

##### Short black actuator, 2 switch positions



3SU1150-2BF60-1BA0

Latching, 90°	White	1	1	0	▶	3SU1150-2BF60-1BA0 3SU1150-2BF60-1FA0 3SU1150-2BF60-1MA0	1	1 unit
			1	1	3		1	1 unit
		2	1	1	▶		1	1 unit

##### Short black actuator, 3 switch positions (I - O - II)

Momentary contact, 2x45°, reset from left + right	White	2	2	2	▶	3SU1150-2BM60-1LA0 3SU1150-2BM60-1NA0	1	1 unit
			2	0	3		1	1 unit

Latching, 2x45°	White	2	2	2	▶	3SU1150-2BL60-1LA0 3SU1150-2BL60-1NA0	1	1 unit
			2	0	▶		1	1 unit

#### Spring-type terminals

##### Short black actuator, 2 switch positions



3SU1150-2BL60-3NA0

Latching, 90°	White	1	1	0	5	3SU1150-2BF60-3BA0 3SU1150-2BF60-3MA0	1	1 unit
			1	1	5		1	1 unit

##### Short black actuator, 3 switch positions

Momentary contact, 2x45°, reset from left + right	White	2	2	2	5	3SU1150-2BM60-3LA0 3SU1150-2BM60-3NA0	1	1 unit
			2	0	5		1	1 unit

Latching, 2x45°	White	2	2	2	5	3SU1150-2BL60-3LA0 3SU1150-2BL60-3NA0	1	1 unit
			2	0	5		1	1 unit

### Selection and ordering data

Operating principle	Switch position for key removal	Number of			Number of keys	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		Contact modules	NO contacts	NC contacts					

#### Key-operated switches

##### With RONIS lock, SB30, 2 switch positions



3SU1150-4BF11-1BA0

Latching, 90° (10:30/1:30 o'clock)	All	1	1	0	2	3	3SU1150-4BF11-1BA0 3SU1150-4BF11-1FA0	1	1 unit
	All		1	1	2	3		1	1 unit

#### Spring-type terminals

All	All	1	1	0	2	5	3SU1150-4BF11-3BA0 3SU1150-4BF11-3FA0 3SU1150-4BF01-3PA0	1	1 unit
All	All		1	1	2	5		1	1 unit
O	O	2	0	2	2	5		1	1 unit



# 3SU1 22 mm, Metal, Shiny — Complete Units

## Coordinate switches

### Selection and ordering data

Number of NO contacts (1 per direction)	Operating principle	Direction of actuation	SD	Screw terminals		PU (UNIT, SET, M)	PS*
				Article No.	Price per PU		

#### Coordinate switches

##### Without mechanical interlock, 2 switch positions

2		Momentary contact	Horizontal	5	3SU1150-7AC88-1NA0	1	1 unit
			Vertical	5	3SU1150-7AD88-1NA0	1	1 unit
	<b>NEW</b>	Latching	Horizontal	5	3SU1150-7AA88-1NA0	1	1 unit
			Vertical	5	3SU1150-7AB88-1NA0	1	1 unit

##### Without mechanical interlock, 4 switch positions

4		Momentary contact	Horizontal/Vertical	3	3SU1150-7AF88-1QA0	1	1 unit
		<b>NEW</b>	Latching	Horizontal/Vertical	5	3SU1150-7AE88-1QA0	1

##### With mechanical interlock, 2 switch positions

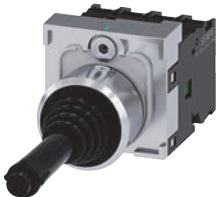
2		Momentary contact	Horizontal	5	3SU1150-7BC88-1NA0	1	1 unit
			Vertical	5	3SU1150-7BD88-1NA0	1	1 unit
	<b>NEW</b>	Latching	Horizontal	5	3SU1150-7BA88-1NA0	1	1 unit
			Vertical	5	3SU1150-7BB88-1NA0	1	1 unit

##### With mechanical interlock, 4 switch positions

4		Momentary contact	Horizontal/Vertical	5	3SU1150-7BF88-1QA0	1	1 unit
		<b>NEW</b>	Latching	Horizontal/Vertical	5	3SU1150-7BE88-1QA0	1



3SU1150-7AF88-1QA0



3SU1150-7BF88-1QA0



# 3SU1 22 mm, Metal, Shiny — Complete Units




## Indicator lights

### Selection and ordering data

Operational voltage		Color		SD	Screw terminals	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value	of actuating element	of light source				
V	V			d	Article No.	Price per PU	

#### Indicator lights

#### With smooth lens and integrated LED

	24	24	Amber	Amber	5	3SU1152-6AA00-1AA0	1	1 unit
			Red	Red	▶	3SU1152-6AA20-1AA0	1	1 unit
			Yellow	Yellow	▶	3SU1152-6AA30-1AA0	1	1 unit
			Green	Green	▶	3SU1152-6AA40-1AA0	1	1 unit
			Blue	Blue	3	3SU1152-6AA50-1AA0	1	1 unit
			White	White	▶	3SU1152-6AA60-1AA0	1	1 unit
			Clear	White	5	3SU1152-6AA70-1AA0	1	1 unit
				110	--	Amber	Amber	5
Red	Red	▶				3SU1153-6AA20-1AA0	1	1 unit
Yellow	Yellow	3				3SU1153-6AA30-1AA0	1	1 unit
Green	Green	▶				3SU1153-6AA40-1AA0	1	1 unit
Blue	Blue	5				3SU1153-6AA50-1AA0	1	1 unit
White	White	3				3SU1153-6AA60-1AA0	1	1 unit
Clear	White	5				3SU1153-6AA70-1AA0	1	1 unit
	230	--				Red	Red	▶
			Yellow	Yellow	3	3SU1156-6AA30-1AA0	1	1 unit
			Green	Green	▶	3SU1156-6AA40-1AA0	1	1 unit
			Blue	Blue	5	3SU1156-6AA50-1AA0	1	1 unit
			White	White	3	3SU1156-6AA60-1AA0	1	1 unit
			Clear	White	5	3SU1156-6AA70-1AA0	1	1 unit

#### Spring-type terminals

	24	24	Red	Red	3	3SU1152-6AA20-3AA0	1	1 unit
			Yellow	Yellow	5	3SU1152-6AA30-3AA0	1	1 unit
			Green	Green	3	3SU1152-6AA40-3AA0	1	1 unit
			Blue	Blue	3	3SU1152-6AA50-3AA0	1	1 unit
			White	White	5	3SU1152-6AA60-3AA0	1	1 unit
			Clear	White	5	3SU1152-6AA70-3AA0	1	1 unit
	110	--	Red	Red	5	3SU1153-6AA20-3AA0	1	1 unit
			Yellow	Yellow	5	3SU1153-6AA30-3AA0	1	1 unit
			Green	Green	5	3SU1153-6AA40-3AA0	1	1 unit
			Blue	Blue	5	3SU1153-6AA50-3AA0	1	1 unit
			White	White	5	3SU1153-6AA60-3AA0	1	1 unit
			Clear	White	5	3SU1153-6AA70-3AA0	1	1 unit
	230	--	Red	Red	5	3SU1156-6AA20-3AA0	1	1 unit
			Yellow	Yellow	5	3SU1156-6AA30-3AA0	1	1 unit
			Green	Green	5	3SU1156-6AA40-3AA0	1	1 unit
			Blue	Blue	5	3SU1156-6AA50-3AA0	1	1 unit
			White	White	5	3SU1156-6AA60-3AA0	1	1 unit
			Clear	White	5	3SU1156-6AA70-3AA0	1	1 unit

# 3SU1 22 mm, Metal, Shiny — Compact Units

## Potentiometers

### Selection and ordering data

Operational voltage		Color of actuating element	Color of light source	SD	Screw terminals	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value						
V	V			d	Article No.	Price per PU	

#### Indicator lights with "traffic light" LED **NEW**



3SU1251-6AG24-1AA0

6 ... 24	6 ... 24	Clear	Red/Yellow/Green	▶	<b>3SU1251-6AG24-1AA0</b>	1	1 unit
110	--	Clear	Red/Yellow/Green	▶	<b>3SU1251-6AC24-1AA0</b>	1	1 unit
230	--	Clear	Red/Yellow/Green	▶	<b>3SU1251-6AF24-1AA0</b>	1	1 unit

### Selection and ordering data

Operational voltage		Volume level	SD	Screw terminals	PU (UNIT, SET, M)	PS*
at AC, rated value	at DC, rated value					
V	V	dB	d	Article No.	Price per PU	

#### Acoustic signaling devices **NEW**



3SU1250-6KB10-1AA0

24	24	90	5	▶	<b>3SU1250-6KB10-1AA0</b>	1	1 unit
110	110	90	5	▶	<b>3SU1250-6KC10-1AA0</b>	1	1 unit
230	230	90	5	▶	<b>3SU1250-6KF10-1AA0</b>	1	1 unit

### Selection and ordering data

Version of actuating element	Operating principle	Adjustable resistance	SD	Screw terminals	PU (UNIT, SET, M)	PS*

#### Potentiometers



3SU1250-2PQ10-1AA0

Rotary knob	Stepless	1	▶	<b>3SU1250-2PQ10-1AA0</b>	1	1 unit
		4.7	▶	<b>3SU1250-2PR10-1AA0</b>	1	1 unit
		10	▶	<b>3SU1250-2PS10-1AA0</b>	1	1 unit
		47	▶	<b>3SU1250-2PT10-1AA0</b>	1	1 unit
		100	▶	<b>3SU1250-2PU10-1AA0</b>	1	1 unit
		470	▶	<b>3SU1250-2PV10-1AA0</b>	1	1 unit

Labeling plates for potentiometers, [see page 10/144](#).

# 3SU1 22 mm, Metal, Shiny — Compact Units

## Pushbuttons with extended stroke

### Selection and ordering data

Version	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Pushbuttons with extended stroke

For actuating relays, can only be combined with extension plunger, no contact module or LED module required

#### Pushbuttons with flat button



3SU1250-0EB40-0AA0

Red  
Green  
Blue

5  
5  
7

**3SU1250-0EB20-0AA0**  
**3SU1250-0EB40-0AA0**  
**3SU1250-0EB50-0AA0**

1 1 unit  
1 1 unit  
1 1 unit

#### Pushbuttons with raised button



3SU1250-0FB10-0AA0

Black

▶

**3SU1250-0FB10-0AA0**

1 1 unit

#### Pushbuttons with flat transparent button for insertion of insert labels



3SU1251-0EB20-0AA0

Red  
Clear

3  
3

**3SU1251-0EB20-0AA0**  
**3SU1251-0EB70-0AA0**

1 1 unit  
1 1 unit

Version	Material	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Accessories

#### Extension plungers



3SU1900-0KG10-0AA0

Plastic

Gray

▶

**3SU1900-0KG10-0AA0**






1 1 unit

For compensation of the distance between the pushbutton and the unlatching button of an overload relay

# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements




## Pushbuttons

### Selection and ordering data

Version of actuating element Front ring version	Operating principle Unlatching method	Color, marking	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Pushbuttons</b>								
 <p>3SU1050-0AB40-0AC0</p>	<b>Pushbuttons with flat button</b> Standard	Momentary contact	Black	▶	3SU1050-0AB10-0AA0		1	1 unit
			Black, "O"	▶	3SU1050-0AB10-0AD0		1	1 unit
			Red	▶	3SU1050-0AB20-0AA0		1	1 unit
			Red, "O"	▶	3SU1050-0AB20-0AD0		1	1 unit
			Yellow	3	3SU1050-0AB30-0AA0		1	1 unit
			Green	▶	3SU1050-0AB40-0AA0		1	1 unit
			Green, "I"	▶	3SU1050-0AB40-0AC0		1	1 unit
			Blue	3	3SU1050-0AB50-0AA0		1	1 unit
			Blue, "R"	5	3SU1050-0AB50-0AR0		1	1 unit
			White	3	3SU1050-0AB60-0AA0		1	1 unit
			White, "⊕"	5	3SU1050-0AB60-0AB0		1	1 unit
			White, "I"	▶	3SU1050-0AB60-0AC0		1	1 unit
			Clear	3	3SU1050-0AB70-0AA0		1	1 unit
			Gray	▶	3SU1050-0AB80-0AA0		1	1 unit
 <p>3SU1050-0AA30-0AA0</p>		Latching	Black	▶	3SU1050-0AA10-0AA0	1	1 unit	
		Push to unlatch	Red	▶	3SU1050-0AA20-0AA0	1	1 unit	
		Yellow	▶	3SU1050-0AA30-0AA0	1	1 unit		
		Green	▶	3SU1050-0AA40-0AA0	1	1 unit		
		Blue	▶	3SU1050-0AA50-0AA0	1	1 unit		
		White	▶	3SU1050-0AA60-0AA0	1	1 unit		
 <p>3SU1050-0BB20-0AA0</p>	<b>Pushbuttons with raised button</b> Standard	Momentary contact	Black	3	3SU1050-0BB10-0AA0	1	1 unit	
			Red	▶	3SU1050-0BB20-0AA0	1	1 unit	
			Yellow	▶	3SU1050-0BB30-0AA0	1	1 unit	
			Green	▶	3SU1050-0BB40-0AA0	1	1 unit	
			Blue	▶	3SU1050-0BB50-0AA0	1	1 unit	
		White	▶	3SU1050-0BB60-0AA0	1	1 unit		
		Latching	Red	5	3SU1050-0BA20-0AA0	1	1 unit	
Push to unlatch								
 <p>3SU1050-0CB50-0AA0</p>	<b>Pushbuttons with flat button</b> Raised	Momentary contact	Black	5	3SU1050-0CB10-0AA0	1	1 unit	
			Red	5	3SU1050-0CB20-0AA0	1	1 unit	
			Yellow	5	3SU1050-0CB30-0AA0	1	1 unit	
			Green	5	3SU1050-0CB40-0AA0	1	1 unit	
			Blue	5	3SU1050-0CB50-0AA0	1	1 unit	
			White	5	3SU1050-0CB60-0AA0	1	1 unit	
 <p>3SU1051-0CB40-0AA0</p>	<b>Illuminated pushbuttons with flat button</b> Raised <b>NEW</b>	Momentary contact	Green	X	3SU1051-0CB40-0AA0	1	20 units	

# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements



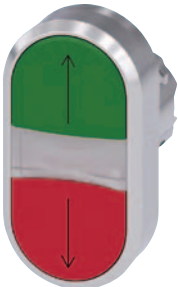

## Pushbuttons

Version of actuating element	Operating principle	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Front ring version	Unlatching method		d				
<b>Pushbuttons</b>							
 <p>3SU1051-0AB30-0AA0</p>	<b>Illuminated pushbuttons with flat button</b> Standard	Momentary contact	Amber	5	3SU1051-0AB00-0AA0		1 1 unit
			Red	▶	3SU1051-0AB20-0AA0		1 1 unit
			Yellow	3	3SU1051-0AB30-0AA0		1 1 unit
			Green	▶	3SU1051-0AB40-0AA0		1 1 unit
			Blue	3	3SU1051-0AB50-0AA0		1 1 unit
			White	▶	3SU1051-0AB60-0AA0		1 1 unit
			Clear	▶	3SU1051-0AB70-0AA0		1 1 unit
		 <p>3SU1051-0AA20-0AA0</p>	<b>Illuminated pushbuttons with raised button</b> Standard	Latching	Red	▶	3SU1051-0AA20-0AA0
Push to unlatch	Yellow			▶	3SU1051-0AA30-0AA0		1 1 unit
	Green			▶	3SU1051-0AA40-0AA0		1 1 unit
	Blue			▶	3SU1051-0AA50-0AA0		1 1 unit
	White			▶	3SU1051-0AA60-0AA0		1 1 unit
	Clear			5	3SU1051-0AA70-0AA0		1 1 unit
 <p>3SU1051-0BB20-0AA0</p>	<b>Illuminated pushbuttons with raised button</b> Standard			Momentary contact	Amber	5	3SU1051-0BB00-0AA0
			Red	▶	3SU1051-0BB20-0AA0		1 1 unit
			Yellow	▶	3SU1051-0BB30-0AA0		1 1 unit
			Green	▶	3SU1051-0BB40-0AA0		1 1 unit
			Blue	▶	3SU1051-0BB50-0AA0		1 1 unit
			White	5	3SU1051-0BB60-0AA0		1 1 unit
			Clear	3	3SU1051-0BB70-0AA0		1 1 unit

# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

## Twin pushbuttons

### Selection and ordering data

Version of actuating element	Operating principle	Color	Marking Symbol No.	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Twin pushbuttons</b>								
 <p>3SU1050-3AB66-0AL0</p>	Twin pushbuttons flat, flat	Momentary contact	Green/Red	--	3			
			"I"/"O"	3				
			White/Black	--	3			
			"I"/"O"	3				
			White/White	--	3			
			"-"/"+"	5				
			Arrows, hor.	5				
			Black/Black	--	3			
			⊙	5				
			○	5				
5264/5265 (IEC 60417)								
 <p>3SU1050-3BB42-0AK0</p>	Twin pushbuttons flat, raised	Momentary contact	Green/Red	--	3			
			"I"/"O"	3				
			White/Black	--	3			
			"I"/"O"	5				
 <p>3SU1051-3AB42-0AN0</p>	Twin pushbuttons flat, flat, illuminated	Momentary contact	Green/Red	--	▶ 3			
			"I"/"O"	▶ 3				
			Arrows, vert.	5				
			White/Black	--	▶ 3			
			"I"/"O"	3				
 <p>3SU1051-3BB61-0AA0</p>	Twin pushbuttons flat, raised, illuminated	Momentary contact	Green/Red	--	▶ 3			
			"I"/"O"	▶ 3				
			White/Black	--	3			
			"I"/"O"	5				

# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

## Mushroom pushbuttons












### Selection and ordering data

Version of actuating element	Operating principle Unlatching method	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Mushroom pushbuttons</b>							
<b>2 switch positions</b>							
 3SU1050-1AD20-0AA0 Mushroom pushbuttons 30 mm diameter, 2 positions	Momentary contact	Black	▶	3SU1050-1AD10-0AA0		1	1 unit
		Red	▶	3SU1050-1AD20-0AA0		1	1 unit
		Yellow	▶	3SU1050-1AD30-0AA0		1	1 unit
		Green	▶	3SU1050-1AD40-0AA0		1	1 unit
	Latching	Black	▶	3SU1050-1AA10-0AA0		1	1 unit
	Pull to unlatch	Red	▶	3SU1050-1AA20-0AA0		1	1 unit
 3SU1050-1BD30-0AA0 Mushroom pushbuttons 40 mm diameter, 2 positions	Momentary contact	Black	3	3SU1050-1BD10-0AA0		1	1 unit
		Red	5	3SU1050-1BD20-0AA0		1	1 unit
		Yellow	5	3SU1050-1BD30-0AA0		1	1 unit
		Green	5	3SU1050-1BD40-0AA0		1	1 unit
	Latching	Black	3	3SU1050-1BA10-0AA0		1	1 unit
	Pull to unlatch	Red	3	3SU1050-1BA20-0AA0		1	1 unit
		Yellow	5	3SU1050-1BA30-0AA0		1	1 unit
 3SU1050-1CD40-0AA0 Mushroom pushbuttons 60 mm diameter, 2 positions	Momentary contact	Black	5	3SU1050-1CD10-0AA0		1	1 unit
		Red	5	3SU1050-1CD20-0AA0		1	1 unit
		Yellow	5	3SU1050-1CD30-0AA0		1	1 unit
		Green	5	3SU1050-1CD40-0AA0		1	1 unit
	Latching	Black	5	3SU1050-1CA10-0AA0		1	1 unit
	Pull to unlatch	Red	5	3SU1050-1CA20-0AA0		1	1 unit
 3SU1051-1AD60-0AA0 Mushroom pushbuttons 30 mm diameter, 2 positions, illuminated	Momentary contact	Yellow	5	3SU1051-1AD30-0AA0		1	1 unit
		Green	5	3SU1051-1AD40-0AA0		1	1 unit
		White	5	3SU1051-1AD60-0AA0		1	1 unit
	Latching	Amber	5	3SU1051-1AA00-0AA0		1	1 unit
		Red	5	3SU1051-1AA20-0AA0		1	1 unit
		Yellow	5	3SU1051-1AA30-0AA0		1	1 unit
		Green	5	3SU1051-1AA40-0AA0		1	1 unit
		Blue	5	3SU1051-1AA50-0AA0		1	1 unit
		Clear	5	3SU1051-1AA70-0AA0		1	1 unit
 3SU1051-1BD40-0AA0 Mushroom pushbuttons 40 mm diameter, 2 positions, illuminated	Momentary contact	Amber	5	3SU1051-1BD00-0AA0		1	1 unit
		Yellow	5	3SU1051-1BD30-0AA0		1	1 unit
		Green	5	3SU1051-1BD40-0AA0		1	1 unit
		White	5	3SU1051-1BD60-0AA0		1	1 unit
	Latching	Amber	5	3SU1051-1BA00-0AA0		1	1 unit
		Red	3	3SU1051-1BA20-0AA0		1	1 unit
		Yellow	5	3SU1051-1BA30-0AA0		1	1 unit
		Green	5	3SU1051-1BA40-0AA0		1	1 unit
		Blue	5	3SU1051-1BA50-0AA0		1	1 unit
	Clear	5	3SU1051-1BA70-0AA0		1	1 unit	
 3SU1051-1CA50-0AA0 Mushroom pushbuttons 60 mm diameter, 2 positions, illuminated	Momentary contact	Amber	5	3SU1051-1CD00-0AA0		1	1 unit
		Yellow	5	3SU1051-1CD30-0AA0		1	1 unit
		Green	5	3SU1051-1CD40-0AA0		1	1 unit
		White	5	3SU1051-1CD60-0AA0		1	1 unit
	Latching	Red	5	3SU1051-1CA20-0AA0		1	1 unit
		Yellow	5	3SU1051-1CA30-0AA0		1	1 unit
		Green	5	3SU1051-1CA40-0AA0		1	1 unit
		Blue	5	3SU1051-1CA50-0AA0		1	1 unit
		Clear	5	3SU1051-1CA70-0AA0		1	1 unit





# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

## Mushroom pushbuttons / EMERGENCY STOP mushroom pushbuttons

Version of actuating element	Operating principle Unlatching method	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Mushroom pushbuttons</b>							
<b>2 switch positions</b>							
 3SU1050-1HB10-0AA0	<b>Mushroom pushbuttons</b> with raised mushroom, tamper-proof, 40 mm diameter, 2 positions	Latching	Black	5	<b>3SU1050-1HB10-0AA0</b>	1	1 unit
		Rotate to unlatch	Yellow	5	<b>3SU1050-1HB30-0AA0</b>	1	1 unit
<b>3 switch positions</b>							
 3SU1050-1EA20-0AA0	<b>Mushroom pushbuttons</b> 40 mm diameter, 3 positions	Momentary contact	Black	5	<b>3SU1050-1ED10-0AA0</b>	1	1 unit
		 Latching	Red	5	<b>3SU1050-1ED20-0AA0</b>	1	1 unit
 3SU1051-1EA40-0AA0	<b>Mushroom pushbuttons</b> 40 mm diameter, 3 positions, illuminated	 Latching	Black	5	<b>3SU1050-1EA10-0AA0</b>	1	1 unit
		 Pull to unlatch	Red	5	<b>3SU1050-1EA20-0AA0</b>	1	1 unit
 3SU1051-1EA40-0AA0	<b>Mushroom pushbuttons</b> 40 mm diameter, 3 positions, illuminated	Momentary contact	Red	5	<b>3SU1051-1ED20-0AA0</b>	1	1 unit
		 Latching	White	5	<b>3SU1051-1ED60-0AA0</b>	1	1 unit
 3SU1051-1EA40-0AA0	<b>Mushroom pushbuttons</b> 40 mm diameter, 3 positions, illuminated	 Latching	Red	5	<b>3SU1051-1EA20-0AA0</b>	1	1 unit
		 Pull to unlatch	Green	5	<b>3SU1051-1EA40-0AA0</b>	1	1 unit

### Selection and ordering data

Version of actuating element	Outer diameter of mushroom	Make of lock	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5</b>								
<b>With pull-to-unlatch mechanism</b>								
 3SU1050-1HA20-0AA0	Tamper-proof, 2 positions	40	--	Red	3	<b>3SU1050-1HA20-0AA0</b>	1	1 unit
<b>With rotate-to-unlatch mechanism</b>								
 3SU1050-1GB20-0AA0	Tamper-proof, 2 positions	33.8	--	Red	3	<b>3SU1050-1GB20-0AA0</b>	1	1 unit

# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

## EMERGENCY STOP mushroom pushbuttons

Version of actuating element	Outer diameter of mushroom	Make of lock	Color	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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**EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5**

**With rotate-to-unlatch mechanism**



3SU1050-1HB20-0AA0

Tamper-proof, 2 positions	40	--	Red		d	<b>3SU1050-1HB20-0AA0</b>		1	1 unit
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3SU1050-1JB20-0AA0

	60	--	Red		5	<b>3SU1050-1JB20-0AA0</b>		1	1 unit
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**With rotate-to-unlatch mechanism, can be illuminated**



3SU1051-1HB20-0AA0

Tamper-proof, 2 positions	33.8 40 60	--	Red			<b>3SU1051-1GB20-0AA0</b>		1	1 unit
						<b>3SU1051-1HB20-0AA0</b>		1	1 unit
						<b>3SU1051-1JB20-0AA0</b>		1	1 unit

**With key-operated release**



3SU1050-1HF20-0AA0

Tamper-proof, 2 positions	40	RONIS SB30	Red	2	3	<b>3SU1050-1HF20-0AA0</b>		1	1 unit
		RONIS 455		2	5	<b>3SU1050-1HG20-0AA0</b>		1	1 unit
		RONIS 421		2	5	<b>3SU1050-1HH20-0AA0</b>		1	1 unit



3SU1050-1HK20-0AA0

		BKS S1	Red	2	5	<b>3SU1050-1HK20-0AA0</b>		1	1 unit
		BKS E7		0	5	<b>3SU1050-1HM20-0AA0</b>		1	1 unit
		BKS E9		0	5	<b>3SU1050-1HN20-0AA0</b>		1	1 unit
		O.M.R. 73037		2	5	<b>3SU1050-1HQ20-0AA0</b>		1	1 unit




3SU1050-1HR20-0AA0

		CES SSG10	Red	2	3	<b>3SU1050-1HR20-0AA0</b>		1	1 unit
		CES SSP9		2	5	<b>3SU1050-1HS20-0AA0</b>		1	1 unit
		CES VL5	Black	2	5	<b>3SU1050-1HU10-0AA0</b>		1	1 unit
			Red	2	5	<b>3SU1050-1HU20-0AA0</b>		1	1 unit
		CES VL1		2	5	<b>3SU1050-1HV20-0AA0</b>		1	1 unit
		IKON 360012K1		2	5	<b>3SU1050-1HX20-0AA0</b>		1	1 unit




# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

## Toggle switches / Selector switches

### Selection and ordering data














	Number of switching positions	Number of command points	Color of actuating element	Operating principle of the actuating element	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Toggle switches</b>									
 3SU1050-3EA10-0AA0	2	1	Black	Latching	5	<b>3SU1050-3EA10-0AA0</b>		1	1 unit
				Momentary contact, reset from above	5	<b>3SU1050-3EC10-0AA0</b>		1	1 unit

### Selection and ordering data

	Version of actuating element	Operating principle	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Selector switches</b>									
<b>2 switch positions, can be illuminated</b>									
 3SU1052-2BC20-0AA0	Selector, short black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	3	<b>3SU1052-2BC10-0AA0</b>		1	1 unit	
			Red	▶	<b>3SU1052-2BC20-0AA0</b>		1	1 unit	
			Yellow	5	<b>3SU1052-2BC30-0AA0</b>		1	1 unit	
			Green	▶	<b>3SU1052-2BC40-0AA0</b>		1	1 unit	
			Blue	▶	<b>3SU1052-2BC50-0AA0</b>		1	1 unit	
			White	3	<b>3SU1052-2BC60-0AA0</b>		1	1 unit	
 3SU1052-2BF40-0AA0	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock)	Amber	5	<b>3SU1052-2BF00-0AA0</b>		1	1 unit	
			Black	▶	<b>3SU1052-2BF10-0AA0</b>		1	1 unit	
			Red	3	<b>3SU1052-2BF20-0AA0</b>		1	1 unit	
			Green	3	<b>3SU1052-2BF40-0AA0</b>		1	1 unit	
			White	▶	<b>3SU1052-2BF60-0AA0</b>		1	1 unit	
 3SU1052-2CF60-0AA0	Selector, long black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	5	<b>3SU1052-2CC10-0AA0</b>		1	1 unit	
			Yellow	5	<b>3SU1052-2CC30-0AA0</b>		1	1 unit	
			Green	5	<b>3SU1052-2CC40-0AA0</b>		1	1 unit	
			Blue	5	<b>3SU1052-2CC50-0AA0</b>		1	1 unit	
			White	5	<b>3SU1052-2CC60-0AA0</b>		1	1 unit	
	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock)	Black	5	<b>3SU1052-2CF10-0AA0</b>		1	1 unit	
			Red	5	<b>3SU1052-2CF20-0AA0</b>		1	1 unit	
			Yellow	5	<b>3SU1052-2CF30-0AA0</b>		1	1 unit	
			Green	5	<b>3SU1052-2CF40-0AA0</b>		1	1 unit	
			Blue	5	<b>3SU1052-2CF50-0AA0</b>		1	1 unit	
		White	5	<b>3SU1052-2CF60-0AA0</b>		1	1 unit		

# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements









## Selector switches

Version of actuating element	Operating principle	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*		
<b>Selector switches</b>									
<b>3 switch positions, can be illuminated</b>									
 3SU1052-2BM50-0AA0   3SU1052-2BL30-0AA0   3SU1052-2BN20-0AA0   3SU1052-2CL40-0AA0	Selector, short black actuator	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right 	Amber 5 Black ▶ 3SU1052-2BM10-0AA0 Red 5 3SU1052-2BM20-0AA0 Yellow 5 3SU1052-2BM30-0AA0 Green ▶ 3SU1052-2BM40-0AA0 Blue ▶ 3SU1052-2BM50-0AA0 White ▶ 3SU1052-2BM60-0AA0	3SU1052-2BM00-0AA0 3SU1052-2BM10-0AA0 3SU1052-2BM20-0AA0 3SU1052-2BM30-0AA0 3SU1052-2BM40-0AA0 3SU1052-2BM50-0AA0 3SU1052-2BM60-0AA0	1	1 unit	1	1 unit	
		Latching, 2x45° (10:30/12/1:30 o'clock)		Black ▶ 3SU1052-2BL10-0AA0 Red ▶ 3SU1052-2BL20-0AA0 Yellow ▶ 3SU1052-2BL30-0AA0 Green ▶ 3SU1052-2BL40-0AA0 White ▶ 3SU1052-2BL60-0AA0	3SU1052-2BL10-0AA0 3SU1052-2BL20-0AA0 3SU1052-2BL30-0AA0 3SU1052-2BL40-0AA0 3SU1052-2BL60-0AA0	1	1 unit	1	1 unit
		Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to the right		Black 5 3SU1052-2BP10-0AA0 Red 5 3SU1052-2BP20-0AA0 Green 5 3SU1052-2BP40-0AA0 White 5 3SU1052-2BP60-0AA0	3SU1052-2BP10-0AA0 3SU1052-2BP20-0AA0 3SU1052-2BP40-0AA0 3SU1052-2BP60-0AA0	1	1 unit	1	1 unit
		Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to the left		Black 3 3SU1052-2BN10-0AA0 Red 5 3SU1052-2BN20-0AA0 Green ▶ 3SU1052-2BN40-0AA0 White 3 3SU1052-2BN60-0AA0	3SU1052-2BN10-0AA0 3SU1052-2BN20-0AA0 3SU1052-2BN40-0AA0 3SU1052-2BN60-0AA0	1	1 unit	1	1 unit
		Selector, long black actuator	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right 	Black 3 3SU1052-2CM10-0AA0 Red 5 3SU1052-2CM20-0AA0 Green 5 3SU1052-2CM40-0AA0 White 3 3SU1052-2CM60-0AA0	3SU1052-2CM10-0AA0 3SU1052-2CM20-0AA0 3SU1052-2CM40-0AA0 3SU1052-2CM60-0AA0	1	1 unit	1	1 unit
		Latching, 2x45° (10:30/12/1:30 o'clock)		Black 5 3SU1052-2CL10-0AA0 Red 5 3SU1052-2CL20-0AA0 Green 5 3SU1052-2CL40-0AA0 White 5 3SU1052-2CL60-0AA0	3SU1052-2CL10-0AA0 3SU1052-2CL20-0AA0 3SU1052-2CL40-0AA0 3SU1052-2CL60-0AA0	1	1 unit	1	1 unit
		Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to the right		Black 5 3SU1052-2CP10-0AA0 Red 5 3SU1052-2CP20-0AA0 White 5 3SU1052-2CP60-0AA0	3SU1052-2CP10-0AA0 3SU1052-2CP20-0AA0 3SU1052-2CP60-0AA0	1	1 unit	1	1 unit
		Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to the left		Black 5 3SU1052-2CN10-0AA0 Red 5 3SU1052-2CN20-0AA0 White 5 3SU1052-2CN60-0AA0	3SU1052-2CN10-0AA0 3SU1052-2CN20-0AA0 3SU1052-2CN60-0AA0	1	1 unit	1	1 unit
		<b>4 switch positions</b> Rotary knob	Latching, 4x90° (3/6/9/12 o'clock) 	White 3 3SU1050-2AS60-0AA0	3SU1050-2AS60-0AA0	1	1 unit	1	1 unit

# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

## Key-operated switches

### Selection and ordering data

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Key-operated switches</b>									
<b>2 switch positions</b>									
 <p>3SU1050-4BC01-0AA0</p> <p>Momentary contact, 45° (10:30/12 o'clock), reset from center to left</p> 	RONIS, SB30	O	2	3	<b>3SU1050-4BC01-0AA0</b>		1	1 unit	
	RONIS, 455	O	2	5	<b>3SU1050-4CC01-0AA0</b>		1	1 unit	
	O.M.R. 73037, red	O	2	5	<b>3SU1050-4FC01-0AA0</b>		1	1 unit	
	O.M.R. 73038, light blue	O	2	5	<b>3SU1050-4GC01-0AA0</b>		1	1 unit	
	O.M.R. 73034, black	O	2	5	<b>3SU1050-4HC01-0AA0</b>		1	1 unit	
	O.M.R. 73033, yellow	O	2	5	<b>3SU1050-4JC01-0AA0</b>		1	1 unit	
	CES, SSG10	O	2	3	<b>3SU1050-5BC01-0AA0</b>		1	1 unit	
	CES, LSG1	O	2	5	<b>3SU1050-5HC01-0AA0</b>		1	1 unit	
	CES, VL5	O	2	5	<b>3SU1050-5KC01-0AA0</b>		1	1 unit	
	CES, STGH10	O	2	5	<b>3SU1050-5LC01-0AA0</b>		1	1 unit	
	BKS, S1	O	2	5	<b>3SU1050-5PC01-0AA0</b>		1	1 unit	
	IKON, 360012K1	O	2	5	<b>3SU1050-5XC01-0AA0</b>		1	1 unit	
	 <p>3SU1050-4BF01-0AA0</p> <p>Latching, 90° (10:30/1:30 o'clock)</p> 	RONIS, SB30	O	2	3	<b>3SU1050-4BF01-0AA0</b>		1	1 unit
		O+I	2	3	<b>3SU1050-4BF11-0AA0</b>		1	1 unit	
		I	2	5	<b>3SU1050-4BF21-0AA0</b>		1	1 unit	
RONIS, 455		O	2	5	<b>3SU1050-4CF01-0AA0</b>		1	1 unit	
		O+I	2	5	<b>3SU1050-4CF11-0AA0</b>		1	1 unit	
		I	2	5	<b>3SU1050-4CF21-0AA0</b>		1	1 unit	
RONIS, 421		O+I	2	5	<b>3SU1050-4DF11-0AA0</b>		1	1 unit	
O.M.R. 73037, red		O	2	5	<b>3SU1050-4FF01-0AA0</b>		1	1 unit	
		O+I	2	5	<b>3SU1050-4FF11-0AA0</b>		1	1 unit	
		I	2	5	<b>3SU1050-4FF21-0AA0</b>		1	1 unit	
 <p>3SU1050-4GF11-0AA0</p>	O.M.R. 73038, light blue	O	2	5	<b>3SU1050-4GF01-0AA0</b>		1	1 unit	
		O+I	2	5	<b>3SU1050-4GF11-0AA0</b>		1	1 unit	
		I	2	5	<b>3SU1050-4GF21-0AA0</b>		1	1 unit	
	O.M.R. 73034, black	O	2	5	<b>3SU1050-4HF01-0AA0</b>		1	1 unit	
		O+I	2	5	<b>3SU1050-4HF11-0AA0</b>		1	1 unit	
		I	2	5	<b>3SU1050-4HF21-0AA0</b>		1	1 unit	
	O.M.R. 73033, yellow	O	2	5	<b>3SU1050-4JF01-0AA0</b>		1	1 unit	
		O+I	2	5	<b>3SU1050-4JF11-0AA0</b>		1	1 unit	
		I	2	5	<b>3SU1050-4JF21-0AA0</b>		1	1 unit	
	 <p>3SU1050-5BF01-0AA0</p>	CES, SSG10	O	2	3	<b>3SU1050-5BF01-0AA0</b>		1	1 unit
		O+I	2	3	<b>3SU1050-5BF11-0AA0</b>		1	1 unit	
		I	2	5	<b>3SU1050-5BF21-0AA0</b>		1	1 unit	
CES, LSG1		O	2	5	<b>3SU1050-5HF01-0AA0</b>		1	1 unit	
		O+I	2	5	<b>3SU1050-5HF11-0AA0</b>		1	1 unit	
CES, VL5		O	2	5	<b>3SU1050-5KF01-0AA0</b>		1	1 unit	
CES, STGH10		O+I	2	5	<b>3SU1050-5LF11-0AA0</b>		1	1 unit	
 <p>3SU1050-5PF01-0AA0</p>		BKS, S1	O	2	5	<b>3SU1050-5PF01-0AA0</b>		1	1 unit
			O+I	2	5	<b>3SU1050-5PF11-0AA0</b>		1	1 unit
			I	2	5	<b>3SU1050-5PF21-0AA0</b>		1	1 unit
	BKS, E1	O	0	5	<b>3SU1050-5QF01-0AA0</b>		1	1 unit	
		O+I	0	5	<b>3SU1050-5QF11-0AA0</b>		1	1 unit	
	BKS, E2	O	0	3	<b>3SU1050-5RF01-0AA0</b>		1	1 unit	
		O+I	0	5	<b>3SU1050-5RF11-0AA0</b>		1	1 unit	
	BKS, E7	O	0	5	<b>3SU1050-5SF01-0AA0</b>		1	1 unit	
		O+I	0	5	<b>3SU1050-5SF11-0AA0</b>		1	1 unit	
	BKS, E9	O	0	5	<b>3SU1050-5TF01-0AA0</b>		1	1 unit	
	O+I	0	5	<b>3SU1050-5TF11-0AA0</b>		1	1 unit		
 <p>3SU1050-5XF01-0AA0</p>	IKON, 360012K1	O	2	5	<b>3SU1050-5XF01-0AA0</b>		1	1 unit	
		O+I	2	5	<b>3SU1050-5XF11-0AA0</b>		1	1 unit	

# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

## Key-operated switches

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Key-operated switches

#### 3 switch positions



3SU1050-4BM01-0AA0

Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right



RONIS, SB30	O	2	5		<b>3SU1050-4BM01-0AA0</b>		1	1 unit
RONIS, 455	O	2	5		<b>3SU1050-4CM01-0AA0</b>		1	1 unit
O.M.R. 73034, black	O	2	5		<b>3SU1050-4HM01-0AA0</b>		1	1 unit
CES, SSG10	O	2	5		<b>3SU1050-5BM01-0AA0</b>		1	1 unit
CES, STGH10	O	2	5		<b>3SU1050-5LM01-0AA0</b>		1	1 unit
BKS, S1	O	2	5		<b>3SU1050-5PM01-0AA0</b>		1	1 unit
IKON, 360012K1	O	2	5		<b>3SU1050-5XM01-0AA0</b>		1	1 unit

Latching, 2x45° (10:30/12/1:30 o'clock)



RONIS, SB30	O	2	5		<b>3SU1050-4BL01-0AA0</b>		1	1 unit
	I+O+II	2	3		<b>3SU1050-4BL11-0AA0</b>		1	1 unit
	I	2	5		<b>3SU1050-4BL21-0AA0</b>		1	1 unit
	II	2	5		<b>3SU1050-4BL31-0AA0</b>		1	1 unit
	I+II	2	5		<b>3SU1050-4BL41-0AA0</b>		1	1 unit
	O+I	2	5		<b>3SU1050-4BL51-0AA0</b>		1	1 unit
RONIS, 455	O	2	5		<b>3SU1050-4CL01-0AA0</b>		1	1 unit
	I+O+II	2	5		<b>3SU1050-4CL11-0AA0</b>		1	1 unit
RONIS, 421		2	5		<b>3SU1050-4DL11-0AA0</b>		1	1 unit
O.M.R. 73037, red	I+O+II	2	5		<b>3SU1050-4FL11-0AA0</b>		1	1 unit
O.M.R. 73038, light blue	O	2	5		<b>3SU1050-4GL01-0AA0</b>		1	1 unit
	I+O+III	2	5		<b>3SU1050-4GL11-0AA0</b>		1	1 unit
O.M.R. 73034, black	O	2	5		<b>3SU1050-4HL01-0AA0</b>		1	1 unit
	I+O+II	2	5		<b>3SU1050-4HL11-0AA0</b>		1	1 unit



3SU1050-4FL11-0AA0



3SU1050-5BL01-0AA0

CES, SSG10	O	2	5		<b>3SU1050-5BL01-0AA0</b>		1	1 unit
	I+O+II	2	3		<b>3SU1050-5BL11-0AA0</b>		1	1 unit
	I	2	5		<b>3SU1050-5BL21-0AA0</b>		1	1 unit
	II	2	5		<b>3SU1050-5BL31-0AA0</b>		1	1 unit
	I+II	2	5		<b>3SU1050-5BL41-0AA0</b>		1	1 unit
BKS, S1	O	2	5		<b>3SU1050-5PL01-0AA0</b>		1	1 unit
	I+O+II	2	5		<b>3SU1050-5PL11-0AA0</b>		1	1 unit
	I	2	5		<b>3SU1050-5PL21-0AA0</b>		1	1 unit
	I+II	2	5		<b>3SU1050-5PL41-0AA0</b>		1	1 unit
IKON, 360012K1	O	2	5		<b>3SU1050-5XL01-0AA0</b>		1	1 unit
	I+O+II	2	5		<b>3SU1050-5XL11-0AA0</b>		1	1 unit

Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to the right



RONIS, SB30	O	2	5		<b>3SU1050-4BP01-0AA0</b>		1	1 unit
	O+II	2	5		<b>3SU1050-4BP61-0AA0</b>		1	1 unit
O.M.R. 73034, black	II	2	5		<b>3SU1050-4HP31-0AA0</b>		1	1 unit
O.M.R. 73033, yellow	II	2	5		<b>3SU1050-4JP31-0AA0</b>		1	1 unit
CES, SSG10	O	2	5		<b>3SU1050-5BP01-0AA0</b>		1	1 unit
	II	2	5		<b>3SU1050-5BP31-0AA0</b>		1	1 unit
	O+II	2	5		<b>3SU1050-5BP61-0AA0</b>		1	1 unit
BKS, S1	O	2	5		<b>3SU1050-5PP01-0AA0</b>		1	1 unit



3SU1050-4BP01-0AA0

Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to the left



RONIS, SB30	O	2	5		<b>3SU1050-4BN01-0AA0</b>		1	1 unit
	I	2	5		<b>3SU1050-4BN21-0AA0</b>		1	1 unit
	O+IO+I	2	5		<b>3SU1050-4BN51-0AA0</b>		1	1 unit
CES, SSG10	O	2	5		<b>3SU1050-5BN01-0AA0</b>		1	1 unit
	I	2	5		<b>3SU1050-5BN21-0AA0</b>		1	1 unit
	O+I	2	5		<b>3SU1050-5BN51-0AA0</b>		1	1 unit
CES, STGH10	O+I	2	5		<b>3SU1050-5LN51-0AA0</b>		1	1 unit
BKS, S1	O	2	5		<b>3SU1050-5PN01-0AA0</b>		1	1 unit
	I	2	5		<b>3SU1050-5PN21-0AA0</b>		1	1 unit
	O+I	2	5		<b>3SU1050-5PN51-0AA0</b>		1	1 unit



# 3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

## Key-operated switches / Indicator lights

### Selection and ordering data

Number of NO contacts (1 per direction)	Operating principle	Direction of actuation	SD	Screw terminals	⊕	PU (UNIT, SET, M)	PS*
				Article No.	Price per PU		

#### Coordinate switches

##### Without mechanical interlock, 2 switch positions

2	Momentary contact	Horizontal	▶	3SU1050-7AC88-0AA0	1	1 unit
		Vertical	▶	3SU1050-7AD88-0AA0	1	1 unit
<b>NEW</b>	Latching	Horizontal	▶	3SU1050-7AA88-0AA0	1	1 unit
		Vertical	▶	3SU1050-7AB88-0AA0	1	1 unit

##### Without mechanical interlock, 4 switch positions

4	Momentary contact	Horizontal/Vertical	▶	3SU1150-7AF88-0AA0	1	1 unit
	Latching	Horizontal/Vertical	▶	3SU1150-7AE88-0AA0	1	1 unit

##### With mechanical interlock, 2 switch positions

2	Momentary contact	Horizontal	▶	3SU1050-7BC88-0AA0	1	1 unit
		Vertical	▶	3SU1050-7BD88-0AA0	1	1 unit
<b>NEW</b>	Latching	Horizontal	▶	3SU1050-7BA88-0AA0	1	1 unit
		Vertical	▶	3SU1050-7BB88-0AA0	1	1 unit

##### With mechanical interlock, 4 switch positions

4	Momentary contact	Horizontal/Vertical	▶	3SU1050-7BF88-0AA0	1	1 unit
	Latching	Horizontal/Vertical	▶	3SU1050-7BE88-0AA0	1	1 unit



3SU1050-7AC88-0AA0



3SU1050-7BC88-0AA0

### Selection and ordering data

Type of product	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Indicator lights

##### With smooth lens

	Amber	3	3SU1051-6AA00-0AA0		1	1 unit
	Red	▶	3SU1051-6AA20-0AA0		1	1 unit
	Yellow	▶	3SU1051-6AA30-0AA0		1	1 unit
	Green	▶	3SU1051-6AA40-0AA0		1	1 unit
	Blue	3	3SU1051-6AA50-0AA0		1	1 unit
	White	▶	3SU1051-6AA60-0AA0		1	1 unit
	Clear	3	3SU1051-6AA70-0AA0		1	1 unit

3SU1051-6AA40-0AA0



# 3SU1 30 mm, Round, Metal, Matte — Actuating & Signaling Elements

## Pushbuttons

### Overview



Actuators and indicators, flat, 30mm, metal, matte  
(all devices are shipped including adapter)

- ① Actuator
- ② Adapter









### Selection and ordering data

Version	Operating principle	Unlatching method	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Pushbuttons</b>							
 3SU1060-0JB50-0AA0	<b>Pushbuttons with flat button</b> Momentary contact	---	Black	B	<b>3SU1060-0JB10-0AA0</b>	1	1 unit
			Red	B	<b>3SU1060-0JB20-0AA0</b>	1	1 unit
			Yellow	B	<b>3SU1060-0JB30-0AA0</b>	1	1 unit
			Green	B	<b>3SU1060-0JB40-0AA0</b>	1	1 unit
			Blue	B	<b>3SU1060-0JB50-0AA0</b>	1	1 unit
			White	B	<b>3SU1060-0JB60-0AA0</b>	1	1 unit
 3SU1060-0JA20-0AA0	Latching Push to unlatch	---	Black	B	<b>3SU1060-0JA10-0AA0</b>	1	1 unit
			Red	B	<b>3SU1060-0JA20-0AA0</b>	1	1 unit
			Yellow	B	<b>3SU1060-0JA30-0AA0</b>	1	1 unit
			Green	B	<b>3SU1060-0JA40-0AA0</b>	1	1 unit
			Blue	B	<b>3SU1060-0JA50-0AA0</b>	1	1 unit
			White	B	<b>3SU1060-0JA60-0AA0</b>	1	1 unit
 3SU1061-0JB40-0AA0	<b>Illuminated pushbuttons with flat button</b> Momentary contact	---	Red	B	<b>3SU1061-0JB20-0AA0</b>	1	1 unit
			Yellow	B	<b>3SU1061-0JB30-0AA0</b>	1	1 unit
			Green	B	<b>3SU1061-0JB40-0AA0</b>	1	1 unit
			Blue	B	<b>3SU1061-0JB50-0AA0</b>	1	1 unit
			Clear	B	<b>3SU1061-0JB70-0AA0</b>	1	1 unit
 3SU1061-0JA30-0AA0	Latching Push to unlatch	---	Red	B	<b>3SU1061-0JA20-0AA0</b>	1	1 unit
			Yellow	B	<b>3SU1061-0JA30-0AA0</b>	1	1 unit
			Green	B	<b>3SU1061-0JA40-0AA0</b>	1	1 unit
			Blue	B	<b>3SU1061-0JA50-0AA0</b>	1	1 unit
			Clear	B	<b>3SU1061-0JA70-0AA0</b>	1	1 unit

# 3SU1 30 mm, Round, Metal, Matte — Actuating & Signaling Elements

## Selector switches

### Selection and ordering data

Version	Operating principle	Color	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Selector switches</b>								
<b>2 switch positions, can be illuminated</b>								
 <p>3SU1062-2DC40-0AA0</p>	Selector, short black actuator and front ring for flat mounting	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	B	3SU1062-2DC10-0AA0	1	1 unit	
				Red	B	3SU1062-2DC20-0AA0	1	1 unit
				Green	B	3SU1062-2DC40-0AA0	1	1 unit
				White	B	3SU1062-2DC60-0AA0	1	1 unit
 <p>3SU1062-2DF10-0AA0</p>	Selector, long black actuator and front ring for flat mounting	Latching, 90° (10:30/1:30 o'clock)	Black	B	3SU1062-2DF10-0AA0	1	1 unit	
				Red	B	3SU1062-2DF20-0AA0	1	1 unit
				Green	B	3SU1062-2DF40-0AA0	1	1 unit
				Blue	B	3SU1062-2DF50-0AA0	1	1 unit
				White	B	3SU1062-2DF60-0AA0	1	1 unit
 <p>3SU1062-2EC20-0AA0</p>	Selector, long black actuator and front ring for flat mounting	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	B	3SU1062-2EC10-0AA0	1	1 unit	
				Red	B	3SU1062-2EC20-0AA0	1	1 unit
				Green	B	3SU1062-2EC40-0AA0	1	1 unit
				White	B	3SU1062-2EC60-0AA0	1	1 unit
 <p>3SU1062-2EF10-0AA0</p>	Selector, long black actuator and front ring for flat mounting	Latching, 90° (10:30/1:30 o'clock)	Black	B	3SU1062-2EF10-0AA0	1	1 unit	
				Red	B	3SU1062-2EF20-0AA0	1	1 unit
				Green	B	3SU1062-2EF40-0AA0	1	1 unit
				White	B	3SU1062-2EF60-0AA0	1	1 unit
<b>3 switch positions (I+O+II), can be illuminated</b>								
 <p>3SU1062-2DM60-0AA0</p>	Selector, short black actuator and front ring for flat mounting	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right + left	Black	B	3SU1062-2DM10-0AA0	1	1 unit	
				Red	B	3SU1062-2DM20-0AA0	1	1 unit
				Green	B	3SU1062-2DM40-0AA0	1	1 unit
				White	B	3SU1062-2DM60-0AA0	1	1 unit
 <p>3SU1062-2DL60-0AA0</p>	Selector, long black actuator and front ring for flat mounting	Latching, 2x45° (10:30/12/1:30 o'clock)	Black	B	3SU1062-2DL10-0AA0	1	1 unit	
				Red	B	3SU1062-2DL20-0AA0	1	1 unit
				Blue	B	3SU1062-2DL30-0AA0	1	1 unit
				Green	B	3SU1062-2DL40-0AA0	1	1 unit
				White	B	3SU1062-2DL60-0AA0	1	1 unit
 <p>3SU1062-2EM60-0AA0</p>	Selector, long black actuator and front ring for flat mounting	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right + left	Black	B	3SU1062-2EM10-0AA0	1	1 unit	
				Red	B	3SU1062-2EM20-0AA0	1	1 unit
				Green	B	3SU1062-2EM40-0AA0	1	1 unit
				White	B	3SU1062-2EM60-0AA0	1	1 unit
 <p>3SU1062-2EL60-0AA0</p>	Selector, long black actuator and front ring for flat mounting	Latching, 2x45° (10:30/12/1:30 o'clock)	Black	B	3SU1062-2EL10-0AA0	1	1 unit	
				Red	B	3SU1062-2EL20-0AA0	1	1 unit
				Green	B	3SU1062-2EL40-0AA0	1	1 unit
				White	B	3SU1062-2EL60-0AA0	1	1 unit

# 3SU1 30 mm, Round, Metal, Matte — Actuating & Signaling Elements

## Key-operated switches / Indicator lights

### Selection and ordering data

Make of lock	Operating principle	Switch position for key removal	DT	Order No.	PU (UNIT, SET, M)	PS*
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#### Key-operated switches with 2 keys

##### 2 switch positions (O+I)



3SU1060-4LF11-0AA0

RONIS, SB30 and front ring for flat mounting

Momentary contact, 45° (10:30/12 o'clock), reset from center to left



B 3SU1060-4LC01-0AA0

1 1 unit

Latching, 90° (10:30/1:30 o'clock)

O+I  
I

B 3SU1060-4LF11-0AA0  
B 3SU1060-4LF21-0AA0

1 1 unit  
1 1 unit



##### 3 switch positions (I+O+II)



3SU1060-4LL11-0AA0

RONIS, SB30 and front ring for flat mounting

Latching, 2x45° (10:30/12/1:30 o'clock)



O+I+II

B 3SU1060-4LL11-0AA0

1 1 unit

### Selection and ordering data

Version	Operating principle	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
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#### Indicator lights



3SU1061-0JD40-0AA0

**Illuminated pushbuttons** Fixed button with flat button

Red B 3SU1061-0JD20-0AA0  
Yellow B 3SU1061-0JD30-0AA0  
Green B 3SU1061-0JD40-0AA0  
Blue B 3SU1061-0JD50-0AA0  
Clear B 3SU1061-0JD70-0AA0

1 1 unit  
1 1 unit  
1 1 unit  
1 1 unit  
1 1 unit

# Actuators and Indicators, Customized Designs

## Special locks

### Options

#### Special locks for key-operated switches

The plastic and metal key-operated switches of type RONIS, BKS, CES and IKON can be optionally ordered with additional locks.

In this case **"-Z"**, the order code **"Y01"** and the required lock number must be added to the Order No. of the relevant key-operated switch for standard locking.

Order code	Y01
Normal delivery time	25 working days
Additional price per unit	On request
Ordering example	3SU1000-5BF01-0AA0-Z Y01 Z = SSG18

#### Ordering notes

- For all special locks, an additional price applies.
- The order code **"Y01"** must be quoted in accordance with the above tables. Automated processing of the order with a defined delivery time can be guaranteed only for correctly submitted orders.
- For applications in which access security is important and several lock numbers are used, we recommend the use of BKS or CES key-operated switches.
- Special locks for VW (E1, E2, ...) will be delivered without keys, all others with 2 keys.
- With RONIS, the special locks SB31, 421 and 455 are possible.

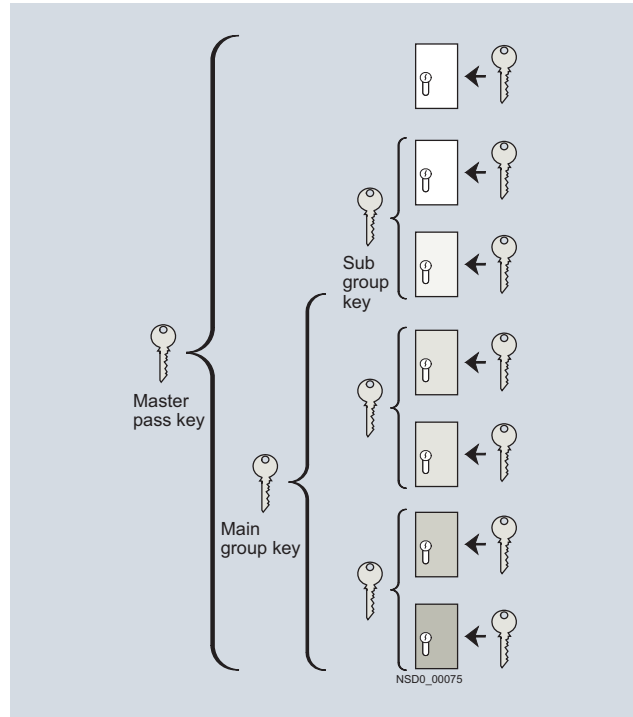
#### Master and master-pass key systems

The following key systems can be supplied with BKS, CES or IKON key-operated switches:

- Central lock systems
- Master key systems
- Central master key systems
- Master-pass key systems

When placing an order you must supplement the Order No. of the matching key-operated switches with **"-Z"** and quote the order code **"Y03"**.

Price and delivery time on request.



Example of master-pass key system

# Actuators and Indicators, Customized Designs

## Contact Block Selection Table for Selector Switches, Key-operated Switches, and 3-position push-pull

### Selection and Ordering Data

Switch Position (front of switch)		Contact Block Circuit	Contact Block Position <sup>1)</sup>		Contact Block Order No.
Left	Right				

#### Two-Position Selector Switch Contact Block Selection

Switch Position (front of switch)		Contact Block Circuit	Contact Block Position <sup>1)</sup>		Contact Block Order No.
Left	Right				
O	X	1 NO	Any Position		<b>3SU1400-1AA10-1BA0</b>
X	O	1 NC	Any Position		<b>3SU1400-1AA10-1CA0</b>
O	X	1 NO/1 NC	Any Position		<b>3SU1400-1AA10-1FA0</b>
X	O				
O	X	2 NO	Any Position		<b>3SU1400-1AA10-1DA0</b>
O	X				
X	O	2 NC	Any Position		<b>3SU1400-1AA10-1EA0</b>
X	O				

Switch Position (front of switch)			Contact Block Circuit	Contact Block Position <sup>1)</sup>		Contact Block Order No.
Left	Center	Right		On Holder	Stacked	

#### Three-Position Selector Switch Contact Block Selection

Switch Position (front of switch)			Contact Block Circuit	Contact Block Position <sup>1)</sup>		Contact Block Order No.
Left	Center	Right		On Holder	Stacked	
X	O	O	1 NO	2 or 3A	5 or 6A	<b>3SU1400-1AA10-1BA0</b>
X	O	X	1 NO	3	6	<b>3SU1400-1AA10-1BA0</b>
O	O	X	1 NO	1 or 3B	4 or 6B	<b>3SU1400-1AA10-1BA0</b>
O	X	X	1 NC	2 or 3A	5 or 6A	<b>3SU1400-1AA10-1CA0</b>
O	X	O	1 NC	3	6	<b>3SU1400-1AA10-1CA0</b>
X	X	O	1 NC	1 or 3B	4 or 6B	<b>3SU1400-1AA10-1CA0</b>
X	O	O	1 NO/1 NC	2 or 3A	--	<b>3SU1400-1AA10-1FA0</b>
O	X	X				
X	O	X	1 NO/1 NC	3	--	<b>3SU1400-1AA10-1FA0</b>
O	X	O				
O	O	X	1 NO/1 NC	1 or 3B	--	<b>3SU1400-1AA10-1FA0</b>
X	X	O				
X	O	O	2 NO	2 or 3A	--	<b>3SU1400-1AA10-1DA0</b>
X	O	O				
X	O	X	2 NO	3	--	<b>3SU1400-1AA10-1DA0</b>
X	O	X				
O	O	X	2 NO	1 or 3B	--	<b>3SU1400-1AA10-1DA0</b>
O	O	X				
O	X	X	2 NC	2 or 3A	--	<b>3SU1400-1AA10-1EA0</b>
O	X	X				
O	X	O	2 NC	3	--	<b>3SU1400-1AA10-1EA0</b>
O	X	O				
X	X	O	2 NC	1 or 3B	--	<b>3SU1400-1AA10-1EA0</b>
X	X	O				

#### Three-Position Push-Pull Contact Block Selection

Out	Center	In	Contact Block Circuit	Contact Block Position <sup>1)</sup>		Contact Block Order No.
				On Holder	Stacked	
X	O	O	1 NO	2 or 3A	5 or 6A	<b>3SU1400-1AA10-1BA0</b>
O	O	X	1 NO	1 or 3B	4 or 6B	<b>3SU1400-1AA10-1BA0</b>
X	X	O	1 NC	1 or 3B	4 or 6B	<b>3SU1400-1AA10-1CA0</b>
O	X	X	1 NC	2 or 3A	5 or 6A	<b>3SU1400-1AA10-1CA0</b>
O	X	X	1 NO/1 NC	2 or 3A	--	<b>3SU1400-1AA10-1FA0</b>
X	O	O				
X	X	O	1 NO/1 NC	1 or 3B	--	<b>3SU1400-1AA10-1FA0</b>
O	O	X				
O	X	O	2 NC	3	--	<b>3SU1400-1AA10-1FA0</b>
X	O	X				

<sup>1)</sup> Single-element Contact Blocks are stackable (2 deep). Dual Contact Blocks are not stackable.

In order to attach a Light Module to the actuator, both plungers must be removed and Light Module placed in position #3.

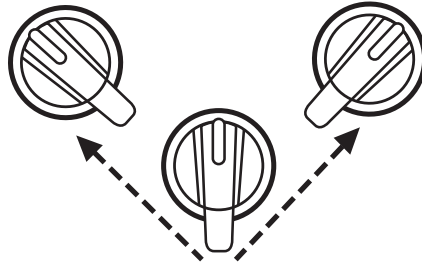
Rear View	Plungers Inserted	Center Module Position Numbers	Replace the asterisks in center position numbers 3* or 6*:
	Both	3 or 6	Contact Blocks Position Number will be (3 or 6) when "Both" plungers are installed.
	Right	3B or 6B	Contact Blocks Position Number will be (3B or 6B) when "Right" plunger only is installed.
	Left	3A or 6A	Contact Blocks Position Number will be (3A or 6A) when "Left" plunger only is installed.
	None	None	Both plungers are removed if Center Module Position 3 is used with LED Light Module

X ----- Contact Closed  
 O ----- Contact Open  
 3 or 6 ----- Both Plungers Inserted  
 3A or 6A --- Left Plunger Inserted  
 3B or 6B --- Right Plunger Inserted

# Actuators and Indicators, Customized Designs

Contact Block Selection Table for Selector – Switches and Key-operated Switches

## Function Table



Plunger Position		Selector Switch Position <sup>1)</sup>					
Rear View	Front View	Left Position			Right Position		
		2	3	1	2	3	1
		■	■	□	□	■	■
		■	□	□	□	■	■
		■	■	□	□	□	■
		■	⊗	□	□	⊗	■

- Activated
- Not Activated
- ⊗ LED Available
- ☰ Plunger

<sup>1)</sup> The selector switch position is viewed from the front.  
 All selector switches are packaged with two plungers, which can be removed manually.

# Actuators and Indicators, Customized Designs

## Laser inscriptions

### Options

#### Inscription of actuating and signaling elements

Actuating and signaling elements of plastic as well as metal can be optionally inscribed with a laser.



Example of laser inscription

The actuators of the pushbuttons, illuminated pushbuttons, twin pushbuttons, mushroom pushbuttons, illuminated mushroom pushbuttons, EMERGENCY STOP mushroom pushbuttons (without lock), the lenses of the indicator lights, and the acoustic signaling devices can all be inscribed.

#### Version

Text inscriptions have centered alignment and a font height of 4 mm as standard.

The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

The maximum possible number of characters per line is:

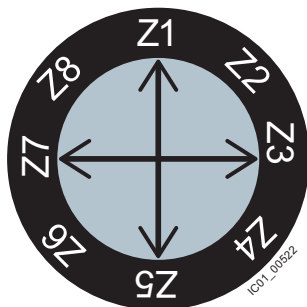
- 10 characters for one line of text
- 8 characters for 2 lines of text
- 6 characters for 3 lines of text, but 10 characters in the middle line

#### Note:

Selected pushbuttons and twin pushbuttons can be supplied as standard with inscribed letters or symbols.

Selector switches, key-operated switches and toggle switches can be inscribed on the front ring only if they are made of plastic (only one text line and the supplement Y19).

#### Assignment of the positions on the actuator



#### Ordering notes

To order, the inscribed actuating and signaling elements can be selected via the SIRIUS ACT Configurator. An electronic order form is then generated.

For configurator, see

- [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)
- Electronic Catalog CA 01 on DVD or
- Industry Mall: [www.siemens.com/industrymall](http://www.siemens.com/industrymall)

When ordering, add **-Z** and an order code to the article number of the actuator or the indicator light:

- **Y10:** Text line in upper/lower case, all lines begin with upper case letters (e.g. line 1: Text/line 2: Text)
- **Y11:** Text in upper case (e.g. LIFT)
- **Y12:** Text in lower case (e.g. lift/off/lower)
- **Y15:** Text in upper/lower case, all words begin with upper case letters (e.g. On/Off)
- **Y13:** Symbol with number according to ISO 7000 or IEC 60417
- **Y19:** Inscription of choice, text or symbol, can only be ordered via SIRIUS ACT Configurator with a Configuration Identification Number (CIN)

When ordering, specify the required inscription in plain text without spaces, in addition to the article number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language. In the case of symbols with number, quote the corresponding standard (see ordering example 1).

In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. Z1=Lift, Z2=Lower.

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering examples 2 and 3).

The SIRIUS ACT Configurator must be used to select special inscriptions and symbols (order code Y19). In this case a CIN (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard ordering channels.

#### Ordering example 1

A round pushbutton with the inscription Reset is required:

**3SU1030-0AB20-0AA0-Z**

Y10

Z1=Reset

#### Ordering example 2

A pushbutton inscribed with symbol No. 5389 according to IEC 60417 is required:

**3SU1030-0AB20-0AA0-Z**

Y13

Z=5389 IEC

#### Ordering example 3

A selector switch with 2 switch positions and multi-line inscription on the front ring is required:

**3SU1002-2BF10-0AA0-Z**

Z8=0

Z2=1



# Holders

## Holders without module

### Overview

Holders made of plastic can only be attached to actuators and indicators made of plastic (3SU100) or plastic with metal front ring (3SU103).

Metal holders can be attached to all versions of actuators and indicators. Metal holders are automatically grounded by their fastening screw, but a grounding stud can also be fitted.



### Selection and ordering data

	Version	Holder material	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Holders without module</b>						
 3SU1500-0AA10-0AA0	<b>3x without module</b>	Plastic	A	<b>3SU1500-0AA10-0AA0</b>	1	1 unit
 3SU1500-0BA10-0AA0	<b>4x without module</b> For selector switch with 4 switch positions and for coordinate switches	Plastic	A	<b>3SU1500-0BA10-0AA0</b>	1	1 unit
<b>Holders without module</b>						
	Version	Holder material	DT	Order No.	PU (UNIT, SET, M)	PS*
 3SU1550-0AA10-0AA0	<b>3x without module</b>	Metal	A	<b>3SU1550-0AA10-0AA0</b>	1	1 unit
 3SU1550-0BA10-0AA0	<b>4x without module</b> For selector switch with 4 switch positions and for coordinate switches	Metal	A	<b>3SU1550-0BA10-0AA0</b>	1	1 unit

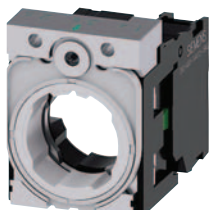
# Holders

## Holders with module

### Selection and ordering data

Number of		SD	Screw terminals	PU (UNIT, SET, M)	PS*			
Contact modules	LED modules					NO cont.	NC cont.	Color of light source
		d	Article No.	Price per PU				
<b>Holders with module</b>								
<b>3x with module, plastic</b>								
	1	0	1	0	--	▶ 3SU1500-1AA10-1BA0	1	1 unit
						▶ 3SU1500-1AA10-1CA0	1	1 unit
						▶ 3SU1500-1AA10-1FA0	1	1 unit
	2	0	2	0	--	⊕ 3SU1500-1AA10-1NA0	1	1 unit
						⊕ 3SU1500-1AA10-1PA0	1	1 unit
						⊕ 3SU1500-1AA10-1LA0	1	1 unit
<b>3x with contact and LED module<sup>1)</sup> (6 ... 24 V AC/DC)</b>								
	1	1	1	0		Amber 3 3SU1501-1AG00-1BA0	1	1 unit
						Red 3 3SU1501-1AG20-1BA0	1	1 unit
						Yellow 3 3SU1501-1AG30-1BA0	1	1 unit
						Green 3 3SU1501-1AG40-1BA0	1	1 unit
						Blue 3 3SU1501-1AG50-1BA0	1	1 unit
						White 3 3SU1501-1AG60-1BA0	1	1 unit
	0	1				Amber ⊕ 3 3SU1501-1AG00-1CA0	1	1 unit
						Red ⊕ 3 3SU1501-1AG20-1CA0	1	1 unit
						Yellow ⊕ 3 3SU1501-1AG30-1CA0	1	1 unit
						Green ⊕ 3 3SU1501-1AG40-1CA0	1	1 unit
						Blue ⊕ 3 3SU1501-1AG50-1CA0	1	1 unit
						White ⊕ 3 3SU1501-1AG60-1CA0	1	1 unit
	1	1				Amber ⊕ 3 3SU1501-1AG00-1FA0	1	1 unit
						Red ⊕ 3 3SU1501-1AG20-1FA0	1	1 unit
						Yellow ⊕ 3 3SU1501-1AG30-1FA0	1	1 unit
						Green ⊕ 3 3SU1501-1AG40-1FA0	1	1 unit
						Blue ⊕ 3 3SU1501-1AG50-1FA0	1	1 unit
						White ⊕ 3 3SU1501-1AG60-1FA0	1	1 unit
2	1	2	0		Amber ⊕ 3 3SU1501-1AG00-1NA0	1	1 unit	
					Red ⊕ 3 3SU1501-1AG20-1NA0	1	1 unit	
					Yellow ⊕ 3 3SU1501-1AG30-1NA0	1	1 unit	
					Green ⊕ 3 3SU1501-1AG40-1NA0	1	1 unit	
					Blue ⊕ 3 3SU1501-1AG50-1NA0	1	1 unit	
					White ⊕ 3 3SU1501-1AG60-1NA0	1	1 unit	
	2	2	2	2		Amber ⊕ 3 3SU1501-1AG00-1LA0	1	1 unit
						Red ⊕ 3 3SU1501-1AG20-1LA0	1	1 unit
						Yellow ⊕ 3 3SU1501-1AG30-1LA0	1	1 unit
						Green ⊕ 3 3SU1501-1AG40-1LA0	1	1 unit
						Blue ⊕ 3 3SU1501-1AG50-1LA0	1	1 unit
						White ⊕ 3 3SU1501-1AG60-1LA0	1	1 unit

<sup>1)</sup> Only for use with SIRIUS commanding and signaling devices.

Number of		SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG				
Contact modules	NO contacts						NC contacts			
		d	Article No.	Price per PU						
<b>Holders with module</b>										
<b>3x with module, metal</b>										
	1	1	0			3 3SU1550-1AA10-1BA0	1	1 unit	41J	
						⊕ 3 3SU1550-1AA10-1CA0	1	1 unit	41J	
						⊕ 3 3SU1550-1AA10-1FA0	1	1 unit	41J	
	2	2	0	2			⊕ 3 3SU1550-1AA10-1NA0	1	1 unit	41J
							⊕ 3 3SU1550-1AA10-1PA0	1	1 unit	41J
							⊕ 3 3SU1550-1AA10-1LA0	1	1 unit	41J

3SU1550-1AA10-1BA0

⊕ Positive opening according to IEC 60947-5-1, Annex K.  
Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System, see Section 13.



# Modules for Actuators and Indicators

## Contact modules

### Overview

#### Contact modules and LED modules

The contact modules are fitted with slow-action contacts (NO contacts or NC contacts). These ensure a high switching reliability even with small voltages and currents, such as 5 V/1 mA. They are suitable for use in electronic systems as well as conventional controls. The contact pieces of the NC contacts are positively driven.

Only LED modules with permanently integrated LEDs are available for illumination.

Contact modules and LED modules bear terminal designations acc. to EN 50013.

#### Mounting the modules



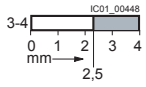

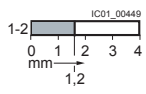

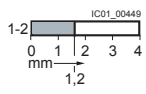


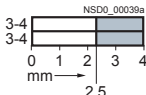

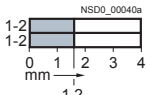

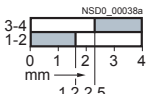


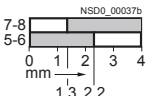
With SIRIUS ACT, the modules are mounted on the holder without any further accessories. Holders in plastic or metal versions are available for mounting three modules.

#### Connection methods

The modules are available with:

- Screw terminals
- Spring-type terminals or
- Solder pin connections (0.8 mm x 0.8 mm solder pins) for assembly on printed circuit boards


### Selection and ordering data

Contact version	Number of NO contacts	NC contacts	SD	Screw terminals		PU (UNIT, SET, M)	PS*	
				Article No.	Price per PU			
<b>Contact modules for front plate mounting</b>								
	Silver alloy	1	0			<b>3SU1400-1AA10-1BA0</b>	1	1 unit
		0	1			<b>3SU1400-1AA10-1CA0</b>	1	1 unit
		0	1 with installation monitoring <sup>1)</sup>			<b>3SU1400-1AA10-1HA0</b>	1	1 unit
		2	0			<b>3SU1400-1AA10-1DA0</b>	1	1 unit
		0	2			<b>3SU1400-1AA10-1EA0</b>	1	1 unit
		1	1			<b>3SU1400-1AA10-1FA0</b>	1	1 unit
		1 leading switching	1 lagging switching			<b>3SU1400-1AA10-1GA0</b>	1	1 unit

**NEW**




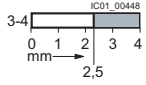

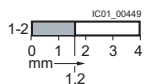

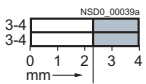

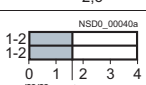

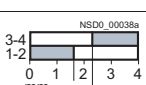

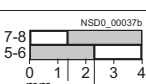
<sup>1)</sup> The contact module has 1 NO internal contact + 1 NC internal contact. The NO contact is connected in series with the NC contact and brought out at terminal 1-2. When the module is snapped onto the holder, the NO contact closes. It opens when the module is detached from the holder again (the NC contact remains closed). The NC contact opens when the EMERGENCY STOP device is actuated (the NO contact remains closed). The contact is closed only when both the NC and NO contacts are closed. Unsuitable for mounting in 3SU18 enclosure.

⊕ Positive opening according to IEC 60947-5-1, Annex K. Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System, see Section 13.

Certificate: 

# Modules for Actuators and Indicators

## Contact modules

Contact version	Number of NO contacts	NC contacts		SD	Screw terminals 	PU (UNIT, SET, M)	PS*		
				d	Article No.	Price per PU			
<b>Contact modules for front plate mounting <i>NEW</i></b>									
	Gold-plated	1	0			3	<b>3SU1400-1AA10-1LA0</b>	1	1 unit
		0	1			5	<b>3SU1400-1AA10-1MA0</b>	1	1 unit
		2	0			5	<b>3SU1400-1AA10-1NA0</b>	1	1 unit
		0	2			5	<b>3SU1400-1AA10-1PA0</b>	1	1 unit
		1	1			5	<b>3SU1400-1AA10-1QA0</b>	1	1 unit
		1 leading	1 lagging			5	<b>3SU1400-1AA10-1RA0</b>	1	1 unit

⊕ Positive opening according to IEC 60947-5-1, Annex K.  
 Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System,  
 see Section 13.  
 Certificate:



# Modules for Actuators and Indicators

## Contact modules

Contact version	Number of		SD	Spring-type terminals	PU (UNIT, SET, M)	PS*	
	NO contacts	NC contacts					
Contact modules for front plate mounting				Article No.	Price per PU		
 3SU1400-1AA10-3BA0	Silver alloy	1	0		3SU1400-1AA10-3BA0	1	1 unit
		0	1		3SU1400-1AA10-3CA0	1	1 unit
 3SU1400-1AA10-3HA0		0	1 with installation monitoring <sup>1)</sup>		3SU1400-1AA10-3HA0	1	1 unit
		2	0		3SU1400-1AA10-3DA0	1	1 unit
 3SU1400-1AA10-3DA0	<b>NEW</b>	0	2		3SU1400-1AA10-3DA0	1	1 unit
	<b>NEW</b>	0	2		3SU1400-1AA10-3EA0	1	1 unit
 3SU1400-1AA10-3FA0	<b>NEW</b>	1	1		3SU1400-1AA10-3FA0	1	1 unit
	<b>NEW</b>	1 leading	1 lagging		3SU1400-1AA10-3GA0	1	1 unit


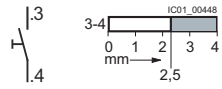
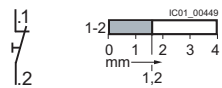
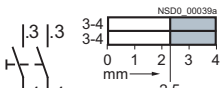
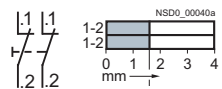
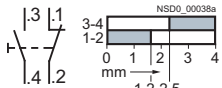
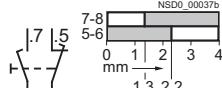
<sup>1)</sup> The contact module has 1 NO internal contact + 1 NC internal contact. The NO contact is connected in series with the NC contact and brought out at terminal 1-2. When the module is snapped onto the holder, the NO contact closes. It opens when the module is detached from the holder again (the NC contact remains closed). The NC contact opens when the EMERGENCY STOP device is actuated (the NO contact remains closed). The contact is closed only when both the NC and NO contacts are closed. Not suitable for installation in 3SU18 enclosure.

⊕ Positive opening according to IEC 60947-5-1, Annex K. Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System, see Section 13. Certificate:



# Modules for Actuators and Indicators

## Contact modules

Contact version	Number of		SD	Spring-type terminals	PU (UNIT, SET, M)	PS*		
	NO contacts	NC contacts						
Contact modules for front plate mounting <b>NEW</b>				Article No.	Price per PU			
 3SU1400-1AA10-3LA0	Gold-plated	1	0		5	<b>3SU1400-1AA10-3LA0</b>	1	1 unit
		0	1		5	<b>3SU1400-1AA10-3MA0</b>	1	1 unit
		2	0		5	<b>3SU1400-1AA10-3NA0</b>	1	1 unit
		0	2		5	<b>3SU1400-1AA10-3PA0</b>	1	1 unit
		1	1		5	<b>3SU1400-1AA10-3QA0</b>	1	1 unit
		1 leading	1 lagging		5	<b>3SU1400-1AA10-3RA0</b>	1	1 unit



⊖ Positive opening according to IEC 60947-5-1, Annex K.  
 Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System,  
 see Section 13.  
 Certificate:



# Modules for Actuators and Indicators

## LED modules

### Selection and ordering data



	Operational voltage at AC	Operational voltage at DC	Color	DT	Screw terminals	PU (UNIT, SET, M)	PS*		
	V	V			Order No.				
<b>LED modules<sup>1)</sup> for front plate mounting</b>									
 3SU1401-1BB30-1AA0	24	24	Amber	A	3SU1401-1BB00-1AA0 3SU1401-1BB20-1AA0 3SU1401-1BB30-1AA0 3SU1401-1BB40-1AA0 3SU1401-1BB50-1AA0 3SU1401-1BB60-1AA0	1	1 unit		
			Red	▶				1	1 unit
			Yellow	▶				1	1 unit
			Green	▶				1	1 unit
			Blue	▶				1	1 unit
			White	▶				1	1 unit
			110	--				Amber	B
Red	▶	1			1 unit				
Yellow	▶	1			1 unit				
Green	▶	1			1 unit				
Blue	▶	1			1 unit				
White	▶	1			1 unit				
230	--	Amber	B	3SU1401-1BF00-1AA0 3SU1401-1BF20-1AA0 3SU1401-1BF30-1AA0 3SU1401-1BF40-1AA0 3SU1401-1BF50-1AA0 3SU1401-1BF60-1AA0	1	1 unit			
		Red	▶				1	1 unit	
		Yellow	▶				1	1 unit	
		Green	▶				1	1 unit	
		Blue	▶				1	1 unit	
		White	▶				1	1 unit	
<b>Spring-type terminals</b>									
 3SU1401-1BB30-3AA0	24	24	Amber	B	3SU1401-1BB00-3AA0 3SU1401-1BB20-3AA0 3SU1401-1BB30-3AA0 3SU1401-1BB40-3AA0 3SU1401-1BB50-3AA0 3SU1401-1BB60-3AA0	1	1 unit		
			Red	▶				1	1 unit
			Yellow	▶				1	1 unit
			Green	▶				1	1 unit
			Blue	▶				1	1 unit
			White	▶				1	1 unit
			110	--				Amber	B
Red	▶	1			1 unit				
Yellow	B	1			1 unit				
Green	▶	1			1 unit				
Blue	B	1			1 unit				
White	▶	1			1 unit				
230	--	Amber	B	3SU1401-1BF00-3AA0 3SU1401-1BF20-3AA0 3SU1401-1BF30-3AA0 3SU1401-1BF40-3AA0 3SU1401-1BF50-3AA0 3SU1401-1BF60-3AA0	1	1 unit			
		Red	▶				1	1 unit	
		Yellow	B				1	1 unit	
		Green	▶				1	1 unit	
		Blue	B				1	1 unit	
		White	▶				1	1 unit	

<sup>1)</sup> Only for use with SIRIUS commanding and signaling devices.





# Modules for Actuators and Indicators

## LED modules

Operational voltage at AC	Operational voltage at DC	Color	DT	Screw terminals	PU (UNIT, SET, M)	PS*	
V	V			Order No.			
<b>LED modules<sup>1)</sup> for front plate mounting</b>							
 3SU1401-1BG30-1AA0	6 ... 24	6 ... 24	Amber	A	3SU1401-1BG00-1AA0	1	1 unit
			Red	▶	3SU1401-1BG20-1AA0	1	1 unit
			Yellow	▶	3SU1401-1BG30-1AA0	1	1 unit
			Green	▶	3SU1401-1BG40-1AA0	1	1 unit
			Blue	▶	3SU1401-1BG50-1AA0	1	1 unit
			White	▶	3SU1401-1BG60-1AA0	1	1 unit
			24 ... 240	24 ... 240	Amber	B	3SU1401-1BH00-1AA0
Red	▶	3SU1401-1BH20-1AA0			1	1 unit	
Yellow	▶	3SU1401-1BH30-1AA0			1	1 unit	
Green	▶	3SU1401-1BH40-1AA0			1	1 unit	
Blue	▶	3SU1401-1BH50-1AA0			1	1 unit	
White	▶	3SU1401-1BH60-1AA0			1	1 unit	
<b>Spring-type terminals</b>							
 3SU1401-1BG30-3AA0	6 ... 24	6 ... 24	Amber	B	3SU1401-1BG00-3AA0	1	1 unit
			Red	▶	3SU1401-1BG20-3AA0	1	1 unit
			Yellow	▶	3SU1401-1BG30-3AA0	1	1 unit
			Green	▶	3SU1401-1BG40-3AA0	1	1 unit
			Blue	B	3SU1401-1BG50-3AA0	1	1 unit
			White	▶	3SU1401-1BG60-3AA0	1	1 unit
			24 ... 240	24 ... 240	Amber	B	3SU1401-1BH00-3AA0
Red	B	3SU1401-1BH20-3AA0			1	1 unit	
Yellow	B	3SU1401-1BH30-3AA0			1	1 unit	
Green	▶	3SU1401-1BH40-3AA0			1	1 unit	
Blue	B	3SU1401-1BH50-3AA0			1	1 unit	
White	B	3SU1401-1BH60-3AA0			1	1 unit	

<sup>1)</sup> Only for use with SIRIUS commanding and signaling devices.

Operational voltage at AC	Operational voltage at DC	DT	Screw terminals	PU (UNIT, SET, M)	PS*	
V	V		Order No.			
<b>LED test modules<sup>1)</sup> for front plate mounting</b>						
 3SU1401-1CK10-1AA0	12 ... 240	12 ... 240	▶	3SU1400-1CK10-1AA0	1	1 unit

Operational voltage at AC	Operational voltage at DC	Color	DT	Socket terminals (THT)	PU (UNIT, SET, M)	PS*	
V	V			Order No.			
<b>LED modules<sup>1)</sup> for mounting on printed circuit boards</b>							
 3SU1401-3BA20-5AA0	--	5	Amber	B	3SU1401-3BA00-5AA0	1	1 unit
			Red	▶	3SU1401-3BA20-5AA0	1	1 unit
			Yellow	▶	3SU1401-3BA30-5AA0	1	1 unit
			Green	▶	3SU1401-3BA40-5AA0	1	1 unit
			Blue	▶	3SU1401-3BA50-5AA0	1	1 unit
			White	▶	3SU1401-3BA60-5AA0	1	1 unit

<sup>1)</sup> Only for use with SIRIUS commanding and signaling devices.









# Modules for Actuators and Indicators

## AS-Interface modules

### Selection and ordering data

Operational voltage	Slave type	Number of digital inputs		Number of digital outputs	SD	Screw terminals + Spring-type terminals		PU (UNIT, SET, M)	PS*
		Standard	Safety-related			Article No.	Price per PU		

#### AS-Interface modules for front plate mounting

 3SU1400-1EA10-2AA0	30 V	2 F-DI	--	2	--	5	3SU1400-1EA10-2AA0	1	1 unit
		2 F-DI + 1 LED	Red	2	1	5	3SU1401-1EE20-2AA0	1	1 unit
 3SU1400-1EC10-2AA0		2 F-DI + 1 DQ	--	2	1	5	3SU1400-1EC10-2AA0	1	1 unit
									Insulation piercing method 
 3SU1400-1EA10-4AA0		2 F-DI	--	2	--	5	3SU1400-1EA10-4AA0	1	1 unit
		2 F-DI + 1 LED	Red	2	1	▶	3SU1401-1EE20-4AA0	1	1 unit
 3SU1400-1EC10-4AA0		2 F-DI + 1 DQ	--	2	1	5	3SU1400-1EC10-4AA0	1	1 unit
									Spring-type terminals + Insulation piercing method  
 3SU1400-1EJ10-6AA0	30 V	4 DI/3 DO AB	--	4	4	5	3SU1400-1EJ10-6AA0	1	1 unit
		4 DI/4 DO	--	4	4	5	3SU1400-1EK10-6AA0	1	1 unit

# Modules for Actuators and Indicators

## Electronic modules for IO-Link/support terminals

### Selection and ordering data

Operational voltage	Slave type	Number of digital inputs	Number of digital outputs	SD	Spring-type terminals (push-in)	PU (UNIT, SET, M)	PS*
				d	Article No. Price per PU		
<b>Electronic modules for IO-Link, front panel mounting</b>							
24 V	Freely programmable (default 6 DI/2 DQ)	0 ... 8	0 ... 8	5	<b>3SU1400-1HL10-6AA0</b>	1	1 unit



3SU1400-1HL10-6AA0

### Selection and ordering data

Color	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	d	Article No. Price per PU		
<b>Support terminals <i>NEW</i></b>				
Black	3	<b>3SU1400-1DA10-1AA0</b>	1	1 unit
Blue	5	<b>3SU1400-1DA50-1AA0</b>	1	1 unit
Green/Yellow	3	<b>3SU1400-1DA43-1AA0</b>	1	1 unit
<hr/>				
		<b>Spring-type terminals</b>		
Black	5	<b>3SU1400-1DA10-3AA0</b>	1	1 unit
Blue	5	<b>3SU1400-1DA50-3AA0</b>	1	1 unit
Green/Yellow	5	<b>3SU1400-1DA43-3AA0</b>	1	1 unit



3SU1400-1DA10-1AA0




3SU1400-1DA50-3AA0




# Modules for Actuators and Indicators

## Electronic modules for ID key-operated switches

### Technical specifications

Order No.	3SU1400-1GC10-1AA0	3SU1400-1GD10-1AA0
<b>Communication</b>		
Protocol is supported by IO-Link protocol	No	Yes
Product function	Group ID 24 V DC	IO-Link 24 V DC
IO-Link transfer rate	--	COM2 (38.4 kBaud)
Point-to-point cycle time between the master and the IO-Link device minimum	ms --	10
Type of voltage supply via IO-Link master	--	3
<b>Data volume</b>		
• of the address area of the inputs with cyclic transfer total	bytes --	2
• of the address area of the outputs with cyclic transfer total	bytes --	0
Number of NO contacts	5	5
<b>General data</b>		
Impulse withstand voltage rated value	V 800	
Insulation voltage rated value	V 30	
Pollution degree	3	
<b>Type of voltage</b>		
• of operational voltage	DC	
• of input voltage	DC	
<b>Operational voltage</b>		
• 1 at DC rated value	V 24	
• Rated value	V 18 ... 30	
Current consumed maximum	mA 49	
<b>Ambient temperature</b>		
• During operation	°C -25 ... +70	
• During storage	°C -40 ... +80	
IP degree of protection	IP20	
Touch protection against electric shock	Finger-safe	
<b>Connections</b>		
Type of electrical connection	Screw terminals 	
<b>Connectable conductor cross-section for auxiliary contacts</b>		
• Solid or stranded	mm <sup>2</sup> 0.2 ... 2.5	
• Solid		
- With end sleeves	mm <sup>2</sup> 0.2 ... 0.75	
• Finely stranded		
- With end sleeves	mm <sup>2</sup> 0.25 ... 1.5	
- Without end sleeves	mm <sup>2</sup> 0.2 ... 2.5	
<b>AWG number as coded connectable conductor cross-section</b>		
• For auxiliary contacts	26 ... 14	
<b>Tightening torque</b>		
• For screw terminals	Nm 0.4 ... 0.8	

### Selection and ordering data

	Type of voltage supply via IO-Link master	Protocol is supported IO-Link protocol	Number of NO contacts	IO-Link transfer rate	DT	Screw terminals 	PU (UNIT, SET, M)	PS*
Order No.								
<b>Electronic modules for ID key-operated switches</b>								
 3SU1400-1GC10-1AA0	--	No	5	--	B	3SU1400-1GC10-1AA0	1	1 unit
 3SU1400-1GD10-1AA0 ✓ Yes -- No	Yes	Yes	5	COM2 (38.4 kBaud)	X	3SU1400-1GD10-1AA0	1	1 unit

# Modules for Actuators and Indicators

## Interface modules for PROFINET/terminal modules

### Selection and ordering data

Supply voltage at DC	Number of interfaces according to PROFINET SIL claim limit acc. to EN 62061	Number of digital inputs	Number of digital outputs	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
V				d				

#### Interface modules for PROFINET **NEW**



3SU1400-1LK10-1AA1

#### Interface modules

24	1	0	0	5				
				5				

#### Screw terminals



#### 3SU1400-1LK10-1AA1

1 1 unit

#### Spring-type terminals



#### 3SU1400-1LK10-3AA1

1 1 unit



3SU1400-1LL10-3BA1

#### Fail-safe interface modules

24	1	4	1	5				
	SIL CL 3			5				

#### Screw terminals



#### 3SU1400-1LL10-1BA1

1 1 unit

#### Spring-type terminals



#### 3SU1400-1LL10-3BA1

1 1 unit

Type of product	Color of light source	SD	Insulation displacement connection	Price per PU	PU (UNIT, SET, M)	PS*
		d				

#### Terminal modules **NEW**



3SU1401-1ME60-1DA1

With 2 contacts	--	5	<b>3SU1400-1MA10-1BA1</b>		1	1 unit
With 2 contacts and integrated LED	Amber	5	<b>3SU1401-1MC00-1CA1</b>		1	1 unit
	Red	5	<b>3SU1401-1MC20-1CA1</b>		1	1 unit
	Yellow	5	<b>3SU1401-1MC30-1CA1</b>		1	1 unit
	Green	5	<b>3SU1401-1MC40-1CA1</b>		1	1 unit
	Blue	5	<b>3SU1401-1MC50-1CA1</b>		1	1 unit
	White	5	<b>3SU1401-1MC60-1CA1</b>		1	1 unit
With integrated LED	Amber	5	<b>3SU1401-1ME00-1DA1</b>		1	1 unit
	Red	5	<b>3SU1401-1ME20-1DA1</b>		1	1 unit
	Yellow	5	<b>3SU1401-1ME30-1DA1</b>		1	1 unit
	Green	5	<b>3SU1401-1ME40-1DA1</b>		1	1 unit
	Blue	5	<b>3SU1401-1ME50-1DA1</b>		1	1 unit
	White	5	<b>3SU1401-1ME60-1DA1</b>		1	1 unit

Type of product	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				

#### Memory modules for 3SK2



3RK3931-0AA00

#### Memory module

For backing up the complete parameterization of the 3SK2 safety system without a PC/PG through the system interface

2	<b>3RK3931-0AA00</b>			1	1 unit
---	----------------------	--	--	---	--------

Flat ribbon cable, [see page 10/156](#).

LED modules for mounting on printed-circuit boards, [see page 10/112](#).

# Enclosures

## General data

### Overview

#### Design



Enclosures with standard fittings

Enclosed SIRIUS ACT pushbuttons and indicator lights are used as hand-operated commanding devices for separately allocated control units and cabinets. The devices are suitable for use in any climate.

#### Standards

IEC 60947-5-1 or EN 60947-5-1

#### Versions

The enclosed pushbuttons and indicator lights are available with conventional controls as well as for connection to AS-Interface. The following versions are available:

- Empty enclosures with 1 to 6 command points (the installed components must be ordered separately; use modules for base mounting)
- Enclosures with standard fittings with 1 to 3 command points, e.g. EMERGENCY STOP enclosure with EMERGENCY STOP mushroom pushbutton
- Enclosures with customized fittings with 1 to 6 command points

#### Color of the enclosures

Top:

- Gray, RAL 7035
- Yellow, RAL 1004 for EMERGENCY STOP

Base:

- Black, RAL 9005

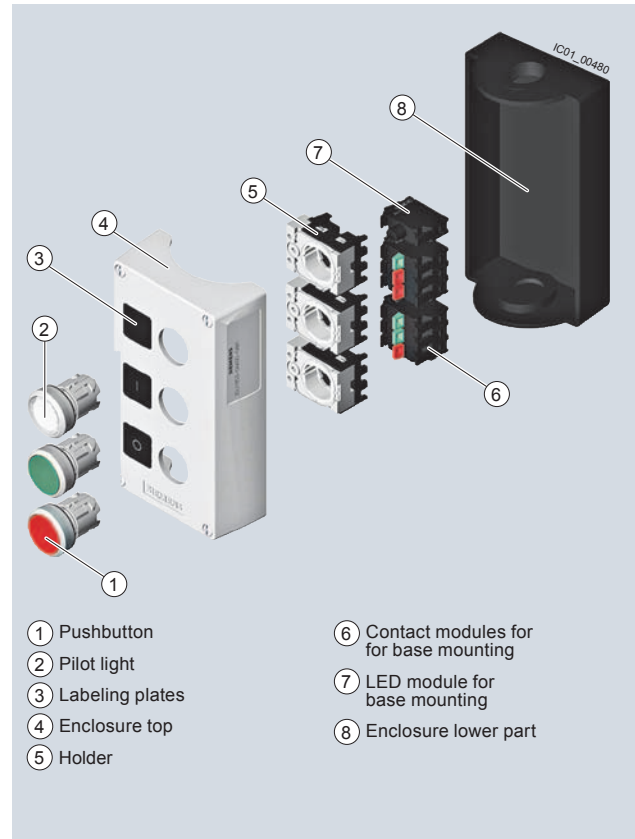
#### Customized enclosures

The fittings and labeling of the command points can be chosen using the Configurator on the Internet, see: [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)

### Application

The enclosures are climate-proof (KTW 24) according to EN ISO 6270-2 and suitable for stationary use, and for use in marine applications.

#### Enclosures with standard fittings



- |                   |                                     |
|-------------------|-------------------------------------|
| ① Pushbutton      | ⑥ Contact modules for base mounting |
| ② Pilot light     | ⑦ LED module for base mounting      |
| ③ Labeling plates | ⑧ Enclosure lower part              |
| ④ Enclosure top   |                                     |
| ⑤ Holder          |                                     |

Pushbuttons and indicator lights in the enclosure

#### Nomenclature of command points

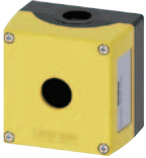









- 6th command point = F
- 5th command point = E
- 4th command point = D
- 3rd command point = C
- 2nd command point = B
- 1st command point = A

# Enclosures

## Empty enclosures

### Selection and ordering data

Color of enclosure top	Number of command points	Enclosure version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*			
<b>Enclosures for surface mounting</b>										
<b>Plastic</b>										
	Yellow	1	Center command point	▶	3SU1801-0AA00-0AA2	1	1 unit			
			With protective collar	▶	3SU1801-0AA00-0AC2	1	1 unit			
			With recess for labeling plate	▶	3SU1801-0AA00-0AB2	1	1 unit			
	Gray	2	With recess for labeling plate	▶	3SU1802-0AA00-0AB2	1	1 unit			
			1	With recess for labeling plate	▶	3SU1801-0AA00-0AB1	1	1 unit		
				With recess for labeling plate	▶	3SU1802-0AA00-0AB1	1	1 unit		
				With recess for labeling plate	▶	3SU1803-0AA00-0AB1	1	1 unit		
				With recess for labeling plate	▶	3SU1804-0AA00-0AB1	1	1 unit		
	Gray	6	With recess for labeling plate	▶	3SU1806-0AA00-0AB1	1	1 unit			
			<b>Metal</b>							
				Yellow	1	Center command point	▶	3SU1851-0AA00-0AA2	1	1 unit
						With protective collar	3	3SU1851-0AA00-0AC2	1	1 unit
						With recess for labeling plate	▶	3SU1851-0AA00-0AB2	1	1 unit
				Yellow	3	With protective collar for 5 padlocks, mushroom 40 mm	3	3SU1851-0AA00-0AF2	1	1 unit
With protective collar for 5 padlocks, mushroom 40 mm with key-operated release	3	3SU1851-0AA00-0AG2				1	1 unit			
With protective collar for 5 padlocks, mushroom 60 mm	3	3SU1851-0AA00-0AH2				1	1 unit			
With protective collar for 5 padlocks, mushroom 60 mm	3	3SU1851-0AA00-0AH1				1	1 unit			
	Gray	1	With recess for labeling plate	▶	3SU1851-0AA00-0AB1	1	1 unit			
			With protective collar	5	3SU1851-0AA00-0AC1	1	1 unit			
			2	With recess for labeling plate	▶	3SU1852-0AA00-0AB1	1	1 unit		
				3	With recess for labeling plate	▶	3SU1853-0AA00-0AB1	1	1 unit	
			4		With recess for labeling plate	▶	3SU1854-0AA00-0AB1	1	1 unit	
				6	With recess for labeling plate	▶	3SU1856-0AA00-0AB1	1	1 unit	
			<b>Enclosure for 4-position selector switches, coordinate switches, ID key-operated switches and sensor switches</b>							
<b>Plastic, front plate mounting</b>										
	Gray	1	Center command point	3	3SU1801-1AA00-1AA1	1	1 unit			
			<b>Metal, front plate mounting</b>							
	Gray	1	Center command point	5	3SU1851-1AA00-1AA1	1	1 unit			



# Enclosures

## Pushbuttons and indicator lights in the enclosure

### Overview

Pushbuttons and indicator lights in the enclosure (standard fittings) are available with:

- 1 to 3 command points (equipped, for example, with A, B, C, in each case from bottom to top)
- Operational voltage up to 400 V
- Vertical mounting type
- Plastic enclosures are equipped with plastic actuators and indicators, metal enclosures are equipped with metal actuators and indicators
- Contact modules and LED modules for base mounting (are snapped into the enclosure base); screw terminals as standard; some versions also with spring-type terminals

### Palm pushbuttons

Palm pushbuttons have a particularly large button surface. This means that they can be actuated quickly and easily with the hand, arm or foot.

### Selection and ordering data

Color of enclosure top	Number of command points	Enclosure version Pushbutton and signaling device equipment	Color of actuating element Marking	Number of		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				NC contacts	NO contacts					

#### Enclosures with standard fittings

##### Plastic



3SU1801-0NA00-2AA2



3SU1801-0NA00-2AC2








3SU1801-2NG00-2AA2

Yellow	1	Center command point A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red	1	0	▶	<b>3SU1801-0NA00-2AA2</b>		1	1 unit
		With protective collar A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red A = I	1	0	▶	<b>3SU1801-0NA00-2AC2</b>		1	1 unit
				2	0	▶	<b>3SU1801-0NB00-2AC2</b>		1	1 unit
	2	With recess for labeling plate A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch B = Indicator light 24 V AC/DC	A = Red B = Red	2	1	3	<b>3SU1802-0NB00-2AB2</b>		1	1 unit
			A = "Without inscription" B = "Without inscription"							
	1	Center command point A = EMERGENCY STOP palm pushbuttons with positive latching function acc. to ISO 13850, pull to unlatch	Red	1	1	3	<b>3SU1801-2NG00-2AA2</b>		1	1 unit








# Enclosures

## Pushbuttons and indicator lights in the enclosure

Color of enclosure top	Number of command points	Enclosure version Pushbutton and signaling device equipment	Color of actuating element Marking	Number of		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*		
				NC contacts	NO contacts							
<b>Enclosures with standard fittings</b>												
<b>Plastic</b>												
 3SU1801-0AB00-2AB1	1	With recess for labeling plate A = Pushbutton	Green	A = I	0	1	3	<b>3SU1801-0AB00-2AB1</b> <b>3SU1801-0AC00-2AB1</b> <b>3SU1801-0AD00-2AB1</b> <b>3SU1801-0AE00-2AB1</b>			1 unit	
			Red	A = O	1	0	▶				1 unit	
			White	A = I	0	1	5				1 unit	
			Black	A = O	1	0	5				1 unit	
 3SU1802-0AB00-2AB1	2	With recess for labeling plate A = Pushbutton/ B = Pushbutton	A = Red/ B = Green			1	1	3	<b>3SU1802-0AB00-2AB1</b> <b>3SU1802-0AC00-2AB1</b>			1 unit
			A = O/ B = I									
			A = Black/ B = Black			1	1	5				1 unit
 3SU1803-0AB00-2AB1	3	With recess for labeling plate A = Pushbutton/ B = Pushbutton/ C = Indicator light	A = Red/ B = Green/ C = Clear			1	1	▶	<b>3SU1803-0AB00-2AB1</b> <b>3SU1803-0AC00-2AB1</b> <b>3SU1803-0AD00-2AB1</b>			1 unit
			A = O/ B = I/ C = "Without inscription"									
			A = Black/ B = White/ C = Clear			1	1	5				1 unit
			A = O/ B = I/ C = "Without inscription"									
 3SU1803-0AB00-2AB1		With recess for labeling plate A = Pushbutton/ B = Pushbutton/ C = Pushbutton	A = Red/ B = Black/ C = Black			1	2	5	<b>3SU1803-0AD00-2AB1</b>			1 unit
			A = O/ B = I/ C = II									
 3SU1801-2GA00-2AA1	1	Center command point A = Palm pushbutton, momentary-contact type	Black			0	1	3	<b>3SU1801-2GA00-2AA1</b>			1 unit

# Enclosures

## Pushbuttons and indicator lights in the enclosure

Color of enclosure top	Number of command points	Enclosure version Pushbutton and signaling device equipment	Color of actuating element Marking	Number of		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*				
				NC contacts	NO contacts									
<b>Enclosures with standard fittings</b>														
<b>Metal</b>														
	Yellow	1	Center command point A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red	1	0	3	<b>3SU1851-0NA00-2AA2</b>			1	1 unit		
					2	0	5				<b>3SU1851-0NB00-2AA2</b>	1	1 unit	
	Yellow	1	With protective collar A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red	1	0	▶	<b>3SU1851-0NA00-2AC2</b>			1	1 unit		
					2	0	3				<b>3SU1851-0NB00-2AC2</b>	1	1 unit	
					2	1	5				<b>3SU1851-0ND00-2AC2</b>	1	1 unit	
	Yellow	1	Center command point A = EMERGENCY STOP palm pushbuttons with positive latching acc. to ISO 13850 Pull to unlatch	Red	1	1	3	<b>3SU1851-2NG00-2AA2</b>			1	1 unit		
	Gray	1	With recess for labeling plate A = Pushbutton	Green	A = I	0	1	5	<b>3SU1851-0AB00-2AB1</b>			1	1 unit	
				Red	A = O	1	0	5				<b>3SU1851-0AC00-2AB1</b>	1	1 unit
				White	A = I	0	1	5				<b>3SU1851-0AD00-2AB1</b>	1	1 unit
				Black	A = O	1	0	5				<b>3SU1851-0AE00-2AB1</b>	1	1 unit
	Gray	2	With recess for labeling plate A = Pushbutton/ B = Pushbutton	A = Red/ B = Green	A = O/ B = I	1	1	5	<b>3SU1852-0AB00-2AB1</b>			1	1 unit	
				A = Black/ B = White	A = O/ B = I	1	1	5				<b>3SU1852-0AC00-2AB1</b>	1	1 unit
	Gray	3	With recess for labeling plate A = Pushbutton/ B = Pushbutton/ C = Indicator light	A = Red/ B = Green/ C = Clear	A = O/ B = I/ C = "Without inscription"	1	1	5	<b>3SU1853-0AB00-2AB1</b>			1	1 unit	
				A = Red/ B = Black/ C = Black	A = O/ B = I/ C = II	1	2	5				<b>3SU1853-0AD00-2AB1</b>	1	1 unit
	Gray	1	Center command point A = Palm pushbutton, momentary-contact type	Black		0	1	3	<b>3SU1851-2GA00-2AA1</b>			1	1 unit	

# Enclosures

## Pushbuttons and indicator lights in the enclosure

Number of command points	Product function / EMERGENCY STOP function	DT	Order No.	PU (UNIT, SET, M)	PS*
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**Customized enclosures<sup>1)</sup>**



**Plastic version**

1	No	A	3SU1801-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1801-0NZ00 K0Y	1	1 unit
2	No	A	3SU1802-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1802-0NZ00 K0Y	1	1 unit
3	No	A	3SU1803-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1803-0NZ00 K0Y	1	1 unit
4	No	A	3SU1804-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1804-0NZ00 K0Y	1	1 unit
6	No	A	3SU1806-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1806-0NZ00 K0Y	1	1 unit



**Metal version**

1	No	A	3SU1851-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1851-0NZ00 K0Y	1	1 unit
2	No	A	3SU1852-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1852-0NZ00 K0Y	1	1 unit
3	No	A	3SU1853-0AZ00K0Y	1	1 unit
	Yes	A	3SU1853-0NZ00 K0Y	1	1 unit
4	No	A	3SU1854-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1854-0NZ00 K0Y	1	1 unit
6	No	A	3SU1856-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1856-0NZ00 K0Y	1	1 unit

<sup>1)</sup> The fittings and labeling of the command points can be chosen using the Configurator on the Internet. The prices depend on the equipment selected; see [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator).

# Enclosures

## Pushbuttons and indicator lights in the enclosure for AS-Interface

### Overview

With AS-Interface enclosures, distributed SIRIUS ACT pushbuttons and indicator lights can be quickly connected to the AS-Interface communication system. Using suitable components you can assemble your own enclosures with integrated AS-Interface or flexibly modify existing enclosures.



Enclosures for AS-Interface

### Enclosures

Color of enclosure top:

- Gray, RAL 7035
- Yellow, RAL 1004, for EMERGENCY STOP

Color of enclosure lower part:

- Black, RAL 9005

### Equipping with AS-Interface slaves

The following slaves are available for connecting the command points:

- Slave in A/B technology with 4 digital inputs and 3 digital outputs (4 DI / 3 DO)
- Slave with 4 digital inputs and 4 digital outputs (4 DI / 4 DO)
- F slave with 2 safe inputs for EMERGENCY STOP mushroom pushbutton (2 F-DI), also with LED
- F slave with 2 safe inputs and one digital output (2 F-DI + 1 DO)

The following table shows the maximum number of slaves possible:

Number of command points	Number of slaves for enclosures without EMERGENCY STOP	Number of slaves for enclosures with EMERGENCY STOP
1	--	1 x F slave 2 F-DI
2	1 x slave 4 DI/4 DO or 4 DI/3 DO	--
3	1 x slave 4 DI/4 DO or 4 DI/3 DO	1 x slave 4 DI/4 DO or 4 DI/3 DO + 1 x F slave
4	2 x slave 4 DI/4 DO or 4 DI/3 DO	2 x slave 4 DI/4 DO or 4 DI/3 DO + 1 x F slave
6	2 x slave 4 DI/4 DO or 4 DI/3 DO	2 x slave 4 DI/4 DO or 4 DI/3 DO + 1 x F slave

### Connection

One set of links is required in each case to connect a slave to contact modules, LED modules, and the connection element.

The connection elements are mounted in the front-end cable glands and are used to connect the AS-Interface or bring unused inputs or outputs out of the enclosure.

For connection to AS-Interface, the following options are available:

- Terminal for shaped AS-Interface cable. The cable is contacted by the insulation piercing method and routed past the enclosure on the outside (possible only with plastic enclosure).
- Cable gland for the shaped AS-Interface cable or round cable. The cable is routed into the enclosure (preferable for metal enclosure).
- Connection using M12 plug.

If less than all inputs/outputs of the installed slaves in an enclosure are used for connecting the commanding devices, free inputs and outputs can be routed on request to the outside through an M12 socket on the top or bottom side of the enclosure.

To supply inputs with power, the S+ connection of the slave must be assigned to the socket, for outputs the OUT- connection must be assigned. Addressing is performed using the AS-Interface connections or the integrated addressing socket. An external power supply is not required.

### Enclosures with standard fittings

Enclosures with standard fittings are available with:

- 1 to 3 command points
- Operational voltage through AS-Interface (approx. 30 V)
- Vertical mounting type
- Plastic enclosures are equipped with plastic actuators and indicators, metal enclosures are equipped with metal actuators and indicators

The enclosures without EMERGENCY STOP each have one module with 4I/3O; the enclosures with EMERGENCY STOP mushroom pushbuttons have a safe AS-Interface slave integrated in the enclosure. Enclosures with EMERGENCY STOP mushroom pushbuttons are fitted with two NC contact modules, which are wired to the safe F slave.

The contact modules and LED modules (with spring-type terminals) of the commanding devices and the AS-Interface slaves are mounted in the base of the enclosure and connected using cables. The plastic enclosures are designed with a connection for the AS-Interface flat cable (the cable is run along the outside of the enclosure). For metal enclosures, the AS-Interface cable is run inside the enclosure.

The enclosures with EMERGENCY STOP mushroom pushbuttons are also available with an M12 connector.

### Customized enclosures (selection by configurator)


To order customized 3SU18 AS-Interface enclosures with pushbuttons and indicator lights, use the 3SU1 configurator to select the elements for equipping. An electronic order form will be generated for the options.

Configurator see [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)

# Enclosures




## Pushbuttons and indicator lights in the enclosure for AS-Interface

### Selection and ordering data

Color of enclosure top	Number of command points	Enclosure version Command point fittings	Color, marking	DT	Insulation piercing method		PU (UNIT, SET, M)	PS*
Order No.								

#### Enclosures with standard fittings


##### Plastic version

	Yellow	1	With recess for labeling plate A = EMERGENCY STOP mushroom push-button 40 mm, with positive latching function according to ISO 13850, Rotate to unlatch	Red	B	<b>3SU1801-0NB10-4HB2</b>	1	1 unit
3SU1801-0NB10-4HB2								
	Gray	2	With recess for labeling plate A = pushbutton / B = pushbutton	A = red, O B = green, I	B	<b>3SU1802-0AB10-4HB1</b>	1	1 unit
3SU1802-0AB10-4HB1				A = black, O B = white, I	B	<b>3SU1802-0AC10-4HB1</b>	1	1 unit
		3	With recess for labeling plate A = pushbutton / B = pushbutton / C = indicator light	A = red, O B = green, I C = clear, without inscription	B	<b>3SU1803-0AB10-4HB1</b>	1	1 unit
3SU1803-0AB10-4HB1								


Number of command points	Emergency stop functionality	DT	Order No.	PU (UNIT, SET, M)	PS*
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#### Customer specific enclosures for AS-Interface

##### Plastic version

	1	No	A	<b>3SU1801-0NZ10 K0Y</b>	1	1 unit
	2	No	A	<b>3SU1802-0AZ10 K0Y</b>	1	1 unit
		Yes	A	<b>3SU1802-0NZ10 K0Y</b>	1	1 unit
	3	No	A	<b>3SU1803-0AZ10 K0Y</b>	1	1 unit
		Yes	A	<b>3SU1803-0NZ10 K0Y</b>	1	1 unit
	4	No	A	<b>3SU1804-0AZ10 K0Y</b>	1	1 unit
		Yes	A	<b>3SU1804-0NZ10 K0Y</b>	1	1 unit
	6	No	A	<b>3SU1806-0AZ10 K0Y</b>	1	1 unit
		Yes	A	<b>3SU1806-0NZ10 K0Y</b>	1	1 unit

##### Metal version

	1	No	A	<b>3SU1851-0NZ10 K0Y</b>	1	1 unit
	2	No	A	<b>3SU1852-0AZ10 K0Y</b>	1	1 unit
		Yes	A	<b>3SU1852-0NZ10 K0Y</b>	1	1 unit
	3	No	A	<b>3SU1853-0AZ10K0Y</b>	1	1 unit
		Yes	A	<b>3SU1853-0NZ10 K0Y</b>	1	1 unit
	4	No	A	<b>3SU1854-0AZ10 K0Y</b>	1	1 unit
		Yes	A	<b>3SU1854-0NZ10 K0Y</b>	1	1 unit
	6	No	A	<b>3SU1856-0AZ10 K0Y</b>	1	1 unit
		Yes	A	<b>3SU1856-0NZ10 K0Y</b>	1	1 unit

<sup>1)</sup> The command points and inscription can be configured online via the SIRIUS ACT configurator, [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)

# Enclosures

## Modules for enclosures

### Selection and ordering data

Contact version	Number of		SD	Screw terminals		PU (UNIT, SET, M)	PS*	
	NO contacts	NC contacts		Article No.	Price per PU			
<b>Contact modules for base mounting</b>								
 3SU1400-2AA10-1BA0	Silver alloy	1	0		▶	3SU1400-2AA10-1BA0	1	1 unit
		0	1		▶	3SU1400-2AA10-1CA0	1	1 unit
 3SU1400-2AA10-1LA0	Gold-plated <b>NEW</b>	1	0		5	3SU1400-2AA10-1LA0	1	1 unit
		0	1		5	3SU1400-2AA10-1MA0	1	1 unit
<b>Spring-type terminals</b>								
 3SU1400-2AA10-3BA0	Silver alloy	1	0		▶	3SU1400-2AA10-3BA0	1	1 unit
		0	1		▶	3SU1400-2AA10-3CA0	1	1 unit
 3SU1400-2AA10-3LA0	Gold-plated <b>NEW</b>	1	0		5	3SU1400-2AA10-3LA0	1	1 unit

⊖ Positive opening according to IEC 60947-5-1, Annex K.  
 Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System,  
 see Section 13.  
 Certificate:





# Enclosures

## Modules for enclosures

Operational voltage at AC	Operational voltage at DC	Color	SD	Screw terminals		PU (UNIT, SET, M)	PS*
				Article No.	Price per PU		
<b>LED modules<sup>1)</sup> for base mounting</b>							
24	24	Amber	3	3SU1401-2BB00-1AA0		1	1 unit
		Red	3	3SU1401-2BB20-1AA0		1	1 unit
		Yellow	3	3SU1401-2BB30-1AA0		1	1 unit
		Green	3	3SU1401-2BB40-1AA0		1	1 unit
		Blue	▶	3SU1401-2BB50-1AA0		1	1 unit
		White	3	3SU1401-2BB60-1AA0		1	1 unit
110	--	Amber	5	3SU1401-2BC00-1AA0		1	1 unit
		Red	▶	3SU1401-2BC20-1AA0		1	1 unit
		Yellow	5	3SU1401-2BC30-1AA0		1	1 unit
		Green	▶	3SU1401-2BC40-1AA0		1	1 unit
		Blue	▶	3SU1401-2BC50-1AA0		1	1 unit
		White	▶	3SU1401-2BC60-1AA0		1	1 unit
230	--	Amber	5	3SU1401-2BF00-1AA0		1	1 unit
		Red	▶	3SU1401-2BF20-1AA0		1	1 unit
		Yellow	5	3SU1401-2BF30-1AA0		1	1 unit
		Green	▶	3SU1401-2BF40-1AA0		1	1 unit
		Blue	▶	3SU1401-2BF50-1AA0		1	1 unit
		White	▶	3SU1401-2BF60-1AA0		1	1 unit



3SU1401-2BB60-1AA0

<sup>1)</sup> Only for use with SIRIUS commanding and signaling devices.

Operational voltage at AC	Operational voltage at DC	Color	SD	Spring-type terminals		PU (UNIT, SET, M)	PS*
				Article No.	Price per PU		
<b>LED modules<sup>1)</sup> for base mounting</b>							
24	24	Amber	5	3SU1401-2BB00-3AA0		1	1 unit
		Red	▶	3SU1401-2BB20-3AA0		1	1 unit
		Yellow	5	3SU1401-2BB30-3AA0		1	1 unit
		Green	▶	3SU1401-2BB40-3AA0		1	1 unit
		Blue	▶	3SU1401-2BB50-3AA0		1	1 unit
		White	▶	3SU1401-2BB60-3AA0		1	1 unit
110	--	Amber	5	3SU1401-2BC00-3AA0		1	1 unit
		Red	▶	3SU1401-2BC20-3AA0		1	1 unit
		Yellow	5	3SU1401-2BC30-3AA0		1	1 unit
		Green	▶	3SU1401-2BC40-3AA0		1	1 unit
		Blue	▶	3SU1401-2BC50-3AA0		1	1 unit
		White	▶	3SU1401-2BC60-3AA0		1	1 unit
230	--	Amber	5	3SU1401-2BF00-3AA0		1	1 unit
		Red	▶	3SU1401-2BF20-3AA0		1	1 unit
		Yellow	5	3SU1401-2BF30-3AA0		1	1 unit
		Green	▶	3SU1401-2BF40-3AA0		1	1 unit
		Blue	▶	3SU1401-2BF50-3AA0		1	1 unit
		White	▶	3SU1401-2BF60-3AA0		1	1 unit





3SU1401-2BB20-3AA0


<sup>1)</sup> Only for use with SIRIUS commanding and signaling devices.

# Enclosures

## Modules for enclosures

	Operational voltage at AC	Operational voltage at DC	Color	SD	Screw terminals	PU (UNIT, SET, M)	PS*			
	V	V			Article No.			Price per PU		
<b>LED modules<sup>1)</sup> for base mounting - wide voltage range</b>										
 3SU1401-2BG60-1AA0	6 ... 24	6 ... 24	Amber	3	3SU1401-2BG00-1AA0		1	1 unit		
			Red	▶	3SU1401-2BG20-1AA0				1	1 unit
			Yellow	5	3SU1401-2BG30-1AA0				1	1 unit
			Green	▶	3SU1401-2BG40-1AA0				1	1 unit
			Blue	▶	3SU1401-2BG50-1AA0				1	1 unit
			White	▶	3SU1401-2BG60-1AA0				1	1 unit
	24 ... 240	24 ... 240	Amber	5	3SU1401-2BH00-1AA0		1	1 unit		
			Red	▶	3SU1401-2BH20-1AA0				1	1 unit
			Yellow	5	3SU1401-2BH30-1AA0				1	1 unit
			Green	▶	3SU1401-2BH40-1AA0				1	1 unit
		Blue	▶	3SU1401-2BH50-1AA0		1	1 unit			
		White	▶	3SU1401-2BH60-1AA0				1	1 unit	
<b>Spring-type terminals</b>										
 3SU1401-2BG20-3AA0	6 ... 24	6 ... 24	Amber	5	3SU1401-2BG00-3AA0		1	1 unit		
			Red	▶	3SU1401-2BG20-3AA0				1	1 unit
			Yellow	5	3SU1401-2BG30-3AA0				1	1 unit
			Green	▶	3SU1401-2BG40-3AA0				1	1 unit
			Blue	▶	3SU1401-2BG50-3AA0				1	1 unit
			White	▶	3SU1401-2BG60-3AA0				1	1 unit
	24 ... 240	24 ... 240	Amber	5	3SU1401-2BH00-3AA0		1	1 unit		
			Red	▶	3SU1401-2BH20-3AA0				1	1 unit
			Yellow	5	3SU1401-2BH30-3AA0				1	1 unit
			Green	▶	3SU1401-2BH40-3AA0				1	1 unit
		Blue	▶	3SU1401-2BH50-3AA0		1	1 unit			
		White	▶	3SU1401-2BH60-3AA0				1	1 unit	


<sup>1)</sup> Only for use with SIRIUS commanding and signaling devices.

	Operational voltage at AC	Operational voltage at DC	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	V	V		Article No.		
<b>LED test modules<sup>1)</sup> for base mounting</b>						
 3SU1401-1CK10-1AA0	6 ... 240	6 ... 240	▶	3SU1400-2CK10-1AA0	1	1 unit

<sup>1)</sup> Only to be used for SIRIUS ACT LED modules (6 ... 24 V AC/DC, 24 V AC/DC, 24 ... 240 V AC/DC).

# Enclosures

## Modules for enclosures

Operational voltage	Slave type	Number of digital inputs		Number of digital outputs	SD	Spring-type terminals (push-in)	PU (UNIT, SET, M)	PS*
		Standard	Safety-related					
						Article No.	Price per PU	

### AS-Interface modules, base mounting



30 V	4 DI/3 DQ AB	4	0	3	5	<b>3SU1400-2EJ10-6AA0</b>	1	1 unit
	4 DI/4DQ	4	0	4	▶	<b>3SU1400-2EK10-6AA0</b>	1	1 unit
	2 F-DI	0	2	0	5	<b>3SU1400-2EA10-6AA0</b>	1	1 unit
	2 F-DI + 1LED	0	2	1	5	<b>3SU1401-2EE20-6AA0</b>	1	1 unit

3SU1400-2EJ10-6AA0

### Electronic module for IO-Link, base mounting



24 V	Freely programmable (default 6 DI/2 DQ)	0-8	0	0-8	5	<b>3SU1400-2HL10-6AA0</b>	1	1 unit
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3SU1400-2HL10-6AA0

Color	SD	Screw terminals	PU (UNIT, SET, M)	PS*
				
		Article No.	Price per PU	

### Support terminals **NEW**



Black	3	<b>3SU1400-2DA10-1AA0</b>	1	1 unit
Blue	5	<b>3SU1400-2DA50-1AA0</b>	1	1 unit
Green/Yellow	3	<b>3SU1400-2DA43-1AA0</b>	1	1 unit

3SU1400-2DA10-1AA0



Color	SD	Spring-type terminals	PU (UNIT, SET, M)	PS*
				
Black	5	<b>3SU1400-2DA10-3AA0</b>	1	1 unit
Blue	5	<b>3SU1400-2DA50-3AA0</b>	1	1 unit
Green/Yellow	5	<b>3SU1400-2DA43-3AA0</b>	1	1 unit

3SU1400-2DA50-3AA0

# Enclosures

## Two-hand operation consoles

### Overview

#### Equipment

The two-hand operation consoles are pre-equipped with commanding devices. In the case of plastic enclosures the command points are equipped as standard with actuators and indicators made of plastic, in the case of metal enclosures they are equipped with actuators and indicators made of metal.

The standard equipment comprises:

- 2 black mushroom pushbuttons, Ø 40 mm, 1 NO + 1 NC
- 1 red EMERGENCY STOP mushroom pushbutton according to ISO 13850, Ø 40 mm, with positive latching, 2 NC

The plastic version can be retrofitted with up to 8 customized command points. The surface of the console has premachined breaking points for this purpose.

### Application

The two-hand operation consoles are required for use with machines and systems that have hazardous areas, in order to direct both hands of the operator to one position.

The operation consoles are primarily used on presses, stamping machines, printing presses and paper converting machines, in the chemical industry and in the rubber and plastics industries.






The control command is given by pressing the two mushroom pushbuttons on the sides simultaneously (within 0.5 s of each other) and must be maintained for as long as a hazard exists.

For the further processing of control commands, suitable evaluation units are used, e.g. 3SK11 safety relays or the 3RK3 Modular Safety System.

### Standards

The two-hand operation consoles comply with the requirements of EN 574.

### Selection and ordering data

		Version of actuating element Unlatching method	Color of actuating element	Number of NO contacts	Number of NC contacts	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Enclosures - Two-hand operation consoles</b>									
<b>Plastic enclosures</b>									
	None	--		0	0	B	<b>3SU1803-3AA00-1AA1</b>	1	1 unit
	A = mushroom pushbutton, pull-to unlatch mechanism B = EMERGENCY STOP mushroom pushbutton, rotate-to-unlatch mechanism C = mushroom pushbutton, pull-to-unlatch mechanism	A = black B = red C = black		2	4	B	<b>3SU1803-3NB00-1AE1</b>	1	1 unit
	3SU1803-3NB00-1AE1								
<b>Metal enclosures</b>									
	None	--		0	0	B	<b>3SU1853-3AA00-0AA1</b>	1	1 unit
	3SU1853-3AA00-0AA1								
	A = mushroom pushbutton, pull-to unlatch mechanism B = EMERGENCY STOP mushroom pushbutton, rotate-to-unlatch mechanism C = mushroom pushbutton, pull-to-unlatch mechanism	A = black B = red C = black		2	4	B	<b>3SU1853-3NB00-1AA1</b>	1	1 unit
	3SU1853-3NB00-1AA1								
				2	4	B	<b>3SU1853-3NB00-1AD1</b>	1	1 unit
3SU1853-3NB00-1AD1									
<b>Accessories</b>									
	<b>Stands for two-hand operation console</b>	Metal	Silver			B	<b>3SU1950-0HN10-0AA0</b>	1	1 unit
3SU1950-0HN10-0AA0									

# Labels

## Insert labels

### Overview

Labels can be inserted for identification purposes in pushbuttons (clear) and in illuminated pushbuttons with a flat button. These insert labels are made of semi-transparent plastic with black inscription; they can be fitted in any 90° angle.



### Inscription

The inscription is in upper/lower case, all words begin with upper case letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

The insert labels without inscription are suitable for user marking with permanent pen.

For customized inscription, see "Options" on page 10/132.

### Selection and ordering data

	Color	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Insert labels</b>						
 3SU1900-0AB71-0AA0	<b>For self-inscription</b>					
	Clear/Black (label/lettering)	None	B	<b>3SU1900-0AB71-0AA0</b>	100	10 units
 3SU1900-0AB71-0DN0	<b>For customized inscription</b>					
	Clear/Black (label/lettering)	None	B	<b>3SU1900-0AB71-0AZ0</b>	100	10 units
<b>Inscription in English</b>						
	Clear/Black (label/lettering)	On	B	<b>3SU1900-0AB71-0DJ0</b>	100	10 units
		Off	B	<b>3SU1900-0AB71-0DK0</b>	100	10 units
		Up	B	<b>3SU1900-0AB71-0DL0</b>	100	10 units
		Down	B	<b>3SU1900-0AB71-0DM0</b>	100	10 units
		Forward+	B	<b>3SU1900-0AB71-0DN0</b>	100	10 units
		Right	B	<b>3SU1900-0AB71-0DQ0</b>	100	10 units
		Left	B	<b>3SU1900-0AB71-0DR0</b>	100	10 units
		Stop	B	<b>3SU1900-0AB71-0DS0</b>	100	10 units
		Start	B	<b>3SU1900-0AB71-0DT0</b>	100	10 units
		Reset	B	<b>3SU1900-0AB71-0DU0</b>	100	10 units
		Test	B	<b>3SU1900-0AB71-0DV0</b>	100	10 units
		Open	B	<b>3SU1900-0AB71-0DW0</b>	100	10 units
		Close	B	<b>3SU1900-0AB71-0DX0</b>	100	10 units
		Running	B	<b>3SU1900-0AB71-0EB0</b>	100	10 units
		Fast	B	<b>3SU1900-0AB71-0EE0</b>	100	10 units
		Slow	B	<b>3SU1900-0AB71-0EF0</b>	100	10 units

# Labels

## Insert labels

Color	Marking	Symbol No.	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Insert labels

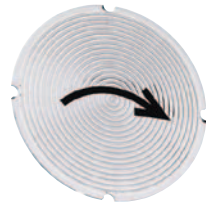
#### With symbol (ON/OFF)



3SU1900-0AB71-0QCO

Milky white/ black (label/lettering)	O	5008 IEC	▶	<b>3SU1900-0AB71-0QA0</b>		100	10 units
	I	5007 IEC	▶	<b>3SU1900-0AB71-0QB0</b>		100	10 units
	II	--	5	<b>3SU1900-0AB71-0QC0</b>		100	10 units
	III	--	5	<b>3SU1900-0AB71-0QD0</b>		100	10 units

#### With symbol (graphic)



3SU1900-0AB71-0QT0



3SU1900-0AB71-0RB0



3SU1900-0AB71-0RNO

Milky white/ black (label/lettering)	→	ARROW DIRECTION TO RIGHT	5022 IEC	▶	<b>3SU1900-0AB71-0QR0</b>	100	10 units
	↖	ARROW DIRECTION UP AND TO LEFT	--	▶	<b>3SU1900-0AB71-0QS0</b>	100	10 units
	↻	CLOCKWISE ROTATION	0004 ISO	5	<b>3SU1900-0AB71-0QT0</b>	100	10 units
	↺	COUNTERCLOCK- WISE ROTATION	--	5	<b>3SU1900-0AB71-0QU0</b>	100	10 units
	⚡	RAPID TRAVERSE	0266 ISO	5	<b>3SU1900-0AB71-0QV0</b>	100	10 units
	⚡	FEED	0259 ISO	5	<b>3SU1900-0AB71-0QW0</b>	100	10 units
	+	INCREASE, PLUS	5005 IEC	5	<b>3SU1900-0AB71-0QX0</b>	100	10 units
	-	DECREASE, MINUS	5006 IEC	5	<b>3SU1900-0AB71-0QY0</b>	100	10 units
	⚙	ELECTRIC MOTOR	0011 ISO	5	<b>3SU1900-0AB71-0RA0</b>	100	10 units
	📢	HORN	5014 IEC	5	<b>3SU1900-0AB71-0RB0</b>	100	10 units
	⚙	WATER INLET	--	5	<b>3SU1900-0AB71-0RC0</b>	100	10 units
	⚙	PUMP	0134 ISO	5	<b>3SU1900-0AB71-0RD0</b>	100	10 units
	⚙	COOLANT PUMP	0355 ISO	5	<b>3SU1900-0AB71-0RE0</b>	100	10 units
	🔩	LOCK, TIGHTEN	5653 IEC	5	<b>3SU1900-0AB71-0RF0</b>	100	10 units
	🔓	UNLOCK, UNCLAMP	5652 IEC	5	<b>3SU1900-0AB71-0RG0</b>	100	10 units
	🛑	BRAKE	--	5	<b>3SU1900-0AB71-0RH0</b>	100	10 units
	🛑	RELEASE BRAKE	0021 ISO	5	<b>3SU1900-0AB71-0RJ0</b>	100	10 units
	🔒	INTERLOCK	0022 ISO	5	<b>3SU1900-0AB71-0RK0</b>	100	10 units
	🔓	UNLOCK	0023 ISO	5	<b>3SU1900-0AB71-0RL0</b>	100	10 units
	⚙	SET UP	0910 ISO	5	<b>3SU1900-0AB71-0RM0</b>	100	10 units
⊕	ON/OFF, MOMENTARY CONTACT TYPE	5011 IEC	5	<b>3SU1900-0AB71-0RNO</b>	100	10 units	
👤	MANUAL OPERATION	0096 ISO	5	<b>3SU1900-0AB71-0RP0</b>	100	10 units	
🔄	AUTOMATIC CYCLE	0017 ISO	▶	<b>3SU1900-0AB71-0RQ0</b>	100	10 units	
🌀	SUCTION	--	5	<b>3SU1900-0AB71-0RR0</b>	100	10 units	
🌀	BLOWING	--	5	<b>3SU1900-0AB71-0RS0</b>	100	10 units	

# Labels

## Insert labels

### Options

#### Customized inscriptions

The labels can be inscribed with text and symbols not listed in the ordering data.

By default, a letter height of 4 mm (for a single line of text) or 3 mm (for two or three lines of text) is used for text inscriptions.

The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

For round insert labels, the maximum possible number of characters per line is:

- 10 characters for one line of text
- 8 characters for 2 lines of text
- 6 characters for 3 lines of text, but 10 characters in the middle line

#### Examples for customized inscription



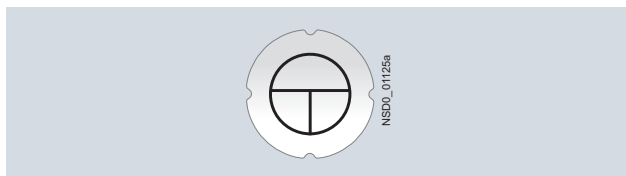
Two-line inscription in upper/lower case lettering (Q0Y)



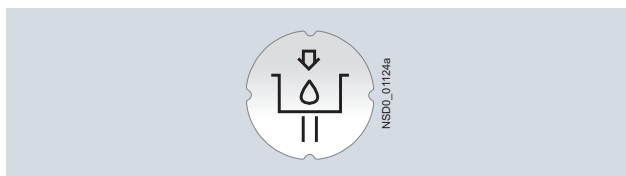
Single-line inscription in upper case lettering (Q1Y)



Three-line inscription in lower case letters (Q2Y)



Symbol number 5011 according to IEC 60417 (Q3Y)



Any symbol according to order form supplement (Q9Y)

#### Ordering notes

Append the following order codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift / Off"): **Q0Y**
- Text line(s) in upper case (e.g. "LIFT"): **Q1Y**
- Text line(s) in lower case (e.g. "lift / off / lower"): **Q2Y**
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "On Off"): **Q5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **Q3Y**
- Any inscription or symbol according to order form supplement: **Q9Y**

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language. In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 =Lower". For long words you can also specify the end-of-line division; see [ordering example 1](#)

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417; see [ordering examples 2 and 3](#)

The SIRIUS ACT Configurator must be used to select customized inscriptions and symbols (order code Q9Y). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard order channels.

Standard ordering channels:

- Configurator: [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)
- Electronic Catalog CA 01 on DVD
- Industry Mall: [www.usa.siemens.com/industrymall](http://www.usa.siemens.com/industrymall)

#### Ordering example 1

A label with 2 lines of text is required:

3SU1900-0AB71-0AZ0  
Q1Y  
Z1 = LIFT  
Z2 = LOWER

#### Ordering example 2

A label inscribed with symbol No. 5011 according to IEC 60417 is required:

3SU1900-0AB71-0AZ0  
Q3Y  
Z = 5011 IEC

#### Ordering example 3

A label inscribed with symbol No. 1118 according to ISO 7000 is required:






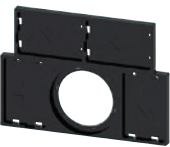
3SU1900-0AB71-0AZ0  
Q3Y  
Z = 1118 ISO



# Labels

## Label holders for labeling plates

### Selection and ordering data

Label holder shape	Label holder color	Label fastening method	Labeling plate size		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			Height mm	Width mm					
<b>Label holders for labeling plates</b>									
	With rounded bottom	Black	Self-adhesive	12.5	27	▶	<b>3SU1900-0AG10-0AA0</b>	100	10 units
				17.5	27	▶	<b>3SU1900-0AH10-0AA0</b>	100	10 units
				27	27	▶	<b>3SU1900-0AJ10-0AA0</b>	100	10 units
	Snap-on	12.5	27	▶	<b>3SU1900-0AR10-0AA0</b>	100	10 units		
		17.5	27	▶	<b>3SU1900-0AS10-0AA0</b>	100	10 units		
		27	27	▶	<b>3SU1900-0AT10-0AA0</b>	100	10 units		
3SU1900-0AG10-0AA0									
	With square bottom	Black	Self-adhesive	12.5	27	3	<b>3SU1900-0AN10-0AA0</b>	100	10 units
				17.5	27	▶	<b>3SU1900-0AP10-0AA0</b>	100	10 units
				27	27	5	<b>3SU1900-0AQ10-0AA0</b>	100	10 units
3SU1900-0AN10-0AA0									
<b>Label holders for labeling plates, coordinate switches</b>									
	With square bottom	Black	Self-adhesive	27	27	▶	<b>3SU1900-0AL10-0AA0</b>	1	1 unit
	Cross	Black	Self-adhesive	27	27	▶	<b>3SU1900-0AM10-0AA0</b>	1	1 unit
<b>Label holders for labeling plates, twin pushbuttons</b>									
	Rectangular	Black	Self-adhesive	12.5	27	▶	<b>3SU1900-0AK10-0AA0</b>	100	10 units
<b>Single frames</b>									
	Square	--	--	29.8	29.8	▶	<b>3SU1900-0AX10-0AA0</b>	1	10 units
<b>Label holders for labeling plates 17.5 x 27 mm <span style="color: orange;">NEW</span></b>									
	For 2 labeling plates	Black	Self-adhesive	17.5	27	▶	<b>3SU1900-0BQ10-0AA0</b>	1	1 unit
			Snap-on						
	For 4 labeling plates	Black	Self-adhesive	▶	<b>3SU1900-0BS10-0AA0</b>	1	1 unit		
			Snap-on					▶	<b>3SU1900-0BT10-0AA0</b>
3SU1900-0BT10-0AA0									

# Labels

## Labeling plates

### Overview

The backing plates consist of a black molded-plastic label holder and a labeling plate (black with white print or silver-colored with black print) for sticking or snapping in place. They are not suitable for EMERGENCY STOP buttons. Note mounting dimensions!

### Inscription

The inscription is in upper/lower case, all words begin with upper case letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

For customized inscription, see "Options" on page 10/139.




### Labeling plates for sticking/snapping in place

The labels are available in three sizes:

- 12.5 mm × 27 mm
- 17.5 mm × 27 mm
- 27 mm × 27 mm





For mounting the labeling plates, you can choose between label holders for stick-on or snap-on mounting.

### Selection and ordering data

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Labeling plates 12.5 mm x 27 mm</b>						
<b>For self-inscription</b>						
	Black/White (label/lettering)	None	--	▶ <b>3SU1900-0AC16-0AA0</b>	100	10 units
	Black/White (label/lettering)	None	--	▶ <b>3SU1900-0AB71-0AZ0</b>	100	10 units
<b>Inscription in English</b>						
	Black/White (label/lettering)	On	--	B <b>3SU1900-0AC16-0DJ0</b>	100	10 units
		Off	--	B <b>3SU1900-0AC16-0DK0</b>	100	10 units
		Up	--	B <b>3SU1900-0AC16-0DL0</b>	100	10 units
		Down	--	B <b>3SU1900-0AC16-0DM0</b>	100	10 units
		Forward	--	▶ <b>3SU1900-0AC16-0DN0</b>	100	10 units
		Reverse	--	B <b>3SU1900-0AC16-0DP0</b>	100	10 units
		Right	--	B <b>3SU1900-0AC16-0DQ0</b>	100	10 units
		Left	--	B <b>3SU1900-0AC16-0DR0</b>	100	10 units
		Stop	--	▶ <b>3SU1900-0AC16-0DS0</b>	100	10 units
		Start	--	▶ <b>3SU1900-0AC16-0DT0</b>	100	10 units
		Reset	--	B <b>3SU1900-0AC16-0DU0</b>	100	10 units
		Test	--	B <b>3SU1900-0AC16-0DV0</b>	100	10 units
		Open	--	▶ <b>3SU1900-0AC16-0DW0</b>	100	10 units
		Close	--	▶ <b>3SU1900-0AC16-0DX0</b>	100	10 units
		Jog	--	B <b>3SU1900-0AC16-0DE0</b>	100	10 units
		Running	--	B <b>3SU1900-0AC16-0EB0</b>	100	10 units
		Fault	--	B <b>3SU1900-0AC16-0EC0</b>	100	10 units
		Run	--	B <b>3SU1900-0AC16-0ED0</b>	100	10 units
		Stop Start	--	B <b>3SU1900-0AC16-0DC0</b>	100	10 units
		Off On	--	▶ <b>3SU1900-0AC16-0DH0</b>	100	10 units
	Power off	--	B <b>3SU1900-0AC16-0DF0</b>	100	10 units	
	Power on	--	B <b>3SU1900-0AC16-0DG0</b>	100	10 units	
	Man O Auto	--	B <b>3SU1900-0AC16-0DY0</b>	100	10 units	
	Man Auto	--	B <b>3SU1900-0AC16-0EA0</b>	100	10 units	
	Hand Auto	--	B <b>3SU1900-0AC16-0DB0</b>	100	10 units	
	Hand O Auto	--	B <b>3SU1900-0AC16-0DD0</b>	100	10 units	
<b>With symbol</b>						
	Black/White (label/lettering)	O	--	B <b>3SU1900-0AC16-0QA0</b>	100	10 units
		I	--	B <b>3SU1900-0AC16-0QB0</b>	100	10 units
		O I	--	B <b>3SU1900-0AC16-0QG0</b>	100	10 units
		1 2	--	B <b>3SU1900-0AC16-0QJ0</b>	100	10 units
		↑ ARROWDIRECTION UP	--	B <b>3SU1900-0AC16-0QS0</b>	100	10 units

# Labels

## Labeling plates

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Labeling plates 12.5 mm x 27 mm</b>						
<b>For self-inscription</b>						
	Silver/Black (label/lettering)	None	A	<b>3SU1900-0AC81-0AA0</b>	100	10 units
	<b>For custom inscription</b>					
	Silver/Black (label/lettering)	None	A	<b>3SU1900-0AC81-0AZ0</b>	100	10 units
	<b>Inscription in English</b>					
	Silver/Black (label/lettering)	On	--	B	<b>3SU1900-0AC81-0DJ0</b>	100 10 units
		Off	--	B	<b>3SU1900-0AC81-0DK0</b>	100 10 units
		Up	--	B	<b>3SU1900-0AC81-0DL0</b>	100 10 units
		Down	--	B	<b>3SU1900-0AC81-0DM0</b>	100 10 units
		Stop	--	B	<b>3SU1900-0AC81-0DS0</b>	100 10 units
		Start	--	B	<b>3SU1900-0AC81-0DT0</b>	100 10 units
		Reset	--	B	<b>3SU1900-0AC81-0DU0</b>	100 10 units
		Test	--	B	<b>3SU1900-0AC81-0DV0</b>	100 10 units
		Open	--	B	<b>3SU1900-0AC81-0DW0</b>	100 10 units
		Close	--	B	<b>3SU1900-0AC81-0DX0</b>	100 10 units
		Man O Auto	--	B	<b>3SU1900-0AC81-0DY0</b>	100 10 units
		Man Auto	--	B	<b>3SU1900-0AC81-0EA0</b>	100 10 units
		Running	--	B	<b>3SU1900-0AC81-0EB0</b>	100 10 units
		Fault	--	B	<b>3SU1900-0AC81-0EC0</b>	100 10 units
		Fast	--	B	<b>3SU1900-0AC81-0EE0</b>	100 10 units
		Slow	--	B	<b>3SU1900-0AC81-0EF0</b>	100 10 units
		Hand Auto	--	B	<b>3SU1900-0AC81-0DB0</b>	100 10 units
	Stop Start	--	B	<b>3SU1900-0AC81-0DC0</b>	100 10 units	
	Hand O Auto	--	B	<b>3SU1900-0AC81-0DD0</b>	100 10 units	
<b>With symbol</b>						
	Silver/Black (label/lettering)	O	5008 IEC	B	<b>3SU1900-0AC81-0QA0</b>	100 10 units
		I	5007 IEC	B	<b>3SU1900-0AC81-0QB0</b>	100 10 units
		II	--	B	<b>3SU1900-0AC81-0QC0</b>	100 10 units
		III	--	B	<b>3SU1900-0AC81-0QD0</b>	100 10 units
		O I	--	B	<b>3SU1900-0AC81-0QG0</b>	100 10 units
		I O II	--	B	<b>3SU1900-0AC81-0QK0</b>	100 10 units
		1 O 2	--	B	<b>3SU1900-0AC81-0QL0</b>	100 10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B	<b>3SU1900-0AC81-0QR0</b>	100 10 units
		↑ ARROW DIRECTION UP	--	B	<b>3SU1900-0AC81-0QS0</b>	100 10 units




# Labels

## Labeling plates

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*	
<b>Labeling plates 17.5 mm x 27 mm</b>							
<b>For self-inscription</b>							
	Black/White (label/lettering)	None	--	▶ <b>3SU1900-0AD16-0AA0</b>	100	10 units	
	<b>For custom inscription</b>						
	Black/White (label/lettering)	None	--	▶ <b>3SU1900-0AD16-0AZ0</b>	100	10 units	
<b>Inscription in English</b>							
	Black/White (label/lettering)	Stop Start	--	B <b>3SU1900-0AD16-0DC0</b>	100	10 units	
		On	--	B <b>3SU1900-0AD16-0DJ0</b>	100	10 units	
		Off	--	B <b>3SU1900-0AD16-0DK0</b>	100	10 units	
		Up	--	B <b>3SU1900-0AD16-0DL0</b>	100	10 units	
		Down	--	B <b>3SU1900-0AD16-0DM0</b>	100	10 units	
		Forward	--	B <b>3SU1900-0AD16-0DN0</b>	100	10 units	
		Reverse	--	B <b>3SU1900-0AD16-0DP0</b>	100	10 units	
		Right	--	B <b>3SU1900-0AD16-0DQ0</b>	100	10 units	
		Stop	--	B <b>3SU1900-0AD16-0DS0</b>	100	10 units	
		Start	--	B <b>3SU1900-0AD16-0DT0</b>	100	10 units	
		Open	--	B <b>3SU1900-0AD16-0DW0</b>	100	10 units	
		Close	--	B <b>3SU1900-0AD16-0DX0</b>	100	10 units	
		Man Auto	--	B <b>3SU1900-0AD16-0EA0</b>	100	10 units	
		Running	--	B <b>3SU1900-0AD16-0EB0</b>	100	10 units	
		Fault	--	B <b>3SU1900-0AD16-0EC0</b>	100	10 units	
	Hand Auto	--	B <b>3SU1900-0AD16-0DB0</b>	100	10 units		
<b>With symbol</b>							
	Black/White (label/lettering)	O	5008 IEC	B <b>3SU1900-0AD16-0QA0</b>	100	10 units	
		I	5007 IEC	B <b>3SU1900-0AD16-0QB0</b>	100	10 units	
		O I	--	B <b>3SU1900-0AD16-0QG0</b>	100	10 units	
		→	ARROW DIRECTION TO RIGHT	5022 IEC	B <b>3SU1900-0AD16-0QR0</b>	100	10 units
		↑	ARROW DIRECTION UP	--	B <b>3SU1900-0AD16-0QS0</b>	100	10 units

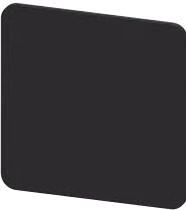



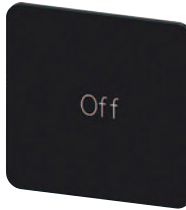

# Labels

## Labeling plates

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*	
<b>Labeling plates 17.5 mm x 27 mm</b>							
<b>For self-inscription</b>							
	Silver/Black (label/lettering)	None	--	A	<b>3SU1900-0AD81-0AA0</b>	100 10 units	
	<b>For custom inscription</b>						
	Silver/Black (label/lettering)	None	--	A	<b>3SU1900-0AD81-0AZ0</b>	100 10 units	
<b>Inscription in English</b>							
	Silver/Black (label/lettering)	On	--	B	<b>3SU1900-0AD81-0DJ0</b>	100 10 units	
		Off	--	B	<b>3SU1900-0AD81-0DK0</b>	100 10 units	
		Stop	--	B	<b>3SU1900-0AD81-0DS0</b>	100 10 units	
		Start	--	B	<b>3SU1900-0AD81-0DT0</b>	100 10 units	
		Reset	--	B	<b>3SU1900-0AD81-0DU0</b>	100 10 units	
		Man O Auto	--	B	<b>3SU1900-0AD81-0DY0</b>	100 10 units	
		Fault	--	B	<b>3SU1900-0AD81-0EC0</b>	100 10 units	
		Hand O Auto	--	B	<b>3SU1900-0AD81-0DB0</b>	100 10 units	
<b>With symbol</b>							
	Silver/Black (label/lettering)	O	5008 IEC	B	<b>3SU1900-0AD81-0QA0</b>	100 10 units	
		I	5007 IEC	B	<b>3SU1900-0AD81-0QB0</b>	100 10 units	
		O I	--	B	<b>3SU1900-0AD81-0QG0</b>	100 10 units	
		I O II	--	B	<b>3SU1900-0AD81-0QK0</b>	100 10 units	
		I O 2	--	B	<b>3SU1900-0AD81-0QL0</b>	100 10 units	
		→	ARROW DIRECTION TO RIGHT	5022 IEC	B	<b>3SU1900-0AD81-0QR0</b>	100 10 units
		↑	ARROW DIRECTION UP	--	B	<b>3SU1900-0AD81-0QS0</b>	100 10 units
	<b>3SU1900-0AD81-0AA0</b>						
	<b>3SU1900-0AD81-0EC0</b>						
	<b>3SU1900-0AD81-0QG0</b>						

# Labels

## Labeling plates

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*	
<b>Labeling plates 27 mm x 27 mm</b>							
	<b>For self-inscription</b>						
	Black/White (label/lettering)	None	--	▶	<b>3SU1900-0AE16-0AA0</b>	100	10 units
	<b>For custom inscription</b>						
	Black/White (label/lettering)	None	--	▶	<b>3SU1900-0AE16-0AZ0</b>	100	10 units
<hr/>							
	<b>For self-inscription</b>			A	<b>3SU1900-0AE81-0AA0</b>	100	10 units
	Silver/Black (label/lettering)						
	<b>For custom inscription</b>			A	<b>3SU1900-0AE81-0AZ0</b>	100	10 units
	Silver/Black (label/lettering)		--				
<hr/>							
<b>Inscription in English</b>							
	Black/White (label/lettering)	On	--	B	<b>3SU1900-0AE16-0DJ0</b>	100	10 units
		Off	--	B	<b>3SU1900-0AE16-0DK0</b>	100	10 units
		Up	--	B	<b>3SU1900-0AE16-0DL0</b>	100	10 units
		Down	--	B	<b>3SU1900-0AE16-0DM0</b>	100	10 units
		Forward	--	B	<b>3SU1900-0AE16-0DN0</b>	100	10 units
		Reverse	--	B	<b>3SU1900-0AE16-0DP0</b>	100	10 units
		Stop	--	B	<b>3SU1900-0AE16-0DS0</b>	100	10 units
		Start	--	B	<b>3SU1900-0AE16-0DT0</b>	100	10 units
		EMERGENCY STOP	--	B	<b>3SU1900-0AE16-0DA0</b>	100	10 units
		Stop Start	--	B	<b>3SU1900-0AE16-0DC0</b>	100	10 units
		Hand Auto	--	B	<b>3SU1900-0AE16-0DB0</b>	100	10 units
<hr/>							
<b>With symbol</b>							
	Black/White (label/lettering)	O I	--	B	<b>3SU1900-0AE16-0QG0</b>	100	10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B	<b>3SU1900-0AE16-0QR0</b>	100	10 units

### Options

#### Customized inscriptions

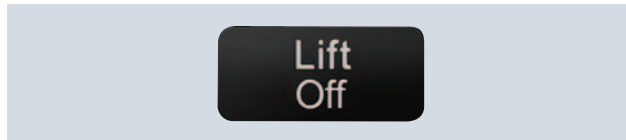
The labels can be inscribed with text and symbols not listed in the ordering data.

The following letter heights are used as standard for text inscriptions:

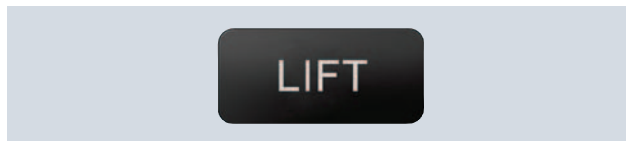
- Label size 12.5 mm × 27 mm: 3 lines with letter height 4 mm (1-line), 3.5 mm (2-line) or 2.5 mm (3-line)
- Label size 17.5 mm × 27 mm: 3 lines with letter height 4 mm (1- to 2-line) or 3 mm (3-line)
- Label size 27 mm × 27 mm: 5 lines with letter height 4 mm (1- to 5-line)

Up to 11 characters per line are possible. The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

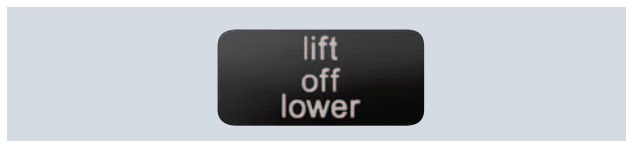
#### Examples for customized inscription



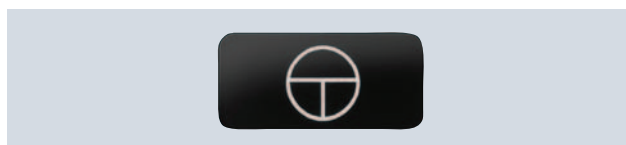
Two-line inscription in upper/lower case lettering (Q0Y)



Single-line inscription in upper case lettering (Q1Y)



Three-line inscription in lower case letters (Q2Y)



Symbol number 5011 according to IEC 60417 (Q3Y)



Any symbol according to order form supplement (Q9Y)

#### Ordering notes

Append the following order codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift / Off"): **Q0Y**
- Text line(s) in upper case (e.g. "LIFT"): **Q1Y**
- Text line(s) in lower case (e.g. "lift / off / lower"): **Q2Y**
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "On Off"): **Q5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **Q3Y**
- Any inscription or symbol according to order form supplement: **Q9Y**

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 =Lower".

For long words you can also specify the end-of-line division; see ordering example 1

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417; see ordering examples 2 and 3

For special symbols (order code Q9Y), a CAD drawing in BMP, GIF, JPEG, PDF, PNG or TIFF format must be submitted. For special inscriptions (order code Q9Y): document in DOC or XLS format.

The SIRIUS ACT Configurator must be used to select special inscriptions and symbols (order code Q9Y). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard order channels.

Standard ordering channels:

- Configurator: [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)
- Electronic Catalog CA 01 on DVD
- Industry Mall: [www.usa.siemens.com/industrymall](http://www.usa.siemens.com/industrymall)

#### Ordering example 1

A label with 2 lines of text is required:

3SU1900-0AC16-0AZ0

Q1Y

Z1 = LIFT

Z2 = LOWER

#### Ordering example 2

A label inscribed with symbol No. 5011 according to IEC 60417 is required:

3SU1900-0AC16-0AZ0

Q3Y

Z = 5011 IEC

#### Ordering example 3

A label inscribed with symbol No. 1118 according to ISO 7000 is required:

3SU1900-0AC16-0AZ0

Q3Y

Z = 1118 ISO



# Labels

## Labeling plates for enclosures

### Overview

The labeling plates in size 22 mm x 22 mm can be attached to enclosures with cutouts for labels. There are versions in black with white print or silver-colored with black print.

### Inscription

The inscription is in upper/lower case, all words begin with upper case letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

For customized inscription, see "Options" on page 10/142.

### Selection and ordering data

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Labeling plates 22 mm x 22 mm</b>						
<b>For self-inscription</b>						
	Black/White (label/lettering)	None	--	▶ <b>3SU1900-0AF16-0AA0</b>	100	10 units
	Black/White (label/lettering)	None	--	▶ <b>3SU1900-0AF16-0AZ0</b>	100	10 units
<b>Inscription in English</b>						
	Black/White (label/lettering)	On	--	B <b>3SU1900-0AF16-0DJ0</b>	1	10 units
		Off	--	B <b>3SU1900-0AF16-0DK0</b>	1	10 units
		Up	--	▶ <b>3SU1900-0AF16-0DL0</b>	1	10 units
		Down	--	▶ <b>3SU1900-0AF16-0DM0</b>	1	10 units
		Forward	--	B <b>3SU1900-0AF16-0DN0</b>	1	10 units
		Right	--	B <b>3SU1900-0AF16-0DQ0</b>	1	10 units
		Left	--	B <b>3SU1900-0AF16-0DR0</b>	1	10 units
		Stop	--	▶ <b>3SU1900-0AF16-0DS0</b>	1	10 units
		Start	--	▶ <b>3SU1900-0AF16-0DT0</b>	1	10 units
		Reset	--	B <b>3SU1900-0AF16-0DU0</b>	1	10 units
		Test	--	▶ <b>3SU1900-0AF16-0DV0</b>	1	10 units
		Open	--	B <b>3SU1900-0AF16-0DW0</b>	1	10 units
		Close	--	B <b>3SU1900-0AF16-0DX0</b>	1	10 units
		Running	--	B <b>3SU1900-0AF16-0EB0</b>	1	10 units
	Black/White (label/lettering)	Fault	--	B <b>3SU1900-0AF16-0EC0</b>	1	10 units
		Fast	--	B <b>3SU1900-0AF16-0EE0</b>	1	10 units
		Slow	--	B <b>3SU1900-0AF16-0EF0</b>	1	10 units
		EMERGENCY STOP	--	▶ <b>3SU1900-0AF16-0DA0</b>	1	10 units
<b>With symbol (ON/OFF)</b>						
	Black/White (label/lettering)	O	5008 IEC	▶ <b>3SU1900-0AF16-0QA0</b>	1	10 units
		I	5007 IEC	▶ <b>3SU1900-0AF16-0QB0</b>	1	10 units
		II	--	▶ <b>3SU1900-0AF16-0QC0</b>	1	10 units
		III	--	B <b>3SU1900-0AF16-0QD0</b>	1	10 units
		O I	--	B <b>3SU1900-0AF16-0QG0</b>	1	10 units
		I O II	--	B <b>3SU1900-0AF16-0QK0</b>	1	10 units
		I O	--	B <b>3SU1900-0AF16-0QP0</b>	1	10 units
		(one below the other)				
		II O I	--	B <b>3SU1900-0AF16-0QQ0</b>	1	10 units
		(one below the other)				
<b>With symbol (graphic)</b>						
	Black/White (label/lettering)	→ ARROW DIRECTION TO RIGHT	5022 IEC	▶ <b>3SU1900-0AF16-0QR0</b>	1	10 units
		☪ PUMP	0134 ISO	B <b>3SU1900-0AF16-0RD0</b>	1	10 units
		☪ FAN	--	B <b>3SU1900-0AF16-0RV0</b>	1	10 units
		☪ COOLING	--	B <b>3SU1900-0AF16-0RW0</b>	1	10 units
		☪ ILLUMINATION	--	B <b>3SU1900-0AF16-0RX0</b>	1	10 units
		☪ MOTOR	--	B <b>3SU1900-0AF16-0RY0</b>	1	10 units

# Labels

## Labeling plates for enclosures

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Labeling plates 22 mm x 22 mm</b>						
<b>For self-inscription</b>						
	Silver/Black (label/lettering)	None	--	A	<b>3SU1900-0AF81-0AA0</b>	100 10 units
	<b>For custom inscription</b>					
	Silver/Black (label/lettering)	None	--	A	<b>3SU1900-0AF81-0AZ0</b>	100 10 units
<b>Inscription in English</b>						
	Silver/Black (label/lettering)	Stop	--	B	<b>3SU1900-0AF81-0DS0</b>	1 10 units
		Start	--	B	<b>3SU1900-0AF81-0DT0</b>	1 10 units
		Reset	--	B	<b>3SU1900-0AF81-0DU0</b>	1 10 units
		Test	--	B	<b>3SU1900-0AF81-0DV0</b>	1 10 units
		Open	--	B	<b>3SU1900-0AF81-0DW0</b>	1 10 units
		Hand O Auto	--	B	<b>3SU1900-0AF81-0DD0</b>	1 10 units
<b>With symbol (ON/OFF)</b>						
	Silver/Black (label/lettering)	O	5008 IEC	B	<b>3SU1900-0AF81-0QA0</b>	1 10 units
		I	5007 IEC	B	<b>3SU1900-0AF81-0QB0</b>	1 10 units
		II	--	B	<b>3SU1900-0AF81-0QC0</b>	1 10 units
		III	--	B	<b>3SU1900-0AF81-0QD0</b>	1 10 units
		O I	--	B	<b>3SU1900-0AF81-0QG0</b>	1 10 units
		I O II	--	B	<b>3SU1900-0AF81-0QK0</b>	1 10 units
		I O (one below the other)	--	B	<b>3SU1900-0AF81-0QP0</b>	1 10 units
		II O I (one below the other)	--	B	<b>3SU1900-0AF81-0QQ0</b>	1 10 units
<b>With symbol (graphic)</b>						
	Silver/Black (label/lettering)	→ ARROW DIRECTION TO RIGHT	5022 IEC	B	<b>3SU1900-0AF81-0QR0</b>	1 10 units

# Labels

## Labeling plates for enclosures

### Options

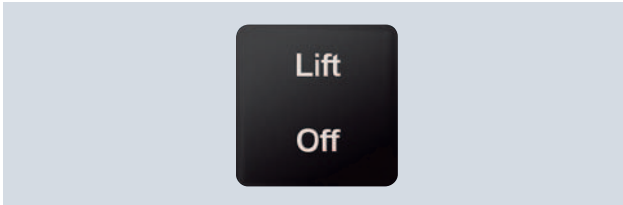
#### Customized inscriptions

The labels can be inscribed with texts and symbols not listed in the ordering data.

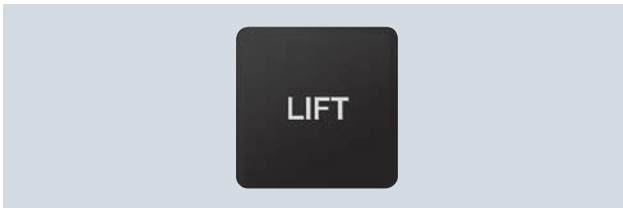
A letter height of 4 mm is used for text inscriptions (1 to 3 lines).

Up to 11 characters per line are possible. The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

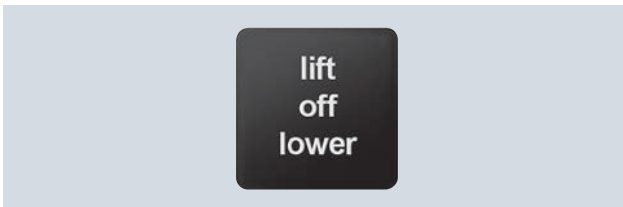
#### Examples for customized inscription



Two-line inscription in upper/lower case lettering (Q0Y)



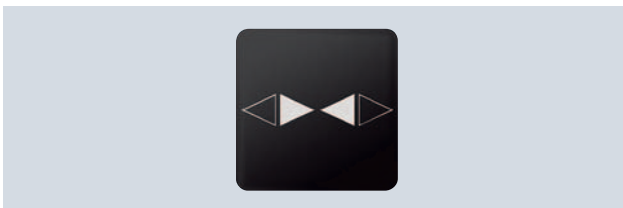
Single-line inscription in upper case lettering (Q1Y)



3SB39 backing plate for enclosures, customized inscription (Q2Y)



Symbol number 5011 according to IEC 60417 (Q3Y)



Any symbol according to order form supplement (Q9Y)

#### Ordering notes

Append the following order codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift / Off"): **Q0Y**
- Text line(s) in upper case (e.g. "LIFT"): **Q1Y**
- Text line(s) in lower case (e.g. "lift / off / lower"): **Q2Y**
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "On Off"): **Q5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **Q3Y**
- Any inscription or symbol according to order form supplement: **Q9Y**

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 =Lower". For long words you can also specify the end-of-line division (see ordering example 1).

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering examples 2 and 3).

For special symbols (order code Q9Y), a CAD drawing in DXF format can be submitted.

The SIRIUS ACT Configurator must be used to select special inscriptions and symbols (order code Q9Y). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard order channels.

Standard ordering channels:

- Configurator: [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)
- Electronic Catalog CA 01 on DVD
- Industry Mall: [www.usa.siemens.com/industrymall](http://www.usa.siemens.com/industrymall)

#### Ordering example 1

A label with 2 lines of text is required:

3SU1900-0AF16-0AZ0  
Q1Y  
Z1 = LIFT  
Z2 = LOWER

#### Ordering example 2

A label inscribed with symbol No. 5011 according to IEC 60417 is required:

3SU1900-0AF16-0AZ0  
Q3Y  
Z = 5011 IEC

#### Ordering example 3

A label inscribed with symbol No. 1118 according to ISO 7000 is required:

3SU1900-0AF16-0AZ0  
Q3Y  
Z = 1118 ISO

# Labels

## Labels for laser printers

### Overview

#### Label inscriptions



Using the *Label Designer* software, which can be downloaded from the Internet, and the labeling plates for laser inscription you can create your own customized labels with a standard laser printer. The self-adhesive or snap-on labels can be stuck or snapped onto the corresponding label holders. Round labels are provided for inserting in illuminated pushbuttons and switches.

The labels are suitable for inscription with one to three lines of text or symbols.

For applications with more exacting requirements we recommend factory-printed labeling plates and insert labels (laser-printed or engraved depending on the type).

For the *Label Designer* software see: [www.siemens.com/sirius-label-designer](http://www.siemens.com/sirius-label-designer)


### Selection and ordering data

	Fastening method	Height mm	Width mm	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Labels for printing - insert labels</b>							
	Insert	--	--	B	<b>3SU1900-0BH60-0AA0</b>	100	480 units
3SU1900-0BH60-0AA0							
<b>Labels for printing - labeling plates</b>							
	Self-adhesive	12.5	27.5	A	<b>3SU1900-0BJ61-0AA0</b>	100	480 units
		17.5	27	A	<b>3SU1900-0BK61-0AA0</b>	100	720 units
		27	27	A	<b>3SU1900-0BL61-0AA0</b>	100	480 units
		22	22	A	<b>3SU1900-0BM61-0AA0</b>	100	700 units
3SU1900-0BJ61-0AA0							

# Labels

## Other labels

### Selection and ordering data


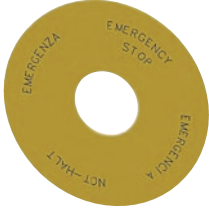
Color	Fastening method	Outer diameter mm	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>EMERGENCY STOP backing plates</b>							
	Yellow/Black (label/lettering)	None	45	None	A	<b>3SU1900-0BA31-0AA0</b>	1 10 units
			75	None	A	<b>3SU1900-0BB31-0AA0</b>	1 10 units
			75	EMERGENCY STOP	A	<b>3SU1900-0BB31-0DA0</b>	1 10 units

**For Custom Inscription**

For inscription or symbol options refer to page 112

3SU1900-0BB31-0AA0

### EMERGENCY STOP backing plates


	Yellow/Black (label/lettering)	Self-adhesive	75	None	▶	<b>3SU1900-0BC31-0AA0</b>	1 10 units
						▶	<b>3SU1900-0BC31-0DA0</b>
	Yellow/Black (label/lettering)	Self-adhesive	75	NOT-HALT, EMERGENCY STOP, EMERGENZA, EMERGENCIA (de, en, it, sp)	A	<b>3SU1900-0BC31-0NB0</b>	1 10 units

**For Custom Inscription**

For inscription or symbol options refer to page 112

3SU1900-0BC31-0NB0


### Labeling plates for potentiometers

	Black/White (label/lettering)	None	40	--	▶	<b>3SU1900-0BG16-0AA0</b>	1 10 units
				SYMBOL: 0 ... 9	▶	<b>3SU1900-0BG16-0RT0</b>	1 10 units
				SYMBOL: 0 ... 10	3	<b>3SU1900-0BG16-0SA0</b>	1 10 units
				SYMBOL: Power up	▶	<b>3SU1900-0BG16-0RU0</b>	1 10 units

3SU1900-0BG16-0RU0


Color	Label fastening method	Height mm	Width mm	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*
-------	------------------------	--------------	-------------	---------	----	-----------	-------------------------	-----

### Labeling plates for enclosures with EMERGENCY STOP

	Yellow/Black (label/lettering)	Self-adhesive	38	150	None	A	<b>3SU1900-0BE31-0AA0</b>	1 10 units
---	-----------------------------------	---------------	----	-----	------	---	---------------------------	------------


3SU1900-0BE31-0AA0

### Labeling plates for enclosures with EMERGENCY STOP with recess

	Yellow/Black (label/lettering)	Self-adhesive	38	150	None	B	<b>3SU1900-0BF31-0AA0</b>	1 10 units
---	-----------------------------------	---------------	----	-----	------	---	---------------------------	------------

3SU1900-0BF31-0AA0

### Unit labeling plates

	White/Black (label/lettering)	Insert	9.5	10.5	None	B	<b>3SU1900-0AY61-0AA0</b>	100 10 units
---	----------------------------------	--------	-----	------	------	---	---------------------------	--------------

3SU1900-0BY61-0AA0

# Labels

## Other labels

### Options

#### Customized inscriptions

The labels can be inscribed with text and symbols not listed in the ordering data.

The emergency stop backing plates are divided into four segments. Each segment can be customized individually. The letter height depends on the chosen number of characters and can be adjusted.

Example: Four segments of the emergency backing plate for customized inscription



#### Ordering notes

Append the following order codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Text"): **Q0Y**
- Text line(s) in upper case (e.g. "TEXT"): **Q1Y**
- Text line(s) in lower case (e.g. "text"): **Q2Y**
- Text line(s) in upper/lower case, all words begin with uppercase letters (e.g. "Text / Text"): **Q5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **Q3Y**

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than English, give the exact spelling and specify the language. In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 =Lower". For long words you can also specify the end-of-line division (see [ordering example 1](#)).

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417; (see [ordering example 2](#)).

The SIRIUS ACT Configurator must be used to select customized inscriptions and symbols (order code **Q9Y**). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mail shopping cart) or via the standard order channels.

Standard ordering channels:

- Configurator: [www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)
- Electronic Catalog CA 01 on DVD
- Industry Mall: [www.usa.siemens.com/industrymall](http://www.usa.siemens.com/industrymall)

#### Ordering example 1

A label with 2 lines of text is required:

**3SU1900-0BB31-0AZ0**

Q1Y  
Z1=Text 1  
Z2=Text 2

#### Ordering example 2

A label inscribed with symbol No. 5638 according to IEC 60417 is required:








**3SU1900-0BB31-0AZ0**

Q3Y  
Z=IEC5638

# Accessories





## Protection/access protection

### Selection and ordering data

Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*	
<b>Protective caps</b>							
	<b>Sealable caps</b>	Plastic	Black	B	<b>3SU1900-0DA10-0AA0</b>	1	1 unit
			Clear	B	<b>3SU1900-0DA70-0AA0</b>	1	1 unit
3SU1900-0DA10-0AA0							
	<b>Sealable caps for pushbuttons</b>	Plastic	Black	B	<b>3SU1900-0EL10-0AA0</b>	1	1 unit
			Clear	B	<b>3SU1900-0EL70-0AA0</b>	1	1 unit
3SU1900-0EL70-0AA0							
	<b>Silicone protective caps for pushbuttons, flat</b>	Plastic	Clear	A	<b>3SU1900-0DB70-0AA0</b>	1	1 unit
				A	<b>3SU1900-0ED70-0AA0</b>	1	1 unit
3SU1900-0DB70-0AA0							
	<b>Silicone protective caps for pushbuttons, raised</b>	Plastic	Clear	A	<b>3SU1900-0DC70-0AA0</b>	1	1 unit
				A	<b>3SU1900-0EE70-0AA0</b>	1	1 unit
3SU1900-0DC70-0AA0							
	<b>Silicone protective caps for selectors, short</b>	Plastic	Clear	B	<b>3SU1900-0DD70-0AA0</b>	1	1 unit
				B	<b>3SU1900-0EF70-0AA0</b>	1	1 unit
3SU1900-0DD70-0AA0							
	<b>Silicone protective caps for mushroom pushbuttons 40 mm</b>	Plastic	Clear	B	<b>3SU1900-0DE70-0AA0</b>	1	1 unit
				B	<b>3SU1900-0EG70-0AA0</b>	1	1 unit
3SU1900-0DE70-0AA0							
	<b>Silicone protective caps for EMERGENCY STOP</b>	Plastic	Clear	B	<b>3SU1900-0DF70-0AA0</b>	1	1 unit
				B	<b>3SU1900-0EH70-0AA0</b>	1	1 unit
3SU1900-0DF70-0AA0							

# Accessories





## Protection/access protection

Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Protective caps</b>						
 3SU1900-0DG70-0AA0	<b>Silicone protective caps for twin pushbuttons, flat</b>	Plastic	Clear	▶	<b>3SU1900-0DG70-0AA0</b>	1 1 unit
	<b>Silicone protective caps for twin pushbuttons, raised</b>	Plastic	Clear	B	<b>3SU1900-0DH70-0AA0</b>	1 1 unit
	<b>Silicone-free protective caps for twin pushbuttons, raised</b>	Plastic	Clear	B	<b>3SU1900-0EK70-0AA0</b>	1 1 unit
 3SU1900-0EB10-0AA0	<b>Dust caps for key-operated switches</b>	Plastic	Black	B	<b>3SU1900-0EB10-0AA0</b>	1 1 unit
<b>Protective collars</b>						
 3SU1900-0DJ10-0AA0	<b>Sun collar for illuminated pushbuttons</b>	Plastic	Black	5	<b>3SU1900-0DJ10-0AA0</b>	1 1 unit
 3SU1900-0DW10-0AA0	<b>360° protective collars for pushbuttons and selectors, short</b>	Plastic	Black	B	<b>3SU1900-0DW10-0AA0</b>	1 1 unit




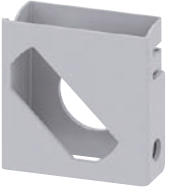





# Accessories

## Protection/access protection

Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Protective collars</b>						
	<b>360° protective collars for pushbuttons, visibility from the side</b>	Metal	Silver	B	<b>3SU1950-ODK80-0AA0</b>	1 1 unit
3SU1950-ODK80-0AA0						
	<b>360° protective collars for mushroom pushbuttons 40 mm, visibility from the side</b>	Metal	Silver	B	<b>3SU1950-ODL80-0AA0</b>	1 1 unit
3SU1950-ODL80-0AA0						
	<b>Protective collars for EMERGENCY STOP</b>	Plastic	Yellow Silver	▶	<b>3SU1900-ODY30-0AA0</b> <b>3SU1900-ODY80-0AA0</b>	1 1 unit 1 1 unit
3SU1900-ODY30-0AA0	With text "EMERGENCY STOP"	Plastic	Yellow	▶	<b>3SU1900-ODY30-0DA0</b>	1 1 unit
	<b>Protective collars for padlocks</b>	Metal	Yellow Silver	B B	<b>3SU1950-ODX30-0AA0</b> <b>3SU1950-ODX80-0AA0</b>	1 1 unit 1 1 unit
3SU1950-ODX30-0AA0						
	<b>360° protective collars for EMERGENCY STOP, SEMI-Industry</b>	Plastic	Yellow	B	<b>3SU1900-0EA30-0AA0</b>	1 1 unit
	<b>Protection for sensor switch</b>	Plastic	Black	B	<b>3SU1900-0EC10-0AA0</b>	1 1 unit
3SU1900-0EC10-0AA0						

# Accessories



## Protection/access protection

Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Locking devices</b>						
	Metal	Silver	B	<b>3SU1950-0DM80-0AA0</b>	1	1 unit
				<b>3SU1950-0DN80-0AA0</b>	1	1 unit
				<b>3SU1950-0DP80-0AA0</b>	1	1 unit
3SU1950-0DM80-0AA0						
	Metal	Silver	B	<b>3SU1950-0DQ80-0AA0</b>	1	1 unit
3SU1950-0DQ80-0AA0						
	Metal	Silver	B	<b>3SU1950-0DR80-0AA0</b>	1	1 unit
3SU1950-0DR80-0AA0						
	Metal	Silver	B	<b>3SU1950-0DS80-0AA0</b>	1	1 unit
3SU1950-0DS80-0AA0						
	Metal	Silver	B	<b>3SU1950-0DT80-0AA0</b>	1	1 unit
3SU1950-0DT80-0AA0						
	Metal	Silver	B	<b>3SU1950-0DU80-0AA0</b>	1	1 unit
3SU1950-0DU80-0AA0						
	Metal	Silver	B	<b>3SU1950-0DV80-0AA0</b>	1	1 unit
3SU1950-0DV80-0AA0						








# Accessories

## Actuators

### Selection and ordering data





Material	Mounting diameter mm	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Sealing plugs<sup>1)</sup>, 22 mm</b>							
Plastic	22	Black	▶	<b>3SU1900-0FA10-0AA0</b>		1	1 unit
							
3SU1900-0FA10-0AA0							
Metal, matte	22	Sand gray	▶	<b>3SU1930-0FA80-0AA0</b>		1	1 unit
Metal, shiny	22	Silver	▶	<b>3SU1950-0FA80-0AA0</b>		1	1 unit
							
3SU1950-0FA80-0AA0							
Metal, matte	30	Sand gray	▶	<b>3SU1960-0FA80-0AA0</b>		1	1 unit

<sup>1)</sup> The sealing plug is mounted with a holder. Modules might already be mounted on the holder.

Type of product	Outer diameter of the actuating element mm	Accessory color	Accessory material	SD d	<b>Screw terminals</b>	PU (UNIT, SET, M)	PS*
					Article No.	Price per PU	
<b>USB port <i>NEW</i></b>							
USB 3.0	22	Black	Plastic	3	<b>3SU1900-0GA10-0AA0</b>		1 1 unit
							
		Sand gray	Metal/plastic	3	<b>3SU1930-0GA80-0AA0</b>		1 1 unit
		Silver	Metal, shiny	3	<b>3SU1950-0GA80-0AA0</b>		1 1 unit
	30	Sand gray	Metal, matte	3	<b>3SU1960-0GA80-0AA0</b>		1 1 unit
							
3SU1930-0GA80-0AA0							
							
3SU1960-0GA80-0AA0							
							
3SU1960-0GA80-0AA0							
<b>RJ45 connection <i>NEW</i></b>							
RJ-45 Cat. 6	22	Black	Plastic	3	<b>3SU1900-0GB10-0AA0</b>		1 1 unit
							
		Sand gray	Metal/plastic	3	<b>3SU1930-0GB80-0AA0</b>		1 1 unit
		Silver	Metal, shiny	3	<b>3SU1950-0GB80-0AA0</b>		1 1 unit
	30	Sand gray	Metal, matte	3	<b>3SU1960-0GB80-0AA0</b>		1 1 unit
							
3SU1900-0GB10-0AA0							
							
3SU1950-0GB80-0AA0							
							
3SU1960-0GB80-0AA0							

# Accessories








## Actuators

Material	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Buttons, flat<sup>1)</sup></b>						
<b>For pushbuttons</b>						
 3SU1900-0FT20-0AA0	Plastic		▶ 3SU1900-0FT10-0AA0		100	10 units
			▶ 3SU1900-0FT20-0AA0		100	10 units
			▶ 3SU1900-0FT30-0AA0		100	10 units
			▶ 3SU1900-0FT40-0AA0		100	10 units
			▶ 3SU1900-0FT50-0AA0		100	10 units
			▶ 3SU1900-0FT60-0AA0		100	10 units
<b>For illuminated pushbuttons</b>						
 3SU1901-0FT30-0AA0	Plastic	5	▶ 3SU1901-0FT00-0AA0		100	10 units
			▶ 3SU1901-0FT20-0AA0		100	10 units
			▶ 3SU1901-0FT30-0AA0		100	10 units
			▶ 3SU1901-0FT40-0AA0		100	10 units
			▶ 3SU1901-0FT50-0AA0		100	10 units
			▶ 3SU1901-0FT60-0AA0		100	10 units
			▶ 3SU1901-0FT70-0AA0		100	10 units
<b>Buttons, raised<sup>1)</sup></b>						
<b>For pushbuttons</b>						
 3SU1900-0FS30-0AA0	Plastic		▶ 3SU1900-0FS10-0AA0		1	10 units
			▶ 3SU1900-0FS20-0AA0		1	10 units
			▶ 3SU1900-0FS30-0AA0		1	10 units
			▶ 3SU1900-0FS40-0AA0		1	10 units
<b>For illuminated pushbuttons</b>						
 3SU1901-0FS40-0AA0	Plastic		▶ 3SU1901-0FS20-0AA0		1	10 units
			▶ 3SU1901-0FS30-0AA0		1	10 units
			▶ 3SU1901-0FS40-0AA0		1	10 units
			▶ 3SU1901-0FS50-0AA0		1	10 units
			▶ 3SU1901-0FS70-0AA0		1	10 units

<sup>1)</sup> Buttons are not interchangeable between pushbuttons and illuminated pushbuttons with a raised button and those with a flat button (raised front ring, castellated).

# Accessories

## Actuators

	Material	Key number	RFID coding version	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
<b>Ronis keys</b>								
	Metal	SB30	--	Silver	▶	<b>3SU1950-0FB80-0AA0</b>	1	1 unit
		455			B		<b>3SU1950-0FC80-0AA0</b>	1
3SSU1950-0FB80-0AA0								
<b>BKS keys</b>								
	Metal	S1	--	Silver	B	<b>3SU1950-0FD80-0AA0</b>	1	1 unit
3SSU1950-0FD80-0AA0								
<b>OMR keys</b>								
	Metal	73038	--	Blue	B	<b>3SU1950-0FJ50-0AA0</b>	1	1 unit
		73037		Red	B	<b>3SU1950-0FK20-0AA0</b>	1	1 unit
		73034		Black	B	<b>3SU1950-0FL10-0AA0</b>	1	1 unit
		73033		Yellow	B	<b>3SU1950-0FM30-0AA0</b>	1	1 unit
3SSU1950-0FJ50-0AA0								
<b>CES keys</b>								
	Metal	LSG1	--	Silver	B	<b>3SU1950-0FN80-0AA0</b>	1	1 unit
		SSG10			A	<b>3SU1950-0FP80-0AA0</b>	1	1 unit
		VL5			B	<b>3SU1950-0FQ80-0AA0</b>	1	1 unit
3SSU1950-0FP80-0AA0								
<b>IKON keys</b>								
	Metal	360012K1	--	Silver	B	<b>3SU1950-0FR80-0AA0</b>	1	1 unit
3SU1950-0FR80-0AA0								
<b>ID keys ID group individual</b>								
	Plastic	--	Individually coded, programmable several times	White	X	<b>3SU1900-0FU60-0AA0</b>	1	1 unit
3SU1900-0FU60-0AA0								
<b>ID keys</b>								
	Plastic	--	ID group 1	Green	X	<b>3SU1900-0FV40-0AA0</b>	1	1 unit
			ID group 2	Yellow	X	<b>3SU1900-0FW30-0AA0</b>	1	1 unit
			ID group 3	Red	X	<b>3SU1900-0FX20-0AA0</b>	1	1 unit
			ID group 4	Blue	X	<b>3SU1900-0FY50-0AA0</b>	1	1 unit
3SU1900-0FV40-0AA0								

# Accessories


## Enclosures

### Selection and ordering data

Product version	Material	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Metric cable glands</b>								
 <p>3SU1900-0HG10-0AA0</p>	<b>M20 for round cable and enclosures</b> With 1 to 3 command points	Plastic	Black	▶	<b>3SU1900-0HG10-0AA0</b>	1	1 unit	
	<b>M25 for round cable and enclosures</b> With 4 and 6 command points				5	<b>3SU1900-0HH10-0AA0</b>	1	1 unit
	<b>M20 for round cable and AS-i enclosure</b> With 1 to 3 command points with 2-pin connector plug for AS-i module				3	<b>3SU1900-0JA10-0AA0</b>	1	1 unit
	<b>M25 for round cable and AS-i enclosure</b> With 4 to 6 command points with 2-pin connector plug for AS-i module				3	<b>3SU1900-0JB10-0AA0</b>	1	1 unit
	<b>M20 for round cable and IO-Link enclosure</b> With 1 to 3 command points with 10-pin connector plug for IO-Link	<b>NEW</b>			▶	<b>3SU1900-0JC10-0AA0</b>	1	1 unit
	<b>M25 for round cable and IO-Link enclosure</b> With 4 to 6 command points with 10-pin connector plug for IO-Link	<b>NEW</b>			▶	<b>3SU1900-0JD10-0AA0</b>	1	1 unit
	<b>M20 for AS-i profile cable and AS-i enclosure</b> With 1 to 3 command points with 2-pin connector plug for AS-i module	<b>NEW</b>			5	<b>3SU1900-0HE10-0AA0</b>	1	1 unit
	<b>M25 for AS-i profile cable and AS-i enclosure</b> With 4 to 6 command points with 2-pin connector plug for AS-i module	<b>NEW</b>			5	<b>3SU1900-0HF10-0AA0</b>	1	1 unit
<b>Connection pieces</b>								
 <p>3SU1900-0HJ10-0AA0</p>	<b>For plastic enclosures</b>							
	<b>M20/M20 connection piece</b> For connecting 2 enclosures	Plastic	Black	▶	<b>3SU1900-0HJ10-0AA0</b>	1	1 unit	
	<b>M20/M25 connection piece</b> For connecting 2 enclosures				5	<b>3SU1900-0HK10-0AA0</b>	1	1 unit
	<b>M25/M25 connection piece</b> For connecting 2 enclosures				5	<b>3SU1900-0HL10-0AA0</b>	1	1 unit
 <p>3SU1950-0HJ10-0AA0</p>	<b>For metal enclosures</b>							
	<b>M20/M20 connection piece</b> For connecting 2 enclosures	Metal	Silver	5	<b>3SU1950-0HJ10-0AA0</b>	1	1 unit	
	<b>M20/M25 connection piece</b> For connecting 2 enclosures				5	<b>3SU1950-0HK10-0AA0</b>	1	1 unit
	<b>M25/M25 connection piece</b> For connecting 2 enclosures				5	<b>3SU1950-0HL10-0AA0</b>	1	1 unit

# Accessories

## Enclosures

Product version	Material	Color	DT	Insulation piercing method 	PU (UNIT, SET, M)	PS*
Order No.						

### Adapters for AS-i shaped cables



3SU1900-0HX10-0AA0

Insulation piercing method M20 M25	Plastic	Black	B B	3SU1900-0HX10-0AA0	1	1 unit
				3SU1900-0HY10-0AA0	1	1 unit

### Adapters

#### For plastic enclosures



3SU1930-0HS10-0AA0

M12 sockets, 4-pole M20 M25	Plastic	Black	B B	3SU1930-0HA10-0AA0	1	1 unit
				3SU1930-0HB10-0AA0	1	1 unit
M12 connectors, 4-pole M20 M25			B B	3SU1930-0HC10-0AA0	1	1 unit
				3SU1930-0HD10-0AA0	1	1 unit
M12 sockets, 5-pole M20 M25	Plastic	Black	B B	3SU1930-0HP10-0AA0	1	1 unit
				3SU1930-0HQ10-0AA0	1	1 unit
M12 connectors, 5-pole M20 M25			B B	3SU1930-0HR10-0AA0	1	1 unit
				3SU1930-0HS10-0AA0	1	1 unit
M12 sockets, 8-pole M20 M25	Plastic	Black	B B	3SU1930-0HT10-0AA0	1	1 unit
				3SU1930-0HU10-0AA0	1	1 unit
M12 connectors, 8-pole M20 M25			B B	3SU1930-0HV10-0AA0	1	1 unit
				3SU1930-0HW10-0AA0	1	1 unit

#### For metal enclosures



3SU1950-0HA10-0AA0

M12 sockets, 4-pole M20 M25	Metal	Black	B B	3SU1950-0HA10-0AA0	1	1 unit
				3SU1950-0HB10-0AA0	1	1 unit
M12 connectors, 4-pole M20 M25			B B	3SU1950-0HC10-0AA0	1	1 unit
				3SU1950-0HD10-0AA0	1	1 unit
M12 sockets, 5-pole M20 M25	Metal	Black	B B	3SU1950-0HP10-0AA0	1	1 unit
				3SU1950-0HQ10-0AA0	1	1 unit
M12 connectors, 5-pole M20 M25			B B	3SU1950-0HR10-0AA0	1	1 unit
				3SU1950-0HS10-0AA0	1	1 unit
M12 sockets, 8-pole M20 M25	Metal	Black	B B	3SU1950-0HT10-0AA0	1	1 unit
				3SU1950-0HU10-0AA0	1	1 unit
M12 connectors, 8-pole M20 M25			B B	3SU1950-0HV10-0AA0	1	1 unit
				3SU1950-0HW10-0AA0	1	1 unit

### Enclosure cover monitoring









3SU1900-0HM10-0AA0

Enclosure cover monitoring (module with extension plunger)	Plastic	Black	B	3SU1900-0HM10-0AA0	1	1 unit
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# Accessories

## Miscellaneous accessories

### Selection and ordering data

Product designation Product version	Material	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Miscellaneous accessories</b>							
 <p>3SU1900-0KA10-0AA0</p>	<b>PCB carriers</b>	Plastic	Black	5	<b>3SU1900-0KA10-0AA0</b>	100	10 units
 <p>3SU1900-0CK10-0AA0</p>	<b>Pressure plates for selectors and locks</b>	Plastic	White	▶	<b>3SU1900-0CK10-0AA0</b>	100	10 units
 <p>3SU1900-0KF10-0AA0</p>	<b>Drilling template for grid</b> 30 x 40, horizontal	Plastic	Black	5	<b>3SU1900-0KF10-0AA0</b>	1	1 unit
 <p>3SU1900-0KG10-0AA0</p>	<b>Extension plungers</b> For compensation of the distance between the pushbutton and the unlatching button of an overload relay	Plastic	Gray	▶	<b>3SU1900-0KG10-0AA0</b>	1	1 unit
 <p>3SU1950-0JE80-0AA0</p>	<b>Strut profile mounting adapters</b> <b>NEW</b>	Metal	Sand gray	3	<b>3SU1950-0JE80-0AA0</b>	1	1 unit
	<b>Adapters</b> <b>NEW</b>	Plastic	Black	5	<b>3SU1900-0JF10-0AA0</b>	1	1 unit
	Between enclosure top and bottom						
 <p>3SU1900-0KH80-0AA0</p>	<b>Adapters for standard rail mounting</b>	Plastic	Black	▶	<b>3SU1900-0KH80-0AA0</b>	1	1 unit



# Accessories

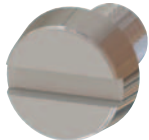
## Miscellaneous accessories



3SU1950-0KJ80-0AA0



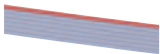
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3SU1900-0KL10-0AA0



3SU1900-0KP80-0AA0

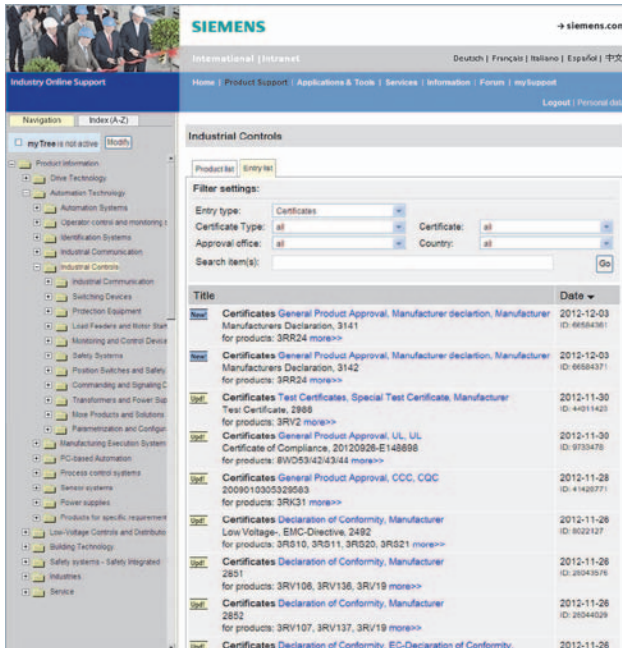
Product designation Product version	Material	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Adapters for actuators and indicators</b> With front ring for flat mounting	Metal	Silver	d ▶	<b>3SU1950-0KJ80-0AA0</b>		1	1 unit
<b>Adapters for 30.5 mm to 22.5 mm mounting hole</b>	Metal, shiny	Silver	▶	<b>3SU1950-0KB10-0AA0</b>		1	1 unit
<b>NEW</b>	Metal, matte	Sand gray	▶	<b>3SU1960-0KB10-0AA0</b>		1	1 unit
<b>Grounding studs</b>	Metal	Silver	5	<b>3SU1950-0KK80-0AA0</b>		100	50 units
<b>Connectors for sensor switches, angled socket with screw terminal connection</b>	Plastic	Black	▶	<b>3SU1900-0KL10-0AA0</b>		1	1 unit
<b>Flat ribbon cable</b> 7 cores							
• Length 10 m	Plastic	Gray	5	<b>3SU1900-0KQ80-0AA0</b>		1	1 unit
• Length 5 m	Plastic	Gray	5	<b>3SU1900-0KP80-0AA0</b>		1	1 unit

Standards and approvals

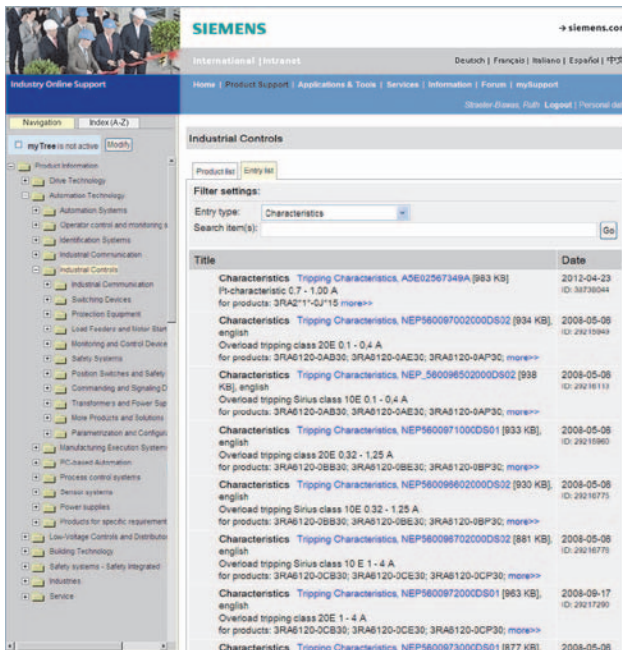
**Approvals, test certificates, characteristic curves**

An overview of the certificates available for Industrial Control products along with more technical documentation can be consulted daily on the Internet at:

[www.siemens.com/sirius/approvals](http://www.siemens.com/sirius/approvals)



Product support: Approvals/certificates



Product support: Characteristics

**Safety characteristics**

In the following standards, the so-called B10 values for calculating the safety integrity or safety integrity level (SIL) in functional safety at a high or continuous demand rate are required also for electromechanical switchgear:

- IEC 62061 "Safety of machines – Functional safety of safety-related electrical, electronic and programmable electronic control systems",
- ISO 13849-1 "Safety of machines – Safety-related components of controls – Part 1: General principles".

Failure rates of electromechanical components are required for calculating the safety integrity or safety integrity level (SIL) in functional safety:

- in the manufacturing industry at a high demand rate
- in the process industry at a low demand rate

Further requirements are laid down in IEC 61511-1 "Functional safety – Safety instrumented systems for the process industry sector – Part 1: Framework, definitions, system, hardware and software requirements".

The German versions of the above standards are:

- EN 62061 (VDE 0113-50), 2005 + AMD 1:2013, which since 31.12.2005 has been harmonized as EN 62061 under the Machinery Directive
- EN ISO 13849-1:2008
- EN 61511-1 (VDE 810-1)

The TÜV-tested Safety Evaluation Tool assists in calculating the safety function as verification for the machine documentation. It is available on the Internet at [www.siemens.com/safety-evaluation-tool](http://www.siemens.com/safety-evaluation-tool).

At [www.siemens.com/safety-integrated](http://www.siemens.com/safety-integrated) you will also find examples of functions with calculations according to the current standards.

Definitions

$\lambda(t) dt$  is the probability that a unit which has not failed by a certain time  $t$  will fail in the following interval  $(t; t + dt)$ . Failure rates have the dimension 1/time unit, e.g. 1/h. Failure rates for components are often specified in FIT (failures in time unit): 1 FIT equals  $10^{-9}/h$ .

From the failure rate it is possible to derive a (mathematical) distribution function of the failure probability:

$F(t) = 1 - \exp(-\lambda t)$ , with  $\lambda$  as constant failure rate

- The mean value of this exponential distribution is also referred to as:
  - Mean Time To Failure (MTTF) in the case of irreparable components; 63.2 % of components fail by the MTTF.
  - Mean Operating Time Between Failures (MTBF) in the case of repairable components.
- $MTTF = 1/\lambda$   
(MTTF is a statistical mean value but no guarantee for endurance)

Electromechanical components are often irreparable components. In general, the failure rate of monitored units changes with age.

Standards and approvals

The B10 value for devices subject to wear is expressed in number of operating cycles:

- it is the number of operating cycles after which 10 % of the test specimens fail in the course of an endurance test (or: the number of operating cycles after which 10 % of the devices have failed).

For low demand rates (mainly in the process industry), the failure rate and not the B10 value is used to determine the failure probability.

Standard B10 values at a high demand rate

With the help of the B10 value and a simplified formula (see section 6.7.8.2.1 of EN 62061), the user can then calculate the total failure rate of an electromechanical component:

$$\lambda = 0.1 \times C/B10$$

with C = operating cycles per hour. C is specified by the user.

The failure rate is made up of safe ( $\lambda_S$ ) and dangerous ( $\lambda_D$ ) failures:

$$\lambda = \lambda_S + \lambda_D$$

or

$$\lambda_D = [\text{share of dangerous failures in \%}] \times \lambda$$

$$\lambda_S = [\text{share of safe failures in \%}] \times \lambda$$

The failure rate of the dangerous failures  $\lambda_D$  of the components used is needed for further calculations.

Listed in the following table are the standard B10 values and the share of dangerous failures for SIRIUS product groups at a high demand rate.

Standard B10 values (at a high demand rate)		
SIRIUS ACT product group (electromechanical components)	Standard B10 value <sup>1)</sup> (operating cycles)	Share of dangerous failures
3SU1 EMERGENCY-STOP mushroom pushbuttons (with positive-opening contacts)	100 000	20 %
3SU1 pushbuttons (non-latching, with positive-opening contacts)	10 000 000	20 %

<sup>1)</sup> Only applies under the conditions specified in the technical specifications.

The B10<sub>d</sub> value used in EN ISO 13849-1:2008 is determined as follows:

$$B10_d = \frac{B10}{\text{Share of dangerous failures}}$$

Calculation example

A protective door is monitored by a position switch with a separate actuator.

The protective door is opened 4 times an hour.

The overall failure rate of the position switch is:

$$\lambda = 0.1 \cdot C/B10 \text{ [failures/h]}$$

$$\lambda = 0.1 \cdot 4/1000000 = 4 \cdot 10^{-7} \text{ [failures/h]}$$

The dangerous failure rate is calculated with:

$$\lambda_D = 20 \% \text{ of } \lambda = 0.2 \cdot 4 \cdot 10^{-7} \text{ [failures/h]}$$

$$\lambda_D = 8 \cdot 10^{-8} \text{ [failures/h]}$$

Standard failure rates (at a low demand rate)

On the basis of the failure rates, it is possible to calculate the average probability of failure on demand (PFD<sub>avg</sub>) of a PLT protective device.

A so-called low demand rate is assumed, meaning the rate of demand on the safety-related system amounts to no more than once a year and is not greater than double the frequency of the repeat test.

A repeat test once a year is recommended for electromechanical components in order to reveal passive faults.

For special applications it is possible, in agreement with the inspecting institution (e.g. a technical inspectorate, government agency or the like) to extend the test intervals by using suitable solutions (e.g. a multi-channel version etc.).

Listed in the following table are the standard failure rates and the share of dangerous failures for SIRIUS product groups at a low demand rate.

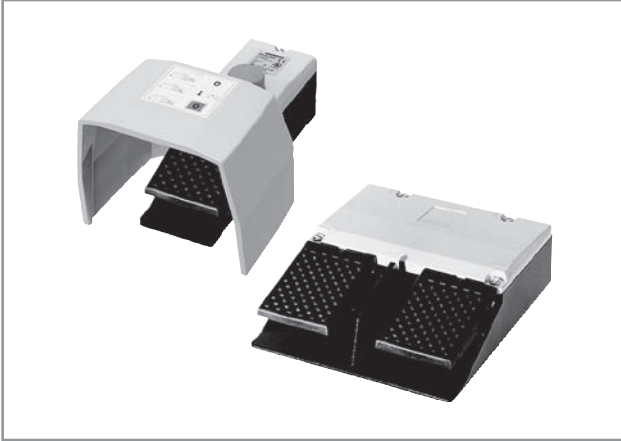
Standard failure rates at a low demand rate		
SIRIUS ACT product group (electromechanical components)	Standard failure rates (in FIT) <sup>1)</sup>	Share of dangerous failures
3SU1 EMERGENCY-STOP mushroom pushbuttons (with positive-opening contacts)	100	20 %
3SU1 pushbuttons (non-latching, with positive-opening contacts)	100	20 %

<sup>1)</sup> The failure rates specified in the table were limited to 100 FIT.

# 3SE2, 3SE3 Foot Switches

Plastic and metal enclosures

## Overview



Foot switches with metal enclosures

### Standard switches

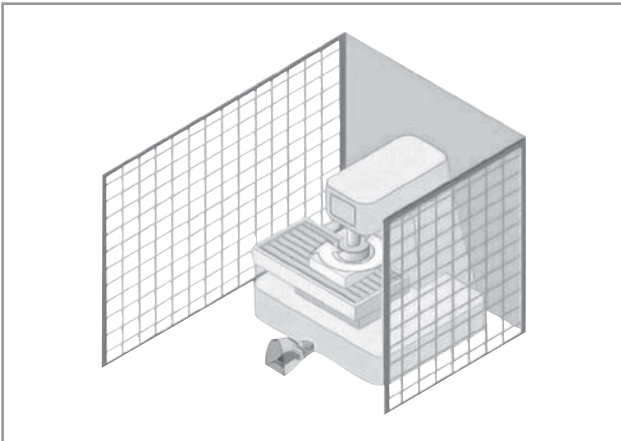
The 3SE2 9 and 3SE3 9 foot switch range encompasses versions in a metal enclosure for rugged applications as well as versions with plastic enclosure for less harsh environments. The devices can be supplied with or without a cover and have fixing holes for them to be screwed to the floor.

Depending on the particular application, the metal enclosures can be ordered in latching or momentary-contact versions. The momentary-contact pedal switch in the plastic enclosure has one microswitch (changeover contact) per actuating pedal.

### Safety foot switches

The 3SE2 924-3AA20 single-pedal safety foot switches are used on machines and plants as OK switches when operation by hand is not possible and the EMERGENCY-STOP function must be available if a hazardous status arises. The switches are interlocked according to EN ISO 13850 and bear the CE mark in accordance with the machinery directive.

The safety foot switches are protected by a guard hood against accidental operation.



Application example

The switches have two contact blocks, each with one NO contact and one NC contact. The NO contacts and NC contacts of the two contact blocks are connected for easy connection of a single-phase motor. The normal workflow is initiated by pressing down the pedal as far as the pressure point so that the two NO contacts close and the motor starts to run.

If in the event of danger the pedal is pressed beyond the resistance of the pressure point, the positively driven NC contacts will open and the motor is stopped. At the same time the independent latching takes effect and holds the NC contacts in open position. This prevents the machine parts from continuing to run out of control or from being restarted.

After the hazard is eliminated, the machine can only be restarted after manually releasing the switch using a push button on the top of the enclosure. The contacts are then released again and return to their initial position (the NO contacts are open and the NC contacts are closed).

## Technical specifications

Type	3SE29	3SE39
<b>Metal and plastic enclosures</b>		
<b>Standards</b>	IEC 60947-5-1	
<b>Electrical load</b>		
• At AC-15, 400 V		
- 1 NO + 1 NC	A 16	—
- 2 NO + 2 NC	A 6	—
- 3SE2 924-3AA20 (2 NO + 2 NC)	A 16	—
• At 250 V AC	A —	5
<b>Short-circuit protection</b>		
- 1 NO + 1 NC / 3SE2 924-3AA20	A 16 (slow)	—
- 2 NO + 2 NC	A 6 (slow)	—
- 1 CO contact	A —	5 (slow)
<b>Mechanical endurance</b>	> 10 <sup>6</sup> operating cycles	
<b>Material</b>		
• Enclosures	Aluminum casting	Impact-resistant thermoplast, self-extinguishing according to UL 94 VO
• Covers	Thermoplast	—
• Guard hoods	Aluminum casting	Metal
<b>Degree of protection</b>	IP65	IP65
<b>Ambient temperature</b>	°C -25 ... +80	-10 ... +75
<b>Connection</b>	Cable entry, metric	Cable AWG20, UL Style 2464, length 3 m

# 3SE2, 3SE3 Foot Switches

## Plastic and metal enclosures

### Selection and ordering data

Version	Slow-action contacts for each pedal	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Metal enclosures, degree of protection IP65</b>							
 <p>3SE290-..AA20 3SE291-..AA20</p>	<b>Momentary-contact foot switches, single pedal, non-latching</b> M20 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC ↻ 2	<b>3SE2902-0AB20</b>		1	1 unit	
		2 NO + 2 NC ↻ 2	<b>3SE2903-1AB20</b>		1	1 unit	
	• With hood	1 NO + 1 NC ↻ 2	<b>3SE2902-0AA20</b>		1	1 unit	
	2 NO + 2 NC ↻ 2	<b>3SE2903-1AA20</b>		1	1 unit		
 <p>3SE2912-2AB20 3SE2912-2AA20</p>	<b>Momentary-contact foot switches, single pedal, latching</b> M20 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC ↻ 15	<b>3SE2912-2AB20</b>		1	1 unit	
	• With hood	1 NO + 1 NC ↻ 15	<b>3SE2912-2AA20</b>		1	1 unit	
 <p>3SE2932-..AB20 3SE2932-..AA20</p>	<b>Momentary-contact foot switches, two pedals, non-latching</b> M25 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC ↻ 5	<b>3SE2932-0AB20</b>		1	1 unit	
		2 NO + 2 NC ↻ 5	<b>3SE2932-1AB20</b>		1	1 unit	
	• With hood	1 NO + 1 NC ↻ 5	<b>3SE2932-0AA20</b>		1	1 unit	
2 NO + 2 NC ↻ 5		<b>3SE2932-1AA20</b>		1	1 unit		
 <p>3SE2924-3AA20</p>	<b>Safety momentary-contact foot switches, non-latching, single pedal</b> With hood M20 x 1.5 cable entry with interlocking function NO closes as momentary contact type NC opens with automatic latching (safety function)		2 NO + 2 NC ↻ 15	<b>3SE2924-3AA20</b>	1	1 unit	
<b>Plastic enclosures, degree of protection IP65</b>							
 <p>3SE3902-4CA20 3SE3934-5CB20</p>	<b>Momentary-contact pedal switches,</b> 3 m cable		Microswitch				
	• Single pedal	- Without hood	1 CO contact	5	<b>3SE3902-4CB20</b>	1	1 unit
		- With hood	1 CO contact	5	<b>3SE3902-4CA20</b>	1	1 unit
	• Two pedals, without hood	2 x 1 CO	5	<b>3SE3934-5CB20</b>	1	1 unit	
<b>Accessories</b>							
	<b>Protection cover</b> Single pedal foot switch for 3SE2912-2AA20	--	20	<b>3SE3980-8M</b>	1	1 unit	
	<b>Contact block, 6 A,</b> Supersedes momentary-contact foot switch 3SE29.2-..A.20 and 3SE29.3-..A.20	2 NO + 2 NC	X	<b>3SE3982-0K</b>	1	1 unit	
	<b>Contact block, 16 A,</b> Supersedes momentary-contact foot switch 3SE29.2-0A.20	1 NO + 1 NC	X	<b>3SE3982-0L</b>	1	1 unit	
	<b>Contact block, 16 A,</b> Supersedes momentary-contact foot switch 3SE2924-3AA20	2 NO + 2 NC	X	<b>3SE3982-7J</b>	1	1 unit	
	<b>Contact block, 16 A,</b> Supersedes momentary-contact foot switch 3SE2912-2A.20	1 NO + 1 NC	30	<b>3SE3982-7L</b>	1	1 unit	

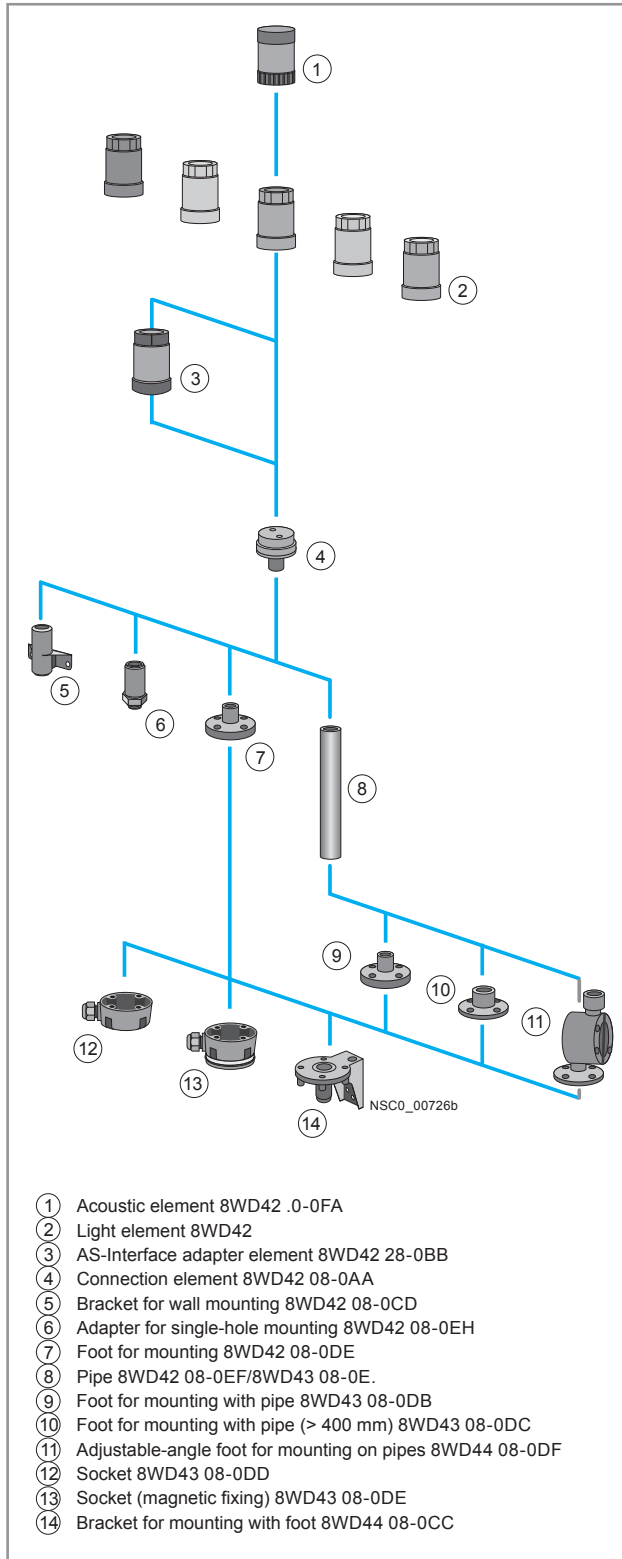
↻ Positive opening according to IEC 60947-5-1, Annex K.

# 8WD4 Signaling Columns

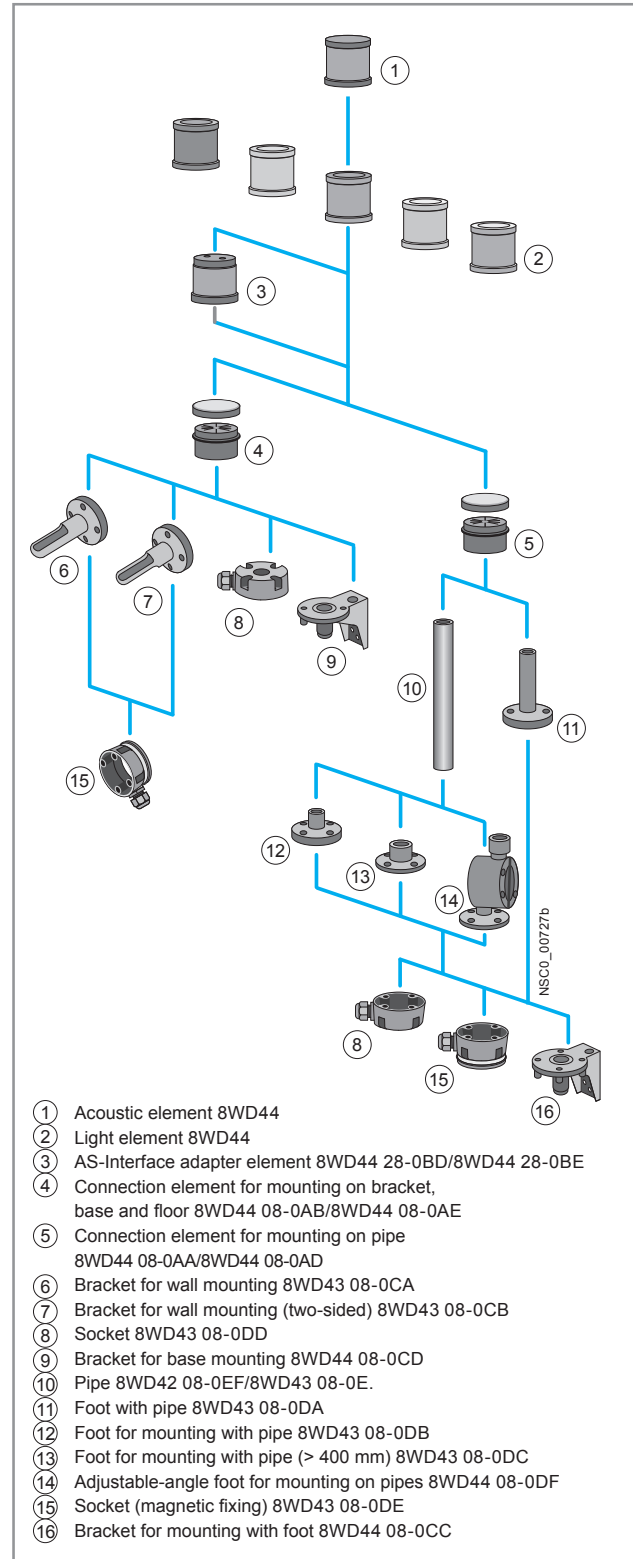
## General Data

### Overview

The 8WD4 signaling columns are flexible in design and versatile in use.



8WD42 signaling columns (width 50 mm) with up to 4 elements



8WD44 signaling columns (width 70 mm) with up to 5 elements



# 8WD4 Signaling Columns

## General Data

Two product series are available:

- 8WD42
  - Thermoplast enclosure, diameter 50 mm
  - Degree of protection IP54
  - Up to 4 elements can be mounted between the connection element and the cover
- 8WD44
  - Thermoplast enclosure, diameter 70 mm
  - Advanced design and significantly improved illumination
  - Faster and more flexible connection using spring-type terminals
  - Integrated degree of protection IP65
  - Up to 5 elements can be mounted between the connection element and the cover



Signaling columns, mounting examples

The illustrated examples are from the left:

- 8WD42: Cover (no No.), 4 light elements ②, connection element ④, pipe ⑧, foot ⑨
- 8WD44: Acoustic element with integral cover ①, 2 light elements ②, connection element ⑤, foot with pipe ⑪
- 8WD44: Cover (no No.), 4 light elements ②, AS-Interface adapter element ③, connection element ④, bracket for wall mounting ⑥
- 8WD44: Cover (no No.), 3 light elements ②, AS-Interface adapter element ③, connection element ⑤, foot with pipe ⑪

Note:

The cover is supplied with the connection element; it is not needed with the acoustic element.

### Benefits

- Choice of various light and acoustic elements with different functions: continuous light, blinklight, flashlight and rotating light; buzzer and siren
- Light elements with particularly long-lasting LEDs
- Variety of colors: red, yellow, green, white or blue
- Optimized illumination through improved prism technology with the 8WD44
- Acoustic elements can be adjusted in tone and volume
- Extremely resistant to shock and vibrations
- Easy connection and quick lamp change with secure bayonet mechanism
- Communication capability through connection to AS-Interface

### Application

8WD4 signaling columns are used in machines or in automatic processes for monitoring complex procedures or as visual or acoustic warning devices in emergency situations, e.g. for displaying individual assembly stages.

#### Communication capability

##### Connection to AS-Interface

The 8WD4 signaling columns can be directly connected to the AS-Interface bus system through an adapter element that can be integrated in the column. Wiring outlay is reduced as the result. The two-wire bus cable is fixed to the terminals in the connection element. Up to four signaling elements can be mounted on it using an adapter element.

A/B technology enables the connection of up to 62 slaves on one AS-Interface system.

#### Connection

The signaling elements are wired up using the screw terminals in the connection element, screw terminals on the 8WD42 and screw or spring-type terminals on the 8WD44.

##### Cable outlet

The connecting cables can be guided either downwards or sideways through the cable gland using an adapter that can be screwed under the foot. This makes wiring easier if there is no access from below.

##### Connection to AS-Interface



#### 8WD42:

The two-wire bus cable is fixed to the screw terminals in the connection element. The adapter element must be the first module to be mounted on the connection element. A maximum of 4 signaling elements can then be mounted on it.

The adapter element 8WD42 28-0BB is a standard slave.

#### 8WD44:

The two-wire bus cable is fixed to the screw or spring-type terminals in the connection element. The adapter element must be the first module to be mounted on the connection element. The signaling elements can then be mounted on it.

The adapter element 8WD44 28-0BE is a standard slave. A maximum of 4 signaling elements can be mounted on it.

The adapter element 8WD44 28-0BD with A/B technology enables the connection of up to 62 slaves on one AS-Interface system. The addressing socket provides user-friendly parameterization of the AS-Interface elements. A maximum of 3 signaling elements can be mounted on it.

# 8WD4 Signaling Columns

## General Data

### Technical specifications

Type	8WD42	8WD44
<b>General data</b>		
<b>Approvals</b>	UL, CSA	UL, CSA
<b>Light and acoustic elements</b>		
<b>Rated voltage, power consumption</b>		
Light elements with incandescent lamp	(AC values for 50/60 Hz)	(AC values for 50/60 Hz)
• Continuous light	12 V, 24 V, 115 V, 230 V AC/DC	12 V, 24 V, 115 V, 230 V AC/DC
• Blinklight	24 V AC/DC/125 mA; 115 V AC/20 mA; 230 V AC/15 mA	24 V AC/DC/125 mA; 115 V AC/20 mA; 230 V AC/15 mA
• Flashlights	—	24 V DC/125 mA; 115 V AC/20 mA; 230 V AC/35 mA
• Max. inrush current, blinklight/flashlight	—	500 mA
Light elements with integrated LED		
• Continuous light	24 V AC/DC/60 mA	24 V AC/DC/45 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA
• Blinklight	—	24 V AC/DC/40 mA
• Rotating light	—	24 V AC/DC/70 mA
Acoustic elements		
• Buzzer element (tone: pulsating or continuous, 85 dB)	24 V AC/DC/25 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA	24 V AC/DC/25 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA
• Siren element (8 tones + amplification can be set, 100 dB)	—	24 V AC/DC/80 mA; 115 V AC/30 mA; 230 V AC/16 mA
• Siren element (108 dB)	—	24 V DC/100 mA
<b>Power consumption</b>		
• Incandescent lamps, base BA 15d	W max. 5	7
• Flashlight, flash energy	Ws —	2
<b>Endurance</b>		
• Flashlights	4 x 10 <sup>6</sup> flashes	4 x 10 <sup>6</sup> flashes
<b>AS-Interface adapter elements</b>		
<b>IO code/ID code</b>	8/F	8/E
<b>Power supply</b>		
• Operational voltage	V 18.5 ... 31.6	Through bus cable 18.5 ... 31.6
• Power consumption $I_{max}$	mA 50	100
<b>Protective measures</b>		
• Watchdog	✓	✓
• Short-circuit/overload protection	External back-up fuse M 1.6 A	✓
• Reverse polarity protection	✓	✓
• Induction protection	N/A	✓
<b>Outputs</b>		
• Load voltage	V 4 Relay outputs External auxiliary voltage 0 ... 30 DC V 0 ... 230 AC	3 solid-state outputs through bus cable or external auxiliary voltage, switch-selectable
• Current carrying capacity $\Sigma I_{max}$		
- With external auxiliary voltage	A 1.5	0.3
- Without external auxiliary voltage	A —	0.2
<b>Operating temperature</b>	°C -20 ... +50	-20 ... +50
<b>Enclosures</b>		
<b>Enclosure material</b>	Thermoplast (polyamide), impact-resistant, black	Thermoplast (polyamide), impact-resistant, black
<b>Light elements</b>	Thermoplast (polycarbonate)	Thermoplast (polycarbonate)
<b>Mounting</b>		
• Horizontal (floor mounting, foot with 25 mm Ø pipe)	✓	✓
• Horizontal (single-hole mounting)	✓	—
• Vertical with bracket	✓	✓
<b>Degree of protection</b>		
• Light elements	IP54	IP65 (seal premounted with every module)
• Acoustic elements, AS-i adapter elements	IP54	IP65
<b>Operating temperature</b>	°C -20 ... +50	-20 ... +50
<b>Connection</b>		
• Conductor cross-sections	mm <sup>2</sup> M3 screw terminal Max. 2.5	Spring-type terminals/M3 screw terminals Max. 2.5
• Tightening torque	Nm Max. 0.5	- / Max. 0.5



# 8WD4 Signaling Columns

8WD42 signaling columns, 50 mm diameter

## Selection and ordering data

Version	Slow-action contacts for each pedal	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Metal enclosures, degree of protection IP65</b>							
 <p>3SE290.-.AA20 3SE291.-.AA20</p>	<b>Momentary-contact foot switches, single pedal, non-latching</b> M20 x 1.5 cable entry						
	<ul style="list-style-type: none"> <li>Without hood</li> <li>With hood</li> </ul>	1 NO + 1 NC ↻ 2 2 NO + 2 NC ↻ 2 1 NO + 1 NC ↻ 2 2 NO + 2 NC ↻ 2		3SE2902-0AB20 3SE2903-1AB20 3SE2902-0AA20 3SE2903-1AA20		1 1 unit 1 1 unit 1 1 unit 1 1 unit	
 <p>3SE2912-2AB20 3SE2912-2AA20</p>	<b>Momentary-contact foot switches, single pedal, latching</b> M20 x 1.5 cable entry						
	<ul style="list-style-type: none"> <li>Without hood</li> <li>With hood</li> </ul>	1 NO + 1 NC ↻ 15 1 NO + 1 NC ↻ 15		3SE2912-2AB20 3SE2912-2AA20		1 1 unit 1 1 unit	
 <p>3SE2932-AB20 3SE2932-AA20</p>	<b>Momentary-contact foot switches, two pedals, non-latching</b> M25 x 1.5 cable entry						
	<ul style="list-style-type: none"> <li>Without hood</li> <li>With hood</li> </ul>	1 NO + 1 NC ↻ 5 2 NO + 2 NC ↻ 5 1 NO + 1 NC ↻ 5 2 NO + 2 NC ↻ 5		3SE2932-0AB20 3SE2932-1AB20 3SE2932-0AA20 3SE2932-1AA20		1 1 unit 1 1 unit 1 1 unit 1 1 unit	
 <p>3SE2924-3AA20</p>	<b>Safety momentary-contact foot switches, non-latching, single pedal</b> With hood M20 x 1.5 cable entry with interlocking function NO closes as momentary contact type NC opens with automatic latching (safety function)		2 NO + 2 NC ↻ 15	3SE2924-3AA20		1 1 unit	
<b>Plastic enclosures, degree of protection IP65</b>							
 <p>3SE3902-4CA20 3SE3934-5CB20</p>	<b>Momentary-contact pedal switches,</b> 3 m cable		Microswitch				
	<ul style="list-style-type: none"> <li>Single pedal</li> <li>- Without hood</li> <li>- With hood</li> </ul>	1 CO contact 1 CO contact	5 5	3SE3902-4CB20 3SE3902-4CA20		1 1 unit 1 1 unit	
	<ul style="list-style-type: none"> <li>Two pedals, without hood</li> </ul>	2 x 1 CO	5	3SE3934-5CB20		1 1 unit	
<b>Accessories</b>							
	<b>Protection cover</b> Single pedal foot switch for 3SE2912-2AA20		--	20	3SE3980-8M	1 1 unit	
	<b>Contact block, 6 A,</b> Supersedes momentary-contact foot switch 3SE29.2-.A.20 and 3SE29.3-.A.20		2 NO + 2 NC	X	3SE3982-0K	1 1 unit	
	<b>Contact block, 16 A,</b> Supersedes momentary-contact foot switch 3SE29.2-0A.20		1 NO + 1 NC	X	3SE3982-0L	1 1 unit	
	<b>Contact block, 16 A,</b> Supersedes momentary-contact foot switch 3SE2924-3AA20		2 NO + 2 NC	X	3SE3982-7J	1 1 unit	
	<b>Contact block, 16 A,</b> Supersedes momentary-contact foot switch 3SE2912-2A.20		1 NO + 1 NC	30	3SE3982-7L	1 1 unit	

↻ Positive opening according to IEC 60947-5-1, Annex K.

# 8WD4 Signaling Columns

## 8WD42 signaling columns, 50 mm diameter

Version	Rated voltage	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V		d				
<b>Connection elements</b>							
	<b>Connection elements with cover</b> For mounting on pipes, floors and angles Essential part for assembling the signaling columns		Black	2	<b>8WD4208-0AA</b>	1	1 unit
<b>Mounting</b>							
	<b>Feet, single</b>	Plastic, for mounting on pipes		2	<b>8WD4308-0DB</b>	1	1 unit
		Metal, for pipe lengths > 400 mm		2	<b>8WD4308-0DC</b>	1	1 unit
	<b>Adjustable-angle feet</b> For positioning in 7.5° increments <sup>1)</sup>	Plastic, for floor mounting (without pipe)		2	<b>8WD4208-0DE</b>	1	1 unit
		Plastic, for mounting on pipes, incl. rubber seal		2	<b>8WD4408-0DF</b>	1	1 unit
	<b>Pipes, single</b>	Length 100 mm		2	<b>8WD4208-0EF</b>	1	1 unit
		Length 150 mm		2	<b>8WD4308-0EE</b>	1	1 unit
		Length 250 mm		2	<b>8WD4308-0EA</b>	1	1 unit
		Length 400 mm		2	<b>8WD4308-0EB</b>	1	1 unit
		Length 1000 mm		2	<b>8WD4308-0ED</b>	1	1 unit
	<b>Sockets for feet</b>	Side cable outlet		2	<b>8WD4308-0DD</b>	1	1 unit
		Side cable outlet, with magnetic fixing <sup>2)</sup>		2	<b>8WD4308-0DE</b>	1	1 unit
	<b>Brackets for mounting with foot</b>			2	<b>8WD4408-0CC</b>	1	1 unit
	<b>Brackets for wall mounting</b> (plastic)	Mounting without feet or pipe		2	<b>8WD4208-0CD</b>	1	1 unit
	<b>Adapters for single-hole mounting</b>	Mounting without feet and pipe, with M18 thread and fixing nut		2	<b>8WD4208-0EH</b>	1	1 unit
<b>Lamps</b>							
	<b>Incandescent lamps, 5 W</b> Base BA 15d	24 AC/DC	Clear	2	<b>8WD4328-1XX</b>	1	10 units
		115 AC	Clear	2	<b>8WD4348-1XX</b>	1	10 units
		230 AC	Clear	2	<b>8WD4358-1XX</b>	1	10 units
	<b>LEDs</b> Base BA 15d	24 AC/DC	Red	2	<b>8WD4428-6XB</b>	1	1 unit
			Green	2	<b>8WD4428-6XC</b>	1	1 unit
			Yellow	2	<b>8WD4428-6XD</b>	1	1 unit
			Clear	2	<b>8WD4428-6XE</b>	1	1 unit
			Blue	2	<b>8WD4428-6XF</b>	1	1 unit
		115 AC	Red	2	<b>8WD4448-6XB</b>	1	1 unit
			Green	2	<b>8WD4448-6XC</b>	1	1 unit
			Yellow	2	<b>8WD4448-6XD</b>	1	1 unit
			Clear	2	<b>8WD4448-6XE</b>	1	1 unit
			Blue	2	<b>8WD4448-6XF</b>	1	1 unit
		230 AC	Red	2	<b>8WD4458-6XB</b>	1	1 unit
			Green	2	<b>8WD4458-6XC</b>	1	1 unit
			Yellow	2	<b>8WD4458-6XD</b>	1	1 unit
			Clear	2	<b>8WD4458-6XE</b>	1	1 unit
			Blue	2	<b>8WD4458-6XF</b>	1	1 unit

For labeling panels see 8WD44, page 10/169.

<sup>1)</sup> Markings for 30°, 45°, 60° and 90°.

<sup>2)</sup> For horizontal mounting, only 1 element is recommended.

# 8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter


## Overview

Features:

- Thermoplast enclosure, diameter 70 mm
- Advanced design and significantly improved illumination

- Fast and flexible connection using spring-type terminals
- Integrated degree of protection IP65
- Up to 5 elements can be mounted

## Selection and ordering data

Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS	
V							
<b>Acoustic elements<sup>1)</sup></b>							
	<b>Buzzer elements</b> 85 dB, pulsating or continuous tone, adjustable by means of a wire jumper	24 AC/DC	Black	A	<b>8WD44 20-0FA</b>	1	1 unit
		115 AC		A	<b>8WD44 40-0FA</b>	1	1 unit
		230 AC		A	<b>8WD44 50-0FA</b>	1	1 unit
	<b>Siren elements</b> , multi-tone, 100 dB, 8 tones and volume are adjustable	24 AC/DC	Black	A	<b>8WD44 20-0EA2</b>	1	1 unit
		115 AC		A	<b>8WD44 40-0EA2</b>	1	1 unit
		230 AC		A	<b>8WD44 50-0EA2</b>	1	1 unit
<b>Siren elements</b> 108 dB, IP40	24 DC	Black	A	<b>8WD44 20-0EA</b>	1	1 unit	
<b>Light elements for incandescent lamps/LEDs, BA 15d bases<sup>2)</sup></b>							
	<b>Continuous light elements</b>	12 ... 230 AC/DC	Red	A	<b>8WD44 00-1AB</b>	1	1 unit
			Green	A	<b>8WD44 00-1AC</b>	1	1 unit
			Yellow	A	<b>8WD44 00-1AD</b>	1	1 unit
			Clear	A	<b>8WD44 00-1AE</b>	1	1 unit
			Blue	A	<b>8WD44 00-1AF</b>	1	1 unit
	<b>Blinklight elements</b>	24 AC/DC	Red	A	<b>8WD44 20-1BB</b>	1	1 unit
			Green	A	<b>8WD44 20-1BC</b>	1	1 unit
			Yellow	A	<b>8WD44 20-1BD</b>	1	1 unit
			Clear	A	<b>8WD44 20-1BE</b>	1	1 unit
			Blue	A	<b>8WD44 20-1BF</b>	1	1 unit
		115 AC	Red	A	<b>8WD44 40-1BB</b>	1	1 unit
			Green	A	<b>8WD44 40-1BC</b>	1	1 unit
			Yellow	A	<b>8WD44 40-1BD</b>	1	1 unit
			Clear	A	<b>8WD44 40-1BE</b>	1	1 unit
			Blue	A	<b>8WD44 40-1BF</b>	1	1 unit
		230 AC	Red	A	<b>8WD44 50-1BB</b>	1	1 unit
			Green	A	<b>8WD44 50-1BC</b>	1	1 unit
			Yellow	A	<b>8WD44 50-1BD</b>	1	1 unit
			Clear	A	<b>8WD44 50-1BE</b>	1	1 unit
			Blue	A	<b>8WD44 50-1BF</b>	1	1 unit
<b>Light elements with integrated flash lamps<sup>3)</sup></b>							
	<b>Flashlight elements</b> with integrated electronic flash	24 DC	Red	A	<b>8WD44 20-0CB</b>	1	1 unit
			Green	A	<b>8WD44 20-0CC</b>	1	1 unit
			Yellow	A	<b>8WD44 20-0CD</b>	1	1 unit
			Clear	A	<b>8WD44 20-0CE</b>	1	1 unit
			Blue	A	<b>8WD44 20-0CF</b>	1	1 unit
		115 AC	Red	A	<b>8WD44 40-0CB</b>	1	1 unit
			Green	D	<b>8WD44 40-0CC</b>	1	1 unit
			Yellow	A	<b>8WD44 40-0CD</b>	1	1 unit
			Clear	D	<b>8WD44 40-0CE</b>	1	1 unit
			Blue	D	<b>8WD44 40-0CF</b>	1	1 unit
		230 AC	Red	A	<b>8WD44 50-0CB</b>	1	1 unit
			Green	A	<b>8WD44 50-0CC</b>	1	1 unit
			Yellow	A	<b>8WD44 50-0CD</b>	1	1 unit
			Clear	A	<b>8WD44 50-0CE</b>	1	1 unit
			Blue	A	<b>8WD44 50-0CF</b>	1	1 unit

<sup>1)</sup> One acoustic element can be mounted per signaling column. The cover is included in the scope of supply of the acoustic elements and fixed in place.

<sup>2)</sup> The lamp is not included in the scope of supply. Please order separately.

<sup>3)</sup> The lamp is included in the scope of supply.

# 8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter

Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS								
V														
<b>Light elements with integrated LED</b>														
	<b>Continuous light elements</b>	24 AC/DC	Red	A	<b>8WD44 20-5AB</b>	1	1 unit							
			Green	A	<b>8WD44 20-5AC</b>	1	1 unit							
			Yellow	A	<b>8WD44 20-5AD</b>	1	1 unit							
			Clear	A	<b>8WD44 20-5AE</b>	1	1 unit							
			Blue	A	<b>8WD44 20-5AF</b>	1	1 unit							
		115 AC	Red	A	<b>8WD44 40-5AB</b>	1	1 unit							
			Green	A	<b>8WD44 40-5AC</b>	1	1 unit							
			Yellow	A	<b>8WD44 40-5AD</b>	1	1 unit							
			Clear	A	<b>8WD44 40-5AE</b>	1	1 unit							
			Blue	A	<b>8WD44 40-5AF</b>	1	1 unit							
		230 AC	Red	A	<b>8WD44 50-5AB</b>	1	1 unit							
			Green	A	<b>8WD44 50-5AC</b>	1	1 unit							
			Yellow	A	<b>8WD44 50-5AD</b>	1	1 unit							
			Clear	A	<b>8WD44 50-5AE</b>	1	1 unit							
			Blue	A	<b>8WD44 50-5AF</b>	1	1 unit							
	<b>Blinklight elements</b>	24 AC/DC	Red	A	<b>8WD44 20-5BB</b>	1	1 unit							
			Green	A	<b>8WD44 20-5BC</b>	1	1 unit							
			Yellow	A	<b>8WD44 20-5BD</b>	1	1 unit							
			Clear	X	<b>8WD44 20-5BE</b>	1	1 unit							
			Blue	A	<b>8WD44 20-5BF</b>	1	1 unit							
		115 AC	Red	A	<b>8WD44 40-5BB</b>	1	1 unit							
			Green	A	<b>8WD44 40-5BC</b>	1	1 unit							
			Yellow	A	<b>8WD44 40-5BD</b>	1	1 unit							
			Clear	A	<b>8WD44 40-5BE</b>	1	1 unit							
			Blue	A	<b>8WD44 40-5BF</b>	1	1 unit							
		230 AC	Red	A	<b>8WD44 50-5BB</b>	1	1 unit							
			Green	A	<b>8WD44 50-5BC</b>	1	1 unit							
			Yellow	A	<b>8WD44 50-5BD</b>	1	1 unit							
			Clear	A	<b>8WD44 50-5BE</b>	1	1 unit							
			Blue	A	<b>8WD44 50-5BF</b>	1	1 unit							
	<b>Rotating light elements</b>	24 AC/DC	Red	A	<b>8WD44 20-5DB</b>	1	1 unit							
			Green	A	<b>8WD44 20-5DC</b>	1	1 unit							
			Yellow	A	<b>8WD44 20-5DD</b>	1	1 unit							
<b>Adapter elements for AS-Interface</b>														
	<b>AS-Interface adapter elements</b> With/without external auxiliary voltage, switchable													
								• A/B technology	For 3 signaling elements 24 V DC	Black	A	<b>8WD44 28-0BD</b>	1	1 unit
								• Standard AS-i	For 4 signaling elements 24 V DC	Black	A	<b>8WD44 28-0BE</b>	1	1 unit
<b>Connection elements<sup>1)</sup></b>														
	<b>Connection elements with cover</b>													
								Screw terminals	Black					
								• For mounting on pipes						
								• For mounting on brackets and floors	A	<b>8WD44 08-0AB</b>	1	1 unit		
								Spring-type terminals	Black					
								• For mounting on pipes						
• For mounting on brackets and floors	A	<b>8WD44 08-0AE</b>	1	1 unit										
Cover (replacement)	A	<b>8WD44 08-0XA</b>	1	1 unit										

<sup>1)</sup> The connection element with cover is an essential part for assembling the signaling columns.

# 8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter

Version	DT	Order No.	PU (UNIT, SET, M)	PS		
<b>Mounting</b>						
	<b>Foot with pipe</b>	Plastic foot with pipe length 100 mm	A	<b>8WD43 08-0DA</b>	1	1 unit
	<b>Feet, single</b>	Plastic, for mounting on pipes	A	<b>8WD43 08-0DB</b>	1	1 unit
		Metal, for pipe lengths > 400 mm	A	<b>8WD43 08-0DC</b>	1	1 unit
	<b>Adjustable-angle feet</b> for positioning in 7.5° increments <sup>1)</sup>	Plastic, for mounting on pipes, incl. rubber seal	X	<b>8WD44 08-0DF</b>	1	1 unit
	<b>Pipes, single</b>	Length 100 mm	A	<b>8WD42 08-0EF</b>	1	1 unit
		Length 150 mm	A	<b>8WD43 08-0EE</b>	1	1 unit
		Length 250 mm	A	<b>8WD43 08-0EA</b>	1	1 unit
		Length 400 mm	A	<b>8WD43 08-0EB</b>	1	1 unit
		Length 1000 mm	A	<b>8WD43 08-0ED</b>	1	1 unit
	<b>Sockets for feet</b>	Side cable outlet (can also be used without feet)	A	<b>8WD43 08-0DD</b>	1	1 unit
		Side cable outlet, with magnetic fixing <sup>2)</sup>	A	<b>8WD43 08-0DE</b>	1	1 unit
	<b>Brackets for wall mounting</b> (mounting without feet and pipe)	For single-sided mounting	A	<b>8WD43 08-0CA</b>	1	1 unit
		For double-sided mounting	A	<b>8WD43 08-0CB</b>	1	1 unit
	<b>Brackets for mounting with foot</b>		A	<b>8WD44 08-0CC</b>	1	1 unit
	<b>Brackets for base mounting</b>	Mounting without feet and pipe	A	<b>8WD44 08-0CD</b>	1	1 unit
	<b>Adapter for mounting on pipes according to NPT</b>	Mounting on pipes, Ø 25 mm, with NPT 1/2" thread	A	<b>8WD43 08-0DF</b>	1	1 unit

<sup>1)</sup> Markings for 30°, 45°, 60° and 90°.




<sup>2)</sup> For horizontal mounting, only 1 element is recommended.

Note:

For mounting and configuring aid [see the publication "Versatile, robust, communication-capable: SIRIUS signaling columns and integrated signal lamps", Order No. E20001-A670-P305.](#)

# 8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter

Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS	
V							
<b>Lamps</b>							
	<b>Incandescent lamps, 5 W</b>						
	Base BA 15d	24 AC/DC	A	<b>8WD43 28-1XX</b>	1	10 units	
		115 AC	A	<b>8WD43 48-1XX</b>	1	10 units	
		230 AC	A	<b>8WD43 58-1XX</b>	1	10 units	
	<b>LEDs</b>						
	Base BA 15d	24 AC/DC	Red	A	<b>8WD44 28-6XB</b>	1	1 unit
			Green	A	<b>8WD44 28-6XC</b>	1	1 unit
			Yellow	A	<b>8WD44 28-6XD</b>	1	1 unit
			Clear	A	<b>8WD44 28-6XE</b>	1	1 unit
			Blue	A	<b>8WD44 28-6XF</b>	1	1 unit
		115 AC	Red	A	<b>8WD44 48-6XB</b>	1	1 unit
			Green	A	<b>8WD44 48-6XC</b>	1	1 unit
			Yellow	A	<b>8WD44 48-6XD</b>	1	1 unit
			Clear	A	<b>8WD44 48-6XE</b>	1	1 unit
			Blue	A	<b>8WD44 48-6XF</b>	1	1 unit
		230 AC	Red	A	<b>8WD44 58-6XB</b>	1	1 unit
			Green	A	<b>8WD44 58-6XC</b>	1	1 unit
			Yellow	A	<b>8WD44 58-6XD</b>	1	1 unit
			Clear	A	<b>8WD44 58-6XE</b>	1	1 unit
Blue			A	<b>8WD44 58-6XF</b>	1	1 unit	
<b>Inscriptions</b>							
	<b>Labeling panels</b>		A	<b>8WD44 08-0FA</b>	1	1 unit	
<p>With fixing accessories for mounting on pipe <math>\varnothing</math> 25 mm</p> <p>Inscription area/ step 50 mm x 140 mm</p> <p>Suitable for standard labels, e.g.</p> <ul style="list-style-type: none"> <li>• Zweckform 3425</li> <li>• Herma 4457</li> </ul>							

# 8WD53 Beacons

8WD53 beacons, 70 mm diameter

## Overview



Integrated signal lamps

## Design

Features:

- Thermoplast enclosures, diameter 70 mm
- Degree of protection IP65
- Rated voltage 24 V, 115 V, 230 V AC/DC
- Ambient temperature -20 to +50 °C, incandescent lamp up to 60 °C

The special shape of the integrated signal lamps means that the light is emitted optimally in every direction (to the sides and upwards). Continuous lights (with incandescent lamp or LED) and single-flash lights are available in five colors.

The LED versions of the integrated signal lamps offer a considerably longer endurance than the incandescent lamp versions.

All integrated signal lamps have a high degree of protection IP65 and are made of a material highly resistant to impact.

## Mounting

8WD53 integrated signal lamps can be mounted directly at any point of the machine for the purpose of giving visual signals. They are mounted by means of a PG29 screw base with nut.

## Selection and ordering data

Version	Rated voltage	Color	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS	PG	
<b>Luminaires for incandescent lamps/LED, BA 15d base</b>									
	Continuous light <sup>1)</sup>	12 ... 230 AC/DC		Red	A	<b>8WD53 00-1AB</b>	1	1 unit	41J
		Green	A	<b>8WD53 00-1AC</b>	1	1 unit	41J		
		Yellow	A	<b>8WD53 00-1AD</b>	1	1 unit	41J		
		Clear	A	<b>8WD53 00-1AE</b>	1	1 unit	41J		
		Blue	A	<b>8WD53 00-1AF</b>	1	1 unit	41J		
<b>Luminaires with integrated flash lamp</b>									
	Single-flash light with integrated electronic flash	24 AC/DC		Red	A	<b>8WD53 20-0CB</b>	1	1 unit	41J
		Green	D	<b>8WD53 20-0CC</b>	1	1 unit	41J		
		Yellow	A	<b>8WD53 20-0CD</b>	1	1 unit	41J		
		Clear	A	<b>8WD53 20-0CE</b>	1	1 unit	41J		
		Blue	A	<b>8WD53 20-0CF</b>	1	1 unit	41J		
		115 AC		Red	A	<b>8WD53 40-0CB</b>	1	1 unit	41J
		Green	D	<b>8WD53 40-0CC</b>	1	1 unit	41J		
		Yellow	D	<b>8WD53 40-0CD</b>	1	1 unit	41J		
		Clear	D	<b>8WD53 40-0CE</b>	1	1 unit	41J		
		Blue	D	<b>8WD53 40-0CF</b>	1	1 unit	41J		
		230 AC		Red	A	<b>8WD53 50-0CB</b>	1	1 unit	41J
		Green	D	<b>8WD53 50-0CC</b>	1	1 unit	41J		
Yellow	A	<b>8WD53 50-0CD</b>	1	1 unit	41J				
Clear	A	<b>8WD53 50-0CE</b>	1	1 unit	41J				
Blue	D	<b>8WD53 50-0CF</b>	1	1 unit	41J				
<b>Luminaires with integrated LED</b>									
	Continuous light	24 AC/DC		Red	A	<b>8WD53 20-5AB</b>	1	1 unit	41J
		Green	A	<b>8WD53 20-5AC</b>	1	1 unit	41J		
		Yellow	A	<b>8WD53 20-5AD</b>	1	1 unit	41J		
	Blinklight lamps	24 AC/DC		Red	A	<b>8WD53 20-5BB</b>	1	1 unit	41J
		Green	D	<b>8WD53 20-5BC</b>	1	1 unit	41J		
		Yellow	A	<b>8WD53 20-5BD</b>	1	1 unit	41J		
	Rotating light	24 AC/DC		Red	A	<b>8WD53 20-5DB</b>	1	1 unit	41J
		Green	A	<b>8WD53 20-5DC</b>	1	1 unit	41J		
		Yellow	A	<b>8WD53 20-5DD</b>	1	1 unit	41J		

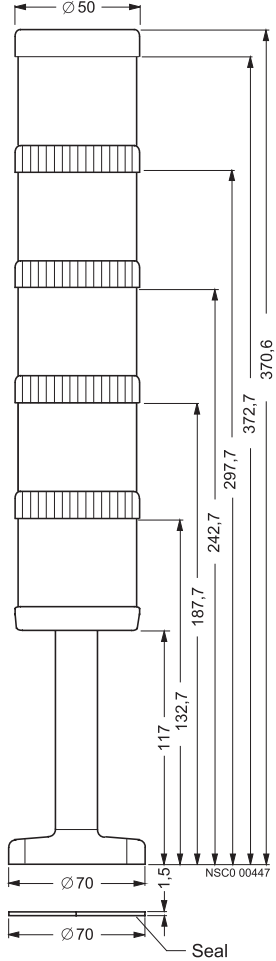
For incandescent lamps and LEDs see "Signaling Columns" page 10/169

<sup>1)</sup> Lamp not included in scope of supply. Please order separately.

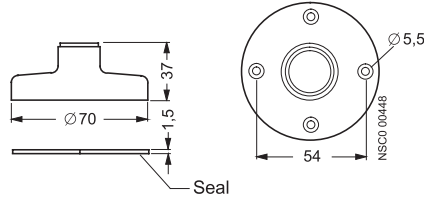
# 8WD4 Signaling Columns

## Dimension drawings

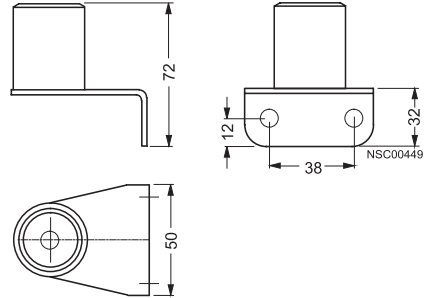
### Signaling column (4-tier)



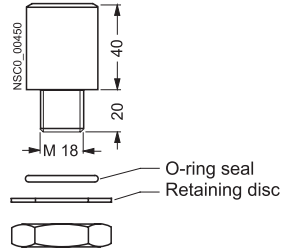
### Foot



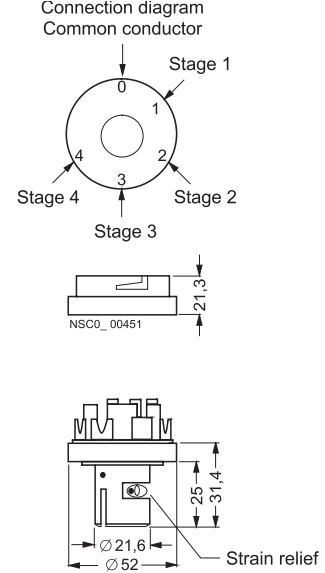
### Bracket for wall mounting



### Adapter for single-hole mounting



### Connection element



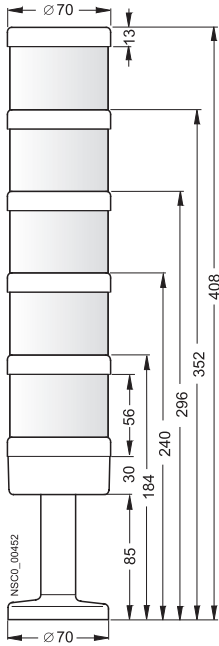


# 8WD4 Signaling Columns

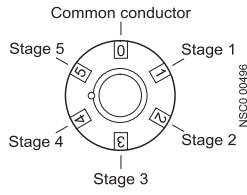
## Dimension drawings

### Dimension drawings

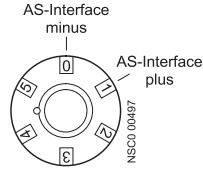
#### Signaling column (5-tier)



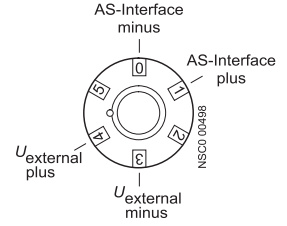
#### Connection diagrams



conventional

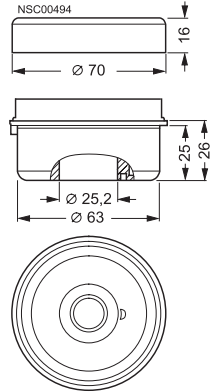


with AS-Interface,  
without external auxiliary  
voltage

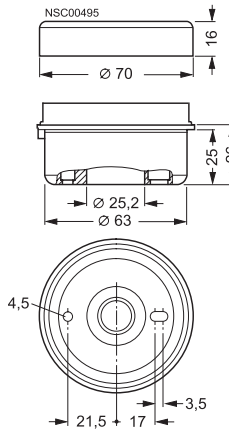


with external auxiliary voltage

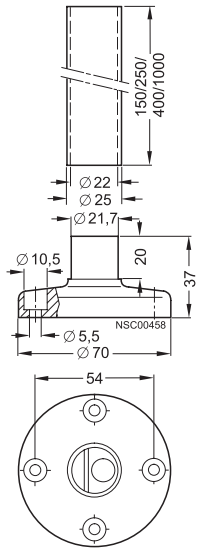
#### Connection element and cover for mounting on pipes



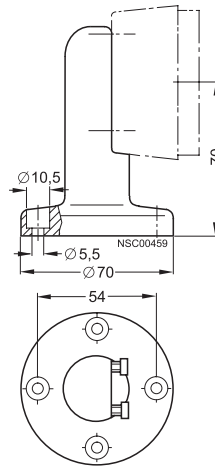
#### Connection element and cover for mounting on floor/bracket



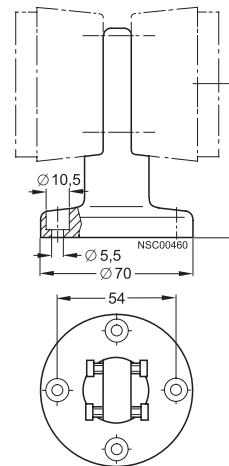
#### Foot with pipe



#### Bracket for single-sided mounting



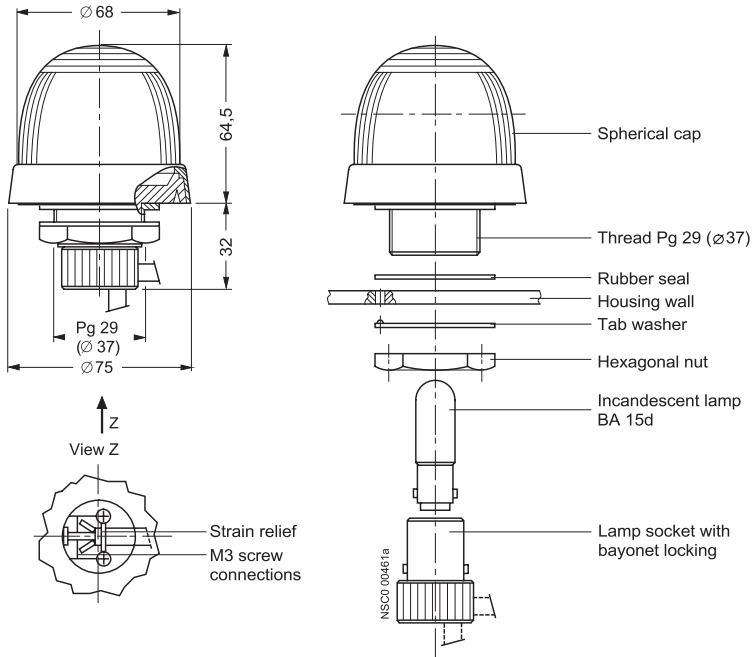
#### Bracket for double-sided mounting



# 8WD53 Beacons

## Dimension drawings

### Dimension drawings



# Class 50 Standard Duty Pushbutton Stations

## General

### Features

- Snap In Legend Inserts
- Flush and Surface Mounted Types
- Convertible Selector
- Double Break Contacts
- Dual Voltage Pilot Light with Snap In Lens
- Conversion Kits
- UL Listed File #E22655
- CSA Certified File #LR6535

### Application

Standard duty control stations are used with magnetic controllers to control the starting, stopping, reversing or speed of applicable motors.

Stations are assembled of one, two or three push button, selector switch or pilot light units in a variety of combinations to provide compact control units for remote control of magnetic starters and contactors.

Station enclosures are available in Type 1 surface mounted, 1B flush plate mounted and 4 watertight.

### Features

Type 1 surface mounted bases are constructed of 14 gauge sheet steel, primed and finished in baked gray enamel. The base is predrilled to receive a variety of contact blocks, pilot lights and accessory devices. Covers are of 20 gauge sheet steel, wrap-around construction, primed and finished in baked gray enamel. Siemens Type 4 watertight heavy duty push button stations are supplied with a provision to padlock the stop button in the depressed position. Enclosures are predrilled and tapped for 3/4" conduit.

Contact blocks have double break, fine silver contacts with a NEMA B600 rating. Type 4 stations have a NEMA A600 rating.

The pilot light assembly is dual voltage with clearly marked pressure type terminals for 120 volt or 240 volt connection.

The lens of the pilot light snaps into the cover and is available in both red and green.

Push buttons are equipped with an operator into which a selected legend insert is snapped. Legend inserts are molded thermoplastic and come in a wide variety of legends and colors.

The selector switch operator can be instantly set for two or three positions at any time.

### Mushroom Head

50ZMH mounts on any standard push button operator. The Mushroom Head is red molded thermoplastic, 1 1/2" in diameter, and provides a large operator for emergency stop or similar applications.

### Mechanical Interlock

50ZAM is a base mounted zinc plate, dichromate dipped, steel assembly. When mounted in conjunction with Duplex Contact Block 50ZAC3 (one NO and one NO) the interlock prevents one contact from being closed while the other contact is closed.

### Padlock Attachment Kit

50ZAL can be mounted to any Type 1 surface mounted station by the lower screw which fastens the cover to the station base. Made of heavy steel, chrome plated, the attachment provides for the padlocking of a push button in the depressed position or a selector switch in any position. When used with a push button operator, raised Legend Insert D53493003 (Red Stop) must be used.

### Electrical Ratings

NEMA AC Ratings 50/60Hz

Nema B600 5 Continuous Amps

Volts	Make	Break
120	30	3
240	15	1.5
480	7.5	0.75
600	6	0.6
VA	3600	360

### Ordering Information

- Legend Inserts [see page 10/181](#).
- Accessories [see page 10/181](#).



**2 Push Buttons  
Surface Mounting, NEMA 1**



**2 Push Buttons  
Flush Mounting, NEMA 1B**



**1 Push Button  
Surface Mounting**



**1 Selector Switch  
Flush Mounting**



**2 Push Buttons  
1 Selector Switch**






**1 Pilot Light  
2 Push Buttons**

# Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600



## Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
 <p>1 unit surface mount-momentary pushbutton</p>	A = Momentary flush pushbutton green, surface, label "START"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA3D</b>	1
	A = Momentary flush pushbutton red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA3E</b>	1
	A = Momentary raised pushbutton red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA3F</b>	1
	A = Momentary mushroom head red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA3G</b>	1
	A = Momentary flush pushbutton less insert, surface	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA3A</b>	1
	A = 3 position selector switch, surface, label "HAND-OFF-AUTO"	NEMA 1	2 NO 2SPST (50ZAC8)	1	<b>50AA3C3</b>	1
	A = 2 position selector switch, surface, label "Off-On"	NEMA 1	2 NO 2SPST (50ZAC8)	1	<b>50AA3C6</b>	1
	A = 2/3 selector switch, surface, multiple legends	NEMA 1	2 NO 2SPST (50ZAC8)	1	<b>50AA3B9</b>	1
	A = Indicator light, red, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	<b>50BA3Y</b>	1
	A = Indicator light, green, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	<b>50BA3Z</b>	1
A = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	<b>50BA32</b>	1	
 <p>1 unit flush mount-momentary pushbutton</p>	A = Momentary flush pushbutton green, flush, label "START"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA2D</b>	1
	A = Momentary flush pushbutton red, flush, label "STOP"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA2E</b>	1
	A = Momentary raised pushbutton red, flush, label "STOP"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA2F</b>	1
	A = Momentary flush pushbutton less insert, flush	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA2A</b>	1
	A = Momentary flush pushbutton less insert, flush, chrome plate	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	<b>50AA6A</b>	1
	A = 3 position selector switch, flush, label "HAND-OFF-AUTO"	NEMA 1B	2 NO 2SPST (50ZAC8)	1	<b>50AA2C3</b>	1
	A = 3 position selector switch, flush, label "Off-On"	NEMA 1B	2 NO 2SPST (50ZAC8)	1	<b>50AA2C6</b>	1
	A = 2/3 selector switch, multiple legends, flush	NEMA 1B	2 NO 2SPST (50ZAC8)	1	<b>50AA2B9</b>	1
	A = 2/3 selector switch, multiple legends, chrome plate, flush	NEMA 1B	2 NO 2SPST (50ZAC8)	1	<b>50AA6B9</b>	1
	A = Indicator light, red, flush	NEMA 1B	120/240V dual voltage	1	<b>50BA2Y</b>	1
A = Indicator light, green, flush	NEMA 1B	120/240V dual voltage	1	<b>50BA2Z</b>	1	
A = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage	1	<b>50BA22</b>	1	
A = Indicator light, less lens, chrome plate, flush	NEMA 1B	120PSB lamp	1	<b>50BA62</b>	1	
 <p>2 unit surface mount-momentary pushbutton</p>	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	<b>50CA3DE</b>	1
	A = Momentary pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	<b>50CA3DF</b>	1
	A = Momentary raised pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	<b>50CA3DG</b>	1
	A = Momentary mushroom head pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton, less insert, surface	NEMA 1	1NO, 1NC (50ZAC2)	2	<b>50CA3AA</b>	1
	A = Momentary pushbutton, less insert, surface					
	B = Momentary pushbutton, surface, label "FORWARD"	NEMA 1	2 NO (50ZAC3)	2	<b>50DA3KL</b>	1
	A = Momentary pushbutton, surface, label "REVERSE"					

# Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

## Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
2 unit surface mount-momentary pushbutton 	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO (50ZAC3)	2	<b>50DA3HJ</b>	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO (50ZAC3)	2	<b>50DA3NP</b>	1
	B = Momentary pushbutton, surface, less insert A = Momentary pushbutton, surface, less insert	NEMA 1	2 NO (50ZAC3)	2	<b>50DA3AA</b>	1
	B = Momentary pushbutton, surface, label "FORWARD" A = Momentary pushbutton, surface, label "REVERSE"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA3KL</b>	1
	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA3HJ</b>	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA3NP</b>	1
	B = Momentary pushbutton, surface, label "ON" A = Momentary pushbutton, surface, label "OFF"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA334</b>	1
	B = Momentary pushbutton, less insert surface A = Momentary pushbutton, less insert, surface	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA3AA</b>	1
	B = Momentary pushbutton, surface, label "FORWARD" A = Momentary pushbutton, surface, label "REVERSE"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA3KL</b>	1
	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA3HJ</b>	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA3NP</b>	1
	B = Momentary pushbutton, surface, label "ON" A = Momentary pushbutton, surface, label "OFF"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA334</b>	1
	B = Momentary pushbutton, surface, less insert A = Momentary pushbutton, surface, less insert	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA3AA</b>	1
	2 unit flush mount-momentary pushbutton 	B = Momentary pushbutton green, flush, label "START" A = Momentary pushbutton red, flush, label "STOP"	NEMA 1B	1NO, 1NC (50ZAC2)	2	<b>50CA2DE</b>
B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush		NEMA 1B	1NO, 1NC (50ZAC2)	2	<b>50CA2AA</b>	1
B = Momentary pushbutton green, flush, label "START" A = Momentary raised pushbutton red, flush, label "STOP"		NEMA 1B	1NO, 1NC (50ZAC2)	2	<b>50CA2DF</b>	1
B = Momentary pushbutton green, flush, label "START" A = Momentary mushroom head pushbutton red, flush, label "STOP"		NEMA 1B	1NO, 1NC (50ZAC2)	2	<b>50CA2DG</b>	1
B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush		NEMA 1B	1NO, 1NC (50ZAC2)	2	<b>50CA6AA</b>	1

# Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA A600

## Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
2 unit flush mount-momentary pushbutton	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO (50ZAC3)	2	<b>50DA2KL</b>	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO (50ZAC3)	2	<b>50DA2HJ</b>	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO (50ZAC3)	2	<b>50DA2NP</b>	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO (50ZAC3)	2	<b>50DA2AA</b>	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO (50ZAC3)	2	<b>50DA6AA</b>	1
	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA2KL</b>	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA2HJ</b>	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA2NP</b>	1
	B = Momentary pushbutton, flush, label "ON" A = Momentary pushbutton, flush, label "OFF"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA234</b>	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA2AA</b>	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	<b>50RA6AA</b>	1
	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA2KL</b>	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA2HJ</b>	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA2NP</b>	1
	B = Momentary pushbutton, flush, label "ON" A = Momentary pushbutton, flush, label "OFF"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA234</b>	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA2AA</b>	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	<b>50EA6AA</b>	1

# Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

## Selection and ordering data


	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
2 unit surface mount-momentary pushbutton and selector switch	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC1)	2	<b>50FA3DC3</b>	1
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert, surface	NEMA 1	1NO, 1NC (50ZAC1)	2	<b>50FA3AB9</b>	1
	A = Maintained selector switch, multiple legends, surface		2 NO 2SPDT w/ common jumper (50ZAC8)			
2 unit surface mount-momentary pushbutton and indicator light	B = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	<b>50HA3YC3</b>	1
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	<b>50HA32B9</b>	1
	A = Maintained selector switch, multiple legends, surface		2 NO 2SPDT w/ common jumper (50ZAC8)			
2 unit surface mount-momentary pushbutton and indicator light	B = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	<b>50GA3ZY</b>	1
	A = Indicator light, red, surface					
	B = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	<b>50GA322</b>	1
	A = Indicator light, less lens, surface					
2 unit flush mount-momentary pushbutton and selector switch	B = Momentary pushbutton green, flush, label "START"	NEMA 1B	1NO, 1NC (50ZAC1)	2	<b>50FA2DC3</b>	1
	A = Maintained selector switch, flush, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert, flush	NEMA 1B	1NO, 1NC (50ZAC1)	2	<b>50FA2AB9</b>	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert chrome plate, flush	NEMA 1B	1NO, 1NC (50ZAC1)	2	<b>50FA6AB9</b>	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, red, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	<b>50HA2YC3</b>	1
	A = Maintained selector switch, flush, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	<b>50HA22B9</b>	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, less lens, chrome plate, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	<b>50HA62B9</b>	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
2 unit flush mount-momentary pushbutton and indicator light	B = Indicator light, green, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	<b>50GA2ZY</b>	1
	A = Indicator light, red, flush					
	B = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	<b>50GA222</b>	1
	A = Indicator light, less lens, flush					
2 unit flush mount-momentary pushbutton and indicator light	B = Indicator light, less lens, chrome plate, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	<b>50GA622</b>	1
	A = Indicator light, less lens, chrome plate, flush					
	C = Momentary pushbutton, surface, label "FORWARD"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	<b>50MA3KLE</b>	1
	B = Momentary pushbutton, surface, label "REVERSE"		1NO - 1NC with common jumper (50ZAC1)			
3 unit surface mount-momentary pushbutton	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label "UP"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	<b>50MA3NPE</b>	1
	B = Momentary pushbutton, surface, label "DOWN"		1NO - 1NC with common jumper (50ZAC1)			
	A = Momentary pushbutton, surface, label "STOP"					
3 unit surface mount-momentary pushbutton	C = Momentary pushbutton, surface, label "OPEN"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	<b>50MA3HJE</b>	1
	B = Momentary pushbutton, surface, label "CLOSE"		1NO - 1NC with common jumper (50ZAC1)			
	A = Momentary pushbutton, surface, label "STOP"					



# Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

## Selection and ordering data




	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
3 unit surface mount-momentary pushbutton	C = Momentary pushbutton, surface, label "FAST"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3TUE	1
	B = Momentary pushbutton, surface, label "SLOW"					
	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label "START"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3DME	1
	B = Momentary pushbutton, surface, label "JOG"					
	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label less insert	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3AAA	1
	B = Momentary pushbutton, surface, label less insert					
	A = Momentary pushbutton, surface, label less insert					
3 unit surface mount-momentary pushbutton and selector switch	C = Momentary pushbutton, surface, label "START"	NEMA 1	1 NO, 1 NC (50ZAC2) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50LA3DEC3	1
	B = Momentary pushbutton, surface, label "STOP"					
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"					
	C = Momentary pushbutton, less insert, surface	NEMA 1	1 NO, 1 NC (50ZAC2) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50LA3AAB9	1
	B = Momentary pushbutton, less insert, surface					
	A = Maintained selector switch, multiple legends, surface					
3 unit surface mount-momentary pushbutton and indicator light	C = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA3YDE	1
	B = Momentary pushbutton, surface, label "START"					
	A = Momentary pushbutton, surface, label "STOP"					
	C = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA3ZDE	1
	B = Momentary pushbutton, surface, label "START"					
	A = Momentary pushbutton, surface, label "STOP"					
	C = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA32AA	1
	B = Momentary pushbutton, less insert, surface					
	A = Momentary pushbutton, less insert, surface					
	C = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50NA3ZYC3	1
	B = Indicator light, red, surface					
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"					
	C = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50NA322B9	1
	B = Indicator light, less lens, surface					
	A = Maintained selector switch, multiple legends, surface					



# Class 50 Standard Duty Pushbutton Stations

Heavy duty - 10A 600V AC NEMA A600

## Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
	A = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	1	<b>50HA1E1</b>	1
	A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC	1	<b>50HA1E2</b>	1
	A = Momentary pushbutton green, surface, label "RESET"	NEMA 4	1NO - 1NC	1	<b>50HA1E4</b>	1
	A = Momentary pushbutton green, surface, label "JOG"	NEMA 4	1NO - 1NC	1	<b>50HA1E5</b>	1
	A = Maintained selector switch, surface, label "SAFE-RUN"	NEMA 4	1NO - 1NC	1	<b>50HA1E6</b>	1
	A = Maintained selector switch, surface, label "OFF-ON"	NEMA 4	1NO - 1NC	1	<b>50HA1E7</b>	1
	A = Maintained selector switch, surface, label "JOG-RUN"	NEMA 4	1NO - 1NC	1	<b>50HA1E8</b>	1
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"	NEMA 4	1NO - 1NC	1	<b>50HA1E9</b>	1
		B = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	2	<b>50HA2E1</b>
A = Momentary pushbutton red, surface, label "STOP"			1NO - 1NC			
B = Momentary pushbutton green, surface, label "FORWARD"		NEMA 4	1NO - 1NC	2	<b>50HA2E2</b>	1
A = Momentary pushbutton red, surface, label "REVERSE"			1NO - 1NC			
B = Momentary pushbutton green, surface, label "UP"		NEMA 4	1NO - 1NC	2	<b>50HA2E3</b>	1
A = Momentary pushbutton red, surface, label "DOWN"			1NO - 1NC			
B = Momentary pushbutton green, surface, label "OPEN"		NEMA 4	1NO - 1NC	2	<b>50HA2E4</b>	1
A = Momentary pushbutton red, surface, label "CLOSE"			1NO - 1NC			
B = Momentary pushbutton green, surface, label "FAST"		NEMA 4	1NO - 1NC	2	<b>50HA2E5</b>	1
A = Momentary pushbutton red, surface, label "SLOW"			1NO - 1NC			
	C = Momentary pushbutton green, surface, label "FORWARD"	NEMA 4	1NO - 1NC	3	<b>50HA3E1</b>	1
	B = Momentary pushbutton green, surface, label "REVERSE"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "UP"	NEMA 4	1NO - 1NC	3	<b>50HA3E2</b>	1
	B = Momentary pushbutton green, surface, label "DOWN"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "OPEN"	NEMA 4	1NO - 1NC	3	<b>50HA3E3</b>	1
	B = Momentary pushbutton green, surface, label "CLOSE"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	3	<b>50HA3E9</b>	1
	B = Momentary pushbutton green, surface, label "JOG"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "FAST"	NEMA 4	1NO - 1NC	3	<b>50HA3E4</b>	1
	B = Momentary pushbutton green, surface, label "SLOW"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			





# Class 50 Standard Duty Pushbutton Stations

## Standard duty station accessories

### Selection and ordering data

Legend inscription insert for snap-on mounting

Inscription	Color	Order No.	Pack
			Unit
Close	Orange	50D53493005	1
Down	Orange	50D53493010	1
Fast	Black	50D53493013	1
Forward	Green	50D53493006	1
High	Black	50D53493015	1
Hoist	Green	50D53493011	1
Jog	Black	50D53493008	1
Low	Black	50D53493016	1
Lower	Orange	50D53493012	1
Off	Red	50D53493018	1
On	Green	50D53493017	1
Open	Green	50D53493004	1
Reverse	Orange	50D53493007	1
Slow	Black	50D53493014	1
Start	Green	50D53493001	1
Stop	Red	50D53493002	1
Stop (raised)	Red	50D53493003	1
Up	Green	50D53493009	1

Version	Suitable for	Color	Order No.	Pack
				Unit
 50ZAC1	<b>Mushroom head</b>	Red	50ZMH	1
 50ZAC2	<b>Padlock attachment</b>	Used only for raised buttons	50ZAL	1
	<b>Mechanical interlock kit</b>		50ZAM	1
 50ZAC8	<b>Contact blocks</b>			
 50ZAC3	1NO, 1NC	Single button	50ZAC1	1
	2NO, 2SPST	Selector switch	50ZAC8	1
	1NO, 1NC	Two button	50ZAC2	1
	1NO, 1NO	Two button	50ZAC3	1
	<b>Pilot light</b>	120/240V Dual Voltage, no lens	50ZAC6	1
	<b>Pilot light lens</b>	Red	50ZPL01	1
		Green	50ZPL02	1
	<b>Replacement lamps</b>	Class 50 type 1, 1B 120V	50D21983001	1
	Slide base, lamp type 120PSB			

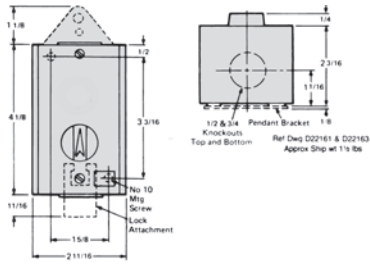
## Heavy duty station accessories

Version	Suitable for	Color	Order No.	Pack
				Unit
	<b>Pushbutton caps</b>			
	NEMA 4 control stations	Red	BHP15X	1
	NEMA 4 control stations	Black	BHP16X	1

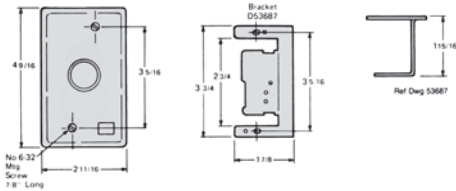
# Class 50 Standard Duty Pushbutton Stations

Standard duty - 5A 600V AC NEMA B600

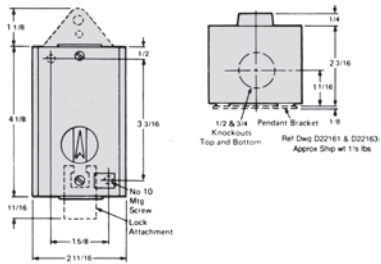
1 Unit Station Surface Mounting—Type 1



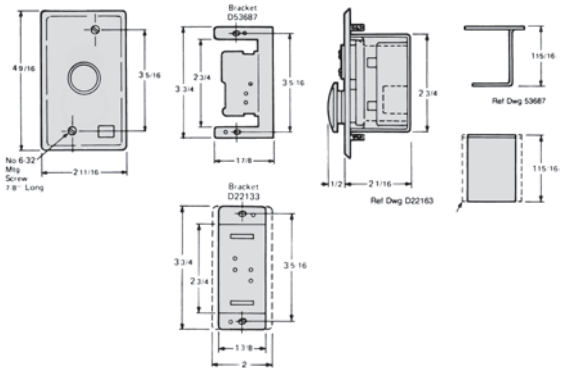
1 Unit Station Flush Mounting—Type 1B



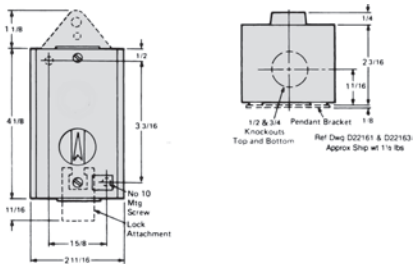
2 Pushbutton Stations Surface Mounting—Type 1



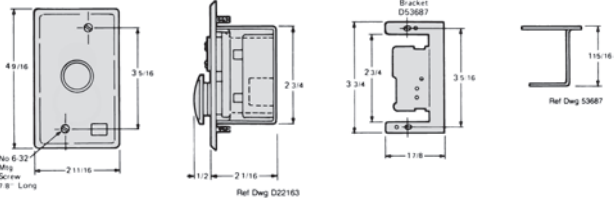
2 Pushbutton Stations Flush Mounting—Type 1B



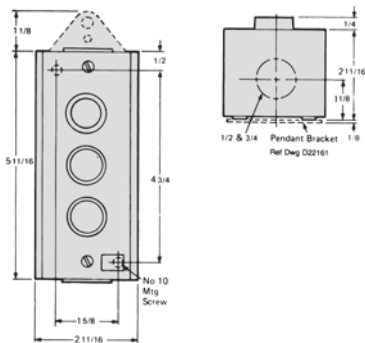
2 Unit Stations Surface Mounting—Type 1



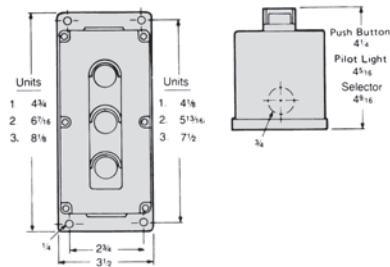
2 Unit Station Flush Mounting—Type 1B



3 Unit Stations Surface Mounting



1 Unit Stations—Type 4



# Class 51 Pilot Devices

## Hazardous location

### Features

- UL Listed and cUL Listed for Class I, Groups C & D and Class II, Groups E, F & G
- Short or Long Bushing Lengths
- Mount into 3/4-14 NPSM Threaded Hole
- Sealing Lock Nut
- Similar in Appearance to Class 52 Oil Tight Pilot Devices
- Double Break Bifurcated Contacts Rated AC NEMA A600, DC NEMA P600
- ⊕ Positively Driven Contacts
- Touchsafe Terminals
- UL Listed File # E39935
- CSA File No: 023889\_0\_000

### Application

When properly installed in a Type 7 & 9 enclosure, these components meet the National Electrical Code's requirements for Class I, Division 1 & 2, Groups C and D hazardous gases, Class II, Division 1, Groups E, F and G hazardous dust, and Class III, hazardous fibers and flyings. Class 51 pilot devices may be used in a location where the presence of flammable gases, vapors or finely pulverized dusts in the atmosphere are sufficient to create a threat of explosion or fire. They may also be required where easily ignitable fibers or flyings are present. Short bushing units are used in most standard Type 7 & 9 enclosures. Long bushings are used when an additional front panel is required or in enclosures up to 2 1/8 inches thick. Class 51 devices also meet Type 4 applications.

### Rugged

Hazardous location control units are durable one piece castings of a corrosion resistant copper free aluminum alloy with stainless steel springs and type 316 stainless steel shafts to provide a long dependable life. The "O" ring ensures the longest seal life available. Contact blocks have double break bifurcated contacts for increased reliability.

Pilot light bulbs are removable from the front for ease of maintenance. Many common parts between the Class 51 hazardous location pilot devices and the Class 52 oil tight pilot devices allow for increased serviceability with fewer parts.

### Industrial Appearance

Hazardous location control units add luster to panels. They are uniform in appearance and match 52 Class oil tight pilot devices.

### Typical Applications

#### Class I

#### Class II

#### Class III

### Electrical Ratings

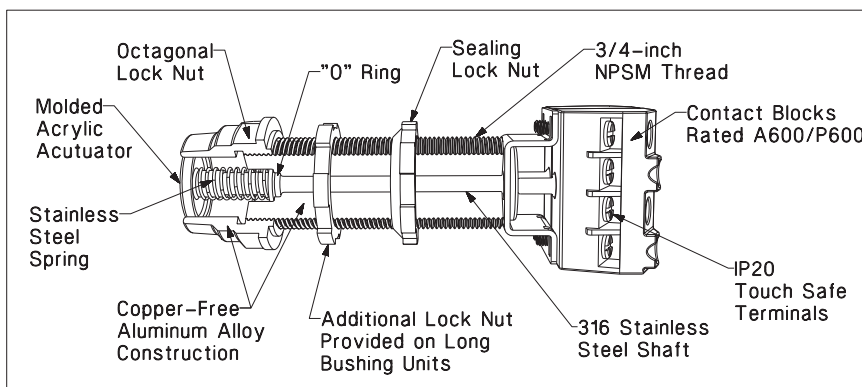
NEMA AC Ratings 50/60Hz

Nema A600 10 Continuous Amps

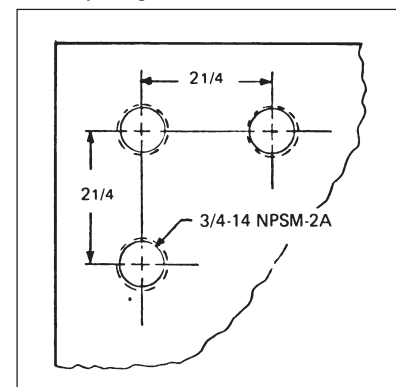
Volts	Make	Break
120	60	6
240	30	3
480	15	1.5
600	12	1.2
VA	7200	720

### Ordering Information

- Accessories [see page 10/191-10/192.](#)
- Selector Operating Position and Contact Operation [page 10/189.](#)
- Legend Plates [see page 10/229.](#)
- Enclosures [see page 10/190.](#)
- Technical Specifications: [page 10/231.](#)








### Panel Spacing



# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Operators only



## Selection and ordering data

	Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit
Pushbutton with flat cap 	<b>Pushbutton with flush cap</b>	Black		<b>51PA8A1</b>	<b>51PA8A1LB</b>	1
		Red		<b>51PA8A2</b>	<b>51PA8A2LB</b>	1
		Green		<b>51PA8A3</b>	<b>51PA8A3LB</b>	1
Pushbutton with extended cap 	<b>Pushbutton with extended cap</b>	Black		<b>51PA8B1</b>	<b>51PA8B1LB</b>	1
		Red		<b>51PA8B2</b>	<b>51PA8B2LB</b>	1
		Green		<b>51PA8B3</b>	<b>51PA8B3LB</b>	1
Dual pushbutton 	<b>Dual Pushbutton</b>	Flush Black		<b>51PD8A1B2</b>	<b>51PD8A1B2LB</b>	1
		Raised Red				
	<b>Pushbutton with mushroom cap 1 5/8"(41.3mm)</b>	Black		<b>51PA9D1</b>	<b>51PA9D1LB</b>	1
		Red		<b>51PA9D2</b>	<b>51PA9D2LB</b>	1
		Green		<b>51PA9D3</b>	<b>51PA9D3LB</b>	1
	<b>Pushbutton with mushroom cap 2 1/2"(63.5mm)</b>	Black		<b>51PA9E1</b>	<b>51PA9E1LB</b>	1
		Red		<b>51PA9E2</b>	<b>51PA9E2LB</b>	1
		Green		<b>51PA9E3</b>	<b>51PA9E3LB</b>	1
		Less head		<b>51PA9</b>	<b>51PA9LB</b>	1
2 position push-pull 	<b>2 Position Push Pull Maintained, Non Illuminated</b> Small Plastic Mushroom Head, 1 5/8" (41.3 mm)	Black		<b>51PA2D1</b>	<b>51PA2D1LB</b>	1
		Red		<b>51PA2D2</b>	<b>51PA2D2LB</b>	1
		Green		<b>51PA2D3</b>	<b>51PA2D3LB</b>	1
	Large Plastic Mushroom Head, 2 1/4" (57.2 mm)	Black		<b>51PA2E1</b>	<b>51PA2E1LB</b>	1
		Red		<b>51PA2E2</b>	<b>51PA2E2LB</b>	1
		Green		<b>51PA2E3</b>	<b>51PA2E3LB</b>	1
		Less head		<b>51PA2</b>	<b>51PA2LB</b>	1
	<b>2 Position Push Pull Maintained, Non Illuminated</b> Small Mushroom Head, 1 5/8"(41.3mm)	Black	1NC + 1NO	<b>51PA2D1A</b>	<b>51PA2D1LBA</b>	1
		Red	1NC + 1NO	<b>51PA2D2A</b>	<b>51PA2D2LBA</b>	1
		Green	1NC + 1NO	<b>51PA2D3A</b>	<b>51PA2D3LBA</b>	1
	Large Mushroom Head, 2 1/2"(63.5mm)	Black	1NC + 1NO	<b>51PA2E1A</b>	<b>51PA2E1LBA</b>	1
		Red	1NC + 1NO	<b>51PA2E2A</b>	<b>51PA2E2LBA</b>	1
		Green	1NC + 1NO	<b>51PA2E3A</b>	<b>51PA2E3LBA</b>	1
3 position push-pull 	<b>3 Position Push Pull Momentary, Non Illuminated</b> Small Mushroom Head, 1 5/8"(41.3mm)	Black	1NC + 1NO	<b>51PA3A1U</b>	<b>51PA3A1ULB</b>	1
		Red	1NC + 1NO	<b>51PA3A2U</b>	<b>51PA3A2ULB</b>	1
		Green	1NC + 1NO	<b>51PA3A3U</b>	<b>51PA3A3ULB</b>	1

# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Indicator light

### Selection and ordering data

Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit		
Indicator light- full voltage  	<b>Indicator light with glass lens - Full voltage type AC/DC (with 6" pigtail leads) <sup>1) 3)</sup></b>						
	Operators with Incandescent Lamp 6-8V with 755 type	Red Green Amber Less lens		<b>51PC5B2</b> <b>51PC5B3</b> <b>51PC5B9</b> <b>51PC5BN</b>	<b>51PC5B2LB</b> <b>51PC5B3LB</b> <b>51PC5B9LB</b> <b>51PC5BNLB</b>	1	
	12V with 756 type	Red Green Amber Less lens		<b>51PC5C2</b> <b>51PC5C3</b> <b>51PC5C9</b> <b>51PC5CN</b>	<b>51PC5C2LB</b> <b>51PC5C3LB</b> <b>51PC5C9LB</b> <b>51PC5CNLB</b>	1	
	24V with 757 type	Red Green Amber Less lens		<b>51PC5D2</b> <b>51PC5D3</b> <b>51PC5D9</b> <b>51PC5DN</b>	<b>51PC5D2LB</b> <b>51PC5D3LB</b> <b>51PC5D9LB</b> <b>51PC5DNLB</b>	1	
	Operators with LED Lamp <sup>2)</sup> 6-8V with BA9 type LED	Red Green Amber		<b>51PE5B2</b> <b>51PE5B3</b> <b>51PE5B9</b>	<b>51PE5B2LB</b> <b>51PE5B3LB</b> <b>51PE5B9LB</b>	1	
	24V with BA9 type LED	Red Green Amber		<b>51PE5D2</b> <b>51PE5D3</b> <b>51PE5D9</b>	<b>51PE5D2LB</b> <b>51PE5D3LB</b> <b>51PE5D9LB</b>	1	
	Indicator light- transformer type  	<b>Indicator light with glass lens - Transformer type AC/DC <sup>1) 3)</sup></b>					
		Operators with Incandescent Lamp 120V with 6V 755 type lamp	Red Green Amber Less lens		<b>51PC5G2</b> <b>51PC5G3</b> <b>51PC5G9</b> <b>51PC5GN</b>	<b>51PC5G2LB</b> <b>51PC5G3LB</b> <b>51PC5G9LB</b> <b>51PC5GNLB</b>	1
		240V with 6V 755 type lamp	Red Green Amber Less lens		<b>51PC5H2</b> <b>51PC5H3</b> <b>51PC5H9</b> <b>51PC5HN</b>	<b>51PC5H2LB</b> <b>51PC5H3LB</b> <b>51PC5H9LB</b> <b>51PC5HNLB</b>	1
		480V with 6V 755 type lamp	Red Green Amber Less lens		<b>51PC5J2</b> <b>51PC5J3</b> <b>51PC5J9</b> <b>51PC5JN</b>	<b>51PC5J2LB</b> <b>51PC5J3LB</b> <b>51PC5J9LB</b> <b>51PC5JNLB</b>	1
		600V with 6V 755 type lamp	Red Green Amber Less lens		<b>51PC5K2</b> <b>51PC5K3</b> <b>51PC5K9</b> <b>51PC5KN</b>	<b>51PC5K2LB</b> <b>51PC5K3LB</b> <b>51PC5K9LB</b> <b>51PC5KNLB</b>	1
		Operators with LED Lamp <sup>2)</sup> 120V with 6V BA9 type LED	Red Green Amber Less lens		<b>51PE5G2</b> <b>51PE5G3</b> <b>51PE5G9</b> —	<b>51PE5G2LB</b> <b>51PE5G3LB</b> <b>51PE5G9LB</b> —	1
240V with 6V BA9 type LED		Red Green Amber Less lens		<b>51PE5H2</b> <b>51PE5H3</b> <b>51PE5H9</b> —	<b>51PE5H2LB</b> <b>51PE5H3LB</b> <b>51PE5H9LB</b> —	1	
480V with 6V BA9 type LED		Red Green Amber Less lens		<b>51PE5J2</b> <b>51PE5J3</b> <b>51PE5J9</b> —	<b>51PE5J3LB</b> <b>51PE5J3LB</b> <b>51PE5J9LB</b> —	1	
600V with 6V BA9 type LED		Red Green Amber Less lens		<b>51PE5K2</b> <b>51PE5K3</b> <b>51PE5K9</b> —	<b>51PE5K2LB</b> <b>51PE5K3LB</b> <b>51PE5K9LB</b> —	1	

1) For other colors not listed, order operator less lens and separate lens from page 10/127.



2) LED color must match lens color.

3) All illuminated devices come with std. Touch-safe shield per UL stds.



# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Push to test complete units

### Selection and ordering data

Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit	
Push to test full voltage 	<b>Push to test/Illuminated pushbutton with glass lens - Full voltage type AC/DC</b> <sup>1) 3)</sup>					
	Red	1NO + 1NC	<b>51PC6B2A</b>	<b>51PC6B2ALB</b>	1	
	Green	1NO + 1NC	<b>51PC6B3A</b>	<b>51PC6B3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PC6B9A</b>	<b>51PC6B9ALB</b>	1	
	Less lens	1NO + 1NC	<b>51PC6BNA</b>	<b>51PC6BNALB</b>	1	
	24V with 757 type lamp	Red	1NO + 1NC	<b>51PC6D2A</b>	<b>51PC6D2ALB</b>	1
		Amber	1NO + 1NC	<b>51PC6D3A</b>	<b>51PC6D3ALB</b>	1
		Green	1NO + 1NC	<b>51PC6D9A</b>	<b>51PC6D9ALB</b>	1
		Less lens	1NO + 1NC	<b>51PC6DNA</b>	<b>51PC6DNALB</b>	1
	Operators with LED Lamp <sup>2)</sup> 6-8V with BA9 type LED	Red	1NO + 1NC	<b>51PE6B2A</b>	<b>51PE6B2ALB</b>	1
	Green	1NO + 1NC	<b>51PE6B3A</b>	<b>51PE6B3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PE6B9A</b>	<b>51PE6B9ALB</b>	1	
24V with BA9 type LED	Red	1NO + 1NC	<b>51PE6D2A</b>	<b>51PE6D2ALB</b>	1	
	Green	1NO + 1NC	<b>51PE6D3A</b>	<b>51PE6D3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PE6D9A</b>	<b>51PE6D9ALB</b>	1	
Push to test transformer type 	<b>Push to test/Illuminated pushbutton with glass lens - Transformer type (50/60 Hz)</b> <sup>1) 3)</sup>					
	Red	1NO + 1NC	<b>51PC6G2A</b>	<b>51PC6G2ALB</b>	1	
	Green	1NO + 1NC	<b>51PC6G3A</b>	<b>51PC6G3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PC6G9A</b>	<b>51PC6G9ALB</b>	1	
	Less lens	1NO + 1NC	<b>51PC6GNA</b>	<b>51PC6GNALB</b>	1	
	240V with 6V 755 type lamp	Red	1NO + 1NC	<b>51PC6H2A</b>	<b>51PC6H2ALB</b>	1
		Green	1NO + 1NC	<b>51PC6H3A</b>	<b>51PC6H3ALB</b>	1
		Amber	1NO + 1NC	<b>51PC6H9A</b>	<b>51PC6H9ALB</b>	1
		Less lens	1NO + 1NC	<b>51PC6HNA</b>	<b>51PC6HNALB</b>	1
	480V with 6V 755 type lamp	Red	1NO + 1NC	<b>51PC6J2A</b>	<b>51PC6J2ALB</b>	1
	Green	1NO + 1NC	<b>51PC6J3A</b>	<b>51PC6J3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PC6J9A</b>	<b>51PC6J9ALB</b>	1	
	Less lens	1NO + 1NC	<b>51PC6JNA</b>	<b>51PC6JNALB</b>	1	
600V with 6V 755 type lamp	Red	1NO + 1NC	<b>51PC6K2A</b>	<b>51PC6K2ALB</b>	1	
	Green	1NO + 1NC	<b>51PC6K3A</b>	<b>51PC6K3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PC6K9A</b>	<b>51PC6K9ALB</b>	1	
	Less lens	1NO + 1NC	<b>51PC6KNA</b>	<b>51PC6KNALB</b>	1	
Operators with LED Lamp <sup>2)</sup> 120V with 6V BA9 type LED	Red	1NO + 1NC	<b>51PE6G2A</b>	<b>51PE6G2ALB</b>	1	
	Green	1NO + 1NC	<b>51PE6G3A</b>	<b>51PE6G3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PE6G9A</b>	<b>51PE6G9ALB</b>	1	
240V with 6V BA9 type LED	Red	1NO + 1NC	<b>51PE6H2A</b>	<b>51PE6H2ALB</b>	1	
	Green	1NO + 1NC	<b>51PE6H3A</b>	<b>51PE6H3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PE6H9A</b>	<b>51PE6H9ALB</b>	1	
480V with 6V BA9 type LED	Red	1NO + 1NC	<b>51PE6J2A</b>	<b>51PE6J2ALB</b>	1	
	Green	1NO + 1NC	<b>51PE6J3A</b>	<b>51PE6J3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PE6J9A</b>	<b>51PE6J9ALB</b>	1	
600V with 6V BA9 type LED	Red	1NO + 1NC	<b>51PE6K2A</b>	<b>51PE6K2ALB</b>	1	
	Green	1NO + 1NC	<b>51PE6K3A</b>	<b>51PE6K3ALB</b>	1	
	Amber	1NO + 1NC	<b>51PE6K9A</b>	<b>51PE6K9ALB</b>	1	

### Overload reset operators with reset legend plate

Version	Color	Legend Inscription	Order No.
 Single unit 7/8" diameter reset pad, 10" shaft can be cut to length.	Red	Reset	<b>51AAS</b>
 Multi unit For use with multi push operation requirements.	Red	Reset	<b>51AAM</b>

1) For other colors not listed, order operator less lens and separate lens from page 10/127.

2) LED color must match lens color.



3) All illuminated devices come with std. Touch-safe shield per UL stds.



# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Selector switch operators

### Selection and ordering data

Version	Lever type	Color of insert	Cam Code 1) 2)	Short bushing Order No.	Long bushing Order No.	Pack Unit
	Short lever, non-Illuminated	White	A	<b>51SA2AA</b>	<b>51SA2AALB</b>	1
	Long lever, non-Illuminated	White	A	<b>51SB2AA</b>	<b>51SB2AALB</b>	
	Short lever, non-Illuminated	White	A	<b>51SA2AC</b>	<b>51SA2ACLB</b>	1
	Long lever, non-Illuminated	White	A	<b>51SB2AC</b>	<b>51SB2ACLB</b>	
<b>Selector switches with 3 switching positions</b> Maintained operation	Short lever, non-Illuminated	White	B	<b>51SA2BA</b>	<b>51SA2BALB</b>	1
	Long lever, non-Illuminated	White	B	<b>51SB2BA</b>	<b>51SB2BALB</b>	
	Short lever, non-Illuminated	White	C	<b>51SA2CA</b>	<b>51SA2CALB</b>	
	Long lever, non-Illuminated	White	C	<b>51SB2CA</b>	<b>51SB2CALB</b>	
	Short lever, non-Illuminated	White	D	<b>51SA2DA</b>	<b>51SA2DALB</b>	
	Long lever, non-Illuminated	White	D	<b>51SB2DA</b>	<b>51SB2DALB</b>	
	Short lever, non-Illuminated	White	E	<b>51SA2EA</b>	<b>51SA2EALB</b>	
	Long lever, non-Illuminated	White	E	<b>51SB2EA</b>	<b>51SB2EALB</b>	
	Short lever, non-Illuminated	White	G	<b>51SA2GA</b>	<b>51SA2GALB</b>	
	Long lever, non-Illuminated	White	G	<b>51SB2GA</b>	<b>51SB2GALB</b>	
Spring return from right operation	Short lever, non-Illuminated	White	B	<b>51SA2BC</b>	<b>51SA2BCLB</b>	1
	Long lever, non-Illuminated	White	B	<b>51SB2BC</b>	<b>51SB2BCLB</b>	
	Short lever, non-Illuminated	White	C	<b>51SA2CC</b>	<b>51SA2CCLB</b>	
	Long lever, non-Illuminated	White	C	<b>51SB2CC</b>	<b>51SB2CCLB</b>	
	Short lever, non-Illuminated	White	D	<b>51SA2DC</b>	<b>51SA2DCLB</b>	
	Long lever, non-Illuminated	White	D	<b>51SB2DC</b>	<b>51SB2DCLB</b>	
	Short lever, non-Illuminated	White	E	<b>51SA2EC</b>	<b>51SA2ECLB</b>	
	Long lever, non-Illuminated	White	E	<b>51SB2EC</b>	<b>51SB2ECLB</b>	
Spring return from left operation	Short lever, non-Illuminated	White	G	<b>51SA2GC</b>	<b>51SA2GCLB</b>	1
	Long lever, non-Illuminated	White	G	<b>51SB2GC</b>	<b>51SB2GCLB</b>	
	Short lever, non-Illuminated	White	B	<b>51SA2BB</b>	<b>51SA2BBLB</b>	
	Long lever, non-Illuminated	White	B	<b>51SB2BB</b>	<b>51SB2BBLB</b>	
	Short lever, non-Illuminated	White	C	<b>51SA2CB</b>	<b>51SA2CBLB</b>	
	Long lever, non-Illuminated	White	C	<b>51SB2CB</b>	<b>51SB2CBLB</b>	
	Short lever, non-Illuminated	White	D	<b>51SA2DB</b>	<b>51SA2DBLB</b>	
	Long lever, non-Illuminated	White	D	<b>51SB2DB</b>	<b>51SB2DBLB</b>	
Spring return from left and right operation	Short lever, non-Illuminated	White	E	<b>51SA2EB</b>	<b>51SA2EBLB</b>	1
	Long lever, non-Illuminated	White	E	<b>51SB2EB</b>	<b>51SB2EBLB</b>	
	Short lever, non-Illuminated	White	G	<b>51SA2GB</b>	<b>51SA2GBLB</b>	
	Long lever, non-Illuminated	White	G	<b>51SB2GB</b>	<b>51SB2GBLB</b>	
	Short lever, non-Illuminated	White	B	<b>51SA2BD</b>	<b>51SA2BDLB</b>	
	Long lever, non-Illuminated	White	B	<b>51SB2BD</b>	<b>51SB2BDLB</b>	
	Short lever, non-Illuminated	White	C	<b>51SA2CD</b>	<b>51SA2CDLB</b>	
	Long lever, non-Illuminated	White	C	<b>51SB2CD</b>	<b>51SB2CDLB</b>	
	Short lever, non-Illuminated	White	D	<b>51SA2DD</b>	<b>51SA2DDLb</b>	
	Long lever, non-Illuminated	White	D	<b>51SB2DD</b>	<b>51SB2DDLb</b>	
Short lever, non-Illuminated	White	E	<b>51SA2ED</b>	<b>51SA2EDLB</b>		
Long lever, non-Illuminated	White	E	<b>51SB2ED</b>	<b>51SB2EDLB</b>		
Short lever, non-Illuminated	White	G	<b>51SA2GD</b>	<b>51SA2GDLB</b>		
Long lever, non-Illuminated	White	G	<b>51SB2GD</b>	<b>51SB2GDLB</b>		

1)C CAM limited to 4 single or double pole blocks on spring return operators.

2)For contact operation, see CAM selection chart on [page 10/189](#).



# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Selector switch operators

### Selection and ordering data



Version	Key removal position	Lock number	CAM Code 1) 2)	Short bushing Order No.	Long bushing Order No.	Pack Unit
<b>Key-operated selector switches with 2 switching positions</b>	Both	550CH	A	<b>51SA6AE</b>	<b>51SA6AELB</b>	1
	Left	550CH	A	<b>51SA6AF</b>	<b>51SA6AFLB</b>	
	Right	550CH	A	<b>51SA6AG</b>	<b>51SA6AGLB</b>	
Maintained operation	Right	550CH	A	<b>51SA6AG</b>	<b>51SA6AGLB</b>	
Spring return from right operation	Left	550CH	A	<b>51SA6AC</b>	<b>51SA6ACLB</b>	1
<b>Key-operated selector switches with 3 switching positions</b>	All	550CH	B	<b>51SA6BE</b>	<b>51SA6BELB</b>	1
			C	<b>51SA6CE</b>	<b>51SA6CELB</b>	
			D	<b>51SA6DE</b>	<b>51SA6DELB</b>	
			E	<b>51SA6EE</b>	<b>51SA6EELB</b>	
			G	<b>51SA6GE</b>	<b>51SA6GELB</b>	
	Left	550CH	B	<b>51SA6BF</b>	<b>51SA6BFLB</b>	1
			C	<b>51SA6CF</b>	<b>51SA6CFLB</b>	
			D	<b>51SA6DF</b>	<b>51SA6DFLB</b>	
			E	<b>51SA6EF</b>	<b>51SA6EFLB</b>	
			G	<b>51SA6GF</b>	<b>51SA6GFLB</b>	
	Right	550CH	B	<b>51SA6BG</b>	<b>51SA6BGLB</b>	1
			C	<b>51SA6CG</b>	<b>51SA6CGLB</b>	
			D	<b>51SA6DG</b>	<b>51SA6DGLB</b>	
			E	<b>51SA6EG</b>	<b>51SA6EGLB</b>	
			G	<b>51SA6GG</b>	<b>51SA6GGLB</b>	
Center	550CH	B	<b>51SA6BH</b>	<b>51SA6BHLB</b>	1	
		C	<b>51SA6CH</b>	<b>51SA6CHLB</b>		
		D	<b>51SA6DH</b>	<b>51SA6DHLB</b>		
		E	<b>51SA6EH</b>	<b>51SA6EHLB</b>		
		G	<b>51SA6GH</b>	<b>51SA6GHLB</b>		
Left and Center	550CH	B	<b>51SA6BK</b>	<b>51SA6BKLB</b>	1	
		C	<b>51SA6CK</b>	<b>51SA6CKLB</b>		
		D	<b>51SA6DK</b>	<b>51SA6DKLB</b>		
		E	<b>51SA6EK</b>	<b>51SA6EKLb</b>		
		G	<b>51SA6GK</b>	<b>51SA6GKLB</b>		
Spring return from right operation	Center	550CH	B	<b>51SA6BU</b>	<b>51SA6BULB</b>	1
			C	<b>51SA6CU</b>	<b>51SA6CULB</b>	
			D	<b>51SA6DU</b>	<b>51SA6DULB</b>	
			E	<b>51SA6EU</b>	<b>51SA6EULB</b>	
			G	<b>51SA6GU</b>	<b>51SA6GULB</b>	
Spring return from left operation	Center	550CH	B	<b>51SA6BT</b>	<b>51SA6BTLB</b>	1
			C	<b>51SA6CT</b>	<b>51SA6CTLB</b>	
			D	<b>51SA6DT</b>	<b>51SA6DTLB</b>	
			E	<b>51SA6ET</b>	<b>51SA6ETLB</b>	
			G	<b>51SA6GT</b>	<b>51SA6GTLB</b>	
Spring return from left and right operation	Center	550CH	B	<b>51SA6BV</b>	<b>51SA6BVLB</b>	1
			C	<b>51SA6CV</b>	<b>51SA6CVLB</b>	
			D	<b>51SA6DV</b>	<b>51SA6DVLB</b>	
			E	<b>51SA6EV</b>	<b>51SA6EVLB</b>	
			G	<b>51SA6GV</b>	<b>51SA6GVLB</b>	

See page 10/213 for replacement keys, and up-to 15 additional uniquely keyed M - Series Lock Options available for use with the 51SA6 key-operated selector switches.

5

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**To order special locks for keyed selector switches, append corresponding 'X' suffix to part number**

Ordering example:  
51SA6AEX298

#549CH	<b>X639</b>		1
#548CH	<b>X640</b>		1
#547CH	<b>X641</b>		1
#501CH	<b>X642</b>		1
#506CH	<b>X643</b>		1

1)C CAM limited to 4 single or double pole blocks on spring return operators.

2)For contact operation, see CAM selection chart on page 10/189.

# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Cam selection

### Selection and ordering data

Design	Ordering Information
	<ul style="list-style-type: none"> <li>Contact blocks are ordered separately, <a href="#">see page 10/192</a>.</li> <li>Determine which table to use based upon the type of selector (non-illuminated &amp; keyed on top, illuminated on bottom).</li> <li>Find the correct number of selector positions (2, 3 or 4 positions).</li> <li>Select the contact operation required for each selector position. X indicates the contacts are closed, while O indicates the contacts are open. (For the selector pushbutton, N=normal and D=depressed). Contact block must be assembled in position shown for each circuit application.</li> <li>Identify the CAM letter required for the chosen contact operation (only 1 CAM can be used per selector switch or selector pushbutton).</li> <li>Contact blocks must be assembled in the position shown for each circuit application. The mounting position is viewed from the front of the device.</li> </ul> <p><b>Ordering CAMs D, E or G</b></p> <ul style="list-style-type: none"> <li>CAM D, E or G may be ordered at the same price by changing the 6th character of the selector catalog number. Example: Selector with D cam <b>51SA2DA</b>.</li> </ul> <p><b>Size Requirements</b></p> <ul style="list-style-type: none"> <li>C CAM on spring return selectors is limited to 4 contact blocks. Standard push buttons accept 4 contact blocks on each side, for a maximum of 8 contact blocks.</li> <li>Selector operators in enclosures are limited to depth of 1 contact block. (2 blocks wide).</li> </ul>

### Non-illuminated and keyed selector switches (viewed from front)

2 Selector Positions			Contact Blocks	CAM	Mounting	
Left		Right			Left	Right
X		O	52BAJ (NC)	A	L	R
O		X	52BAK (NO)	A	L	R
3 Selector Positions			Contact Blocks	CAM	Mounting	
Left	Center	Right			Left	Right
X	O	O	52BAK (NO)	B		R
O	O	X	52BAK (NO)	B	L	
X	X	O	52BAJ (NC)	B	L	
O	X	X	52BAJ (NC)	B	R	
O	O	X	52BAK (NO)	C	L	R
X	O	O	52BAJ (NC)	C	L	R
O	O	X	52BAK (NO)	D	L	R
O	X	O	52BAJ (NC)	D	L	R
X	O	O	52BAK (NO)	E	L	R
O	X	O	52BAJ (NC)	E	L	R
X	O	O	52BAJ (NC)	G	L	
O	X	O	52BAJ (NC)	G		R
O	O	X	52BAK (NO)	G	L	R

### Illuminated selector switches






2 Selector Positions			Contact Blocks	CAM	Mounting	
Left		Right			Left	Right
X		O	52BAJ (NC)	A	L	
O		X	52BAK (NO)	A	L	

1) Wired in parallel.

# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Control stations

### Selection and ordering data

	Operator Identification <sup>1)</sup>	Degree of operator	Contacts/voltage	Number of command points	Order No.	Pack
						Unit
	A = Momentary flush pushbutton black, label "START"	NEMA 7/9	1NO - 1NC	1	51C101H	1
	A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC	1	51C103H	1
	A = Momentary 1 5/8" mushroom head red label "STOP"	NEMA 7/9	1NO - 1NC	1	51C104H	1
	A = Momentary dual pushbutton red label "START, STOP"	NEMA 7/9	1NO - 1NC	1	51C105H	1
	A = 2 position selector switch label "Off-On"	NEMA 7/9	1NO - 1NC	1	51C159H	1
	A = 3 position selector switch label "HAND-OFF-AUTO"	NEMA 7/9	1NO - 1NC	1	51C156H	1
	A = Indicator light, green, 120 V A = Indicator light, red, 120 V	NEMA 7/9 NEMA 7/9			1 1	51C131H 51C135H
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C201H	1
	B = Momentary flush pushbutton black, label "FORWARD" A = Momentary flush pushbutton red, label "REV"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C204H	1
	B = Momentary flush pushbutton black, label "START" A = Momentary 1 5/8" mushroom head pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C202H	1
	B = Indicator light, red, 120 V A = Indicator light, green, 120 V	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C230H	1
	C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	51C301H	1
	C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	51C303H	1
	C = Indicator light, green, 120 V B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	3	51C307H	1
<b>Enclosures only<sup>2)</sup></b>						
	For field assembly of Type 7 & 9 UL listed and cUL listed control stations. Devices may be installed for either horizontal or vertical mounting using a standard legend. Limited to depth of 1 contact block.			1	51EA1H	1
				2	51EA2H	1
				3	51EA3H	1











1) All enclosures come standard with one conduit entry on top. To get two conduit entries, append X-311 to the end of the order number.

2) For legend plates see page 10/229.

# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Accessories and spare parts



### Selection and ordering data

Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
	For small 1 5/8" (41.3mm) type, non-illuminated mushroom push-buttons		Black	<b>52RB3D1</b>	1
			Red	<b>52RB3D2</b>	
			Green	<b>52RB3D3</b>	
			Yellow	<b>52RB3D4</b>	
			Blue	<b>52RB3D5</b>	
			Gray	<b>52RB3D6</b>	
			Orange	<b>52RB3D8</b>	
			1 kit of each	<b>52RB3DN</b>	
				For large 2 1/2" (63.5mm) type, non-illuminated mushroom push-buttons	
Red	<b>52RB3E2</b>				
Green	<b>52RB3E3</b>				
Yellow	<b>52RB3E4</b>				
Blue	<b>52RB3E5</b>				
Gray	<b>52RB3E6</b>				
Orange	<b>52RB3E8</b>				
1 kit of each	<b>52RB3EN</b>				
	Replacement lens for pilot lights				Red
			Green	<b>51RC4G3</b>	
			Blue	<b>51RC4G5</b>	
			Amber	<b>51RC4G9</b>	
			Clear	<b>51RC4GA</b>	
	Replacement lens for push to test/illuminated pushbuttons		Red	<b>51RC5G2</b>	1
			Green	<b>51RC5G3</b>	
			Amber	<b>51RC5G9</b>	
	Guards		Chrome	<b>51AAGM</b>	1
	Prevents accidental operation	Non-illuminated Pushbuttons & Push Pull Operators with Mushroom Head Caps 1 5/8" to 1 3/4" in diameter.			
	Lever inserts		Red	<b>52RA2A2</b>	1
			Green	<b>52RA2A3</b>	
			Blue	<b>52RA2A4</b>	
			Amber	<b>52RA2A5</b>	
			Gray	<b>52RA2A6</b>	
			Orange	<b>52RA2A8</b>	
			White	<b>52RA2AB</b>	
			Short lever		
	Long lever		Red	<b>52RA2B2</b>	1
			Green	<b>52RA2B3</b>	
			Blue	<b>52RA2B4</b>	
			Amber	<b>52RA2B5</b>	
			Gray	<b>52RA2B6</b>	
			Orange	<b>52RA2B8</b>	
			White	<b>52RA2BB</b>	
			Long lever		
	Padlock attachment	Only for raised pushbutton operators		<b>51AAL</b>	1
	Breather/drain (Stainless Steel)	Installs in bottom as a drain or in the top as a breather. Suitable for Class 1 groups C & D and for Class 2 groups F & G applications only. Fits 1/2" NPT.		<b>51AADB</b>	1
	Lock nut wrench	All devices		<b>52MAWB</b>	1
	Spare keys	550CH (1 key)		<b>52KEY-550CH</b>	1

# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Accessories and spare parts




### Selection and ordering data

Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit	
	Cast aluminum, UL recognized and CSA certified. Used to reduce existing tapered NPT conduit opening when required.	3/4 - 1/2		<b>51AARBA</b>	1	
		1 - 1/2		<b>51AARCA</b>		
		1 1/2 - 3/4		<b>51AARDB</b>		
		1 1/2 - 1		<b>51AARDC</b>		
		2 1/2 - 3/4		<b>51AARFB</b>		
		2 1/2 - 1		<b>51AARFC</b>		
		2 1/2 - 1 1/2		<b>51AARFD</b>		
		2 1/2 - 2		<b>51AARFE</b>		
		3 - 1		<b>51AARGC</b>		
		3 - 1 1/2		<b>51AARGD</b>		
		3 - 2		<b>51AARGE</b>		
		3 - 2 1/2		<b>51AARGF</b>		
		<b>Lamps with screw connection, miniature bayonet incandescent lamps</b>				
	Flashing, type 267 lamp (replaces 755 lamp)	51, 52	6V	<b>52AABNF</b>	1	
	6V Full voltage, transformer type 755 lamp	51, 52	6V	<b>52AABN</b>	1	
	12V full voltage, type 756	51, 52	12V	<b>52AACN</b>	1	
	24V full voltage, 120/240V resistor push-to-test type 757	51, 52	24V	<b>52AADN</b>	1	
	Neon (uses resistors) type B2A (NE-51H)	51, 52	120V	<b>52AAPN</b>	1	
	120V, full voltage type 3S6/5	51, 52	120V	<b>52AAENC</b>	1	
	LEDs, Single element	51, 52	6V	Red	<b>52AEB2</b>	1
		51, 52	6V	Green	<b>52AEB3</b>	
		51, 52	6V	Yellow	<b>52AEB4</b>	
		51, 52	6V	White	<b>52AEBB</b>	
		51, 52	6V	Blue	<b>52AEB5</b>	
		51, 52	24V	Red	<b>52AED2</b>	
		51, 52	24V	Green	<b>52AED3</b>	
51, 52		24V	Yellow	<b>52AED4</b>		
51, 52		24V	White	<b>52AEDB</b>		
51, 52		24V	Blue	<b>52AED5</b>		
51, 52	120V	Red	<b>52AEE2</b>			
51, 52	120V	Green	<b>52AEE3</b>			
51, 52	120V	Yellow	<b>52AEE4</b>			
51, 52	120V	White	<b>52AEEB</b>			
51, 52	120V	Blue	<b>52AEE5</b>			

# Class 51, Hazardous Location NEMA Type 7 & 9 Devices

## Accessories and spare parts

### Selection and ordering data

	Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
	52BAJ					
	52BAK					
	52BAR					
					<b>Touchsafe contact blocks with gold flashing</b>	
	1 NO				<b>52BAK</b>	1
	1 NC				<b>52BAJ</b> <sup>②</sup>	
	1 NO - 1 NC				<b>52BJK</b> <sup>②</sup>	
	1 NO early make	closes before 52BAK			<b>52BAH</b>	
	1 NC late break	opens after 52BAJ			<b>52BAE</b>	
	1 NO - 1 NC	Reed switch			<b>52BAR</b> <sup>①</sup>	
		UL listed for class 1 division 2				
		.25A Max, 200V AC, 10 Watt max				
		.5A Max, 200V DC, 10 Watt max				
	1 NC extra late break				<b>52BAU</b>	

① Hermetically sealed.

② ↻ Positive opening according to IEC 60947-5-1, Appendix K.

# 30 mm Heavy Duty, Watertight/Oiltight, Class 52

## Pushbutton complete units

### Features

- Octagonal Mounting Nuts
- Meets Type 1, 3, 3R, 4, 4X, 12, 13 and Automotive Standards
- Heavy Duty Rated NEMA A600/P600 Contacts
- ☞ Positively Driven Contacts
- Positive Indexing Selectors
- Bifurcated Movable Contacts
- Attractive Chrome Plating
- Boots Not Required for Type 4
- UL Listed File # E22655
- CSA Certified File # LR6535
- Touchsafe Terminals

### Application

Oil tight pilot controls and accessories are designed to provide long, trouble free service in the most demanding industrial applications. These controls are oil and dust tight and meet Type 3, 4, 4X, 12 and 13 specifications.

#### Rugged

Industrial control operators are durable one piece castings. Heavy duty plastic buttons resist oils and corrosion. Silver contacts carry heavy duty ratings.

#### Flexible

Accessories modify standard push buttons, selector switches and pilot lights. Building block construction of contact blocks makes possible many circuitry combinations.

#### Industrial Appearance

Pilot controls add luster to panels. Chrome plating covers exposed metal parts.

#### Push Button Operators

The Operator Base consists of a durable, one piece casting equipped with a heavy duty actuator with a stainless steel spring, a neoprene actuator sealing ring to prevent oil and dust from penetrating to the contact blocks, a neoprene gasket to seal operator mounting hole and a chrome plated lock nut.

#### Mushroom Head Push Button Operators

The Mushroom Head base construction is identical to the push button base. The actuator is molded of high impact material for either a 1 5/8 inch or 2 1/2 inch diameter molded head.

E-STOP Mushroom Head Operators according to EN 60947-5-5 Cat. No. 52BP, 52BR, 52PP, and 52PR, 2 Position, Twist-To-Release & 2 Position, Push Pull Maintained operators provided with red operating heads and 52BJK contact blocks meet the requirements of EN 60947-5-5 for Electrical Emergency Stop Device With Mechanical Latching Function (e-stop).

#### Contact Blocks

Contact Blocks have double break bifurcated silver contacts, with gold flashing as standard, which improves contact reliability. Contact blocks are heavy duty rated NEMA A600 and suitable for applications down to 5V/1MA solid state outputs. 52BJK offers ☞ Positive Opening Contacts according to IEC 60947-5-1, Appendix K. Molded bodies and pushers resist arcing and tracking. All units have stainless steel springs that resist corrosion and provide strong contact pressure. Captive mounting screws speed panel assembly.

#### Push Pull Operators

Push Pull Operators combine two or three functions in one unit. The maintained operator has two positions, typically pull to start, push to stop. The momentary operator with three positions provides spring return from both pull and push positions. In addition, a three position push maintained, pull momentary operator is available. The actuator come is 1 3/4 inch or 2 1/2 inch diameter and is available in an illuminated version.

#### 2 Button Maintained Operator

Maintained Push Buttons consist of two push buttons and a latching assembly. When actuated the button remains depressed and is freed only by the release operator to which it is linked. The button assembly adjusts for mounting from a 1 13/16 inch to a 2 5/8 inch center.

#### Transformer Type Pilot Lights

Transformer Type Pilot Lights are available with a 120, 240, 480 or 600 Volt primary (50/60 Hertz) and a separate secondary winding which supplies reduced voltage to a miniature bayonet base 6 Volt lamp. These units are suitable for applications where vibration is present and long bulb life is desirable.

#### Full Voltage Type Pilot Lights

Full Voltage Pilot Lights are available for 6, 12, 24 and 120 Volt AC and DC applications.

### Electrical Ratings

NEMA AC Ratings 50/60Hz

NEMA A600 10 Continuous Amps

Volts	Make	Break
120	60	6
240	30	3
480	15	1.5
600	12	1.2
VA	7200	720

### Ordering Information

- Accessories: [pages 10/218 – 10/221](#)
- Selector Position and Contact Operation: [page 10/216 – 10/217](#).
- Legend Plates: [page 10/229](#).
- Enclosures: [page 10/230](#).
- Technical Specifications: [page 10/231](#).

#### Resistor Type Pilot Lights

Resistor Type Pilot Lights are available for 240 Volt AC and DC applications. The 240 Volt pilot light is supplied with a 120 Volt lamp and a voltage dropping resistor.

#### LED Type Pilot Lights

LED's (light emitting diodes) can be used in pilot lights instead of incandescent bulbs because of their long life (up to 10 years), resistance to vibration and ambient sensitivity. Clusted LED options are available for standard pilot lights only. Cluster LED options are not available on Push to test Pilot Lights, Illuminated Pushbuttons, Push-pull, or Twist-to-Release Operators.

#### Integrated LED Module Type Pilot Lights

The integrated LED module is available for 24, 120, and 240 V. LED modules are vibration resistant and have a long life (up to 10 years). The integrated LED module is available for 24, 120, and 240 V. LED modules are vibration resistant and have a long life (up to 10 yrs.).

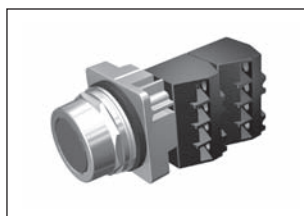
#### Selector Operators

Selector Operators have positive action indexing. Operators are available with either a short or long lever. The molded black lever is designed to accept a color insert. A white insert is provided as standard. Each operator is equipped with a cam to actuate plungers of contact blocks assembled behind the operator. Two, three and four position operators are available with seven different cams.

Lever color inserts are available in 8 colors.



Indicator Light



Push Button



Selector Switch



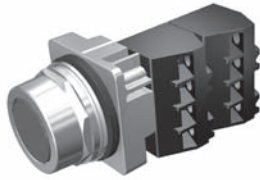
Selector Push Button

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Push Button

### Selection Guide

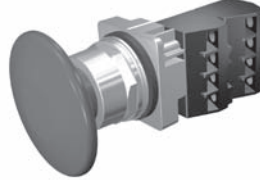
#### Momentary Push Button - Non-Illuminated



Flush Head



Extended Head



Large Mushroom Head 2 1/2"



Small Mushroom Head 1 3/4"

<b>Part Number</b>	<b>52</b>	<b>a</b>	<b>M</b> <b>b</b>	<b>c</b>	<b>d</b>	<b>e<sup>1</sup></b>
--------------------	-----------	----------	----------------------	----------	----------	----------------------

<b>a</b>	<b>Code</b>	<b>Finish</b>
	<b>P</b>	Chrome - Command 52
	<b>B</b>	Epoxy Coated - Black Max

<b>b</b>	<b>Code</b>	<b>Type</b>
	<b>M</b>	Momentary Push Button

<b>c</b>	<b>Code</b>	<b>Style / Head Type</b>
		<b>Flush / Extended Cap<sup>2</sup></b>
	<b>8A</b>	Flush
	<b>8B</b>	Extended
		<b>Mushroom Head Metal</b>
	<b>9A</b>	Small Mushroom Head 1 3/4" (44.5mm)
		<b>Mushroom Head Plastic</b>
	<b>9W</b>	Small Mushroom Head 1 3/4" (44.5mm)
	<b>9V</b>	Large Mushroom Head 2 1/2" (63.5mm)

<b>d</b>	<b>Code</b>	<b>Plastic</b>	<b>Metal</b>
	<b>1</b>	Black	—
	<b>2</b>	Red	Red
	<b>3</b>	Green	Green
	<b>4</b>	Yellow	—
	<b>5</b>	Blue	—
	<b>6</b>	Gray	—
	<b>7</b>	All Color Caps	—
	<b>8</b>	Orange	—
<b>C</b>	—	Chrome	

<b>e<sup>1</sup></b>	<b>Code</b>	<b>Contact Blocks</b>
	<b>A</b>	1 NO + 1 NC
	<b>B</b>	2 NO + 2 NC
	<b>C</b>	3 NO + 3 NC
	<b>D</b>	4 NO + 4 NC
	<b>E</b>	1 NC (LB)
	<b>F</b>	2 NO
	<b>G</b>	2 NC
	<b>H</b>	1NO (EM)
	<b>J</b>	1 NC
	<b>K</b>	1 NO

<sup>1</sup> For operator without contact blocks leave position e blank.  
<sup>2</sup> Products available fall 2014. For current product offer please refer to the 2010 Industrial Control Catalog.



Selection Tables

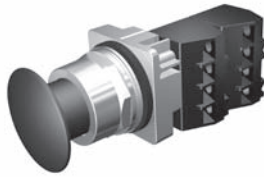
Momentary Push Button - Non-Illuminated

Head Style	Contacts	Color	Finish	
			Chrome	Black Max
Flush	—	Less cap	<b>52PM8</b>	<b>52BM8</b>
		Black	<b>52PM8A1</b>	<b>52BM8A1</b>
		Red	<b>52PM8A2</b>	<b>52BM8A2</b>
		Green	<b>52PM8A3</b>	<b>52BM8A3</b>
		Yellow	<b>52PM8A4</b>	<b>52BM8A4</b>
	1 NO - 1 NC	Black	<b>52PM8A1A</b>	<b>52BM8A1A</b>
		Red	<b>52PM8A2A</b>	<b>52BM8A2A</b>
		Green	<b>52PM8A3A</b>	<b>52BM8A3A</b>
	1 NO	Black	<b>52PM8A1K</b>	<b>52BM8A1K</b>
		Red	<b>52PM8A2K</b>	<b>52BM8A2K</b>
		Green	<b>52PM8A3K</b>	<b>52BM8A3K</b>
	1 NC	Red	<b>52PM8A2J</b>	<b>52BM8A2J</b>
Extended	—	Black	<b>52PM8B1</b>	<b>52BM8B1</b>
		Red	<b>52PM8B2</b>	<b>52BM8B2</b>
		Green	<b>52PM8B3</b>	<b>52BM8B3</b>
	1 NO	Black	<b>52PM8B1K</b>	<b>52BM8B1K</b>
		Red	<b>52PM8B2K</b>	<b>52BM8B2K</b>
	1 NC	Red	<b>52PM8B2J</b>	<b>52BM8B2J</b>
Mushroom Head Plastic Ø 1 3/4"	—	Less cap	<b>52PM9</b>	<b>52BM9</b>
		Red	<b>52PM9W2</b>	<b>52BM9W2</b>
	1 NO	Green	<b>52PM9W3K</b>	<b>52BM9W3K</b>
	1 NO - 1 NC	Black	<b>52PM9W1A</b>	<b>52BM9W1A</b>
		Red	<b>52PM9W2A</b>	<b>52BM9W2A</b>
	1 NO - 1 NC	Green	<b>52PM9W3A</b>	<b>52BM9W3A</b>
Mushroom Head Plastic Ø 2 1/2"	—	Red	<b>52PM9V2</b>	<b>52BM9V2</b>
		Black	<b>52PM9V1A</b>	<b>52BM9V1A</b>
	1 NO - 1 NC	Red	<b>52PM9V2A</b>	<b>52BM9V2A</b>
		Green	<b>52PM9V3A</b>	<b>52BM9V3A</b>

Readily available items are in **bold**.  
This is a small representation of stocked items.

**Selection Guide**

2 & 3 Position Push-Pull Mushroom Head Devices - Non-Illuminated



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

<b>Part Number</b>	<b>52</b>	<u>    </u>	<b>P</b>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>
		<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f<sup>3</sup></b>

<b>a</b>	<b>Code</b>	<b>Finish</b>
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

<b>b</b>	<b>Code</b>	<b>Type</b>
	P	Push Pull

<b>c</b>	<b>Code</b>	<b>Function</b>
	2	2 positions - maintained <sup>1</sup>
	3	3 positions - momentary in - momentary out
	7	3 positions - maintained in - momentary out

<b>d</b>	<b>Code</b>	<b>Style</b>
	A	Small metal 1-3/4" (44.5 mm)
	W	Small plastic 1-3/4" (44.5 mm)
	V	Large plastic 2-1/2" (63.5 mm)

<b>e</b>	<b>Code</b>	<b>Color</b>	
		<b>Plastic</b>	<b>Metal</b>
	1	Black	—
	2	Red <sup>1</sup>	Red <sup>1</sup>
	3	Green	Green
	4	Yellow	—
	5	Blue	—
	6	Gray	—
	8	Orange	—
	C	—	Chrome
		<b>No Operating Head</b>	
	Z	No head	

<b>f<sup>3</sup></b>	<b>Code</b>	<b>Contact Blocks</b>
		<b>2 Position</b>
	A	1 NO + 1 NC <sup>1</sup>
	B	2 NO + 2 NC <sup>1</sup>
	C	3 NO + 3 NC <sup>1</sup>
	D	4 NO + 4 NC <sup>1</sup>
	E	1 NC (LB)
	F	2 NO
	G	2 NC <sup>1</sup>
	H	1 NO (EM)
	J	1 NC <sup>1</sup>
	K	1 NO
	Q	1 NO - 1 NC (ELB)
		<b>3 Position</b>
	U	1 NO - 1 NC extra late break <sup>2</sup>

<sup>1</sup> EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K.

<sup>2</sup> Blocks cannot be interchanged (stop-start circuit - pull to start, push to stop).

<sup>3</sup> For operator without contact blocks leave position f blank.

Selection Tables

2 & 3 Position Push-Pull Mushroom Head Devices - Non-Illuminated

		2 pos - maintained					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	<b>52PP2W1</b>	52BP2W1	52PP2V1	2BP2V1
	Red	<b>52PP2A2</b>	52BP2A2	<b>52PP2W2</b>	<b>52BP2W2</b>	<b>52PP2V2</b>	52BP2V2
	Green	52PP2A3	52BP2A3	<b>52PP2W3</b>	52BP2W3	52PP2V3	52BP2V3
	Yellow	—	—	52PP2W4	52BP2W4	52PP2V4	52BP2V4
1 NO - 1 NC	Red	<b>52PP2A2A<sup>1</sup></b>	<b>52BP2A2A<sup>1</sup></b>	<b>52PP2W2A<sup>1</sup></b>	<b>52BP2W2A<sup>1</sup></b>	<b>52PP2V2A<sup>1</sup></b>	52BP2V2A <sup>1</sup>
	Green	<b>52PP2A3A</b>	52BP2A3A	<b>52PP2W3A</b>	52BP2W3A	<b>52PP2V3A</b>	—
	Yellow	—	—	<b>52PP2W4A</b>	52BP2W4A	52BP2V4A	52BP2V4A
	Chrome	<b>52PP2ACA</b>	52BP2ACA	—	—	—	—

		3 pos - momentary in - momentary out					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	52PP3W1	52BP3W1	52PP3V1	52BP3V1
	Red	52PP3A2	52BP3A2	<b>52PP3W2</b>	52BP3W2	52PP3V2	52BP3V2
	Green	52PP3A3	52BP3A3	52PP3W3	52BP3W3	52PP3V3	2BP3V3
	Chrome	52PP3AC	52BP3AC	—	—	—	—
1 NO - 1 NCELB	Red	52PP3A2U	52BP3A2U	52PP3W2U	52BP3W2U	52PP3V2U	52BP3V2U
	Green	52PP3A3U	52BP3A3U	52PP3W3U	52BP3W3U	52PP3V3U	52BP3V3U

		3 pos - maintained in - momentary out					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	52PP7W1	52BP7W1	52PP7V1	52BP7V1
	Red	<b>52PP7A2</b>	52BP7A2	52PP7W2	52BP7W2	52PP7V2	52BP7V2
	Green	52PP7A3	52BP7A3	52PP7W3	52BP7W3	52PP7V3	52BP7V3
	Chrome	52PP7AC	52BP7AC	—	—	—	—
1 NO - 1 NCELB	Red	52PP7A2U1	52BP7A2U	52PP7W2U	52BP7W2U	52PP7V2U	52BP7V2U
	Green	52PP7A3U	52BP7A3U	52PP7W3U	52BP7W3U	52PP7V3U	52BP7V3U

Readily available items are in **bold**.  
This is a small representation of stocked items.

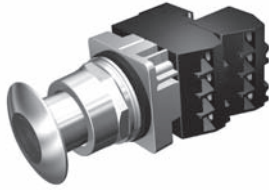
<sup>1</sup> EMERGENCY-STOP control devices according to IEC 60947-5-5

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Illuminated Push Pull & Push Button

### Selection Guide

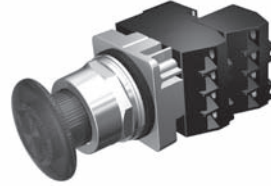
### 2 & 3 Position Push-Pull Mushroom Head Devices - Illuminated



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

Part Number	<b>52</b>	<b>a</b>	<b>P</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>
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a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	P	Push Pull Operator

c	Code	Function
	2	2 positions - maintained <sup>1</sup>
	3	3 positions - momentary in - momentary out <sup>2</sup>
	7	3 positions - maintained in - momentary out <sup>2</sup>

d	Code	Operation	
		Full Voltage <sup>3</sup> (AC/DC)	
		Incandescent	LED <sup>4</sup>
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		Transformer <sup>3</sup>	
	G	120V AC	
	H	240V AC	
	J	480V AC	
	K	600V AC	

e	Code	Style / Color
		<b>Mushroom Head Metal Ø 1 3/4" (44.5mm)</b>
	2	Red <sup>1</sup>
	3	Green
	5	Blue
	9	Amber
	A	Clear
	B	White
		<b>Mushroom Head Plastic Ø 1 3/4" (44.5 mm)</b>
	R	Red <sup>1</sup>
	S	Green
	T	Amber
		<b>Mushroom Head Plastic Ø 2 1/2" (63.5mm)</b>
	D	Red <sup>1</sup>
	E	Green
	F	Amber
		<b>No Head (full voltage &amp; transformer only)</b>
	Z	No head

f	Code	Contact Blocks
		<b>2 Position</b>
	A	1 NO + 1 NC <sup>1</sup>
	B	2 NO - 2 NC <sup>1</sup>
	F	2 NO
	G	2 NC <sup>1</sup>
	J	1 NC <sup>1</sup>
	K	1 NO
	Q	1 NO - 1 NC (ELB)
		<b>3 Position</b>
	U	1 NO - 1 NC extra late break <sup>2</sup>

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED <sup>5</sup>

1 EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks.

Positive opening contacts according to IEC 60947-5-1, Appendix K,

2 Blocks cannot be interchanged (stop-start circuit - pull to start, push to stop).

3 Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "no head".

4 LED voltages apply to table g option code B and Y. 6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

5 Not available in 240V.

Selection Tables

					Operator Type			
					2 pos - maintained			
					Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Type	Lamp Type	Voltage	Color	Contacts	Chrome	Black Max	Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	1 NO - 1 NC	<b>52PP2D2AB<sup>1</sup></b>	<b>52BP2D2AB<sup>1</sup></b>	<b>52PP2DRAB<sup>1</sup></b>	<b>52BP2DRAB<sup>1</sup></b>
			Green	1 NO - 1 NC	<b>52PP2D3AB</b>	<b>52BP2D3AB</b>	52PP2DSAB	52BP2DSAB
	Incandescent	24V	Red	1 NO - 1 NC	<b>52PP2D2A<sup>1</sup></b>	<b>52BP2D2A<sup>1</sup></b>	<b>52PP2DRA<sup>1</sup></b>	<b>52BP2DRA<sup>1</sup></b>
			Green	1 NO - 1 NC	<b>52PP2D3A</b>	<b>52BP2D3A</b>	<b>52PP2DSA</b>	<b>52BP2DSA</b>
		120V	Red	1 NO - 1 NC	52PP2E2A <sup>1</sup>	52BP2E2A <sup>1</sup>	52PP2ERA <sup>1</sup>	52BP2ERA <sup>1</sup>
			—	—	52PP2E2	52BP2E2	52PP2ER	52BP2ER
Transformer (AC)	LED	120V	Red	1 NO - 1 NC	<b>52PP2G2AB<sup>1</sup></b>	<b>52BP2G2AB<sup>1</sup></b>	<b>52PP2GRAB<sup>1</sup></b>	<b>52BP2GRAB<sup>1</sup></b>
			Green	1 NO - 1 NC	<b>52PP2G3AB</b>	<b>52BP2G3AB</b>	52PP2GSAB	52BP2GSAB
	Incandescent	120V	Red	1 NO - 1 NC	<b>52PP2G2A<sup>1</sup></b>	<b>52BP2G2A<sup>1</sup></b>	<b>52PP2GRA<sup>1</sup></b>	<b>52BP2GRA<sup>1</sup></b>
			Green	1 NO - 1 NC	<b>52PP2G3A</b>	<b>52BP2G3A</b>	<b>52PP2GSA</b>	<b>52BP2GSA</b>

					Operator Type			
					3 pos - momentary in - momentary out			
					Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Type	Lamp Type	Voltage	Color	Contacts	Chrome	Black Max	Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Green	1 NO - 1 NCELB	52PP3D3UB	52BP3D3UB	52PP3DRUB	52BP3DRUB
			Green	1 NO - 1 NCELB	52PP3D3U	52BP3D3U	52PP3DSU	52BP3DSU
	Incandescent	24V	Red	1 NO - 1 NCELB	52PP3D2U	52BP3D2U	52PP3DRU	52BP3DRU
			Red	—	52PP3E2	52BP3E2	52PP3ER	52BP3ER
		120V	Red	1 NO - 1 NCELB	52PP3G2UB	52BP3G2UB	52PP3GRUB	52BP3GRUB
			Green	1 NO - 1 NCELB	<b>52PP3G3UB</b>	<b>52BP3G3UB</b>	52PP3GSUB	52BP3GSUB
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB	52PP3G2U	52BP3G2U	52PP3GRU	52BP3GRU
			Green	1 NO - 1 NCELB	52PP3G3U	52BP3G3U	52PP3GRU	52BP3GRU

					Operator Type			
					3 pos - maintained in - momentary out			
					Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Type	Lamp Type	Voltage	Color	Contacts	Chrome	Black Max	Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Green	1 NO - 1 NCELB	52PP7D3UB	52BP7D3UB	52PP7DSUB	52BP7DSUB
			Green	1 NO - 1 NCELB	52PP7D3U	52BP7D3U	52PP7DSU	52BP7DSU
	Incandescent	24V	Red	1 NO - 1 NCELB	52PP7D2U	52BP7D2U	52PP7DRU	52BP7DRU
			Red	—	52PP7E2	52BP7E2	52PP7ER	52BP7ER
		120V	Red	1 NO - 1 NCELB	52PP7G2UB	52BP7G2UB	52PP7GRUB	52BP7GRUB
			Green	1 NO - 1 NCELB	52PP7G3UB	52BP7G3UB	52PP7GSUB	52BP7GSUB
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB	52PP7G2U	52BP7G2U	52PP7GRU	52BP7GRU
			Green	1 NO - 1 NCELB	52PP7G3U	52BP7G3U	52PP7GRU	52BP7GRU

Readily available items are in **bold**.  
This is a small representation of stocked items.

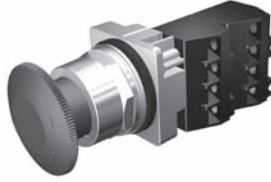
<sup>1</sup> EMERGENCY-STOP control devices according to IEC 60947-5-5

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Non-Illuminated Twist-to-Release

### Selection Guide

#### 2 Position Twist-to-Release Devices Mushroom Head - Non-Illuminated



Plastic 1 3/4" Mushroom Head - Chrome



Plastic 1 3/4" Mushroom Head - Black Max

<b>Part Number</b>	<b>52</b>	<u>    </u> <b>a</b>	<u>    </u> <b>R</b> <b>b</b>	<u>    </u> <b>8</b> <b>c</b>	<u>    </u> <b>W</b> <b>d</b>	<u>    </u> <b>e</b>	<u>    </u> <b>f<sup>2</sup></b>
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Finish	Function	Style	Color	Contacts	Part Number
Chrome	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	1 NO - 1 NC	<b>52PR8W2A</b>
Black Max	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	1 NO - 1 NC	<b>52BR8W2A</b>
Chrome	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	None	52PR8W2

Readily available items are in **bold**.  
This is a small representation of stocked items.

<b>a</b>	<b>Code</b>	<b>Finish</b>
	<b>P</b>	Chrome-Command 52
	<b>B</b>	Epoxy Coated-Black Max
<b>b</b>	<b>Code</b>	<b>Function</b>
	<b>R</b>	2 Position Twist-to-Release, Maintained <sup>1</sup>
<b>c</b>	<b>Code</b>	<b>Style</b>
	<b>8</b>	Plastic 1 3/4" Mushroom Head
<b>d</b>	<b>Code</b>	<b>Lamp Type</b>
	<b>W</b>	Non-Illuminated

<b>e</b>	<b>Code</b>	<b>Color</b>
	<b>2</b>	Red <sup>1</sup>
	<b>3</b>	Green
	<b>4</b>	Yellow
	<b>Z</b>	No head
<b>f<sup>2</sup></b>	<b>Code</b>	<b>Contact Blocks</b>
	<b>A</b>	1 NO + 1 NC <sup>1</sup>
	<b>B</b>	2 NO + 2 NC <sup>1</sup>
	<b>C</b>	3 NO + 3 NC <sup>1</sup>
	<b>D</b>	4 NO + 4 NC <sup>1</sup>
	<b>E</b>	1 NC (LB)
	<b>F</b>	2 NO
	<b>G</b>	2NC <sup>1</sup>
	<b>H</b>	1NO (EM)
	<b>J</b>	1 NC <sup>1</sup>
	<b>K</b>	1 NO

<sup>1</sup> EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K.

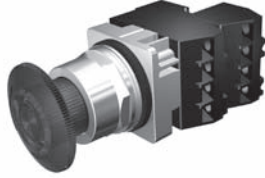
<sup>2</sup> For operator without contact blocks leave position f blank.

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Illuminated Twist-to-Release

### Selection Guide

### 2 Position Twist-to-Release Mushroom Head Devices - Illuminated



Plastic 1 3/4" Mushroom Head - Chrome



Plastic 1 3/4" Mushroom Head - Black Max

Part Number	<b>52</b>	<b>a</b>	<b>R</b>	<b>8</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>
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Finish	Style	Voltage	Bulb Type	Color	Contacts	Part Number
Chrome	Plastic 1 3/4" Mushroom Head	24V	LED	Red	1 NO - 1 NC	52PR8DRAB
Chrome	Plastic 1 3/4" Mushroom Head	120V	Incandescent	Red	1 NO - 1 NC	52PR8ERA
Chrome	Plastic 1 3/4" Mushroom Head	120V	LED	Red	1 NO - 1 NC	52PR8GRAB

Readily available items are in **bold**.  
This is a small representation of stocked items.

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Function
	R	2 Position Twist-to-Release, Maintained

c	Code	Style
	8	Plastic 1 3/4" Mushroom Head

d	Code	Operation	
		Full Voltage <sup>2</sup> (AC/DC)	
		Incandescent	LED <sup>3</sup>
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		Transformer <sup>2</sup>	
	G	120V AC	
	H	240V AC	
	J	480V AC	
	K	600V AC	

e	Code	Color
	R	Red <sup>1</sup>
	S	Green
	T	Amber
	Z	No head

f	Code	Contact Blocks
	A	1 NO + 1 NC <sup>1</sup>
	B	2 NO + 2 NC <sup>1</sup>
	C	3 NO + 3 NC <sup>1</sup>
	D	4 NO + 4 NC <sup>1</sup>
	E	1 NC (LB)
	F	2 NO
	G	2NC <sup>1</sup>
	H	1NO (EM)
	J	1 NC <sup>1</sup>
K	1 NO	

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED <sup>4</sup>

1 EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K, Molded bodies.

2 Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "no head."

3 LED voltages apply to table g option code B and Y. 6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

4 Not available in 240V.

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Indicator Light

### Selection Guide

#### Indicator Light



Plastic Lens



Glass Lens

<b>Part Number</b>	<b>52</b>	<u>    </u> <b>a</b>	<u>    </u> <b>L</b> <b>b</b>	<u>    </u> <b>c</b>	<u>    </u> <b>d</b>	<u>    </u> <b>e</b>	<u>    </u> <b>f</b>
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<b>a</b>	<b>Code</b>	<b>Finish</b>
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

<b>b</b>	<b>Code</b>	<b>Type</b>
	L	Indicator Light

<b>c</b>	<b>Code</b>	<b>Style</b>
	4	Plastic Lens
	5	Glass Lens

<b>d</b>	<b>Code</b>	<b>Operation</b>	
		<b>Full Voltage<sup>1</sup> (AC/DC)</b>	
		<b>Incandescent</b>	<b>LED<sup>2</sup></b>
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		<b>Transformer<sup>1</sup></b>	
	G	120V AC	
	H	240V AC	
	J	480V AC	
	K	600V AC	

<b>e</b>	<b>Code</b>	<b>Color</b>
	2	Red
	3	Green
	5	Blue
	7	All Colors
	9	Amber
	A	Clear
	B	White
N	No Lens	

<b>f</b>	<b>Code</b>	<b>Bulb Type</b>
	Blank	Incandescent
	XB	LED
	XY	Super-Bright LED <sup>3</sup>

<sup>1</sup> Default bulb type is incandescent. For LED options, append field f. LED option not available on units sold "No Lens".

<sup>2</sup> LED voltages apply to table f option code XB and XY. 6V, 24V (Super Bright only) and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

<sup>3</sup> Not available in 240V.



Selection Tables

Indicator Light

Type	Lamp Type	Voltage	Color	Plastic Lens	
				Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	<b>52PL4D2XB</b>	<b>52BL4D2XB</b>
			Green	<b>52PL4D3XB</b>	<b>52BL4D3XB</b>
			Blue	<b>52PL4D5XB</b>	<b>52BL4D5XB</b>
			Amber	<b>52PL4D9XB</b>	<b>52BL4D9XB</b>
			White	<b>52PL4DBXB</b>	<b>52BL4DBXB</b>
		120V	Red	<b>52PL4E2XB</b>	<b>52BL4E2XB</b>
			Green	<b>52PL4E3XB</b>	<b>52BL4E3XB</b>
			Amber	<b>52PL4E9XB</b>	<b>52BL4E9XB</b>
	Incandescent	24V	Clear	<b>52PL4EAXB</b>	<b>52BL4EAXB</b>
			White	<b>52PL4EBXB</b>	<b>52BL4EBXB</b>
			Red	<b>52PL4D2</b>	<b>52BL4D2</b>
			Green	<b>52PL4D3</b>	<b>52BL4D3</b>
			Blue	<b>52PL4D5</b>	<b>52BL4D5</b>
		120V	Amber	<b>52PL4D9</b>	<b>52BL4D9</b>
			White	<b>52PL4DB</b>	<b>52BL4DB</b>
			No Lens	<b>52PL4DN</b>	<b>52BL4DN</b>
Transformer (AC)	LED	120V	Red	<b>52PL4G2XB</b>	<b>52BL4G2XB</b>
			Green	<b>52PL4G3XB</b>	<b>52BL4G3XB</b>
			Amber	<b>52PL4G9XB</b>	<b>52BL4G9XB</b>
			White	<b>52PL4GBXB</b>	<b>52BL4GBXB</b>
		480V	Red	<b>52PL4J2XB</b>	<b>52BL4J2XB</b>
			Green	<b>52PL4J3XB</b>	<b>52BL4J3XB</b>
			White	<b>52PL4JBXB</b>	<b>52BL4JBXB</b>
			No Lens	<b>52PL4GN</b>	<b>52BL4GN</b>
	Incandescent	120V	Red	<b>52PL4G2</b>	<b>52BL4G2</b>
			Green	<b>52PL4G3</b>	<b>52BL4G3</b>
			Amber	<b>52PL4G9</b>	<b>52BL4G9</b>
			White	<b>52PL4GB</b>	<b>52BL4GB</b>
		240V	Red	<b>52PL4H2</b>	<b>52BL4H2</b>
			Green	<b>52PL4H3</b>	<b>52BL4H3</b>
		480V	Red	<b>52PL4J2</b>	<b>52BL4J2</b>
			Green	<b>52PL4J3</b>	<b>52BL4J3</b>
Amber	<b>52PL4J9</b>	<b>52BL4J9</b>			

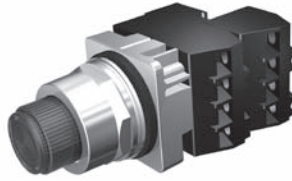
Readily available items are in **bold**.  
This is a small representation of stocked items.

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

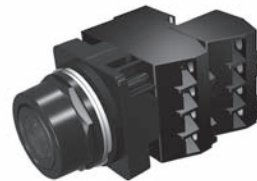
## Illuminated Push Button & Push-to-Test

### Selection Guide

#### Push Button & Push-to-Test - Illuminated



Extended Lens



Flush Lens

Part Number	<b>52</b>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>
		<b>a</b>	<b>T</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>

<b>a</b>	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

<b>b</b>	Code	Function
	T	Illuminated Push Button / Push-to-Test <sup>1</sup>

<b>c</b>	Code	Style
	6	Extended Lens
	8	Flush Lens <sup>2</sup>

<b>d</b>	Code	Operation	
		Full Voltage <sup>3</sup> (AC/DC)	
		Incandescent	LED <sup>4</sup>
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		Transformer <sup>3</sup>	
	G	120V AC	
H	240V AC		
J	480V AC		
K	600V AC		

<b>e</b>	Code	Color
	2	Red
	3	Green
	5	Blue
	7	All Colors
	9	Amber
	A	Clear
	B	White
N	No Lens	

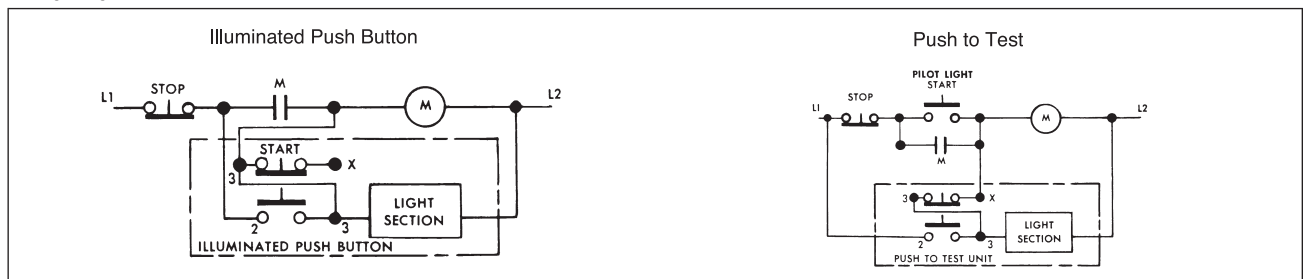
<b>f</b>	Code	Contact Blocks
	A	1 NO - 1 NC
	B	2 NO + 2 NC
	C	3 NO + 3 NC
	D	4 NO + 4 NC
	E	1 NC (LB)
	F	2 NO
	G	2 NC
	H	1NO (EM)
	J	1 NC
	K	1 NO

<b>g</b>	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED <sup>5</sup>

1 For push-to-test functionality, wire according to wiring diagram below.  
 2 Products available fall 2014.

3 Default bulb type is incandescent. For LED options, append field g.  
 LED option not available on units sold "No Lens".  
 4 LED voltages apply to table g option code B and Y.  
 6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.  
 5 Not available in 240V.

#### Wiring Diagrams



Selection Tables

Push Button & Push-to-Test - Illuminated

Type	Lamp Type	Voltage	Color	Contacts	Extended Lens	
					Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	1 NO - 1 NC	<b>52PT6D2AB</b>	<b>52BT6D2AB</b>
			Green	1 NO - 1 NC	<b>52PT6D3AB</b>	<b>52BT6D3AB</b>
			Blue	1 NO - 1 NC	<b>52PT6D5AB</b>	<b>52BT6D5AB</b>
			Amber	1 NO - 1 NC	<b>52PT6D9AB</b>	<b>52BT6D9AB</b>
			White	1 NO - 1 NC	<b>52PT6DBAB</b>	<b>52BT6DBAB</b>
	Incandescent	24V	Red	1 NO - 1 NC	<b>52PT6E2AB</b>	<b>52BT6E2AB</b>
			Green	1 NO - 1 NC	<b>52PT6E3AB</b>	<b>52BT6E3AB</b>
			Red	1 NO - 1 NC	<b>52PT6D2A</b>	<b>52BT6D2A</b>
			Green	1 NO - 1 NC	<b>52PT6D3A</b>	<b>52BT6D3A</b>
			Blue	1 NO - 1 NC	<b>52PT6D5A</b>	<b>52BT6D5A</b>
Transformer (AC)	LED	120V	Amber	1 NO - 1 NC	<b>52PT6D9A</b>	<b>52BT6D9A</b>
			White	1 NO - 1 NC	<b>52PT6DBA</b>	<b>52BT6DBA</b>
			Red	1 NO - 1 NC	<b>52PT6E2A</b>	<b>52BT6E2A</b>
			Green	1 NO - 1 NC	<b>52PT6E3A</b>	<b>52BT6E3A</b>
			Red	1 NO - 1 NC	<b>52PT6G2AB</b>	<b>52BT6G2AB</b>
	Incandescent	120V	Green	1 NO - 1 NC	<b>52PT6G3AB</b>	<b>52BT6G3AB</b>
			Amber	1 NO - 1 NC	<b>52PT6G9AB</b>	<b>52BT6G9AB</b>
			White	1 NO - 1 NC	<b>52PT6GBAB</b>	<b>52BT6GBAB</b>
			Red	1 NO - 1 NC	<b>52PT6H2AB</b>	<b>52BT6H2AB</b>
			Green	1 NO - 1 NC	<b>52PT6H3AB</b>	<b>52BT6H3AB</b>
Incandescent	120V	Red	1 NO - 1 NC	<b>52PT6G2A</b>	<b>52BT6G2A</b>	
		Green	1 NO - 1 NC	<b>52PT6G3A</b>	<b>52BT6G3A</b>	
		Amber	1 NO - 1 NC	<b>52PT6G9A</b>	<b>52BT6G9A</b>	
		White	1 NO - 1 NC	<b>52PT6GBA</b>	<b>52BT6GBA</b>	
		No Lens	1 NO - 1 NC	<b>52PT6GNA</b>	<b>52BT6GNA</b>	
Incandescent	240V	Green	1 NO - 1 NC	<b>52PT6H3A</b>	<b>52BT6H3A</b>	
		Clear	1 NO - 1 NC	<b>52PT6JAA</b>	<b>52BT6JAA</b>	

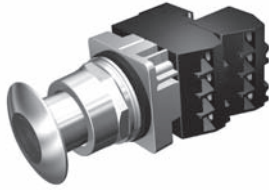
Readily available items are in **bold**.  
This is a small representation of stocked items.

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Illuminated Push Button

### Selection Guide

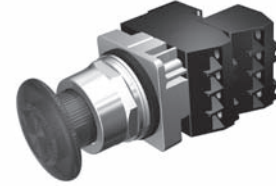
### Push Button Mushroom Head Devices – Illuminated<sup>4</sup>



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

Part Number	<b>52</b>	<b>a</b>	<b>T</b>	<b>9</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>
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a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	T	Push Button Operator

c	Code	Function
	9	2 positions – momentary in

d	Code	Operation
		<b>Full Voltage<sup>2</sup> (AC/DC)</b>
		<b>Incandescent</b> <b>LED<sup>3</sup></b>
	B	6-8V      6V
	C	12-13V      —
	D	24-28V      24-28V
	E	120V      120V
	F	—      240V
		<b>Transformer<sup>2</sup></b>
	G	120V AC
	H	240V AC
	J	480V AC
	K	600V AC

e	Code	Style / Color
		<b>Mushroom Head Metal Ø 1 3/4" (44.5mm)</b>
	2	Red <sup>1</sup>
	3	Green
	5	Blue
	9	Amber
	A	Clear
	B	White
		<b>Mushroom Head Plastic Ø 1 3/4" (44.5 mm)</b>
	R	Red
	S	Green
	T	Amber
		<b>Mushroom Head Plastic Ø 2 1/2" (63.5mm)</b>
	D	Red <sup>1</sup>
	E	Green
	F	Amber
		<b>No Head (full voltage &amp; transformer only)</b>
	Z	No head

f	Code	Contact Blocks
	A	1 NO + 1 NC
	B	2 NO + 2 NC
	C	3 NO + 3 NC
	D	4 NO + 4 NC
	E	1 NC (LB)
	F	2 NO
	G	2 NC
	H	1NO (EM)
	J	1 NC
	K	1 NO

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED <sup>5</sup>

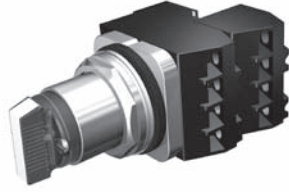
1 Positive opening according to IEC 60947-5-1, Appendix K.  
 2 Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "no head".  
 3 LED voltages apply to table g option code B and Y. 6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.  
 4 Products available fall 2014.  
 5 Not available in 240V.

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Illuminated Selector Switches

### Selection Guide

### Selector Switches – Illuminated



Short Lever – Chrome



Short Lever – Black Max

<b>Part Number</b>	<b>52</b>	<b>S</b>	<b>7</b>						
		<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>

Finish	Style	Cam Type	Function	Color	Contacts	Part Number
Chrome	Maintained	2 Position: CAM A	24-28V AC/DC	No Insert	None	52SA7ADN
Chrome	Maintained	2 Position: CAM A	120V AC (Transformer)	No Insert	None	<b>52SA7AGN</b>
Chrome	Maintained	3 Position: CAM C	120V AC	No Insert	None	<b>52SA7CGN</b>

Readily available items are in **bold**.  
This is a small representation of stocked items.

<b>a</b>	Code	Type
	<b>S</b>	Selector Switch

<b>b</b>	Code	Finish
	<b>A</b>	Chrome - Command 52
	<b>X</b>	Epoxy Coated - Black Max

<b>c</b>	Code	Style
	<b>7</b>	Maintained

<b>d</b>	Code	Function
	<b>A</b>	2 Position: CAM A
	<b>B</b>	3 Position: CAM B
	<b>C</b>	3 Position: CAM C

<b>e</b>	Code	Operation	
		Full Voltage <sup>1</sup> (AC/DC)	
		Incandescent	LED <sup>2</sup>
	<b>B</b>	6-8V	6V
	<b>C</b>	12-13V	—
	<b>D</b>	24-28V	24-28V
	<b>E</b>	120V	120V
	<b>F</b>	—	240V
		Transformer <sup>1</sup>	
	<b>G</b>	120V AC	
	<b>H</b>	240V AC	
	<b>J</b>	480V AC	
	<b>K</b>	600V AC	

<b>f</b>	Code	Color
	<b>2</b>	Red
	<b>3</b>	Green
	<b>5</b>	Blue
	<b>9</b>	Amber
	<b>A</b>	Clear
	<b>N</b>	No Insert

<b>g</b>	Code	Contact Blocks
	<b>A</b>	1 NO - 1 NC
	<b>E</b>	1 NC (LB)
	<b>H</b>	1 NO (EM)
	<b>J</b>	1 NC
	<b>K</b>	1 NO

<b>h</b>	Code	Contact Quantity & Location	
		A CAM & C CAM Left	B CAM Right
	<b>0</b>	1	—
	<b>1</b>	—	1
	<b>3</b>	2	—
	<b>4</b>	—	2

<b>i</b>	Code	Bulb Type
	<b>Blank</b>	Incandescent
	<b>B</b>	LED
	<b>Y</b>	Super-Bright LED <sup>3</sup>

<sup>1</sup> Default bulb type is incandescent. For LED options, append field i.  
LED option not available on units sold "no head".

<sup>2</sup> LED voltages apply to table i option code B and Y.  
6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

<sup>3</sup> Not available in 240V.

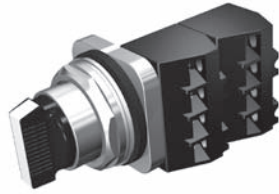
For CAM selection see page 10/216.

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Non-Illuminated Selector Switch

### Selection Guide

### Selector Switch – Non-Illuminated



Short Lever



Long Lever

Part Number	<b>52</b>	<b>S</b>	<b>2</b>					
	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g<sup>2</sup></b>	<b>h<sup>2</sup></b>

a	Code	Type
	S	Selector Switch

b	Code	Finish
	A	Chrome - Short Lever
	B	Chrome - Long Lever
	X	BlackMax - Short Lever
	W	BlackMax - Long Lever

c	Code	Style
	2	Non-Illuminated

d	Code	Function
	A	2 Position: CAM A
	B	3 Position: CAM B
	C	3 Position: CAM C <sup>1</sup>
	D	3 Position: CAM D
	E	3 Position: CAM E
	G	3 Position: CAM G
	H	4 Position: CAM H

e	Code	Type
		<b>2 Position</b>
		Maintained Spring Return
	A	All —
	C	Left Right
		<b>3 Position</b>
		Maintained Spring Return
	A	All —
	B	Center, Right Left
	C	Center, Left Right
	D	Center Left, Right
		<b>4 Position</b>
		Maintained Position Spring Return
	A	All —

f	Code	Color
	2	Red
	3	Green
	4	Yellow
	5	Blue
	6	Gray
	8	Orange
	B	White
	N	No Insert (Black)

g <sup>2</sup>	Code	Contact Blocks
	A	1 NO - 1 NC
	E	1 NC (LB)
	H	1 NO (EM)
	J	1 NC
	K	1 NO

h <sup>2</sup>	Code	Contact Quantity & Location	
		Left	Right
	0	1	—
	1	—	1
	2	1	1
	3	2	—
	4	—	2
	5	2	1
	6	1	2
	7	2	2
	8	3	—
	9	—	3

<sup>1</sup> C CAM on spring return selectors is limited to 4 contact blocks.  
For CAM selection see page 10/216.

<sup>2</sup> For operator without contact blocks leave positions g and h blank.

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Non-Illuminated Selector Switch

### Selector Switch, Non-Illuminated<sup>1)</sup>

Contact Type	Contact	Switch Position		Type M = Maintained S = Spring Return	Chrome		Black Max	
		Left	Right		Short Lever	Long Lever	Short Lever	Long Lever
					<b>2-Position Operator</b>			
No Contacts	—	—	—	M M	<b>52SA2AAB</b>	<b>52SB2AAB</b>	<b>52SX2AAB</b>	<b>52SW2AAB</b>
				M<---S	<b>52SA2ACB</b>	<b>52SB2ACB</b>	<b>52SX2ACB</b>	<b>52SW2ACB</b>
1 N.O.	A	O	X	M M	<b>52SA2AABK1</b>	<b>52SB2AABK1</b>	<b>52SX2AABK1</b>	<b>52SW2AABK1</b>
				M<---S	<b>52SA2ACBK1</b>	<b>52SB2ACBK1</b>	<b>52SX2ACBK1</b>	<b>52SW2ACBK1</b>
1 N.O.	A	O	X	M M	<b>52SA2AABA1</b>	<b>52SB2AABA1</b>	<b>52SX2AABA1</b>	<b>52SW2AABA1</b>
1 N.C.	B	X	O	M<---S	<b>52SA2ACBA1</b>	<b>52SB2ACBA1</b>	<b>52SX2ACBA1</b>	<b>52SW2ACBA1</b>

Contact Type	Contact	Switch Position			Type M = Maintained S = Spring Return	Chrome		Black Max	
		Left	Center	Right		Short Lever	Long Lever	Short Lever	Long Lever
						<b>3-Position Operator</b>			
No Contacts	—	—	—	—	M M M	<b>52SA2CAB</b>	<b>52SB2CAB</b>	<b>52SX2CAB</b>	<b>52SW2CAB</b>
					M M M	<b>52SA2BAB</b>	<b>52SB2BAB</b>	<b>52SX2BAB</b>	<b>52SW2BAB</b>
					S--->M M	<b>52SA2BBB</b>	<b>52SB2BBB</b>	<b>52SX2BBB</b>	<b>52SW2BBB</b>
					M M<---S	<b>52SA2BCB</b>	<b>52SB2BCB</b>	<b>52SX2BCB</b>	<b>52SW2BCB</b>
					S--->M<---S	<b>52SA2BDB</b>	<b>52SB2BDB</b>	<b>52SX2BDB</b>	<b>52SW2BDB</b>
1 N.O.	A	O	O	X	M M M	<b>52SA2CABA1</b>	<b>52SB2CABA1</b>	<b>52SX2CABA1</b>	<b>52SW2CABA1</b>
					S--->M M	<b>52SA2CBBA1</b>	<b>52SB2CBBA1</b>	<b>52SX2CBBA1</b>	<b>52SW2CBBA1</b>
1 N.C.	B	X	O	O	M M<---S	<b>52SA2CCBA1</b>	<b>52SB2CCBA1</b>	<b>52SX2CCBA1</b>	<b>52SW2CCBA1</b>
					S--->M<---S	<b>52SA2CDBA1</b>	<b>52SB2CDBA1</b>	<b>52SX2CDBA1</b>	<b>52SW2CDBA1</b>
1 N.O.	A	O	O	X	M M M	<b>52SA2CABA2</b>	<b>52SB2CABA2</b>	<b>52SX2CABA2</b>	<b>52SW2CABA2</b>
1 N.C.	B	X	O	O	S--->M M	<b>52SA2CBBA2</b>	<b>52SB2CBBA2</b>	<b>52SX2CBBA2</b>	<b>52SW2CBBA2</b>
1 N.O.	C	O	O	X	M M<---S	<b>52SA2CCBA2</b>	<b>52SB2CCBA2</b>	<b>52SX2CCBA2</b>	<b>52SW2CCBA2</b>
1 N.C.	D	X	O	O	S--->M<---S	<b>52SA2CDBA2</b>	<b>52SB2CDBA2</b>	<b>52SX2CDBA2</b>	<b>52SW2CDBA2</b>
1 N.O.	A	O	O	X	M M M	<b>52SA2GABJ2K1</b>	<b>52SB2GABJ2K1</b>	<b>52SX2GABJ2K1</b>	<b>52SW2GABJ2K1</b>
1 N.C.	B	X	O	O	M M M	<b>52SA2GABJ2K1</b>	<b>52SB2GABJ2K1</b>	<b>52SX2GABJ2K1</b>	<b>52SW2GABJ2K1</b>
1 N.C.	C	O	X	O	M M M	<b>52SA2GABJ2K1</b>	<b>52SB2GABJ2K1</b>	<b>52SX2GABJ2K1</b>	<b>52SW2GABJ2K1</b>

Contact Type	Contact	Switch Position				Type M = Maintained S = Spring Return	Chrome		Black Max	
		Left	Center	Right	Center		Short Lever	Long Lever	Short Lever	Long Lever
							<b>4-Position Operator</b>			
No Contacts	—	—	—	—	—	M M M M	<b>52SA2HAB</b>	<b>52SB2HAB</b>	<b>52SX2HAB</b>	<b>52SW2HAB</b>
1 N.O.	A	X	O	O	O	M M M M	<b>52SA2HABJ2K1</b>	<b>52SB2HABJ2K1</b>	<b>52SX2HABJ2K1</b>	<b>52SW2HABJ2K1</b>
1 N.C.	B	O	X	O	O	M M M M	<b>52SA2HABJ2K1</b>	<b>52SB2HABJ2K1</b>	<b>52SX2HABJ2K1</b>	<b>52SW2HABJ2K1</b>
1 N.C.	C	O	O	X	O	M M M M	<b>52SA2HABJ2K1</b>	<b>52SB2HABJ2K1</b>	<b>52SX2HABJ2K1</b>	<b>52SW2HABJ2K1</b>
1 N.O.	A	O	O	O	X	M M M M	<b>52SA2HABJ2K2</b>	<b>52SB2HABJ2K2</b>	<b>52SX2HABJ2K2</b>	<b>52SW2HABJ2K2</b>
1 N.O.	B	X	O	O	O	M M M M	<b>52SA2HABJ2K2</b>	<b>52SB2HABJ2K2</b>	<b>52SX2HABJ2K2</b>	<b>52SW2HABJ2K2</b>
1 N.C.	C	O	X	O	O	M M M M	<b>52SA2HABJ2K2</b>	<b>52SB2HABJ2K2</b>	<b>52SX2HABJ2K2</b>	<b>52SW2HABJ2K2</b>
1 N.C.	D	O	O	X	O	M M M M	<b>52SA2HABJ2K2</b>	<b>52SB2HABJ2K2</b>	<b>52SX2HABJ2K2</b>	<b>52SW2HABJ2K2</b>

Note: X = Closed / O = Open

1) Readily available items are in **bold**.

This is a small representation of stocked items.

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Keyed Selector Switch

### Selection Guide

### Keyed Selector Switch

Part Number	<b>52</b>	<b>S</b>	<b>C</b>						
		<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f<sup>3</sup></b>	<b>g<sup>3</sup></b>	<b>h</b>

<b>a</b>	<b>Code</b>	<b>Type</b>
	S	Selector Switch

<b>b</b>	<b>Code</b>	<b>Finish</b>
	C	Chrome – Command 52

<b>c</b>	<b>Code</b>	<b>Style</b>
	5	Non-Standard Lock/Key <sup>1a</sup>
	6	Standard Lock/Key

<b>d</b>	<b>Code</b>	<b>Function</b>
	A	2 Position: CAM A
	B	3 Position: CAM B
	C	3 Position: CAM C <sup>2</sup>
	D	3 Position: CAM D
	E	3 Position: CAM E
	G	3 Position: CAM G
	H	4 Position: CAM H

<b>e</b>	<b>Code</b>	<b>Lock Type</b>		
		2 Position		
		Maintained / Spring Return	Key Removal	
			Left	Right
	E	All Maintained	X	X
	F	All Maintained	X	—
	G	All Maintained	—	X
	X	Spring from Right	X	—

<b>e</b>		3 Position				
		Maintained Position	Spring Return	Key Removal		
				Left	Center	Right
	E	All	—	X	X	X
	F	All	—	X	—	—
	G	All	—	—	—	X
	H	All	—	—	X	—
	J	All	—	X	—	X
	K	All	—	X	X	—
	M	All	—	—	X	X
	T	Center, Right	Left	—	X	—
	U	Left, Center	Right	—	X	—
	V	Center	Left, Right	—	X	—
	W	Center, Right	Left	—	—	X
Y	Center, Right	Left	—	X	X	
Z	Left, Center	Right	X	X	X	

<b>e</b>		4 Position				
		Maintained Position	Key Removal			
			Left	Left Center	Right Center	Right
	E	All	X	X	X	X
	F	All	X	—	—	—
G	All	—	—	—	X	

<b>f<sup>3</sup></b>	<b>Code</b>	<b>Contact Blocks</b>
	A	1 NO - 1 NC
	J	1 NC
	K	1 NO
	E	1 NC (LB)
H	1 NO (EM)	

<b>g<sup>3</sup></b>	<b>Code</b>	<b>Contact Quantity &amp; Location</b>	
		Left	Right
	0	1	—
	1	—	1
	2	1	1
	3	2	—
	4	—	2
	5	2	1
	6	1	2
	7	2	2
8	3	—	
9	—	3	

<b>h</b>	<b>Code</b>	<b>Key Type<sup>1b</sup></b>
	Blank	501CH
	X298	550CH
	X299	549CH
	X300	548CH
	X301	547CH
X302	506CH	



Standard Lock/Key

1a. See page 10/213 for replacement keys, and up-to 15 additional uniquely keyed M - Series Lock Options available for use with the 52SC6 key-operated selector switches.

1b. To order the specific lock types shown in table h, simply append the corresponding "X" suffix to a standard part number (Ordering Example: 52SC6AEX298).

Note: Same list price applies as standard keyed locks.

2. C CAM on spring return selectors is limited to 4 contact blocks. For CAM selection see page 10/216.

3 For operator without contact blocks leave positions f and g blank.



# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Keyed Selector Switch

### Key-operated Selector Switch, Non-Illuminated<sup>1)</sup>

Contact Type	Contact	Switch Position		Type	Key Removal	
		Left	Right	M = Maintained S = Spring Return	Left	Both
					<b>2-Position Operator</b>	
No Contacts	—	—	—	M M	<b>52SC6AF</b>	<b>52SC6AE</b>
				M<---S	<b>52SC6AX</b>	—
1 N.O.	A	O	X	M M	<b>52SC6AFK1</b>	<b>52SC6AEK1</b>
				M<---S	<b>52SC6AXK1</b>	—
1 N.O.	A	O	X	M M	<b>52SC6AFA1</b>	<b>52SC6AEA1</b>
1 N.C.	B	X	O	M<---S	<b>52SC6AXA1</b>	—

Contact Type	Contact	Switch Position			Type	Key Removal							
		Left	Center	Right	M = Maintained S = Spring Return	Left	Right	Center	Left & Center	Left & Right	Center & Right	All Positions	
						<b>3-Position Operator</b>							
No Contacts	—	—	—	—	M M M	52SC6CF	52SC6CG	52SC6CH	52SC6CK	52SC6CJ	52SC6CM	<b>52SC6CE</b>	
					M M M	<b>52SC6BF</b>	<b>52SC6BG</b>	52SC6BH	52SC6BK	52SC6BJ	52SC6BM	<b>52SC6BE</b>	
					S--->M M	—	—	52SC6BW	52SC6BT	—	—	52SC6BY	—
					M M<----S	—	—	52SC6BU	52SC6BZ	—	—	—	—
					S--->M<---S	—	—	52SC6BV	—	—	—	—	—
1 N.O.	A	O	O	X	M M M	52SC6CFA1	52SC6CGA1	52SC6CHA1	52SC6CKA1	52SC6CJA1	52SC6CMA1	<b>52SC6CEA1</b>	
					S--->M M	—	—	52SC6CWA1	52SC6CTA1	—	—	52SC6CYA1	—
					M M<----S	—	—	52SC6CUA1	52SC6CZA1	—	—	—	—
1 N.C.	B	X	O	O	S--->M<---S	—	—	52SC6CVA1	—	—	—	—	
					M M M	52SC6CFA2	52SC6CGA2	52SC6CHA2	52SC6CKA2	52SC6CJA2	52SC6CMA2	<b>52SC6CEA2</b>	
1 N.C.	B	X	O	O	S--->M M	—	—	52SC6CWA2	52SC6CTA2	—	—	52SC6CYA2	—
1 N.O.	C	O	O	X	M M<----S	—	—	52SC6CUA2	52SC6CZA2	—	—	—	
1 N.C.	D	X	O	O	S--->M<---S	—	—	52SC6CVA2	—	—	—	—	
1 N.O.	A	O	O	X	M M M	52SC6GFJ2K1	52SC6GGJ2K1	52SC6GHJ2K1	52SC6GKJ2K1	52SC6GJJ2K1	52SC6GMJ2K1	<b>52SC6GEJ2K1</b>	
1 N.C.	B	X	O	O	M M M	52SC6GFJ2K1	52SC6GGJ2K1	52SC6GHJ2K1	52SC6GKJ2K1	52SC6GJJ2K1	52SC6GMJ2K1	<b>52SC6GEJ2K1</b>	
1 N.C.	C	O	X	O	M M M	52SC6GFJ2K1	52SC6GGJ2K1	52SC6GHJ2K1	52SC6GKJ2K1	52SC6GJJ2K1	52SC6GMJ2K1	<b>52SC6GEJ2K1</b>	

Contact Type	Contact	Switch Position				Type	Key Removal	
		Left	Left Center	Right Center	Right	M = Maintained S = Spring Return	Right	All Positions
							<b>4-Position Operator</b>	
No Contacts	—	—	—	—	—	M M M M	<b>52SC6HG</b>	52SC6HE
1 N.O.	A	X	O	O	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.C.	B	O	X	O	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.C.	C	O	O	X	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.O.	A	O	O	O	X	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.O.	B	X	O	O	O	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.C.	C	O	X	O	O	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.C.	D	O	O	X	O	M M M M	52SC6HGJ2K2	52SC6HEJ2K2

Note: X = Closed / O = Open

All Operators listed above are furnished with Lock No. 501CH

1) Readily available items are in bold.

This is a small representation of stocked items.

# Actuators and Indicators, Customized Designs

## Special locks

### Options

#### Special locks for key-operated switches

Siemens Key-Operated Selector Switches beginning with 51SA6 or 52SC6 can be optionally ordered with the 15 uniquely keyed M-Series Locks by appending the corresponding "X" suffixes from the table below to the catalog number. (Ordering Example for Lock Number M705: 52SC6CEX705).

Note: Pricing for M - Series Locks on this page are slightly higher than standard lock types.

Suffix Code	Lock Number
X705	M705
X709	M709
X713	M713
X714	M714
X715	M715
X723	M723
X725	M725
X738	M738
X749	M749
X750	M750
X757	M757
X766	M766
X779	M779
X782	M782
X795	M795

#### Spare Keys for Key-Operated Selector Switches

Spare Key	Part Number
550CH (1 Key)	52KEY-550CH
549CH (1 Key)	52KEY-549CH
548CH (1 Key)	52KEY-548CH
547CH (1 Key)	52KEY-547CH
501CH (1 Key)	52KEY-501CH
506CH (1 Key)	52KEY-506CH
M703 (1 Key)	52KEY-M703
M705 (1 Key)	52KEY-M705
M706 (1 Key)	52KEY-M706
M709 (1 Key)	52KEY-M709
M712 (1 Key)	52KEY-M712
M713 (1 Key)	52KEY-M713
M714 (1 Key)	52KEY-M714
M715 (1 Key)	52KEY-M715
M716 (1 Key)	52KEY-M716
M717 (1 Key)	52KEY-M717
M723 (1 Key)	52KEY-M723
M725 (1 Key)	52KEY-M725
M728 (1 Key)	52KEY-M728
M730 (1 Key)	52KEY-M730
M735 (1 Key)	52KEY-M735
M736 (1 Key)	52KEY-M736
M738 (1 Key)	52KEY-M738
M747 (1 Key)	52KEY-M747
M749 (1 Key)	52KEY-M749
M750 (1 Key)	52KEY-M750
M752 (1 Key)	52KEY-M752
M753 (1 Key)	52KEY-M753
M756 (1 Key)	52KEY-M756
M757 (1 Key)	52KEY-M757
M759 (1 Key)	52KEY-M759
M766 (1 Key)	52KEY-M766
M769 (1 Key)	52KEY-M769
M771 (1 Key)	52KEY-M771
M779 (1 Key)	52KEY-M779
M784 (1 Key)	52KEY-M784
M790 (1 Key)	52KEY-M790
M795 (1 Key)	52KEY-M795
M700 (1 Key)	52KEY-M700
M701 (1 Key)	52KEY-M701
M702 (1 Key)	52KEY-M702
M704 (1 Key)	52KEY-M704
M705 (1 Key)	52KEY-M705
M707 (1 Key)	52KEY-M707
M711 (1 Key)	52KEY-M711
M713 (1 Key)	52KEY-M713
M715 (1 Key)	52KEY-M715
M782 (1 Key)	52KEY-M782
M795 (1 Key)	52KEY-M795

# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Selector Push Button

### Selection Guide

### Selector Push Button

<b>Part Number</b>	<b>52</b>	<b>S</b> a	<b>A</b> b	c	d	e	f <sup>1</sup>
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Selector Push Buttons

Finish	Style	Function	Color	Contacts	Part Number
Chrome	Flush Selector Push Button	2 Position CAM Q	Black	None	<b>52SA3Q1</b>
Chrome	Flush Selector Push Button	2 Position CAM R	Black	None	52SA3R1
Chrome	Flush Selector Push Button	2 Position CAM P	Black	None	52SA3P1

Readily available items are in **bold**.  
This is a small representation of stocked items.





<b>a</b>	<b>Code</b>	<b>Type</b>
	S	Selector Push Buttons
<b>b</b>	<b>Code</b>	<b>Finish</b>
	A	Chrome - Command 52
<b>c</b>	<b>Code</b>	<b>Style</b>
	3	Flush Button
	4	Extended Button - 1/2"

<b>d</b>	<b>Code</b>	<b>Function</b>
	P	2 Position: CAM P
	Q	2 Position: CAM Q
	R	2 Position: CAM R
<b>e</b>	<b>Code</b>	<b>Color</b>
	1	Black
	2	Red

f <sup>1</sup>	Code		Contact Blocks						Contact Blocks	Mounting Position
			CAM P (2 Selector Position)							
		Left		Center		Right				
		N	D	N/A	N/A	N	D			
	J0	X	O	—	—	O	O	NC	Left	
	K0	O	X	—	—	X	X	NO	Left	
		Left		Center		Right				
		N	D	N/A	N/A	N	D			
	J0	X	X	—	—	O	O	NC	Left	
	J1	X	O	—	—	O	O	NC	Right	
	K0	O	O	—	—	O	X	NO	Left	
	K1	O	X	—	—	O	X	NO	Right	
		Left		Center		Right				
		N	D	N/A	N/A	N	D			
	J0	X	X	—	—	X	O	NC	Left	
	J1	X	O	—	—	X	X	NC	Left	
	K0	O	O	—	—	O	X	NO	Right	
	K1	O	X	—	—	O	O	NO	Right	
		Left		Center		Right				
		N	D	N	D	N	D			
	J0	X	O	O	O	O	O	NC	Left	
	J1	X	O	X	X	O	O	NC	Right	
	K0	O	O	O	X	O	X	NO	Left	
	K1	O	X	O	O	O	X	NO	Right	

Note: X = Closed / O = Open      1 For operator without contact blocks leave position f blank

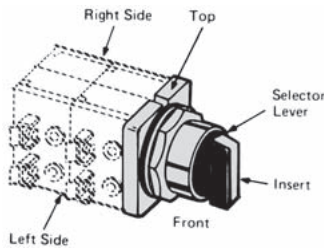
Selection and ordering data

	Version	Ohms / color	Order no.	Pack			
	Potentiometer operator 2 Watts, 500 V AC/DC (NEMA Type 4)	50 150 250 500 750 1 K 2.5 K 5 K 10 K 15 K 25 K 50 K 100 K 150 K 250 K 500 K 1 M 1.5 M 2 M 5 M	<b>52MA3B01</b> <b>52MA3B03</b> <b>52MA3B04</b> <b>52MA3B06</b> <b>52MA3B07</b> <b>52MA3B08</b> <b>52MA3B10</b> <b>52MA3B12</b> <b>52MA3B14</b> <b>52MA3B15</b> <b>52MA3B16</b> <b>52MA3B18</b> <b>52MA3B20</b> <b>52MA3B21</b> <b>52MA3B22</b> <b>52MA3B24</b> <b>52MA3B26</b> <b>52MA3B27</b> <b>52MA3B28</b> <b>52MA3B31</b>	1			
		2 Button maintained operator	black (flush) / red (flush) black (flush) / red (extended) black (flush) / yellow (mushroom) green (flush) / red (flush) green (flush) / red (extended) green (flush) / red (mushroom) green (flush) / green (mushroom)	<b>52MP2A1A2</b> <b>52MP2A1B2</b> <b>52MP2A1W4</b> <b>52MP2A3A2</b> <b>52MP2A3B2</b> <b>52MP2A3W2</b> <b>52MP2A3W3</b>	1		
		Button remains depressed when pushed	less caps	<b>52MP2</b>			
			Wobble stick 2.5" operator For use with 52BAJ (NC) contact block	red green grey	<b>52ABW2</b> <sup>①</sup> <b>52ABW3</b> <sup>①</sup> <b>52ABW6</b> <sup>①</sup>	1	
				Maintained toggle operator		<b>52ABT</b>	1

① For use with 52BAJ (NC) contact block

## Cam selection

### Selection and ordering data



#### Ordering Information

- Contact blocks are ordered separately, [see page 10/216](#)
- Determine which table to use based upon the type of selector (non-illum selector switch-top, illum selector switch-middle, and selector pushbutton-bottom).
- Find the correct number of selector positions (2, 3 or 4 positions).
- Select the contact operation required for each selector position. X indicates the contacts are closed, while O indicates the contacts are open. (For the selector pushbutton, N=normal and D=depressed).
- Contact block must be assembled in position shown for each circuit application.
- Identify the CAM letter required for the chosen contact operation (only 1 CAM can be used per selector switch or selector pushbutton).
- Contact blocks must be assembled in the position shown for each circuit application. The mounting position is viewed from the front of the device.

#### Ordering CAMs D, E or G

- CAM D, E or G may be ordered at the same price by changing the 6th character of the selector catalog number. Example: Selector with D cam **52SX2DAB**.

#### Size Requirements

- C CAM on spring return selectors is limited to 4 contact blocks.
- Selector operators in enclosures are limited to depth of 1 contact block. (2 blocks wide).

### Non-illuminated and keyed selector switches (viewed from front)

2 Selector Positions				Contact Blocks	CAM	Mounting		
Left		Right	Left			Right		
X		O		NC (52BAJ)	A	L	or R	
O		X		NO (52BAK)	A	L	or R	
3 Selector Positions				Contact Blocks	CAM	Mounting		
Left	Center	Right	Left			Right		
X		O		NO (52BAK)	B		R	
O		X		NO (52BAK)	B	L		
X	X	O		NC (52BAJ)	B	L		
O	X	X		NC (52BAJ)	B		R	
X	O	X		2NO (2-52BAK)	B	L	and R	
X	O	O		NC (52BAJ)	C	L	or R	
O	O	X		NO (52BAK)	C	L	or R	
O	X	O		NC (52BAJ)	D	L	or R	
O	O	X		NO (52BAK)	D	L	or R	
X	O	O		NO (52BAK)	E	L	or R	
O	X	O		NC (52BAJ)	E	L	or R	
X	O	O		NC (52BAJ)	G	L		
O	X	O		NC (52BAJ)	G		R	
O	O	X		NO (52BAK)	G	L	or R	
4 Selector Positions					Contact Blocks	CAM	Mounting	
Left	Left Center	Right Center	Right	Left			Right	
X	O	O	O	NO (52BAK)	H		R	
O	X	O	O	NC (52BAJ)	H	L		
O	O	X	O	NC (52BAJ)	H		R	
O	O	O	X	NO (52BAK)	H	L		

### Illuminated selector switches (viewed from front)

2 Selector Positions				Contact Blocks	CAM	Mounting	
Left		Right	Left			Right	
X		O		NC (52BAJ)	A	L	
O		X		NO (52BAK)	A	L	
3 Selector Positions				Contact Blocks	CAM	Mounting	
Left	Center	Right	Left			Right	
O	O	X		NC (52BAJ)	B		R
O	X	O		NO (52BAK)	B		R
X	O	O		NC (52BAJ)	C	L	
O	O	X		NO (52BAK)	C	L	

### Selector Pushbuttons (viewed from front)

2 Selector Positions						Contact Blocks	CAM	Mounting	
Left		Right		Left	Right				
N	D	N	D						
X	O	O	O	NC (52BAJ)	Q				R
X	X	O	O	NC (52BAJ)	Q	L			
O	X	O	X	NO (52BAK)	Q				R
O	O	O	X	NO (52BAK)	Q	L			
X	O	O	O	NC (52BAJ)	P	L	or		R
O	X	X	X	NO (52BAK)	P	L	or		R
X	X	X	O	NC (52BAJ)	R	L			
X	O	X	X	NC (52BAJ)	R				R
O	X	O	O	NO (52BAK)	R				R
O	O	O	X	NO (52BAK)	R	L			
3 Selector Positions						Contact Blocks	CAM	Mounting	
Left		Center		Right				Left	Right
N	D	N	D	N	D				
X	O	O	O	O	O	NC (52BAJ)	S	L	
X	O	X	X	O	O	NC (52BAJ)	S		R
O	X	O	O	O	X	NO (52BAK)	S		R
O	O	O	X	O	X	NO (52BAK)	S	L	

### Selection and ordering data

#### Assembled Non-illuminated Selector Switches







- Determine contact block and location from above.
- Select block suffix. Ex: **J = 52BAJ**.
- Now select position suffix.
- **1-52BAJ** block mounted on right side, suffix will be **J 1**.
- Additional suffixes allow for multiple quantities and locations.
- Repeat process for next block if required.
- Add list price of blocks to operator list price.
- Consult factory for delivery.

**Example 1:**     X O O  
                   O O X  
 HAND-OFF-AUTO Maintained Switch  
 Catalog No **52SA2CAB A 1 = 52A2CABA1**  
 (**52BJK** block mounted on right side)

**Example 2:**     X O O **52BAJ (L)**  
                   O X O **52BAJ (R)**  
                   O O X **52BAK (L or R) }K1**  
 G Cam required  
 Catalog No **52SA2GAB J2 K1 = 52SA2GABJ2K1**

Block Suffix	Position Suffix	
	Suffix	Quantity and Location
		Left      Right
A = 1 NO - 1 NC, <b>52BJK</b>	0	1      —
E = NC Late Break, <b>52BAE</b>	1	—      1
H = NO Early Make, <b>52BAH</b>	2	1      1
J = NC, <b>52BAJ</b>	3	2      —
K = NO, <b>52BAK</b>	4	—      2
	5	2      1
	6	1      2
	7	2      2
	8	3      —
	9	—      3

Selection and ordering data








Version	Suitable for	Color	Order no.
 <p><b>Flush actuator lens cap</b> The 52RC1 Screw-on style caps shown are used on the new 52BM8 &amp; 52PM8 Pushbutton Operators. To order Snap-on style replacement caps for the old style 52PA8 &amp; 52PX8 Pushbutton Operators change the 4th character from "C" to "A" (i.e. 52RA1A1).</p>	For flush type, non-illuminated pushbuttons bag of 5 caps	black red green yellow blue gray orange kit- all colors	52RC1A1 52RC1A2 52RC1A3 52RC1A4 52RC1A5 52RC1A6 52RC1A8 52RC1AN
 <p><b>Extended actuator lens cap</b> The 52RC1 Screw-on style caps shown are used on the new 52BM8 &amp; 52PM8 Pushbutton Operators. To order Snap-on style replacement caps for the old style 52PA8 &amp; 52PX8 Pushbutton Operators change the 4th character from "C" to "A" (i.e. 52RA1B1).</p>	For extended type, non-illuminated pushbuttons bag of 5 caps	black red green yellow blue gray orange 1 of each color cap	52RC1B1 52RC1B2 52RC1B3 52RC1B4 52RC1B5 52RC1B6 52RC1B8 52RC1BN
 <p><b>Mushroom head cap - Plastic set-screw type</b> replacement caps are for discontinued 52PB9 and 52PX9 operators only</p>	For large 2 1/2"(63.5mm) type, set screw non-illuminated mushroom pushbuttons	black red green yellow blue gray orange 1 kit of each color cap	52RB3E1 52RB3E2 52RB3E3 52RB3E4 52RB3E5 52RB3E6 52RB3E8 52RB3EN
	For small 1 5/8"(41.3mm) type, non-illuminated mushroom pushbuttons	black red green yellow blue gray orange 1 of each color cap	52RB3D1 52RB3D2 52RB3D3 52RB3D4 52RB3D5 52RB3D6 52RB3D8 52RB3DN
 <p><b>Mushroom head cap - Metal set-screw type</b></p>	For small 1 5/8"(41.3mm) type, set screw non-illuminated mushroom pushbuttons	chrome red green	52RB3FC 52RB3F2 52RB3F3
 <p><b>Replacement Lens for Indicator Lights</b></p>	For catalog numbers starting with 52PL or 52BL <sup>①②</sup>		
	Plastic	red green blue amber clear white 1 of each color	52RA4S2 52RA4S3 52RA4S5 52RA4S9 52RA4SA 52RA4SB 52RA4SN
	Glass	red green blue amber clear white 1 of each color	52RA4T2 52RA4T3 52RA4T5 52RA4T9 52RA4TA 52RA4TB 52RA4TN
 <p><b>Replacement Lens for Push to Test/Illuminated Pushbuttons</b> The 52RA5S Raised lens caps shown are used on the 52BT6 &amp; 52PT6 PTT/Illuminated Pushbutton Operators. To order Flush lens caps for the new style 52BT8 &amp; 52PT8 PTT/Illuminated Pushbutton Operators change the 52RA5S prefix to 52RC5P (i.e. 52RC5P2).</p>	For catalog numbers starting with 52PT or 52BT <sup>③</sup>		
	Plastic	red green blue amber clear white	52RA5S2 52RA5S3 52RA5S5 52RA5S9 52RA5SA 52RA5SB

① To order replacement lens for indicator lights starting with 52PA, 52PE, or 52PX, change the 6th digit to P for plastic and G for glass.

② It is possible to retrofit catalog numbers starting with 52PA, 52PE and 52PX with the replacement lens. The new lens have concentric ribs for improved light distribution.

③ To order replacement lens for push to test / illuminated pushbuttons starting with 52PA, 52PE, or 52PX, change the 6th digit to a P.

**Selection and ordering data**

Version	Suitable for	Color	Order no.
<b>Mushroom head push pull illuminated plastic screw-on type</b>	For small 1 3/4" type, push-pull units	red green amber	<b>52RC3JR</b> <b>52RC3JS</b> <b>52RC3JT</b>
	For large 2 1/2" type, push-pull units	red green amber	<b>52RC3KR</b> <b>52RC3KS</b> <b>52RC3KT</b>
	Chrome, for small 1 3/4" type, push-pull units	red green amber white	<b>52RB3H2</b> <b>52RB3H3</b> <b>52RB3H9</b> <b>52RB3HB</b>
	BlackMax, for small 1 3/4" type, push-pull units	red green amber white	<b>52RX3H2</b> <b>52RX3H3</b> <b>52RX3H9</b> <b>52RX3HB</b>
	For small 1 3/4" type, push-pull units (catalog numbers starting with 52PP, 52BP, 52PM9 or 52BM9)①	black red green yellow blue gray orange 1 of each color	<b>52RC3D1</b> <b>52RC3D2</b> <b>52RC3D3</b> <b>52RC3D4</b> <b>52RC3D5</b> <b>52RC3D6</b> <b>52RC3D8</b> <b>52RC3DN</b>
	For large 2 1/2" type, push-pull units (catalog numbers starting with 52PP, 52BP, 52PM9 or 52BM9)①	black red green yellow blue gray orange 1 of each color	<b>52RC3E1</b> <b>52RC3E2</b> <b>52RC3E3</b> <b>52RC3E4</b> <b>52RC3E5</b> <b>52RC3E6</b> <b>52RC3E8</b> <b>52RC3EN</b>
	<b>Mushroom head push pull non-illuminated metal screw-on type</b>	For small 1 3/4" type, push-pull units (catalog numbers starting with 52PP or 52BP)①	red green chrome <b>52RC3F2</b> <b>52RC3F3</b> <b>52RC3FC</b>
	<b>Twist to release head illuminated plastic screw-on type</b>	For small twist to release units	red green amber <b>52RC3RR</b> <b>52RC3RS</b> <b>52RC3RT</b>
	<b>Twist to release head non-illuminated plastic screw-on type</b>	For small twist to release units	red green yellow <b>52RC3R2</b> <b>52RC3R3</b> <b>52RC3R4</b>
	<b>Replacement lens kit for illuminated selector switches (Knob with Insert)</b>	red green blue amber clear white <b>52RA6P2</b> <b>52RA6P3</b> <b>52RA6P5</b> <b>52RA6P9</b> <b>52RA6PA</b> <b>52RA6PB</b>	
	<b>Lever inserts</b>		
	<b>Short lever</b>	red green yellow blue gray orange white red green yellow blue gray orange white	<b>52RA2A2</b> <b>52RA2A3</b> <b>52RA2A4</b> <b>52RA2A5</b> <b>52RA2A6</b> <b>52RA2A8</b> <b>52RA2AB</b> <b>52RA2B2</b> <b>52RA2B3</b> <b>52RA2B4</b> <b>52RA2B5</b> <b>52RA2B6</b> <b>52RA2B8</b> <b>52RA2BB</b>
<b>Long lever</b>			













① For push-pull units whose catalog numbers that start with 52PX, 52PA or 52PE, replacement heads are available. Order from the 52RB type "Mushroom head pushbutton cap" section on page 10/216.



# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Accessories and spare parts

### Selection and ordering data

Version	Suitable for	Color	Order no.
 <b>Protective boot</b> Offers protection from ice and foreign substances from interfering with button operation	Flush pushbutton operations	clear black	<b>52AABA</b> <b>52AAB1</b>
 <b>Guards</b> Prevents accidental operation	Non-illuminated basic pushbuttons  1 5/8" mushroom pushbuttons, 1 3/4" push-pull units <sup>①</sup> , and twist to release units Push to test/illuminated pushbutton and indicator lights	chrome blackmax  chrome blackmax  chrome blackmax	<b>52AAGP</b> <b>52AXGP</b>  <b>52AAGM</b> <b>52AXGM</b>  <b>52AAGL</b> <b>52AXGL</b>
 <b>EMERGENCY-STOP Backing Ring</b>	Yellow 90mm E-STOP Backing Ring		<b>52AAR</b>
 <b>Locknuts</b> Replacement front ring	Non-illuminated basic pushbuttons  Non-illuminated mushroom pushbuttons  Push-pull and twist-to-release units (only for push-pull units starting with 52PP or 52BP) <sup>②</sup> Indicator Lights  Selector switches	chrome blackmax  chrome blackmax  chrome blackmax  blue amber  chrome blackmax	<b>52AANP</b> <b>52AXNP</b>  <b>52AANL</b> <b>52AXNL</b>  <b>52CANP</b> <b>52CXNP</b>  <b>52AANL</b> <b>52AXNL</b>  <b>52AANS</b> <b>52AXNS</b>
<b>Mounting Accessories</b>	Class 52 Trim Washer Kit (Set of 10 pcs) Class 52 Washer Kit (Include 2-Neoprene Gaskets, 1-Trim Washer, 1-Index Locking Ring (chrome))	chrome	<b>52AAQ</b> <b>52AAD</b>
<b>Padlock attachments</b>	Non-illuminated basic pushbuttons	flush extended	<b>52AALA</b> <b>52AALB</b>
 <b>EMERGENCY-STOP Lock Out</b>	Class 52 Illuminated Mushroom Head Pushbuttons; 304 Stainless Steel	chrome (304 SS)	<b>52AALE</b>
 <b>Padlock cover</b> Lock devices in off position	Pushbuttons, selector switches, and non-illuminated mushroom heads		<b>52AALS</b>
 <b>Lock nut wrench</b>	All devices		<b>52MAWB</b>
 <b>Hole plugs</b>		corrosion resistant steel, grey stainless steel	<b>52AAH6</b> <b>52ABH6</b> <b>52ABHS</b>
<b>Spare keys</b> (Kit includes 1 Key)	Class 52 Standard Keyed Selector Switch. Keyed Selector Switch ordered with Suffix X302. Keyed Selector Switch ordered with Suffix X301. Keyed Selector Switch ordered with Suffix X300. Keyed Selector Switch ordered with Suffix X299. Keyed Selector Switch ordered with Suffix X298.	501CH 506CH 547CH 548CH 549CH 550CH	<b>52KEY-501CH</b> <b>52KEY-506CH</b> <b>52KEY-547CH</b> <b>52KEY-548CH</b> <b>52KEY-549CH</b> <b>52KEY-550CH</b>
 <b>Grounding kit</b>	All devices		<b>52AL109145</b>
 52 BAJ  52 BAK  52 BAR	<b>Touchsafe contact blocks with gold flashing</b>  1 NO 1 NC 1 NO - 1 NC  1 NO early make 1 NC late break 1 NO - 1 NC  1 NC extra late break	  closes before 52BAK opens after 52 BAJ Reed switch; UL listed for class 1 division 2; .25A Max, 200V AC, 10 Watt max .5A Max, 200V DC, 10 Watt max	  <b>52BAK</b> <b>52BAJ</b> <sup>③</sup> <b>52BJK</b> <sup>④</sup> <b>52BAH</b> <b>52BAE</b> <b>52BAR</b> <sup>③</sup>  <b>52BAU</b>


① These can also be used with the 1 5/8" push-pull devices.

② For push-pull units starting with part numbers 52PA, 52PE or 52PX, replacement locknuts can be ordered using 52AANL (Chrome) and 52AXNL (BlackMax).

③ Hermetically Sealed

④ ⊕ Positive opening according to IEC 60947-5-1, Appendix K.

### Selection and ordering data

Version	Suitable for	Lamp voltage	Color	Order no.
<b>Lamps with screw connection, miniature bayonet (BA 9s style)</b>				
<b>Incandescent lamps,</b>				
	Flashing, type 267 lamp (replaces 755 lamp)	51, 52	6 V	<b>52AABNF</b>
	6V type 755 lamp (Rated 150 mA)	51, 52	6 V	<b>52AABN</b>
	12V type 756 (Rated 80 mA)	51, 52	12 V	<b>52AACN</b>
	24V type 757 (Rated 80 mA)	51, 52	24 V	<b>52AADN</b>
	48V, 2W	52	48 V	<b>3SB1902-1AP</b>
	60V, 2W	52	60 V	<b>3SR9424</b>
	120V, 2.5W, type #120MB (Rated 250 mA)	52	120 V	<b>52AAENC1</b>
Neon (uses resistors) type B2A (NE-51H)	52	120 V	<b>52AAPN</b>	
<b>Candelabra, 120V, 3W, Full voltage type 3S6/5</b>	52 older revision styles	120 V		<b>52AAENC</b>
<b>LED bulbs<sup>①</sup></b>				
LED, BA9s type <sup>②</sup>	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC		<b>52AEB□</b> <b>52AED□</b> <b>52AEE□</b>
Super-Bright LED <sup>②</sup>	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC 120 V DC		<b>52AEB□7</b> <b>52AED□7</b> <b>52AEE□7</b> <b>52AEV□7</b>
<b>LED lighting module with integrated LED.</b>				
Single LED (Rated 35 mA Maximum)	Class 52	24 V AC/DC 120 V AC 240 V AC		<b>52AAIL□</b> <b>52AAIM□</b> <b>52AAIN□</b>
<b>Full voltage lighting module accessory with BA9s type lamp<sup>①</sup></b>				
LED <sup>②</sup>	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC		<b>52AAF□B</b> <b>52AAF□D</b> <b>52AAF□E</b>
Super-Bright LED <sup>②</sup>	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC		<b>52AAF□Y</b> <b>52AAF□D□Y</b> <b>52AAF□E□Y</b>
Incandescent bulb	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC		<b>52AAF□B</b> <b>52AAF□D</b> <b>52AAF□E</b>
<b>Transformer lighting module accessory with BA9s type lamp<sup>①</sup></b>				
LED	Class 52	120 V AC 240 V AC 480 V AC 600 V AC		<b>52AAT□B</b> <b>52AATH□B</b> <b>52AAT□J□B</b> <b>52AAT□K□B</b>
Super-Bright LED	Class 52	120 V AC 240 V AC 480 V AC 600 V AC		<b>52AAT□Y</b> <b>52AATH□Y</b> <b>52AAT□J□Y</b> <b>52AAT□K□Y</b>
Incandescent bulb	Class 52	120 V AC 240 V AC 480 V AC 600 V AC		<b>52AAT□N</b> <b>52AATH□N</b> <b>52AAT□J□N</b> <b>52AAT□K□N</b>

Color options:

red  
green  
yellow/amber  
blue  
white/clear

2  
3  
4  
5  
B

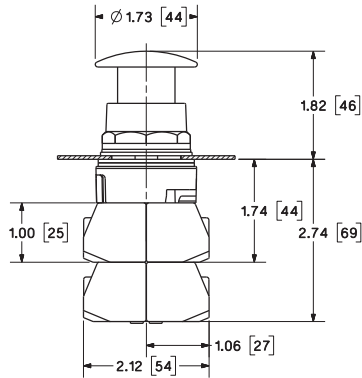
① Standard LED lamps are recommended for indoor applications, Super-Bright LED Lamps are recommended for outdoor applications.

② 6V, 24V (Super Bright only) and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

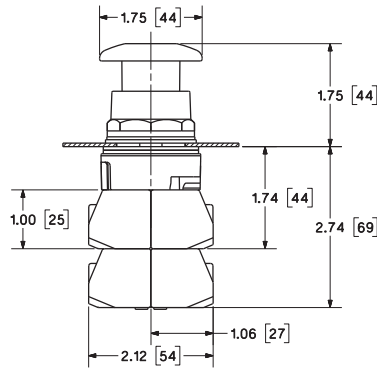
# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Dimensional drawings

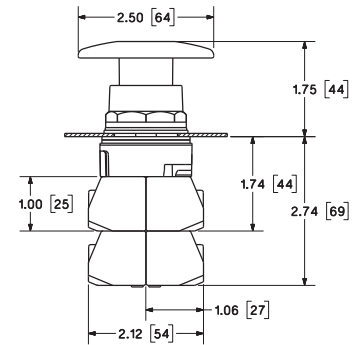
Non-Illuminated Push-Pull  
Metal Mushroom Head



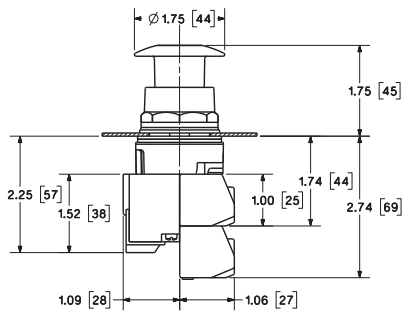
Non-Illuminated Push-Pull  
Small Plastic Mushroom Head



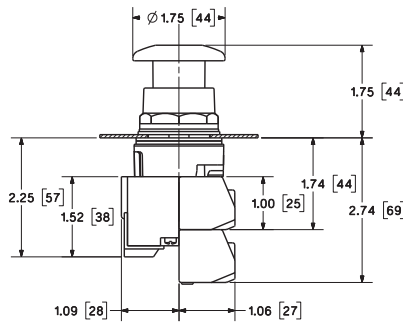
Non-Illuminated Push-Pull  
Large Plastic Mushroom Head



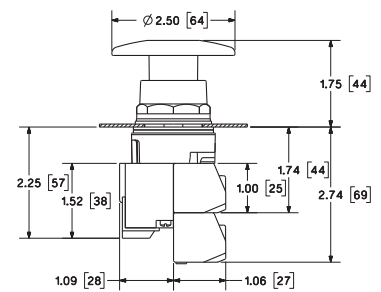
Illuminated Push-Pull  
Metal Mushroom Head



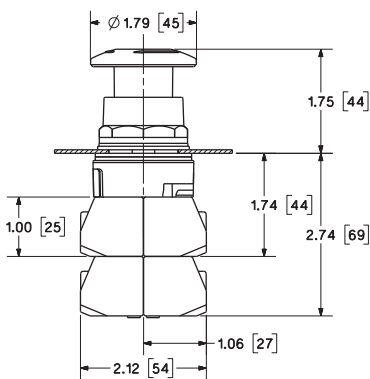
Fully Illuminated Push-Pull  
Small Plastic Mushroom Head



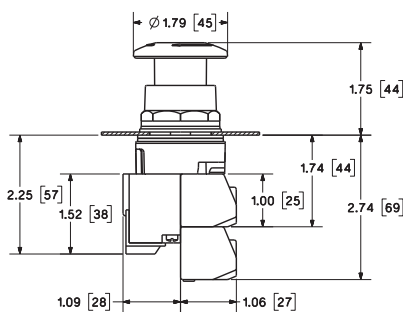
Illuminated Push-Pull  
Large Plastic Mushroom Head



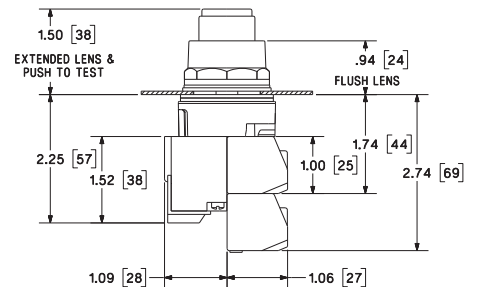
Non-Illuminated Twist Release  
Plastic Mushroom Head



Illuminated Twist Release  
Plastic Mushroom Head



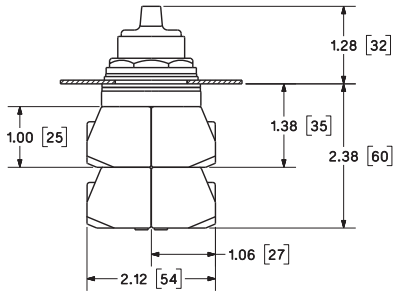
Illuminated Pushbutton Flush Lens  
Illuminated Pushbutton Extended Lens  
Illuminated Push to Test



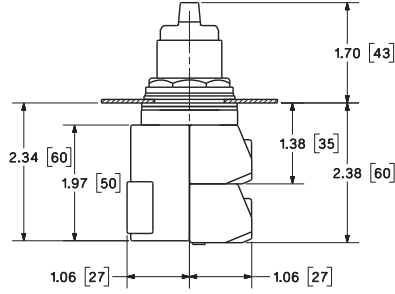
# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Dimensional drawings

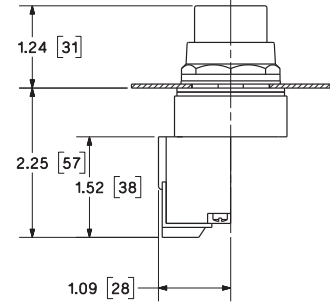
Selector Switch  
Non-Illuminated



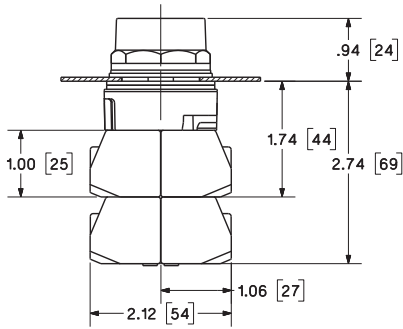
Selector Switch  
Illuminated



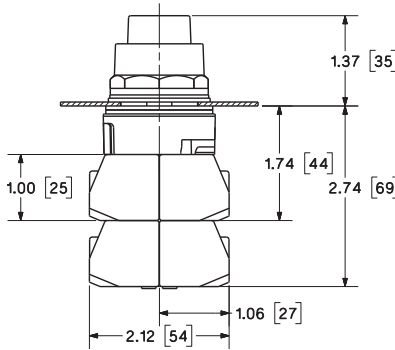
Indicator Light  
Plastic Lens



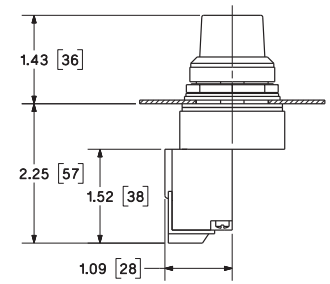
Momentary Pushbutton  
Non-Illuminated Flush Cap



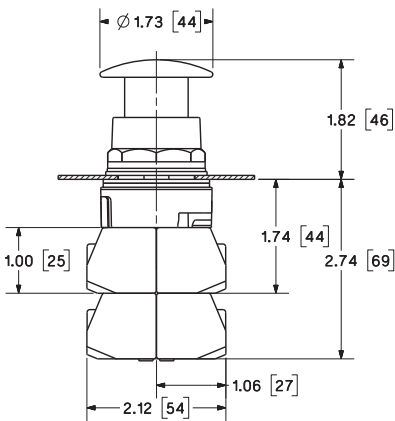
Momentary Pushbutton  
Non-Illuminated Raised Cap



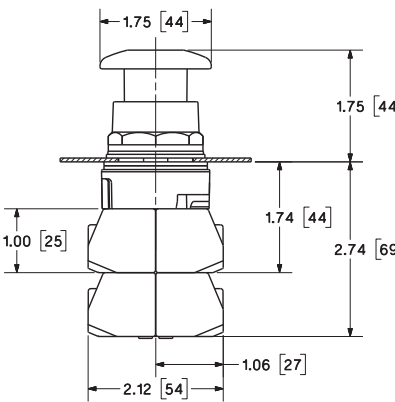
Indicator Light  
Glass Lens



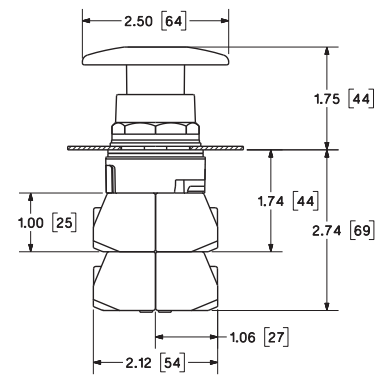
Momentary Pushbutton  
Metal Mushroom Head



Momentary Pushbutton  
Small Plastic Mushroom Head



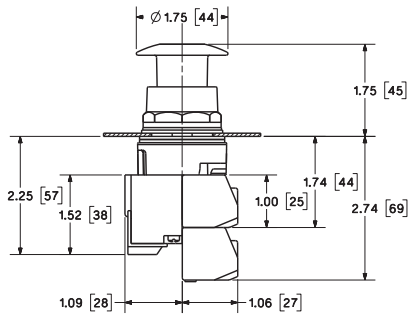
Momentary Pushbutton  
Large Plastic Mushroom Head



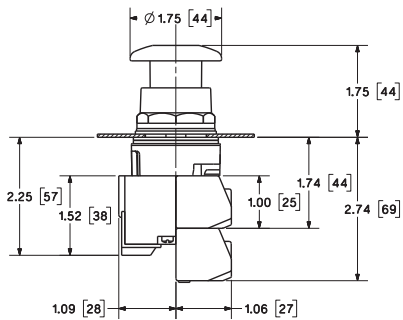
# 30mm Water, Oil Tight & Corrosion Resistant – Class 52

## Dimensional drawings

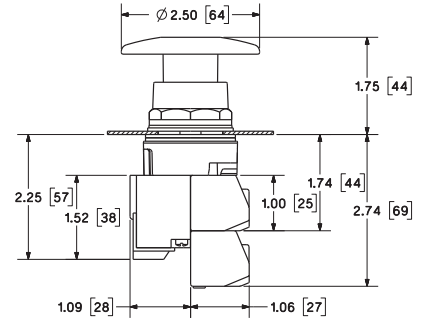
Illuminated Momentary Pushbutton  
Metal Mushroom Head



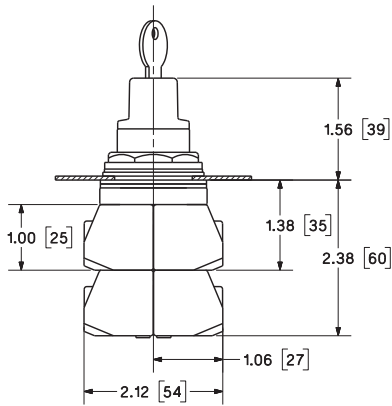
Illuminated Momentary Pushbutton  
Small Plastic Mushroom Head



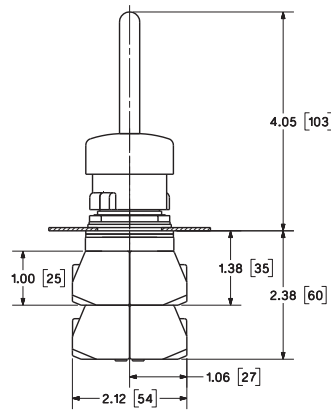
Illuminated Momentary Pushbutton  
Large Plastic Mushroom Head



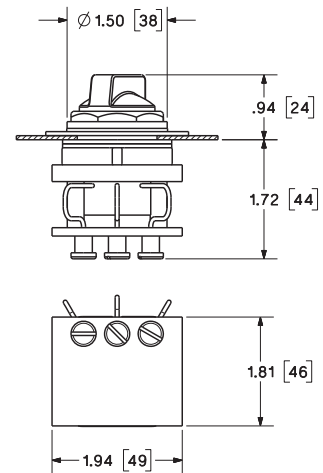
Selector Switch  
Keyed



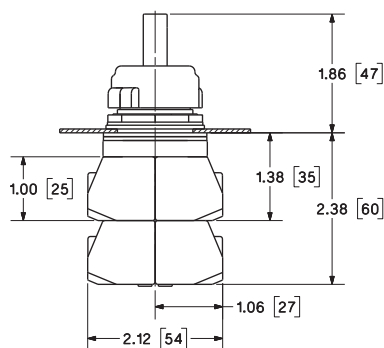
Wobble Switch



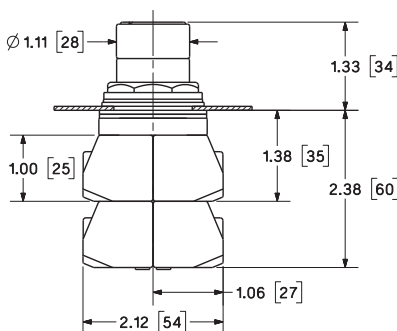
Potentiometer Switch



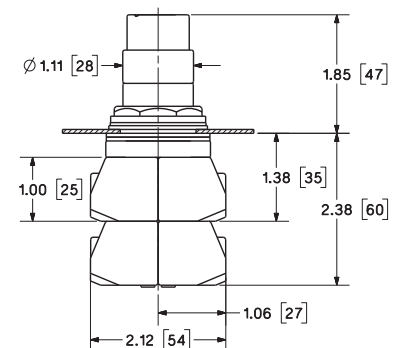
Toggle Switch



Selector Pushbutton Switch  
Flush Cap

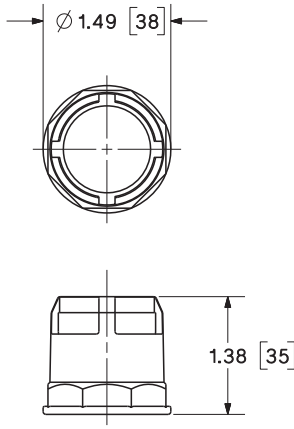


Selector Pushbutton Switch  
Raised Cap

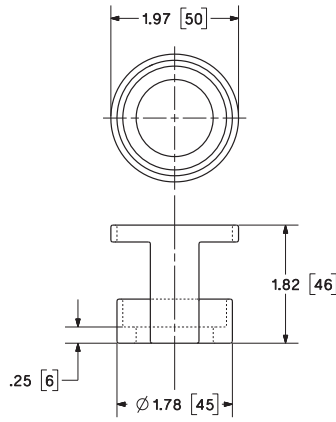


Dimensional drawings

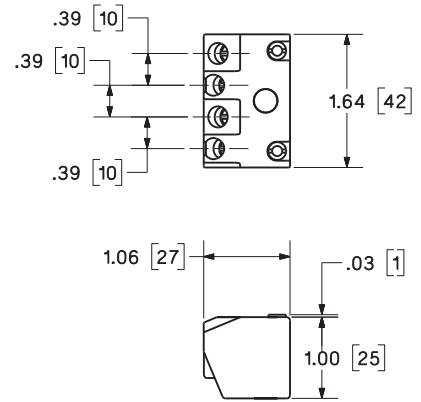
Momentary Pushbutton Guard  
Illuminated Push to Test Guard



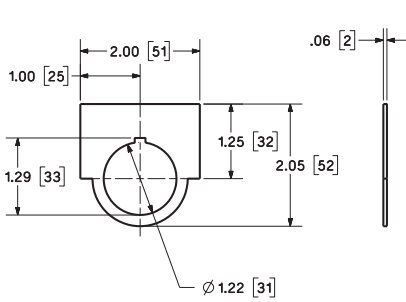
Mushroom Head Guard



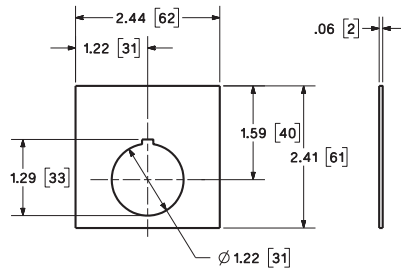
Contact Block



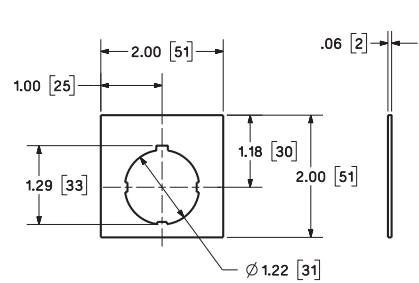
Large Metal Legend Plate



Automotive Metal Legend Plate



Large Plastic Legend Plate



# 30mm Water, Oil Tight & Corrosion Resistant - Class 52

## Class 52 oiltight pushbutton stations


### Selection and ordering data

	Actuator identification C = top device in station B = middle device in station A = bottom device in station	Degree of protection <sup>①</sup>	Contact / voltage	No. of command points	Order no.	Pack  Unit
1 unit control station	A = Momentary flush pushbutton black, label "START"	NEMA 12	1NO - 1NC	1	<b>52C101A</b>	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO - 1NC	1	<b>52C103A</b>	
	A = Momentary mushroom head red, label "STOP"	NEMA 12	1NO - 1NC	1	<b>52C104A</b>	
	A = Maintained metal mushroom head red, label "EMERGENCY STOP"	NEMA 12	1NO - 1NC	1	<b>52C117A</b>	
	A = 2 position selector switch "OFF-ON"	NEMA 12	1NO - 1NC	1	<b>52C159A</b>	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 12	1NO - 1NC	1	<b>52C156A</b>	
	A = Indicator light, red	NEMA 12	120V Transformer type	1	<b>52C131A</b>	
	A = Indicator light, green	NEMA 12	120V Transformer type	1	<b>52C135A</b>	
	A = Momentary flush pushbutton black, label "START"	NEMA 4X Stainless Steel	1NO - 1NC	1	<b>52C101S</b>	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	<b>52C103S</b>	
	A = Momentary mushroom head red, label "STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	<b>52C104S</b>	
	A = Maintained plastic mushroom head red, label "EMERGENCY STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	<b>52C116S</b>	
	A = 2 position selector switch "OFF-ON"	NEMA 4X Stainless Steel	1NO - 1NC	1	<b>52C159S</b>	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 4X Stainless Steel	1NO - 1NC	1	<b>52C156S</b>	
	A = Momentary flush pushbutton black, label "START"	NEMA 4X Fiberglass	1NO - 1NC	1	<b>52C101X</b>	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	<b>52C103X</b>	
	A = Momentary mushroom head red, label "STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	<b>52C104X</b>	
	A = Maintained plastic mushroom head red, label "EMERGENCY STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	<b>52C116X</b>	
	A = 2 position selector switch "OFF-ON"	NEMA 4X Fiberglass	1NO - 1NC	1	<b>52C159X</b>	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 4X Fiberglass	1NO - 1NC	1	<b>52C156X</b>	
2 unit control station	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC	2	<b>52C201A</b>	
	B = Momentary flush pushbutton black, label "START" A = Momentary Mushroom head pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC	2	<b>52C202A</b>	
	B = Momentary flush pushbutton, label "FORWARD" A = Momentary flush pushbutton, label "REVERSE"	NEMA 12	1NO, 1NC 1NO, 1NC	2	<b>52C204A</b>	
	B = Momentary flush pushbutton, label "UP" A = Momentary flush pushbutton, label "DOWN"	NEMA 12	1NO, 1NC 1NO, 1NC	2	<b>52C223A</b>	
	B = Indicator light, red, label "RUN" A = Maintained selector switch, label "HAND-OFF-AUTO"	NEMA 12	120V Transformer type	2	<b>52C224A</b>	
	B = Indicator light, red A = Indicator light, green	NEMA 12	120V Transformer type	2	<b>52C230A</b>	
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	<b>52C201S</b>	
	B = Momentary flush pushbutton black, label "START" A = Momentary Mushroom head pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	<b>52C202S</b>	
	B = Momentary flush pushbutton, label "UP" A = Momentary flush pushbutton, label "DOWN"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	<b>52C223S</b>	
	B = Indicator light, red, label "RUN" A = Maintained selector switch, label "HAND-OFF-AUTO"	NEMA 4X Stainless Steel	120V Transformer type 1NO, 1NC	2	<b>52C224S</b>	
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	<b>52C201X</b>	
	B = Momentary flush pushbutton black, label "START" A = Momentary Mushroom head pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	<b>52C202X</b>	
	B = Momentary flush pushbutton, label "UP" A = Momentary flush pushbutton, label "DOWN"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	<b>52C223X</b>	
	B = Indicator light, red, label "RUN" A = Maintained selector switch, label "HAND-OFF-AUTO"	NEMA 4X Fiberglass	120V Transformer type 1NO, 1NC	2	<b>52C224X</b>	



① NEMA 4X Stainless Steel Enclosure is 304 SS.

**Selection and ordering data**

Actuator identification	Degree of protection <sup>①</sup>	Contact / voltage	No. of command points	Order no.	Pack	
3 unit control station 	C = Indicator light, red	NEMA 12	120V 1NO, 1NC	3	<b>52C307A</b>	Unit
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC 1NO, 1NC			
	C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C301A</b>	
C = Momentary flush pushbutton black, label "UP" B = Momentary flush pushbutton black, label "DOWN" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C332A</b>		
C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C333A</b>		
C = Momentary flush pushbutton black, label "HI" B = Momentary flush pushbutton, black label "LOW" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C334A</b>		
C = Indicator light, red	NEMA 4X Stainless Steel	120V 1NO, 1NC	3	<b>52C307S</b>		
B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC 1NO, 1NC				
C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C301S</b>		
C = Momentary flush pushbutton black, label "UP" B = Momentary flush pushbutton black, label "DOWN" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C332S</b>		
C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C333S</b>		
C = Momentary flush pushbutton black, label "HI" B = Momentary flush pushbutton, black label "LOW" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C334S</b>		
C = Indicator light, red	NEMA 4X Fiberglass	120V 1NO, 1NC	3	<b>52C307X</b>		
B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC 1NO, 1NC				
C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C301X</b>		
C = Momentary flush pushbutton black, label "UP" B = Momentary flush pushbutton black, label "DOWN" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C332X</b>		
C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C333X</b>		
C = Momentary flush pushbutton black, label "HI" B = Momentary flush pushbutton, black label "LOW" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	<b>52C334X</b>		

① NEMA 4X Stainless Steel Enclosure is 304 SS.



# 30mm Water, Oil Tight & Corrosion Resistant - Class 52

## Empty enclosures

### Selection and ordering data



Version	Number of command points	Degree of protection	Order No.①	Pack Unit
Standard enclosures come with 2 1/4" leg center for legend spacing. Automotive end plates require 2 1/2" spacing. For more than 2 contact blocks on the right or left, use extra deep enclosure.	1	NEMA Type 12/13	<b>P30EMS01</b>	Unit
	1	NEMA Type 12/13 extra deep	<b>P30EMS01D</b>	
	1	NEMA Type 4/4X stainless steel	<b>P30EMS014</b>	
	1	NEMA Type 4/4X Fiberglass	<b>P30EMS01X</b>	
Mounting hole arrangement  1 thru 4 are in one row 6 holes are 3 down and 2 across 9 holes are 3 down and 3 across 12 holes are 4 down and 3 across 16 holes are 4 down and 4 across	2	NEMA Type 12/13	<b>P30EMS02</b>	
	2	NEMA Type 12/13 extra deep	<b>P30EMS02D</b>	
	2	NEMA Type 4/4X stainless steel	<b>P30EMS024</b>	
	2	NEMA Type 4/4X Fiberglass	<b>P30EMS02X</b>	
	3	NEMA Type 12/13	<b>P30EMS03</b>	
	3	NEMA Type 12/13 extra deep	<b>P30EMS03D</b>	
	3	NEMA Type 4/4X stainless steel	<b>P30EMS034</b>	
	3	NEMA Type 4/4X Fiberglass	<b>P30EMS03X</b>	
	4	NEMA Type 12/13	<b>P30EMS04</b>	
	4	NEMA Type 12/13 extra deep	<b>P30EMS04D</b>	
	4	NEMA Type 4/4X stainless steel	<b>P30EMS044</b>	
	4	NEMA Type 4/4X Fiberglass	<b>P30EMS04X</b>	
6	NEMA Type 12/13	<b>P30EMS06</b>		
6	NEMA Type 12/13 extra deep	<b>P30EMS06D</b>		
6	NEMA Type 4/4X stainless steel	<b>P30EMS064</b>		
9	NEMA Type 12/13	<b>P30EMS09</b>		
9	NEMA Type 12/13 extra deep	<b>P30EMS09D</b>		
9	NEMA Type 4/4X stainless steel	<b>P30EMS094</b>		
12	NEMA Type 12/13	<b>P30EMS12</b>		
12	NEMA Type 12/13 extra deep	<b>P30EMS12D</b>		
12	NEMA Type 4/4X stainless steel	<b>P30EMS124</b>		
16	NEMA Type 12/13	<b>P30EMS16</b>		
16	NEMA Type 12/13 extra deep	<b>P30EMS16D</b>		
16	NEMA Type 4/4X stainless steel	<b>P30EMS164</b>		

### Order Form

Ordering Information	
<p>Enclosure Hole Arrangement</p>	<p>To order non-standard control stations select catalog numbers from the previous pages, determine the required position in the enclosure and fill in the table below. If a special legend plate is required, specify description in the table. The combined list prices of the components is the list price of the station.</p> <ul style="list-style-type: none"> <li>Select enclosure</li> <li>Vertical or Horizontal. Outline Diagram at left starting at the top left-hand corner. Example: 3 unit vertical outline location No. 1A, 2A and 3A. 3 unit horizontal outline location No. 1A, 1B, and 1C</li> <li>List location No. and applicable catalog numbers in the table below. Use complete catalog numbers where possible</li> </ul>
<p>Order No./Item No. _____</p> <p>Customer _____</p> <p>Enclosure Catalog No. _____</p>	

Location	Operator PB-SEL.-PL	Accessories Key Lock, Boot, Etc,	Legend Plate Legend or Blank	Special Marking

① NEMA 4X Stainless Steel Enclosure is 304 SS.

# 30 mm Heavy Duty, Watertight/Oiltight, Class 52

## Legend plates for Class 51 and 52

### Design

The 30 mm legend plates are approved for the use with both Class 51 and Class 52 devices. Automotive legend plates require 2 1/2" mounting centers. Plastic legend plates will have white letters engraved.

When ordering custom engraved legend plates, specify the required inscription text.

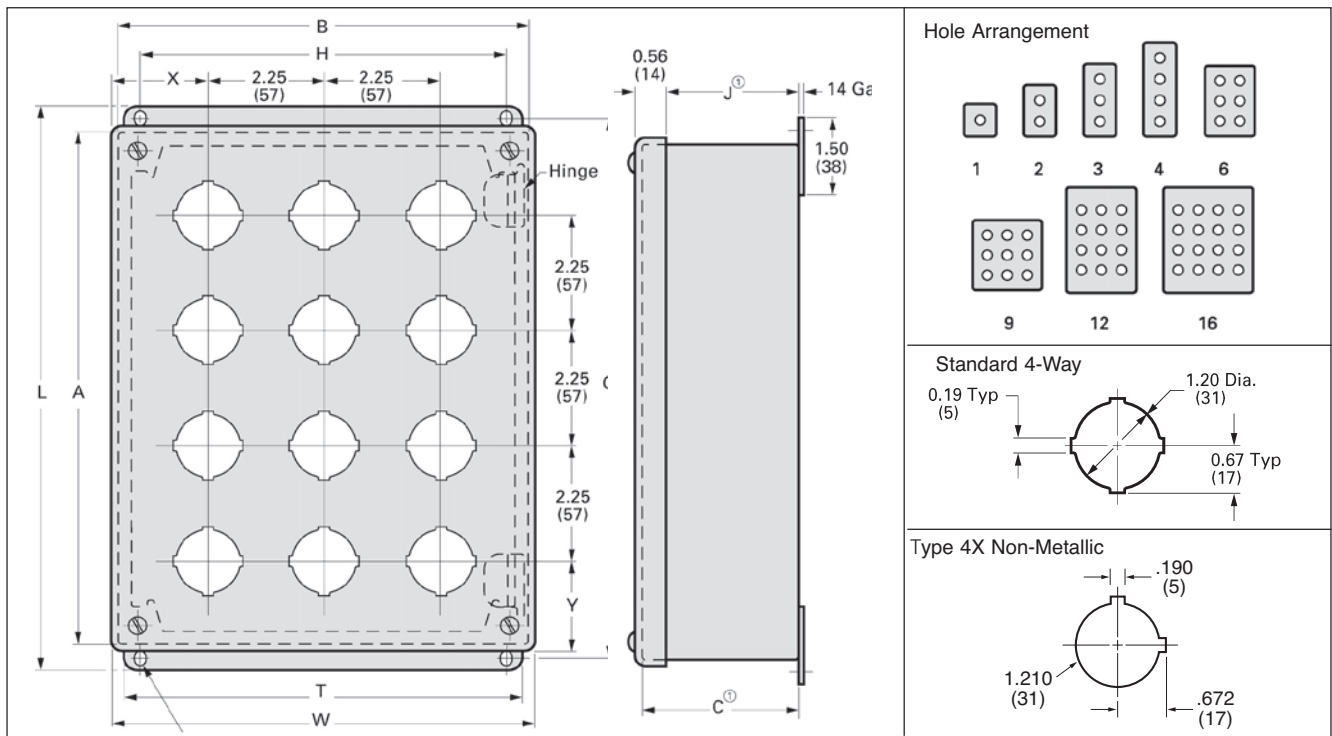
### Selection and ordering data

Inscription	Large (1 1/4" x 2")	Automotive <sup>①</sup> (2 7/16" x 2 7/16")	Large Plastic <sup>②</sup> (2 1/16" x 2")	Automotive Plastic <sup>②②</sup> (2 7/16" x 2 7/16")
	Order No.	Order No.	Order No.	Order No.
"Blank (brushed aluminum)"	<b>52NL02</b>	<b>52NA02</b>	—	—
"Blank (red)"	<b>52NL02R</b>	<b>52NA02R</b>	<b>52ND02R</b>	<b>52NE02R</b>
"Blank (Black)"	<b>52NL02B</b>	<b>52NA02B</b>	<b>52ND02B</b>	<b>52NE02B</b>
<b>Inscribed legend plates with large brushed aluminum background</b>				
Close	<b>52NL18</b>	<b>52NA18</b>	—	—
Down	<b>52NL10</b>	<b>52NA10</b>	—	—
Emerg Stop	<b>52NL16</b>	<b>52NA16</b>	—	—
Emerg Stop (red)	<b>52NL16R</b>	<b>52NA16R</b>	—	—
Fast-Slow	<b>52NL33</b>	<b>52NA33</b>	—	—
Forward	<b>52NL05</b>	<b>52NA05</b>	—	—
For-Off-Rev	<b>52NL38</b>	<b>52NA38</b>	—	—
For-Rev	<b>52NL31</b>	<b>52NA31</b>	—	—
Hand-Off-Auto	<b>52NL37</b>	<b>52NA37</b>	—	—
High	<b>52NL07</b>	<b>52NA07</b>	—	—
High-Low	<b>52NL30</b>	<b>52NA30</b>	—	—
High-Off-Low	<b>52NL44</b>	<b>52NA44</b>	—	—
In	<b>52NL21</b>	<b>52NA21</b>	—	—
Jog	<b>52NL13</b>	<b>52NA13</b>	—	—
Jog-Forward	<b>52NL24</b>	<b>52NA24</b>	—	—
Jog-Reverse	<b>52NL25</b>	<b>52NA25</b>	—	—
Low	<b>52NL08</b>	<b>52NA08</b>	—	—
Lower	<b>52NL20</b>	<b>52NA20</b>	—	—
Man-Auto	<b>52NL35</b>	<b>52NA35</b>	—	—
Off	<b>52NL12</b>	<b>52NA12</b>	—	—
Off-On	<b>52NL26</b>	<b>52NA26</b>	—	—
On	<b>52NL11</b>	<b>52NA11</b>	—	—
On-Off-Auto	<b>52NL40</b>	<b>52NA40</b>	—	—
Open	<b>52NL17</b>	<b>52NA17</b>	—	—
Open-Close	<b>52NL34</b>	<b>52NA34</b>	—	—
Open-Off-Close	<b>52NL41</b>	<b>52NA41</b>	—	—
Out	<b>52NL22</b>	<b>52NA22</b>	—	—
Pull to Start Push to Stop	<b>52NL47</b>	<b>52NA47</b>	—	—
Raise	<b>52NL19</b>	<b>52NA19</b>	—	—
Raise-Lower	<b>52NL36</b>	<b>52NA36</b>	—	—
Reset	<b>52NL14</b>	<b>52NA14</b>	—	—
Reverse	<b>52NL06</b>	<b>52NA06</b>	—	—
Run	<b>52NL23</b>	<b>52NA23</b>	—	—
Run-Jog	<b>52NL29</b>	<b>52NA29</b>	—	—
Safe-Run	<b>52NL27</b>	<b>52NA27</b>	—	—
Slow-Off-Fast	<b>52NL39</b>	<b>52NA39</b>	—	—
Start	<b>52NL03</b>	<b>52NA03</b>	—	—
Start-Jog	<b>52NL28</b>	<b>52NA28</b>	—	—
Start-Stop	<b>52NL32</b>	<b>52NA32</b>	—	—
Stop	<b>52NL04</b>	<b>52NA04</b>	—	—
Stop (red)	<b>52NL04R</b>	<b>52NA04R</b>	—	—
Up	<b>52NL09</b>	<b>52NA09</b>	—	—
Up-Down	<b>52NL49</b>	<b>52NA49</b>	—	—
Up-Off-Down	<b>52NL42</b>	<b>52NA42</b>	—	—
<b>Inscription plates with custom engraving</b>				
"Custom engraved (brushed aluminum)"	<b>52NL02E</b>	<b>52NA02E</b>	—	—
"Custom engraved (red)"	<b>52NL02RE</b>	<b>52NA02RE</b>	<b>52ND02RE</b>	<b>52NE02RE</b>
"Custom engraved (Black)"	<b>52NL02BE</b>	<b>52NA02BE</b>	<b>52ND02BE</b>	<b>52NE02BE</b>
Max. number of rows	2	2	2	2
Letter height	5/32"	1/4"	5/32"	1/4"
Characters per row	14	16	14	16

① Automotive requires 2 1/2" mounting centers  
 ② White letters on plastic nameplate.

# 30mm Heavy Duty, Watertight/Oiltight, Class 52

## Dimensional drawings



### Type 12/13 and 4X Stainless Steel

Units	Enclosure Size			Mounting		Overall					
	A	B	C	G	H	L	W	J	T	X	Y
1	3.50 (89)	3.25 (83)	2.75 (70)	4.00 (102)	2.38 (60)	4.50 (114)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
2	5.75 (146)	3.25 (83)	2.75 (70)	6.25 (159)	2.38 (60)	6.75 (171)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
3	8.00 (203)	3.25 (83)	2.75 (70)	8.50 (216)	2.38 (60)	9.00 (229)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
4	10.25 (260)	3.25 (83)	2.75 (70)	10.75 (273)	2.38 (60)	11.25 (286)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
6	9.50 (241)	6.25 (159)	3.00 (76)	10.00 (254)	5.38 (137)	10.50 (267)	6.47 (164)	2.56 (65)	6.00 (152)	2.11 (54)	2.61 (66)
9	9.50 (241)	8.50 (216)	3.00 (76)	10.00 (254)	7.62 (194)	10.50 (267)	8.72 (221)	2.56 (65)	8.25 (210)	2.11 (54)	2.61 (66)
12	11.75 (298)	8.50 (216)	3.00 (76)	12.25 (311)	7.62 (194)	12.75 (324)	8.72 (221)	2.56 (65)	8.25 (210)	2.11 (54)	2.61 (66)
16 <sup>2)</sup>	11.75 (298)	10.75 (273)	3.00 (76)	12.25 (311)	9.88 (251)	12.75 (324)	10.97 (279)	2.56 (65) <sup>2)</sup>	10.50 (267)	2.11 (54)	2.61 (66)

### Type 12/13 Extra Deep Enclosures

Units	Enclosure Size			Mounting		Overall					
	A	B	C	G	H	L	W	J	T	X	Y
1	4.00	4.00	4.75	4.50	3.12	5.00	4.22	4.31	3.75	2.11	2.11
2	6.00	4.00	4.75	6.50	3.12	7.00	4.22	4.31	3.75	2.11	1.98
3	8.00	4.00	4.75	8.50	3.12	9.00	4.22	4.31	3.75	2.11	1.86
4	10.00	4.00	4.75	10.50	3.12	11.00	4.22	4.31	3.75	2.11	1.73
6	9.50	6.25	4.75	10.00	5.38	10.50	6.47	4.31	6.00	2.11	2.61
9	9.50	8.50	4.75	10.00	7.62	10.50	8.72	4.31	8.25	2.11	2.61
12	11.75	8.50	4.75	12.25	7.62	12.75	8.72	4.31	8.25	2.11	2.61
16 <sup>2)</sup>	11.75	10.75	4.75	12.25	9.88	12.75	10.97	4.31	10.50	2.11	2.61

### Type 4X Non-Metallic

Units	Enclosure Size		Mounting		Overall	
	A	B	C	G	H	W
1	6.00	3.19	3.63	4.88	2.94	3.81
2	6.00	3.19	3.63	4.88	2.94	3.81
3	8.26	3.19	3.63	7.13	2.94	3.81
4	10.51	3.19	3.63	9.37	2.94	3.81

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

- 1) Grounding stud in body of enclosure.
- 2) For stainless steel add 1.75 (45) to depth.

# 30 mm Pilot Devices

## Technical Specifications

<b>Standards</b>	UL Listed File # E22655	CSA Certified File # LR6535
<b>Utilization</b>	Category NEMA	A600/P600
<b>Degree of Protection</b>	52B, 52P-, 52S-, 52M- Operators	NEMA: 1, 3, 3R, 4, 4X, 12 and 13 IEC 529; IP10, IP11, IP14, IP52, IP54, IP56 and IP66

### Rated Operational Current

NEMA A600 – 10 Continuous Amps			NEMA P600 – Rating Codes for DC Control Circuit Application	
Voltage AC	Make Amps	Break Amps	Thermal Continuous Test Current Amps	
120V	<b>60</b>	<b>6</b>	<b>Maximum Make or Break; Current / Amps</b>	5.0
240V	<b>30</b>	<b>3</b>	125V	1.10
480V	<b>15</b>	<b>1.5</b>	250V	0.55
600V	<b>12</b>	<b>1.2</b>	301-600V	0.20
Total VA	<b>7200</b>	<b>720</b>	<b>Maximum Make or Break Volt amperes at 300V or Less</b>	138

<b>Contact Blocks</b>	52BAK, -BAJ <sup>Ⓞ</sup> , -BAH, -BAU, -BJK <sup>Ⓞ</sup> 52BAR	600VAC Maximum, Heavy Duty 200VAC .25 Amp, 10 Watt Maximum 200VDC .50 Amp, 10 Watt Maximum
-----------------------	---	--

<sup>Ⓞ</sup> Positively driven contacts. Contact blocks are suitable for applications down to 5V/1MA low voltage applications as found in PLCs. 52BAR are Class 1; Division 2 Compliant

<b>Pilot Light</b>	Full Voltage LED Module Transformer Type	52PL4/52PL5 or 52BL4/52BL5	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V) -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600V AC Max., 50/60 Hz
<b>Push-to-Test</b>	Full Voltage LED Module Transformer Type	52PT6 or 52BT6	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
<b>Illuminated Push-Pull</b>	Full Voltage LED Module Transformer	52PP2(3,7) or 52BP2(3,7)	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
<b>Twist-to-Release</b>	Full Voltage LED Module Transformer	52BR8 or 52PR8	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
<b>Illuminated Selector Switch</b>	Full Voltage Transformer	52SA7(A,B,C) or 52SX7(A,B,C)	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 600V AC Max., 50/60 Hz

**Dielectric Strength** 2200V for one minute

### Mechanical Design Life Cycles

<b>Vibration</b>	Frequency 5 - 60Hz.; Disp. .030 inches, sweep 5 minutes for a duration of 30 minutes on each axis. Not to exceed 5.5 G's for maximum of 1 minute.	
<b>Pushbuttons</b>	Momentary, Non-illuminated	5,000,000 Operating Cycles
	Momentary, Illuminated	300,000 Operating Cycles
<b>Push-Pull</b>	Maintained	300,000 Operating Cycles
	Momentary	2,000,000 Operating Cycles
<b>Twist-to-Release</b>		300,000 Operating Cycles
<b>Selector Switches</b>	Non-illuminated	2,000,000 Operating Cycles
	Illuminated, Key-operated	2,000,000 Operating Cycles
<b>Contact Operation</b>	Standard Contact Black Logic Reed	
<b>Wire Gauge</b>	#18-12 AWG	
<b>Terminal Screw Torque</b>	2-10 lb-in / 20 lb-in max; 8 lb-in recommended	
<b>Locknut Torque</b>	15 ft. lbs. max	
<b>Temperature Range</b>	Operating	31F to +158F (-35C to +70C)
	Storage	40F to +185F (-40C to +85C)

All parts are designed and manufactured of corrosion resistant material or are plated or painted as corrosion protection. All contact block contacts are gold flashed as a standard offering. Internal return spring mechanisms of operators and contact blocks of stainless steel. RoHS Compliant.

**Declaration of Conformity** — The products listed below, to which this declaration relates, are in conformity with the following standards, following the provisions of the Low Voltage Directive (LVD) (73/23/EEC), and the Electromagnetic Compatibility Directive (89/336/EEC.)

**Products:** Contact Blocks: Cat Nos. 52BAE, 52BAH, 52BAJ, 52BAK, 52BAR, 52BAU and 52BJK, with suffixes. Pilot Lights: Cat Nos 52P, with suffixes. Operators: Cat Nos 52S or 52P, with suffixes.

**Applicable Standards:** EN 60947-5-1 Low-Voltage Switchgear and controlgear. Enclosed devices meet the requirements of environmental ratings of IP10, IP11, IP14, IP52, IP54, and IP56. Open devices, when mounted as instructed, in environmental type IP10, IP11, IP14, IP52, IP54 or IP56 enclosures, maintain the environmental requirements for those enclosure types. Cat. No. 52BP, 52BR, 52PP, and 52PR, 2 Position, Twist-To-Release and 2 Position, Push Pull Maintained operators provided with red operating heads and 52BJK contact blocks meet the requirements of EN 60947-5-5 for Electrical Emergency Stop Device With Mechanical Latching Function (e-stop).

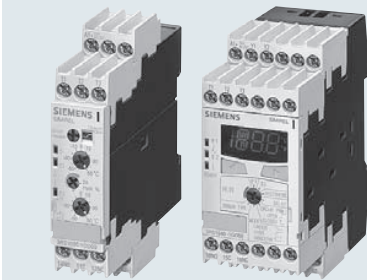


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For electrical quantities

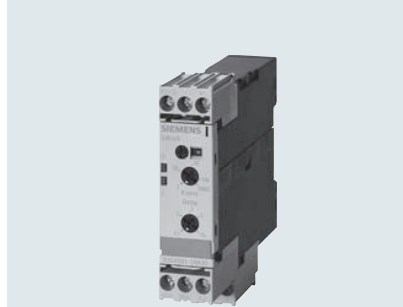
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3RQ3 coupling relays slim design

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Coupling relays and interfaces



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3TG10 power relay,  
20A max. resistance load pole

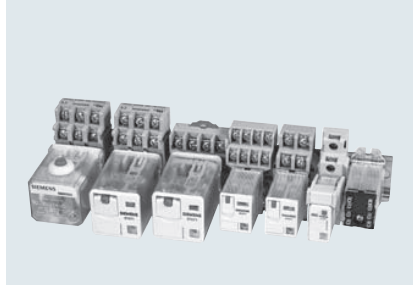
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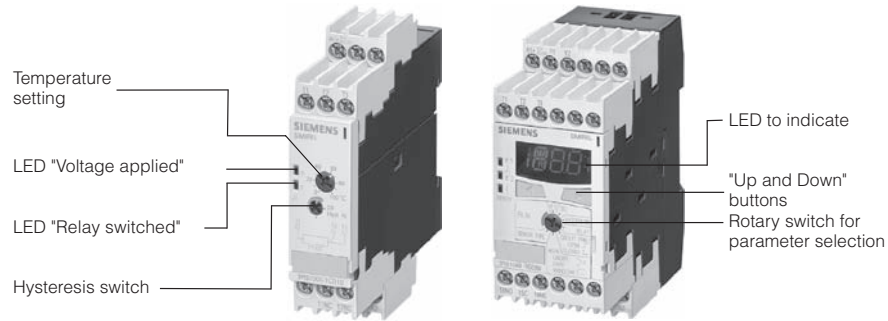
# Temperature Monitoring Relays

3RS10/3RS11

RELAYS, INTERFACES & CONVERTERS 11

## Overview

The 3RS1/3RS2 SIMIREL temperature monitoring relays can be used for measuring temperatures in solid, liquid and gaseous media. The temperature is acquired by the sensor in the medium, evaluated by the device and monitored for overshoot, undershoot or within a range (window function). The family consists of analog adjustable devices with one or two threshold values and digital devices that represent an excellent alternative to thermostats in the low-end performance range. The output relay picks up and releases at the threshold values in accordance with the parameter settings.



### Analog evaluation units

- Sensor types: PT100/Type J/ Type K
- Measuring principle for 2- and 3-wire sensors
- Electrical isolation between sensor and supply voltage (with the exception of AC/DC 24 V devices)
- Separate designs for overshoot and undershoot
- Measuring range depending on the version for -50 °C to +50 °C, 0 °C to 100 °C, 0 °C to 200 °C, 0 °C to 600 °C or 500 °C to 1000 °C
- Potentiometer for adjustable limit temperature and hysteresis of 2 to 20 %
- Closed-circuit principle
- Narrow 22.5 mm enclosure with 12 terminals

### With one threshold value

- Supply voltage for AC/DC 24 V or AC 110/230 V
- Indication of supply voltage and relay status via LEDs
- One NO and one NC contact

### With two threshold values

- Additional potentiometer for  $\Delta 2$  (hysteresis for second limit value is 5 % of the measuring range)
- Supply voltage for AC/DC 24 V or 24 to 240 V
- LED indication of supply voltage and both relay states
- Open-circuit/closed-circuit principle switchover
- One NO and one CO contact

### Digital evaluation units

- High-end evaluation unit for 1 or 1-3 sensor circuits
- Multifunctional digital display and three LEDs (for threshold values and Ready)
- Adjustable sensor types
- Adjustable overshoot, undershoot or window function
- Switchable open-circuit or closed-circuit principle
- Hysteresis for both threshold values (1 to 99 K)
- Memory function can be selected by means of an external control signal (Y1/Y2)
- One NO and two SPDT contacts
- Adjustable time delay from 0 to 999 s
- Wire-break and short-circuit detection with separate signaling contact (1 NO)
- Non-volatile storage of the set parameters
- 45 mm housing with 24 supply terminals
- Measuring principle for 2- and 3-wire sensors
- Electrical isolation (with the exception of AC/DC 24 V devices)
- In the 3-sensor design, the status of the individual sensors is indicated on limit value overshoot/undershoot

It clearly displays which of the connected sensors has overshoot or undershot one or both threshold values.

### Advantages

- All devices are with Cage Clamp terminals
- All devices with the exception of AC/DC 24 V devices are electrically isolated
- Variants for the evaluation of 1 to 3 sensors in one unit, e.g. for multiple monitoring in a plant or for motor protection
- Easy operation without complex menu systems
- Graduated product range; the right device for every application
- Adjustable hysteresis
- Rapid fault diagnosis due to short-circuit monitoring and sensor wire-break detection
- Power packs with wide range of input voltage reduce the number of variants
- Easy configuration for either two-point or three-point closed-loop control

### Application

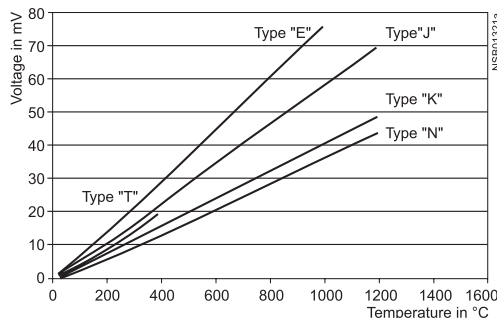
The 3RS1/3RS2 SIMIREL temperature monitoring relays can be used in almost any application in which limit temperatures must not be overshoot or undershot, e.g.:

Monitoring of set limit temperatures and output of alarm messages for:

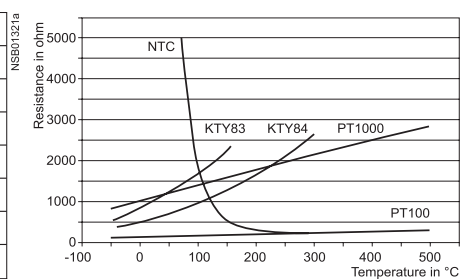
- Motor and plant protection
- Switchgear cabinet temperature monitoring
- Frost monitoring
- Temperature limits for process variables, e.g. in the packaging industry or galvanising equipment
- Control of plants and machines such as heating, air-conditioning and ventilation systems, solar collectors, heat pumps or warm water supplies
- Monitoring of servo motors with KTY sensors
- Bearing and gearbox oil-level monitoring
- Monitoring of cooling liquids

### Characteristics for thermocouples and resistance sensors

#### Thermocouples



#### Resistance sensors



## Temperature Monitoring Relays

3RS10/3RS11

3RS10/3RS11 Temperature monitoring relays						
Sensor	Function	Measuring range	Rated control supply voltage $V_s$ 50–60 Hz AC	Order No.	List Price \$	
<b>Analog setting, 1 threshold value, 22.5 mm wide; analog closed-circuit principle, no holding on supply failure function; 1 NO + 1 NC</b>						
PT100 (resistance sensor)	Overrange	–50...+50 °C	24 V AC/DC	3RS10 00-□CD00		
			110/230 V AC	3RS10 00-□CK00		
		0...+100 °C	24 V AC/DC	3RS10 00-□CD10		
			110/230 V AC	3RS10 00-□CK10		
	Underrange	0...+200 °C	24 V AC/DC	3RS10 00-□CD20		
			110/230 V AC	3RS10 00-□CK20		
		–50...+50 °C	24 V AC/DC	3RS10 10-1CD00		
			110/230 V AC	3RS10 10-1CK00		
	0...+100 °C	24 V AC/DC	3RS10 10-1CD10			
		110/230 V AC	3RS10 10-1CK10			
	0...+200 °C	24 V AC/DC	3RS10 10-1CD20			
		110/230 V AC	3RS10 10-1CK20			
Typ J (thermocouple)	Overrange	0...+200 °C	24 V AC/DC	3RS11 00-□CD20		
			110/230 V AC	3RS11 00-1CK20		
		0...+600 °C	24 V AC/DC	3RS11 00-1CD30		
			110/230 V AC	3RS11 00-1CK30		
Typ K (thermocouple)	Overrange	0...+200 °C	24 V AC/DC	3RS11 01-□CD20		
			110/230 V AC	3RS11 01-1CK20		
		0...+600 °C	24 V AC/DC	3RS11 01-1CD30		
			110/230 V AC	3RS11 01-1CK30		
		+500...+1000 °C	24 V AC/DC	3RS11 01-1CD40		
		110/230 V AC	3RS11 01-1CK40			
<b>Analog setting for alarm and trip (2 threshold values), 22.5 mm wide; open-circuit – closed-circuit current principle can be toggled between; no holding on supply failure function; 1 NO + 1 CO</b>						
PT100 (resistance sensor)	Overrange	–50...+50 °C	24 V AC/DC	3RS10 20-1DD00		
			24–240 V AC/DC	3RS10 20-1DW00		
		0...+100 °C	24 V AC/DC	3RS10 20-1DD10		
			24–240 V AC/DC	3RS10 20-1DW10		
		0...+200 °C	24 V AC/DC	3RS10 20-1DD20		
	Underrange		24–240 V AC/DC	3RS10 20-□DW20		
		–50...+50 °C	24 V AC/DC	3RS10 30-1DD00		
			24–240 V AC/DC	3RS10 30-1DW00		
		0...+100 °C	24 V AC/DC	3RS10 30-1DD10		
			24–240 V AC/DC	3RS10 30-1DW10		
		0...+200 °C	24 V AC/DC	3RS10 30-□DD20		
			24–240 V AC/DC	3RS10 30-1DW20		
	Typ J (thermocouple)	Overrange	0...+200 °C	24 V AC/DC	3RS11 20-□DD20	
				24–240 V AC/DC	3RS11 20-1DW20	
		0...+600 °C	24 V AC/DC	3RS11 20-1DD30		
			24–240 V AC/DC	3RS11 20-1DW30		
Typ K (thermocouple)	Overrange	0...+200 °C	24–240 V AC/DC	3RS11 21-1DW20		
		0...+600 °C	24–240 V AC/DC	3RS11 21-1DW30		
		+500...+1000 °C	24 V AC/DC	3RS11 21-1DD40		
			24–240 V AC/DC	3RS11 21-1DW40		

Analog setting evaluation devices with one and two threshold values. For analog setting devices, the threshold values and the hysteresis from 2 to 20% are set using a rotary potentiometer. For devices with 2 threshold values, the selectable hysteresis only acts on threshold value 1. For the second threshold value, the hysteresis is permanently set to 5%. This series of products was developed for applications where a setting accuracy of  $\pm 5\%$  is sufficient.

Screw Terminal 1  
Spring-type Terminal 2

# Temperature Monitoring Relays

3RS10/3RS11

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Sensor	Measuring range (measuring range limit depends on the sensor)	Rated control supply voltage V <sub>S</sub> 50–60 Hz AC	Order No.	List Price \$
<b>"Temperature monitor" acc. to DIN 3440, digital settings, 2 threshold values, 45 mm wide; 1 CO + 1 CO + 1 NO, memory function can be enabled using an external jumper. Relay parameters have a holding on supply failure function</b>				
PT100/1000; KTY83/84; NTC (resistance sensor) <sup>1)</sup>	–50...+500 °C	24 V AC/DC 24–240 V AC/DC	<b>3RS10 40-□GD50</b> <b>3RS10 40-□GW50</b>	
	–50...+932 °F	24 V AC/DC 24–240 V AC/DC	<b>3RS20 40-□GD50</b> <b>3RS20 40-□GW50</b>	
TYPE J, K, T, E, N (thermocouple)	–99...+999 °C	24 V AC/DC 24–240 V AC/DC	<b>3RS11 40-□GD60</b> <b>3RS11 40-□GW60</b>	
	–99...+1830 °F	24 V AC/DC 24–240 V AC/DC	<b>3RS21 40-□GD60</b> <b>3RS21 40-□GW60</b>	
<b>"Temperature limiter" and "temperature monitor" acc. to DIN 3440, digital settings, 2 threshold values, 45 mm wide; 1 CO + 1 CO + 1 NO, tripped state and relay parameters are saved using a holding on supply failure function</b>				
PT100/1000; KTY83/84; NTC (resistance sensor) <sup>1)</sup>	–50...+750 °C	24 V AC/DC 24–240 V AC/DC	<b>3RS10 42-□GD70</b> <b>3RS10 42-□GW70</b>	
	–99...+1800 °C	24 V AC/DC 24–240 V AC/DC	<b>3RS11 42-□GD80</b> <b>3RS11 42-□GW80</b>	

<b>Motor monitoring relays, digital settings for up to 3 sensors, 45 mm wide; 1 CO + 1 CO + 1 NO</b>					
Sensor	No of sensors	Measuring range	Rated control supply voltage V <sub>S</sub>	Order No.	List Price \$
PT100/1000; KTY83/84; NTC (resistance sensor) <sup>1)</sup>	1 to 3 sensors	–50...+500 °C	24–240 V AC/DC	<b>3RS10 41-□GW50</b>	
		–50...+932 °F	24–240 V AC/DC	<b>3RS20 41-□GW50</b>	

<sup>1)</sup> NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ)

Screw Terminal **1**  
Spring-type Terminal **2**

The short-circuit and wire breakage detection, as well as the measuring range are restricted, depending on the sensor type:

<b>Measuring ranges in °C for thermocouple</b>				
Sensor type	Short-circuit	Wire breakage	3RS11 40 measuring range	3RS11 42 measuring range
J	–	x	–99...999	–99...1200
K	–	x	–99...999	–99...1350
T	–	x	–99...400	–99...400
E	–	x	–99...999	–99...999
N	–	x	–99...999	–99...999
S	–	x	–	0...1750
R	–	x	–	0...1750
B	–	x	–	400...1800

<b>Measuring ranges in °C for resistance sensors</b>				
Sensor type	Short-circuit	Wire breakage	3RS10 40 measuring range	3RS10 42 measuring range
PT100	x	x	–50...500	–50...750
PT1000	x	x	–50...500	–50...500
KTY83-110	x	x	–50...175	–50...175
KTY84	x	x	–40...300	–40...300
NTC <sup>1)</sup>	x	–	80...160	80...160

<sup>1)</sup> NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ)

**Evaluation units with digital settings**

Temperature monitoring relays distinguish themselves due to the fact that they are extremely easy-to-use. The actual temperature is always displayed on the three-digit LED display. A dedicated relay with one NO contact is integrated to monitor the sensor. The relay is switched-out in the parameterizing mode. The following parameters can be set:

- Sensor type
- 2 threshold values J<sub>1</sub>, J<sub>2</sub>
- 1 hysteresis; this acts on both thresholds (0–99 K)
- 1 delay time; this acts on both thresholds (0–9999 s)
- Either the open-circuit/closed-circuit principle can be selected
- Function: Overtemperature/Undertemperature (overrange/underrange) or window monitoring within a defined range

Versions with a wide-range voltage have electrical isolation. The temperature ranges are dependant on the sensor type (refer to the function).

## Temperature Monitoring Relays

3RS10/3RS11

Technical data											
General data											
Type		3RS10 00 3RS10 10	3RS11 00	3RS11 01	3RS10 20 3RS10 30	3RS11 20 3RS11 30	3RS11 21 3RS11 31	3RS.0 40 3RS.0 41	3RS.1 40		
Sensor type		PT100	TC Type J	TC Type K	PT100	TC Type J	TC Type K	PT100; 1000 KTY83/84; NTC	TC Type J, K, T, E, N		
Width	mm	22.5							45		
Operating range	V	0.85 to 1.1 x $U_s$									
Rated power	W/VA	< 2 / 4							< 4 / 7		
Auxiliary circuit											
Contacts		1 NO + 1 NC			1 SPDT + 1 NO		1 SPDT + 1 SPDT + 1 NO				
Rated operational current $I_e$											
AC15 at AC 230 V, 50 Hz	A	3									
DC13 at 24 V	A	1									
DC13 at 240 V	A	0.1									
Required DIAZED fuse											
Utilisation category	gL/gG	A	4								
Electrical endurance	AC 15 at 3 A	100,000									
Mechanical endurance											
Mechanical operating cycles		30 x 10 <sup>6</sup>									
Tripping unit											
Measuring accuracy at 20°C ambient temperature (T20)		typically < ± 5% of upper limit of scale						< ± 2K ± 1 digit	< ± 5K ± 1 digit		
Reference point accuracy		-	< ± 5 K	-	< ± 5 K	-	< ± 5 K	-			
Deviations due to ambient temperature in % of measuring range	%	<2	<3	<2	<3	0.05 °C per K deviation from T20					
Measuring cycle	ms							500			
Hysteresis adjustments for temperature 1 for temperature 2		2 to 20 % of upper limit of scale 5 % of upper limit of scale						1 to 99 Kelvin, for both values			
Sensor circuit											
Typical sensor current											
PT100	mA	Typically 1	-		Typically 1	-		Typically 1	-		
PT1000 / KTY83 / KTY84 / NTC	mA	Typically 0.2	-		Typically 0.2	-		Typically 0.2	-		
Wire-break detection		No						Yes <sup>1)</sup>	Yes		
Short-circuit detection		No						Yes	No		
3-wire connection		Yes <sup>2)</sup>	-		Yes <sup>2)</sup>	-		Yes <sup>2)</sup>	-		
Enclosure											
Environmental effects											
Permissible ambient temperature	°C	- 25° to 60°									
Permissible storage temperature	°C	- 40° to 80°									
Permissible mounting position		any									
Degree of protection to EN 60 529		Terminals: IP20; cover: IP40									
Rated insulation voltage $U_i$ (pollution degree 3)	AC V	300									
Conductor cross-section											
Screw terminals											
- solid	mm <sup>2</sup>	M 3.5 (for standard screwdriver Size 2 and Pozidriv 2)									
- finely stranded, with end sleeves	mm <sup>2</sup>	1 x (0.5 to 4) / 2 x (0.5 to 2.5)									
- solid or stranded AWG conductors	AWG	1 x (0.5 to 2.5) / 2 x (0.5 to 1.5)									
- Tightening torque	Nm	2 x (20 to 14)									
		0.8 to 1.2									
Cage Clamp terminals											
- solid	mm <sup>2</sup>	2 x (0.25 to 1.5)									
- finely stranded, with end sleeves	mm <sup>2</sup>	2 x (0.25 to 1)									
- finely stranded, without end-sleeves	mm <sup>2</sup>	2 x (0.25 to 1.5)									
- solid or stranded AWG conductors	AWG	2 x (24 to 16)									
- corresponding opening tool		8WA2 807									
Vibration performance IEC 68-2-6		5 to 26 Hz/0.75 mm									
Shock resistance IEC 68-2-27		15 g/11 ms									

1) Not for NTC (B57227-K333-A1  
(100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

2) 2-wire connection of resistance sensors  
with wire jumper between T2 and T3.

# Temperature Monitoring Relays

## 3RS10/3RS11

### Configuration

#### Specifications

The temperature monitoring relays correspond to:

- IEC 60 721-3-3 "Environmental conditions"
- IEC 947-5-1; DIN VDE 0660 "Low-voltage switchgear and controlgear"

- EN 50 081-2 "Basic technical standard for emitted interference (industry)"
- EN 61 000-6-2 "Basic technical standard for interference immunity (industry)"
- DIN EN 50 042 "Terminal marking"
- UL/CSA under application

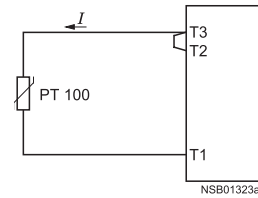
#### Connection of resistance thermometers

##### 2-wire measurement

When 2-wire temperature sensors are used, the sensor resistance is added to the wire resistance. The system error that results must be taken into

account when the parameters are set for the evaluation unit. A jumper must be clamped between terminals T2 and T3.

The following table can be used to determine the temperature error when a PT100 is used.



##### Error due to wiring

The error that arises due to the wiring is approx. 2.5 Kelvin/ohm. If the resistance of the wiring is not known and cannot be measured, the wiring error can be estimated by means of the following table.

Temperature error as a function of conductor length and cross-section with PT 100 sensors and 20°C ambient temperature, in K

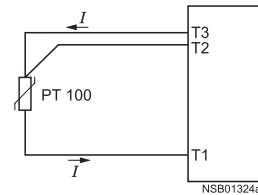
Cable length in m	Cross-section mm <sup>2</sup>			
	0.5	0.75	1	1.5
0	0.0	0.0	0.0	0.0
10	1.8	1.2	0.9	0.6
25	4.5	3.0	2.3	1.5
50	9.0	6.0	4.5	3.0
75	13.6	9.0	6.8	4.5
100	18.1	12.1	9.0	6.0
200	36.3	24.2	18.1	12.1
500	91.6	60.8	45.5	30.2

##### 3-wire measurement

To minimise the effects of the wiring resistances, a 3-wire circuit is usually used.

Using the additional wire, it is possible for two measuring circuits to be formed of which one is used as a reference.

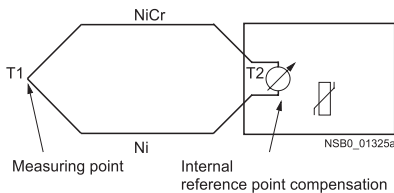
The evaluation unit can then automatically calculate the wiring resistance and take it into account.



#### Connection of thermoelements

A differential temperature measurement is obtained from the thermo-electrical effect

between the measuring point and the evaluation unit.



This principle assumes that the evaluation unit knows the temperature at the terminal (T2). The 3RS11 temperature monitoring relays have a built-in reference point correction function that determines this reference temperature and uses it to generate the measurement result.

The absolute temperature is therefore calculated from the ambient temperature of the evaluation unit and the temperature difference measured by the thermoelement.

In this manner, temperature acquisition (T1) is possible without knowing the precise ambient temperature at the terminals of the evaluation unit (T2).

The connecting lead is only permitted to be extended using equalising conductors made from the same material as the thermoelement itself. If a different type of lead is used, the measurement will be inaccurate.

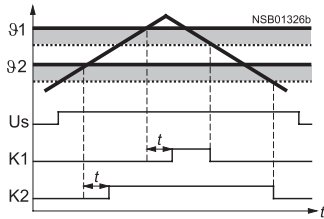
# Temperature Monitoring Relays

3RS10/3RS11

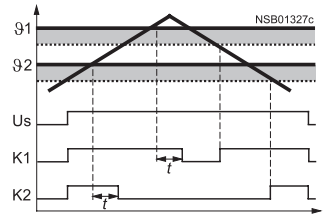
## Functions

### Temperature overshoot

#### Open-circuit principle



#### Closed-circuit principle



#### Digital evaluation units:

After the temperature has reached the set threshold value  $\vartheta_1$ , output relay K1 changes its switching state appropriately as soon as the set time  $t$  has elapsed (K2 responds to  $\vartheta_2$  similarly).

#### Analog evaluation units:

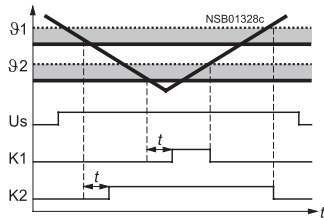
When the set threshold value is reached, output relay K1 changes its switching status. For devices with 2 threshold values, relay K2 responds to the second set threshold value.

As soon as the temperature reaches the respective set hysteresis value, the relays return immediately to the original state.

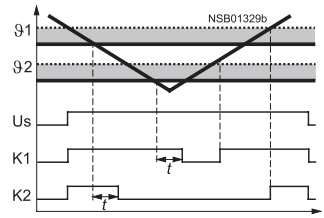
A time delay cannot be set ( $t = 0$ ).

### Temperature undershoot

#### Open-circuit principle

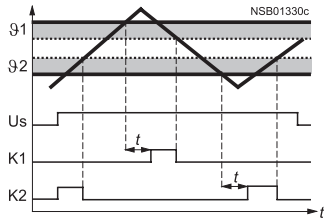


#### Closed-circuit principle

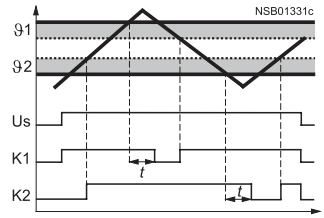


### Window monitoring

#### Open-circuit principle



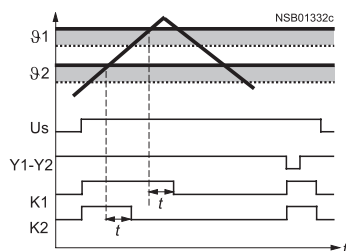
#### Closed-circuit principle



When the temperature has reached the upper threshold  $\vartheta_1$  and the set delay time  $t$  has elapsed, the output relay K1 changes its switching state. As soon as the temperature reaches the respective set hysteresis value, the relay returns immediately to the original state.

In the same manner, K2 responds to the lower threshold value of  $\vartheta_2$ .

### Principle of operation with memory function, based on the example of temperature overshoot using the closed-circuit principle



When the temperature has reached the set threshold  $\vartheta_1$  and the set delay time  $t$  has elapsed, the output relay K1 changes its switching state (similarly, K2 responds to  $\vartheta_2$ .)

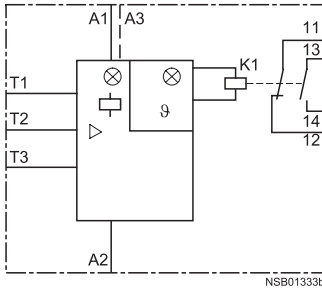
The relays will only return to the original state when the temperature has fallen below the respective set hysteresis value and the connection Y1-Y2 was briefly interrupted.

- Absolute limit
  - Hysteresis range
  - ..... Hysteresis limit
- NSB00629

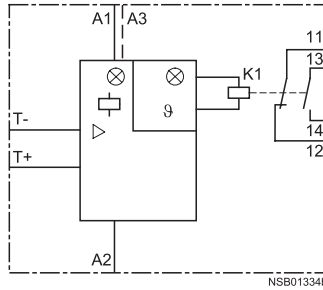
### Circuit diagrams

#### Connection examples

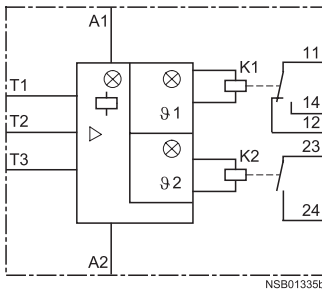
**3RS10 00**  
**3RS10 10**



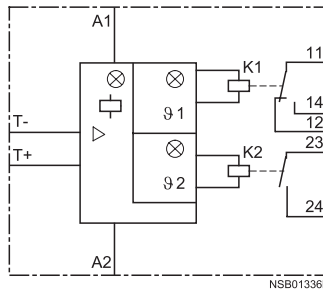
**3RS11 00**  
**3RS11 01**



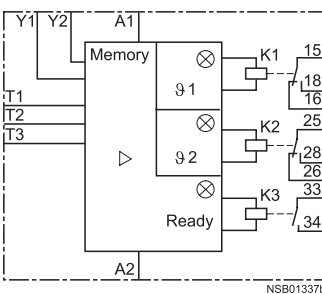
**3RS10 20**  
**3RS10 30**



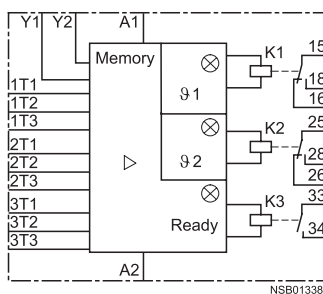
**3RS11 20/3RS11 30**  
**3RS11 21/3RS11 31**



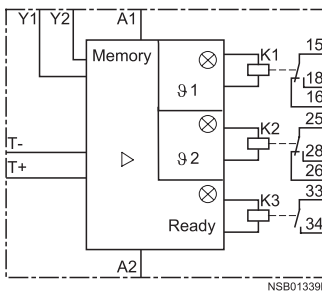
**3RS10 40**  
**3RS20 40**



**3RS10 41**  
**3RS20 41**



**3RS11 40**  
**3RS21 40**



#### General equipment designations

A1, A2, A3 Rated control supply voltage terminals  
K1, K2, K3 Output relays

Equipment designations for:  
3RS1000, 3RS1010, 3RS1101, 3RS1100,  
3RS1110, 3RS1111, 3RS1020, 3RS1021,  
3RS1030, 3RS1031

□ = LED: "Voltage applied"  
ø1 = LED: "Relay 1 switched"  
ø2 = LED: "Relay 2 switched"  
T1 to T3 = Terminals for connection of resistance sensor  
T+ / T- = Terminals for connection of thermoelements

Equipment designations for:  
3RS1040, 3RS1140, 3RS2040, 3RS2140

ø1 = LED: "Relay 1 switched"  
ø2 = LED: "Relay 2 switched"  
Ready = LED: "Device operating"  
T1 to T3 = Terminals for connection of resistance sensor  
T+ / T- = Terminals for connection of thermoelements  
Y1/Y2 Terminals for memory jumper  
JBiq

Equipment designations for:  
3RS1041, 3RS2041

ø1 = LED: "Relay 1 switched"  
ø2 = LED: "Relay 2 switched"  
Ready = LED: "Device operating"  
1T1 to 1T3 = Terminals for connection of resistance sensor 1  
2T1 to 2T3 = Terminals for connection of resistance sensor 2  
3T1 to 3T3 = Terminals for connection of resistance sensor 3  
Y1/Y2 Terminals for memory jumper



**Important!**  
When resistance sensors are used in a 2-wire connection, a jumper must be installed between T2 and T3.

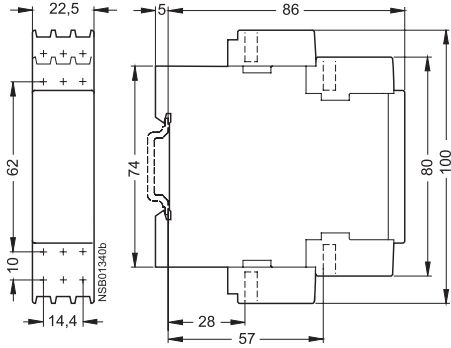
# Temperature Monitoring Relays

3RS10/3RS11

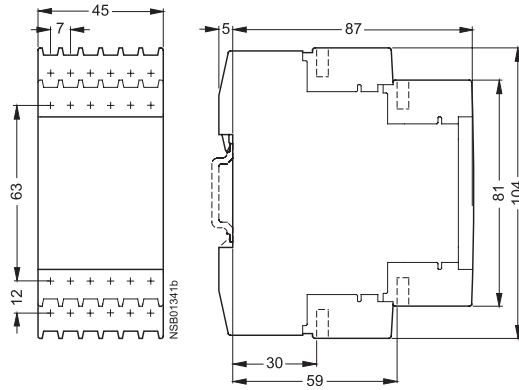
## Dimension drawings

### Temperature monitoring relay

3RS10/3RS11 .. with 22.5 mm enclosure



3RS20/3RS21  
3RS10/3RS11 .. with 45 mm enclosure





## Thermistor Motor Protection

3RN2

## Overview



SIRIUS 3RN2 thermistor motor protection

## More information

Homepage, see [www.siemens.com/relays](http://www.siemens.com/relays)Industry Mall, see [www.siemens.com/product?3RN2](http://www.siemens.com/product?3RN2)For the conversion tool, e.g. from 3RN1 to 3RN2, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool)

Thermistor motor protection devices are used for direct monitoring of the motor winding temperature. For this purpose, the motors are equipped with temperature-dependent resistors (PTC) that are directly installed in the motor winding and abruptly change their resistance at their temperature limit.

## Article No. scheme

Product versions		Article number								
Thermistor motor protection relay with PTC sensor, type A		3RN20 □ □ - □ □ □ □ □								
Number and version of the sensor circuits	1 sensor circuit, supply voltage = root voltage	0								
	1 sensor circuit	1								
	2 sensor circuits for warning and disconnection	2								
RESET	Auto RESET	0								
	Manual RESET, with open-circuit and short-circuit detection	1								
	Manual/Auto/Remote RESET, non-volatile, with open-circuit and short-circuit detection	2								
	Manual/Auto/Remote RESET, non-volatile, with open-circuit and short-circuit detection, with protective separation	3								
Connection method	Screw terminals			1						
	Spring-type terminals (push-in)			2						
Auxiliary switches	1 CO					A				
	2 CO					B				
	1 NO + 1 NC					C				
	1 NO + 1 CO					D				
	2 CO, hard gold-plated					G				
Rated control supply voltage	24 V AC/DC					A	3			
	24 ... 240 V AC/DC					W	3			
Response to failure	Monostable						0			
	Bistable						1			
Example		3RN20	0	0	-	1	A	A	3	0

## Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

## Versions

SIRIUS 3RN2 thermistor motor protection relays are available in the following versions:

- 3RN2000 compact evaluation unit
- 3RN2010 compact/standard evaluation unit
- 3RN2012-.BW31 bistable evaluation unit
- 3RN2011, 3RN2012-...30, 3RN2013 standard evaluation unit with ATEX approval
- 3RN2023 evaluation unit with ATEX approval and 2 sensor circuits for warning and disconnection

They comply with

- IEC 60947-8. Low-voltage switchgear and controlgear – Part 8: "Control units for built-in thermal protection (PTC) for rotating electrical machines"
- IEC 61000-6-2, IEC 61000-6-4. "Electromagnetic compatibility for industrial-process measurement and control equipment"

The 3RN2 thermistor motor protection relays with ATEX approval fulfill SIL1 in compliance with EN 50495.

The terminals of the auxiliary contacts are designated in accordance with EN 60947-1.

3RN2 evaluation units are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60715 or for screw fixing using an adapter (accessory).

For your orders, please use the article numbers quoted in the selection and ordering data.

## Thermistor Motor Protection

3RN2

**Benefits**

- Thanks to direct motor protection, overdimensioning of the motors is not necessary
- No settings on the device are necessary
- Semiconductor compatible output thanks to versions with hard gold-plated contacts
- Rapid error diagnosis thanks to versions that indicate open and short circuits in the sensor circuit
- All versions with removable terminals
- All versions with screw or spring-type terminals with push-in functionality

**Application**

Direct motor protection through temperature monitoring of the motor winding offers 100% motor protection even under the most difficult ambient conditions, without the need to make adjustments on the device. Versions with hard gold-plated contacts ensure, in addition, a high switching reliability that is even higher than an electronic control.

Direct motor protection

- At increased ambient temperatures
- When switching frequency is too high
- When start up and braking procedures are too long

**ATEX approval for operation in areas subject to explosion hazard**

The SIRIUS 3RN2011, 3RN2012-...30, 3RN2013 and 3RN2023 thermistor motor protection relays for PTC sensors are certified according to ATEX Ex II (2) G and D for environments with explosive gas or dust loads.

**Motor protection using current- and temperature-dependent protective devices**

IEC 60204 stipulates that motors must be protected from overheating at a rating of 0.5 kW and higher. The protection can take the form of overload protection, overtemperature protection or current limiting.

For motors with frequent starting and braking and in environments where cooling may be impaired (e.g. by dust), it is recommended to use the overtemperature protection option in the form of a protective device coordinated with this mode of operation. A good choice in this case is the use of 3RN2 thermistor motor protection devices.

On rotor-critical motors, overtemperature detection in the stator windings can lead to delayed and hence inadequate protection. In this case the standards stipulate additional protection, e.g. by means of an overload relay.

This combination of thermistor motor protection and an overload relay is recommended for full motor protection in case of frequent starting and braking of motors, irregular intermittent duty or excessive switching frequency. To prevent premature tripping of the overload relay in such operating conditions, a higher setting than that normally required for the operational current is chosen. The overload relay then performs stall protection, and the 3RN2 thermistor motor protection relay monitors the temperature of the motor windings.

Application	Motor protection		
	Only current-dependent, e.g. with overload relay	Temperature-dependent only, e.g. with thermistor motor protection relay	Current- and temperature-dependent
Motor protection in case of			
Overloading in uninterrupted duty	✓	✓	✓
Long start up and braking operations	○	✓	✓
Irregular intermittent duty	○	✓	✓
Excessively high switching frequency	○	✓	✓
Single-phase operation and current unbalance	✓	✓	✓
Voltage and frequency fluctuations	✓	✓	✓
Stalling of the rotor	✓	✓	✓
Switching on a stalled rotor of a stator-critical motor	✓	✓	✓
Switching on a stalled rotor of a rotor-critical motor	✓	○	✓
Elevated ambient temperature	--	✓	✓
Impeded cooling	--	✓	✓

- ✓ Full protection
- Conditional protection
- No protection

## Thermistor Motor Protection

3RN2

## Technical specifications

## More information

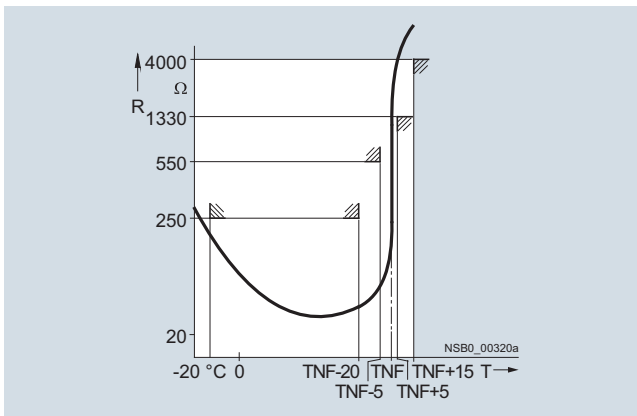
Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/24302/td>  
 Operating instructions and internal circuit diagrams, see <https://support.industry.siemens.com/cs/ww/en/ps/24302/man>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/24302/faq>  
 For more information on explosion protection (ATEX), see [www.siemens.com/sirius/atex](http://www.siemens.com/sirius/atex)

## Type A PTC temperature sensor

If a Type A temperature sensor is connected to a Type A evaluation unit, compliance with the operating temperatures is assured (on pick-up and reset) according to IEC 60947-8.

The characteristic curves of the Type A temperature sensors are described in IEC 60947-8, EN 44081 and EN 44082 standards.



Characteristic curve of the 3RN2 evaluation unit

## Bimetallic switch

In some applications, bimetallic switches (e.g. Klixon, Thermo-click) are used as sensors instead of PTC temperature sensors. Bimetallic switches are temperature- and current-dependent NC contacts and are available for different temperature ranges. Because bimetallic switches have practically no resistance below their opening temperature, short-circuit detection is not possible when using bimetallic switches. A bimetallic switch can be used for versions 3RN2000 and 3RN2010 on the SIRIUS thermistor motor protection relay.

## Note:

Never use bimetallic switches in applications subject to an explosion hazard! Because of their non-standardized tripping characteristic, bimetallic switches must not be used in applications where there is an explosion hazard. Use Type A PTC sensors instead!

## Use in hazardous areas

Increased danger in hazardous areas means it is necessary to observe the following notes and standards carefully:

- EN 60079-14/VDE 0165-1 for electrical apparatus for explosive gas atmospheres
- EN 60079-17 Explosive atmospheres – Electrical installations inspection and maintenance
- EN 50495 Safety devices required for the safe functioning of equipment with respect to explosion risks

The following SIRIUS 3RN2 thermistor motor protection relays with short-circuit detection are approved for Equipment Group II, Category (2) in Area "G" (areas in which potentially explosive gas, vapor, mist, or air mixtures are present) and are additionally approved for Area "D" (areas containing combustible dust):

- 3RN2011
- 3RN2012-...30
- 3RN2013
- 3RN2023

PTB 15 ATEX 3011 ex II (2) G (Ex E) (EX d) (Ex px)  
 PTB 15 ATEX 3011 ex II (2) D (Ex T) (Ex p)

For 3RN2 thermistor motor protection relays, the EC type examination certificate is available for Group II, Category (2) G [Ex e] [Ex d] [Ex px] and D [Ex t] [Ex p]. The number is PTB 15 ATEX 3011.

SIRIUS 3RN2 thermistor motor protection relays are not intended for installation in hazardous areas. If they are installed in a potentially explosive atmosphere, the SIRIUS 3RN2 thermistor motor protection relays must be adapted to the applicable type of protection.

The machine or plant must shut down immediately if the SIRIUS 3RN2 thermistor motor protection relay is tripped, even if connected through a frequency converter. This must be implemented with circuitry.

SIRIUS 3RN2 thermistor motor protection relays with functional safety in accordance with EN 50495 are suitable for protecting explosion-proof motors/machines.

On evaluation units with a supply voltage of 24 V AC/DC, you must ensure electrical separation with a battery network or a power supply unit with electrical separation (e.g. isolating transformer) (does not apply to 3RN2013-BA30).

A SIRIUS 3RN2 thermistor motor protection relay set to "automatic RESET" mode will be reset automatically after the recovery time has elapsed, without the RESET button being pressed. An additional ON button has to be used to ensure that the motor does not start up automatically following tripping. "Automatic RESET" mode must not be used in applications where there is a risk of personal injury or damage to property if the motor restarts unexpectedly.

## Thermistor Motor Protection

## 3RN2

**⚠ NOTICE!**

When used in a hazardous area, the thermistor motor protection relay must not be operated with automatic RESET (terminal Y1 and Y2 permanently jumpered).

A risk analysis must be performed for the complete plant or machine. If this analysis yields a lower hazard potential (category 1), all SIRIUS 3RN2 thermistor motor protection relays can be used, provided the safety regulations are observed.

**⚠ WARNING!**

All work involved in connecting, commissioning and maintenance must be carried out by qualified, responsible personnel. Improper handling may result in serious personal injury and considerable damage to property.

**Cable routing**

The measuring circuit leads must be routed as separate control cables. It is not permitted to use cores from the supply line of the motor or any other main supply cables. If extreme inductive or capacitive interference is expected as a result of power lines routed in parallel, shielded control cables must be used.

Maximum length of sensor circuit cables for evaluation units without short-circuit detection in the sensor circuit:

Cable cross-section	3RN2000, 3RN2010
2.5 mm <sup>2</sup>	2 x 2800 m
1.5 mm <sup>2</sup>	2 x 1500 m
0.5 mm <sup>2</sup>	2 x 500 m

Maximum length of sensor circuit cables for evaluation units with short-circuit detection<sup>1)</sup>

Cable cross-section	3RN2011, 3RN2012, 3RN2013, 3RN2023
2.5 mm <sup>2</sup>	2 x 250 m
1.5 mm <sup>2</sup>	2 x 150 m
0.5 mm <sup>2</sup>	2 x 50 m

<sup>1)</sup> A short circuit in the sensor circuit will be detected up to this maximum cable length.

**Principle of operation**

SIRIUS 3RN2 thermistor motor protection relays are thermal protection devices that are suitable, in combination with type A PTC thermistors, for monitoring temperatures of electrical drives, transformer windings, oils, bearings, air, etc.

The most frequent application is monitoring of three-phase motors in which the motor manufacturer has fitted a PTC sensor into every winding overhang and in which these PTC sensors are connected in series.

The SIRIUS 3RN2 thermistor motor protection relays operate in accordance with the closed-circuit principle and therefore monitor themselves for loss of supply voltage. The exceptions are the warning output on 3RN2023, which always works on the open-circuit principle and the bistable relays of the 3RN2012-.BW31, which always retain the last switching state.

A micro-interruption in the power supply of less than 30 ms does not change the status of the output relays.

For devices with the "Manual RESET" function, the test function can be activated and a trip simulated by pressing the blue Test/RESET button for > 2 seconds.

The 3RN2011, 3RN2012, 3RN2013 and 3RN2023 devices are additionally equipped with open-circuit and short-circuit detection in the sensor circuit. The unit will trip in the event of a short-circuit (resistance in sensor circuit < 10 Ω) or open circuit in the sensor circuit (dynamic open-circuit detection). Tripping as the result of a short-circuit in the sensor circuit is indicated by a flickering red LED (TRIPPED). In the event of a short-circuit in the sensor circuit for warning on the 3RN2023, the yellow warning LED (WARNING) flickers. The devices with dynamic open-circuit detection evaluate the rise time of the sensor circuit resistance. If the sensor circuit resistance rises from 3 300 Ω to 12 kΩ within 200 ms, the unit will not only trip, but also indicate the open circuit via a flashing red LED (TRIPPED). In the event of an open circuit in a sensor circuit, the yellow warning LED (WARNING) flashes for the 3RN2023.

All evaluation units (except for the 3RN2000 compact evaluation unit) feature electrical separation between the control circuit and the sensor circuit. The relay outputs are also electrically separated from all other circuits. The 3RN2013 and 3RN2023 evaluation units incorporate protective electrical separation between all circuits up to  $U_i = 300$  V.

**3RN2000 compact evaluation unit**

The compact unit, which is only 17.5 mm wide, is equipped with a red LED (TRIPPED) for the tripped indicator and a changeover contact. After the unit has tripped, it is automatically reset once the thermistors have cooled down. The root of the changeover contact is connected to the control voltage (terminal 11 is connected to terminal A1). This unit is particularly suitable in circuits in which the control circuit and signaling circuit have the same potential, e.g. in local control boxes.

**3RN2010, 3RN2011, 3RN2012 and 3RN2013 compact/standard evaluation units**

The units are equipped with two LEDs (READY and TRIPPED) for an operating and tripped display and are available with either 1 NO + 1 NC contacts (3RN2010, overall width 17.5 mm) or with 2 CO contacts. Depending on the version, they are available with Auto RESET (3RN2010), Manual/Remote RESET (3RN2011) or Manual/Auto and Remote RESET (3RN2012 and 3RN2013). Remote RESET can be achieved by connecting an external pushbutton with a normally-open function to terminals Y1 and Y2. If terminals Y1 and Y2 are jumpered, the unit is automatically reset once the thermistors have cooled down (Auto RESET). 3RN2012 and 3RN2013 are non-volatile. This means a previous trip remains stored in the event of a control supply voltage failure – the thermistor motor protection relay remains in the safe state with an opened output relay until it is intentionally reset by pressing the TEST/RESET button of the unit or an external pushbutton.

**3RN2023 "warning and disconnection" evaluation units**

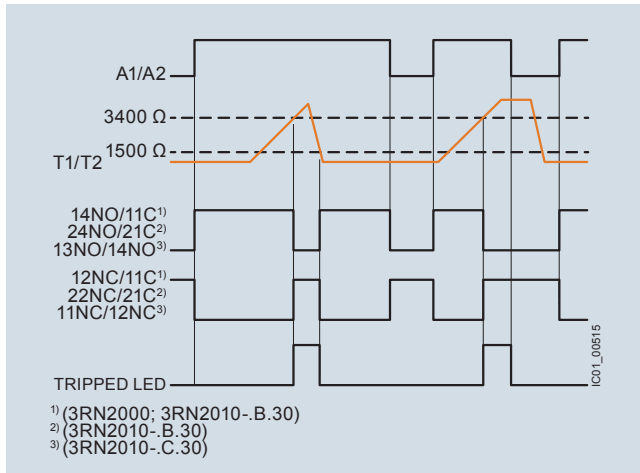
Two sensor circuits can be connected to one 3RN2023 evaluation unit that act on two separate output relays with 1 NO contact for warning and 1 CO contact for disconnection. Thermistors with different rated response temperatures TNF are used to implement the "Warning" and "Disconnection" functions. When sensor circuit 2 for "Warning" responds, a yellow LED is lit and when the "Disconnection" circuit responds, a red LED is lit. The sensor circuits have a different reset response and operating behavior: The "Warning" thermistor sensor circuit 2 (terminals 2T1, 2T2) works only with Auto RESET and according to the open-circuit principle (output relay K2, NO contact). The "Disconnection" thermistor sensor circuit 1, (terminals 1T1, 1T2) can be changed from Manual RESET to Auto RESET by jumpering terminals Y1 and Y2. Remote RESET is implemented by connecting an external pushbutton with a normally-open function to these terminals.

# Thermistor Motor Protection

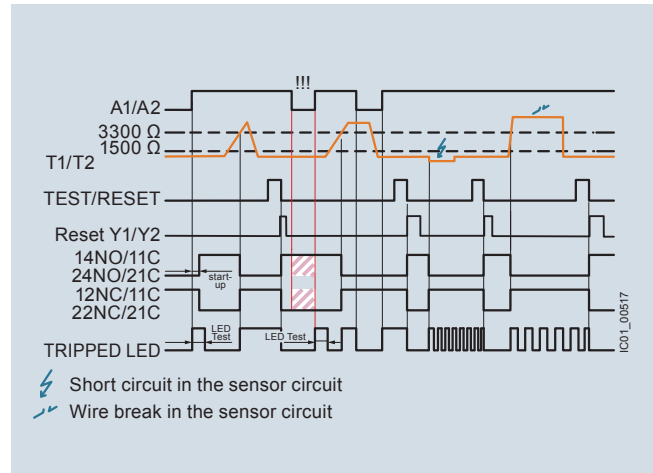
3RN2

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RELAYS, INTERFACES  
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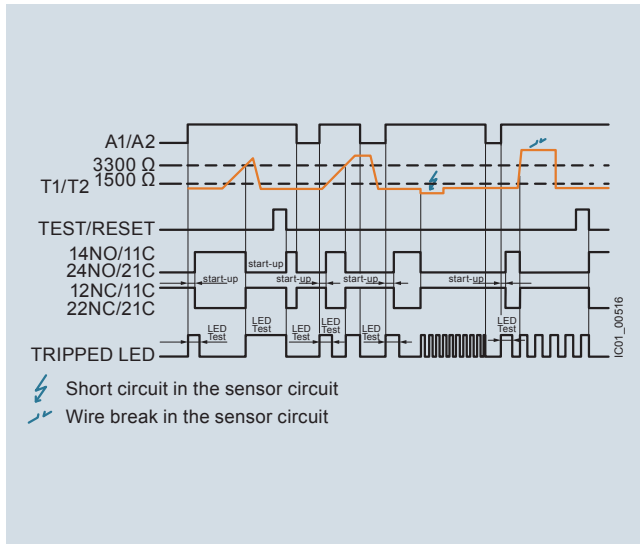
## Function diagrams



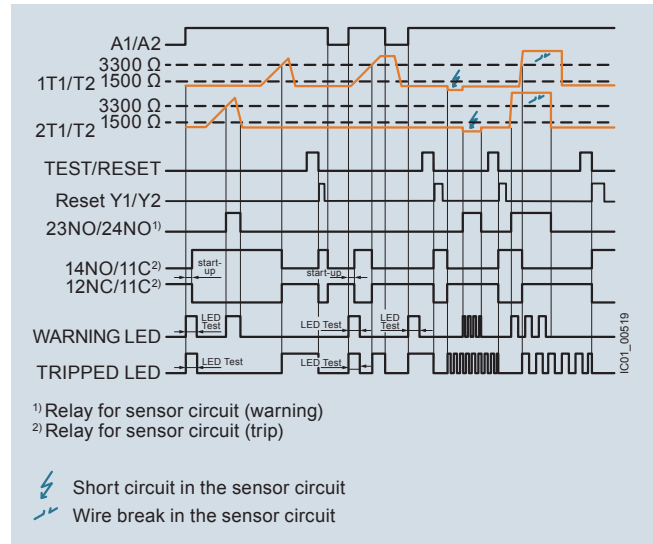
3RN2000, 3RN2010



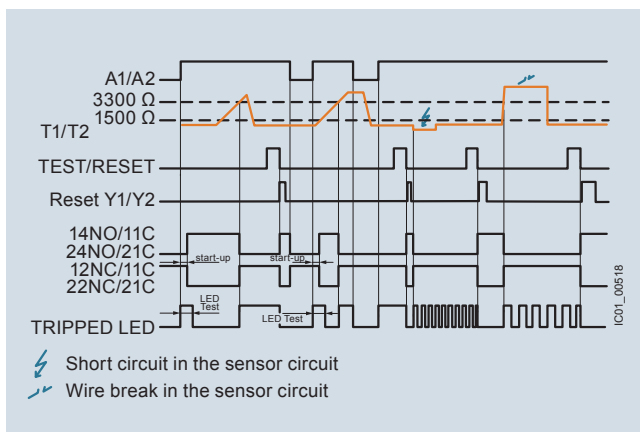
3RN2012-.BW31: resetting via the TEST/RESET button or external push-button



3RN2011: resetting via external pushbutton or interruption of the supply voltage



3RN2023: resetting via the TEST/RESET button or external pushbutton

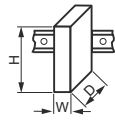


3RN2012-.B.30, 3RN2013: resetting via the TEST/RESET button or external pushbutton

## Thermistor Motor Protection

## 3RN2

Article number	<b>3RN2000-.A, 3RN2010-.C</b>	<b>3RN201-.B, 3RN2013-.G, 3RN2023-.D</b>
Width x height x depth	mm 100 × 17.5 × 90	100 × 22.5 × 90





Article number	<b>3RN2000-.AA30</b>	<b>3RN2000-.AW30, 3RN2010-.BW30, 3RN2010-.CW30</b>	<b>3RN2010-.BA30, 3RN2010-.CA30</b>	<b>3RN2011-.BA30, 3RN2012-.BA30</b>	<b>3RN2011-.BW30, 3RN2012-.BW30</b>	<b>3RN2012-.BW31</b>	<b>3RN2013-.BA30</b>	<b>3RN2013-.BW30, 3RN2013-.GW30</b>	<b>3RN2023-.DW30</b>
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General technical specifications									
Type of electrical isolation		None	Isolated				Protective separation		
Electrical endurance (operating cycles) for AC-15 at 230 V		100 000							
Mechanical endurance (operating cycles)		10 000 000							
Insulation voltage for overvoltage category III according to IEC 60664 for pollution degree 3 / rated value	V	300							
Impulse withstand voltage, rated value	kV	4				6			
Minimum mains failure buffering time	ms	40						30	
Pollution degree		3							
Degree of protection		IP20							
Vibration resistance acc. to IEC 60068-2-27		11g/15 ms							
Vibration resistance acc. to IEC 60068-2-6		10 ... 55 Hz; 0.35 mm							
Type of mounting		For screw-fixing and snap-on mounting to 35 mm standard mounting rail							
• Mounting position		Any							
• Installation altitude at height above sea level, maximum	m	2 000							
Ambient temperature during operation	°C	-25 ... +60							
Relative humidity during operation, maximum	%	70							
ATEX									
Ex device group and Ex category according to ATEX product directive 2014/34/EU		--		II 2G, II 2D		--		II 2G, II 2D	
Safety device type according to IEC 61508-2		--		Type B		--		Type B	
Safety integrity level (SIL) according to IEC 61508		--		SIL1		--		SIL1	
Performance level (PL) according to EN ISO 13849-1		--		c		--		c	
T1 value for proof test interval or service duration according to IEC 61508	y	--		3		--		3	
Measuring circuit									
Number of measuring circuits		1						2	
Relative measuring accuracy	%	9				2			
Maximum number of sensors in series		6							
Cable length of sensor, maximum	m	2 800			250				
Thermistor resistance response value	Ω	1 500 ... 1 650			1 500 ... 1 550				
Thermistor resistance return value	Ω	3 400 ... 3 600			3 300 ... 3 350				

## Thermistor Motor Protection

## 3RN2

Article number	3RN2000- .AA30	3RN2000- .AW30, 3RN2010- .BW30, 3RN2010- .CW30	3RN2010- .BA30, 3RN2010- .CA30	3RN2011- .BA30, 3RN2012- .BA30	3RN2011- .BW30, 3RN2012- .BW30	3RN2012- .BW31	3RN2013- .BA30	3RN2013- .BW30, 3RN2013- .GW30	3RN2023- .DW30
<b>Control circuit</b>									
<b>Current carrying capacity of the output relay</b>									
• At AC-15 at 250 V at 50/60 Hz	A	3							
• At DC-13 at 24 V	A	1							
• At DC-13 at 125 V	A	0.2							
• At DC-13 at 250 V	A	0.1							
<b>Thermal current of the non-solid-state contact blocks, maximum</b>	A	5							
<b>Continuous current of the output relay's DIAZED fuse link</b>	A	6							
<b>Supply voltage</b>									
<b>Control supply voltage</b>									
• At AC									
- At 50 Hz rated value	V	24 ... 24	24 ... 240	24 ... 24	24 ... 240		24 ... 24	24 ... 240	
- At 60 Hz rated value	V	24 ... 24	24 ... 240	24 ... 24	24 ... 240		24 ... 24	24 ... 240	
• At DC, rated value	V	24 ... 24	24 ... 240	24 ... 24	24 ... 240		24 ... 24	24 ... 240	
<b>Operating range factor of the control supply voltage, rated value</b>									
• At AC at 50 Hz		0.85 ... 1.1							
• At AC at 60 Hz		0.85 ... 1.1							
• At DC		0.85 ... 1.1							

Article number	3RN20..-1	3RN20..-2
<b>Type of electrical connection</b>	 Screw terminals	 Spring-type terminals (push-in)
<b>Tightening torque</b>	Nm 0.6 ... 0.8	--
<b>Type of connectable conductor cross-sections</b>		
• Solid	mm <sup>2</sup> 1x (0.5 ... 4.0 mm <sup>2</sup> ), 2x (0.5 ... 2.5 mm <sup>2</sup> )	1x (0.5 ... 4 mm <sup>2</sup> )
• Finely stranded with end sleeve	mm <sup>2</sup> 1x (0.5 ... 4 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )	1x (0.5 ... 2.5 mm <sup>2</sup> )
• For AWG cables		
- Solid	AWG 1x (20 ... 12), 2x (20 ... 14)	1x (20 ... 12)
- Stranded	AWG --	1x (20 ... 12)



# Thermistor Motor Protection

3RN2

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RELAYS, INTERFACES  
& CONVERTERS

## Selection and ordering data



3RN2000-1AA30      3RN2010-1BA30      3RN2011-1BA30      3RN2012-1BW30      3RN2023-1DW30

Product function	Number of CO contacts for auxiliary contacts	Number of NO contacts for auxiliary contacts	Number of NC contacts for auxiliary contacts	Material of switching contacts	Control supply voltage For AC at 50 Hz rated value	Control supply voltage For DC, rated value	SD	Article No.	PU (UNIT, SET, M)	PS*
					V	V	d			

### Compact evaluation unit, suitable for bimetallic switch

#### Terminal A1 jumpered with root of changeover contact

Auto RESET	1	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2000-□AA30	1	1 unit
					24 ... 240	24 ... 240	2	3RN2000-□AW30	1	1 unit
	0	1	1	AgSnO2	24 ... 24	24 ... 24	2	3RN2010-□CA30	1	1 unit
					24 ... 240	24 ... 240	2	3RN2010-□CW30	1	1 unit

### Standard evaluation unit, suitable for bimetallic switch

Auto RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2010-□BA30	1	1 unit
					24 ... 240	24 ... 240	2	3RN2010-□BW30	1	1 unit

### Bistable evaluation unit, open-circuit and short-circuit detection in the sensor circuit

#### Does not trigger in the event of control supply voltage failure

Auto RESET	2	0	0	AgSnO2	24 ... 240	24 ... 240	2	3RN2012-□BW31	1	1 unit
Manual RESET										
External RESET										
Error memory										

### Standard evaluation unit with ATEX approval, open-circuit and short-circuit detection in the sensor circuit<sup>1)</sup>

Manual RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2011-□BA30	1	1 unit
External RESET					24 ... 240	24 ... 240	2	3RN2011-□BW30	1	1 unit

#### Non-volatile<sup>3)</sup>

Auto RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2012-□BA30	1	1 unit
Manual RESET					24 ... 240	24 ... 240	2	3RN2012-□BW30	1	1 unit
External RESET										
Error memory										

#### Protective separation, non-volatile<sup>2)3)</sup>

Auto RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2013-□BA30	1	1 unit
Manual RESET					24 ... 240	24 ... 240	2	3RN2013-□BW30	1	1 unit
External RESET										
Error memory				AgSnO2 Hard gold-plated	24 ... 240	24 ... 240	2	3RN2013-□GW30	1	1 unit

### Evaluation unit with ATEX approval and 2 sensor circuits for warning and disconnection, open-circuit and short-circuit detection in both sensor circuits

#### Protective separation, non-volatile<sup>2)3)</sup>

Auto RESET	1	1	0	AgSnO2	24 ... 240	24 ... 240	2	3RN2023-□DW30	1	1 unit
Manual RESET										
External RESET										
Error memory										

#### Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

1  
2

<sup>1)</sup> For 3RN2011: The unit can be reset with the RESET button or by disconnecting the control supply voltage.

<sup>2)</sup> Protective separation up to 300 V acc. to DIN/VDE 0160, IEC 60947-1.








<sup>3)</sup> Protection against voltage failure or non-volatile fault storage means that previous tripping due to a fault remains stored even if the control supply voltage fails. The monitoring device is not reset if the voltage fails. With an active fault, meaning a fault which has not been manually confirmed, an automatic restart of the plant upon recovery of the power is prevented therefore and plant safety increased as the result.



## Thermistor Motor Protection

3RN2

## Accessories

Version	SD	Article No.	PU (UNIT, SET, M)	PS*	
	d				
<b>Terminals for SIRIUS devices in the industrial standard mounting rail enclosure</b>					
 3ZY1122-1BA00	<b>Removable terminals</b>	<b>Screw terminals</b> 			
	• 2-pole, up to 2 x 2.5 mm <sup>2</sup> or 1 x 4 mm <sup>2</sup>	2	<b>3ZY1122-1BA00</b>	1 6 units	
	• 2-pole, up to 1 x 4 mm <sup>2</sup> or 2 x 1.5 mm <sup>2</sup>	2	<b>Spring-type terminals (push-in)</b> 		
			<b>3ZY1122-2BA00</b>	1 6 units	
<b>Accessories for enclosures</b>					
 3ZY1311-0AA00	<b>Push-in lugs</b> For wall mounting	2	<b>3ZY1311-0AA00</b>	1 10 units	
	<b>Coding pins</b> For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure. They enable the mechanical coding of terminals, see Manual "SIRIUS 3RN2 thermistor motor protection", <a href="https://support.industry.siemens.com/cs/ww/en/ps/24302/man">https://support.industry.siemens.com/cs/ww/en/ps/24302/man</a>	2	<b>3ZY1440-1AA00</b>	1 12 units	
 3ZY1440-1AA00	<b>Tools for opening spring-type terminals</b>				
	<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	<b>Spring-type terminals (push-in)</b> 		
 3RA2908-1A			<b>3RA2908-1A</b>	1 1 unit	

## Timing Relays

3RP25 / 3RP20 / 7PV15

## Overview



7PV15, SIRIUS 3RP25 and SIRIUS 3RP20 timing relays

Electronic timing relays are used in control, starting, and protective circuits for all switching operations involving time delays. Their fully developed concept and space-saving, compact design make the SIRIUS 3RP timing relays ideal modules for control cabinet, switchgear and control manufacturers in the industry.

With their narrow design, the 7PV15 timing relays are ideal in particular for use in heating, ventilation and air-conditioning systems and in compressors. All 7PV15 timing relays in this enclosure version are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60175. The enclosure complies with DIN 43880.

## Benefits

- Clear-cut basic range with five basic units in the case of the 7PV15 timing relays, and seven basic units in the case of the 3RP timing relays
- Logistic advantages provided by versions with wide voltage range and wire setting range
- No tools required for assembly or disassembly on standard mounting rails
- Cadmium-free relay contacts
- Recyclable, halogen-free enclosure
- Optimum price/performance ratio
- Versions with logical separation
- Low variance: One design for distribution boards and for control cabinets
- Compliance with EMC requirements for buildings
- Environmentally friendly laser inscription instead of printing containing solvents
- Timing relays suitable for the 3RT miniature contactors allow smaller tier spacing
- Versions with screw terminals or alternatively with spring-type terminals

## Application

**Timing relays with ON-delay**

- Interference pulse suppression (gating of interference pulses)
- Gradual startup of motors so as not to overload the power supply

**Timing relays with OFF-delay**

- Generation of overtravel functions following removal of voltage
- Gradual, delayed shutdown, e.g. of motors or fans, to allow a plant to be shut down selectively

**Wye-delta timing relay**

- Switchover of motors from wye to delta with a dead interval of 50 ms to prevent phase-to-phase short circuits

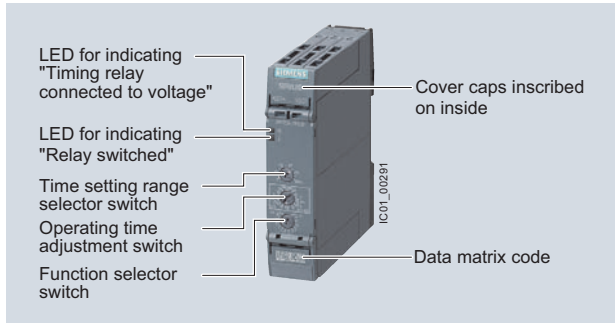
**Multifunctional timing relays**

- Maximum flexibility, with a device for every application
- Available with relay and semiconductor output

# Timing Relays

## 3RP25 timing relays

### Overview



SIRIUS 3RP25 timing relays

Electronic timing relays for general use in control systems and mechanical engineering with:

- 1 or 2 CO, 1 NO (semiconductor) or 3 NO
- Monofunction or multifunction
- Combination voltage
- Wide voltage range
- Single or selectable time setting ranges
- Switch position indication and voltage indication by LED

### Standards

The timing relays comply with:

- IEC 60721-3-3 "Classification of environmental conditions"
- IEC 61812-1/DIN VDE 0435 Part 201 "Specified time relays for industrial use"
- IEC 61000-6-2, IEC 61000-6-3 and IEC 61000-6-4 "Electromagnetic compatibility"
- IEC 60947-5-1 "Low-voltage switchgear and controlgear – Electromechanical control circuit devices"

### 3RP2505 multifunctional timing relays

The functions of the 3RP2505 multifunctional timing relays can be set by means of the function selector switch. Whether both CO contacts are switched in parallel or one CO contact with a delay and one instantaneously and the choice of time setting range are set by means of the time setting range selector switch. The exact operating time can be adjusted with the operating time switch.

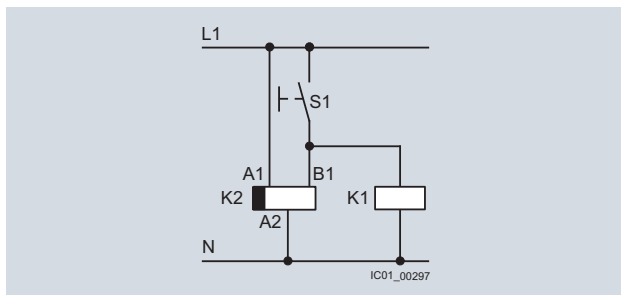
With a set of foil labels the timing relay can be legibly marked with the functions which can be selected on the timing relay. This is supplied together with the multifunctional timing relay.

The same potential must be applied to terminals A. and B.

Functions, [see the overview of functions on page 11/23](#).

#### Note:

The activation of loads parallel to the start input is permissible when using AC/DC control voltage ([see diagram](#)).



Diagram

### Accessories



Push-in lugs for wall mounting



Sealable cover 17.5 mm

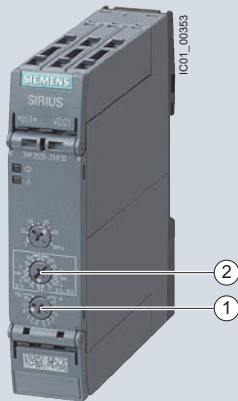


Sealable cover 22.5 mm

# Timing Relays

3RP25 timing relays, 17.5 mm and 22.5 mm

**Two setting options for implementing the multifunctions (A-M):**



- ① Determination of 13 functions by the setting A to M, with 1 CO, 1 NO, 2 CO that switch in parallel.
- ② Extended function variance by selecting the time range and determining, whether 2 CO switch in parallel or whether 1 CO switches with delay + 1 CO switches immediately (1 CO + 1 CO)

Setting the functions on the device

**Overview of functions of the 3RP2505 multifunctional timing relay**

Identification letter	13 functions 1 CO, 1 NO (semiconductor) or 2 CO switched in parallel	27 functions 13 functions (A - M) 2 CO switched in parallel + 13 functions (A - M) 1 CO delayed + 1 CO instantaneous (1 CO + 1 CO) and wye-delta function
A	ON-delay	ON-delay and instantaneous contact
B	OFF-delay with control signal	OFF-delay with control signal and instantaneous contact
C	ON-delay/OFF-delay with control signal	ON-delay/OFF-delay with control signal and instantaneous contact
D	Flashing, symmetrical, starting with interval	Flashing, symmetrical, starting with interval and instantaneous contact
E	Passing make contact, interval relay	Passing make contact, interval relay and instantaneous contact
F	Retriggerable interval relay with deactivated control signal (passing break contact with control signal)	Retriggerable interval relay with deactivated control signal (passing break contact with control signal) and instantaneous contact
G	Passing make contact, with control signal, not retriggerable (pulse-forming with control signal)	Passing make contact, with control signal, not retriggerable (pulse-forming with control signal) and instantaneous contact
H	Additive ON-delay, instantaneous OFF with control signal	Additive ON-delay, instantaneous OFF with control signal and instantaneous contact
I	Additive ON-delay with control signal	Additive ON-delay with control signal and instantaneous contact
J	Flashing, symmetrical, starting with pulse	Flashing, symmetrical, starting with pulse and instantaneous contact
K	Pulse-delayed (fixed pulse (at 1 s) and settable pulse delay)	Pulse-delayed (fixed pulse (at 1 s) and settable pulse delay) and instantaneous contact
L	Pulse-delayed with control signal (fixed pulse (at 1 s) and settable pulse delay)	Pulse-delayed with control signal (fixed pulse (at 1 s) and settable pulse delay) and instantaneous contact
M	Retriggerable interval relay with activated control signal (watchdog)	Retriggerable interval relay with activated control signal and instantaneous contact (watchdog)
--	--	Wye-delta function

Note:

Conversion tool e.g. from 3RP15 to 3RP25, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool).

# Timing Relays

## 3RP25 timing relays, 17.5 mm and 22.5 mm

**Article No. scheme**

Digit of the Article No.	1 <sup>st</sup> - 5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	-	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>	12 <sup>th</sup>
	□□□□□	□	□	-	□	□	□	□	0
<b>Timing relays in industrial enclosure 17.5 mm and 22.5 mm</b>	<b>3 R P 25</b>								
<b>Functions/time setting ranges</b>		□	□						
<b>Connection type</b>					□				
<b>Contacts</b>						□			
<b>Rated control supply voltage</b>							□	□	
<b>Example</b>	<b>3 R P 25</b>	<b>0</b>	<b>5</b>	<b>-</b>	<b>1</b>	<b>A</b>	<b>W</b>	<b>3</b>	<b>0</b>

Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the catalog in the Selection and ordering data.

**Benefits**

- Easy stock keeping and logistics thanks to low variance of devices
- Reduced space requirement in the control cabinet thanks to variants in width 17.5 mm and 22 mm
- Consistent for all functions thanks to wide voltage range from 12 to 240 V AC/DC
- Up to 27 functions according to IEC 61812 in the multifunctional timing relay with wide voltage range
- Multifunctional timing relay with semiconductor output for high switching frequencies, bounce-free and wear-free switching

**Application**

Timing relays are used in control, starting, and protective circuits for all switching operations involving time delays. They guarantee a high level of functionality and a high repeat accuracy of timer settings.

**Enclosure version**

All timing relays are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60715 or for screw fixing.

# Timing Relays



3RP25 timing relays, 17.5 mm and 22.5 mm

## Technical specifications

<b>Type</b>		<b>3RP2505-.A, 3RP2505-.C, 3RP251., 3RP2525-.A, 3RP2527, 3RP253., 3RP255.</b>	<b>3RP2505-.B, 3RP2505-.R, 3RP2525-.B, 3RP254., 3RP256., 3RP257.</b>
Width	mm	17.5	22.5
Height	mm	100	100
Depth	mm	90	90



<b>Type</b>		<b>3RP25...-AB30, 3RP25...-AW30, 3RP25...-BB30, 3RP25...-BW30, 3RP25...-NW30, 3RP25...-SW30</b>	<b>3RP25...-BT20, 3RP25...-NM20</b>	<b>3RP25...-CW30</b>	<b>3RP25...-EW30</b>	<b>3RP25...-RW30</b>
<b>Insulation voltage</b> For overvoltage category III According to IEC 60664 For pollution degree 3, rated value	V AC	300	500	300	--	300
<b>Ambient temperature</b> • During operation • During storage	°C	-25 ... +60 -40 ... +85				-40 ... +70
<b>Operating range factor</b> Of the control supply voltage, rated value • At AC - At 50 Hz - At 60 Hz • At DC		0.85 ... 1.1 0.85 ... 1.1 0.85 ... 1.1	--	0.85 ... 1.1	0.85 ... 1.1	0.7 ... 1.1 0.7 ... 1.1 0.7 ... 1.1
<b>Switching capacity current</b> With inductive load	A	0.01 ... 3	0.01 ... 3	0.01 ... 1	0.01 ... 6	0.01 ... 3
<b>Operational current of the auxiliary contacts</b> • At AC-15 - At 24 V - At 250 V - At 400 V • At DC-12 - At 24 V - At 125 V - At 250 V • At DC-13 - At 24 V - At 125 V - At 250 V	A	3 3 -- -- -- -- 1 0.2 0.1	3 3 3 -- -- -- 1 0.2 0.1	1 1 -- 1 -- -- -- -- --	-- -- -- -- -- -- -- -- --	3 3 -- -- -- -- 1 0.2 0.1
<b>Uninterrupted thermal current <math>I_{th}</math></b>	A	5	5	1	0.6	5
<b>Mechanical endurance</b> (Operating cycles) Typical		10 x 10 <sup>6</sup>				
<b>Electrical endurance</b> For AC-15 at 230 V, typical		1 x 10 <sup>5</sup>				

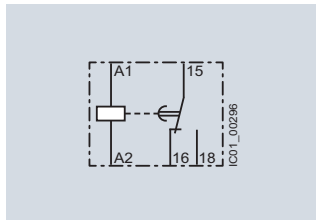
<b>Type</b>	<b>3RP25</b>	
<b>Connection type</b>	 <b>Screw terminals</b>	
• Design of thread of connection screw	M3	
• Solid	mm <sup>2</sup>	1 x (0.5 ... 4.0)/2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.5 ... 4)/2 x (0.5 ... 1.5)
• Solid for AWG cables	AWG	1 x (20 ... 12), 2 x (20 ... 14)
• Stranded for AWG cables	AWG	1 x (20 ... 12), 2 x (20 ... 14)
• Tightening torque	Nm	0.6 ... 0.8
<b>Connection type</b>	 <b>Spring-type terminals</b>	
• Solid	mm <sup>2</sup>	1 x (0.5 ... 4)
• Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.5 ... 2.5)
• AWG cables, solid	AWG	1 x (20 ... 12)

# Timing Relays

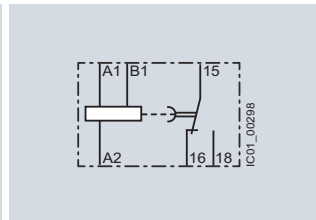
## 3RP25 timing relays, 17.5 mm and 22.5 mm

### Internal circuit diagrams 3RP25

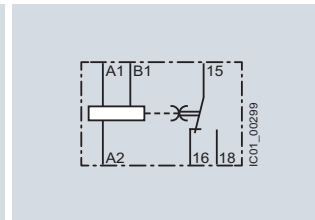
Multifunction 3RP2505-.A, 13 functions, 1 CO



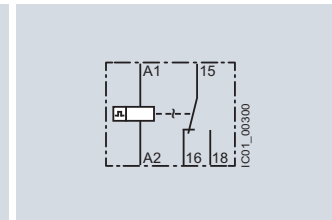
3RP2505-.A (A)  
ON-delay



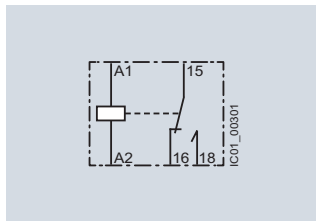
3RP2505-.A (B)  
OFF-delay with control signal



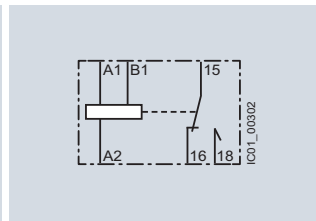
3RP2505-.A (C)  
ON-delay/OFF-delay  
with control signal



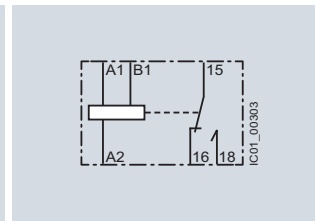
3RP2505-.A (D)  
Flashing, symmetrical,  
starting with interval



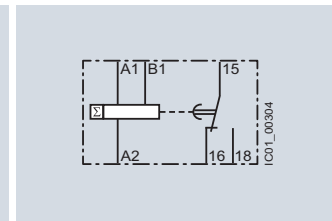
3RP2505-.A (E)  
Passing make contact, interval relay



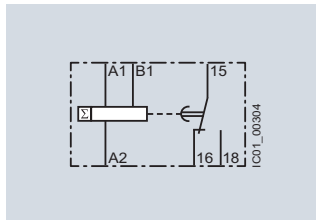
3RP2505-.A (F)  
Retriggerable interval relay with  
deactivated control signal (passing  
break contact with control signal)



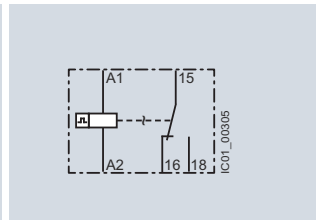
3RP2505-.A (G)  
Passing make contact with  
control signal, not retriggerable  
(pulse-forming with control signal)



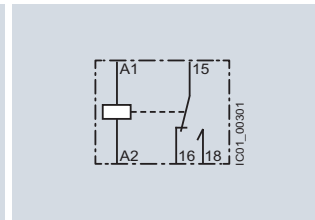
3RP2505-.A (H)  
Additive ON-delay, instantaneous OFF  
with control signal



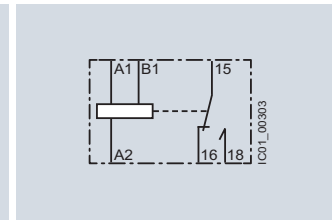
3RP2505-.A (I)  
Additive ON-delay with control signal



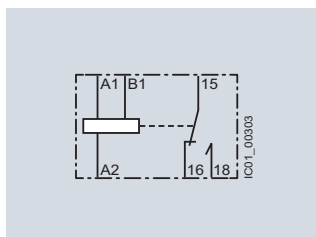
3RP2505-.A (J)  
Flashing, symmetrical,  
starting with pulse



3RP2505-.A (K)  
Pulse-delayed (fixed pulse (at 1 s)  
and settable pulse delay)



3RP2505-.A (L)  
Pulse-delayed with control signal (fixed  
pulse (at 1 s) and settable pulse delay)

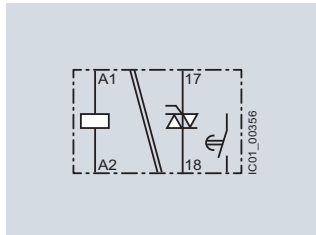


3RP2505-.A (M)  
Retriggerable interval relay with  
activated control signal (watchdog)

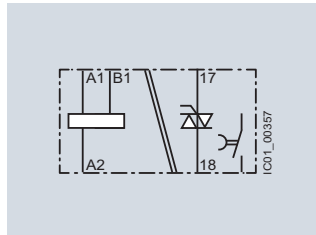
# Timing Relays

## 3RP25 timing relays, 17.5 mm and 22.5 mm

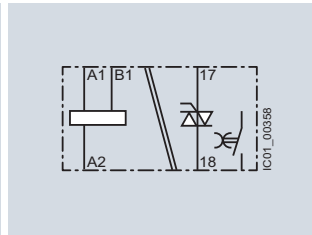
Multifunction 3RP2505-.C, 13 functions, 1 NO (semiconductor)



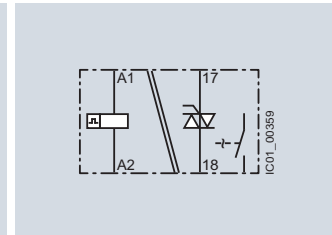
3RP2505-.C (A)  
ON-delay



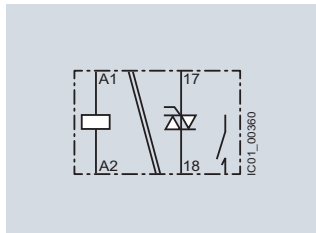
3RP2505-.C (B)  
OFF-delay with control signal



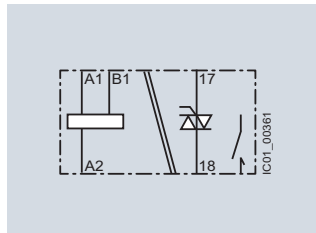
3RP2505-.C (C)  
ON-delay/OFF-delay  
with control signal



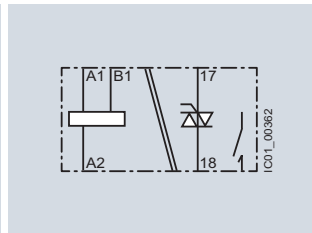
3RP2505-.C (D)  
Flashing, symmetrical,  
starting with interval



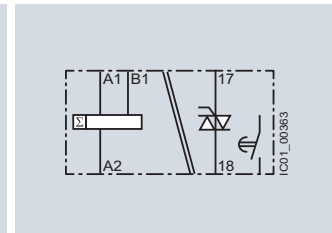
3RP2505-.C (E)  
Passing make contact, interval relay



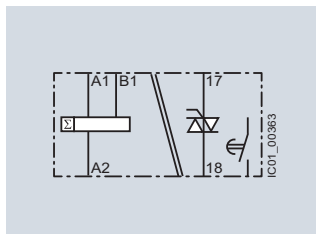
3RP2505-.C (F)  
Retriggerable interval relay with  
deactivated control signal (passing  
break contact with control signal)



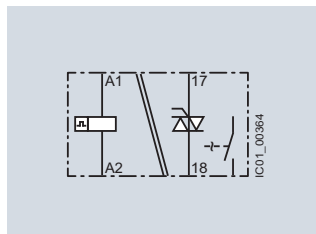
3RP2505-.C (G)  
Passing make contact with  
control signal, not retriggerable  
(pulse-forming with control signal)



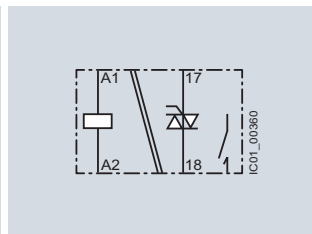
3RP2505-.C (H)  
Additive ON-delay, instantaneous OFF  
with control signal



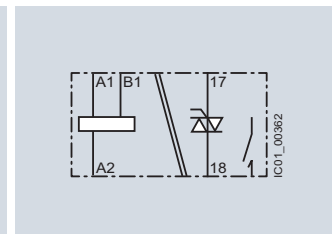
3RP2505-.C (I)  
Additive ON-delay with control signal



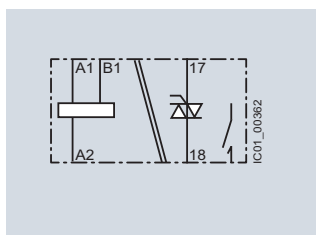
3RP2505-.C (J)  
Flashing, symmetrical,  
starting with pulse



3RP2505-.C (K)  
Pulse-delayed (fixed pulse (at 1 s)  
and settable pulse delay)



3RP2505-.C (L)  
Pulse-delayed with control signal (fixed  
pulse (at 1 s) and settable pulse delay)



3RP2505-.C (M)  
Retriggerable interval relay with  
activated control signal (watchdog)

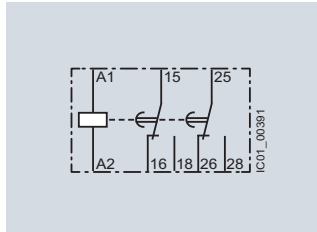


# Timing Relays

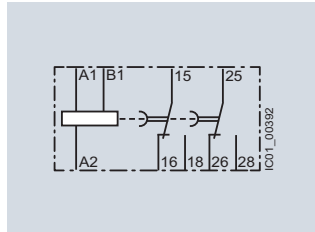
## 3RP25 timing relays, 17.5 mm and 22.5 mm

RELAYS, INTERFACES & CONVERTERS 11

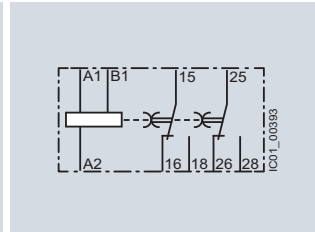
Multifunction 3RP2505-.B, 27 functions, 2 CO switched in parallel with delay/  
multifunction 3RP2505-.R, 13 functions, 2 CO positively driven, and switched in parallel with delay (see also note below)



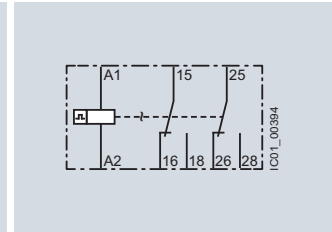
3RP2505-.B (A)  
ON-delay



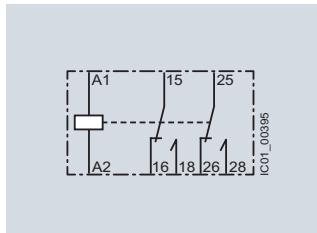
3RP2505-.B (B)  
OFF-delay with control signal



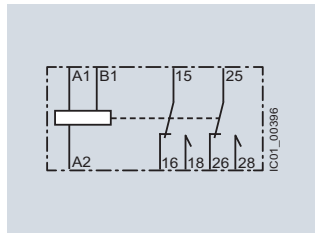
3RP2505-.B (C)  
ON-delay/OFF-delay  
with control signal



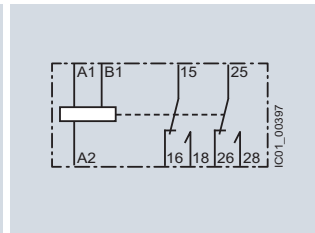
3RP2505-.B (D)  
Flashing, symmetrical,  
starting with interval



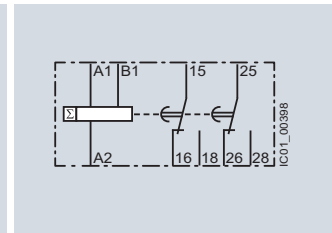
3RP2505-.B (E)  
Passing make contact, interval relay



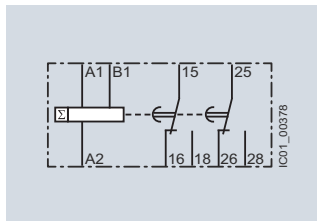
3RP2505-.B (F)  
Retriggerable interval relay with  
deactivated control signal (passing  
break contact with control signal)



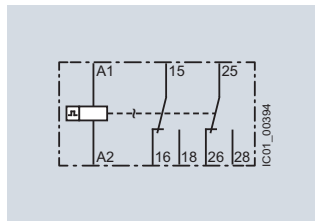
3RP2505-.B (G)  
Passing make contact with  
control signal, not retriggerable  
(pulse-forming with control signal)



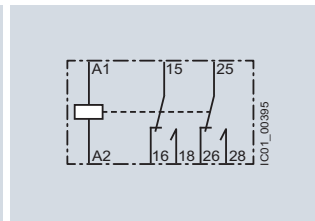
3RP2505-.B (H)  
Additive ON-delay, instantaneous OFF  
with control signal



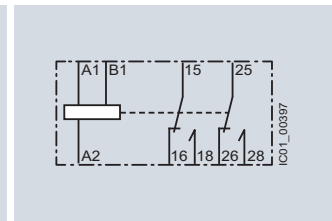
3RP2505-.B (I)  
Additive ON-delay with control signal



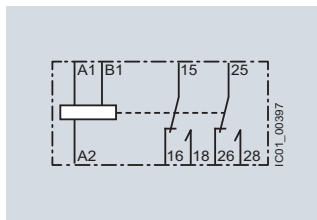
3RP2505-.B (J)  
Flashing, symmetrical,  
starting with pulse



3RP2505-.B (K)  
Pulse-delayed (fixed pulse (at 1 s)  
and settable pulse delay)



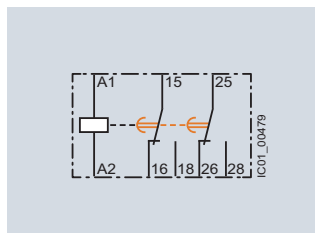
3RP2505-.B (L)  
Pulse-delayed with control signal (fixed  
pulse (at 1 s) and settable pulse delay)



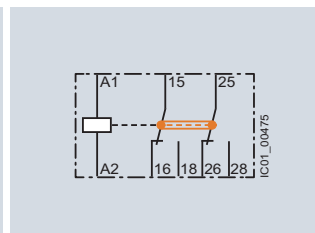
3RP2505-.B (M)  
Retriggerable interval relay with  
activated control signal (watchdog)

**Note:**

3RP2505-.RW30 has 13 functions (A to M) like 3RP2505-.B switched in parallel with delay, but with positively driven contacts. The circuit diagrams are identical except for the representation of the symbols for these contacts, see also the example on the right for 3RP2505-.RW30 of the function (A) with ON-delay.



3RP2505-.B (A)  
ON-delay

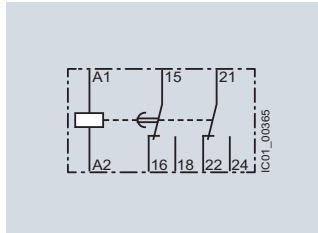


3RP2505-.R (A)  
with positively driven contacts  
ON-delay

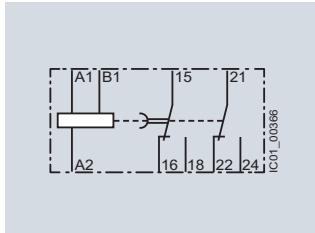
# Timing Relays

## 3RP25 timing relays, 17.5 mm and 22.5 mm

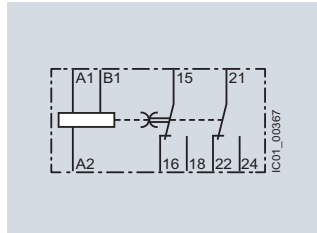
Multifunction 3RP2505-.B, 27 functions, 1 CO delayed + 1 CO instantaneous (continued)



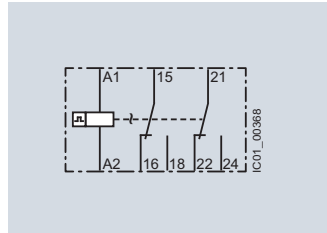
3RP2505-B (A)  
ON-delay and instantaneous contact



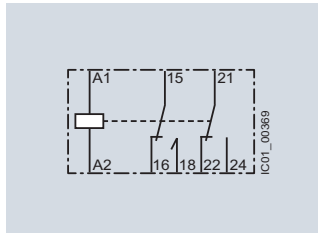
3RP2505-B (B)  
OFF-delay with control signal and instantaneous contact



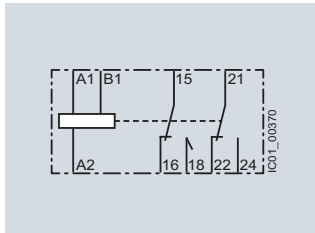
3RP2505-B (C)  
ON-delay/OFF-delay with control signal and instantaneous contact



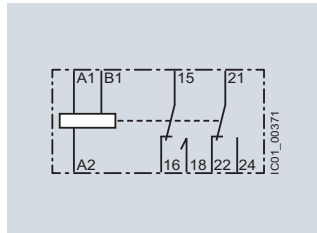
3RP2505-B (D)  
Flashing, symmetrical, starting with interval and instantaneous contact



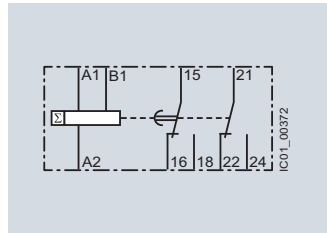
3RP2505-B (E)  
Passing make contact, interval relay and instantaneous contact



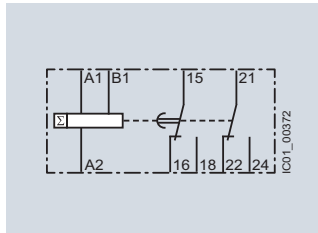
3RP2505-B (F)  
Retriggerable interval relay with deactivated control signal (passing break contact with control signal) and instantaneous contact



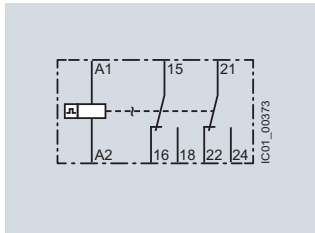
3RP2505-B (G)  
Passing make contact with control signal, not retriggerable (pulse-forming with control signal) and instantaneous contact



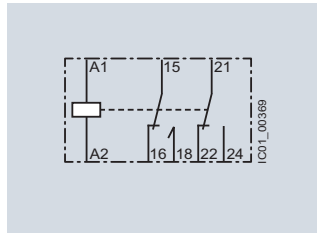
3RP2505-B (H)  
Additive ON-delay, instantaneous OFF with control signal and instantaneous contact



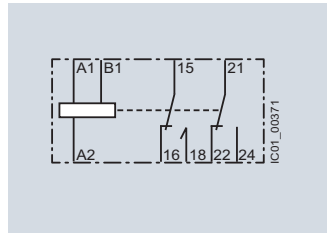
3RP2505-B (I)  
Additive ON-delay with control signal and instantaneous contact



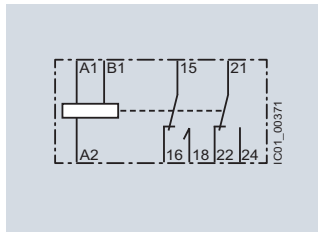
3RP2505-B (J)  
Flashing, symmetrical, starting with pulse and instantaneous contact



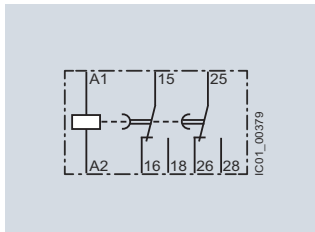
3RP2505-B (K)  
Pulse-delayed (fixed pulse (at 1 s) and settable pulse delay) and instantaneous contact



3RP2505-B (L)  
Pulse-delayed with control signal (fixed pulse (at 1 s) and settable pulse delay) and instantaneous contact



3RP2505-B (M)  
Retriggerable interval relay with activated control signal and instantaneous contact (watchdog)

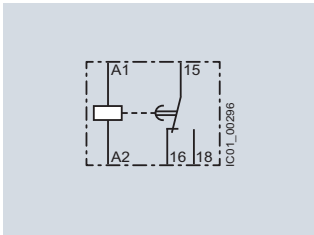


3RP2505-B  
Wye-delta function

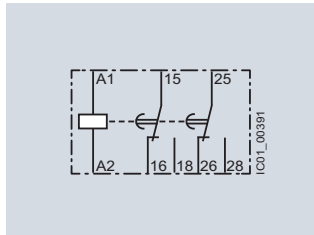
# Timing Relays

## 3RP25 timing relays, 17.5 mm and 22.5 mm

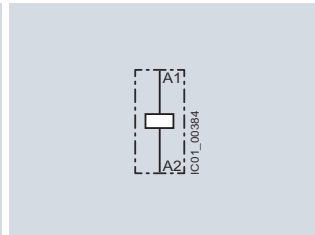
Monofunctions 3RP251. up to 3RP257.<sup>1)</sup>



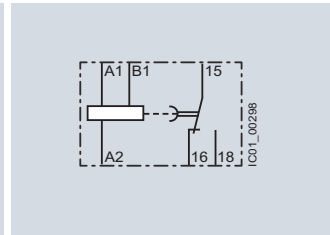
3RP251., 3RP2525-A  
ON-delay



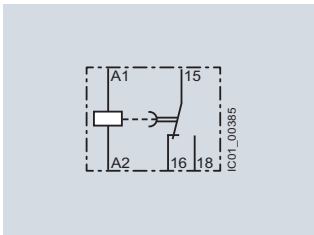
3RP2525-B  
ON-delay



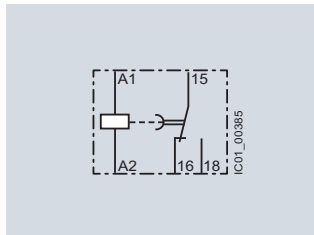
3RP2527  
ON-delay, two-wire design



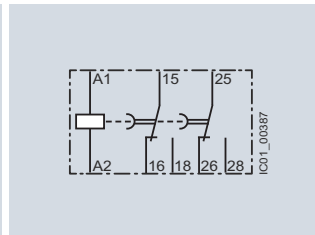
3RP2535  
OFF-delay with control signal



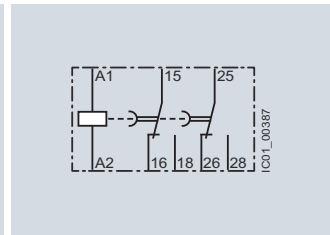
3RP2540-A (N)<sup>1)</sup>  
OFF-delay



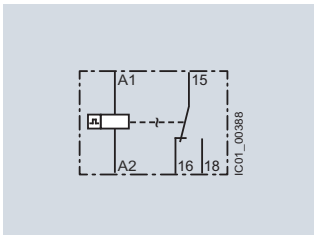
3RP2540-A (O)<sup>1)</sup>  
Positive passing make contact



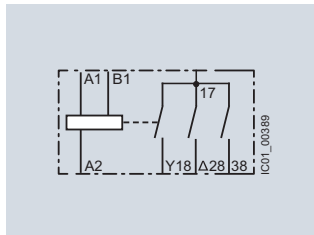
3RP2540-B (N)<sup>1)</sup>  
OFF-delay



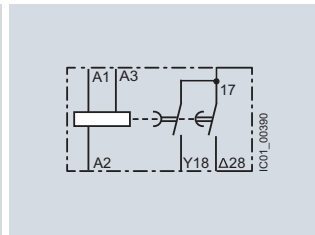
3RP2540-B (O)<sup>1)</sup>  
Positive passing make contact



3RP2555  
Flashing, asymmetrical, starting with interval (clock-pulse relay)



3RP2560  
Wye-delta function with overtravel function (idling)



3RP257.  
Wye-delta function

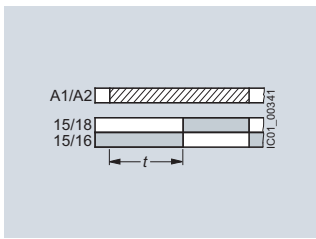
<sup>1)</sup> 3RP2540 has a double function:  
Function N = OFF-delay  
Function O = Positive passing make contact.

# Timing Relays

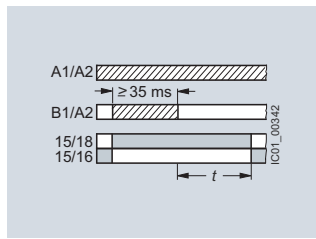
3RP25 timing relays, 17.5 mm and 22.5 mm

### 3RP25 function diagrams

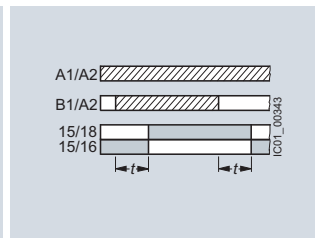
Multifunction 3RP2505-.A, 1 CO, 13 functions and 3RP2505-.C, 1 NO (semiconductor), 13 functions



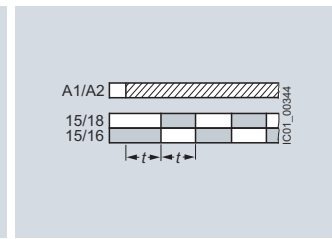
**A**  
ON-delay



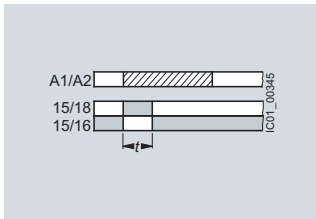
**B**  
OFF-delay with control signal



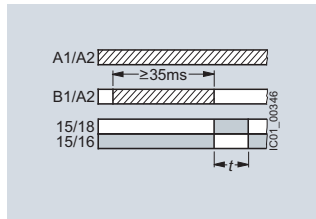
**C**  
ON-delay/OFF-delay  
with control signal



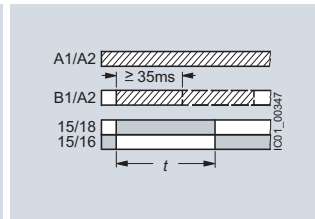
**D**  
Flashing, symmetrical,  
starting with interval



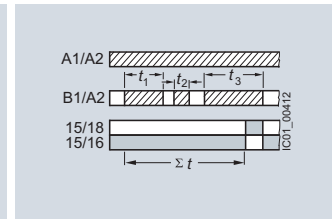
**E**  
Passing make contact, interval relay



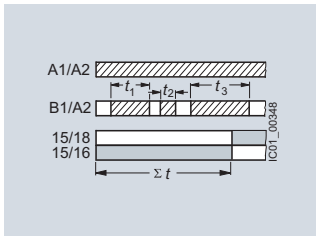
**F**  
Retriggerable interval relay with  
deactivated control signal (passing  
break contact with control signal)



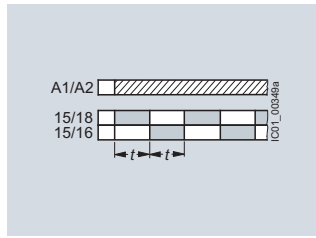
**G**  
Passing make contact with  
control signal, not retriggerable  
(pulse-forming with control signal)



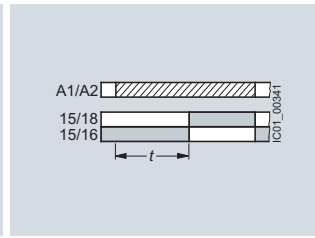
**H**  
Additive ON-delay, instantaneous OFF  
with control signal



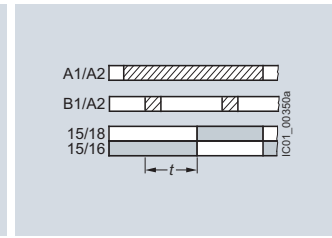
**I**  
Additive ON-delay, with control signal



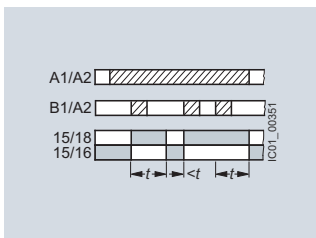
**J**  
Flashing, symmetrical,  
starting with pulse



**K**  
Pulse-delayed (fixed pulse (at 1 s)  
and settable pulse delay)



**L**  
Pulse-delayed with control signal (fixed  
pulse (at 1 s) and settable pulse delay)



**M**  
Retriggerable interval relay with  
activated control signal (watchdog)

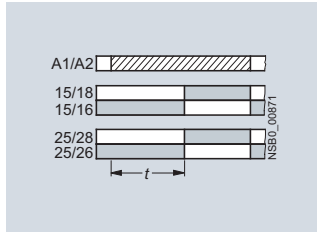
#### Legend

- A ... M** Identification letters
- Timing relay energized
- Contact closed
- Contact open

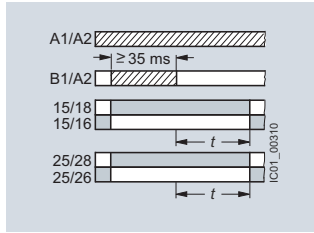
# Timing Relays

3RP25 timing relays, 17.5 mm and 22.5 mm

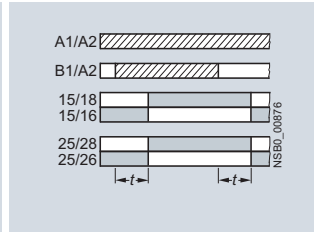
Multifunction 3RP2505-.B, 13 functions, 2 CO positively driven and switched in parallel with delay



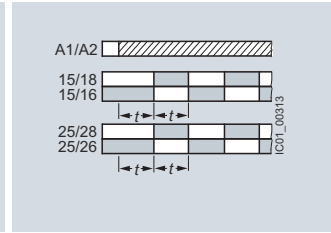
**A**  
ON-delay



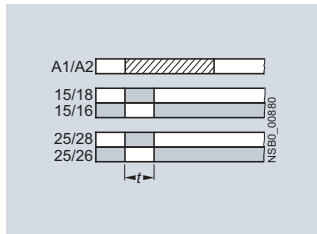
**B**  
OFF-delay with control signal



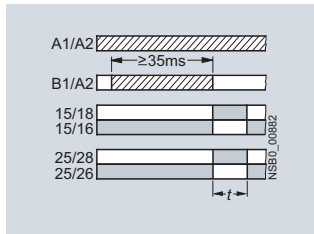
**C**  
ON-delay/OFF-delay with control signal



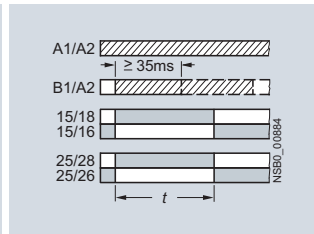
**D**  
Flashing, symmetrical, starting with interval



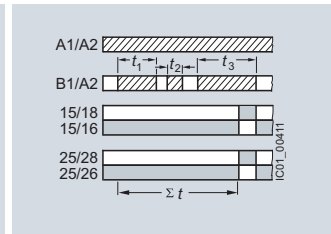
**E**  
Passing make contact, interval relay



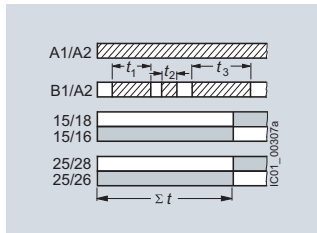
**F**  
Retriggerable interval relay with deactivated control signal (passing break contact with control signal)



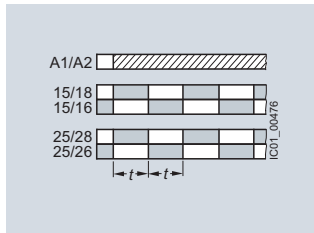
**G**  
Passing make contact with control signal, not retriggerable (pulse-forming with control signal)



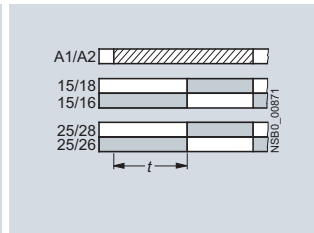
**H**  
Additive ON-delay, instantaneous OFF with control signal



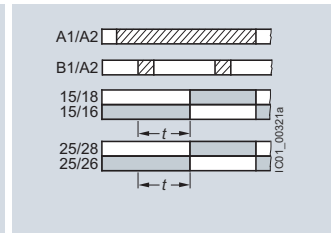
**I**  
Additive ON-delay with control signal



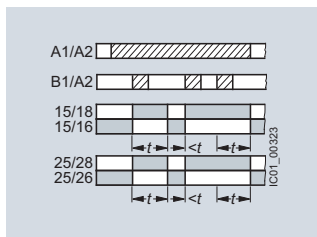
**J**  
Flashing, symmetrical, starting with pulse



**K**  
Pulse-delayed (fixed pulse at 1 s and settable pulse delay)



**L**  
Pulse-delayed with control signal (fixed pulse at 1 s and settable pulse delay)



**M**  
Retriggerable interval relay with activated control signal (watchdog)

Legend

- A ... M** Identification letters
- Timing relay energized
- Contact closed
- Contact open

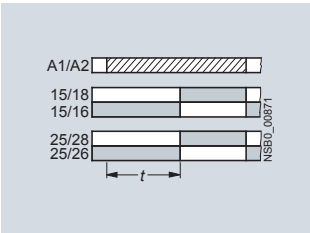
# Timing Relays

3RP25 timing relays, 17.5 mm and 22.5 mm

## Multifunction 3RP2505-.B, 27 functions, 2 CO

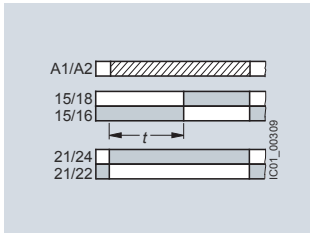
**A**

2 CO switched in parallel



ON-delay

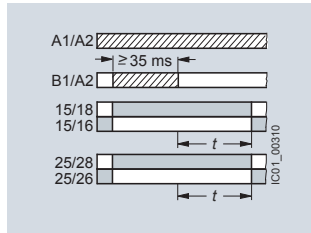
1 CO delayed +  
1 CO instantaneous



ON-delay and instantaneous contact

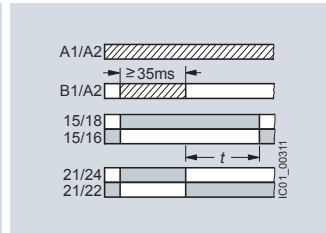
**B**

2 CO switched in parallel



OFF-delay with control signal

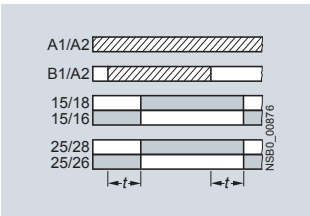
1 CO delayed +  
1 CO instantaneous



OFF-delay with control signal and  
instantaneous contact

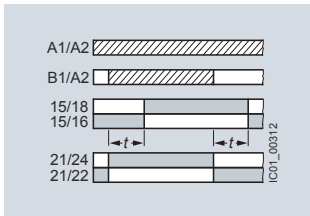
**C**

2 CO switched in parallel



ON-delay/OFF-delay  
with control signal

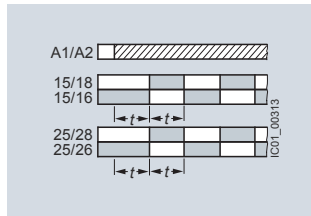
1 CO delayed +  
1 CO instantaneous



ON-delay/OFF-delay with control  
signal and instantaneous contact

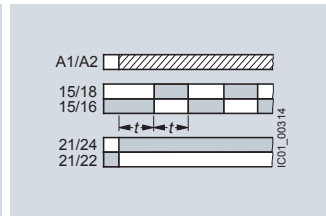
**D**

2 CO switched in parallel



Flashing, symmetrical,  
starting with interval

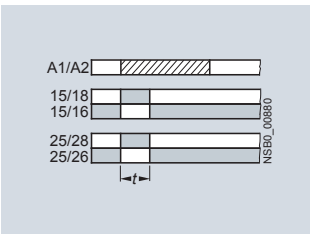
1 CO delayed +  
1 CO instantaneous



Flashing, symmetrical, starting with  
interval and instantaneous contact

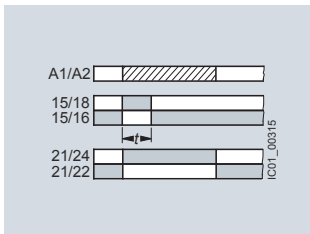
**E**

2 CO switched in parallel



Passing make contact, interval relay

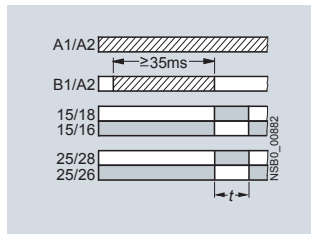
1 CO delayed +  
1 CO instantaneous



Passing make contact, interval relay  
and instantaneous contact

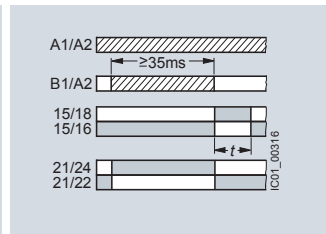
**F**

2 CO switched in parallel



Retriggerable interval relay with  
deactivated control signal (passing  
break contact with control signal)

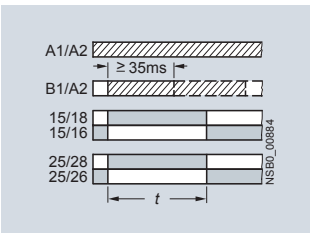
1 CO delayed +  
1 CO instantaneous



Retriggerable interval relay with  
deactivated control signal (passing  
break contact with control signal)  
and instantaneous contact

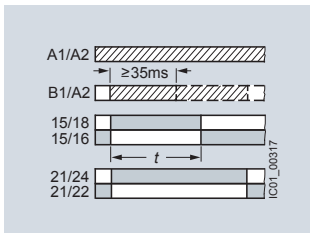
**G**

2 CO switched in parallel



Passing make contact with  
control signal, not retriggerable  
(pulse-forming with control signal)

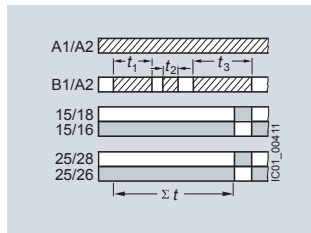
1 CO delayed +  
1 CO instantaneous



Passing make contact with  
control signal, not retriggerable  
(pulse-forming with control signal)  
and instantaneous contact

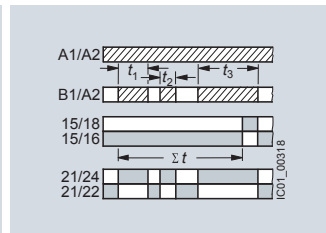
**H**

2 CO switched in parallel



Additive ON-delay, instantaneous  
OFF with control signal

1 CO delayed +  
1 CO instantaneous



Additive ON-delay, instantaneous OFF  
with control signal and instantaneous  
contact

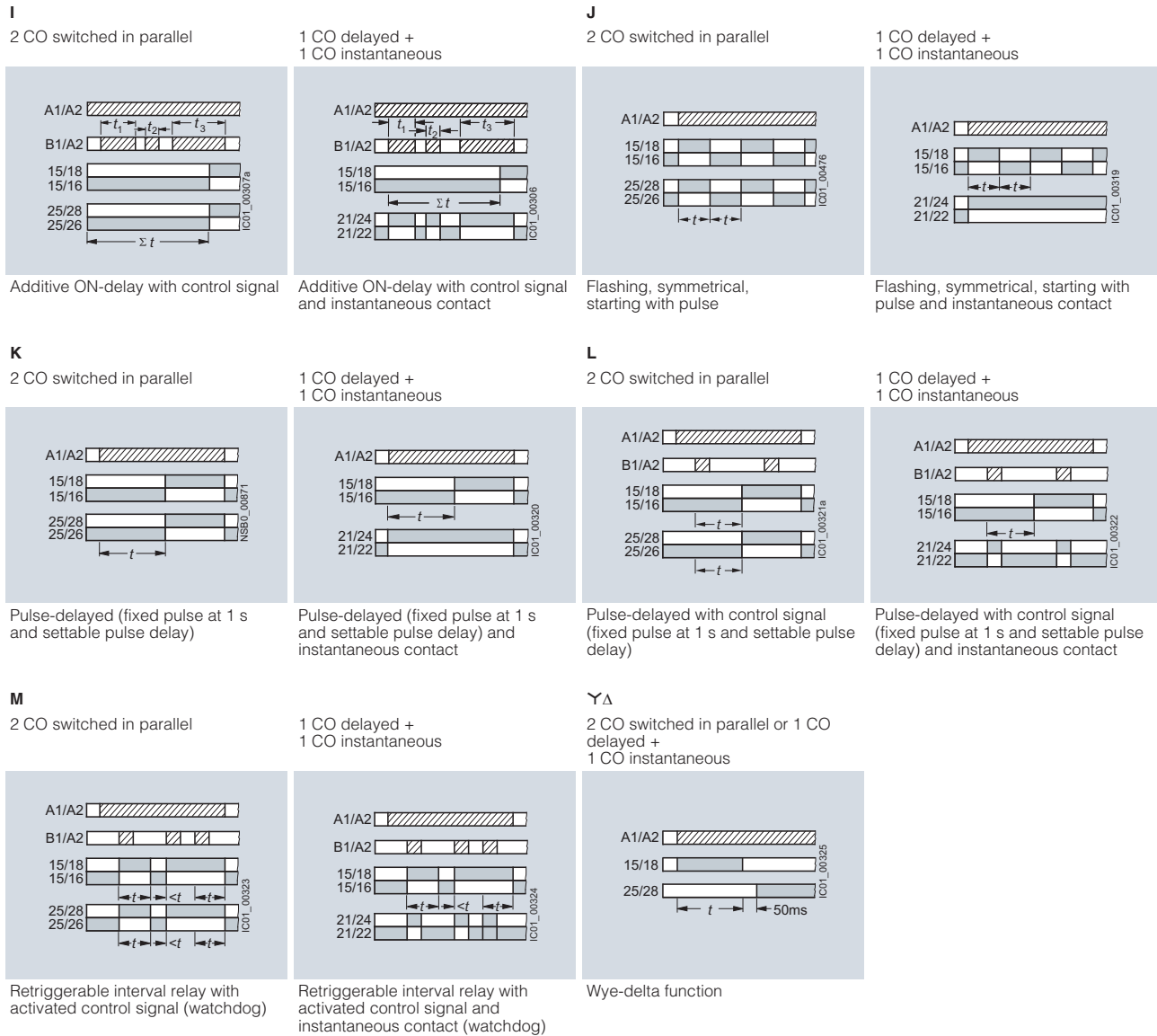
### Legend

- A ... M** Identification letters
- Timing relay energized
- Contact closed
- Contact open

# Timing Relays

## 3RP25 timing relays, 17.5 mm and 22.5 mm

### Multifunction 3RP2505-.B, 27 functions, 2 CO (continued)



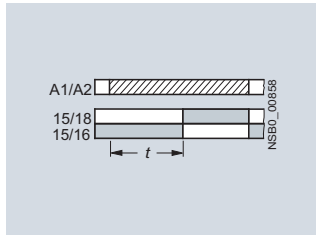
Legend

- A ... M** Identification letters
- Timing relay energized
- Contact closed
- Contact open

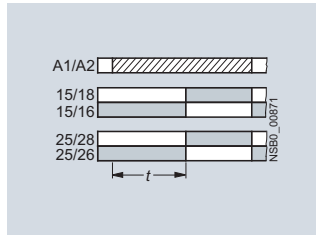
# Timing Relays

## 3RP25 timing relays, 17.5 mm and 22.5 mm

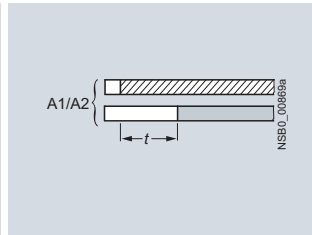
Monofunctions 3RP251.. up to 3RP257.<sup>1)</sup>



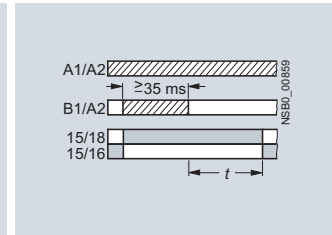
3RP251..AW30, 1 CO, ON-delay



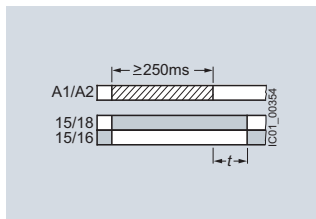
3RP2525..W30, 2 CO, ON-delay



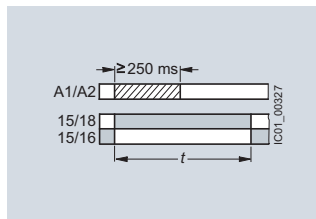
3RP2527..EW30, 1 NO (semiconductor), ON-delay



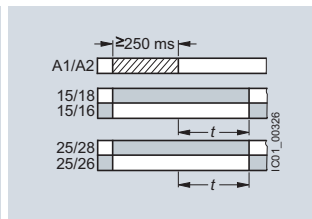
3RP2535..AW30, 1 CO, OFF-delay with control signal



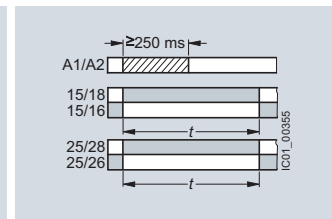
3RP2540..A.30, 1 CO, OFF-delay (N)<sup>1)</sup>



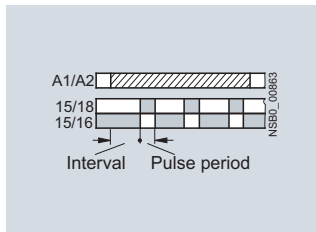
3RP2540..A.30, 1 CO, positive passing make contact (O)<sup>1)</sup>



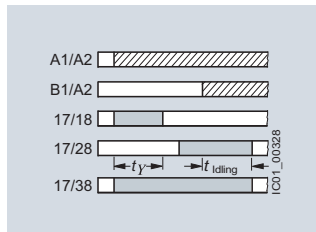
3RP2540..B.30, 2 CO, OFF-delay (N)<sup>1)</sup>



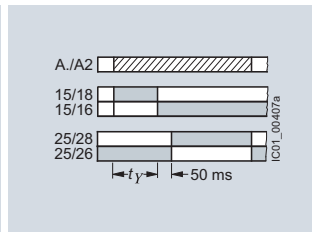
3RP2540..B.30, 2 CO, positive passing make contact (O)<sup>1)</sup>



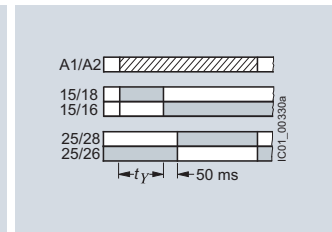
3RP2555..AW30, 1 CO, flashing, asymmetrical, starting with interval (clock-pulse relay)



3RP2560..SW30, 3 NO, wye-delta function with overtravel function (idling)



3RP257..NM20, 2 NO, wye-delta function



3RP257..NM30, 2 NO, wye-delta function

**Legend**

- Timing relay energized
- Contact closed
- Contact open

<sup>1)</sup> 3RP2540 has a double function:  
Function N = OFF-delay  
Function O = positive passing make contact.



# Timing Relays

3RP25 timing relays, 17.5 mm and 22.5 mm

RELAYS, INTERFACES & CONVERTERS 11

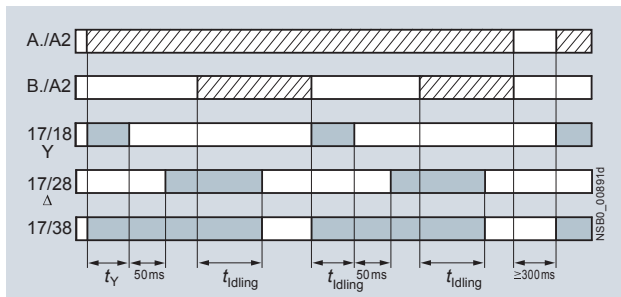
## Possibilities of operation of the 3RP2560-.SW30 timing relay

Operation 1: Start contact B./A2 is open when control supply voltage A./A2 is applied

The control supply voltage is applied to A./A2 and there is no control signal on B./A2. This starts the  $\Upsilon\Delta$  timing. The idling time (coasting time) is started by applying a control signal to B./A2. When the set time  $t_{idling}$  (30 ... 600 s) has elapsed, the output relays (17/38 and 17/28) are reset. If the control signal on B./A2 is switched off (minimum OFF period 270 ms), a new timing is started.

Note:

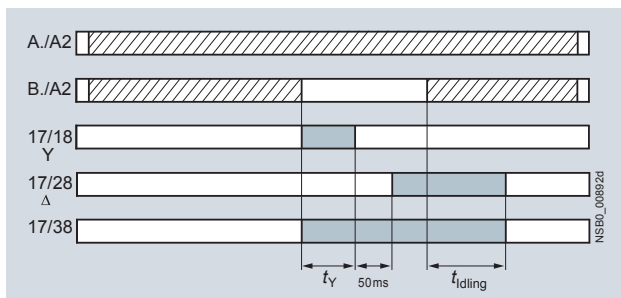
Observe response time (dead time) of 400 ms on energizing control supply voltage until contacts 17/18 and 17/16 close.



Operation 1

Operation 2: Start contact B./A2 is closed when control supply voltage A./A2 is applied

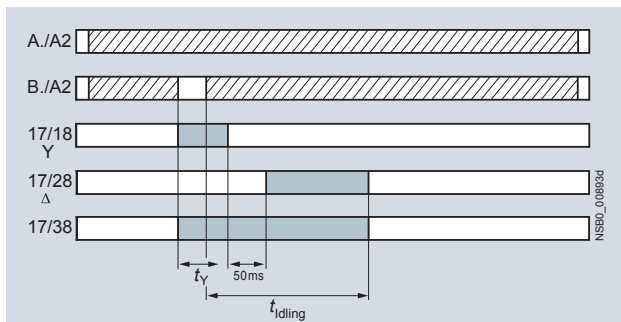
If the control signal B./A2 is already present when the control supply voltage A./A2 is applied, **no** timing is started. The timing is only started when the control signal B./A2 is switched off.



Operation 2

Operation 3: Start contact B./A2 closes while star time is running

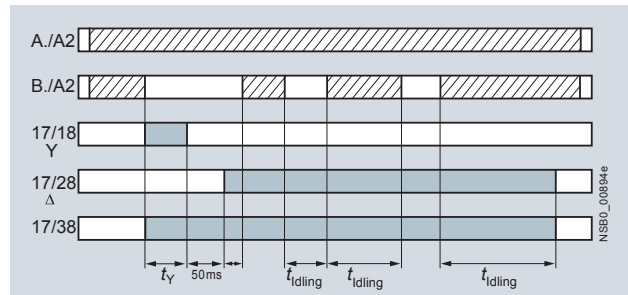
If the control signal B./A2 is applied again during the star time, the idling time starts and the timing is terminated normally.



Operation 3

Operation 4: Start contact B./A2 opens while delta time is running and is applied again

If the control signal on B./A2 is applied and switched off again during the delta time, although the idling time has not yet elapsed, the idling time (coasting time) is reset to zero. If the control signal is re-applied to B./A2, the idling time is restarted.



Operation 4

Legend

- Timing relay energized
- Contact closed
- Contact open

$t_Y$  = Star time 1 ... 20 s

$t_{idling}$  = Idling time (coasting time) 30 ... 600 s

Note:

The following applies to all operations: The pressure switch controls the timing via B./A2.

Application example based on standard operation (operation 1): For example, use of 3RP2560 for compressor control

Frequent starting of compressors strains the network, the machine, and the increased costs for the operator. The new timing relay prevents frequent starting at times when there is high demand for compressed air. A special control circuit prevents the compressor from being switched off immediately when the required air pressure in the tank has been reached. Instead, the valve in the intake tube is closed and the compressor runs in "Idling" mode, i.e. in no-load operation for a specific time which can be set from 30 ... 600 s.

If the pressure falls within this time, the motor does not have to be restarted again, but can return to nominal load operation from no-load operation.

If the pressure does not fall within this idling time, the motor is switched off.

The pressure switch controls the timing via B./A2.

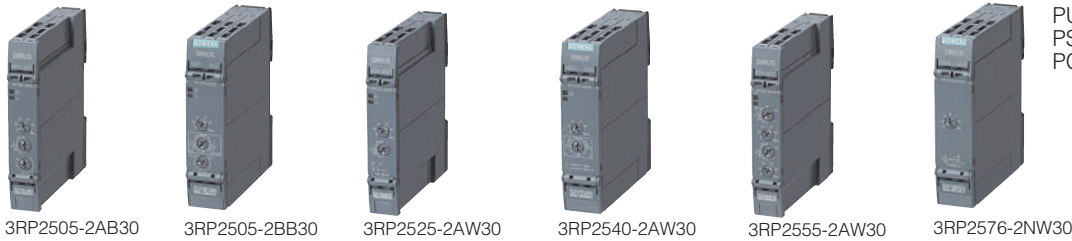
The control supply voltage is applied to A./A2 and the start contact B./A2 is open, i.e. there is no control signal on B./A2 when the control supply voltage is applied. The pressure switch signals "too little pressure in system" and starts the timing by way of terminal B./A2. The compressor is started, enters  $\Upsilon\Delta$  operation, and fills the pressure tank.

When the pressure switch signals "sufficient pressure", the control signal B./A2 is applied, the idling time (coasting time) is started, and the compressor enters no-load operation for the set period of time from 30 ... 600 s. The compressor is then switched off. The compressor is only restarted if the pressure switch responds again (low pressure).

# Timing Relays

3RP25 timing relays, 17.5 mm and 22.5 mm

## Selection and ordering data



PU (UNIT, SET, M) = 1  
PS\* = 1 unit  
PG = 41H

Number of NO contacts		Number of CO contacts		Semi-conduc-tor output	Adjustable time	Control supply voltage		DT	Screw terminals		DT	Spring-type terminals (push-in)	
Instan-taneous switch-ing	De-layed switch-ing	Instan-taneous switch-ing	De-layed switch-ing			At AC 50/60 Hz	At DC		Article No.	Price per PU		Article No.	Price per PU

### 3RP2505-.A and 3RP2505-.C timing relays, 13 functions

The functions can be adjusted by means of function selector switches on the device. With a set of foil labels the timing relay can be legibly marked with the functions which can be selected on the timing relay. This is supplied together with the multifunctional timing relay. The same potential must be applied to terminals A. and B. Functions, [see the overview of functions on page 10/41](#)

0	0	0	1	--	0.05 s ... 100 h	24	24	A	<b>3RP2505-1AB30</b>	A	<b>3RP2505-2AB30</b>
						12 ... 240	12 ... 240	A	<b>3RP2505-1AW30</b>	A	<b>3RP2505-2AW30</b>
0	1	0	0	✓	0.05 s ... 100 h	12 ... 240	12 ... 240	A	<b>3RP2505-1CW30</b>	A	<b>3RP2505-2CW30</b>

### 3RP2505-.R timing relays suitable for railway applications, 13 functions

Start of delivery planned for 11/2015

The functions can be adjusted by means of function selector switches on the device. With a set of foil labels the timing relay can be legibly marked with the functions which can be selected on the timing relay. This is supplied together with the multifunctional timing relay. The same potential must be applied to terminals A. and B. Functions, [see the overview of functions on page 10/41](#)

0	0	--	2 <sup>1)</sup>	--	0.05 s ... 100 h	24 ... 240	24 ... 240	A	<b>3RP2505-1RW30</b>	A	<b>3RP2505-2RW30</b>
---	---	----	-----------------	----	------------------	------------	------------	---	----------------------	---	----------------------

### 3RP2505-.B timing relay, 27 functions

The functions can be adjusted by means of function selector switches on the device. With a set of foil labels the timing relay can be legibly marked with the functions which can be selected on the timing relay. This is supplied together with the multifunctional timing relay. The same potential must be applied to terminals A. and B. Functions, [see the overview of functions on page 10/41](#)

0	0	--	2 <sup>2)</sup>	--	0.05 s ... 100 h	24	24	A	<b>3RP2505-1BB30</b>	A	<b>3RP2505-2BB30</b>
						400 ... 440	--	A	<b>3RP2505-1BT20</b>	A	<b>3RP2505-2BT30</b>
						12 ... 240	12 ... 240	A	<b>3RP2505-1BW30</b>	A	<b>3RP2505-2BW30</b>

### 3RP251. and 3RP252. timing relays, ON-delay

0	0	0	1	--	0.5 ... 10 s	12 ... 240	12 ... 240	A	<b>3RP2511-1AW30</b>	A	<b>3RP2511-2AW30</b>
					1 ... 30 s	12 ... 240	12 ... 240	A	<b>3RP2512-1AW30</b>	A	<b>3RP2512-2AW30</b>
					5 ... 100 s	12 ... 240	12 ... 240	A	<b>3RP2513-1AW30</b>	A	<b>3RP2513-2AW30</b>
					0.05 s ... 100 h	12 ... 240	12 ... 240	A	<b>3RP2525-1AW30</b>	A	<b>3RP2525-2AW30</b>

0	0	0	2	--	0.05 s ... 100 h	24	24	A	<b>3RP2525-1BB30</b>	A	<b>3RP2525-2BB30</b>
						12 ... 240	12 ... 240	A	<b>3RP2525-1BW30</b>	A	<b>3RP2525-2BW30</b>

0	1	0	0	✓	0.05 s ... 240 s	12 ... 240	12 ... 240	A	<b>3RP2527-1EW30</b>	A	<b>3RP2527-2EW30</b>
---	---	---	---	---	------------------	------------	------------	---	----------------------	---	----------------------

### 3RP2535 timing relays, OFF-delay with control signal

0	0	0	1	--	0.05 s ... 100 h	12 ... 240	12 ... 240	A	<b>3RP2535-1AW30</b>	A	<b>3RP2535-2AW30</b>
---	---	---	---	----	------------------	------------	------------	---	----------------------	---	----------------------

### 3RP2540 timing relays, OFF-delay, without control signal, non-volatile, passing make contact

0	0	0	1	--	0.05 s ... 600 s	24	24	A	<b>3RP2540-1AB30</b>	A	<b>3RP2540-2AB30</b>
						12 ... 240	12 ... 240	A	<b>3RP2540-1AW30</b>	A	<b>3RP2540-2AW30</b>

0	0	0	2	--	0.05 s ... 600 s	24	24	A	<b>3RP2540-1BB30</b>	A	<b>3RP2540-2BB30</b>
						12 ... 240	12 ... 240	A	<b>3RP2540-1BW30</b>	A	<b>3RP2540-2BW30</b>

### 3RP2555 timing relays, clock-pulse relay, flashing, asymmetrical

0	0	0	1	--	0.05 s ... 100 h	12 ... 240	12 ... 240	A	<b>3RP2555-1AW30</b>	A	<b>3RP2555-2AW30</b>
---	---	---	---	----	------------------	------------	------------	---	----------------------	---	----------------------

### 3RP2560 timing relays, wye-delta function with overtravel function (idling)

1	2	0	0	--	1 ... 20 s	12 ... 240	12 ... 240	A	<b>3RP2560-1SW30</b>	A	<b>3RP2560-2SW30</b>
---	---	---	---	----	------------	------------	------------	---	----------------------	---	----------------------

### 3RP257. timing relays, wye-delta function

1	1	0	0	--	1 ... 20 s	380 ... 440 <sup>3)</sup>	--	A	<b>3RP2574-1NM20</b>	A	<b>3RP2574-2NM20</b>
						12 ... 240	12 ... 240	A	<b>3RP2574-1NW30</b>	A	<b>3RP2574-2NW30</b>

1	1	0	0	--	3 ... 60 s	380 ... 440 <sup>3)</sup>	--	A	<b>3RP2576-1NM20</b>	A	<b>3RP2576-2NM20</b>
						12 ... 240	12 ... 240	A	<b>3RP2576-1NW30</b>	A	<b>3RP2576-2NW30</b>

✓ Available

-- Not available

1) Positively-driven contacts.

2) Optionally 1 CO delayed + 1 CO instantaneous.






3) With 3RP2574-.NM20 and 3RP2576-.NM20, connection of 200 ... 240 V AC, 50/60 Hz control voltage is also possible.

For accessories, [see page 11/38](#).

# Timing Relays

3RP25 timing relays, 17.5 mm and 22.5 mm

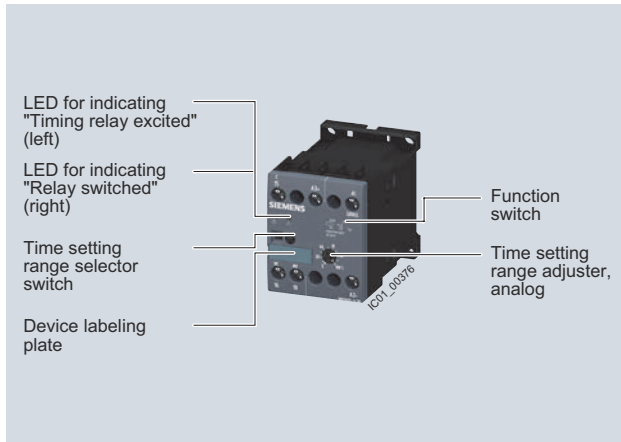
## Accessories

Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
<b>Accessories for enclosures</b>						
<b>Sealing covers</b>						
 3ZY1321-1AA00 • 17.5 mm	A	<b>3ZY1321-1AA00</b>		1	5 units	41L
 3ZY1321-2AA00 • 22.5 mm	A	<b>3ZY1321-2AA00</b>		1	5 units	41L
 3ZY1311-0AA00 <b>Push-in lugs</b> For wall mounting	A	<b>3ZY1311-0AA00</b>		1	10 units	41L
 3ZY1440-0AA00 <b>Coding pins</b> For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; enable the mechanical coding of terminals	A	<b>3ZY1440-1AA00</b>		1	12 units	41L
<b>Terminals for SIRIUS devices in the industrial standard mounting rail enclosure</b>						
<b>Removable terminals</b>						
 3ZY1122-1BA00 • 2-pole, screw terminals 1 x 4 mm <sup>2</sup>	A	<b>Screw terminals</b>  <b>3ZY1122-1BA00</b>		1	6 units	41L
 3ZY1122-2BA00 • 2-pole, push-in terminals 1 x 4 mm <sup>2</sup>	A	<b>Spring-type terminals (push-in)</b>  <b>3ZY1122-2BA00</b>		1	6 units	41L
<b>Tools for opening spring-type terminals</b>						
 3RA2908-1A <b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	A	<b>Spring-type terminals</b>  <b>3RA2908-1A</b>		1	1 unit	41B

# Timing Relays

3RP20 timing relays, 45 mm

## Overview



SIRIUS 3RP20 timing relays

SIRIUS 3RP20 electronic timing relays for use in control systems and mechanical engineering with:

- 1 or 2 CO contacts
- Multifunction or monofunction
- Wide voltage range or combination voltage
- Single or selectable time setting ranges
- Switch position indication and voltage indication by LED

## Standards

The timing relays comply with:

- IEC 60721-3-3 "Classification of environmental conditions"
- IEC 61812-1 "Time relays for industrial and residential use"
- IEC 61000-6-2 and EN 61000-6-4 "Electromagnetic compatibility"
- IEC 60947-5-1 "Low-voltage switchgear and controlgear – Electromechanical control circuit devices"
- IEC 60947-1, Appendix N "Protective separation"

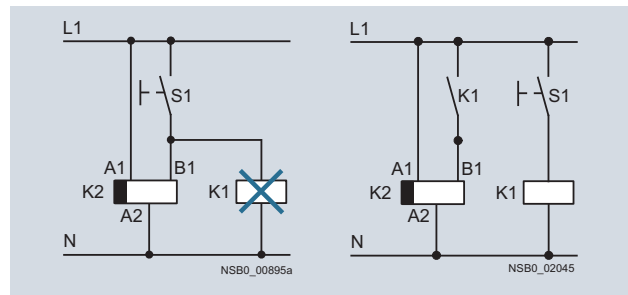
## Multifunction

The functions of the 3RP2005 multifunctional timing relays can be set by means of the function selector switch. Insert labels can be used to adjust different functions of the timing relay clearly and unmistakably. The corresponding labels can be ordered as an accessory. The same potential must be applied to terminals A. and B.

For functions, see 3RP2901 label set, page 11/44.

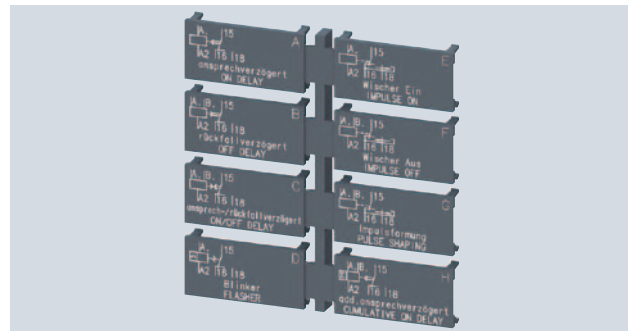
### Note:

The activation of loads parallel to the start input is not permissible when using AC control voltage (see diagrams).



Diagrams

## Accessories



Label set for marking the multifunctional relay

## Article No. scheme

Digit of the Article No.	1st - 5th	6th	7th	8th	9th	10th	11th	12th
	□□□□□	□	□	-	□	□	□	0
SIRIUS timing relays, enclosure 45 mm	3 R P 2 0							
Functions/time setting ranges		□	□					
Connection type					□			
Contacts						□		
Rated control supply voltage							□	□
Example	3 R P 2 0 5 - 1 A P 3 0							

### Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the catalog in the Selection and ordering data.

## Benefits

- Suitable for 3RT miniature contactors
- Uniform design
- Ideal for small distance between standard mounting rails and/or for low mounting depth, e.g. in control boxes
- Labels are used on the multifunctional time relay to document the function that has been set

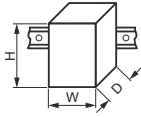


# Timing Relays

## 3RP20 timing relays, 45 mm

### Application

Timing relays are used in control, starting, and protective circuits for all switching operations involving time delays. They guarantee a high level of functionality and a high repeat accuracy of timer settings.

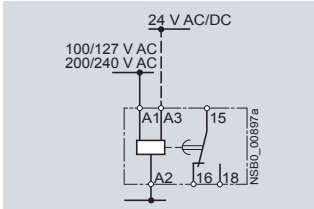
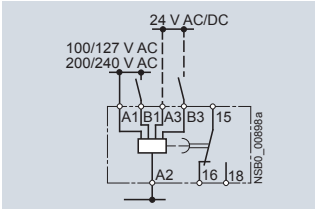
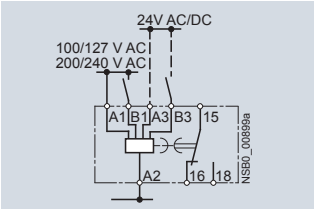
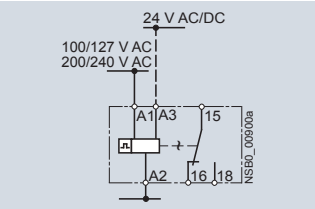
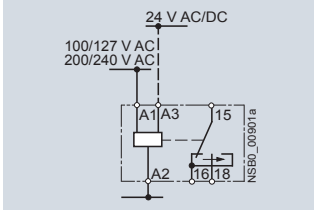
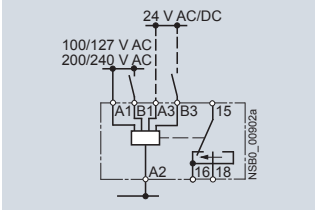
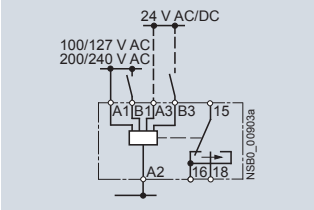
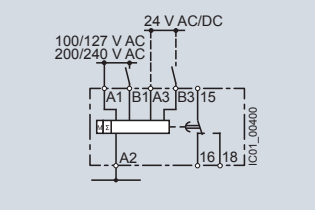
### Technical specifications

<b>Type</b>	<b>3RP2005, 3RP2025</b>	
Dimensions (W x H x D)		mm 45 x 57 x 73
<b>Rated insulation voltage</b> Pollution degree 3 Overvoltage category III	V AC	300
<b>Permissible ambient temperature</b> • During operation • During storage	°C	-25 ... +60 -40 ... +85
<b>Operating range at excitation<sup>1)</sup></b>		0.85 ... 1.1 x U <sub>s</sub> at AC; 0.8 ... 1.25 x U <sub>s</sub> at DC; 0.95 ... 1.05 times the rated frequency
<b>Mechanical endurance</b>	Operating cycles	10 x 10 <sup>6</sup>
<b>Electrical endurance at I<sub>6</sub></b>	Operating cycles	1 x 10 <sup>5</sup>
<b>Connection type</b>	 <b>Screw terminals</b>	
• Terminal screw • Solid • Finely stranded with end sleeve • Stranded • AWG cables • Tightening torque	mm <sup>2</sup> mm <sup>2</sup> AWG AWG Nm	M3 (for standard screwdriver, size 2 and Pozidriv 2) 2 x (0.5 ... 1.5) <sup>2)</sup> , 2 x (0.75 ... 2.5) <sup>2)</sup> 2 x (0.5 ... 1.5) <sup>2)</sup> , 2 x (0.75 ... 2.5) <sup>2)</sup> 2 x (0.5 ... 1.5) <sup>2)</sup> , 2 x (0.75 ... 2.5) <sup>2)</sup> 2 x (18 ... 14) 0.8 ... 1.2
<b>Connection type</b>	 <b>Spring-type terminals</b>	
• Solid • Finely stranded with end sleeve • Finely stranded without end sleeve • AWG cables, solid or stranded • Max. external diameter of the conductor insulation	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> AWG mm	2 x (0.25 ... 2.5) 2 x (0.25 ... 1.5) 2 x (0.25 ... 2.5) 2 x (24 ... 14) 3.6

1) If nothing else is stated.

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

### 3RP20 internal circuit diagrams

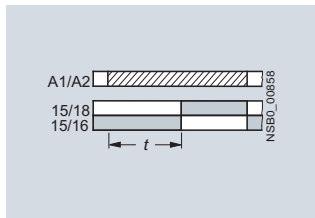
			
3RP2005, 3RP2025 ON-delay	3RP2005 OFF-delay with control signal	3RP2005 ON-delay and OFF-delay with control signal	3RP2005 Flashing, starting with interval
			
3RP2005 Passing make contact	3RP2005 Passing break contact with control signal	3RP2005 Pulse-forming with control signal	3RP2005 Additive ON-delay with control signal

# Timing Relays

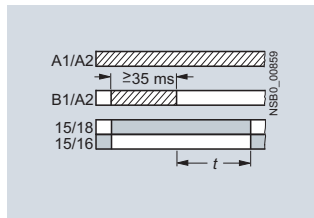
## 3RP20 timing relays, 45 mm

### 3RP20 function diagrams and 3RP2901 label set

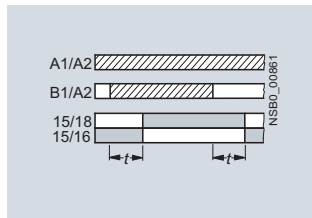
#### 1 CO contact



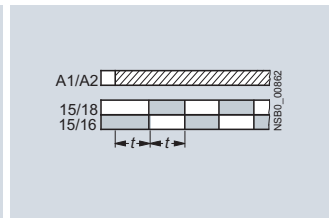
**A**  
3RP2005-.A, 3RP2025  
ON-delay



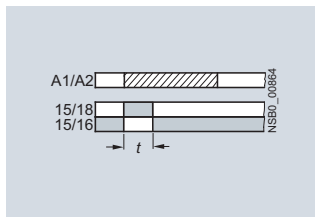
**B**<sup>1)</sup>  
3RP2005-.A  
OFF-delay with control signal



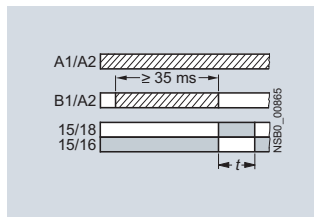
**C**<sup>1)</sup>  
3RP2005-.A  
ON-delay and OFF-delay  
with control signal ( $t = t_{on} = t_{off}$ )



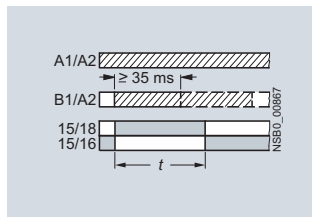
**D**  
3RP2005-.A  
Flashing, starting with interval  
(pulse/interval 1:1)



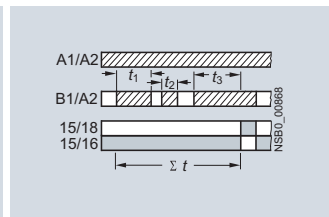
**E**  
3RP2005-.A  
Passing make contact



**F**<sup>1)</sup>  
3RP2005-.A  
Passing break contact  
with control signal



**G**<sup>1)</sup>  
3RP2005-.A  
Pulse-forming with control signal  
(pulse generation at the output does  
not depend on duration of energizing)



**H**<sup>1)</sup>  
3RP2005-.A  
Additive ON-delay with control signal

#### Legend

**A ... H** Identification letters for 3RP2005

Timing relay energized

Contact closed

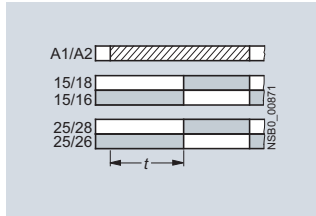
Contact open

<sup>1)</sup> Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero (retriggerable). This does not apply to G, G● and H●, which are not retriggerable.

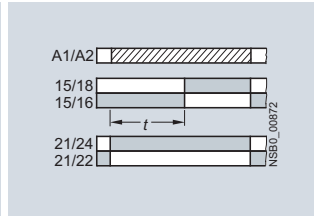
# Timing Relays

## 3RP20 timing relays, 45 mm

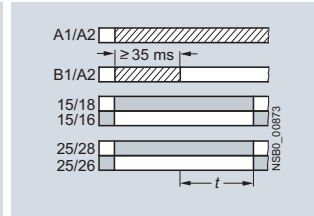
### 2 CO contacts



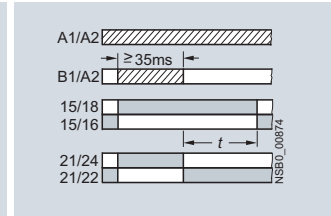
**A**  
3RP2005-.B  
ON-delay



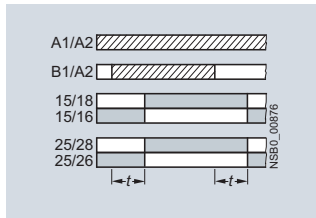
**A•**  
3RP2005-.B  
ON-delay and instantaneous contact



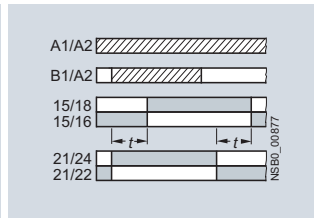
**B<sup>1)</sup>**  
3RP2005-.B  
OFF-delay with control signal



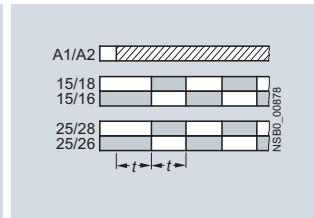
**B•<sup>1)</sup>**  
3RP2005-.B  
OFF-delay with control signal  
and instantaneous contact



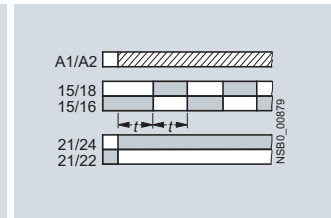
**C<sup>1)</sup>**  
3RP2005-.B  
ON-delay and OFF-delay  
with control signal ( $t = t_{on} = t_{off}$ )



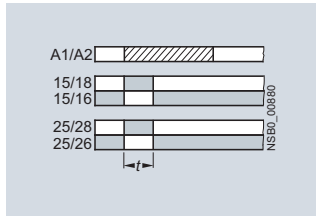
**C•<sup>1)</sup>**  
3RP2005-.B  
ON-delay and OFF-delay  
with control signal and instantaneous  
contact  
( $t = t_{on} = t_{off}$ )



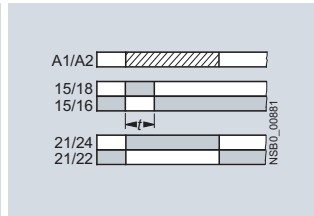
**D**  
3RP2005-.B  
Flashing, starting with interval  
(pulse/interval 1:1)



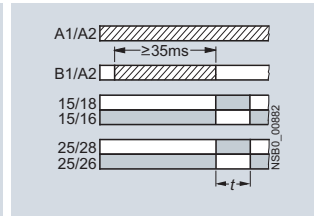
**D•**  
3RP2005-.B  
Flashing, starting with interval  
(pulse/interval 1:1) and instantaneous  
contact



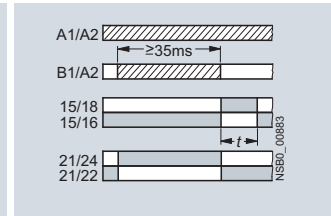
**E**  
3RP2005-.B  
Passing make contact



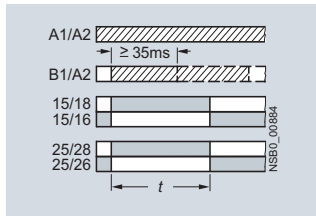
**E•**  
3RP2005-.B  
Passing make contact and  
instantaneous contact



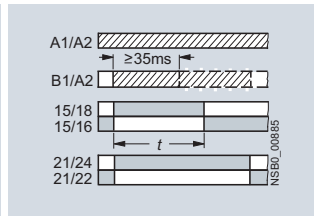
**F<sup>1)</sup>**  
3RP2005-.B  
Passing break contact  
with control signal



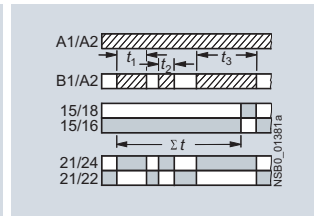
**F•<sup>1)</sup>**  
3RP2005-.B  
Passing break contact  
with control signal  
and instantaneous contact



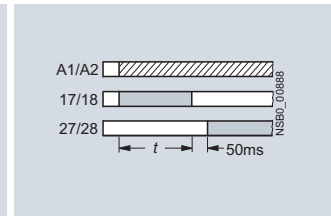
**G<sup>1)</sup>**  
3RP2005-.B  
Pulse-forming with control signal  
(pulse generation at the output does  
not depend on duration of energizing)



**G•<sup>1)</sup>**  
3RP2005-.B  
Pulse-forming with control signal  
and instantaneous contact (pulse  
generation at the output does not  
depend on duration of energizing)



**H<sup>1)</sup>**  
3RP2005-.B  
Additive ON-delay with control signal  
and instantaneous contact



**YΔ**  
3RP2005-.B  
Wye-delta function

#### Legend

**A ... H** Identification letters for 3RP2005

Timing relay energized

Contact closed

Contact open

<sup>1)</sup> Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero (retriggerable). This does not apply to G, G• and H•, which are not retriggerable.

# Timing Relays

## 3RP20 timing relays, 45 mm

### Selection and ordering data

PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41H



3RP2005-1AP30



3RP2005-1BW30



3RP2005-2AP30



3RP2025-2BW30

Version	Time setting range <i>t</i>	Rated control supply voltage $U_s$		DT	Screw terminals	DT	Spring-type terminals
		50/60 Hz AC	DC				
		V	V		Article No.	Price per PU	Article No. Price per PU

### 3RP2005 timing relays, multifunction, 15 time setting ranges

The functions can be adjusted by means of rotary switches. Insert labels can be used to adjust different functions of the 3RP2005 timing relay clearly and unmistakably. The corresponding labels can be ordered as an accessory. The same potential must be applied to terminals A. and B.  
 For functions, see [3RP2901 label set, page 11/44](#).

With LED and 1 CO contact <sup>1)</sup> , 8 functions	0.05 ... 1 s 0.15 ... 3 s 0.5 ... 10 s 1.5 ... 30 s	24/100 ... 127 24/200 ... 240	24 24	▶ ▶	<b>3RP2005-1AQ30</b> <b>3RP2005-1AP30</b>	A ▶	<b>3RP2005-2AQ30</b> <b>3RP2005-2AP30</b>
With LED and 2 CO contacts, 16 functions	0.05 ... 1 min 5 ... 100 s 0.15 ... 3 min 0.5 ... 10 min 1.5 ... 30 min 0.05 ... 1 h 5 ... 100 min 0.15 ... 3 h 0.5 ... 10 h 1.5 ... 30 h 5 ... 100 h ∞ <sup>2)</sup>	24 ... 240 <sup>3)</sup>	24 ... 240 <sup>4)</sup>	▶	<b>3RP2005-1BW30</b>	A	<b>3RP2005-2BW30</b>

### 3RP2025. timing relays, ON-delay, 15 time setting ranges

With LED and 1 CO contact <sup>1)</sup>	0.05 ... 1 s 0.15 ... 3 s 0.5 ... 10 s 1.5 ... 30 s 0.05 ... 1 min 5 ... 100 s 0.15 ... 3 min 0.5 ... 10 min 1.5 ... 30 min 0.05 ... 1 h 5 ... 100 min 0.15 ... 3 h 0.5 ... 10 h 1.5 ... 30 h 5 ... 100 h ∞ <sup>2)</sup>	24/100 ... 127 24/200 ... 240	24 24	▶ ▶	<b>3RP2025-1AQ30</b> <b>3RP2025-1AP30</b>	▶ ▶	<b>3RP2025-2AQ30</b> <b>3RP2025-2AP30</b>
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For accessories, see [page 11/44](#).

- 1) Units with protective separation.
- 2) With switch position ∞ no timing. For test purposes (ON/OFF function) on site. Relay is constantly on when activated, or relay remains constantly off when activated. Depending on which function is set.
- 3) Operating range 0.8 to 1.1 ×  $U_s$ .
- 4) Operating range 0.7 to 1.1 ×  $U_s$ .



# Timing Relays

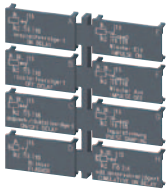
## 3RP20 timing relays, 45 mm

### Accessories

Version	Function	Identifi- cation letter	Use	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
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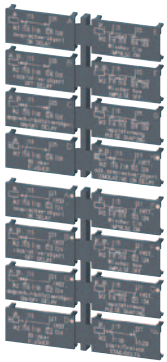
#### Label sets for 3RP20

Accessories for 3RP20 (not included in the scope of supply).  
The label set offers the possibility of labeling timing relays  
with the set function in English and German.



3RP2901-0A

1 label set (1 unit) with 8 functions	ON-delay OFF-delay with control signal ON-delay and OFF-delay with control signal Flashing, starting with interval Passing make contact Passing break contact with control signal Pulse-forming with control signal Additive ON-delay with control signal	A B C D E F G H	For devices with 1 CO	C	<b>3RP2901-0A</b>		1	5 units	41H
--	---	--------------------------------------	-----------------------------	---	-------------------	--	---	---------	-----



3RP2901-0B

1 label set (1 unit) with 16 functions	ON-delay OFF-delay with control signal ON-delay and OFF-delay with control signal Flashing, starting with interval Passing make contact Passing break contact with control signal Pulse-forming with control signal ON-delay and instantaneous con- tact OFF-delay with control signal and instantaneous contact ON-delay and OFF-delay with control signal and instantaneous contact Flashing, starting with interval, and instantaneous contact Passing make contact and instan- taneous contact Passing break contact with control signal and instantaneous contact Pulse-forming with control signal and instantaneous contact Additive ON-delay with control signal and instantaneous contact Wye-delta function	A B C D E F G A• B• C• D• E• F• G• H• YΔ	For devices with 2 CO contacts	C	<b>3RP2901-0B</b>		1	5 units	41H
---	---	---	---	---	-------------------	--	---	---------	-----

#### Blank inscription labels for 3RP20

Blank labels, 20 mm x 7 mm, pastel turquoise <sup>1)</sup>				For 3RP20	D	<b>3RT1900-1SB20</b>	100	340 units	41B
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<sup>1)</sup> PC labeling system for individual inscription of unit  
labeling plates available from:  
murrplastik Systemtechnik GmbH

# Timing Relays

7PV15 timing relays in enclosure, 17.5 mm

## Overview



7PV15 timing relay

Electronic timing relays for general use and in control systems, mechanical engineering and infrastructure with:

- 1 or 2 CO contacts
- Multifunction or monofunction
- Wide voltage range or combination voltage
- Single or selectable time setting ranges
- Switch position indication and voltage indication by LED

### Standards

The timing relays comply with:

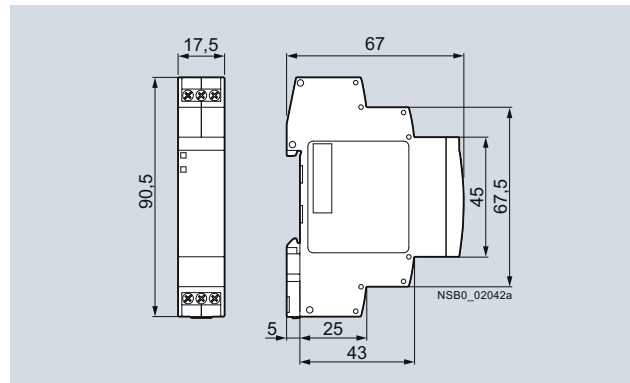
- IEC 60721-3-3 "Classification of environmental conditions"
- IEC 61812-1 "Time relays for industrial and residential use"
- IEC 61000-6-2 and EN 61000-6-4 "Electromagnetic compatibility"
- IEC 60947-5-1 "Low-voltage switchgear and controlgear – Electromechanical control circuit devices"
- DIN 43880 "Built-in equipment for electrical installations; overall dimensions and related mounting dimensions"

### Multifunction

The functions of the 7PV1508-1A multifunctional timing relays can be set by means of rotary switches. The identification letters A to G are printed on the front alongside the rotary selector switch of the unit. The related function can be found in the form of a bar graph on the side of the device.

### Enclosure version

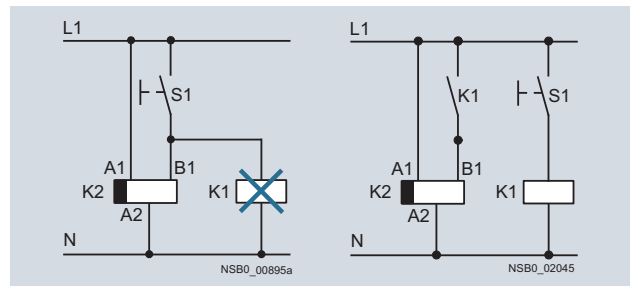
All timing relays are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60715. The enclosure complies with DIN 43880, 1 MW.



Dimensions

### Note:

The activation of loads parallel to the start input is not permissible when using AC control voltage (see diagrams).



Diagrams

### Article No. scheme

Digit of the Article No.	1 <sup>st</sup> - 5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>	12 <sup>th</sup>
	□□□□□	□	□	-	□	□	□	0
Timing relays in industrial enclosure, 17.5 mm	7 P V 1 5							
Functions/time setting ranges	□ □							
Connection type					□			
Contacts					□			
Rated control supply voltage					□	□		
Example	7 P V 1 5 0 8 - 1 A W 3 0							

### Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the catalog in the Selection and ordering data.

# Timing Relays

## 7PV15 timing relays in enclosure, 17.5 mm


### Benefits

- Wide voltage range 12 to 240 V AC/DC
- High switching capacity, e.g. AC-15 at 230 V, 3 A
- Combination voltage, e.g. 24 V AC/DC and 200 to 240 V AC
- Changes to the time setting range during operation
- Changes to the function in the de-energized state
- High level of functionality and a high repeat accuracy of timer settings
- Integrated surge suppressor
- Function charts printed on the side of the device for reliable device adjustment

### Application

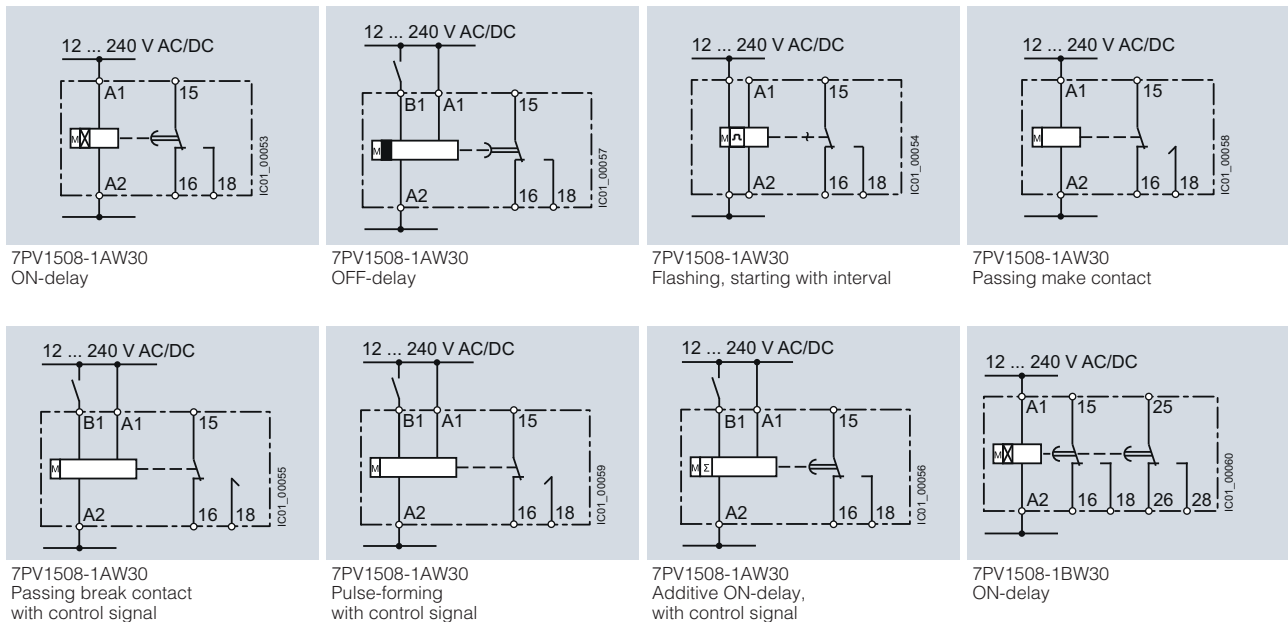
Timing relays are used in control, starting and protective circuits for all switching operations involving time delays, e.g. in non-residential buildings, airports, industrial buildings etc.

### Technical specifications

Type	7PV15	
<b>Rated insulation voltage</b> Pollution degree 2, overvoltage category III	V AC	300
<b>Permissible ambient temperature</b>	°C	-25 ... +55
• During operation	°C	-40 ... +70
<b>Operating range at excitation<sup>1)</sup></b>	0.85 ... 1.1 x $U_N$ at V AC/DC, 50/60 Hz 0.8 ... 1.25 x $U_N$ 24 V DC 0.95 ... 1.05 times the rated frequency	
<b>Rated operational current <math>I_e</math></b>	A	3
• AC-15 at 24 ... 240 V, 50 Hz	A	1
• DC-13 at	A	0.2
- 24 V		
- 125 V		
<b>Uninterrupted thermal current <math>I_{th}</math></b>	A	5
<b>Mechanical endurance</b>	Operating cycles	1 x 10 <sup>6</sup>
<b>Electrical endurance at <math>I_e</math></b>	Operating cycles	1 x 10 <sup>5</sup>
<b>Connection type</b>	 <b>Screw terminals</b>	
• Terminal screw	M3 (for standard screwdriver, size 2 and Pozidriv 2)	
• Solid	mm <sup>2</sup>	1 x (0.2 ... 2.5)
• Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.25 ... 1.5)
• Finely stranded without end sleeve	mm <sup>2</sup>	1 x (0.2 ... 1.5)
• AWG cables, solid or stranded	AWG	1 x (24 ... 14)
• Tightening torque	Nm	0.4 ... 0.5

<sup>1)</sup> If nothing else is stated.

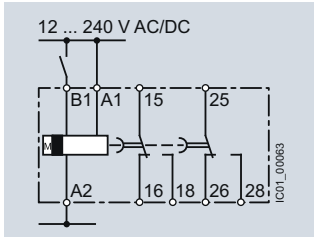
### 7PV15 internal circuit diagrams



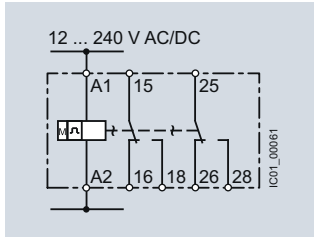
# Timing Relays

7PV15 timing relays in enclosure, 17.5 mm

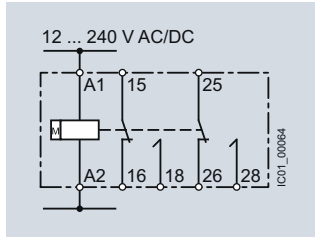
**7PV15 internal circuit diagrams (continued)**



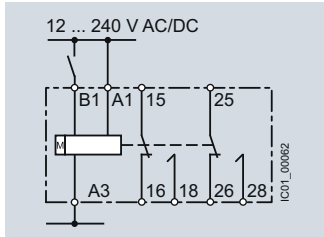
7PV1508-1BW30  
OFF-delay  
with control signal



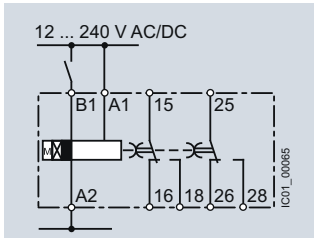
7PV1508-1BW30  
Flashing,  
starting with interval



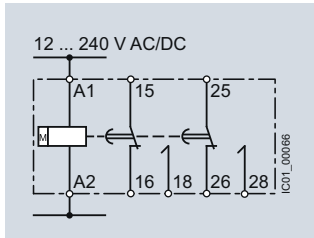
7PV1508-1BW30  
Passing make contact



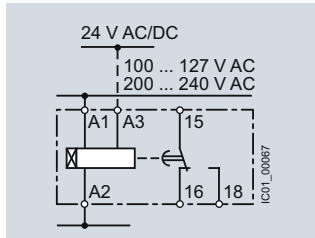
7PV1508-1BW30  
Pulse-forming  
with control signal



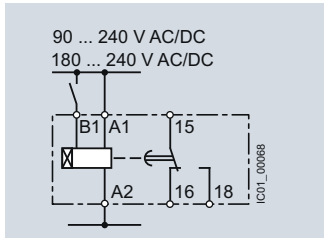
7PV1508-1BW30  
ON and OFF-delay



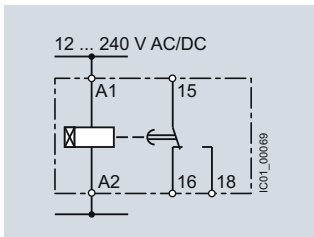
7PV1508-1BW30  
Fixed pulse after ON-delay



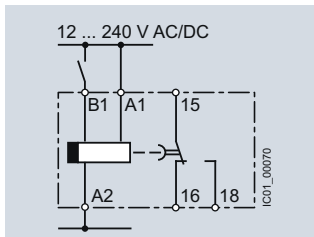
7PV151.-1AQ30, 7PV151.-1AP30  
ON-delay



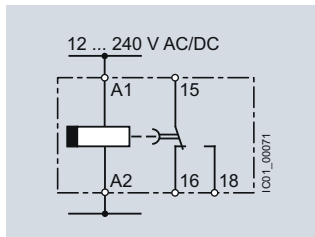
7PV1518-1AJ30, 7PV1518-1AN30  
ON-delay



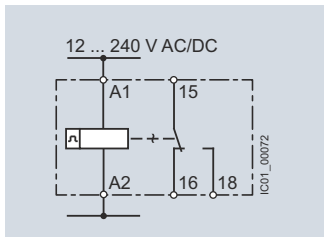
7PV1518-1AW30  
ON-delay



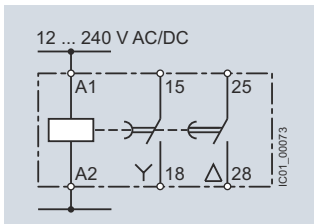
7PV1538-1AW30  
OFF-delay  
with control signal



7PV1540-1AW30  
OFF-delay  
without control signal



7PV1558-1AW30  
Clock-pulse relay



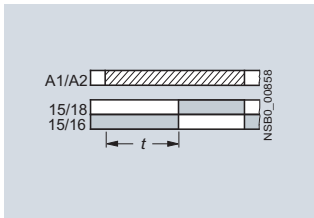
7PV1578-1BW30  
Wye-delta

# Timing Relays

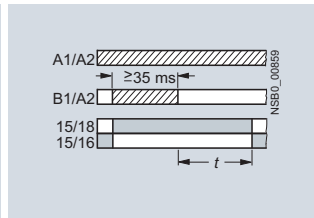
7PV15 timing relays in enclosure, 17.5 mm

## 7PV15 function diagrams

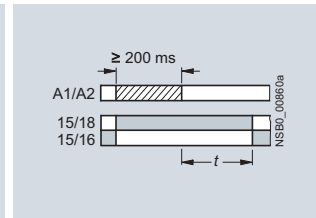
1 CO contact



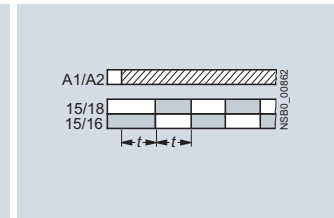
**A**  
7PV1508-1A, 7PV1511, 7PV1512, 7PV1513, 7PV1518  
ON-delay



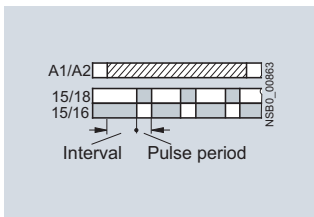
**B<sup>1)</sup>**  
7PV1508-1A, 7PV1538  
OFF-delay with control signal



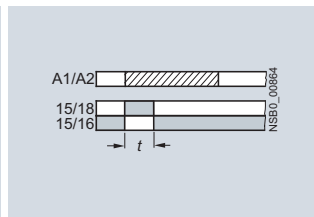
**--**  
7PV1540  
OFF-delay without control signal



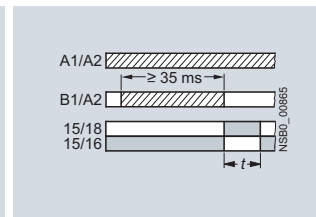
**C**  
7PV1508-1A  
Flashing, starting with interval (pulse/interval 1:1)



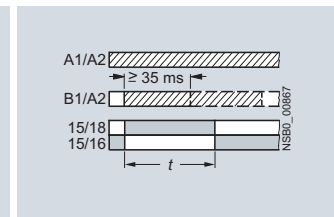
**--**  
7PV1558  
Clock-pulse, starting with interval (dead period, pulse time, and time setting ranges each separately adjustable)



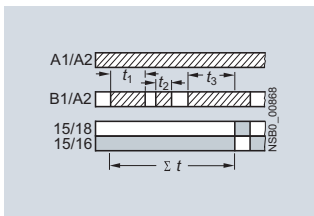
**D**  
7PV1508-1A  
Passing make contact



**E<sup>1)</sup>**  
7PV1508-1A  
Passing break contact with control signal



**F<sup>1)</sup>**  
7PV1508-1A  
Pulse-forming with control signal (pulse generation at the output does not depend on duration of energizing)



**G<sup>1)</sup>**  
7PV1508-1A  
Additive ON-delay with control signal

Legend

**A ... G** Identification letters for 7PV1508

- Timing relay energized
- Contact closed
- Contact open

<sup>1)</sup> Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero (retriggerable). This does not apply to E, F and G, which are not retriggerable.

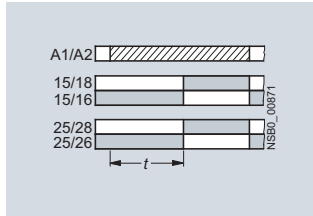
Note:

With the 7PV1508-1A multifunctional relay the identification letters A to G are printed on the front alongside the rotary selector switch of the unit. The related function can be found in the form of a bar graph on the side of the device.

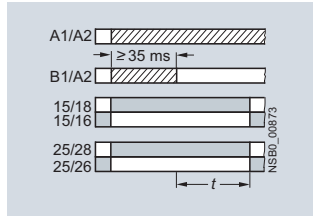
# Timing Relays

## 7PV15 timing relays in enclosure, 17.5 mm

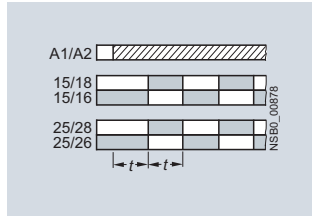
### 2 CO contacts



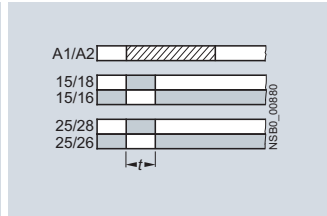
**A**  
7PV1508-1B  
ON-delay



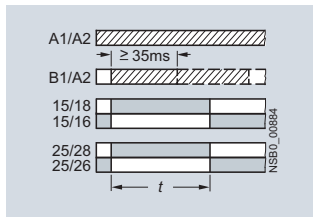
**B<sup>1)</sup>**  
7PV1508-1B  
OFF-delay with control signal



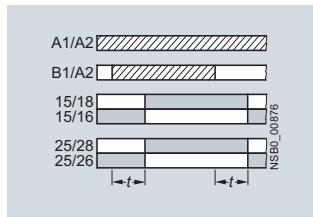
**C**  
7PV1508-1B  
Flashing, starting with interval  
(pulse/interval 1:1)



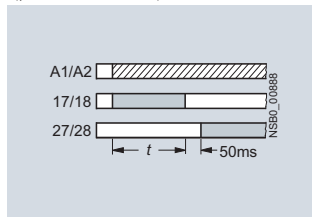
**D**  
7PV1508-1B  
Passing make contact



**F<sup>1)</sup>**  
7PV1508-1B  
Pulse-forming with control signal  
(pulse generation at the output does  
not depend on duration of  
energizing)

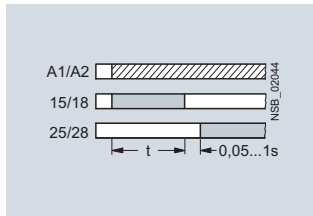


**H<sup>1)</sup>**  
7PV1508-1B  
ON-delay and OFF-delay  
with control signal



**I**  
7PV1508-1B  
Fixed pulse after ON-delay

### 2 NO contacts



--  
7PV1578  
Wye-delta function<sup>2)</sup>

### Legend

**A ... D, F, H, I** Identification letters for 7PV1508

- Timing relay energized
- Contact closed
- Contact open

<sup>1)</sup> Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero (retriggerable). This does not apply to E, F and G, which are not retriggerable.

<sup>2)</sup> With 7PV1578 the contacts 16 and 26 are not needed for the wye-delta function.

### Note:

With the 7PV1508-1B multifunctional relay the identification letters A to D, F, H, I are printed on the front alongside the rotary selector switch of the unit. The related function can be found in the form of a bar graph on the side of the device.

# Timing Relays

7PV15 timing relays in enclosure, 17.5 mm

RELAYS, INTERFACES & CONVERTERS 11

## Selection and ordering data



Version	Time setting range $t$ adjustable by rotary switch to	Rated control supply voltage $U_s$	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG
		50/60 Hz AC V	DC V	Article No.	Price per PU		

### 7PV1508 timing relays, multifunction, 7 time setting ranges

The functions can be adjusted by means of rotary switches. The same potential must be applied to terminals A. and B.

With LED and 1 CO contact, 7 functions	0.05 ... 1 s 0.5 ... 10 s 5 ... 100 s	12 ... 240	12 ... 240	▶	<b>7PV1508-1AW30</b>	1	1 unit	41H
With LED and 2 CO contacts, 7 functions	30 s ... 10 min 3 min ... 1 h 30 min ... 10 h 5 ... 100 h	12 ... 240	12 ... 240	▶	<b>7PV1508-1BW30</b>	1	1 unit	41H

### 7PV151. timing relays, ON-delay, 1 time setting range

With LED and 1 CO contact	0.05 ... 1 s	24/200 ... 240	24	▶	<b>7PV1511-1AP30</b>	1	1 unit	41H
	0.5 ... 10 s	24/100 ... 127	24	▶	<b>7PV1512-1AQ30</b>	1	1 unit	41H
		24/200 ... 240	24	▶	<b>7PV1512-1AP30</b>	1	1 unit	41H
	5 ... 100 s	24/100 ... 127	24	▶	<b>7PV1513-1AQ30</b>	1	1 unit	41H
		24/200 ... 240	24	▶	<b>7PV1513-1AP30</b>	1	1 unit	41H

### 7PV1518 timing relays, ON-delay, 7 time setting ranges

With LED and 1 CO contact	0.05 ... 1 s	12 ... 240	12 ... 240	▶	<b>7PV1518-1AW30</b>	1	1 unit	41H
	0.5 ... 10 s	90 ... 127	90 ... 127	▶	<b>7PV1518-1AJ30</b>	1	1 unit	41H
	5 ... 100 s							
	30 s ... 10 min	180 ... 240	180 ... 240	▶	<b>7PV1518-1AN30</b>	1	1 unit	41H
	3 min ... 1 h							
	30 min ... 10 h							
	5 ... 100 h							

### 7PV1538 timing relays, OFF-delay, with control signal, 7 time setting range

With LED and 1 CO contact	0.05 ... 1 s	12 ... 240	12 ... 240	▶	<b>7PV1538-1AW30</b>	1	1 unit	41H
	0.5 ... 10 s							
	5 ... 100 s							
	30 s ... 10 min							
	3 min ... 1 h							
	30 min ... 10 h							
	5 ... 100 h							

### 7PV1540 timing relays, OFF-delay, without control signal, 7 time setting ranges

With LED and 1 CO contact	0.05 ... 1 s	12 ... 240	12 ... 240	▶	<b>7PV1540-1AW30</b>	1	1 unit	41H
	0.15 ... 3s							
	0.3 ... 6 s							
	0.5 ... 10 s							
	1.5 ... 30 s							
	3 ... 60 s							
	5 ... 100 s							

### 7PV1558 timing relays, clock-pulse relay, 7 time setting ranges

With LED and 1 CO contact	0.05 ... 1 s	12 ... 240	12 ... 240	▶	<b>7PV1558-1AW30</b>	1	1 unit	41H
	0.5 ... 10 s							
	5 ... 100 s							
	30 s ... 10 min							
	3 min ... 1 h							
	30 min ... 10 h							
	5 ... 100 h							

### 7PV1578 timing relays, wye-delta function, 7 time setting ranges

With LED and 2 NO contacts, dead interval 0.05 ... 1 s adjustable	0.05 ... 1 s	12 ... 240	12 ... 240	▶	<b>7PV1578-1BW30</b>	1	1 unit	41H
	0.5 ... 10 s							
	5 ... 100 s							
	30 s ... 10 min							
	3 min ... 1 h							
	30 min ... 10 h							
	5 ... 100 h							

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## General data

### Overview



SIRIUS 3UG4 monitoring relay

#### More information

Homepage, see [www.siemens.com/relays](http://www.siemens.com/relays)

Industry Mall, see [www.siemens.com/product?3UG45](http://www.siemens.com/product?3UG45)

For the conversion tool, e.g. from 3UG3 to 3UG4, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool)

The field-proven SIRIUS monitoring relays for electrical and mechanical variables enable constant monitoring of all important characteristic quantities that provide information about the functional capability of a plant. Both sudden disturbances and gradual changes, which may indicate the need for maintenance, are detected. Thanks to their relay outputs, the monitoring relays permit direct disconnection of the affected system components as well as alerting (e.g. by switching a warning lamp).

Thanks to adjustable delay times the monitoring relays can respond very flexibly to brief faults such as voltage dips or load changes. This avoids unnecessary alarms and disconnections while enhancing plant availability.

The individual 3UG4 monitoring relays offer the following functions in various combinations:

- Undershooting and/or overshooting of liquid levels
- Phase sequence
- Phase failure, neutral conductor failure
- Phase asymmetry
- Undershooting and/or overshooting of limit values for voltage
- Undershooting and/or overshooting of limit values for current
- Undershooting and/or overshooting of limit values for power factor
- Monitoring of the active current or the apparent current
- Monitoring of the residual current
- Monitoring of the insulation resistance
- Undershooting and/or overshooting of limit values for speed

### Article No. scheme

Product versions		Article number									
<b>Monitoring relays</b>		<b>3UG4</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>0</b>
Type of setting	e.g. 5 = analogically adjustable		<input type="checkbox"/>								
Functions	e.g. 11 = line monitoring		<input type="checkbox"/>	<input type="checkbox"/>							
Connection type	Screw terminals						<b>1</b>				
	Spring-type terminals						<b>2</b>				
Contacts	e.g. A = 1 CO contact							<input type="checkbox"/>			
Supply voltage	e.g. N2 = 160 ... 260 V AC								<input type="checkbox"/>	<input type="checkbox"/>	
Example		<b>3UG4</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>A</b>	<b>N</b>	<b>2</b>	<b>0</b>

#### Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## General data

### Benefits

- Customary screw and spring-type terminals for quick and reliable wiring
- Fast commissioning thanks to menu-guided parameterization and actual value display for limit value determination
- Reduced space requirement in the control cabinet thanks to a consistent width of 22.5 mm
- Parameterizable monitoring functions, delay times, RESET response, etc.
- Reduced stockkeeping thanks to minimized variance and large measuring ranges
- Wide-voltage power supply units for global applicability
- Device replacement without renewed wiring thanks to removable terminals
- Reliable system diagnostics thanks to actual value display and connectable fault memory
- Rapid diagnostics thanks to unambiguous error messages on the display

### Application

The SIRIUS 3UG4 monitoring relays monitor the most diverse electrical and mechanical quantities in the feeder, and provide reliable protection against damage in the plant. For this purpose, they offer freely parameterizable limit values and diverse options for adapting to the respective task, and in the event of a fault, they provide clear diagnostics information.

The digitally adjustable products also display the current measured values direct on the device. This not only facilitates the display of valuable plant status information during operation, it also enables adjustment of the monitored limit values in accordance with the actual conditions.

The positive result: More selective avoidance of production faults – sustained increases in availability and productivity.

The 3UG4 monitoring relays are available for the following applications:

- Line and single-phase voltage monitoring
- Single-phase current monitoring or power factor and active current monitoring
- Residual current monitoring
- Insulation monitoring
- Level monitoring
- Speed monitoring

### Technical specifications

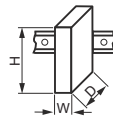
#### More information

Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16367/td>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16367/faq>

Manual and internal circuit diagrams, see <https://support.industry.siemens.com/cs/ww/en/view/54397927>

Type	3UG	
<b>General data</b>		
Dimensions (W x H x D)		
• For 2 terminal blocks - Screw terminals - Spring-type terminals	mm	22.5 x 83 x 91
	mm	22.5 x 84 x 91
• For 3 terminal blocks - Screw terminals - Spring-type terminals	mm	22.5 x 92 x 91
	mm	22.5 x 94 x 91
• For 4 terminal blocks - Screw terminals - Spring-type terminals	mm	22.5 x 103 x 91
	mm	22.5 x 103 x 91
<b>Permissible ambient temperature</b>		
• During operation	°C	-25 ... +60
<b>Connection type</b>		
<b>⊕ Screw terminals</b>		
• Terminal screw • Solid • Finely stranded with end sleeve • AWG cables, solid or stranded	mm <sup>2</sup>	M3 (for standard screwdriver, size 2 and Pozidriv 2)
	mm <sup>2</sup>	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)
	AWG	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5) 2 x (20 ... 14)
<b>⊖ Spring-type terminals</b>		
• Solid • Finely stranded, with end sleeve acc. to DIN 46228 • Finely stranded • AWG cables, solid or stranded	mm <sup>2</sup>	2 x (0.25 ... 1.5)
	mm <sup>2</sup>	2 x (0.25 ... 1.5)
	mm <sup>2</sup>	2 x (0.25 ... 1.5)
	AWG	2 x (24 ... 16)



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Line monitoring

### Overview



SIRIUS 3UG4615 monitoring relay

Electronic line monitoring relays provide maximum protection for mobile machines and plants or for unstable networks. Network and voltage faults can thus be detected early and rectified before far greater damage ensues.

Depending on the version, the relays monitor phase sequence, phase failure with and without N conductor monitoring, phase asymmetry, undervoltage or overvoltage.

Phase asymmetry is evaluated as the difference between the greatest and the smallest phase voltage relative to the greatest phase voltage. Undervoltage or overvoltage exists when at least one phase voltage deviates by 20% from the set rated system voltage or the directly set limit values are overshoot or undershot. The rms value of the voltage is measured.

With the 3UG4617 or 3UG4618 relay, a wrong direction of rotation can also be corrected automatically.

### Benefits

- Can be used without auxiliary voltage in any network from 160 to 630 V AC worldwide thanks to wide voltage range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Permanent display of actual value and line fault type on the digital versions
- Automatic correction of the direction of rotation by distinguishing between power system faults and wrong phase sequence
- All versions with removable terminals
- All versions with screw or spring-type terminals

### Application

The relays are used above all for mobile equipment, e.g. air conditioning compressors, refrigerating containers, building site compressors and cranes.

Function	Application
Phase sequence	<ul style="list-style-type: none"> <li>• Direction of rotation of the drive</li> </ul>
Phase failure	<ul style="list-style-type: none"> <li>• A fuse has tripped</li> <li>• Failure of the control supply voltage</li> <li>• Broken cable</li> </ul>
Phase asymmetry	<ul style="list-style-type: none"> <li>• Overheating of the motor due to asymmetrical voltage</li> <li>• Detection of asymmetrically loaded networks</li> </ul>
Undervoltage	<ul style="list-style-type: none"> <li>• Increased current on a motor with corresponding overheating</li> <li>• Unintentional resetting of a device</li> <li>• Network collapse, particularly with battery power</li> </ul>
Overvoltage	<ul style="list-style-type: none"> <li>• Protection of a plant against destruction due to overvoltage</li> </ul>

### Technical specifications

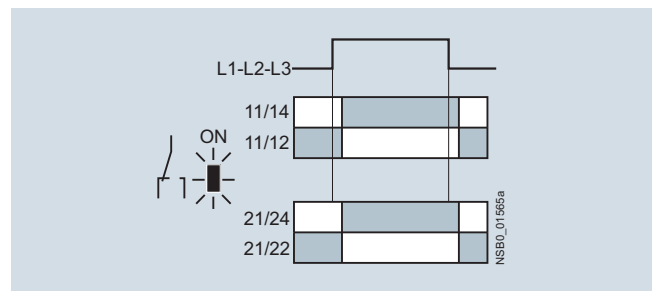
#### 3UG4511 monitoring relays

The 3UG4511 phase sequenced relay monitors the phase sequence in a three-phase network. No adjustments are required for operation. The device has an internal power supply and works using the closed-circuit principle. If the phase sequence at the terminals L1-L2-L3 is correct, the output relay picks up after the delay time has elapsed and the LED is lit. If the phase sequence is wrong, the output relay remains in its rest position.

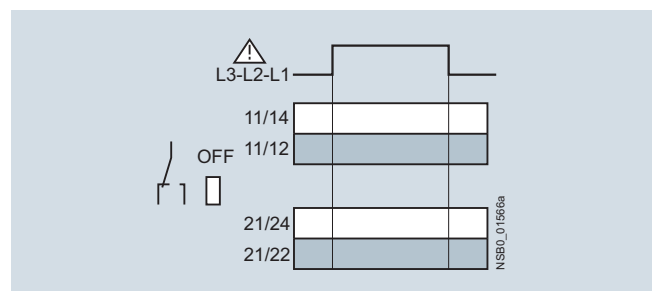
#### Note:

When one phase fails, connected loads (motor windings, lamps, transformers, coils, etc.) create a feedback voltage at the terminal of the failed phase due to the network coupling. Because the 3UG4511 relays are not resistant to voltage feedback, such a phase failure is not detected. Should this be required, then the 3UG4512 monitoring relay must be used.

#### Correct phase sequence



#### Wrong phase sequence



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Line monitoring

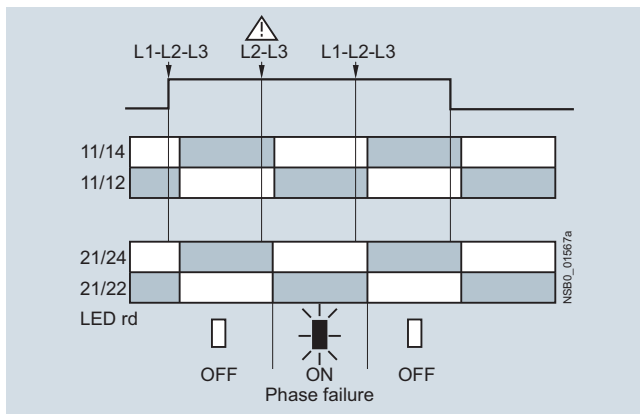
### 3UG4512 monitoring relays

The 3UG4512 line monitoring relay monitors three-phase networks with regard to phase sequence, phase failure and phase unbalance of 10%. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V AC and feedback through the load of up to 90%. The device has an internal power supply and works using the closed-circuit principle. No adjustments are required. If the line voltage is switched on, the green LED will light up. If the phase sequence at the terminals L1-L2-L3 is correct, the output relay picks up. If the phase sequence is wrong, the red LED flashes and the output relay remains in its rest position. If a phase fails, the red LED is permanently lit and the output relay drops.

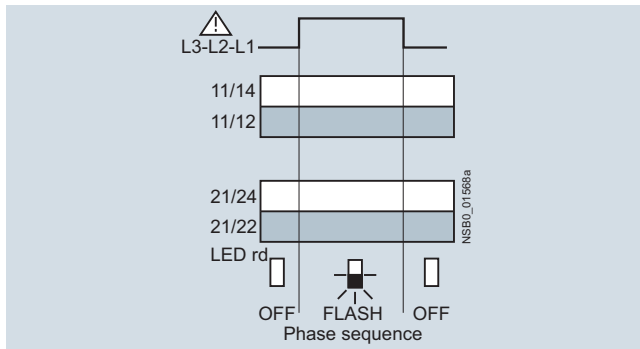
**Note:**

The red LED is a fault diagnostic indicator and does not show the current relay status. The 3UG4512 monitoring relay is suitable for line frequencies of 50/60 Hz.

Phase failure



Wrong phase sequence



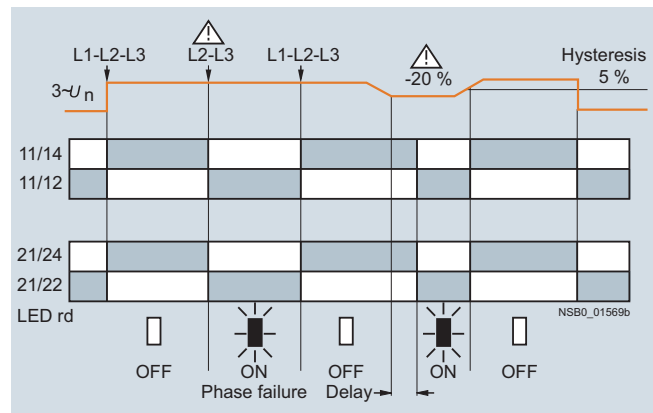
### 3UG4513 monitoring relays

The 3UG4513 line monitoring relay monitors three-phase networks with regard to phase sequence, phase failure, phase asymmetry and undervoltage of 20%. The device has an internal power supply and works using the closed-circuit principle. The hysteresis is 5%. The integrated response delay time T is adjustable from 0 to 20 s and responds to undervoltage. If the direction is incorrect, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V and feedback through the load of up to 80%. If the line voltage is switched on, the green LED will light up. If the phase sequence at the terminals L1-L2-L3 is correct, the output relay picks up. If the phase sequence is wrong, the red LED flashes and the output relay remains in its rest position. If a phase fails, the red LED is permanently lit and the output relay drops.

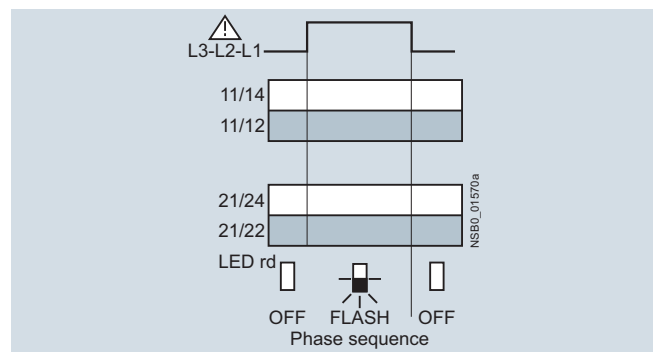
**Note:**

The red LED is a fault diagnostic indicator and does not show the current relay status. The 3UG4513 monitoring relay is suitable for line frequencies of 50/60 Hz.

Phase failure and undervoltage



Wrong phase sequence



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Voltage monitoring

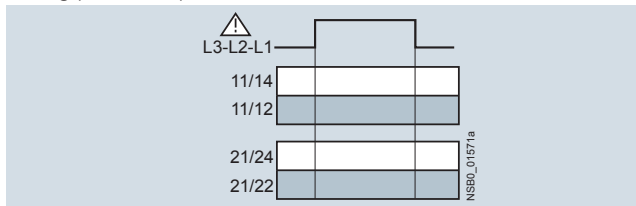
### 3UG4614 monitoring relays

The 3UG4614 line monitoring relay has a wide voltage range input and an internal power supply. The device is equipped with a display and is parameterized using three buttons. The unit monitors three-phase networks with regard to phase asymmetry from 5 to 20%, phase failure, undervoltage and phase sequence. The hysteresis is adjustable from 1 to 20 V. In addition the device has a response delay and ON-delay from 0 to 20 s in each case. The integrated response delay time responds to phase asymmetry and undervoltage. If the direction is incorrect, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V and feedback through the load of up to 80%.

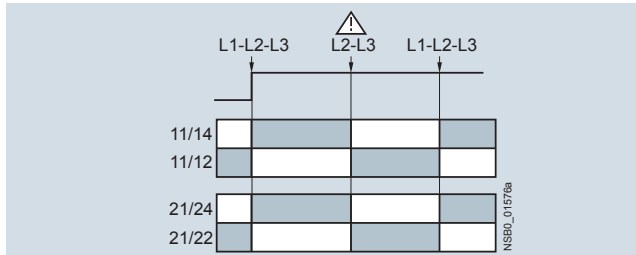
The 3UG4614 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

With the closed-circuit principle selected

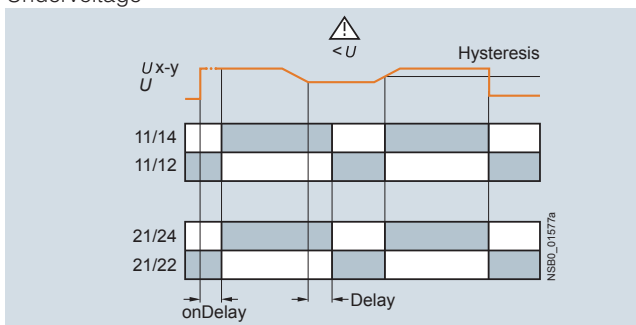
Wrong phase sequence



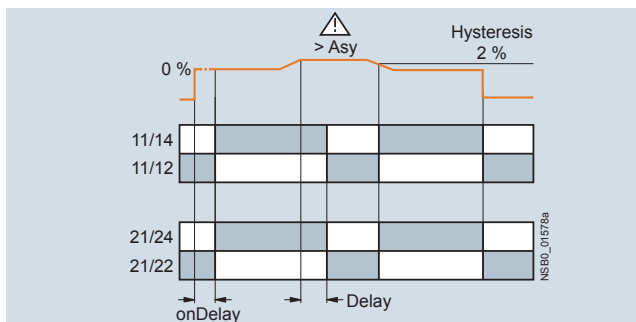
Phase failure



Undervoltage



Unbalance



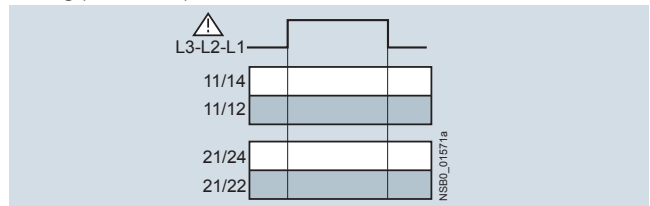
### 3UG4615/3UG4616 monitoring relays

The 3UG4615/3UG4616 line monitoring relay has a wide voltage range input and an internal power supply. The device is equipped with a display and is parameterized using three buttons. The 3UG4615 device monitors three-phase networks with regard to phase failure, undervoltage, overvoltage and phase sequence. The 3UG4616 monitoring relay monitors the neutral conductor as well. The hysteresis is adjustable from 1 to 20 V. In addition the device has two separately adjustable delay times for overvoltage and undervoltage from 0 to 20 s in each case. If the direction of rotation is incorrect, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V and feedback through the load of up to 80%.

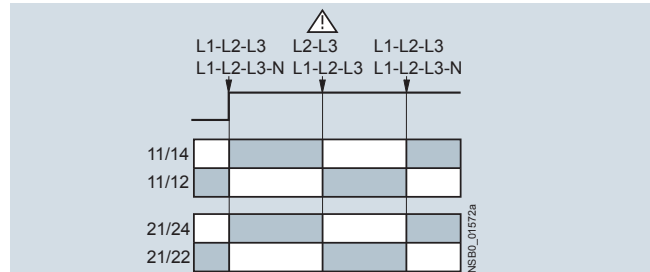
The 3UG4615/3UG4616 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

With the closed-circuit principle selected

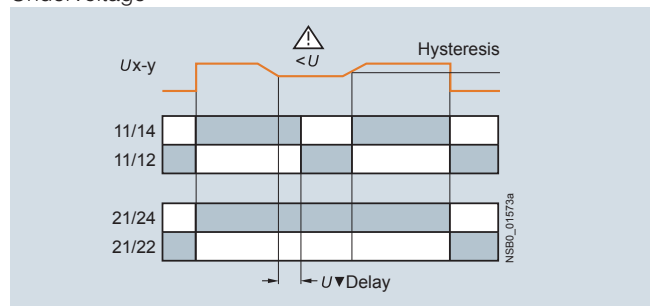
Wrong phase sequence



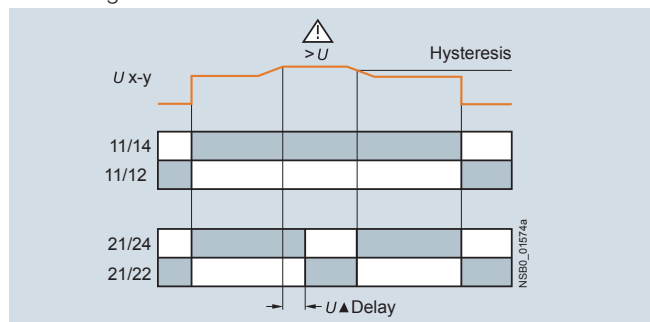
Phase failure



Undervoltage



Overvoltage



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Line monitoring

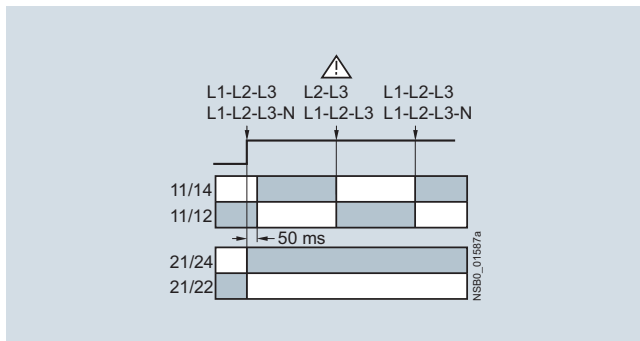
### 3UG4617/3UG4618 monitoring relays

The 3UG4617/3UG4618 line monitoring relay has an internal power supply and can automatically correct a wrong direction of rotation. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V AC and feedback through the load of up to 80%. The device is equipped with a display and is parameterized using three buttons. The 3UG4617 line monitoring relay unit monitors three-phase networks with regard to phase sequence, phase failure, phase unbalance, undervoltage and overvoltage. The 3UG4618 monitoring relay monitors the neutral conductor as well. The hysteresis is adjustable from 1 to 20 V. In addition the device has delay times from 0 to 20 s in each case for overvoltage, undervoltage, phase failure and phase unbalance. The 3UG4617/3UG4618 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

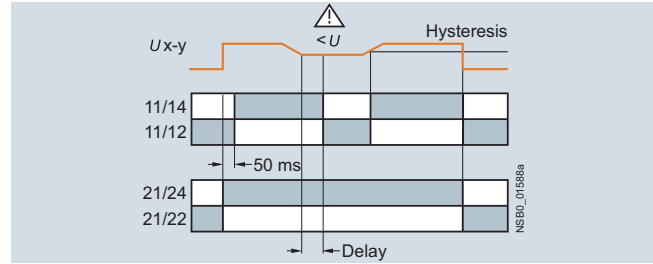
The one changeover contact is used for warning or disconnection in the event of power system faults (voltage, asymmetry), the other responds only to a wrong phase sequence. In conjunction with a contactor reversing assembly it is thus possible to change the direction automatically.

With the closed-circuit principle selected

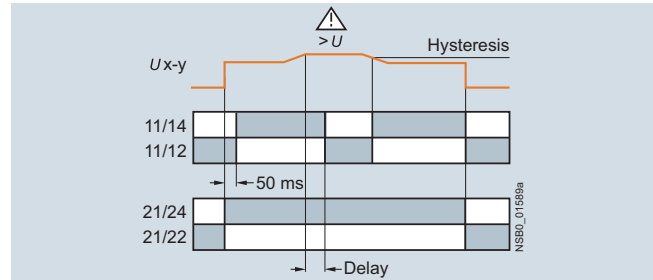
#### Phase failure



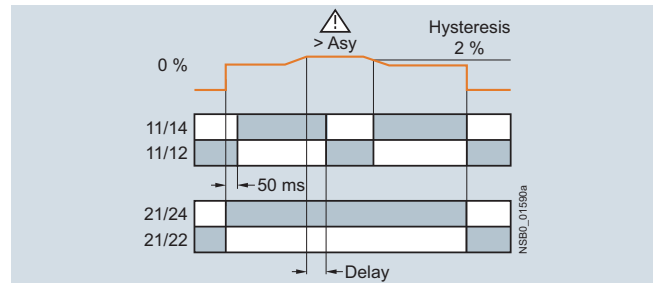
#### Undervoltage



#### Overvoltage



#### Unbalance



Type	3UG4511 ... 3UG4513, 3UG4614 ... 3UG4618	
<b>General data</b>		
Rated insulation voltage $U_i$	V	690
Pollution degree 3 Overvoltage category III acc. to VDE 0110		
Rated impulse withstand voltage $U_{imp}$	kV	6
<b>Control circuit</b>		
Load capacity of the output relay		
• Thermal current $I_{th}$	A	5
Rated operational current $I_e$ at		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	1
• DC-13/125 V	A	0.2
• DC-13/250 V	A	0.1
Minimum contact load at 17 V DC	mA	5
Electrical endurance AC-15	Million operating cycles	0.1
Mechanical endurance	Million operating cycles	10

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Line monitoring

### Selection and ordering data

PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H



Adjustable hysteresis	Under-voltage detection	Over-voltage detection	Stabilization time adjustable stDEL	Tripping delay time adjustable Del	Version of auxiliary contacts	Measurable line voltage <sup>1)</sup>	SD	Screw terminals	SD	Spring-type terminals	
			s	s	CO contact	V	d	Article No.	Price per PU	Article No.	Price per PU
<b>Monitoring of phase sequence</b>											
Auto RESET											
--	--	--	--	--	1	160 ... 260 AC	2	3UG4511-1AN20	2	3UG4511-2AN20	
					2		2	3UG4511-1BN20	2	3UG4511-2BN20	
					1	320 ... 500 AC	2	3UG4511-1AP20	2	3UG4511-2AP20	
					2		2	3UG4511-1BP20	2	3UG4511-2BP20	
					1	420 ... 690 AC	2	3UG4511-1AQ20	5	3UG4511-2AQ20	
					2		2	3UG4511-1BQ20	5	3UG4511-2BQ20	
<b>Monitoring of phase sequence, phase failure and phase unbalance</b>											
Auto RESET, closed-circuit principle, unbalance threshold permanently 10%											
--	--	--	--	--	1	160 ... 690 AC	2	3UG4512-1AR20	2	3UG4512-2AR20	
					2		2	3UG4512-1BR20	2	3UG4512-2BR20	
<b>Monitoring of phase sequence, phase failure, unbalance and undervoltage</b>											
Analogically adjustable, Auto RESET, closed-circuit principle, asymmetry and undervoltage threshold permanently 20%											
5% of set value	✓	--	--	0.1 ... 20	2	160 ... 690 AC	2	3UG4513-1BR20	2	3UG4513-2BR20	
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle, asymmetry threshold 0 or 5 ... 20%											
adjustable 1 ... 20 V	✓	--	--	0.1 ... 20	2	160 ... 690 AC	2	3UG4614-1BR20	2	3UG4614-2BR20	
<b>Monitoring of phase sequence, phase failure, overvoltage and undervoltage</b>											
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle											
adjustable 1 ... 20 V	✓	✓	--	0.1 ... 20 <sup>2)</sup>	2 <sup>2)</sup>	160 ... 690 AC	2	3UG4615-1CR20	2	3UG4615-2CR20	
<b>Monitoring of phase sequence, phase and N conductor failure, overvoltage and undervoltage</b>											
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle											
adjustable 1 ... 20 V	✓	✓	--	0.1 ... 20 <sup>2)</sup>	2 <sup>2)</sup>	90... 400 AC against N	2	3UG4616-1CR20	2	3UG4616-2CR20	
<b>Automatic correction of the direction of rotation in case of wrong phase sequence, phase failure, unbalance, overvoltage and undervoltage</b>											
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle, asymmetry threshold 0 or 5 ... 20%											
adjustable 1 ... 20 V	✓	✓	--	0.1 ... 20	2 <sup>3)</sup>	160 ... 690 AC	2	3UG4617-1CR20	2	3UG4617-2CR20	
<b>Automatic correction of the direction of rotation in case of wrong phase sequence, phase and N conductor failure, phase unbalance, overvoltage and undervoltage</b>											
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle, asymmetry threshold 0 or 5 ... 20%											
adjustable 1 ... 20 V	✓	✓	--	0.1 ... 20	2 <sup>3)</sup>	90 ... 400 AC against N	2	3UG4618-1CR20	2	3UG4618-2CR20	

✓ Function available  
 -- Function not available

<sup>1)</sup> Absolute limit values.

<sup>2)</sup> 1 CO contact each and one tripping delay time each for  $U_{min}$  and  $U_{max}$ .

<sup>3)</sup> 1 CO contact each for power system fault and phase sequence correction.

For accessories, see page 11/83

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Voltage monitoring

### Overview



SIRIUS 3UG4631 monitoring relay

The relays monitor single-phase AC voltages (rms value) and DC voltages against the set threshold value for overshoot and undershoot. The devices differ with regard to their power supply (internal or external).

### Benefits

- Versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display of ACTUAL value and status messages
- All versions with removable terminals
- All versions with screw or spring-type terminals

### Application

- Protection of a plant against destruction due to overvoltage
- Switch-on of a plant at a defined voltage and higher
- Protection from undervoltage due to overloaded control supply voltages, particularly with battery power
- Threshold switch for analog signals from 0.1 to 10 V

### Technical specifications

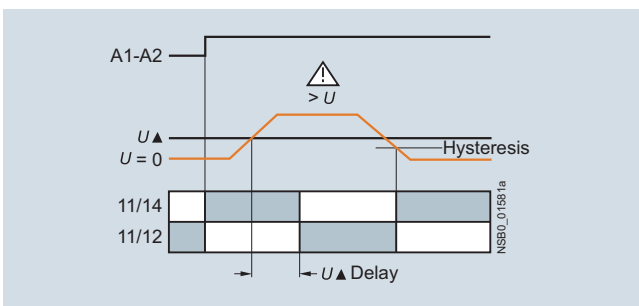
#### 3UG4631/3UG4632 monitoring relays

The 3UG4631/3UG4632 voltage monitoring relay is supplied with an auxiliary voltage of 24 V AC/DC or 24 to 240 V AC/DC and performs overshoot, undershoot or range monitoring of the voltage depending on parameterization. The device is equipped with a display and is parameterized using three buttons.

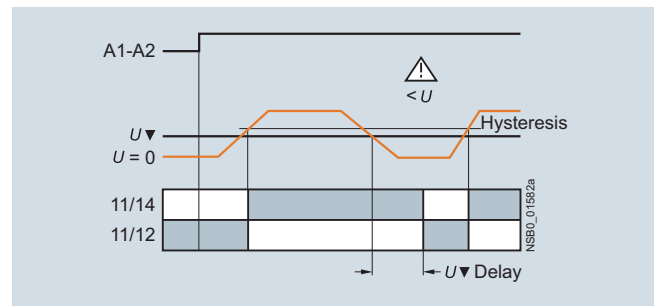
The measuring range extends from 0.1 to 60 V or 10 to 600 V AC/DC. The threshold values for overshoot or undershoot can be freely configured within this range. If one of these threshold values is reached, the output relay responds according to the set principle of operation as soon as the delay time has elapsed. This delay time  $U_{Del}$  can be set from 0.1 to 20 s. The hysteresis can be set from 0.1 to 30 V or 0.1 to 300 V. The device can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. One output changeover contact is available as signaling contact.

With the closed-circuit principle selected

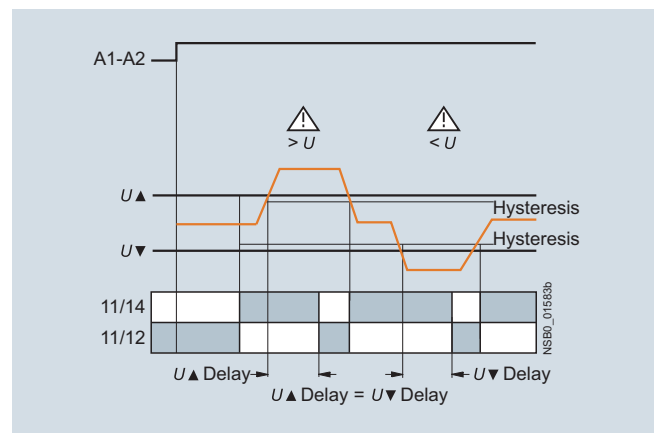
#### Overvoltage



#### Undervoltage



#### Range monitoring





# 33UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Voltage monitoring

### 3UG4633 monitoring relay

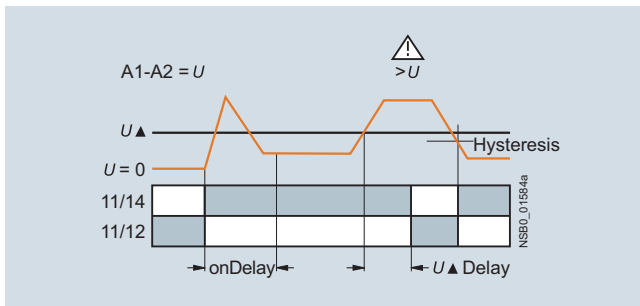
The 3UG4633 voltage monitoring relay has an internal power supply and performs overshoot, undershoot or range monitoring of the voltage depending on parameterization. The device is equipped with a display and is parameterized using three buttons.

The operating and measuring range extends from 17 to 275 V AC/DC. The threshold values for overshoot or undershoot can be freely configured within this range. If one of these threshold values is reached, the output relay responds according to the set principle of operation as soon as the tripping delay time has elapsed. This delay time  $U_{Del}$  can also be adjusted, just like the ON-delay time  $on_{Del}$ , from 0.1 to 20 s.

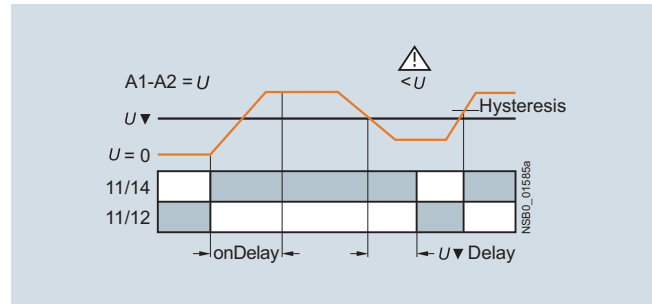
The hysteresis is adjustable from 0.1 to 150 V. The device can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. One output change-over contact is available as signaling contact.

With the closed-circuit principle selected

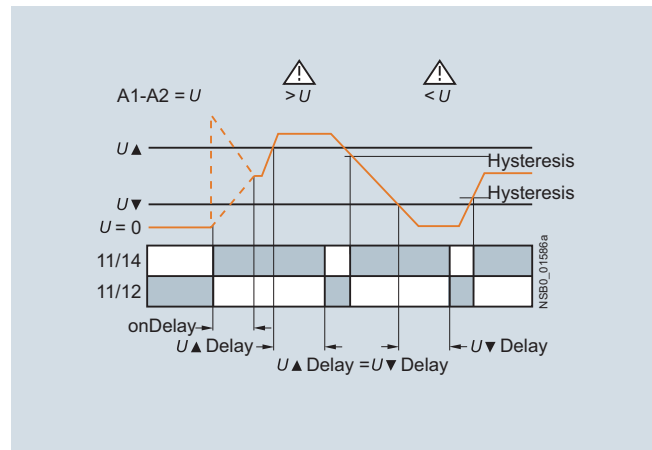
#### Overvoltage



#### Undervoltage



#### Range monitoring



Type		3UG4631	3UG4632	3UG4633
<b>General data</b>				
<b>Rated insulation voltage <math>U_i</math></b>	V	690		
Pollution degree 3 Overvoltage category III acc. to VDE 0110				
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6		
<b>Measuring circuit</b>				
<b>Permissible measuring range</b> single-phase AC/DC voltage	V	0.1 ... 68	10 ... 650	17 ... 275
<b>Measuring frequency</b>	Hz	40 ... 500		
<b>Setting range</b> single-phase voltage	V	0.1 ... 60	10 ... 600	17 ... 275
<b>Control circuit</b>				
<b>Load capacity of the output relay</b>				
• Thermal current $I_{th}$	A	5		
<b>Rated operational current <math>I_e</math> at</b>				
• AC-15/24 ... 400 V	A	3		
• DC-13/24 V	A	1		
• DC-13/125 V	A	0.2		
• DC-13/250 V	A	0.1		
<b>Minimum contact load</b> at 17 V DC	mA	5		



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Voltage monitoring

### Selection and ordering data

- Digitally adjustable, with illuminated LCD
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact



PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H



3UG4631-1AA30



3UG4633-2AL30

Measuring range	Adjustable hysteresis	Rated control supply voltage $U_s$	SD	Screw terminals 	SD	Spring-type terminals 	
V	V	V	d	Article No.	Price per PU	Article No.	Price per PU
<b>Internal power supply without auxiliary voltage, separately adjustable ON-delay and tripping delay 0.1 ... 20 s</b>							
17 ... 275 AC/DC	0.1 ... 150	17 ... 275 AC/DC <sup>1)</sup>	2	<b>3UG4633-1AL30</b>	2	<b>3UG4633-2AL30</b>	
<b>Externally supplied with auxiliary voltage, tripping delay adjustable 0.1 ... 20 s</b>							
0.1 ... 60 AC/DC	0.1 ... 30	24 AC/DC	2	<b>3UG4631-1AA30</b>	2	<b>3UG4631-2AA30</b>	
10 ... 600 AC/DC	0.1 ... 300		2	<b>3UG4632-1AA30</b>	2	<b>3UG4632-2AA30</b>	
0.1 ... 60 AC/DC	0.1 ... 30	24 ... 240 AC/DC	2	<b>3UG4631-1AW30</b>	2	<b>3UG4631-2AW30</b>	
10 ... 600 AC/DC	0.1 ... 300		2	<b>3UG4632-1AW30</b>	2	<b>3UG4632-2AW30</b>	

<sup>1)</sup> Absolute limit values.

For accessories, see page 11/83

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Current monitoring

### Overview



SIRIUS 3UG4622 monitoring relay

The relays monitor single-phase AC currents (rms value) and DC currents against the set threshold value for overshoot and undershoot. They differ with regard to their measuring ranges and control supply voltage types.

### Benefits

- Versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display of ACTUAL value and status messages
- All versions with removable terminals
- All versions with screw or spring-type terminals

### Application

- Overcurrent and undercurrent monitoring
- Monitoring the functionality of electrical loads
- Open-circuit monitoring
- Threshold switch for analog signals from 4 to 20 mA

### Technical specifications

#### 3UG4621/3UG4622 monitoring relays

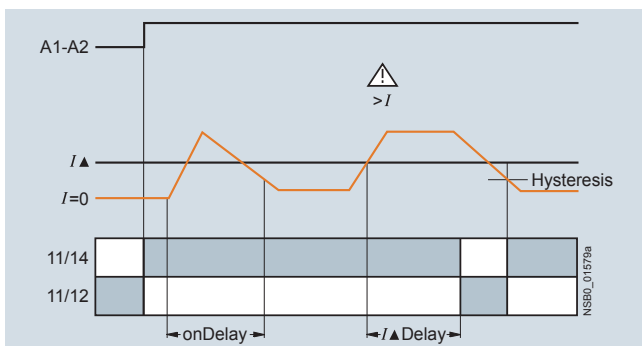
The 3UG4621 or 3UG4622 current monitoring relay is supplied with an auxiliary voltage of 24 V AC/DC or 24 to 240 V AC/DC and performs overshoot, undershoot or range monitoring of the current depending on parameterization. The device is equipped with a display and is parameterized using three buttons.

The measuring range extends from 3 to 500 mA or 0.05 to 10 A. The rms value of the current is measured. The threshold values for overshoot or undershoot can be freely configured within this range. If one of these threshold values is reached, the output relay responds according to the set principle of operation as soon as the tripping delay time  $I_{Del}$  has elapsed. This time and the ON-delay time  $on_{Del}$  are adjustable from 0.1 to 20 s.

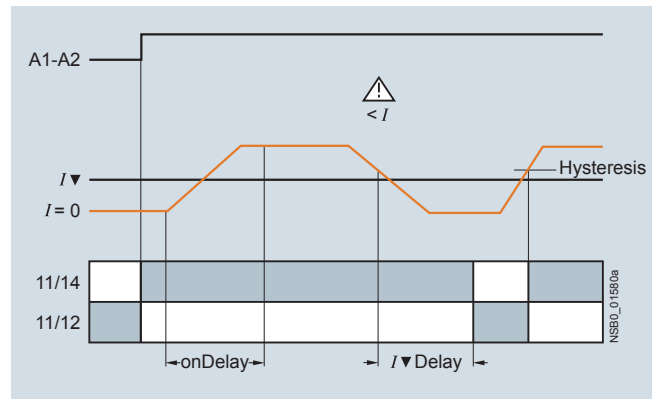
The hysteresis is adjustable from 0.1 to 250 mA or 0.01 to 5 A. The device can be operated with Manual or Auto RESET and on the basis of either the open-circuit or closed-circuit principle. You can decide here whether the output relay is to respond when the supply voltage  $U_s = ON$  is applied, or not until the lower measuring range limit of the measuring current ( $I > 3 \text{ mA}/50 \text{ mA}$ ) is reached. One output changeover contact is available as signaling contact.

With the closed-circuit principle selected upon application of the control supply voltage

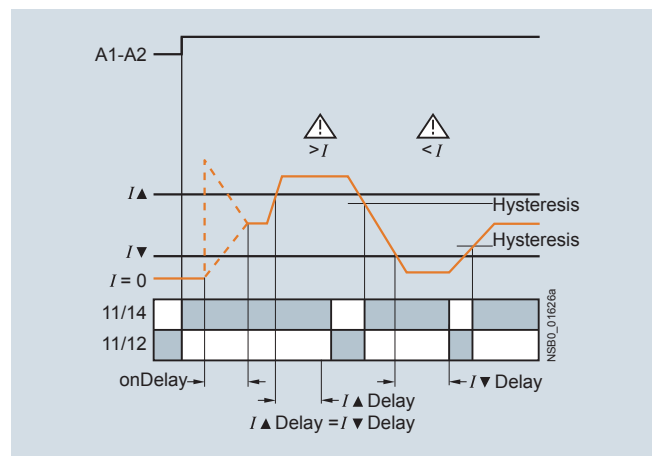
#### Current overshoot



#### Current undershoot



#### Range monitoring



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Current monitoring

Type		3UG4621-AA	3UG4621-AW	3UG4622-AA	3UG4622-AW
<b>General data</b>					
<b>Rated insulation voltage <math>U_i</math></b>	V	690			
Pollution degree 3; overvoltage category III according to VDE 0110					
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6			
<b>Measuring circuit</b>					
<b>Measuring range for single-phase AC/DC current</b>	A	0.003 ... 0.6		0.05 ... 15	
<b>Measuring frequency</b>	Hz	40 ... 500			
<b>Setting range for single-phase current</b>	A	0.003 ... 0.5		0.05 ... 10	
<b>Load supply voltage</b>	V	24	Max. 300 <sup>1)</sup> Max. 500 <sup>2)</sup>	24	Max. 300 <sup>1)</sup> Max. 500 <sup>2)</sup>
<b>Control circuit</b>					
<b>Load capacity of the output relay</b>					
• Thermal current $I_{th}$	A	5			
<b>Rated operational current <math>I_e</math> at</b>					
• AC-15/24 ... 400 V	A	3			
• DC-13/24 V	A	1			
• DC-13/125 V	A	0.2			
• DC-13/250 V	A	0.1			
<b>Minimum contact load at 17 V DC</b>	mA	5			

1) With protective separation.

2) With simple separation.

### Selection and ordering data

- Digitally adjustable, with illuminated LCD
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact

PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H



3UG4621-1AA30



3UG4622-2AW30

Measuring range	Adjustable hysteresis	Rated control supply voltage $U_s$	SD	Screw terminals	SD	Spring-type terminals	
		V	d	Article No.	Price per PU	Article No.	Price per PU
<b>Monitoring of undercurrent and overcurrent, start up delay and tripping delay times can be adjusted separately 0.1 ... 20 s</b>							
3 ... 500 mA AC/DC	0.1 ... 250 mA	24 AC/DC <sup>1)</sup>	2	<b>3UG4621-1AA30</b>	2	<b>3UG4621-2AA30</b>	
0.05 ... 10 A AC/DC	0.01 ... 5 A		2	<b>3UG4622-1AA30</b>	2	<b>3UG4622-2AA30</b>	
3 ... 500 mA AC/DC	0.1 ... 250 mA	24 ... 240 AC/DC <sup>2)</sup>	2	<b>3UG4621-1AW30</b>	2	<b>3UG4621-2AW30</b>	
0.05 ... 10 A AC/DC	0.01 ... 5 A		2	<b>3UG4622-1AW30</b>	2	<b>3UG4622-2AW30</b>	

1) No electrical separation. Load supply voltage 24 V.

2) Electrical separation between control circuit and measuring circuit. Load supply voltage for protective separation max. 300 V, for simple separation max. 500 V.

For accessories, see page 11/83

With AC currents  $I > 10$  A it is possible to use 4NC current transformers as an accessory.

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Power factor and active current monitoring

### Overview



SIRIUS 3UG4641 monitoring relay

The 3UG4641 power factor and active current monitoring device enables the load monitoring of motors.

Whereas power factor (p.f.) monitoring is used above all for monitoring no-load operation, the active current monitoring option can be used to observe and evaluate the load factor over the entire torque range.

### Technical specifications

#### 3UG4641 monitoring relay

The 3UG4641 monitoring relay is self-powered and serves the single-phase monitoring of the power factor or performs overshoot, undershoot or range monitoring of the active current depending on how it is parameterized. The load to be monitored is connected upstream of the IN terminal. The load current flows through the terminals IN and Ly/N. The setting range for the power factor is 0.1 to 0.99 and for the active current  $I_{res}$  it is 0.2 to 10 A. If the control supply voltage is switched on and no load current flows, the display will show  $I < 0.2$  and a symbol for overrange, underrange or range monitoring. If the motor is now switched on and the current exceeds 0.2 A, the set ON-delay time begins. During this time, if the set limit values are undershot or exceeded, this does not lead to a relay reaction of the changeover contact. If the operational flowing active current and/or the power factor value falls below or exceeds the respective set threshold value, the spike delay begins. When this time has expired, the relay changes its switch position. The relevant measured variables for overshooting and undershooting in the display flash. If monitoring for active current undershoot is switched off ( $I_{res} \nabla = \text{OFF}$ ), and if the load current undershoots the lower measuring range threshold (0.2 A), the CO contacts remain unchanged. If a threshold value is set for the monitoring of active current undershooting, then undershooting of the measuring range threshold (0.2 A) will result in a response of the CO contacts.

The relay operates either according to the open-circuit or closed-circuit principle. If the device is set to Auto RESET (Memory = No), depending on the set principle of operation, the switching relay returns to its initial state and the flashing ends when the hysteresis threshold is reached.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continues to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2 seconds, or by switching the supply voltage off and back on again.

### Benefits

- Can be used worldwide thanks to wide voltage range from 90 to 690 V (absolute limit values)
- Monitoring of even small single-phase motors with a no-load supply current below 0.5 A
- Simple determination of threshold values by the direct collection of measured variables on motor loading
- Range monitoring and active current measurement enable detection of cable breaks between control cabinets and motors, as well as phase failures
- Power factor (p.f.) or  $I_{res}$  (active current) can be selected as the measurement principle
- Width 22.5 mm
- All versions with removable terminals

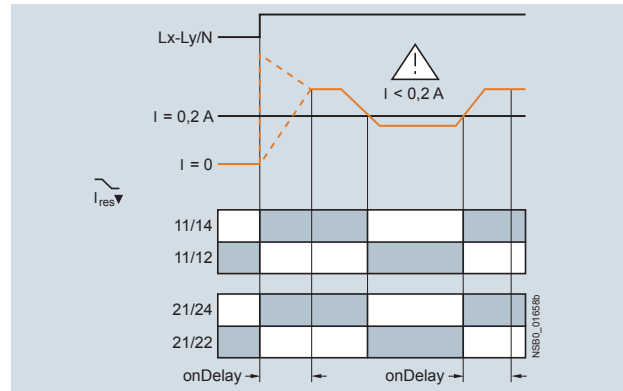
### Application

- No-load monitoring and load shedding, such as in the event of a V-belt tear
- Underload monitoring in the low-end performance range, e.g. in the event of pump no-load operation
- Monitoring of overload, e.g. due to a dirty filter system
- Simple power factor monitoring in power systems for control of compensation equipment
- Broken cable between control cabinet and motor

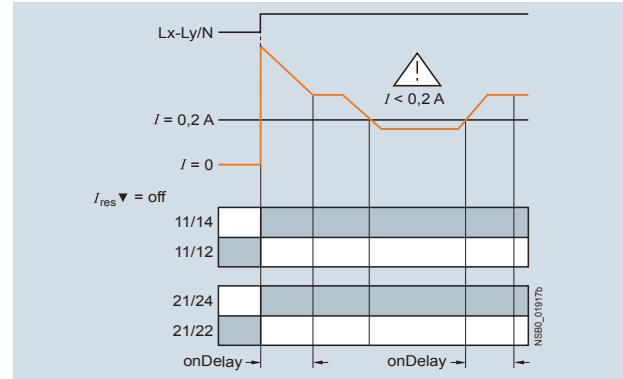
#### With the closed-circuit principle selected

Response in the event of undershooting the measuring range limit

- With activated monitoring of  $I_{res} \nabla$



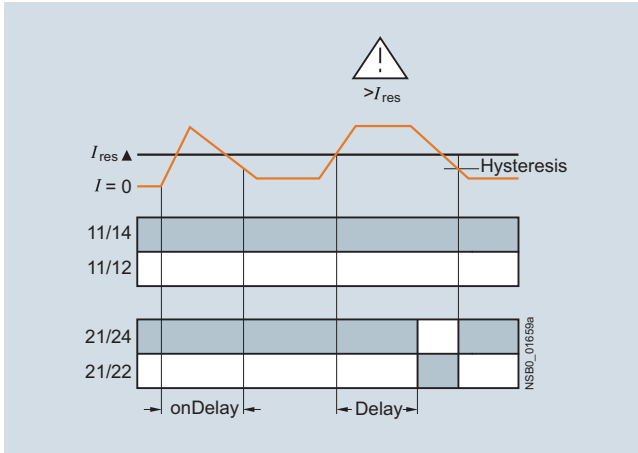
- With deactivated monitoring of active current undershooting



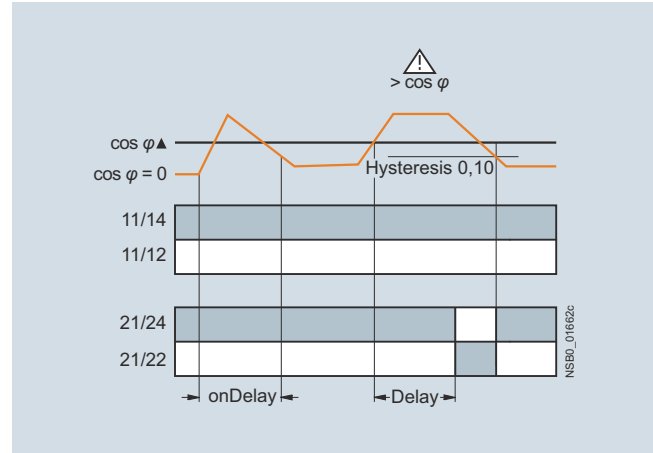
# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Power factor and active current monitoring

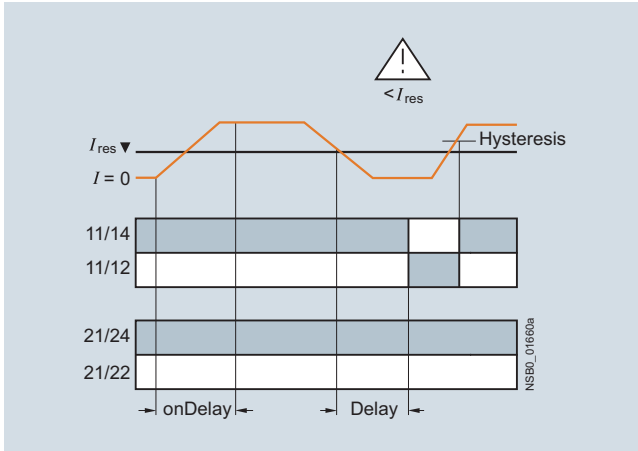
Overshooting of active current



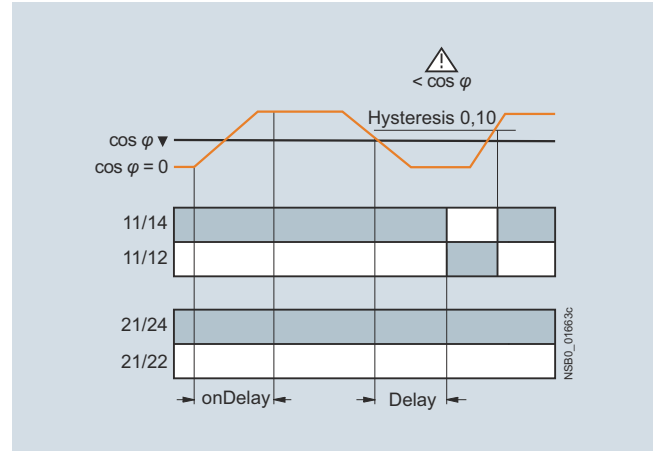
Overshooting of power factor



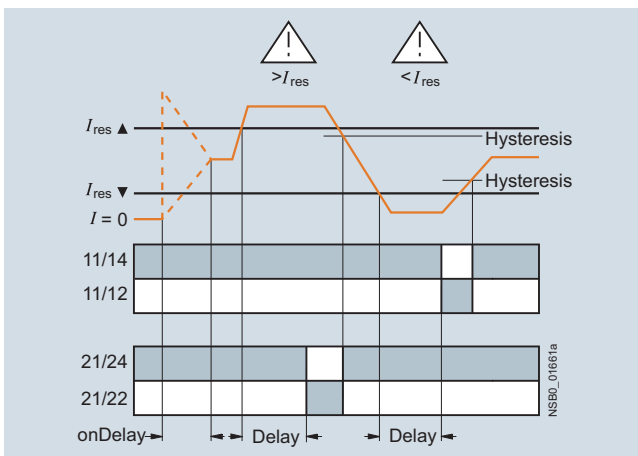
Undershooting of active current



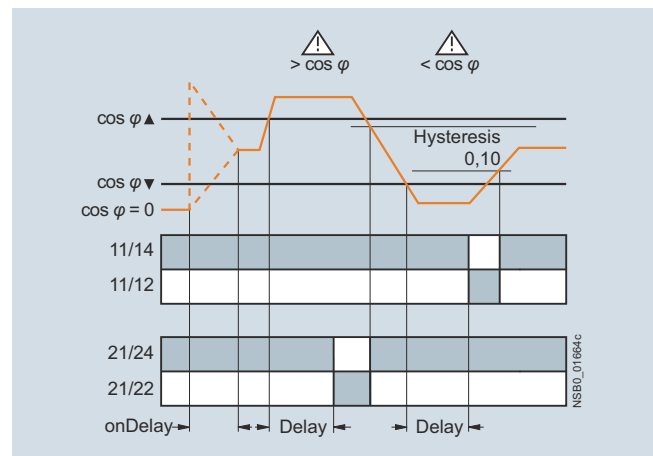
Undershooting of power factor



Range monitoring of active current



Range monitoring of power factor



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Power factor and active current monitoring

Type	3UG4641	
<b>General data</b>		
<b>Rated insulation voltage <math>U_i</math></b> Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6
<b>Control circuit</b>		
<b>Number of CO contacts for auxiliary contacts</b>		2
<b>Load capacity of the output relay</b>		
• Thermal current $I_{th}$	A	5
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	1
• DC-13/125 V	A	0.2
• DC-13/250 V	A	0.1
<b>Minimum contact load at 17 V DC</b>	mA	5

### Selection and ordering data

- For monitoring the power factor and the active current  $I_{res}$  (p.f.  $\times I$ )
- Suitable for single- and three-phase currents
- Digitally adjustable, with illuminated LCD
- Overshoot, undershoot or range monitoring adjustable
- Upper and lower threshold value can be adjusted separately
- Permanent display of actual value and tripping state
- 1 changeover contact each for undershoot/overshoot

PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H

Measuring range		Adjustable hysteresis		ON-delay time adjustable onDel	Tripping delay time adjustable I▲Del/ I▼Del, φ▲Del/ φ▼Del	Rated control supply voltage $U_s$ <sup>1)</sup> 50/60 Hz AC	SD	Screw terminals	SD	Spring-type terminals		
For power factor	For active current $I_{res}$	For power factor	For active current $I_{res}$	s	s	V	d	Article No.	Price per PU	d	Article No.	Price per PU
0.10 ... 0.99	0.2 ... 10.0	0.1	0.1 ... 2.0	0 ... 99	0.1 ... 20.0	90 ... 690	2	<b>3UG4641-1CS20</b>		2	<b>3UG4641-2CS20</b>	

<sup>1)</sup> Absolute limit values.

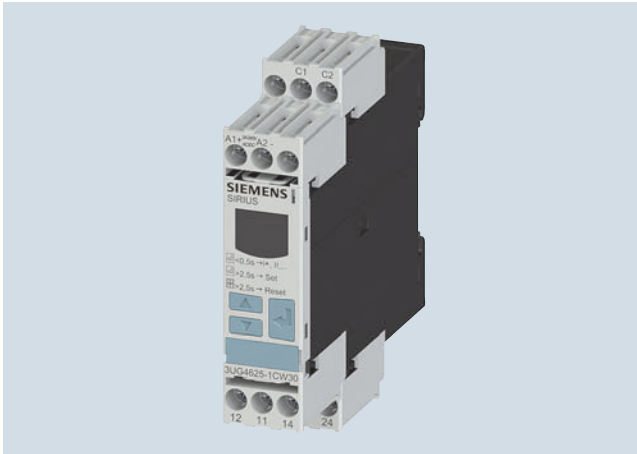
For accessories, see page 10/111.

With AC active currents  $I_{res} > 10$  A it is possible to use 4NC current transformers as an accessory, see Catalog LV 10.

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Residual-current monitoring relays

### Overview



SIRIUS 3UG4625 monitoring relay

The 3UG4625 residual-current monitoring relays are used in conjunction with the 3UL23 residual-current transformers for monitoring plants in which higher residual currents are increasingly expected due to ambient conditions. Monitoring encompasses pure AC residual currents or AC residual currents with a pulsating DC fault current component (transformer type A in accordance with DIN VDE 0100-530/IEC TR 60755).

### Technical specifications

#### 3UG4625 monitoring relays

The main conductor, and any neutral conductor to which a load is connected, are routed through the opening of the annular ring core of a residual-current transformer. A secondary winding is placed around this annular strip-wound core to which the monitoring relay is connected.

If operation of a plant is fault-free, the sum of the inflowing and outward currents equals zero. No current is then induced in the secondary winding of the residual-current transformer.

However, if an insulation fault occurs downstream of the residual current operated circuit breaker, the sum of the inflowing currents is greater than that of the outward currents. The differential current – i.e. the residual current – induces a secondary current in the secondary winding of the transformer. This current is evaluated in the monitoring relay and is used on the one hand to display the actual residual current and on the other, to switch the relay if the set warning or tripping threshold is overshoot.

If the measured residual current exceeds the set warning value, the associated changeover contact instantly changes the switching state and an indication appears on the display.

If the measured residual current exceeds the set tripping value, the set delay time begins and the associated relay symbol flashes. On expiry of this time, the associated changeover contact changes the switching state.

#### ON-delay time for motor start

To be able to start a drive when a residual current is detected, the output relays switch to the OK state for an adjustable ON-delay time depending on the selected open-circuit principle or closed-circuit principle.

The changeover contacts do not react if the set threshold values are overshoot during this period.

### Benefits

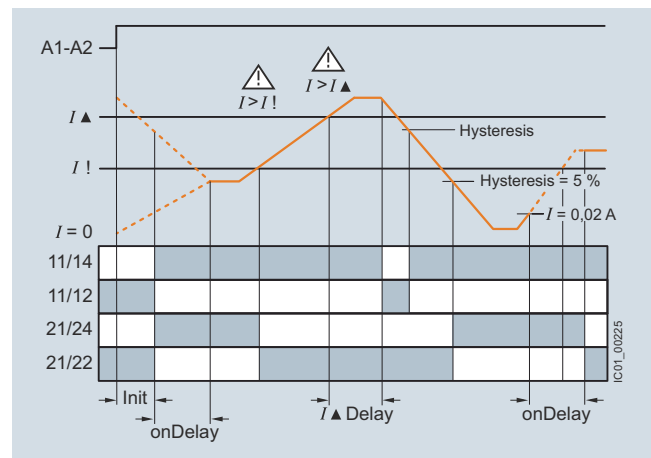
- Worldwide use thanks to wide voltage range from 24 to 240 V AC/DC
- High measuring accuracy of  $\pm 7.5\%$
- Permanent self-monitoring
- Variable threshold values for warning and disconnection
- Freely configurable delay times and RESET response
- Permanent display of the actual value and fault diagnostics via the display
- High level of flexibility and space saving through installation of the transformer inside or outside the control cabinet
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-type terminals

### Application

Monitoring of plants in which residual currents can occur, e.g. due to dust deposits or moisture, porous cables and leads, or capacitive residual currents.

With the closed-circuit principle selected

Residual current monitoring with Auto RESET (Memory = no)



If the device is set to Auto RESET, the relay switches back to the OK state for the tripping value once the value falls below the set hysteresis threshold and the display stops flashing.

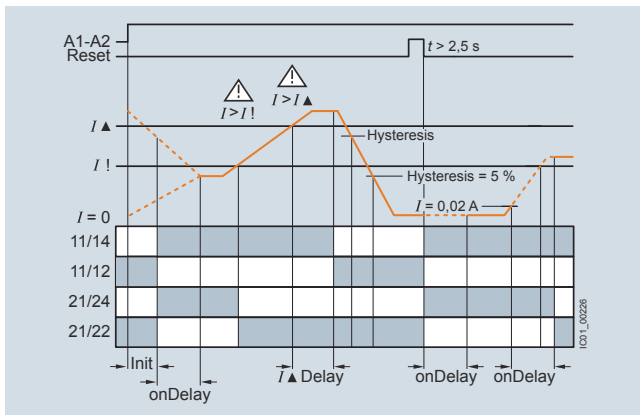
The associated relay changes its switching state if the value falls below the fixed hysteresis value of 5% of the set warning value.

Any overshoots are therefore not stored.

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Residual-current monitoring relays

Residual current monitoring with Manual RESET (Memory = yes)



If Manual RESET is selected in the menu, the output relays remain in their current switching state and the current measured value and the symbol for overshooting continues to flash, even when the measured residual current returns to a permissible value. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for > 2 seconds, or by switching the supply voltage off and back on again.

**Note:**

Do not ground the neutral conductor downstream of the residual-current transformer as otherwise residual current monitoring functions can no longer be ensured.

11 RELAYS, INTERFACES & CONVERTERS

Type	3UG4625-1CW30, 3UG4625-2CW30	
<b>General data</b>		
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3, rated value	V	300
Impulse withstand voltage, rated value $U_{imp}$	kV	4
<b>Control circuit</b>		
Number of CO contacts for auxiliary contacts		2
Thermal current of the non-solid-state contact blocks, maximum	A	5
Current carrying capacity of the output relay	A	3
• At AC-15 at 250 V at 50/60 Hz		
• At DC-13		
- At 24 V	A	1
- At 125 V	A	0.2
- At 250 V	A	0.1
Operational current at 17 V, minimum	mA	5

**Selection and ordering data**

- For monitoring residual currents from 0.03 to 40 A, from 16 to 400 Hz
- For 3UL23 residual-current transformers with feed-through opening from 35 to 210 mm
- Permanent self-monitoring
- Certified in accordance with IEC 60947, functionality corresponds to IEC 62020
- Digitally adjustable, with illuminated LCD

- Permanent display of actual value and tripping state
- Separately adjustable limit value and warning threshold
- 1 changeover contact each for warning threshold and tripping threshold

PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41H



3UG4625-1CW30



3UG4625-2CW30

Measurable current	Adjustable response value current	Switching hysteresis	Adjustable ON-delay time	Control supply voltage			SD	Screw terminals		SD	Spring-type terminals	
				For AC at 50 Hz rated value	For AC at 60 Hz rated value	At DC rated value		Article No.	Price per PU		Article No.	Price per PU
A	A	%	s	V	V	V	d			d		
0.01 ... 43	0.03 ... 40	0 ... 50	0 ... 20	24 ... 240	24 ... 240	24 ... 240	2	<b>3UG4625-1CW30</b>		2	<b>3UG4625-2CW30</b>	

For accessories, see page 11/83

For 3UL23 residual-current transformers, see page 11/68.



# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## 3UL23 residual-current transformers

### Overview



SIRIUS 3UL23 residual-current transformer

The 3UL23 residual-current transformers detect residual currents in machines and plants. They are suitable for pure AC residual currents or AC residual currents with a pulsating DC fault current component (transformer type A in accordance with DIN VDE 0100-530/IEC TR 60755).


Together with the 3UG4625, 3UG4825 residual-current monitoring relays for IO-Link or the SIMOCODE 3UF motor management and control device they enable residual-current and ground-fault monitoring.

The 3UL2302-1A and 3UL2303-1A residual-current transformers with a feed-through opening from 35 to 55 mm can be mounted in conjunction with the 3UL2900 accessories on a TH 35 standard mounting rail according to IEC 60715.

### Selection and ordering data

Diameter of the bushing opening	Connectable cross-section of the connecting terminal	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
mm	mm <sup>2</sup>	d	Article No.	Price per PU		
<b>Residual-current transformers (essential accessories for 3UG4625, 3UG4825)</b>						
35	2.5	2	<b>3UL2302-1A</b>		1	1 unit 41H
55	2.5	2	<b>3UL2303-1A</b>		1	1 unit 41H
80	2.5	2	<b>3UL2304-1A</b>		1	1 unit 41H
110	2.5	2	<b>3UL2305-1A</b>		1	1 unit 41H
140	2.5	2	<b>3UL2306-1A</b>		1	1 unit 41H
210	4	2	<b>3UL2307-1A</b>		1	1 unit 41H

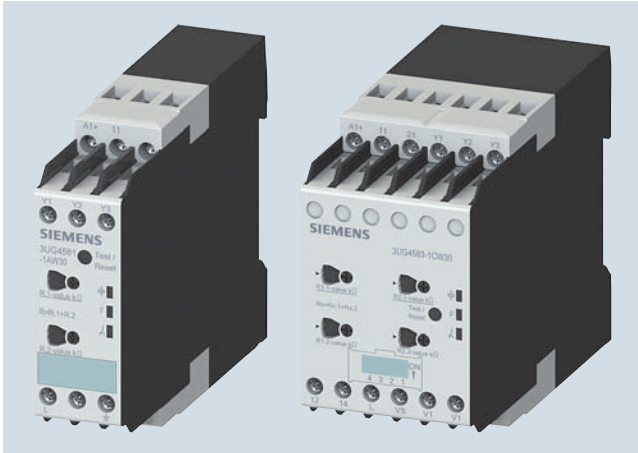
### Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
<b>Adapters</b>	2	<b>3UL2900</b>		1	2 units	41H
		<b>Adapters</b> For mounting onto standard rail for 3UL23 to diameter 55 mm				
3UL2900						

## 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Insulation monitoring

## Overview



SIRIUS 3UG458. insulation monitor

Insulation monitoring relays are used for monitoring the insulation resistance between ungrounded single or three-phase AC supplies and a protective conductor.

Ungrounded, i.e. isolated networks (IT networks) are always used where high demands are placed on the reliability of the power supply, e.g. emergency lighting systems. IT systems are supplied via an isolating transformer or by power supply sources such as batteries or a generator. While an initial insulation fault between a phase conductor and the ground effectively grounds the conductor, as a result no circuit has been closed, so it is possible to continue work in safety (single-fault safety). However, the fault must be rectified as quickly as possible before a second insulation fault occurs (e.g. according to DIN VDE 0100-410). For this purpose insulation monitoring relays are used, which constantly measure the resistance to ground of the phase conductor and the neutral conductor, reporting a fault immediately if insulation resistance falls below the set value so that either a controlled shutdown can be performed or the fault can be rectified without interrupting the power supply.

**Two device series**

- 3UG4581 insulation monitoring relays for ungrounded AC networks
- 3UG4582 and 3UG4583 insulation monitoring relays for ungrounded DC and AC networks

## Benefits

- Devices for AC and DC systems
- All devices have a wide control supply voltage range
- Direct connection to networks with mains voltages of up to 690 V AC and 1 000 V DC by means of a voltage reducer module
- For AC supply systems: Frequency range 15 to 400 Hz
- Monitoring of broken conductors
- Monitoring of setting errors
- Safety in use thanks to integrated system test after startup
- Option of resetting and testing (by means of button on front or using control contact)
- New predictive measurement principle allows very fast response times

## Application

IT networks are used, for example:

- In emergency power supplies
- In safety lighting systems
- In industrial production facilities with high availability requirements (chemical industry, automobile manufacturing, printing plants)
- In shipping and railways
- For mobile generators (aircraft)
- For renewable energies, such as wind energy and photovoltaic power plants
- In the mining industry

## 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Insulation monitoring general data

## Technical specifications

## More information

For manuals, see

- <https://support.industry.siemens.com/cs/ww/en/view/54382552>
- <https://support.industry.siemens.com/cs/ww/en/view/54382528>

Type	3UG4581-1AW30	3UG4582-1AW30	3UG4583-1CW30
<b>General data</b>			
<b>Setting range for the setpoint response values</b>			
• 1 ... 100 kΩ	✓	✓	✓
• 2 ... 200 kΩ	--	--	✓
<b>Rated voltage of the network being monitored</b>			
• 0 ... 250 V AC	--	✓	--
• 0 ... 440 V AC	✓	--	✓
• 0 ... 690 V AC	--	--	✓ <sup>1)</sup>
• 0 ... 300 V DC	--	✓	--
• 0 ... 600 V DC	--	--	✓
• 0 ... 1 000 V DC	--	--	✓ <sup>1)</sup>
<b>Max. leakage capacitance of the system</b>			
• 10 μF	✓	✓	--
• 20 μF	--	--	✓
<b>Output contacts</b>			
• 1 CO	✓	✓	--
• 2 CO or 1 CO + 1 CO, adjustable	--	--	✓
<b>Number of limit values</b>			
• 1	✓	✓	--
• 1 or 2, adjustable	--	--	✓
<b>Principle of operation</b>	Closed-circuit principle	Closed-circuit principle	Open-circuit/closed-circuit principle, adjustable
<b>Rated control supply voltage</b>			
• 24 ... 240 V AC/DC	✓	✓	✓
<b>Rated frequency</b>			
• 15 ... 400 Hz	--	✓	✓
• 50/60 Hz	✓	--	--
<b>Auto or Manual RESET</b>	✓ Adjustable	✓ Adjustable	✓ Adjustable
<b>Remote RESET</b>	✓ Via control input	✓ Via control input	✓ Via control input
<b>Non-volatile error memory</b>	--	--	✓ Adjustable
<b>Broken wire detection</b>	--	--	✓ Adjustable
<b>Replacement for</b>			
Rated control supply voltage $U_s$	Voltage range of the network being monitored		
<b>3UG3081-1AK20</b> 110 ... 130/220 ... 240 V AC/DC	3 x 230/400 V AC	✓	--
<b>3UG3081-1AW30</b> 24 ... 240 V AC/DC	3 x 230/400 V AC	✓	--
<b>3UG3082-1AW30</b> 24 ... 240 V AC/DC	24 ... 240 V DC	--	✓

✓ Available

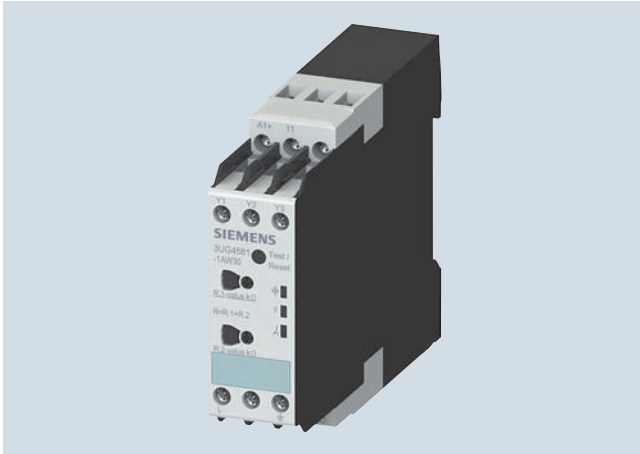
-- Not available

1) With voltage reducer module.

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Insulation monitoring for ungrounded AC networks

### Overview



SIRIUS 3UG4581 insulation monitor

The 3UG4581 insulation monitoring relays are used to monitor insulation resistance according to IEC 61557-8 in ungrounded AC networks with rated voltages of up to 400 V.

These devices can monitor control circuits (single-phase) and main circuits (three-phase).

They measure insulation resistances between system cables and system ground. If the value falls below the threshold value, the output relays are switched to fault status.

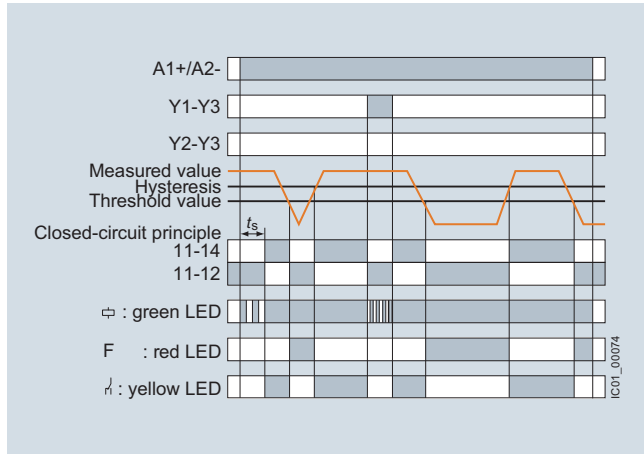
In the case of 3UG4581 a higher-level DC measuring signal is used. The higher-level DC measuring signal and the resulting current are used to determine the value of the insulation resistance of the network which is to be measured.

### Technical specifications

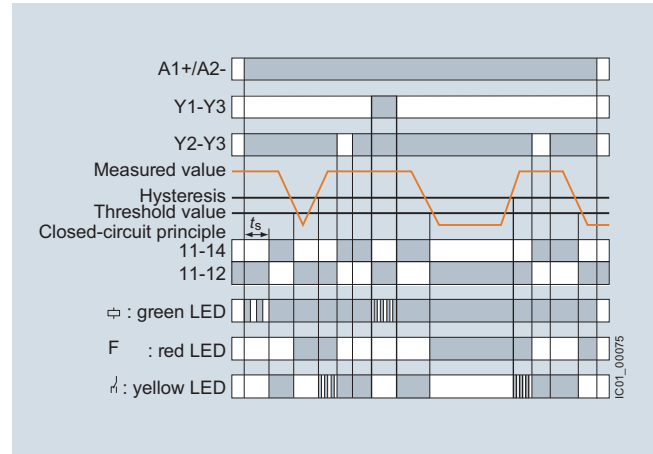
#### 3UG4581 monitoring relay

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with Auto RESET

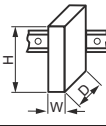



Insulation resistance monitoring with fault storage and Manual RESET




# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Insulation monitoring for ungrounded AC networks

<b>Type</b>	<b>3UG4581</b>	
Dimensions (W x H x D)	mm	22.5 x 100 x 100
		
<b>Connection type</b>	 <b>Screw terminals</b>	
<ul style="list-style-type: none"> <li>• Solid</li> <li>• Finely stranded with end sleeve</li> <li>• AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> AWG	2 x (0.5 ... 4) 2 x (0.75 ... 2.5) 2 x (20 ... 14)
<b>General data</b>		
<b>Rated insulation voltage <math>U_i</math></b>	V	400 supply circuit/measuring circuit 300 supply circuit/output circuit
Pollution degree 3 Overvoltage category III acc. to IEC 60664		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6
<b>Rated control supply voltage</b>	V	24 ... 240 AC/DC
<b>Rated frequency</b>	Hz	15 ... 400
<b>Measuring circuit</b>		
<b>Rated line voltage of the network being monitored</b>	V	0 ... 400
<b>Rated frequency of the network being monitored</b>	Hz	50 ... 60
<b>Setting range for insulation resistance</b>	k $\Omega$	1 ... 100
<b>Control circuit</b>		
<b>Load capacity of the output relay</b>		
• Thermal current $I_{th}$	A	4
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	2
<b>Minimum contact load at 24 V DC</b>	mA	10

### Selection and ordering data

- Auto or Manual RESET
- Closed-circuit principle
- 1 CO contact
- Fault memory adjustable using control input (Y2-Y3)
- Reset by means of button on front or using control input (Y2-Y3)
- Test by means of button on front or using control input (Y1-Y3)

Rated line voltage $U_n$	Measuring range $U_e$	Rated control supply voltage $U_s$	System leakage capacitance	SD	Screw terminals 	PU (UNIT, SET, M)	PS*	PG
V AC	k $\Omega$	V	$\mu$ F	d	Article No.	Price per PU		

### Insulation monitors for ungrounded AC networks

0 ... 400	1 ... 100	24 ... 240 AC/DC	Max. 10	5	<b>3UG4581-1AW30</b>		1	1 unit	41H
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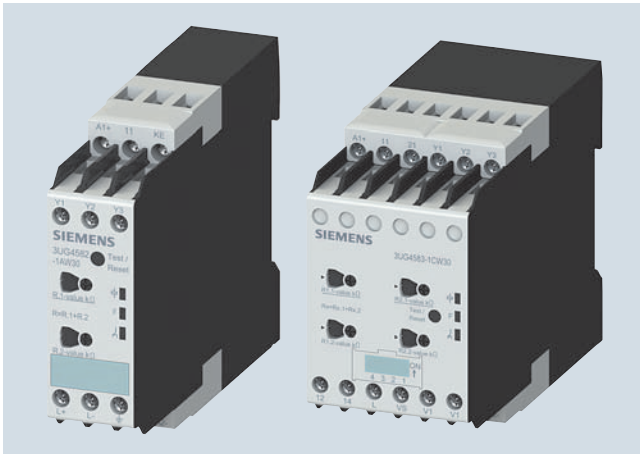
3UG4581-1AW30

For accessories, see page 11/83

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Insulation monitoring for ungrounded DC and AC networks

## Overview



SIRIUS 3UG4582 and 3UG4583 insulation monitors

The 3UG4582 and 3UG4583 insulation monitoring relays are used to monitor insulation resistance in ungrounded IT AC or DC networks according to IEC 61557-8.

They measure insulation resistances between system cables and system ground. If the value falls below the threshold value, the output relays are switched to fault status. With these devices, which are suitable for both AC and DC networks, a pulsed test signal is fed into the network to be monitored and the isolation resistance is determined.

The pulsed test signal changes its form according to insulation resistance and network loss capacitance. The changed form is used to predict the changed insulation resistance.

If the predicted insulation resistance matches the insulation resistance calculated in the next measurement cycle, and is lower than the threshold value, the output relays are activated or deactivated, depending on the device configuration. This measurement principle is also suitable for identifying symmetrical insulation faults.

### 3UG4983 voltage reducer module

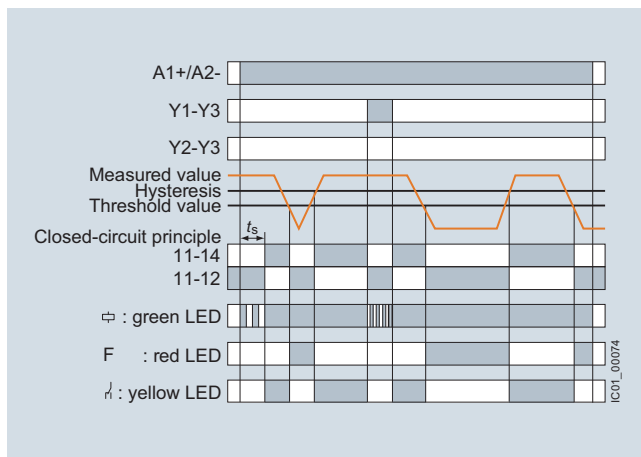
The 3UG4983 passive voltage reducer module can be used to allow the 3UG4583 insulation monitoring relay to be used for insulation monitoring of IT networks with rated voltages of up to 690 V AC and 1 000 V DC.

## Technical specifications

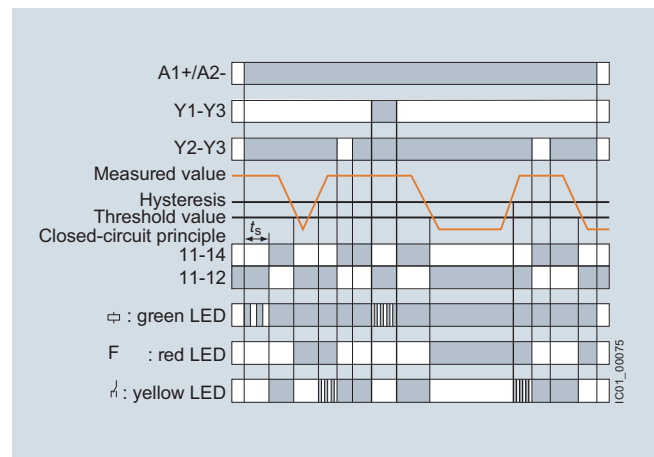
### 3UG4582 monitoring relays

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with Auto RESET



Insulation resistance monitoring with fault storage and Manual RESET



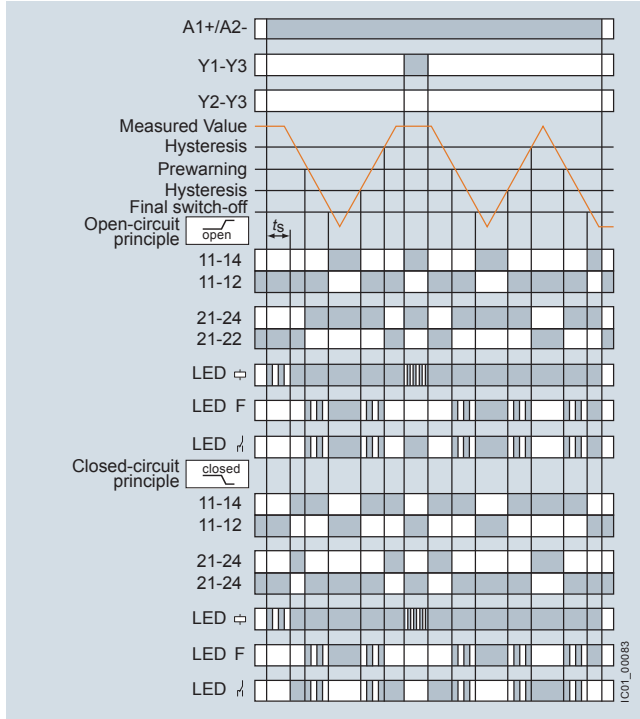
# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Insulation monitoring for ungrounded DC and AC networks

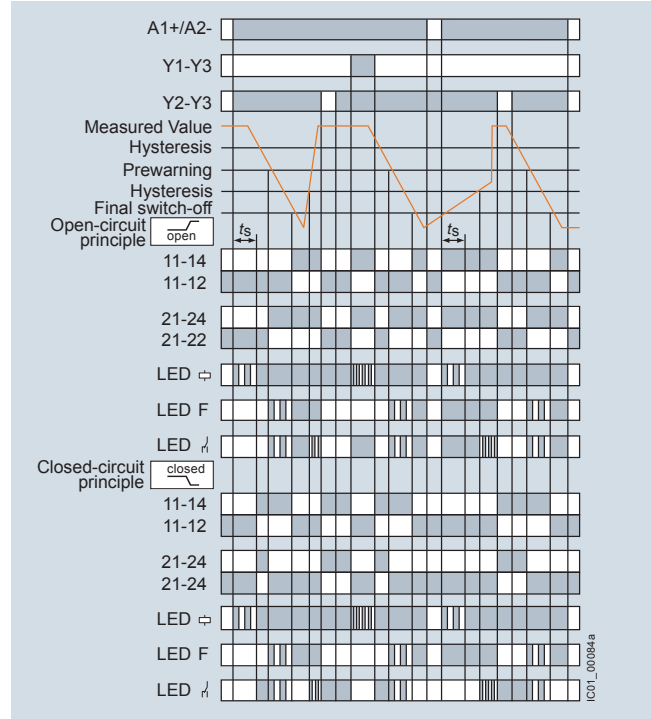
### 3UG4583 monitoring relays

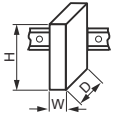
With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with Auto RESET



Insulation resistance monitoring with fault storage and Manual RESET



Type		3UG4582	3UG4583
Dimensions (W x H x D)	 mm	22.5 x 100 x 100	45 x 100 x 100
Connection type		⚡ Screw terminals	
<ul style="list-style-type: none"> <li>Solid</li> <li>Finely stranded with end sleeve</li> <li>AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> AWG	2 x (0.5 ... 4) 2 x (0.75 ... 2.5) 2 x (20 ... 14)	
<b>General data</b>			
Rated insulation voltage $U_i$	V	400 supply circuit/measuring circuit, 300 supply circuit/output circuit	400 supply circuit/measuring circuit, 300 supply circuit/output circuit, 300 output circuit 1/output circuit 2
Pollution degree 3 Overvoltage category III acc. to IEC 60664			
Rated impulse withstand voltage $U_{imp}$	kV	6	
Rated control supply voltage	V AC/DC	24 ... 240	
Rated frequency	Hz	15 ... 400	
<b>Measuring circuit</b>			
Rated line voltage of the network being monitored	V	0 ... 250 AC, 0 ... 300 DC	0 ... 300 AC, 0 ... 690 AC with 3UG49 83 0 ... 600 DC, 0 ... 1 000 DC with 3UG49 83
Rated frequency of the network being monitored	Hz	DC or 15 ... 400	
Setting range for insulation resistance	k	1 ... 100	1 ... 100, 2 ... 200 for 2nd limit value (disconnectable)
<b>Control circuit</b>			
Number of CO contacts for auxiliary contacts		1	2 or 1 + 1, adjustable
Load capacity of the output relay			
<ul style="list-style-type: none"> <li>Thermal current <math>I_{th}</math></li> </ul>	A	4	
Rated operational current $I_e$ at			
<ul style="list-style-type: none"> <li>AC-15/24 ... 400 V</li> <li>DC-13/24 V</li> </ul>	A	3	
	A	2	
Minimum contact load at 24 V DC	mA	10	

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Insulation monitoring for ungrounded DC and AC networks

### Selection and ordering data

- Auto or Manual RESET
- Rated control supply voltage  $U_s$  24 ... 240 V AC/DC
- 3UG4582: Closed-circuit principle  
3UG4583: Open-circuit or closed-circuit principle, adjustable
- 1 or 2 CO contacts
- Fault memory adjustable using control input (Y2-Y3)
- Reset by means of button on front or using control input (Y2-Y3)
- Test by means of button on front or using control input (Y1-Y3)
- 3UG4583: Non-volatile fault storage can be configured
- 3UG4583: 2 separate limit values (e.g. for warning and disconnection) or 2 CO contacts for one limit value (e.g. for a local alarm and signaling to the PLC via separate circuits) can be configured

Note:

With the 3UG4983-1A coupling unit, connection to networks with voltages of up to 690 V AC and 1 000 V DC is possible, see below.

	Rated line voltage $U_n$	System leakage capacitance	Output relays	Measuring range $U_e$	Broken wire detection in the measuring range	SD	Screw terminals		PU (UNIT, SET, M)	PS*
							Article No.	Price per PU		
	V	$\mu$ F		k $\Omega$		d				
<b>3UG4582 insulation monitors</b>										
	0 ... 250 AC, 0 ... 300 DC	Max. 10	1 CO	1 ... 100	✓	5	<b>3UG4582-1AW30</b>		1	1 unit
<b>3UG4583 insulation monitors</b>										
	0 ... 400 AC, 0 ... 600 DC <sup>1)</sup>	Max. 20	2 CO or 1 CO + 1 CO, adjustable	1 ... 100, 2 ... 200 for 2nd limit value, adjustable	✓ Adjustable	5	<b>3UG4583-1CW30</b>		1	1 unit
<b>Voltage reducer module for 3UG4583</b>										
	For extending the network voltage range to max. 690 V AC and 1 000 V DC					5	<b>3UG4983-1A</b>		1	1 unit

3UG4582-1AW30

✓ Available

<sup>1)</sup> With 3UG4983-1A voltage reducer module suitable also for the insulation monitoring of IT networks of up to 690 V AC and 1 000 V DC.

For accessories, see page 11/83



# SIRIUS 3UG Monitoring Relays for Stand-Alone Installation

Insulation monitoring for ungrounded DC and AC networks

### Overview



SIRIUS 3UG4501 monitoring relay

The 3UG4501 level monitoring relay is used in combination with 2- or 3-pole sensors to monitor the levels of conductive liquids.

### Benefits

- Can be used worldwide thanks to wide voltage range from 24 to 240 V (absolute limit values)
- Individually shortenable 2- and 3-pole wire electrodes for easy mounting from above/below
- Bow electrodes for installation from the side, for larger filling levels and minimum space requirements
- Can be flexibly adapted to different conductive liquids through analog setting of the sensitivity from 2 to 200 kΩ
- Compensation for wave movements through tripping delay times from 0.1 to 10 s
- Upstream or downstream function selectable
- All versions with removable terminals
- All versions with screw or spring-type terminals

### Application

- Single-point and two-point level monitoring
- Overflow protection
- Dry run protection
- Leak monitoring

### Technical specifications

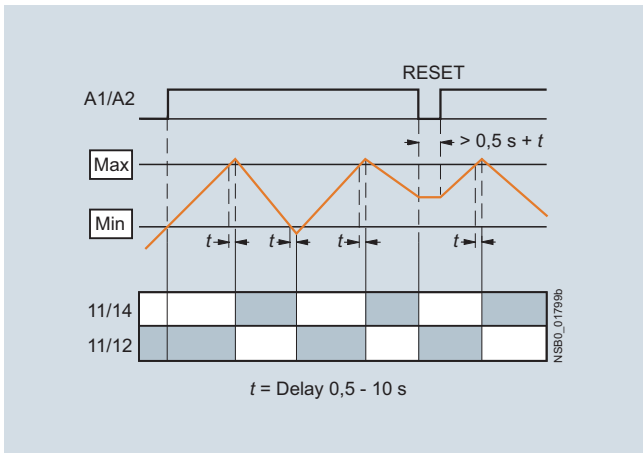
#### 3UG4501 monitoring relays

The principle of operation of the 3UG4501 level monitoring relay is based on measuring the electrical resistance of the liquid between two immersion sensors and a reference terminal. If the measured value is lower than the sensitivity set at the front, the output relay changes its switching state. In order to exclude electrolytic phenomena in the liquid, the sensors are supplied with alternating current.

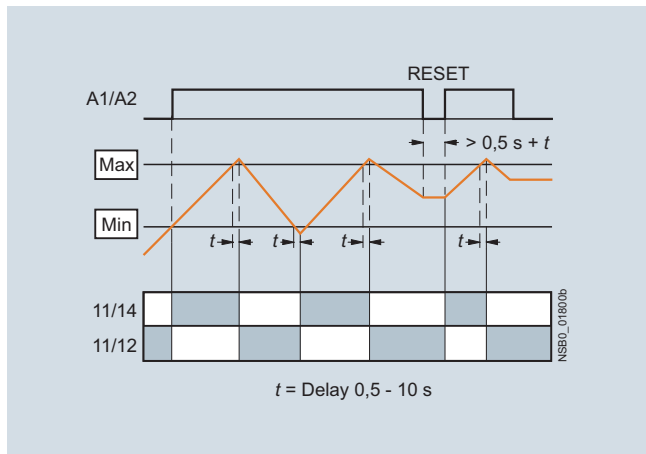
#### Two-point control

The output relay changes its switching state as soon as the liquid level reaches the maximum sensor, while the minimum sensor is submerged. The relay returns to its original switching state as soon as the minimum sensor no longer has contact with the liquid.

#### OVER, two-point control



#### UNDER, two-point control



#### Note:

It is also possible to connect other resistance sensors to the Min and Max terminals in the range 2 to 200 kΩ, e.g. photoresistors, temperature sensors, encoders based on resistance, etc. The monitoring relay can therefore also be used for other applications as well as for monitoring the levels of liquids.

# SIRIUS 3UG Monitoring Relays for Stand-Alone Installation

## Insulation monitoring for ungrounded DC and AC networks

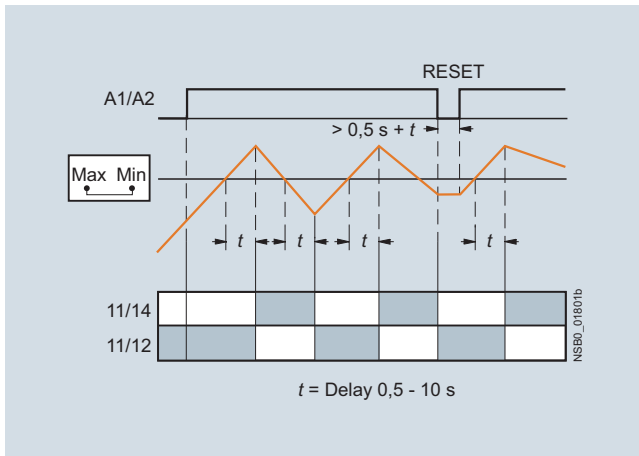
### Single-point control

If only one level is being controlled, the terminals for Min and Max on the monitoring relay are bridged. The output relay changes its switching state as soon as the liquid level is reached and returns to its original switching state once the sensor no longer has contact with the liquid.

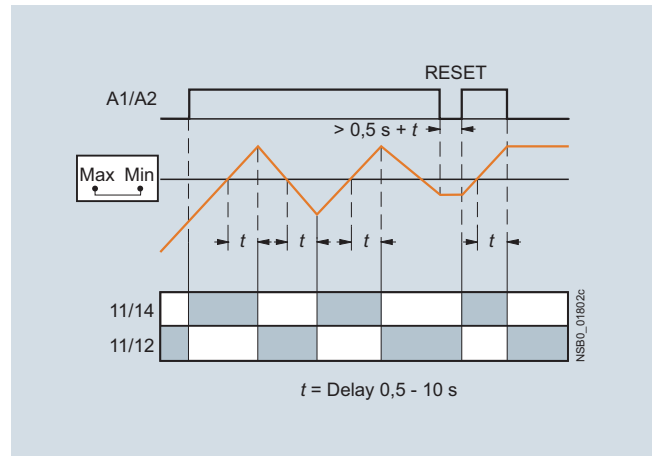
In order to prevent premature tripping of the switching function caused by wave motion or frothing, even though the set level has not been reached, it is possible to delay this function by 0.5 to 10 s.

For safe resetting, the control supply voltage must be interrupted for at least the set delay time of +0.5 s.

### OVER, single-point control



### UNDER, single-point control



Type	3UG4501	
<b>General data</b>		
<b>Rated insulation voltage <math>U_i</math></b>	V	300
Pollution degree 3 Overvoltage category III acc. to VDE 0110		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4
<b>Measuring circuit</b>		
<b>Electrode current, max.</b> (typ. 70 Hz)	mA	1
<b>Electrode voltage, max.</b> (typ. 70 Hz)	V	15
<b>Sensor feeder cable</b>	m	Max. 100
<b>Conductor capacitance of sensor cable<sup>1)</sup></b>	nF	Max. 10
<b>Control circuit</b>		
<b>Load capacity of the output relay</b>		
Thermal current $I_{th}$	A	5
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	1
• DC-13/125 V	A	0.2
• DC-13/250 V	A	0.1
<b>Minimum contact load at 17 V DC</b>	mA	5



<sup>1)</sup> The sensor cable does not necessarily have to be shielded, but we do not recommend installing this cable parallel to the power supply lines. It is also possible to use a shielded cable, whereby the shield has to be connected to the M terminal.

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Level monitoring: Level monitoring relays

### Selection and ordering data

- For level monitoring of electrically conductive liquids
  - Control principle: inlet or sequence control adjustable per rotary switch
  - Single-point and two-point control possible
  - Analogically adjustable sensitivity (specific resistance of the liquid)
  - Analogically adjustable tripping delay time
  - 1 yellow LED for displaying the relay state
  - 1 green LED for displaying the applied control supply voltage
  - 1 CO contact
- PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H

Sensitivity	Tripping delay time	Rated control supply voltage $U_s$	SD	Screw terminals 		Spring-type terminals 	
				Article No.	Price per PU	Article No.	Price per PU
2 ... 200	0.5 ... 10	V	d	<b>3UG4501-1AA30</b>	2	<b>3UG4501-2AA30</b>	2
		AC/DC	d				
		24 <sup>1)</sup>	2				
		24 ... 240	2	<b>3UG4501-1AW30</b>	2	<b>3UG4501-2AW30</b>	2

<sup>1)</sup> The rated control supply voltage and the measuring circuit are not electrically separated.

For accessories, [see page 11/83](#)

For level monitoring sensors, [see page 11/79](#)

## 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Level monitoring: Level monitoring sensors

## Technical specifications

Type		3UG3207-3A Three-pole	3UG3207-2A Two-pole	3UG3207-2B Two-pole	3UG3207-1B Single-pole	3UG3207-1C Single-pole
Length	mm	500		--		
Insulation	Teflon insulation (PTFE)	Yes			--	Yes
Installation		Vertical		Lateral		
Screw-in gland width A/F		22				
Thread	inch	R 3/8				
Connecting cable	mm <sup>2</sup>	3 x 0.5, 2 m long				
Operating temperature	°C	90				
Operating pressure	bar	10				
Cable/electrode assignment						
• Cable brown		Center electrode	Not assignable	Gland		
• Cable white		Not assignable			Electrode	
• Cable green		Not assignable	--	Not assignable	--	

## Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
---------	----	-------------	--------------	-------------------	-----

## Level monitoring sensors (essential accessory)

The wire electrodes can be cut or bent to the required length before or after installation. The Teflon insulation must be removed over a length of approx. 5 mm.

**Three-pole wire electrodes, 500 mm long**

For 2-point liquid level control in an insulating tank. One electrode each for the min. and max. value and a common reference electrode.



3UG3207-3A

**Two-pole wire electrodes, 500 mm long**

For alarm indication in the event of overflow or low level and for 2-point liquid level control, when the conductive tank is used as the reference electrode.



3UG3207-2A

**Two-pole bow electrodes**

Thanks to the small space requirements due to lateral fitting, ideal for use in small containers and pipes, as a leak monitor and level monitor or for warning of water entering an enclosure.



3UG3207-2B

**Single-pole bow electrodes for lateral fitting**

As a max. value electrode for lateral fitting or for alarm indication in conductive tanks or pipes.



3UG3207-1B

**Single-pole rod electrodes for lateral fitting**

For high flow velocities or for intensively sparkling fluids.



3UG3207-1C

## 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Speed monitoring

## Overview



SIRIUS 3UG4651 monitoring relay

The 3UG4651 monitoring relay is used in combination with a sensor to monitor motor drives for overspeed and/or under-speed.

Furthermore, the monitoring relay is ideal for all functions where a continuous pulse signal needs to be monitored (e.g. belt travel monitoring, completeness monitoring, passing monitoring, clock-time monitoring).

## Benefits

- Can be used worldwide thanks to wide voltage range from 24 to 240 V (absolute limit values)
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Permanent display of actual value and fault type
- Use of up to 10 sensors per rotation for extremely slowly rotating motors
- 2- or 3-wire sensors and sensors with a mechanical switching output or semiconductor output can be connected
- Auxiliary voltage for sensor integrated
- All versions with removable terminals
- All versions with screw or spring-type terminals

## Application

- Slip or tear of a belt drive
- Overload monitoring
- Transport monitoring for completeness

## Technical specifications

**3UG4651 monitoring relay**

The speed monitoring relay operates according to the principle of period duration measurement.

In the monitoring relay, the time between two successive rising edges of the pulse encoder is measured and compared to the minimum and/or maximum permissible period duration calculated from the set limit values for the speed.

Thus, the period duration measurement recognizes any deviation in speed after just two pulses, even at very low speeds or in the case of extended pulse gaps.

By using up to ten pulse encoders evenly distributed around the circumference, it is possible to shorten the period duration, and in turn the response time. By taking into account the number of sensors in the monitoring relay, the speed continues to be indicated in rpm.

ON-delay time for motor start

To be able to start a motor drive, and depending on whether the open-circuit or closed-circuit principle is selected, the output relay switches to the GO state during the ON-delay time, even if the speed is still below the set value.

The ON-delay time is started by either switching on the auxiliary voltage or, if the auxiliary voltage is already applied, by actuating the respective NC contact (e.g. auxiliary contact).

Speed monitoring with Auto RESET (Memory = no)

If the device is set to Auto RESET, the output relay switches to the GO state, once the adjustable hysteresis threshold is reached in the range of 0.1 to 99.9 rpm and the flashing stops. Any overshoots or undershoots are therefore not stored.

Speed monitoring with Manual RESET (Memory = yes)

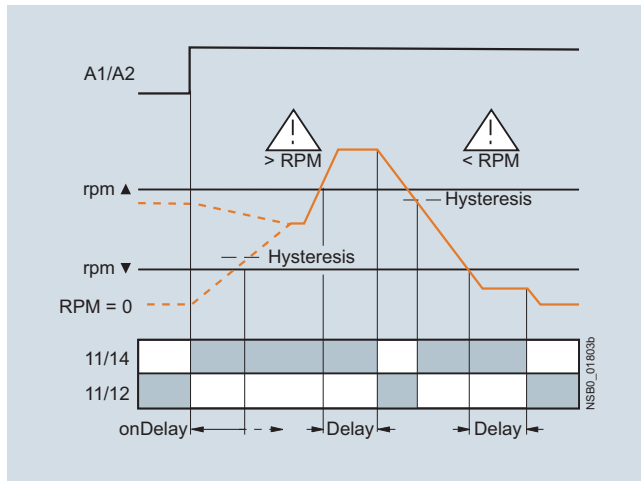
If Manual RESET is selected in the menu, the output relay remains in its current switching state and the current measured value and the symbol for overshooting/undershooting continue to flash, even when the speed returns to a permissible value. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for > 2 s, by connecting the RESET device terminal to 24 V DC or by switching the control supply voltage off and back on again.

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

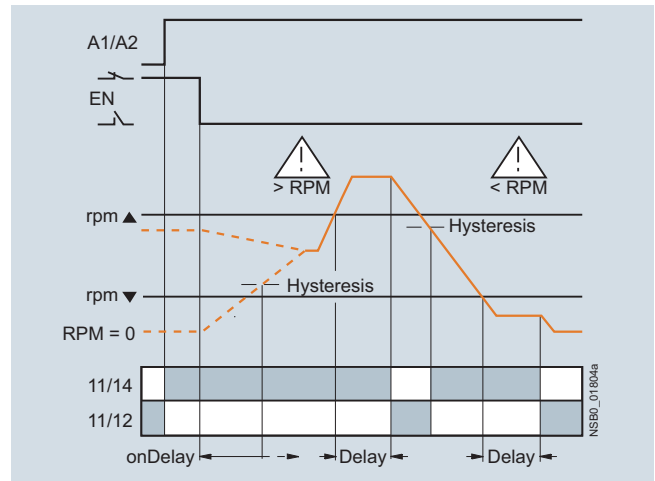
## Speed monitoring

With the closed-circuit principle selected

Range monitoring without enable input



Range monitoring with enable input





Type	3UG4651	
<b>General data</b>		
<b>Rated insulation voltage <math>U_i</math></b>	V	300
Pollution degree 3 Overvoltage category III acc. to VDE 0110		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4
<b>Measuring circuit</b>		
<b>Sensor supply</b>		
• For 3-wire sensor (24 V/0 V)	mA	Max. 50
• For 2-wire NAMUR sensor (8V2)	mA	Max. 8.2
<b>Signal input</b>		
• IN1	k $\Omega$	16, 3-wire sensor, pnp operation
• IN2	k $\Omega$	1, floating contact, 2-wire NAMUR sensor
<b>Voltage level</b>		
• For level 1 at IN1	V	4.5 ... 30
• For level 0 at IN1	V	0 ... 1
<b>Current level</b>		
• For level 1 at IN2	mA	> 2.1
• For level 0 at IN2	mA	< 1.2
<b>Minimum pulse duration of signal</b>	ms	5
<b>Minimum interval between 2 pulses</b>	ms	5
<b>Control circuit</b>		
<b>Number of CO contacts for auxiliary contacts</b>		1
<b>Load capacity of the output relay</b>		
Thermal current $I_{th}$	A	5
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	1
• DC-13/125 V	A	0.2
• DC-13/250 V	A	0.1
<b>Minimum contact load at 17 V DC</b>	mA	5

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Speed monitoring

### Selection and ordering data

- For speed monitoring in revolutions per minute (rpm)
  - Two- or three-wire sensor with mechanical or electronic switching output can be connected
  - Two-wire NAMUR sensor can be connected
  - Sensor supply 24 V DC/50 mA integrated
  - Input frequency 0.1 to 2 200 pulses rpm (0.0017 to 36.7 Hz)
  - With or without enable signal for the drive to be monitored
  - Digitally adjustable, with illuminated LCD
  - Overshoot, undershoot or range monitoring adjustable
  - Number of pulses per revolution can be adjusted
  - Upper and lower threshold value can be adjusted separately
  - Auto, manual or remote RESET options after tripping
  - Permanent display of actual value and tripping state
  - 1 CO contact
- PU (UNIT, SET, M) = 1  
PKG\* = 1 UNIT

Measuring range	Hysteresis	ON-delay time	Tripping delay time	Pulses per revolution	Rated control supply voltage $U_s$ AC/DC	SD	Screw terminals 	SD	Spring-type terminals 		
rpm	rpm	s	s		V	d	Article No.	Price per PU	d	Article No.	Price per PU
0.1 ... 2 200	OFF 0.1 ... 99.9	0 ... 900	0.1 ... 99.9	1 ... 10	24 <sup>1)</sup>	2	<b>3UG4651-1AA30</b>	2	<b>3UG4651-2AA30</b>		
					24 ... 240	2	<b>3UG4651-1AW30</b>	2	<b>3UG4651-2AW30</b>		

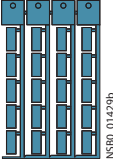






<sup>1)</sup> The rated control supply voltage and the measuring circuit are not electrically separated.

For accessories, see page 11/83

# 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Accessories

### Selection and ordering data

Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Blank labels</b>						
 3RT1900-1SB20	For 3UG4		<b>Unit labeling plates</b> For SIRIUS devices 20 mm x 7 mm, pastel turquoise	20	<b>3RT1900-1SB20</b>	100 340 units
	For 3UG4		<b>Adhesive labels</b> for SIRIUS devices	15	<b>3RT1900-1SB60</b>	100 3 060 units
			<ul style="list-style-type: none"> <li>• 19 mm x 6 mm, pastel turquoise</li> <li>• 19 mm x 6 mm, zinc yellow</li> </ul>	15	<b>3RT1900-1SD60</b>	100 3 060 units
<b>Push-in lugs and covers</b>						
 3RP1903	For 3UG4		<b>Push-in lugs</b> For screw fixing, 2 units are required for each device	5	<b>3RP1903</b>	1 10 units
	 3RP1902	For 3UG4		<b>Sealable covers</b> For securing against unauthorized adjustment of setting knobs	5	<b>3RP1902</b>
For 3UG45			<b>Sealing foil</b> For securing against unauthorized adjustment of setting knobs	▶	<b>3TK2820-0AA00</b>	1 1 unit
<b>Covers for insulation monitoring relays</b>						
 3UG4981-0C	For 3UG4581 and 3UG4582		<b>Sealable, transparent covers</b>	5	<b>3UG4981-0C</b>	1 1 unit
	 3UG4983-0C	For 3UG4583			5	<b>3UG4983-0C</b>
<b>Tools for opening spring-type terminals</b>						
 3RA2908-1A	For auxiliary circuit connections		<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	2	<b>Spring-type terminals</b> 	<b>3RA2908-1A</b> 1 1 unit

**Note:**

For products for mechanical bearing monitoring, e.g. condition monitoring systems, see [www.siemens.com/siplus-cms](http://www.siemens.com/siplus-cms).



## 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## General data

## Overview



SIRIUS 3UG48 monitoring relays

## More information

Homepage, see [www.siemens.com/relays](http://www.siemens.com/relays)

Industry Mall, see [www.siemens.com/product?3UG48](http://www.siemens.com/product?3UG48)

For the conversion tool, e.g. from 3UG3 to 3UG4, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool)

The SIRIUS 3UG4 monitoring relays for electronic and mechanical variables monitor all important characteristics that allow conclusions to be drawn about the functionality of a plant. Both sudden disturbances and gradual changes, which may indicate the need for maintenance, are detected.

Thanks to their relay outputs, the monitoring relays permit direct disconnection of the affected system components and alerting, e.g. by the triggering of a warning light. Thanks to adjustable delay times the 3UG4 monitoring relays can respond very flexibly to brief faults such as voltage dips or load changes and can thus avoid unnecessary alarms and disconnections and increase system availability.

**3UG48 monitoring relays for IO-Link**

The SIRIUS 3UG48 monitoring relays for IO-Link also offer many other options based upon the monitoring functions of the tried-and-tested SIRIUS 3UG4 monitoring relays:

- Measured value transmission to a controller, including resolution and unit, may be parameterizable as to which value is cyclically transmitted
- Transmission of alarm flags to a controller
- Full diagnosis capability by inquiry as to the cause of the fault in the diagnosis data record
- Remote parameterization is also possible, in addition to or instead of local parameterization
- Rapid parameterization of the same devices by duplication of the parameterization in the controller
- Parameter transmission through uploading to a controller by IO-Link call or by parameter server (if IO-Link master from IO-Link Specification V1.1 and higher is used)
- Consistent central data storage in the event of parameter change locally or via a controller
- Automatic reparameterizing when devices are exchanged
- Blocking of local parameterization via IO-Link possible
- Faults are saved in parameterizable and non-volatile fashion to prevent an automatic start up after voltage failure and to make sure diagnostics data is not lost

- Integration into the automation level provides the option of parameterizing the monitoring relays at any time via a display unit, or displaying the measured values in a control room or locally at the machine/control cabinet

Even without communication via IO-Link the devices continue to function fully autonomously:

- Parameterization can take place locally at the device, independently of a controller.
- In the event of failure or before the controller becomes available the monitoring relays work as long as the control supply voltage (24 V DC) is present.
- If the monitoring relays are operated without the controller, the 3UG48 monitoring relays have, thanks to the integrated SIO mode, an additional semiconductor output, which switches when the adjustable warning threshold is exceeded.

Thanks to the combination of autonomous monitoring relay function and integrated IO-Link communication, redundant sensors and/or analog signal converters – which previously took over the transmission of measured values to a controller, leading to considerable extra cost and wiring outlay – are no longer needed.

Because the output relays are still present, the monitoring relays increase the functional reliability of the system, since only the controller can fulfill the control tasks if the current measured values are available, whereas the output relays can also be used for the disconnection of the system if limit values that cannot be reached during operation are exceeded.

The individual 3UG48 monitoring relays for IO-Link offer the following functions in different combinations:

- Phase sequence
- Phase failure, neutral conductor failure
- Phase asymmetry
- Undershooting and/or overshooting of limit values for voltage
- Undershooting and/or overshooting of limit values for current
- Undershooting and/or overshooting of power factor limit values
- Monitoring of the active current or the apparent current
- Monitoring of the residual current
- Undershooting and/or overshooting of limit values for speed

Note:

For more information on the IO-Link bus system, [click here](#).

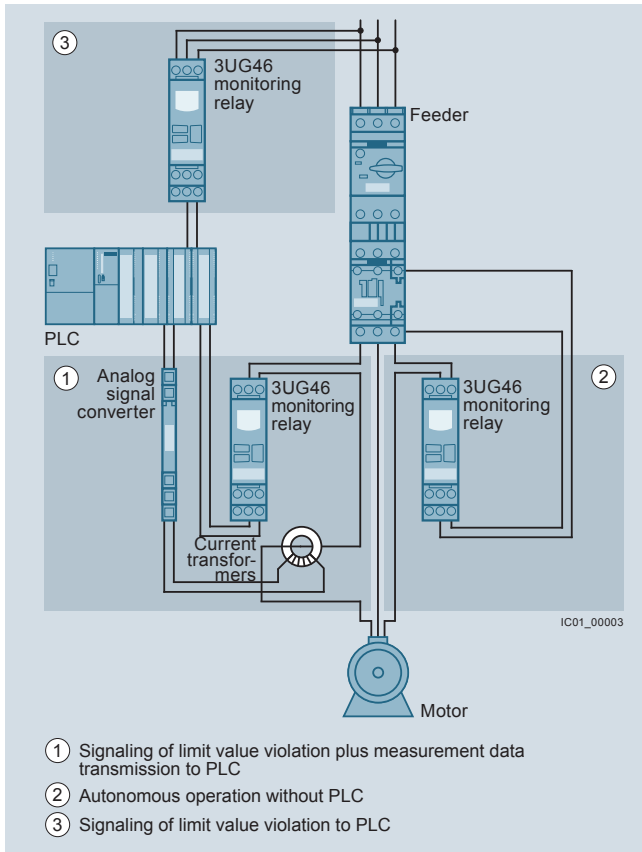
Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions represent only one component of such a concept.

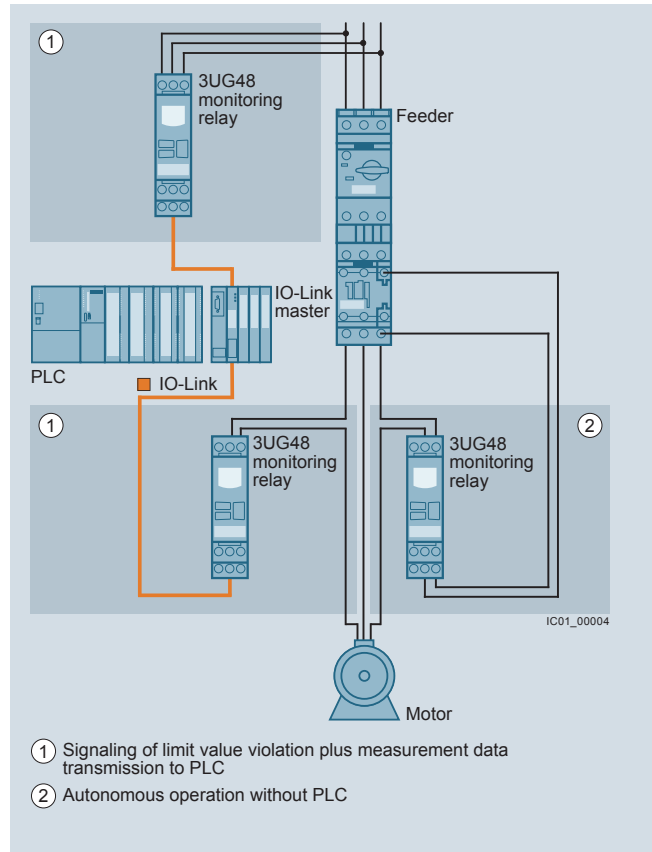
For more information on Industrial Security, see [www.siemens.com/industrialsecurity](http://www.siemens.com/industrialsecurity).

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## General data



Use of conventional monitoring relays



Monitoring relays for IO-Link

**Notes:**

Devices required for the communication via IO-Link:

- Any controller that supports the IO-Link (e.g. ET 200SP with CPU or S7-1200).
- IO-Link master (e.g. CM 4xIO-Link for SIMATIC ET 200SP or SM 1278 for S7-1200).

Each monitoring relay requires an IO-Link channel.

**Article No. scheme**

Product versions		Article number	
<b>3UG4 monitoring relay with IO-Link</b>		<b>3UG4</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>0</b>
Type of setting	e.g. 8 = analogically adjustable	<input type="checkbox"/>	
Functions	e.g. 15 = line monitoring	<input type="checkbox"/> <input type="checkbox"/>	
Connection type	Screw terminals		<b>1</b>
	Spring-type terminals (push-in)		<b>2</b>
Contacts	e.g. A = 1 CO contact	<input type="checkbox"/>	
Supply voltage	e.g. A4 = 160 ... 690 V AC		<input type="checkbox"/> <input type="checkbox"/>
Example		<b>3UG4</b>	<b>8 1 5 - 1 A A 4 0</b>

**Note:**

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

**Benefits**

- Simple cyclical transmission of the current measured values, relay switching states and events to a controller
- Remote parameterization
- Automatic reparameterizing when devices are exchanged
- Simple duplication of identical or similar parameterizations
- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Integration in TIA means clear diagnostics if a fault occurs
- Cost saving and space saving in control cabinet due to the elimination of AI and IO modules as well as analog signal converters and duplicated sensors

## 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## General data

## Application

The use of SIRIUS monitoring relays for IO-Link is particularly recommended for machines and plants in which these relays, in addition to their monitoring function, are to be connected to the automation level for the rapid, simple and fault-free provision of the current measured values and/or for remote parameterization.

The monitoring relays can either relieve the controller of monitoring tasks or, as a second monitoring entity in parallel to and independent of the controller, increase the reliability in the process or in the system. In addition, the elimination of AI and IO modules allows the width of the controller to be reduced despite significantly expanded functionality.

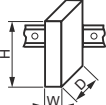


## Technical specifications

## More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/16368/td>

Manual and internal circuit diagrams, see  
<https://support.industry.siemens.com/cs/ww/en/view/54375430>

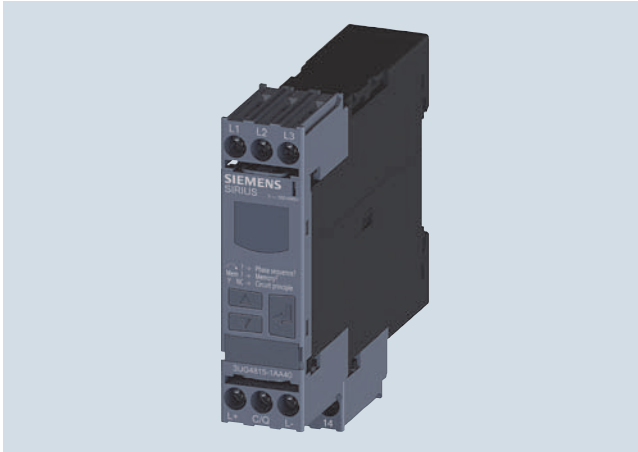
FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16368/faq>

Type	3UG48	
<b>General technical specifications</b>		
Dimensions (W x H x D)		
<ul style="list-style-type: none"> <li>For 3 terminal blocks               <ul style="list-style-type: none"> <li>- Screw terminals</li> <li>- Spring-type terminals</li> </ul> </li> <li>For 4 terminal blocks               <ul style="list-style-type: none"> <li>- Screw terminals</li> <li>- Spring-type terminals</li> </ul> </li> </ul>		mm 22.5 x 92 x 91
		mm 22.5 x 94 x 91
	mm 22.5 x 103 x 91	mm 22.5 x 103 x 91
<b>Permissible ambient temperature</b>		
• During operation	°C	-25 ... +60
<b>Connection type</b>		 <b>Screw terminals</b>
<ul style="list-style-type: none"> <li>Terminal screw</li> <li>Solid</li> <li>Finely stranded with end sleeve</li> <li>AWG cables, solid or stranded</li> <li>Tightening torque</li> </ul>	mm <sup>2</sup>	M3 (for standard screwdriver, size 2 and Pozidriv 2)
	mm <sup>2</sup>	1 x (0.5 ... 2.5), 2 x (0.5 ... 2.5)
	AWG	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)
	Nm	2 x (20 ... 14) 0.8 ... 1.2
<b>Connection type</b>		 <b>Spring-type terminals</b>
<ul style="list-style-type: none"> <li>Solid</li> <li>Finely stranded, with end sleeve acc. to DIN 46228</li> <li>Finely stranded</li> <li>AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup>	2 x (0.25 ... 1.5)
	mm <sup>2</sup>	2 x (0.25 ... 1.5)
	mm <sup>2</sup>	2 x (0.25 ... 1.5)
	AWG	2 x (24 ... 16)

## 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Line monitoring

## Overview



SIRIUS 3UG4815 monitoring relay

Solid-state line monitoring relays provide maximum protection for mobile machines, plants and hoisting equipment or for unstable networks. Network and voltage faults can thus be detected early and rectified before far greater damage ensues.

The line monitoring relays with IO-Link monitor phase sequence, phase failure (with or without N conductor monitoring), phase asymmetry and undervoltage and/or overvoltage.

Phase asymmetry is evaluated as the difference between the greatest and the smallest phase voltage relative to the greatest phase voltage. Undervoltage or overvoltage exist if the set limit values for at least one phase voltage are overshoot or undershot. The rms value of the voltage is measured.

## Benefits

- Can be used in any network from 160 to 630 V AC worldwide thanks to wide voltage range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display and transmission of actual value and network fault type to controller
- All versions with removable terminals
- All versions with screw or spring-type terminals

## Application

The relays are used above all for mobile equipment, e.g. air conditioning compressors, refrigerating containers, building site compressors and cranes.

Function	Application
Phase sequence	<ul style="list-style-type: none"> <li>• Direction of rotation of the drive</li> </ul>
Phase failure	<ul style="list-style-type: none"> <li>• A fuse has tripped</li> <li>• Failure of the control supply voltage</li> <li>• Broken cable</li> </ul>
Phase asymmetry	<ul style="list-style-type: none"> <li>• Overheating of the motor due to asymmetrical voltage</li> <li>• Detection of asymmetrically loaded networks</li> </ul>
Undervoltage	<ul style="list-style-type: none"> <li>• Increased current on a motor with corresponding overheating</li> <li>• Unintentional resetting of a device</li> <li>• Network collapse, particularly with battery power</li> </ul>
Oversvoltage	<ul style="list-style-type: none"> <li>• Protection of a plant against destruction due to overvoltage</li> </ul>

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Line monitoring

### Technical specifications

#### 3UG4815/3UG4816 monitoring relays

The 3UG4815 and 3UG4816 line monitoring relays have a wide voltage range input and are supplied with power through IO-Link or from an external 24 V DC source.

The device is equipped with a display and is parameterized using three buttons. The 3UG4815 monitoring relay monitors three-phase networks with regard to phase sequence, phase failure, phase asymmetry, undervoltage and overvoltage. The 3UG4816 monitoring relay monitors the neutral conductor as well. The hysteresis is adjustable from 1 to 20 V.

The device has two separately adjustable delay times for overvoltage and undervoltage and for line stabilization. If the direction of rotation is incorrect or a phase fails, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from and potentially high feedback through the load.

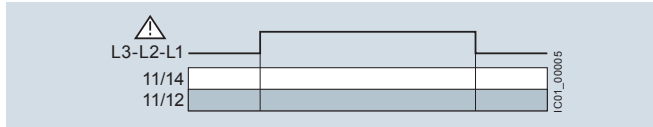
The 3UG4815 and 3UG4816 monitoring relays can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continues to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2.5 s.

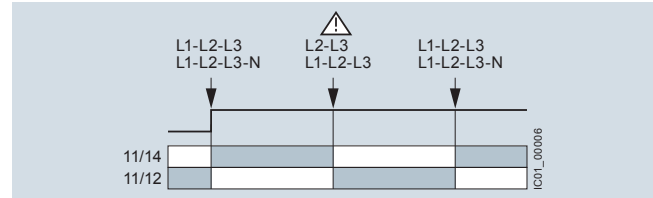
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected

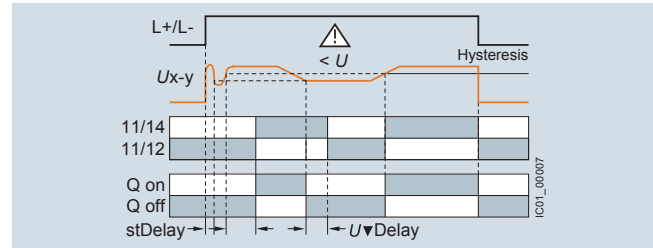
Wrong phase sequence



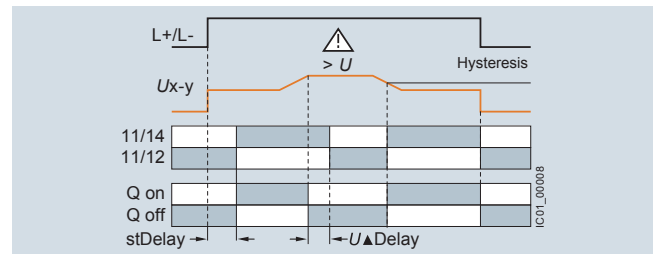
Phase failure



Undervoltage



Overvoltage



Type	3UG4815, 3UG4816	
<b>General technical specifications</b>		
<b>Rated insulation voltage <math>U_i</math></b>	V	690
Pollution degree 2 Overvoltage category III acc. to VDE 0110		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6
<b>Control circuit</b>		
<b>Load capacity of the output relay</b>		
• Thermal current $I_{th}$	A	5
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 400 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
<b>Minimum contact load at 17 V DC</b>	mA	5
<b>Electrical endurance AC-15</b>	Million operating cycles	0.1
<b>Mechanical endurance</b>	Million operating cycles	10

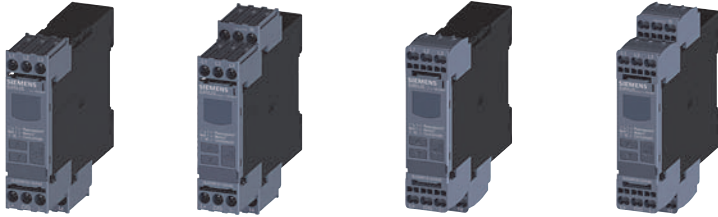
# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Line monitoring

### Selection and ordering data

- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact, 1 semiconductor output (in SIO mode)

PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H



3UG4815-1AA40      3UG4816-1AA40      3UG4815-2AA40      3UG4816-2AA40

Adjustable hysteresis	Under-voltage detection	Over-voltage detection	Stabilization time adjustable stDEL	Tripping delay time adjustable Del	Version of auxiliary contacts	Measurable line voltage <sup>1)</sup>	SD	Screw terminals	SD	Spring-type terminals	
V			s	s		VAC	d	Article No.	Price per PU	Article No.	Price per PU
<b>Monitoring of phase sequence, phase failure, phase asymmetry, overvoltage and undervoltage</b>											
1 ... 20	✓	✓	0.1 ... 999.9	0.1 ... 999.9	1 CO + 1 Q <sup>2)</sup>	160 ... 690	2	<b>3UG4815-1AA40</b>	2	<b>3UG4815-2AA40</b>	
<b>Monitoring of phase sequence, phase and N conductor failure, phase asymmetry, overvoltage and undervoltage</b>											
1 ... 20	✓	✓	0.1 ... 999.9	0.1 ... 999.9	1 CO + 1 Q <sup>2)</sup>	90 ... 400 to N	2	<b>3UG4816-1AA40</b>	2	<b>3UG4816-2AA40</b>	

✓ Function supported

<sup>1)</sup> Absolute limit values.

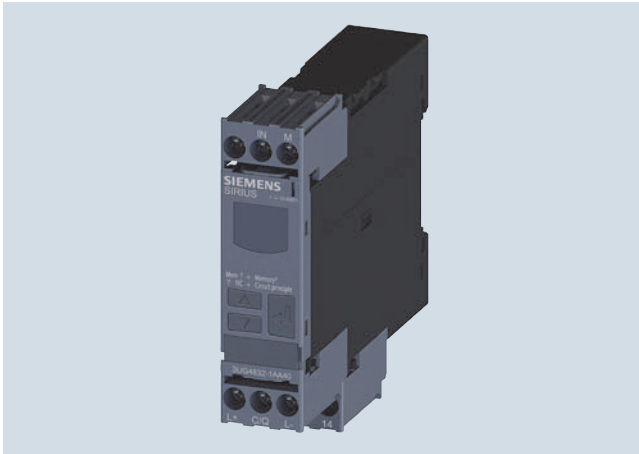
<sup>2)</sup> In SIO mode.

For accessories, see page 10/134.

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Voltage monitoring

### Overview



SIRIUS 3UG4832 monitoring relays

The relays monitor single-phase AC voltages (rms value) and DC voltages against the set limit value for overshoot and undershoot.

### Benefits

- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display and transmission of actual value and status messages to controller
- All versions with removable terminals
- All versions with screw or spring-type terminals

### Application

- Protection of a plant against destruction due to overvoltage
- Switch-on of a plant at a defined voltage and higher
- Protection from undervoltage due to overloaded control supply voltages, particularly with battery power

### Technical specifications

#### 3UG4832 monitoring relays

The 3UG4832 voltage monitoring relays are supplied with power through IO-Link or with an external auxiliary voltage of 24 V DC and perform overshoot, undershoot or range monitoring of the voltage depending on parameterization. The devices are equipped with a display and are parameterized by means of three buttons or through IO-Link.

The measuring range extends from 10 to 600 V AC/DC. The limit values for overshoot or undershoot can be freely configured within this range. If one of these limit values is reached, the output relay responds according to the set principle of operation as soon as the delay time has elapsed. This tripping delay time  $U\Delta$  Del/ $U\nabla$ Del can be set from 0 to 999.9 s, as can the ON-delay time onDel. The hysteresis is adjustable from 0.1 to 300 V.

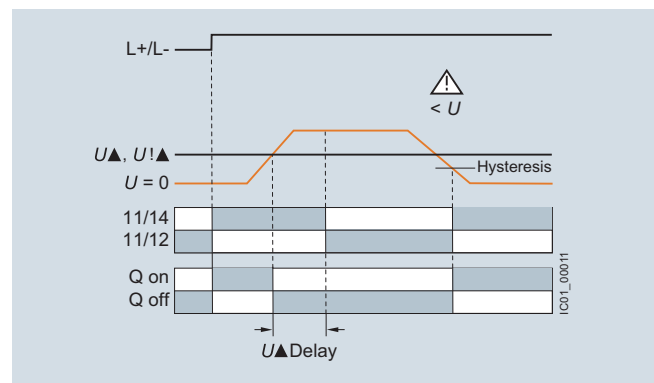
The device can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. One output changeover contact is available as a signaling contact, and a semiconductor output is available in addition in SIO mode.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continues to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2.5 s.

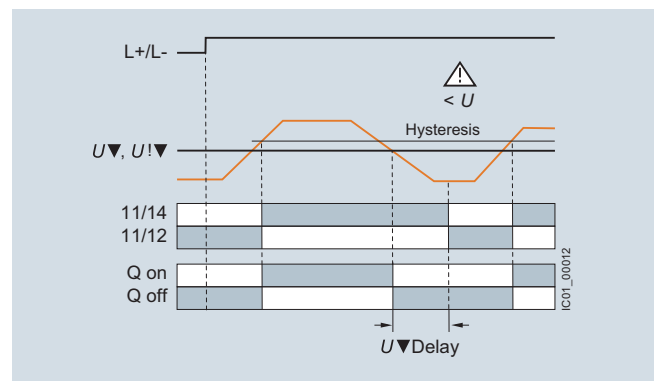
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

#### With the closed-circuit principle selected

##### Overvoltage



##### Undervoltage

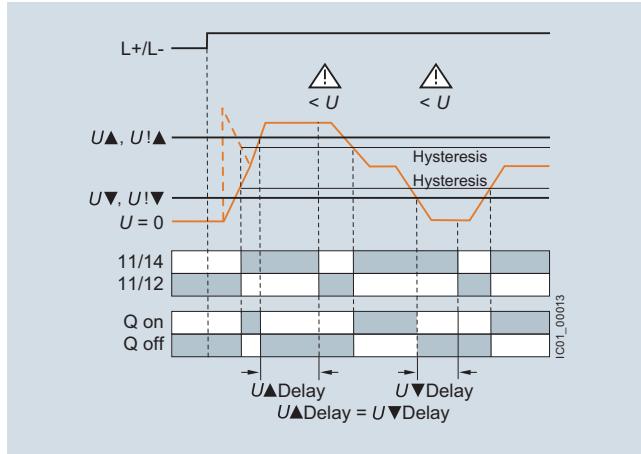


# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Voltage monitoring

With the closed-circuit principle selected

Range monitoring



Type	3UG4832	
<b>General technical specifications</b>		
<b>Rated insulation voltage <math>U_i</math></b>	V	690
Pollution degree 2 Overvoltage category III acc. to VDE 0110		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6
<b>Measuring circuit</b>		
<b>Permissible measuring range</b> single-phase AC/DC voltage	V	10 ... 690
<b>Measuring frequency</b>	Hz	40 ... 500
<b>Setting range</b> single-phase voltage	V	10 ... 600
<b>Control circuit</b>		
<b>Load capacity of the output relay</b>		
• Thermal current $I_{th}$	A	5
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 400 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
<b>Minimum contact load</b> at 17 V DC	mA	5



# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Voltage monitoring

### Selection and ordering data

- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact, 1 semiconductor output (in SIO mode)



PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H



3UG4832-1AA40



3UG4832-2AA40

Measuring range	Adjustable hysteresis	ON-delay time adjustable onDel	Tripping delay time separately adjustable U▲Del/U▼Del	SD	Screw terminals 	SD	Spring-type terminals 	
V AC/DC	V	s	s	d	Article No.	Price per PU	Article No.	Price per PU
<b>Monitoring of voltage for overshoot or undershoot</b>								
10 ... 600	0.1 ... 300	0 ... 999.9	0 ... 999.9	2	<b>3UG4832-1AA40</b>		<b>3UG4832-2AA40</b>	

For accessories, [see page 10/134](#).

For accessories, [see page 11/106](#).

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Current monitoring

### Overview



SIRIUS 3UG4822 monitoring relays

The relays monitor single-phase AC (rms value) and DC currents against the set limit value for overshoot and undershoot.

### Benefits

- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display and transmission of actual value and status messages to controller
- All versions with removable terminals
- All versions with screw or spring-type terminals

### Application

- Overcurrent and undercurrent monitoring
- Monitoring the functionality of electrical loads
- Monitoring for broken conductors

### Technical specifications

#### 3UG4822 monitoring relays

The 3UG4822 current monitoring relays are supplied with power through IO-Link or with an external voltage of 24 V DC and perform overshoot, undershoot or range monitoring of the current depending on the parameterization. The devices are equipped with a display and are parameterized using three buttons.

The measuring range extends from 0.05 to 10 A. For larger AC currents the measuring range can be extended by using commercially available current transformers. Using the adjustable transformer factor, the display of the measured primary currents up to 750 A instead of the secondary currents (max. 1 A or 5 A) is possible.

The rms value of the current is measured. The limit values for overshoot or undershoot can be freely configured within this range. If one of these limit values is reached, the output relay responds according to the set principle of operation as soon as the delay time  $I\blacktriangle\text{Del}/I\blacktriangledown\text{Del}$  has elapsed. This time and the ON-delay time  $\text{onDel}$  are adjustable from 0 to 999.9 s.

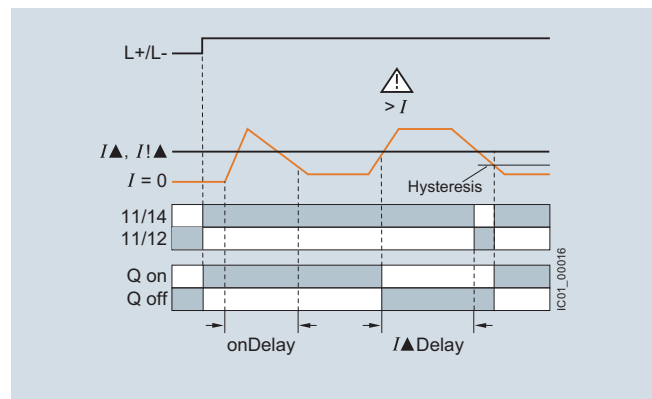
The hysteresis is adjustable from 0.01 to 5 A. The device can be operated with Manual or Auto RESET and on the basis of either the open-circuit or closed-circuit principle. You can decide here whether the output relay is to respond when the supply voltage  $U_s = \text{ON}$  is applied, or not until the lower measuring range limit of the measuring current ( $I > 50 \text{ mA}$ ) is reached. One output changeover contact is available as a signaling contact, and a semiconductor output is available in addition in SIO mode.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continues to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP  $\blacktriangle$  and DOWN  $\blacktriangledown$  keys for 2.5 s.

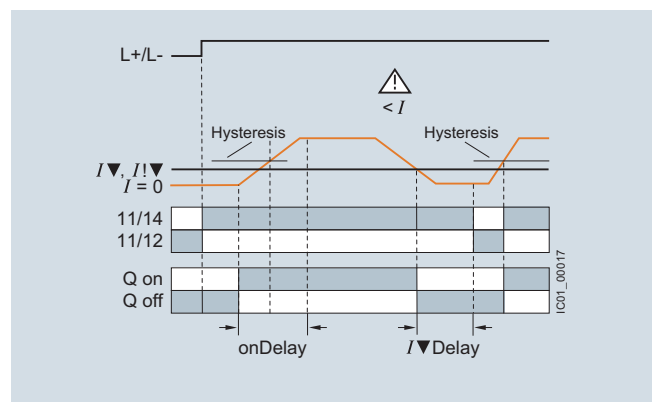
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected upon application of the control supply voltage

#### Current overshoot



#### Current undershoot

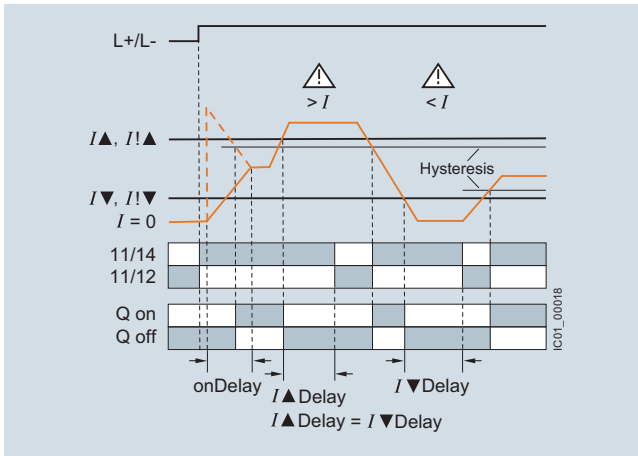


## 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Current monitoring

With the closed-circuit principle selected  
upon application of the control supply voltage

Range monitoring



Type	3UG4822	
<b>General technical specifications</b>		
<b>Rated insulation voltage <math>U_i</math></b>	V	690
Pollution degree 2 Overvoltage category III acc. to VDE 0110		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6
<b>Measuring circuit</b>		
<b>Measuring range</b> for single-phase AC/DC current	A	0.05 ... 15
<b>Measuring frequency</b>	Hz	40 ... 500
<b>Setting range</b> for single-phase current	A	0.05 ... 10
<b>Load supply voltage</b>	V	Max. 300 (with protective separation) Max. 500 (with simple separation)
<b>Control circuit</b>		
<b>Load capacity of the output relay</b>		
• Thermal current $I_{th}$	A	5
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 400 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
<b>Minimum contact load</b> at 17 V DC	mA	5

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Current monitoring

### Selection and ordering data

- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Adjustable converter factor to display the measured primary current when an external current transformer is used
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact, 1 semiconductor output (in SIO mode)



PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H



3UG4822-1AA40



3UG4822-2AA40

Measuring range	Adjustable hysteresis	ON-delay time adjustable onDel	Tripping delay time separately adjustable /▲Del/▼Del	SD	Screw terminals 	SD	Spring-type terminals 	
A AC/DC	A	s	s	d	Article No.	Price per PU	Article No.	Price per PU
<b>Monitoring of current for overshooting and undershooting</b>								
0.05 ... 10	0.01 ... 5	0.1 ... 999.9	0.1 ... 999.9	2	<b>3UG4822-1AA40</b>		<b>3UG4822-2AA40</b>	

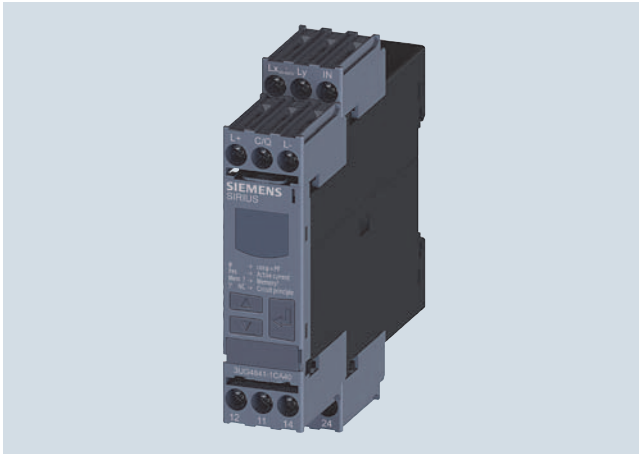
For accessories, [see page 11/106](#).

For AC currents  $I > 10$  A it is possible to use commercially available current transformers, e.g. the Siemens 4NC current transformer, as accessories, [see Catalog LV 10](#).

## 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Power factor and active current monitoring

## Overview



SIRIUS 3UG4841 monitoring relay

The 3UG4841 power factor and active current monitoring devices enable the load monitoring of motors.

Whereas power factor (p.f.) monitoring is used above all for monitoring no-load operation, the active current monitoring option can be used to observe and evaluate the load factor over the entire torque range.

## Benefits

- Monitoring of even small single-phase motors with a no-load supply current below 0.5 A
- Simple determination of threshold values by the direct collection of measured variables on motor loading
- Range monitoring and active current measurement enable detection of cable breaks between control cabinets and motors, as well as phase failures
- Power factor and/or  $I_{res}$  (active current) can be selected as the measurement principle
- Width 22.5 mm
- Display and transmission of actual value and status messages to controller
- All versions with removable terminals
- All versions with screw or spring-type terminals

## Application

- No-load monitoring and load shedding, such as in the event of a V-belt tear
- Underload monitoring in the low-end performance range, e.g. in the event of pump no-load operation
- Monitoring of overload, e.g. due to a dirty filter system
- Power factor monitoring in networks for control of compensation equipment
- Broken cable between control cabinet and motor

## Technical specifications

**3UG4841 monitoring relays**

The 3UG4841 monitoring relays are supplied with power through IO-Link or with an external auxiliary voltage of 24 V DC and are used for performing overshoot, undershoot or range monitoring of the power factor and/or the resulting active current, depending on parameterization. The load to be monitored is connected upstream of the IN terminal. The load current flows through the terminals IN and Ly/N. The setting range for the power factor is 0 to 0.99 and for the active current  $I_{res}$  it is 0.2 to 10 A. If the control supply voltage is switched on and no load current flows, the display will show  $I < 0.2$  and a symbol for overrange, under-range or range monitoring. If the motor is now switched on and the current exceeds 0.2 A, the set ON-delay time  $onDel$  begins. During this time, if the set limit values are undershot or exceeded, this does not lead to a relay reaction of the changeover contact. If the operational flowing active current and/or the p.f. value falls below or exceeds the respective set threshold value, the tripping delay time begins. When this time has expired, the relay changes its switch position. The relevant measured variables for overshooting and undershooting in the display flash. If monitoring for active current undershoot is switched off ( $I_{res} \nabla = OFF$ ), and if the load current undershoots the lower measuring range threshold (0.2 A), the CO contacts remain unchanged. If a threshold value is set for the monitoring of active current undershooting, then undershooting of the measuring range threshold (0.2 A) will result in a response of the CO contacts.

The relay operates either according to the open-circuit or closed-circuit principle.

If the device is set to Auto RESET (Memory = No), depending on the set principle of operation, the switching relay returns to its initial state and the flashing ends when the hysteresis threshold is reached.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continues to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2.5 s.

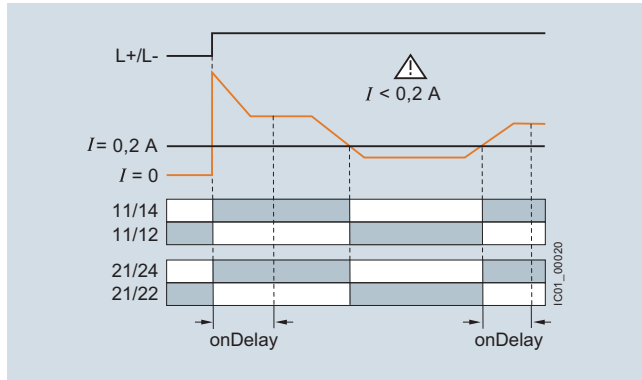
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

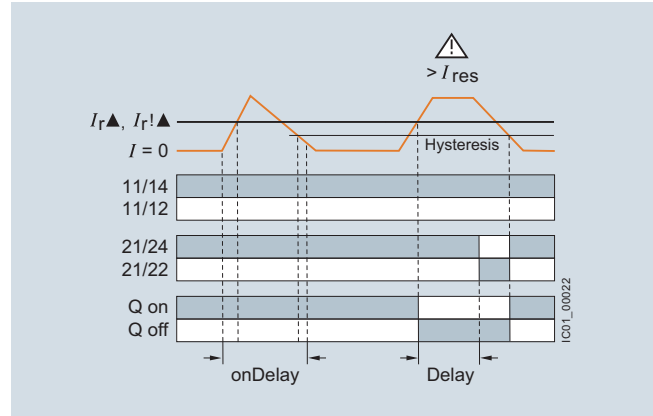
## Power factor and active current monitoring

With the closed-circuit principle selected

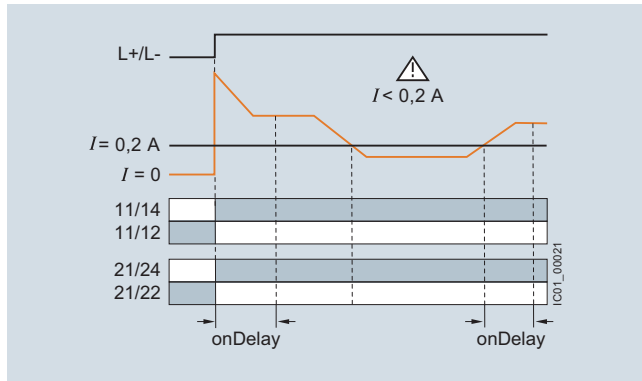
Response in the event of undershooting the measuring range limit with activated monitoring of  $I_{res}$  ▼



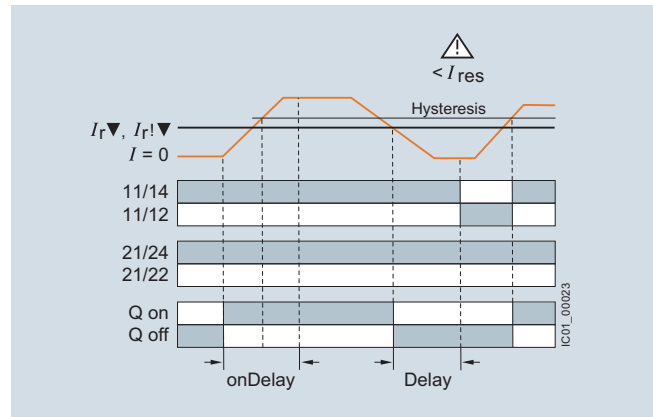
Overshooting of active current



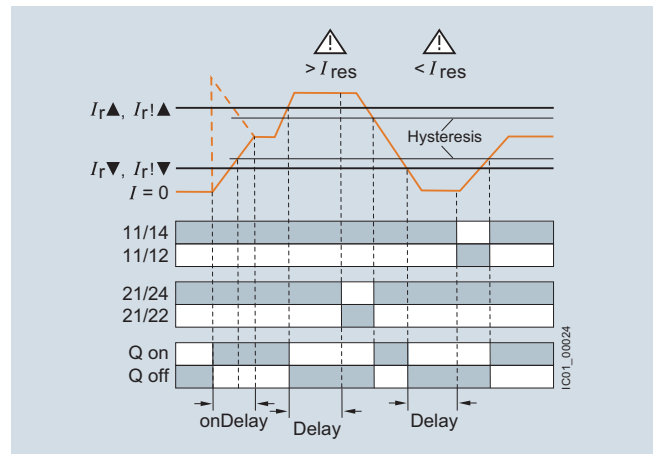
Response in the event of undershooting the measuring range limit with deactivated monitoring of active current undershooting



Undershooting of active current



Range monitoring of active current



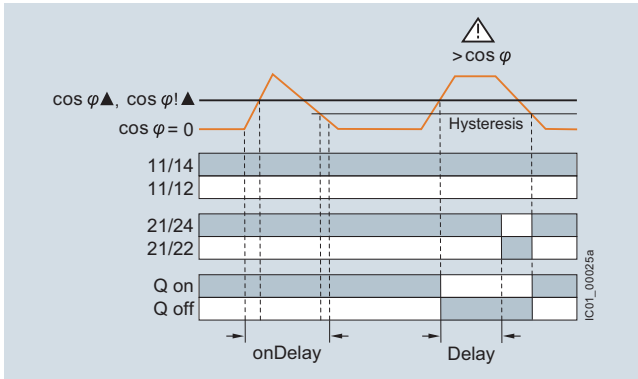
# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Power factor and active current monitoring

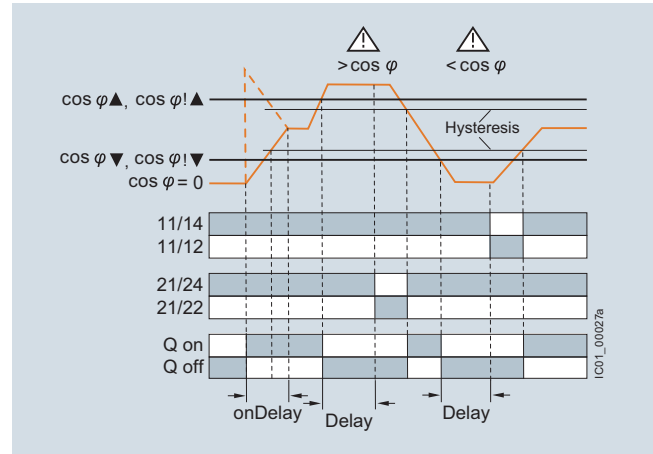
11  
RELAYS, INTERFACES  
& CONVERTERS

With the closed-circuit principle selected

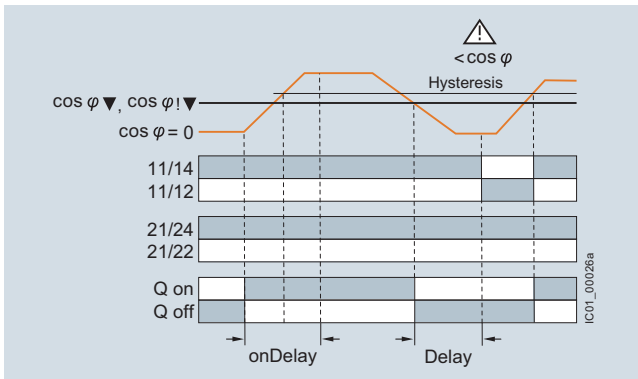
Overshooting of power factor



Range monitoring of power factor



Undershooting of power factor



Type	3UG4841	
<b>General technical specifications</b>		
<b>Rated insulation voltage <math>U_i</math></b>	V	690
Pollution degree 2 Overvoltage category III according to IEC 60664-1		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6
<b>Control circuit</b>		
<b>Number of CO contacts for auxiliary contacts</b>		2
<b>Load capacity of the output relay</b>		
• Thermal current $I_{th}$	A	5
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 400 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
<b>Minimum contact load at 17 V DC</b>	mA	5

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Power factor and active current monitoring

### Selection and ordering data

- For monitoring the power factor and the active current  $I_{res}$  (p.f.  $\times I$ )
- Suitable for single- and three-phase currents
- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Overshoot, undershoot or range monitoring adjustable
- Upper and lower limit values can be adjusted separately
- Permanent display of actual value and tripping state
- 1 CO contact each for undershoot and overshoot, 1 semiconductor output (in SIO mode)

PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H



3UG4841-1CA40



3UG4841-2CA40

Measuring range		Voltage range of the measuring voltage <sup>1)</sup> 50/60 Hz AC	Hysteresis		ON-delay time adjustable onDel	Tripping delay time separately adjustable U▲Del/ U▼Del, φ▲Del/ φ▼Del	SD	Screw terminals		SD	Spring-type terminals	
For power factor	For active current $I_{res}$		Adjustable for power factor	Adjustable for active current $I_{res}$				Article No.	Price per PU		Article No.	Price per PU
P.f.	A	V	P.f.	A	s	s	d					
<b>Monitoring of power factor and active current for overshooting or undershooting</b>												
0.1 ... 0.99	0.2 ... 10	90 ... 690	0.1 ... 0.2	0.1 ... 3	0 ... 999.9	0 ... 999.9	2	<b>3UG4841-1CA40</b>	2	<b>3UG4841-2CA40</b>		

<sup>1)</sup> Absolute limit values.

For accessories, see page 11/106.

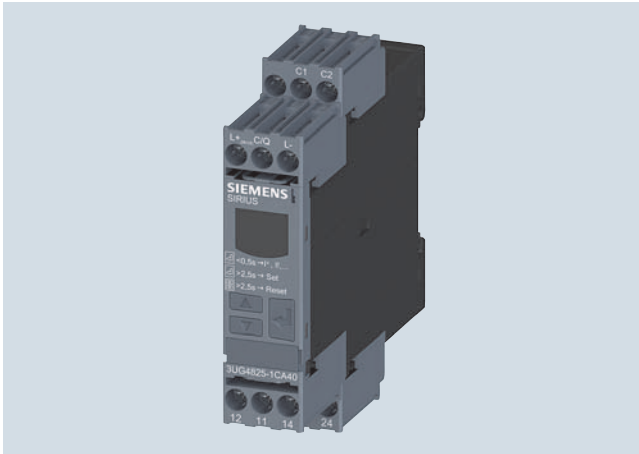
For AC active currents  $I_{res} > 10$  A it is possible to use commercially available current transformers, e.g. Siemens 4NC current transformers, as accessories, see Catalog LV 10.



# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Residual-current monitoring relays

### Overview



SIRIUS 3UG4825 monitoring relay

The 3UG4825 residual-current monitoring relays are used in conjunction with the 3UL23 residual-current transformers for monitoring plants in which higher residual currents are increasingly expected due to ambient conditions. Monitoring encompasses pure AC residual currents or AC residual currents with a pulsating DC fault current component (transformer type A in accordance with DIN VDE 0100-530/IEC TR 60755).

### Benefits

- High measuring accuracy of  $\pm 7.5\%$
- Permanent self-monitoring
- Parameterization of the devices locally or via IO-Link possible
- Variable threshold values for warning and disconnection
- Freely configurable delay times and RESET response
- Display and transmission of actual value and status messages to controller
- High level of flexibility and space saving through installation of the transformer inside or outside the control cabinet
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-type terminals

### Application

Monitoring of plants in which residual currents can occur, e.g. due to dust deposits or moisture, porous cables and leads, or capacitive residual currents.

### Technical specifications

#### 3UG4825 monitoring relays

The main conductor, and any neutral conductor to which a load is connected, are routed through the opening of the annular ring core of a residual-current transformer. A secondary winding is placed around this annular strip-wound core to which the monitoring relay is connected.

If operation of a plant is fault-free, the sum of the inflowing and outward currents equals zero. No current is then induced in the secondary winding of the residual-current transformer.

However, if an insulation fault occurs downstream of the residual current operated circuit breaker, the sum of the inflowing currents is greater than that of the outward currents. The differential current – the residual current – induces a secondary current in the secondary winding of the transformer. This current is evaluated in the monitoring relay and is used on the one hand to display the actual residual current and on the other, to switch the relay if the set warning or tripping threshold is overshoot.

If the measured residual current exceeds the set warning value, the associated changeover contact instantly changes the switching state and an indication appears on the display.

If the measured residual current exceeds the set tripping value, the set delay time begins and the associated relay symbol flashes. On expiry of this time, the associated changeover contact changes the switching state.

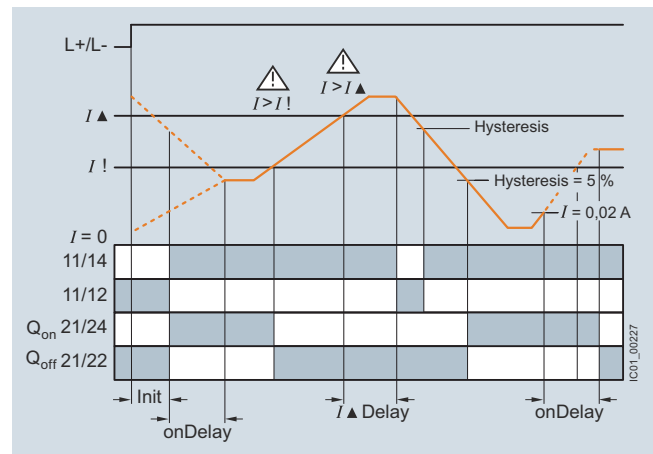
#### ON-delay time for motor start

To be able to start a drive when a residual current is detected, the output relays switch to the OK state for an adjustable ON-delay time depending on the selected open-circuit principle or closed-circuit principle.

The changeover contacts do not react if the set threshold values are overshoot during this period.

With the closed-circuit principle selected

Residual current monitoring with Auto RESET (Memory = no)



If the device is set to Auto RESET, the relay switches back to the OK state for the tripping value once the value falls below the set hysteresis threshold and the display stops flashing.

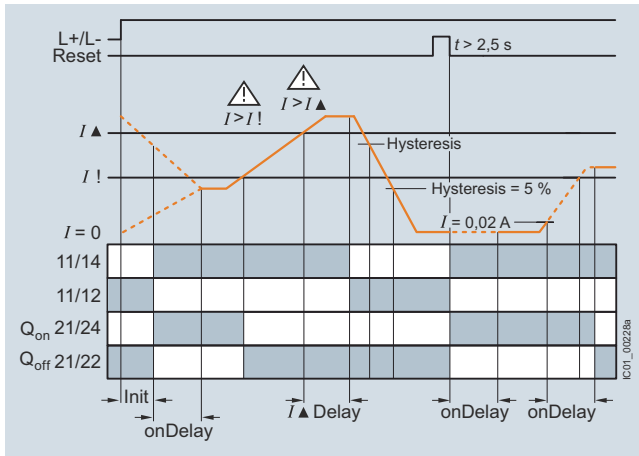
The associated relay changes its switching state if the value falls below the fixed hysteresis value of 5% of the warning value.

Any overshoots are therefore not stored.

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Residual-current monitoring relays

Residual current monitoring with Manual RESET (Memory = yes)



If Manual RESET is selected in the menu, the output relays remain in their current switching state and the current measured value and the symbol for overshooting continues to flash, even when the measured residual current returns to a permissible value. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for > 2 seconds, or by switching the supply voltage off and back on again.

**Note:**

The neutral conductor must not be grounded downstream of the summation current transformer as this may impair the function of the residual-current monitoring device.

Type	3UG4825-1CA40, 3UG4825-2CA40	
<b>General data</b>		
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value	V	300
Impulse withstand voltage, rated value $U_{imp}$	kV	4
<b>Control circuit</b>		
Number of CO contacts for auxiliary contacts		2
Thermal current of the non-solid-state contact blocks, maximum	A	5
<b>Current carrying capacity of the output relay</b>		
• At AC-15 at 250 V at 50/60 Hz	A	3
• At DC-13		
- At 24 V	A	1
- At 125 V	A	0.2
- At 250 V	A	0.1
Operational current at 17 V, minimum	mA	5

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Residual-current monitoring relays

### Selection and ordering data



- For monitoring residual currents from 0.03 to 40 A, from 16 to 400 Hz
  - For 3UL23 residual-current transformers with feed-through opening from 35 to 210 mm
  - Permanent self-monitoring
  - Certified in accordance with IEC 60947, functionality corresponds to IEC 62020
  - Digitally adjustable, with illuminated LCD
  - Permanent display of actual value and tripping state
  - Separately adjustable limit value and warning threshold
  - 1 changeover contact each for warning threshold and tripping threshold
- PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41H



3UG4825-1CA40



3UG4825-2CA40

Measurable current	Adjustable response value current	Switching hysteresis	Adjustable ON-delay time	Control supply voltage At DC rated value	SD	Screw terminals 	SD	Spring-type terminals 	
A	A	%	s	V	d	Article No.	Price per PU	Article No.	Price per PU
0.01 ... 43	0.03 ... 40	0 ... 50	0 ... 999.9	24	2	<b>3UG4825-1CA40</b>		<b>3UG4825-2CA40</b>	

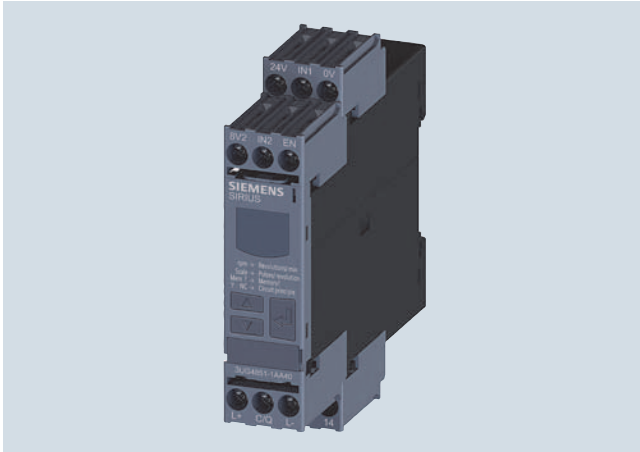
For accessories, [see page 11/106](#).

For 3UL23 residual-current transformers and accessories for 3UL23, [see page 11/68](#).

## 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Speed monitoring

## Overview



SIRIUS 3UG4851 monitoring relay

3UG4851 monitoring relays are used in combination with a sensor to monitor drives for overspeed and/or underspeed.

Furthermore, the monitoring relays are ideal for all functions where a continuous pulse signal needs to be monitored (e.g. belt travel monitoring, completeness monitoring, passing monitoring, clock-time monitoring).

## Technical specifications

**3UG4851 monitoring relays**

The speed monitoring relay operates according to the principle of period duration measurement.

In the monitoring relay, the time between two successive rising edges of the pulse encoder is measured and compared to the minimum and/or maximum permissible period duration calculated from the set limit values for the speed.

Thus, the period duration measurement recognizes any deviation in speed after just two pulses, even at very low speeds or in the case of extended pulse gaps.

By using up to ten pulse encoders evenly distributed around the circumference, it is possible to shorten the period duration, and in turn the response time. By taking into account the number of sensors in the monitoring relay, the speed continues to be indicated in rpm.

ON-delay time for motor start

To be able to start a motor drive, and depending on whether the open-circuit or closed-circuit principle is selected, the output relay switches to the GO state during the ON-delay time, even if the speed is still below the set value.

The ON-delay time is started by either switching on the auxiliary voltage or, if the auxiliary voltage is already applied, by actuating the respective NC contact (e.g. auxiliary contact).

## Benefits

- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display and transmission of actual value and fault type to controller
- Use of up to 10 sensors per rotation for extremely slowly rotating motors
- 2- or 3-wire sensors and sensors with a mechanical switching output or semiconductor output can be connected
- Auxiliary voltage for sensor integrated
- All versions with removable terminals
- All versions with screw or spring-type terminals

## Application

- Slip or tear of a belt drive
- Overload monitoring
- Transport monitoring for completeness

Speed monitoring with Auto RESET (Memory = no)

If the device is set to Auto RESET, the output relay switches to the GO state, once the adjustable hysteresis threshold is reached in the range of 1 to 99.9 rpm and the flashing stops. Any overshoots or undershoots are therefore not stored.

Speed monitoring with Manual RESET (Memory = yes)

If Manual RESET is selected in the menu, the output relay remains in its current switching state and the current measured value and the symbol for overshooting/undershooting continue to flash, even when the speed returns to a permissible value. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for > 2.5 s or by connecting the RESET device terminal to 24 V DC.

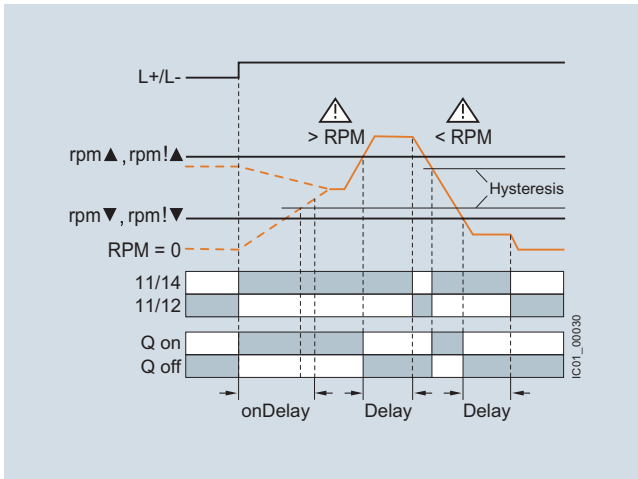
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

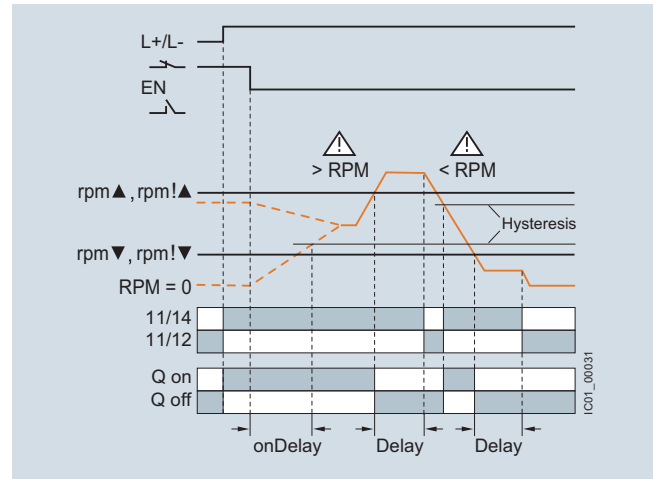
## Speed monitoring

With the closed-circuit principle selected

Range monitoring without enable input



Range monitoring with enable input



Type	3UG4851	
<b>General technical specifications</b>		
<b>Rated insulation voltage <math>U_i</math></b>	V	300
Pollution degree 2 Overvoltage category III acc. to VDE 0110		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4
<b>Measuring circuit</b>		
<b>Sensor supply</b>		
• For 3-wire sensor (24 V/0 V)	mA	Max. 50
• For 2-wire NAMUR sensor (8V2)	mA	Max. 8.2
<b>Signal input</b>		
• IN1	k $\Omega$	16, 3-wire sensor, pnp operation
• IN2	k $\Omega$	1, floating contact, 2-wire NAMUR sensor
<b>Voltage level</b>		
• For level 1 at IN1	V	4.5 ... 30
• For level 0 at IN1	V	0 ... 1
<b>Current level</b>		
• For level 1 at IN2	mA	> 2.1
• For level 0 at IN2	mA	< 1.2
<b>Minimum pulse duration of signal</b>	ms	5
<b>Minimum interval between 2 pulses</b>	ms	5
<b>Control circuit</b>		
<b>Number of CO contacts for auxiliary contacts</b>		1
<b>Load capacity of the output relay</b>		
Thermal current $I_{th}$	A	5
<b>Rated operational current <math>I_e</math> at</b>		
• AC-15/24 ... 250 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
<b>Minimum contact load at 17 V DC</b>	mA	5

# 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

## Speed monitoring

### Selection and ordering data

- For speed monitoring in revolutions per minute (rpm)
- Two- or three-wire sensor with mechanical or electronic switching output can be connected
- Two-wire NAMUR sensor can be connected
- Sensor supply 24 V DC/50 mA integrated
- Input frequency 0.1 to 2 200 pulses per minute (0.0017 to 36.7 Hz)
- With or without enable signal for the drive to be monitored
- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Overshoot, undershoot or range monitoring adjustable
- Number of pulses per revolution can be adjusted
- Upper and lower limit values can be adjusted separately
- Auto, manual or remote RESET options after tripping
- Permanent display of actual value and tripping state
- 1 CO contact, 1 semiconductor output (in SIO mode)



PU (UNIT, SET, M) = 1  
 PKG\* = 1 UNIT  
 PG = 41H



3UG4851-1AA40



3UG4851-2AA40

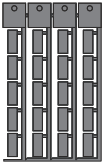




Measuring range	Adjustable hysteresis	ON-delay time adjustable onDel	Tripping delay time separately adjustable rpm▲Del/ rpm▼Del	Pulses per revolution	SD	Screw terminals 	SD	Spring-type terminals 	
rpm	rpm	s	s		d	Article No.	Price per PU	Article No.	Price per PU
<b>Speed monitoring for overshooting and undershooting</b>									
0.1 ... 2 200	OFF 1 ... 99.9	0 ... 999.9	0 ... 999.9	1 ... 10	2	<b>3UG4851-1AA40</b>	2	<b>3UG4851-2AA40</b>	

For accessories, see page 11/106.

3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Accessories

Selection and ordering data

	Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Blank labels</b>							
 3RT2900-1SB20	For 3UG48	<b>Unit labeling plates</b> For SIRIUS devices 20 mm x 7 mm, titanium gray	20	<b>3RT2900-1SB20</b>		100	340 units
	For 3UG48	<b>Adhesive labels</b> for SIRIUS devices • 19 mm x 6 mm, pastel turquoise • 19 mm x 6 mm, zinc yellow	15	<b>3RT1900-1SB60</b>		100	3 060 units
			15	<b>3RT1900-1SD60</b>		100	3 060 units
<b>Push-in lugs and covers</b>							
 3RP1903   3RP1902	For 3UG48	<b>Push-in lugs</b> For screw fixing, 2 units are required for each device	5	<b>3RP1903</b>		1	10 units
	For 3UG48	<b>Sealable covers</b> For securing against unauthorized adjustment of setting knobs	5	<b>3RP1902</b>		1	5 units
<b>Tools for opening spring-type terminals</b>							
 3RA2908-1A	For auxiliary circuit connections	<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	<b>Spring-type terminals</b> 		1	1 unit
				<b>3RA2908-1A</b>			

# Coupling Relays – Narrow Design

3RQ3

**Overview**



SIRIUS 3RQ3 coupling relays

SIRIUS 3RQ3 coupling relays in narrow design are used for coupling control signals from and to a controller, and they are available in different versions:

- Coupling relays with relay output (not plug-in)
- Coupling relays with plug-in relays
- Coupling relays with semiconductor output (not plug-in)

**Coupling relays with relay output**

**AC and DC operation**

IEC 60947-5-1, EN 60947-5-1

The input and output coupling relays differ with regard to the positioning of the terminals and the LEDs.

**Coupling relays with plug-in relays**

**AC and DC operation**

IEC 60947-1

The coupling relays are plug-in, so the relay can be replaced quickly at the end of its service life without detaching the wiring.

**Coupling relays with semiconductor output**

**AC and DC operation**

IEC 60947-1, EN 60664-1 and EN 50005;  
coupling relays with semiconductor output: EN 60747-5;  
programmable controllers: IEC 61131-2

The input and output coupling relays differ with regard to the positioning of the terminals and the LEDs.

The coupling relays with semiconductor output have extremely high contact reliability, so they are especially suitable for electronic systems.

For test purposes, versions are available with manual-0-automatic switches.

**Spring-type terminal with push-in functionality**

Push-in connections are a form of spring-type terminals allowing fast wiring without tools for rigid conductors or conductors equipped with end sleeves.

As with other spring-type terminals, a screwdriver (with 3.0 x 0.5 mm blade) is required to disconnect the conductor. The same tool can also be used to wire finely-stranded conductors with no end finishing.

The advantages of the push-in terminals are found, as with all spring-type terminals, in speed of assembly and disassembly and vibration-proof connection. There is no need for the checking and tightening required with screw terminals.

Note:

For the conversion tool e.g. from 3TX7 to 3RQ3, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool).

**Article No. scheme**

Digit of the Article No.	1st - 4th	5th	6th	7th	8th	9th	10th	11th	12th
	□□□□	□	□	□	-	□	□	□	□
<b>Coupling relays in the new 6.2 mm enclosure</b>	<b>3RQ3</b>								
<b>Function</b>		<input type="checkbox"/>							
<b>Design and type of output</b>			<input type="checkbox"/>						
<b>Switching current at the output</b>				<input type="checkbox"/>					
<b>Connection methods</b>					<input type="checkbox"/>				
<b>Contacts</b>						<input type="checkbox"/>			
<b>Rated control supply voltage</b>							<input type="checkbox"/>		
<b>Max. switchable voltage at the output</b>								<input type="checkbox"/>	
<b>Contact variant</b>									<input type="checkbox"/>
<b>Example</b>	<b>3RQ3</b>	<b>1</b>	<b>1</b>	<b>8</b>	<b>-</b>	<b>1</b>	<b>A</b>	<b>M</b>	<b>0 0</b>

Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the catalog in the Selection and ordering data.



## Coupling Relays – Narrow Design

3RQ3

**Benefits****General**

- All versions with screw terminals or spring-type terminals (push-in technology)
- TOP wiring for spring-type terminals (push-in) for quick and reliable wiring.
- Reduced space requirement in the control cabinet thanks to a consistent width of 6.2 mm
- Reduced inventory due to fewer variants
- Clearly visible functional state of the coupling relay by green LED
- Integrated reverse polarity protection and EMC arc-suppression diode
- Standardized accessories across the entire 3RQ3 series
- Universal bridging option using connecting combs for all terminals
- Galvanic isolation plate for isolating different voltages for neighboring units
- Clip-on labels available as set for individual labeling

**Coupling relays with relay output**

- Permanently soldered relay for enhanced contact reliability
- Device variants with hard gold-plated contacts, hence high contact reliability at low currents

**Coupling relays with plug-in relays**

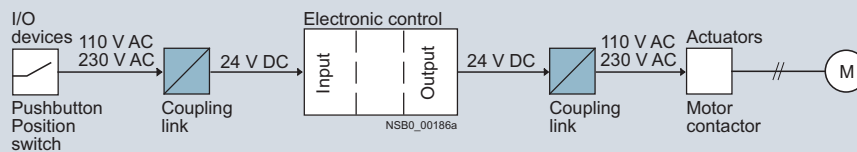
- Fast replacement of the relays with existing wiring
- Tested complete units → lower assembly time
- Individual relays available as spare parts
- Device variants with hard gold-plated contacts, hence high contact reliability at low currents

**Coupling relays with semiconductor output**

- Long service life since there is no mechanical wear
- High switching frequency thanks to short make-break times
- Vibration-resistant
- No contact bounce
- Extremely high contact reliability
- Noise-free switching
- Low control power required
- Switching of DC and capacitive loads

**Application**

- Electrical separation between the input and output circuit
- Adjustment of different signal levels
- Signal amplification

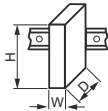




Application example motor controller

# Coupling Relays – Narrow Design

3RQ3

## Technical specifications

Type	3RQ3018-.AB0., 3RQ3018-.AE00, 3RQ3018-.AF00, 3RQ3038-.AB0., 3RQ3038-.AE0., 3RQ3038-.AF0., 3RQ3052-.SM50, 3RQ3053-.SG30	3RQ3018- 2A.08-0AA0	3RQ3050-.SM50, 3RQ3052-.SM30, 3RQ3052-.SM40, 3RQ3055-.SM30, 3RQ3070-.SB30	3RQ3065- .SM30	3RQ3070- .SG30	3RQ3118-.AB0., 3RQ3118-.AE0., 3RQ3118-.AF0., 3RQ3118-.AM0.
<b>General data</b>						
<b>Dimensions (W x H x D)</b>		mm	6.2 x 93 x 72.5	6.2 x 93 x 75	6.2 x 93 x 72.5	6.2 x 93 x 76
<b>Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value</b>	V		300	50	--	300
<b>Max. permissible voltage for protective separation between control circuit and auxiliary circuit</b>	V		300	50	--	300
<b>Permissible ambient temperature</b>						
• During operation	°C		-25 ... +60	-40 ... +70	-25 ... +60	
• During storage	°C		-40 ... +85			
<b>IP degree of protection</b>			IP20			
<b>Version of the fuse link required for short-circuit protection of the auxiliary switch</b>			Fuse gG: 4 A			
<b>Conductor cross-sections</b>						
<b>Main and auxiliary conductors</b> (1 or 2 conductors connectable)			 <b>Screw terminals</b>			
• Solid	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded with end sleeve	mm <sup>2</sup>		1x (0.25 ... 1.5)			
• AWG cables	AWG		1x (20 ... 14)			
<b>Main and auxiliary conductors</b> (1 or 2 conductors connectable)			 <b>Spring-type terminals</b>			
• Solid	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded without end sleeve	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded with end sleeve	mm <sup>2</sup>		1x (0.25 ... 1.5)			
• AWG cables	AWG		1x (20 ... 14)			

# Coupling Relays – Narrow Design

## 3RQ3

Type	3RQ3018-.AB00, 3RQ3018-.AE00, 3RQ3018-.AF00, 3RQ3018-2A.08- 0AA0, 3RQ3038-.AB00, 3RQ3038-.AE00, 3RQ3038-.AF00, 3RQ3118-.AB00, 3RQ3118-.AE00, 3RQ3118-.AF00, 3RQ3118-.AM00	3RQ3018-.AB01, 3RQ3038-.AB01, 3RQ3038-.AE01, 3RQ3038-.AF01, 3RQ3118-.AB01, 3RQ3118-.AE01, 3RQ3118-.AF01, 3RQ3118-.AM01	3RQ3050- .SM50	3RQ3052-.SM30, 3RQ3053-.SG30, 3RQ3055-.SM30, 3RQ3065-.SM30	3RQ3052- .SM40	3RQ3052- .SM50	3RQ3070- .S.30
------	--	---	-------------------	---	-------------------	-------------------	-------------------

Load side								
<b>Operational current of the auxiliary contacts</b>								
• At AC-15								
- At 24 V	A	3						
- At 250 V	A	3						
• At DC-13								
- At 24 V	A	1						
- At 125 V	A	0.2						
- At 250 V	A	0.1						
<b>Contact reliability of the auxiliary contacts</b> (one incorrect switching operation per 100 million)		17 V, 1 mA	5 V, 1 mA					
<b>Switching voltage of the semiconductor output</b>								
• At AC	V	--					19.2 ... 264	--
• At DC	V	--		20 ... 60	10 ... 30	20 ... 60	--	10 ... 30
<b>Current carrying capacity of the semiconductor output, minimal</b>								
• At AC	A	--					0.05	--
• At DC	A	--		0.01	0.5		--	0.01
<b>Mechanical endurance, typical</b>	Operating cycles	10 000 000						
<b>Electrical endurance, typical</b>								
• At AC-15 at 230 V	Operating cycles	100 000						

### Coupling relays with relay output

Type		3RQ3018-.AB0., 3RQ3038-.AB0.	3RQ3018-.AE00, 3RQ3038-.AE0.	3RQ3018-.AF00, 3RQ3038-.AF0.	3RQ3018-2AM08- 0AA0	3RQ3018-2AN08- 0AA0
<b>Operating range factor of the control supply voltage, rated value</b>						
• At AC, at 50 Hz		0.8 ... 1.25	0.8 ... 1.1		--	
• At DC		0.8 ... 1.25	0.8 ... 1.1		0.7 ... 1.25	
<b>Active power input</b>	W	0.3	0.7	1	0.3	0.6
<b>Thermal current</b>	A	6				

### Coupling relays with plug-in relays

Type		3RQ3118-.AB0.	3RQ3118-.AE0.	3RQ3118-.AF0.	3RQ3118-.AM0.
<b>Operating range factor of the control supply voltage, rated value</b>					
• At AC, at 50 Hz		0.8 ... 1.25	0.8 ... 1.1		--
• At DC		0.8 ... 1.25	0.8 ... 1.1		0.8 ... 1.25
<b>Active power input</b>	W	0.3	0.7	1	0.3
<b>Thermal current</b>	A	6			

### Coupling relays with semiconductor output

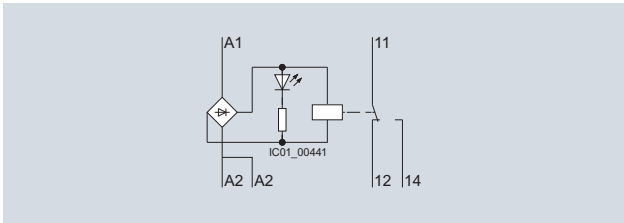
Type		3RQ3050- .SM50	3RQ3052-.SM30, 3RQ3052-.SM40	3RQ3052- .SM50	3RQ3053- .SG30	3RQ3055-.SM30, 3RQ3065-.SM30	3RQ3070- .SB30	3RQ3070- .SG30
<b>Operating range factor of the control supply voltage, rated value</b>								
• At AC, at 50 Hz		--			0.8 ... 1.1	--		0.8 ... 1.1
• At DC		0.8 ... 1.25			0.8 ... 1.1	0.8 ... 1.25		0.8 ... 1.1
<b>Active power input</b>	W	0.3		0.25	0.3		0.7	
<b>Thermal current</b>	A	0.5	2		3	5	0.5	

# Coupling Relays – Narrow Design

## 3RQ3

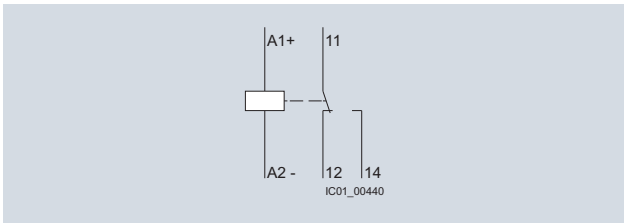
### Circuit diagrams

#### Coupling relays with relay output (not plug-in)



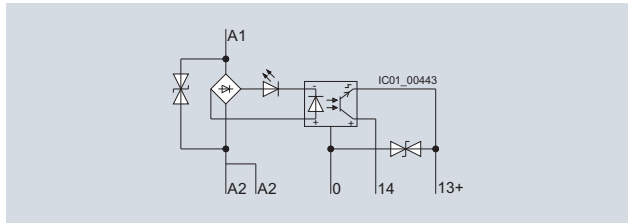
3RQ30.8

#### Coupling relays with plug-in relays

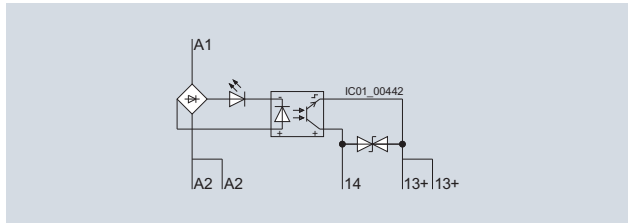


3RQ3118

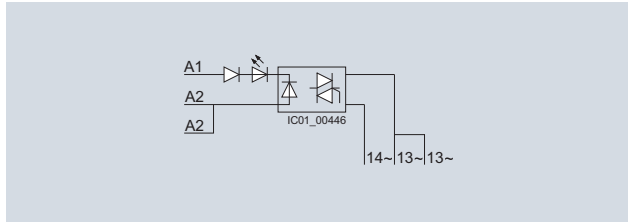
#### Coupling relays with semiconductor output (not plug-in)



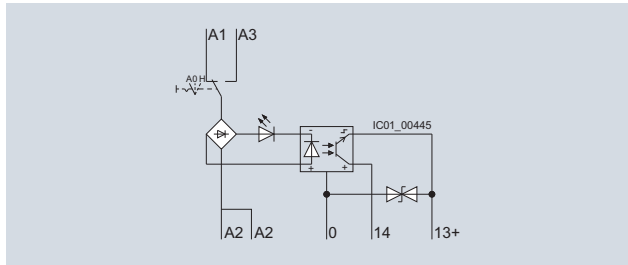
3RQ305.-.S.30



3RQ305.-.SM.0, 3RQ3070.-S.30



3RQ3052.-SM50



3RQ3065.-SM30

# Coupling Relays – Narrow Design

## 3RQ3 with relay output

### Selection and ordering data



PU (UNIT, SET, M)= 1  
 PS\* = 5 units  
 PG = 41H



3RQ30.8-1



3RQ30.8-2

Control supply voltage rated value	Number of CO contacts for auxiliary contacts	Contacts hard gold-plated	DT	Screw terminals 	DT	Spring-type terminals (push-in) 	
				Article No.	Price per PU	Article No.	Price per PU

V

### Coupling relays with relay output

#### Output coupling links

Control supply voltage	Number of CO contacts	Contacts	DT	Screw terminals	DT	Spring-type terminals
24 AC/DC	1	--	A	<b>3RQ3018-1AB00</b>	A	<b>3RQ3018-2AB00</b>
		✓	A	<b>3RQ3018-1AB01</b>	A	<b>3RQ3018-2AB01</b>
115 AC/DC	1	--	A	<b>3RQ3018-1AE00</b>	A	<b>3RQ3018-2AE00</b>
230 AC/DC	1	--	A	<b>3RQ3018-1AF00</b>	A	<b>3RQ3018-2AF00</b>
24 DC	1	--		--	A	<b>3RQ3018-2AM08-0AA0</b>
110 DC	1	--		--	A	<b>3RQ3018-2AN08-0AA0</b>

#### Input coupling links

Control supply voltage	Number of CO contacts	Contacts	DT	Screw terminals	DT	Spring-type terminals
24 AC/DC	1	--	A	<b>3RQ3038-1AB00</b>	A	<b>3RQ3038-2AB00</b>
		✓	A	<b>3RQ3038-1AB01</b>	A	<b>3RQ3038-2AB01</b>
115 AC/DC	1	--	A	<b>3RQ3038-1AE00</b>	A	<b>3RQ3038-2AE00</b>
		✓	A	<b>3RQ3038-1AE01</b>	A	<b>3RQ3038-2AE01</b>
230 AC/DC	1	--	A	<b>3RQ3038-1AF00</b>	A	<b>3RQ3038-2AF00</b>
		✓	A	<b>3RQ3038-1AF01</b>	A	<b>3RQ3038-2AF01</b>

✓ Available  
 -- Not available

# Coupling Relays – Narrow Design

## 3RQ3 with plug-in relays

### Selection and ordering data



PU (UNIT, SET, M)= 1  
 PS\* = 5 units  
 PG = 41H



3RQ3118-1



3RQ3118-2

Control supply voltage rated value	Number of CO contacts for auxiliary contacts	Contacts hard gold-plated	DT	Screw terminals 	DT	Spring-type terminals (push-in) 	
				Article No.	Price per PU	Article No.	Price per PU

V

### Coupling relays with plug-in relays

#### Output coupling links

24 AC/DC	1	--	A	<b>3RQ3118-1AB00</b>	A	<b>3RQ3118-2AB00</b>
		✓	A	<b>3RQ3118-1AB01</b>	A	<b>3RQ3118-2AB01</b>
115 AC/DC	1	--	A	<b>3RQ3118-1AE00</b>	A	<b>3RQ3118-2AE00</b>
		✓	A	<b>3RQ3118-1AE01</b>	A	<b>3RQ3118-2AE01</b>
230 AC/DC	1	--	A	<b>3RQ3118-1AF00</b>	A	<b>3RQ3118-2AF00</b>
		✓	A	<b>3RQ3118-1AF01</b>	A	<b>3RQ3118-2AF01</b>
24 DC	1	--	A	<b>3RQ3118-1AM00</b>	A	<b>3RQ3118-2AM00</b>
		✓	A	<b>3RQ3118-1AM01</b>	A	<b>3RQ3118-2AM01</b>

✓ Available  
 -- Not available

# Coupling Relays – Narrow Design

## 3RQ3 with semiconductor output

### Selection and ordering data

PU (UNIT, SET, M)= 1  
 PS\* = 5 units  
 PG = 41H



3RQ3050-1SM50



3RQ3050-2SM50

Control supply voltage rated value	Current carrying capacity of the semiconductor output				Manual-0-automatic switch	DT	Screw terminals		DT	Spring-type terminals (push-in)	
	Resistive load	At DC-13		At AC-15			Article No.	Price per PU		Article No.	Price per PU
V	A	At 24 V	At 60 V	At 240 V At 50/60 Hz							

### Coupling relays with semiconductor output

#### Output coupling links

Control supply voltage	Resistive load (A)	At DC-13 (A)	At 60 V (A)	At AC-15 (A)	Manual-0-automatic switch	DT	Article No.	Price per PU	DT	Article No.	Price per PU
24 DC	0.5	0.5	0.5	--	--	A	3RQ3050-1SM50		A	3RQ3050-2SM50	
	2	2	--	--	--	A	3RQ3052-1SM30		A	3RQ3052-2SM30	
		2	2	--	--	--	A	3RQ3052-1SM40		A	3RQ3052-2SM40
	2	--	--	2	--	A	3RQ3052-1SM50		A	3RQ3052-2SM50	
	5	5	--	--	--	A	3RQ3055-1SM30		A	3RQ3055-2SM30	
					✓	A	3RQ3065-1SM30		A	3RQ3065-2SM30	
110 ... 230 AC/DC	3	3	--	--	--	A	3RQ3053-1SG30		A	3RQ3053-2SG30	

#### Input coupling links




Control supply voltage	Resistive load (A)	At DC-13 (A)	At 60 V (A)	At AC-15 (A)	Manual-0-automatic switch	DT	Article No.	Price per PU	DT	Article No.	Price per PU
24 DC	0.5	5	--	--	--	A	3RQ3070-1SB30		A	3RQ3070-2SB30	
110 ... 230 AC/DC	0.5	0.5	--	--	--	A	3RQ3070-1SG30		A	3RQ3070-2SG30	

✓ Available  
 -- Not available

# Coupling Relays – Narrow Design

## 3RQ3 accessories

### Selection and ordering data

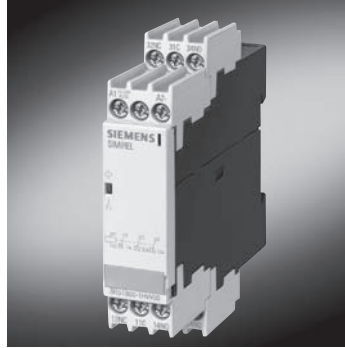
Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
<b>Galvanic isolation plates</b>							
 3RQ3900-0A		<b>Galvanic isolation plates</b>					
	A	3RQ3900-0A					
For electrical separation of different potentials when devices of different types are installed side by side							
<b>Connecting combs</b>							
 3RQ3901-0B		<b>Connecting combs</b>					
		For linking the same potentials, current carrying capacity for infeed max. 6 A					
		• 2-pole	A	3RQ3901-0A	1	10 units	41H
		• 4-pole	A	3RQ3901-0B	1	10 units	41H
		• 8-pole	A	3RQ3901-0C	1	10 units	41H
	• 16-pole	A	3RQ3901-0D	1	10 units	41H	
<b>Clip-on labels</b>							
		<b>Clip-on labels</b>					
		For terminal marking and equipment labeling, white					
		• 5 x 5 mm	A	3RQ3902-0A	100	2 000 units	41H
		• 6 x 12 mm	A	3RQ3902-0B	100	1 200 units	41H
<b>Tools for opening spring-type terminals</b>							
 3RA2908-1A		<b>Screwdrivers</b>					
	A	For all SIRIUS devices with spring-type terminals, 3.0 mm x 0.5 mm, length approx. 200 mm; titanium gray/black, partially insulated					
		<b>Spring-type terminals</b>					
		3RA2908-1A			1	1 unit	41B



# Interface Relays in a Rugged Industrial Enclosure

## 3RS18 relay interfaces

The new 3RS18 interface relays set new standards: They have a wide-range voltage extending from 24 V AC DC to 240 V. This makes them absolutely unique in the interface market. All of these devices are accommodated in a well-proven, rugged 22.5 mm wide enclosure. Relays with 1, 2 and 3 changeover contacts are available in both screw and Cage Clamp terminal versions. Not only this, also in combination and wide-range voltage with hard-gold-plated contacts for an especially high contact reliability – even at low current levels. Thanks to the well-proven, rugged enclosure, you can enjoy the benefits of user-friendly connection systems, including Cage Clamp terminals – just the same as delete our time relays. 2 conductors can be connected at each terminal point.



**Your advantages:**

- New, worldwide: One device for all voltages
- Lower costs due to fewer versions
- User-friendly wiring
- Especially high contact reliability even at low currents

**Applications:**

- Everywhere that contacts which are electronics-compatible are required and where devices with wide-range voltage are used
- Thanks to the hard-gold-plated contacts, predestined for PLC I/O

3RS18 interface relays in a rugged, industrial enclosure 22.5 mm wide			
Rated control supply voltage $V_S$	Contact versions	Order No.	List Price \$
<b>50 60 Hz</b>			
<b>Wide-range voltage</b> 24–240 V AC/DC	2 CO	3RS18 00-□BW00	
	3 CO	3RS18 00-□HW00	
	3 CO hard-gold-plated	3RS18 00-□HW01	
<b>Combination voltage</b> 24 V AC/DC and 110–120 V AC	1 CO	3RS18 00-□AQ00	
	2 CO	3RS18 00-□BQ00	
	3 CO	3RS18 00-□HQ00	
	3 CO hard-gold-plated	3RS18 00-□HQ01	
24 V AC/DC and 220–240 V AC	1 CO	3RS18 00-□AP00	
	2 CO	3RS18 00-□BP00	
	3 CO	3RS18 00-□HP00	
	3 CO hard-gold-plated	3RS18 00-□HP01	

Screw Terminal 1

Spring-type Terminal 2

# Signal Converters

## 3RS70

### Overview



SIRIUS 3RS70 signal converters

Signal converters perform the coupling function for analog signals on both the input side and the output side. They are indispensable when processing analog values with electronic controls. Under harsh industrial conditions in particular, it is often necessary to transmit analog signals over long distances. Electrical separation is then needed as a result of the different power supplies. The resistance of the wiring causes potential differences and losses which must be prevented.

Electromagnetic disturbance and overvoltages can affect the signals on the input side in particular or even destroy the analog modules. All terminals of the 3RS70 signal converters are safe up to a voltage of 30 V DC and protected against switching poles. Short-circuit protection is an especially important function for the outputs.

The devices are EMC-tested according to

- IEC 61000-6-4 (basic standard for emitted interference)
- IEC 61000-6-2 (basic standard for interference immunity)

The analog signals comply with

- IEC 60381-1/2.

Note:

For the conversion tool e.g. from 3RS17 to 3RS70, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool).

### Article No. scheme

Digit of the Article No.	1 <sup>st</sup> - 5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	-	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>	12 <sup>th</sup>
	□□□□□	□	□	-	□	□	□	0	0
Signal converters	3RS70								
Type of input signal		□	□						
Connection methods					□				
Type of output signal						□			
Version of the supply voltage							□		
Example	3RS70	0	0	-	1	A	E	0	0

Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the catalog in the Selection and ordering data.

### Benefits

- Narrow width
- Easy-to-set universal converters
- Converters with frequency output
- All ranges are fully calibrated
- Universal family of devices – the perfect solution for every application
- Integrated manual/automatic switch with a setpoint generator
- Outputs are short-circuit-proof
- Up to 30 V – protected against damage caused by wiring errors

### Application

- Signal converters are used in analog signal processing for
- Electrical separation
  - Conversion of normalized and non-normalized signals
  - Amplification and impedance adaptation
  - Conversion to a frequency for processing by a digital input
  - Overvoltage and EMC protection
  - Short-circuit protection of the outputs

# Signal Converters

## 3RS70

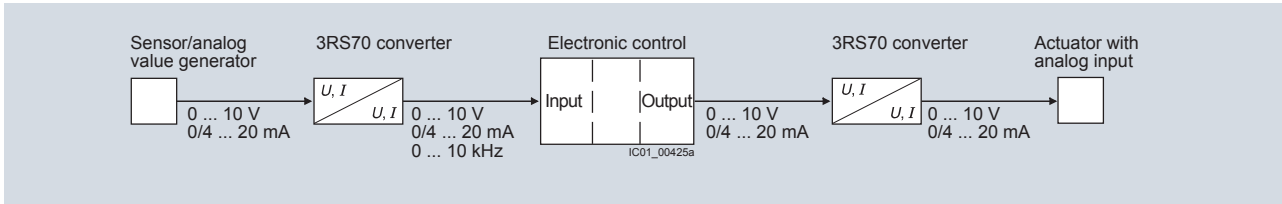
### 3RS7025 manual/automatic converter

For special applications in which analog signals have to be simulated, or during plant commissioning when the actual process value is not yet available, the 3RS7025 devices feature an adjustable potentiometer for manual setpoint selection and a manual/automatic switch.

The potentiometer for the 3RS7025 devices is used to simulate analog output signals when the changeover switch is set to "Manual" and the control supply voltage is applied, without the

need for an analog input signal. The scale ranges from 0 ... 100 %.

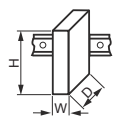


Example: When it is set for an output of 4 ... 20 mA, the left stop on the potentiometer represents an output current of 4 mA and the right stop represents an output current of 20 mA. In the "Auto" switch position, the output signal follows the input signal proportionally regardless of the potentiometer setting.



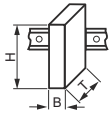


3RS70 interface converters, application example: analog signal processing

### Technical specifications

#### Single-range converters, active/passive

Type		3RS7000-AE00	3RS7000-CE00, 3RS7000-DE00	3RS7002-AE00, 3RS7003-AE00	3RS7002-CE00, 3RS7002-DE00, 3RS7003-CE00, 3RS7003-DE00	3RS7020-ET00
<b>General data</b>						
<b>Dimensions (W x H x D)</b>		mm	6.2 x 93 x 73			6.2 x 93 x 71
<b>Ambient temperature</b>		°C	-25 ... +60			
• During operation		°C	-40 ... +85			
• During storage						
<b>Relative humidity during operation</b>		%	10 ... 90			
<b>Insulation voltage</b>		V	50			
For overvoltage category III To IEC 60664 for pollution degree 3 Rated value						
<b>Active power input</b>		W	0.29			--
<b>Degree of protection</b>			IP20			
<b>Conductor cross-sections</b>						
 <b>Screw terminals</b>						
• Solid	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded with end sleeve	mm <sup>2</sup>		1x (0.25 ... 1.5)			
• AWG cables, solid	AWG		1x (20 ... 14)			
 <b>Spring-type terminals</b>						
• Solid	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded without end sleeve	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded with end sleeve	mm <sup>2</sup>		1x (0.25 ... 1.5)			
• AWG cables, solid	AWG		1x (20 ... 14)			
<b>Inputs</b>						
<b>Input voltage</b>		V	30			
• Max.		V	24			
• Typical						
<b>Input impedance</b>		Ω	--			100
• Of current input		kΩ	330			--
• Of voltage input						
<b>Outputs</b>						
<b>Load</b>		Ω	500			1000
• Maximum at current output		kΩ	2			--
• Maximum at voltage output			--	2	--	
<b>Relative measuring accuracy</b>		%	0.1			
<b>Overvoltage strength</b>		V	30			
Maximum at current output						
<b>Short-circuit proof</b>			Yes			

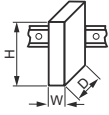


**Multi-range converters, active**

Type		3RS7005-.FE00	3RS7005-.KE00	3RS7005-.FW00	3RS7005-.KW00	3RS7025-.FE00, 3RS7025-.FW00
<b>General data</b>						
<b>Dimensions (W x H x D)</b>		mm	6.2 x 93 x 73		17.5 x 93 x 73	17.5 x 93 x 75
<b>Ambient temperature</b>		°C	-25 ... +60			
• During operation		°C	-40 ... +85			
• During storage						
<b>Relative humidity during operation</b>		%	10 ... 90			
<b>Insulation voltage</b>		V	50		300	
For overvoltage category III To IEC 60664 for pollution degree 3 Rated value						
<b>Active power input</b>		W	0.29		0.34	0.5
<b>Degree of protection</b>			IP20			
<b>Conductor cross-sections</b>						
			 <b>Screw terminals</b>			
• Solid	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded with end sleeve	mm <sup>2</sup>		1x (0.25 ... 1.5)			
• AWG cables, solid	AWG		1x (20 ... 14)			
			 <b>Spring-type terminals</b>			
• Solid	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded without end sleeve	mm <sup>2</sup>		1x (0.25 ... 2.5)			
• Finely stranded with end sleeve	mm <sup>2</sup>		1x (0.25 ... 1.5)			
• AWG cables, solid	AWG		1x (20 ... 14)			
<b>Inputs</b>						
<b>Input voltage</b>						
• Max.	V		30			
• Typical	V		24			
<b>Input impedance</b>						
• Of current input	Ω		100			
• Of voltage input	kΩ		330			
<b>Outputs</b>						
<b>Load</b>						
• Maximum at voltage output	kΩ		2	--	2	2
• Maximum at current output	Ω		500	--	500	500
<b>Relative measuring accuracy</b>		%	0.1			
<b>Overvoltage strength</b>		V	30			
Maximum at current output						
<b>Short-circuit proof</b>			Yes			

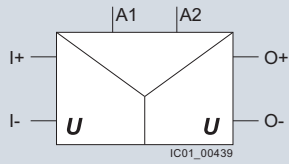
## Signal Converters

3RS70

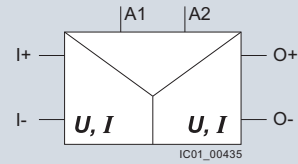
**Universal converters, active**

Type	<b>3RS7006-F.00</b>	
<b>General data</b>		
<b>Dimensions (W x H x D)</b>	mm	17.5 × 93 × 73
		
<b>Ambient temperature</b>		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +85
<b>Relative humidity during operation</b>	%	10 ... 90
<b>Insulation voltage</b>	V	300
For overvoltage category III To IEC 60664 for pollution degree 3 Rated value		
<b>Active power input</b>	W	0.5
<b>Degree of protection</b>		IP20
<b>Conductor cross-sections</b>		
 <b>Screw terminals</b>		
• Solid	mm <sup>2</sup>	1x (0.25 ... 2.5)
• Finely stranded with end sleeve	mm <sup>2</sup>	1x (0.25 ... 1.5)
• AWG cables, solid	AWG	1x (20 ... 14)
 <b>Spring-type terminals</b>		
• Solid	mm <sup>2</sup>	1x (0.25 ... 2.5)
• Finely stranded without end sleeve	mm <sup>2</sup>	1x (0.25 ... 2.5)
• Finely stranded with end sleeve	mm <sup>2</sup>	1x (0.25 ... 1.5)
• AWG cables, solid	AWG	1x (20 ... 14)
<b>Inputs</b>		
<b>Input voltage</b>		
• Max.	V	30
• Typical	V	24
<b>Input impedance</b>		
• Of current input	Ω	100
• Of voltage input	kΩ	330
<b>Outputs</b>		
<b>Load</b>		
• Maximum at voltage output	kΩ	2
• Maximum at current output	Ω	500
<b>Relative measuring accuracy</b>	%	0.1
<b>Overvoltage strength</b>	V	30
Maximum at current output		
<b>Short-circuit proof</b>		Yes

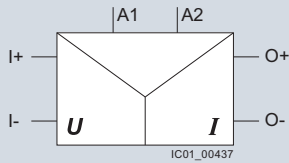
Circuit diagrams



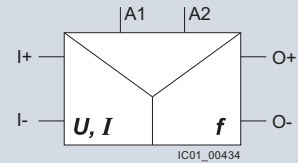
3RS7000-.AE00



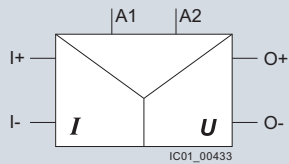
3RS7005-.FE00, 3RS7005-.FW00, 3RS7006-.FE00, 3RS7006-.FW00



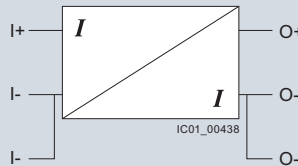
3RS7000-.CE00, 3RS7000-.DE00



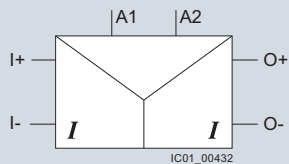
3RS7005-.KE00, 3RS7005-.KW00



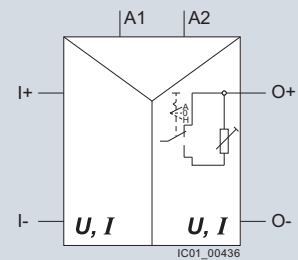
3RS7002-.AE00, 3RS7003-.AE00



3RS7020-.ET00



3RS7002-.CE00, 3RS7002-.DE00, 3RS7003-.CE00, 3RS7003-.DE00



3RS7025-.FE00., 3RS7025-.FW00

# Signal Converters

3RS70

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RELAYS, INTERFACES  
& CONVERTERS

## Selection and ordering data

PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41 H



3RS7000-1AE00






3RS7000-2AE00

Signal type		Supply voltage	Width	DT	Screw terminals		Spring-type terminals	
At the input	At the output				⊕	⊖	⊕	⊖
				mm	Article No.	Price per PU	Article No.	Price per PU
<b>Single-range converters, passive, 2-way separation</b>								
4 ... 20 mA	4 ... 20 mA	--	6.2	A	<b>3RS7020-1ET00</b>	A	<b>3RS7020-2ET00</b>	
<b>Single-range converters, active, 3-way separation</b>								
0 ... 10 V	0 ... 10 V	24 V AC/DC	6.2	A	<b>3RS7000-1AE00</b>	A	<b>3RS7000-2AE00</b>	
0 ... 20 mA	0 ... 10 V	24 V AC/DC	6.2	A	<b>3RS7002-1AE00</b>	A	<b>3RS7002-2AE00</b>	
4 ... 20 mA	0 ... 10 V	24 V AC/DC	6.2	A	<b>3RS7003-1AE00</b>	A	<b>3RS7003-2AE00</b>	
0 ... 10 V	0 ... 20 mA	24 V AC/DC	6.2	A	<b>3RS7000-1CE00</b>	A	<b>3RS7000-2CE00</b>	
0 ... 20 mA	0 ... 20 mA	24 V AC/DC	6.2	A	<b>3RS7002-1CE00</b>	A	<b>3RS7002-2CE00</b>	
4 ... 20 mA	0 ... 20 mA	24 V AC/DC	6.2	A	<b>3RS7003-1CE00</b>	A	<b>3RS7003-2CE00</b>	
0 ... 10 V	4 ... 20 mA	24 V AC/DC	6.2	A	<b>3RS7000-1DE00</b>	A	<b>3RS7000-2DE00</b>	
0 ... 20 mA	4 ... 20 mA	24 V AC/DC	6.2	A	<b>3RS7002-1DE00</b>	A	<b>3RS7002-2DE00</b>	
4 ... 20 mA	4 ... 20 mA	24 V AC/DC	6.2	A	<b>3RS7003-1DE00</b>	A	<b>3RS7003-2DE00</b>	
<b>Switchable multi-range converters, active</b>								
0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	24 V AC/DC 24 ... 240 V AC/DC	6.2 17.5	A A	<b>3RS7005-1FE00</b> <b>3RS7005-1FW00</b>	A A	<b>3RS7005-2FE00</b> <b>3RS7005-2FW00</b>	
	0 ... 50 Hz 0 ... 100 Hz 0 ... 1 kHz 0 ... 10 kHz	24 V AC/DC 24 ... 240 V AC/DC	6.2 17.5	A A	<b>3RS7005-1KE00</b> <b>3RS7005-1KW00</b>	A A	<b>3RS7005-2KE00</b> <b>3RS7005-2KW00</b>	
<b>Switchable multi-range converters, active, with manual/automatic switch and setting potentiometer as manual analog signal transmitter</b>								
0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	24 V AC/DC 24 ... 240 V AC/DC	17.5 17.5	A A	<b>3RS7025-1FE00</b> <b>3RS7025-1FW00</b>	A A	<b>3RS7025-2FE00</b> <b>3RS7025-2FW00</b>	
<b>Switchable universal converters, active, with 16 input ranges and 3 output ranges</b>								
0 ... 60 mV, 0 ... 100 mV, 0 ... 300 mV, 0 ... 500 mV, 0 ... 1 V, 0 ... 2 V, 0 ... 5 V, 0 ... 10 V, 0 ... 20 V, 2 ... 10 V, 0 ... 5 mA, 0 ... 10 mA, 0 ... 20 mA, 4 ... 20 mA, -5 ... +5 mA, -20 ... +20 mA	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	24 V AC/DC 24 ... 240 V AC/DC	17.5 17.5	A A	<b>3RS7006-1FE00</b> <b>3RS7006-1FW00</b>	A A	<b>3RS7006-2FE00</b> <b>3RS7006-2FW00</b>	

# Signal Converters

3RS70

## Accessories

Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
<b>Galvanic isolation plates</b>							
		<b>Galvanic isolation plates</b> For electrical separation of different potentials when devices of different types are installed side by side	A	<b>3RQ3900-0A</b>	1	10 units	41H
3RQ3900-0A							
<b>Connecting combs</b>							
		<b>Connecting combs</b> For linking the same potentials, current carrying capacity for infeed max. 6 A					
3RQ3901-0B		<ul style="list-style-type: none"> <li>• 2-pole</li> <li>• 4-pole</li> <li>• 8-pole</li> <li>• 16-pole</li> </ul>	A	<b>3RQ3901-0A</b>	1	10 units	41H
			A	<b>3RQ3901-0B</b>	1	10 units	41H
			A	<b>3RQ3901-0C</b>	1	10 units	41H
			A	<b>3RQ3901-0D</b>	1	10 units	41H
<b>Clip-on labels</b>							
		<b>Clip-on labels</b> For terminal marking and equipment labeling, white					
		• 5 x 5 mm	A	<b>3RQ3902-0A</b>	100	2 000 units	41H
<b>Tools for opening spring-type terminals</b>							
		<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	A	<b>3RA2908-1A</b>	1	1 unit	41B
3RA2908-1A							



# Signal Converters

3RS70

RELAYS, INTERFACES & CONVERTERS 11

## More information

### Active signal converters

Active signal converters provide maximum flexibility for the application by the use of an external supply voltage. Configuration with active signal converters is extremely easy because input and output resistances and voltage drops are compensated by the auxiliary supply. They support electrical separation as well as conversion from one signal type to another or reinforcement. The load of the measured value transmitter is negligible.

### Passive signal converters

Passive signal converters do not require an external supply voltage. This advantage can only be used by current signals that are converted 1:1. Reinforcement or conversion is not possible. The converters are used for complete electrical separation of current signals and to protect the inputs and outputs. Passive signal converters do not operate reaction-free, i.e. any load on the output produces an equal load on the input signal. When the passive converter is to be used, the output power of the sensor and the input resistance of the analog input must be analyzed.

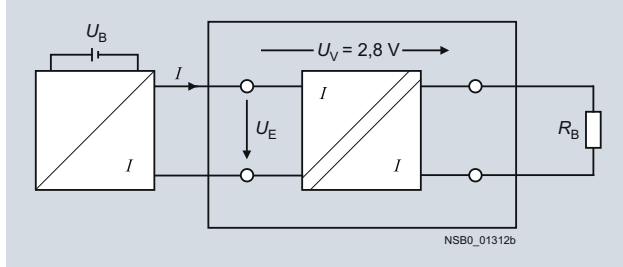
#### Calculation guide for passive converters

Important: Please note the following when using passive signal converters:

The current-driving voltage of the measuring transducer  $U_E$  must be sufficient to drive the maximum current of 20 mA over the passive separators with a voltage loss of  $U_V = 2.8$  V and the load  $R_B$ .

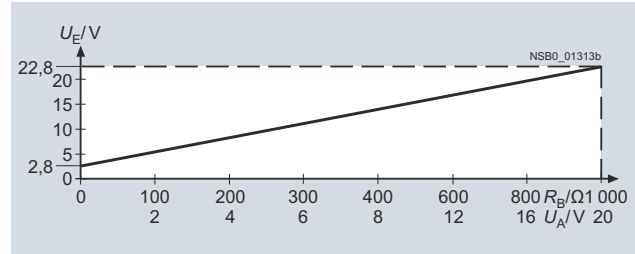
This means that:

$$U_B \geq U_E = 2.8 \text{ V} + 20 \text{ mA} \times R_B$$



Distribution of the voltages in the case of passive signal converters

The following figure shows the input voltage  $U_E$  as a function of the load  $R_B$  taking into account the voltage loss  $U_V$ . If the load is known, the y-axis shows the minimum voltage that has to be supplied by the current source in order to drive the maximum current of 20 mA over the passive signal converter and load.



Input voltage depending on the load at  $I_a = 20$  mA

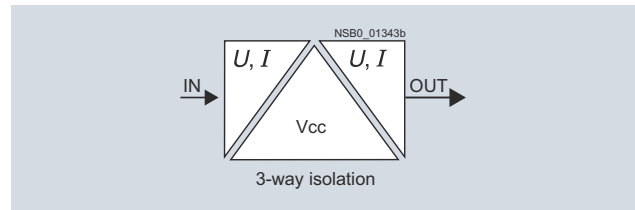
### Load rating of the outputs

A maximum output load is specified for current signals. This resistance value specifies how large the input resistance of the next device connected in series can be as a result of the power of the converter.

For voltage signals, the maximum current that can be drawn from the output is the decisive factor.

### 3-way separation

For the 3-way separation, each circuit is electrically separated from the other circuits, i.e. input, output, and control supply voltage do not have equipotential bonding.



3-way separation

# Coupling Relays and Interfaces

## 3TG10 power relays

### Overview

#### Version

The 3TG10 contactors with 4 main contacts are available with screw-type terminals or with 6.3 mm to 0.8 mm tab connectors. The designs with screw-type terminals are suitable for use in any climate and safe from touch to DIN VDE 0106 Part 100.

The 3TG10 contactors have a compact design. Their overall width is 36 mm.

### Application

They are suitable for use in household appliances as well as for distribution boards in offices and residential buildings, owing to their hum-free construction. They can further be used in all areas where there is only a limited amount of space available, e.g. in air conditioners, heating systems, pumps and fans - basically in all simple electrical controls.

#### AC and DC operation

EN 60 947-4-1  
(VDE 0660 Part 102).

#### Surge suppression


The 3TG10 contactors are fitted with an integrated protective circuit for damping opening surges.

#### Overload and short-circuit protection

The 3UA7 overload relay can be used for overload protection (see NS E catalogue, available in German). This applies both for contactor mounting and for mounting as a single unit.


The data for short-circuit protection of the contactors without using an overload relay are provided in the technical data.

### Selection and ordering data

Ratings Utilization category			Main contacts	Rated control supply voltage $U_c$	Order No.	List Price \$	Weight approx.	Pack
AC-1 maximum resistive load	Horsepower ratings of three-phase loads at 50 Hz 400 V	AC-3 maximum inductive current	Design 					
A	kW	A	NO NC				kg	Units

#### With screw connections, 4-pin for screwing and snapping onto 35 mm standard mounting rail · hum-free

##### • AC operation


	3TG10 ...0	20	5	8.4	4 -	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	<b>3TG10 10-0AL2</b> <b>3TG10 10-0AG2</b> <b>3TG10 10-0AC2</b>	0.15	10
					3 1	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	<b>3TG10 01-0AL2</b> <b>3TG10 01-0AG2</b> <b>3TG10 01-0AC2</b>	0.15	10

##### • DC operation

	20	5	8.4	4 -	DC 24 V	<b>3TG10 10-0BB4</b> <b>3TG10 01-0BB4</b>	0.15	10
				3 1	DC 24 V			

#### With tab connectors 6.3 x 0.8 mm, 4-pin for screwing and snapping onto 35 mm standard mounting rail · hum-free

##### • AC operation

	3TG10 ...-1	16	5	8.4	4 -	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	<b>3TG10 10-1AL2</b> <b>3TG10 10-1AG2</b> <b>3TG10 10-1AC2</b>	0.14	10
					3 1	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	<b>3TG10 01-1AL2</b> <b>3TG10 01-1AG2</b> <b>3TG10 01-1AC2</b>	0.14	10

##### • DC operation

	16	5	8.4	4 -	DC 24 V	<b>3TG10 10-1BB4</b> <b>3TG10 01-1BB4</b>	0.14	10
				3 1	DC 24 V			

1) The links for paralleling can be reduced by one pole. The rated operational currents are valid for each pole. The links for paralleling are insulated.

## Coupling Relays and Interfaces

## 3TG10 power relays

## Technical data

## General data

<b>Mechanical endurance</b>	operating cycles			3 mill.
<b>Electrical endurance at <math>I_e</math></b>	operating cycles	AC-1 AC-3		0.1 million 0.4 million
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)			V	400
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>			kV	4
<b>Safe isolation</b> acc. to DIN VDE 0106 Part 101 and A1 (draft 2/89) between coil and contacts			V	up to 300
<b>Permissible ambient temperature</b>	in operation <sup>1)</sup>		°C	-25 ... +55
	when stored		°C	-50 ... +80
<b>Degree of protection</b> acc. to IEC 60 947-1 and IEC 60 529 (VDE 0470 Part 1)				IP 00, coil system IP 20
<b>Power consumption of the coils</b> (with coil in cold state and $1.0 \times U_s$ )				
	AC operation 45 – 450 Hz		VA	4.4
	p.f.			0.9 (hum-free)
	DC operation		W	4
<b>Coil voltage tolerance</b>				$0.85$ to $1.1 \times U_s$
<b>Operating times</b> (break-time = opening time + arcing time)				AC operation   DC operation
	Closing	closing time	NO ms	10 ... 50
		opening time	NC ms	5 ... 45
	Opening	opening time	NO ms	20 ... 30
		closing time	NC ms	20 ... 30
	Arcing time		ms	10 to 15
<b>Shock resistance</b>				
rectangular pulse	AC and DC operation		g/ms	5.1/5 and 3.5/10
sine pulse	AC and DC operation		g/ms	7.9/5 and 5.2/10
<b>Operating frequency <math>z</math></b> in operating cycles per hour				
Rated operation	No-load op. frequency		1/h	10000
	for AC-1		1/h	1000
	for AC-2		1/h	500
	for AC-3		1/h	1000

## Short-circuit protection

<b>Fuse links</b>	NH	Type 3NA		
Utilisation category gL/gG	DIAZED	Type 5SB		
	NEOZED	Type 5SE		
acc. to IEC 60 947-4-1 (DIN VDE 0660 Part 102)	Type of coordination "1"		A	25
	Type of coordination "2"		A	10
Miniature circuit-breaker	C-characteristic		A	10

## Load ratings with AC

<b>AC-1 utilisation category, switching resistive load</b>				
<b>Rated operational current <math>I_e</math></b> at 55 °C to 400 V <sup>1)</sup>				
with screw connection			A	20
with tab connector			A	16
<b>Ratings <math>U_e</math></b> of three-phase loads p.f. = 1			V	400
with screw connection			kW	13
with tab connector			kW	10
Minimum conductor cross-section with $I_{e\text{ load}}$			mm <sup>2</sup>	2.5

1) If the three main conducting paths are loaded with 20 A and  $I > 10$  A for the fourth conducting

path; the permissible ambient temperature is 40 °C.

Technical data										
<b>Load ratings with AC</b>										
<b>AC-2 and AC-3 utilisation categories</b>										
Rated operational currents $I_e$ up to 400 V	A	8.4								
Ratings of motors with slipping or squirrel-cage rotor at 50 Hz and 60 Hz and at 400 V	kW	4								
<b>AC-5a utilisation category</b> (permissible supply impedance: $\geq 0.5 \Omega$ )										
<b>Switching gas discharge lamps</b> per main conducting path at 50 Hz 230 V										
		Uncorrected			Lead-lag					
Rating per lamp	W	18	36	58	18	36	58			
Rated operational current per lamp	A	0.37	0.43	0.67	2 x 0.11	2 x 0.21	2 x 0.32			
Number of lamps	unit	43	37	24	2 x 81	2 x 42	2 x 28			
<b>Switching gas discharge lamps with correction, electronic ballast</b> per main conducting path at 50 Hz 230 V										
		Parallel correction			Electr. ballast, 1 lamp		Electr. ballast, 2 lamps			
Rating per lamp	W	18	36	58	18	36	58	18	36	58
Capacitor	$\mu\text{F}$	4.5	4.5	7	6.8	6.8	10	10	10	22
Rated operational current per lamp	A	0.11	0.21	0.32	0.10	0.18	0.27	0.18	0.35	0.52
Number of lamps	unit	15	15	10	39	39	26	2 x 26	2 x 26	2 x 1
<b>AC-5b utilisation category, switching incandescent lamps</b> per main conducting path at 50 Hz 230 V										
	kW	1.6								
<b>Load ratings with DC</b>										
<b>DC-1 utilisation category, switching resistive load</b> ( $\frac{L}{R} \leq 1 \text{ ms}$ )										
<b>Rated operational current <math>I_e</math></b>										
		Conducting paths connected in series		1	2	3	4			
		up to 24 V	A	16	16	18	20			
		60 V	A	6	16	18	20			
		110 V	A	2	6	16	20			
		220 V/240 V	A	0.8	1.6	6	20			
<b>DC-3 and DC-5 utilisation categories, shunt and series motors</b> ( $\frac{L}{R} \leq 15 \text{ ms}$ )										
<b>Rated operational current <math>I_e</math></b>										
		Conducting paths connected in series		1	2	3	4			
		up to 24 V	A	10	16	16	18			
		60 V	A	0.5	5	16	16			
		110 V	A	0.15	0.35	10	10			
		220 V/240 V	A	–	–	1.75	2			
<b>Conductor cross-sections for designs</b>										
<b>with screw connections</b>										
Screw connection		M3								
Finely stranded with end sleeve (DIN 46 228, style A/D/C)	mm <sup>2</sup>	2 x (0.75 to 2.5)								
Solid	mm <sup>2</sup>	2 x (1 to 2.5)								
	mm <sup>2</sup>	1 x 4								
<b>with tab connectors</b>										
Finely stranded		6.3 to 1	mm <sup>2</sup>	0.5 to 1						
When using push-on contact acc. to DIN 46 245/46 247		6.3 to 2.5	mm <sup>2</sup>	1 to 2.5						
<b>Ⓢ and Ⓣ ratings (screw connection)</b>										
<b>Rated insulation voltage</b>										
	AC	V	600							
<b>Conventional thermal current</b>										
	Free air and enclosed	A	20							
<b>Maximum horsepower ratings</b> (Ⓢ and Ⓣ-approved values)										
Ratings of three-phase motors at 60 Hz										
				1-phase	3-phase					
	at 115 V	hp	1/2	–	–					
	200 V	hp	1	3	3					
	230 V	hp	1 1/2	3	3					
	460 V/575 V	hp	–	5	5					
	600 V	hp	–	5	5					

# Coupling Relays and Interfaces

## 3TG10 power relays

### Accessories

For contactor	Design	Order No.	List Price \$	Weight approx.	Pack
Type	Max. rated operational currents $I_{th}/AC-1$ (at 55 °C) of contactors A	Max. conductor cross-sections mm <sup>2</sup>	PG 101	kg	Units

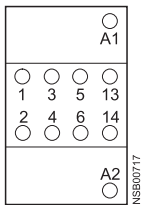
### Links for paralleling (star jumpers)

<ul style="list-style-type: none"> <li>• 3-pole without terminal <sup>1)2)</sup></li> </ul>					
3TG10	16 Star jumpers can be reduced by one pole	–	<b>3RT1 916-4BA31</b>	0.004	1
<ul style="list-style-type: none"> <li>• 3-pole with terminal <sup>1)3)</sup></li> </ul>					
3TG10	40	25	<b>3RT1 916-4BB31</b>	0.013	1
<ul style="list-style-type: none"> <li>• 4-pole with terminal <sup>1)4)</sup></li> </ul>					
3TG10	50	25	<b>3RT1 916-4BB41</b>	0.02	1

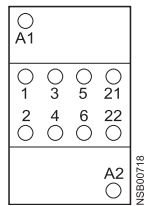
### Circuit diagrams

#### Position of terminals

**3TG10 10**  
1 NO

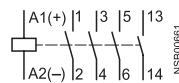


**3TG10 01**  
1 NC

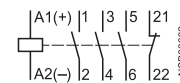


#### Internal circuit diagram

**3TG10 10**  
1 NO  
Ident. 10E



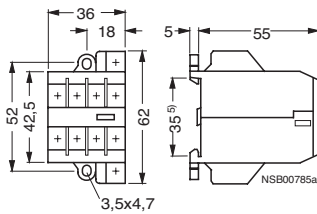
**3TG10 01**  
1 NC  
01E



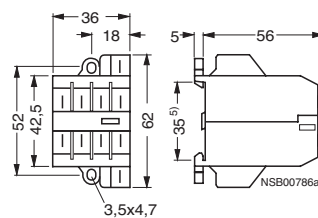
### Dimension drawings

#### AC and DC operation

**3TG10 ..-0..**  
with screw connections

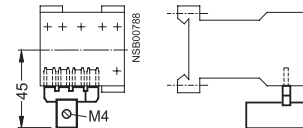


**3TG10 ..-1..**  
with tab connectors



#### Accessories for 3TG10

**3RT19 16-4BB41 links for paralleling, 4-pole, with terminal**



The links for paralleling can be reduced by one pole.

- 1) The links for paralleling can be reduced by one pole. The rated operational currents are valid for each pole. The links for paralleling are insulated.
- 2) Replacement type for 3TX44 90-2C.
- 3) Replacement type for 3TX44 90-2A.
- 4) Replacement type for 3TX44 90-2B.
- 5) Can be snapped onto 35 mm standard mounting rails.

# Coupling Relays and Interfaces

## 3TX71 plug-in relays

### Selection and ordering data

Siemens offers a wide range of plug-in relays to meet your industrial needs. Basic style relays are the most economical and are equipped with a mechanical flag indicator only. Premium style relays are full featured with LED and mechanical flag indication, push to test button and typically a latching hold down door which provides a method of activating the contacts without applying power to the coil. This feature is very handy during commissioning and troubleshooting. Premium Bifurcated style relays are ideal for low minimum holding current requirements on the contacts. Typical minimum holding current for bifurcated contacts is 3mA instead of 100mA.

Relays are divided up by the following functions for selection:

- Base style
- Contact Arrangement
- Contact Rating
- Coil Voltage
- Optional Features (Basic, Premium and Premium Bifurcated)



### Square Base (Narrow)

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
SPDT	15	12VDC	3TX7110-5BB03C	3TX7110-5JB03	4E7	1L7	B	3L5	3L4
		24 VDC	3TX7110-5BC03C	3TX7110-5JC03	4E7	1L7	B	3L5	3L4
		24 VAC	3TX7110-5BC13C	3TX7110-5JC13	4E7	1L7	B	3L5	3L4
		120 VAC	3TX7110-5BF13C	3TX7110-5JF13	4E7	1L7	B	3L5	3L4
		240 VAC	—	3TX7110-5JG13	4E7	1L7	B	3L5	3L4



### Square Base (Standard)

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
DPDT	12	24 VDC	3TX7111-3DC03C	3TX7111-3LC03	4E5	1L6	B	3L7	3L6
		24 VAC	3TX7111-3DC13C	3TX7111-3LC13	4E5	1L6	B	3L7	3L6
		120 VAC	3TX7111-3DF13C	3TX7111-3LF13	4E5	1L6	B	3L7	3L6
DPDT	15	12 VDC	3TX7114-5DB03C	3TX7114-5LB03	4E6	1L6	B	3L7	3L6
		24VDC	3TX7114-5DC03C	3TX7114-5LC03	4E6	1L6	B	3L7	3L6
		24VAC	3TX7114-5DC13C	3TX7114-5LC13	4E6	1L6	B	3L7	3L6
		120 VAC	3TX7114-5DF13C	3TX7114-5LF13	4E6	1L6	B	3L7	3L6
DPDT	10	240 VAC	—	3TX7114-5LH13	4E6	1L6	B	3L7	3L6
		12 VDC	3TX7115-5DB03C	—	4E4	1L12	A	—	—
		24VDC	3TX7115-5DC03C	3TX7115-5LC03	4E4	1L12	A	—	—
		24VAC	3TX7115-5DC13C	3TX7115-5LC13	4E4	1L12	A	—	—
DPDT	10	120 VAC	3TX7115-5DF13C	3TX7115-5LF13	4E4	1L12	A	—	—

Option	Basic	Premium
Mechanical Flag	✓	✓
Push To Test		✓
Lock Down Door		✓
LED		✓

Note: See page 11/131 for socket accessories.

## Coupling Relays and Interfaces

## 3TX71 plug-in relays

## Selection and ordering data



## Square Base (Standard)

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Premium Bifurcated	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
3PDT	15	24VDC	3TX7116-5FC03C	3TX7116-5NC03	—	4E8	1L9	A	1M3	1M4
		24VAC	3TX7116-5FC13C	3TX7116-5NC13	—	4E8	1L9	A	1M3	1M4
		120 VAC	3TX7116-5FF13C	3TX7116-5NF13	—	4E8	1L9	A	1M3	1M4
3PDT	10	24VDC	—	3TX7115-5NC03	—	4E4	1L12	A	—	—
		120 VAC	3TX7115-5FF13C	3TX7115-5NF13	—	4E4	1L12	A	—	—
4PDT	6A for Basic and Premium and 3A for Bifurcated	24VDC	3TX7111-3HC03C	3TX7111-3PC03	3TX7111-5PC03B	4E5	1L6	B	3L7	3L6
		24VAC	3TX7111-3HC13C	3TX7111-3PC13	—	4E5	1L6	B	3L7	3L6
		120 VAC	3TX7111-3HF13C	3TX7111-3PF13	3TX7111-5PF13B	4E5	1L6	B	3L7	3L6
		240 VAC	—	3TX7111-3PG13	—	4E5	1L6	B	3L7	3L6
4PDT	15	24VDC	3TX7117-5HC03C	3TX7117-5PC03	—	4E9	1L10	A	1M5	1M6
		24VAC	3TX7117-5HC13C	3TX7117-5PC13	—	4E9	1L10	A	1M5	1M6
		120 VAC	3TX7117-5HF13C	3TX7117-5PF13	—	4E9	1L10	A	1M5	1M6

Option	Basic	Premium	Premium Bifurcated
Mechanical Flag	✓	✓	✓
Push To Test		✓	✓
Lock Down Door		✓	✓
LED		✓	✓

Note: See page 11/131 for socket accessories.

# Coupling Relays and Interfaces

## 3TX71 plug-in relays

### Selection and ordering data



#### Standard Octal Base

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set
DPDT	10	12 VDC	3TX7112-1DB03C	3TX7112-1LB03	4E2	1L14	A
		24VDC	3TX7112-1DC03C	3TX7112-1LC03	4E2	1L14	A
		24VAC	3TX7112-1DC13C	3TX7112-1LC13	4E2	1L14	A
		120 VAC	3TX7112-1DF13C	3TX7112-1LF13	4E2	1L14	A
		240 VAC	3TX7112-1DG13C	3TX7112-1LG13	4E2	1L14	A
3PDT	10	24VDC	3TX7112-1FC03C	3TX7112-1NC03	4E3	1L14	A
		24VAC	3TX7112-1FC13C	3TX7112-1NC13	4E3	1L14	A
		120 VAC	3TX7112-1FF13C	3TX7112-1NF13	4E3	1L14	A
		240 VAC	—	3TX7112-1NG13	4E3	1L14	A



#### Hermetically Sealed

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set
DPDT	12	24 VDC	3TX7127-5HC00	4E2	1L12	A
4PDT	3	24VDC	3TX7127-3HC00	4E5	1L11	B
		24VAC	3TX7127-3HC10	4E5	1L11	B
		120 VAC	3TX7127-3HF10	4E5	1L11	B
4PDT	5	12 VDC	3TX7127-3HB03	4E5	1L11	B
		24VDC	3TX7127-3HC03	4E5	1L11	B
		120 VAC	3TX7127-3HF13	4E5	1L11	B

#### Socket Accessories

Access. Series	MOV	MOV	R/C	R/C	Diode
	24VAC/DC	120VAC/DC	6-24VAC/DC	110-240VAC/DC	6-250VDC
A	3TX7144-H1	3TX7144-H20	3TX7144-H4	3TX7144-H5	3TX7144-H6
B	3TX7144-H9	3TX7144-H17	—	—	3TX7144-H12

Note: See socket accessories above.



## Coupling Relays and Interfaces

## 3TX71 plug-in relays

## Selection and ordering data

## Open Power Relays

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Metal Cover 7144-
SPST NO-DM	40	24VAC	3TX7130-0AC13	1M0
SPST NO-DM		120 VAC	3TX7130-0AF13	1M0
SPST NO-DM		240 VAC	3TX7130-0AH13	1M0
SPST NC-DM	40	120 VAC	3TX7130-0QF13	1M0
SPDT		24 VAC	3TX7130-0BC13	1M0
SPDT		120 VAC	3TX7130-0BF13	1M0
SPDT		240 VAC	3TX7130-0BH13	1M0
DPDT	40	277 VAC	3TX7130-0BS13	1M0
		24 VAC	3TX7130-0DC13	1M0
		120 VAC	3TX7130-0DF13	1M0
		240 VAC	3TX7130-0DH13	1M0
		277 VAC	3TX7130-0DS13	1M0
		12 VDC	3TX7130-0DB03	1M0
		24 VDC	3TX7130-0DC03	1M0
DPST NO	40	48 VDC	3TX7130-0DD03	1M0
		110 VDC	3TX7130-0DF03	1M0
		24 VAC	3TX7130-0CC13	1M0
		120 VAC	3TX7130-0CF13	1M0
		240 VAC	3TX7130-0CH13	1M0
DPDT (Mag Blowout)	40	12 VDC	3TX7130-0CB03	1M0
		24 VDC	3TX7130-0CC03	1M0
		48 VDC	3TX7130-0CD03	1M0
		120 VAC	3TX7130-0RF13	1M0
		12 VDC	3TX7130-0RB03	1M0
		24 VDC	3TX7130-0RC03	1M0
		48 VDC	3TX7130-0RD03	1M0
		110 VDC	3TX7130-0RF03	1M0



## Enclosed Power Relays

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay
DPST-NO	30	24VAC	3TX7131-4CC13
		120 VAC	3TX7131-4CF13
		230 VAC	3TX7131-4CH13
DPDT	30 NO/ 3 NC	12 VDC	3TX7131-4DB03
		24 VDC	3TX7131-4DC03
		24VAC	3TX7131-4DC13
		120 VAC	3TX7131-4DF13
		230 VAC	3TX7131-4DH13



Note: See page 11/131 for socket accessories.

# Coupling Relays and Interfaces

## 3TX71 plug-in relays

### General specifications

Contact Characteristics		Units	3TX7109	3TX7110	3TX7111				
Number and Type of Contacts			SPDT	SPDT	SPDT	DPDT	DPDT	4PDT	4PDT
Contact Material			Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy
Thermal (Carrying) Current	A		20	15	3 (Bifurcated)	12	3 (Bifurcated)	6	3 (Bifurcated)
Maximum Switching Voltage	V		300	300	300	300	300	300	300
Switching Current at Voltage	Resistive		16A @240V	15A @240V	3A @240V	—	3A @240V	6A @240V	3A @240V
	Resistive		16A @120V	15A @120V	—	12A @120V	3A @120V	6A @120V	3A @120V
	Resistive		16A @ 28	15A @ 28	—	12A @ 28	3A @ 30	6A @ 28	3A @ 30
	HP		1/2 @ 120VAC	1/2 @ 120VAC	—	1/3 @ 120VAC	1/16 @ 120VAC	1/3 @ 120VAC	1/16 @ 120VAC
	HP		1 @ 240VAC	1 @ 240VAC	—	—	—	1 @ 240VAC	—
	Pilot Duty		B300	B300	—	B300	—	B300	—
Minimum Switching Requirement	mA		100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)
<b>Coil Characteristics</b>									
Voltage Range	AC	V	6...240	6...240	6...240	6...240	6...240	6...240	6...240
	DC	V	6...125	6...125	6...125	6...125	6...125	6...125	6...125
Operating Range	AC	%	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110
	DC	%	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110
Average Consumption	AC	VA	1.2	0.9	0.9	1.2	1.2	1.2	1.2
	DC	W	0.9	0.7	0.7	0.9	0.9	0.9	0.9
Drop-out Voltage Threshold	AC	%	15	15	15	15	15	15	15
	DC	%	10	10	10	10	10	10	10
<b>Performance Characteristics</b>									
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000	100,000	100,000	200,000	200,000	200,000	200,000
Mechanical Life	Unpowered		10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Operating Time (response time)		ms	20	20	20	20	20	20	20
Dielectric Strength	Between Coil and Contact	V(rms)	2500	2500	2500	2500	2500	2500	2500
	Between Poles	V(rms)	1500	1500	1500	1500	1500	1500	1500
	Between Contacts	V(rms)	1500	1500	1500	1500	1500	1500	1500
<b>Environment</b>									
Product Certifications	Standard Version		UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS
Ambient Air Temperature around the Device	Storage	°C	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85
	Operational	°C	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55
Vibration Resistance	Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz
Shock Resistance		g-n	10	10	10	10	10	10	10
Degree of Protection			IP40	IP40	IP40	IP40	IP40	IP40	IP40
Weight		grams	36	29	29	36	36	36	36

Contact Characteristics		Units	3TX7112	3TX7114	3TX7115	3TX7116	3TX7117		
Number and Type of Contacts			DPDT	3PDT	DPDT	DPDT	3PDT	3PDT	4PDT
Contact Material			Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy
Thermal (Carrying) Current	A		10	15	10	10	15	15	15
Maximum Switching Voltage	V		300	300	300	300	300	300	300
Switching Current at Voltage	Resistive		10A @240V	10A @240V	12A @277V	10A @277V	10A @277V	12A @277V	12A @277V
	Resistive		10A @120V	10A @120V	15A @120V	10A @120V	10A @120V	15A @120V	15A @120V
	Resistive		10A @ 28	10A @ 28	12A @ 28	10A @ 28	10A @ 28	12A @ 28	12A @ 28
	HP		1/3 @ 120VAC	1/3 @ 120VAC	1/2 @ 120VAC	1/3 @ 120VAC	1/3 @ 120VAC	1/2 @ 120VAC	1/2 @ 120VAC
	HP		1/2 @ 240VAC	1/2 @ 240VAC	1 @ 240VAC	1/2 @ 240VAC	1/2 @ 240VAC	3/4 @ 240VAC	3/4 @ 240VAC
	Pilot Duty		B300	B300	B300	B300	B300	B300	B300
Minimum Switching Requirement	mA		100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)
<b>Coil Characteristics</b>									
Voltage Range	AC	V	6...240	6...240	6...240	6...240	6...240	6...240	6...240
	DC	V	6...125	6...125	6...125	6...125	6...125	6...125	6...125
Operating Range	AC	%	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110
	DC	%	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110
Average Consumption	AC	VA	1.2	1.2	1.2	1.2	1.5	1.5	1.5
	DC	W	0.9	0.9	0.9	0.9	1.4	1.5	1.5
Drop-out Voltage Threshold	AC	%	15	15	15	15	15	15	15
	DC	%	10	10	10	10	10	10	10
<b>Performance Characteristics</b>									
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	200,000	200,000	100,000	100,000	100,000	200,000	200,000
Mechanical Life	Unpowered		10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Operating Time (response time)		ms	20	20	20	20	20	20	20
Dielectric Strength	Between Coil and Contact	V(rms)	2500	2500	2500	2500	2500	2500	2500
	Between Poles	V(rms)	1500	1500	1500	1500	1500	2500	2500
	Between Contacts	V(rms)	1500	1500	1500	1500	1500	1500	2500
<b>Environment</b>									
Product Certifications	Standard Version		UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS
Ambient Air Temperature around the Device	Storage	°C	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85
	Operational	°C	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55
Vibration Resistance	Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz
Shock Resistance		g-n	10	10	10	10	10	10	10
Degree of Protection			IP40	IP40	IP40	IP40	IP40	IP40	IP40
Weight		grams	89	89	36	88	88	60	60

## Coupling Relays and Interfaces

## 3TX71 plug-in relays

## General specifications

Contact Characteristics		Units	3TX7119	3TX7127	4PDT	4PDT	3TX7130
Number and Type of Contacts			DPDT	DPDT	4PDT	4PDT	All
Contact Material			Silver Alloy	Silver Alloy	Fine Silver	Silver Alloy	Silver Alloy
Thermal (Carrying) Current		A	20	12	3	5	40
Maximum Switching Voltage		V	600	300	300	300	600
Switching Current at Voltage		Resistive	20A @300V	12A @240V	3A @240V	12A @240V	40A @277V
		Resistive	—	12A @120V	3A @120V	—	—
		Resistive	20A @ 28	12A @ 28	3A @ 30	—	40A @ 28
		HP	1/3 @ 120VAC	1/3 @ 120VAC	1/16 @ 120VAC	—	—
		HP	1/2 @ 600VAC	1/2 @ 240VAC	1/10 @ 240VAC	—	—
		Pilot Duty	B600	B300	—	—	—
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	10 @ 5VDC (.5W)	100 @ 5VDC (.5W)	1000 @ 12VAC/DC
Coil Characteristics							
Voltage Range		V	6...240	6...240	6...240	6...240	6...600
Operating Range		%	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110
Average Consumption		VA	2.75	1.2	1.2	1.2	10
Drop-out Voltage Threshold		%	15	15	15	15	10
		%	10	10	10	10	10
Performance Characteristics							
Electrical Life (UL508)		Operations @ Rated Current (Resistive)	100,000	100,000	100,000	100,000	100,000
Mechanical Life		Unpowered	10,000,000	10,000,000	10,000,000	10,000,000	1,000,000
Operating Time (response time)		ms	20	20	20	20	30
Dielectric Strength		Between Coil and Contact	V(rms)	1,500	1,240	1,240	2,200
		Between Poles	V(rms)	2,000	1,500	1,240	2,200
		Between Contacts	V(rms)	1,500	1,500	500	1,500
Environment							
Product Certifications		Standard Version	UL	UL,RoHS	UL,RoHS	UL,RoHS	UL
Ambient Air Temperature around the Device		Storage	°C	-40...+85	-40...+85	-40...+85	-40...+85
		Operational	°C	-40...+55	-40...+55	-40...+70	-40...+70
Vibration Resistance		Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz
Shock Resistance			g-n	10	10	10	—
Degree of Protection				IP40	IP67	IP67	Open
Weight		grams	88	130	45	45	227 to 312

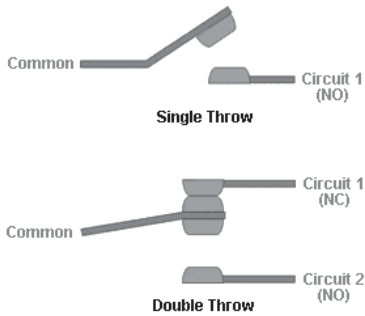
Contact Characteristics		Units	3TX7131	3TX7132	3TX7136	3TX7137		
Number and Type of Contacts			DPST-NO	DPDT	SPDT	DPDT		
Contact Material			Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy		
Thermal (Carrying) Current		A	30	30 DPDT-NO	30 SPDT-NO	12		
Maximum Switching Voltage		V	600	300	300	300		
Switching Current at Voltage		Resistive	20A @300V	30A @277V	30A @277V	30A @277V	12A @240V	
		Resistive	—	—	—	—	16A @120V	
		Resistive	20A @ 28	20A @ 28	3A @ 28	10A @ 28	3A @ 28	12A @ 28
		HP	1/3 @ 120VAC	1 @ 120VAC	—	1 @ 120VAC	—	1/2 @ 120VAC
		HP	1/2 @ 600VAC	3 @ 240VAC	—	2 @ 240VAC	—	1/3 @ 240VAC
		Pilot Duty	—	—	—	—	—	B300
Minimum Switching Requirement		mA	500 @ 12VAC/DC	500 @ 12VAC/DC	1000 @ 12VAC/5VDC	500 @ 12VAC/DC	100 @ 5VDC (.5W)	
Coil Characteristics								
Voltage Range		V	12...240	12...240	12...277	12...277	12...120	
Operating Range		%	85 to 120	85 to 120	85 to 120	85 to 120	85 to 110	
Average Consumption		VA	4	4	2.8	2.8	1.8	
Drop-out Voltage Threshold		%	10	10	10	10	15	
		%	10	10	10	10	10	
Performance Characteristics								
Electrical Life (UL508)		Operations @ Rated Current (Resistive)	100,000	100,000	100,000	100,000	100,000	
Mechanical Life		Unpowered	5,000,000	5,000,000	10,000,000	10,000,000	10,000,000	
Operating Time (response time)		ms	15	15	15	15	35	
Dielectric Strength		Between Coil and Contact	V(rms)	4,000	4,000	2,500	2,500	1,500
		Between Poles	V(rms)	2,000	2,000	1,500	1,500	500
		Between Contacts	V(rms)	1,500	1,500	1,500	1,500	1,500
Environment								
Product Certifications		Standard Version	UL	UL	UL	UL	UL	
Ambient Air Temperature around the Device		Storage	°C	-40...+85	-40...+85	-40...+85	-40...+85	
		Operational	°C	-40...+55	-40...+55	-40...+55	-40...+70	
Vibration Resistance		Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	
Shock Resistance			g-n	10	10	10	10	
Degree of Protection				—	—	—	IP40	
Weight		grams	86	86	33	33	110	

# Coupling Relays and Interfaces

## 3TX71 plug-in relays

### Overview

#### Contact arrangement - throws

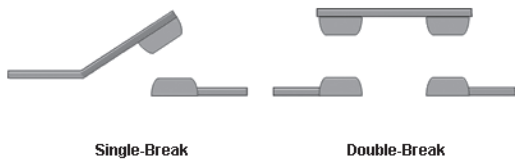


Throw is the number of different closed contact positions per pole. In other words a throw describes the total number of different circuits each pole controls.

The following abbreviations are used to indicate contact configurations:

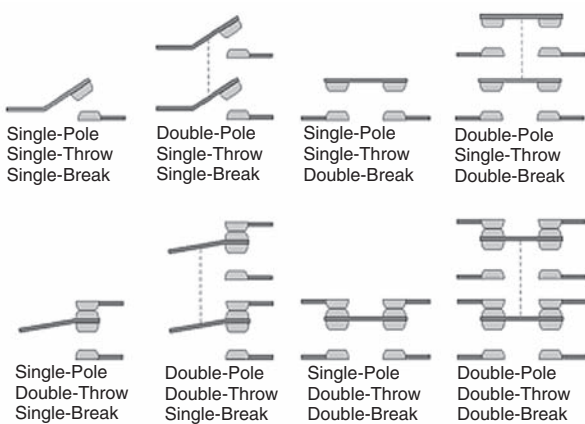
- SPST** Single-pole, single-throw
- SPDT** Single-pole, double-throw
- DPST** Double-pole, single-throw
- DPDT** Double-pole, double-throw

#### Contact arrangement - break



Break is the number of separate contacts the switch uses to open or close an individual circuits. If the relay breaks the circuit in one place, then it is a single break relay. If the relay breaks the circuit in two places, then it is a double break relay.

#### Contact arrangements overview



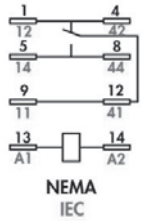
This illustration shows various contact arrangement types.

# Coupling Relays and Interfaces

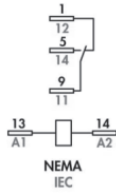
## 3TX71 plug-in relays

Circuit diagrams

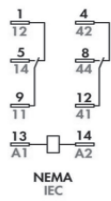
3TX7109 (SPDT)



3TX7110  
SPDT



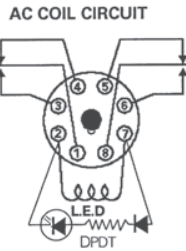
3TX7111  
DPDT



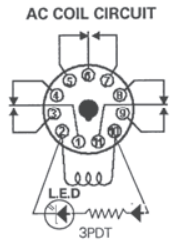
3TX7111  
4PDT



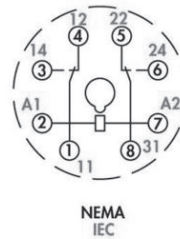
3TX7112  
DPDT



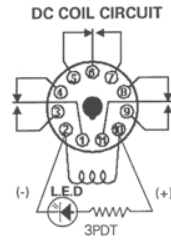
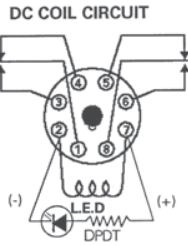
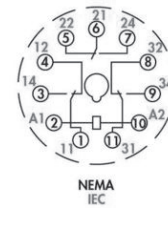
3TX7112  
3PDT



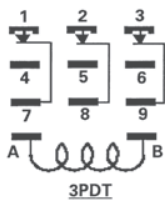
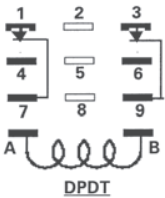
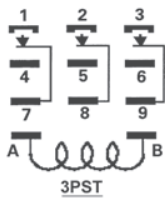
3TX7112-1L, -1D  
DPDT



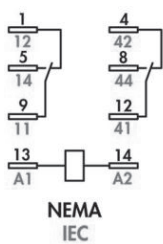
3TX7112-1N, -1F  
3PDT



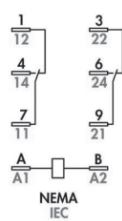
3TX7113  
DPDT, 3PST, 3PDT



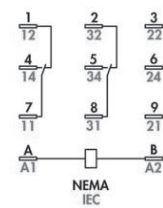
3TX7114  
DPDT



3TX7115  
DPDT



3TX7115  
3PDT



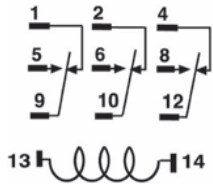
# Coupling Relays and Interfaces

## 3TX71 plug-in

Circuit diagrams

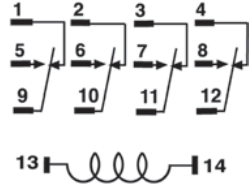
3TX7116

3PDT

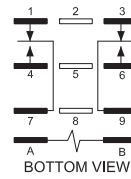


3TX7117

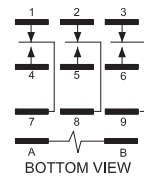
4PDT



3TX7119 (DPDT)

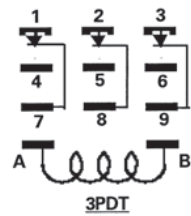
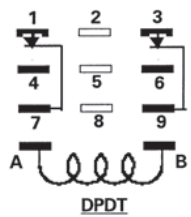


3TX7119 (3PDT)



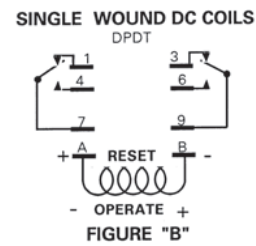
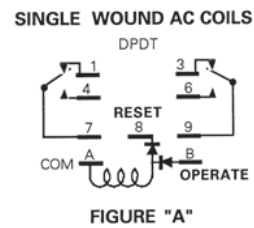
3TX7121

DPDT, 3PDT



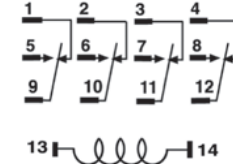
3TX7125

DPDT

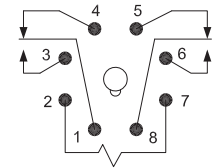


3TX7126/ 3TX7127

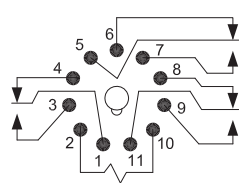
4PDT



3TX7127 (DPDT)



3TX7127 (3PDT)



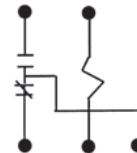
3TX7130

SPST-NO



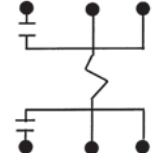
3TX7130

SPDT



3TX7130

DPST-NO



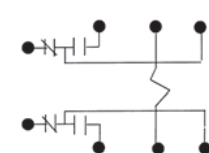
3TX7130

SPST-NC

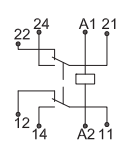


3TX7130

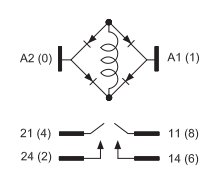
DPDT



3TX7130 (DPDT)



3TX7131 (DPST-NO) (AC)

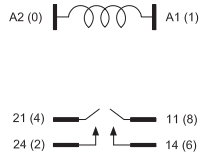


# Coupling Relays and Interfaces

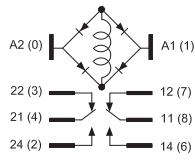
## 3TX71 plug-in relays

Circuit diagrams

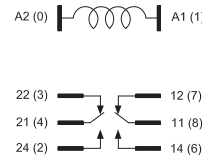
**3TX7131 (DPST-NO) (DC)**



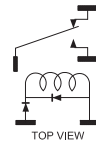
**3TX7131 (DPDT) (AC)**



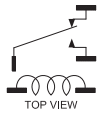
**3TX7131 (DPDT) (DC)**



**3TX7132 (SPDT) (AC)**



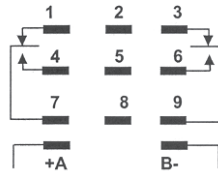
**3TX7132 (SPDT) (DC)**



**3TX7136**

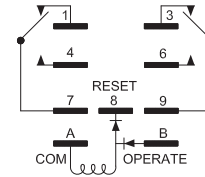
DPDT

WIRING DIAGRAM  
VIEWED FROM PIN END

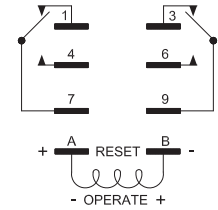


INPUT SIGNAL

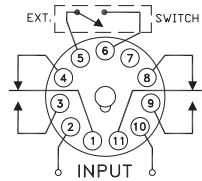
**3TX7137 (DPDT) (AC)**



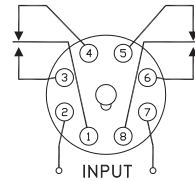
**3TX7137 (DPDT) (DC)**



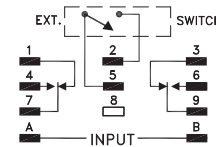
**OFD-DFOB (DPDT)**



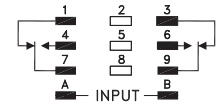
**OND-DFOB (DPDT)**



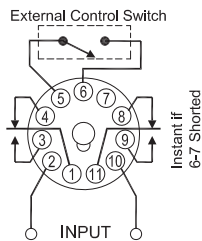
**OFD-DFSB (DPDT)**



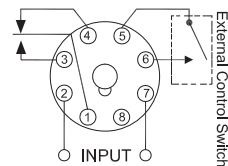
**OND-DFSB (DPDT)**



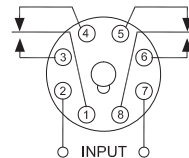
**OFD-DFPR-00 (DPDT)**



**OND-DFPR-01 (SPDT)**



**OND-DFPR-02 (DPDT)**

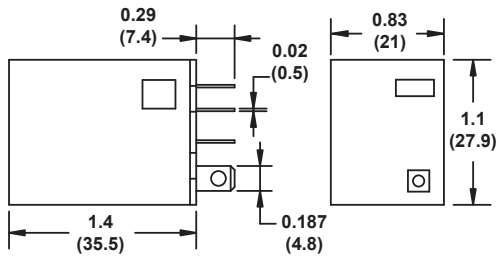


# Coupling Relays and Interfaces

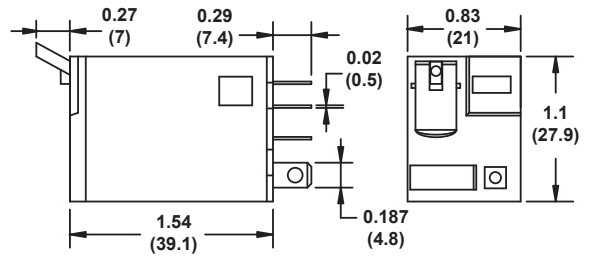
## 3TX71 plug-in relays

### Dimension drawings

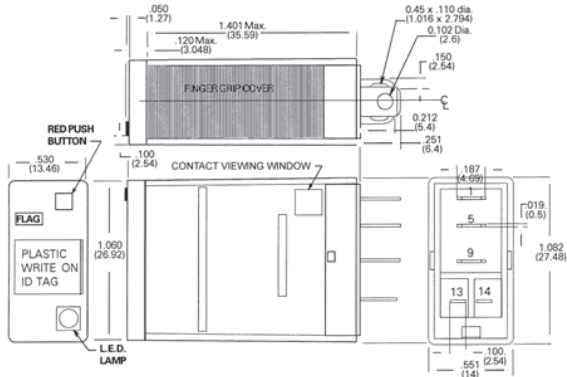
3TX7109 (SPDT) (clear cover)



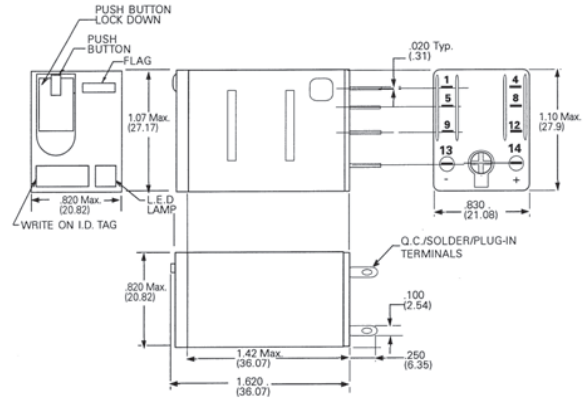
3TX7109 (SPDT) (full feature)



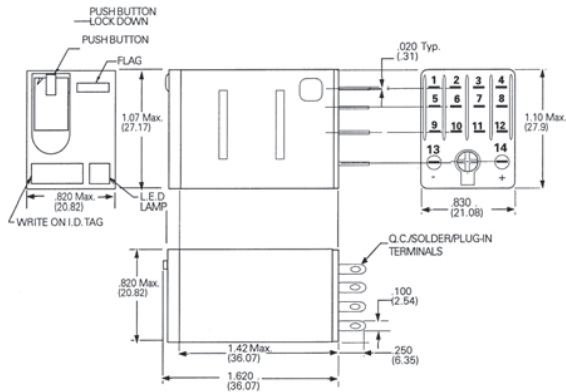
3TX7110 SPDT



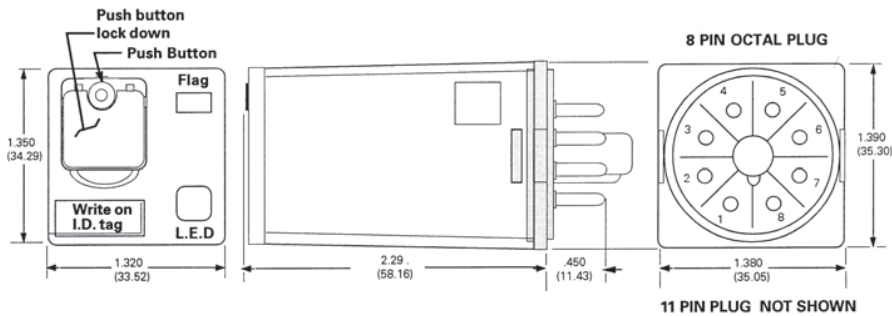
3TX7111 DPDT



3TX7111 4PDT



3TX7112 DPDT



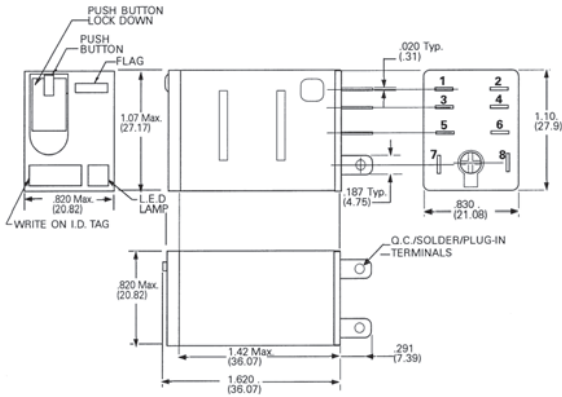


# Coupling Relays and Interfaces

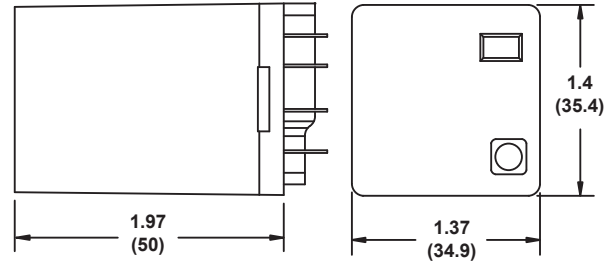
## 3TX71 plug-in relays

Dimension drawings

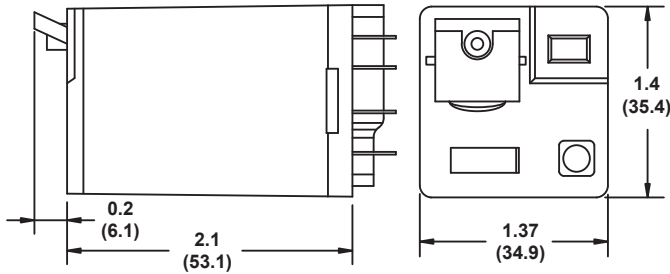
3TX7114 DPDT



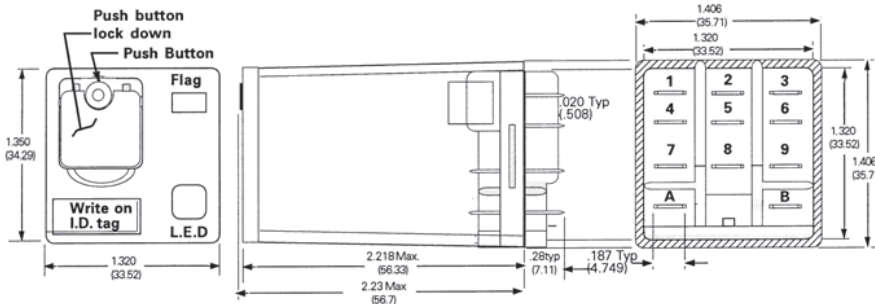
3TX7115 (DPDT) (clear cover)



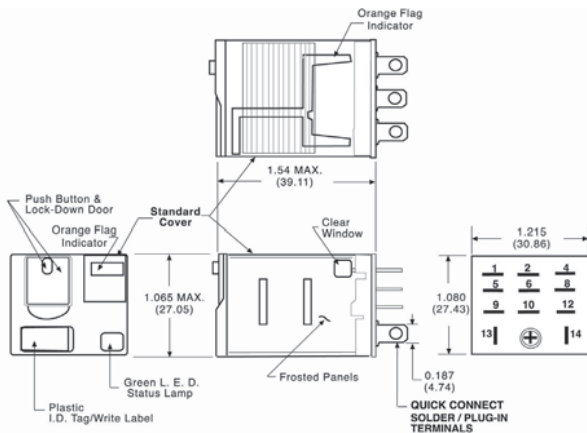
3TX7115 (DPDT) (full feature)



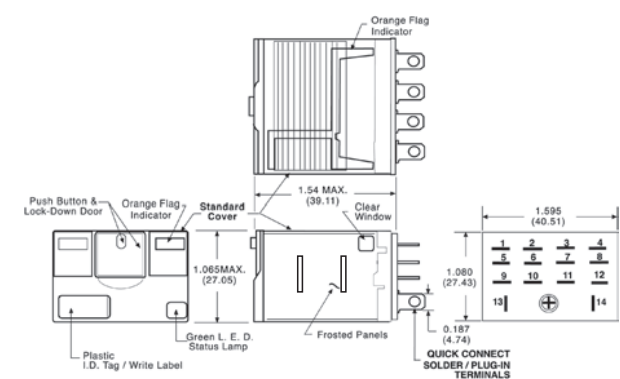
3TX7115 3PDT



3TX7116 3PDT



3TX7117 4PDT

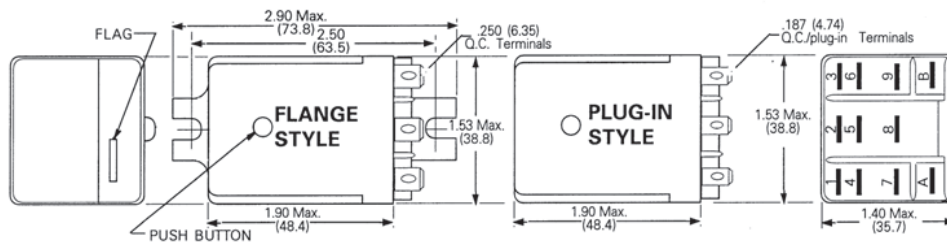


# Coupling Relays and Interfaces

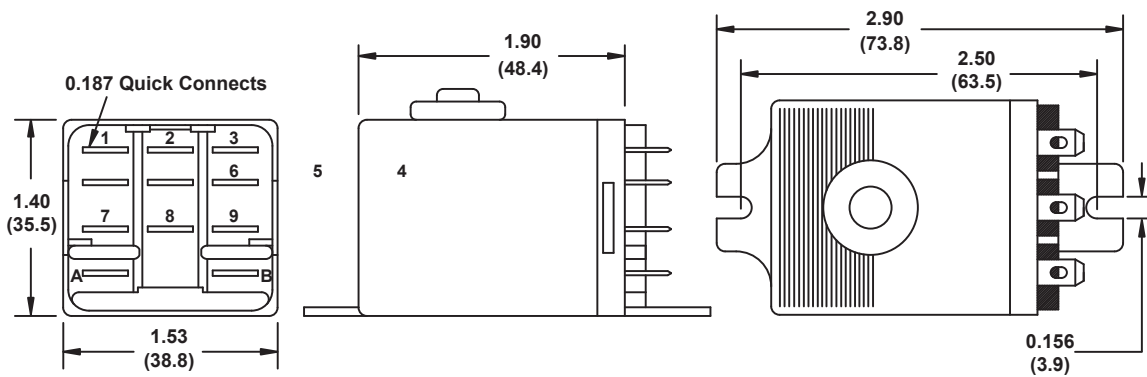
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### Dimension drawings

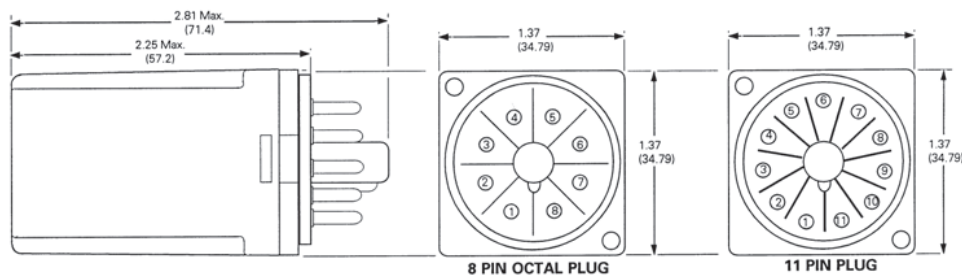
#### 3TX7119 DPDT



#### 3TX7119 (3PDT)

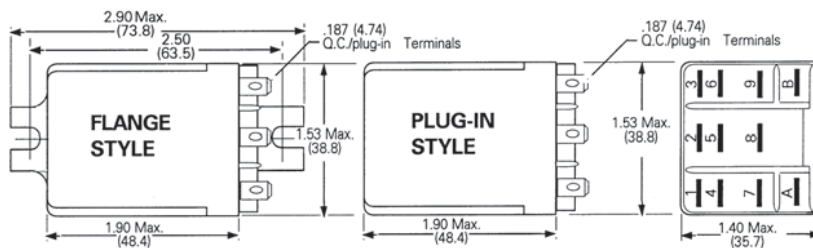


#### 3TX7120



#### 3TX7121/3TX7122

#### 3TX7123



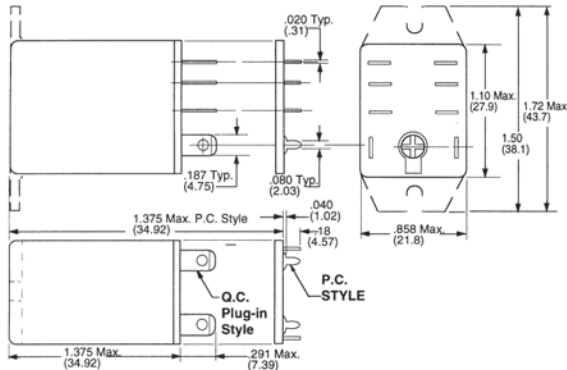
# Coupling Relays and Interfaces

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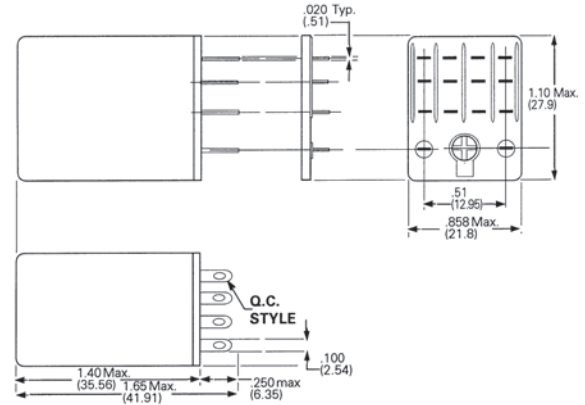
RELAYS, INTERFACES & CONVERTERS 11

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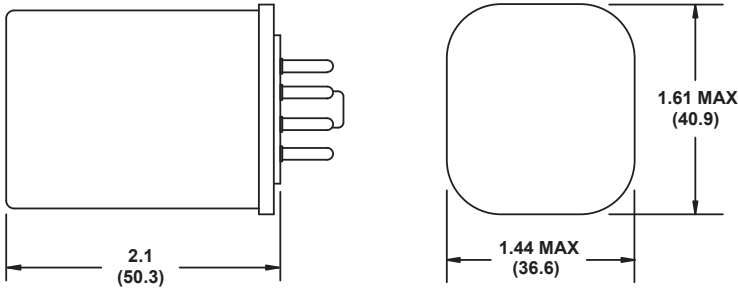
3TX7123



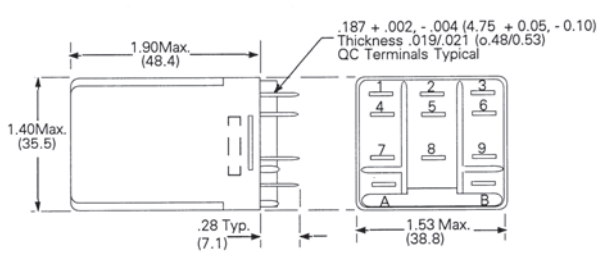
3TX7126



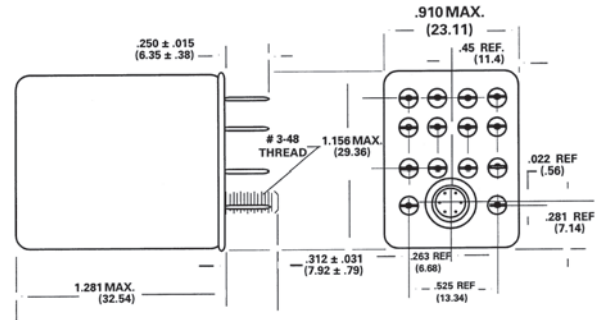
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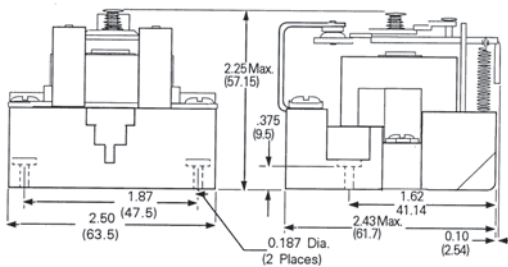
3TX7127 3PDT



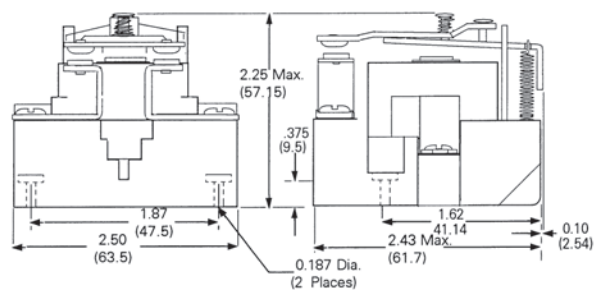
3TX7127 4PDT



3TX7130 SPST NC



3TX7130 SPST NO

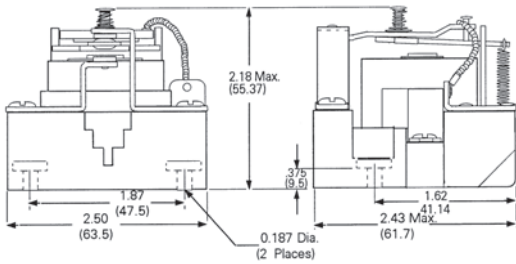


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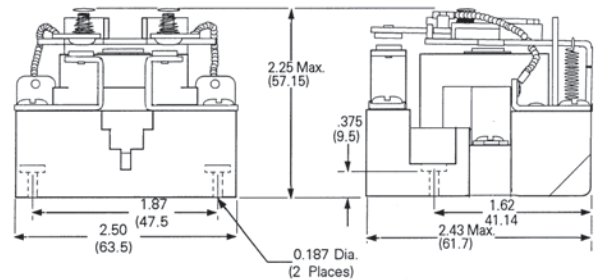
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### Dimension drawings

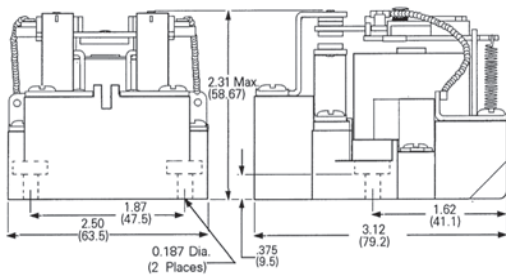
3TX7130 SPDT



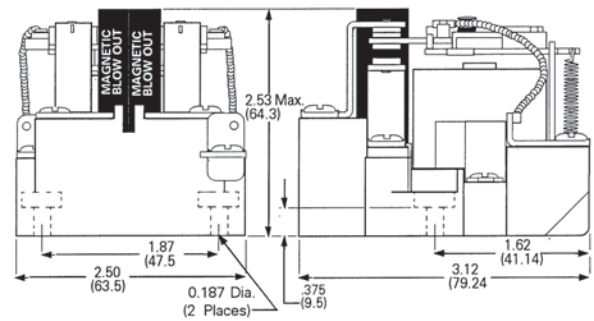
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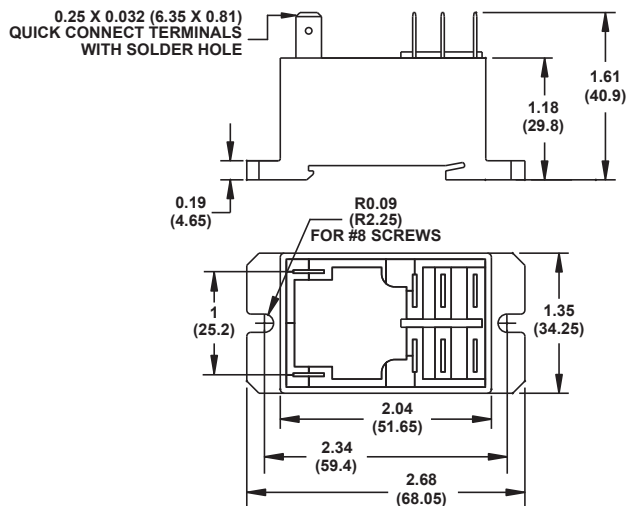
3TX7130 DPDT



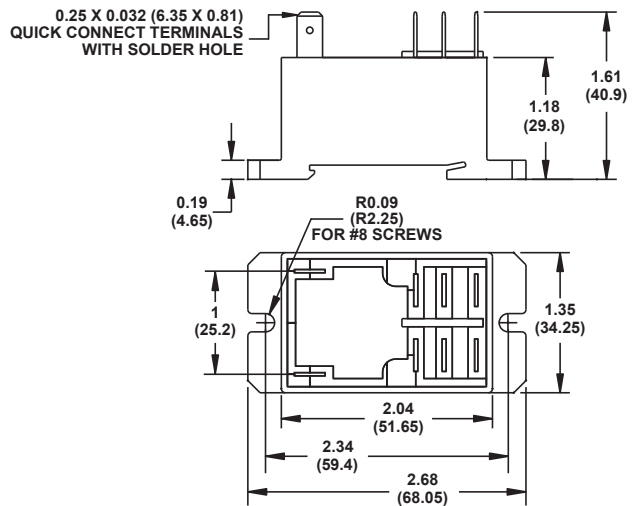
3TX7130 DPDT with magnetic  
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3TX7131 (DPST-NO)



3TX7131 (DPDT)



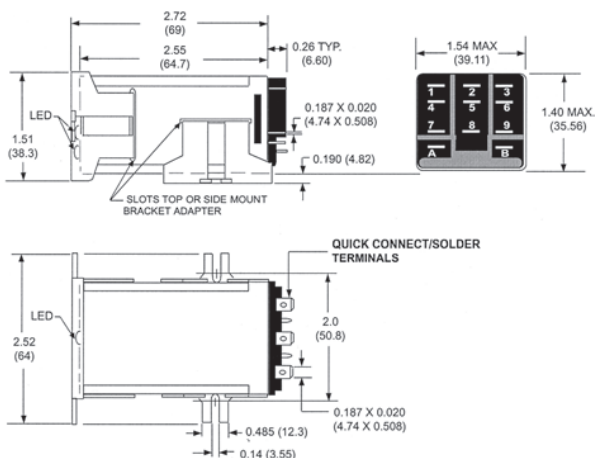
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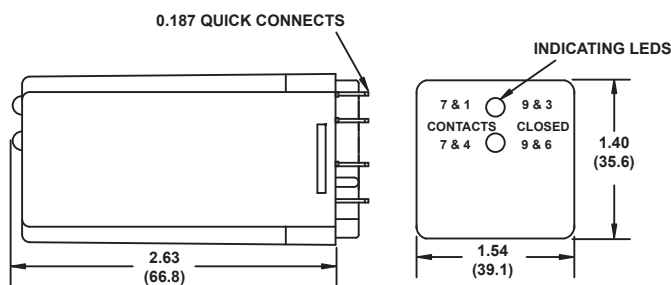
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### Dimension drawings

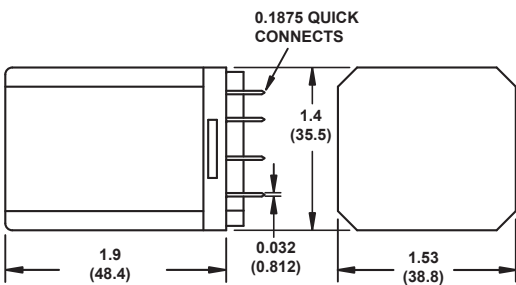
**3TX7136**



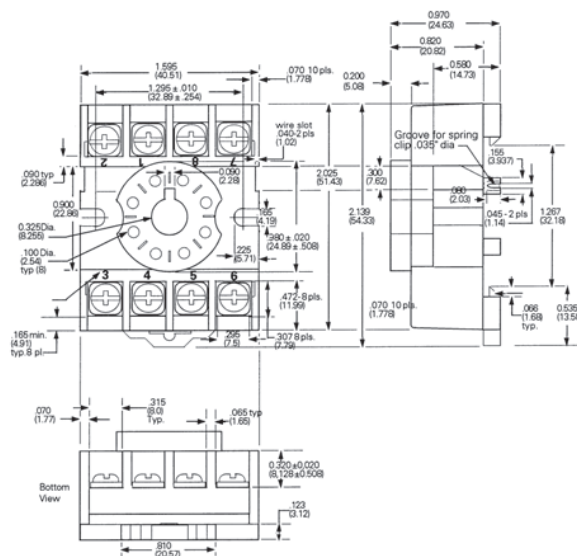
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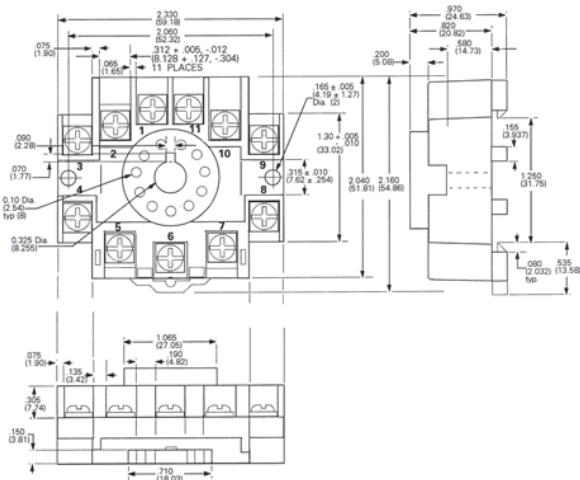
**3TX7137 (DPDT)**



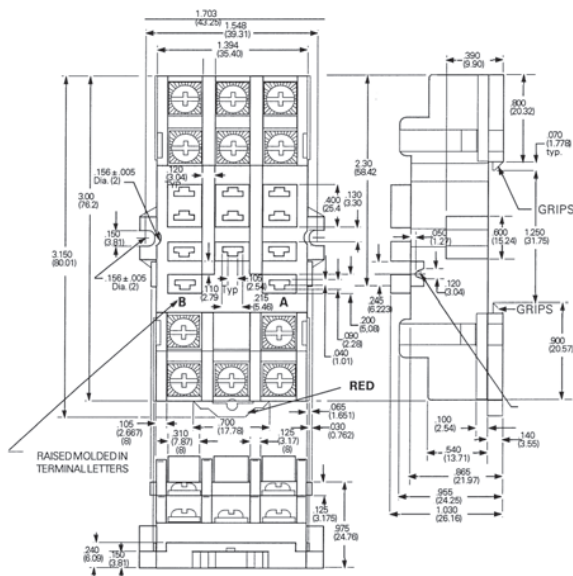
**3TX7144-1E2**



**3TX7144-1E3**



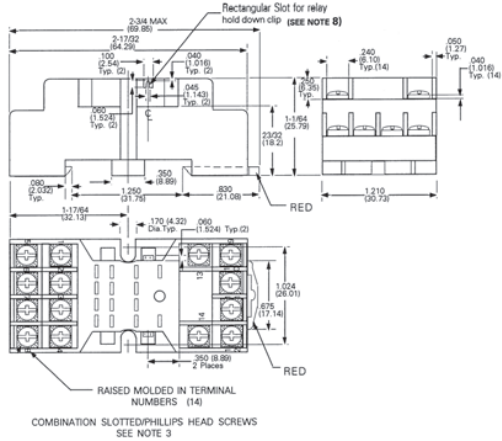
**3TX7144-1E4**



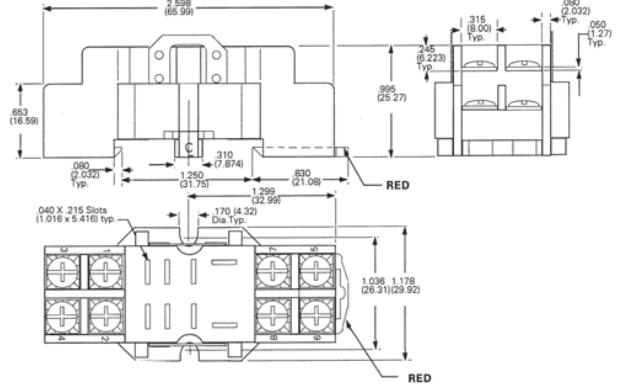
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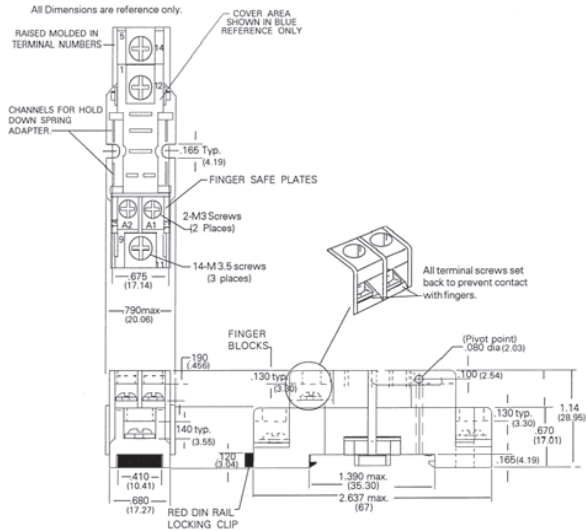
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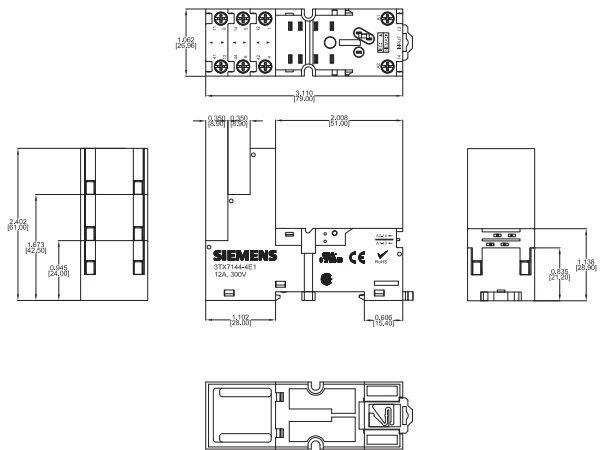
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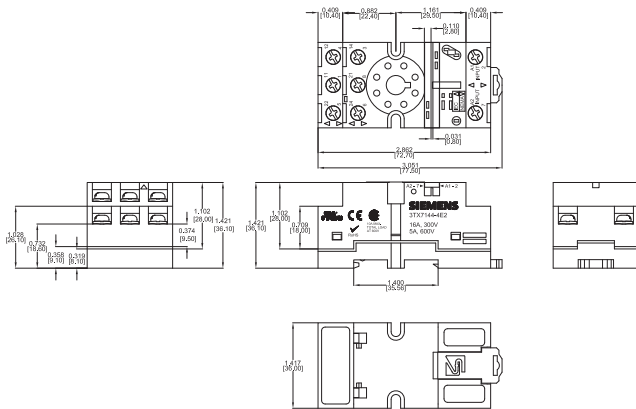
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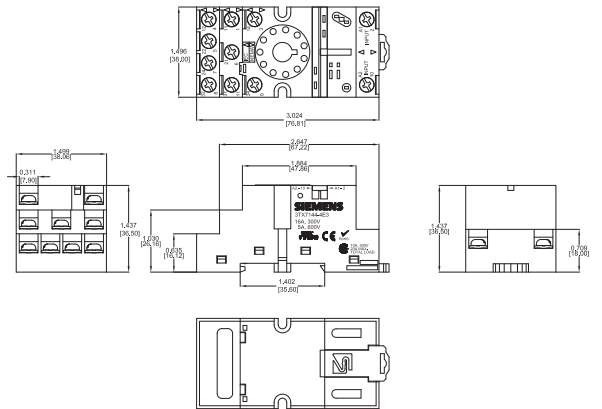
3TX7144-4E1



3TX7144-4E2



3TX7144-4E3

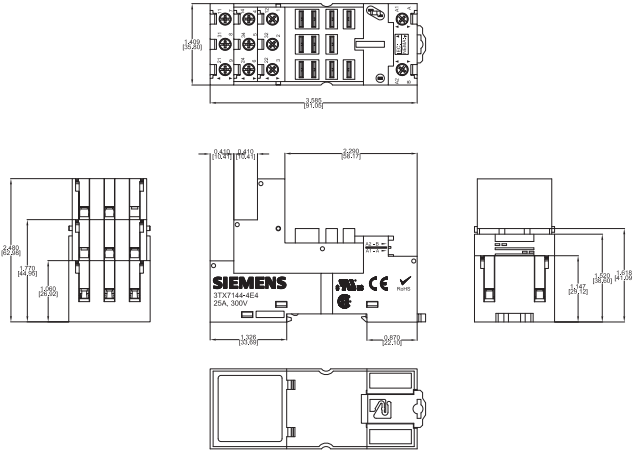


# Coupling Relays and Interfaces

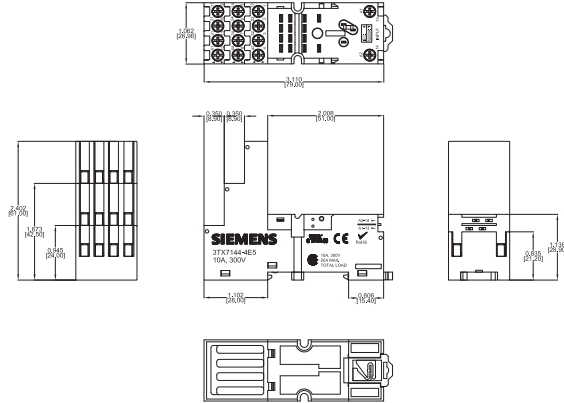
## 3TX71 plug-in relays

### Dimension drawings

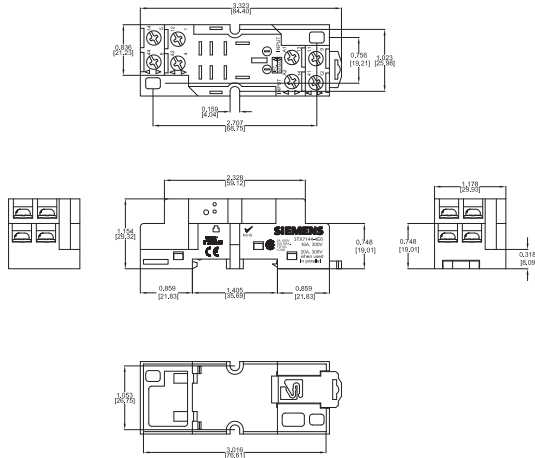
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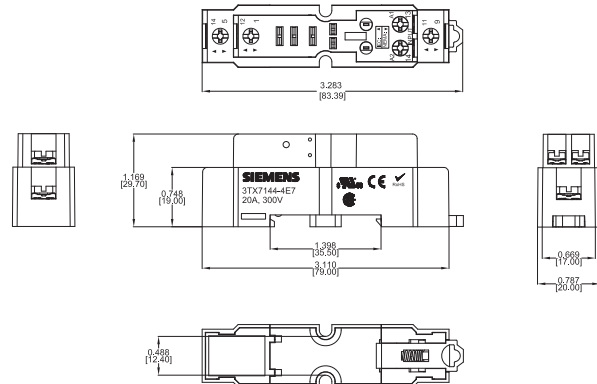
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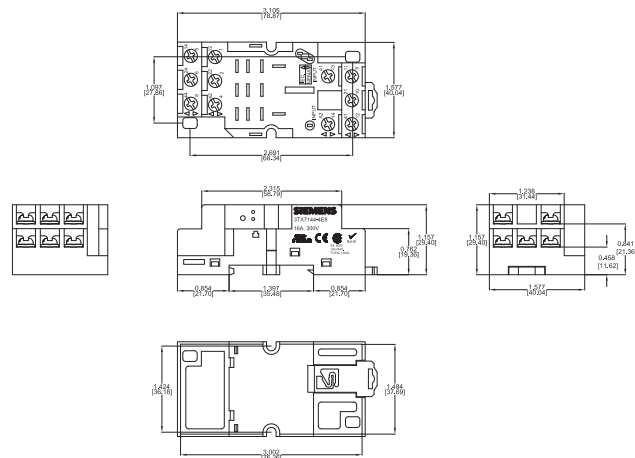
3TX7144-4E6



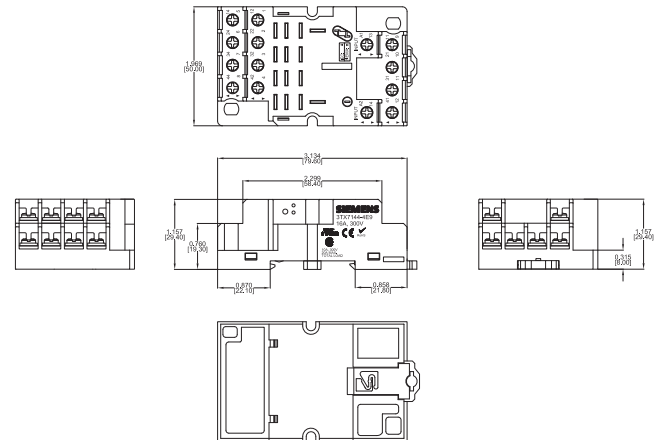
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3TX7144-4E8



3TX7144-4E9



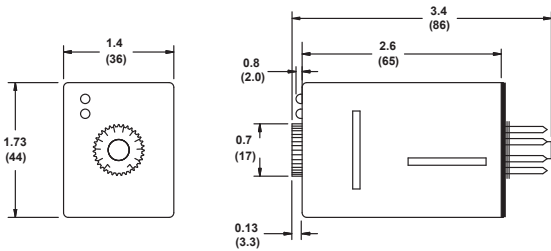


# Coupling Relays and Interfaces

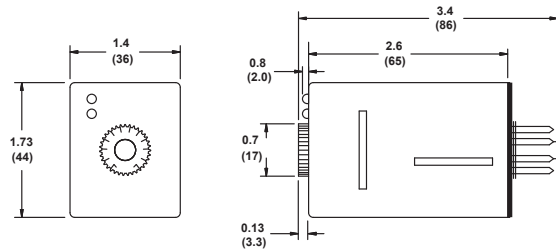
## 3TX71 plug-in relays

### Dimension drawings

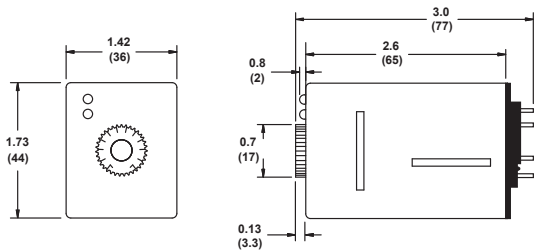
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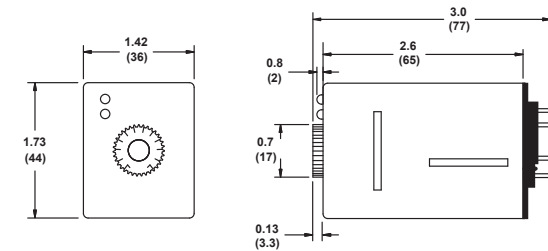
OND-DFOB (DPDT)



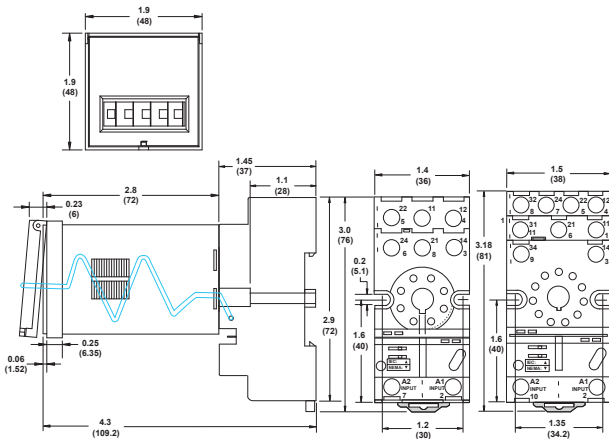
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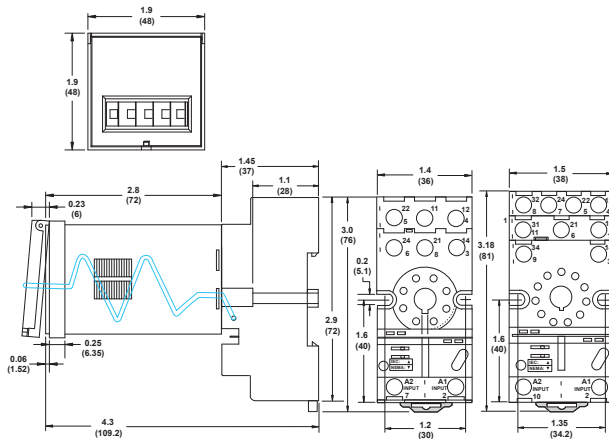
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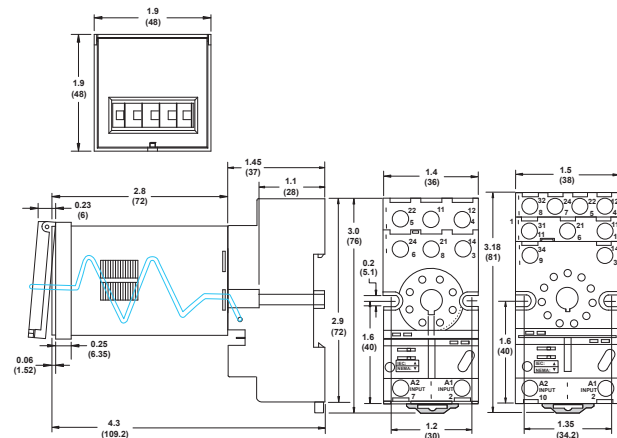
OFD-DFPR-00 (DPDT)



OND-DFPR-01 (SPDT)



OND-DFPR-02 (DPDT)

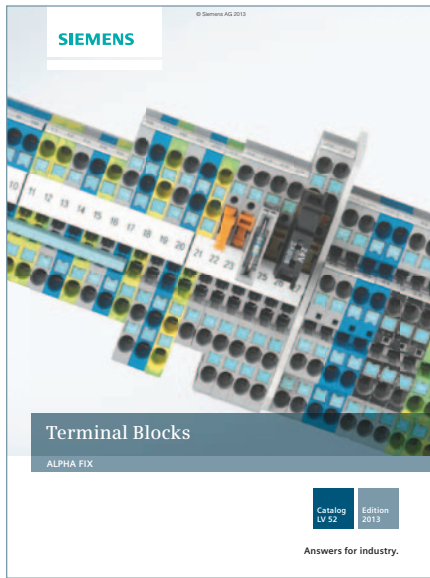




Notes

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RELAYS, INTERFACES  
& CONVERTERS



Siemens complete terminal block offering is found in the [2013 Terminal Block Supplemental Catalog](#), Order No. PDCA-TERMB-1013

In this section you will find the Table of Contents for the 2013 Terminal Block Supplemental and information not found in the supplemental catalog.

A PDF version of the catalog can be downloaded from the Siemens' Internet Site at: [usa.siemens.com/terminalblocks](http://usa.siemens.com/terminalblocks)

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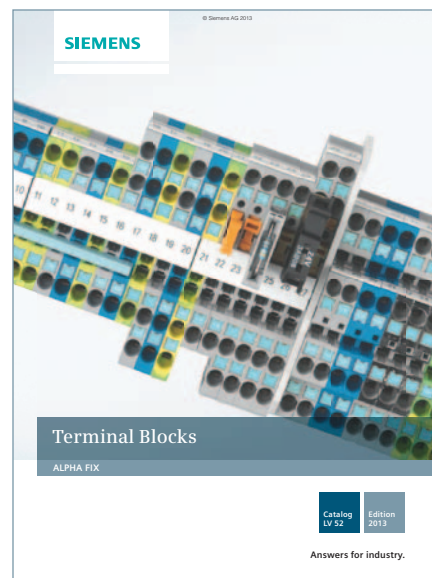
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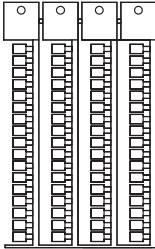
A PDF version of the catalog can be downloaded from the Siemens' Internet Site at: [usa.siemens.com/terminalblocks](http://usa.siemens.com/terminalblocks)

# Labeling Plates for Ink Plotter System

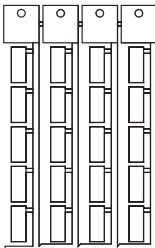
8WA1/8WH

**Labeling accessories:**

**Labeling plates for modular terminals,**  
1 frame = 68 plates



**Equipment identification labels,**  
1 frame = 20 labels



Description	Inscription area/color W x H mm	Order No.	List Price \$	Price Unit (PU) Labels	Order Multiples Labels
<b>8WA blank labeling plates (plotter inscription)</b>					
<b>Labeling plates</b>					
for 8WA1 and 8WA2 individually detachable	5 x 7, white 5 x 10, white	<b>8WA8 850-2AY</b> <b>8WA8 851-2AY</b>		100	1020
for 8WA1 singly, for 8WA2 together to be used in grid pattern				100	1020
Terminal size 2.5 mm <sup>2</sup>	5 x 10	<b>8WA8 854-2AY</b>		100	1260
for 8WA2 from terminal size 4 mm <sup>2</sup>	6 x 7 6 x 10	<b>8WA8 853-2AY</b> <b>8WA8 855-2AY</b>		100	1080
				100	1080
<b>Equipment identification labels</b>	20 x 9, white	<b>3TX4 210-0R</b>		100	380

Description	Inscription area/color Width mm	Order No.	List Price \$	Price Unit (PU) Labels	Order Multiples Labels
<b>8WA blank labeling plates (plotter inscription)</b>					
<b>Labeling plates</b>					
Front (Top)					
Individually detachable	4.2	<b>8WH8 112-1AA05</b>		100	1024
	5.2 and 6.2	<b>8WH8 112-2AA05</b>		100	1400
	8.2, 10 and 15	<b>8WH8 112-4AA05</b>		100	1000
Flat (Side)					
Individually detachable	4.2, 5.2, 6.2, 8.2, and 10	<b>8WH8 113-1AA05</b>		100	2000
	15	<b>8WH8 113-6AA05</b>		100	1080

**Computer labeling system for individual inscription of:**

- Labeling plates for terminal blocks
- Device labeling plates
- Label plates for individual wires

Obtain from:

**Murrplastik Systems, Inc.**  
**North American Operations**  
 2367 North Penn Road, Suite 200  
 Hatfield, PA. 19440  
 Telephone: 877-340-3444  
 Fax: 215-822-7626  
 E-Mail: [cablemgmt@murrplastik.com](mailto:cablemgmt@murrplastik.com)  
 Internet: [www.murrplastik.com](http://www.murrplastik.com)

**8WA and 8WH Labeling Plates per Frame**

8WA Labeling Plates		8WH Labeling Plates	
Order No.	Labels per Frame	Order No.	Labels per Frame
<b>8WA8 850-2AY, 8WA8 851-2AY<sup>1)</sup></b>	68	<b>8WH8 112-1AA05, 8WH8 112-4AA05</b>	64
<b>8WA8 854-2AY</b>	84	<b>8WH8 112-2AA05</b>	88
<b>8WA8 853-2AY, 8WA8 855-2AY</b>	72	<b>8WH8 113-1AA05</b>	mixed
<b>3TX4 210-0R</b>	20	<b>8WH8 113-6AA05</b>	19

<sup>1)</sup> Not suitable for two-tier terminals (lower tier); push-on terminals:  
 8WA1 010-1PQ00, 8WA1 808, 8WA1011-1DQ10 and 8WA1011-1DS10.

## Special Label Instructions

8WA1/8WA2

## Description

8WA8848... 8WA8847... labels are used when special label inscriptions are required. **See page 12/5 for Special Label Order Form.**

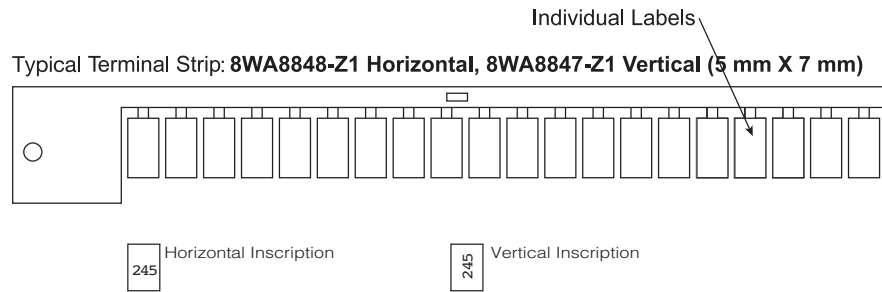
## Ordering information

- Select catalog number required for your order.
- Type legibly the catalog no. and quantity in the area provided. The printed, legible inscription must be exactly how it is to appear on the completed labels.

**NOTE:** If the form selected is being completed by someone other than the end user, please make sure that the end user

reviews the layout before submitting the form to customer service.

- Fax completed forms to:  
Siemens Customer Service  
FAX **800-547-5864**
- **Lead time.** Typical lead time is five (5) working days from the time customer service receives a completed and approved order form.



**Note: Special Labeling Plates are sold in multiples of 100 labels I.E. 100, 200,..., etc. Orders cannot be placed in strips.**

## Selection data

Label dimensions <sup>1)</sup> mm	Strips per order	Labels per strip	Rows per label	Characters per label	Inscription format	Order No.	List Price \$	Order Multiples Labels
5 x 7 mm	5	20	2	6	Horizontal	<b>8WA8 848-Z1</b>	1 unit	100
5 x 7 mm	5	20	3	6	Vertical	<b>8WA8 847-Z1</b>		100

## Horizontal 8WA8848-Z1

5 X 7		Max: 2 rows
1 2		Max: 3 characters
3 4		per row
5 6		Total: 6 characters

## Vertical 8WA8847-Z1

5 X 7		Max: 3 rows
3 6		Max: 2 characters
2 5		per row
1 4		Total: 6 characters

Vertical inscription <b>8WA8 847-m.m</b>	Inscription as required (100 labels)	<b>Z1 (5 mm / 7 mm)</b>
Horizontal inscription <b>8WA8 848-m.m</b>	Inscription as required (100 labels)	<b>Z1 (5 mm / 7 mm)</b>
Without inscription <b>8WA8 848-m.m.m</b>	2AY (100 labels)	<b>2AY (5 mm / 7 mm)</b>

1) 25.4 mm = 1.00 inch.

# Special Label Instructions

8WA1/8WA2



Special 8WA884... Label inscriptions  
(Label Size 5 mm x 7 mm - 100 labels)

## Order Form

Account No.		Date
Distributor		
Address		
City, State/Zip Code		
Contact Person		Purchase Order No.
Telephone ( )		Requested Ship Date
FAX ( )		Siemens Order No.

Type or print legibly in areas below exactly how the information is to appear on the 8WA884...Labels

8WA884  -Z1

Qty \_\_\_\_\_

Note: Qty 1 = 100 labels  
with markings per this  
page only.

Qty 2 = 200 labels with  
markings per this page  
I.E. 1,2,3,...,100 (Twice)


REPRODUCE THIS FORM BEFORE COMPLETING. FAX completed form to: Customer Service at 800-547-5864.

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# Limit Switches and Safety



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Overview



	Position switches, standard					Safety hinge switches	
<b>Enclosure</b>							
Plastic	✓	✓	✓	—	—	✓	✓
Metal	✓	—	✓	✓	✓	✓	✓
Dimensions (W x H x D) in mm	31 x 68 x 33	50 x 53 x 33	40 x 78 x 38	56 x 78 x 38	56 x 100 x 38	31 x 68 x 33	40 x 78 x 38
Degree of protection	IP65, IP66/IP67	IP66/IP67	IP66/IP67	IP66/IP67	IP66/IP67	IP65, IP66/IP67	IP66/IP67
<b>Standards</b>							
IEC 60947-5-1	Mounting and operating points acc. to EN 50047	Operating points acc. to EN 50047	Mounting and operating points acc. to EN 50041	Operating points acc. to EN 50041	Operating points acc. to EN 50047	Mounting and operating points acc. to EN 50047	Mounting and operating points acc. to EN 50041
<b>Approvals</b>	CE, UL, CSA, CCC		CE, UL, CSA, CCC			CE, UL, CSA, CCC	
<b>Contact blocks</b>							
2 slow-action contacts	1 NO + 1 NC, 2 NC		1 NO + 1 NC, 2 NC		—	1 NO + 1 NC	
2 snap-action contacts	1 NO + 1 NC		1 NO + 1 NC		—	1 NO + 1 NC	
• Short stroke	1 NO + 1 NC		✓		—	✓	
• With 2 x 2 mm contact gap	1 NO + 1 NC		✓		—	✓	
3 slow-action contacts	1 NO + 2 NC, 2 NO + 1 NC		1 NO + 2 NC, 2 NO + 1 NC		—	1 NO + 2 NC	
• With make-before-break	1 NO + 2 NC		1 NO + 2 NC		—	1 NO + 2 NC	
3 snap-action contacts	1 NO + 2 NC		1 NO + 2 NC		—	1 NO + 2 NC	
2 x (2 or 3 contacts)	—		—		✓	—	
<b>Special features</b>							
LED status display	✓		✓		—	✓	
Increased corrosion protection	✓		✓		✓	✓	
<b>Explosion protection (ATEX)</b>	—		✓		✓	✓	
<b>ASIsafe integrated</b>	✓		✓		—	✓	
<b>Electrical specifications</b>							
Insulation voltage $U_i$	400 V		400 V			400 V	
Conventional thermal current $I_{the}$	6 A/10 A (3-/2-pole)		6 A/10 A (3-/2-pole)			6 A/10 A (3-/2-pole)	
<b>Connections</b>							
Cable entry	1 x M20 x 1.5	2 x M20 x 1.5	1 x M20 x 1.5	3 x M20 x 1.5	1 x M20 x 1.5	1 x M20 x 1.5	1 x M20 x 1.5
M12 connector socket, 4-, 5- or 8-pole	✓	✓	✓	✓	✓	✓	✓
Connector socket, 6-pole + PE	—	—	✓	✓	—	—	—
<b>Actuators</b>							
Rounded plungers and roller plungers	✓		✓		—	—	
Roller and angular roller levers	✓		✓		—	—	
Spring rod	✓		✓		—	—	
Twist levers and rod actuators	✓		✓		—	—	
Fork lever	—		✓		—	—	
Hinge switches	—		—		—	✓	
<b>Page</b>							
Complete units	13/10, 13/27	13/19	13/15, 13/31	13/35	13/39	13/102	13/103
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ASIsafe	on-line	on-line	on-line	on-line	—	on-line	on-line
ATEX	on-line	on-line	on-line	on-line	on-line	on-line	on-line

✓ Available  
— Not available

Introduction



	Compact design	Open-type	Safety switches with separate actuator		Safety switches with solenoid interlocking	RFID safety switch
<b>Enclosure</b>						
Plastic	—	✓	✓	✓	✓	✓
Metal	✓	—	✓	✓	✓	—
Dimensions (W x H x D) in mm	30 x .. x .., 40 x .. x ..	30 x 48.5 x 20	31 x 68 x 33, 50 x 53 x 33	40 x 78 x 38, 56 x 78 x 38	54 x 185 x 44	25 x 91 x 22
Degree of protection	IP66/IP67	IP10 or IP20	IP65, IP66/IP67	IP66/IP67	IP66/IP67	IP69K
<b>Standards</b>	—	Mounting and operating points acc. to EN 50047	Mounting acc. to EN 50047	Mounting acc. to EN 50041	EN 1088	Category 4 acc. to ISO 13849-1, PL e acc. to ISO 13849-1, SIL 3 acc. to IEC 61508
IEC 60947-5-1						
<b>Approvals</b>	CE, UL, CSA	—	CE, TÜV, UL, CSA, CCC		CE, TÜV, UL, CSA, CCC	CE, TÜV
<b>Contact blocks</b>						
2 slow-action contacts	—	1 NO + 1 NC	1 NO + 1 NC	—	—	—
2 snap-action contacts	1 NO + 1 NC	1 NO + 1 NC	—	—	—	—
• Short stroke	—	✓	—	—	—	—
• With 2 x 2 mm contact gap	—	✓	—	—	—	—
3 slow-action contacts	—	1 NO + 2 NC	1 NO + 2 NC	—	—	—
• With make-before-break	—	1 NO + 2 NC	—	—	—	—
3 snap-action contacts	—	1 NO + 2 NC	—	—	—	—
6 slow-action contacts	—	—	—	—	2 x (1 NO + 2 NC)	—
<b>Special features</b>						
LED status display	—	—	✓	—	✓	✓
Increased corrosion protection	—	—	✓	—	✓	✓
<b>Explosion protection (ATEX)</b>	—	—	✓	—	—	—
<b>ASIsafe integrated</b>	—	—	✓	—	✓	—
<b>Electrical specifications</b>						
Insulation voltage $U_i$	400 V	400 V	400 V	—	400 V	—
Conventional thermal current $I_{the}$	10 A	6 A	6 A	—	6 A	—
<b>Connections</b>						
Cable entry	—	—	1 x M20 x 1.5, 2 x M20 x 1.5	1 x M20 x 1.5, 3 x M20 x 1.5	3 x M20 x 1.5	—
M12 connector socket, 4-, 5- or 8-pole	✓	—	✓	✓	✓	✓
Molded cables	✓	—	—	—	—	—
AS-Interface	—	—	✓	✓	✓	—
<b>Actuators</b>						
Plungers, twist levers	✓	✓	—	—	—	—
Separate actuators	—	—	✓	—	✓	—
<b>Page</b>						
Complete units	13/46	13/47	13/82	13/85	13/95	—
Modular system	—	—	—	—	—	13/110
ASIsafe	—	—	on-line	on-line	on-line	—
ATEX	—	—	on-line	on-line	—	—

✓ Available  
— Not available

## SIRIUS 3SE5 International Limit Switches

## General Data

**Overview**

Position switches in the innovative SIRIUS 3SE5 series are modern in design, compact, modular and simple to connect.

**Complete units**

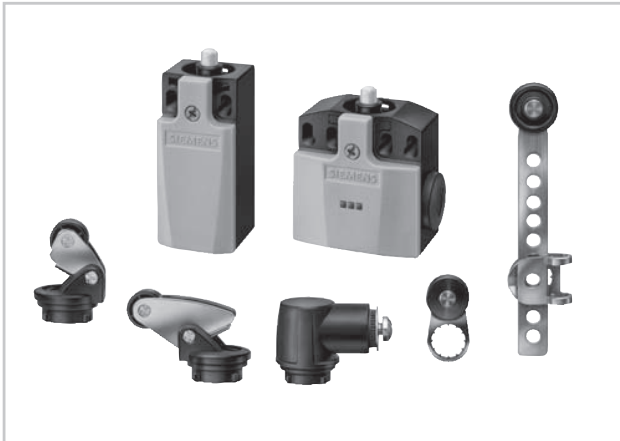
Popular versions of the position switches in standard enclosures are available as complete units.



Position switches with plastic and metal enclosures

**Modular system**

The 3SE5 series features a new modular system comprising different sizes of the basic switch and an actuator which must be ordered separately. Thanks to the modular construction of the switch the user can select the right solution for his application from numerous versions and install it himself in a very short time. The short delivery times of the modules enable fast replacement and thus ensure high plant availability.



Examples of selection options in the modular system

**Design**Enclosure sizes

All enclosure versions have an integrated chlorinated rubber diaphragm for high functional safety in cold and aggressive environments.

The 3SE5 switches are available in five different enclosure sizes with 2 or 3 contacts and with the XL enclosure:

- Open-type position switch IP20 or IP10
- Plastic enclosures according to EN 50047 (31 mm wide), IP65, 1 cable entry
- Plastic enclosures (50 mm wide), IP66/IP67, 2 cable entries
- Metal enclosures according to EN 50047, (31 mm wide), IP66/IP67, 1 cable entry
- Plastic and metal enclosures according to EN 50041 (40 mm wide), IP66/IP67, 1 cable entry
- Metal enclosures (56 mm wide), IP66/IP67, 3 cable entries
- XL metal enclosures with 4 to 6 contacts, 56 mm wide, IP66/IP67, 3 cable entries

Various basic switches can be selected for the 3SE5 series:

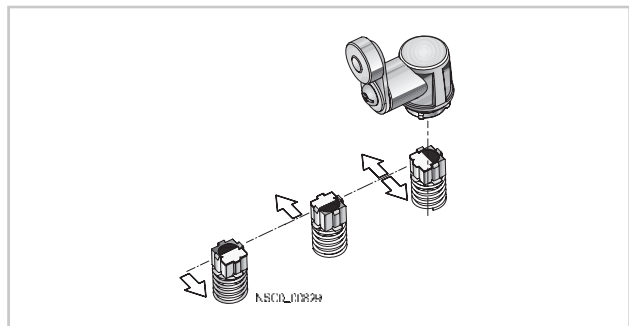
- With contact blocks with two or three contacts (screw terminals) designed as slow-action or snap-action contacts; the slow-action contacts also make-before-break
- Optional LED status display
- With mounted four or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- With increased corrosion protection
- Versions for operating temperature to -40° C
- Metal enclosures for explosion protection (ATEX)
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs

Actuator variants

All operating mechanisms can be rotate around the axis in increments of 22.5°. The following actuator variants are available:

- Standard, rounded and roller plungers
- Roller and angular roller levers
- Spring rods
- Twist levers and rod actuators
- Fork levers with twist actuator

The actuator rollers are available with various materials and diameters.



Twist actuators for twist levers and rod actuators, with setting of switching to right, left or right/left (standard for all twist actuators except version for fork levers)

## SIRIUS 3SE5 International Limit Switches

## General Data

**Optional LED indicators**

LED indicators available for all enclosure sizes



The enclosure versions can be supplied with an LED signaling indicator (1 × green + 1 × yellow). This is the first time that optical signaling equipment is also available for small standard enclosures according to EN 50047. The LED signaling indicators are available in all common voltages (24 V DC and 230 V AC).

**Additional contacts**

Exchangeable two and three-pole switching blocks for all enclosure sizes



The three-pole switching block (2 NC, 1 NO) in snap-action and slow-action is regularly available for all enclosure forms. It offers more switching through redundant shutdowns (2 NC contacts) with simultaneous signaling (1 NO contact). The same installation space is required as for a two-pole switching block.

**Contact reliability**

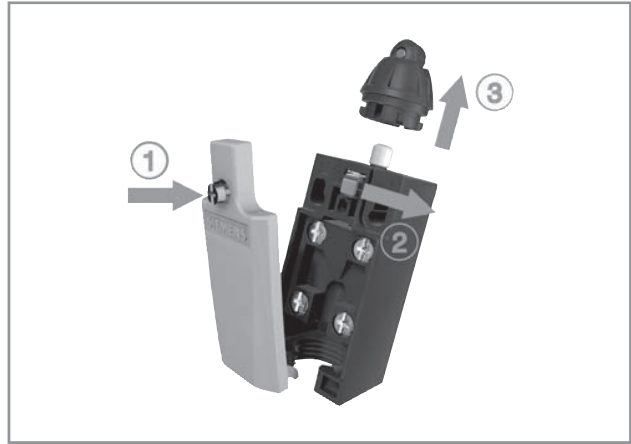
The new contact blocks ensure an extremely high contact stability. This applies even when the devices are switching low voltages and currents, e. g. 1 mA at 5 V DC.

**Positive opening** ☞

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".

**Mounting**

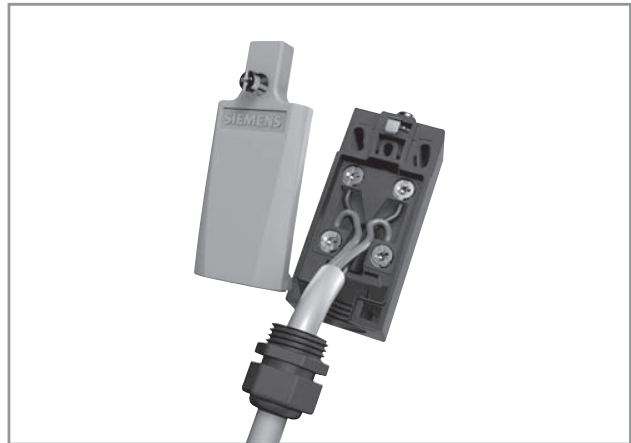
Easy plug-in method – for fast replacement of the actuator head



- (1) Open cover
- (2) Actuate locking lever
- (3) Replace the head (turnable by 16 x 22.5°)
- (4) Lock and close the cover

**Fast connection method**

For plastic enclosure with a width of 31 mm



These position switches can be wired quickly and easily as an added customer benefit. The connecting cable is first connected to the terminals of the contact block and then guided through a slit into the cable gland opening. The time saved through this new connection method is approx. 20 to 25 %.



**Benefits**

The 3SE5 position switches differ from the previous series through the following new characteristics:

- The modular design of the product range allows a number of versions with a smaller number of bearing types for enclosures and operating mechanisms.
- All actuators can be turned around the axis in increments of 22.5° (see picture on page 13/6).
- Rounded and roller plungers according to EN 50041 with 3 mm overtravel (total travel 9 mm) for greater tolerance when switching
- All enclosure sizes – now also including the small enclosure 31 mm wide – are optionally available with an LED signaling indicator (see picture on page 13/7).
- All enclosure versions have an integrated chlorinated rubber diaphragm (high functional safety in cold and aggressive environments).
- All contact blocks are replaceable (see page 13/49).
- The three-pole contact blocks are available for all enclosure sizes (see picture on page 13/7).
- Elements with 1 NO + 2 NC slow-action contacts with make-before-break and 2 NO + 1 NC
- The short-stroke contact block 1 NO + 1 NC improves the precision of the switching operation through a reduced actuation path.
- The contact block with 1 NO + 1 NC snap-action contacts with 2 x 2 mm contact opening is suitable for simultaneous disconnection and signaling, particularly in the elevator industry
- NEW: XL enclosures for accommodating two 2- or 3-pole contact blocks
- The plastic enclosure with a width of 31 mm has simple and fast wiring equipment which makes it possible to save from approx. 20 to 25 % of the time when connecting (see picture on page 13/7).
- The ASIsafe electric component is integrated for the versions with the AS-Interface connection (see on-line); an additional adapter is not required.

**Application**

With the standard position switches, mechanical positions of moved machine parts are converted into electrical signals. Through their modular and uniform design and large number of versions, the devices can meet practically all requirements in industry.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. And many different actuator versions are available to match the mechanical configuration of the moved machined parts. Dimensions, fixing points and characteristics are largely in accordance with the EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

**Standards**

IEC 60947-5-1 or EN 60947-5-1.

The protective measure of "total insulation" by the molded-plastic enclosure is guaranteed by the use of molded-plastic screw-glands.

**Safety position switches**

For controls according to IEC 60204-1 or EN 60204-1 the devices can be used as a safety position switch. To secure position switches against changes in their position, keyed techniques must be employed on installation.

**Safety circuits**

IEC 60947-5-1 and EN 60947-5-1 require positive opening of the NC contacts, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to the IEC standard 60947-5-1 with the symbol  $q$ .

Category 2 according to ISO 13849-1 (EN 954-1) can be attained with 3SE5 position switches with  $q$ , and category 3 or 4 when using an additional position switch, if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching devices from the ASIsafe, SIMATIC or SINUMERIK product ranges. The operating mechanisms (actuators) must also be connected to the enclosure by keyed techniques. The corresponding operating mechanisms are marked in the catalog with  $q$ .

**Contacts for each application**

- Snap-action contacts: NC and NO contacts switch simultaneously – regardless of the actuating speed ( $v_{\min} = 0.01$  m/s) and contact erosion.
- Slow-action contacts: Difference in travel between "NC contact opens" and "NO contact closes"; the switching speed is the same as or proportional to the actuating speed ( $v_{\min} = 0.4$  m/s).
- Slow-action contacts with make-before-break: e.g. suitable for adding a second function to a sequence control.

**Operating mechanisms for each application**Standard, rounded and roller plungers

- Operation in direction of the plunger axis or in case of roller plunger with bar at right angles to the plunger axis
- The roller plunger is recommended for lateral actuation and relatively long overtravel.

Roller and angular roller levers

- For actuators made of finely ground steel in the form of cams, straight-edges (approach angle 30°) or cam disks

Spring rod

- Can be used for undefined actuations and changing starting conditions
- Starting from any direction is possible

Twist levers and rod actuators

- For a high starting speed ( $v = 1.5$  m/s)
- Variety of starting options
- Insensitive to oil, grinding dust and coarse-grained material
- Adjustment of the lever in increments of 10°.
- Can be adjusted with left or right switching

Fork lever

- Switchable in two directions
- Latching actuator
- For reciprocating movements

# SIRIUS 3SE5 International Limit Switches

## General Data

### Options

On the following pages you will find selection tables for complete units as well as components of the modular system.

- Complete units
- Modular system

The difference between units is indicated in the selection and ordering data by gray backgrounds.

Using the modular system you can assemble switch variants which are not available as complete units. Each complete unit can also be supplied as a module.

A basic switch for the modular system comprises an enclosure with a contact block and a cover. Among the basic switches the following versions, for example, can be selected:

- Basic enclosure with teflon plunger
- Version with increased corrosion protection
- Version with 2 LEDs

- Version with M12 connector socket or 6-pole + PE
- Version with M12 connector socket and with 2 LEDs

For the plastic enclosures with a width of 31 and 50 mm the basic switches are designed as complete units with rounded plunger (according to standard).

### Online configurator

The online configurator helps you not only to select and order the right position switch but also to create complete product documentation.

- Product data sheets
- Dimensional drawings
- Operating travel diagrams
- CAD data in 2D and 3D model images
- Ordering data
- Product photos

[www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators)


### Complete units

#### Ordering example

Required:

- Position switch according to EN 50047 in a plastic enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Angular roller lever, metal lever and plastic roller

To be ordered:

Version	Complete units <input type="checkbox"/>
Order No.	
<b>Complete units • Enclosure width 31 mm</b>	
	<b>Angular roller levers</b> With metal lever and plastic roller 13 mm Slow-action contacts 1 NO + 1 NC <b>3SE5 232-0BF10</b>

### Modular system

#### Ordering example 1

Required:



- Position switch according to EN 50047 in a plastic enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Angular roller lever, metal lever and plastic roller

#### Ordering example 2




Required:

- Position switch according to EN 50047 in a plastic enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Twist lever, high-grade steel lever and plastic roller

To be ordered separately:

Version	Modular system <input checked="" type="checkbox"/>
Order No.	
<b>Basic switches • Enclosure width 31 mm</b>	
	<b>With teflon plunger</b> Slow-action contacts 1 NO + 1 NC <b>3SE5 232-0BC05</b>
+	
<b>Operating mechanisms</b>	
	<b>Angular roller levers</b> Metal lever, plastic roller <b>3SE5 000-0AF10</b>

To be ordered separately:

Version	Modular system <input checked="" type="checkbox"/>
Order No.	
<b>Basic switches • Enclosure width 31 mm</b>	
	<b>With teflon plunger</b> Slow-action contacts 1 NO + 1 NC <b>3SE5 232-0BC05</b>
+	
<b>Twist actuators</b>	
	<b>Twist actuators</b> <b>3SE5 000-0AK00</b>
	<b>Twist levers</b> High-grade steel lever, plastic roller <b>3SE5 000-0AA31</b>



# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 31 mm acc. to EN 50047

## Selection and ordering data

### Complete units

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5<sup>1)</sup>

Version	Contacts	LEDs	DT	Complete units	Configurator	Order No.	Price per PU	PU (UNIT, SET, M)	PS*

### Complete units<sup>2)</sup> · Enclosure width 31 mm

#### Rounded plungers, type B, acc. to EN 50047

##### With teflon plunger

Slow-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 232-0BC05</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0CC05</b>	1	1 unit
Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ A	<b>3SE5 232-0HC05</b>	1	1 unit
Snap-action contacts • Short stroke, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0FC05</b>	1	1 unit
Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0GC05</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 232-0KC05</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 232-0LC05</b>	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 232-0MC05</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ A	<b>3SE5 232-0PC05</b>	1	1 unit

##### With increased corrosion protection

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0BC05-1CA0</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0CC05-1CA0</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0KC05-1CA0</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0LC05-1CA0</b>	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0MC05-1CA0</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 232-0PC05-1CA0</b>	1	1 unit

##### With M12 connector socket, 4-pole (250 V, 4 A)

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 234-0BC05-1AC4</b>	1	1 unit
Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ A	<b>3SE5 234-0HC05-1AC4</b>	1	1 unit
Slow-action contacts	2 NC	—	⊕ B	<b>3SE5 234-0KC05-1AE0</b>	1	1 unit
Snap-action contacts	2 NC	—	⊕ A	<b>3SE5 234-0LC05-1AE0</b>	1	1 unit

##### With 2 LEDs, yellow/green

Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 232-1KC05</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 232-1LC05</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 232-3KC05</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 232-3LC05</b>	1	1 unit

##### With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs

Slow-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 234-1BC05-1AF3</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 234-1CC05-1AF3</b>	1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> A cable gland with seal must be used with the quick-connect method.

<sup>2)</sup> Popular versions.

<sup>3)</sup> Subsequent replacement of contact blocks is not possible.



Rounded plungers



With increased corrosion protection



With 2 LEDs





# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 31 mm acc. to EN 50047

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5<sup>1)</sup>

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.		Price per PU	

**Complete units<sup>2)</sup> · Enclosure width 31 mm**

 Roller plunger	<b>Roller plungers, type C acc. to EN 50047</b>						
	<b>With plastic roller 10 mm</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0BD03</b>		1 1 unit
	Snap-action contacts • Integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ A	<b>3SE5 232-0HD03</b>		1 1 unit
	Snap-action contacts • Short stroke, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0FD03</b>		1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0KD03</b>		1 1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 232-0LD03</b>		1 1 unit	
<b>Actuator head rotated by 90°</b>							
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0LD03-1AH0</b>		1 1 unit	
<b>With M12 connector socket, 4-pole (250 V, 4 A)</b>							
Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 234-0HD03-1AC4</b>		1 1 unit	
 Roller plunger with central fixing	<b>Roller plungers with central fixing</b>						
	Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0HD10</b>		1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0KD10</b>		1 1 unit
 Roller lever	<b>Roller levers, type E acc. to EN 50047</b>						
	<b>With metal lever and plastic roller 13 mm</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 232-0BE10</b>		1 1 unit
	Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ A	<b>3SE5 232-0HE10</b>		1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0KE10</b>		1 1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0LE10</b>		1 1 unit	
<b>With M12 connector socket, 4-pole (250 V, 4 A)</b>							
Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 234-0HE10-1AC4</b>		1 1 unit	
 Angular roller lever	<b>Angular roller levers</b>						
	<b>With metal lever and plastic roller 13 mm</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 232-0BF10</b>		1 1 unit
	Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 232-0HF10</b>		1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0KF10</b>		1 1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0LF10</b>		1 1 unit	

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> A cable gland with seal must be used with the quick-connect method.

<sup>2)</sup> Popular versions.

<sup>3)</sup> Subsequent replacement of contact blocks is not possible.

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 31 mm acc. to EN 50047

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5<sup>1)</sup>

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.	Price per PU		

**Complete units<sup>2)</sup> · Enclosure width 31 mm**

**Spring rods**

**Length 142.5 mm, with plastic plunger 50 mm**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	A	<b>3SE5 232-0HR01</b>		1	1 unit
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**With M12 connector socket, 4-pole (250 V, 4 A)**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	B	<b>3SE5 234-0HR01-1AC4</b>		1	1 unit
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**Twist levers, type A acc. to EN 50047**

**With metal lever 21 mm and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 232-0BK21</b>		1	1 unit
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Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 232-0HK21</b>		1	1 unit
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Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0KK21</b>		1	1 unit
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Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0LK21</b>		1	1 unit
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**With M12 connector socket, 4-pole (250 V, 4 A)**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 234-0HK21-1AC4</b>		1	1 unit
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**With metal lever 35 mm and plastic roller 19 mm**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0HK15</b>		1	1 unit
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**Twist levers, adjustable length**

**With metal lever with grid hole and plastic roller 19 mm**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ A	<b>3SE5 232-0HK60</b>		1	1 unit
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**With metal lever and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	B	<b>3SE5 232-0BK50</b>		1	1 unit
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Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	▶	<b>3SE5 232-0HK50</b>		1	1 unit
--	-------------	---	---	-----------------------	--	---	--------

Snap-action contacts	1 NO + 2 NC	—	B	<b>3SE5 232-0LK50</b>		1	1 unit
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**With M12 connector socket, 4-pole (250 V, 4 A)**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	B	<b>3SE5 234-0HK50-1AC4</b>		1	1 unit
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**Rod actuators**

**With aluminum rod, length 200 mm**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	B	<b>3SE5 232-0HK80</b>		1	1 unit
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**With plastic rod, length 200 mm**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	▶	<b>3SE5 232-0HK82</b>		1	1 unit
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**With M12 connector socket, 4-pole (250 V, 4 A)**

Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	B	<b>3SE5 234-0HK82-1AC4</b>		1	1 unit
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Spring rod



Twist lever



Twist lever, adjustable length



Rod actuator

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators) .

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> A cable gland with seal must be used with the quick-connect method.

<sup>2)</sup> Popular versions.

<sup>3)</sup> Subsequent replacement of contact blocks is not possible.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/13.

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 31 mm acc. to EN 50047

## Modular system

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5<sup>1)</sup>

Version	Contacts	LEDs	DT	Modular system		PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.	Price per PU		

### Basic switches · Enclosure width 31 mm (with rounded plunger<sup>2)</sup>)

	<b>With teflon plunger</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 232-0BC05</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 232-0CC05</b>	1	1 unit
	Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 232-0HC05</b>	1	1 unit
	Snap-action contacts • Short stroke, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0FC05</b>	1	1 unit
	Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0GC05</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 232-0KC05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 232-0LC05</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ A	<b>3SE5 232-0MC05</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ A	<b>3SE5 232-0PC05</b>	1	1 unit	
	<b>With increased corrosion protection<sup>4)</sup></b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0BC05-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0CC05-1CA0</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0KC05-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0LC05-1CA0</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0MC05-1CA0</b>	1	1 unit
	<b>With M12 connector socket, 4-pole (250 V, 4 A)</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 234-0BC05-1AC4</b>	1	1 unit
	Snap-action contacts, integrated <sup>3)</sup>	1 NO + 1 NC	—	⊕ A	<b>3SE5 234-0HC05-1AC4</b>	1	1 unit
	Slow-action contacts	2 NC	—	⊕ B	<b>3SE5 234-0KC05-1AE0</b>	1	1 unit
	Snap-action contacts	2 NC	—	⊕ A	<b>3SE5 234-0LC05-1AE0</b>	1	1 unit
	<b>With 2 LEDs, yellow/green</b>						
	Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 232-1KC05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 232-1LC05</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 232-3KC05</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 232-3LC05</b>	1	1 unit	
	<b>With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs</b>						
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 234-1BC05-1AF3</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 234-1CC05-1AF3</b>	1	1 unit	

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> A cable gland with seal must be used with the quick-connect method.

<sup>2)</sup> For enclosures with widths of 31mm, the basic switch is a complete unit with rounded plungers.

<sup>3)</sup> Subsequent replacement of contact blocks is not possible.











<sup>4)</sup> Use corresponding high-grade steel lever.

Note:

Selection aid [see page 13/9](#).

## SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 31 mm acc. to EN 50047

Version	Diameter	DT	Modular system	Price per PU	PU (UNIT, SET, M)	PS*	
	mm		Order No.				
<b>Operating mechanisms</b>							
 Roller plunger	<b>Roller plungers, type C acc. to EN 50047</b>						
	Plastic rollers	10	⊕ ▶	<b>3SE5 000-0AD03</b>	1	1 unit	
	High-grade steel rollers	10	⊕ B	<b>3SE5 000-0AD04</b>	1	1 unit	
 With central fixing	<b>Roller plungers with central fixing</b>						
	Plastic rollers	10	⊕ B	<b>3SE5 000-0AD10</b>	1	1 unit	
	High-grade steel rollers	10	⊕ B	<b>3SE5 000-0AD11</b>	1	1 unit	
 Roller lever	<b>Roller levers, type E acc. to EN 50047</b>						
	Metal lever, plastic roller	13	⊕ ▶	<b>3SE5 000-0AE10</b>	1	1 unit	
	Metal lever, high-grade steel roller	13	⊕ ▶	<b>3SE5 000-0AE11</b>	1	1 unit	
	High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE12</b>	1	1 unit	
	High-grade steel lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AE13</b>	1	1 unit	
 Angular roller lever	<b>Angular roller levers</b>						
	Metal lever, plastic roller	13	⊕ ▶	<b>3SE5 000-0AF10</b>	1	1 unit	
	Metal lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AF11</b>	1	1 unit	
	High-grade steel lever, plastic roller	13	⊕ A	<b>3SE5 000-0AF12</b>	1	1 unit	
	High-grade steel lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AF13</b>	1	1 unit	
 Spring rod	<b>Spring rods</b> (for switches with snap-action contacts only)						
	Plastic plunger and high-grade steel spring:						
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		▶	<b>3SE5 000-0AR01</b>	1	1 unit	
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		▶	<b>3SE5 000-0AR03</b>	1	1 unit	
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	<b>3SE5 000-0AR04</b>	1	1 unit	
	High-grade steel plunger and spring:	7					
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR02</b>	1	1 unit		
<b>Twist actuators</b>							
 Twist actuator	<b>Twist actuators, plastic (without lever)</b>						
	Switching right and/or left, adjustable		⊕ ▶	<b>3SE5 000-0AK00</b>	1	1 unit	
 Twist lever	<b>Levers for twist actuators</b>						
	<b>Twist levers 21 mm, straight, type A acc. to EN 50047</b>						
	Metal lever, plastic roller	19	⊕ ▶	<b>3SE5 000-0AA21</b>	1	1 unit	
	Metal lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA22</b>	1	1 unit	
	Metal lever, roller with ball bearing	19	⊕ B	<b>3SE5 000-0AA23</b>	1	1 unit	
	Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA25</b>	1	1 unit	
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA31</b>	1	1 unit	
High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA32</b>	1	1 unit		
 Twist levers 30 mm, straight <sup>1)</sup>	Metal lever, plastic roller		19	⊕ B	<b>3SE5 000-0AA24</b>	1	1 unit
	<b>Twist levers, adjustable length, with grid hole</b>						
 Twist lever, adjustable length	Metal lever, plastic roller	19	⊕ ▶	<b>3SE5 000-0AA60</b>	1	1 unit	
	Metal lever, high-grade steel roller	19	⊕ ▶	<b>3SE5 000-0AA61</b>	1	1 unit	
	Metal lever, plastic roller	50	⊕ B	<b>3SE5 000-0AA67</b>	1	1 unit	
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA68</b>	1	1 unit	
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62</b>	1	1 unit	
	High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA63</b>	1	1 unit	
 Rod actuator	<b>Twist levers, adjustable length</b>						
	Metal lever, plastic roller	19	A	<b>3SE5 000-0AA50</b>	1	1 unit	
	Metal lever, high-grade steel roller	19	B	<b>3SE5 000-0AA51</b>	1	1 unit	
	Metal lever, plastic roller	30	B	<b>3SE5 000-0AA55</b>	1	1 unit	
	Metal lever, plastic roller	50	B	<b>3SE5 000-0AA57</b>	1	1 unit	
	Metal lever, rubber roller	50	B	<b>3SE5 000-0AA58</b>	1	1 unit	
	High-grade steel lever, plastic roller	19	B	<b>3SE5 000-0AA52</b>	1	1 unit	
	High-grade steel lever, high-grade steel roller	19	B	<b>3SE5 000-0AA53</b>	1	1 unit	
<b>Rod actuators</b>							
Aluminum rod, length 200 mm	6	▶	<b>3SE5 000-0AA80</b>	1	1 unit		
Spring rod, length 200 mm	6	B	<b>3SE5 000-0AA81</b>	1	1 unit		
Plastic rod, length 200 mm	6	▶	<b>3SE5 000-0AA82</b>	1	1 unit		

⊕ Positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 40 mm acc. to EN 50041

## Selection and ordering data

### Complete units

2 or 3 contacts · Degree of protection IP66/67 · Cable entry M20 x 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.		Price per PU	

### Complete units<sup>1)</sup> · Enclosure width 40 mm

	<b>Plain plungers</b>						
	<b>With high-grade steel plunger</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0BB01</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0CB01</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0KB01</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0LB01</b>	1	1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 132-0PB01</b>	1	1 unit
	<b>Rounded plungers, type B acc. to EN 50041</b>						
	<b>With plastic plunger</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 132-0BC03</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 132-0CC03</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0KC03</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0LC03</b>	1	1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 132-0PC03</b>	1	1 unit
	<b>Roller plungers, type C acc. to EN 50041</b>						
	<b>With plastic roller 13 mm</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0BD05</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 132-0CD05</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0KD05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0LD05</b>	1	1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 132-0PD05</b>	1	1 unit
	<b>Roller levers</b>						
	<b>With metal lever and plastic roller 22 mm</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0BE05</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 132-0CE05</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0KE05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0LE05</b>	1	1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 132-0PE05</b>	1	1 unit
	<b>Angular roller levers</b>						
	<b>With metal lever and plastic roller 22 mm</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0BF05</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0CF05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0LF05</b>	1	1 unit
	<b>Spring rods</b>						
	<b>Length 142.5 mm, with plastic plunger 50 mm</b>						
	Snap-action contacts	1 NO + 1 NC	—	B	<b>3SE5 132-0CR01</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	B	<b>3SE5 132-0LR01</b>	1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.





# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 40 mm acc. to EN 50041

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.	Price per PU		

**Complete units<sup>1)</sup> · Enclosure width 40 mm**

 <p>Twist lever</p>	<b>Twist levers, type A acc. to EN 50041</b>						
	<b>With metal lever 27 mm and plastic roller 19 mm</b>						
	Slow-action contacts	1 NO + 1 NC	—	A	<b>3SE5 132-0BJ01</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	▶	<b>3SE5 132-0CJ01</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	B	<b>3SE5 132-0KJ01</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	B	<b>3SE5 132-0LJ01</b>	1	1 unit
	Slow-action contacts	2 NO + 1 NC	—	B	<b>3SE5 132-0PJ01</b>	1	1 unit
 <p>Twist lever, adjustable length, with grid hole</p>	<b>Twist levers, adjustable length</b>						
	<b>With metal lever with grid hole and plastic roller 19 mm</b>						
	Snap-action contacts	1 NO + 1 NC	—	B	<b>3SE5 132-0CJ60</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	B	<b>3SE5 132-0LJ60</b>	1	1 unit
 <p>Twist lever, adjustable length</p>	<b>With metal lever and plastic roller 19 mm</b>						
	Snap-action contacts	1 NO + 1 NC	—	A	<b>3SE5 132-0CJ50</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	B	<b>3SE5 132-0LJ50</b>	1	1 unit
 <p>Rod actuator</p>	<b>Rod actuators, type D, acc. to EN 50041</b>						
	<b>With aluminum rod, length 200 mm</b>						
	Snap-action contacts	1 NO + 1 NC	—	B	<b>3SE5 132-0CJ80</b>	1	1 unit
	<b>With plastic rod, length 200 mm</b>						
	Snap-action contacts	1 NO + 1 NC	—	A	<b>3SE5 132-0CJ82</b>	1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/17.





# SIRIUS 3SE5 International Limit Switches





3SE5, plastic enclosures – Enclosure width 40 mm acc. to EN 50041

## Modular system


2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
						
						
				Order No.	Price per PU	

### Basic switches · Enclosure width 40 mm

	<b>With M20 × 1.5 connecting thread</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0BA00</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 132-0CA00</b>	1	1 unit
	• Gold-plated contacts			⊕ B	<b>3SE5 132-0CA00-1AC1</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0KA00</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0LA00</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0MA00</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 132-0PA00</b>	1	1 unit	
	<b>With increased corrosion protection<sup>1)</sup></b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0BA00-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 132-0CA00-1CA0</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0KA00-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0LA00-1CA0</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 132-0MA00-1CA0</b>	1	1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 132-0PA00-1CA0</b>	1	1 unit
	<b>With M12 connector socket, 4-pole (250 V, 4 A)</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 134-0BA00-1AC4</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 134-0CA00-1AC4</b>	1	1 unit
	Slow-action contacts	2 NC	—	⊕ B	<b>3SE5 134-0KA00-1AE0</b>	1	1 unit
	Snap-action contacts	2 NC	—	⊕ B	<b>3SE5 134-0LA00-1AE0</b>	1	1 unit
	<b>With 2 LEDs, yellow/green</b>						
	Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ C	<b>3SE5 132-1KA00</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ C	<b>3SE5 132-1LA00</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ C	<b>3SE5 132-3KA00</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ C	<b>3SE5 132-3LA00</b>	1	1 unit

 For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

 Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Use corresponding high-grade steel lever.













Note:

Selection aid [see page 13/9](#).



# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 40 mm acc. to EN 50041

Version	Diameter	DT	Modular system	Price per PU	PU (UNIT, SET, M)	PS*
	mm		Order No.			
<b>Operating mechanisms</b>						
	<b>Plain plungers</b>					
Plain plunger	High-grade steel plungers	10	⊕ A	<b>3SE5 000-0AB01</b>	1	1 unit
	<b>Rounded plungers, type B acc. to EN 50041</b>					
	Plastic plungers	10	⊕ B	<b>3SE5 000-0AC03</b>	1	1 unit
	<b>Roller plungers, type C acc. to EN 50041</b>					
Plunger	Plastic plunger, plastic roller	13	⊕ B	<b>3SE5 000-0AD05</b>	1	1 unit
	Plastic plunger, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AD06</b>	1	1 unit
	<b>Roller levers</b>					
Roller lever	Metal lever with plastic roller, plastic base	22	⊕ B	<b>3SE5 000-0AE05</b>	1	1 unit
	<b>Angular roller levers</b>					
Angular roller lever	Metal lever with plastic roller, plastic base	22	⊕ B	<b>3SE5 000-0AF05</b>	1	1 unit
	<b>Spring rods</b> (for switches with snap-action contacts only)					
Spring rod	Plastic plunger and high-grade steel spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR01</b>	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	<b>3SE5 000-0AR03</b>	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	<b>3SE5 000-0AR04</b>	1	1 unit
	High-grade steel plunger and spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR02</b>	1	1 unit
<b>Twist actuators</b>						
	<b>Twist actuators, plastic</b> (without lever)					
Twist actuator	• For twist levers and rod actuators, switching right and/or left, adjustable		⊕ B	<b>3SE5 000-0AJ00</b>	1	1 unit
	<b>Levers for twist actuators</b>					
Twist lever	<b>Twist levers, offset, type A acc. to EN 50041</b>					
	Metal lever 27 mm, plastic roller	19	⊕ ▶	<b>3SE5 000-0AA01</b>	1	1 unit
	Metal lever 27 mm, high-grade steel roller	19	⊕ ▶	<b>3SE5 000-0AA02</b>	1	1 unit
	Metal lever 27 mm, roller with ball bearing	19	⊕ B	<b>3SE5 000-0AA03</b>	1	1 unit
	Metal lever 27 mm, 2 plastic rollers	19	⊕ ▶	<b>3SE5 000-0AA04</b>	1	1 unit
	Metal lever 27 mm, plastic roller	30	⊕ B	<b>3SE5 000-0AA05</b>	1	1 unit
	Metal lever 27 mm, rubber roller	50	⊕ ▶	<b>3SE5 000-0AA08</b>	1	1 unit
	High-grade steel lever 27 mm, plastic roller	19	⊕ B	<b>3SE5 000-0AA11</b>	1	1 unit
	High-grade steel lever 27 mm, high-grade steel roller	19	⊕ ▶	<b>3SE5 000-0AA12</b>	1	1 unit
	Metal lever 35 mm, plastic roller	19	⊕ B	<b>3SE5 000-0AA15</b>	1	1 unit
	<b>Twist levers 30 mm, straight<sup>1)</sup></b>					
Twist lever, adjustable length	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA24</b>	1	1 unit
	Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA26</b>	1	1 unit
	<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60</b>	1	1 unit
	Metal lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA61</b>	1	1 unit
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA68</b>	1	1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA63</b>	1	1 unit
	<b>Twist levers, adjustable length</b>					
	Metal lever, plastic roller	19	A	<b>3SE5 000-0AA50</b>	1	1 unit
	Metal lever, high-grade steel roller	19	B	<b>3SE5 000-0AA51</b>	1	1 unit
	Metal lever, plastic roller	30	B	<b>3SE5 000-0AA55</b>	1	1 unit
	Metal lever, rubber roller	50	B	<b>3SE5 000-0AA58</b>	1	1 unit
	High-grade steel lever, plastic roller	19	B	<b>3SE5 000-0AA52</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	19	B	<b>3SE5 000-0AA53</b>	1	1 unit
	<b>Rod actuators, type D acc. to EN 50041</b>					
Rod actuator	Aluminum rod, length 200 mm	6	B	<b>3SE5 000-0AA80</b>	1	1 unit
	Spring rod, length 200 mm	6	B	<b>3SE5 000-0AA81</b>	1	1 unit
	Plastic rod, length 200 mm	6	B	<b>3SE5 000-0AA82</b>	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 50 mm

## Selection and ordering data

### Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 2 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.		Price per PU	

### Complete units<sup>1)</sup> · Enclosure width 50 mm



Rounded plunger

#### Rounded plungers

##### With teflon plunger

Slow-action contacts	1 NO + 1 NC	—	⊙ ▶	<b>3SE5 242-0BC05</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊙ B	<b>3SE5 242-0CC05</b>		1	1 unit
Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊙ ▶	<b>3SE5 242-0HC05</b>		1	1 unit
Snap-action contacts • Short stroke, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊙ B	<b>3SE5 242-0FC05</b>		1	1 unit
Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	—	⊙ B	<b>3SE5 242-0GC05</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊙ B	<b>3SE5 242-0KC05</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊙ B	<b>3SE5 242-0LC05</b>		1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊙ A	<b>3SE5 242-0MC05</b>		1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊙ A	<b>3SE5 242-0PC05</b>		1	1 unit



With increased corrosion protection

##### With increased corrosion protection

Slow-action contacts	1 NO + 1 NC	—	⊙ B	<b>3SE5 242-0BC05-1CA0</b>		1	1 unit
Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊙ B	<b>3SE5 242-0HC05-1CA0</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊙ B	<b>3SE5 242-0KC05-1CA0</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊙ B	<b>3SE5 242-0LC05-1CA0</b>		1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊙ B	<b>3SE5 242-0MC05-1CA0</b>		1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊙ B	<b>3SE5 242-0PC05-1CA0</b>		1	1 unit



With 2 LEDs

##### With 2 LEDs, yellow/green

Slow-action contacts	1 NO + 2 NC	24 V DC	⊙ B	<b>3SE5 242-1KC05</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	⊙ B	<b>3SE5 242-1LC05</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	⊙ B	<b>3SE5 242-3KC05</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	⊙ B	<b>3SE5 242-3LC05</b>		1	1 unit



Roller plunger

#### Roller plungers

##### With plastic roller 10 mm

Slow-action contacts	1 NO + 1 NC	—	⊙ ▶	<b>3SE5 242-0BD03</b>		1	1 unit
Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊙ ▶	<b>3SE5 242-0HD03</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊙ ▶	<b>3SE5 242-0LD03</b>		1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

<sup>2)</sup> Subsequent replacement of contact blocks is not possible.

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 50 mm

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 2 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

**Complete units<sup>1)</sup> · Enclosure width 50 mm**



Roller lever

**Roller levers**

**With metal lever and plastic roller 13 mm**

Slow-action contacts	1 NO + 1 NC	—		B	<b>3SE5 242-0BE10</b>	1	1 unit
Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—		▶	<b>3SE5 242-0HE10</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—		B	<b>3SE5 242-0LE10</b>	1	1 unit

**With M12 connector socket, 4-pole right (250 V, 4 A)**

Snap-action contacts	2 NC	—		B	<b>3SE5 244-0LE10-1AE0</b>	1	1 unit
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**Twist levers**

**With metal lever 21 mm and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—		B	<b>3SE5 242-0BK21</b>	1	1 unit
Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—		▶	<b>3SE5 242-0HK21</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—		B	<b>3SE5 242-0LK21</b>	1	1 unit



Twist lever

**Twist levers, adjustable length**

**With metal lever and plastic roller 19 mm**

Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—		B	<b>3SE5 242-0HK50</b>	1	1 unit
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Twist lever, adjustable length

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

<sup>2)</sup> Subsequent replacement of contact blocks is not possible.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/21.

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 50 mm

## Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 2 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Order No.	Price per PU	

### Basic switches · Enclosure width 50 mm (with rounded plunger<sup>1)</sup>)

	<b>With teflon plunger</b>					
	Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 242-0BC05</b>	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 242-0CC05</b>	1 1 unit
	Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 242-0HC05</b>	1 1 unit
	Snap-action contacts • Short stroke, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 242-0FC05</b>	1 1 unit
	Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	—	⊕ B	<b>3SE5 242-0GC05</b>	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 242-0KC05</b>	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 242-0LC05</b>	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ A	<b>3SE5 242-0MC05</b>	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ A	<b>3SE5 242-0PC05</b>	1 1 unit
	<b>With increased corrosion protection<sup>3)</sup></b>					
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 242-0BC05-1CA0</b>	1 1 unit
	Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 242-0HC05-1CA0</b>	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 242-0KC05-1CA0</b>	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 242-0LC05-1CA0</b>	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 242-0MC05-1CA0</b>	1 1 unit
	<b>With 2 LEDs, yellow/green</b>					
	Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 242-1KC05</b>	1 1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 242-1LC05</b>	1 1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 242-3KC05</b>	1 1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 242-3LC05</b>	1 1 unit

⚙ For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> For enclosures with widths of 50 mm, the basic switch is a complete unit with rounded plungers.

<sup>2)</sup> Subsequent replacement of contact blocks is not possible.

<sup>3)</sup> Use corresponding high-grade steel lever.

Note:  
Selection aid [see page 13/9](#).

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm				
			Order No.	Price per PU	








### Operating mechanisms

	<b>Roller plungers, type C acc. to EN 50047</b>					
	Plastic rollers	10	⊕ A	<b>3SE5 000-0AD03</b>	1 1 unit	
	High-grade steel rollers	10	⊕ B	<b>3SE5 000-0AD04</b>	1 1 unit	
	<b>Roller plungers with central fixing</b>					
	Plastic rollers	10	⊕ B	<b>3SE5 000-0AD10</b>	1 1 unit	
	High-grade steel rollers	10	⊕ B	<b>3SE5 000-0AD11</b>	1 1 unit	

⊕ Positively driven actuator, necessary in safety circuits.

## SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure width 50 mm

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU	
<b>Operating mechanisms</b>					
	<b>Roller levers, type E acc. to EN 50047</b>				
	Metal lever, plastic roller	13	⊕ A	<b>3SE5 000-0AE10</b>	1 1 unit
	Metal lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AE11</b>	1 1 unit
	High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE12</b>	1 1 unit
	<b>Angular roller levers</b>				
	Metal lever, plastic roller	13	⊕ A	<b>3SE5 000-0AF10</b>	1 1 unit
	Metal lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AF11</b>	1 1 unit
	High-grade steel lever, plastic roller	13	⊕ A	<b>3SE5 000-0AF12</b>	1 1 unit
	<b>Spring rods</b> (for switches with snap-action contacts only)				
	Plastic plunger and high-grade steel spring:	7			
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR01</b>	1 1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	<b>3SE5 000-0AR03</b>	1 1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	<b>3SE5 000-0AR04</b>	1 1 unit
	High-grade steel plunger and spring:	7			
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR02</b>	1 1 unit	
<b>Twist actuators</b>					
	<b>Twist actuators, plastic (without lever)</b>				
	Switching right and/or left, adjustable		⊕ A	<b>3SE5 000-0AK00</b>	1 1 unit
	<b>Levers for twist actuators</b>				
	<b>Twist levers 21 mm, straight, type A acc. to EN 50047</b>				
	Metal lever, plastic roller	19	⊕ A	<b>3SE5 000-0AA21</b>	1 1 unit
	Metal lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA22</b>	1 1 unit
	Metal lever, roller with ball bearing	19	⊕ B	<b>3SE5 000-0AA23</b>	1 1 unit
	Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA25</b>	1 1 unit
	<b>Twist levers 30 mm, straight<sup>1)</sup></b>				
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA31</b>	1 1 unit
	High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA32</b>	1 1 unit
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA24</b>	1 1 unit
	Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA26</b>	1 1 unit
	<b>Twist levers, adjustable length, with grid hole</b>				
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60</b>	1 1 unit
	Metal lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA61</b>	1 1 unit
	Metal lever, plastic roller	50	⊕ B	<b>3SE5 000-0AA67</b>	1 1 unit
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA68</b>	1 1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62</b>	1 1 unit
	High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA63</b>	1 1 unit
<b>Twist levers, adjustable length</b>					
Metal lever, plastic roller	19	A	<b>3SE5 000-0AA50</b>	1 1 unit	
Metal lever, high-grade steel roller	19	B	<b>3SE5 000-0AA51</b>	1 1 unit	
Metal lever, plastic roller	30	B	<b>3SE5 000-0AA55</b>	1 1 unit	
Metal lever, plastic roller	50	B	<b>3SE5 000-0AA57</b>	1 1 unit	
Metal lever, rubber roller	50	B	<b>3SE5 000-0AA58</b>	1 1 unit	
High-grade steel lever, plastic roller	19	B	<b>3SE5 000-0AA52</b>	1 1 unit	
High-grade steel lever, high-grade steel roller	19	B	<b>3SE5 000-0AA53</b>	1 1 unit	
<b>Rod actuators</b>					
Aluminum rod, length 200 mm	6	B	<b>3SE5 000-0AA80</b>	1 1 unit	
Spring rod, length 200 mm	6	B	<b>3SE5 000-0AA81</b>	1 1 unit	
Plastic rod, length 200 mm	6	B	<b>3SE5 000-0AA82</b>	1 1 unit	

⊕ Positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Ambient temperature to –40 °C

## Selection and ordering data

### Complete units

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*	PG
				<b>Configurator</b>				
				Order No.	Price per PU			

### Complete units<sup>1)</sup> · Enclosure width 31 mm



Roller plunger with central fixing

<b>Roller plungers with central fixing</b>								
Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 232-0CD10-1AJ0</b>		1	1 unit	41K



Twist lever

<b>Twist levers, type A acc. to EN 50047</b>								
<b>With high-grade steel lever 21 mm and plastic roller 19 mm</b>								
Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 232-0CK31-1AJ0</b>		1	1 unit	41K



Twist lever, adjustable length

<b>Twist levers, adjustable length</b>								
<b>With high-grade steel lever with grid hole and plastic roller 19 mm</b>								
Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 232-0CK62-1AJ0</b>		1	1 unit	41K
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 232-0LK62-1AJ0</b>		1	1 unit	41K

### Complete units<sup>1)</sup> · Enclosure width 50 mm



Twist lever, adjustable length

<b>Twist levers</b>								
<b>With metal lever 21 mm and plastic roller 19 mm</b>								
Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 242-0HK21-1AJ0</b>		1	1 unit	41K
<b>Twist levers, adjustable length</b>								
<b>With high-grade steel lever with grid hole and plastic roller 19 mm</b>								
Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC	—	⊕ B	<b>3SE5 242-0HK62-1AJ0</b>		1	1 unit	41K

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Popular versions.

<sup>2)</sup> Subsequent replacement of contact blocks is not possible.

Note:

If the device you require is not available as a complete unit, see “Modular System”, see page 13/24.

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Ambient temperature to –40 °C

## Modular system

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system		PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

### Basic switches · Enclosure width 31 mm (with rounded plunger<sup>1)</sup>)



#### With teflon plunger

Snap-action contacts	1 NO + 1 NC —		B	<b>3SE5 232-0CC05-1AJ0</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC —		B	<b>3SE5 232-0KC05-1AJ0</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC —		B	<b>3SE5 232-0LC05-1AJ0</b>	1	1 unit

Basic switch

### Basic switches · Enclosure width 50 mm (with rounded plunger<sup>1)</sup>)



#### With teflon plunger

Slow-action contacts	1 NO + 1 NC —		B	<b>3SE5 242-0BC05-1AJ0</b>	1	1 unit
Snap-action contacts, integrated <sup>2)</sup>	1 NO + 1 NC —		B	<b>3SE5 242-0HC05-1AJ0</b>	1	1 unit

Basic switch

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> For enclosures with widths of 31 and 50 mm, the basic switch is a complete unit with rounded plungers.







<sup>2)</sup> Subsequent replacement of contact blocks is not possible.

Note:

Selection aid [see page 13/9](#).

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Ambient temperature to –40 °C

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No. Price per PU		
<b>Operating mechanisms</b>					
	<b>Roller plungers, type C acc. to EN 50047</b>				
Roller plunger	Plastic rollers	10	⊕ B	<b>3SE5 000-0AD03-1AJ0</b>	1 1 unit
	<b>Roller levers, type E acc. to EN 50047</b>				
Roller lever	Metal lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE10-1AJ0</b>	1 1 unit
	High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE12-1AJ0</b>	1 1 unit
	<b>Angular roller levers</b>				
Angular roller lever	Metal lever, plastic roller	13	⊕ B	<b>3SE5 000-0AF10-1AJ0</b>	1 1 unit
	High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AF12-1AJ0</b>	1 1 unit
<b>Twist actuators</b>					
	<b>Twist actuators, plastic (without lever)</b>				
Twist actuator	Switching right and/or left, adjustable		⊕ B	<b>3SE5 000-0AK00-1AJ0</b>	1 1 unit
<b>Levers for twist actuators</b>					
	<b>Twist levers straight, 21 mm, type A acc. to EN 50047</b>				
Twist lever	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA21-1AJ0</b>	1 1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA31-1AJ0</b>	1 1 unit
	<b>Twist levers, adjustable length, with grid hole</b>				
Twist lever, adjustable length	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60-1AJ0</b>	1 1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62-1AJ0</b>	1 1 unit

⊕ Positively driven actuator, necessary in safety circuits.



# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Ambient temperature to –40 °C

## Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Order No.	Price per PU	

### Basic switches · Enclosure width 40 mm



#### With M20 □ 1.5 connecting thread

Snap-action contacts	1 NO + 1 NC	—		B	<b>3SE5 132-0CA00-1AJ0</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC	—		B	<b>3SE5 132-0KA00-1AJ0</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—		B	<b>3SE5 132-0LA00-1AJ0</b>	1	1 unit

Basic switch

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

Note:

Selection aid [see page 13/9](#).

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm				
			Order No.	Price per PU	

### Operating mechanisms



#### Rounded plungers, type B acc. to EN 50041

Plastic plunger	10		B	<b>3SE5 000-0AC03-1AJ0</b>	1	1 unit
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Rounded plunger



#### Roller plungers, type C acc. to EN 50041

Plastic plunger, plastic roller	13		B	<b>3SE5 000-0AD05-1AJ0</b>	1	1 unit
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Roller plunger



#### Roller levers

Metal lever with plastic roller, plastic base	22		B	<b>3SE5 000-0AE05-1AJ0</b>	1	1 unit
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Roller lever

### Twist actuators



#### Twist actuators, plastic (without lever)

• For twist levers and rod actuators, switching right and/or left, adjustable			B	<b>3SE5 000-0AJ00-1AJ0</b>	1	1 unit
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Twist actuator

#### Levers for twist actuators

##### Twist lever, type A acc. to EN 50041

Metal lever, plastic roller	19		B	<b>3SE5 000-0AA01-1AJ0</b>	1	1 unit
High-grade steel lever, plastic roller	19		B	<b>3SE5 000-0AA11-1AJ0</b>	1	1 unit

Twist levers

##### Twist levers, adjustable length, with grid hole

Metal lever, plastic roller	19		B	<b>3SE5 000-0AA60-1AJ0</b>	1	1 unit
High-grade steel lever, plastic roller	19		B	<b>3SE5 000-0AA62-1AJ0</b>	1	1 unit

Twist lever, adjustable length

Positively driven actuator, necessary in safety circuits.

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 31 mm acc. to EN 50047






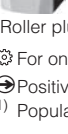
## Selection and ordering data

### Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.		Price per PU	

### Complete units<sup>1)</sup> · Enclosure width 31 mm

<b>Rounded plungers, type B, acc. to EN 50047</b>							
	<b>With plunger</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0BC05</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0CC05</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 212-0KC05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 212-0LC05</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ A	<b>3SE5 212-0MC05</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ A	<b>3SE5 212-0PC05</b>	1	1 unit	
	<b>With increased corrosion protection</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0BC05-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0CC05-1CA0</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0KC05-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LC05-1CA0</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0MC05-1CA0</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 212-0PC05-1CA0</b>	1	1 unit	
	<b>With M12 connector socket, 5-pole (125 V, 4 A)</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 214-0BC05-1AC5</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 214-0CC05-1AC5</b>	1	1 unit
	Slow-action contacts	2 NC	—	⊕ B	<b>3SE5 214-0KC05-1AE1</b>	1	1 unit
	Snap-action contacts	2 NC	—	⊕ B	<b>3SE5 214-0LC05-1AE1</b>	1	1 unit
	<b>With 2 LEDs, yellow/green</b>						
Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 212-1KC05</b>	1	1 unit	
Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ A	<b>3SE5 212-1LC05</b>	1	1 unit	
Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 212-3KC05</b>	1	1 unit	
Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 212-3LC05</b>	1	1 unit	
	<b>With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs</b>						
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 214-1BC05-1AF3</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 214-1CC05-1AF3</b>	1	1 unit
<b>Plain plungers</b>							
	<b>With high-grade steel plunger</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0BB01</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0CB01</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0KB01</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LB01</b>	1	1 unit	
<b>Roller plungers, type C acc. to EN 50047</b>							
	<b>With plastic roller 10 mm</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0BD03</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0CD03</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 212-0KD03</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LD03</b>	1	1 unit	

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 31 mm acc. to EN 50047

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.	Price per PU		

**Complete units<sup>1)</sup> · Enclosure width 31 mm**

**Roller levers, type E acc. to EN 50047**



Roller lever

**With metal lever and plastic roller 13 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0BE10</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0CE10</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0KE10</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LE10</b>		1	1 unit

**Angular roller levers**



Angular roller lever

**With metal lever and plastic roller 13 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0BF10</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0CF10</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0KF10</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LF10</b>		1	1 unit

**Twist levers, type A acc. to EN 50047**



Twist lever

**With metal lever 21 mm and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0BK21</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0CK21</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0KK21</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LK21</b>		1	1 unit

**Twist levers, adjustable length**



Twist lever, adjustable length

**With metal lever with grid hole and plastic roller 19 mm**

Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0CK60</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0KK60</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LK60</b>		1	1 unit

**With metal lever and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	A	<b>3SE5 212-0BK50</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	B	<b>3SE5 212-0CK50</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	B	<b>3SE5 212-0LK50</b>		1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

Note:

If the device you require is not available as a complete unit, see “Modular System”, see page 13/29.

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 31 mm acc. to EN 50047

## Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	☒	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>	⚙️		
				Order No.	Price per PU		

### Basic switches · Enclosure width 31 mm (with rounded plunger<sup>1)</sup>)

Image	Description	Contacts	LEDs	DT	Model	PU	PS*
	<b>With plunger</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0BC05</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 212-0CC05</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 212-0KC05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 212-0LC05</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ A	<b>3SE5 212-0MC05</b>	1	1 unit
	<b>With increased corrosion protection<sup>2)</sup></b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0BC05-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0CC05-1CA0</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0KC05-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LC05-1CA0</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0MC05-1CA0</b>	1	1 unit
	<b>With M12 connector socket, 5-pole (125 V, 4 A)</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 214-0BC05-1AC5</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 214-0CC05-1AC5</b>	1	1 unit
	Slow-action contacts	2 NC	—	⊕ B	<b>3SE5 214-0KC05-1AE1</b>	1	1 unit
	Snap-action contacts	2 NC	—	⊕ B	<b>3SE5 214-0LC05-1AE1</b>	1	1 unit
	<b>With 2 LEDs, yellow/green</b>						
	Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 212-1KC05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ A	<b>3SE5 212-1LC05</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 212-3KC05</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 212-3LC05</b>	1	1 unit
	<b>With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs</b>						
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 214-1BC05-1AF3</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 214-1CC05-1AF3</b>	1	1 unit

⚙️ For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> For enclosures with widths of 31mm, the basic switch is a complete unit with rounded plungers.

<sup>2)</sup> Use corresponding high-grade steel lever.

Note:

Selection aid see page 13/9.

Version	Diameter	DT	Modular system	☒	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU		











### Operating mechanisms

Image	Description	Diameter	DT	Model	PU	PS*
	<b>Plain plungers</b>					
	High-grade steel plungers	10	⊕ A	<b>3SE5 000-0AB01</b>	1	1 unit
	<b>Roller plungers, type C acc. to EN 50047</b>					
	Plastic rollers	10	⊕ A	<b>3SE5 000-0AD03</b>	1	1 unit
	High-grade steel rollers	10	⊕ B	<b>3SE5 000-0AD04</b>	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

## SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 31 mm acc. to EN 50047

Version	Diameter	DT	Modular system	Price per PU	PU (UNIT, SET, M)	PS*
	mm		Order No.			
<b>Operating mechanisms</b>						
	<b>Roller plungers with central fixing</b>					
	Plastic rollers	10	⊕ B	<b>3SE5 000-0AD10</b>	1	1 unit
	High-grade steel rollers	10	⊕ B	<b>3SE5 000-0AD11</b>	1	1 unit
With central fixing						
	<b>Roller levers, type E acc. to EN 50047</b>					
	Metal lever, plastic roller	13	⊕ A	<b>3SE5 000-0AE10</b>	1	1 unit
	Metal lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AE11</b>	1	1 unit
	High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE12</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AE13</b>	1	1 unit
	<b>Angular roller levers</b>					
	Metal lever, plastic roller	13	⊕ A	<b>3SE5 000-0AF10</b>	1	1 unit
	Metal lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AF11</b>	1	1 unit
	High-grade steel lever, plastic roller	13	⊕ A	<b>3SE5 000-0AF12</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	13	⊕ B	<b>3SE5 000-0AF13</b>	1	1 unit
	<b>Spring rods</b> (for switches with snap-action contacts only)					
	Plastic plunger and high-grade steel spring:					
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR01</b>	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	<b>3SE5 000-0AR03</b>	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	<b>3SE5 000-0AR04</b>	1	1 unit
High-grade steel plunger and spring:	7					
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR02</b>	1	1 unit	
<b>Twist actuators</b>						
	<b>Twist actuators, plastic (without lever)</b>					
	Switching right and/or left, adjustable		⊕ A	<b>3SE5 000-0AK00</b>	1	1 unit
<b>Levers for twist actuators</b>						
	<b>Twist levers, straight, type A acc. to EN 50047</b>					
	Metal lever 21 mm, plastic roller	19	⊕ A	<b>3SE5 000-0AA21</b>	1	1 unit
	Metal lever 21 mm, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA22</b>	1	1 unit
	Metal lever 21 mm, roller with ball bearing	19	⊕ B	<b>3SE5 000-0AA23</b>	1	1 unit
	Metal lever 21 mm, plastic roller	30	⊕ B	<b>3SE5 000-0AA25</b>	1	1 unit
	High-grade steel lever 21 mm, plastic roller	19	⊕ B	<b>3SE5 000-0AA31</b>	1	1 unit
	High-grade steel lever 21 mm, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA32</b>	1	1 unit
	<b>Twist levers 30 mm, straight<sup>1)</sup></b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA24</b>	1	1 unit
	Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA26</b>	1	1 unit
	<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60</b>	1	1 unit
	Metal lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA61</b>	1	1 unit
	Metal lever, plastic roller	50	⊕ B	<b>3SE5 000-0AA67</b>	1	1 unit
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA68</b>	1	1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA63</b>	1	1 unit
	<b>Twist levers, adjustable length</b>					
	Metal lever, plastic roller	19	A	<b>3SE5 000-0AA50</b>	1	1 unit
	Metal lever, high-grade steel roller	19	B	<b>3SE5 000-0AA51</b>	1	1 unit
	Metal lever, plastic roller	30	B	<b>3SE5 000-0AA55</b>	1	1 unit
	Metal lever, plastic roller	50	B	<b>3SE5 000-0AA57</b>	1	1 unit
	Metal lever, rubber roller	50	B	<b>3SE5 000-0AA58</b>	1	1 unit
	High-grade steel lever, plastic roller	19	B	<b>3SE5 000-0AA52</b>	1	1 unit
High-grade steel lever, high-grade steel roller	19	B	<b>3SE5 000-0AA53</b>	1	1 unit	
	<b>Rod actuators, type D acc. to EN 50041</b>					
	Aluminum rod, length 200 mm	6	B	<b>3SE5 000-0AA80</b>	1	1 unit
	Spring rod, length 200 mm	6	B	<b>3SE5 000-0AA81</b>	1	1 unit
	Plastic rod, length 200 mm	6	B	<b>3SE5 000-0AA82</b>	1	1 unit
	Plastic rod, length 330 mm	6	B	<b>3SE5 000-0AA83</b>	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 40 mm acc. to EN 50041

## Selection and ordering data

### Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.		Price per PU	

### Complete units<sup>1)</sup> · Enclosure width 40 mm

	<b>Plain plungers</b>						
	<b>With high-grade steel plunger</b>						
	Slow-action contacts	1 NO + 1 NC —	⊕ A	<b>3SE5 112-0BB01</b>		1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ A	<b>3SE5 112-0CB01</b>		1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ ▶	<b>3SE5 112-0KB01</b>		1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	<b>3SE5 112-0LB01</b>		1	1 unit
	<b>Rounded plungers, type B acc. to EN 50041</b>						
	<b>With high-grade steel plungers, with 3 mm overtravel</b>						
	Slow-action contacts	1 NO + 1 NC —	⊕ ▶	<b>3SE5 112-0BC02</b>		1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ ▶	<b>3SE5 112-0CC02</b>		1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⊕ B	<b>3SE5 112-0KC02</b>		1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	<b>3SE5 112-0LC02</b>		1	1 unit
	<b>Roller plungers, type C acc. to EN 50041</b>						
	<b>With high-grade steel roller 13 mm, with 3 mm overtravel</b>						
	Slow-action contacts	1 NO + 1 NC —	⊕ ▶	<b>3SE5 112-0BD02</b>		1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ ▶	<b>3SE5 112-0CD02</b>		1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⊕ ▶	<b>3SE5 112-0KD02</b>		1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ ▶	<b>3SE5 112-0LD02</b>		1	1 unit
	<b>With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs</b>						
	Snap-action contacts	1 NO + 1 NC 24 V DC	⊕ B	<b>3SE5 114-1CD02-1AF3</b>		1	1 unit
	<b>Roller levers</b>						
	<b>With metal lever and plastic roller 22 mm</b>						
	Slow-action contacts	1 NO + 1 NC —	⊕ ▶	<b>3SE5 112-0BE01</b>		1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ ▶	<b>3SE5 112-0CE01</b>		1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⊕ B	<b>3SE5 112-0KE01</b>		1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	<b>3SE5 112-0LE01</b>		1	1 unit
	<b>Angular roller levers</b>						
	<b>With metal lever and plastic roller 22 mm</b>						
	Slow-action contacts	1 NO + 1 NC —	⊕ B	<b>3SE5 112-0BF01</b>		1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ ▶	<b>3SE5 112-0CF01</b>		1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	<b>3SE5 112-0LF01</b>		1	1 unit
	<b>Spring rods</b>						
	<b>Length 142.5 mm, with plastic plunger 50 mm</b>						
	Snap-action contacts	1 NO + 1 NC —	▶	<b>3SE5 112-0CR01</b>		1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 40 mm acc. to EN 50041

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.	Price per PU		

**Complete units<sup>1)</sup> · Enclosure width 40 mm**

**Twist levers, type A acc. to EN 50041**



Twist lever

**With metal lever 27 mm and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 112-0BH01</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 112-0CH01</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 112-0KH01</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 112-0LH01</b>		1	1 unit

**With M12 connector socket, 5-pole (125 V, 4 A)**

Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 114-0CH01-1AC5</b>		1	1 unit
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**With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs**

Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 114-1CH01-1AF3</b>		1	1 unit
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**With metal lever 27 mm and high-grade steel roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 112-0BH02</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 112-0CH02</b>		1	1 unit

**With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs**

Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 114-1CH02-1AF3</b>		1	1 unit
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**With metal lever 30 mm and plastic roller 19 mm**

Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 112-0CH24</b>		1	1 unit
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**Twist levers, adjustable length**



Twist lever, adjustable length, with grid hole

**With metal lever with grid hole and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 112-0BH60</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 112-0CH60</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 112-0LH60</b>		1	1 unit

**With metal lever and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	B	<b>3SE5 112-0BH50</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	▶	<b>3SE5 112-0CH50</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	B	<b>3SE5 112-0LH50</b>		1	1 unit

**With M12 connector socket, 8-pole (30 V, 2 A) and 2 LEDs**

Snap-action contacts	1 NO + 2 NC	24 V DC	B	<b>3SE5 114-1LH50-1AD4</b>		1	1 unit
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**With metal lever and high-grade steel roller 19 mm**

Snap-action contacts	1 NO + 1 NC	—	B	<b>3SE5 112-0CH51</b>		1	1 unit
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Twist lever, adjustable length

**Fork levers, latching**

**With metal lever and 2 plastic rollers 19 mm**

Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 112-0CT11</b>		1	1 unit
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Fork lever

**Rod actuators, type D, acc. to EN 50041**

**With aluminum rod, length 200 mm**

Snap-action contacts	1 NO + 1 NC	—	▶	<b>3SE5 112-0CH80</b>		1	1 unit
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**With plastic rod, length 200 mm**

Snap-action contacts	1 NO + 1 NC	—	B	<b>3SE5 112-0CH82</b>		1	1 unit
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Rod actuator

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/33.



# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 40 mm acc. to EN 50041

## Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*	
				Order No.	Price per PU		
<b>Basic switches · Enclosure width 40 mm</b>							
<b>With M20 × 1.5 connecting thread</b>							
	Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 112-0BA00</b>	1 1 unit	
	Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 112-0CA00</b>	1 1 unit	
	• Gold-plated contacts			⊕ B	<b>3SE5 112-0CA00-1AC1</b>	1 1 unit	
	Slow-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 112-0KA00</b>	1 1 unit	
	Snap-action contacts	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 112-0LA00</b>	1 1 unit	
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 112-0MA00</b>	1 1 unit	
	Slow-action contacts	2 NO + 1 NC	—	⊕ ▶	<b>3SE5 112-0PA00</b>	1 1 unit	
	<b>With increased corrosion protection<sup>1)</sup></b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 112-0BA00-1CA0</b>	1 1 unit	
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 112-0CA00-1CA0</b>	1 1 unit	
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 112-0KA00-1CA0</b>	1 1 unit	
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 112-0LA00-1CA0</b>	1 1 unit	
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 112-0MA00-1CA0</b>	1 1 unit	
	Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 112-0PA00-1CA0</b>	1 1 unit	
	<b>With M12 connector socket, 5-pole (125 V, 4 A)</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 114-0BA00-1AC5</b>	1 1 unit	
	Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 114-0CA00-1AC5</b>	1 1 unit	
	Slow-action contacts	2 NC	—	⊕ B	<b>3SE5 114-0KA00-1AE1</b>	1 1 unit	
	Snap-action contacts	2 NC	—	⊕ B	<b>3SE5 114-0LA00-1AE1</b>	1 1 unit	
	<b>With connector socket, 6-pole + PE (250 V, 10 A)</b>						
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 115-0KA00-1AD1</b>	1 1 unit	
	Snap-action contacts	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 115-0LA00-1AD1</b>	1 1 unit	
	<b>With connector socket, 6-pole + PE (250 V, 10 A) and quick-release device</b>						
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 115-0CA00-1AD0</b>	1 1 unit	
	<b>With 2 LEDs, yellow/green</b>						
	Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 112-1KA00</b>	1 1 unit	
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ ▶	<b>3SE5 112-1LA00</b>	1 1 unit	
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 112-3KA00</b>	1 1 unit	
	Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 112-3LA00</b>	1 1 unit	
	<b>With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs</b>						
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 114-1BA00-1AF3</b>	1 1 unit	
	Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 114-1CA00-1AF3</b>	1 1 unit	
	<b>With M12 connector socket, 8-pole (30 V, 2 A) and 2 LEDs</b>						
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 114-1LA00-1AD4</b>	1 1 unit	
	<b>With connector socket, 6-pole + PE (10 A), and 2 LEDs</b>						
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 115-1BA00-1AF2</b>	1 1 unit	
	Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	<b>3SE5 115-1CA00-1AF2</b>	1 1 unit	
	Snap-action contacts	2 NC	24 V DC	⊕ B	<b>3SE5 115-1LA00-1AD2</b>	1 1 unit	

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Use corresponding high-grade steel lever.







Note:

Selection aid, see page 13/9.



# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 40 mm acc. to EN 50041

Version	Diameter	DT	Modular system	Price per PU	PU (UNIT, SET, M)	PS*	
	mm		Order No.				
<b>Operating mechanisms</b>							
	<b>Plain plungers</b>						
	High-grade steel plungers	10	⊕ A	<b>3SE5 000-0AB01</b>	1	1 unit	
	<b>Rounded plungers, type B acc. to EN 50041</b>						
	High-grade steel plungers, with 3 mm overtravel	10	⊕ ▶	<b>3SE5 000-0AC02</b>	1	1 unit	
	<b>Roller plungers, type C acc. to EN 50041</b>						
	High-grade steel roller, with 3 mm overtravel	13	⊕ ▶	<b>3SE5 000-0AD02</b>	1	1 unit	
	<b>Roller levers</b>						
	Metal lever, plastic roller	22	⊕ ▶	<b>3SE5 000-0AE01</b>	1	1 unit	
	Metal lever, high-grade steel roller	22	⊕ ▶	<b>3SE5 000-0AE02</b>	1	1 unit	
	High-grade steel lever, plastic roller	22	⊕ B	<b>3SE5 000-0AE03</b>	1	1 unit	
	<b>Angular roller levers</b>						
	Metal lever, plastic roller	22	⊕ ▶	<b>3SE5 000-0AF01</b>	1	1 unit	
	Metal lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AF02</b>	1	1 unit	
	High-grade steel lever, plastic roller	22	⊕ B	<b>3SE5 000-0AF03</b>	1	1 unit	
	<b>High-grade steel roller, high-grade steel roller</b>						
		22	⊕ B	<b>3SE5 000-0AE04</b>	1	1 unit	
	<b>Spring rods (for switches with snap-action contacts only)</b>						
	Plastic plunger and high-grade steel spring:	7					
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR01</b>	1	1 unit	
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	<b>3SE5 000-0AR03</b>	1	1 unit	
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	<b>3SE5 000-0AR04</b>	1	1 unit	
	High-grade steel plunger and spring:		7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR02</b>	1	1 unit	
	<b>Twist actuators</b>						
		<b>Twist actuators, metal (without lever)</b>					
		• For twist levers and rod actuators, switching right and/or left, adjustable		⊕ A	<b>3SE5 000-0AH00</b>	1	1 unit
		• For fork levers, latching		⊕ ▶	<b>3SE5 000-0AT10</b>	1	1 unit
		<b>Levers for twist actuators</b>					
<b>Twist levers, offset, type A acc. to EN 50041</b>							
Metal lever 27 mm, plastic roller		19	⊕ A	<b>3SE5 000-0AA01</b>	1	1 unit	
Metal lever 27 mm, high-grade steel roller		19	⊕ A	<b>3SE5 000-0AA02</b>	1	1 unit	
Metal lever 27 mm, roller with ball bearing		19	⊕ B	<b>3SE5 000-0AA03</b>	1	1 unit	
Metal lever 27 mm, 2 plastic rollers		19	⊕ B	<b>3SE5 000-0AA04</b>	1	1 unit	
Metal lever 27 mm, plastic roller		30	⊕ B	<b>3SE5 000-0AA05</b>	1	1 unit	
Metal lever 27 mm, rubber roller		50	⊕ B	<b>3SE5 000-0AA08</b>	1	1 unit	
High-grade steel lever 27 mm, plastic roller		19	⊕ B	<b>3SE5 000-0AA11</b>	1	1 unit	
High-grade steel lever 27 mm, high-grade steel roller		19	⊕ B	<b>3SE5 000-0AA12</b>	1	1 unit	
Metal lever 35 mm, plastic roller		19	⊕ B	<b>3SE5 000-0AA15</b>	1	1 unit	
		<b>Twist levers 30 mm, straight<sup>1)</sup></b>					
		Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA24</b>	1	1 unit
		<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60</b>	1	1 unit	
	Metal lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA61</b>	1	1 unit	
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA68</b>	1	1 unit	
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62</b>	1	1 unit	
	High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA63</b>	1	1 unit	
	<b>Twist levers, adjustable length</b>						
	Metal lever, plastic roller	19	A	<b>3SE5 000-0AA50</b>	1	1 unit	
	Metal lever, high-grade steel roller	19	B	<b>3SE5 000-0AA51</b>	1	1 unit	
	Metal lever, plastic roller	30	B	<b>3SE5 000-0AA55</b>	1	1 unit	
	Metal lever, rubber roller	50	B	<b>3SE5 000-0AA58</b>	1	1 unit	
	High-grade steel lever, plastic roller	19	B	<b>3SE5 000-0AA52</b>	1	1 unit	
	High-grade steel lever, high-grade steel roller	19	B	<b>3SE5 000-0AA53</b>	1	1 unit	
	<b>Fork levers (for switches with snap-action contacts only)</b>						
	2 metal levers, 2 plastic rollers	19	⊕ ▶	<b>3SE5 000-0AT01</b>	1	1 unit	
	2 metal levers, 2 high-grade steel rollers	19	⊕ B	<b>3SE5 000-0AT02</b>	1	1 unit	
2 high-grade steel levers, 2 plastic rollers	19	⊕ B	<b>3SE5 000-0AT03</b>	1	1 unit		
	<b>Rod actuators, type D acc. to EN 50041</b>						
	Aluminum rod, length 200 mm	6	B	<b>3SE5 000-0AA80</b>	1	1 unit	
	Spring rod, length 200 mm	6	B	<b>3SE5 000-0AA81</b>	1	1 unit	
	Plastic rod, length 200 mm	6	B	<b>3SE5 000-0AA82</b>	1	1 unit	

⊕ Positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 56 mm

## Selection and ordering data

### Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Order No.	Price per PU	

### Complete units<sup>1)</sup> · Enclosure width 56 mm



Plain plunger

#### Plain plungers

##### With high-grade steel plunger

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0BB01</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0CB01</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0KB01</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0LB01</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 122-0PB01</b>	1	1 unit



Rounded plunger

#### Rounded plungers

##### With high-grade steel plungers, with 3 mm overtravel

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0BC02</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 122-0CC02</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0KC02</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0LC02</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 122-0PC02</b>	1	1 unit



Roller plunger

#### Roller plungers

##### With high-grade steel roller 13 mm, with 3 mm overtravel

Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 122-0BD02</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 122-0CD02</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 122-0KD02</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0LD02</b>	1	1 unit



Roller lever

#### Roller levers

##### With metal lever and plastic roller 22 mm

Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 122-0BE01</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 122-0CE01</b>	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ ▶	<b>3SE5 122-0KE01</b>	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0LE01</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 122-0PE01</b>	1	1 unit

##### With metal lever and high-grade steel roller 22 mm

Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0CE02</b>	1	1 unit
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Angular roller lever

#### Angular roller levers

##### With metal lever and plastic roller 22 mm

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0BF01</b>	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 122-0CF01</b>	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 122-0PF01</b>	1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 56 mm

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>			
				Order No.	Price per PU		

**Complete units<sup>1)</sup> · Enclosure width 56 mm**



Spring rod

**Spring rods**

**Length 142.5 mm, with plastic plunger 50 mm**

Snap-action contacts	1 NO + 1 NC	—	▶	<b>3SE5 122-0CR01</b>		1	1 unit
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Twist lever

**Twist levers**

**With metal lever 27 mm and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0BH01</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ A	<b>3SE5 122-0CH01</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0KH01</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0LH01</b>		1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊕ B	<b>3SE5 122-0PH01</b>		1	1 unit

**With metal lever 27 mm and high-grade steel roller 19 mm**

Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0CH02</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0LH02</b>		1	1 unit



Twist lever, adjustable length

**Twist levers, adjustable length**

**With metal lever with grid hole and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0BH60</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0CH60</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0LH60</b>		1	1 unit

**With metal lever and plastic roller 19 mm**

Slow-action contacts	1 NO + 1 NC	—	B	<b>3SE5 122-0BH50</b>		1	1 unit
Snap-action contacts	1 NO + 1 NC	—	▶	<b>3SE5 122-0CH50</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	B	<b>3SE5 122-0LH50</b>		1	1 unit



Fork lever

**Fork levers, latching**

**With metal lever and 2 plastic rollers 19 mm**

Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0CT11</b>		1	1 unit
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Rod actuator

**Rod actuators**

**With aluminum rod, length 200 mm**

Snap-action contacts	1 NO + 1 NC	—	B	<b>3SE5 122-0CH80</b>		1	1 unit
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**With plastic rod, length 200 mm**

Snap-action contacts	1 NO + 1 NC	—	B	<b>3SE5 122-0CH82</b>		1	1 unit
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Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/37.

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 56 mm

## Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Order No.	Price per PU	

### Basic switches · Enclosure width 56 mm

Image	Operating mechanism	Contacts	LEDs	DT	Part No.	PU (UNIT, SET, M)	PS*
	<b>With 3 x M20 x 1.5 connecting thread</b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 122-0BA00</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ ▶	<b>3SE5 122-0CA00</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0KA00</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ A	<b>3SE5 122-0LA00</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ A	<b>3SE5 122-0MA00</b>	1	1 unit
	<b>With increased corrosion protection<sup>1)</sup></b>						
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0BA00-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 122-0CA00-1CA0</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0KA00-1CA0</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0LA00-1CA0</b>	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	<b>3SE5 122-0MA00-1CA0</b>	1	1 unit
	<b>With 2 LEDs, yellow/green</b>						
	Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 122-1KA00</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ B	<b>3SE5 122-1LA00</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 122-3KA00</b>	1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	<b>3SE5 122-3LA00</b>	1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Use corresponding high-grade steel lever.

Note:

Selection aid see page 13/9.




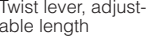


Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm				
			Order No.	Price per PU	

### Operating mechanisms

Image	Operating mechanism	Diameter	DT	Part No.	PU (UNIT, SET, M)	PS*
	<b>Plain plungers</b>					
	High-grade steel plungers	10	⊕ A	<b>3SE5 000-0AB01</b>	1	1 unit
	<b>Rounded plungers, type B acc. to EN 50041</b>					
	High-grade steel plungers, with 3 mm overtravel	10	⊕ B	<b>3SE5 000-0AC02</b>	1	1 unit
	<b>Roller plungers, type C acc. to EN 50041</b>					
	High-grade steel roller, with 3 mm overtravel	13	⊕ B	<b>3SE5 000-0AD02</b>	1	1 unit
	<b>Roller levers</b>					
	Metal lever, plastic roller	22	⊕ A	<b>3SE5 000-0AE01</b>	1	1 unit
	Metal lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AE02</b>	1	1 unit
	High-grade steel lever, plastic roller	22	⊕ B	<b>3SE5 000-0AE03</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AE04</b>	1	1 unit
	<b>Angular roller levers</b>					
	Metal lever, plastic roller	22	⊕ A	<b>3SE5 000-0AF01</b>	1	1 unit
	Metal lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AF02</b>	1	1 unit
	High-grade steel lever, plastic roller	22	⊕ B	<b>3SE5 000-0AF03</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AF04</b>	1	1 unit
	<b>Spring rods (for switches with snap-action contacts only)</b>					
	Plastic plunger and high-grade steel spring:	7				
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR01</b>	1	1 unit	
• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	<b>3SE5 000-0AR03</b>	1	1 unit	
• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	<b>3SE5 000-0AR04</b>	1	1 unit	
High-grade steel plunger and spring:	7					
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR02</b>	1	1 unit	

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure width 56 mm

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	
	mm		Order No.	Price per PU		
<b>Twist actuators</b>						
	<b>Twist actuators, metal (without lever)</b>					
	<ul style="list-style-type: none"> <li>For twist levers and rod actuators, switching right and/or left, adjustable</li> <li>For fork levers, latching</li> </ul>	<ul style="list-style-type: none"> <li>⊕ A</li> <li>⊕ B</li> </ul>	<ul style="list-style-type: none"> <li><b>3SE5 000-0AH00</b></li> <li><b>3SE5 000-0AT10</b></li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>1</li> </ul>	<ul style="list-style-type: none"> <li>1 unit</li> <li>1 unit</li> </ul>	
<b>Levers for twist actuators</b>						
	<b>Twist levers 27 mm, offset, type A acc. to EN 50041</b>					
	Metal lever, plastic roller	19	⊕ A	<b>3SE5 000-0AA01</b>	1	1 unit
	Metal lever, high-grade steel roller	19	⊕ A	<b>3SE5 000-0AA02</b>	1	1 unit
	Metal lever, roller with ball bearing	19	⊕ B	<b>3SE5 000-0AA03</b>	1	1 unit
	Metal lever, 2 plastic rollers	19	⊕ B	<b>3SE5 000-0AA04</b>	1	1 unit
	Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA05</b>	1	1 unit
	Metal lever, plastic roller	50	⊕ B	<b>3SE5 000-0AA07</b>	1	1 unit
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA08</b>	1	1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA11</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA12</b>	1	1 unit
	<b>Twist levers 35 mm, offset</b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA15</b>	1	1 unit
	<b>Twist levers 30 mm, straight<sup>1)</sup></b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA24</b>	1	1 unit
Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA26</b>	1	1 unit	
	<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60</b>	1	1 unit
	Metal lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA61</b>	1	1 unit
	Metal lever, plastic roller	50	⊕ B	<b>3SE5 000-0AA67</b>	1	1 unit
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA68</b>	1	1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62</b>	1	1 unit
High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA63</b>	1	1 unit	
	<b>Twist levers, adjustable length</b>					
	Metal lever, plastic roller	19	A	<b>3SE5 000-0AA50</b>	1	1 unit
	Metal lever, high-grade steel roller	19	B	<b>3SE5 000-0AA51</b>	1	1 unit
	Metal lever, plastic roller	30	B	<b>3SE5 000-0AA55</b>	1	1 unit
	Metal lever, plastic roller	50	B	<b>3SE5 000-0AA57</b>	1	1 unit
	Metal lever, rubber roller	50	B	<b>3SE5 000-0AA58</b>	1	1 unit
	High-grade steel lever, plastic roller	19	B	<b>3SE5 000-0AA52</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	19	B	<b>3SE5 000-0AA53</b>	1	1 unit
	<b>Fork levers (for switches with snap-action contacts only)</b>					
	2 metal levers, 2 plastic rollers	19	⊕ B	<b>3SE5 000-0AT01</b>	1	1 unit
	2 metal levers, 2 high-grade steel rollers	19	⊕ B	<b>3SE5 000-0AT02</b>	1	1 unit
	2 high-grade steel levers, 2 plastic rollers	19	⊕ B	<b>3SE5 000-0AT03</b>	1	1 unit
	2 high-grade steel levers, 2 high-grade steel rollers	19	⊕ B	<b>3SE5 000-0AT04</b>	1	1 unit
	<b>Rod actuators, type D acc. to EN 50041</b>					
	Aluminum rod, length 200 mm	6	B	<b>3SE5 000-0AA80</b>	1	1 unit
	Spring rod, length 200 mm	6	B	<b>3SE5 000-0AA81</b>	1	1 unit
	Plastic rod, length 200 mm	6	B	<b>3SE5 000-0AA82</b>	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

# SIRIUS 3SE5 International Limit Switches

Metal enclosures – Enclosure width 56 mm, XL

## Selection and ordering data

### Complete units

4 or 5 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

### Complete units<sup>1)</sup> · Enclosure width 56 mm, XL



Plain plunger

#### Plain plungers

##### With high-grade steel plunger

Snap-action contacts 2 × (1 NO + 1 NC) — B 3SE5 162-0CB01 1 1 unit



Rounded plunger

#### Rounded plungers

##### With high-grade steel plungers, with 3 mm overtravel

Slow-action contacts 1 NO + 1 NC and B 3SE5 162-0EC02 1 1 unit  
 Slow-action contacts with make-before-break 1 NO + 2 NC  
 2 mm travel difference



Roller plunger

#### Roller plungers

##### With high-grade steel roller 13 mm, with 3 mm overtravel

Slow-action contacts 2 × (1 NO + 1 NC) — B 3SE5 162-0BD02 1 1 unit  
 Snap-action contacts 2 × (1 NO + 1 NC) — A 3SE5 162-0CD02 1 1 unit



Roller lever

#### Roller levers

##### With metal lever and plastic roller 22 mm

Slow-action contacts 2 × (1 NO + 1 NC) — B 3SE5 162-0BE01 1 1 unit  
 Snap-action contacts 2 × (1 NO + 1 NC) — A 3SE5 162-0CE01 1 1 unit

##### With metal lever and high-grade steel roller 22 mm

Snap-action contacts 2 × (1 NO + 1 NC) — B 3SE5 162-0CE02 1 1 unit



Angular roller lever

#### Angular roller levers

##### With metal lever and plastic roller 22 mm

Snap-action contacts 2 × (1 NO + 1 NC) — B 3SE5 162-0CF01 1 1 unit



Twist lever

#### Twist levers

##### With metal lever 27 mm and plastic roller 19 mm

Snap-action contacts 2 × (1 NO + 1 NC) — A 3SE5 162-0CH01 1 1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Popular versions.

#### Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/40.

# SIRIUS 3SE5 International Limit Switches

Metal enclosures – Enclosure width 56 mm, XL

## Modular system

4 or 6 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Order No.	Price per PU	

### Basic switches · Enclosure width 56 mm, XL



Basic switch

#### With 3 x M20 x 1.5 connecting thread

Slow-action contacts	2 × (1 NO + 1 NC)	—	⊕ ▶	<b>3SE5 162-0BA00</b>	1	1 unit
Snap-action contacts	2 × (1 NO + 1 NC)	—	⊕ A	<b>3SE5 162-0CA00</b>	1	1 unit
Slow-action contacts with make-before-break	2 × (1 NO + 2 NC)	—	⊕ A	<b>3SE5 162-0DA00</b>	1	1 unit

#### With increased corrosion protection<sup>1)</sup>

Slow-action contacts	2 × (1 NO + 1 NC)	—	⊕ B	<b>3SE5 162-0BA00-1CA0</b>	1	1 unit
Snap-action contacts	2 × (1 NO + 1 NC)	—	⊕ B	<b>3SE5 162-0CA00-1CA0</b>	1	1 unit
Slow-action contacts with make-before-break	2 × (1 NO + 2 NC)	—	⊕ B	<b>3SE5 162-0DA00-1CA0</b>	1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Use corresponding high-grade steel lever.

Note:

Selection aid [see page 13/9](#).

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU	

### Operating mechanisms



Plain plunger

#### Plain plungers

High-grade steel plungers	10	⊕ A	<b>3SE5 000-0AB01</b>	1	1 unit
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Rounded plunger

#### Rounded plungers, type B acc. to EN 50041

High-grade steel plungers, with 3 mm overtravel	10	⊕ B	<b>3SE5 000-0AC02</b>	1	1 unit
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Roller plunger

#### Roller plungers, type C acc. to EN 50041

High-grade steel roller, with 3 mm overtravel	13	⊕ B	<b>3SE5 000-0AD02</b>	1	1 unit
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Roller lever

#### Roller levers

Metal lever, plastic roller	22	⊕ A	<b>3SE5 000-0AE01</b>	1	1 unit
Metal lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AE02</b>	1	1 unit
High-grade steel lever, plastic roller	22	⊕ B	<b>3SE5 000-0AE03</b>	1	1 unit
High-grade steel lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AE04</b>	1	1 unit



Angular roller lever

#### Angular roller levers

Metal lever, plastic roller	22	⊕ A	<b>3SE5 000-0AF01</b>	1	1 unit
Metal lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AF02</b>	1	1 unit
High-grade steel lever, plastic roller	22	⊕ B	<b>3SE5 000-0AF03</b>	1	1 unit
High-grade steel lever, high-grade steel roller	22	⊕ B	<b>3SE5 000-0AF04</b>	1	1 unit



Spring rod

#### Spring rods (for switches with snap-action contacts only)




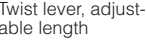


Plastic plunger and high-grade steel spring:	7				
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR01</b>	1	1 unit
• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	<b>3SE5 000-0AR03</b>	1	1 unit
• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	<b>3SE5 000-0AR04</b>	1	1 unit
High-grade steel plunger and spring:	7				
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	<b>3SE5 000-0AR02</b>	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.



# SIRIUS 3SE5 International Limit Switches

Metal enclosures – Enclosure width 56mm and 56mm, XL

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	
	mm		Order No.	Price per PU		
<b>Twist actuators</b>						
	<b>Twist actuators, metal (without lever)</b>					
	<ul style="list-style-type: none"> <li>For twist levers and rod actuators, switching right and/or left, adjustable</li> <li>For fork levers, latching</li> </ul>					
		⊕ A	<b>3SE5 000-0AH00</b>	1	1 unit	
		⊕ B	<b>3SE5 000-0AT10</b>	1	1 unit	
<b>Levers for twist actuators</b>						
	<b>Twist levers 27 mm, offset, type A acc. to EN 50041</b>					
	Metal lever, plastic roller	19	⊕ A	<b>3SE5 000-0AA01</b>	1	1 unit
	Metal lever, high-grade steel roller	19	⊕ A	<b>3SE5 000-0AA02</b>	1	1 unit
	Metal lever, roller with ball bearing	19	⊕ B	<b>3SE5 000-0AA03</b>	1	1 unit
	Metal lever, 2 plastic rollers	19	⊕ B	<b>3SE5 000-0AA04</b>	1	1 unit
	Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA05</b>	1	1 unit
	Metal lever, plastic roller	50	⊕ B	<b>3SE5 000-0AA07</b>	1	1 unit
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA08</b>	1	1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA11</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA12</b>	1	1 unit
	<b>Twist levers 35 mm, offset</b>					
Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA15</b>	1	1 unit	
<b>Twist levers 30 mm, straight<sup>1)</sup></b>						
Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA24</b>	1	1 unit	
Metal lever, plastic roller	30	⊕ B	<b>3SE5 000-0AA26</b>	1	1 unit	
	<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60</b>	1	1 unit
	Metal lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA61</b>	1	1 unit
	Metal lever, plastic roller	50	⊕ B	<b>3SE5 000-0AA67</b>	1	1 unit
	Metal lever, rubber roller	50	⊕ B	<b>3SE5 000-0AA68</b>	1	1 unit
	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62</b>	1	1 unit
High-grade steel lever, high-grade steel roller	19	⊕ B	<b>3SE5 000-0AA63</b>	1	1 unit	
	<b>Twist levers, adjustable length</b>					
	Metal lever, plastic roller	19	A	<b>3SE5 000-0AA50</b>	1	1 unit
	Metal lever, high-grade steel roller	19	B	<b>3SE5 000-0AA51</b>	1	1 unit
	Metal lever, plastic roller	30	B	<b>3SE5 000-0AA55</b>	1	1 unit
	Metal lever, plastic roller	50	B	<b>3SE5 000-0AA57</b>	1	1 unit
	Metal lever, rubber roller	50	B	<b>3SE5 000-0AA58</b>	1	1 unit
	High-grade steel lever, plastic roller	19	B	<b>3SE5 000-0AA52</b>	1	1 unit
	High-grade steel lever, high-grade steel roller	19	B	<b>3SE5 000-0AA53</b>	1	1 unit
	<b>Fork levers (for switches with snap-action contacts only)</b>					
	2 metal levers, 2 plastic rollers	19	⊕ B	<b>3SE5 000-0AT01</b>	1	1 unit
	2 metal levers, 2 high-grade steel rollers	19	⊕ B	<b>3SE5 000-0AT02</b>	1	1 unit
	2 high-grade steel levers, 2 plastic rollers	19	⊕ B	<b>3SE5 000-0AT03</b>	1	1 unit
	2 high-grade steel levers, 2 high-grade steel rollers	19	⊕ B	<b>3SE5 000-0AT04</b>	1	1 unit
	<b>Rod actuators, type D acc. to EN 50041</b>					
	Aluminum rod, length 200 mm	6	B	<b>3SE5 000-0AA80</b>	1	1 unit
	Spring rod, length 200 mm	6	B	<b>3SE5 000-0AA81</b>	1	1 unit
	Plastic rod, length 200 mm	6	B	<b>3SE5 000-0AA82</b>	1	1 unit
	Plastic rod, length 330 mm	6	B	<b>3SE5 000-0AA83<sup>2)</sup></b>	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

<sup>2)</sup> For Enclosure width 56mm XL only.



# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Ambient temperature to –40 °C

## Selection and ordering data

### Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	☒	PU (UNIT, SET, M)	PS*
				<b>Configurator</b>	⚙️		
				Order No.	Price per PU		

### Basic switches · Enclosure width 31 mm (with rounded plunger<sup>1)</sup>)



Basic switch

#### With plunger

Snap-action contacts	1 NO + 1 NC	—	⊕ B	<b>3SE5 212-0CC05-1AJ0</b>		1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0KC05-1AJ0</b>		1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	<b>3SE5 212-0LC05-1AJ0</b>		1	1 unit

⚙️ For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positively opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

<sup>1)</sup> For enclosures with widths of 31 mm, the basic switch is a complete unit with rounded plungers.

Note:

Selection aid [see page 13/9](#).

Version	Diameter	DT	Modular system	☒	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU		

### Operating mechanisms



Roller plunger

#### Roller plungers, type C acc. to EN 50047

Plastic rollers	10	⊕ B	<b>3SE5 000-0AD03-1AJ0</b>		1	1 unit
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Roller lever

#### Roller levers, type E acc. to EN 50047

Metal lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE10-1AJ0</b>		1	1 unit
High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE12-1AJ0</b>		1	1 unit



Angular roller lever

#### Angular roller levers

Metal lever, plastic roller	13	⊕ B	<b>3SE5 000-0AF10-1AJ0</b>		1	1 unit
High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AF12-1AJ0</b>		1	1 unit

### Twist actuators



Twist actuator

#### Twist actuators, plastic (without lever)

Switching right and/or left, adjustable		⊕ B	<b>3SE5 000-0AK00-1AJ0</b>		1	1 unit
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#### Levers for twist actuators



Twist lever

#### Twist lever straight, 21 mm, type A acc. to EN 50047

Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA21-1AJ0</b>		1	1 unit
High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA31-1AJ0</b>		1	1 unit



Twist lever, adjustable length

#### Twist levers, adjustable length, with grid hole

Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60-1AJ0</b>		1	1 unit
High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62-1AJ0</b>		1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Ambient temperature to –40 °C

### Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	Configurator	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Complete units · Enclosure width 40 mm



Rounded plunger

##### Rounded plungers, type B acc. to EN 50041

With high-grade steel plungers, with 3 mm overtravel

Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 112-0CC02-1AJ0				1	1 unit
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Twist lever, adjustable length

##### Twist levers, adjustable length

With high-grade steel lever with grid hole and plastic roller 19 mm

Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 112-0CH62-1AJ0				1	1 unit
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For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K or positively driven actuator, necessary in safety circuits.

**Note:**

If the device you require is not available as a complete unit, see "Modular System".

### Modular system

2, 3 or 4 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	Configurator	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
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#### Basic switches · Enclosure width 40 mm



Basic switch

##### With M20 □ 1.5 connecting thread

Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 112-0CA00-1AJ0				1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 112-0KA00-1AJ0				1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 112-0LA00-1AJ0				1	1 unit

#### Basic switches · Enclosure width 56 mm



Basic switch

##### With 3 x M20 x 1.5 connecting thread

Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 122-0CA00-1AJ0				1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 122-0KA00-1AJ0				1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 122-0LA00-1AJ0				1	1 unit

#### Basic switches · Enclosure width 56 mm, XL



Basic switch

##### With 3 x M20 x 1.5 connecting thread

Slow-action contacts	2 × (1 NO + 1 NC)	—	⊕ B	3SE5 162-0BA00-1AJ0				1	1 unit
Snap-action contacts	2 × (1 NO + 1 NC)	—	⊕ B	3SE5 162-0CA00-1AJ0				1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).








⊕ Positive opening according to IEC 60947-5-1, Appendix K or positively driven actuator, necessary in safety circuits.

**Note:**

Selection aid [see page 13/9](#).

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Ambient temperature to –40 °C

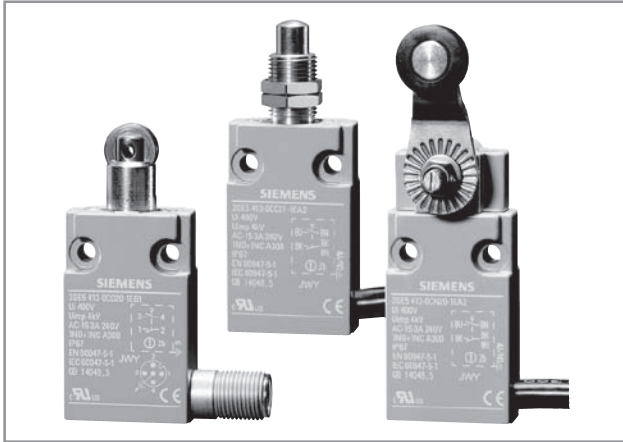
Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No. Price per PU		
<b>Operating mechanisms</b>					
	<b>Rounded plungers, type B acc. to EN 50041</b> High-grade steel plungers, with 3 mm overtravel	10	⊕ B	<b>3SE5 000-0AC02-1AJ0</b>	1 1 unit
Rounded plunger					
	<b>Roller plungers, type C acc. to EN 50041</b> High-grade steel roller, with 3 mm overtravel	10	⊕ B	<b>3SE5 000-0AD02-1AJ0</b>	1 1 unit
Roller plunger					
<b>Roller levers</b>					
	Metal lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE01-1AJ0</b>	1 1 unit
Roller lever	High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AE03-1AJ0</b>	1 1 unit
<b>Angular roller levers</b>					
	Metal lever, plastic roller	13	⊕ B	<b>3SE5 000-0AF01-1AJ0</b>	1 1 unit
Angular roller lever	High-grade steel lever, plastic roller	13	⊕ B	<b>3SE5 000-0AF03-1AJ0</b>	1 1 unit
<b>Twist actuators</b>					
	<b>Twist actuators, metal (without lever)</b> Switching right and/or left, adjustable		⊕ B	<b>3SE5 000-0AH00-1AJ0</b>	1 1 unit
Twist actuator					
<b>Levers for twist actuators</b>					
	<b>Twist levers, type A acc. to EN 50041</b> Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA01-1AJ0</b>	1 1 unit
Twist lever	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA11-1AJ0</b>	1 1 unit
<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA60-1AJ0</b>	1 1 unit
Twist lever, adjustable length	High-grade steel lever, plastic roller	19	⊕ B	<b>3SE5 000-0AA62-1AJ0</b>	1 1 unit

⊕ Positively driven actuator, necessary in safety circuits.

## SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Compact design

## Overview



Compact design in width 30 mm

Particularly in harsh environments or on equipment with limited space, the small 3SE5 4 position switches in compact design with a depth of 16 mm and a weight of only 80 g (without cable) are ideal. Above all the versions with molded cable can be mounted in the most confined places.

3SE5 4 compact position switches are available in two different widths as complete units:

- The 3SE5 413 series complies with the EU standard and features a 30 mm wide enclosure with drilled holes at a distance of 20 mm.
- The 3SE5 423 series meets the requirements of the US market and features a 40 mm wide enclosure with drilled holes at a spacing of 25 mm.

Both the enclosure and the twist actuator are made of metal and comply with the high IP67 degree of protection. Following actuators are available:

- Rounded plungers
- Rounded plungers with central fixing
- Rounded plungers with external seal
- Roller plungers
- Roller plunger with central fixing
- Twist levers

The contact block is designed with snap-action contacts 1 NO + 1 NC. The NC contact complies with the requirements for positive opening acc. to IEC 60947-5-1.

Use in safety circuits up to Category 4 according to EN ISO 13849-1.

Connection:

- With molded cable, 2 m or 5 m long
- With M12 connector socket

## Benefits


- Very compact yet with the same rating as the 3SE51 standard switches, for notable space savings in confined installation conditions
- Various actuator versions available
- Actuator heads rotatable in increments of 90°
- Time is saved when mounting the fully assembled unit
- With metal enclosure of degree of protection IP67, ideal for use in rough industrial environments
- Insensitive to electromagnetic interference

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Compact design

## Selection and ordering data

2 snap-action contacts 1 NO + 1 NC · Degree of protection IP67 · With connecting cable or M12 connector socket

Operating mechanism	Enclosure width	DT	Configurator 	PU (UNIT, SET, M)	PS*
	mm		Order No. Price per PU		

### Complete units · Enclosure width 30 or 40 mm

#### Rounded plungers

- Standard mounting
  - With 2 m cable 5 x 0.75 mm<sup>2</sup>
  - With 5 m cable 5 x 0.75 mm<sup>2</sup>
  - With M12 connector socket



Rounded plunger

- With central fixing M12 x 1
  - With 2 m cable 5 x 0.75 mm<sup>2</sup>



With central fixing

- With external seal
  - With 2 m cable 5 x 0.75 mm<sup>2</sup>



With external seal

#### Roller plungers

- Standard mounting
  - With 2 m cable 5 x 0.75 mm<sup>2</sup>
  - With 5 m cable 5 x 0.75 mm<sup>2</sup>
  - With M12 connector socket



Roller plunger

- With central fixing M12 x 1
  - With 2 m cable 5 x 0.75 mm<sup>2</sup>



With plug

- Actuator head rotated 90°
  - With 2 m cable 5 x 0.75 mm<sup>2</sup>



With plug, enclosure width 40 mm

#### Twist levers


- Standard mounting
  - With 2 m cable 5 x 0.75 mm<sup>2</sup>
  - With 5 m cable 5 x 0.75 mm<sup>2</sup>
  - With M12 connector socket



Twist lever

3SE5 413-0CC20-1EA2	1	1 unit
3SE5 423-0CC20-1EA2	1	1 unit
3SE5 413-0CC20-1EA5	1	1 unit
3SE5 413-0CC20-1EB1	1	1 unit
3SE5 423-0CC20-1EB1	1	1 unit
3SE5 413-0CC21-1EA2	1	1 unit
3SE5 423-0CC21-1EA2	1	1 unit
3SE5 413-0CC22-1EA2	1	1 unit
3SE5 423-0CC22-1EA2	1	1 unit
3SE5 413-0CD20-1EA2	1	1 unit
3SE5 423-0CD20-1EA2	1	1 unit
3SE5 413-0CD20-1EA5	1	1 unit
3SE5 413-0CD20-1EB1	1	1 unit
3SE5 423-0CD20-1EB1	1	1 unit
3SE5 413-0CD21-1EA2	1	1 unit
3SE5 423-0CD21-1EA2	1	1 unit
3SE5 413-0CD23-1EA2	1	1 unit
3SE5 413-0CN20-1EA2	1	1 unit
3SE5 423-0CN20-1EA2	1	1 unit
3SE5 413-0CN20-1EA5	1	1 unit
3SE5 413-0CN20-1EB1	1	1 unit
3SE5 423-0CN20-1EB1	1	1 unit

 For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

 Positive opening according to IEC 60947-5-1, Appendix K.

# SIRIUS 3SE5 International Limit Switches

3SE5, open-type design

## Overview



Open-type design




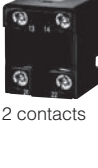
Their compact design makes these switches particularly suitable for use in confined conditions. The fixing dimensions and operating points are according to EN 50047.

The switches are equipped with two or three contacts in slow-action or snap-action versions. The stroke is 6 mm.

The empty enclosure can be equipped with all switch block versions (see page 13/49).

## Selection and ordering data

2 or 3 contacts · Degree of protection IP20 (2 contacts), IP10 (3 contacts)

Version	Contacts	DT	Configurator	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Plastic enclosures · Enclosure width 30 mm</b>							
<b>With teflon plunger, Ø 6 mm</b>							
	Slow-action contacts	1 NO + 1 NC	⊕ ▶	<b>3SE5 250-0BC05</b>		1	1 unit
	Snap-action contacts	1 NO + 1 NC	⊕ ▶	<b>3SE5 250-0CC05</b>		1	1 unit
	Slow-action contacts	1 NO + 2 NC	⊕ ▶	<b>3SE5 250-0KC05</b>		1	1 unit
	Snap-action contacts	1 NO + 2 NC	⊕ ▶	<b>3SE5 250-0LC05</b>		1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	⊕ A	<b>3SE5 250-0MC05</b>		1	1 unit
	Slow-action contacts	2 NO + 1 NC	⊕ ▶	<b>3SE5 250-0PC05</b>		1	1 unit
	Empty enclosures without contact block	—	⊕ B	<b>3SE5 250-0AC05</b>		1	1 unit
<b>Contact blocks with 2 contacts for open-type design<sup>1)</sup></b>							
	• Slow-action contacts	1 NO + 1 NC	⊕ B	<b>3SE5 050-0BA00</b>		1	1 unit
	• Snap-action contacts	1 NO + 1 NC	⊕ B	<b>3SE5 050-0CA00</b>		1	1 unit
	- Standard		⊕ B	<b>3SE5 050-0GA00</b>		1	1 unit
	- 2 × 2 mm switching interval		⊕ B	<b>3SE5 050-0GA00</b>		1	1 unit
	- Short stroke		⊕ B	<b>3SE5 050-0NA00</b>		1	1 unit

⚙ For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Contact blocks with 3 contacts see page 13/49.

# SIRIUS 3SE5 International Limit Switches

## Accessories







### Selection and ordering data

Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
<b>Plug-in connections for M20 × 1.5 connecting threads</b>							
		<b>Connector sockets (6-pole+PE), for M20x1.5</b>		1	1 unit	102	0.030
	B	For max. 250 V, 10 A With 0.75 mm <sup>2</sup> connecting cable, plastic, degree of protection IP65, ambient temperature -40 to +90 °C					
		<b>Cable boxes (6-pole + PE)<sup>1)</sup></b>		1	1 unit	102	0.065
	A	With terminal compartment, can be pre-assembled, plastic, degree of protection IP65					
	B	<b>Connector sockets (4-pole), M12, for M20 × 1.5, fixed</b>		1	1 unit	102	0.010
		For max 250 V, 4 A, $U_{imp} = 2500 V$ With four 0.25 mm <sup>2</sup> connecting cables, plastic, degree of protection IP67, ambient temperature -40 to +85 °C					
	A	<b>Cable boxes (4-pole), M12, with terminal compartment, can be pre-assembled</b>		1	1 unit	574	0.015
	A	<b>Angular cable boxes (4-pole), M12, with terminal compartment, can be pre-assembled</b>		1	1 unit	574	0.015
		<b>Connector sockets (5-pole), M12, for M20 × 1.5, fixed</b>		1	1 unit	102	0.010
	B	For max 125 V, 4 A, $U_{imp} = 1500 V$ With five 0.25 mm <sup>2</sup> connecting cables, plastic, degree of protection IP67, ambient temperature -40 to +85 °C					
		<b>Cable boxes (5-pole), M12, with terminal compartment, can be pre-assembled</b>		1	1 unit	574	0.016
	A						
	A	<b>Angular cable boxes (5-pole), M12, with terminal compartment, can be pre-assembled</b>		1	1 unit	574	0.016
	A						
		<b>Connector sockets (8-pole), M12, for M20 × 1.5, fixed, metal version</b>		1	1 unit	102	0.025
	B	For max 30 V, 2 A, $U_{imp} = 800 V$ With eight 0.25 mm <sup>2</sup> connecting cables, metal, degree of protection IP67, ambient temperature -40 to +85 °C					
	A	<b>Cable boxes (8-pole), M12</b>		1	1 unit	574	0.335
	A	With 5 m PUR cable, 8 × 0.25 mm <sup>2</sup> , IP67					
<b>Adaptors for 3SE. (with M 16)</b>							
		metal M16 x 1.5 to 1/2" NPT		1	1 unit		0.022
<b>Adaptors for 3SE2 (with M 20)</b>							
		plastic M20 x 1.5 wire gland		1	1 unit		0.011
		metal M20 x 1.5 to 1/2" NPT		1	1 unit		0.022
		plastic M20 x 1.5 to 1/2" NPT		1	1 unit		0.012
		plastic cable gland, M20 x 1.5		1	1 unit		0.010
<b>Adaptors for 3SE. (with M 25)</b>							
		metal M 25 x 1.5 to 1/2" NPT		1	1 unit		0.022

<sup>1)</sup> For wiring, a crimping tool is necessary, max. conductor cross-section 1 mm<sup>2</sup>.

# SIRIUS 3SE5 International Limit Switches

## Accessories and spare parts

Version	Color/ contacts	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Optional accessories for 3SE52</b>						
	<b>Protective caps, rubber,</b> for rounded plungers acc. to EN 50047, 3SE5 ...-...C05	Black	A	<b>3SE5 000-0AC30</b>	1	1 unit
<b>Spare parts for 3SE51, 3SE52</b>						
	<b>Empty enclosures, plastic</b>	Turquoise				
	Enclosure width 31 mm		B	<b>3SE5 232-0AC05</b>	1	1 unit
	• With increased corrosion protection		B	<b>3SE5 232-0AC05-1CA0</b>	1	1 unit
	Enclosure width 50 mm		B	<b>3SE5 242-0AC05</b>	1	1 unit
	• With increased corrosion protection		B	<b>3SE5 242-0AC05-1CA0</b>	1	1 unit
	<b>Empty enclosures, metal</b>	Turquoise				
	Enclosure width 31 mm		B	<b>3SE5 212-0AC05</b>	1	1 unit
	• With increased corrosion protection		B	<b>3SE5 212-0AC05-1CA0</b>	1	1 unit
	Enclosure width 40 mm		B	<b>3SE5 112-0AA00</b>	1	1 unit
	• With increased corrosion protection		B	<b>3SE5 112-0AA00-1CA0</b>	1	1 unit
	Enclosure width 56 mm		B	<b>3SE5 122-0AA00</b>	1	1 unit
	• With increased corrosion protection		B	<b>3SE5 122-0AA00-1CA0</b>	1	1 unit
	Enclosure width 56 mm, XL <sup>1)</sup>		B	<b>3SE5 162-0AA00</b>	1	1 unit
	<b>Contact blocks with 2 contacts<sup>2)</sup></b>					
	• Slow-action contacts	1 NO + 1 NC	⊕ ▶	<b>3SE5 000-0BA00</b>	1	1 unit
	• Snap-action contacts	1 NO + 1 NC				
	- Standard		⊕ B	<b>3SE5 000-0CA00</b>	1	1 unit
	- Gold-plated contacts		⊕ B	<b>3SE5 000-0CA00-1AC1</b>	1	1 unit
	- 2 x 2 mm switching interval		⊕ B	<b>3SE5 000-0GA00</b>	1	1 unit
- Short stroke		⊕ B	<b>3SE5 000-0NA00</b>	1	1 unit	
	<b>Contact blocks with 3 contacts</b>					
	• Slow-action contacts	1 NO + 2 NC	⊕ B	<b>3SE5 000-0KA00</b>	1	1 unit
	• Snap-action contacts	1 NO + 2 NC	⊕ B	<b>3SE5 000-0LA00</b>	1	1 unit
	• Slow-action contacts with make-before-break	1 NO + 2 NC	⊕ A	<b>3SE5 000-0MA00</b>	1	1 unit
• Slow-action contacts	2 NO + 1 NC	A	<b>3SE5 000-0PA00</b>	1	1 unit	
	<b>Contact blocks for enclosure XL<sup>1)</sup></b>					
	• Slow-action contacts	1 NO + 1 NC	⊕ B	<b>3SE5 060-0BA00</b>	1	1 unit
	• Snap-action contacts	1 NO + 1 NC	⊕ B	<b>3SE5 060-0CA00</b>	1	1 unit
	• Slow-action contacts with make-before-break	1 NO + 2 NC	⊕ B	<b>3SE5 060-0MA00</b>	1	1 unit

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

1) Equip XL enclosures only with contact combinations according to pages 12/11, 12/42 and 12/43.

2) Unsuitable for open-type position switches; see page 13/47.



# SIRIUS 3SE5 International Limit Switches

## Accessories and spare parts

Version	Rated voltage LED	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
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V

### Spare parts for 3SE51, 3SE52



31 mm, turquoise with LED

#### Covers for plastic enclosures, width 31 mm

• Turquoise with LED	24 DC	B	<b>3SE5 230-1AA00</b>		1	1 unit
	230 AC	B	<b>3SE5 230-3AA00</b>		1	1 unit
• Yellow	—	B	<b>3SE5 230-0AA00-1AG0</b>		1	1 unit
• Yellow with LED	24 DC	B	<b>3SE5 230-1AA00-1AG0</b>		1	1 unit
	230 AC	B	<b>3SE5 230-3AA00-1AG0</b>		1	1 unit



40 mm, yellow with LED

#### Covers for plastic enclosures, width 40 mm

• Turquoise with LED	24 DC	B	<b>3SE5 130-1AA00</b>		1	1 unit
	230 AC	B	<b>3SE5 130-3AA00</b>		1	1 unit
• Yellow	—	B	<b>3SE5 130-0AA00-1AG0</b>		1	1 unit
• Yellow with LED	24 DC	B	<b>3SE5 130-1AA00-1AG0</b>		1	1 unit
	230 AC	B	<b>3SE5 130-3AA00-1AG0</b>		1	1 unit



50 mm, turquoise with LED

#### Covers for plastic enclosures, width 50 mm

• Turquoise with LED	24 DC	B	<b>3SE5 240-1AA00</b>		1	1 unit
	230 AC	B	<b>3SE5 240-3AA00</b>		1	1 unit
• Yellow	—	B	<b>3SE5 240-0AA00-1AG0</b>		1	1 unit
• Yellow with LED	24 DC	B	<b>3SE5 240-1AA00-1AG0</b>		1	1 unit
	230 AC	B	<b>3SE5 240-3AA00-1AG0</b>		1	1 unit



31 mm, turquoise with LED

#### Covers for metal enclosures, width 31 mm

• Turquoise with LED	24 DC	B	<b>3SE5 210-1AA00</b>		1	1 unit
	230 AC	B	<b>3SE5 210-3AA00</b>		1	1 unit
• Yellow	—	B	<b>3SE5 210-0AA00-1AG0</b>		1	1 unit
• Yellow with LED	24 DC	B	<b>3SE5 210-1AA00-1AG0</b>		1	1 unit
	230 AC	B	<b>3SE5 210-3AA00-1AG0</b>		1	1 unit



40 mm, yellow with LED

#### Covers for metal enclosures, width 40 mm

• Turquoise with LED	24 DC	B	<b>3SE5 110-1AA00</b>		1	1 unit
	230 AC	B	<b>3SE5 110-3AA00</b>		1	1 unit
• Yellow	—	B	<b>3SE5 110-0AA00-1AG0</b>		1	1 unit
• Yellow with LED	24 DC	B	<b>3SE5 110-1AA00-1AG0</b>		1	1 unit
	230 AC	B	<b>3SE5 110-3AA00-1AG0</b>		1	1 unit



56 mm, yellow with LED

#### Covers for metal enclosures, width 56 mm

• Turquoise with LED	24 DC	B	<b>3SE5 120-1AA00</b>		1	1 unit
	230 AC	B	<b>3SE5 120-3AA00</b>		1	1 unit
• Yellow	—	B	<b>3SE5 120-0AA00-1AG0</b>		1	1 unit
• Yellow with LED	24 DC	B	<b>3SE5 120-1AA00-1AG0</b>		1	1 unit
	230 AC	B	<b>3SE5 120-3AA00-1AG0</b>		1	1 unit

#### Covers for XL metal enclosures, width 56 mm

• Yellow	—	B	<b>3SE5 160-0AA00-1AG0</b>		1	1 unit
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## Technical specifications

Type		3SE5 1..., 3SE5 2..	3SE5 41.	3SE5 42.
<b>General data</b>				
<b>Standards</b>		IEC 60947-5-1, EN 60947-5-1		
<b>Rated insulation voltage <math>U_i</math></b>	V	400	400	
<b>Pollution degree</b> acc. to IEC 60664-1		Class 3	Class 3	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6	4	
<b>Rated operational voltage <math>U_e</math></b>	V	400 V AC, over 300 V AC only for equal potential <sup>1)</sup>	300 AC	
<b>Conventional thermal current <math>I_{th}</math></b>	A	10	6	10
<b>Rated operational current <math>I_e</math></b>		2-pole	3-pole	2-pole
• With alternating current 50/60 Hz		$I_e/AC-15$	$I_e/AC-15$	$I_e/AC-15$
- At 24 V	A	6	6	6
- At 120 V	A	6	3	6
- At 240 V	A	3	1.5	3
• For direct current		$I_e/DC-13$	$I_e/DC-13$	$I_e/DC-13$
- At 24 V	A	3	3	3
- At 125 V	A	0.55	0.55	0.55
- At 250 V	A	0.27	0.27	0.27
<b>Short-circuit protection<sup>2)</sup></b>				
• With DIAZED fuse links, gG operational class	A	6		
• With miniature circuit breaker, Char. C	A	1	2	1
<b>Mechanical endurance</b>				
• Basic switches		15 × 10 <sup>6</sup> operating cycles	30 × 10 <sup>6</sup> operating cycles	30 × 10 <sup>6</sup> operating cycles
• With spring rod, 3SE5 ...-R..		10 × 10 <sup>6</sup> operating cycles	—	—
• With fork lever 3SE5 1...-T..		1 × 10 <sup>6</sup> operating cycles	—	—
<b>Electrical endurance</b>				
• With 3RH.1, 3RT contactors in size S00, S0		10 × 10 <sup>6</sup> operating cycles	10 × 10 <sup>6</sup> operating cycles	5 × 10 <sup>6</sup> operating cycles
• For utilization category AC-15 when switching off $I_e/AC-15$ at 240 V		0.1 × 10 <sup>6</sup> operating cycles	—	—
• With utilization category DC-12/DC-13		For direct current depending on the loading of the switch		
<b>Switching frequency</b> With 3RH.1, 3RT contactors in size S00, S0		6000 operating cycles/h	1800 operating cycles/h	
<b>Switching accuracy</b> For repeated switching, measured at the plunger of the contact block	mm	0.05		
• With twist actuators		1°		
<b>Rated data acc. to <math>\mathcal{E}</math>, <math>\mathcal{R}</math> and <math>\mathcal{V}</math></b>				
• Rated voltage	V	300		
• Uninterrupted current	A	6		
• Switching capacity		Heavy duty, A 300 / B 300 / Q 300	A 300 / Q 300	

<sup>1)</sup> For slow-action contacts 1 NO + 2 NC with make-before-break and  
2 NO + 1 NC the following applies: over 250 V AC only equal potential

<sup>2)</sup> Without any welds according to IEC 60947-5-1.

Type		3SE5 23.	3SE5 13	3SE5 24.	3SE5 21.	3SE5 11.	3SE5 12., 3SE5 16.	3SE5 4..	3SE5 25.
<b>Enclosure</b>									
<b>Enclosure</b>		Ultramid A3X2G7			Zinc diecasting GD Zn Al4 Cu1				
• Material									
• Width	mm	31	40	50	31	40	56	30 / 40	30
<b>Degree of protection</b> acc. to IEC 60529		IP65	IP66/IP67 <sup>1)</sup>					IP67	IP20, IP10
<b>Ambient temperature</b>									
• During operation	°C	-25 ... +85						-25 ... +85	-25 ... +85
• In operation, switch with LEDs	°C	-25 ... +70						—	—
• Storage, transport	°C	-40 ... +90						-40 ... +90	-40 ... +90
<b>Mounting position</b>		Any							
<b>Connection</b>									
<b>Cable entry</b>		1 × (M20 × 1.5)	2 × (M20 × 1.5)	1 × (M20 × 1.5)	3 × (M20 × 1.5)	—	—		
<b>Conductor cross-sections<sup>2)</sup></b>									
• Solid	mm <sup>2</sup>	2 × (0.5 ... 0.75), 1 × (0.5 ... 1.5)							
• Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 ... 1.5)							
<b>Tightening torque</b> , contact block	Nm	0.8 ... 1.0							
<b>Protective conductor connection</b> inside enclosure		—			M3.5			—	—

<sup>1)</sup> For twist actuators with spring rod and rod actuators: IP65/IP67.

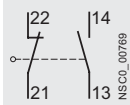
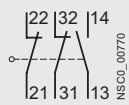
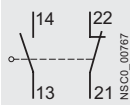
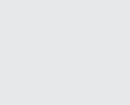
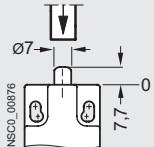
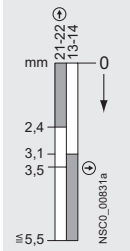
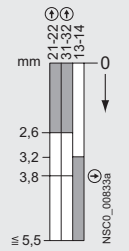
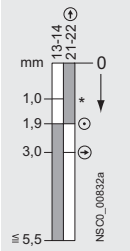
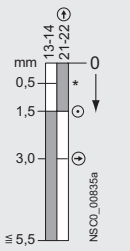
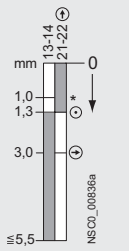
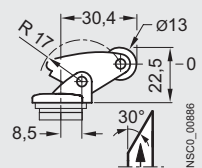
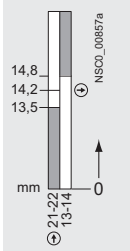
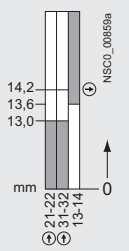
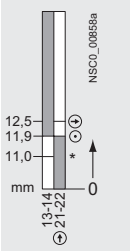
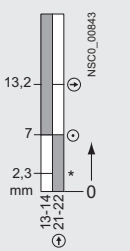
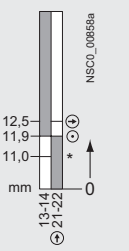
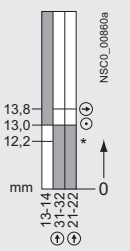
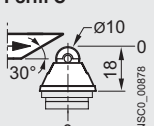
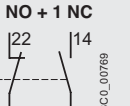
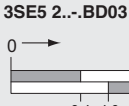
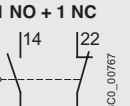
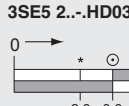
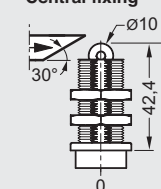
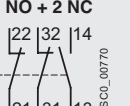
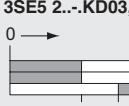
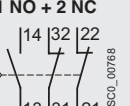
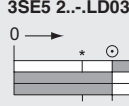
<sup>2)</sup> For the maximum number of connectable conductors for the respective contact block see operating instructions.

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure widths 31 mm and 50 mm

## Configuration

### Actuation and operating travel (angle) for enclosure width 31 mm and 50 mm

<b>Operation by bar (standard)</b> ○ Operating point acc. to EN 50047 (snap-action) * Operating point on return (snap-action) ⊕ Positive opening acc. to EN 60947-5-1 → Direction of operation $v_{max}$ Max. actuating speed ■ Contact closed □ Contact open		<b>Slow-action contacts</b> <b>1 NO + 1 NC</b>  Ident. No. <b>11</b>		<b>Slow-action contacts</b> <b>1 NO + 2 NC</b>  Ident. No. <b>12</b>		<b>Snap-action contacts</b> <b>1 NO + 1 NC</b>  Ident. No. <b>11</b>		<b>Snap-action contacts</b> <b>1 NO + 2 NC</b>  Ident. No. <b>12</b>					
<b>Rounded plungers, type B</b> <b>3SE5 2...-C05</b>  $v_{max} = 1 \text{ m/s}$ Minimum force required in direction of operation: 18 N		Actuation along plunger axis <b>-BC05</b>  $v_{max} 5,5$		Actuation along plunger axis <b>-KC05</b>  $v_{max} 5,5$		Actuation along plunger axis <b>-CC05, -HC05 -FC05</b>  $v_{max} 5,5$ Short stroke		Actuation along plunger axis <b>-GC05</b>  $v_{max} 5,5$ Switching interval 2 x 2 mm		Actuation along plunger axis <b>-LC05</b>  $v_{max} 5,5$			
<b>Angular roller levers</b> <b>3SE5 2...-F1.</b>  $v_{max} = 1 \text{ m/s}$ Minimum force required in direction of operation: 9 N		Actuation along plunger axis <b>-BF10</b>  $v_{max} 5,5$		Actuation along plunger axis <b>-KF10</b>  $v_{max} 5,5$		Actuation along plunger axis <b>-HF10</b>  $v_{max} 5,5$ Short stroke		Actuation along plunger axis <b>-FC05 + head<sup>1)</sup></b>  $v_{max} 5,5$ Short stroke		Actuation along plunger axis <b>-GC05 + head<sup>1)</sup></b>  $v_{max} 5,5$ Switching interval 2 x 2 mm		Actuation along plunger axis <b>-LF10</b>  $v_{max} 5,5$	
<b>Operation by bar (standard)</b> ○ Operating point acc. to EN 50047 (snap-action) * Operating point on return (snap-action) ⊕ Positive opening acc. to EN 60947-5-1 → Direction of operation $v_{max}$ Max. actuating speed ■ Contact closed □ Contact open		<b>Slow-action contacts</b> ■ Contact closed □ Contact open		<b>Snap-action contacts</b> ■ Contact closed □ Contact open									
<b>Roller plungers</b> <b>3SE5 2...-D03, -D04</b> <b>3SE5 2...-D10, -D11</b> <b>Form C</b>  $v_{max} = 1 \text{ m/s}$ Minimum force required in direction of operation: 18 N		Lateral actuation <b>1 NO + 1 NC</b>  Ident. No. <b>11</b>		Lateral actuation <b>3SE5 2...-BD03</b>  $v_{max} 5,5$		Lateral actuation <b>1 NO + 1 NC</b>  Ident. No. <b>11</b>		Lateral actuation <b>3SE5 2...-HD03, -HD10</b>  $v_{max} 5,5$					
<b>Central fixing</b>  $v_{max} = 1 \text{ m/s}$ Minimum force required in direction of operation: 18 N		Lateral actuation <b>1 NO + 2 NC</b>  Ident. No. <b>12</b>		Lateral actuation <b>3SE5 2...-KD03, -KD10</b>  $v_{max} 5,5$		Lateral actuation <b>1 NO + 2 NC</b>  Ident. No. <b>12</b>		Lateral actuation <b>3SE5 2...-LD03</b>  $v_{max} 5,5$					

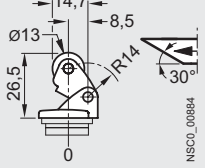
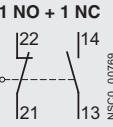
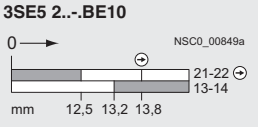
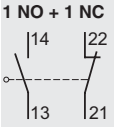
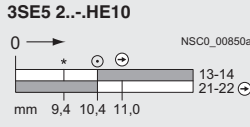
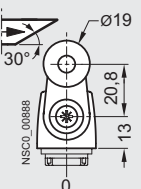
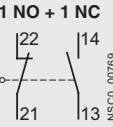
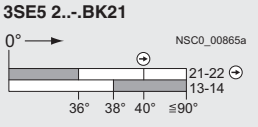
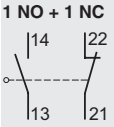
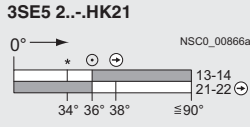
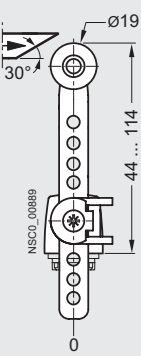
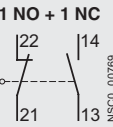
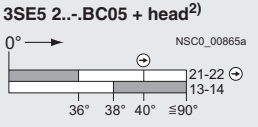
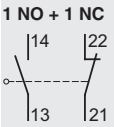
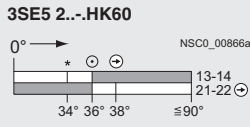
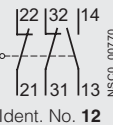
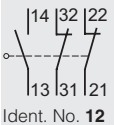
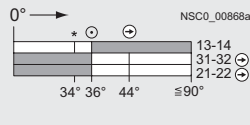
<sup>1)</sup> The basic switch and actuator head must be ordered separately.

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure widths 31 mm and 50 mm

## Configuration

Actuation and operating travel (angle) for enclosure width 31 mm and 50 mm

<b>Operation by bar (standard)</b> ○ Operating point acc. to EN 50047 (snap-action) * Operating point on return (snap-action) ⊕ Positive opening acc. to EN 60947-5-1 → Direction of operation $v_{max}$ Max. actuating speed	<b>Slow-action contacts</b> ■ Contact closed □ Contact open	<b>Snap-action contacts</b> ■ Contact closed □ Contact open
<b>Roller levers, type E</b> <b>3SE5 2...-E1.</b>  <p><math>v_{max} = 1 \text{ m/s}</math> Minimum force required in direction of operation: 9 N</p>	<b>Lateral actuation</b> <b>1 NO + 1 NC</b>  <b>3SE5 2...-BE10</b>  <p>Ident. No. 11</p>	<b>Lateral actuation</b> <b>1 NO + 1 NC</b>  <b>3SE5 2...-HE10</b>  <p>Ident. No. 11</p>
<b>Twist levers<sup>1)</sup>, type A</b> <b>3SE5 2...-K2.</b>  <p><math>v_{max} = 1.5 \text{ m/s}</math> Minimum torque in direction of operation: 0.25 Nm</p>	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  <b>3SE5 2...-BK21</b>  <p>Ident. No. 11</p>	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  <b>3SE5 2...-HK21</b>  <p>Ident. No. 11</p>
<b>Twist levers<sup>1)</sup>, adjustable length</b> <b>3SE5 2...-K6.</b>  <p><math>v_{max} = 1.5 \text{ m/s}</math> Minimum torque in direction of operation: 0.25 Nm</p>	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  <b>3SE5 2...-BC05 + head<sup>2)</sup></b>  <p>Ident. No. 11</p>	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  <b>3SE5 2...-HK60</b>  <p>Ident. No. 11</p>
<b>1 NO + 2 NC</b>  <p>Ident. No. 12</p>	<b>1 NO + 2 NC</b>  <p>Ident. No. 12</p>	<b>Short stroke</b> <b>3SE5 2...-FC05 + head<sup>2)</sup></b>  <p>Ident. No. 11</p>
<p><sup>1)</sup> Adjustment of the lever in increments of 10°, maximum deflection 90°.</p>	<p><sup>2)</sup> The basic switch and actuator head must be ordered separately.</p>	

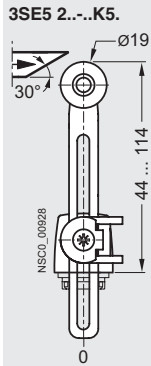
# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure widths 31 mm and 50 mm

### Operation by bar (standard)

- ⊙ Operating point acc. to EN 50041/47 (snap-action)
- \* Operating point on return (snap-action)
- ⊕ Positive opening acc. to EN 60947-5-1
- Direction of operation
- $v_{max}$  Max. actuating speed

### Twist levers<sup>1)</sup>, adjustable length

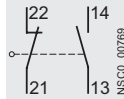


$xv_{max} = 1.5$  m/s  
Minimum torque in direction of operation: 0.25 Nm

### Slow-action contacts

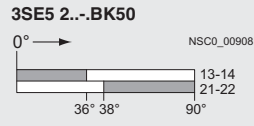
- Contact closed
- Contact open

#### 1 NO + 1 NC



Ident. No. 11

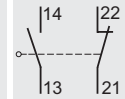
### Deflection in direction of rotation



### Snap-action contacts

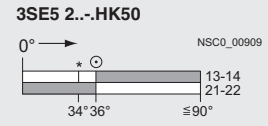
- Contact closed
- Contact open

#### 1 NO + 1 NC



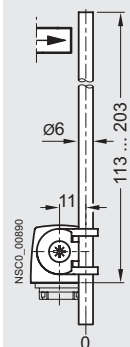
Ident. No. 11

### Deflection in direction of rotation



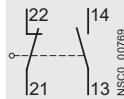
### Rod actuators<sup>1)</sup>, type D

#### 3SE5 2...-K8.



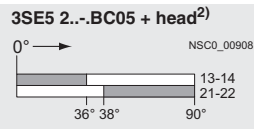
$v_{max} = 1.5$  m/s  
Minimum torque in direction of operation: 0.25 Nm

#### 1 NO + 1 NC

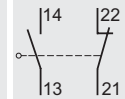


Ident. No. 11

### Deflection in direction of rotation

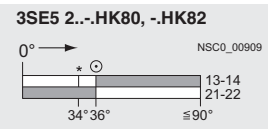


#### 1 NO + 1 NC



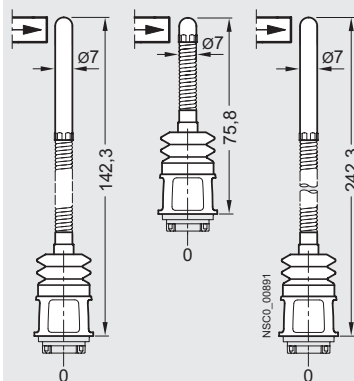
Ident. No. 11

### Deflection in direction of rotation



### Spring rods

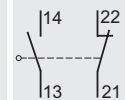
#### 3SE5 2...-R0.



$v_{max} = 1$  m/s  
Minimum force required in direction of operation: 9 N

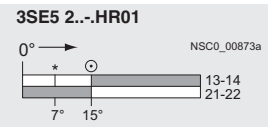
The spring rods can be used only with snap-action contacts.

#### 1 NO + 1 NC

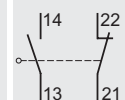


Ident. No. 11

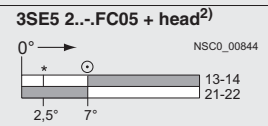
### Deflection of spring rod



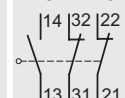
#### 1 NO + 1 NC



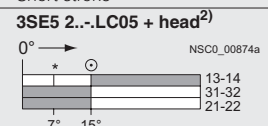
Ident. No. 11



#### 1 NO + 2 NC



Ident. No. 12



<sup>1)</sup> Adjustment of the lever in increments of 10°, maximum deflection 90°.

<sup>2)</sup> The basic switch and actuator head must be ordered separately.

# SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures – Enclosure widths 40 mm and 56 mm

## Configuration

Actuation and operating travel (angle) for enclosure width 40 mm and 56 mm

Operation by bar (standard)	Slow-action contacts	Snap-action contacts		
<ul style="list-style-type: none"> <li>Operating point acc. to EN 50041 (snap-action)</li> <li>* Operating point on return (snap-action)</li> <li>Positive opening acc. to EN 60947-5-1</li> <li>→ Direction of operation</li> <li><math>v_{max}</math> Max. actuating speed</li> <li>■ Contact closed</li> <li>□ Contact open</li> </ul>	<b>1 NO + 1 NC</b>  Ident. No. <b>11</b>	<b>1 NO + 2 NC</b>  Ident. No. <b>12</b>	<b>1 NO + 1 NC</b>  Ident. No. <b>11</b>	<b>1 NO + 2 NC</b>  Ident. No. <b>12</b>

Rounded plungers, type B	Actuation along plunger axis		Actuation along plunger axis	
<b>3SE5 1...-C02</b>  $v_{max} = 1.5 \text{ m/s}$ Minimum force required in direction of operation: 18 N	<b>3SE5 1...-BC02</b>  Ident. No. <b>11</b>	<b>3SE5 1...-KC02</b>  Ident. No. <b>12</b>	<b>3SE5 1...-CC02</b>  Ident. No. <b>11</b>	<b>3SE5 1...-LC02</b>  Ident. No. <b>12</b>

Angular roller levers	Actuation along plunger axis		Actuation along plunger axis	
<b>3SE5 112...F0.</b>  $v_{max} = 2.5 \text{ m/s}$ Minimum force required in direction of operation: 9 N	<b>3SE5 1...-BF01</b>  Ident. No. <b>11</b>	<b>3SE5 1...-KA00 + head<sup>1)</sup></b>  Ident. No. <b>12</b>	<b>3SE5 1...-CF01</b>  Ident. No. <b>11</b>	<b>3SE5 1...-LF01</b>  Ident. No. <b>12</b>

Operation by bar (standard)	Slow-action contacts	Snap-action contacts	
<ul style="list-style-type: none"> <li>Operating point acc. to EN 50041 (snap-action)</li> <li>* Operating point on return (snap-action)</li> <li>Positive opening acc. to EN 60947-5-1</li> <li>→ Direction of operation</li> <li><math>v_{max}</math> Max. actuating speed</li> <li>■ Contact closed</li> <li>□ Contact open</li> </ul>	■ Contact closed □ Contact open	■ Contact closed □ Contact open	

Roller plungers, type C	Lateral actuation		Lateral actuation	
<b>3SE5 1...-D02</b>  $v_{max} = 1 \text{ m/s}$ Minimum force required in direction of operation: 18 N	<b>1 NO + 1 NC</b>  Ident. No. <b>11</b>	<b>3SE5 1...-BD02</b>  Ident. No. <b>11</b>	<b>1 NO + 1 NC</b>  Ident. No. <b>11</b>	<b>3SE5 1...-CD02</b>  Ident. No. <b>12</b>
	<b>1 NO + 2 NC</b>  Ident. No. <b>12</b>	<b>3SE5 1...-KD02</b>  Ident. No. <b>12</b>	<b>1 NO + 2 NC</b>  Ident. No. <b>12</b>	<b>3SE5 1...-LD02</b>  Ident. No. <b>12</b>

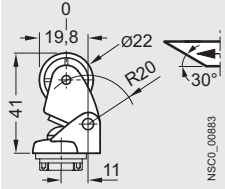
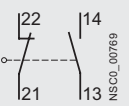
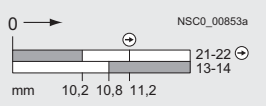
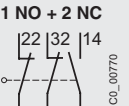
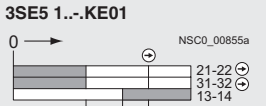
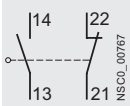
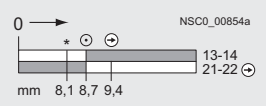
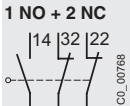
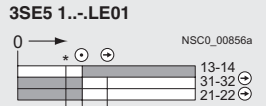
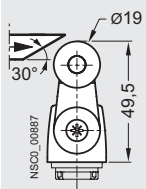
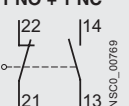
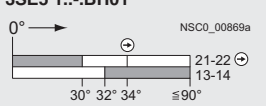
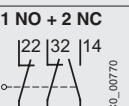
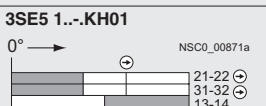
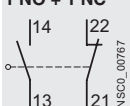
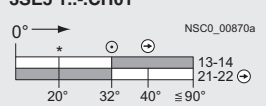
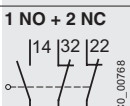
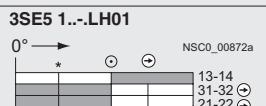
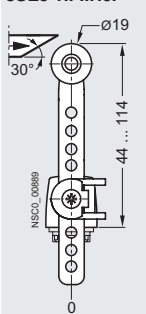
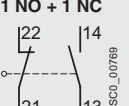
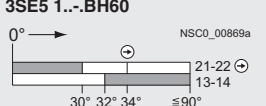
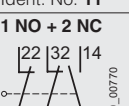

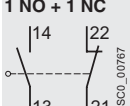
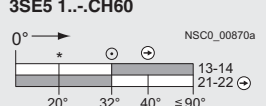
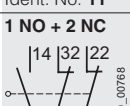

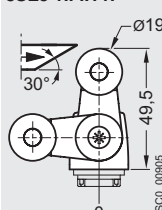
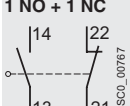
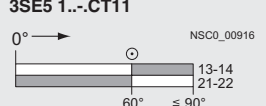
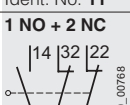
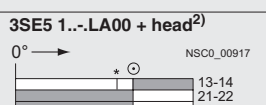
<sup>1)</sup> The basic switch and actuator head must be ordered separately.

# SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures – Enclosure widths 31 mm and 50 mm

## Configuration

Actuation and operating travel (angle) for enclosure width 40 mm and 56 mm

<b>Operation by bar (standard)</b> ○ Operating point acc. to EN 50041 (snap-action) * Operating point on return (snap-action) ↻ Positive opening acc. to EN 60947-5-1 → Direction of operation V <sub>max</sub> Max. actuating speed	<b>Slow-action contacts</b> ■ Contact closed □ Contact open	<b>Snap-action contacts</b> ■ Contact closed □ Contact open
<b>Roller levers</b> <b>3SE5 1...-E0.</b>  <p>V<sub>max</sub> = 2.5 m/s Minimum force required in direction of operation: 9 N</p>	<b>Lateral actuation</b> <b>1 NO + 1 NC</b>  NSCO_00769 <b>3SE5 1...-BE01</b>  NSCO_00853a Ident. No. 11 <b>1 NO + 2 NC</b>  NSCO_00770 <b>3SE5 1...-KE01</b>  NSCO_00855a Ident. No. 12	<b>Lateral actuation</b> <b>1 NO + 1 NC</b>  NSCO_00767 <b>3SE5 1...-CE01</b>  NSCO_00854a Ident. No. 11 <b>1 NO + 2 NC</b>  NSCO_00768 <b>3SE5 1...-LE01</b>  NSCO_00856a Ident. No. 12
<b>Twist levers<sup>1)</sup>, type A</b> <b>3SE5 1...-H0.</b>  <p>V<sub>max</sub> = 1.5 m/s Minimum torque in direction of operation: 0.25 Nm</p>	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  NSCO_00769 <b>3SE5 1...-BH01</b>  NSCO_00869a Ident. No. 11 <b>1 NO + 2 NC</b>  NSCO_00770 <b>3SE5 1...-KH01</b>  NSCO_00871a Ident. No. 12	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  NSCO_00767 <b>3SE5 1...-CH01</b>  NSCO_00870a Ident. No. 11 <b>1 NO + 2 NC</b>  NSCO_00768 <b>3SE5 1...-LH01</b>  NSCO_00872a Ident. No. 12
<b>Twist levers<sup>1)</sup>, adjustable length</b> <b>3SE5 1...-H6.</b>  <p>V<sub>max</sub> = 1.5 m/s Minimum torque in direction of operation: 0.25 Nm</p>	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  NSCO_00769 <b>3SE5 1...-BH60</b>  NSCO_00869a Ident. No. 11 <b>1 NO + 2 NC</b>  NSCO_00770 <b>3SE5 1...-KA00 + head<sup>2)</sup></b>  NSCO_00871a Ident. No. 12	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  NSCO_00767 <b>3SE5 1...-CH60</b>  NSCO_00870a Ident. No. 11 <b>1 NO + 2 NC</b>  NSCO_00768 <b>3SE5 1...-LH60</b>  NSCO_00872a Ident. No. 12
<b>Fork levers<sup>1)</sup></b> <b>3SE5 1...-T1.</b>  <p>V<sub>max</sub> = 1.5 m/s Minimum torque in direction of operation: 0.25 Nm</p>	The fork levers can be used only with snap-action contacts.	<b>Deflection in direction of rotation</b> <b>1 NO + 1 NC</b>  NSCO_00767 <b>3SE5 1...-CT11</b>  NSCO_00916 Ident. No. 11 <b>1 NO + 2 NC</b>  NSCO_00768 <b>3SE5 1...-LA00 + head<sup>2)</sup></b>  NSCO_00917 Ident. No. 12

<sup>1)</sup> Adjustment of the lever in increments of 10°, maximum deflection 90°.

<sup>2)</sup> The basic switch and actuator head must be ordered separately.

# SIRIUS 3SE5 International Limit Switches

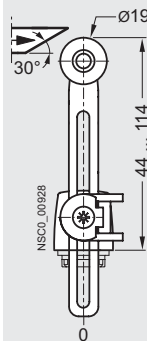
3SE5, metal enclosures – Enclosure widths 40 mm and 56 mm

**Operation by bar (standard)**

- Operating point acc. to EN 50041/47 (snap-action)
- \* Operating point on return (snap-action)
- ⊕ Positive opening acc. to EN 60947-5-1
- Direction of operation
- $v_{ma}$  Max. actuating speed

**Twist levers<sup>1)</sup>, adjustable length**

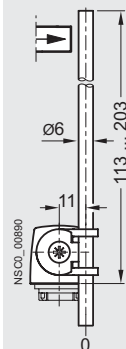
**3SE5 1...-H5.**



$v_{max} = 1.5 \text{ m/s}$   
Minimum torque in direction of operation: 0.25 Nm

**Rod actuators<sup>1)</sup>, type D**

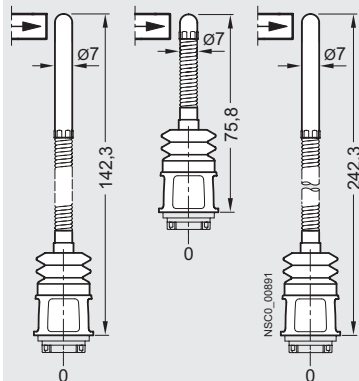
**3SE5 1...-H8.**



$v_{max} = 1.5 \text{ m/s}$   
Minimum torque in direction of operation: 0.25 Nm

**Spring rods**

**3SE5 1...-R0.**

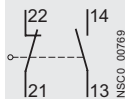


$v_{max} = 1 \text{ m/s}$   
Minimum force required in direction of operation: 9 N

**Slow-action contacts**

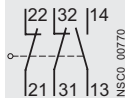
- Contact closed
- Contact open

**1 NO + 1 NC**



Ident. No. 11

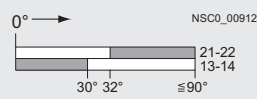
**1 NO + 2 NC**



Ident. No. 12

Deflection in direction of rotation

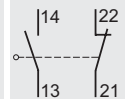
**3SE5 1...-BH50**



**Snap-action contacts**

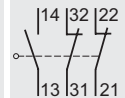
- Contact closed
- Contact open

**1 NO + 1 NC**



Ident. No. 11

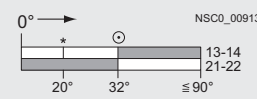
**1 NO + 2 NC**



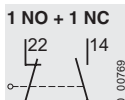
Ident. No. 12

Deflection in direction of rotation

**3SE5 1...-CH50, -CH51**

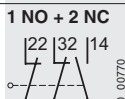


**1 NO + 1 NC**



Ident. No. 11

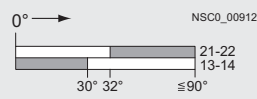
**1 NO + 2 NC**



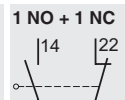
Ident. No. 12

Deflection in direction of rotation

**3SE5 1...-BA00 + head<sup>2)</sup>**

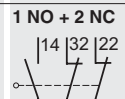


**1 NO + 1 NC**



Ident. No. 11

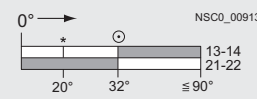
**1 NO + 2 NC**



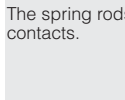
Ident. No. 12

Deflection in direction of rotation

**3SE5 1...-CH80, -CH82**

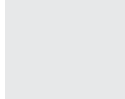


**1 NO + 1 NC**



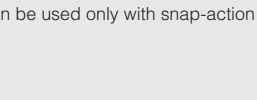
Ident. No. 11

**1 NO + 2 NC**



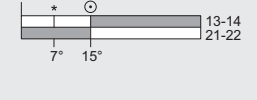
Ident. No. 12

The spring rods can be used only with snap-action contacts.



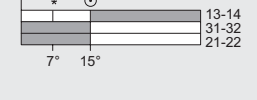
Deflection of spring rod

**3SE5 1...-CR01**



Deflection of spring rod

**3SE5 1...-LA00 + head<sup>2)</sup>**



<sup>1)</sup> Adjustment of the lever in increments of 10°, maximum deflection 90°.

<sup>2)</sup> The basic switch and actuator head must be ordered separately.

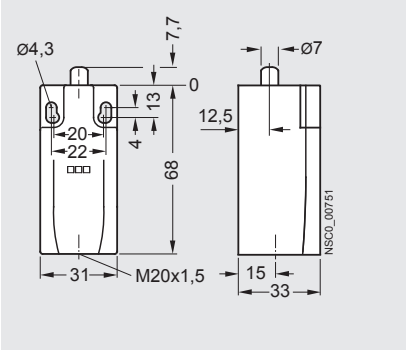


# SIRIUS 3SE5 International Limit Switches

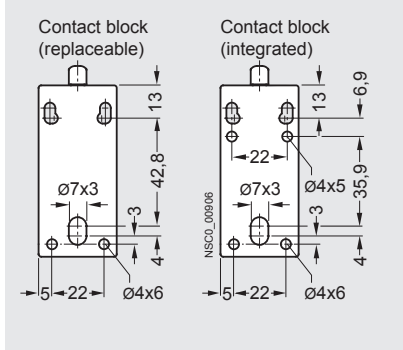
## Dimensional drawings

### Dimensions of the basic switches

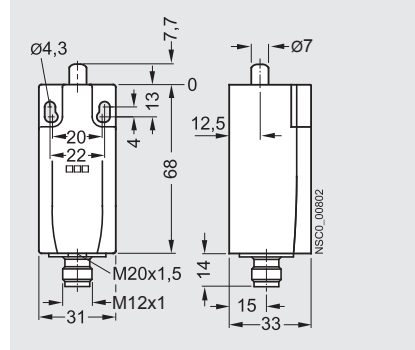
Enclosure width 31 mm, EN 50047, with M20 x 1.5 connecting thread 3SE5 232, 3SE5 212



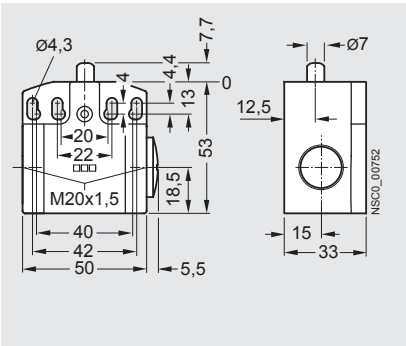
Enclosure width 31 mm, EN 50047, rear with fixing holes 3SE5 232, 3SE5 212



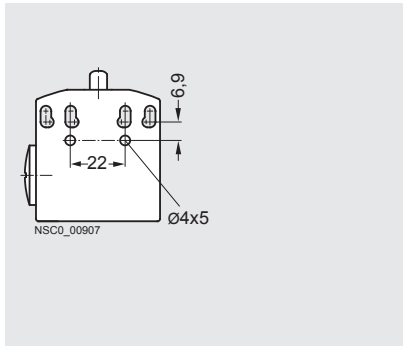
Enclosure width 31 mm, EN 50047, with M12 connector socket 3SE5 234, 3SE5 212



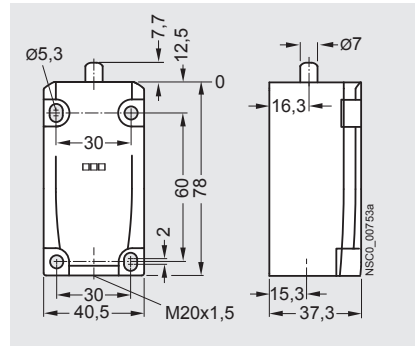
Enclosure width 50 mm, with M20 x 1.5 connecting thread 3SE5 242



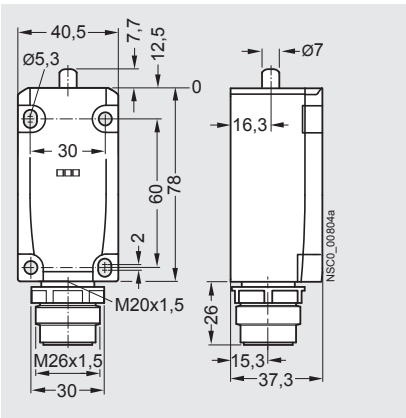
Enclosure width 50 mm, rear with fixing holes 3SE5 242



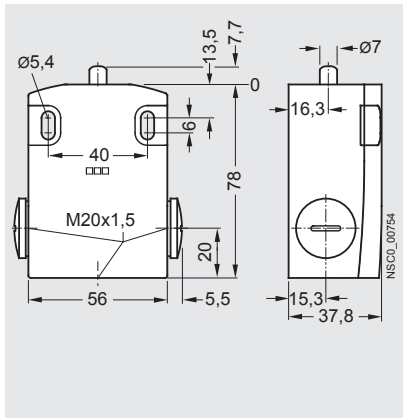
Enclosure width 40 mm, EN 50041, with M20 x 1.5 connecting thread 3SE5 112, 3SE5 132



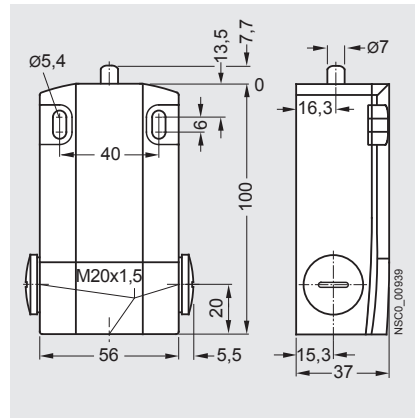
Enclosure width 40 mm, EN 50041, with 6-pole connector socket 3SE5 115



Enclosure width 56 mm, with M20 x 1.5 connecting thread 3SE5 122



XL enclosure, width 56 mm, with M20 x 1.5 connecting thread 3SE5 162



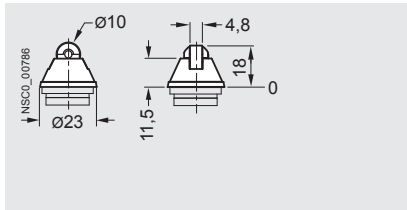
Operating mechanisms for basic switches, see pages 13/59 and 13/60.

# SIRIUS 3SE5 International Limit Switches

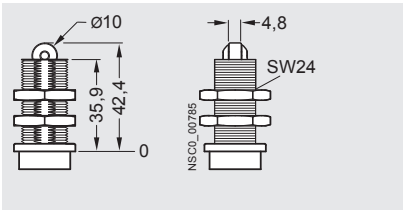
3SE5, open-type design

## Operating mechanisms for enclosure width 31 mm and 50 mm

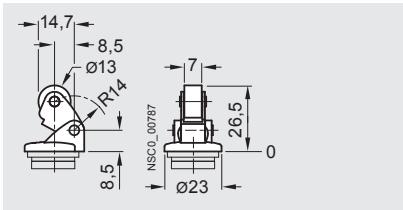
Roller plunger, type C acc. to EN 50047



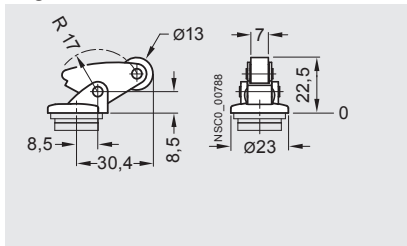
Roller plunger with central fixing



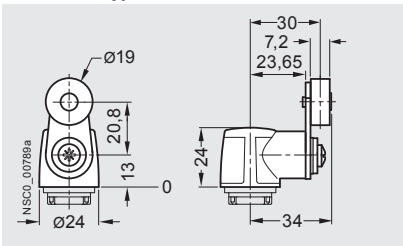
Roller lever, type E acc. to EN 50047



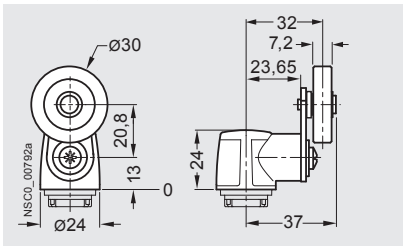
Angular roller lever



Twist lever, type A acc. to EN 50047



Twist lever, roller 30 mm

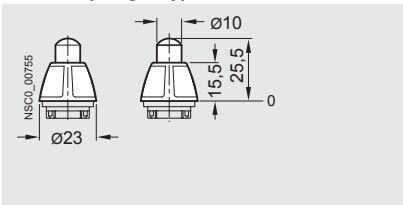


## Operating mechanism for enclosure width 40 mm and 56 mm

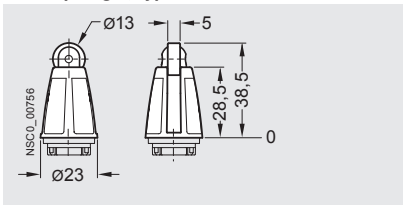
Plain plunger



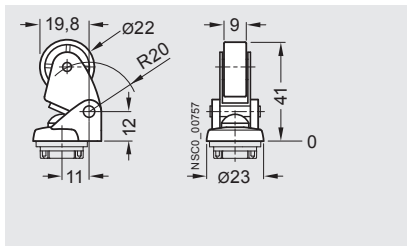
Rounded plunger, type B acc. to EN 50041



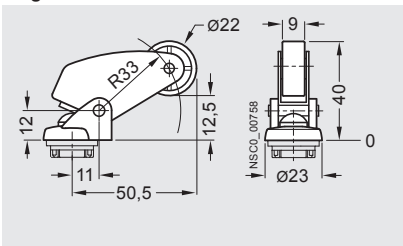
Roller plunger, type C acc. to EN 50041



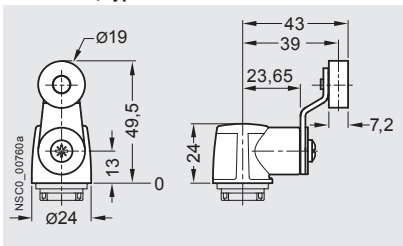
Roller lever



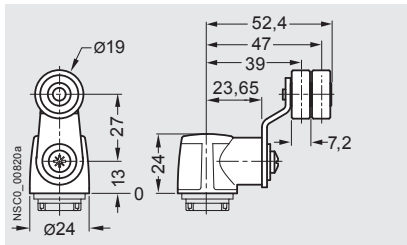
Angular roller lever



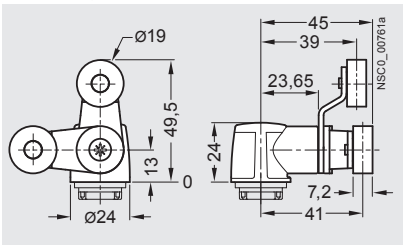
Twist lever, type A acc. to EN 50041



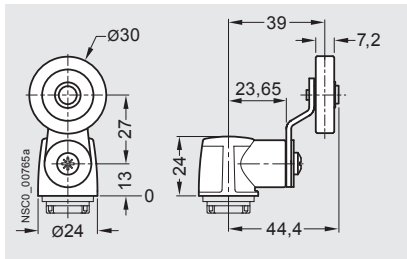
Twist lever, 2 rollers 19 mm



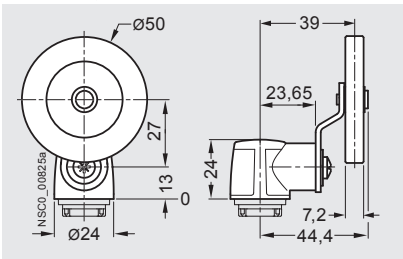
Fork lever, roller 19 mm



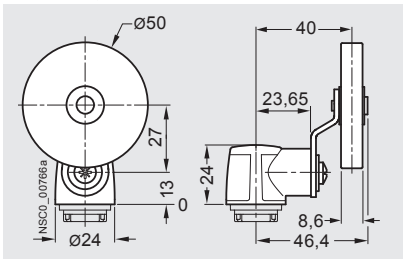
Twist lever, roller 30 mm



Twist lever, roller 50 mm



Twist lever, rubber roller 50 mm

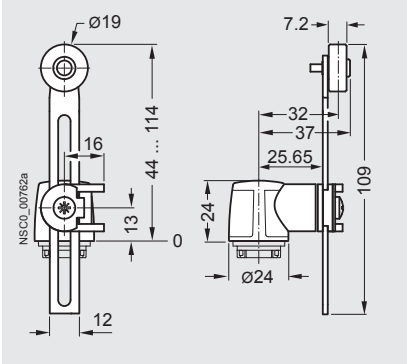


# SIRIUS 3SE5 International Limit Switches

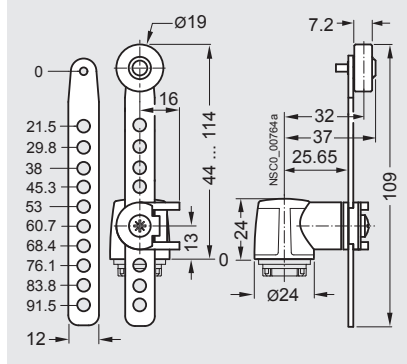
## Dimensional drawings

### Operating mechanisms for all enclosure widths

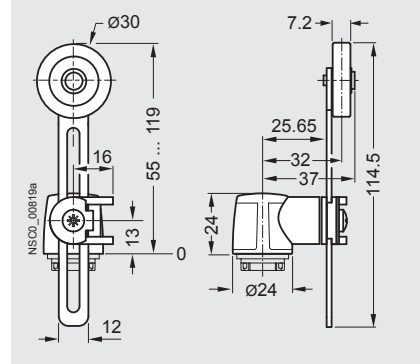
**Twist lever, adjustable length, roller 19 mm**



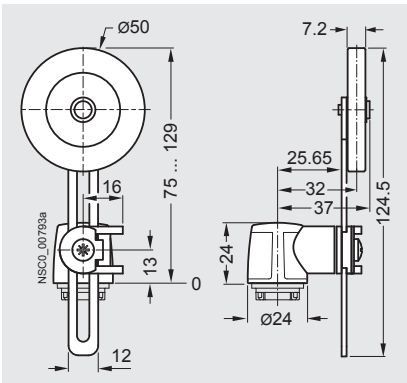
**Twist lever, adjustable length, with grid hole, roller 19 mm**



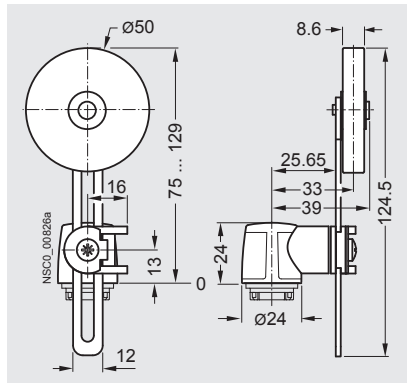
**Twist lever, adjustable length, roller 30 mm**



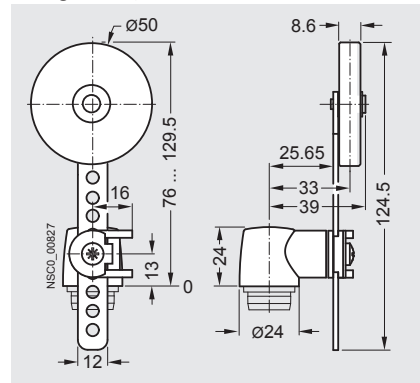
**Twist lever, adjustable length, roller 50 mm**



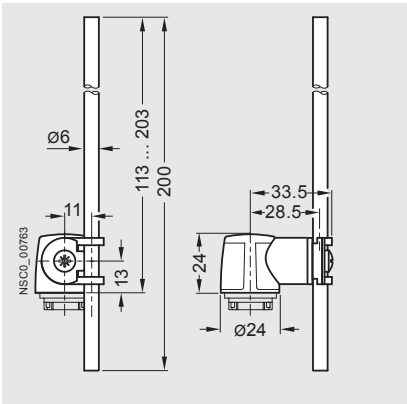
**Twist lever, adjustable length, rubber roller 50 mm**



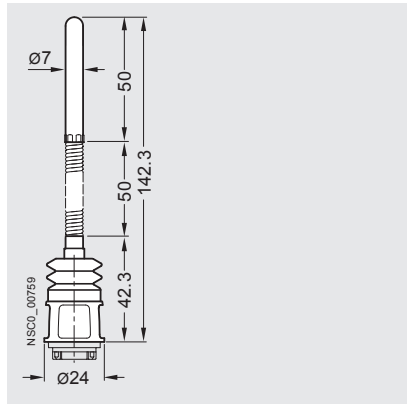
**Twist lever, adjustable length, with grid hole, rubber roller 50 mm**



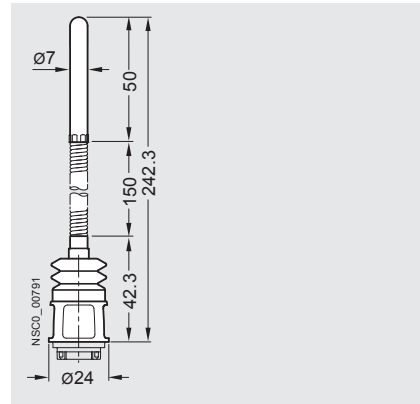
**Rod actuator**



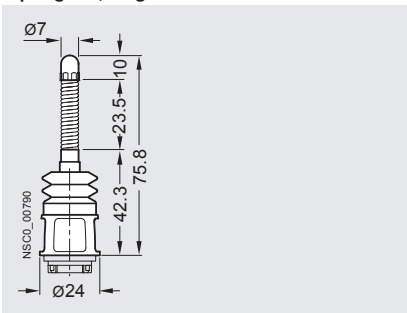
**Spring rod, length 142.5 mm**



**Spring rod, length 242.5 mm**



**Spring rod, length 76 mm**



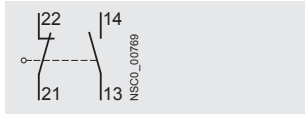
# SIRIUS 3SE5 International Limit Switches

## Dimensional drawings

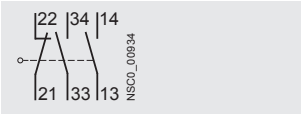
### Circuit diagrams

Enclosure widths 31, 40, 50 and 56 mm

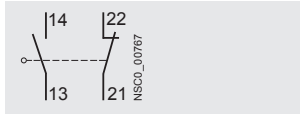
**Slow-action contacts**  
1 NO + 1 NC  
3SE5 ...-B..., -R...



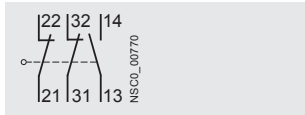
**Slow-action contacts**  
2 NO + 1 NC  
3SE5 ...-P...



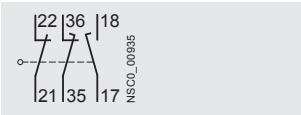
**Snap-action contacts**  
1 NO + 1 NC  
3SE5 ...-C..., -F..., -G..., -H..., -N...



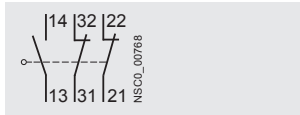
**Slow-action contacts**  
1 NO + 2 NC  
3SE5 ...-K..., -Q...



**Slow-action contacts**  
1 NO + 2 NC with make-before-break, 3SE5 ...-M...

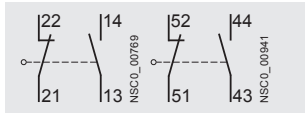


**Snap-action contacts**  
1 NO + 2 NC  
3SE5 ...-L...

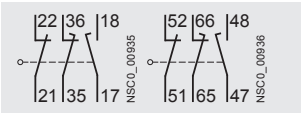


XL enclosures, width 56 mm

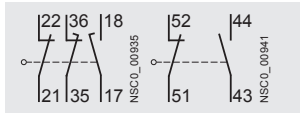
**Slow-action contacts**  
2 x (1 NO + 1 NC)  
3SE5 162-0B...



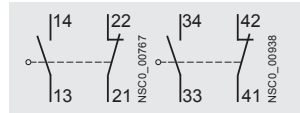
**Slow-action contacts**  
2 x (1 NO + 2 NC) with make-before-break, 3SE5 162-0D...



**For slow-action contacts**  
1 NO + 2 NC with make-before-break, 1 NO + 1 NC, 3SE5 162-0E...

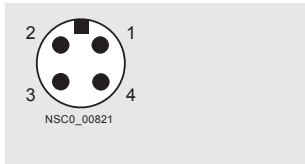


**Snap-action contacts**  
2 x (1 NO + 1 NC)  
3SE5 162-0C...

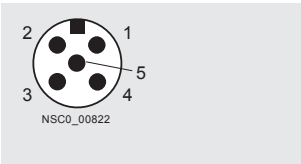


### 3SE5 connector assignment

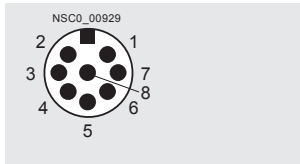
**M12 connector socket, 4-pole**  
3SY3 127



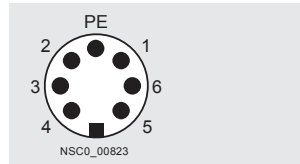
**M12 connector socket, 5-pole**  
3SY3 128



**M12 connector socket, 8-pole**  
3SY3 134



**Connector sockets, 6-pole + PE**  
3SY3 131



Order No.	Connector sockets		LEDs	Connections								
	Type	Version		Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	PE
<b>M12 connector sockets (4-, 5- or 8-pole)</b>												
3SE5..4-0.....1AC4	3SY3 127	1 NO + 1 NC	—	21	22	13	14	—	—	—	—	—
3SE5..4-0.....1AC5	3SY3 128	1 NO + 1 NC	—	21	22	13	14	PE	—	—	—	—
3SE5..4-0.....1AE0	3SY3 127	2 NC	—	21	22	31	32	—	—	—	—	—
3SE5..4-0.....1AE1	3SY3 128	2 NC	—	21	22	31	32	PE	—	—	—	—
3SE5..4-1C...-1AF3	3SY3 128	1 NO + 1 NC snap action	2 LEDs	21	22	13 / LED gn	14 / LED ye	Ground LED	—	—	—	—
3SE5..4-1B...-1AF3	3SY3 128	1 NO + 1 NC slow-action	2 LEDs	21	22	14 / LED gn	13 / LED ye	Ground LED	—	—	—	—
3SE5..4-1L...-1AD4	3SY3 134	1 NO + 2 NC snap action	2 LEDs	21	22	13 / LED gn	14 / LED ye	31	32	Ground LED	PE	—
3SE5..4-1K...-1AD4	3SY3 134	1 NO + 2 NC slow-action	2 LEDs	21	22	14 / LED gn	13 / LED ye	31	32	Ground LED	PE	—
<b>Connector sockets, 6-pole + PE</b>												
3SE5..5-0.....1AD0	3SY3 131	1 NO + 1 NC	—	21	22	13	14	—	—	—	—	✓
3SE5..5-0.....1AD1	3SY3 131	1 NO + 2 NC	—	21	22	13	14	31	32	—	—	✓
3SE5..5-C...-1AF2	3SY3 131	1 NO + 1 NC snap action	2 LEDs	21	22	13 / LED gn	14 / LED ye	—	Ground LED	—	—	✓
3SE5..5-B...-1AF2	3SY3 131	1 NO + 1 NC slow-action	2 LEDs	21	22	14 / LED gn	13 / LED ye	—	Ground LED	—	—	✓
3SE5..5-L...-1AD2	3SY3 131	2 NC snap-action	2 LEDs	21	22	31	32	13 / LED gn	Ground LED	—	—	✓
3SE5..5-K...-1AD2	3SY3 131	2 NC slow-action	2 LEDs	21	22	31	32	14 / LED gn	Ground LED	—	—	✓

gn Green  
ye Yellow

✓ Connected  
— Not available

## Features

Modular plug-in



Prewired receptacle with pin connector



Prewired cable



## Features

- UL Listed, CSA Certified.
- UL File: E47512
- All Metal Captive Screws.
- Keyed, Four-Directional Head.
- Steel-Reinforced Diaphragm Seal Between Operational Head And Switch Body.
- Permanent Instructions for Adjusting Operational Head.
- Modular, Plug-In Housing
  1. Heavy-Duty, Bifurcated, Plug-In Prongs.
  2. Ample Receptacle Wiring Space with 1/2" NPT threaded conduit opening.
  3. Stepped Terminals On Single Pole; Deep Center Trough On Double Pole.
- NEMA Type 6P Submersible
  1. Completely Sealed With Epoxy.
  2. SOOW-A Cable or Prewired Receptacle With Pin Connector.
  3. Factory wired cable features a 350 pound pullput capacity.
- Rotary heads are field convertible CW, CCW, or both without special tools.

## Design

## Modular Plug-In Housing

These heavy duty plug-in limit switches may be provided as complete devices using a composite catalog number; or, separately as components; operating head, plug-in module and base receptacle.

## Example:

Complete Switch:

**3SE03-AR1**

Single Pole, Double Throw contacts with Side Rotary, Momentary Head

## Components

**3SE03-SA**⓪

Single Pole, Double Throw Plug-in Module

**3SE03-DR1**

Side Rotary Head, Momentary

**3SE03-RA**⓪

Standard, Single Pole Receptacle, 1 NO + 1 NC

Since components may be interchanged, operating heads, plug-in modules and receptacles may be combined to satisfy most of your everyday limit switch requirements. This leads to less inventory with greater flexibility.

Operating heads include side rotary; plain and roller plunger; and, wobble. A variety of levers are available.

The zinc die-cast housing has an epoxy finish to protect against corrosion. All screws on the module and head are captive.

## NEMA Type 6P Submersible

These heavy duty prewired, factory sealed switches meet the demanding enclosure requirements of UL (NEMA) Type 3, 4, 4X, 6P, 12, and 13. They are intended for wet environments where the integrity of the threaded conduit and switch body seals must be assured.

The switch body cavity including threaded conduit entry is completely sealed with epoxy. An 8 foot, 5 or 9 conductor SOOW-A cable; or 5 or 9 pin prewired receptacle with pin connector is provided as standard.

Switches are provided as complete devices using composite catalog numbers; or, separately as components; operating head and switch body.

UL (NEMA) Type 6P switches are designed to provide a degree of protection against the entry of water during prolonged submersion at limited depths (tested with a 6 foot head of water for 24 hours).

Both the Modular Plug-in and the (NEMA) Type 6P Submersible styles provide 60 Amp make and 6 Amp break—120V AC and 10 Amp continuous current for 120, 240, 480 and 600V AC. The circuit contact configuration depends on the device selected and the application criteria.

Switches are available with momentary or maintained operating heads; and, single pole, double pole or center neutral (modular, plug-in only) contact configurations.

3SE03 limit switches offer a new standard of reliability and quality in automatic control circuits under heavy duty applications.

⓪ Plug-in module and receptacle are keyed.

## 3SE03 North American Limit Switches

Modular, plug-in and NEMA type 6P submersible

## Technical data

Type	Modular, Plug-in and NEMA Type 6P Submersible					
<b>Mechanical life</b>	Side rotary: $13 \times 10^6$ make-break operations minimum All others: $10 \times 10^6$ make-break operations minimum					
<b>Electrical life</b>	Single Pole: $1 \times 10^6$ operations typical at full load Double Pole: $1 \times 10^5$ operations typical at full load					
<b>Switching frequency</b>	$8 \times 10^3$ make-break operations per hour (maximum)					
<b>Operating point accuracy</b>	Side operated: 0.0012 in. (modular, plug-in housing) Side rotary: 0.0014 in. (modular plug-in). Top operated: 0.0003 in. (modular, plug-in housing)					
<b>Cable entry</b>	1/2 in.-NPT, Prewired Cable or Prewired Receptacle with Pin Connector					
<b>Ambient temperature</b>	Without Cable: $-10^\circ$ to $+121^\circ\text{C}$ , $14^\circ$ to $250^\circ\text{F}$ With Cable: $-10^\circ$ to $+105^\circ\text{C}$ , $14^\circ$ to $221^\circ\text{F}$					
<b>Degree of protection</b>	NEMA Type 1, 3, 3S, 4, 4X, 6, 6P, 13; IP67					
<b>Conductor size</b>	22–12 AWG (modular, plug-in housing), single or stranded wire 5 or 9 conductor, 16 AWG yellow jacketed type SOOW-A cable (prewired cable) 5 or 9 pin, 0.87 in. (22 mm) diameter receptacle (prewired receptacle with pin connector)					
<b>Mounting</b>	Any position					
<b>Tightening Torque</b>	Switch body screws: 25–30 lb-in. Operating head screws: 14–18 lb-in.					
<b>NEMA rating</b>	<b>DC, NEMA R300</b>			<b>AC, NEMA A600</b>		
<b>Maximum current at</b>	<b>125V</b>	<b>250V</b>	<b>120V</b>	<b>240V</b>	<b>480V</b>	<b>600V</b>
<b>Make</b>	0.22A	0.11A	60A	30A	15A	12A
<b>Break</b>	0.22A	0.11A	6A	3A	1.5A	1.2A
<b>Max. volt-ampere</b>						
<b>Make</b>	28VA	28VA	7200VA	7200VA	7200VA	7200VA
<b>Break</b>	28VA	28VA	720VA	720VA	720VA	720VA
<b>Rated thermal current</b>	DC, 1A			AC, 10A		
<b>Rated operating voltage</b>	DC, 300V			AC, 600V		

Operating temperature <sup>1) 2)</sup>

Temperature rating	Operation		Temperature range	
	Type	Return	Without cable	With cable
<b>1</b>	Side rotary <sup>3)</sup>	Momentary CW only or CCW only	$10^\circ\text{F}$ to $200^\circ\text{F}$ $-12^\circ\text{C}$ to $94^\circ\text{C}$	$10^\circ\text{F}$ to $200^\circ\text{F}$ $-12^\circ\text{C}$ to $94^\circ\text{C}$
<b>2</b>	Center neutral Side rotary Side plunger Two-sided plunger Roller side plunger <sup>4)</sup>	Momentary CW or CCW Maintained Momentary Maintained Momentary	$14^\circ\text{F}$ to $200^\circ\text{F}$ $-10^\circ\text{C}$ to $94^\circ\text{C}$	$14^\circ\text{F}$ to $200^\circ\text{F}$ $-10^\circ\text{C}$ to $94^\circ\text{C}$
<b>3</b>	Top plunger Top roller plunger <sup>4)</sup> Wobble head	Momentary Momentary Momentary	$14^\circ\text{F}$ to $250^\circ\text{F}$ $-10^\circ\text{C}$ to $121^\circ\text{C}$	$14^\circ\text{F}$ to $221^\circ\text{F}$ $-10^\circ\text{C}$ to $105^\circ\text{C}$

1) Temperature ranges below  $+32^\circ\text{F}$  ( $0^\circ\text{C}$ ) are based on absence of freezing moisture or water.

2) For temperature rating of specific switch, refer to page 13/70, Operating Heads.




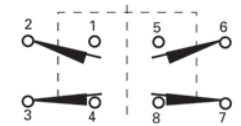







3) For CW only or CCW only operation, upper temperature limit increases to  $250^\circ\text{F}$  ( $121^\circ\text{C}$ ) without cable, and  $221^\circ\text{F}$  ( $105^\circ\text{C}$ ) with pre-wired cable.



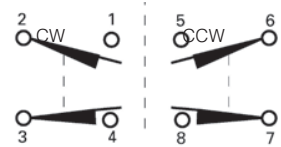

4) Roller direction can be converted in the field.

# 3SE03 North American Limit Switches

Modular, plug-in metal housing

**Complete switches without lever - threaded cable entry:**

	<b>Plug-In module type</b>	Standard single pole 1 NO + 1 NC (3SE03-SA)	Standard double pole 2 NO + 2 NC (3SE03-SB)				
	<b>Receptacle type surface mount</b>	Single pole (3SE03-RA) 	Double pole (3SE03-RB) 				
<b>Operating head type</b>		<b>Composite catalog number consisting of head, module and receptacle</b>					
		<b>DT</b>	<b>Catalog Number</b>	<b>List Price \$ 1 unit</b>	<b>DT</b>	<b>Catalog Number</b>	<b>List Price \$ 1 unit</b>
	<b>Side rotary</b> CW and CCW operation convertible to CW only or CCW only	Standard momentary (3SE03-DR1)	▶ 3SE03-AR1 <sup>①</sup>		▶ 3SE03-BR1 <sup>①</sup>		
		Standard maintained (3SE03-DM1)	▶ 3SE03-AM1		▶ 3SE03-BM1		
		Low torqued momentary (3SE03-DL1)	▶ 3SE03-AL1 <sup>②</sup>		3SE03-BL1 <sup>②</sup>		
	<b>Plain side plunger</b>	Momentary (3SE03-DS1)	▶ 3SE03-AS1		▶ 3SE03-BS1		
	<b>Roller side plunger</b>	Momentary (3SE03-DS3)	▶ 3SE03-AS3		3SE03-BS3		
	<b>Two-sided plunger</b>	Maintained (3SE03-DH1)	3SE03-AH1		3SE03-BH1		
	<b>Plain top plunger</b>	Momentary (3SE03-DT1)	▶ 3SE03-AT1		3SE03-BT1		
	<b>Roller top plunger</b>	Momentary (3SE03-DT3)	3SE03-AT3		▶ 3SE03-BT3		
	<b>Wobble head (without lever)</b>	Momentary (3SE03-DW1)	▶ 3SE03-AW1		▶ 3SE03-BW1		

	<b>Plug-In module type</b>	Center neutral Double pole 2 NO + 2 NC (3SE03-SN)		
	<b>Receptacle type surface mount</b>	Center neutral (3SE03-RB) 		
<b>Operating head type</b>		<b>Composite catalog number consisting of head, module and receptacle</b>		
		<b>DT</b>	<b>Catalog Number</b>	<b>List Price \$ 1 unit</b>
	<b>Side rotary (momentary)</b>	Center (3SE03-DN1)	▶ 3SE03-NN1 <sup>①</sup>	
		Neutral (3SE03-DN2)	▶ 3SE03-NN2 <sup>②</sup>	



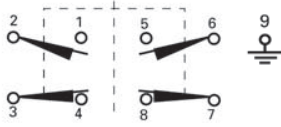
① 5° pretravel to operate contacts.








② 15° pretravel to operate contacts.

# 3SE03 North American Limit Switches

NEMA type 6P submersible, prewired cable

**Complete switches without lever - prewired cable:**

 <p>Switch body type—prewired cable with 8 foot cable</p>	<p>Single pole 1 NO + 1 NC (3SE03-SA6P)</p> <p>Cable color code 1 - White 2 - Black 3 - Red 4 - Orange 5 - Green</p>	<p>Double pole 2 NO + 2 NC (3SE03-SB6P)</p> <p>Cable color code 1 - White      6 - Pink 2 - Black      7 - Yellow 3 - Red        8 - Blue 4 - Orange     9 - Green 5 - Brown</p>
		


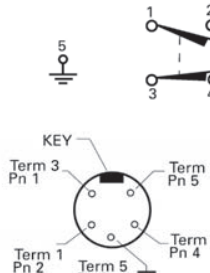
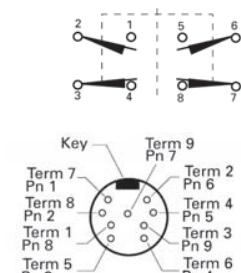
Operating head type		Composite catalog number consisting of head and switch body				
		DT	Catalog Number	List Price \$ 1 unit	Catalog Number	List Price \$ 1 unit
 <p><b>Side rotary</b> CW and CCW operation convertible to CW only or CCW only</p>	Standard momentary (3SE03-DR1)	▶	3SE03-AR16P		3SE03-BR16P	
	Standard maintained (3SE03-DM1)		3SE03-AM16P		3SE03-BM16P	
	Low torqued momentary (3SE03-DL1)		3SE03-AL16P		3SE03-BL16P	
 <p><b>Plain side plunger</b></p>	Momentary (3SE03-DS1)		3SE03-AS16P		3SE03-BS16P	
 <p><b>Roller side plunger</b></p>	Momentary (3SE03-DS3)		3SE03-AS36P		3SE03-BS36P	
 <p><b>Two-sided plunger</b></p>	Maintained (3SE03-DH1)		3SE03-AH16P		Not available	
 <p><b>Plain top plunger</b></p>	Momentary (3SE03-DT1)		3SE03-AT16P		3SE03-BT16P	
 <p><b>Roller top plunger</b></p>	Momentary (3SE03-DT3)		3SE03-AT36P		3SE03-BT36P	
 <p><b>Wobble head (without lever)</b></p>	Momentary (3SE03-DW1)		3SE03-AW16P		3SE03-BW16P	










# 3SE03 North American Limit Switches

NEMA type 6P submersible, prewired receptacle

**Complete switches without lever - prewired receptacle with pin connector:**



 <p>Switch Body Type—prewired receptacle with pin connector</p>	<p>Single pole 1 NO + 1 NC (3SE03-SA6PC)</p> 	<p>Double pole 2 NO + 2 NC (3SE03-SB6PC)</p> 
--	---	--

Operating head type		Composite catalog number consisting of head and switch body				
		DT	Catalog Number	List Price \$ 1 unit	Catalog Number	List Price \$ 1 unit
 <p><b>Side rotary</b> CW and CCW operation convertible to CW only or CCW only</p>	Standard momentary (3SE03-DR1)	▶	3SE03-AR16PC		3SE03-BR16PC	
	Standard maintained (3SE03-DM1)		3SE03-AM16PC		3SE03-BM16PC	
	Low torqued momentary (3SE03-DL1)		3SE03-AL16PC		3SE03-BL16PC	
 <p><b>Plain side plunger</b></p>	Momentary (3SE03-DS1)		3SE03-AS16PC		3SE03-BS16PC	
 <p><b>Roller side plunger</b></p>	Momentary (3SE03-DS3)		3SE03-AS36PC		3SE03-BS36PC	
 <p><b>Two-sided plunger</b></p>	Maintained (3SE03-DH1)		3SE03-AH16PC		Not available	
 <p><b>Plain top plunger</b></p>	Momentary (3SE03-DT1)		3SE03-AT16PC		3SE03-BT16PC	
 <p><b>Roller top plunger</b></p>	Momentary (3SE03-DT3)		3SE03-AT36PC		3SE03-BT36PC	
 <p><b>Wobble head (without lever)</b></p>	Momentary (3SE03-DW1)		3SE03-AW16PC		3SE03-BW16PC	



# 3SE03 North American Limit Switches

Modular, plug-in and NEMA type 6P submersible











**Components:**

 <p><b>Plug-in module</b></p>	<b>Plug-in module</b>	<b>DT</b>	<b>Catalog Number</b>	<b>List Price \$ 1 unit</b>
	Standard single pole 1 NO + 1 NC	▶	3SE03-SA	
	Standard double pole 2 NO + 2 NC	▶	3SE03-SB	
	Center neutral 2 NO + 2 NC <sup>①</sup>	▶	3SE03-SN	
 <p><b>Receptacle</b></p>	<b>Receptacle for plug-in module</b>		<b>Catalog Number</b>	<b>List Price \$ 1 unit</b>
	Single pole 1 NO + 1 NC (5 terminals)	▶	3SE03-RA	
	Single pole 2 NO + 2 NC (9 terminals)		3SE03-RB	

**Switch body—NEMA type 6P submersible:**

 <p><b>Prewired cable</b></p>  <p><b>Prewired receptacle</b></p>		<b>Prewired cable 8 foot length</b>			<b>Prewired receptacle with pin connector</b>		
	<b>Switch body</b>	<b>DT</b>	<b>Catalog Number</b>	<b>List Price \$ 1 unit</b>	<b>DT</b>	<b>Catalog Number</b>	<b>List Price \$ 1 unit</b>
	Single pole 1 NO + 1 NC	▶	3SE03-SA6P			—	—
	Single pole 2 NO + 2 NC	▶	3SE03-SB6P			—	—
	Single pole 1 NO + 1 NC		—	—	▶	3SE03-SA6PC	
Single pole 2 NO + 2 NC		—	—	▶	3SE03-SB6PC		

**Operating heads<sup>②</sup>:**

 		<b>Nominal operating data</b>								
<b>Operating head type</b>		<b>Total travel</b>	<b>Pretravel</b>	<b>Operating force</b>	<b>Release position</b>	<b>Minimum return force</b>	<b>Operating temp range<sup>⑦</sup></b>	<b>DT</b>	<b>Catalog Number</b>	<b>List Price \$ 1 unit</b>
 <p><b>Side rotary<sup>③</sup></b></p>	Standard momentary <sup>④</sup>	90°	5°	3 lb-in.	2°	4.5 oz-in.	1	▶	3SE03-DR1	
	Low torqued momentary <sup>④</sup>	90°	15°	1.5 lb-in.	6°	2.5 oz-in.	1	▶	3SE03-DL1	
	Standard maintained	90°	50°	3 lb-in.	50°	—	—	2	▶	3SE03-DM1
 <p><b>Plain side plunger</b></p>	Momentary	0.25 in.	0.065 in.	4 lbs	0.03 in.	8 oz.	2	▶	3SE03-DS1	
 <p><b>Roller side plunger</b></p>	Momentary <sup>②</sup>	0.25 in.	0.065 in.	4 lbs	0.03 in.	8 oz.	2	▶	3SE03-DS3	
 <p><b>Two-sided plunger</b></p>	Maintained	0.32 in.	0.2 in.	5 lbs	0.13 in.	5 lbs	2	▶	3SE03-DH1	
 <p><b>Plain top plunger</b></p>	Momentary	0.28 in.	0.04 in.	4 lbs	0.02 in.	8 oz.	3	▶	3SE03-DT1	
 <p><b>Roller top plunger</b></p>	Momentary	0.28 in.	0.04 in.	4 lbs	0.02 in.	8 oz.	3	▶	3SE03-DT3	
 <p><b>Wobble head<sup>⑤⑧</sup></b></p>	Momentary	15°	10°	2 lb-in.	6°	2.4 oz-in.	3	▶	3SE03-DW1	
 <p><b>Center neutral<sup>⑥⑨</sup></b></p>	Momentary	90°	5°	1.8 lb-in.	2°	2.5 oz-in.	2	▶	3SE03-DN1	
			90°	15°	1.8 lb-in.	2°	2.5 oz-in.	2	▶	3SE03-DN2

① For use with 3SE03-DN1, -DN2 operating heads and 3SE03-RB receptacle only.

② For use with modular, Plug-in and NEMA Type 6P.

③

④ Refer to "Operating Temperature", Catalog page 13/118 for Temperature Ranges.

⑤ Without Operating Levers.

⑥ CW and CCW operation. Convertible to CW or CCW operation only.

⑦ Convertible—Horizontal to Vertical.



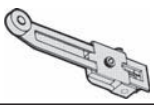
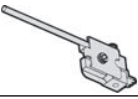

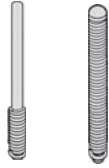
⑧ Requires Lever.

⑨ For use with 3SE03-SN plug-in module only.


# 3SE03 North American Limit Switches

Modular, plug-in metal housing

**Levers for plug-in and non-plug-in versions—most widely used**

Description	Length <sup>①</sup>	Roller mounted on side of lever	Roller material	Roller diameter	Roller face width	Max required <sup>②</sup> return torque (oz-in.)	DT	Catalog Number	List Price \$ 1 unit
	1.5 (38)	Front	Nylatron	0.75 (19)	0.31 (8)	0.53	▶	3SX03-KL200	
	1.5 (38)	Front	Cast aluminum	0.75 (19)	0.31 (8)	1.10	▶	3SX03-KL355	
	1.5 (38)	Back	Cast aluminum	0.75 (19)	0.31 (8)	1.10	▶	3SX03-KL579	
	1.5 (38)	Back / back	Nylatron	0.75 (19)	0.31	-	▶	3SX03-KL204	
	1-3.5 (25-89)	Front	Nylatron	0.75 (19)	0.31 (8)	1.90 <sup>⑤</sup>	▶	3SX03-KL201	
	1-3.5 (25-89)	Front	Metal	0.75 (19)	0.31 (8)	3.40 <sup>⑤</sup>	▶	3SX03-KL538	
	9 (229)	-	Stainless steel	-	-	7.00 <sup>⑤</sup>	▶	3SX03-KL220	
	Adjustable spring rod	12.125 (308)	-	Nylon	-	-	3.50 <sup>⑤</sup>	▶	3SX03-KL556
	6 (152)	-	Nylatron	-	-	0.40	▶	3SX03-KL142	
<b>Levers</b>									
	Rod	-	Nylon	-	-	-	▶	3SX03-KW2	
	Coil spring	-	Coil spring	-	-	-	▶	3SX03-KW4	
	For plunger actuated switches wobble actuators	⑥							

**Levers for plug-in and non-plug-in versions:**

Operator	Length <sup>①</sup>	Roller			Max required <sup>②</sup> return torque (oz-in.)	Catalog Number			List Price \$ 1 unit
		Type	Diameter	Face (width)		Stainless steel	DT	Cast aluminum	
	1.37 (35)	Metal	0.75 (19)	0.31 (8)	0.95	-	▶	3SX03-KL40	
	1.50 (38)	Nylatron	0.75 (19)	1.00 (25)	0.92	-	▶	3SX03-KL337	
		Ball bearing	0.69 (17)	0.25 (6)	0.77	-		3SX03-KL531	
		Without roller	-	-	0.32	-		3SX03-KL32	
	2.00 (51)	Nylatron	0.75 (19)	0.31 (8)	0.71	-	▶	3SX03-KL546	
		Nylatron	0.75 (19)	1.00 (25)	1.45	-		3SX03-KL572	
		Metal	0.75 (19)	0.31 (8)	1.5	-	▶	3SX03-KL549	
		Ball bearing	0.69 (17)	0.25 (6)	1.1	-		3SX03-KL552	
	250 (64)	Nylatron	0.75 (19)	0.31 (8)	1.0	-		3SX03-KL547	
		Nylatron	0.75 (19)	1.00 (25)	1.8	-		3SX03-KL573	
Nylatron		1.5 (38)	0.28 (7)	1.4	-		3SX03-KL575		
Metal		0.75 (19)	0.31 (8)	2.0	-		3SX03-KL550		
Ball bearing		0.69 (17)	0.25 (6)	1.5	-	▶	3SX03-KL553		
Cast aluminum	3.00 (76)	Nylatron	0.75 (19)	0.31 (8)	1.3	-	▶	3SX03-KL548	
		Nylatron	0.75 (19)	1.00 (25)	2.3	-	▶	3SX03-KL574	
		Nylatron	1.5 (38)	0.28 (7)	1.8	-	▶	3SX03-KL576	
		Metal	0.75 (19)	0.31 (8)	2.5	-	▶	3SX03-KL551	
		Ball bearing	0.69 (17)	0.25 (6)	1.8	-		3SX03-KL554	

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

① Roller lever: Length from the operating shaft axis to the roller axis.  
All other: Length from the operating shaft axis to the tip.

② Caution—When selecting lever, required return torque should not exceed minimum return torque in operating head.








③ Cap screw accommodates 3/64 inch Allen wrench.  
④ By re-assembling lever minimum can be reduced another 0.50 (13).

⑤ Applies when lever extended to maximum dimension.  
⑥ See dimensions page 13/76.





# 3SE03 North American Limit Switches

Modular, plug-in and NEMA type 6P submersible

**Levers for plug-in and non-plug-in versions—most widely used**

Operator	Length <sup>①</sup> Inches (mm)	Roller			Min. required return torque oz-in. <sup>⑤</sup>	Catalog Number				
		Type	Diameter In. (mm)	Face width in. (mm)		DT	Stainless steel	Cast aluminum	List Price \$ 1 unit	
<b>Roller levers</b>										
	Roller on reverse side	1.50 (38)	Nylatron	0.75 (19)	0.31 (8)	0.53	▶	–	3SX03-KL310	
			Nylatron	1.5 (38)	0.28 (7)	0.96	–	–	3SX03-KL536	
			Ball bearing	0.69 (17)	0.25 (6)	0.77	–	–	3SX03-KL580	
	Offset lever (Inboard roller shown)	1.50 (38)	Nylatron	0.75 (19)	0.31 (8)	0.65	▶	3SX03-KL24	–	
			Metal	0.75 (19)	0.31 (8)	1.20	▶	3SX03-KL25	–	
		1.50 (38)	Nylatron	0.75 (19)	0.31 (8)	0.65	▶	3SX03-KL27	–	
			Metal	0.75 (19)	0.31 (8)	1.20	▶	3SX03-KL28	–	
			Ball bearing	0.69 (17)	0.25 (6)	0.90	▶	3SX03-KL29	–	
Nylatron	0.75 (19)	1 (25)	1.10	▶	3SX03-KL30	–				
	Bantam lever	0.69 (18)	Metal	0.88 (22)	0.19 (5)	0.45	▶	3SX03-KL532		
	Precision adjustment	1.50 (38) <sup>②</sup>	Nylatron	0.75 (19)	0.31 (8)	0.65	–	3SX03-KL340		
			Metal	0.75 (19)	0.31 (8)	1.20	–	3SX03-KL465		
			Ball bearing	0.69 (17)	0.25 (6)	0.90	▶	3SX03-KL535		
	Adjustable roller	1–3.75 (25–95) <sup>③</sup> 1–3.75 (25–95) <sup>③</sup> 1.62–3.75 (41–95) <sup>③</sup> 0.50–3.75 (13–95) 1–3.75 (25–95) <sup>③</sup> 0.50–3.75 (13–95)	Nylatron	0.75 (19)	0.5 (13)	1.90 <sup>④</sup>	▶	3SX03-KL599		
			Nylatron	0.75 (19)	1 (25)	3.10 <sup>④</sup>	▶	3SX03-KL537		
			Nylatron	1.5 (38)	0.28 (7)	2.50 <sup>④</sup>	▶	3SX03-KL443		
			Large nylatron	4 (102)	0.11 (3)	4.50 <sup>④</sup>	▶	3SX03-KL598		
			Ball bearing	0.69 (17)	0.25 (6)	2.50 <sup>④</sup>	▶	3SX03-KL539		
			Without roller	–	–	1.20 <sup>④</sup>	▶	3SX03-KL31		
	Fork lever _ both rollers one side	1.50 (38)	Nylatron	0.75 (19)	1 (25)	–	▶	3SX03-KL543		
			Metal	0.75 (19)	0.31 (8)	–	▶	3SX03-KL544		
			Ball bearing	0.69 (17)	0.25 (6)	–	▶	3SX03-KL545		
	Fork lever _ both rollers outside, one side	1.50 (38)	Nylatron	0.75 (19)	0.31 (8)	–	▶	3SX03-KL203		
			Metal	0.75 (19)	0.31 (8)	–	–	3SX03-KL541		
			Ball bearing	0.69 (17)	0.25 (6)	–	–	3SX03-KL542		

**Levers for plug-in and non-plug-in versions:**

Operator		Length <sup>①</sup> Inches (mm)	Description Inches (mm)	Min. required return force oz-in. <sup>⑤</sup>	DT	Catalog Number	List Price \$ 1 unit
	Adjustable rod	5.50 (140) Max.	Nylon Rod—0.19 (5) Dia.	0.40 <sup>④</sup>	▶	3SX03-KL399	
		5.50 (140) Max.	Metal Rod—0.12 (3) Dia.	0.92 <sup>④</sup>	▶	3SX03-KL202	
		8.75 (222) Max.	Metal Rod (Square)—0.12 (3) Max.	2.20 <sup>④</sup>	▶	3SX03-KL581	
		12 (305) Max.	Steel (Formable) Rod—0.12 (3) Dia.	5.00 <sup>④</sup>	▶	3SX03-KL226	
		–	Clamp Only—0.19 (5) Hole	–	▶	3SX03-KL35	
		–	Clamp Only—0.12 (3) Hole	–	–	3SX03-KL36	
	Spring rod	11.62 (295)	Metal rod	2.80		3SX03-KL421	
	Adjustable wire	12.12 (308) max.	Nylon covered wire	1.50 <sup>④</sup>	▶	3SX03-KL533	
	Adjustable wide roller lever	3.9 (99)	0.75 (19) Dia. Nylatron Roller 0.19 (30) Dia. Rod	4.50 <sup>④</sup>	▶	3SX03-KL37	
<b>Wobble head operators</b>							
See dimensions page 13/76	Stainless steel rod	–	Rod diameter - 0.06 (2)	–	▶	3SX03-KW3	

① Length from operating shaft axis to the roller axis.  
 ② Maximum dimensions, precision adjustable to lesser dimensions.  
 ③ By re-assembling lever minimum can be reduced by 1/2 in.

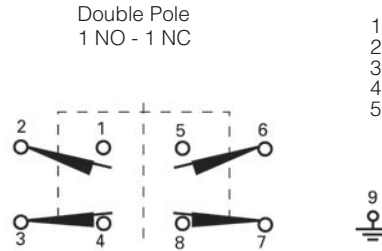
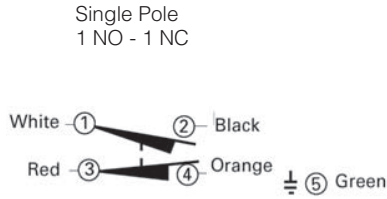
④ Applies when lever extended to maximum dimension.  
 ⑤ Caution—When selecting lever, required return torque should not exceed minimum return force in operating head.

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

# 3SE03 North American Limit Switches

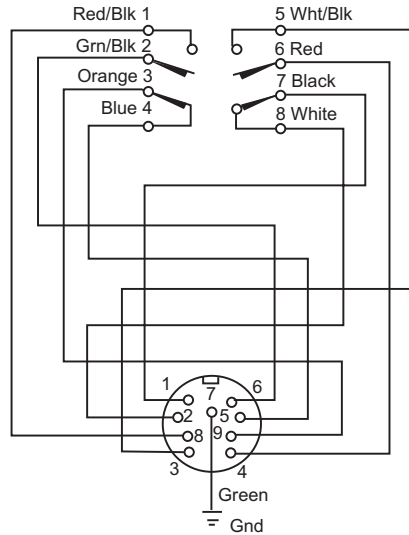
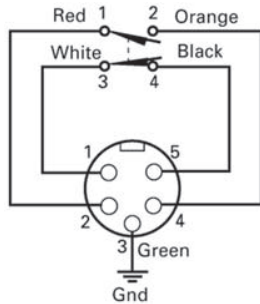
Modular, plug-in and NEMA type 6P submersible

## Wiring diagrams



- Cable color code
- |            |            |
|------------|------------|
| 1 - White  | 6 - Pink   |
| 2 - Black  | 7 - Yellow |
| 3 - Red    | 8 - Blue   |
| 4 - Orange | 9 - Green  |
| 5 - Brown  |            |
- Pre-wired cable

## Modular, plug-in and prewired cable



## Prewired receptacle with pin connector

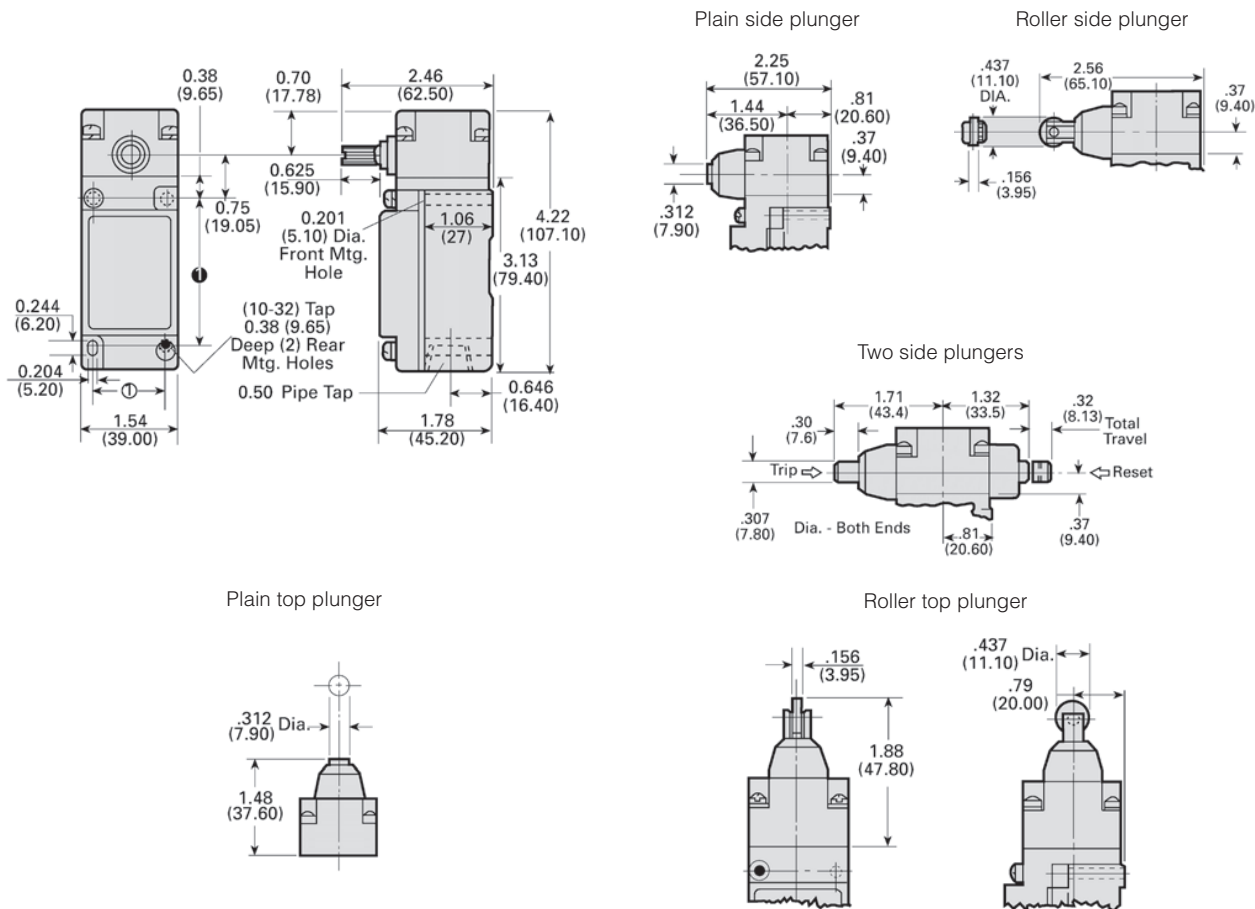
### Typical connector cable (supplied by user)

Cable length ft.	Manufacturers part number			
	Daniel Woodhead Brad Harrison	Cooper Crouse-Hinds	Molex (Industrial Interface)	Lumberg USA
<b>5 Pin connector cable</b>				
3	105000A01F030	5000111-3_	14541	RK50-77/1M
6	105000A01F060	5000111-4_	14542	RK50-77/2M
12	105000A01F120	5000111-5_	14544	RK50-77/4M
<b>9 Pin connector cable</b>				
3	309000A01F030	X8990-3	-	-
6	309000A01F060	X8990-4	-	-
12	309000A01F120	X8990-5	-	-

# 3SE03 North American Limit Switches

Modular, plug-in and NEMA type 6P submersible

## Dimension drawings



## Rotary lever operators

Catalog Number	Dimensions						Catalog Number	Dimensions					
	A	B	C	D	E	F		A	B	C	D	E	F
3SX03-KL200	1.50 (38.1)	0.75 (19.0)	0.32 (8.1)	0.44 (11.2)	0.20 (5.1)	0.24 (6.1)	3SX03-KL554	3.00 (76.2)	0.688 (17.5)	0.25 (6.4)	0.42 (10.7)	0.12 (3.0)	0.18 (4.6)
3SX03-KL355	1.50 (38.1)	0.75 (19.0)	0.32 (8.1)	0.44 (11.2)	0.20 (5.1)	0.24 (6.1)	3SX03-KL572	2.00 (50.8)	0.75 (19.0)	1.00 (25.4)	0.42 (10.7)	0.90 (22.9)	0.90 (22.9)
3SX03-KL531	1.50 (38.1)	0.688 (17.5)	0.25 (6.4)	0.44 (11.2)	0.12 (3.0)	0.18 (4.6)	3SX03-KL573	2.50 (63.5)	0.75 (19.0)	1.00 (25.4)	0.42 (10.7)	0.90 (22.9)	0.90 (22.9)
3SX03-KL546	2.00 (50.8)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL574	3.00 (76.2)	0.75 (19.0)	1.00 (25.4)	0.42 (10.7)	0.90 (22.9)	0.90 (22.9)
3SX03-KL547	2.50 (63.5)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL575	2.50 (63.5)	1.50 (38.1)	0.29 (7.4)	0.42 (10.7)	0.18 (4.6)	0.24 (6.1)
3SX03-KL548	3.00 (76.2)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL576	3.00 (76.2)	1.50 (38.1)	0.29 (7.4)	0.42 (10.7)	0.18 (4.6)	0.24 (6.1)
3SX03-KL549	2.00 (50.8)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	<b>With rollers on reverse side</b>						
3SX03-KL550	2.50 (63.5)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL310	1.50 (38.1)	0.75 (19.0)	0.32 (8.1)	0.44 (11.2)	0.34 (8.6)	0.38 (9.7)
3SX03-KL551	3.00 (76.2)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL536	1.50 (38.1)	1.50 (38.1)	0.28 (7.1)	0.44 (11.2)	0.30 (7.6)	0.38 (9.7)
3SX03-KL552	2.00 (50.8)	0.688 (17.5)	0.25 (6.4)	0.42 (10.7)	0.12 (3.0)	0.18 (4.6)	3SX03-KL579	1.50 (38.1)	0.75 (19.0)	0.32 (8.1)	0.44 (11.2)	0.34 (8.6)	0.38 (9.7)
3SX03-KL553	2.50 (63.5)	0.688 (17.5)	0.25 (6.4)	0.42 (10.7)	0.12 (3.0)	0.18 (4.6)	3SX03-KL580	1.50 (38.1)	0.688 (17.5)	0.25 (6.4)	0.44 (11.2)	0.25 (6.4)	0.31 (7.9)

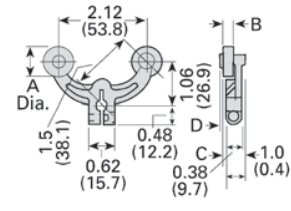
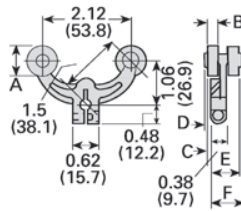
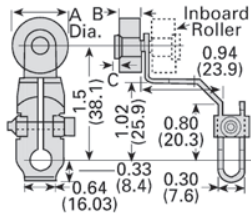
All dimensions shown in inches and (millimeters). For reference purpose only. Not to be used for design or construction purposes.

© Can accommodate both U.S. 1.16 (29.4) x 2.34 (59.5) and DIN 1.18 (30.0) x 2.36 (60.0) mounting dimensions.

# 3SE03 North American Limit Switches

Modular, plug-in and NEMA type 6P submersible

## Dimension drawings



### Offset roller levers

Catalog Number	Dimensions		
	A	B	C
<b>Outboard roller</b>			
3SX03-KL27	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL28	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL29	0.69 (18)	0.25 (6)	0.04 (1)
3SX03-KL30	0.75 (19)	1.0 (25)	-
<b>Inboard roller</b>			
3SX03-KL24	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL25	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL26	0.69 (18)	0.25 (6)	0.04 (1)

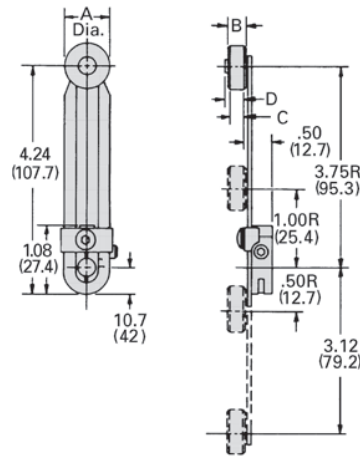
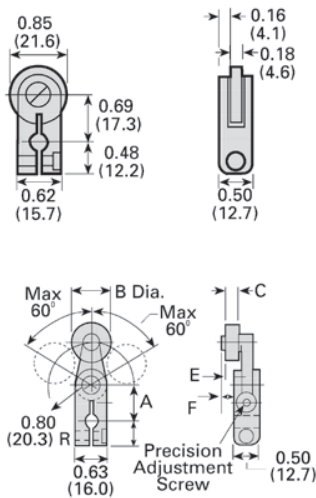
### Fork lever, one roller inside, one roller outside

Catalog Number	Dimensions					
	A	B	C	D	E	F
3SX03-KL203	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)	0.73 (19)	0.77 (20)
3SX03-KL541	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)	0.73 (19)	0.77 (20)
3SX03-KL542	0.69 (18)	0.25 (6)	0.08 (2)	0.14 (4)	0.64 (16)	0.70 (18)

### Fork lever - Both rollers on one side

Catalog Number	Dimensions			
	A	B	C	D
3SX03-KL204	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)
3SX03-KL543	0.75 (19)	1.0 (25)	0.86 (22)	0.86 (22)
3SX03-KL544	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)
3SX03-KL545	0.69 (18)	0.25 (6)	0.08 (2)	0.1 (3)

### Bantam roller lever



### Precision adjustment roller lever

Catalog Number	Dimensions					
	A	B	C	D	E	F
3SX03-KL340	0.69 (18)	0.75 (19)	0.32 (8)	0.48 (12)	0.24 (6)	0.28 (7)
3SX03-KL465	0.69 (18)	0.75 (19)	0.32 (8)	0.48 (12)	0.24 (6)	0.28 (7)
3SX03-KL535	0.69 (18)	0.69 (18)	0.25 (6)	0.48 (12)	0.16 (4)	0.22 (6)

### Adjustable roller lever

Catalog Number	Dimensions			
	A	B	C	D
3SX03-KL201	0.75 (19)	0.32 (8)	0.29 (7)	0.33 (8)
3SX03-KL443	1.5 (38)	0.29 (7)	0.26 (7)	0.32 (8)
3SX03-KL537	0.75 (19)	0.32 (8)	0.29 (7)	0.33 (8)
3SX03-KL538	0.69 (18)	0.25 (6)	0.21 (5)	0.27 (7)
3SX03-KL539	0.69 (18)	0.25 (6)	0.21 (5)	0.27 (7)
3SX03-KL598	0.39 (10)	0.11 (3)	0.11 (3)	0.19 (5)
3SX03-KL599	0.75 (19)	0.5 (13)	0.46 (12)	0.47 (12)

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

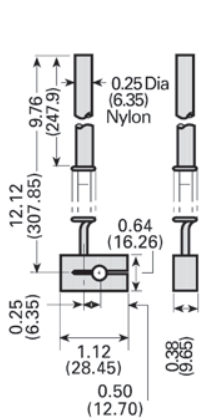


# 3SE03 North American Limit Switches

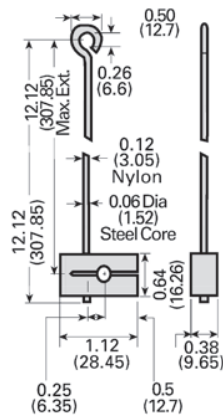
Modular, plug-in and NEMA type 6P submersible

## Dimension drawings

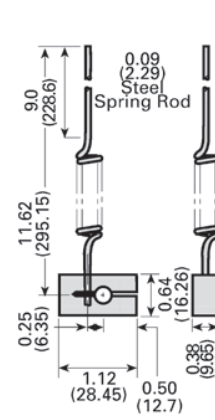
Nylon Spring Rod Actuator  
3SX03-KL556



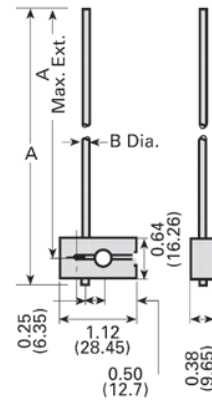
Nylon Covered Wire Actuator  
3SX03-KL533



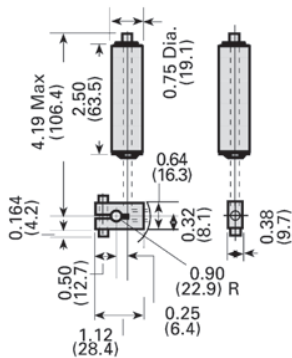
Stainless Steel Spring Actuator  
3SX03-KL421



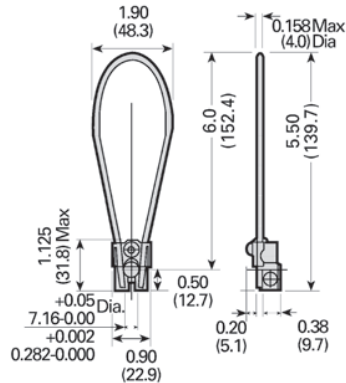
Adjustable Rod Actuator



Adjustable Wire Roller Actuator  
3SX03-KL37



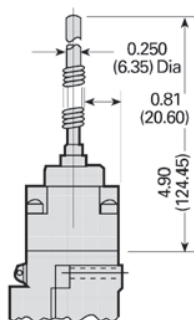
Nylatron Loop Actuator  
3SX03-KL142



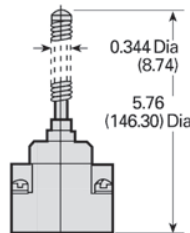
### Adjustable rod actuators

Catalog Number	Material	Dimensions	
		A	B
3SX03-KL202	Steel-Round	5.50 (140)	0.120 (3)
3SX03-KL581	Steel-Square	8.75 (222)	0.125 (3)
3SX03-KL399	Nylon	5.50 (140)	0.190 (5)
3SX03-KL220	Stainless Steel	9.00 (229)	0.190 (5)
3SX03-KL226	Plated Steel	12.0 (305)	0.120 (3)

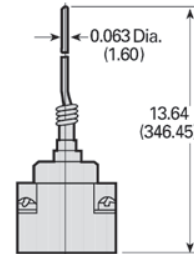
Wobble head with nylon head  
3SE03-DW1  
3SX03-KW2



Wobble head with coil spring  
3SE03-DW1  
3SX03-KW4



Wobble head with stainless steel rod  
3SE03-DW1  
3SX03-KW3



All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.



# 3SE03 North American Limit Switches

## 3SE03 Metal enclosure

### Description

#### Features

- NEMA 1 Enclosed Aluminum Die Cast Housing
- Screw Terminals
- Booted versions for added protection
- 1/2" Conduit Entrance
- NEMA A600, R300 Contacts
- UL Recognized
- CSA Certified
- INO/INC Snap-action contacts (form c)

#### Application

These switches are designed for accurate repeatability. Their compact size makes them ideal for use in space-restricted areas.

Typical applications include overhead, folding and elevator doors, sliding gates and other automated equipment.

Overall dimensions	Specifications ①	DT	Catalog Number	List Price \$ 1 unit
<b>Plunger actuator</b>	OF Max. - 8.82 - 12.3 oz. (250 - 350 g) RF Min. 4.02 oz. (114 g) PT Max. - 0.016 in. (0.4 mm) OT Min. - 0.217 in. (5.5 mm) MD Max. - 0.002 in. (0.05 mm) OP - 1.504 in. (38.2 mm)	▶	<b>3SE03 - EB05</b>	
<b>Booted plunger</b>	OF Max. - 28.22 oz. (800 g) RF Min. 8.46 oz. (240 g) PT Max. - 0.079 in. (2.0 mm) OT Min. - 0.197 in. (5.0 mm) MD Max. - 0.004 in. (0.1 mm) OP - 1.803 in. (45.8 mm)	▶	<b>3SE03 - EB06</b>	
<b>Roller lever</b>	OF Max. - 20.1 oz. (570 g) RF Min. 6.0 oz. (170 g) PT Max. - 0.157 in. (4.0 mm) OT Min. - 0.236 in. (6.0 mm) MD Max. - 0.016 in. (0.4 mm)	▶	<b>3SE03 - EB32</b>	
<b>Booted roller lever</b>	OF Max. - 22.57 oz. (640 g) RF Min. 8.11 oz. (230 g) PT Max. - 0.197 in. (5.0 mm) OT Min. - 0.236 in. (6.0 mm) MD Max. - 0.016 in. (0.4 mm)	▶	<b>3SE03 - EB33</b>	

① OF = Operating Force  
 RF = Return Force  
 PT = Pretravel  
 OT = Operating Travel  
 MD = Movement Differential  
 OP = Operating Position

# 3SE03 North American Limit Switches

## 3SE03 Metal enclosure

### Dimension drawings

Overall dimensions	Specifications	DT	Catalog Number	List Price \$ 1 unit
<p><b>Roller plunger</b></p>	<p>OF Max. - 9.92 - 12.3 oz. (250 - 350 g)                      RF Min. 4.02 oz. (114 g)                      PT Max. - 0.02 in. (0.5 mm)                      OT Min. - 0.142 in. (3.6 mm)                      MD Max. - 0.002 in. (0.05 mm)                      OP - 1.957 in. (49.7 mm)</p>	▶	<b>3SE03 - EB07</b>	
<p><b>Booted roller plunger</b></p>	<p>OF Max. - 17.64 oz. (500 g)                      RF Min. 3.53 oz. (100 g)                      PT Max. - 0.039 in. (1.0 mm)                      OT Min. - 0.138 in. (3.5 mm)                      MD Max. - 0.006 in. (0.12 mm)                      OP - 1.957 in. (49.7 mm)</p>	▶	<b>3SE03 - EB08</b>	

Technical data								
<b>Mechanical Life</b>	3,000,000 operations maximum							
<b>Electrical Life</b>	500,000 operations minimum							
<b>Operating Speed</b>	0.01 m/second to 1m/second							
<b>Cable Entry</b>	1/2" NPT							
<b>Temperature Range</b>	-15° to 80° (5° to 176°F)							
<b>Degree of Protection</b>	NEMA 1							
<b>Mounting</b>	Any Position							
<b>NEMA Rating</b>	A600, R300							
Rated Voltage (V) <sup>1)2)</sup>	Non-Inductive Load (A)			Inductive load (A)			Inrush current (A)	
	Resistive load		Lamp load	Inductive load		Motor load		
	NC-NO	NO	NC	NC-NO	NO	NC	NO	NC
<b>125 VAC</b>	15	3	1.5	15	5	2.5	30 maximum	15 maximum
<b>250 VAC</b>	15	2.5	1.25	15	3	1.5		
<b>500 VAC</b>	3	1.5	0.75	2.5	1.5	0.75		
<b>8 VDC</b>	15	3	1.5	15	5	2.5		
<b>14 VDC</b>	15	3	1.5	10	5	2.5		
<b>30 VDC</b>	6 (2)	3	1.5	5	5	2.5		
<b>125 VDC</b>	0.4	0.4	0.4	0.05	0.05	0.05		
<b>250 VDC</b>	0.2	0.2	0.2	0.03	0.03	0.03		

1) Inductive load has power factor of 0.04 minimum (AC) and a time of 7m/second (DC)

2) Lamp load has an inrush current of 6 times steady-state current.

# SIRIUS 3SE7 Cable-Operated Switches

## General Information

### Application

Cable-operated switches are used for monitoring or for EMERGENCY-STOP facilities on particularly endangered system sections. They are available with metal enclosures.

As the effective range of a cable-operated switch is limited by the length of the pull-wire, large systems can also be protected.

Cable-operated switches (requiring pulling at both ends) and conveyor belt unbalance trackers are used primarily for monitoring very long belt systems.

### Specifications

Switches with latching for implementation in EMERGENCY-STOP equipment correspond to the EN 418 standard.

### Principle of operation

The switch contacts of the cable-operated switches and the conveyor belt unbalance protection devices are positive opening.

Cable-operated switches with one-side operation are held in free position by the pre-tension force on the turnbuckle.

- In the 3SE7 140, -150 and -160 cable-operated switches, both switching contacts are available for cable-break/cable pull signaling. The NO contact is used, for example, for signaling purposes.

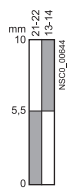
For switches with latching, with a pretensioned cable, the locking must be deactivated beforehand in order to return the switch to its free position.

### Technical data

Type	3SE7 120	3SE7 150	3SE7 140	3SE7 141	3SE7 160	3SE7 310
<b>Standards</b>	IEC 60947-5-1, EN 60947-5-1; IEC 60204-1, EN 60204-1; EN ISO 13850					
<b>Certifications</b>	UL / CSA					
<b>Electrical design</b>	Contacts electrically isolated from each other					
<b>Electrical loading</b>	<ul style="list-style-type: none"> <li>at AC-15</li> <li>minimum</li> </ul>					
	AC 400 V, 6A			AC 250 V, 2A	AC 400 V, 6A	
	AC/DC 24 V, 10 mA					
<b>Short circuit protection</b>	6 A (Slow acting)					
<b>Mechanical endurance</b>	> 1 x 10 <sup>6</sup> operating cycles					
<b>Contact material</b>	Fine silver					
<b>Actuation</b>	By pulling or breaking of a rope (cable)					
<b>Rope length, maximum Spacing between rope supports, maximum</b>	10 m 2.5 m	25 m 3 m	50 m 5 m	75 m <sup>1)</sup> 5 m	2 x 50 m 5 m	– –
<b>Enclosure</b>	GDAL alloy, coated (color), dark black RAL 9005					
<b>Cover</b>	Shock-resistant thermoplastic					
<b>Degree of protection acc. To IEC 60529</b>	IP65			IP67	1P65	
<b>Ambient temperature</b>	-25C to +70C					
<b>Mounting</b>	Designed for M 5					
<b>Mounting space</b>	30 mm and 40 mm					
<b>Cable entry</b>	2x(M20x1.5)	2x(M20x1.5)	1x(M16x1.5)	3x(M20x1.5)	2x(M25x1.5)	
<b>Type of connection</b>	M3.5 screw connection; Self-lifting pressure plate terminals					

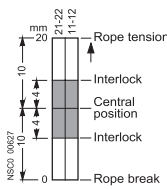
### Travel diagrams

3SE7 120-2DD01



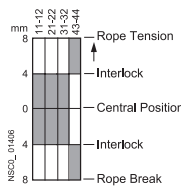
Central position

3SE7 140-1.F00



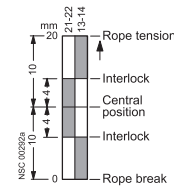
Central position

3SE7 141-1EG10



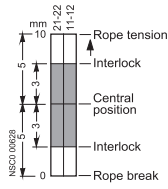
Central position

3SE7 140-1.D0.



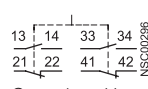
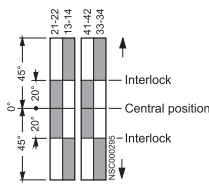
Central position

3SE7 120-1BF00, 3SE7 150-1BF00



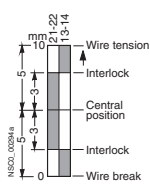
Central position

3SE7 160-1AE, 3SE7 310-1AE



Central position

3SE7 150-1.D00, 3SE7 150-2DD00



Central position

1) 75 m cable length possible provided the ambient temperature range is strictly observed, otherwise, 50 m.

# SIRIUS 3SE7 Cable-Operated Switches

## Selection

### Selection and ordering data

Version	Wire length	Contacts	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	
<b>Cable-operated switches</b>								
 3SE7 120-1BH00	10	<b>Metal enclosures, IP65</b> (cover made of molded plastic)						
		• Without latching, only cable pull monitoring	1 NO + 1 NC	↻	A	<b>3SE7 120-2DD01</b>	1	1 unit
		• With latching and button reset	2 NC	↻	A	<b>3SE7 120-1BF00</b>	1	1 unit
		- With yellow lid	1 NO + 2 NC	↻	A	<b>3SE7 120-1BH00</b>	1	1 unit
 3SE7 150-1BD00 3SE7 150-1BH00	25	<b>Metal enclosures, IP65</b> (cover made of molded plastic), with alignment window						
		• Without latching	1 NO + 1 NC	↻	A	<b>3SE7 150-2DD00</b>	1	1 unit
		• With latching and button reset	1 NO + 1 NC	↻	▶	<b>3SE7 150-1BD00</b>	1	1 unit
			2 NC	↻	▶	<b>3SE7 150-1BF00</b>	1	1 unit
		- With yellow lid	1 NO + 2 NC	↻	▶	<b>3SE7 150-1BH00</b>	1	1 unit
		• With latching and key unlatching	1 NO + 1 NC	↻	B	<b>3SE7 150-1CD00</b>	1	1 unit
 3SE7 150-1BD04	25	<b>Metal enclosures, IP65</b> (cover made of molded plastic), with alignment window, with LED, red, 24 V DC						
		• Without latching	1 NO + 1 NC	↻	B	<b>3SE7 150-2DD04</b>	1	1 unit
		• With latching and button reset	1 NO + 1 NC	↻	▶	<b>3SE7 150-1BD04</b>	1	1 unit
 3SE7 140-1B.00	50	<b>Metal enclosures, IP65</b> (cover made of molded plastic)						
		• With latching and button reset	1 NO + 1 NC	↻	A	<b>3SE7 140-1BD00</b>	1	1 unit
			2 NC	↻	▶	<b>3SE7 140-1BF00</b>	1	1 unit
		• In addition with LED, red, 24 V DC	1 NO + 1 NC	↻	B	<b>3SE7 140-1BD04</b>	1	1 unit
		• With latching and key unlatching	1 NO + 1 NC	↻	B	<b>3SE7 140-1CD00</b>	1	1 unit
 3SE7 141-1EG10	75	<b>Metal enclosures, IP67</b> (cover made of molded plastic), with EMERGENCY-STOP mushroom, with rotate-to-unlatch mechanism						
			1 NO + 3 NC	↻	▶	<b>3SE7 141-1EG10</b>	1	1 unit
 3SE7 160-1AE00	2 × 75	<b>Metal enclosures, IP65</b> with actuation on both sides						
		• With latching and button reset	2 NO + 2 NC	↻	A	<b>3SE7 160-1AE00</b>	1	1 unit
			1 NO + 1 NC	↻	B	<b>3SE7 160-1BD00</b>	1	1 unit
		• In addition with LED, red, 24 V DC	2 NO + 2 NC	↻	B	<b>3SE7 160-1AE04</b>	1	1 unit

↻ Positive opening according to IEC 60947-5-1, Appendix K.

# SIRIUS 3SE7 Cable-Operated Switches

## Selection

Version	Contacts	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Conveyor belt unbalance trackers



3SE7 310-1AE00

#### Metal enclosures, IP65

- With latching and button reset
- In addition with LED, red, 24 V DC

2 NO + 2 NC	↻	B	<b>3SE7 310-1AE00</b>		1	1 unit
2 NO + 2 NC	↻	B	<b>3SE7 310-1AE04</b>		1	1 unit

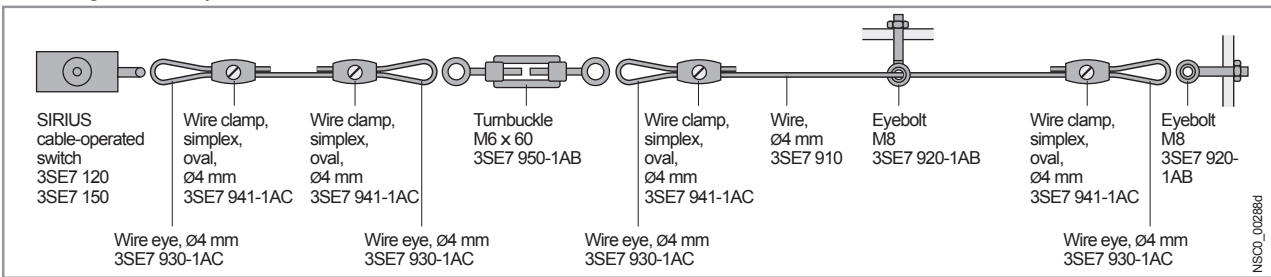
↻ Positive opening according to IEC 60947-5-1, Appendix K.

Product Category: SFTY

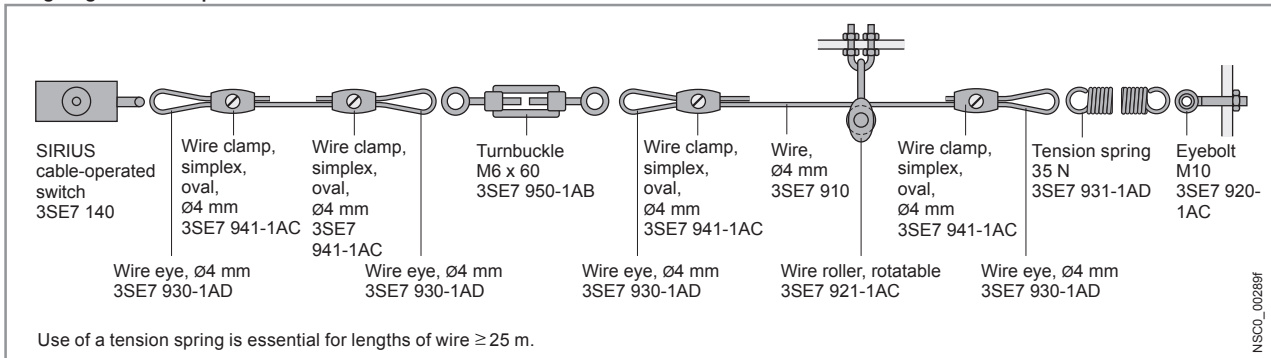
### Accessories

#### Configuration of the cable-operated switches

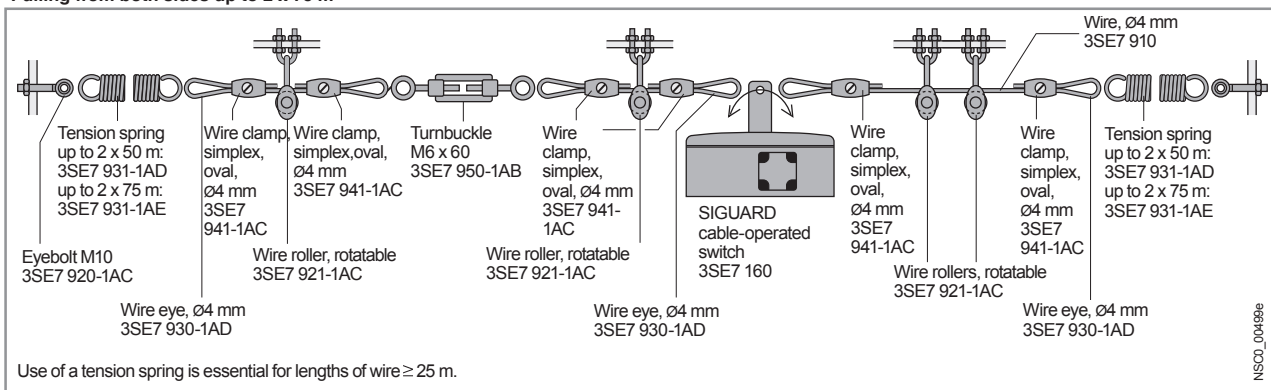
##### Short lengths of wire up to 25 m



##### Long lengths of wire up to 50 m



##### Pulling from both sides up to 2 x 75 m











#### Note:

Large temperature fluctuations require corresponding compensation springs. For reliable connection the PVC sheath must be

removed from the clamping area of the steel trip-wire. Wire supports must be used at the recommended intervals.

# SIRIUS 3SE7 Cable-Operated Switches

## Accessories

Version	Wire length/ diameter	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Trip-wire with fixing</b>						
	<b>Steel wires</b> , with red plastic sheath, Ø 4 mm <sup>1)</sup>	10 m	A	<b>3SE7 910-3AA</b>	1	1 unit
		15 m	A	<b>3SE7 910-3AB</b>	1	1 unit
		20 m	▶	<b>3SE7 910-3AC</b>	1	1 unit
		50 m	A	<b>3SE7 910-3AH</b>	1	1 unit
	<b>Wire clamps</b> , galvanized white					
	• Oval	2 × Ø 4 mm	A	<b>3SE7 941-1AC</b>	1	1 unit
	• Simplex (1 set = 4 units)	2 × Ø 4 mm	▶	<b>3SE7 943-1AC</b>	1	4 units
	• Duplex (1 set = 4 units)	2 × Ø 4 mm	A	<b>3SE7 944-1AC</b>	1	4 units
	• Single (1 set = 4 units)	2 × Ø 4 mm	A	<b>3SE7 942-1AA</b>	1	4 units
	<b>Tension springs</b> (zinc-plated) to maintain the counter tension					
	• 13 N		A	<b>3SE7 931-1AB</b>	1	1 unit
	• 35 N, for trip-wires up to 50 m		▶	<b>3SE7 931-1AD</b>	1	1 unit
	• > 35 N, for trip-wires up to 2 × 75 m		▶	<b>3SE7 931-1AE</b>	1	1 unit
	<b>Wire rollers</b> for changing the direction of the wire, Ø 4 mm rotatable		A	<b>3SE7 921-1AC</b>	1	1 unit
	<b>Fixtures for the wire rollers</b> (incl. fixing nuts)		▶	<b>3SE7 921-1AA</b>	1	1 unit
	<b>Wire eyes</b> for changes in wire direction and improved power transmission at the fixing points (1 set = 4 units)	Ø 4 mm	▶	<b>3SE7 930-1AD</b>	1	4 units
	<b>Eyebolts</b> for fixing the wire					
	• Including M8 nut		A	<b>3SE7 920-1AB</b>	1	1 unit
	• Including M10 nut		▶	<b>3SE7 920-1AC</b>	1	1 unit
	<b>Turnbuckles</b> for precise adjustment of the pretension					
	• M6 x 60		A	<b>3SE7 950-1AB</b>	1	1 unit
	• M6 x 110		A	<b>3SE7 950-1AD</b>	1	1 unit
<b>Spare parts</b>						
	<b>LED lamps</b> , red 24 V DC 25 mm diameter; for M20 x 1.5 connection		D	<b>3SX3 235</b>	1	1 unit

<sup>1)</sup> Diameter including casing; the diameter of the steel wire is 3.2 mm.

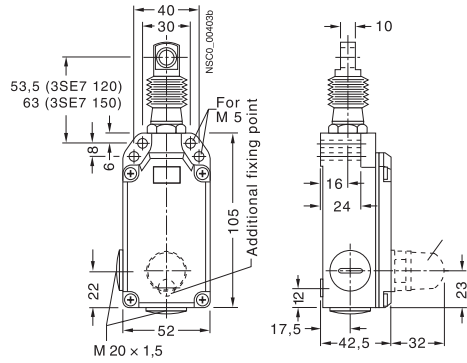
# SIRIUS 3SE7 Cable-Operated Switches

## 3SE7, metal enclosures

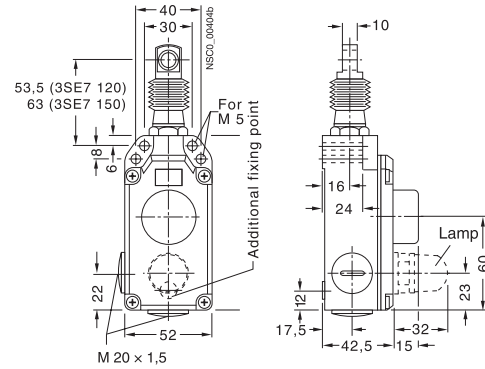
### Dimension drawings

#### Metal enclosure

**3SE7 120-2DD.., 3SE7 150-2DD..**  
without latching

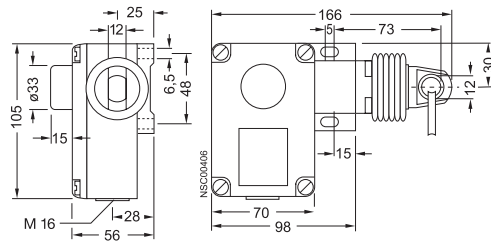


**3SE7 120-1B..., 3SE7 150-1B...**  
with latching and button reset

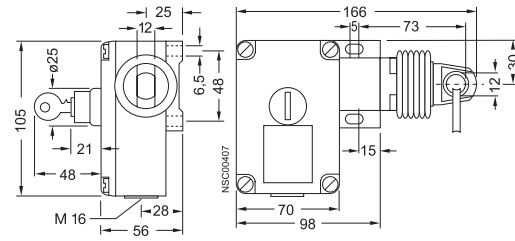


#### Metal enclosure

**3SE7 140-1B...**  
with latching and button reset

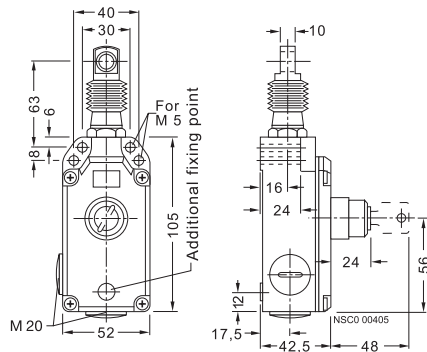


**3SE7 140-1ECD.**  
with latching and key reset

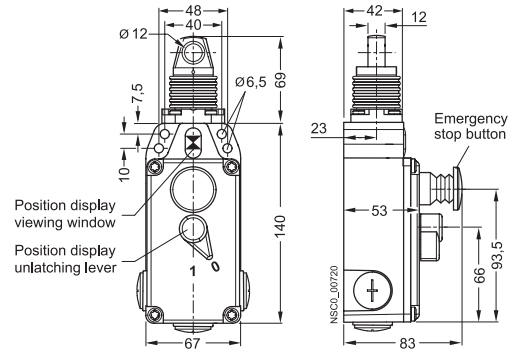


#### Metal enclosure

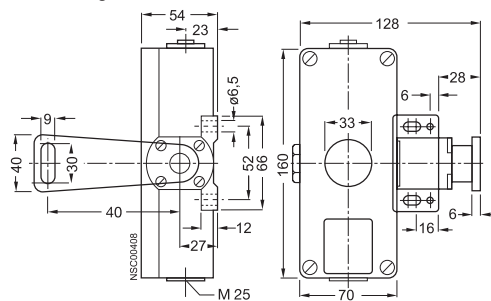
**3SE7 150-1CD..**  
with latching and key reset



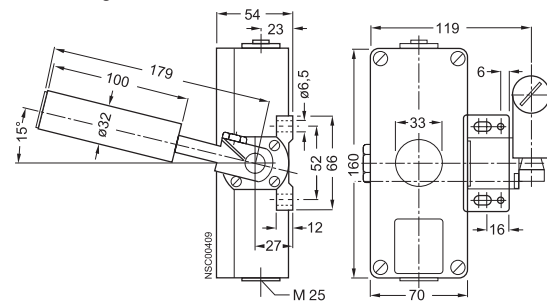
**3SE7 141-1EG10.**  
with EMERGENCY STOP and Lockout release



**3SE7 160-1AE..**  
with latching and button reset



**3SE7 310-1AE.. conveyor belt unbalance protection device**  
with latching and button reset





## SIRIUS 3SE5 Interlock Switches

## General data

## Overview

Position switches with separate actuator are used where the position of doors, covers or protective grills must be monitored for safety reasons.

3SE5 position switches with separate actuator have the same enclosures as the standard switches (modular system).



Position switches with head for separate actuator

## Design

## Enclosure sizes

The 3SE5 switches are available in various enclosure sizes:

- Plastic enclosures according to EN 50047, 31 mm wide, IP65, 1 cable entry
- Metal enclosures according to EN 50047, 31 mm wide, IP66/IP67, 1 cable entry
- Plastic and metal enclosures according to EN 50041, 40 mm wide, IP66/IP67, 1 cable entry
- Plastic enclosures, 50 mm wide, IP66/IP67, 2 cable entries
- Metal enclosures, 56 mm wide, IP66/IP67, 3 cable entries

Also available is a switch in the 3SE2 series which has arisen in this form according to general market requirements:

- Molded-plastic enclosures outside of the standards, enclosure width 52 mm, IP67

## Enclosure versions

Various basic versions can be selected for the enclosures of the 3SE5 series:

- Available with two- or three-pole contact blocks designed as slow-action contacts
- Optional LED status display
- With mounted four- or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- Similarly with a combination of connector socket and LED indicators
- Metal enclosures for explosion protection (ATEX) ([see online](#))
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs ([see online](#))

For a description of the basic switches, [see page 13/6](#).

## Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through  $4 \times 90^\circ$ . The switches can also be approached from above.

The twist actuators of the 3SE2 243 and 3SE2 257 switches with special enclosures cannot be changed. The switches can be approached from the two broad sides and from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from various versions to suit the application ([see page 13/86](#)).

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

## Radius actuators

The position switches with radius actuators are particularly suitable for rotatable protective devices. The movable actuation key allows even small radii to be approached. Damage to the switch and the actuator due to inaccurate approach is prevented.

## Locking devices

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety ([see page 13/86](#)).



Blocking insert with padlock

## Dust protection

A rubber cap to protect the twist actuator from contamination is available for operation in dusty environments ([see page 13/86](#)).

## Contact reliability

The new contact blocks ensure an extremely high contact stability. This applies even when the devices are switching low voltages and currents, e.g. 1 mA at 5 V DC.

Positive opening 

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".



# SIRIUS 3SE5 Interlock Switches

3SE5, plastic enclosures with separate actuator






## Selection and ordering data

### Complete units



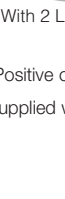
2 or 3 contacts · 5 directions of approach · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5

Version <sup>1)</sup>	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				Order No.	List Price \$ per PU				kg

### Enclosure width 31 mm to EN 50047

	<b>5 directions of approach</b>								
	Slow-action contacts	1 NO + 1 NC --	⊙ ▶	<b>3SE5 232-0RV40</b>		1	1 unit	102	0.150
	Slow-action contacts	1 NO + 2 NC --	⊙ ▶	<b>3SE5 232-0QV40</b>		1	1 unit	102	0.155
	<b>With increased minimum pull-out force 30 N</b>								
	Slow-action contacts	1 NO + 1 NC --	⊙ B	<b>3SE5 232-0QV40-1AA1</b>		1	1 unit	102	0.150
	<b>With M12 connector socket, 4-pole (250 V, 4 A)</b>								
	Slow-action contacts	1 NO + 1 NC --	⊙ B	<b>3SE5 234-0RV40-1AC4</b>		1	1 unit	102	0.165
	Slow-action contacts	1 NO + 2 NC --	⊙ B	<b>3SE5 234-0QV40-1AE0</b>		1	1 unit	102	0.170
	<b>With 2 LEDs, yellow/green</b>								
	Slow-action contacts	1 NO + 1 NC 24 V DC	⊙ B	<b>3SE5 232-1RV40</b>		1	1 unit	102	0.155
	Slow-action contacts	1 NO + 1 NC 230 V AC	⊙ B	<b>3SE5 232-3RV40</b>		1	1 unit	102	0.110
	<b>With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs</b>								
	Slow-action contacts	1 NO + 1 NC 24 V DC	⊙ C	<b>3SE5 234-1RV40-1AF3</b>		1	1 unit	102	0.175

### Enclosure width 50 mm

	<b>5 directions of approach</b>								
	Slow-action contacts	1 NO + 2 NC --	⊙ B	<b>3SE5 242-0QV40</b>		1	1 unit	102	0.110
	<b>With increased minimum pull-out force 30 N</b>								
	Slow-action contacts	1 NO + 1 NC --	⊙ B	<b>3SE5 242-0RV40-1AA1</b>		1	1 unit	102	0.110
	<b>With 2 LEDs, yellow/green</b>								
	Slow-action contacts	1 NO + 2 NC 24 V DC	⊙ B	<b>3SE5 242-1QV40</b>		1	1 unit	102	0.120
	Slow-action contacts	1 NO + 2 NC 230 V AC	⊙ C	<b>3SE5 242-3QV40</b>		1	1 unit	102	0.120

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/86).

For 1/2" NPT adaptors and cable glands, see page 13/48.

# SIRIUS 3SE5 Interlock Switches

3SE5, plastic enclosures – Enclosure width 40 mm acc. to EN 50041

## Selection and ordering data

### Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version <sup>1)</sup>	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Order No.	Price per PU	

### Enclosure width 40 mm acc. to EN 50041



With separate actuator

5 directions of approach								
Slow-action contacts	1 NO + 2 NC	—	⤵ B	<b>3SE5 132-0QV20</b>	1	1 unit		
With 2 LEDs, yellow/green								
Slow-action contacts	1 NO + 2 NC	24 V DC	⤵ C	<b>3SE5 132-1QV20</b>	1	1 unit		
Slow-action contacts	1 NO + 2 NC	230 V AC	⤵ C	<b>3SE5 132-3QV20</b>	1	1 unit		



With 2 LEDs

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/86).

# SIRIUS 3SE5 Interlock Switches

3SE5, metal enclosures – Enclosure width 31 mm acc. to EN 50047

## Selection and ordering data

### Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version <sup>1)</sup>	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Order No.	Price per PU	

### Enclosure width 31 mm acc. to EN 50047

		Contacts	LEDs	DT	Order No.	PU (UNIT, SET, M)	PS*
	<b>5 directions of approach</b>						
	Slow-action contacts	1 NO + 1 NC	—	↻ A	<b>3SE5 212-0RV40</b>	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	↻ B	<b>3SE5 212-0QV40</b>	1	1 unit
	<b>With 2 LEDs, yellow/green</b>						
	Slow-action contacts	1 NO + 1 NC	24 V DC	↻ B	<b>3SE5 212-1RV40</b>	1	1 unit
	Slow-action contacts	1 NO + 1 NC	230 V AC	↻ B	<b>3SE5 212-3RV40</b>	1	1 unit

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators).

Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/86).

# SIRIUS 3SE5 Interlock Switches

3SE5, metal enclosures with separate actuator

## Selection and ordering data

### Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version <sup>1)</sup>	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				Order No.	List Price \$ per PU			kg

### Enclosure width 40 mm to EN 50041



With separate actuator

<b>5 directions of approach</b>								
Slow-action contacts	1 NO + 2 NC --		⊕ ▶	<b>3SE5 112-0QV10</b>		1	1 unit	102 0.360
<b>With increased minimum pull-out force 30 N</b>								
Slow-action contacts	1 NO + 2 NC --		⊕ B	<b>3SE5 112-0QV10-1AA7</b>		1	1 unit	102 0.360



With M12 socket

<b>With M12 connector socket, 5-pole (125 V, 4 A)</b>								
Slow-action contacts	1 NO + 1 NC --		⊕ C	<b>3SE5 114-0RV10-1AC5</b>		1	1 unit	102 0.360
Slow-action contacts	2 NC --		⊕ C	<b>3SE5 114-0QV10-1AE1</b>		1	1 unit	102 0.360
<b>With connector socket, 6-pole + PE (250 V, 10 A)</b>								
Slow-action contacts	1 NO + 2 NC --		⊕ C	<b>3SE5 115-0QV10-1AD1</b>		1	1 unit	102 0.380



With 2 LEDs

<b>With 2 LEDs, yellow/green</b>								
Slow-action contacts	1 NO + 2 NC 24 V DC		⊕ B	<b>3SE5 112-1QV10</b>		1	1 unit	102 0.370
Slow-action contacts	1 NO + 2 NC 230 V AC		⊕ C	<b>3SE5 112-3QV10</b>		1	1 unit	102 0.370
<b>With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs</b>								
Slow-action contacts	1 NO + 1 NC 24 V DC		⊕ C	<b>3SE5 114-1RV10-1AF3</b>		1	1 unit	102 0.360
<b>With connector socket, 6-pole + PE (10 A) and 2 LEDs</b>								
Slow-action contacts	1 NO + 1 NC 24 V DC		⊕ C	<b>3SE5 115-1RV10-1AF2</b>		1	1 unit	102 0.380

### Enclosure width 56 mm



With separate actuator

<b>5 directions of approach</b>								
Slow-action contacts	1 NO + 2 NC --		⊕ ▶	<b>3SE5 122-0QV10</b>		1	1 unit	102 0.360
<b>With increased minimum pull-out force 30 N</b>								
Slow-action contacts	1 NO + 2 NC --		⊕ B	<b>3SE5 122-0QV10-1AA7</b>		1	1 unit	102 0.360



With 2 LEDs

<b>With 2 LEDs, yellow/green</b>								
Slow-action contacts	1 NO + 2 NC 24 V DC		⊕ ▶	<b>3SE5 122-1QV10</b>		1	1 unit	102 0.370
Slow-action contacts	1 NO + 2 NC 230 V AC		⊕ C	<b>3SE5 122-3QV10</b>		1	1 unit	102 0.370

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/86).

For 1/2" NPT adaptors and cable glands, see page 13/48.

## SIRIUS 3SE5 Interlock Switches

3SE5, metal and plastic enclosures – Accessories

## Selection and ordering data

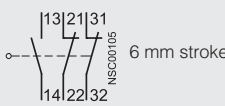
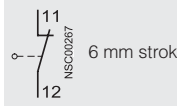






Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
<b>Actuators for 3SE5</b>							
 3SE5 000-0AV01		Standard actuators, length 75.6 mm	A	<b>3SE5 000-0AV01</b>	1	1 unit	102 0.040
 3SE5 000-0AV02		With vertical fixing, length 53 mm	▶	<b>3SE5 000-0AV02</b>	1	1 unit	102 0.070
 3SE5 000-0AV03		With transverse fixing, length 47 mm	▶	<b>3SE5 000-0AV03</b>	1	1 unit	102 0.070
 3SE5 000-0AV06		Radius actuators, length 51 mm	▶	<b>3SE5 000-0AV04</b>	1	1 unit	102 0.070
		• Direction of approach from the left	▶	<b>3SE5 000-0AV06</b>	1	1 unit	102 0.070
		• Direction of approach from the right	A				
 3SE5 000-0AV05		Universal radius actuators, length 77 mm	▶	<b>3SE5 000-0AV05</b>	1	1 unit	102 0.090
 3SE5 000-0AV07		Universal radius actuators, heavy-duty	A	<b>3SE5 000-0AV07-1AK2</b>	1	1 unit	102 0.120
		• Length 67 mm	A	<b>3SE5 000-0AV07</b>	1	1 unit	102 0.090
		• Length 77 mm					
<b>Optional accessories for 3SE5</b>							
 3SE5 000-0AV08-1AA2		<b>Protective caps</b> made of black rubber for the actuator head, to protect the actuator openings from contamination Not to be used for 3SE5 2.. plastic enclosures.	B	<b>3SE5 000-0AV08-1AA2</b>	1	1 unit	102 0.010
 3SE5 000-0AV08-1AA3		<b>Blocking inserts</b> , high-grade steel, for actuator head, for up to 8 padlocks	B	<b>3SE5 000-0AV08-1AA3</b>	1	1 unit	102 0.065
<b>Connections for 3SE5, 3SE2</b>							
 3SY3 127		<b>Connector sockets (4-pole), M12, fixed for M20 x 1.5</b> For max. 250 V, 4 A With 0.25 mm <sup>2</sup> connecting cable, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	B	<b>3SY3 127</b>	1	1 unit	102 0.010
 3RX8 000		<b>Cable boxes (4-pole), M12</b> With terminal compartment, can be pre-assembled	A	<b>3RX8 000-0CB45</b>	1	1 unit	574 0.015
		<b>Angular cable boxes (4-pole), M12</b> With terminal compartment, can be pre-assembled	A	<b>3RX8 000-0CC45</b>	1	1 unit	574 0.015
 3SX9 926		<b>Connector sockets (5-pole), M12, fixed for M20 x 1.5</b> For max. 125 V, 4 A With 0.25 mm <sup>2</sup> connecting cable, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	B	<b>3SY3 128</b>	1	1 unit	102 0.010
		<b>Cable boxes (5-pole), M12</b> With terminal compart., can be pre-assembled	A	<b>3RX8 000-0CB55</b>	1	1 unit	574 0.016
		<b>Angular cable boxes (5-pole), M12</b> With terminal compart., can be pre-assembled	A	<b>3RX8 000-0CC55</b>	1	1 unit	574 0.016
		<b>Cable glands M20 x 1.5</b> Plastic	A	<b>3SX9 926</b>	1	1 unit	102 0.010

# 3SE2 Interlock Switches

3SE2, plastic enclosures with separate actuator

## Selection and ordering data

1 contact · 3 contacts · Moving double-break contacts <sup>1) 2)</sup>

Actuation	Enclosure width	Length of actuator	DT	3SE. position switches with 3 slow-action contacts	Wght. approx.	3SE. position switches with 1 slow-action contact	Wght. approx.
	mm	mm		 Ident. No. <b>12</b> acc. to EN 50 013	kg	 Ident. No. <b>01</b> acc. to EN 50 013	kg
				Order No.	List Price \$ 1 unit	Order No.	List Price \$ 1 unit
<b>Molded plastic enclosure IP 67</b>							
<b>3SE2 243-0XX Top and side entry<sup>1)</sup></b>							
M20 x 1.5 connecting thread <ul style="list-style-type: none"> <li>Extraction force 5 N 52</li> <li>Extraction force 30 N 52</li> <li>With automatic ejection 52</li> </ul> M16 x 1.5 connecting thread <ul style="list-style-type: none"> <li>Extraction force 5 N 52</li> <li>Extraction force 30 N 52</li> <li>With automatic ejection 52</li> </ul>							
				<ul style="list-style-type: none"> <li>→ <b>3SE2 243-0XX40</b> 0.140</li> <li>→ <b>3SE2 243-0XX</b> 0.140</li> <li>→ <b>3SE2 243-0XX30</b> 0.140</li> <li>→ <b>3SE2 243-0XX48</b> 0.140</li> <li>→ <b>3SE2 243-0XX18</b> 0.140</li> <li>→ <b>3SE2 243-0XX38</b> 0.140</li> </ul>		<ul style="list-style-type: none"> <li>→ <b>3SE2 257-6XX40</b> 0.120</li> <li>→ <b>3SE2 257-6XX</b> 0.120</li> <li>→ <b>3SE2 257-6XX30</b> 0.120</li> <li>→ <b>3SE2 257-6XX48</b> 0.140</li> <li>→ <b>3SE2 257-6XX18</b> 0.140</li> <li>→ <b>3SE2 257-6XX38</b> 0.140</li> </ul>	
<b>Actuators</b>							
		28		<b>3SX3 218</b> 0.020			
		33		<b>3SX3 228</b> 0.025			
		28		<b>3SX3 217</b> 0.035			
		34		<b>3SX3 234</b> 0.035			
		82		<b>3SX3 256</b> 0.020			
<b>Accessories</b>							
<ul style="list-style-type: none"> <li>Slit cover only for 3SX3234 (1 set = 3 units)</li> </ul>				<b>3SX3 233</b> 0.005			

For operation, operating speed and travel, see Page 13/92.

→ Positive opening acc. to IEC 60 947-5-1, Appendix K, and DIN VDE 0660 Part 200.

1) Supplied without actuator.

2) For conduit thread adaptors, see page 13/48.

## SIRIUS 3SE5 Interlock Switches

## Technical data

## Benefits

The 3SE5 position switches with separate actuator differ from the previous series through the following new characteristics:

- All enclosure sizes with increased corrosion protection
- All enclosure sizes are optionally available with a LED signaling indicator.
- The three-pole contact block 1 NO + 2 NC is available for all enclosure sizes.
- The plastic enclosure has simple and fast wiring equipment which makes it possible to save from approx. 20 to 25 % of the time when connecting.
- The ASIsafe electric component is integrated for the versions with the AS-Interface connection (see online); an adapter is not required.

## Application

Position switches with separate actuator are used where the position of doors, covers or protective grills must be monitored for safety reasons.

The position switch can only be operated with the matching coded actuator. Simple overruling by hand or auxiliary devices is impossible.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. Dimensions, fixing points of the enclosure are in

accordance with EN 50041 or EN 50047 standards. The devices are suitable for use in any climate.

## Standards

IEC 60947-5-1 or EN 60947-5-1.

The protective measure of "total insulation" by the molded-plastic enclosure is guaranteed by the use of molded-plastic screw-lands.

## Safety position switches

For controls according to IEC 60204-1 or EN 60204-1 the devices can be used as a safety position switch. To secure position switches against changes in their position, keyed techniques must be employed on installation.

## Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening of the NC contacts, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to the IEC standard 60947-5-1 with the symbol ☺.

Category 3 according to ISO 13849-1 (EN 954-1) can be attained with a position switch with a separate actuator if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.

Category 4 can be achieved when using an additional position switch.

## Technical specifications

Type		3SE5 1...-V.., 3SE5 2...-V..	3SE2 257-XX..	3SE2 243-XX..			
<b>General data</b>							
<b>Standards</b>		IEC 60947-5-1, EN 60947-5-1					
<b>Rated insulation voltage <math>U_i</math></b>	V	400	500				
<b>Pollution degree</b> acc. to IEC 60664-1		Class 3	Class 3				
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6					
<b>Rated operational voltage <math>U_e</math></b>	V	400 AC; over 300 V AC only equal potential	500 AC; over 380 V AC only equal potential				
<b>Conventional thermal current <math>I_{th}</math></b>	A	6	10				
<b>Rated operational current <math>I_e</math></b>		2-pole	3-pole	1-pole	3-pole		
• With alternating current 50/60 Hz		$I_e/AC-15$	$I_e/AC-15$	$I_e/AC-12$	$I_e/AC-15$	$I_e/AC-12$	$I_e/AC-15$
- At 24 V	A	6	6	10	10	10	10
- At 120 V	A	6	3	10	10	10	10
- At 240 V	A	3	1.5	10	6	10	4
- At 400 V	A	—	—	10	4	10	4
- At 500 V	A	—	—	10	3	10	3
• For direct current		$I_e/DC-13$	$I_e/DC-13$	$I_e/DC-12$	$I_e/DC-13$	$I_e/DC-12$	$I_e/DC-13$
- At 24 V	A	3	3	10	10	10	10
- At 125 V	A	0.55	0.55	—	—	—	—
- At 250 V	A	0.27	0.27	—	—	—	—
- At 110 V	A	—	—	4	1	4	1
- At 220 V	A	—	—	1	0.4	1	0.4
- At 440 V	A	—	—	0.5	0.2	0.5	0.2
<b>Short-circuit protection<sup>1)</sup></b>							
• With DIAZED fuse links, gG operational class	A	6	6				
• With fuse links, quick		—	10				
• With miniature circuit breaker, Char. C	A	1	2	—			
<b>Mechanical endurance</b>		1 × 10 <sup>6</sup> operating cycles					
<b>Electrical endurance</b>							
• With 3RH.1, 3RT contactors in size S00, S0		10 × 10 <sup>6</sup> operating cycles		> 1 × 10 <sup>6</sup> operating cycles			
• For utilization category AC-15 when switching off $I_e/AC-15$ at 240 V		0.1 × 10 <sup>6</sup> operating cycles		0.5 × 10 <sup>6</sup> operating cycles			
<b>Switching frequency</b> With 3RH.1, 3RT contactors in size S00, S0		6000 operating cycles/h					
<b>Minimum pull-out force</b> for positive opening	N	20	10		30		

# SIRIUS 3SE5 Interlock Switches

3SE5 with separate actuator – Metal and plastic enclosures

## Configuration

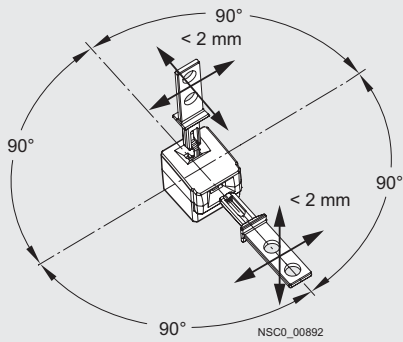
### Operation and operating travel of actuators

<p><b>Operation by a separate actuator</b></p> <p>⊕ Positive opening acc. to EN 60947-5-1</p> <p><math>v_{max}</math> Max. actuating speed</p> <p>→ Direction of operation</p>	<p><b>Contact blocks</b></p> <p>Terminal designation acc. to EN 50013</p>	<p><b>Nominal travel</b></p> <p>■ Contact closed</p> <p>□ Contact open</p> <p>Actuator in actuator head: NC is closed</p>
--	---	---

### Separate actuators

#### Standard actuators

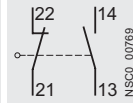
Axial and lateral actuation ( $4 \times 90^\circ$ )



Minimum force required in operating direction 30 N (on retraction)

#### Slow-action contacts

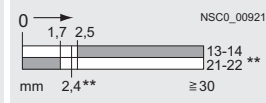
1 NO + 1 NC



Ident. No. 11

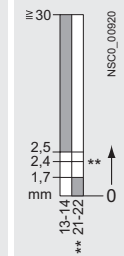
Lateral actuation

3SE5 ...-RV..

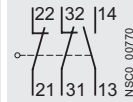


Axial actuation

3SE5 ...-RV..

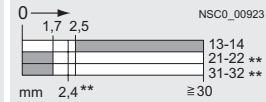


1 NO + 2 NC

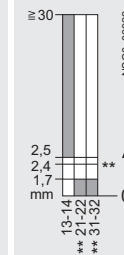


Ident. No. 12

3SE5 ...-QV..

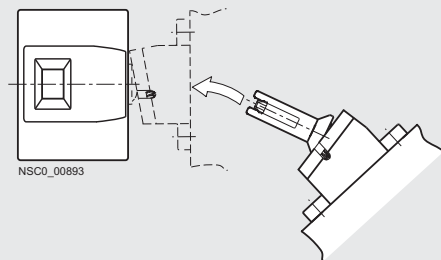


3SE5 ...-QV..



#### Radius actuators (all directions of approach)

Example: direction of approach from the left



For connector assignment, see page 13/61.



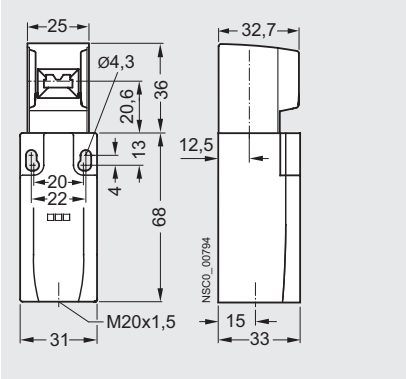
# SIRIUS 3SE5 Interlock Switches

3SE5 with separate actuator – Metal and plastic enclosures

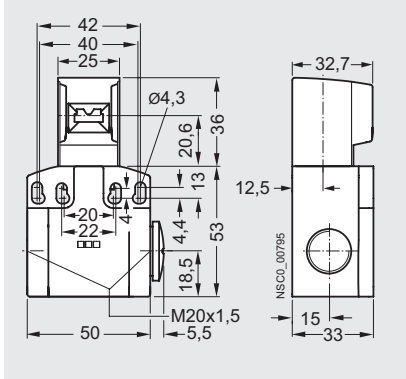
## Dimensional drawings

### Complete units

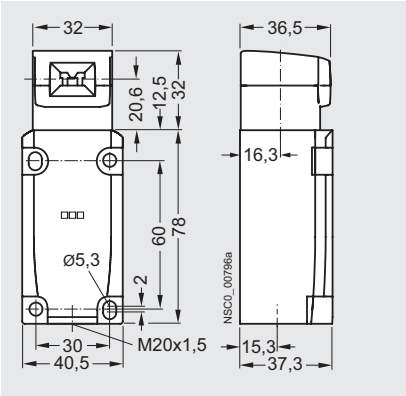
**Enclosure width 31 mm**  
3SE5 23.-.QV40, 3SE5 23.-.RV40



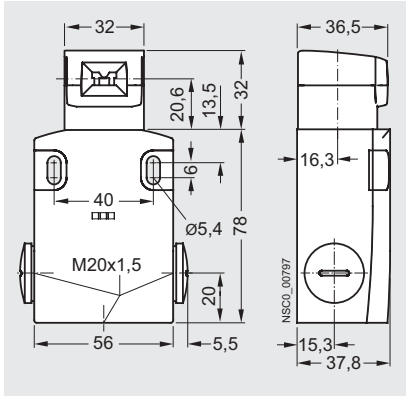
**Enclosure width 50 mm**  
3SE5 24.-.QV40, 3SE5 24.-.RV40



**Enclosure width 40 mm**  
3SE5 11.-.QV10, 3SE5 11.-.RV10

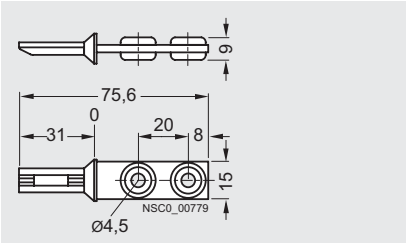


**Enclosure width 56 mm**  
3SE5 12.-.QV10, 3SE5 12.-.RV10

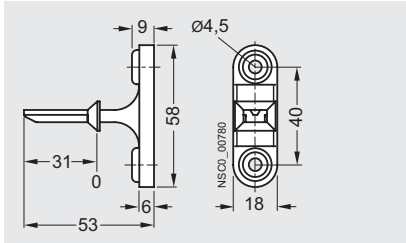


### Actuators

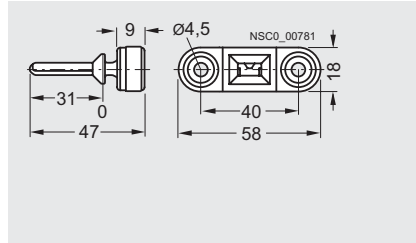
**3SE5 000-0AV01**  
standard actuator



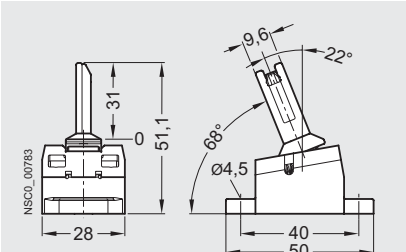
**3SE5 000-0AV02**  
actuator with vertical fixing



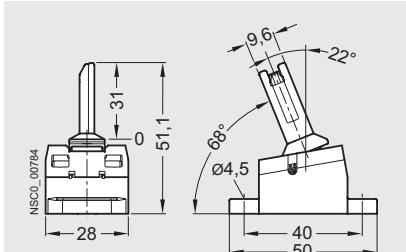
**3SE5 000-0AV03**  
actuator with horizontal fixing



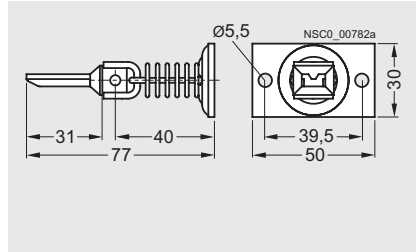
**3SE5 000-0AV04**  
radius actuator, approach from left



**3SE5 000-0AV06**  
radius actuator approach from right



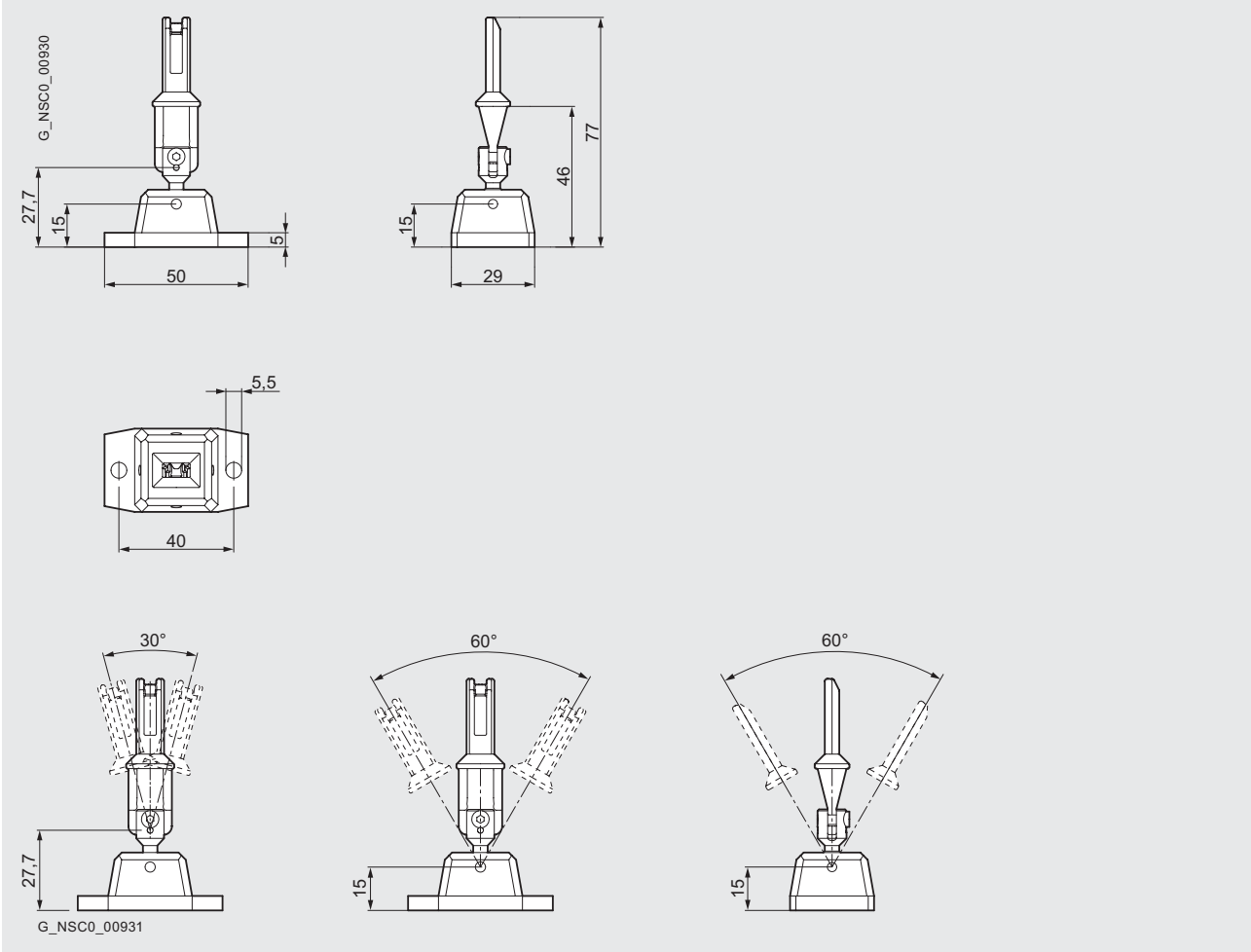
**3SE5 000-0AV05**  
universal radius actuator



# SIRIUS 3SE5 Interlock Switches

3SE5 with separate actuator – Metal and plastic enclosures

3SE5 000-0AV07  
universal radius actuator, heavy duty



# SIRIUS 3SE5 Interlock Switches

## 3SE2 with separate actuator – Plastic enclosures

### Configuration

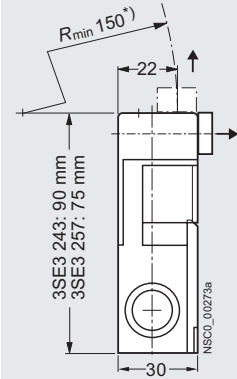
#### Operation and operating travel of actuators

<p><b>Operation by a separate actuator</b></p> <p><math>v_{max}</math> Max. actuating speed  <math>\rightarrow</math> Direction of operation</p> <p>Radius actuation:          for all directions of approach</p>	<p><b>Contact blocks</b></p> <p>Terminal designation          acc. to EN 50013</p>	<p><b>Nominal travel</b></p> <p>■ Contact closed          □ Contact open</p> <p>Actuator in actuator head:          NC is closed</p>	<p>Minimum force required in operating direction on retraction</p>
---	--	--	--

#### Separate actuators

##### Standard and radius actuators

Axial and lateral actuation



\*) Radius actuator:  $R_{min} > 38$  mm.

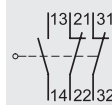
##### Slow-action contacts

1 NC



Ident. No. 01

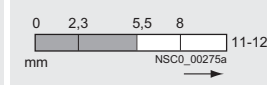
1 NO + 2 NC



Ident. No. 12

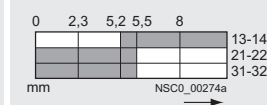
Lateral actuation

3SE2 257-XX..



30 N  
or  
5 N

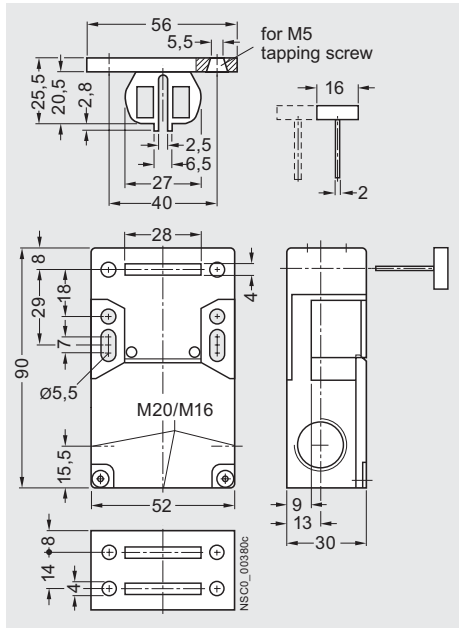
3SE2 243-XX..



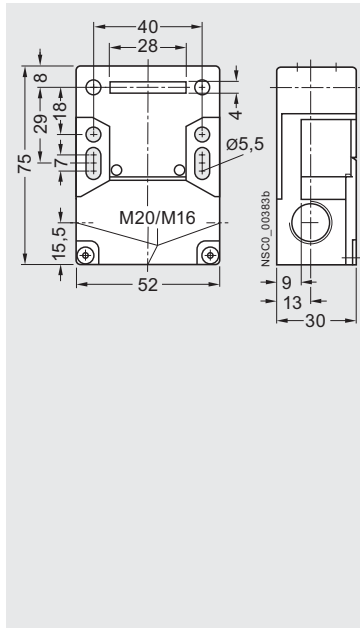
30 N  
or  
5 N

### Dimensional drawings

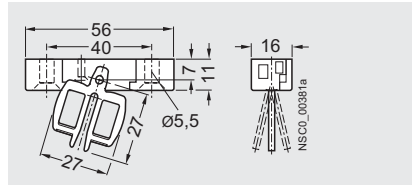
3SE2 243, lateral and front-end actuation, with 3SX3 218 standard actuator



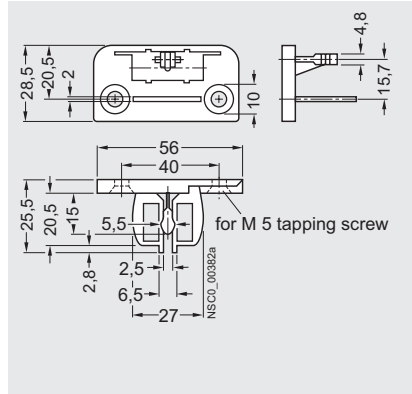
3SE2 257, lateral and front-end actuation



3SX3 228 universal radius actuator



3SX3 217 actuator with ball locating



## SIRIUS 3SE5 Interlock Switches

## 3SE5 / 3SE2 with solenoid locking – General data

## Overview

The position switches with solenoid interlocking are exceptional, technically safe devices which restrict and prevent an unforeseen or intentional opening of protective doors, protective grilles or other covers as long as a dangerous situation is present (i.e. follow-on motion of the shutdown machine).



The safety position switches with solenoid interlocking are comprised of a switch part with electromechanical interlock and a mechanical actuator which has to be ordered separately.

They are rugged protective devices that enable the greatest possible safety for man and machine.

The position switches with solenoid interlocking are offered in plastic or metal enclosures.

Dimensions (W × H × D):

- 3SE5 3: 54 mm × 185 mm × 43.5 mm,
- 3SE2 8: 90 mm × 100 mm (+ head 41.3 mm) × 45 mm.

## Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 × 90°. The 3SE5 3 switches can also be approached from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from a choice of six versions to suit the application (see page 13/97).

Actuation data:

- Maximum actuating speed  $v_{\max} = 1.5$  m/s
- Minimum actuating speed  $v_{\min} = 0.4$  mm/s
- Minimum force in the direction of actuation  $F_{\min} = 30$  N

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

## Radius actuators

The position switches with radius actuators are particularly suitable for rotatable protective devices. The movable actuation key allows even small radii to be approached. Damage to the switch and the actuator due to inaccurate approach is prevented.

## Locking devices

A high-grade steel locking device for attaching up to eight padlocks is available for even more safety (see page 13/97).

## Dust protection

A rubber cap to protect the actuator head from contamination is available for operation in dusty environments (see page 13/97).

## Solenoid interlocking

There are two versions for locking the actuator:

- Spring-actuated lock (closed-circuit principle) with various release mechanisms
- Magnetic field lock (open-circuit principle)

The spring-actuated switch is equipped with an auxiliary release for emergency situations or setup mode. Available as options:

- Escape release or
- Emergency release

## Contact blocks

The position switches with solenoid interlocking have one contact block each for:

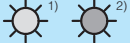


- Monitoring the actuator or the position of the protective door
- Monitoring the position of the solenoid

The mechanical design of the switch corresponds to the requirements of the failsafe principle according to EN 1088.

## Optical signaling equipment

The position switches with solenoid interlocking are available with an optional optical signaling device.

The signaling device indicates the switch position of the lock and the protective device optically by means of 2 LEDs on the front.

Protective device	Interlock	Display	Meaning
Closed	Released		Actuator free to be pulled
Closed	Closed		Actuator locked
Open	Open		Actuator pulled

## Note:

The voltage of the LEDs at the monitored contacts must be the same as the operational voltage of the solenoid (same potential).

<sup>1)</sup> Yellow LED.

<sup>2)</sup> Green LED.

## SIRIUS 3SE5 Interlock Switches

## 3SE5 / 3SE2 with solenoid locking – General data

**Benefits**

The new generation of 3SE5 3 position switches offers:

- More safety through higher locking forces:
  - 1300 N with plastic enclosure
  - 2600 N with metal enclosure
- Various release mechanisms: lock release, escape release and emergency release
- Two contact blocks each with three contacts as standard equipment, hence fewer versions needed
- Same dimensions for all enclosure variants: Plastic, metal or with integrated ASIsafe
- An extensive range of actuators
- An optional LED status display 24 V DC, 115 V AC or 230 V AC for all switch variants

**Application**

The position switches with solenoid interlocking are exceptional, technically safe devices which restrict and prevent an unforeseen or intentional opening of protective doors, protective grilles or other covers as long as a dangerous situation is present (i.e. follow-on motion of the shutdown machine).

The safety position switches with solenoid interlocking have the following functions:

- Enabling the machine or process with closed and locked protective device
- Locking the machine or process with opened protective device
- Position monitoring of the protective device and solenoid

**Standards**

The switches comply with the standards IEC 60947-1 (Low-Voltage Controlgear, General) and IEC 60947-5-1 (Electromechanical Control Devices).

The mechanical design of the switch corresponds to the requirements of the failsafe principle according to EN 1088.

**Approvals**

The switches are approved for use with locking devices according to EN 1088 and EN 292, Parts 1 and 2.

3SE5 3 position switches with solenoid interlocking bear the VDE test mark for tested according to GS-ET 19 (Test Principles of the German Trade Association for Locking Devices with Electromagnetic Interlocks).

The 3SE2 8 metal-enclosed position switches with solenoid interlocking have been awarded a test certificate from the BIA (Berufsgenossenschaftliches Institut für Arbeitssicherheit).

Category 3 according to ISO 13849-1 (EN 954-1) can be attained with a position switch with solenoid interlocking if the corresponding failsafe evaluation units are selected and correctly installed, e. g. the 3TK28 safety relays or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.

Category 4 can be achieved when using an additional position switch.

They are approved according to UL 508, UL 50 and UL 746-C.

**Solenoid interlocking**

The separate actuator operates in a similar way to the coding of a key and protects against manipulation. It transmits the locking force to the protective device and helps to monitor its position.

There are two versions of locking:

**Spring-actuated lock (closed-circuit principle)**

- In the standard version, the position switch locks by means of spring force and releases by means of electromagnetic force. In the case of voltage failure, it reliably prevents the protective device from opening when machine parts are still moving.
- The switch is equipped with an auxiliary release for emergency situations or setup mode.
- An auxiliary release which can be secured with a lock to prevent misuse is available as a version.

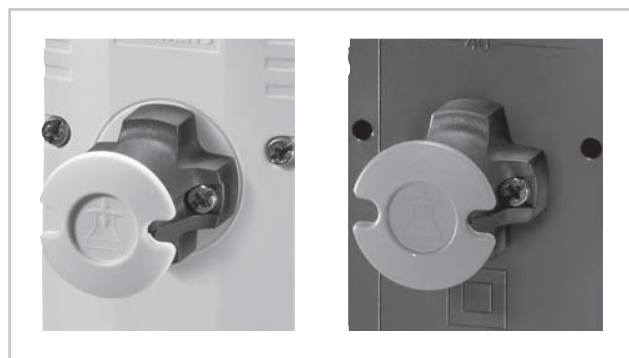


Auxiliary release

Auxiliary release with lock

The new 3SE5 3 position switches are also available with an escape release or an emergency release.

- Personnel working inside the hazard zone can use the escape release feature to manually release the interlock without tools from the escape side (hazardous area side) so that they can exit the hazard area. An intentional act (in this case pulling the gray actuator) is required to release the locking mechanism and restore the normal operating state.
- The emergency release enables someone in an emergency situation to manually release the interlock without tools from the access side (outside the hazardous area). Releasing the lock and restoring the normal operating state must require effort which is comparable to repair activity, in this case disassembly of the red actuator and resetting the mechanical lock.



Escape release from the front

Emergency release from the back

**Magnetic field lock (open-circuit principle)**

- The second version offers locking by means of electromagnetic force and release by means of spring force. This version has an advantage when it is necessary to quickly access the machine after a power failure occurs, or in the case of very short overtravel times.

# SIRIUS 3SE5 Interlock Switches

3SE5, plastic enclosures with locking force up to 1200 N







## Selection and ordering data

6 slow-action contacts · 5 directions of approach · Cable entry 3 × M20 × 1.5 · Degree of protection IP66/IP67  
 Locking force 1300 N (1000 N according to GS-ET 19)

Interlock <sup>1)</sup>	LEDs	Solenoid Rated operational voltage	DT	Complete units Position monitoring: Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		V		Order No.	Price \$ per PU				kg

### 1300 N locking force · Enclosure width 54 mm

#### Spring-actuated locks

	• With auxiliary release	--	24 DC	⊕ A	<b>3SE5 322-0SD21</b>		1	1 unit	102	0.590
		--	115 AC	⊕ B	<b>3SE5 322-0SD22</b>		1	1 unit	102	0.590
		--	230 AC	⊕ B	<b>3SE5 322-0SD23</b>		1	1 unit	102	0.590
		Yellow/Green	24 DC	⊕ A	<b>3SE5 322-1SD21</b>		1	1 unit	102	0.590
		Yellow/Green	115 AC	⊕ B	<b>3SE5 322-2SD22</b>		1	1 unit	102	0.590
		Yellow/Green	230 AC	⊕ B	<b>3SE5 322-3SD23</b>		1	1 unit	102	0.590
	• With auxiliary release	--	24 DC	⊕ ▶	<b>3SE5 322-0SE21</b>		1	1 unit	102	0.745
	With lock	--	115 AC	⊕ B	<b>3SE5 322-0SE22</b>		1	1 unit	102	0.745
		--	230 AC	⊕ B	<b>3SE5 322-0SE23</b>		1	1 unit	102	0.745
		Yellow/Green	24 DC	⊕ B	<b>3SE5 322-1SE21</b>		1	1 unit	102	0.745
		Yellow/Green	115 AC	⊕ B	<b>3SE5 322-2SE22</b>		1	1 unit	102	0.745
		Yellow/Green	230 AC	⊕ B	<b>3SE5 322-3SE23</b>		1	1 unit	102	0.745
	• With escape release from the front	--	24 DC	⊕ B	<b>3SE5 322-0SF21</b>		1	1 unit	102	0.590
		--	115 AC	⊕ B	<b>3SE5 322-0SF22</b>		1	1 unit	102	0.590
		--	230 AC	⊕ B	<b>3SE5 322-0SF23</b>		1	1 unit	102	0.590
		Yellow/Green	24 DC	⊕ B	<b>3SE5 322-1SF21</b>		1	1 unit	102	0.590
		Yellow/Green	115 AC	⊕ B	<b>3SE5 322-2SF22</b>		1	1 unit	102	0.590
		Yellow/Green	230 AC	⊕ B	<b>3SE5 322-3SF23</b>		1	1 unit	102	0.590
	• With escape release from the front and emergency release from back	--	24 DC	⊕ B	<b>3SE5 322-0SL21</b>		1	1 unit	102	0.590
	• For ambient temperature up to to -40 °C	--	24 DC	⊕ B	<b>3SE5 322-0SL21-1AJ0</b>		1	1 unit	102	0.590
	• With escape release from the back and auxiliary release from the front	--	24 DC	⊕ B	<b>3SE5 322-0SG21</b>		1	1 unit	102	0.590
		--	115 AC	⊕ B	<b>3SE5 322-0SG22</b>		1	1 unit	102	0.590
		--	230 AC	⊕ B	<b>3SE5 322-0SG23</b>		1	1 unit	102	0.590
		Yellow/Green	24 DC	⊕ ▶	<b>3SE5 322-1SG21</b>		1	1 unit	102	0.590
	• With escape release from the back and auxiliary release with lock from the front	--	24 DC	⊕ B	<b>3SE5 322-0SH21</b>		1	1 unit	102	0.745
	• With emergency release from the back and auxiliary release from the front	--	24 DC	⊕ B	<b>3SE5 322-0SJ21</b>		1	1 unit	102	0.745
		--	115 AC	⊕ B	<b>3SE5 322-0SJ22</b>		1	1 unit	102	0.745
		--	230 AC	⊕ B	<b>3SE5 322-0SJ23</b>		1	1 unit	102	0.745
		Yellow/Green	24 DC	⊕ B	<b>3SE5 322-1SJ21</b>		1	1 unit	102	0.745
		Yellow/Green	115 AC	⊕ B	<b>3SE5 322-2SJ22</b>		1	1 unit	102	0.745
		Yellow/Green	230 AC	⊕ B	<b>3SE5 322-3SJ23</b>		1	1 unit	102	0.745
	<b>Magnetic field locks</b>	--	24 DC	⊕ ▶	<b>3SE5 322-0SB21</b>		1	1 unit	102	0.590
		--	115 AC	⊕ B	<b>3SE5 322-0SB22</b>		1	1 unit	102	0.590
		--	230 AC	⊕ B	<b>3SE5 322-0SB23</b>		1	1 unit	102	0.590
		Yellow/Green	24 DC	⊕ A	<b>3SE5 322-1SB21</b>		1	1 unit	102	0.590
		Yellow/Green	115 AC	⊕ B	<b>3SE5 322-2SB22</b>		1	1 unit	102	0.590
	Yellow/Green	230 AC	⊕ B	<b>3SE5 322-3SB23</b>		1	1 unit	102	0.590	

⊕ Positive opening according to IEC 60947-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/97).

For 1/2" NPT adaptors and cable glands, see page 13/48.

# SIRIUS 3SE5 Interlock Switches

3SE5, metal enclosures with locking force up to 2000 N

## Selection and ordering data

6 slow-action contacts · 5 directions of approach · Cable entry 3 × M20 × 1.5 · Degree of protection IP66/IP67  
 Locking force 2600 N (2000 N according to GS-ET 19)

Interlock <sup>1)</sup>	LEDs	Solenoid Rated opera- tional voltage	DT	Complete units Position monitoring: Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		V		Order No.	Price \$ per PU				kg

### 2600 N locking force · Enclosure width 54 mm

#### Spring-actuated locks

- With auxiliary release

--	24 DC	⊕ ▶	<b>3SE5 312-0SD11</b>	1	1 unit	102	1.030
--	115 AC	⊕ ▶	<b>3SE5 312-0SD12</b>	1	1 unit	102	1.030
--	230 AC	⊕ B	<b>3SE5 312-0SD13</b>	1	1 unit	102	1.030
Yellow/Green	24 DC	⊕ B	<b>3SE5 312-1SD11</b>	1	1 unit	102	1.040
Yellow/Green	115 AC	⊕ ▶	<b>3SE5 312-2SD12</b>	1	1 unit	102	1.040
Yellow/Green	230 AC	⊕ B	<b>3SE5 312-3SD13</b>	1	1 unit	102	1.040

3SE5 312-0SD1.

- With auxiliary release  
With lock

--	24 DC	⊕ B	<b>3SE5 312-0SE11</b>	1	1 unit	102	1.180
--	115 AC	⊕ B	<b>3SE5 312-0SE12</b>	1	1 unit	102	1.180
--	230 AC	⊕ B	<b>3SE5 312-0SE13</b>	1	1 unit	102	1.180
48 AC/DC		⊕ C	<b>3SE5 312-0SE14</b>	1	1 unit	102	1.180
Yellow/Green	24 DC	⊕ B	<b>3SE5 312-1SE11</b>	1	1 unit	102	1.180
Yellow/Green	115 AC	⊕ B	<b>3SE5 312-2SE12</b>	1	1 unit	102	1.180
Yellow/Green	230 AC	⊕ B	<b>3SE5 312-3SE13</b>	1	1 unit	102	1.180

3SE5 312-0SE1.

- With escape release  
from the front

--	24 DC	⊕ B	<b>3SE5 312-0SF11</b>	1	1 unit	102	1.180
--	115 AC	⊕ B	<b>3SE5 312-0SF12</b>	1	1 unit	102	1.180
--	230 AC	⊕ B	<b>3SE5 312-0SF13</b>	1	1 unit	102	1.180
Yellow/Green	24 DC	⊕ B	<b>3SE5 312-1SF11</b>	1	1 unit	102	1.180
Yellow/Green	115 AC	⊕ B	<b>3SE5 312-2SF12</b>	1	1 unit	102	1.180
Yellow/Green	230 AC	⊕ B	<b>3SE5 312-3SF13</b>	1	1 unit	102	1.180

3SE5 312-0SF1.

- With escape release  
from the back  
and auxiliary release  
from the front

--	24 DC	⊕ B	<b>3SE5 312-0SG11</b>	1	1 unit	102	1.175
--	115 AC	⊕ B	<b>3SE5 312-0SG12</b>	1	1 unit	102	1.175
--	230 AC	⊕ B	<b>3SE5 312-0SG13</b>	1	1 unit	102	1.175
Yellow/Green	24 DC	⊕ ▶	<b>3SE5 312-1SG11</b>	1	1 unit	102	1.180
Yellow/Green	115 AC	⊕ B	<b>3SE5 312-2SG12</b>	1	1 unit	102	1.180
Yellow/Green	230 AC	⊕ B	<b>3SE5 312-3SG13</b>	1	1 unit	102	1.180

3SE5 312-0SG1.

- With escape release  
from the back  
and auxiliary release  
with lock from the front

--	24 DC	⊕ B	<b>3SE5 312-0SH11</b>	1	1 unit	102	1.180
----	-------	-----	-----------------------	---	--------	-----	-------

- With emergency release  
from the back  
and auxiliary release  
from the front

--	24 DC	⊕ B	<b>3SE5 312-0SJ11</b>	1	1 unit	102	1.180
--	115 AC	⊕ B	<b>3SE5 312-0SJ12</b>	1	1 unit	102	1.180
--	230 AC	⊕ B	<b>3SE5 312-0SJ13</b>	1	1 unit	102	1.180
Yellow/Green	24 DC	⊕ B	<b>3SE5 312-1SJ11</b>	1	1 unit	102	1.180
Yellow/Green	115 AC	⊕ B	<b>3SE5 312-2SJ12</b>	1	1 unit	102	1.180
Yellow/Green	230 AC	⊕ B	<b>3SE5 312-3SJ13</b>	1	1 unit	102	1.180

3SE5 312-0SJ1.

#### Magnetic field locks

--	24 DC	⊕ ▶	<b>3SE5 312-0SB11</b>	1	1 unit	102	1.030
--	115 AC	⊕ B	<b>3SE5 312-0SB12</b>	1	1 unit	102	1.030
--	230 AC	⊕ B	<b>3SE5 312-0SB13</b>	1	1 unit	102	1.030
Yellow/Green	24 DC	⊕ B	<b>3SE5 312-1SB11</b>	1	1 unit	102	1.040
Yellow/Green	115 AC	⊕ B	<b>3SE5 312-2SB12</b>	1	1 unit	102	1.040
Yellow/Green	230 AC	⊕ B	<b>3SE5 312-3SB13</b>	1	1 unit	102	1.040

3SE5 312-0SB1.

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/97).

For 1/2" NPT adaptors and cable glands, see page 13/48.



# SIRIUS 3SE5 Interlock Switches

## 3SE5, metal and plastic enclosures – Accessories

### Selection and ordering data

Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg	
<b>Actuators for 3SE5 <sup>1)</sup></b>								
 3SE5 000-0AV01		Standard actuators, length 75.6 mm	A	<b>3SE5 000-0AV01</b>	1	1 unit	102 0.040	
 3SE5 000-0AV02		With vertical fixing, length 53 mm	A	<b>3SE5 000-0AV02</b>	1	1 unit	102 0.070	
 3SE5 000-0AV03		With transverse fixing, length 47 mm	A	<b>3SE5 000-0AV03</b>	1	1 unit	102 0.070	
 3SE5 000-0AV04		Radius actuators, length 51 mm • Direction of approach from the left • Direction of approach from the right	A	<b>3SE5 000-0AV04</b>	1	1 unit	102 0.070	
	A		<b>3SE5 000-0AV06</b>	1	1 unit	102 0.070		
 3SE5 000-0AV05		Universal radius actuators, • Length 77 mm • Length 77 mm, tab rotated 90°	A	<b>3SE5 000-0AV05</b>	1	1 unit	102 0.090	
	A		<b>3SE5 000-0AV05-1AA6</b>	1	1 unit	102 0.090		
 3SE5 000-0AV07		Universal radius actuators, heavy-duty • Length 67 mm • Length 77 mm	A	<b>3SE5 000-0AV07-1AK2</b>	1	1 unit	102 0.120	
	A		<b>3SE5 000-0AV07</b>	1	1 unit	102 0.090		
<b>Optional accessories for 3SE5</b>								
 3SE5 000-0AV08-1AA2		<b>Protective caps</b> made of black rubber for the actuator head, to protect the actuator openings from contamination	B	<b>3SE5 000-0AV08-1AA2</b>	1	1 unit	102 0.010	
 3SE5 000-0AV08-1AA3		<b>Blocking inserts</b> , high-grade steel, for actuator head, for up to 8 padlocks	B	<b>3SE5 000-0AV08-1AA3</b>	1	1 unit	102 0.065	
<b>Connections for 3SE5, 3SE2</b>								
 3SY3 127		<b>Connector sockets (4-pole), M12, fixed for M20 x 1.5</b> For max. 250 V, 4 A With 0.25 mm <sup>2</sup> connecting cable, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	B	<b>3SY3 127</b>	1	1 unit	102 0.010	
	 3RX8 000		<b>Cable boxes (4-pole), M12, non-adjustable</b> With terminal compartment, can be pre-assembled	A	<b>3RX8 000-0CB45</b>	1	1 unit	574 0.015
			<b>Angular cable boxes (4-pole), M12</b> With terminal compartment, can be pre-assembled	A	<b>3RX8 000-0CC45</b>	1	1 unit	574 0.015
 3SX9 926		<b>Connector sockets (5-pole), M12 for M20 x 1.5</b> For max. 125 V, 4 A With 0.25 mm <sup>2</sup> connecting cable, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	B	<b>3SY3 128</b>	1	1 unit	102 0.010	
		<b>Cable boxes (5-pole), M12</b> With terminal compartment, can be pre-assembled	A	<b>3RX8 000-0CB55</b>	1	1 unit	574 0.016	
		<b>Angular cable boxes (5-pole), M12</b> With terminal compartment, can be pre-assembled	A	<b>3RX8 000-0CC55</b>	1	1 unit	574 0.016	
		<b>Cable glands M20 x 1.5</b> Plastic	A	<b>3SX9 926</b>	1	1 unit	102 0.010	

1) See page 13/90 for dimensions drawings.



## SIRIUS 3SE5 Interlock Switches

3SE5 / 3SE2 with solenoid locking

## Technical specifications

Type		3SE5 322	3SE5 312	3SE2 83, 3SE2 84
<b>General data</b>				
<b>Standards</b>		IEC 60947-5-1, EN 60947-5-1		
<b>Rated insulation voltage <math>U_i</math></b>	V	250		
<b>Degree of pollution</b> acc. to EN 60664-1		Class 3		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4		6
<b>Rated operational voltage <math>U_e</math></b>				
• DC	V	24		24
• AC 50/60 Hz	V	230		110 ... 130    230
<b>Conventional thermal current <math>I_{th}</math></b>	A	6		10
<b>Rated operational current <math>I_e</math></b>				
• With alternating current 50/60 Hz		$I_e$ /AC-15 or B300		$I_e$ /AC-12 $I_e$ /AC-15
- At 24 V	A	6		10    4
- At 120 V	A	3		10    4
- At 230 V	A	1.5		10    4
• For direct current		$I_e$ /DC-13 or Q300		$I_e$ /DC-12 $I_e$ /DC-13
- At 24 V	A	3		10    3
- At 60 V		--		5    1.5
- At 110 V		--		2.5    0.7
- At 125 V	A	0.55		--    --
- At 220 V		--		1    0.3
- At 250 V	A	0.27		--    --
<b>Magnet</b>				
• Locking force, max.	N	1300	2600	1820
• Locking force acc. to GS-ET 19	N	1000	2000	1400
• Power consumption at $U_c$	W	3.5		5.2
<b>Short-circuit protection<sup>1)</sup></b>				
• With DIAZED fuse links, operational class gG	A	6		6
• Characteristic quick		--		10
• With miniature circuit breaker, Char. C	A	0.5		--
<b>Mechanical endurance</b>		1 × 10 <sup>6</sup> operating cycles		1 × 10 <sup>6</sup> operating cycles
<b>Electrical endurance</b>				
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		1 × 10 <sup>6</sup> operating cycles		1 × 10 <sup>6</sup> operating cycles
• For AC-15 utilization category		1 × 10 <sup>5</sup> operating cycles, when interrupting $I_e$ /AC-15 at 230 V		0.5 × 10 <sup>6</sup> operating cycles, when interrupting $I_e$ /AC-15 at 230 V
• For DC-13 utilization category		With DC current the contact endurance depends not only on the breaking current but also on the voltage, the circuit inductance and the speed of switching. No generally valid information can be given.		
<b>Switching frequency</b>		6 × 10 <sup>3</sup> operating cycles/h		
With 3RH11, 3RT10 16 to 3RT10 26 contactors				
<b>Shock resistance</b> acc. to IEC 60068-2-27		30 g/11 ms		--

Type		3SE5 322	3SE5 312	3SE2 83, 3SE2 84
<b>Enclosure</b>				
<b>Enclosure material</b>		Ultramid A3X2G7	Zinc diecasting GD Zn Al4 Cu1	Aluminum (GD - AISi 12)
<b>Degree of protection</b> acc. to EN 60529		IP66/IP67		IP67
<b>Ambient temperature</b>				
• During operation	°C	-25 ... +60		-30 ... +70
• During storage, transport	°C	-40 ... +80		--
<b>Mounting position</b>		Any		
<b>Connection</b>				
<b>Cable entry</b>		M 20 × 1.5		M 20 × 1.5
<b>Conductor cross-sections</b>				
• Solid	mm <sup>2</sup>	1 × (0.5 ... 1.5)		2 × 2.5
• Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 ... 0.75)		2 × 1.5
<b>Protective conductor connection</b>		--		M3.5
Inside enclosure				

<sup>1)</sup> Without any welds according to IEC 60947-5-1.

# SIRIUS 3SE5 Interlock Switches

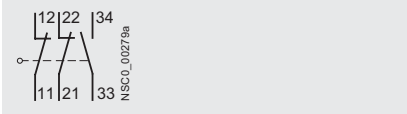
3SE5 with solenoid locking Metal and plastic enclosures

## Schematics

### 3SE5

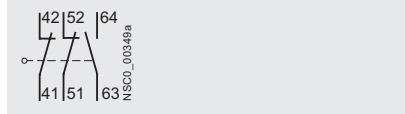
#### Monitoring the actuator:

Slow-action contacts 1 NO + 2 NC



#### Monitoring the solenoid:

Slow-action contacts 1 NO + 2 NC



## Configuration

### Operation and operating travel of actuators

#### Operation by a separate actuator

- ⊕ Positive opening acc. to EN 60947-5-1
- $v_{max}$  Max. actuating speed
- Direction of operation

#### Contact blocks

Terminal designation acc. to EN 50013

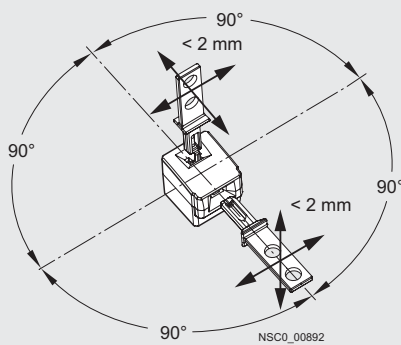
#### Nominal travel

- Contact closed
- Contact open
- Actuator in actuator head: NC is closed

### Separate actuators with solenoid interlocking

#### Standard actuators

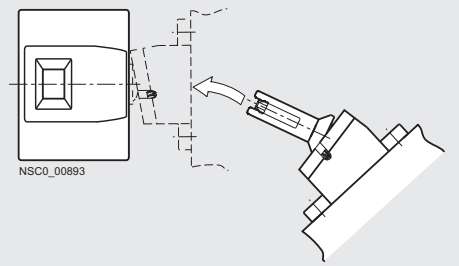
Axial and lateral actuation ( $4 \times 90^\circ$ )



Minimum force required in operating direction 30 N (on retraction)

#### Radius actuators (all directions of approach)

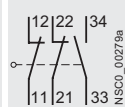
Example: Direction of approach from the left



For connector socket assignment, see page 13/61.

#### Slow-action contacts

1 NO + 2 NC



Ident. No. 12

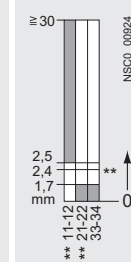
#### Lateral actuation

3SE5 3...-S...



#### Axial actuation

3SE5 3...-S...

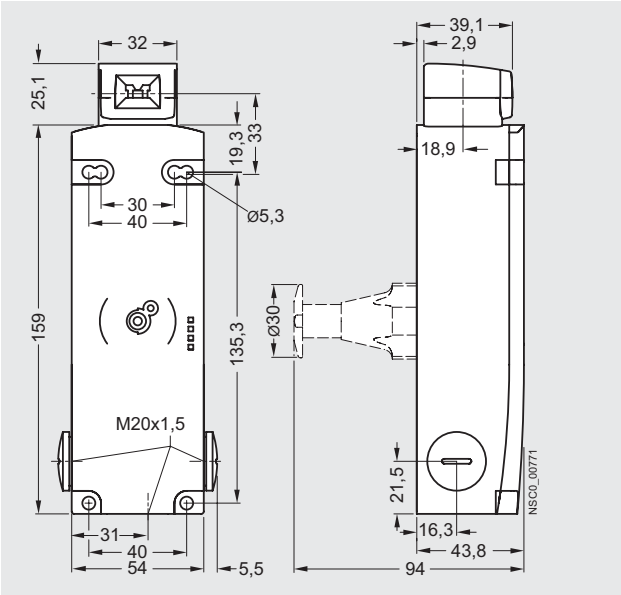


# SIRIUS 3SE5 Interlock Switches

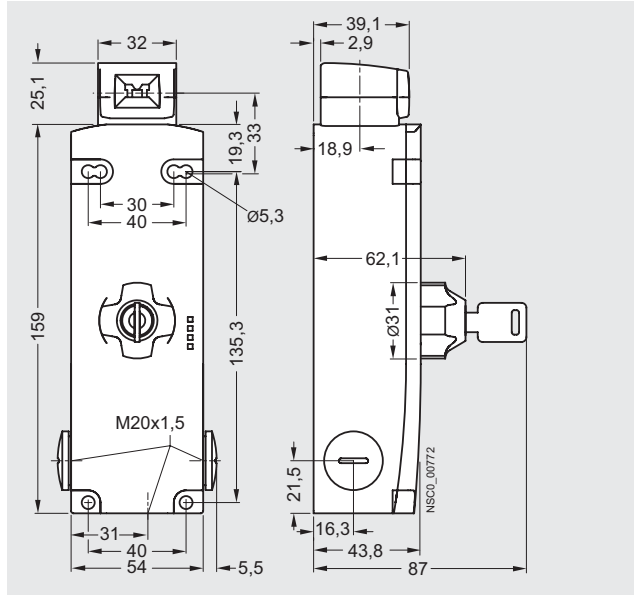
3SE5 with solenoid locking Metal and plastic enclosures

## Dimensional drawings

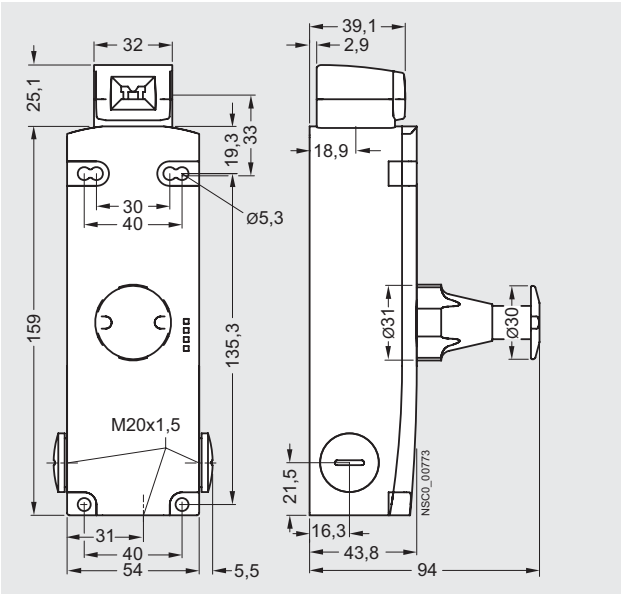
**Spring-actuated lock, with auxiliary release**  
 3SE5 322-SD2., 3SE5 322-SG2., 3SE5 322-SJ2.,  
 3SE5 312-SD1., 3SE5 312-SG1., 3SE5 312-SJ1.,



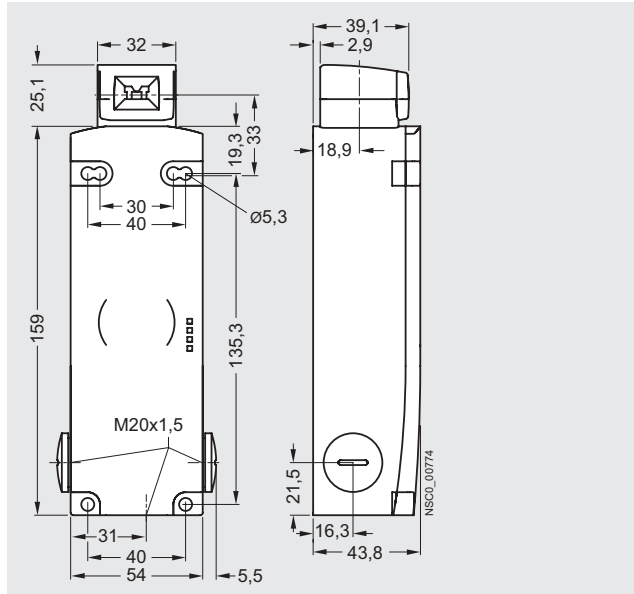
**Spring-actuated lock, with auxiliary release with lock**  
 3SE5 322-SE2.,  
 3SE5 312-SE1.



**Spring-actuated lock, with escape release**  
 3SE5 322-SF2.,  
 3SE5 312-SF1.



**Magnetic field lock**  
 3SE5 322-SB2.,  
 3SE5 312-SB1.



The plastic enclosures have knock-out openings behind the connecting thread; they are delivered therefore without protective caps.  
 For actuators see page 13/90.

## SIRIUS 3SE5 Hinge Switches

## General data

## Overview

3SE5 hinge switches have the same enclosures as the standard switches (modular system).



Hinge switches

## Design

## Enclosure sizes

The 3SE5 switches are available as complete units in two enclosure sizes:

- Plastic enclosures according to EN 50047, 31 mm wide, IP65, 1 cable entry
- Metal enclosures according to EN 50047, 31 mm wide, IP66/IP67, 1 cable entry
- Plastic and metal enclosures according to EN 50041, 40 mm wide, IP66/IP67, 1 cable entry

## Enclosure versions

Various basic versions can be selected for the enclosures:

- Available with two or three-pole contact blocks designed as snap-action contacts
- Metal enclosures for explosion protection (ATEX) ([see online](#))
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs ([see online](#))

For a description of the basic switches, [see page 13/6](#).

## Operating mechanism

The hinge switches are provided for mounting on hinges. The actuator head is included in the scope of supply. There are two versions:

- Operating mechanism with hollow shaft, inner diameter 8 mm, outer 12 mm
- Operating mechanism with solid shaft, diameter 10 mm

## Benefits

The 3SE5 hinge switches differ from the previous series through the following new characteristics:

- All actuators can be turned around the axis in increments of 22.5° ([see picture on page 13/6](#)).
- The new three-pole contact block 1 NO + 2 NC is available for all enclosure sizes ([see picture on page 13/7](#)).
- The plastic enclosure with a width of 31 mm has simple and fast wiring equipment which makes it possible to save from approx. 20 to 25 % of the time when connecting ([see picture on page 13/7](#)).
- The ASIsafe electric component is integrated for the versions with the AS-Interface connection ([see online](#)); an additional adapter is not required.

## Application

The hinge switches are used in those areas where the position of swiveling protective devices such as doors or flaps must be monitored. With these switches, the position of the doors and hinge switches is converted into electric signals. The switches allow shutdown and signaling without delay in the event of a small opening angle through the snap-action contacts with an operating angle of 10°.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. Dimensions and fixing points of the enclosures are in accordance with EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

## Standards


IEC 60947-5-1 or EN 60947-5-1.


The protective measure of "total insulation" by the molded-plastic enclosure is guaranteed by the use of molded-plastic screw-glands.

## Safety position switches

For controls according to IEC 60204-1 or EN 60204-1 the devices can be used as a safety position switch. To secure position switches against changes in their position, keyed techniques must be employed on installation.

## Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening of the NC contacts, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to IEC 60947-5-1 with the symbol .

Category 4 according to EN 954-1 can be attained with the 3SE5 hinge switches with  if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching devices from the ASIsafe, SIMATIC or SINUMERIK product ranges.

# SIRIUS 3SE5 Hinge Switches

3SE5, plastic enclosures – Enclosure width 31 mm / 40 mm

## Selection and ordering data

### Complete units

2 or 3 contacts · Degree of protection IP65 (31 mm) or IP67/IP68 (40 mm) · Cable entry M20 × 1.5

Version	Snap-action contacts	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
			Configurator			
		Order No.	Price per PU			

### Plastic enclosures · Enclosure width 31 mm acc. to EN 50047



With hollow shaft

#### With hollow shaft

Operating angle 10°	1 NO + 1 NC		B	<b>3SE5 232-0HU21</b>	1	1 unit
Operating angle 10°	1 NO + 2 NC		B	<b>3SE5 232-0LU21</b>	1	1 unit



With solid shaft

#### With solid shaft

Operating angle 10°	1 NO + 1 NC		B	<b>3SE5 232-0HU22</b>	1	1 unit
Operating angle 10°	1 NO + 2 NC		B	<b>3SE5 232-0LU22</b>	1	1 unit

### Plastic enclosures · Enclosure width 40 mm acc. to EN 50041



With hollow shaft

#### With hollow shaft

Operating angle 10°	1 NO + 2 NC		B	<b>3SE5 132-0LU21</b>	1	1 unit
---------------------	-------------	--	---	-----------------------	---	--------



With solid shaft

#### With solid shaft

Operating angle 10°	1 NO + 2 NC		B	<b>3SE5 132-0LU22</b>	1	1 unit
---------------------	-------------	--	---	-----------------------	---	--------

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators) .

Positive opening according to IEC 60947-5-1, Appendix K.

### Spare parts

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
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### Actuator heads



With hollow shaft

#### With hollow shaft

Operating angle 10°		B	<b>3SE5 000-0AU21</b>	1	1 unit
---------------------	--	---	-----------------------	---	--------



With solid shaft

#### With solid shaft

Operating angle 10°		B	<b>3SE5 000-0AU22</b>	1	1 unit
---------------------	--	---	-----------------------	---	--------

#### Note:

The respective actuators are included in the scope of supply for the complete units.

# SIRIUS 3SE5 Hinge Switches

3SE5, metal enclosures – Enclosure width 31 mm / 40 mm

## Selection and ordering data

### Complete units

3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Snap-action contacts	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)
			Configurator		
			Order No.	Price per PU	

### Metal enclosures · Enclosure width 31 mm acc. to EN 50047



With hollow shaft

<b>With hollow shaft</b> Operating angle 10°	1 NO + 2 NC	B	<b>3SE5 212-0LU21</b>		1
---	-------------	---	-----------------------	--	---



With solid shaft

<b>With solid shaft</b> Operating angle 10°	1 NO + 2 NC	B	<b>3SE5 212-0LU22</b>		1
--	-------------	---	-----------------------	--	---

### Metal enclosures · Enclosure width 40 mm acc. to EN 50041



With hollow shaft

<b>With hollow shaft</b> Operating angle 10°	1 NO + 2 NC	B	<b>3SE5 112-0LU21</b>		1
---	-------------	---	-----------------------	--	---



With solid shaft

<b>With solid shaft</b> Operating angle 10°	1 NO + 2 NC	B	<b>3SE5 112-0LU22</b>		1
--	-------------	---	-----------------------	--	---

For online configurator see [www.siemens.com/sirius/configurators](http://www.siemens.com/sirius/configurators) .

Positive opening according to IEC 60947-5-1, Appendix K.

### Spare parts

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
---------	----	-----------	--------------	-------------------	-----

### Actuator heads



With hollow shaft

<b>With hollow shaft</b> Operating angle 10°	B	<b>3SE5 000-0AU21</b>		1	1 unit
---	---	-----------------------	--	---	--------



With solid shaft

<b>With solid shaft</b> Operating angle 10°	B	<b>3SE5 000-0AU22</b>		1	1 unit
--	---	-----------------------	--	---	--------

### Note:

The respective actuators are included in the scope of supply for the complete units.

# SIRIUS 3SE2 Hinge Switches

## 3SE2, plastic enclosures with integrated hinge

### Overview

The 3SE2 283 hinge switches are particularly suitable for use in doors and flaps of machines that must be closed to ensure the safety of operating personnel. Their thin profile and compact design allow them to be directly mounted on a hinged protective cover and the stable frame.

### Benefits

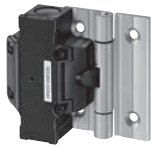
- Easy mounting through use of versions with integrated hinge
- Versions with small operating angle of 4°
- Protection against personal injury provided by positively driven NC contacts according to IEC 60947-5-1
- Simultaneous shutdown and reporting by 1 NO + 2 NC contacts

### Selection and ordering data

3 contacts · Degree of protection IP65 · Cable entry 2 × (M20 × 1.5)

Version	Slow-action contacts	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			Order No.	List Price \$ per PU				kg

#### Plastic enclosures with integrated hinge



3SE2 283

With mounted hinges (delivered with additional hinge and fixing accessories)	Slow-action contacts							
• Aluminum hinge								
- Operating angle 4°	1 NO + 2 NC	⊕ A	<b>3SE2 283-0GA43</b>		1	1 unit	102	0.425
- Operating angle 4°	3 NC	⊕ A	<b>3SE2 283-6GA43</b>		1	1 unit	102	0.425
- Operating angle 8°	1 NO + 2 NC	⊕ D	<b>3SE2 283-0GA53</b>		1	1 unit	102	0.420
- Operating angle 8°	3 NC	⊕ C	<b>3SE2 283-6GA53</b>		1	1 unit	102	0.420
• High-grade steel hinge								
- Operating angle 4°	1 NO + 2 NC	⊕ A	<b>3SE2 283-0GA44</b>		1	1 unit	102	0.800
- Operating angle 4°	3 NC	⊕ C	<b>3SE2 283-6GA44</b>		1	1 unit	102	0.800

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

#### Accessories/spare parts

Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
							kg

#### Accessories



3SX3 225

Additional hinges (delivered with fixing accessories)							
• Made of aluminum		⊕ D	<b>3SX3 225</b>		1	1 unit	102 0.160
• Made of high-grade steel		⊕ D	<b>3SX3 231</b>		1	1 unit	102 0.330

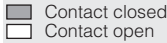
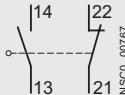
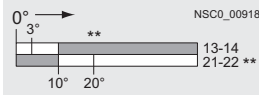
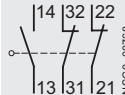
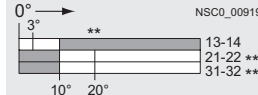
For 1/2" NPT adaptors and cable glands, see page 13/48.

# SIRIUS 3SE5 Hinge Switches

3SE5, plastic and metal enclosures

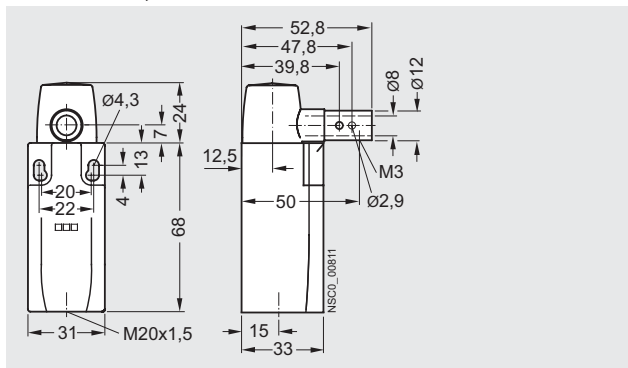
## Configuration

### Contact blocks and operating travel of actuators

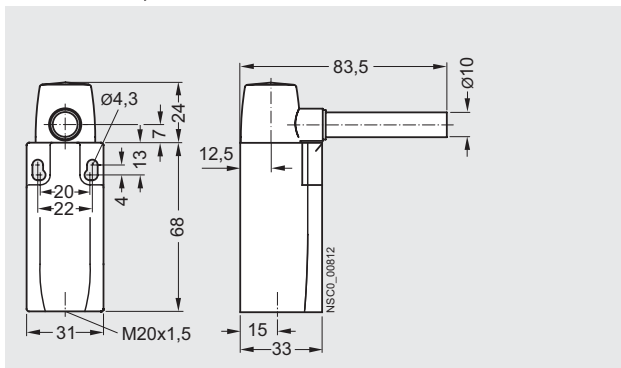
Contact blocks	Nominal travel	Contact blocks	Nominal travel
Terminal designation acc. to EN 50013	 Contact closed Contact open	Terminal designation acc. to EN 50013	
Hinge switches		Snap-action contacts	
<b>1 NO + 1 NC</b>  Ident. No. 11	<b>3SE5 ...-0HU2.</b>  NSCO_00918	<b>1 NO + 2 NC</b>  Ident. No. 12	<b>3SE5 ..-0LU2.</b>  NSCO_00919

## Dimensional drawings

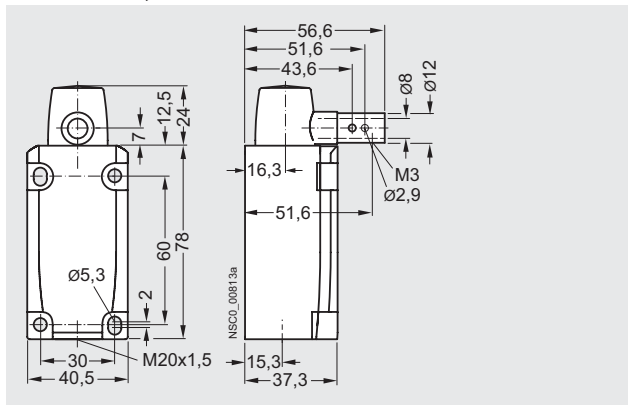
Enclosure width 31 mm with hollow shaft  
3SE5 212-0.U21, 3SE5 232-0.U21



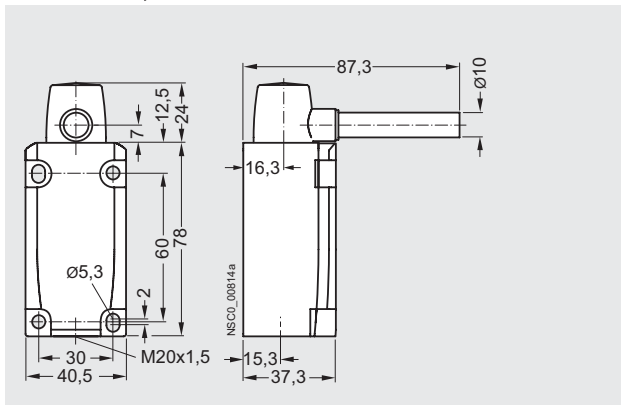
Enclosure width 31 mm with solid shaft  
3SE5 212-0.U22, 3SE5 232-0.U22



Enclosure width 40 mm with hollow shaft  
3SE5 112-0.U21, 3SE5 132-0.U21



Enclosure width 40 mm with solid shaft  
3SE5 122-0.U22, 3SE5 132-0.U22





# SIRIUS 3SE2 Hinge Switches

3SE2, plastic enclosures with integrated hinge

## Overview

The hinge switches are used for monitoring and protecting hinged protective devices such as doors and flaps.

### Characteristics

- Special design, with 2 × M20 × 1.5 connecting thread
- Degree of protection IP65
- 3 contacts
- Operating angle of 4° or 8°

## Design

The 3SE2 283 hinge switch has an integrated electromechanical contact block that is actuated when the hinged protective cover is opened. If the cover is opened by 4° or 8°, the NC contact is positively opened by a direct (not spring-action) mechanism. These positively driven contacts guarantee interruption of the electric circuit and stopping of the machine. The NO contact is closed when the cover is moved by 13.5°.

## Technical specifications

Type	3SE2 283	
Rated insulation voltage $U_i$	V	250
Conventional thermal current $I_{th}$	A	2.5
Rated operational current $I_e$		
• At AC-15, 120 V	A	4.2
• At AC-15, 250 V	A	2
• At DC-13, 24 V	A	1
Min. make-break capacity	> 5 V/1 mA	
Short-circuit protection		
• Operational class gG	A	2
Mechanical endurance	> 1 × 10 <sup>6</sup> operating cycles	
Switching frequency	1200 operating cycles/hour	
Positive opening	2 mm after opening point	
Enclosure material	Plastic	
Degree of protection	IP65	
Ambient temperature	°C	-25 ... +65
Shock resistance	30 g/18 ms	
Resistance to vibrations	20 g/10 ... 200 Hz	
Cable entry	2 × (M20 × 1.5)	
Screw terminals	0.5 ... 1.5 mm <sup>2</sup> /AWG 15	

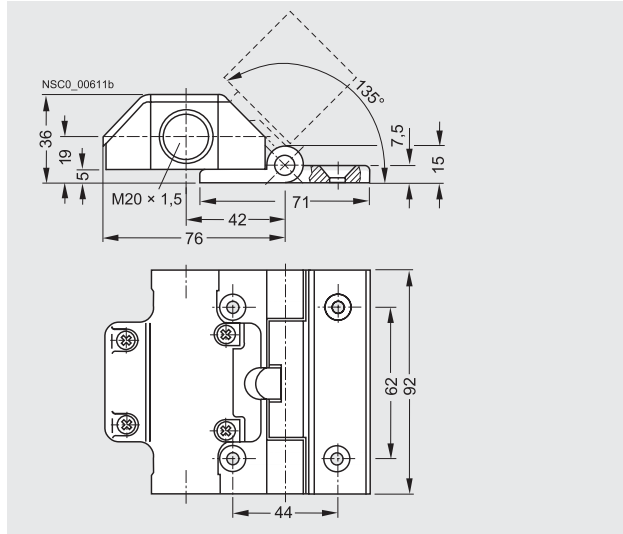
## Configuration

### Contact blocks and operating travel of actuators (operating angle 4°)

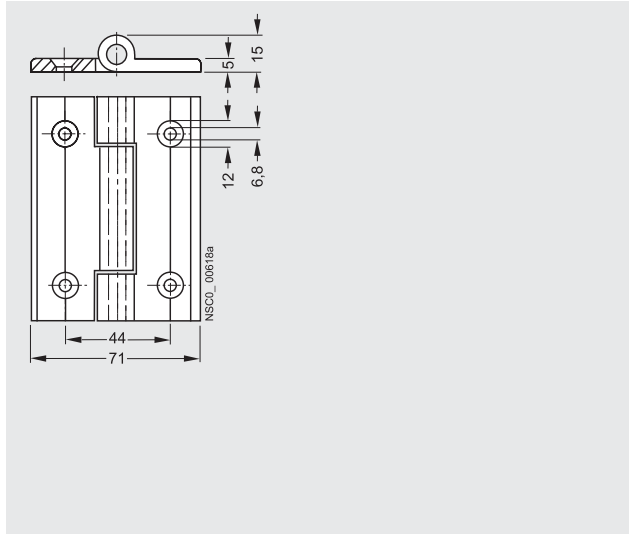
Contact blocks	Nominal travel	Contact blocks	Nominal travel
Terminal designation acc. to EN 50013		Terminal designation acc. to EN 50013	
<b>Hinge switches</b>		<b>Slow-action contacts</b>	
<b>1 NO + 2 NC</b>  Ident. No. 12	<b>3SE2 283-0GA4.</b>  NSC0_00614a	<b>3 NC</b>  Ident. No. 03	<b>3SE2 283-6GA4.</b>  NSC0_00615a

## Dimensional drawings

3SE2 283-.GA.3 hinge switch with hinge



3SX3 225 additional hinge



**Overview**

Non-contact RFID safety switches with maximum tamper resistance

3SE63 RFID contactless safety switches meet the highest safety requirements, SIL3 or Cat. 4, for monitoring the positions of movable protective devices.

An RFID safety switch consists of a coded RFID switch with an 8-pole M12 connector plug and an identical RFID actuator.

The switch is available in several versions:

- Family coded with M12 plug or with additional 18 N magnetic catch as an option
- Individually coded, programmable once, with M12 plug or with additional 18 N magnetic catch as an option
- Individually coded, programmable more than once (an unlimited number of times), with M12 plug or version with additional 18 N magnetic catch

The actuator is therefore available in two versions:

- Standard
- With 18 N magnetic catch

The magnetic catch keeps doors and hinge switches closed with permanent magnets.

**Optional accessories**

- Covers for sealing mounting holes, also suitable for tamper-proofing screw fixings
- Spacers (approx. 3 mm high) to facilitate cleaning under the installation surface when using pressure washers, for example

**Mounting and maintenance**

Reduction in the number of versions, because

- switches can be mounted on right or left sides
- the actuator can be mounted on all sides

Quick and easy mounting by thanks to universal mounting holes

- Standard gauge/holes for 3SE6 magnetically operated switch
- Fine adjustment thanks to slotted holes

Little adjustment or maintenance required

- Threshold indication by LED on the switch for quick and easy adjustment during installation and maintenance
- Molded switch allows it to be used as an end stop for small and medium-sized doors

**Note:**

Keep metal parts and cuttings away from the vicinity of the switch

Minimum distance between two switches 100 mm

**Coding****Family coded**

These safety switches are delivered ready to use, i.e. no programming is necessary.

**Individually coded, programmable once**

The assignment of safety switch and actuator thus created is irreversible.

The actuator is programmed simply by routine during startup, thus permanently preventing any form of tampering by means of a replacement actuator.

**Individually coded, programmable several times**

The procedure for programming a new actuator can be repeated an unlimited number of times. When a new actuator is programmed the previous code becomes invalid. A protected coding process allows new actuators to be programmed for service purposes.

After this, a ten-minute lockout provides enhanced tamper protection. The green LED flashes until the lockout time has ended and the new actuator has been detected. If the operational voltage is interrupted during this time, the ten-minute guard time is restarted.

**Programming procedure for individual coding**

1. Apply operational voltage to safety sensor
2. Move actuator into detecting range: red LED lights up, yellow LED flashes (1 Hz)
3. After 10 s it changes to a shorter flashing frequency (3 Hz). In this state switch off operational voltage.
4. After the next time the operational voltage is switched on, the actuator is detected again to activate the programmed actuator code. The activated code is thus stored permanently.

**Diagnostics**

The RFID safety switch indicates its operating state including faults by means of the LED indicator in the switch and the short-circuit resistant diagnostic output. The signals can then be used for central displays or non-safety-related control tasks.

There are two diagnostics functions:

- Crossover monitoring
- Open-circuit monitoring
- External voltage monitoring
- Ambient temperature too high
- Wrong or defective actuator
- Switching interval threshold identification with LED indication

The signal combination "diagnostics output switched off" and "safety outputs still switched on" can be used to move the machine into a controlled stop position.

Any crossover or a fault that is not currently compromising the safe operation of a safety switch results in the disconnection of the safety channels after a 30 minute delay. However, the diagnostics output switches off instantaneously.

## SIRIUS 3SE6 RFID Non-Contact Safety Switches

## General data

## Mode of operation of the diagnostics LEDs

The safety switch indicates not only its operating state, but also faults by means of LEDs in three colors at the ends of the RFID switch.

- The green LED indicates readiness for operation when the control supply voltage is connected.
- The yellow LED indicates that there is an actuator in detecting range. If the actuator is in the switching interval threshold, this is indicated by flashing. This flashing can be used to identify a change in the distance between sensor and actuator at an early stage (e.g. as a result of the sagging of a protective door). The installation should be tested before the distance increases further, the safety outputs switch off and the machine stops.
- The red LED indicates the individual causes of the fault by means of defined flashing frequencies.

## Benefits

- Maximum tamper resistance by means of individual coding of switches and actuators at the highest safety level
- Plastic enclosure with integrated connector
- 2 electronic short-circuit proof safety outputs, each 250 mA
- Integrated crossover, open circuit and external voltage monitoring, with series circuit as far as the control cabinet
- Safety and diagnostics signals can be connected in series
- Series connection of safety circuits in Cat. 4 / PL e / SIL 3
- LED status indication including switching interval threshold indication for quick and easy adjustment during installation and maintenance
- Short-circuit proof conventional diagnostics output
- Optional version with magnetic catch for interlocking hatches or small doors even when de-energized

- Highly rugged thanks to the use of tested enclosure materials, resistant to aggressive cleaning products, with a degree of protection of up to IP69K
- Fine adjustment thanks to slotted holes
- Little adjustment or maintenance required
- Molded switch allows it to be used as an end stop for small and medium-sized doors

## Application

RFID contactless safety switches are designed for use in safety circuits, and are used to monitor the positions of movable protective devices. They monitor the positions of rotating, laterally sliding or removable protective devices using the coded electronic actuator.

Their high degree of protection (IP69K) and the use of cleaning product-resistant materials means that these switches are optimized for use under extreme environmental conditions.

Their electronic operating principle makes these switches ideal for metalworking machinery.

The switches have a larger switching interval and switching displacement than mechanical switches, improve the mounting tolerance of the protective door, and offer a wide range of diagnostics options.

The RFID switches can be connected to all standard evaluation units, e.g. a PLC, 3TK28 safety evaluation units (in which the built-in crossover monitoring function can be deactivated), or the 3RK3 modular safety system.

The following safety categories can be achieved in safety circuits:

- Category 4 according to EN ISO 13849-1 (EN 954-1)
- PL e according to EN ISO 13849-1
- SIL 3 according to IEC 61508

## Technical specifications

Type	3SE6 3	
<b>General data</b>		
Standards	IEC 60947-5-3, IEC 61508, EN ISO 13849-1	
Enclosure material	Fiber-glass strengthened thermoplast, self-extinguishing	
Degree of protection	IP69K	
Ambient temperature		
• During operation	°C	-25 ... +70
• During storage, transport	°C	-25 ... +85
Shock resistance	30 g/11 ms	
Vibration resistance	10 ... 55 Hz amplitude 1 mm	
<b>Electrical specifications</b>		
Rated insulation voltage $U_i$	V	32
Pollution degree acc. to IEC 60664-1		3
Rated impulse withstand voltage $U_{imp}$	V	800
Rated conditional short-circuit current	A	100
Rated operational voltage $U_e$ (PELV acc. to IEC 60204-1)	V DC	24 – 15/+10 %
Protection class	II	
Overvoltage category	III	
Rated operational current $I_e$	A	0.6
Smallest operational current $I_m$	mA	0.5
No-load supply current $I_0$	mA	35

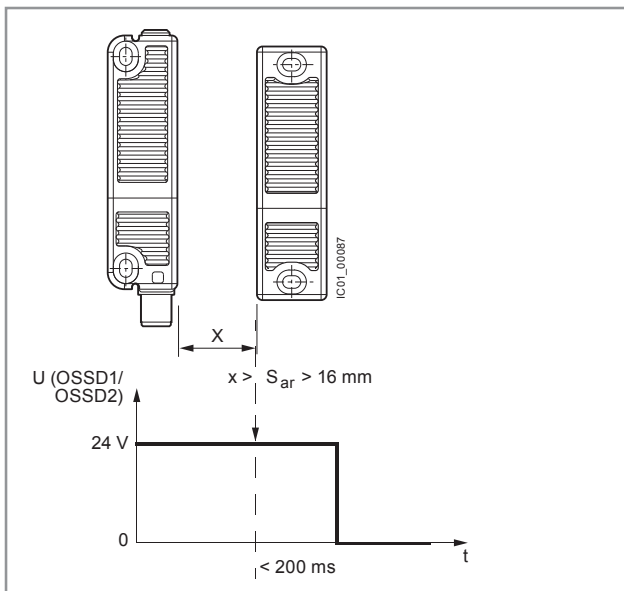
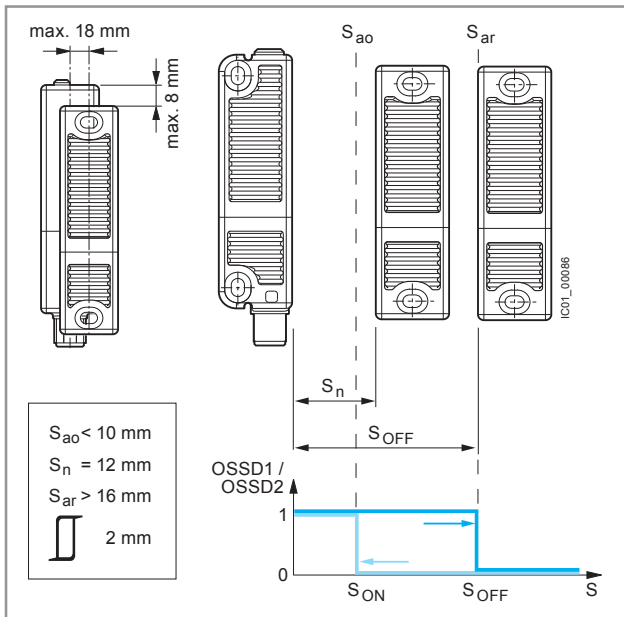
Type	3SE6 3	
<b>Inputs/outputs</b>		
<b>Safety inputs X1/X2</b>		
• Input voltage	V DC	24 – 15/+10 %
• Power consumption per input	mA	5
<b>Safety outputs OSSD1/OSSD2</b>		
p operation		
• Max. rated operational current $I_e$	A	0.25
• Rated operational current $I_e/DC-12/DC-13$ at $U_e$	A	0.25
• Voltage drop $U_e$	V	< 1
• Switching frequency	Hz	1
• Response time, max.	ms	100
• Risk time, max.	ms	200
• Recovery, max.	s	5
<b>Diagnostics output</b>		
p operation		
• Max. rated operational current $I_{e2\ max}$	A	0.05
• Rated operational current $I_e/DC-12/DC-13$ at $U_e$	A	0.05
• Voltage drop $U_e$	V	< 2
• Operational current	mA	150
• Conductor capacity, max.	nF	50

# SIRIUS 3SE6 RFID Non-Contact Safety Switches

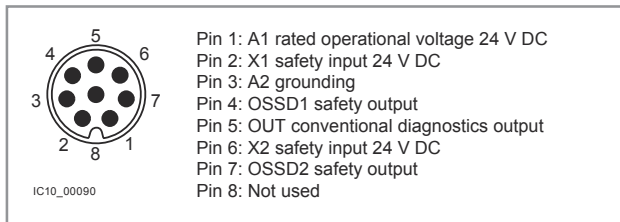
## Technical data

### Directions of approach and switching interval

The side area permits a maximum height offset of the switch and actuator of  $\pm 8$  mm (e.g. mounting tolerance or due to sagging of the protective door). The transverse offset also equals max.  $\pm 8$  mm.

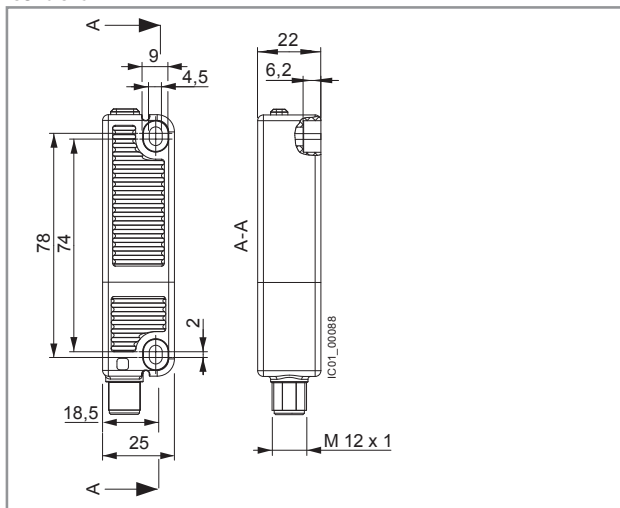


### Connector assignment

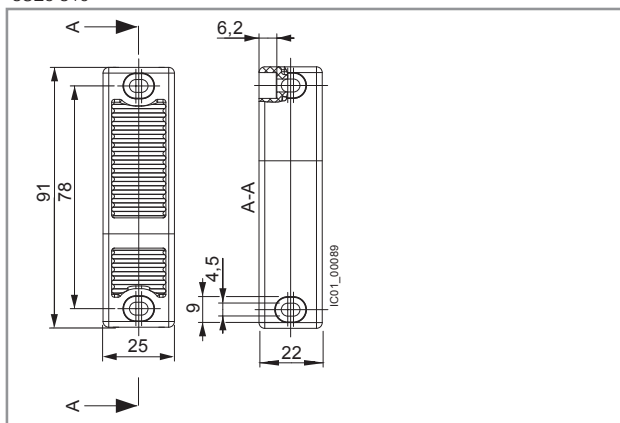


### Dimensional drawings

#### RFID switches 3SE6 315



#### RFID actuator 3SE6 310



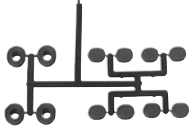



## SIRIUS 3SE6 RFID Non-Contact Safety Switches

## Selection

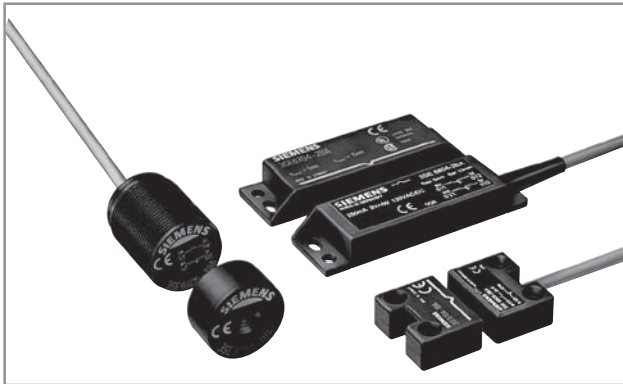
## Selection and ordering data

With M12 connector, 8-pole

Version/coding	Latching / length	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Rectangular safety switches 91 mm x 25 mm</b>						
<b>RFID safety switches</b>						
 3SE6 315	• Family coded	None	▶ <b>3SE6 315-0BB01</b>		1	1 unit
		With 18 N magnetic catch	▶ <b>3SE6 315-1BB01</b>		1	1 unit
	• Individually coded, programmable several times	None	▶ <b>3SE6 315-0BB02</b>		1	1 unit
		With 18 N magnetic catch	▶ <b>3SE6 315-1BB02</b>		1	1 unit
	• Individually coded, programmable once	None	▶ <b>3SE6 315-0BB03</b>		1	1 unit
		With 18 N magnetic catch	▶ <b>3SE6 315-1BB03</b>		1	1 unit
<b>RFID actuators</b>						
 3SE6 310	• Standard	None	▶ <b>3SE6 310-0BC01</b>		1	1 unit
		With 18 N magnetic catch	▶ <b>3SE6 310-1BC01</b>		1	1 unit
<b>Optional accessories</b>						
 3SX5 600-1G	<b>Covers and spacers</b>		A <b>3SX5 600-1G</b>		1	1 unit
		One pack (1 unit) contains 8 covers and 4 spacers				
 3SX5 601-2GA	<b>Connecting cables, 8-pole, with 1 straight M12 socket</b>	Length 3 m	A <b>3SX5 601-2GA03</b>		1	1 unit
		Length 5 m	A <b>3SX5 601-2GA05</b>		1	1 unit
		Length 10 m	A <b>3SX5 601-2GA10</b>		1	1 unit
	Rated voltage 30 V					
	Rated current 2 A					

For monitoring units see Chapter 14, "Industrial Communication"

**Overview**

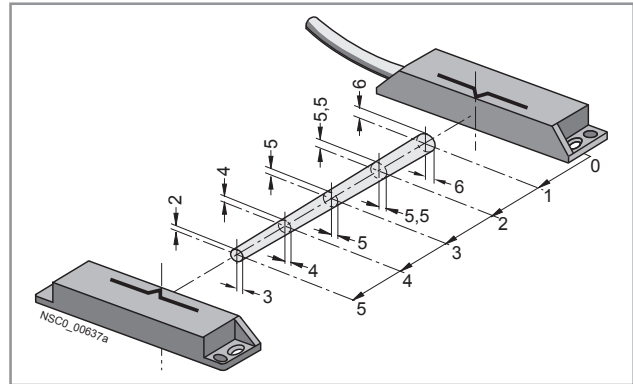


Switching magnets and contact blocks

A magnetically operated switch is comprised of a coded switching magnet and a contact block (sensor unit). Evaluation requires a safety relay or connection to a bus system.

**3SE6 806 safety relays**

Up to six protective devices (sensors) can be connected to the safety relay.



Enabling range (example)

The device has six current-sourcing semiconductor outputs (Y1 ... Y6) which signal the state of the connected protective devices.

The 3SE6 806 safety relay has two floating enabling circuits (safe circuits) as NO contact circuits and one floating signaling circuit as a NC circuit. The number of enabling circuits can be increased by adding one or more 3TK28 30 expansion modules.

**Application**

SIRIUS 3SE6 magnetically operated switches are designed for mounting on movable protective guards (hoods, hinge switches, doors, etc.). Evaluation can be performed by means of a safety relay or through connection to a bus system.

The 3SE6 6 non-contact, magnetically operated safety switches stand out due to their enclosed design with degree of protection IP67. They are particularly suitable therefore for areas exposed to contamination, cleaning or disinfecting.

A magnetic monitoring system comprises one or more magnetically operated switches and an evaluation unit, e.g. a safety relay. When contact blocks 1 NO + 1 NC are used the 3SE6 806 safety relay provides a high degree of protection against manipulation and can be installed in safety circuits up to Category 3 according to ISO 13849-1 (EN 954-1).

**Combination of monitoring units and magnetically operated switches**








Monitoring units	Magnetically operated switches (contact block + switching magnet)					Achievable category (EN 954-1)/ Performance level (EN ISO 13849-1)				
	1 NO + 1 NC	2 NC	1 NO + 2 NC	3SE6 605-1BA	3SE6 605-2BA		3SE6 605-3BA	3SE6 604-2BA	3SE6 606-3BA	3SE6 704-1BA
<b>Relay outputs</b>										
SIRIUS safety relays, 6-fold	3SE6 806-2CD00					<b>Cat. 3</b>				
SIRIUS safety relays	3TK28 20				✓	<b>Cat. 4/e</b>				
	3TK28 26	✓	✓	✓	✓	<b>Cat. 4/e</b>				
<b>Solid-state outputs</b>										
SIRIUS safety relays	3TK28 40				✓	<b>Cat. 3/d</b>				
	3TK28 41, 3TK28 42, 3TK28 45				✓	<b>Cat. 4/e</b>				
SIRIUS safety relays with contactor relay	3TK28 50, 3TK28 51, 3TK28 52				✓	<b>Cat. 3/d</b>				
	3TK28 53				✓	<b>Cat. 4/e</b>				
ASIsafe compact safety modules	3RK1 205, 3RK1 405				✓	<b>Cat. 4</b>				
SIMATIC S7-31xF-2 DP or SIMATIC ET 200M	SM 326 F, 24 DI, 24 V DC, SM 326 F, 8 DI, NAMUR	✓	✓	✓	✓	<b>Cat. 4</b>				
SIMATIC ET 200S PROFIsafe	4/8 F-DI / 3 F-DO, 24 V DC	✓	✓	✓	✓	<b>Cat. 3</b>				
	4/8 F DI, 24 V DC	✓	✓	✓	✓	<b>Cat. 4</b>				
SIMATIC ET 200eco	4/8 F DI, 24 V DC	✓	✓	✓	✓	<b>Cat. 4</b>				
SIMATIC ET 200pro	8/16 F-DI, 24 V DC, 4/8 F-DI / 4 F-DO 2 A, 24 V DC, F-Switch	✓	✓	✓	✓	<b>Cat. 4</b>				
Modular Safety System	3RK3	✓	✓	✓	✓	<b>Cat. 4/e</b>				

✓ Suitable magnetically operated switch

# 3SE6 Magnetic Monitoring Systems

## Selection

### Selection and ordering data

		Design	Size	S <sub>an</sub> ... S <sub>ab</sub>	Contacts	DT	Order No.	List Price \$ 1 unit	Weight approx. kg
<b>Round sensor unit. IP67</b>									
 	3SE6 704-1BA	Switching magnet (coded)	M 30				<b>3SE6 704-1BA</b>		0.035
	3SE6 605-1BA	Switch block with 3 m cable	M 30	5 to 15	1 NO + 1 NC		<b>3SE6 605-1BA</b>		0.166
		Switch block with M12, 4-pole male receptacle <sup>1)</sup>	M 30	5 to 15	1 NO + 1 NC		<b>3SE6 605-1BA02</b>		0.130
<b>Rectangular sensor unit. IP67</b>									
 	3SE6 605-2BA, 3SE6 704-2BA	Switching magnet (coded)	25 x 88				<b>3SE6 704-2BA</b>		0.027
		Switch block with 1 m cable	25 x 88	5 to 15	1 NO + 1 NC 2 NC		<b>3SE6 605-2BA</b> <b>3SE6 604-2BA</b>		0.165 0.165
		Switch block with M8 male receptacle	25 x 88	5 to 15	1 NO + 1 NC 2 NC		<b>3SE6 605-2BA01</b> <b>3SE6 604-2BA01</b>		0.040 0.130
		Switching magnet (coded)	25 x 33				<b>3SE6 704-3BA</b>		0.014
		Switch block with 3 m cable	25 x 33	4 to 14	1 NO + 1 NC		<b>3SE6 605-3BA</b>		0.151
	Switch block with 3 m cable	25 x 33	4 to 14	1 NO + 2 NC		<b>3SE6 606-3BA</b>		0.151	
<b>Accessories</b>									
 	3SX3 260	Spacer for rectangular sensor unit	25 x 88				<b>3SX3 260</b>		0.015
	3SX3 261	Spacer for rectangular sensor unit	25 x 33				<b>3SX3 261</b>		0.010
<b>Monitoring units</b>									
	3SE6 806-2CD00		24	2 NO / 1 NC	6 1 NO + 1 NC		<b>3SE6 806-2CD00</b>		0.200

1) Pin 1 (S21) + Pin 2 (S22) = Normally Closed; Pin 3 (S13) + Pin 4 (S14) = Normally Open  
 Typical 4-pole Female Plugs with black 5 meter cable include: 3RX1542 (right-angle) or 3RX1513 (straight plug).



## Technical specifications

## Magnet Switches

Type	3SE6 60.-1BA 3SE6 60.-2BA	3SE6 60.-3BA
Form	M30, 25 mm x 88 mm	25 mm x 33 mm
Standards	DIN EN 50947-5-3 <sup>3)</sup>	
Sensing type	Magnetic	
Rated voltage	AC/DC 100 V, 120 V	DC 24 V
Rated current	400 mA	100 mA
Performance	10 VA/W	1 W
Max. switching frequency	5 Hz	
Max. sensing distance $S_{an} \dots S_{ab}$	5 ... 15 mm	4 ... 14 mm
Housing material	Fiber-glass strengthened with glass fiber	
Degree of protection acc. to IEC 60529	IP67	
Permissible ambient temperature	<ul style="list-style-type: none"> <li>• Operating</li> <li>• Storage</li> </ul> -25 to +70 °C -25 to +70 °C	
Shock resistance	10 g/11ms	
Vibration resistance	10 ... 55 Hz, 1 mm amplitude	
Conductor	Cable LiYY 4 x 0.25 mm <sup>2</sup> 3 m length	
Receptacle, male	M12, M8	-
Cable length (max for connecting to monitoring unit)	1000 m	100 m

## Magnet Switch Monitoring Unit

Type	3SE6 806-2CD00
Standards	EN ISO 13849-1, EN 1088
Rated control supply voltage $U_c$	DC 24 V
Rated control supply voltage tolerance	0.85 ... 1.2 x $U_s$
Rated power (without signal outputs Y1 ... Y6)	3 W
Maximum load current	<ul style="list-style-type: none"> <li>• Signaling circuit Y1 ... Y6</li> <li>• Signaling circuit 31, 32</li> </ul> 20 mA 2 A
Inputs	6 sensors (1 NO or 1 NC)
Outputs	6 signaling outputs 1 relay output 2 enabling circuits
Response time	<ul style="list-style-type: none"> <li>• Automatic start</li> <li>• Manual start</li> </ul> 150 ms typical 25 ms typical
Release time	20 ms max.
Recovery time	350 ms
Degree of protection to IEC 60529	IP20
Switching capacity <sup>1)</sup>	Release circuits (13, 14 and 23, 24) Continuous current, $I_{th}$ Rated operational current, $I_e$ <sup>2)</sup> <ul style="list-style-type: none"> <li>• AC-15 @ 203 V</li> <li>• DC-13               <ul style="list-style-type: none"> <li>- 24 V</li> <li>- 115 V</li> <li>- 230 V</li> </ul> </li> </ul> 6 A 6 A 6 A 0.2 A 0.1 A
Short circuit protection	DIAZED <ul style="list-style-type: none"> <li>• Fuse type</li> <li>• Duty class               <ul style="list-style-type: none"> <li>- gL(gC)</li> <li>- Quick response</li> </ul> </li> </ul> 6 A 10 A
Permissible ambient temperature, $T_u$	<ul style="list-style-type: none"> <li>• Operating</li> <li>• Storage</li> </ul> -25 to +45 °C -25 to +70 °C

1) Utilization category per DIN VDE 0660, Part 200, IEC 60947-5-1  
 2) With all release circuits loaded

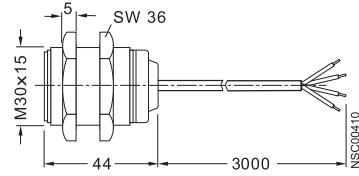
3) In combination with monitoring unit or AS-Interface.



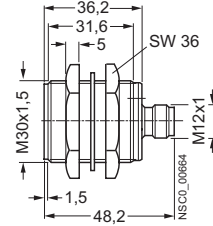
**Dimension drawings**

*Round sensor units*

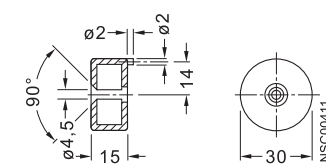
**Switch block 3SE6 605-1BA**



**Switch block 3SE6 605-1BA02**

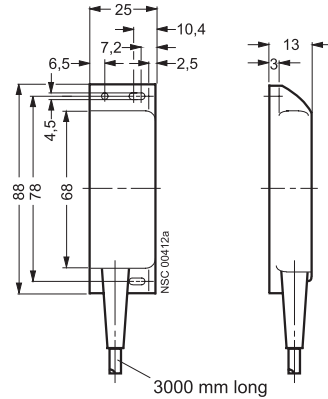


**Coded switching magnet 3SE6 704-1BA**



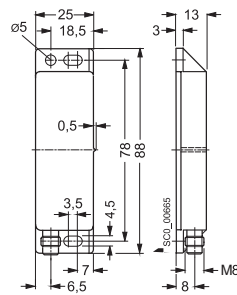
*Rectangular sensor units*

**Switch block 3SE6 605-2BA**

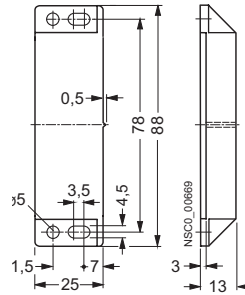


Switching magnet without lead

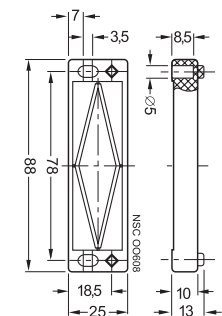
**Switch block 3SE6 60.-2BA0.**



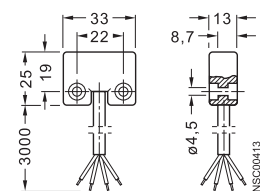
**Switch block 3SE7 704-2BA**



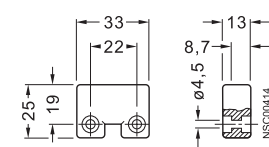
**3SX3 260 spacer**



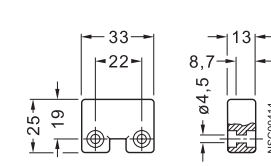
**Switch block 3SE6 605-3BA**



**Coded switching magnet 3SE6 704-3BA**

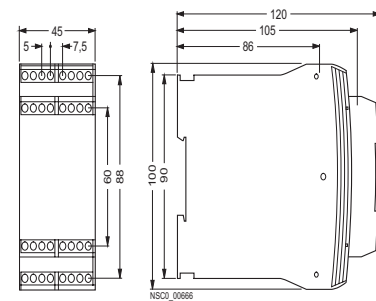


**3SX3 261 spacer**



*Monitoring unit*

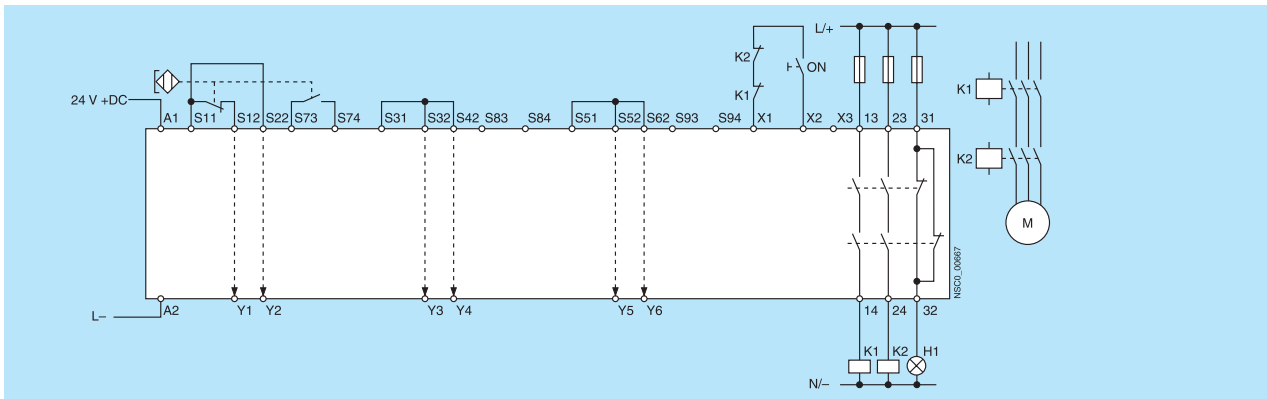
**Magnet Switch Monitor 3SE6 806-2CD00**



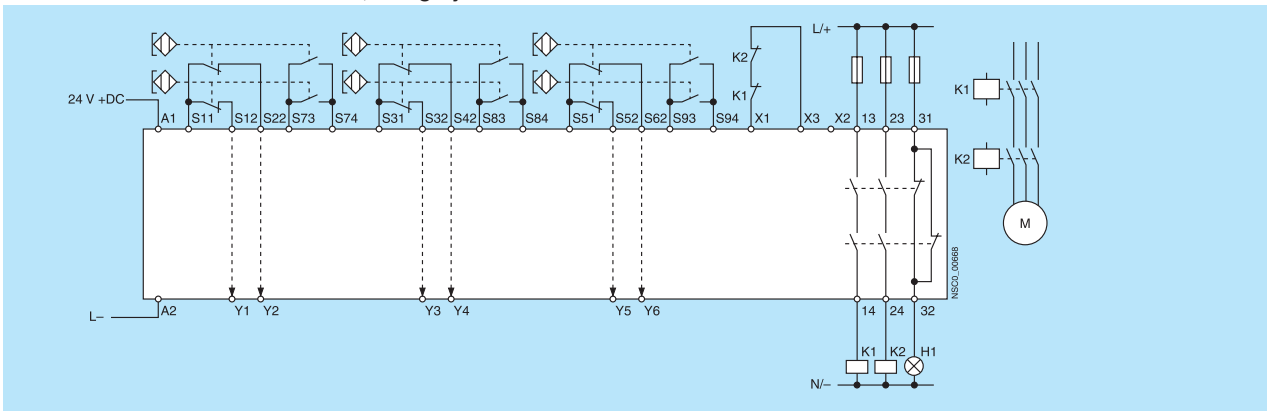
**Circuit diagrams**

*Connection example*

**Single Channel Control, Manual Start, Category 3 to EN ISO 13849-1**



**Six Channel Control. Automatic Start, Category 3 to EN ISO 13849-1**

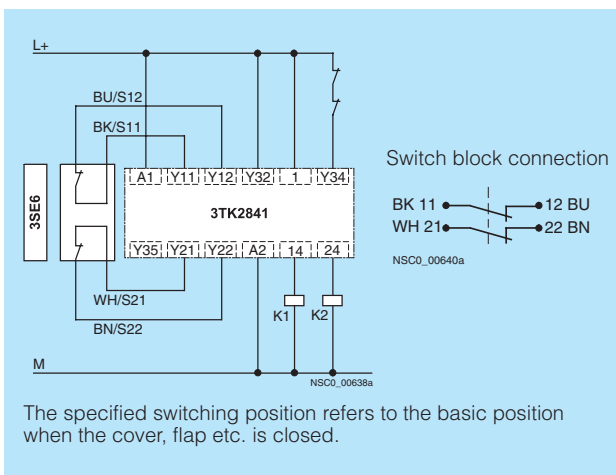


**Terminal Assignments**

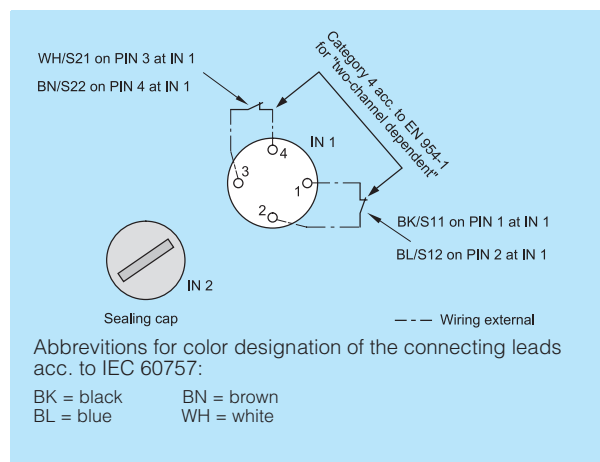
Power	A1+, L+	U <sub>s</sub>
	A2-, L-	24 V DC
Sensors	S11, S12	Channel 1, NC contact
	S11, S22	Channel 2, NC contact
	S31, S32	Channel 3, NC contact
	S31, S42	Channel 4, NC contact
	S51, S52	Channel 5, NC contact
	S51, S62	Channel 6, NC contact

Sensors (Cont.)	S73, S74	Channel 1+2, NO contact (parallel)
	S83, S84	Channel 3+4, NO contact (parallel)
	S93, S94	Channel 5+6, NO contact (parallel)
Outputs	13, 14	Release circuit 1 (safety NO contact)
	23, 24	Release circuit 2 (safety NO contact)
	31, 32	Floating signaling circuit
	Y1 to Y6	Status of Channels 1 through 6

**3SE6 604-2BA magnetically operated switch with 3TK28 safety relay, Category 4 to EN ISO 13849-1**



**3SE6 604-2BA magnetically operated switch on AS-Interface Safety at Work, safe K45F or K60F compact module, Category 4 to EN ISO 13849-1**



# 3SB3 Two-Hand Control

## Selection

### Application

Two-hand operation consoles are required for use with machines and systems that have hazardous areas, in order to direct both hands of the operator to one position.

Operation consoles are primarily used on presses, stamping machines, printing presses and paper converting machines, in the chemical industry and in the rubber and plastics industries.

### Specifications

Two-hand operation consoles fulfill the requirements laid down in DIN 24 980 and EN 574.

### Construction

#### Equipment

All consoles are pre-equipped with SIGNUM 3SB3 control devices. The metal version is also available as an unequipped empty enclosure.

The plastic version can be retrofitted with up to 8 command points, in line with the customer's requirements. The surface of the console has premachined breaking points for this purpose.

### Installation



The two-hand operation consoles can be mounted either on the stand available or directly on the machine by means of the holes in the rear panel.

### Principle of operation

The control command is given by pressing the two operating elements simultaneously (within

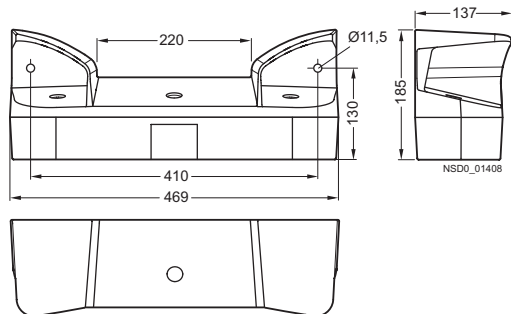
0.5 s of each other) and must be maintained for as long as a hazard exists.

### Selection and ordering data

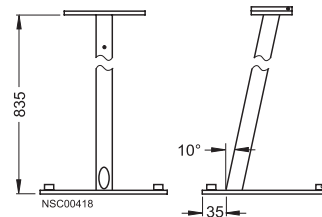
Design	DT	Order No.	List Price \$ 1 unit	Weight approx. kg	
 <p>3SB38 63-4BB</p> <p><b>SIGUARD two-hand operation console</b> Degree of protection IP 65, acc. to DIN 24 980 (EN 574), Standard equipment with 2 black operating elements (mushroom button 3SB30 00-1GA11, Ø 40 mm, 1 NO + 1 NC) and a red EMERGENCY-STOP mushroom button 3SB30 00-1HA20, latching Ø 40 mm, 2 NC</p> <ul style="list-style-type: none"> <li>• <b>Metal version</b> <ul style="list-style-type: none"> <li>- with standard equipment</li> <li>- with standard equipment and 4 additional holes for control devices 22.5 mm</li> <li>- empty enclosure, unequipped</li> </ul> </li> <li>• <b>Plastic version</b> <ul style="list-style-type: none"> <li>- with standard equipment and predetermined breaking points for 8 further command points 22.5 mm</li> <li>- with cable inlet holes for metric screwed cable glands</li> </ul> </li> </ul>		<b>3SB38 63-4BB</b>		4.800	
			<b>3SB38 63-4BA</b>		4.800
			<b>3SB38 63-4BC</b>		4.800
 <p>3SB39 01-0AQ</p> <p><b>Stand for SIGUARD two-hand operation consoles</b></p> <ul style="list-style-type: none"> <li>• with cable inlet holes for metric screwed cable glands</li> </ul>		<b>3SB38 63-1BB3</b>		2.300	
			<b>3SB39 01-0AQ3</b>		4.500

### Dimension drawings

3SB38 63-4 operator panel with metal enclosure



3SB39 01-0AQ stand



Note:

Also available with AS-Interface connection, contact your local Siemens representative.

## Overview



SIRIUS 3SK safety relays

SIRIUS 3SK safety relays are the key elements of a consistent, cost-effective safety chain. Whether you need EMERGENCY-STOP disconnection, protective door monitoring, light arrays, laser scanners or the protection of presses or punches – with SIRIUS safety relays, all safety applications can be implemented within a minimum width to optimum effect in terms of engineering and price.

The following safety-related functions are available:

- Monitoring the safety functions of sensors
- Monitoring the sensor leads
- Monitoring the correct device function of the safety relay
- Monitoring the actuators in the shutdown circuit
- Safety-related disconnection when dangers arise

SIRIUS 3SK safety relays are approved for applications up to SIL 3 (IEC 61508/IEC 62061) or PL e (EN ISO 13849-1).

**Device series**

SIRIUS 3SK safety relays stand out due to their flexibility for both parameterization and system designs with several evaluation units. Optimized solutions when selecting components are facilitated by a clearly structured component range:

- 3SK1 Standard basic units
- 3SK1 Advanced basic units
- 3SK2 basic units
- 3SK output expansions
- 3SK1 input expansions
- Accessories

3SK1 Standard basic units

The 3SK1 Standard basic units are characterized by the following features:

- Compact design
- Simple operation
- Relay and semiconductor outputs
- Economical solution

3SK1 Advanced basic units

The 3SK1 Advanced basic units also offer:

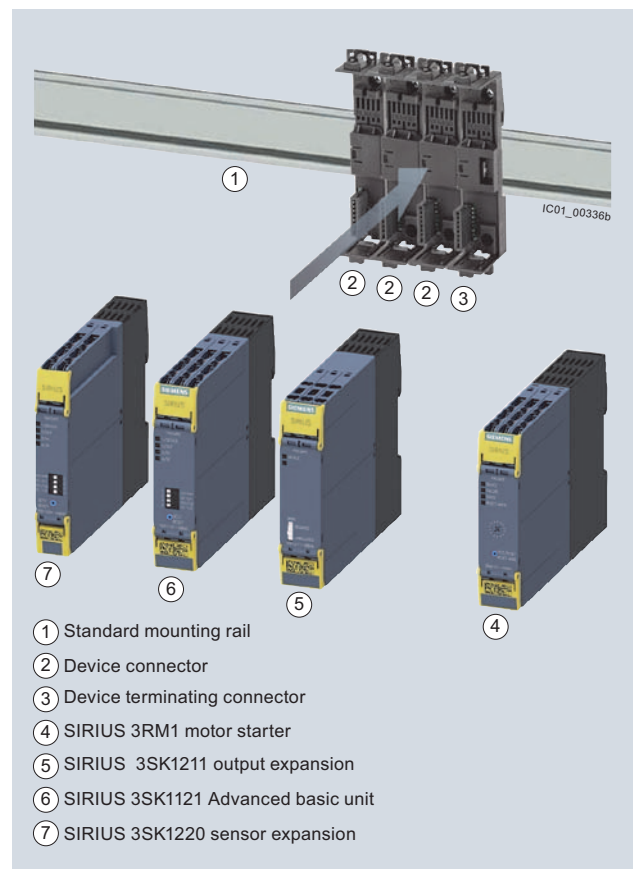
- Universal application possibilities thanks to multifunctionality
- Time-delayed outputs
- Expansion of inputs and outputs

3SK2 basic units

The 3SK2 basic units also offer:

- Up to six fail-safe shutdown functions
- Flexible in use thanks to software parameterization
- Powerful semiconductor outputs
- User-friendly diagnostics using diagnostics display and configuring software

In the case of 3SK1 Advanced basic units or 3SK2 basic units, the 3ZY12 device connector allows safety functions involving several sensors and actuators to be constructed very quickly.



System configuration example

The 3SK1 and 3SK2 Standard and Advanced series are a high-quality replacement for the 3TK28 safety relays. In their narrower design, and equipped with greater functionality, they can replace every 3TK28 device. The only exception to this are the 3TK2810 devices.

Note:

Conversions from 3TK28 to 3SK, [see www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool).

**Overview of functions of the 3SK series**

Type	3SK1 Standard basic units		3SK1 Advanced basic units		3SK2 basic units	
	Safe relay outputs	Safe semiconductor outputs	Safe relay outputs	Safe semiconductor outputs	22.5 mm Safe semiconductor outputs	45 mm Safe semiconductor outputs
<b>Sensors</b>						
• Mechanical	✓	✓	✓	✓	✓	✓
• Single-ended	✓ <sup>1)</sup>	✓	✓	✓	✓	✓
• Antivalent	--	--	✓	✓	✓	✓
• Expandable	--	✓ by means of cascading	✓	✓	--	--
<b>Inputs</b>						
• Freely parameterizable	--	--	--	--	10 single-channel, 5 two-channel	20 single-channel, 10 two-channel
<b>Parameters</b>						
• Start (auto/monitored)	✓	✓	✓	✓	A variety of functions can be set for each input/output by means of software parameterization.	
• Sensor connection, 2 x 1-channel/ 1 x 2-channel	✓ by means of wiring	✓	✓	✓		
• Cross-circuit detection	✓ by means of wiring	✓	✓	✓		
• Start test ON/OFF	--	✓	✓	✓		
• Monitoring of two-hand operator controls according to EN 574	--	--	✓	✓		
• Pressure-sensitive mat	--	--	✓	✓		
• Start	✓	✓	✓	✓		
<b>Safe outputs</b>						
• Instantaneous	✓	✓	✓	✓	Parameterizable	Parameterizable
• Time-delayed	--	--	✓	✓	Parameterizable	Parameterizable
• Expandable with safe relay outputs	✓ by means of wiring	✓ by means of wiring	✓	✓	✓	✓
• Independent	--	--	--	--	✓ <sup>4)</sup>	✓ <sup>5)</sup>
• Device connectors	--	--	✓	✓	✓	✓
<b>Options</b>						
• External memory module	--	--	--	--	--	✓
• Display on the device	--	--	--	--	--	✓
• External diagnostics module can be connected	--	--	--	--	✓	✓
<b>Rated control supply voltage</b>						
• 24 V DC	✓ <sup>2)</sup>	✓	✓	✓	✓	✓
• 115 ... 240 V AC/DC	✓	--	✓ <sup>3)</sup>	✓ <sup>3)</sup>	--	--

✓ Available  
 -- Not available

1) 24 V basic units only.  
 2) 24 V AC/DC.  
 3) Possible using 3SK1230 power supply via device connector.  
 4) Up to 4 independent safe outputs, two of which via device connectors.  
 5) Up to 6 independent safe outputs, two of which via device connectors.

# SIRIUS 3SK

## General Data

### Parameterization

#### 3SK112 and 3SK1112 with DIP switch

The 3SK112 and 3SK1112 safety relays are configurable safety relays. They are used as evaluation units for typical safety chains (identify, evaluate, realize). A number of functions can be set using the DIP switches on the front. 3SK112 and 3SK1112 are therefore universally applicable.

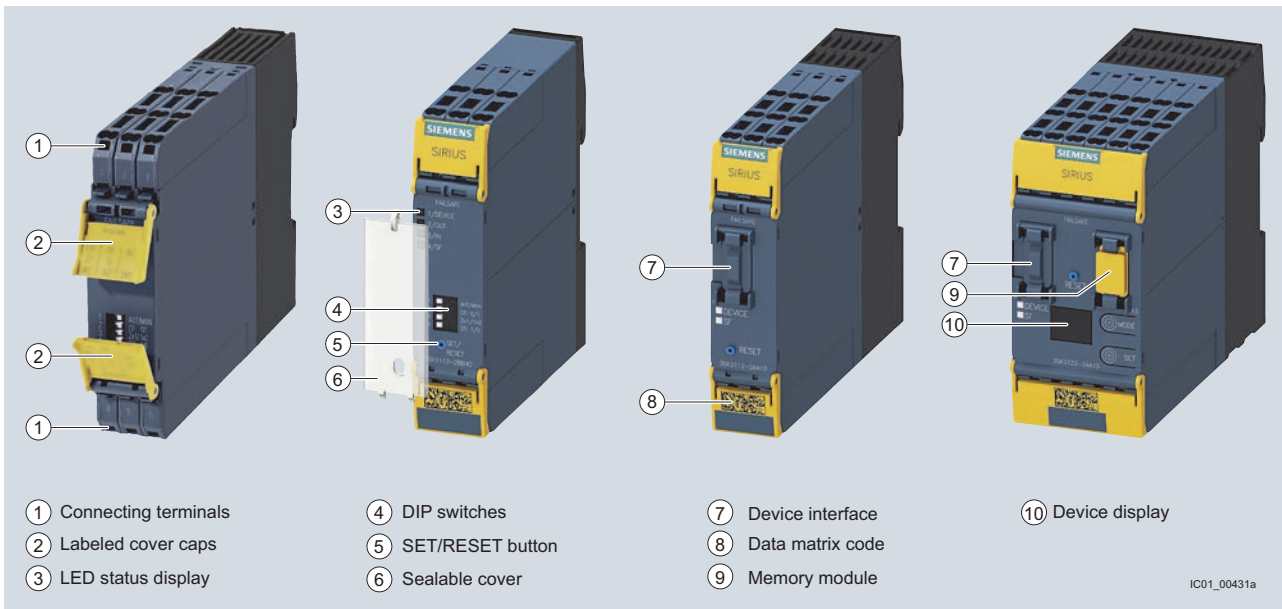
DIP switch No.	OFF	ON	Schematic
1	Sensor input Autostart	Sensor input Monitored start	
2	Without crossover monitoring	With crossover monitoring	
3	2 x single-channel sensor connection	1 x 2-channel sensor connection	
4	With start test	Without start test	

#### 3SK2 with software

The 3SK2 safety relays are configured with the SIRIUS Safety ES software. The behavior of a 3SK2 device as well as the functioning of the individual safe outputs can thus be parameterized simply and conveniently in the logic diagram. In addition, the configuration can be printed out for documentation purposes. The software also supports users in commissioning and troubleshooting by means of online diagnostics and the option of "forcing" signals in the logic diagram. The 3SK2 safety relays thus offer maximum flexibility and universal application options.

**Note:**

For SIRIUS Safety ES, [see page 13/155](#).



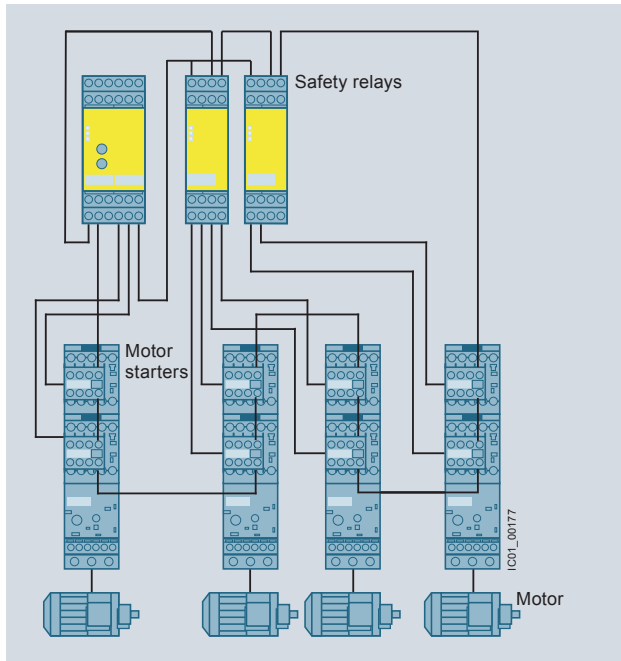
Innovative enclosure concept for SIRIUS 3SK safety relays

### Expansion option by adding the 3RM1 motor starter

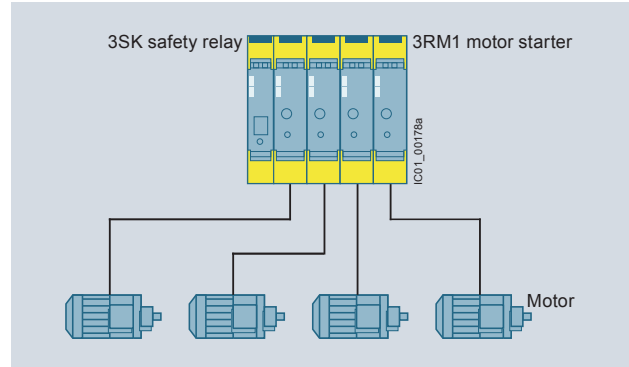
With previous safety relay and motor feeder configurations, a huge amount of wiring was required to monitor the motor feeders in safety applications.

With the integration of the SIRIUS 3RM1 motor starter into the SIRIUS 3SK safety relay system family, this wiring has been minimized for the first time.

Motor starters up to 3 kW can easily be integrated into the safety relay system using SIRIUS 3ZY12 device connectors, without additional wiring between the evaluation unit and the motor starter.



Conventional system configuration



System design using 3SK and 3RM1

### Article No. scheme

#### 3SK1

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	
	□□□	□	□	□	□	-	□	<b>A</b>	□	□	
Safety relays	<b>3SK</b>										
Generation	<input type="checkbox"/>										
Device version	<input type="checkbox"/>										
Device series	<input type="checkbox"/>										
Type of outputs	<input type="checkbox"/>										
Connection type	<input type="checkbox"/>										
Rated control supply voltage	<input type="checkbox"/>										
Type of rated control supply voltage	<input type="checkbox"/>										
Time delay	<input type="checkbox"/>										
Example	<b>3SK</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>A</b>	<b>B</b>	<b>4</b>	<b>0</b>

#### 3SK2

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	
	□□□	□	□	□	□	-	□	<b>A</b>	<b>A</b>	<b>1</b>	<b>0</b>
Safety relays	<b>3SK</b>										
Generation	<input type="checkbox"/>										
Device version	<input type="checkbox"/>										
Device version, alternative volume of project data	<input type="checkbox"/>										
Type of outputs	<input type="checkbox"/>										
Connection type	<input type="checkbox"/>										
Example	<b>3SK</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>1</b>	<b>A</b>	<b>A</b>	<b>1</b>	<b>0</b>

#### Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the catalog in the Selection and ordering data.

**Benefits****General**

- Approved for all safety applications because of its compliance with the highest safety requirements (SIL 3 and PL e)
- Universally usable thanks to adjustable parameters
- Usable worldwide thanks to globally valid certificates
- Compact SIRIUS design
- Device connectors with standard rail mounting for flexible connectability and expandability
- Removable terminals for greater plant availability
- Yellow terminal covers clearly identify the device as a safety component.
- Sensor cable up to 2 000 m long allows it to be used in extensive plants.

**Relay outputs**

- Different voltages can be switched through the floating contacts.
- The power relay contacts allow currents of up to 5 A at AC-15/DC-13 to be connected.

**Semiconductor outputs**

- Wear-free
- Suitable for operation in fast switching applications
- Insensitive to vibrations and dirt
- Good electrical endurance

**Power outputs (3SK1213 output expansion)**

- Different voltages can be switched through the floating contacts.
- The power relay contacts allow currents of up to 10 A AC-15/6 A DC-13 to be connected.
- High mechanical and electrical endurance
- Protective separation between safe outputs and electronics

**Expansion option by adding the 3RM1 motor starter**

SIRIUS 3SK safety relays are ideal for combining with the SIRIUS 3RM1 motor starters.

Combinations are made by means of

- SIRIUS 3ZY12 device connectors (in combination with 3SK1 Advanced/3SK2) or
- Conventional wiring (for all 3SK1 and 3SK2 basic units).

This makes collective shutdown very easy in assemblies. The wiring, and ultimately the shutting down of the control supply voltage for the expansion components in EMERGENCY-STOP situations, is performed via the device connector. There is no further need for complex looping of the connecting cables between the safety relay and the motor starters.

The 3RM1 motor starter combines the benefits of semiconductor technology and relay technology. This combination is also known as hybrid technology.

The hybrid technology in the motor starter is characterized by the following features:

- The inrush current in the case of motorized loads is conducted briefly via the semiconductors. Advantages include protection of the relay contacts and a long service life due to low wear.
- The uninterrupted current is conducted via relay contacts. Advantages include lower heat losses compared with the semiconductor.
- Shutdown is implemented again via the semiconductor. The contacts are only slightly exposed to arcs, and this results in a longer service life.
- Integrated overload protection

**3ZY12 device connectors**

Using 3ZY12 device connectors to combine devices reduces the time required to configure and wire the components. At the same time errors are avoided during wiring, and this considerably reduces the testing required for the fully-assembled application.

**Configuration and stock keeping**

Variable setting options by means of DIP switches or software, a wide voltage range (3SK1111) and a special power supply unit (3SK1 only) reduce the cost of keeping stocks and the considerations involved in configuration where the evaluation units to be selected are concerned.

**Application****3SK1 safety relays**

SIRIUS 3SK1 safety relays are used mainly in autonomous safety applications which are not connected to a safety-related bus system. Their function here is to evaluate the sensors and the safety-related shutdown of hazards. Also they check and monitor the sensors, actuators and safety-related functions of the safety relay.

**3SK2 safety relays**

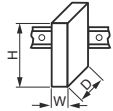
SIRIUS 3SK2 safety relays are used primarily in autonomous, more complex safety applications for which the functional scope of the 3SK1 devices is no longer sufficient, such as in the implementation of independent shutdown functions. Their function here is to evaluate the sensors and the safety-related shutdown of hazards. Also they check and monitor the sensors, actuators and safety-related functions of the safety relay.



### Technical specifications

#### SIRIUS 3SK1 safety relays

Type	3SK1111- .AB30, 3SK1211- .BB00, 3SK1211- .BB40	3SK1111- .AW20, 3SK1121, 3SK1211- .BW20	3SK1112	3SK1120	3SK1122	3SK1213	3SK1220
Dimensions							
• Width	mm	22.5	22.5	22.5	17.5	22.5	90
• Height	mm	100	100	100	100	100	100
• Depth	mm	121.6	121.6	91.6	121.6	121.6	121.6



General data							
<b>Ambient temperature</b>							
• During operation	°C	-25 ... +60					
• During storage	°C	-40 ... +80					
<b>Installation altitude at height above sea level maximum</b>		m	2 000				
<b>Air pressure</b>		kPa	90 ... 106				
According to SN 31205							
<b>Shock resistance</b>			10 g / 11 ms			5 g / 10 ms	10 g / 11 ms
<b>Vibration resistance</b>			5 ... 500 Hz: 0.75 mm				
Acc. to IEC 60068-2-6							
<b>IP degree of protection of the enclosure</b>			IP20				
<b>Touch protection against electric shock</b>			Finger-safe				
<b>Insulation voltage, rated value</b>		V	300		50	300	50
<b>Rated impulse withstand voltage</b>		V	4 000		500	4 000	800
<b>Safety integrity level (SIL)</b>			SIL 3				
According to IEC 61508							
<b>Performance level (PL)</b>			e				
According to ISO 13849-1							
<b>T1 value for proof test interval or a service duration</b>		a	20				
According to IEC 61508							
<b>EMC emitted interference</b>			IEC 60947-5-1, class B		IEC 60947-5-1, class A	IEC 60947-5-1, class B	IEC 60947-5-1, class A
<b>Certificate of suitability</b>			Yes				
• UL certification			Yes				
• TÜV approval			Yes				

Type	3SK1111, 3SK1121-.AB40, 3SK1211	3SK1112, 3SK1122	3SK1120	3SK1121-.CB4.	3SK1213
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Switching capacity					
<b>Switching capacity current of the NO contacts of the relay outputs</b>					
• At AC-15 at 230 V	A	5	--	3	10
• At DC-13 at 24 V	A	5	--	3	6
<b>Switching capacity current of the semiconductor outputs</b>					
• At DC-13 at 24 V	A	--	2	0.5	--

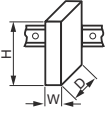
Type	3SK1111- .AB30, 3SK1211	3SK1111- .AW20	3SK1112, 3SK1220	3SK1120, 3SK1122- .AB40	3SK1121- .AB40	3SK1121- .CB4.	3SK1122- .CB4.	3SK1213
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PFHd and PFDavg values										
<b>PFHD with high demand rate</b>		1/h	1.7 x 10 <sup>-9</sup>	1.5 x 10 <sup>-9</sup>	1.0 x 10 <sup>-9</sup>	1.3 x 10 <sup>-9</sup>	2.5 x 10 <sup>-9</sup>	3.7 x 10 <sup>-9</sup>	1.5 x 10 <sup>-9</sup>	1.0 x 10 <sup>-9</sup>
according to EN 62061										
<b>Average probability of failure of the safety function upon demand (PFDavg) at a low demand rate</b>			1.0 x 10 <sup>-6</sup>		7.0 x 10 <sup>-6</sup>					1.0 x 10 <sup>-6</sup>
acc. to IEC 61508										

Note:

For the 3SK1230 technical specifications, see Manual "3SK1 Safety Relays", <https://support.industry.siemens.com/cs/ww/en/view/67585885>.

**SIRIUS 3SK2 safety relays**

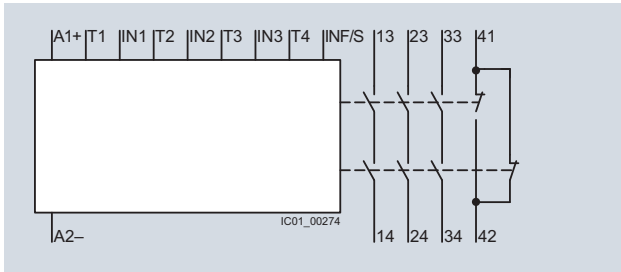
Type	3SK2112-.AA10		3SK2122-.AA10	
Dimensions: • Width • Height • Depth		mm	22.5	45
		mm	100	100
		mm	124.5	124.5
<b>General data</b>				
<b>Ambient temperature</b>				
• During operation	°C	-25 ... +60		
• During storage	°C	-40 ... +80		
<b>Installation altitude at height above sea level maximum</b>	m	2 000		
<b>Air pressure</b> According to SN 31205	kPa	90 ... 106		
<b>Shock resistance</b>	15 g / 11 ms			
<b>Vibration resistance acc. to IEC 60068-2-6</b>	5 ... 500 Hz: 0.75 mm			
<b>IP degree of protection of the enclosure</b>	IP20			
<b>Touch protection against electric shock</b>	Finger-safe			
<b>Insulation voltage, rated value</b>	V	50		
<b>Rated impulse withstand voltage</b>	V	800		
<b>Safety integrity level (SIL)</b> According to IEC 61508	SIL 3			
<b>Performance level (PL)</b> According to EN ISO 13849-1	e			
<b>T1 value for proof test interval or service duration</b> According to IEC 61508	y	20		
<b>EMC emitted interference</b> According to IEC 60947-1	Class A			
<b>Certificate of suitability</b>				
• UL certification	Yes			
• TÜV approval	Yes			
<b>Switching capacity</b>				
<b>Switching capacity current of the semiconductor outputs</b>				
• At DC-13 at 24 V	A	4		
<b>PFHD and PFDavg values</b>				
<b>PFHD with high demand rate</b> according to EN 62061	1/h	1 x 10 <sup>-8</sup>	1.2 x 10 <sup>-8</sup>	
<b>PFDavg at low demand rate</b> according to IEC 61508		1.5 x 10 <sup>-5</sup>	1.8 x 10 <sup>-5</sup>	

**Note:**

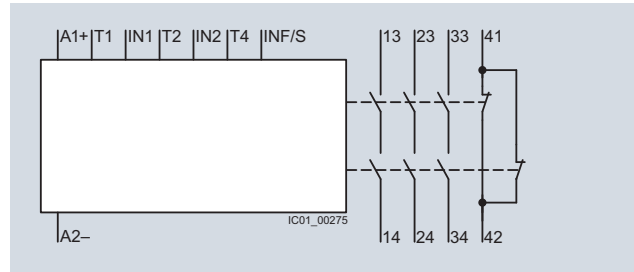
Manual "3SK2 Safety Relays", see <https://support.industry.siemens.com/cs/ww/en/view/109444336>.

**Circuit diagrams**

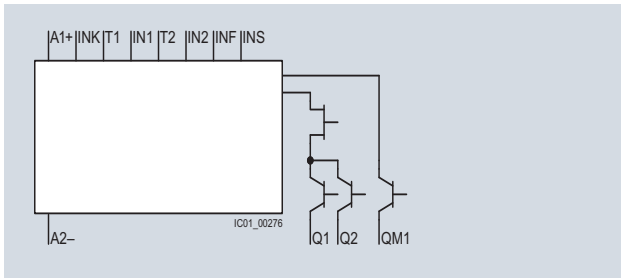
3SK1 basic units



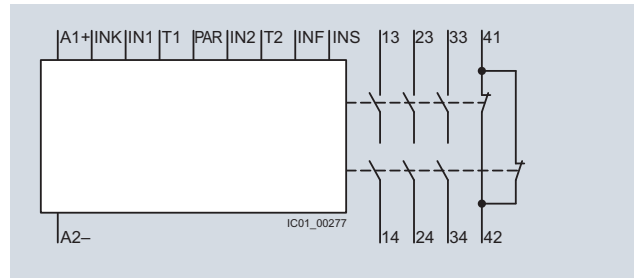
Basic unit 3SK1111-.AB30, Standard relay instantaneous (24 V AC/DC)



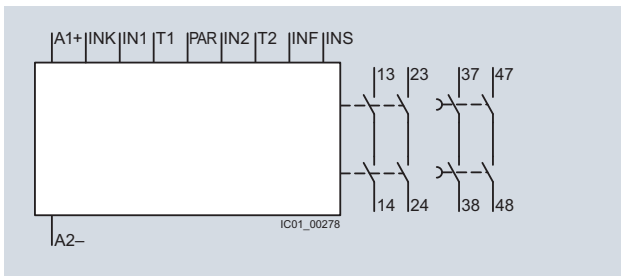
Basic unit 3SK1111-.AW20, Standard relay instantaneous (110 ... 240 V AC/DC)



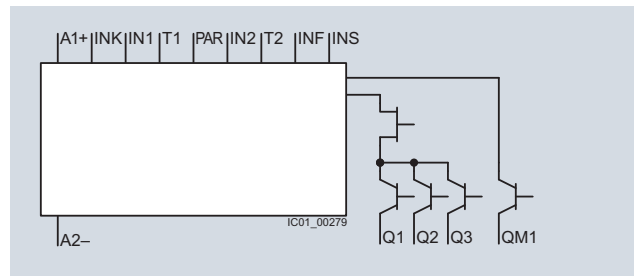
Basic unit 3SK1112-.BB40, Standard solid-state (24 V DC)



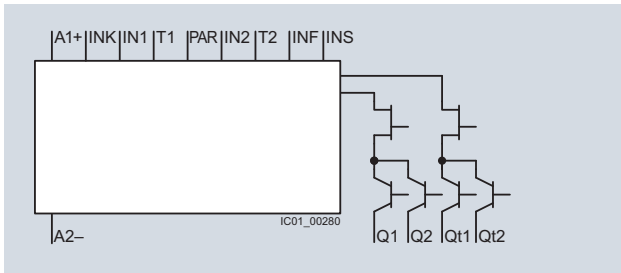
3SK1121-.AB40, Advanced relay instantaneous basic unit



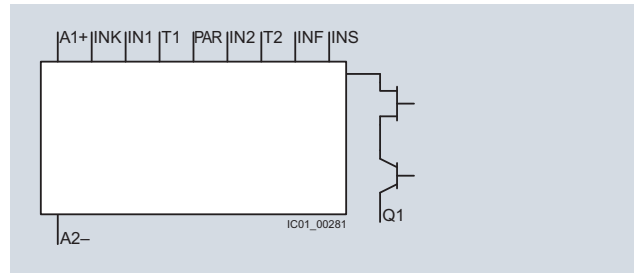
3SK1121-.CB4, Advanced relay instantaneous basic unit



3SK1122-.AB40, Advanced solid-state instantaneous basic unit



3SK1122-.CB4, Advanced solid-state instantaneous basic unit



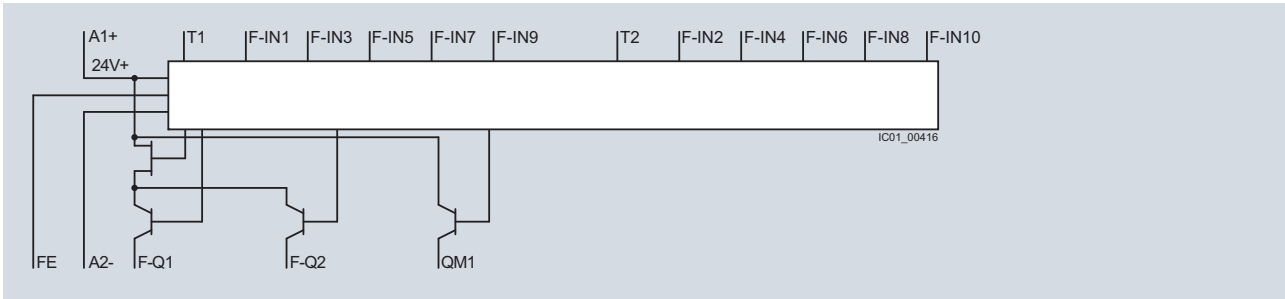
3SK1120-.AB40, Advanced 17.5 mm solid-state instantaneous basic unit

Legend:

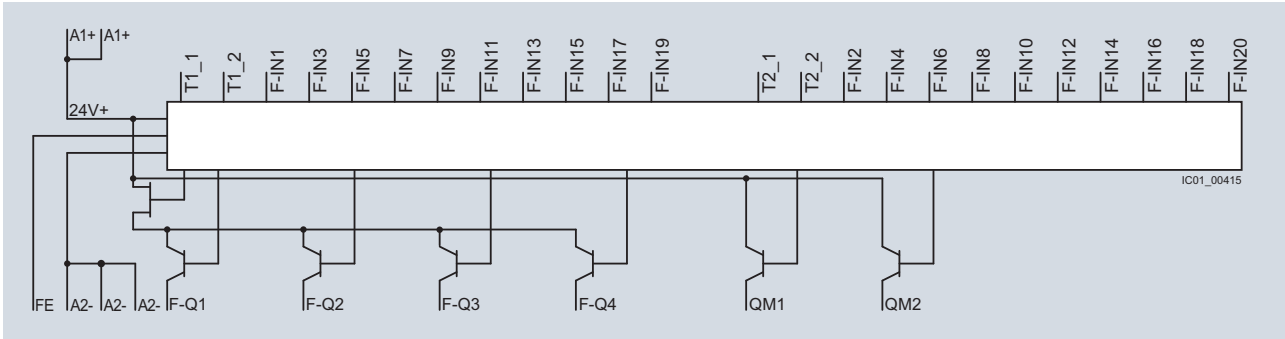
- A1, A2 = Power supply of the device
- 13/14 to 33/34 = Instantaneous safe outputs, relays
- 41/42 = Feedback contact
- T1, T2 = Test signal
- IN1, IN2 = Sensor input
- INF = Feedback circuit

- INS = Start circuit
- INK = Cascading input
- PAR = Parameterizing input (NO/NC monitoring)
- Q1, Q2, Q3 = Instantaneous enabling circuit, solid-state
- QM1 = Signaling output, solid-state

3SK2 basic units



3SK2112 basic unit



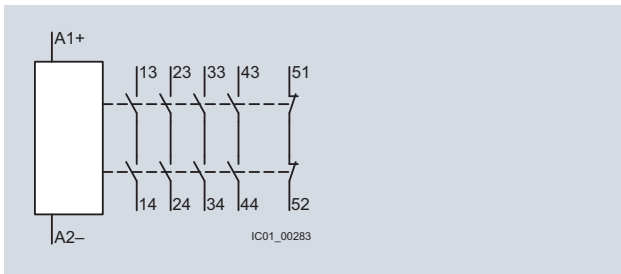
3SK2122 basic unit

Legend:

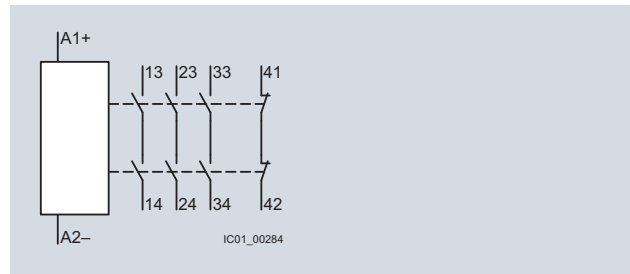
- A1, A2 = Power supply of the device
- FE = Functional ground
- T1, T2 = Test signal
- T1\_1, T2\_1 = First pair of test signals
- T2\_1, T2\_2 = Second pair of test signals
- F-IN1 to F-IN20 = Fail-safe sensor inputs 1 to 20
- F-Q1 to F-Q4 = Fail-safe outputs, solid-state
- QM1, QM2 = Signaling outputs, solid-state

**Circuit diagrams**

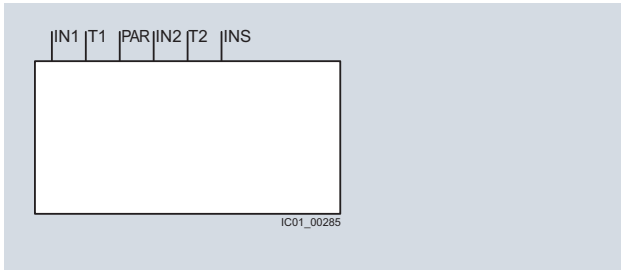
Expansion units



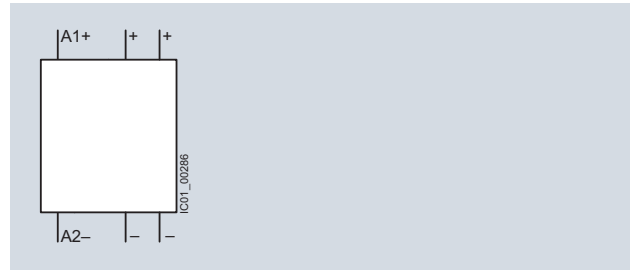
4RO 3SK1211 output expansion



3RO 3SK1213 output expansion



3SK1220 input expansion



3SK1230 power supply

Legend:

A1, A2 = Power supply of the device  
 13/14 to 43/44 = Safe outputs, relays  
 41/42 to 51/52 = Feedback contact  
 T1, T2 = Test signal

IN1, IN2 = Sensor input  
 INS = Start circuit  
 PAR = Parameterizing input (NO/NC monitoring)

**More information**

For the manual "3SK1 Safety Relays", see <https://support.industry.siemens.com/cs/ww/en/view/67585885>.

For the manual "3SK2 Safety Relays", see <https://support.industry.siemens.com/cs/ww/en/view/109444336>.

# SIRIUS 3SK

## 3SK1 Standard basic units

### Overview



3SK111 Standard basic units

The 3SK111 Standard basic units are characterized by simple, variable functionality. These devices are recommended for safety functions requiring only a few sensors and a small number of outputs on the safety relay.

#### Number of safe outputs

	Type and number of safe outputs				Signal- ing circuits	Device connec- tors
	Relays		Semiconductors			
	Instanta- neous	Time- delayed	Instanta- neous	Time- delayed		
<b>3SK1 Standard basic units</b>						
3SK1111-.A..0	3	--	--	--	1	--
3SK1112-.BB40	--	--	2	--	1	--
-- Not available						

### Selection and ordering data

PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41L





3SK1111-1AB30



3SK1111-1AW20



3SK1112-1BB40

Rated control supply voltage $U_s$		DT	Screw terminals 	DT	Spring-type terminals (push-in) 	
At 50 Hz At AC	At DC		Article No.	Price per PU	Article No.	Price per PU
V	V					
<b>Standard basic units with 3 safe relay outputs</b>						
24	24	▶	<b>3SK1111-1AB30</b>	▶	<b>3SK1111-2AB30</b>	
110 ... 240	110 ... 240	A	<b>3SK1111-1AW20</b>	▶	<b>3SK1111-2AW20</b>	
<b>Standard basic units with 2 safe semiconductor outputs</b>						
--	24	A	<b>3SK1112-1BB40</b>	A	<b>3SK1112-2BB40</b>	

### Overview



3SK112 Advanced basic units

The 3SK112 Advanced basic units form an innovative system landscape that allows even complex safety functions with large numbers of sensors and outputs to be built up using the device connectors. It is possible to increase both the number of inputs for sensors and the number of safe outputs of the basic unit without the need for wiring outlay between the devices.

### Number of safe outputs

	Type and number of safe outputs				Signal- ing circuits	Device connec- tors
	Relays		Semiconductors			
	Instanta- neous	Time- delayed	Instanta- neous	Time- delayed		

#### 3SK1 Advanced basic units

3SK1120-.AB40	--	--	1	--	--	✓
3SK1121-.AB40	3	--	--	--	1	✓
3SK1121-.CB4.	2	2	--	--	--	✓
3SK1122-.AB40	--	--	3	--	1	✓
3SK1122-.CB4.	--	--	2	2	--	✓

- ✓ Available
- Not available

### Selection and ordering data

PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41L



3SK1121-1AB40



3SK1120-1AB40



3SK1122-1AB40



3SK1122-1CB41

Rated control supply voltage $U_s$ at DC	Adjustable OFF-delay time	Number of outputs				DT	Screw terminals		DT	Spring-type terminals (push-in)	
		as contacting contact block		as contactless semiconductor contact block			Article No.	Price per PU		Article No.	Price per PU
V	s	Instantaneous switching	Delayed switching	Instantaneous switching	Delayed switching						
<b>Advanced basic units with safe relay outputs</b>											
24	--	3	--	--	--	▶	<b>3SK1121-1AB40</b>	▶	<b>3SK1121-2AB40</b>		
24	0.05 ... 3	2	2	--	--	A	<b>3SK1121-1CB41</b>	B	<b>3SK1121-2CB41</b>		
24	0.5 ... 30	2	2	--	--	▶	<b>3SK1121-1CB42</b>	A	<b>3SK1121-2CB42</b>		
24	5 ... 300	2	2	--	--	B	<b>3SK1121-1CB44</b>	B	<b>3SK1121-2CB44</b>		
<b>Advanced basic units with safe semiconductor outputs</b>											
24	--	--	--	1	--	A	<b>3SK1120-1AB40</b>	A	<b>3SK1120-2AB40</b>		
24	--	--	--	3	--	A	<b>3SK1122-1AB40</b>	A	<b>3SK1122-2AB40</b>		
24	0.05 ... 3	--	--	2	2	B	<b>3SK1122-1CB41</b>	B	<b>3SK1122-2CB41</b>		
24	0.5 ... 30	--	--	2	2	A	<b>3SK1122-1CB42</b>	A	<b>3SK1122-2CB42</b>		
24	5 ... 300	--	--	2	2	B	<b>3SK1122-1CB44</b>	B	<b>3SK1122-2CB44</b>		

# SIRIUS 3SK

## 3SK2 basic units

### Overview



3SK2 basic units

The 3SK2 basic units have a large number of inputs and outputs within a narrow width. In addition, demanding safety applications can be implemented simply with several independent safety functions. Flexible application options are enabled by powerful semiconductor outputs, as well as by expandability with additional 3SK output expansions and 3RM1 Failsafe motor starters. Flexible time functions and diagnostics options are also available.

### Number of safe outputs

	Type and number of safe outputs Semiconductors	Signaling circuits Semi-conductors	Fail-safe outputs by means of device connectors
<b>3SK2 basic units</b>			
3SK2112-AA10	2	1	2
3SK2122-AA10	4	2	2

### Selection and ordering data



PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41L



3SK2112



3SK2122

Rated control supply voltage $U_s$ At DC V	Number of outputs, safety-related 2-channel	Width mm	DT	Screw terminals 		Spring-type terminals (push-in) 	
				Article No.	Price per PU	Article No.	Price per PU
<b>3SK2 basic units</b>							
24	2	22.5	A	<b>3SK2112-1AA10</b>	A	<b>3SK2112-2AA10</b>	
24	4	45	A	<b>3SK2122-1AA10</b>	A	<b>3SK2122-2AA10</b>	



## Overview



3SK121 output expansion

The 3SK121 output expansions can be used to expand all 3SK basic units.

**3SK1211 output expansion**

The 3SK1211 output expansion is used to expand the safe outputs of a basic unit by adding another four safe outputs. These outputs have a switching capacity of AC-15 5 A at a switching voltage of 230 V. The devices can be connected to any 3SK basic unit by means of wiring. In addition, the devices with a 24 V DC control supply voltage can also be connected to 3SK1 Advanced and 3SK2 basic units by means of the 3ZY12 device connectors.

**3SK1213 output expansion**

The 3SK1213 output expansion is used to expand the safe outputs of a basic unit by adding three safe outputs with high switching capacity. These outputs have a switching capacity of AC-15 10 A at a switching voltage of 230 V. The devices can be connected to any 3SK basic unit by means of wiring. As with the 3SK1211, the devices with a 24 V DC control supply voltage can also be connected to 3SK1 Advanced and 3SK2 basic units by means of the 3ZY12 device connectors.

Note:

It is only possible to expand the Standard basic units by means of wiring. Advanced basic units and 3SK2 basic units can be expanded using the 3ZY12 device connector.

**Number of safe outputs**

	Type and number of safe outputs		Signaling circuits	Device connectors
	Relays			
	Instantaneous	Time-delayed		

**3SK output expansions**

• 4RO				
3SK1211	4	--	1 <sup>1)</sup>	✓ <sup>2)</sup>
• 3RO				
3SK1213	3	--	1 <sup>1)</sup>	✓ <sup>2)</sup>

✓ Available

-- Not available

<sup>1)</sup> Feedback circuit.

<sup>2)</sup> For 24 V DC.

## Benefits

- Perfect adaptation of the number of inputs
- Simple expansion of instantaneous and time-delayed safe outputs of the Advanced basic units by means of backplane connection
- When using the device connector the outputs on the terminals can still be used
- Another two freely parameterizable shutdown functions on 3SK2 basic modules when using the device connectors
- Expansion with power contacts for high AC-15/DC-13 currents in the control circuit
- Wiring of the feedback circuit to the basic units not required when using the device connectors
- Shorter installation times
- Less configuring and testing required

# SIRIUS 3SK

## Output expansions

### Selection and ordering data



PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41L



3SK1211-1BB00



3SK1213-1AB40

Rated control supply voltage $U_s$		DT	<b>Screw terminals</b> 	DT	<b>Spring-type terminals (push-in)</b> 	
At 50 Hz At AC V	At DC V		Article No.	Price per PU	Article No.	Price per PU
<b>3SK1211 output expansions with 4RO</b>						
24	--	B	<b>3SK1211-1BB00</b>	B	<b>3SK1211-2BB00</b>	
--	24	▶	<b>3SK1211-1BB40</b>	A	<b>3SK1211-2BB40</b>	
110 ... 240	110 ... 240	A	<b>3SK1211-1BW20</b>	B	<b>3SK1211-2BW20</b>	
<b>3SK1213 output expansions with 3RO</b>						
--	24	B	<b>3SK1213-1AB40</b>	B	<b>3SK1213-2AB40</b>	
115	--	B	<b>3SK1213-1AJ20</b>	B	<b>3SK1213-2AJ20</b>	
230	--	B	<b>3SK1213-1AL20</b>	B	<b>3SK1213-2AL20</b>	

### Overview



3SK1220 sensor expansion

With the input expansions

- 3SK1220 sensor expansion
- 3SK1230 power supply

the 3SK1 Advanced basic units can be made more flexible.

### 3SK1220 input expansion

The 3SK1220 input expansion allows additional sensors to be integrated easily and flexibly. The device monitors two 1-channel sensors or one 2-channel sensor, whatever their output technology (floating/single-ended).

Note:

The 3SK1220 sensor expansion can only be connected to the 3SK1 Advanced basic units by means of the 3ZY12 device connector.

### 3SK1230 power supply

The 3SK1230 power supply makes the 3SK1 devices universally usable, whatever control supply voltage is to be used.

Both devices can be combined with the 3SK112 basic units in the Advanced series without the need for wiring.

Note:

Alongside the 3ZY12 device connector, the 3SK1230 power supply can also be wired to act as a power supply for 3SK1 devices.

### Benefits

- A wide voltage range of 110 ... 240 V AC/DC allows the devices to be used worldwide
- Low stock keeping due to little variance
- Flexible expansion of the number of sensors without the need for additional wiring between the devices
- Perfect adaptation of the number of inputs to suit the application
- Universal use thanks to the wide range of adjustable parameters for sensor expansion (parameters as for 3SK1 Advanced basic units)

### Selection and ordering data



PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41L



3SK1220-1AB40



3SK1230-1AW20

Version	DT	Screw terminals 	DT	Spring-type terminals (push-in) 	
		Article No.	Price per PU	Article No.	Price per PU
<b>3SK1220 sensor expansions</b>					
Sensor expansions for safety-related expansion of the 3SK1 Advanced basic A units by adding a further 2-channel sensor or two 1-channel sensors					
<u>Note:</u> Can only be used in conjunction with 3ZY12 device connectors, see page 13/133.					
		<b>3SK1220-1AB40</b>	A	<b>3SK1220-2AB40</b>	
<b>3SK1230 power supplies</b>					
Power supplies for supplying 3SK1 Advanced basic units via 3ZY12 device A connectors at voltages of 110 ... 240 V AC/DC					
		<b>3SK1230-1AW20</b>	A	<b>3SK1230-2AW20</b>	

### Overview

The following accessories are available for SIRIUS 3SK safety relays:

- Device connectors
- Terminals
- Sealing covers
- Push-in lugs
- Coding pins
- Inscription labels
- Tools

And additionally for 3SK2:

- Connection cables (essential accessory)
- USB PC cables and adapters
- Diagnostics modules
- Memory modules
- Interface covers
- Door adapters

### Device connectors for 3SK112., 3SK12.. and 3SK2

The device connector can be used to connect devices of the 3SK/ 3RM1 system together, with the last device in a system configuration being placed on a device terminating connector.

Device connectors are available in various versions specifically for the 3SK safety relays:

For type	Device connectors				Device terminating connectors	
	3ZY1212-1BA00 (for 3SK1, width 17.5 mm)	3ZY1212-2BA00 (for 3SK1, width 22.5 mm)	3ZY1212-2GA00 (for 3SK2, width 22.5 mm)	3ZY1212-4GA01 (for 3SK2, width 45 mm)	3ZY1212-2DA00 (for 3SK1, width 22.5 mm)	3ZY1212-0FA01 (for 3SK1, set for enclosures ≥ 45 mm)
<b>3SK1 Advanced basic units</b>						
3SK1120	✓	--	--	--	--	--
3SK1121	--	✓	--	--	✓	--
3SK1122	--	✓	--	--	✓	--
<b>3SK2 basic units</b>						
3SK2112	--	--	✓	--	--	--
3SK2122	--	--	--	✓	--	--
<b>Output expansions</b>						
3SK1211	--	✓	✓	✓	✓	--
3SK1213	--	--	✓	✓	--	✓
<b>Input expansions</b>						
3SK1220	✓	--	--	--	--	--
3SK1230	--	✓	--	--	--	--

✓ Available

-- Not available

### Removable terminals for 3SK

The following removable terminals are available for the 3SK safety relays for pre-wiring of the terminals in the control cabinet, or for replacing terminals:

For type	Removable terminals			
	Screw terminals		Spring-type terminals (push-in)	
	2-pole 3ZY1121-1BA00	3-pole 3ZY1131-1BA00	2-pole 3ZY1121-2BA00	3-pole 3ZY1131-2BA00
<b>3SK1 basic units</b>				
3SK1111	--	✓	--	✓
3SK1112	✓	--	✓	--
3SK1120	--	✓	--	✓
3SK1121	--	✓	--	✓
3SK1122	✓ bottom	✓ top	✓ bottom	✓ top
<b>3SK2 basic units</b>				
3SK2112	--	✓	--	✓
3SK2122	--	✓ <sup>1)</sup>	--	✓ <sup>1)</sup>
<b>Output expansions</b>				
3SK1211	✓	--	✓	--
3SK1213	--	--	--	--
<b>Input expansions</b>				
3SK1220	--	✓ top	--	✓ top
3SK1230	✓ bottom	--	✓ bottom	--

✓ Available








-- Not available

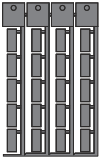



<sup>1)</sup> Two sets of terminals are required for 3SK2122.

### Selection and ordering data

Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
<b>Device connectors for the electrical connection of SIRIUS devices in the industrial standard mounting rail enclosure</b>						
<b>Device connectors for 3SK1</b>						
 3ZY1212-1BA00	• Width 17.5 mm	A	<b>3ZY1212-1BA00</b>		1	1 unit 41L
	• Width 22.5 mm	A	<b>3ZY1212-2BA00</b>		1	1 unit 41L
<b>Device connectors for 3SK2</b>						
 3ZY1212-4GA01	• Width 22.5 mm	<b>NEW</b> A	<b>3ZY1212-2GA00</b>		1	1 unit 41L
	• Width 45 mm	<b>NEW</b> A	<b>3ZY1212-4GA01</b>		1	1 unit 41L
<b>Device terminating connectors</b>						
 3ZY1212-2DA00	For 3SK1, width 22.5 mm	A	<b>3ZY1212-2DA00</b>		1	1 unit 41L
	Note: Observe positions of the slide switch, see Manual "3SK1 Safety Relays", <a href="https://support.industry.siemens.com/cs/ww/en/view/67585885">https://support.industry.siemens.com/cs/ww/en/view/67585885</a>					
<b>Device terminating connector set</b>						
	For 3SK1213, width > 45 mm, comprising 3ZY1212-2FA00 and 3ZY1210-2AA00	A	<b>3ZY1212-0FA01</b>		1	1 unit 41L
<b>Terminals for SIRIUS devices in the industrial standard mounting rail enclosure</b>						
<b>Removable terminals</b>						
 3ZY1121-1BA00	• 2-pole, screw terminals up to 2 x 1.5 mm <sup>2</sup> or 1 x 2.5 mm <sup>2</sup>	A	<b>Screw terminals</b> 		1	6 units 41L
	• 3-pole, screw terminals up to max. 2 x 1.5 mm <sup>2</sup> or 1 x 2.5 mm <sup>2</sup> 1)	A	<b>3ZY1121-1BA00</b>		1	6 units 41L
	• 2-pole, push-in terminals up to max. 2 x 1.5 mm <sup>2</sup>	A	<b>Spring-type terminals (push-in)</b> 		1	6 units 41L
	• 3-pole, push-in terminals up to max. 2 x 1.5 mm <sup>2</sup> 1)	A	<b>3ZY1131-2BA00</b>		1	6 units 41L
<b>Connection cables for 3SK2 (essential accessory)</b>						
<b>Connection cables</b>						
 3UF7932-0AA00-0	For connecting diagnostics module to 3SK2 basic unit					
	• Length 0.1 m (flat)	▶	<b>3UF7931-0AA00-0</b>		1	1 unit 42J
	• Length 0.3 m (flat)	▶	<b>3UF7935-0AA00-0</b>		1	1 unit 42J
	• Length 0.5 m (flat)	▶	<b>3UF7932-0AA00-0</b>		1	1 unit 42J
	• Length 0.5 m (round)	▶	<b>3UF7932-0BA00-0</b>		1	1 unit 42J
	• Length 1.0 m (round)	▶	<b>3UF7937-0BA00-0</b>		1	1 unit 42J
	• Length 2.5 m (round)	▶	<b>3UF7933-0BA00-0</b>		1	1 unit 42J
<b>PC cables and adapters for 3SK2</b>						
<b>USB PC cables</b>						
 3UF7941-0AA00-0	For connecting to the USB interface of a PC/PG, for communication with 3SK2 through the system interface, recommended for use in connection with 3SK2	▶	<b>3UF7941-0AA00-0</b>		1	1 unit 42J
	<b>USB/serial adapters</b>					
	For connecting an RS 232 PC cable to the USB interface of a PC	B	<b>3UF7946-0AA00-0</b>		1	1 unit 42J

1) Two sets of terminals are required for 3SK2122.

Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
<b>Operating and monitoring modules for 3SK2</b>						
		<b>Diagnostics modules</b>	A	<b>3RK3611-3AA00</b>	1	1 unit 42B
		From product version E04 or higher, for direct display of errors, e.g. of cross-circuits				
3RK3611-3AA00						
<b>Door adapters for 3SK2</b>						
		<b>Door adapters</b>	▶	<b>3UF7920-0AA00-0</b>	1	1 unit 42J
		For external connection of the system interface, e.g. outside a control cabinet				
3UF7920-0AA00-0						
<b>Interface covers for 3SK2</b>						
		<b>Interface covers</b>	▶	<b>3UF7950-0AA00-0</b>	1	5 units 42J
		For system interface				
3UF7950-0AA00-0						
<b>Memory modules for 3SK2</b>						
		<b>Memory modules</b>	A	<b>3RK3931-0AA00</b>	1	1 unit 42C
		For backing up the complete parameterization of the 3SK2 safety system without a PC/PG through the system interface				
3RK3931-0AA00						
<b>Accessories for enclosures</b>						
		<b>Sealing covers</b>				
		• 17.5 mm (for 3SK1120 and 3SK1220)	A	<b>3ZY1321-1AA00</b>	1	5 units 41L
		• 22.5 mm (for all 3SK1 devices except 3SK1120 and 3SK1220)	A	<b>3ZY1321-2AA00</b>	1	5 units 41L
3ZY1321-2AA00						
		<b>Push-in lugs</b>	A	<b>3ZY1311-0AA00</b>	1	10 units 41L
		For wall mounting				
3ZY1311-0AA00						
		<b>Coding pins</b>	A	<b>3ZY1440-1AA00</b>	1	12 units 41L
		For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure. They enable the mechanical coding of terminals, see Manual "3SK1 Safety Relays", <a href="https://support.industry.siemens.com/cs/ww/en/view/67585885">https://support.industry.siemens.com/cs/ww/en/view/67585885</a>				
3ZY1440-0AA00						

Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
<b>Blank labels</b>						
		<b>Unit labeling plates</b> For SIRIUS devices 20 mm x 7 mm, titanium gray	D	<b>3RT2900-1SB20</b>	100	340 units 41B
<b>Tools for opening spring-type terminals</b>						
		<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	A	<b>Spring-type terminals</b> 	<b>3RA2908-1A</b>	1 1 unit 41B
<b>Software for 3SK2</b>						
		<b>SIRIUS Safety ES</b> For software for configuring, commissioning, operating and diagnosing of 3SK2 and 3RK3, <a href="#">see page 13/155</a> .		<b>NEW</b>		

3RT2900-1SB20

3RA2908-1A

3ZS1316-.C.10-0Y.5

**Code conversion table**

The table below lists the existing 3TK28 order numbers with the corresponding 3SK1 order numbers.

Order number 3TK28 basic units	Order number 3SK1 Standard basic units	Order number 3SK1 Advanced basic units	Order number 3TK28 basic units	Order number 3SK1 Standard basic units	Order number 3SK1 Advanced basic units
<b>3TK28 20</b>			<b>3TK28 28</b>		
3TK28 20-1AJ20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20	3TK28 28-1AB20	--	--
3TK28 20-1AL20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20	3TK28 28-1AB21	--	--
3TK28 20-1CB30	3SK1 111-1AB30	3SK1 121-1AB40	3TK28 28-1AJ20	--	3SK1 121-1CB42 + 3SK1 230-1AW20
3TK28 20-2AJ20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20	3TK28 28-1AL20	--	3SK1 121-1CB41 + 3SK1 230-1AW20
3TK28 20-2AL20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20	3TK28 28-1AL21	--	3SK1 121-1CB42 + 3SK1 230-1AW20
3TK28 20-2CB30	3SK1 111-2AB30	3SK1 121-2AB40	3TK28 28-1BB40	--	3SK1 121-1CB41 + 3SK1 230-1AW20
<b>3TK28 21</b>			3TK28 28-1BB41	--	3SK1 121-1CB42
3TK28 21-1CB30	3SK1 111-1AB30	3SK1 121-1AB40	3TK28 28-2AB20	--	--
3TK28 21-2CB30	3SK1 111-2AB30	3SK1 121-2AB40	3TK28 28-2AB21	--	--
<b>3TK28 22</b>			3TK28 28-2AJ20	--	3SK1 121-2CB42 + 3SK1 230-2AW20
3TK28 22-1CB30	3SK1 111-1AB30	3SK1 121-1AB40	3TK28 28-2AJ21	--	3SK1 121-2CB41 + 3SK1 230-2AW20
3TK28 22-2CB30	3SK1 111-2AB30	3SK1 121-2AB40	3TK28 28-2AL20	--	3SK1 121-2CB42 + 3SK1 230-2AW20
<b>3TK28 23</b>			3TK28 28-2AL21	--	3SK1 121-2CB41 + 3SK1 230-2AW20
3TK28 23-1CB30	3SK1 111-1AB30	3SK1 121-1AB40	3TK28 28-2BB40	--	3SK1 121-2CB42
3TK28 23-2CB30	3SK1 111-2AB30	3SK1 121-2AB40	<b>3TK28 30</b>		
<b>3TK28 24</b>			3TK28 30-1AJ20	3SK1 211-1BW20	3SK1 211-1BB40
3TK28 24-1AJ20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20	3TK28 30-1AL20	3SK1 211-1BW20	3SK1 211-1BB40
3TK28 24-1AL20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20	3TK28 30-1CB30	3SK1 211-1BB40	3SK1 211-1BB40
3TK28 24-1BB40	3SK1 111-1AB30	3SK1 121-1AB40	3TK28 30-2AJ20	3SK1 211-2BW20	3SK1 211-2BB40
3TK28 24-1CB30	3SK1 111-1AB30	3SK1 121-1AB40	3TK28 30-2AL20	3SK1 211-2BW20	3SK1 211-2BB40
3TK28 24-2AJ20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20	3TK28 30-2CB30	3SK1 211-2BB40	3SK1 211-2BB40
3TK28 24-2AL20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20	<b>3TK28 34</b>		
3TK28 24-2BB40	3SK1 111-2AB30	3SK1 121-2AB40	3TK28 34-1AB20	--	--
3TK28 24-2CB30	3SK1 111-2AB30	3SK1 121-2AB40	3TK28 34-1AJ20	--	3SK1 121-1AB40 + 3SK1 230-1AW20
<b>3TK28 25</b>			3TK28 34-1AL20	--	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 25-1AB20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20	3TK28 34-1BB40	--	3SK1 121-1AB40
3TK28 25-1AJ20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20	3TK28 34-2AB20	--	--
3TK28 25-1AL20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20	3TK28 34-2AJ20	--	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 25-1BB40	3SK1 111-1AB30	3SK1 121-1AB40	3TK28 34-2AL20	--	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 25-2AB20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20	3TK28 34-2BB40	--	3SK1 121-2AB40
3TK28 25-2AJ20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20	<b>3TK28 40</b>		
3TK28 25-2AL20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20	3TK28 40-1BB40	3SK1 112-1BB40	3SK1 122-1AB40
3TK28 25-2BB40	3SK1 111-2AB30	3SK1 121-2AB40	3TK28 40-2BB40	3SK1 112-2BB40	3SK1 122-2AB40
<b>3TK28 27</b>			<b>3TK28 41</b>		
3TK28 27-1AB20	--	--	3TK28 41-1BB40	3SK1 112-1BB40	3SK1 122-1AB40
3TK28 27-1AB21	--	--	3TK28 41-2BB40	3SK1 112-2BB40	3SK1 122-2AB40
3TK28 27-1AJ20	--	3SK1 121-1CB42 + 3SK1 230-1AW20	<b>3TK28 42</b>		
3TK28 27-1AJ21	--	3SK1 121-1CB41 + 3SK1 230-1AW20	3TK28 42-1BB41	--	3SK1 122-1CB41
3TK28 27-1AL20	--	3SK1 121-1CB42 + 3SK1 230-1AW20	3TK28 42-1BB42	--	3SK1 122-1CB42
3TK28 27-1AL21	--	3SK1 121-1CB41 + 3SK1 230-1AW20	3TK28 42-1BB44	--	3SK1 122-1CB44
3TK28 27-1BB40	--	3SK1 121-1CB42	3TK28 42-2BB41	--	3SK1 122-2CB41
3TK28 27-1BB41	--	3SK1 121-1CB41	3TK28 42-2BB42	--	3SK1 122-2CB42
3TK28 27-2AB20	--	--	3TK28 42-2BB44	--	3SK1 122-2CB44
3TK28 27-2AB21	--	--	<b>3TK28 50</b>		
3TK28 27-2AB20	--	3SK1 121-2CB42 + 3SK1 230-2AW20	3TK28 50-1AJ20	3SK1 111-1AW20 + 3SK1 213-1AJ20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 27-2AJ20	--	3SK1 121-2CB41 + 3SK1 230-2AW20	3TK28 50-1AL20	3SK1 111-1AW20 + 3SK1 213-1AL20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 27-2AJ21	--	3SK1 121-2CB42 + 3SK1 230-2AW20	3TK28 50-1BB40	3SK1 111-1AB30 + 3SK1 213-1AB40	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 27-2AL20	--	3SK1 121-2CB41 + 3SK1 230-2AW20	3TK28 50-2AJ20	3SK1 111-2AW20 + 3SK1 213-2AJ20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 27-2AL21	--	3SK1 121-2CB42 + 3SK1 230-2AW20	3TK28 50-2AL20	3SK1 111-2AW20 + 3SK1 213-2AL20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 27-2BB40	--	3SK1 121-2CB42	3TK28 50-2BB40	3SK1 111-2AB30 + 3SK1 213-2AB40	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 27-2BB41	--	3SK1 121-2CB41			



# SIRIUS 3SK1

## Cross reference

Order number 3TK28 basic units	Order number 3SK1 Standard basic units	Order number 3SK1 Advanced basic units
<b>3TK28 51</b>		
3TK28 51-1AJ20	3SK1 111-1AW20 + 3SK1 213-1AJ20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 51-1AL20	3SK1 111-1AW20 + 3SK1 213-1AL20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 51-1BB40	3SK1 111-1AB30 + 3SK1 213-1AB40	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 51-2AJ20	3SK1 111-2AW20 + 3SK1 213-2AJ20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 51-2AL20	3SK1 111-2AW20 + 3SK1 213-2AL20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 51-2BB40	3SK1 111-2AB30 + 3SK1 213-2AB40	3SK1 120-2AB40 + 3SK1 213-2AB40
<b>3TK28 52</b>		
3TK28 52-1AL20	3SK1 111-1AW20 + 3SK1 213-1AL20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 52-1BB40	3SK1 111-1AB30 + 3SK1 213-1AB40	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 52-2AL20	3SK1 111-2AW20 + 3SK1 213-2AL20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 52-2BB40	3SK1 111-2AB30 + 3SK1 213-2AB40	3SK1 120-2AB40 + 3SK1 213-2AB40

Order number 3TK28 basic units	Order number 3SK1 Standard basic units	Order number 3SK1 Advanced basic units
<b>3TK28 53</b>		
3TK28 53-1BB40	3SK1 111-1AB30 + 3SK1 213-1AB40	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 53-2BB40	3SK1 111-2AB30 + 3SK1 213-2AB40	3SK1 120-2AB40 + 3SK1 213-2AB40
<b>3TK28 56</b>		
3TK28 56-1BB40	3SK1 213-1AB40	3SK1 213-1AB40
3TK28 56-2BB40	3SK1 213-2AB40	3SK1 213-2AB40
<b>3TK28 57</b>		
3TK28 57-1BB41	--	3SK1 213-1AB40 (delay as for basic unit)
3TK28 57-1BB42	--	3SK1 213-1AB40 (delay as for basic unit)
3TK28 57-1BB44	--	3SK1 213-1AB40 (delay as for basic unit)
3TK28 57-2BB41	--	3SK1 213-2AB40 (delay as for basic unit)
3TK28 57-2BB42	--	3SK1 213-2AB40 (delay as for basic unit)
3TK28 57-2BB44	--	3SK1 213-2AB40 (delay as for basic unit)

# SIRIUS 3TK28

With relay enabling circuits

## Overview



SIRIUS 3TK282. safety relay

### Safety relays with relay enabling circuits – Safety with floating contacts

SIRIUS safety relays with relay enabling circuits are not only extremely space-saving thanks to their compact design, they also offer extra safety with positively driven NO and feedback contacts in pairs. If one of the contact welds, the other assumes the disconnection of the circuit. A positively driven feedback contact (NC) then performs the fault detection of the faulty NO contact.

3SK121. expansion units are available to increase the number of enabling circuits, [see page 13/130](#).

### 3TK2826 safety relays

The 3TK2826 is a parameterizable safety relay. It is used as an evaluation unit for typical safety chains (identify, evaluate, realize). A number of functions can be set using the DIP switches on the front. The 3TK2826 is therefore universally applicable.

Safety sensors (e.g. an EMERGENCY-STOP device) are connected at the input side while contactors or valves for disconnecting the "hazardous function" are connected at the output side.

The 3TK2826 performs the monitoring of the sensor and actuator functions as well as the safe disconnection of the outputs (enabling circuits).

3TK2826 with DIP switch:

DIP switch No.	ON	OFF	Schematic
1	Switching mat operation	Without crossover monitoring	
2	NC/NC evaluation	NC/NO evaluation	
3	1 x 2-channel	2 x 1-channel	
4	Debounce time for sensor inputs ≈ 10 ms	Debounce time for sensor inputs ≈ 50 ms	
5	Sensor input Monitored start	Sensor input Autostart	
6	Cascading input Monitored start	Cascading input Autostart	
7	Without start test	With start test	
8	Without automatic start after mains failure	Automatic start after mains failure (not permitted in connection with a start test)	

## Benefits

- Compact design
- Floating safe outputs
- Can be used up to an ambient temperature of max. 70 °C
- Connection for all common sensor types
- Many functions available in just one device
- Status displays
- Extended diagnostic capabilities
- Approvals (EN ISO 13849-1, IEC 61508, UL/CSA)
- Reporting of trip faults in the actuator circuit
- Floating outputs
- Wide-range device
- Sensor condition saved in the event of voltage failure

## Technical specifications

Type	Basic units			
	3TK2826 24 V DC	Wide voltage range	24 V DC $t_v$	Wide voltage range $t_v$
<b>Sensors</b>				
• Inputs	1	1	1	1
• Electronic	✓	--	✓	--
• With contacts	✓	✓	✓	✓
• Magnetically operated switch (Reed contacts)	✓	✓	✓	✓
<b>Safety mats</b>	✓	✓	✓	✓
<b>Start</b>				
• Auto	✓	✓	✓	✓
• Monitored	✓	✓	✓	✓
<b>Cascading input 24 V DC</b>	✓	✓	✓	✓
<b>Key-operated switch</b>	--	--	--	--
<b>Enabling circuit, floating</b>				
• Stop category 0	4 NO	4 NO	2 NO	2 NO
• Stop category 1	--	--	2 NO	2 NO
<b>Enabling circuit, electronic</b>				
• Stop category 0	--	--	--	--
• Stop category 1	--	--	--	--
<b>Signaling outputs</b>				
• Floating	1 NC	1 NO + 1 NC	2 NC	1 NO + 2 NC
• Electronic	2	--	2	--
<b>Standards</b>	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508
<b>Test certificates</b>	TÜV, UL, CSA	TÜV, UL, CSA	TÜV, UL, CSA	TÜV, UL, CSA
<b>SIL level max. according to IEC 61508</b>	3	3	3	3
<b>Performance level PL according to ISO 13849-1</b>	e	e	e	e
<b>Probability of a dangerous failure per hour (PFH<sub>d</sub>)</b>	$7.8 \times 10^{-9}$ 1/h	$7.8 \times 10^{-9}$ 1/h	$7.8 \times 10^{-9}$ 1/h	$7.8 \times 10^{-9}$ 1/h
<b>Rated control supply voltage</b>				
• 24 V DC	✓	--	✓	--
• 24 ... 240 V AC/DC	--	✓	--	✓

✓ Available

-- Not available

# SIRIUS 3TK28

With relay enabling circuits

## Selection and ordering data

PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41L



3TK2826-1BB40



3TK2826-2BB40

Rated control supply voltage $U_s$	Start	OFF-delay $t_v$	DT	Screw terminals	DT	Spring-type terminals	
V		s		Article No.	Price per PU	Article No.	Price per PU

### Basic units

#### With floating enabling circuits

##### 3TK2826

Rated control supply voltage $U_s$	Start	OFF-delay $t_v$	DT	Screw terminals	DT	Spring-type terminals
• 24 DC	Auto/monitored	--	A	<b>3TK2826-1BB40</b>	A	<b>3TK2826-2BB40</b>
• 24 ... 240 AC/DC	Auto/monitored	--	A	<b>3TK2826-1CW30</b>	C	<b>3TK2826-2CW30</b>

#### With time-delayed enabling circuits

##### 3TK2826 $t_v$

Rated control supply voltage $U_s$	Start	OFF-delay $t_v$	DT	Screw terminals	DT	Spring-type terminals
• 24 DC	Auto/monitored	0.05 ... 3	C	<b>3TK2826-1BB41</b>	C	<b>3TK2826-2BB41</b>
• 24 ... 240 AC/DC	Auto/monitored	0.05 ... 3	C	<b>3TK2826-1CW31</b>	C	<b>3TK2826-2CW31</b>
• 24 DC	Auto/monitored	0.5 ... 30	A	<b>3TK2826-1BB42</b>	C	<b>3TK2826-2BB42</b>
• 24 ... 240 AC/DC	Auto/monitored	0.5 ... 30	C	<b>3TK2826-1CW32</b>	C	<b>3TK2826-2CW32</b>
• 24 DC	Auto/monitored	5 ... 300	C	<b>3TK2826-1BB44</b>	C	<b>3TK2826-2BB44</b>
• 24 ... 240 AC/DC	Auto/monitored	5 ... 300	C	<b>3TK2826-1CW34</b>	C	<b>3TK2826-2CW34</b>

## SIRIUS 3TK28

With electronic enabling circuits

## Overview



SIRIUS 3TK284. safety relay

**Fast, safe and wear-free switching**

Evaluation units with electronic components are becoming increasingly established in safety applications, as a considerably higher number of starting operations and electrical life of the devices is achieved with permanent functional checks and consistently wear-free operation. The compact and light devices also permit series connection or normal operational switching, e.g. through a PLC.

If several enabling circuits or floating enabling circuits are required in one application, the devices can be expanded with expansion units from the 3SK121. series, [see page 13/130](#).

3TK2845 multi-function units

Up to now, standard combinations of safety applications such as EMERGENCY-STOP and protective door monitoring were possible only by using several individual safety relays. 3TK2845 combines several functions in a single unit. Two electronic and two relay enabling circuits ensure safe disconnection – in just a few actions, quickly and cheaply.

## Benefits

- Permanent function checking
- No wear because switched electronically
- High switching frequency
- Long electrical endurance
- Evaluation of electronic sensors
- Sensor lead up to max. 2 000 m
- Cascading possible
- Insensitive to vibrations and dirt
- Compact design, low weight
- Approved for the world market
- Two sensor inputs (e.g. EMERGENCY-STOP, protective door)
- Also suitable for protective door tumblers and OK button
- Two electronic and two relay enabling circuits

## Technical specifications

Type	Multi-function units 3TK2845							
	"Automatic and monitored start"	"Automatic and monitored start" <i>t<sub>v</sub></i>	"Monitored start"	"Monitored start" <i>t<sub>v</sub></i>	OK button	OK button <i>t<sub>v</sub></i>	"Spring-actuated tumbler" <i>t<sub>v</sub></i>	"Solenoid tumbler" <i>t<sub>v</sub></i>
<b>Sensors</b>								
• Inputs	2	2	2	2	2	2	2	2
• Electronic	✓	✓	✓	✓	✓	✓	✓	✓
• With contacts	✓	✓	✓	✓	✓	✓	✓	✓
• Magnetically operated switch (Reed contacts)	✓	✓	✓	✓	✓	✓	✓	✓
<b>Safety mats</b>	✓	✓	✓	✓	--	--	--	--
<b>Start</b>								
• Auto	1	1	--	--	1	1	--	--
• Monitored	1	1	2	2	1	1	2	2
<b>Cascading input 24 V DC</b>	✓	✓	✓	✓	✓	✓	✓	✓
<b>Key-operated switch</b>	✓	✓	✓	✓	✓	✓	✓	✓
<b>Enabling circuit, floating</b>								
• Stop category 0	2 NO	1 NO	2 NO	1 NO	2 NO	1 NO	1 NO	1 NO
• Stop category 1	--	1 NO	--	1 NO	--	1 NO	1 NO	1 NO
<b>Enabling circuit, electronic</b>								
• Stop category 0	2	1	2	1	2	1	1	1
• Stop category 1	--	1	--	1	--	1	1	1
<b>Signaling outputs</b>								
• Floating	--	--	--	--	--	--	--	--
• Electronic	1	1	1	1	1	1	1	1
<b>Standards</b>	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508
<b>Test certificates</b>								
<b>SIL level max. according to IEC 61508</b>	3	3	3	3	3	3	3	3
<b>Performance level PL according to EN ISO 13849-1</b>	e	e	e	e	e	e	e	e
<b>Probability of a dangerous failure per hour (PFH<sub>d</sub>)</b>	6.9 x 10 <sup>-9</sup> 1/h	6.9 x 10 <sup>-9</sup> 1/h	6.9 x 10 <sup>-9</sup> 1/h	6.9 x 10 <sup>-9</sup> 1/h	6.9 x 10 <sup>-9</sup> 1/h	6.9 x 10 <sup>-9</sup> 1/h	6.9 x 10 <sup>-9</sup> 1/h	6.9 x 10 <sup>-9</sup> 1/h
<b>Rated control supply voltage 24 V DC</b>	✓	✓	✓	✓	✓	✓	✓	✓

✓ Available  
-- Not available

# SIRIUS 3TK28

With electronic enabling circuits

### Selection and ordering data

PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41L



3TK2845-1HB40



3TK2845-1HB41



3TK2845-2DB40

Rated control supply voltage $U_s$	Start Automatic/monitored	OFF-delay $t_v$	DT	Screw terminals	DT	Spring-type terminals	
V		s		Article No.	Price per PU	Article No.	Price per PU
<b>Multi-function units</b>							
<b>3TK2845 "Automatic and monitored start"</b>							
• 24 DC	1/1	--	C	3TK2845-1HB40	C	3TK2845-2HB40	
<b>3TK2845 <math>t_v</math> "Automatic and monitored start"</b>							
• 24 DC	1/1	0.05 ... 3	C	3TK2845-1HB41	C	3TK2845-2HB41	
	1/1	0.5 ... 30	C	3TK2845-1HB42	C	3TK2845-2HB42	
	1/1	5 ... 300	C	3TK2845-1HB44	C	3TK2845-2HB44	
<b>3TK2845 "Monitored start"</b>							
• 24 DC	--/2	--	C	3TK2845-1DB40	C	3TK2845-2DB40	
<b>3TK2845 <math>t_v</math> "Monitored start"</b>							
• 24 DC	--/2	0.05 ... 3	C	3TK2845-1DB41	C	3TK2845-2DB41	
	--/2	0.5 ... 30	C	3TK2845-1DB42	C	3TK2845-2DB42	
	--/2	5 ... 300	C	3TK2845-1DB44	C	3TK2845-2DB44	
<b>3TK2845 "OK button"</b>							
• 24 DC	1/1	--	C	3TK2845-1EB40	C	3TK2845-2EB40	
<b>3TK2845 <math>t_v</math> "OK button"</b>							
• 24 DC	1/1	0.05 ... 3	C	3TK2845-1EB41	C	3TK2845-2EB41	
	1/1	0.5 ... 30	C	3TK2845-1EB42	C	3TK2845-2EB42	
	1/1	5 ... 300	C	3TK2845-1EB44	C	3TK2845-2EB44	
<b>3TK2845 <math>t_v</math> "Spring-actuated tumbler"</b>							
• 24 DC	--/2	0.05 ... 3	C	3TK2845-1FB41	C	3TK2845-2FB41	
	--/2	0.5 ... 30	C	3TK2845-1FB42	C	3TK2845-2FB42	
	--/2	5 ... 300	C	3TK2845-1FB44	C	3TK2845-2FB44	
<b>3TK2845 <math>t_v</math> "Solenoid tumbler"</b>							
• 24 DC	--/2	0.05 ... 3	C	3TK2845-1GB41	C	3TK2845-2GB41	
	--/2	0.5 ... 30	C	3TK2845-1GB42	C	3TK2845-2GB42	
	--/2	5 ... 300	C	3TK2845-1GB44	C	3TK2845-2GB44	

Note:

For additional 3TK28 safety relays, see Catalog Add-On IC 10 AO · 2016.

# SIRIUS 3TK28

With special functions

## Overview



SIRIUS 3TK2810 safety relays

### 3TK2810-0 standstill monitors

The standstill monitor increases safety in hazardous areas. Without a sensor, it detects motor stoppage from the residual magnetization of the rotating motor. When an adjustable threshold value is undershot, it uses its outputs to allow access to hazardous areas, for example by unlocking a protective door.

### 3TK2810-1 speed monitors

The speed monitor combines two safety functions in one unit by continuously monitoring machines and plants for standstill and speed.

Through simple parameterization and permanent diagnosis on the display, faults can be quickly remedied at any time – often before they cause plant downtimes.

In addition to standstill and speed monitoring, the unit also features an integrated monitoring function of a protective door with spring-type interlocking. Therefore, an additional evaluation unit is not needed.

## Benefits

### 3TK2810-0 standstill monitors

- No additional sensors required
- Signaling of faults with diagnostics display
- Standstill time can be set
- Unit can be used with frequency converters

### 3TK2810-1 speed monitors

- Menu-prompted, easy parameterization
- Direct diagnosis on the display means shorter downtimes thanks to early fault detection
- Integrated protective door monitoring means greater safety because access to the plant is allowed only in the safe state
- Suitable for all standard sensors, i.e. high flexibility

## Technical specifications

Type	Standstill monitors 3TK2810-0	Speed monitors 3TK2810-1
<b>Sensors</b>		
• Inputs	3	4
• Electronic	--	3
• With contacts	--	1
• Without sensors (measuring inputs)	3	--
• Magnetically operated switch (Reed contacts)	--	--
<b>Safety mats</b>	--	--
<b>Start</b>		
• Auto	✓	✓
• Monitored	--	✓
<b>Cascading input 24 V DC</b>	--	--
<b>Key-operated switch</b>	--	--
<b>Enabling circuit, floating</b>		
• Stop category 0	3 NO + 1 NC	2
• Stop category 1	--	--
<b>Enabling circuit, electronic</b>		
• Stop category 0	--	--
• Stop category 1	--	--

✓ Available  
-- Not available

Type	Standstill monitors 3TK2810-0	Speed monitors 3TK2810-1
<b>Signaling outputs</b>		
• Floating	1 CO	--
• Electronic	2	2
<b>Standards</b>	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60947-5-1, EN ISO 13849-1, IEC 60204-1, IEC 61508
<b>Test certificates</b>	TÜV, UL, CSA	TÜV, UL, CSA
<b>SIL level max. according to IEC 61508</b>	3	3
<b>Performance level PL according to ISO 13849-1</b>	e	e
<b>Probability of a dangerous failure per hour (PFH<sub>d</sub>)</b>	1.5 x 10 <sup>-8</sup> 1/h	3.38 x 10 <sup>-9</sup> 1/h
<b>Rated control supply voltage</b>		
• 24 V DC	✓	✓
• 230 V AC	✓	--
• 400 V AC	✓	--
• 120 ... 240 V AC/DC	--	✓



# SIRIUS 3TK28

With special functions

## Selection and ordering data

PU (UNIT, SET, M) = 1  
 PS\* = 1 unit  
 PG = 41L



3TK2810-0BA01



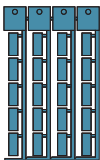





3TK2810-0GA02



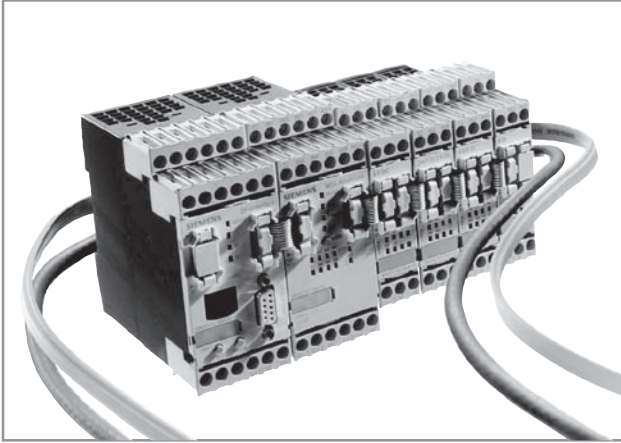
3TK2810-1BA41

Rated control supply voltage $U_s$	Time	DT	Screw terminals	DT	Spring-type terminals	
V	s		Article No.	Price per PU	Article No.	Price per PU
<b>Standstill monitors</b>						
<b>3TK2810-0</b>						
	Standstill time					
• 24 DC	0.2 ... 6	B	<b>3TK2810-0BA01</b>		C	<b>3TK2810-0BA02</b>
• 230 AC	0.2 ... 6	C	<b>3TK2810-0GA01</b>		C	<b>3TK2810-0GA02</b>
• 400 AC	0.2 ... 6	C	<b>3TK2810-0JA01</b>		C	<b>3TK2810-0JA02</b>
<b>Speed monitors</b>						
Release delay time						
<b>3TK2810-1 for NPN/PNP proximity switches and encoders</b>						
• 24 DC	0 ... 999	A	<b>3TK2810-1BA41</b>		A	<b>3TK2810-1BA42</b>
• 120 ... 240 AC/DC	0 ... 999	B	<b>3TK2810-1KA41</b>		B	<b>3TK2810-1KA42</b>
<b>3TK2810-1 for NAMUR proximity switches and encoders</b>						
• 24 DC	0 ... 999	B	<b>3TK2810-1BA41-0AA0</b>		B	<b>3TK2810-1BA42-0AA0</b>
• 120 ... 240 AC/DC	0 ... 999	B	<b>3TK2810-1KA41-0AA0</b>		B	<b>3TK2810-1KA42-0AA0</b>

**Selection and ordering data**

Use	Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
<b>Blank labels</b>							
 NSB0_014296 3RT1900-1SB20	For 3TK28		<b>Unit labeling plates</b> For SIRIUS devices				
			20 mm x 7 mm, pastel turquoise	D	<b>3RT1900-1SB20</b>	100	340 units 41B
	For 3TK28		<b>Adhesive labels</b> For SIRIUS devices				
			• 19 mm x 6 mm, pastel turquoise	C	<b>3RT1900-1SB60</b>	100	3 060 units 41B
			• 19 mm x 6 mm, zinc yellow	C	<b>3RT1900-1SD60</b>	100	3 060 units 41B
<b>Push-in lugs and covers</b>							
 3RP1903	For 3TK28		<b>Push-in lugs</b> For screw fixing, 2 units are required for each device	B	<b>3RP1903</b>	1	10 units 41H
	For 3TK2826		<b>Sealable covers</b> For securing against unauthorized adjustment of setting knobs	A	<b>3TK2826-0DA00-0HA0</b>	1	5 units 41L
	For 3TK28		<b>Sealing foil</b> For securing against unauthorized adjustment of setting knobs	▶	<b>3TK2820-0AA00</b>	1	1 unit 41L
<b>Adapters and connection cables for speed monitors</b>							
 3TK2810-1A  3TK2810-1B	For 3TK2810-1		<b>Adapters</b> for connecting encoders of type Siemens/Heidenhain				
			• 15-pole	A	<b>3TK2810-1A</b>	1	1 unit 41L
			• 25-pole	A	<b>3TK2810-1B</b>	1	1 unit 41L
 3TK2810-0A	For 3TK2810-1		<b>Connection cables</b> For connecting the speed monitor to the 3TK2810-1A or 3TK2810-1B adapter	C	<b>3TK2810-0A</b>	1	1 unit 41L
	<b>Tools for opening spring-type terminals</b>						
 3RA29 08-1A	For auxiliary circuit connections		<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	A			
					<b>Spring-type terminals</b> 		
					<b>3RA2908-1A</b>	1	1 unit 41B

## Overview



SIRIUS 3RK3 Modular Safety System

The 3RK3 Modular Safety System (MSS) is a freely parameterizable modular safety relay. Depending on the external circuit version, safety-oriented applications up to Performance Level e according to EN ISO 13849-1 or SIL 3 according to IEC 62061 can be realized.

The modular safety relay enables the interconnection of several safety applications.

The comprehensive error and status diagnostics provides the possibility of finding errors in the system and localizing signals from sensors. Plant downtimes can be reduced as the result.

The MSS comprises the following system components:

- Central units
- Expansion modules
- Interface modules
- Diagnostics modules
- Parameterization software
- Accessories

**Central units**MSS Basic

The 3RK3 Basic central unit is used wherever more than three safety functions need to be evaluated and the wiring parameterization of safety relays would involve great cost and effort. It reads in inputs, controls outputs and communicates through an interface module with higher-level control systems. An application's entire safety program is processed in the central unit. The 3RK3 Basic central unit is the lowest expansion level and fully functional on its own, without the optional expansion modules.

MSS Advanced

The 3RK3 Advanced central unit is the consistent expansion of the Basic central unit with the functionality of an AS-i safety monitor. In addition to having a larger volume of project data and scope of functionality, it can be integrated into AS-Interface and therefore makes use of the many different possibilities offered by this bus system. The function can be optionally activated in the central unit.

The service-proven insulation piercing method of AS-Interface enables not only the distributed expansion of the project data volume using safe AS-i outputs, safe AS-i sensors and other MSS Advanced or safety monitors (F cross traffic) but also a highly flexible adaptation of the application, e.g. very fast connection of AS-i outputs, LV HRC command devices, position switches with and without interlocking, or light arrays.

Safety-oriented disconnection using MSS or by distributed means using safe AS-i outputs and the formation of switch-off groups can be implemented very easily. The same applies for any subsequent modifications. They are now easily possible by re-addressing, i.e. re-wiring is no longer necessary.

The AS-i bus is connected directly to the central unit.

MSS ASIsafe

The MSS ASIsafe basic and MSS ASIsafe extended central units are a logical development of the AS-i safety monitors based on the 3RK3 Modular Safety System.

Like MSS Advanced, MSS ASIsafe detects – in a comparable way to the safety monitors – safe sensor technology on the AS-i bus and switches actuators off in a safety-oriented manner via a configurable safety logic. It stands out by virtue of its greater project data volume, wider range of functions and the possibility of increasing the the integrated I/O project data volume by means of expansion modules from the MSS system family. In this case the range of functions, such as the number and type of the logic elements that can be interconnected, is equivalent to that of MSS Advanced.

**Expansion modules**

With the optional expansion modules, both safety-related and standard, the system is flexibly adapted to the required safety applications.

**Interface modules**

The DP interface module is used for transferring diagnostics data and device status data to a higher-level PROFIBUS network, e.g. for purposes of visualization via HMI. When using the Basic central unit, 32-bit cyclic data can be exchanged with the control system. If an Advanced/ASIsafe central unit is used, the number is doubled to 64-bit cycle data. The acyclic calling of diagnostics data is possible with both central units.

**Diagnostics modules**

Faults like a cross-circuit, for instance, are displayed directly on the diagnostic display. The fault is diagnosed directly in plain text by the detailed alarm message. The device is fully functional upon delivery. No programming is required.

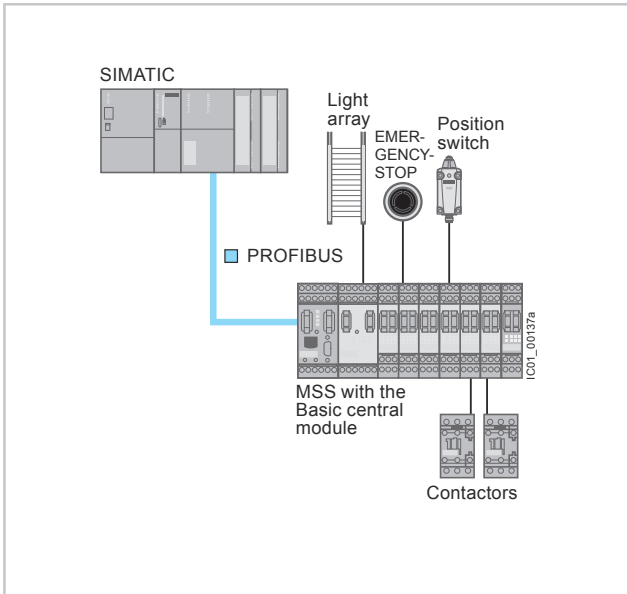
**Parameterization software**

Using the SIRIUS Safety ES graphical parameterization tool it is very easy to create the safety functions as well as their logical links on the PC. You can define disconnection ranges, ON-delays, OFF-delays and other dependent factors, for example.

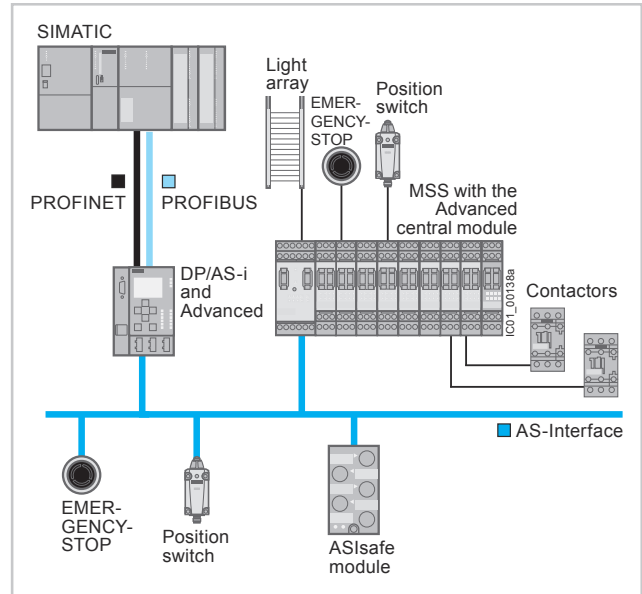
SIRIUS Safety ES also offers comprehensive functions for diagnostics and commissioning. Documentation of the MSS hardware layout and the parameterized logic is drawn up automatically.

# SIRIUS 3RK3 Modular Safety System

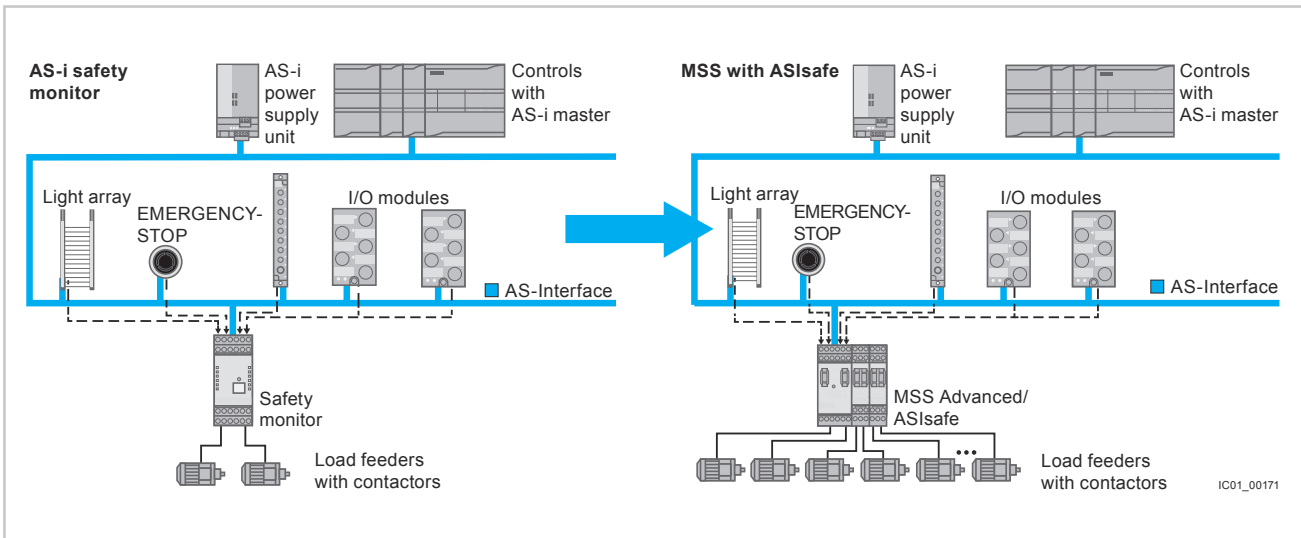
## General data



System configuration with the Basic central unit



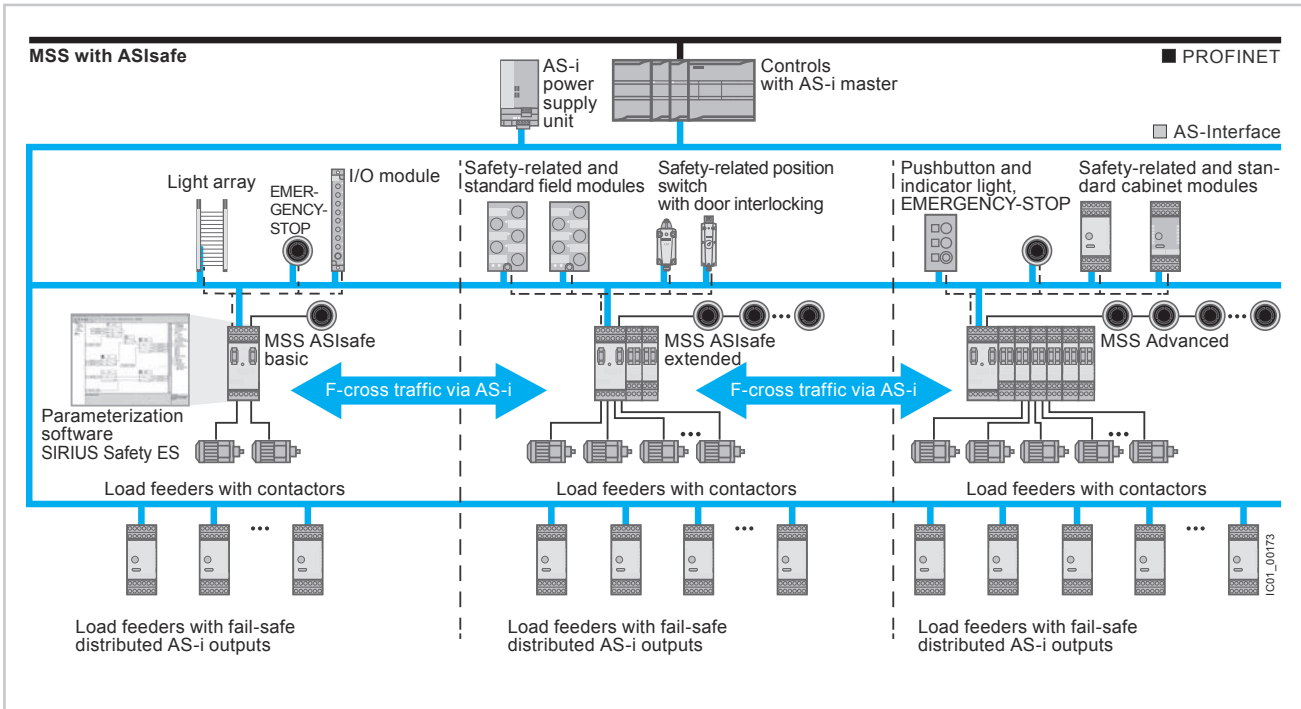
System configuration with the Advanced central unit



Further development of the system design: from the safety monitor to MSS Advanced/MSS ASIsafe

# SIRIUS 3RK3 Modular Safety System

## General data



MSS with ASIsafe

### Order No. scheme

Digit of the Order No.	1st - 4th	5th	6th	7th	8th	9th	10th	11th	12th	
	□□□□	□	□	□	-	□	□	□	□	
<b>Modular safety system</b>	<b>3 R K 3</b>									
<b>Device type</b>	□									
<b>Device type</b>	□ □									
<b>Connection type</b>	□									
<b>Communications</b>	□ □ □									
<b>Version</b>	□									
<b>Example</b>	<b>3 R K 3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>A</b>	<b>A</b>	<b>1</b>	<b>0</b>

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quoted in the catalog in the selection and ordering data.

**Benefits**

- More functionality and flexibility through freely configurable safety logic
- Suitable for all safety applications thanks to compliance with the highest safety standards in factory automation
- For use all over the world through compliance with all product-relevant, globally established certifications
- Modular hardware configuration
- Parameterization by means of software instead of wiring
- Removable terminals for greater plant availability
- Distributed collection from sensors and disconnection of actuators through AS-Interface
- All SIRIUS Safety ES logic functions are also usable for AS-Interface, e. g. muting, protective door with interlocking
- Up to 12 independent safe switch-off groups on the AS-i bus
- Volume of project data can be greatly increased by means of AS-Interface
- Up to 50 two-channel enabling circuits per system

**Communication through PROFIBUS**

The 3RK3 Modular Safety System can be connected to PROFIBUS through the DP interface and can exchange data with higher-level control systems.

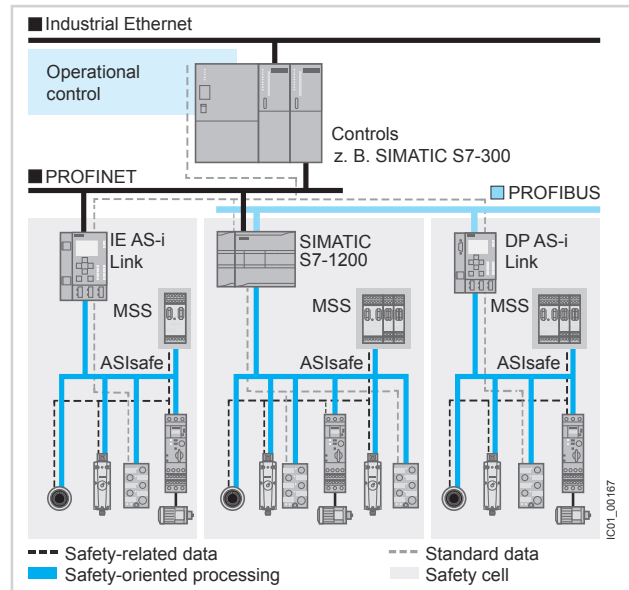
The MSS supports among other things:

- Baud rates up to 12 Mbit/s
- Automatic baud rate detection
- Cyclic services (DPV0) and acyclic services (DPV1)
- Exchange of 32-bit cyclic data with MSS Basic or 64-bit cyclic data with MSS Advanced/MSS ASIsafe
- Diagnostics using data record invocations

**AS-Interface communication**

The 3RK3 Modular Safety System can be integrated into AS-Interface with the Advanced and ASIsafe central units.

- MSS can read in up to 31 AS-i sensors
- Up to 12 preprocessed signals per MSS can be placed on the AS-i bus, e.g. for F-cross traffic or for disconnecting safe AS-i outputs
- Safe cross-traffic between MSS Advanced and MSS ASIsafe or with other AS-i safety monitors
- Standard signals, e.g. for acknowledgement, can also be placed on the bus



Integration of MSS into AS-Interface as ASIsafe Solution Local

MSS with communication function [see page 13/152 onwards](#).

Accessories [see page 13/154 onwards](#).

For more information on AS-Interface with ASIsafe, [see also Chapter 14 on Industrial Communication](#).

# SIRIUS 3RK3 Modular Safety System

## Central units

### Selection and ordering data



PU (UNIT, SET, M) = 1  
 PS\* = 1 unit



3RK3 111-1AA10



3RK3 121-1AC00  
 3RK3 122-1AC00  
 3RK3 131-1AC10

Version	DT	Screw terminals 	DT	Spring-type terminals 	
		Order No.	Price per PU	Order No.	Price per PU

Central units				
<p><b>3RK3 Basic</b></p> <p>Central unit with safety-oriented inputs and outputs</p> <ul style="list-style-type: none"> <li>• 8 non-fail-safe inputs</li> <li>• 1 two-channel relay output</li> <li>• 1 two-channel solid-state output</li> </ul> <p>Max. 7 expansion modules can be connected</p> <p><u>Note:</u>                      Memory module 3RK3 931-0AA00 is included in the scope of supply.</p>	▶	<b>3RK3 111-1AA10</b>	A	<b>3RK3 111-2AA10</b>
<p><b>3RK3 Advanced</b></p> <p>Central units for connecting to AS-Interface with safety-oriented inputs and outputs and extended scope of functions</p> <ul style="list-style-type: none"> <li>• 8 non-fail-safe inputs</li> <li>• 1 two-channel relay output</li> <li>• 1 two-channel solid-state output</li> </ul> <p>Max. 9 expansion modules can be connected</p> <p><u>Note:</u>                      Memory module 3RK3 931-0AA00 is included in the scope of supply.</p>	▶	<b>3RK3 131-1AC10</b>	A	<b>3RK3 131-2AC10</b>
<p><b>3RK3 ASIsafe basic</b></p> <p>Central units for connecting to AS-Interface with safety-oriented inputs and outputs and extended scope of functions</p> <ul style="list-style-type: none"> <li>• 2 fail-safe inputs</li> <li>• 6 non-fail-safe inputs</li> <li>• 1 two-channel relay output</li> <li>• 1 two-channel solid-state output</li> </ul> <p>No expansion modules can be connected</p> <p><u>Note:</u>                      Memory module 3RK3 931-0AA00 is included in the scope of supply.</p>	A	<b>3RK3 121-1AC00</b>	A	<b>3RK3 121-2AC00</b>
<p><b>3RK3 ASIsafe extended</b></p> <p>Central units for connecting to AS-Interface with safety-oriented inputs and outputs and extended scope of functions</p> <ul style="list-style-type: none"> <li>• 4 fail-safe inputs</li> <li>• 4 non-fail-safe inputs</li> <li>• 1 two-channel relay output</li> <li>• 1 two-channel solid-state output</li> </ul> <p>Max. 2 expansion modules can be connected</p> <p><u>Note:</u>                      Memory module 3RK3 931-0AA00 is included in the scope of supply.</p>	A	<b>3RK3 122-1AC00</b>	A	<b>3RK3 122-2AC00</b>

Note:

More information on the Internet at [www.siemens.com/sirius-mss](http://www.siemens.com/sirius-mss).

# SIRIUS 3RK3 Modular Safety System

Expansion modules, interface modules, operating & monitoring modules

## Selection and ordering data

PU (UNIT, SET, M) = 1  
PS\* = 1 unit



3RK3 211-1AA10  
3RK3 221-1AA10  
3RK3 231-1AA10  
3RK3 242-1AA10



3RK3 251-1AA10





3RK3 311-1AA10  
3RK3 321-1AA10



3RK3 511-1BA10



3RK3 611-3AA00

Version	DT	Screw terminals 	DT	Spring-type terminals 	
		Order No.	Price per PU	Order No.	Price per PU
<b>Expansion modules</b>					
<b>4/8 F-DI</b> Safety-related input modules • 8 inputs	A	<b>3RK3 211-1AA10</b>		A	<b>3RK3 211-2AA10</b>
<b>2/4 F-DI 1/2 F-RO</b> Safety-related input/output modules • 4 inputs • 2 single-channel relay outputs	A	<b>3RK3 221-1AA10</b>		A	<b>3RK3 221-2AA10</b>
<b>2/4 F-DI 2F-DO</b> Safety-related input/output modules • 4 inputs • 2 two-channel solid-state outputs	▶	<b>3RK3 231-1AA10</b>		A	<b>3RK3 231-2AA10</b>
<b>4/8 F-RO</b> Safety-oriented output modules • 8 single-channel relay outputs	A	<b>3RK3 251-1AA10</b>		▶	<b>3RK3 251-2AA10</b>
<b>4 F-DO</b> Safety-oriented output modules • 4 two-channel solid-state outputs	A	<b>3RK3 242-1AA10</b>		▶	<b>3RK3 242-2AA10</b>
<b>8 DI</b> Standard input module • 8 inputs	▶	<b>3RK3 321-1AA10</b>		▶	<b>3RK3 321-2AA10</b>
<b>8 DO</b> Standard output module • 8 solid-state outputs	A	<b>3RK3 311-1AA10</b>		A	<b>3RK3 311-2AA10</b>
<b>Interface modules</b>					
<b>DP interface</b> PROFIBUS DP interface, 12 Mbit/s, RS 485, 32-bit cyclic data exchange with Basic central unit or 64-bit with Advanced central unit, acyclic exchange of diagnostics data	A	<b>3RK3 511-1BA10</b>		A	<b>3RK3 511-2BA10</b>
<b>Operating and monitoring modules</b>					
<b>Diagnostics module</b>	A	<b>3RK3 611-3AA00</b>		--	







**Note:**

Connection cable required, [see page 13/154](#).

More information on the Internet at [www.siemens.com/sirius-mss](http://www.siemens.com/sirius-mss).



### Selection and ordering data

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>Connection cables (essential accessory)</b>					
<b>Connection cables</b>					
For connection of					
	Central units with expansion modules or interface module	Diagnostics modules with central unit or interface module			
3UF7 932-0AA00-0	✓	✓	• Length 0.025 m (flat) ▶	<b>3UF7 930-0AA00-0</b>	1 1 unit
--	--	✓	• Length 0.1 m (flat) ▶	<b>3UF7 931-0AA00-0</b>	1 1 unit
--	--	✓	• Length 0.3 m (flat) ▶	<b>3UF7 935-0AA00-0</b>	1 1 unit
--	--	✓	• Length 0.5 m (flat) ▶	<b>3UF7 932-0AA00-0</b>	1 1 unit
--	--	✓	• Length 0.5 m (round) ▶	<b>3UF7 932-0BA00-0</b>	1 1 unit
--	--	✓	• Length 1.0 m (round) ▶	<b>3UF7 937-0BA00-0</b>	1 1 unit
--	--	✓	• Length 2.5 m (round) ▶	<b>3UF7 933-0BA00-0</b>	1 1 unit
<b>PC cables and adapters</b>					
<b>PC cables</b> ▶					
	For connecting to the serial interface of a PC/PG, for communication with 3RK3 through the system interface			<b>3UF7 940-0AA00-0</b>	1 1 unit
3UF7 940-0AA00-0					
<b>USB PC cables</b> ▶					
	For connecting to the USB interface of a PC/PG, for communication with 3RK3 through the system interface, recommended for use in connection with 3RK3			<b>3UF7 941-0AA00-0</b>	1 1 unit
<b>USB/serial adapters</b>					
			B	<b>3UF7 946-0AA00-0</b>	1 1 unit
<b>Interface covers</b>					
<b>Interface covers</b> ▶					
	For system interface			<b>3UF7 950-0AA00-0</b>	1 5 units
3UF7 950-0AA00-0					
<b>Memory modules</b>					
<b>Memory modules</b> ▶					
	For backing up the complete parameterization of the 3RK3 Modular Safety System without a PC/PG through the system interface			<b>3RK3 931-0AA00</b>	1 1 unit
3RK3 931-0AA00					
<b>Door adapters</b>					
<b>Door adapters</b>					
	For external connection of the system interface, e.g. outside a control cabinet			<b>3UF7 920-0AA00-0</b>	1 1 unit
3UF7 920-0AA00-0					
<b>Push-in lugs</b>					
<b>Push-in lugs for screw fixing</b> ▶					
	e.g. on mounting plate, 2 units required per device Can be used for 3RK3			<b>3RP19 03</b>	1 10 units
3RP19 03					
<b>Manuals</b>					
<b>Manuals for the 3RK3 Modular Safety System (MSS)</b>					
	• English		C	<b>3ZX1 012-0RK31-1AC1</b>	1 1 unit




✓ Available  
-- Not available

# SIRIUS 3RK3 Modular Safety System

## Accessories

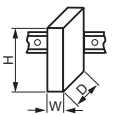
### Parameterization, startup and diagnostics software for 3RK3

- Runs under Windows XP Professional (Service Pack 2 or 3), Windows 7 32/64 Bit Professional/Ultimate/Enterprise (Service Pack 1)
- Delivered without PC cable. Please order separately, see page 13/154.

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
<b>SIRIUS Safety ES Basic</b>					
 <p>3ZS1 316-4CC10-0YA5</p>	<b>Floating license for one user</b> Engineering software in limited-function version for diagnostics purposes, software and documentation on CD, 3 languages (German/English/French), communication through the system interface				
	• License key on USB stick, Class A	A	<b>3ZS1 314-4CC10-0YA5</b>	1	1 unit
	• License key download, Class A	▶	<b>3ZS1 314-4CE10-0YB5</b>	1	1 unit
<b>SIRIUS Safety ES Standard</b>					
 <p>3ZS1 316-5CC10-0YA5</p>	<b>Floating license for one user</b> Engineering software, software and documentation on CD, 3 languages (German/English/French), communication through system interface				
	• License key on USB stick, Class A	B	<b>3ZS1 314-5CC10-0YA5</b>	1	1 unit
	• License key download, Class A	▶	<b>3ZS1 314-5CE10-0YB5</b>	1	1 unit
		<b>Powerpack for SIRIUS Safety ES Basic to Standard</b> Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface	A	<b>3ZS1 314-5CC10-0YD5</b>	1 1 unit
<b>SIRIUS Safety ES Premium</b>					
 <p>3ZS1 316-6CC10-0YA5</p>	<b>Floating license for one user</b> Engineering software, software and documentation on CD, 3 languages (German/English/French), communication through PROFIBUS or the system interface, online diagnostics via PROFIBUS, creating, importing and exporting macros				
	• License key on USB stick, Class A	▶	<b>3ZS1 314-6CC10-0YA5</b>	1	1 unit
	• License key download, Class A	▶	<b>3ZS1 314-6CE10-0YB5</b>	1	1 unit
		<b>Powerpack for SIRIUS Safety ES Basic to Standard</b> Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through PROFIBUS or the system interface, online diagnostics via PROFIBUS, creating, importing and exporting macros	A	<b>3ZS1 314-6CC10-0YD5</b>	1 1 unit

## Technical specifications

## Central units and expansion modules

Type	Central units				Expansion modules							
	Basic	Advanced	ASIsafe basic	ASIsafe extended	4/8F-DI	2/4 F-DI 1/2 F-RO	2/4 F-DI 2F-DO	4/8 F-RO	4 F-DO	8 DI	8 DO	
Dimensions (W x H x D)												
												
• Screw terminals	mm	45 x 111 x 124				22.5 x 111 x 124			45 x 111 x 124		22.5 x 111 x 124	
• Spring-type terminals	mm	45 x 113 x 124				22.5 x 113 x 124			45 x 113 x 124		22.5 x 113 x 124	
<b>Device data</b>												
Shock resistance (sine pulse)	g/ms	15/11										
Touch protection according to EN 50274 and IEC 60529		IP20										
Permissible mounting position		Vertical mounting surface (+10°/-10°), deviating mounting positions are permitted for reduced ambient temperature										
Minimum distances		For heat dissipation through convection from the devices 25 mm to the ventilation openings (top and bottom)										
Permissible ambient temperature												
• During operation	°C	-20 ... +60										
• During storage and transport	°C	-40 ... +85										
Number of sensor inputs (single-channel)												
• Fail-safe		--	--	2	4	8	4	4	--	--	--	--
• Not fail-safe		8	8	6	4	--	--	--	--	--	8	8
Number of test outputs		2	2	2	2	2	2	2	--	--	--	--
Number of outputs												
• Relay outputs												
- Single channel		--	--	--	--	--	2	--	8	--	--	--
- Two-channel		1	1	1	1	--	--	--	--	--	--	--
• Solid-state outputs												
- Single channel		--	--	--	--	--	--	--	--	--	--	8
- Two-channel		1	1	1	1	--	--	2	--	4	--	--
Weight	g	300	300	300	300	160	160	160	400	135	125	160
Installation altitude above sea level	m	2 000										
<b>Environmental data</b>												
EMC interference immunity		IEC 60947-5-1										
Vibrations												
• Frequency	Hz	5 ... 500										
• Amplitude	mm	0.75										
Climatic withstand capability		IEC 60068-2-78										
<b>Electrical specifications</b>												
Rated control supply voltage $U_s$ according to IEC 61131-2	V	24 DC 15 % <sup>1)</sup>										
Operating range		0.85 ... 1.15 x $U_s$										
Rated insulation voltage $U_i$	V	300	300	300	300	50	300	50	300	50	50	50
Rated impulse voltage $U_{imp}$	kV	4	4	4	4	0,5	4	0,5	4	0,5	0,5	0,5
Total current consumption	mA	185	185	185	185	60	85	85	140	8	78	60
Rated power at $U_s$	W	4.5	4.5	4.5	4.5	1.5	2	2	3	4.8	1.9	1.5
Utilization categories acc. to IEC 60947-5-1 (relay outputs)												
• AC-15 at 230 V	A	2	2	2	2	--	2	--	2	--	--	--
• DC-13 at 24 V (semiconductor outputs)	A	1	1	1	1	--	1	--	1	--	--	--
• DC-13 at 24 V	A	1.5	1.5	1.5	1.5	--	--	1	--	2	--	0.5
Mechanical endurance During rated operation	Operating cycles (relay)	$10 \times 10^6$	$10 \times 10^6$	$10 \times 10^6$	$10 \times 10^6$	--	$10 \times 10^6$	--	$10 \times 10^6$	--	--	--

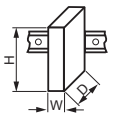
<sup>1)</sup> Device current supply through a power supply unit acc. to IEC 60536 protection class (SELV or PELV).

# SIRIUS 3RK3 Modular Safety System

## Technical data

Type	Central units				Expansion modules							
	Basic	Advanced	ASIsafe basic	ASIsafe extended	4/8F-DI	2/4 F-DI 1/2 F-RO	2/4 F-DI 2F-DO	4/8 F-RO	4 F-DO	8 DI	8 DO	
<b>Electrical specifications (cont.)</b>												
<b>Switching frequency z</b> for rated operational current	1/h	1 000	1 000	1 000	1 000	--	1 000	1 000	360	1 000	--	1 000
<b>Conventional thermal current <math>I_{th}</math></b>	A	2/1.5	2/1.5	2/1.5	2/1.5	--	1	1	3	2	--	0.5
<b>Protection for output contacts</b>												
Fuse links LV HRC Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE												
• Operational class gG	A	4	4	4	4	--	4	--	4	--	--	--
• Operational class quick response	A	6	6	6	6	--	6	--	6	--	--	--
<b>Safety specifications</b>												
<b>Probability of a dangerous failure</b>												
• Per hour (PFH <sub>d</sub> )	1/h	5.14 x 10 <sup>-9</sup>	2.8 x 10 <sup>-9</sup>	2.8 x 10 <sup>-9</sup>	2.8 x 10 <sup>-9</sup>	1.89 x 10 <sup>-9</sup>	3.79 x 10 <sup>-9</sup>	2.7 x 10 <sup>-9</sup>	7.15 x 10 <sup>-9</sup>	3.18 x 10 <sup>-9</sup>	--	--
• On demand (PFD)	1/h	1.28 x 10 <sup>-5</sup>	1.7 x 10 <sup>-4</sup>	1.7 x 10 <sup>-4</sup>	1.7 x 10 <sup>-4</sup>	4.29 x 10 <sup>-6</sup>	5.85 x 10 <sup>-6</sup>	8.34 x 10 <sup>-6</sup>	4.36 x 10 <sup>-5</sup>	2.2 x 10 <sup>-5</sup>	--	--
<b>Parameters for cables</b>												
<b>Line resistance</b>		100	100	100	100	100	100	100	--	--	100	--
<b>Cable length from terminal to terminal</b> With Cu 1.5 mm <sup>2</sup> and 150 nF/km	m	1 000	1 000	1 000	1 000	1 000	1 000	1 000	--	--	1 000	--
<b>Conductor capacity</b>	nF	330	330	330	330	330	330	330	--	--	330	--

### Interface and diagnostics modules

Type	Interface modules		Diagnostics modules	
Dimensions (W x H x D)				
				
• Screw terminals	mm	45 x 111 x 124		96 x 60 x 44
• Spring-type terminals	mm	45 x 113 x 124		--
<b>Device data</b>				
<b>Shock resistance (sine pulse)</b>	g/ms	15/11		
<b>Touch protection</b> according to EN 50274 and IEC 60529		IP20		
<b>Permissible mounting position</b>		Vertical mounting surface (+10°/-10°), deviating mounting positions are permitted for reduced ambient temperature		
<b>Minimum distances</b>		For heat dissipation through convection from the devices 25 mm to the ventilation openings (top and bottom)		
<b>Permissible ambient temperature</b>				
• During operation	°C	-20 ... +60		
• During storage and transport	°C	-40 ... +85		
<b>Weight</b>	g	270		90
<b>Installation altitude above sea level</b>	m	2 000		
<b>Environmental data</b>				
<b>EMC interference immunity</b>		IEC 60947-5-1		
<b>Vibrations</b>				
• Frequency	Hz	5 ... 500		
• Amplitude	mm	0.75		
<b>Climatic withstand capability</b>		IEC 60068-2-78		
<b>Electrical specifications</b>				
<b>Rated control supply voltage <math>U_s</math></b> according to IEC 61131-2	V	24 DC 15 %		24 DC 15 % via connecting cable to the central unit
<b>Operating range</b>		0.85 ... 1.15 x $U_s$		
<b>Rated insulation voltage <math>U_i</math></b>	V	50		
<b>Rated impulse voltage <math>U_{imp}</math></b>	kV	0,5		
<b>Total current consumption</b>	mA	--		24
<b>Rated power at <math>U_s</math></b>	W	--		0.6

## Application

The 3RK3 Modular Safety System can be used for all safety-oriented requirements in the manufacturing industry and offers the following safety functions:

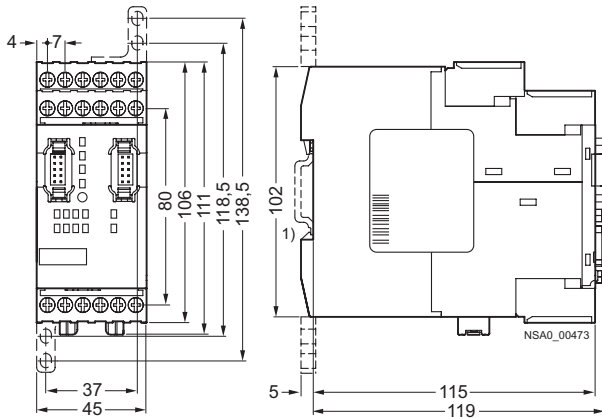
	Symbol	MSS Basic	MSS Advanced, MSS ASIsafe
<b>Monitoring functions</b>			
<b>Universal monitoring</b> Evaluation of any binary signals from single-channel and two-channel sensors		--	✓
<b>EMERGENCY-STOP</b> Evaluation of EMERGENCY-STOP devices with positive-opening contacts		✓	✓
<b>Safety shutdown mats</b> Evaluation of safety shutdown mats with NC contacts and/or cross-circuit detection		✓	✓
<b>Protective door monitoring</b> Evaluation of protective door signals and/or protective flap signals		✓	✓
<b>Protective door interlocking mechanism</b> Evaluation of protective doors with interlocking and locking/unlocking of this device		--	✓
<b>Enabling switches</b> Evaluation of OK buttons with NO contact		✓	✓
<b>Two-hand operator controls</b> Evaluation of two-hand operation consoles		✓	✓
<b>ESPE monitoring</b> Evaluation of electro-sensitive protective equipment such as light arrays and laser scanners		✓	✓
<b>Muting</b> Short-time bridging of electro-sensitive protective equipment, 2/4 sensors in parallel, 4 sensors sequentially		--	✓
<b>Operating mode selector switches</b> Evaluation of operating mode selector switches with NO contacts		✓	✓
<b>Monitoring of AS-i (AS-i 2F-DI)</b> Logic element for monitoring of AS-i input slaves		--	✓

✓ Available  
-- Not available

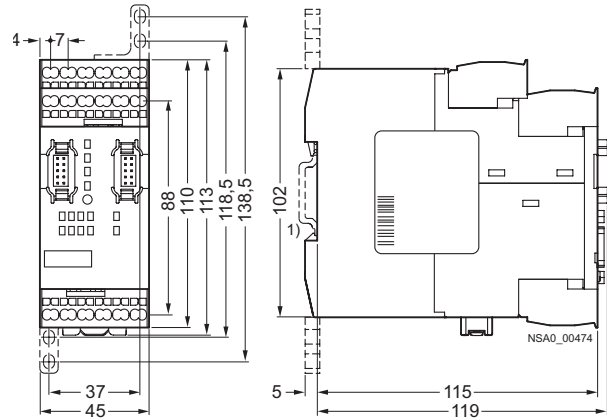
	Symbol	MSS Basic	MSS Advanced, MSS ASIsafe
<b>Logic operation functions</b>			
<b>AND</b>		✓	✓
<b>OR</b>		✓	✓
<b>XOR</b>		✓	✓
<b>NAND</b>		✓	✓
<b>NOR</b>		✓	✓
<b>Negation</b>		✓	✓
<b>Flip-flop</b>		✓	✓
<b>Counter functions</b>			
<b>Counter 0 -&gt; 1</b>		✓	✓
<b>Counter 1 -&gt; 0</b>		✓	✓
<b>Counter 0 -&gt; 1/1 -&gt; 0</b>		✓	✓
<b>Timer functions</b>			
<b>With ON-delay</b>		✓	✓
<b>Passing make contact</b>		✓	✓
<b>With OFF-delay</b>		✓	✓
<b>Clock pulsing</b>		✓	✓
<b>Start functions</b>			
<b>Monitored start</b>		✓	✓
<b>Manual start</b>		✓	✓
<b>Output functions</b>			
<b>Standard output</b>		✓	✓
<b>F output</b>		✓	✓
<b>AS-i output function</b>		--	✓
<b>Status functions</b>			
<b>Element status</b>		--	✓

**Dimensional drawings**

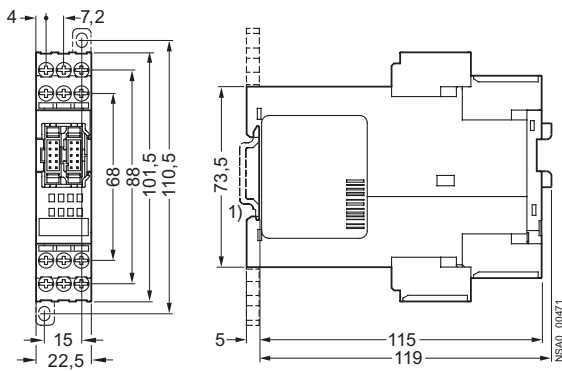
**Central module with screw terminals**



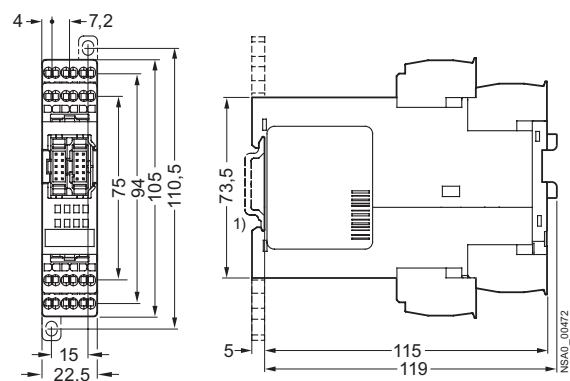
**Central module with spring-type terminals**



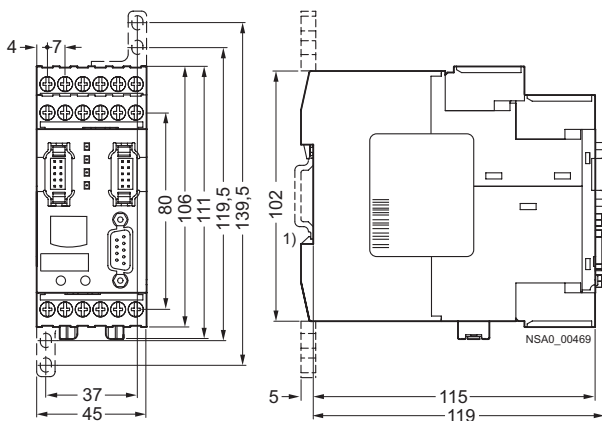
**Expansion module with screw terminals**



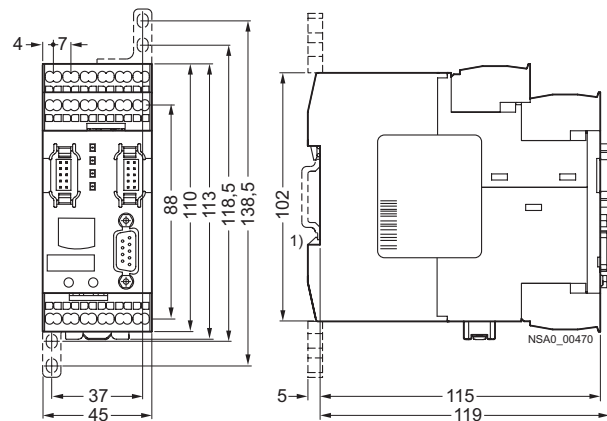
**Expansion module with spring-type terminals**



**Interface module with screw terminals**



**Interface module with spring-type terminals**



1) For standard mounting rail TH 35 according to EN 60715.

# Safety Relays

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Siemens complete AS-Interface offering is found in Section 4 of the Siemens IK PI 2015 Catalog.

In this section you will find the Table of Contents for Section 4 of the Siemens IK PI 2015 catalog and overview information on AS-Interface and ASIsafe.

A PDF version of Section 4 on AS-Interface can be viewed from the Siemens' on-line version of this 2017 Industrial Controls Catalog.

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1) See Catalog IC 10 "Industrial controls".

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<b>3RA27</b>	Contactors Function Modules for AS-Interface
<b>3RA6</b>	Compact Starter
<b>3RG783</b>	SIMATIC FS600 Laser Scanner
<b>3RK11</b>	Safety Monitor, Analog I/O Modules
<b>3RK12</b>	Compact Safety Modules, I/O Modules, Counter Modules, Communication Modules
<b>3RK13</b>	Enclosed Motor Starters
<b>3RK14</b>	Compact Safety Modules, I/O Modules, Communication Modules, Ground Fault Protection Modules, Connections for LOGO!
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Siemens complete IO-Link offering is found in Section 5 of the Siemens IK PI 2015 Catalog.

In this section you will find the Table of Contents for Section 5 of the Siemens IK PI 2015 catalog and overview information on IO-Link.

A PDF version of Section 5 on IO-Link can be viewed from the Siemens' on-line version of this 2017 Industrial Controls Catalog.

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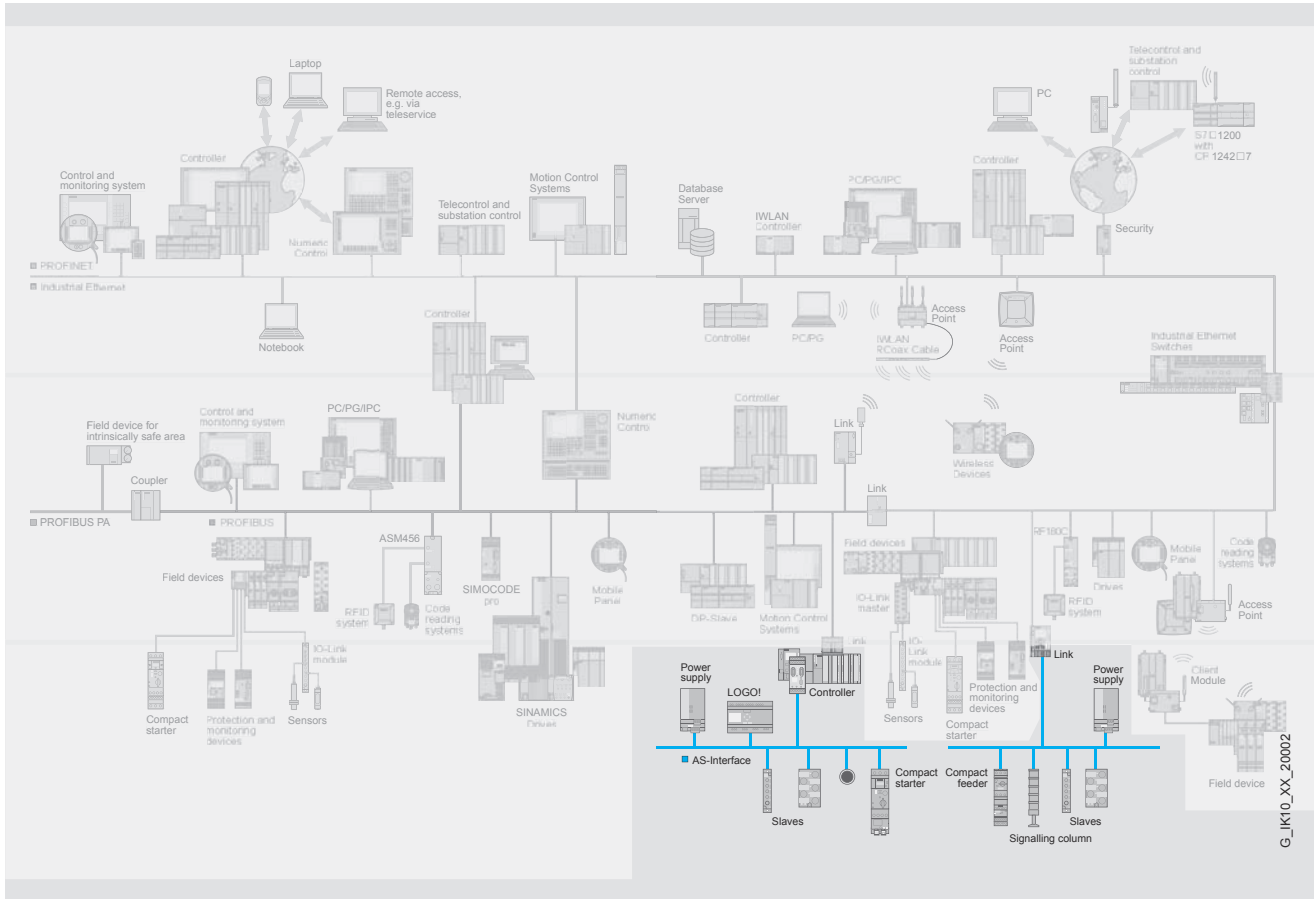
# Introduction

## Communication overview

### Overview

AS-Interface is an open, international standard according to EN 50295 and IEC 62026-2 for process and field communication. Leading manufacturers of actuators and sensors all over the world support the AS-Interface. Interested companies are provided with the electrical and mechanical specifications by the AS-Interface Association.

AS-Interface is a single master system. For automation systems from Siemens, there are communications processors (CPs) communications modules (CMs) and routers (links) that control the process or field communication as masters, and actuators and sensors that are activated as AS-Interface slaves.



14 AS-INTERFACE AND IO LINK

### Benefits

A key feature of AS-Interface technology is the use of a shared two-conductor cable for data transmission and the distribution of auxiliary power to the sensors/actuators. A power supply unit which meets the requirements of the AS-Interface transmission method and has an external data decoupling module if required is used for the distribution of auxiliary power. The AS-Interface cable used for the wiring is mechanically coded and hence protected against polarity reversal and can be easily contacted by the insulation piercing method.

Elaborately wired control cables in the control cabinet and marshalling racks can be replaced by AS-Interface.

The AS-Interface cable can be connected to any points thanks to a specially developed cable and connection by the insulation piercing method.

With this concept you become extremely flexible and achieve high savings.

### Application

#### I/O data exchange

The AS-i master transmits automatically the inputs and outputs between the control system and the digital and analog AS-Interface slaves.

Slave diagnostics information is forwarded to the control system when required.

AS-Interface masters according to the AS-Interface Specification V2.1 or V3.0 support integrated analog value processing. This means that data exchange with analog AS-Interface slaves is just as easy as with digital slaves.

#### Command interface

In addition to I/O data exchange with binary and analog AS-Interface slaves the AS-Interface masters provide a number of other functions through the command interface.

Hence it is possible, for example, for slave addresses to be issued, parameter values transferred or configuration information read out from user programs.

You can find more information on the Internet, see <http://support.automation.siemens.com/WWW/view/en/51678777>

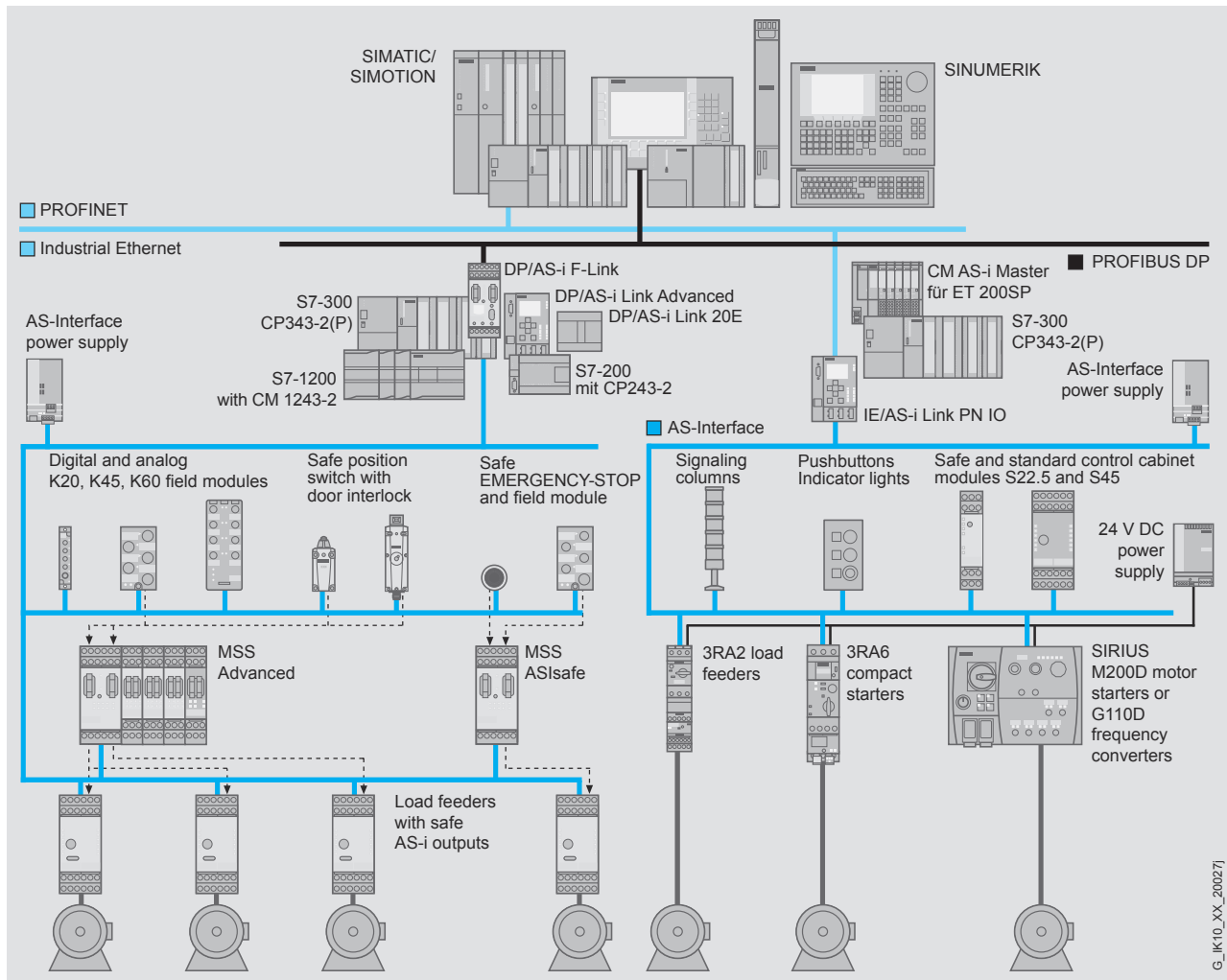
# Introduction

## System components

### Overview

To implement communication, a system installation has the following main components:

- Master interface modules for central control units such as SIMATIC S7, ET 200 distributed peripherals, or routers from PROFIBUS/PROFINET to AS-Interface
- Power supply units, if required in combination with a data decoupling module for the power supply to the slaves
- AS-Interface shaped cables
- Network components such as repeaters and extension plugs (cannot be used for AS-i Power24V)
- Modules for connection of standard sensors/actuators
- Actuators and sensors with integrated AS-i slave
- Safety modules for transmitting safety-oriented data through AS-Interface
- Addressing units for setting the slave addresses during commissioning



Example of a configuration with the system components

### Features

Standard	EN 50295 / IEC 62026-2
Topology	Line, star or tree structure (same as electrical wiring)
Transmission medium	Unshielded two-wire cable (2 x 1.5 mm <sup>2</sup> ) for data and auxiliary power
Connection methods	Contacting of the AS-Interface cable by insulation piercing method
Maximum cable length	<ul style="list-style-type: none"> <li>• 100 m without repeater</li> <li>• 200 m with extension plug</li> <li>• 300 m with two repeaters in series connection</li> <li>• 600 m with extension plugs and two repeaters connected in parallel</li> </ul> Larger cable lengths are also possible when additional repeaters are connected in parallel

Maximum cycle time	<ul style="list-style-type: none"> <li>• 5 ms in full expansion with standard addresses</li> <li>• 10 ms in full expansion with A/B addresses, profile-specific for Spec 3.0 slaves</li> </ul>
Number of stations per AS-Interface line	<ul style="list-style-type: none"> <li>• 31 slaves acc. to AS-Interface Spec. V2.0</li> <li>• 62 slaves (A/B technology) acc. to AS-Interface Spec. V2.1 and V3.0</li> <li>• Integrated analog value transmission</li> </ul>
Number of binary sensors and actuators	<ul style="list-style-type: none"> <li>• Max. 124 DI/124 DO according to Spec. V2.0</li> <li>• Max. 248 DI/186 DO according to Spec. V2.1</li> <li>• Max. 496 DI/496 DO according to Spec. V3.0</li> </ul>
Access control	<ul style="list-style-type: none"> <li>• Cyclic polling master/slave procedure</li> <li>• Cyclic data acceptance from host (PLC, PC)</li> </ul>
Error safeguard	Identification and repetition of faulty message frames

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## Overview

## Scope of the AS-Interface specification

AS-Interface Specification	Maximum number of slaves			Number of digital inputs	Number of digital outputs
	Digital	Analog	ASIsafe	DI	DO
Version 2.0	31	31	31	31 × 4 = 124	31 × 4 = 124
Version 2.1	62	31	31	62 × 4 = 248	62 × 3 = 186
Version 3.0	62	62	31	62 × 8 = 496	62 × 8 = 496

## Basic data of AS-Interface Specification 2.0

- AS-Interface Specification 2.0 describes a fieldbus system with an AS-i master and up to 31 AS-i slaves.
- Each AS-i slave has up to 4 digital inputs and 4 digital outputs.
- With full expansion, the complete transmission of all input/output data requires max. 5 ms cycle time.

## Expansions of AS-Interface Specification 2.1

AS-Interface Specification 2.1 enables the number of network stations to be doubled from 31 to 62 as follows:

- The standard slaves continue to occupy one AS-i address (1...31).
- Slaves with extended addressing divide an address into an A address (1A...31A) and a B address (1B...31B). Up to 62 A/B slaves can be connected accordingly to one AS-Interface network.
- Mixed operation of standard slaves and A/B slaves is possible without difficulty. The AS-i master identifies automatically which type of slave is connected. No special adjustments are required of the user.

Another function of the AS-Interface Specification V2.1 is the integrated analog value transmission function. Access to both analog values and digital values is possible without the need for any special function blocks.

## Expansions of AS-Interface Specification 3.0

- AS-Interface Specification 3.0 enables the connection of nearly 1000 digital inputs/outputs (profile S-7.A.A: 8DI/8DO as A/B slave).
- New profiles have also enabled the option of expanded addressing for analog slaves.
- Acceleration of analog value transmission through "Fast Analog Profile".
- Variable use of analog modules: Optional parameterization of resolution (12/14 bit) and 1- and 2-channel capability.
- Asynchronous serial protocol 100 baud or 50 baud, bidirectional.

## AS-Interface master for A/B slaves

To be able to operate A/B slaves on an AS-Interface network you must use master modules that meet the minimum requirements of Specification 2.1.

AS-Interface specification	Available masters
Version 2.1	CP 243-2 (S7-200)
Version 3.0	CP 343-2, 343-2P (S7-300 / ET 200M), DP/AS-i Link Advanced, DP/AS-i F-Link, DP/AS-Interface Link 20E, IE/AS-i Link PN IO, CM 1243-2 (S7-1200), CM AS-i Master ST for ET 200SP <a href="#">new</a>

The AS-Interface specification relevant for the respective slave is noted in the "Selection and ordering data".

For the exact slave profile [see AS-Interface system manual](#).

## Communication cycle

AS-Interface specification	Maximum cycle time (digital signals)
Version 2.0	5 ms
Version 2.1	5 ms with 31 slaves 10 ms with 62 slaves
Version 3.0	5 ms with 31 slaves 10 ms with 62 slaves, supplementary, up to 20 ms with A/B slaves using 4DI/4DO, up to 40 ms with A/B slaves using 8DI/8DO

Each address is queried in max. 5 ms cycle time. If two A/B slaves are operated on one basic address (e.g. 12A and 12B), a maximum 10 ms will be required for updating the data of both slaves.

All slave types can be mixed and used on a single AS-Interface network.

More information, e.g. whether an AS-Interface slave is a standard slave or an A/B slave, [can be seen in the section "Selection and ordering data" or the "AS-Interface system manual"](#).

## More information

## AS-Interface system manual

More information is available in the AS-Interface system manual.

The German AS-Interface system manual can be downloaded free of charge, [see http://support.automation.siemens.com/WW/view/en/26250840](http://support.automation.siemens.com/WW/view/en/26250840)

The English AS-Interface system manual can be downloaded free of charge, [see http://support.automation.siemens.com/WW/view/en/26250840](http://support.automation.siemens.com/WW/view/en/26250840)

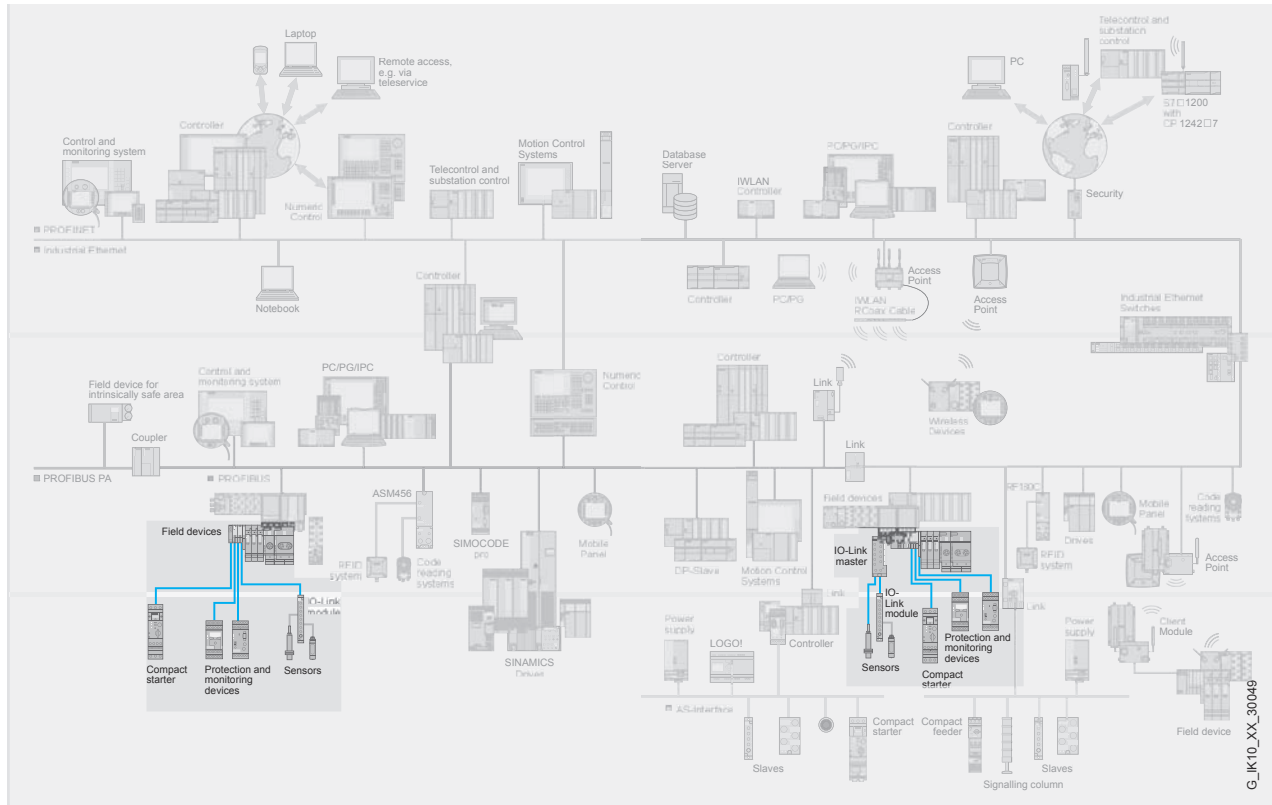
A print version of the AS-Interface system manual is also available under the following order number.

- German 3RK2 703-3AB02-1AA1
- English 3RK2 703-3BB02-1AA1

## Overview

IO-Link is an open communication standard for sensors and actuators - defined by the Profibus User Organization (PNO). IO-Link technology is based on the point-to-point connection of sensors and actuators to the control system.

Parameter and diagnostics data are transmitted in addition to the cyclic operating data for the connected sensors/actuators. The simple, unshielded three-wire cable customary for standard sensors is used for this purpose.



## Benefits

### Engineering

- Standardized, open system for greater flexibility (non-Siemens IO-Link devices can be integrated in engineering)
- Uniform, transparent configuring and programming through integrated engineering (SIMATIC STEP 7)
- Unassigned SIMATIC function blocks for easy parameterization, diagnostics and read-out of measured values
- Efficient engineering thanks to pre-integration into SIMATIC HMI
- Low error rate in CAD circuit diagram design as a result of reduced control current wiring

### Installation and commissioning

- Faster assembly with minimized error rate as a result of reduced control current wiring
- Less space required in the control cabinet
- Low-cost circuitry where there are several feeders by making full use of existing components

### Operation and maintenance

- High transparency in the system right down to field level and integration into power management systems
- Reduction in downtimes and maintenance times thanks to system-wide diagnostics and faster fault correction
- Support of predictive maintenance
- Shorter changeover times, even for field devices, by means of parameter and recipe management

## Application

IO-Link can be used in the following main applications:

- Easy connection of complex IO-Link sensors/actuators with a large number of parameters and diagnostic data to the control system
- Replacement of sensor boxes for connecting binary sensors with the IO-Link input modules optimized in terms of cabling
- Optimized cable connection of switching devices to the control system
- Simple transmission of energy values from the device to the control system for integration into a user program or power management

In these cases, all the diagnostics data are transmitted to the higher-level control system through IO-Link. The parameter settings can be changed during operation. Central data storage means that it is possible to exchange an IO-Link sensor/actuator without a PC or programming device.

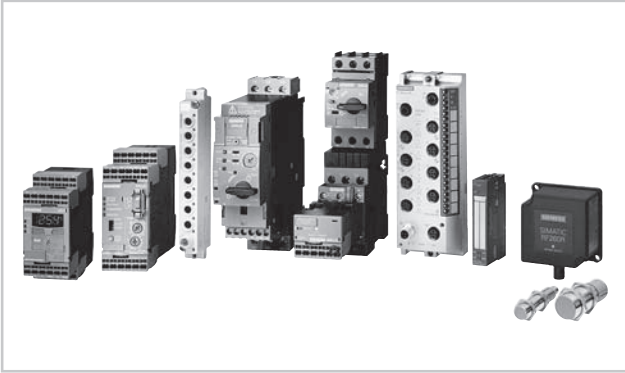
### Integration in STEP 7

Integration of the device configuration in the STEP 7 environment guarantees:

- Quick and easy engineering
- Consistent data storage
- Quick localization and rectification of faults



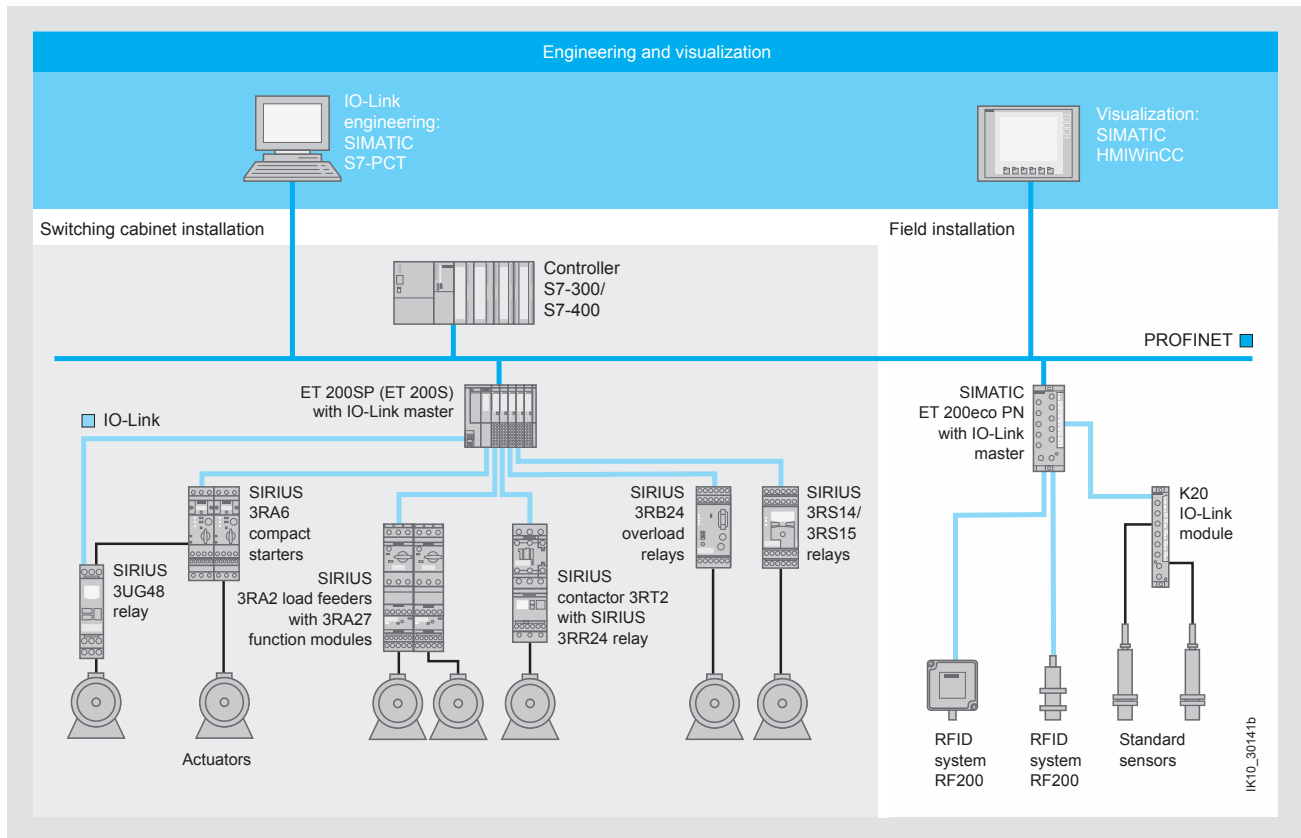
### Overview



IO-Link product family

To implement communication, a system installation has the following main components:

- An IO-Link master
- Several IO-Link devices, usually sensors (RFID systems), actuators or combinations of these
- A standard 3-wire sensor/actuator cable



Example of a configuration with the system components

# Introduction

## System components

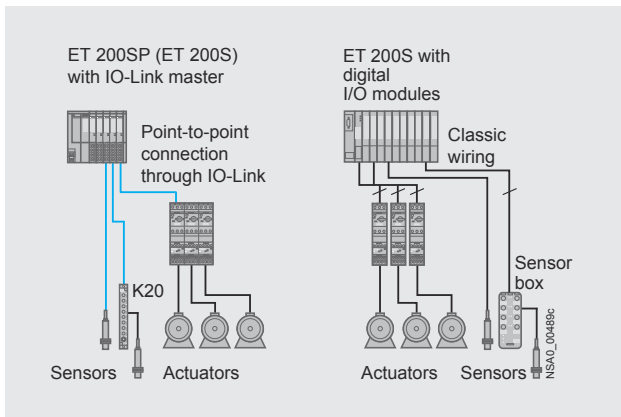
### Compatibility of IO-Link

IO-Link guarantees compatibility between IO-Link-capable modules and standard modules as follows:

- IO-Link sensors can be operated both on IO-Link modules (masters) and standard input modules.
- IO-Link sensors/actuators as well as today's standard sensors/actuators can be used on IO-Link masters.
- If conventional components are used in the IO-Link system, then of course only the standard functions are available at this point.

### Load feeders and motor starters

Through IO-Link it is possible to control not only sensors but also actuators in the form of load feeders and motor starters.



Possibilities for connecting load feeders and motor starters to IO-Link or in the conventional way

### Analog signals

Another advantage of IO-Link technology is that analog signals are digitized already in the IO-Link sensor itself and are digitally transmitted by the IO-Link communication. As the result, faults are prevented and there is no extra cost for cable shielding.

### Enhanced through IO-Link input modules

IO-Link compatibility also permits connection of standard sensors/actuators, i.e. conventional sensors/actuators can also be connected to IO-Link. This is particularly effective with the IO-Link input modules, which allow several sensors to be connected at one time via a cable to the controller.

### Grouping of motor starters

The SIRIUS controls allow four starters to be combined to form a group.



Connection of a motor starter group made up of three 3RA64 direct-on-line starters and a 3RA65 reversing starter

In this way up to 16 starters can be operated on a single IO-Link master. This leads to a reduction in the installation space and control wiring required.



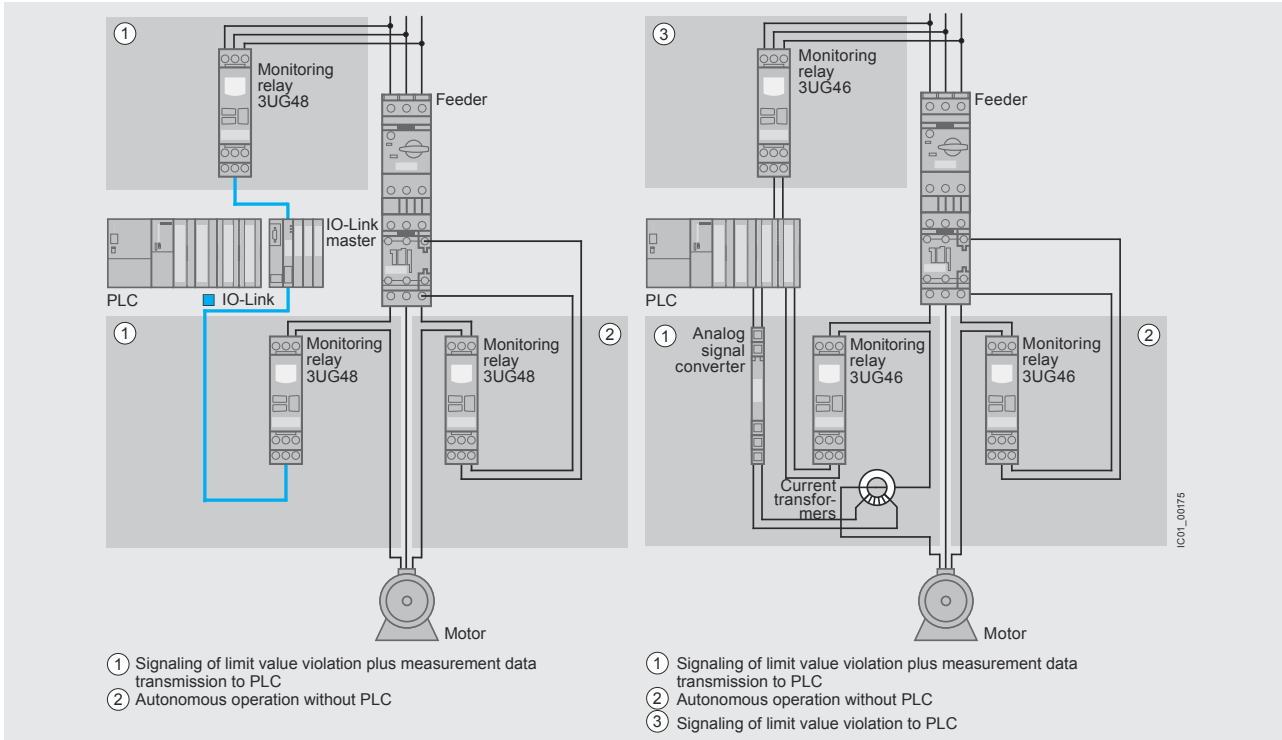
# Introduction

## System components

### Overload and monitoring relays

By combining overload/monitoring relays with IO-Link it is now possible to send data that has already been recorded and

evaluated in the monitoring relays directly to the controller. This avoids the use of duplicated sensors.

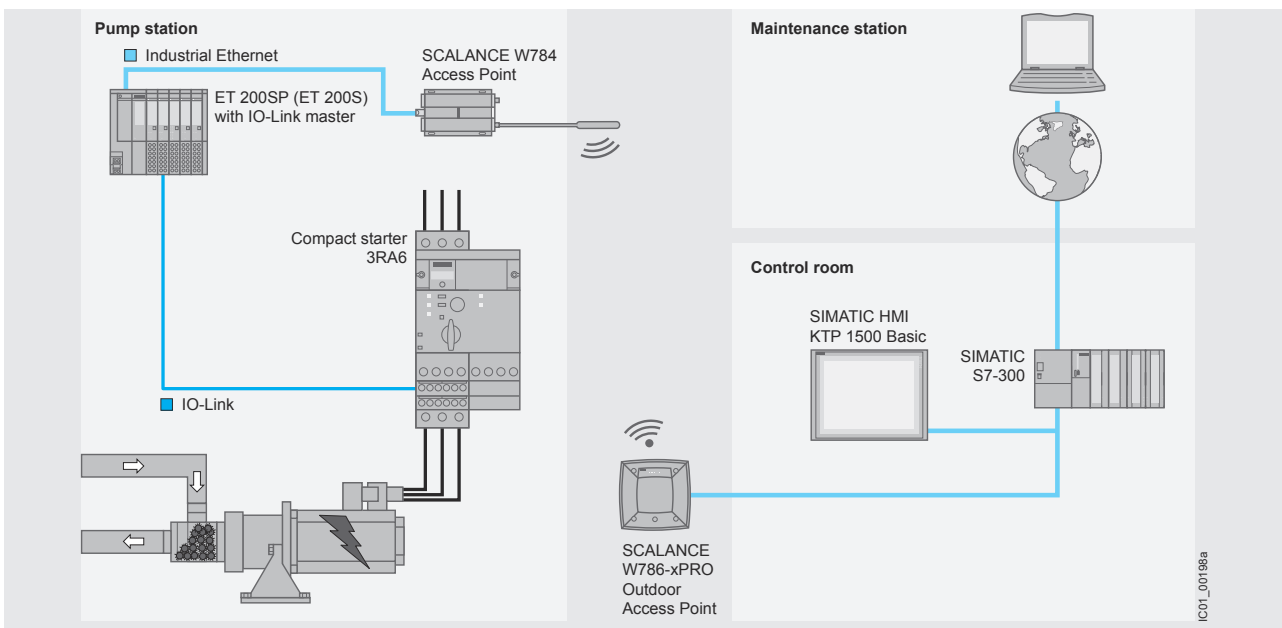


Possibilities for connecting overload relays to IO-Link or in the conventional way

### Wireless communication

Using an upstream IWLAN client module, such as SCALANCE W746-1PRO, allows IO-Link to be integrated into the PROFINET world via a distributed I/O. Possible uses include acting as an alternative to fault-prone cable carrier or collector wire technology. The individual diagnostics options offered by

the various IO-Link devices provide greater transparency for the production process. Just like the parameter data for a device, these diagnostics data can be evaluated remotely using the possibilities offered by SIMATIC. This supports remote maintenance down to the lowest level in the field.



Wireless communication between Industrial Ethernet and IO-Link components

### IO-Link components

#### IO-Link master, software, cables



CM 4x IO-Link for ET 200SP

##### Masters

- IO-Link master modules for ET 200SP
  - CM 4x IO-Link
- IO-Link master modules for ET 200S
  - IO-Link 4SI electronic module
  - SIRIUS 4SI electronic modules
- IO-Link master modules for ET 200eco PN

##### Software

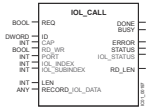
###### STEP 7 PCT



STEP 7 PCT

- Engineering software for configuring the IO-Link master modules for ET 200SP, ET 200S and ET 200eco
  - Available as a stand-alone version or integrated into STEP 7 (Version 5.5 SP1 or later)
  - Retrieving parameter and diagnostics data from the IO-Link devices connected to the master
  - Monitoring of the process image of the IO-Link devices
  - Open interface for importing further IO-DDs
  - Freely available for download from Industry Online Support<sup>1)</sup>

###### IO-Link Call function block



IO-Link Call function block

- STEP 7 function block for easy acyclical data exchange in the user program
  - Freely available for download from Industry Online Support<sup>2)</sup>

###### WinCC flexible template project



WinCC flexible template project

- Easy integration of IO-Link devices into the user program by using ready-made WinCC flexible templates
  - Freely available for download from Industry Online Support<sup>3)</sup>

###### IO-DD files

- IO-Link Device Description (IO-DD) files provide the device description for IO-Link
  - Comprehensive IO-DD catalog of SIEMENS IO-Link devices
  - Freely available for download from Industry Online Support<sup>4)</sup>

###### Cable

- 3-wire standard cable

#### IO-Link devices



K20 input module

##### Detection with IO-Link

###### IO-Link input modules

- K20 input module
  - 4 inputs, M12 connections
  - 8 inputs, standard M8 connections

#### IO-Link devices (continued)



SIMATIC RF210R, SIMATIC RF220R, SIMATIC RF260R

##### IO-Link RFID systems

- SIMATIC RF200 RFID system in the HF range
  - SIMATIC RF210R, SIMATIC RF220R, SIMATIC RF260R products
  - Simple identification tasks (read-only), such as reading an ID number
  - No RFID-specific programming, ideal for those new to RFID
  - Simple connection via master modules for IO-Link, such as SIMATIC ET 200S and ET 200eco
  - Use with the tried and tested ISO 15693 transponders (MOBY D)

##### Switching with IO-Link

###### Contactors and contactor assemblies



SIRIUS 3RA27 11 function module for IO-Link

- Power contactors for switching motors
  - SIRIUS 3RT2 contactors, 3-pole, up to 18.5 kW
  - Contactor assemblies
  - SIRIUS 3RA23 reversing contactor assemblies
  - SIRIUS 3RA24 contactor assemblies for wye-delta starting
  - SIRIUS 3RA27 function modules for IO-Link
  - For direct-on-line starters, reversing starters and wye-delta starters

See chapter 2

###### Motor starters for use in the control cabinet



SIRIUS 3RA64 direct-on-line starter

- SIRIUS 3RA6 compact starters
  - 3RA64 direct-on-line starters
  - 3RA65 reversing starters
  - Infeed systems for 3RA6

See chapter 4

##### Contactors with IO-Link

###### Overload relays



SIRIUS 3RB24 overload relays

- SIRIUS 3RB24 solid-state overload relays for IO-Link
  - Evaluation module
  - Current measuring modules from 0.3 to 630 A
  - Controlling direct-on-line, reversing and star-delta starters via IO-Link in conjunction with contactors
  - Full motor protection
  - Diagnostics and current value transmission via IO-Link

See chapter 3

##### Monitoring with IO-Link

###### Monitoring relays



SIRIUS 3UG48 monitoring relays

- SIRIUS 3UG48 monitoring relays for IO-Link
  - Monitoring voltage, current, power, speed or p.f. according to device design
  - ON-delay and tripping delay time can be adjusted

See chapter 11



SIRIUS 3RS14 temperature monitoring relays

- SIRIUS 3RS14, 3RS15 temperature monitoring relays for IO-Link
  - Temperature monitoring with connected sensors
  - Two limit values, can be adjusted separately

See chapter 11



SIRIUS 3RR24 monitoring relays

- SIRIUS 3RR24 monitoring relays for IO-Link
  - Monitoring of current, phase failure, open circuit and phase sequence
  - Designed for mounting on 3RT2 contactors

See chapter 2

1) <http://support.automation.siemens.com/DE/view/en/37936752>  
 2) <http://support.automation.siemens.com/DE/view/en/38487085>  
 3) <http://support.automation.siemens.com/DE/view/en/38006560>  
 4) <http://support.automation.siemens.com/DE/view/en/29801139/133100>

**Overview****Principles of the IO-Link specification**

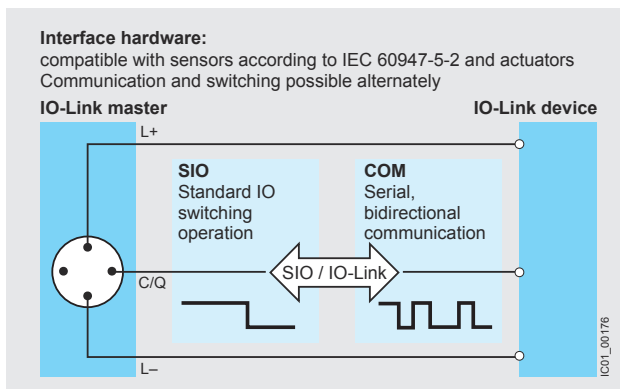
According to the IO-Link specification, communication functions are as follows:

- Transmission takes place via an unshielded three-wire cable no more than 20 m long, of the kind normally used for standard sensors.
- Analog values which have already been digitized are transmitted in the form of message frames, which may correspond to +/- 10 V or 4 to 20 mA.
- Digital communication from 0 to 24 V on the so-called C/Q cable
- Most of the values transmitted are measured values from the sensors which include the units.
- The sensors and actuators are described by the IO-Link Device Description (IODD).
- While the IO-Link specification permits an infinite number of ports, an IO-Link master currently only supports four ports. Only one IO-Link device (slave) can be connected to each port (point-to-point connection).
- Transmission parameters between IO-Link master and the devices: 1 start bit, 8 data bits, 1 parity bit and 1 stop bit.
- The transmission rates between IO-Link master and the devices are as follows:
  - via COM1: 4 800 bps
  - via COM2: 38 400 bps
  - via COM3: 230 400 bps
- The average cycle time is 2 ms for the reading/writing of 16 data bits at a transmission rate of 38 400 bps.

**IO-Link protocol**

For the dialog between device and master, IO-Link uses a standard protocol, the standard asynchronous communication interface (UART) in "semi-duplex" mode.

The IO-Link protocol supports both the Standard IO mode (SIO) and the IO-Link communication mode (COM).



The structure of the protocol and its message frames depends on the types of data to be transmitted.

**Data types**

In the IO-Link specification a distinction is made between the following data types:

**Process data**

The process data of the devices are transmitted cyclically in a data frame, provided the process data width does not exceed 2 bytes. In the case of larger process data widths up to 32 bytes, parts are transmitted one after the other in several cycles. As of Version V1.1 of the specification, up to 32 bytes of process data can be transferred in a single cycle.

**Service data (SD)**

With the aid of the service data, parameter values or device statuses can be read out. It is also possible to write the parameter values or transmit commands via the service data. Service data are always exchanged acyclically and in response to an inquiry from the IO-Link master.

**Events**

Via events it is possible to transmit device events or statuses such as contamination, overheating, short circuits etc., from the device via the IO-Link master to the PLC or to visualize them.

The events are sent on the initiative of the devices via the "event flag", which the master evaluates. The master itself can also generate events.

Three categories of event are defined:

- Error signals (errors)
- Maintenance data (warnings)
- Device functions (notifications)

**M-sequence (message frames)**

Parameter data, events and process data can be transmitted either in an M-sequence (message frame) or in separate M-sequences (message frame).

**Data storage**

As of Specification V1.1, a data storage concept has been created for IO-Link. In this concept, the IO-Link device initiates the storage of its data on a higher-level parameter server. In the event that a device is replaced, the parameter server can restore the original parameterization. It is therefore possible to replace the devices without re-parameterization.

The IO-Link master can contain the parameter server. The parameter server can also be implemented centrally in the PLC or in a system server. In this case the IO-link master passes on the corresponding information.

**IO-Link master**

The IO-Link master is the interface to higher-level control systems. The IO-Link master presents itself as a normal fieldbus node, and is integrated into the appropriate network configurator via the relevant device description (e.g. GSD, FDCML, EDS etc.).

**IO-Link Device Description (IODD)**

The IO-Link Device Description (IODD) has been defined to provide a full, transparent description of system characteristics as far as the IO-Link device. It is based on the open XML standard.

The IODD contains information on communication characteristics, device parameters, identification, process and diagnostics data, and is supplied by the manufacturer. The design of the IODD is the same for all devices from all manufacturers, and is always presented in the same way by the IODD Interpreter Tools. This therefore ensures that the handling is the same for all IO-Link devices, whatever the manufacturer.

**New in IO-Link specification 1.1**

The IO-Link specification is currently available in Version 1.1, and is currently standardized as IEC 61131-9 (CDV).

Specification 1.1 offers the following new features compared with the previous specification 1.0:

- New variable M-sequences allow transmission of up to 32 bytes of process or service data in a single cycle.
- Data storage concept

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# Introduction

## The product range at a glance

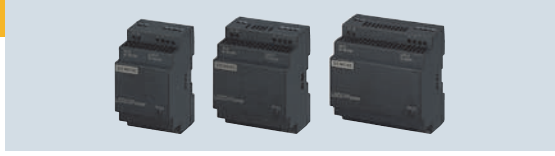
### SITOP compact

*The slim power supply unit for control boxes*



### LOGO!Power

*The flat power supply unit for distribution boards*



### SITOP lite

*The low-cost basic power supply*



### SITOP smart

*The powerful standard power supply*



### SITOP modular

*The technology power supply for demanding solutions*

*Power supply system SITOP PSU8600 with Ethernet/PROFINET and complete integration in TIA*



### SITOP power supplies in SIMATIC design

*The optimum supply for SIMATIC S7 and more*



### SITOP in special designs, made for special tasks

*Well prepared for special tasks and conditions*



### Expansion modules

#### Redundancy modules

Protection against failure of a power supply by means of redundant configuration of the power supply unit

#### Selectivity modules

Protection against overload and short circuit by means of electronic protection of 24 V feeds

#### Buffer module

Protection against power failure for a few seconds



### SITOP DC UPS

#### SITOP UPS500 with capacitors

Protection against power failure on the input side through buffering for a few minutes

#### SITOP UPS1600 with battery modules

Protection against power failure on the input side through buffering for a few hours.

DC UPS with Ethernet/PROFINET – open and integrated in TIA



## Overview

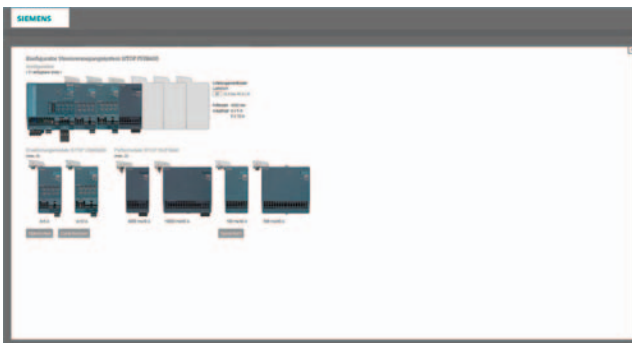
### *SITOP Selection Tool - get to the right power supply simply and quickly*

With the SITOP Selection Tool, you can select not only your DC power supply, but now also the appropriate uninterruptible power supply (DC UPS) with capacitor or battery technology. Entering just a few technical specifications will automatically select the relevant parameters and show the matching products. Selection parameters can be changed at any time.

You can individually configure the PSU8600 power supply system using drag-and-drop to select additional modules for extra outputs or add-on modules for bridging power failures, for example. With the help of mandatory fields such as load current, buffer time and buffer voltage, an appropriate DC UPS is selected and then displayed with its performance characteristics.

The Selection Tool checks the reliability of each production selection or configuration automatically. The user can then save the selected products in the product list and export the list, including performance data, into several file formats, or directly to the Industry Mall shopping cart. More detailed information about the selected products can be found in the form of product data sheets, 3D data and operating instructions. The product data can also be requested directly by means of the CAX Download Manager.

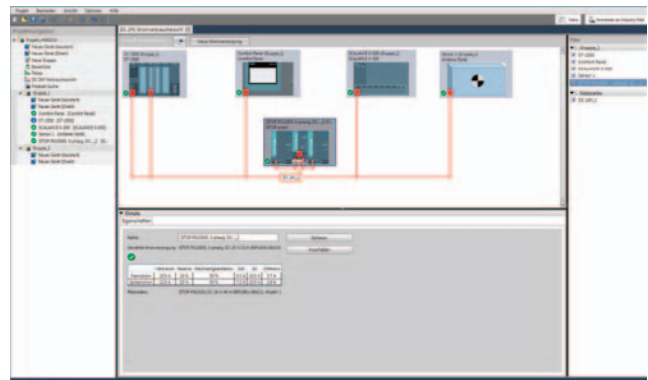
The tool is available on the Internet and in the Industry Mall:  
[www.siemens.com/sitop-selection-tool](http://www.siemens.com/sitop-selection-tool)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)



Selection assistant for the SITOP PSU8600 power supply system

### *TIA Selection Tool - makes it easy to choose the right power supply for 24 V loads*

The "24 V DC power consumer view" of the TIA Selection Tool shows all automation products with 24 V infeed which have already been selected. Using drag-and-drop, the loads can be connected to one or more SITOP power supplies. The total of the required rated and peak currents is automatically calculated and taken into account when selecting power supplies. Other loads such as sensors or actuators which were not selected with the Tool can also be assigned. Only those power supplies are offered which supply the total power demand of the load to be supplied. It is also possible to define additional power reserves for other loads, rated diversity factors or redundant designs. Finally, the required power supplies are transferred into the order list in the Industry Mall and any additional product data can be requested from the CAX Download Manager.



24 V DC power consumer view of the TIA Selection Tool

For more information about the "24 V DC power consumer view" of the TIA Selection Tool, visit:  
[www.siemens.com/sitop-tst](http://www.siemens.com/sitop-tst)



## Introduction

## Selection tables for power supplies

Part number selection table

	Input voltage	Output current	SITOP compact	LOGO!Power	SITOP lite	SITOP smart	
Output voltage 24 V DC	<b>1-phase AC</b>						
	1-phase 120 V AC, 230 V AC	0.6 A	6EP1331-5BA00				
		1.3 A	6EP1331-5BA10		6EP1331-1SH03		
		2 A					
		2.5 A	6EP1332-5BA00		6EP1332-1SH43	6EP1332-1LB00	6EP1332-2BA20
		3 A					
		3.7 A	6EP1332-5BA20				
		4 A	6EP1332-5BA10		6EP1332-1SH52		
		5 A				6EP1333-1LB00	6EP1333-2BA20
		6.2 A					
		8 A					
		10 A				6EP1334-1LB00	6EP1334-2BA20 6EP1334-2AA01-0AB0
		12.5 A					
		20 A				6EP1336-1LB00	6EP1336-2BA10
		40 A					
		<b>1-phase DC</b>					
	48 ... 220 V	0.375 A					
	48 ... 110 V	2 A					
	24 ... 110 V	2 A					
	110 ... 300 V	0.6 A	6EP1331-5BA00		6EP3330-6SB00-0AY0		
		1.3 A	6EP1331-5BA10		6EP1331-1SH03		
		2.5 A	6EP1332-5BA00		6EP1332-1SH43		
		3.7 A	6EP1332-5BA20				
		4 A	6EP1332-5BA20		6EP1332-1SH52		
	300 ... 900 V	20 A					
	<b>3-phase AC</b>						
	3-phase 400 – 500 V AC	5 A					6EP1433-2BA20
8 A							
10 A						6EP1434-2BA20	
17 A							
20 A						6EP1436-2BA10	
20 A / 4 x 5 A							
30 A							
40 A						6EP1437-2BA20	
40 A / 4 x 10 A							
Output voltage 5, 12, 15, 48, ... V DC	<b>1-phase AC</b>						
	1-phase 120 V AC, 230 V AC	5 V/3 A			6EP1311-1SH03		
		5 V/6.3 A			6EP1311-1SH13		
		12 V/1.9 A			6EP1321-1SH03		
		12 V/2.0 A	6EP1321-5BA00				
		12 V/3.0 A					
		12 V/4.5 A			6EP1322-1SH03		
		12 V/6.5 A	6EP1322-5BA10				
		12 V/7 A					6EP1322-2BA00
		12 V/8.3 A					
		12 V/14 A					6EP1323-2BA00
		15 V/1.9 A			6EP1351-1SH03		
		15 V/4 A			6EP1352-1SH03		
		3 – 52 V/2 – 10 A					
		2 x 15 V/3.5 A					
		<b>1-phase DC</b>					
	24 V	12 V/2.5 A					
	110 ... 300 V	5 V/3 A			6EP1311-1SH03		
		5 V/6.3 A			6EP1311-1SH13		
		12 V/1.9 A			6EP1321-1SH03		
		12 V/2 A	6EP1321-5BA00				
		12 V/4.5 A			6EP1322-1SH03		
		12 V/6.5 A	6EP1322-5BA10				
		15 V/1.9 A			6EP1351-1SH03		
		15 V/4 A			6EP1521-1SH03		
	<b>3-phase AC</b>						
	400 ... 500 V	12 V/20 A					
36 V/13 A							
48 V/10 A							
48 V/20 A							

# Introduction

## Selection tables for power supplies

Part number selection table (cont.)

	Input voltage	Output current	SITOP modular	SIMATIC Design	“Special design, special use”	
Output voltage 24 V DC	<b>1-phase AC</b>					
	1-phase 120 V AC, 230 V AC	0.6 A				
		1.3 A				
		2 A			6ES7307-1BA01-0AA0	6EP1331-1LD00 (2.1 A)
		2.5 A	6EP1332-1SH71		6EP1332-1SH71	
		3 A			6EP1332-4BA00	6EP1332-1LD00 (3.1 A)
		3.7 A				
		4 A				6EP1332-1LD10 (4.1 A)
		5 A	6EP3333-8SB00-0AY0 6EP1333-3BA10		6ES7307-1EA01-0AA0 6ES7307-1EA80-0AA0	6EP1333-1AL12 6EP1333-7CA00 6EP1333-1LD00
		6.2 A				6EP1333-1LD00
		8 A			6EP1333-4BA00	6EP1334-7CA00
		10 A	6EP3334-8SB00-0AY0 6EP1334-3BA10		6ES7307-1KA02-0AA0	6EP1334-1AL12
		12.5 A				6EP1334-1LD00
		20 A	6EP1336-3BA10			
		40 A	6EP3337-8SB00-0AY0 6EP1337-3BA00			
		<b>1-phase DC</b>				
	48 ... 220 V	0.375 A				6EP1731-2BA00
	48 ... 110 V	2 A				6EP1732-0AA00
	24 ... 110 V	2 A		6ES7305-1BA80-0AA0		
	110 ... 300 V	0.6 A				
		1.3 A				
		2.5 A				
		3.7 A				
		4 A				
	300 ... 900 V	20 A				6EP1536-3AA00
	<b>3-phase AC</b>					
	3-phase 400 – 500 V AC	5 A	6EP1333-3BA10 <sup>1)</sup>			
		8 A			6ES7148-4PC00-0HA0	6ES7 148-4PC00-0HA0
		10 A	6EP1334-3BA10 <sup>1)</sup>			
		17 A				
		20 A	6EP3436-8SB00-0AY0 6EP3436-8SB00-2AY0			
		20 A / 4 x 5 A	6EP3436-8MB00-2CY0			
		30 A				6EP1437-3BA20
40 A		6EP1437-3BA10				
		6EP3437-8SB00-2AY0				
40 A / 4 x 10 A		6EP3437-8MB00-2CY0				
Output voltage 5, 12, 15, 48, ... V DC	<b>1-phase AC</b>					
	1-phase 120 V AC, 230 V AC	5 V/3 A				
		5 V/6.3 A				
		12 V/1.9 A				
		12 V/2.0 A				
		12 V/3.0 A				6EP1321-1LD00
		12 V/4.5 A				
		12 V/6.5 A				
		12 V/7 A				
		12 V/8.3 A				6EP1322-1LD00
		12 V/14 A				
		15 V/1.9 A				
		15 V/4 A				
		3 – 52 V/2 – 10 A				6EP1353-2BA00
		2 x 15 V/3.5 A				6EP1353-0AA00
		<b>1-phase DC</b>				
	24 V	12 V/2.5 A				6EP1621-2BA00
	110 ... 300 V	5 V/3 A				
		5 V/6.3 A				
		12 V/1.9 A				
		12 V/2 A				
		12 V/4.5 A				
		12 V/6.5 A				
		15 V/1.9 A				
	15 V/4 A					
	<b>3-phase AC</b>					
	400 ... 500 V	12 V/20 A				6EP3424-8UB00-0AY0
		36 V/13 A	6EP3446-8SB10-0AY0			
		48 V/10 A	6EP1456-3BA00			
		48 V/20 A	6EP1457-3BA00			

1) Connection to 2 phases 230 – 500 V AC – see data sheet SITOP modular 1-/2-phase



## Overview

*The slim power supply unit for control boxes*

The single-phase SITOP compact are power supplies for the lower performance range. Thanks to the extremely space-saving slim design, they are especially suited to distributed applications in control boxes or in small control cabinets. The series is characterized by low power losses throughout the entire load range. The losses are extremely low even during idling, which means they are perfectly suited for applications that are frequently in stand-by mode. The SITOP PSU100C power supplies have a wide-range input for AC and DC networks; plug-in terminals facilitate the electrical connection.

To further increase the 24 V availability, the SITOP compact power supplies can be combined with **DC UPS**, **redundancy** and **selectivity modules**.

**Main product highlights**

- 24 V DC/ 0.6 A, 1.3 A, 2.5 A, and 4 A as well as 12 V DC/ 2 A and 6.5 A
- 24 V DC/3.7 A for the supply of NEC class 2 circuits with limited output power (100 VA)
- 1-phase wide-range input from 85 V to 264 V AC or 110 V to 300 V DC
- Small mounting surface thanks to its slim design
- High efficiency across the entire load range: up to 28 % energy savings in comparison with similar devices
- Low energy consumption during no-load operation or stand-by: Energy savings of up to 53 % are possible
- Adjustable output voltage for compensating voltage drops
- Green LED for "Output voltage OK"
- Plug-in connecting terminals for pre-fabricated wiring and fast electrical connection
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as UL, ATEX or GL

## More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

## SITOP compact

1-phase, 12 V DC

## Overview



The single-phase SITOP compact are power supplies for the lower performance range. Thanks to the extremely space-saving slim design, they are especially suited to distributed applications in control boxes or in small control cabinets. The series is characterized by low power losses throughout the entire load range. The losses are extremely low even during idling, which means they are perfectly suited for applications that are frequently in stand-by mode. The SITOP PSU100C power supplies have a wide-range input for AC and DC networks; plug-in terminals facilitate the electrical connection.

**Main product highlights**

- 12 V DC, 2 A and 6.5 A
- 1-phase wide-range input from 85 V to 264 V AC or 110 V to 300 V DC
- Small mounting surface thanks to its slim design
- High efficiency across the entire load range.
- Low energy consumption during no-load operation or stand-by
- Adjustable output voltage for compensating voltage drops
- Green LED for "12 V OK"
- Plug-in connecting terminals for pre-fabricated wiring and fast electrical connection
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as UL, ATEX or GL

**Ordering data****Article No.****SITOP PSU100C 1-phase,  
12 V DC/2 A****6EP1321-5BA00**

Stabilized power supply  
 Input:  
 100 ... 230 V AC (110 ... 300 V DC)  
 Output: 12 V DC/2 A

**SITOP PSU100C 1-phase,  
12 V DC/6.5 A****6EP1322-5BA10**

Stabilized power supply  
 Input:  
 100 ... 230 V AC (110 ... 300 V DC)  
 Output: 12 V DC/6.5 A

**Accessories****Article No.****SITOP Power PSU100C  
accessories****6EP1971-5BA00**

Removable spring-loaded terminal,  
 100 units, for SITOP PSU100C

## Overview



The single-phase SITOP compact are power supplies for the lower performance range. Thanks to the extremely space-saving slim design, they are especially suited to distributed applications in control boxes or in small control cabinets. The series is characterized by low power losses throughout the entire load range. The losses are extremely low even during idling, which means they are perfectly suited for applications that are frequently in stand-by mode. The SITOP PSU100C power supplies have a wide-range input for AC and DC networks; plug-in terminals facilitate the electrical connection.

To further increase the 24 V availability, the SITOP compact power supplies can be combined with **DC UPS**, **redundancy** and **selectivity modules**.

**Main product highlights**

- 24 V DC/ 0.6 A, 1.3 A, 2.5 A and 4 A
- 24 V DC/3.7 A for the supply of NEC class 2 circuits with limited output power (100 VA)
- 1-phase wide-range input from 85 V to 264 V AC or 110 V to 300 V DC
- Small mounting surface thanks to its slim design
- High efficiency across the entire load range.
- Low energy consumption during no-load operation or stand-by
- Adjustable output voltage for compensating voltage drops (starting at 1.3 A)
- Green LED for "24 V OK"
- Plug-in connecting terminals for pre-fabricated wiring and fast electrical connection
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as UL, ATEX or GL

**Ordering data****Article No.****SITOP PSU100C 1-phase,  
24 V DC/0.6 A**

6EP1331-5BA00

Stabilized power supply  
Input:  
100 ... 230 V AC (110 ... 300 V DC)  
Output: 24 V DC/0.6 A

**SITOP PSU100C 1-phase,  
24 V DC/1.3 A**

6EP1331-5BA10

Stabilized power supply  
Input:  
100 ... 230 V AC (110 ... 300 V DC)  
Output: 24 V DC/1.3 A

**SITOP PSU100C 1-phase,  
24 V DC/2.5 A**

6EP1332-5BA00

Stabilized power supply  
Input:  
100 ... 230 V AC (110 ... 300 V DC)  
Output: 24 V DC/2.5 A

**SITOP PSU100C 1-phase,  
24 V DC/3.7 A**

6EP1332-5BA20

Stabilized power supply  
Input:  
100 ... 230 V AC (110 ... 300 V DC)  
Output: 24 V DC/3.7 A  
limited output power NEC Class 2

**SITOP PSU100C 1-phase,  
24 V DC/4 A**

6EP1332-5BA10

Stabilized power supply  
Input:  
100 ... 230 V AC (110 ... 300 V DC)  
Output: 24 V DC/4 A

**Accessories****Article No.****SITOP PSE202U  
redundancy module**

6EP1962-2BA00

Input/output: 24 V DC/NEC Class 2  
suitable for decoupling two SITOP  
power supplies output power  
limited < 100 VA

**SITOP PSE202U  
redundancy module**

6EP1964-2BA00

Input/output: 24 V DC/10 A  
suitable for decoupling two SITOP  
power supplies  
with a maximum of 5 A output  
current

**SITOP PSE200U 3 A  
selectivity module**

4-channel selectivity module  
Input: 24 V DC  
Output: 24 V DC/3A per each  
channel  
output current adjustable 0.5 ... 3 A

- With common alarm signal
- With single-channel signaling

6EP1961-2BA11  
6EP1961-2BA31**SITOP Power PSU100C  
accessories**

6EP1971-5BA00

Removable spring-loaded terminal,  
100 units, for SITOP PSU100C

## Overview



### *The flat power supply unit for distribution boards*

Our miniature power supply units in the same design as the logic modules offer great performance in the smallest space: The excellent efficiency across the entire load range, and the low power losses in no-load operation ensure efficient operation. The wide-range input for 1-phase networks as well as operation with direct voltage, the wide operating temperature range, comprehensive certifications as well as the switch-on behavior optimized for capacitive loads makes them suitable for universal use. These reliable power supplies with their flat, stepped profile can be used extremely flexibly in numerous applications such as in distribution boards, for example.

To further increase the 24 V availability, the LOGO!Power power supplies can be combined with **DC UPS, redundancy and selectivity modules**.

#### **Main product highlights**

- 5 V DC/ 3 A and 6.3 A, 12 V DC/ 1.9 A and 4.5 A, 15 V DC/ 1.9 A and 4 A as well as 24 V DC/ 1.3 A, 2.5 A and 4 A
- 1-phase, wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- Flat LOGO! design with an installation depth of only 55 mm
- High efficiency across the entire load range, low no-load losses
- Power reserve on starting up through 1.5 times the rated current for capacitive loads
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as cULus, CB, FM, ATEX, cCSAus Class I Div. 2, GL and ABS

## More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

## Overview



Our miniature power supply units in the same design as the logic modules offer great performance in the smallest space: The excellent efficiency across the entire load range, and the low power losses in no-load operation ensure efficient operation. The wide-range input for 1-phase networks as well as operation with direct voltage, the wide operating temperature range, comprehensive certifications as well as the switch-on behavior optimized for capacitive loads makes them suitable for universal use. These reliable power supplies with their flat, stepped profile can be used extremely flexibly in numerous applications such as in distribution boards, for example.

### Main product highlights

- 5 V DC/ 3 A and 6.3 A
- 1-phase, wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- Flat LOGO! design with an installation depth of only 55 mm
- High efficiency across the entire load range, low no-load losses
- Power reserve on starting up through 1.5 times the rated current for capacitive loads
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as cULus, CB, FM, ATEX, cCSAus Class I Div. 2, GL and ABS

### Ordering data

### Article No.

#### LOGO!Power 1-phase, 5 V DC/3 A

Stabilized power supply  
 Input:  
 100 ... 240 V AC (110 ... 300 V DC)  
 Output: 5 V DC/3 A

6EP1311-1SH03

#### LOGO!Power 1-phase, 5 V DC/6.3 A

Stabilized power supply  
 Input:  
 100 ... 240 V AC (110 ... 300 V DC)  
 Output: 5 V DC/6.3 A

6EP1311-1SH13

## Overview



Our miniature power supply units in the same design as the logic modules offer great performance in the smallest space: The excellent efficiency across the entire load range, and the low power losses in no-load operation ensure efficient operation. The wide-range input for 1-phase networks as well as operation with direct voltage, the wide operating temperature range, comprehensive certifications as well as the switch-on behavior optimized for capacitive loads makes them suitable for universal use. These reliable power supplies with their flat, stepped profile can be used extremely flexibly in numerous applications such as in distribution boards, for example.

**Main product highlights**

- 12 V DC, 1.9 A and 4.5 A
- 1-phase, wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- Flat LOGO! design with an installation depth of only 55 mm
- High efficiency across the entire load range, low no-load losses
- Power reserve on starting up through 1.5 times the rated current for capacitive loads
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as cULus, CB, FM, ATEX, cCSAus Class I Div. 2, GL and ABS

## Ordering data

## Article No.

**LOGO!Power 1-phase,  
12 V DC/1.9 A**

Stabilized power supply  
Input:  
100 ... 240 V AC (110 ... 300 V DC)  
Output: 12 V DC/1.9 A

**6EP1321-1SH03****LOGO!Power 1-phase,  
12 V DC/4.5 A**

Stabilized power supply  
Input:  
100 ... 240 V AC (110 ... 300 V DC)  
Output: 12 V DC/4.5 A

**6EP1322-1SH03**

## Overview



Our miniature power supply units in the same design as the logic modules offer great performance in the smallest space: The excellent efficiency across the entire load range, and the low power losses in no-load operation ensure efficient operation. The wide-range input for 1-phase networks as well as operation with direct voltage, the wide operating temperature range, comprehensive certifications as well as the switch-on behavior optimized for capacitive loads makes them suitable for universal use. These reliable power supplies with their flat, stepped profile can be used extremely flexibly in numerous applications such as in distribution boards, for example.

**Main product highlights**

- 15 V DC/ 1.9 A and 4 A
- 1-phase, wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- Flat LOGO! design with an installation depth of only 55 mm
- High efficiency across the entire load range, low no-load losses
- Power reserve on starting up through 1.5 times the rated current for capacitive loads
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as cULus, CB, FM, ATEX, cCSAus Class I Div. 2, GL and ABS

**Ordering data****Article No.****LOGO!Power 1-phase,  
15 V DC/1.9 A**

Stabilized power supply  
Input:  
100 ... 240 V AC (110 ... 300 V DC)  
Output: 15 V DC/1.9 A

**6EP1351-1SH03****LOGO!Power 1-phase,  
15 V DC/4 A**

Stabilized power supply  
Input:  
100 ... 240 V AC (110 ... 300 V DC)  
Output: 15 V DC/4 A

**6EP1352-1SH03**

## Overview



Our miniature power supply units in the same design as the logic modules offer great performance in the smallest space: The excellent efficiency across the entire load range, and the low power losses in no-load operation ensure efficient operation. The wide-range input for 1-phase networks as well as operation with direct voltage, the wide operating temperature range, comprehensive certifications as well as the switch-on behavior optimized for capacitive loads makes them suitable for universal use. These reliable power supplies with their flat, stepped profile can be used extremely flexibly in numerous applications such as in distribution boards, for example.

To further increase the 24 V availability, the LOGO!Power power supplies can be combined with **DC UPS, redundancy** and **selectivity modules**.

**Main product highlights**

- 24 V DC/ 1.3 A, 2.5 A, and 4 A
- 1-phase, wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- Flat LOGO! design with an installation depth of only 55 mm
- High efficiency across the entire load range, low no-load losses
- Power reserve on starting up through 1.5 times the rated current for capacitive loads
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as cULus, CB, FM, SEMI F47, ATEX, CCSAus Class I Div. 2, GL, ABS, DNV, BV and LRS

**Ordering data****Article No.****LOGO!Power 1-phase, 24 V DC/1.3 A**

Stabilized power supply  
Input:  
100 ... 240 V AC (110 ... 300 V DC)  
Output: 24 V DC/1.3 A

**6EP1331-1SH03****LOGO!Power 1-phase, 24 V DC/2.5 A**

Stabilized power supply  
Input:  
100 ... 240 V AC (110 ... 300 V DC)  
Output: 24 V DC/2.5 A

**6EP1332-1SH43****LOGO!Power 1-phase, 24 V DC/4 A**

Stabilized power supply  
Input:  
100 ... 240 V AC (110 ... 300 V DC)  
Output: 24 V DC/4 A

**6EP1332-1SH52****Accessories****Article No.****SITOP PSE202U redundancy module**

Input/output:  
24 V DC/NEC Class 2  
suitable for decoupling two SITOP power supplies output power limited < 100 VA

**6EP1962-2BA00****SITOP PSE202U redundancy module**

Input/output:  
24 V DC/10 A  
suitable for decoupling two SITOP power supplies with a maximum of 5 A output current

**6EP1964-2BA00****SITOP PSE200U 3 A selectivity module**

4-channel selectivity module  
Input: 24 V DC  
Output: 24 V DC/3A per each channel output current adjustable 0.5 ... 3 A

- With common alarm signal
- With single-channel signaling

**6EP1961-2BA11**  
**6EP1961-2BA31**



## Overview



The single-phase SITOP lite power supplies are designed for basic requirements in industrial environments and offer all the key functions at an attractive price. Thanks to the slim design, the power supplies require little space on the standard mounting rail, and their excellent efficiency ensures low thermal losses in the control cabinet.

To further increase 24 V availability, the SITOP lite power supplies can be combined with **DC UPS, redundancy and selectivity modules**.

**Main product highlights**

- 24 V DC/ 2.5 A, 5 A and 10 A
- 1-phase wide-range input with manual switchover
- Slim design - no lateral installation clearances required
- High degree of efficiency
- Green LED for "24 V OK"
- Adjustable output voltage for compensating voltage drops
- Parallel connection possible
- Ambient temperature range of 0 °C to 60 °C (above 45 °C with derating)
- Short-circuit and overload protection
- Certification to CE, cULus and CD

**Ordering data****Article No.****SITOP PSU100L 1-phase, 24 V DC/2.5 A**

Stabilized power supply  
Input: 120/230 V AC  
Output: 24 V DC/2.5 A

6EP1332-1LB00

**SITOP PSU100L 1-phase, 24 V DC/5 A**

Stabilized power supply  
Input: 120/230 V AC  
Output: 24 V DC/5 A

6EP1333-1LB00

**SITOP PSU100L 1-phase, 24 V DC/10 A**

Stabilized power supply  
Input: 120/230 V AC  
Output: 24 V DC/10 A

6EP1334-1LB00

**Accessories****Article No.****SITOP PSE202U redundancy module**

Input/output: 24 V DC/NEC Class 2 suitable for decoupling two SITOP power supplies output power limited < 100 VA

6EP1962-2BA00

**SITOP PSE202U redundancy module**

Input/output: 24 V DC/10 A suitable for decoupling two SITOP power supplies with a maximum of 5 A output current

6EP1964-2BA00

**SITOP PSE200U 3 A selectivity module**

4-channel selectivity module  
Input: 24 V DC  
Output: 24 V DC/3A per each channel  
output current adjustable 0.5 ... 3 A

- With common alarm signal
- With single-channel signaling

6EP1961-2BA11

6EP1961-2BA31

**SITOP PSE200U 10 A selectivity module**

4-channel selectivity module  
Input: 24 V DC  
Output: 24 V DC/10 A per channel  
output current adjustable 3 ... 10 A

- With common alarm signal
- With single-channel signaling

6EP1961-2BA21

6EP1961-2BA41

## Overview

*The powerful standard power supply*

The one-phase and three-phase SITOP smart are the universal and powerful standard power supplies for machinery and plant engineering. Despite their compact design, they offer an excellent overload response: Thanks to an extra power of 150 %, loads with high power consumption can be connected without any problems and the permanent overload capability of 120% offers power reserves in case of expansions. The high degree of efficiency results in low energy consumption and minimal heat generation inside the control cabinet.

To further increase the 24 V availability, the SITOP smart power supplies can be combined with **buffer**, **DC UPS**, **redundancy** and **selectivity modules**.

**Main product highlights**

- 1-phase, 24 V DC/2.5 A, 5 A, 10 A and 20 A as well as 12 V/7 A and 14 A
- 3-phase, 24 V DC/5 A, 10 A, 20 A and 40 A
- Compact design - no lateral clearances required
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Permanent overload capability with 1.2 times the rated current up to 45 °C ambient temperature (24 V versions)
- High degree of efficiency up to 91.5 %
- Adjustable output voltage for compensating voltage drops
- Signaling contact for easy integration in the plant monitoring system
- Wide temperature range from -25 or -10 to +70 °C
- Comprehensive certifications, such as cULus, cCSAus, ATEX, IECEx and GL

## More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

## Overview



The one-phase SITOP smart are the universal and powerful standard power supplies for machinery and plant engineering. Despite their compact design, they offer an excellent overload response: Thanks to an extra power of 150 %, loads with high power consumption can be connected without any problems. The high degree of efficiency results in low energy consumption and minimal heat generation inside the control cabinet.

**Main product highlights**

- 1-phase, 12 V DC/7 A and 14 A
- Input voltage 120 V and 230 V AC with automatic range switching
- Compact design - no lateral clearances required
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Adjustable output voltage for compensating voltage drops
- Signaling contact for easy integration in the plant monitoring system
- Wide temperature range from -25 to +70 °C
- Comprehensive certifications, such as cULus, cCSAus, ATEX, IECEx and GL

## Ordering data

## Article No.

**SITOP PSU100S 1-phase,  
12 V DC/7 A**

Stabilized power supply  
Input: 120/230 V AC  
Output: 12 V DC/7 A

**6EP1322-2BA00****SITOP PSU100S 1-phase,  
12 V DC/14 A**

Stabilized power supply  
Input: 120/230 V AC  
Output: 12 V DC/14 A

**6EP1323-2BA00**

## More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

## Overview



The one-phase SITOP smart are the universal and powerful standard power supplies for machinery and plant engineering. Despite their compact design, they offer an excellent overload response: Thanks to an extra power of 150 %, loads with high power consumption can be connected without any problems

and the permanent overload capability of 120% offers power reserves in case of expansions. The high degree of efficiency results in low energy consumption and minimal heat generation inside the control cabinet.

To further increase 24 V availability, the SITOP smart power supplies can be combined with **buffer**, **DC UPS**, **redundancy** and **selectivity modules**.

## Main product highlights

- 1-phase, 24 V DC/2.5 A, 5 A, 10 A and 20 A
- Input voltage 120 V and 230 V AC with automatic range switching
- Compact design - no lateral clearances required
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Permanent overload capability with 1.2 times the rated current up to 45 °C ambient temperature
- Adjustable output voltage for compensating voltage drops
- Signaling contact for easy integration in the plant monitoring system
- Wide temperature range from -25 or 0 to +70 °C
- Comprehensive certifications, such as cULus, cCSAus, ATEX, IECEx and GL

## Ordering data

## Article No.

**SITOP PSU100S 1-phase,  
24 V DC/2.5 A**

6EP1332-2BA20

Stabilized power supply  
Input: 120/230 V AC  
Output: 24 V DC/2.5 A

**SITOP PSU100S 1-phase,  
24 V DC/5 A**

6EP1333-2BA20

Stabilized power supply  
Input: 120/230 V AC  
Output: 24 V DC/5 A

**SITOP PSU100S 1-phase,  
24 V DC/10 A**

6EP1334-2BA20

Stabilized power supply  
Input: 120/230 V AC  
Output: 24 V DC / 10 A

**SITOP PSU100S 1-phase,  
24 V DC/20 A**

6EP1336-2BA10

Stabilized power supply  
Input: 120/230 V AC  
Output: 24 V DC/20 A

## Accessories

## Article No.

**SITOP PSE202U  
redundancy module**

6EP1961-3BA21

Input/output: 24 V DC/40 A  
suitable for decoupling two SITOP  
power supplies with a maximum of  
20 A output current

**SITOP PSE202U  
redundancy module**

6EP1962-2BA00

Input/output: 24 V DC/NEC Class 2  
suitable for decoupling two SITOP  
power supplies output power  
limited < 100 VA

**SITOP PSE202U  
redundancy module**

6EP1964-2BA00

Input/output: 24 V DC/10 A  
suitable for decoupling two SITOP  
power supplies with a maximum of  
5 A output current

**SITOP PSE200U 3 A  
selectivity module**

4-channel selectivity module  
Input: 24 V DC  
Output: 24 V DC/3A per each  
channel  
output current adjustable 0.5 ... 3 A

- With common alarm signal
- With single-channel signaling

6EP1961-2BA11  
6EP1961-2BA31**SITOP PSE200U 10 A  
selectivity module**

4-channel selectivity module  
Input: 24 V DC  
Output: 24 V DC/10 A per channel  
output current adjustable 3 ... 10 A

- With common alarm signal
- With single-channel signaling

6EP1961-2BA21  
6EP1961-2BA41**SITOP PSE201U buffer module**

6EP1961-3BA01

For SITOP smart and SITOP  
modular buffer time 100 ms to 10 s  
dependent on load current

## More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

## Overview



The three-phase SITOP smart are the universal and powerful standard power supplies for machinery and plant engineering. Despite their compact design, they offer an excellent overload response: Thanks to an extra power of 150 %, loads with high power consumption can be connected without any problems

and the permanent overload capability of 120% offers power reserves in case of expansions.

The high degree of efficiency results in low energy consumption and minimal heat generation inside the control cabinet.

To further increase 24 V availability, the SITOP smart power supplies can be combined with **buffer**, **DC UPS**, **redundancy** and **selectivity modules**.

## Main product highlights

- 3-phase, 24 V DC/5 A, 10 A, 20 A and 40 A
- Wide-range input from 340 to 550 V AC for global use
- Compact design - no lateral clearances required
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Permanent overload capability with 1.2 times the rated current up to 45 °C ambient temperature
- Adjustable output voltage for compensating voltage drops
- Signaling contact for easy integration in the plant monitoring system
- Wide temperature range from -25 or 0 to +70 °C
- Comprehensive certifications, such as cULus, cCSAus, ATEX, IECEx and GL

Ordering data	Article No.
<b>SITOP PSU300S 3-phase, 24 V DC/5 A</b> Stabilized power supply Input: 400 ... 500 V 3 AC Output: 24 V DC/5 A	<b>6EP1433-2BA20</b>
<b>SITOP PSU300S 3-phase, 24 V DC/10 A</b> Stabilized power supply Input: 3 AC 400 ... 500 V Output: 24 V DC/10 A	<b>6EP1434-2BA20</b>
<b>SITOP PSU300S 3-phase, 24 V DC/20 A</b> Stabilized power supply Input: 3 AC 400 ... 500 V Output: 24 V DC/20 A	<b>6EP1436-2BA10</b>
<b>SITOP PSU300S 3-phase, 24 V DC/40 A</b> Stabilized power supply Input: 3 AC 400 ... 500 V Output: 24 V DC/40 A	<b>6EP1437-2BA20</b>

## More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

Accessories	Article No.
<b>Device labeling plates</b>	<b>3RT1900-1SB20</b>
<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/40 A suitable for decoupling two SITOP power supplies with a maximum of 20 A output current	<b>6EP1961-3BA21</b>
<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/NEC Class 2 suitable for decoupling two SITOP power supplies output power limited < 100 VA	<b>6EP1962-2BA00</b>
<b>SITOP PSE202U redundancy module</b>	<b>6EP1964-2BA00</b>
<b>SITOP PSE200U 3 A selectivity module</b> 4-channel selectivity module Input: 24 V DC Output: 24 V DC/3A per each channel output current adjustable 0.5 ... 3 A	<b>6EP1961-2BA11</b> <b>6EP1961-2BA31</b>
<b>SITOP PSE200U 10 A selectivity module</b> 4-channel selectivity module Input: 24 V DC Output: 24 V DC/10 A per channel output current adjustable 3 ... 10 A	<b>6EP1961-2BA21</b> <b>6EP1961-2BA41</b>
<b>SITOP PSE201U buffer module</b> For SITOP smart and SITOP modular buffer time 100 ms to 10 s dependent on load current	<b>6EP1961-3BA01</b>

## Overview



### The technology power supply for demanding solutions

The one, two and three-phase SITOP modular units are the technology power supplies for demanding solutions. They offer maximum functionality for use in complex plants and machines. The wide-range input allows a connection to almost any electrical power system worldwide and ensures a high degree of safety even if there are large voltage fluctuations. They offer outstanding overload characteristics: Power boost delivers up to three-times the rated current for short periods of time, and with extra power of 150%, loads with high power consumption can be connected without any problems. And in the event of an overload, you can choose between constant current or latching shut-down. The extremely high efficiency keeps energy consumption and heat buildup in the control cabinet low, and the compact metal enclosure also saves space.

To further increase the 24 V availability, the SITOP smart power supplies can be combined with **buffer**, **DC UPS**, **redundancy** and **selectivity modules**.

### Main product highlights

- 1-phase, 24 V DC / 5 A, 10 A, 20 A, 40 A
- 1-phase and 2-phase, 24 V DC / 5A, 10 A
- 3-phase, 24 V DC/ 20 A, 40 A, 36 V/ 13 A and 48 V/ 10 A, 20 A
- Extremely slim design – no lateral installation clearances required
- Power boost with 3 times rated current (for 25 ms) for tripping protective devices
- Extra power with 1.5 times rated current (5 s/min) for brief functional overload
- Selectable short-circuit response between constant current and latching shutdown
- Symmetrical load distribution can be selected for parallel operation
- Operating state on 3 LEDs
- Extremely high efficiency up to 94 %
- Large temperature range from -25 to +70 °C
- Comprehensive certifications, such as cULus, ATEX, IECex and GL

## More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

## Overview



The 1-phase SITOP modular are technology power supplies for sophisticated solutions and offer maximum functionality for use in complex plants and machines. The wide-range input allows a connection to almost any electrical power system worldwide and ensures a high degree of safety even if there are large voltage fluctuations. The power boost provides up to three times the rated current for brief periods. In case of overload, you can

choose between constant current with automatic restart or latching shutdown.

The high degree of efficiency keeps energy consumption and heating in the control cabinet low, and the compact metal housing also saves space.

To further increase the 24 V availability, the SITOP modular power supplies can be combined with **buffer**, **DC UPS**, **redundancy** and **selectivity modules**.

### Main product highlights

- 24 V DC/ 5 A, 10 A, 20 A and 40 A
- 1-phase wide-range input for connection to any supply system and for safety in case of voltage supply deviations
- Extremely slim design – no lateral installation clearances required
- Power Boost with 3 times the rated current (for 25 ms) for tripping protective devices
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Selectable short-circuit response between constant current and latching shutdown
- Optional symmetrical load distribution for parallel operation
- Operating status on 3 LEDs
- Extremely high efficiency to 94 %
- Wide temperature range from -25 to +70 °C
- Comprehensive certifications, such as cULus, ATEX and GL



Ordering data	Article No.	Accessories	Article No.
<b>SITOP PSU8200 1-phase, 24 V DC/5 A</b> Stabilized power supply Input: 120/230 V AC Output: 24 V DC/5 A	6EP3333-8SB00-0AY0	<b>SITOP PSE201U buffer module</b> For SITOP smart and SITOP modular buffer time 100 ms to 10 s dependent on load current	6EP1961-3BA01
<b>SITOP PSU8200 1-phase, 24 V DC/10 A</b> Stabilized power supply Input: 120/230 V AC Output: 24 V DC/10 A	6EP3334-8SB00-0AY0	<b>SITOP modular signaling module</b> For 6EP1XXX-3BA00 signaling contacts: Output voltage OK, readiness for operation OK, remote ON/OFF	6EP1961-3BA10
<b>SITOP PSU8200, 1-phase, 24 V DC/20 A</b> Stabilized power supply Input: 120 ... 230 V AC/ 110-220 V DC Output: 24 V DC/20 A	6EP1336-3BA10	<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/40 A suitable for decoupling two SITOP power supplies with a maximum of 20 A output current	6EP1961-3BA21
<b>SITOP PSU100M 1-phase, 24 V DC/40 A</b> Stabilized power supply Input: 120/230 V AC Output: 24 V DC/40 A	6EP1337-3BA00	<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/NEC Class 2 suitable for decoupling two SITOP power supplies; output power limited < 100 VA	6EP1962-2BA00
		<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/10 A suitable for decoupling two SITOP power supplies with a maximum of 5 A output current	6EP1964-2BA00
		<b>SITOP PSE200U selectivity module 3 A</b> 4-channel Input: 24 V DC Output: 24 V DC/3 A per channel Adjustable output current 0.5 ... 3 A • With common alarm signal • With single-channel signaling	6EP1961-2BA11 6EP1961-2BA31
		<b>SITOP PSE200U selectivity module 10 A</b> 4-channel Input: 24 V DC Output: 24 V DC/10 A per channel Adjustable output current 3 ... 10 A • With common alarm signal • With single-channel signaling	6EP1961-2BA21 6EP1961-2BA41
		<b>Device labeling plates</b>	3RT1900-1SB20



## Overview



The 1-phase and 2-phase SITOP modular are technology power supplies for sophisticated solutions and offer maximum functionality for use in complex plants and machines. The ultra-wide input range allows connections to almost any 1-phase power supply system or directly between the line conductors of three-phase networks (2-phase) and ensures a high degree of safety even if there are large voltage fluctuations. The power boost provides up to three times the rated current for brief

periods. In case of overload, you can choose between constant current with automatic restart or latching shutdown. The high degree of efficiency keeps energy consumption and heating in the control cabinet low, and the compact metal housing also saves space.

To further increase 24 V availability, the SITOP modular power supplies can be combined with **buffer, DC UPS, redundancy and selectivity modules**.

## Main product highlights

- 24 V/5 A and 10 A, also available as version with PCB with protective coating.
- 1-phase and 2-phase ultra-wide input range
- Extremely slim design – no lateral installation clearances required
- Power Boost with 3 times the rated current (for 25 ms) for tripping protective devices
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Selectable short-circuit response between constant current and latching shutdown
- Optional symmetrical load distribution for parallel operation
- Operating status on 3 LEDs
- High degree of efficiency up to 91 %
- Wide temperature range from -25 to +70 °C
- Comprehensive certifications, such as cULus, ATEX and GL

Ordering data	Article No.
<b>SITOP PSU200M 1-phase and 2-phase, 24 V DC/5 A</b> Stabilized power supply Input: 120 ... 230/230 ... 500 V AC Output: 24 V DC/5 A	6EP1333-3BA10
<b>SITOP modular 1-phase and 2-phase, 24 V DC /5 A</b> Stabilized power supply Input: 120 ... 230/230 ... 500 V AC Output: 24 V DC/5 A Version with protective coating	6EP1333-3BA10-8AC0
<b>SITOP PSU200M 1-phase and 2-phase, 24 V DC/10 A</b> Stabilized power supply Input: 120 ... 230 V/ 230 ... 500 V AC Output: 24 V DC/10 A	6EP1334-3BA10
<b>SITOP modular 1-phase and 2-phase, 24 V DC /10 A</b> Stabilized power supply Input: 120 ... 230/230 ... 500 V AC Output: 24 V DC/10 A version with protective coating	6EP1334-3BA10-8AB0

Accessories	Article No.
<b>SITOP PSE201U buffer module</b> For SITOP smart and SITOP modular buffer time 100 ms to 10 s dependent on load current	6EP1961-3BA01
<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/40 A suitable for decoupling two SITOP power supplies with a maximum of 20 A output current	6EP1961-3BA21
<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/NEC Class 2 suitable for decoupling two SITOP power supplies; output power limited < 100 VA	6EP1962-2BA00
<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/10 A suitable for decoupling two SITOP power supplies with a maximum of 5 A output current	6EP1964-2BA00
<b>SITOP PSE200U selectivity module 3 A</b> 4-channel; Input: 24 V DC Output: 24 V DC/3 A per channel output current adjustable 0.5 ... 3 A <ul style="list-style-type: none"> <li>• With common alarm signal</li> <li>• With single-channel signaling</li> </ul>	6EP1961-2BA11 6EP1961-2BA31
<b>SITOP PSE200U selectivity module 10 A</b> 4-channel; Input: 24 V DC Output: 24 V DC/10 A per channel output current adjustable 3 ... 10 A <ul style="list-style-type: none"> <li>• With common alarm signal</li> <li>• With single-channel signaling</li> </ul>	6EP1961-2BA21 6EP1961-2BA41
<b>Device labeling plates</b>	3RT1900-1SB20

Overview



The 3-phase SITOP modular are technology power supplies for sophisticated solutions and offer maximum functionality for use in complex plants and machines. The wide-range input allows a connection to almost any electrical power system worldwide and ensures a high degree of safety even if there are large voltage fluctuations. The power boost provides up to three times the rated current for brief periods. In case of overload, you can

choose between constant current with automatic restart or latching shutdown. The high degree of efficiency keeps energy consumption and heating in the control cabinet low, and the compact metal housing also saves space.

To further increase 24 V availability, the SITOP modular power supplies can be combined with **buffer, DC UPS, redundancy and selectivity modules**.

Main product highlights

- 24 V DC/ 20 A and 40 A
- 3-phase wide-range input from 320 to 575 V AC for global use
- Extremely slim design – no lateral installation clearances required
- Power Boost with 3 times the rated current (for 25 ms) for tripping protective devices
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Selectable short-circuit response between constant current and latching shutdown
- Optional symmetrical load distribution for parallel operation
- Operating status on 3 LEDs
- Extremely high efficiency up to 94%
- Wide temperature range from -25 to +70 °C
- Comprehensive certifications, such as cULus, ATEX, IECex and GL

Ordering data	Article No.
<b>SITOP PSU8200, 3-phase, 24 V DC/20 A</b> Stabilized power supply Input: 400 ... 500 V 3 AC Output: 24 V DC/20 A	6EP3436-8SB00-0AY0
<b>SITOP PSU8200 3-phase, 24 V DC/40 A</b> Stabilized power supply Input: 400 ... 500 V 3 AC Output: 24 V DC/20 A	6EP1437-3BA10

Accessories	Article No.
<b>SITOP PSE201U buffer module</b> For SITOP smart and SITOP modular buffer time 100 ms to 10 s dependent on load current	6EP1961-3BA01
<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/40 A suitable for decoupling two SITOP power supplies with a maximum of 20 A output current	6EP1961-3BA21
<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/NEC Class 2 suitable for decoupling two SITOP power supplies; output power limited < 100 VA	6EP1962-2BA00
<b>SITOP PSE202U redundancy module</b> Input/output: 24 V DC/10 A suitable for decoupling two SITOP power supplies with a maximum of 5 A output current	6EP1964-2BA00
<b>SITOP PSE200U selectivity module 3 A</b> 4-channel; Input: 24 V DC Output: 24 V DC/3 A per channel output current adjustable 0.5 ... 3 A <ul style="list-style-type: none"> <li>• With common alarm signal</li> <li>• With single-channel signaling</li> </ul>	6EP1961-2BA11 6EP1961-2BA31
<b>SITOP PSE200U selectivity module 10 A</b> 4-channel; Input: 24 V DC Output: 24 V DC/10 A per channel output current adjustable 3 ... 10 A <ul style="list-style-type: none"> <li>• With common alarm signal</li> <li>• With single-channel signaling</li> </ul>	6EP1961-2BA21 6EP1961-2BA41
<b>Device labeling plates</b>	3RT1900-1SB20

## Overview



The 3-phase SITOP modular are technology power supplies for sophisticated solutions and offer maximum functionality for use in complex plants and machines. The wide-range input allows connection to almost any electrical power system worldwide and ensures a high degree of safety, even if there are large voltage

fluctuations. The power boost provides up to three times the rated current for brief periods. In case of overload, you can choose between constant current with automatic restart or latching shutdown. The high degree of efficiency keeps energy consumption and heating in the control cabinet low, and the compact metal housing also saves space.

**Main product highlights**

- 36 V DC/13 A
- 3-phase AC input 400 to 500 volts
- Extremely slim design – no lateral installation clearances required
- Power Boost with 3 times the rated current (for 25 ms) for tripping protective devices
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Choice of constant current or latching shutdown short-circuit response
- Optional symmetrical load distribution for parallel operation
- Operating state on 3 LEDs
- Extremely high efficiency up to 94%
- Wide temperature range from -25 to +70 °C
- Comprehensive certifications, such as cULus, ATEX

**Ordering data****Article No.**

**SITOP PSU8200 3-phase,  
36 V DC/13 A**

**6EP3446-8SB10-0AY0**

Stabilized power supply  
Input: 400 ... 500 V 3 AC  
Output: 36 V DC/13 A

**Accessories****Article No.**

**Device labeling plates**

**3RT1900-1SB20**

# SITOP modular

3-phase, 48 V DC

## Overview



The 3-phase SITOP modular are technology power supplies for sophisticated solutions and offer maximum functionality for use in complex plants and machines. The wide-range input allows a connection to almost any electrical power system worldwide and ensures a high degree of safety even if there are large voltage

fluctuations. The power boost provides up to three times the rated current for brief periods. In case of overload, you can choose between constant current with automatic restart or latching shutdown. The high degree of efficiency keeps energy consumption and heating in the control cabinet low, and the compact metal housing also saves space.

### Main product highlights

- 48 V DC / 10 A and 20 A
- 3-phase wide-range input
- Extremely slim design – no lateral installation clearances required
- Power Boost with 3 times the rated current (for 25 ms) for tripping protective devices
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Selectable short-circuit response between constant current and latching shutdown
- Optional symmetrical load distribution for parallel operation
- Operating status on 3 LEDs
- Extremely high efficiency to 94 %
- Wide temperature range from -25 to +70 °C
- Comprehensive certifications, such as cULus, ATEX and GL

Ordering data	Article No.
<b>SITOP PSU300M 3-phase, 48 V DC/10 A</b> Stabilized power supply Input: 3 AC 400 ... 500 V Output: 48 V DC / 10 A	6EP1456-3BA00
<b>SITOP PSU300M 3-phase, 48 V DC / 20 A</b> Stabilized power supply Input: 3 AC 400 ... 500 V Output: 48 V DC/20 A	6EP1457-3BA00

Accessories	Article No.
Device labeling plates	3RT1900-1SB20

## Overview



As a unique power supply system with complete integration in Totally Integrated Automation (TIA), SITOP PSU8600 sets new standards in industrial power supplies. The benefits of this integration are not only apparent during engineering in TIA Portal but also result in reliable operation. Voltage and current response thresholds can be set individually for each output of the power supply system, and selective monitoring of each output for overload results in fast fault location. Depending on requirements additional modules from the modular system, such as are used for buffering short power failures, can be added without wiring overhead.

Comprehensive diagnostic and maintenance information is available via PROFINET. It can be evaluated directly in SIMATIC S7 and visualized in SIMATIC WinCC. Optimal support is also provided for energy management of plant or machines: From the acquisition of energy data from individual outputs, the specific activation and deactivation of outputs via PROFIenergy, to direct integration in power management systems.

## Benefits

- Reduced space requirement and costs due to multiple integrated outputs with selective monitoring
- Individually configurable outputs (no need for additional power supply for 5 V, 12 V or 15 V)
- Compensation for power losses can be set separately for each output
- Narrow width without lateral installation clearances
- Low temperature rise in the control cabinet due to very high efficiency
- If required, extra units from the modular system (more outputs, buffer module) can be added without wiring effort
- Reliable operation due to bridging of short-term power failures
- Two integrated Ethernet/PROFINET ports (no external switch required)
- Complete integration in TIA requires less time and reduces costs during configuration (TIA Portal) and in operation
- SIMATIC S7 function blocks for easy integration in STEP 7 user programs
- Fast integration in operator control and monitoring with WinCC faceplates
- Preventive maintenance reduces downtimes
- Energy savings during breaks through targeted switching of outputs
- Easy integration in energy management systems (PROFIenergy protocol)

## Application

The SITOP PSU8600 power supply system is used as the central DC power supply of larger plants or machines with networked automation systems. The PSU8600 can be directly integrated into the LAN infrastructure by means of the two integrated PROFINET ports.



An extremely high level of reliability is achieved for the DC voltage supply by monitoring the individual DC branches for overload and bridging short-term power failures (brownouts). Complete transparency and fast fault localization are achieved by providing comprehensive diagnostic and maintenance information (e.g. load states of the outputs, phase/network failure, overtemperature) via PROFINET.

Energy-optimized operation is supported by measuring the current power and voltage values of the individual outputs as well as the individual activation and deactivation of the DC outputs via PROFIenergy during break times.

## Introduction

**Design**

## Basic devices

- SITOP PSU8600, 3-phase power supply, 24 V DC/20 A/4x 5 A with four outputs (max. 5 A per output) and two Ethernet/PROFINET ports
- SITOP PSU8600, 3-phase power supply, 24 V DC/20 A with one output and two Ethernet/PROFINET ports
- SITOP PSU8600, 3-phase power supply, 24 V DC/40 A/4x 10 A with four outputs (max. 10 A per output) and two Ethernet/PROFINET ports
- SITOP PSU8600, 3-phase power supply, 24 V DC/40 A with one output and two Ethernet/PROFINET ports

## Modular system, consisting of:

- SITOP CNX8600 4x 5 A (expansion module with 4 outputs at 5 A each)
- SITOP CNX8600 4x 10 A (expansion module with 4 outputs at 10 A each)
- SITOP BUF8600 100 ms/40 A (buffer module with 100 ms at 40 A)
- SITOP BUF8600 300 ms/40 A (buffer module with 300 ms at 40 A)
- SITOP BUF8600 4 s/40 A (buffer module with 4 s at 40 A)
- SITOP BUF8600 10 s/40 A (buffer module with 10 s at 40 A)

You can connect up to four CNX8600 expansion modules as well as up to two BUF8600 buffer modules to the PSU8600 basic device. Connection takes place on top of the modules without any wiring by means of the System Clip Link, a connecting plug for system data and power supply. The order of the up to six possible add-on modules is random so that an existing configuration does not have to be altered if a module is added later.

**Function****Supply of connected loads**

An individual supply voltage can be set at each output of the power supply system. This means you can supply loads with different rated voltages simultaneously with only one device. Plus the voltage drop caused by the different cable lengths can be compensated individually, which means each load can be supplied with the optimum voltage.

**Monitoring of the outputs for overload**

Each output of the power supply system is individually monitored for overload. If the load current exceeds the set response threshold, the output is shut down according to specified time-current characteristics. All other outputs continue to be supplied reaction-free.

**Enabling and disabling the outputs**

Each output can be manually enabled or disabled directly on the device (e.g. for commissioning or service) and an overload tripping can be reset. Outputs disabled due to overload can also be reset remotely using a remote signal (24 V input).

In addition, program-controlled enabling and disabling of the outputs is possible using the integrated Ethernet/PROFINET interface. This also means you can disable individual outputs by means of PROFIenergy during breaks to save energy.

**Function (continued)****Communication**

Comprehensive diagnostic information can be queried and processed via the integrated Ethernet/PROFINET interface during operation for both the device status as well as the status of the individual outputs. This results in complete transparency, minimal downtimes and quick fault location. The integrated web server also permits remote monitoring of the power supply system.

**Buffering**

In case of short-term power failure, the buffer module supplies the load current for supplying the outputs by means of its energy storage units. Maintenance-free electrolytic capacitors or double-layer capacitors are used as energy-storage units.

**Integration****Software for TIA-based automation systems**

Different software components are available to facilitate easy integration of the SITOP PSU8600 in the TIA environment.

Engineering is simple via the TIA Portal. Special function blocks for SIMATIC S7-300, S7-400, S7-1200 and S7-1500 also support integration in the STEP 7 user program.

The comprehensive operating and diagnostic data of the power supply system can be visualized using ready-to-use PSU8600 faceplates for WinCC.

**TIA Portal**

- User-friendly, failsafe integration of SITOP PSU8600 in the PROFINET network by means of drag-and-drop
- Convenient configuration of the PSU8600 basic units and CNX8600 and BUF8600 add-on modules through simple selection from the TIA Portal hardware catalog
- Free download of HSP (Hardware Support Package) for TIA Portal version V13 or higher available at <http://support.automation.siemens.com/WW/view/en/102254062>
- Free GSD file (Generic Station Description) for STEP 7 V 5.5 <http://support.automation.siemens.com/WW/view/en/102254061>



Error-free establishment of the PROFINET connection between the SITOP PSU8600 and the controller is easy with the TIA Portal



### Integration (continued)

#### STEP 7 function blocks

Function blocks are available for STEP 7 user programs on SIMATIC S7-300/400/1200/1500. They allow further processing of the PSU8600 operating data.

- Function blocks for STEP 7 V5.5
- Function blocks for STEP 7 V13

Free download from:

<http://support.automation.siemens.com/WW/view/en/102379345>

#### Faceplates for WinCC

Ready-to-use faceplates save programming time during visualization of the SITOP PSU8600. The faceplates show all relevant statuses and values of the power supply system and the individual outputs and are available for the following systems:

- Faceplates for WinCC V7.3
- Faceplates for WinCC flexible 2008 SP3
- Faceplates for WinCC Comfort/Advanced/ Professional V13

Free download from:

<http://support.automation.siemens.com/WW/view/en/102379345>

SITOP PSU8600			
State	Trends	Alarms	PSU
PSU8600			
CNX8600 #1	PSU8600 information		
CNX8600 #2	Operating state: <span style="color: green;">■</span> The power supply system is in normal operation.		
CNX8600 #3	Input voltage: 390 V		
BUF8600 #1	System load current: 3.0 A		
BUF8600 #2	Output information		
Information	Output 1:	Uout: 23.9 V Iout: 2.6 A State: <span style="color: green;">■</span>	
	Output 2:	Uout: 24.0 V Iout: 0.1 A State: <span style="color: green;">■</span>	
	Output 3:	Uout: 24.0 V Iout: 0.1 A State: <span style="color: green;">■</span>	
	Output 4:	Uout: 24.0 V Iout: 0.0 A State: <span style="color: green;">■</span>	

The pre-compiled WinCC faceplates show all the relevant data of the power supply system in an easy-to-understand display.

### Web server

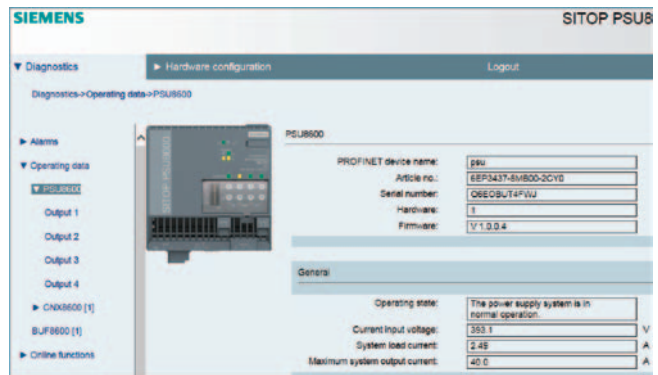
A web server is integrated in the PSU8600 basic unit for remote monitoring of the power supply system.

Remote monitoring of

- Hardware configuration data
- Operating data of the basic unit, all connected add-on modules and the individual outputs
- Alarm messages

Remote access via

- Firefox V29, Internet Explorer 8, 10, 11
- IP address
- User name and password



The password-protected web server offers a view of the configuration and operating data.

### More information

Select the appropriate power supply quickly and easily with the PSU8600 SITOP Selection Tool:

<http://www.siemens.de/sitop-selection-tool>

# SITOP modular, PSU8600 power supply system

## 3-phase, basic units 24 V DC (PSU8600)

### Overview



The ultra-slim 3-phase basic units of the SITOP PSU8600 power supply system include one Ethernet/PROFINET interface as well as one or four configurable outputs (voltage and current threshold) with selective monitoring. Additional units from the modular system can be added as required to the basic unit, without wiring overhead, in order to increase the number of outputs (CNX8600) or to extend the mains buffering time (BUF8600). Comprehensive diagnostic and maintenance information is available via PROFINET. It can be evaluated directly in SIMATIC S7 and visualized in SIMATIC WinCC. Energy management is also optimally supported by collecting the energy data for each output as well as individual activation and deactivation of the outputs via PROFlenergy.

information is available via PROFINET. It can be evaluated directly in SIMATIC S7 and visualized in SIMATIC WinCC. Energy management is also optimally supported by collecting the energy data for each output as well as individual activation and deactivation of the outputs via PROFlenergy.

### Main product highlights

- 3-phase wide-range input 400 to 500 V 3 AC for global use
- Extremely slim design with very high efficiency of up to 94%
- Versions with a configurable output with up to 20 A or 40 A and selective monitoring
- Versions with four integrated, individually configured outputs with up to 5 A or 10 A each and selective monitoring
- Voltage and response threshold can be set separately and are infinitely adjustable for each output
- Extra power with 1.5 times the rated current (5 s/min) for brief, operational overload
- Integrated Ethernet/PROFINET interface (2 ports)
- Easy configuration in the TIA Portal
- Comprehensive diagnostic information during operation
- Outputs can be deactivated and activated in a targeted manner with PROFlenergy
- Individual expansion options from the modular system (expansion modules, buffer modules) without wiring overhead

### Technical specifications

Article number	6EP3436-8SB00-2AY0	6EP3437-8SB00-2AY0	6EP3436-8MB00-2CY0	6EP3437-8MB00-2CY0
Product	SITOP PSU8600	SITOP PSU8600	SITOP PSU8600	SITOP PSU8600
Power supply, type	24 V/20 A	24 V/40 A	24 V/20 A/4x 5 A	24 V/40 A/4x 10 A
<b>Input</b>				
Input	3-phase AC	3-phase AC	3-phase AC	3-phase AC
Rated voltage value $V_{in rated}$	400 ... 500 V	400 ... 500 V	400 ... 500 V	400 ... 500 V
Voltage range AC	320 ... 575 V	320 ... 575 V	320 ... 575 V	320 ... 575 V
• Note	Derating 320 ... 360 and 530 ... 575 V	Derating 320 ... 360 and 530 ... 575 V	Derating 320 ... 360 and 530 ... 575 V	Derating 320 ... 360 and 530 ... 575 V
Wide-range input	Yes	Yes	Yes	Yes
Mains buffering at $I_{out rated}$ , min.	15 ms; at $V_{in} = 400$ V; Prioritized voltage supply at power failure via DIP switch can be selected (only with expansion module CNX8600)	15 ms; at $V_{in} = 400$ V; Prioritized voltage supply at power failure via DIP switch can be selected (only with expansion module CNX8600)	15 ms; at $V_{in} = 400$ V; Prioritized supply Output 1 at power failure can be selected via DIP switch	15 ms; at $V_{in} = 400$ V; Prioritized supply Output 1 at power failure can be selected via DIP switch
Rated line frequency	50 ... 60 Hz	50 ... 60 Hz	50 ... 60 Hz	50 ... 60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Input current				
• at rated input voltage 400 V	1.4 A	2.75 A	1.4 A	2.75 A
• at rated input voltage 500 V	1.1 A	2.2 A	1.1 A	2.2 A
Switch-on current limiting (+25 °C), max.	14 A	14 A	14 A	14 A
$I^2t$ , max.	1.2 A <sup>2</sup> ·s	2.24 A <sup>2</sup> ·s	1.2 A <sup>2</sup> ·s	2.24 A <sup>2</sup> ·s
Built-in incoming fuse	none	none	none	none
Protection in the mains power input (IEC 898)	Required: 3-pole connected miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)	Required: 3-pole connected miniature circuit breaker 10 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)	Required: 3-pole connected miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)	Required: 3-pole connected miniature circuit breaker 10 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)



# SITOP modular, PSU8600 power supply system

## 3-phase, basic units 24 V DC (PSU8600)

### Technical specifications (continued)

Article number	6EP3436-8SB00-2AY0	6EP3437-8SB00-2AY0	6EP3436-8MB00-2CY0	6EP3437-8MB00-2CY0
Product	SITOP PSU8600	SITOP PSU8600	SITOP PSU8600	SITOP PSU8600
Power supply, type	24 V/20 A	24 V/40 A	24 V/20 A/4x 5 A	24 V/40 A/4x 10 A
Suitability for interaction modular system	Yes	Yes	Yes	Yes
Width of the enclosure	80 mm	125 mm	100 mm	125 mm
Height of the enclosure	125 mm	125 mm	125 mm	125 mm
Depth of the enclosure	150 mm	150 mm	150 mm	150 mm
Required spacing				
• top	50 mm	50 mm	50 mm	50 mm
• bottom	50 mm	50 mm	50 mm	50 mm
• left	0 mm	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm	0 mm
Weight, approx.	1.8 kg	2.6 kg	2 kg	2.6 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x15	Snaps onto DIN rail EN 60715 35x15	Snaps onto DIN rail EN 60715 35x15	Snaps onto DIN rail EN 60715 35x15
Electrical accessories	Expansion modules CNX8600, buffer modules BUF8600	Expansion modules CNX8600, buffer modules BUF8600	Expansion modules CNX8600, buffer modules BUF8600	Expansion modules CNX8600, buffer modules BUF8600
Mechanical accessories	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20
MTBF at 40 °C				226 272 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

### Ordering data

### Article No.

<b>SITOP PSU8600 3-phase, 24 V DC/20 A with PN/E connection</b> Stabilized power supply Input: 400 ... 500 V AC 3 AC Output: 24 V DC/20 A	<b>6EP3436-8SB00-2AY0</b>
<b>SITOP PSU8600 3-phase, 24 V DC/40 A with PN/E connection</b> Stabilized power supply Input: 400 ... 500 V AC 3 AC Output: 24 V DC/40 A	<b>6EP3437-8SB00-2AY0</b>
<b>SITOP PSU8600 3-phase, 24 V DC/20 A/4 x 5 A with PN/E connection</b> Stabilized power supply Input: 400 ... 500 V AC 3 AC Output: 24 V DC/20 A/4 x 5 A	<b>6EP3436-8MB00-2CY0</b>
<b>SITOP PSU8600 3-phase, 24 V DC/40 A/4 x 10 A with PN/E connection</b> Stabilized power supply Input: 400 ... 500 V 3 AC Output: 24 V DC/40 A/4 x 10 A	<b>6EP3437-8MB00-2CY0</b>

### Accessories

### Article No.

<b>SITOP CNX8600 4 x 5 A expansion module</b> For SITOP PSU8600 Output: 24 V DC/4 x 5 A	<b>6EP4436-8XB00-0CY0</b>
<b>SITOP CNX8600 4 x 10 A expansion module</b> For SITOP PSU8600 Output: 24 V DC/4 x 10 A	<b>6EP4437-8XB00-0CY0</b>
<b>SITOP BUF8600 100 ms buffer module</b> For SITOP PSU8600 Buffer capacity 100 ms/40 A	<b>6EP4297-8HB00-0XY0</b>
<b>SITOP BUF8600 300 ms buffer module</b> For SITOP PSU8600 Buffer capacity 300 ms/40 A	<b>6EP4297-8HB10-0XY0</b>
<b>SITOP BUF8600 4 s buffer module</b> For SITOP PSU8600 Buffer capacity 4 s/40 A	<b>6EP4293-8HB00-0XY0</b>
<b>SITOP BUF8600 10 s buffer module</b> For SITOP PSU8600 Buffer capacity 10 s/40 A	<b>6EP4295-8HB00-0XY0</b>
<b>Device labeling plates</b>	<b>3RT1900-1SB20</b>

## SITOP modular, PSU8600 power supply system

## Modular system, expansion of outputs (CNX8600)

## Overview



The CNX8600 expansion modules are part of the SITOP PSU8600 modular system and expand the basic unit by increasing the number of selectively monitored outputs.

You can connect up to four CNX8600 expansion modules to the PSU8600 basic device. The connection takes place on top of the modules without any wiring by means of the System Clip Link, a connecting plug for system data and power supply.

**Main product highlights**

- Four integrated outputs with up to 5 A or 10 A each and selective monitoring
- Voltage and response threshold can be set separately and are infinitely adjustable for each output
- Comprehensive diagnostic information during operation via the PSU8600 basic unit
- Outputs can be activated and deactivated in a targeted manner with PROFIenergy via the PSU8600 basic unit
- Easy connection without wiring overhead
- Slim design

## Technical specifications

Article number	6EP4436-8XB00-0CY0	6EP4437-8XB00-0CY0
Product	SITOP CNX8600	SITOP CNX8600
Power supply, type	4x 5 A	4x 10 A
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Number of outputs	4	4
Rated voltage $V_{out}$ DC	24 V	24 V
Output voltage		
• at output 1 at DC Rated value	24 V	24 V
• at output 2 at DC Rated value	24 V	24 V
• at output 3 at DC Rated value	24 V	24 V
• at output 4 at DC Rated value	24 V	24 V
Total tolerance, static $\pm$	3 %	3 %
Static mains compensation, approx.	0.2 %	0.2 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	100 mV	100 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	200 mV	200 mV
Adjustment range	5 ... 28 V	5 ... 28 V
Product function Output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer; Derating > 24 V: 4%/V; max. 120 W per output	via potentiometer; Derating > 24 V: 4%/V; max. 240 W per output
Status display	3-color LED for operating state module; 3-color LED per output for operating state output	3-color LED for operating state module; 3-color LED per output for operating state output
Signaling	Relay contact (changeover contact, contact current capacity DC 60 V/0.3 A) for "Operating state OK" at power supply unit PSU8600	Relay contact (changeover contact, contact current capacity DC 60 V/0.3 A) for "Operating state OK" at power supply unit PSU8600
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	1.5 s; Without on-delay of the outputs	1.5 s; Without on-delay of the outputs
connection of outputs operating	Simultaneous connecting-in of all outputs after device booting or delay time of 25 ms, 100 ms or "load-optimized" for sequential cutting-in of the outputs via DIP switches at power supply unit PSU8600 can be set	Simultaneous connecting-in of all outputs after device booting or delay time of 25 ms, 100 ms or "load-optimized" for sequential cutting-in of the outputs via DIP switches at power supply unit PSU8600 can be set
Voltage increase time of the output voltage maximum	500 ms	500 ms
Rated current value $I_{out}$ rated	20 A	40 A

**Technical specifications** (continued)

Article number	6EP4436-8XB00-0CY0	6EP4437-8XB00-0CY0
<b>Product</b>	<b>SITOP CNX8600</b>	<b>SITOP CNX8600</b>
<b>Power supply, type</b>	<b>4x 5 A</b>	<b>4x 10 A</b>
<b>Operating data</b>		
Ambient temperature		
• during operation	-25 ... +60 °C	-25 ... +60 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
<b>Mechanics</b>		
Connection technology	Plug-in terminals with screwed connection	Plug-in terminals with screwed connection
Connections		
• Output	1, 2, 3, 4: Two plug-in terminals (1, 2 and 3, 4) with 2 screwed connections each for 0.2 ... 2.5 mm <sup>2</sup> ; Ground: Plug-in terminal with 3 screwed connections for 0.2 ... 2.5 mm <sup>2</sup>	1, 2, 3, 4: Two plug-in terminals (1, 2 and 3, 4) with 2 screwed connections each for 0.2 ... 2.5 mm <sup>2</sup> ; Ground: Plug-in terminal with 3 screwed connections for 0.2 ... 2.5 mm <sup>2</sup>
Product function		
• removable terminal at output	Yes	Yes
Type of connection to system components	Via integrated connector	Via integrated connector
Width of the enclosure	60 mm	60 mm
Height of the enclosure	125 mm	125 mm
Depth of the enclosure	150 mm	150 mm
Required spacing		
• top	50 mm	50 mm
• bottom	50 mm	50 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	1.15 kg	1.15 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x15	Snaps onto DIN rail EN 60715 35x15
Mechanical accessories	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20
MTBF at 40 °C	499 861 h	499 861 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

**Ordering data**

**Article No.**

**SITOP CNX8600 4 x 5 A expansion module**

For SITOP PSU8600  
Output: 24 V DC/4 x 5 A

**6EP4436-8XB00-0CY0**

**SITOP CNX8600 4 x 10 A expansion module**

For SITOP PSU8600  
Output: 24 V DC/4 x 10 A

**6EP4437-8XB00-0CY0**

**Accessories**

**Article No.**

**Device labeling plates**

**3RT1900-1SB20**

# SITOP modular, PSU8600 power supply system

## Modular system, buffer (BUF8600)

### Overview



The BUF8600 buffer modules with maintenance free energy storage units are part of the SITOP PSU8600 modular system and are designed to bridge short-term power failures. They automatically take over the DC power supply in case of a line voltage failure. You can connect up to two BUF8600 buffer modules to the PSU8600 basic unit. Connection takes place on top of the modules without any wiring by means of the System Clip Link, a connecting plug for system data and power supply.

#### Main product highlights

- Reliable bridging of short-term power failures up to maximum 20 s (at 24 V DC and full load)
- Buffer module with maintenance free electrolytic capacitors for bridging short-term power failures (brownouts) between 100 ms and max. 600 ms (at 24 V DC/40 A)
- Buffer module with maintenance free double-layer capacitors for bridging longer power failures between 4 s and max. 20 s (at 24 V DC/40 A)
- The two buffer modules can be combined as required.
- Easy connection without wiring overhead

### Technical specifications

Article number	6EP4297-8HB00-0XY0	6EP4297-8HB10-0XY0	6EP4293-8HB00-0XY0	6EP4295-8HB00-0XY0
<b>product brand name</b>	SITOP BUF8600	SITOP BUF8600	SITOP BUF8600	SITOP BUF8600
<b>Type of current supply</b>	100 ms/40 A	300 ms/40 A	4 s/40 A	10 s/40 A
<b>Mains buffering</b>				
Type of energy storage	electrolytic capacitors	electrolytic capacitors	Double-layer capacitors	Double-layer capacitors
Buffering time for rated value of the output current in the event of power failure	100 ms	300 ms	4 s	10 s
<b>Output</b>				
Output current				
• Rated value	40 A	40 A	40 A	40 A
<b>Signaling</b>				
Display version	3-color LED for operating state module	3-color LED for operating state module	3-color LED for operating state module	3-color LED for operating state module
• for normal operation	LED green for "buffer standby exist"	LED green for "buffer standby exist"	LED green for "buffer standby exist"	LED green for "buffer standby exist"
• in buffering mode	LED yellow for "buffered mode"	LED yellow for "buffered mode"	LED yellow for "buffered mode"	LED yellow for "buffered mode"
<b>Interface</b>				
Specification/Interface	Ethernet/PROFINET via power supply unit PSU8600	Ethernet/PROFINET via power supply unit PSU8600	Ethernet/PROFINET via power supply unit PSU8600	Ethernet/PROFINET via power supply unit PSU8600
<b>Safety</b>				
Protection class	Class III	Class III	Class III	Class III
CE marking	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
Explosion protection	IECEX nA IIC T5 Gc; ATEX (EX) II 3G Ex nA IIC T5 Gc	IECEX nA IIC T5 Gc; ATEX (EX) II 3G Ex nA IIC T5 Gc	IECEX nA IIC T5 Gc; ATEX (EX) II 3G Ex nA IIC T5 Gc	IECEX nA IIC T5 Gc; ATEX (EX) II 3G Ex nA IIC T5 Gc
CB approval	Yes	Yes	Yes	Yes
Shipbuilding approval	GL (ABS in process)	GL (ABS in process)	GL (ABS in process)	GL (ABS in process)
Protection class (EN 60529)	IP20	IP20	IP20	IP20
<b>EMC</b>				
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2

Technical specifications (continued)

Article number	6EP4297-8HB00-0XY0	6EP4297-8HB10-0XY0	6EP4293-8HB00-0XY0	6EP4295-8HB00-0XY0
product brand name	SITOP BUF8600	SITOP BUF8600	SITOP BUF8600	SITOP BUF8600
Type of current supply	100 ms/40 A	300 ms/40 A	4 s/40 A	10 s/40 A
<b>Operating data</b>				
Ambient temperature				
• during operation	-25 ... +60 °C; with natural convection	-25 ... +60 °C; with natural convection	-25 ... +60 °C; with natural convection	-25 ... +60 °C; with natural convection
• during transport	-40 ... +70 °C	-40 ... +70 °C	-40 ... +70 °C	-40 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C	-40 ... +70 °C	-40 ... +70 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation	Climate class 3K3, no condensation	Climate class 3K3, no condensation
<b>Mechanics</b>				
Connection technology	-	-	Plug-in terminal with screw connectors	Plug-in terminal with screw connectors
• input	-	-	-	-
• output	-	-	-	-
• auxiliary contact and signaling contacts	-	-	X1, X2 (control contact) and 13,14, 23, 24 (message signals): 1 screw terminal each for 0.2 ... 1.5 mm <sup>2</sup>	X1, X2 (control contact) and 13,14, 23, 24 (message signals): 1 screw terminal each for 0.2 ... 1.5 mm <sup>2</sup>
Type of connection to system components	Via integrated connector	Via integrated connector	Via integrated connector	Via integrated connector
Width of the enclosure	60 mm	125 mm	60 mm	125 mm
Height of the enclosure	125 mm	125 mm	125 mm	125 mm
Depth of the enclosure	150 mm	150 mm	150 mm	150 mm
Required spacing				
• top	50 mm	50 mm	50 mm	50 mm
• bottom	50 mm	50 mm	50 mm	50 mm
• left	0 mm	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm	0 mm
Weight, approx.	1.33 kg	2.26 kg	1.25 kg	1.95 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes	Yes	Yes
Mounting	Snaps onto DIN rail EN 60715 35x15	Snaps onto DIN rail EN 60715 35x15	Snaps onto DIN rail EN 60715 35x15	Snaps onto DIN rail EN 60715 35x15
Mechanical accessories	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20	Device identification label 20 mm x 7 mm, TI-grey 3RT2900-1SB20
MTBF at 40 °C	1 944 258 h	1 944 258 h	-	-
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

Article No.

<b>SITOP BUF8600 100 ms buffer module</b> For SITOP PSU8600 Buffer capacity 100 ms/40 A	<b>6EP4297-8HB00-0XY0</b>
<b>SITOP BUF8600 300 ms buffer module</b> For SITOP PSU8600 Buffer capacity 300 ms/40 A	<b>6EP4297-8HB10-0XY0</b>
<b>SITOP BUF8600 4 s buffer module</b> For SITOP PSU8600 Buffer capacity 4 s/40 A	<b>6EP4293-8HB00-0XY0</b>
<b>SITOP BUF8600 10 s buffer module</b> For SITOP PSU8600 Buffer capacity 10 s/40 A	<b>6EP4295-8HB00-0XY0</b>

Accessories

Article No.

<b>Device labeling plates</b>	<b>3RT1900-1SB20</b>
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### Overview



#### *The optimum supply for SIMATIC S7 and more*

The original SIMATIC power supplies harmonize perfectly with the PLC network in terms of their design and functionality. In addition to the following SIMATIC systems, they also supply further loads reliably with 24 V.

- SIMATIC S7-300
- SIMATIC S7-1200
- SIMATIC S7-1500
- SIMATIC ET200M
- SIMATIC ET200MP
- SIMATIC ET 200pro

### More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

## Overview



The design and functionality of the SIMATIC PS 307 single-phase load power supply (system and load current supply) with automatic range switchover of the input voltage is an optimal match to the SIMATIC S7-300 PLC. By means of the connecting comb that is supplied with the system and load current supply, the supply to the CPU is quickly established. It is also possible to provide a 24 V supply to other S7-300 system components, input/output circuits of the input/output modules and, if necessary, the sensors and actuators. Comprehensive certifications, such as UL, ATEX or GL facilitate universal use (does not apply to outdoor use).

## Design

- The system and load current supplies are screwed directly onto the S7-300 standard mounting rail and can be mounted directly to the left of the CPU (no installation clearance required)
- Diagnostic LED for indicating "Output voltage 24 V DC O.K."
- ON/OFF switches (operation/stand-by) for possible swapping of modules
- Strain-relief assembly for input voltage connection cable

## Function

- Connection to all 1-phase 50/60 Hz networks (120 / 230 V AC) through automatic range switching (PS307) or manual switching (PS307, outdoor)
- Short-term power failure backup
- Output voltage 24 V DC, stabilized, short circuit-proof, open circuit-proof
- Parallel connection of two power supplies for enhanced performance

## Ordering data

## Article No.

<b>Load current supply PS 307, 2A</b> Incl. connection bracket Input: 120/230 V AC Output: 24 V DC/2 A	<b>6ES7307-1BA01-0AA0</b>
<b>SIMATIC S7-300 Outdoor, 2A</b> Stabilized power supply PS305 Input: 24 ... 110 V DC Output: 24 V DC/2 A	<b>6ES7305-1BA80-0AA0</b>
<b>PS 307 load power supply, 5 A</b> Incl. connection bracket Input: 120/230 V AC Output: 24 V DC/5 A	<b>6ES7307-1EA01-0AA0</b>
<b>SIMATIC S7-300 Outdoor, 5A</b> Stabilized power supply PS307 Input: 120/230 V AC Output: 24 V DC/5 A	<b>6ES7307-1EA80-0AA0</b>
<b>PS 307 load power supply, 10 A</b> Input: 120/230 V AC Output: 24 V DC/10 A	<b>6ES7307-1KA02-0AA0</b>

## Accessoires

## Article No.

<b>SIMATIC S7-300 mounting adapter</b> For snapping the new PS 307 onto a 35 mm DIN rail (EN 60715) Spare part	<b>6EP1971-1BA00</b>
<b>SIMATIC S7-300 mounting adapter</b> for snapping the PS307 onto 35 mm DIN rails	<b>6ES7390-6BA00-0AA0</b>

## SITOP in the SIMATIC Design

1-phase, 24 V DC (for S7-1200)

## Overview



In terms of design and functionality, the SIMATIC PM 1207 single-phase load power supply (PM = power module) with automatic range selection of the input voltage is an optimal match to the SIMATIC S7-1200 PLC. It provides the supply to CPUs with 24 V input as well as to signal modules, and to 24 V loads connected to the modules. Comprehensive certifications, such as UL, ATEX and GL facilitate universal use.

## Design

- The load current supplies are directly fastened to the S7-1200 mounting rail (without connection to the backplane bus) and can be mounted directly to the left of the CPU (no installation clearance required)
- LED for status indicator "24 V OK"
- Two 24 V DC output terminals for connection of 24 V consumers

## Function

- Connection to all 1-phase networks (120 V AC/230 V AC) through automatic range switching
- Short-term power failure backup
- Parallel connection of two load current supplies for enhanced performance

## Ordering data

## Article No.

SIMATIC S7-1200 PM 1207

6EP1332-1SH71

Input: 120/230 V AC  
Output: 24 V DC/2.5 A



# SITOP in the SIMATIC Design

1-phase, 24 V DC (for S7-1500 and ET200MP)

## Overview



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

## Design

- The load current supplies are directly fastened to the S7-1500 mounting rail (without connection to the backplane bus) and can be mounted directly to the left of the CPU (no installation clearance required)
- Diagnostics LEDs to indicate status and faults: Operation, Fault, Stand-by
- ON/OFF switches (operation/stand-by) in case of swapping modules
- Mains connection plug with touch protection and strain relief for connection of input voltage (enables permanent wiring)
- Plug-in 24 V DC output terminal with reverse polarity protection for connection of 24 V loads (enables permanent wiring)

## Function

- Connection to all 1-phase 50/60 Hz networks (120 / 230 V AC) through automatic range switching
- Short-term mains buffering
- Output voltage of 24 V DC that is limited to maximum 28 V DC (prevents any damages in 24 V loads if input voltage is too high)
- 50% "Extra Power" for 5 seconds per minute for short-term overloads, for example, when switching on 24V consumers

## Ordering data

### Article No.

#### SIMATIC PM 1507

Stabilized power supply for SIMATIC S7-1500  
Input: 120/230 V AC  
Output: 24 V DC/3 A

6EP1332-4BA00

#### SIMATIC PM 1507

Stabilized power supply for SIMATIC S7-1500  
Input: 120/230 V AC  
Output: 24 V DC/8 A

6EP1333-4BA00

## Accessories

### Article No.

#### Power connector

With coding element for power supply module; spare part, 10 units per packaging unit

6ES7590-8AA00-0AA0

## Overview



The SIMATIC ET200pro PS power supply unit with degree of protection IP67 is used as the electronics/encoder supply and load voltage supply of the new SIMATIC ET 200pro distributed I/O system for use close to the machine without a cabinet. With a signaling contact for "24 V OK" and "Overtemperature", as well as a second plug-in connector for input voltage loop-through.

## Ordering data

### Article No.

#### SIMATIC ET 200pro PS

Stabilized power supply in distributed I/O system design, permitting the loop-through of energy to further modules; with degree of protection IP67; Input: 400-480 V 3 AC Output: 24 V DC/8 A

**6ES7148-4PC00-0HA0**

## Accessories

### Article No.

#### Power connector

For connecting to the distributed I/O system

- For X1 (6 mm<sup>2</sup>)
- For X2 (4 mm<sup>2</sup>)

**3RK1911-2BE30**  
**3RK1911-2BF10**

#### National Fire Protection Association compatible

These devices are only approved for installation in industrial machinery according to the NFPA79 Electrical Standard for Industrial Machinery.

- for X1 SIMATIC ET200pro PS 61 88 201 1003.xx (AWG10)\*
- for X1 SITOP PSU300P 61 88 201 1000.xx / 61 88 201 1002.xx (AWG14)\*
- for X2 SIMATIC ET200pro PS 61 88 202 1010.xx (AWG10)\* supplied blanking cap for X2
- for X3 Phoenix-Contact SAC-5P-M12-M12FS supplied blanking cap for X3

\* <http://www.harting.com/en/home>

**3RK1902-0CK00**

#### Sealing cap

For 9-pole power sockets

- X2 (1 unit)
- X2 (10 units)

**3RK1902-0CJ0**  
**3RK1902-0CK00**

## Overview



### *Well prepared for special tasks and conditions*

Whether restricted installation conditions, harsh ambient conditions, or special input or output voltages are concerned: These standard power supply units ensure a reliable and efficient supply of power, even when subject to extraordinary demands. Thanks to their compact design they can be integrated perfectly into existing installations.

## More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

## Overview

**Low-cost power supply for wall mounting**

The PSU100D switch mode power supplies extend the Siemens power supply portfolio to include single-phase devices for direct wall mounting using screws. The flat and rugged aluminum enclosure with IP20 degree of protection can be installed in various orientations and is therefore ideal for installation locations with limited space or for mounting in control cabinets and enclosures without a DIN rail. The low-cost devices meet all the basic requirements for a power supply, typical applications being apparatus, automated equipment and automation solutions.

**Main product highlights**

- For 12-V standard applications from 3 A to 8.3 A
- For 24 V standard applications from 2.1 A to 12.5 A
- Compact metal enclosure
- Wide-range input
- Green LED for "24 V OK"
- Certification in accordance with CE and UL
- Adjustable output voltage from 22 to 28 V or from 11 to 14 V for compensating voltage drops
- Temperature range from -10 °C to +70 °C

## Introduction

## Overview



The single-phase PSU100Ds are switch mode power supplies for direct wall mounting using screws. The flat and rugged aluminum enclosure with IP20 degree of protection can be installed in various orientations and is therefore ideal for installation locations with limited space or for mounting in control cabinets and enclosures without a DIN rail. The low-cost devices meet all the basic requirements for a power supply, typical applications being apparatus, automated equipment and automation solutions.

**Main product highlights**

- 12 V DC, 3 A and 8.3 A
- Compact metal enclosure
- Wide-range input
- Green LED for "24 V OK"
- Certification in accordance with CE and UL
- Adjustable output voltage from 22 to 28 V or from 11 to 14 V for compensating voltage drops
- Temperature range from -10 °C to +70 °C

## Ordering data

## Article No.

**PSU100D 1-phase, 12 V DC/3 A**

6EP1321-1LD00

Stabilized power supply 35 W,  
for wall mounting  
Input: 100 ... 240 V AC  
Output: 12 V DC/3 A

**PSU100D 1-phase, 12 V DC/8.3 A**

6EP1322-1LD00

Stabilized power supply 100 W,  
for wall mounting  
Input: 100 ... 240 V AC  
Output: 12 V DC/8.3 A

## Special designs, special uses—wall mounting

## 1-phase, 12 V DC (PSU100D)

## Overview



The single-phase PSU100Ds are switch mode power supplies for direct wall mounting using screws. The flat and rugged aluminum enclosure with IP20 degree of protection can be installed in various orientations and is therefore ideal for installation locations with limited space or for mounting in control cabinets and enclosures without a DIN rail. The low-cost devices meet all the basic requirements for a power supply, typical applications being apparatus, automated equipment and automation solutions.

**Main product highlights**

- 24 V DC/ 2.1 A and 3.1 A, 4.1 A, 6.2 A and 12.5 A
- Compact metal enclosure
- Wide-range input
- Green LED for "24 V OK"
- Certification in accordance with CE and UL
- Adjustable output voltage from 22 to 28 V or from 11 to 14 V for compensating voltage drops
- Temperature range from -10 °C to +70 °C

## Ordering data

## Article No.

Ordering data	Article No.
<b>PSU100D 1-phase, 24 V DC/2.1 A</b> Stabilized power supply 50 W, for wall mounting Input: 100 ... 240 V AC Output: 24 V DC/2.1 A	6EP1331-1LD00
<b>PSU100D 1-phase, 24 V DC/3.1 A</b> Stabilized power supply 75 W, for wall mounting Input: 100 ... 240 V AC Output: 24 V DC/3.1 A	6EP1332-1LD00
<b>PSU100D 1-phase, 24 V DC/4.1 A</b> Stabilized power supply 100 W, for wall mounting Input: 100 ... 240 V AC Output: 24 V DC/4.1 A	6EP1332-1LD10
<b>PSU100D 1-phase, 24 V DC/6.2 A</b> Stabilized power supply 150 W, for wall mounting Input: 100 ... 240 V AC Output: 24 V DC/6.2 A	6EP1333-1LD00
<b>PSU100D 1-phase, 24 V DC/12.5 A</b> Stabilized power supply 300 W, for wall mounting Input: 100 ... 240 V AC Output: 24 V DC/12.5 A	6EP1334-1LD00

# Special designs, special uses—high degree of protection

## 1-phase, 24 V DC (SITOP PSU100P, IP67)

### Overview



The SITOP PSU100P 1-phase power supplies for wall mounting, with their rugged design and IP 67 degree of protection are ideal for distributed applications outside the control cabinet.

#### Main product highlights

- 24 V DC/ 5 A and 8 A
- Automatic switchover of the input voltage
- Temperature range from -25 °C to +60 °C without derating
- High efficiency of 93 % for low internal power consumption
- Isolated relay contact "24 V OK"
- Operation display on the device by means of LED (green = "24 V OK", flashing red = overload)

### Ordering data

### Article No.

#### SITOP PSU100P 1-phase, 24 V DC/5 A

Stabilized power supply with IP67 degree of protection  
 Input: 120/230 V AC  
 Output: 24 V DC/5 A

6EP1333-7CA00

#### SITOP PSU100P 1-phase, 24 V DC/8 A

Stabilized power supply with IP67 degree of protection  
 Input: 120/230 V AC  
 Output: 24 V DC/8 A

6EP1334-7CA00

### More information

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

**Overview**



The SIMATIC ET200pro PS power supply unit with degree of protection IP67 is used as the electronics/encoder supply and load voltage supply of the new SIMATIC ET 200pro distributed I/O system for use close to the machine without a cabinet. With a signaling contact for "24 V OK" and "Overtemperature", as well as a second plug-in connector for input voltage loop-through.

**Ordering data**

**SIMATIC ET 200pro PS**  
 Stabilized power supply in distributed I/O system design, permitting the loop-through of energy to further modules; with degree of protection IP67;  
 Input: 400-480 V 3 AC  
 Output: 24 V DC/8 A

**Article No.**

**6ES7148-4PC00-0HA0**

**Accessories**

**Power connector**

For connecting to the distributed I/O system

- For X1 (6 mm<sup>2</sup>)
- For X2 (4 mm<sup>2</sup>)

**Article No.**

**3RK1911-2BE30**  
**3RK1911-2BF10**

**National Fire Protection Association compatible**

These devices are only approved for installation in industrial machinery according to the NFPA79 Electrical Standard for Industrial Machinery.

- for X1 SIMATIC ET200pro PS 61 88 201 1003.xx (AWG10)\*
- for X1 SITOP PSU300P 61 88 201 1000.xx / 61 88 201 1002.xx (AWG14)\*
- for X2 SIMATIC ET200pro PS 61 88 202 1010.xx (AWG10)\*

\* <http://www.harting.com/en/home>

- supplied blanking cap for X2
- for X3 Phoenix-Contact SAC-5P-M12-M12FS
- supplied blanking cap for X3

**3RK1902-0CK00**

**Sealing cap**

- For 9-pole power sockets
- X2 (1 unit)
  - X2 (10 units)

**3RK1902-0CJ0**  
**3RK1902-0CK00**



# Special designs, special uses—battery charging

3-phase, 12 V DC

## Overview



The SITOP PSU3800 3-phase power supplies are suitable for battery charging, thanks to their constant-current characteristic. For other applications, the output characteristic can also be switched to latching shutdown. The three-phase, wide-range input enables them to be used worldwide. The slim design requires little space on the DIN rail. Installation gaps are not required.

## Ordering data

## Article No.

**SITOP PSU3800, 3-phase,  
12 V DC/20 A**

**6EP3424-8UB00-0AY0**

Stabilized power supply  
Input: 400 ... 500 V 3 AC  
Output: 12 V DC/20 A

# Special designs, special uses—battery charging

3-phase, 24 V DC

## Overview



SITOP PSU3800 3-phase power supplies (24 V DC/17 A and 30 A) are suitable for battery charging, thanks to their constant-current characteristic. For other applications the output characteristic can also be switched to latching shutdown. The three-phase, wide-range input enables them to be used worldwide. The slim design requires little space on the DIN rail. Installation gaps are not required.

## Ordering data

## Article No.

**SITOP PSU3800 3-phase,  
24 V DC/17 A**

**6EP3436-8UB00-0AY0**

Stabilized power supply  
Input: 400 ... 500 V 3 AC  
Output: 24 V DC/17 A

**SITOP PSU300B 3-phase,  
24 V DC/30 A**

**6EP1437-3BA20**

Stabilized power supply  
Input: 400 ... 500 V 3 AC  
Output: 24 V AC/30 A

# Special designs, special uses—alternative output voltages

1-phase, 2 x 15 V DC (SITOP dual)

## Overview



The industrial power supply with two 15 V outputs that can be switched in parallel and in series; can be used, for example, to supply electronic loads with  $\pm 15$  V.

## Ordering data

### SITOP power 15 V

Dual output  
 Stabilized power supply  
 Input: 120 ... 230 V AC  
 Output: 2 x 15 V DC/3.5 A

## Article No.

**6EP1353-0AA00**

# Special designs, special uses—alternative output voltages

1-phase, 3-52 V DC (SITOP flexi 120 W)

## Overview



The power supply with flexible output voltage from 3 to 52 V; suitable for all application areas requiring a special voltage other than 24 V.

## Ordering data

**SITOP power flexi**  
Stabilized power supply  
Input: 120 ... 230 V AC  
Output: 3-52 V DC / 2-10 A, 120 W

## Article No.

**6EP1353-2BA00**

## Overview



The optimum power supply for automation solutions in the lower performance range; with wide-range input for **48-220 V DC**; thanks to their compact and slim design, they are particularly suitable for solutions where space is limited and in conjunction with low-voltage switchgear.

## Ordering data

### SITOP power 0.375 A

DC/DC stabilized power supply  
Input: DC 48 ... 220 V  
Output: 24 V DC/0.375 A

**6EP1731-2BA00**

Overview



The DC/DC converter for supply from battery and DC systems; with a wide input voltage range from 38 V to 121 V DC.

Ordering data

**SITOP power 2 A**

DC/DC stabilized power supply  
Input: DC 48/60/110 V  
Output: 24 V DC/2 A

Article No.

**6EP1732-0AA00**

Overview



DC/DC converter for connection to 24 V DC networks. Output voltage 12 V DC; floating, short circuit-proof, open circuit-proof.

Ordering data

**SITOP 2.5 A, DC/DC converter**

Stabilized power supply  
Input: 24 V DC  
Output: 12 V DC/2.5 A

Article No.

**6EP1621-2BA00**

**Application**



The SITOP PSU400M power supply with a 600 V DC input is suitable as an efficient DC/DC converter for drive and battery systems; large input range and temperature range, high efficiency; slim design; with 50% extra power for 5 s/min.

**Ordering data**

**Article No.**

**SITOP PSU 400M 1-phase,  
24 V DC/20 A**

**6EP1536-3AA00**

Stabilized power supply  
Input: 600 V AC  
Output: 24 V DC/20 A

*Accessories*

**Device labels**

**3RT1900-1SB20**



# Special designs, special uses—special applications

1-phase, 24 V DC

## Overview



The 24 V/5 A and 10 A power supplies in a compact metal enclosure can be accommodated where only limited installation depth is available. For example, in covered machine supports or hinged frames.

Ordering data	Article No.
<b>SITOP power 1-phase, 24 V DC/5 A</b> Special Line stabilized power supply Input: 120 ... 230 V AC Output: 24 V DC/5 A	6EP1333-1AL12
<b>SITOP power 1-phase, 24 V DC/10 A</b> Special Line Stabilized power supply Input: 120 ... 230 V AC Output: 24 V DC/10 A	6EP1334-1AL12

Accessories	Article No.
<b>SITOP power mounting bracket</b> 90 degree 35 mm DIN rail, M5 fixing screws, for Special Line flat	6EP1971-1AA01

## Overview

**Slimline 3-phase power supply for low power ratings**

The SITOP PSU300E 3-phase power supply is designed with a 5 A output current for 24 V applications with low power requirements. The metal enclosure is only 42 mm wide and does not require any lateral gap to other devices on the DIN rail. This is made possible by the low heat dissipation (90% efficiency). The wide-range input from 320 V to 550 V AC permits mains buffering times of 50 ms and thus allows the supply to be used in unstable three-phase networks, thanks to UL certification also in North America. The removable plug-in terminals simplify the AC and DC connection.

## Ordering data

**SITOP PSU300E 3-phase,  
24 V/5 A DC**

Stabilized power supply  
Input: 400 ... 500 V 3 AC  
Output: 24 V DC/5 A

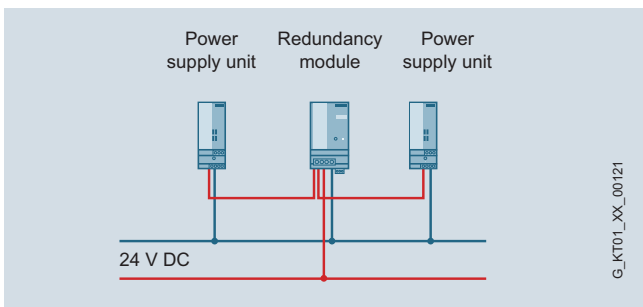
## Article No.

**6EP1433-0AA00**

## Overview

**Expansion modules for increasing system availability**

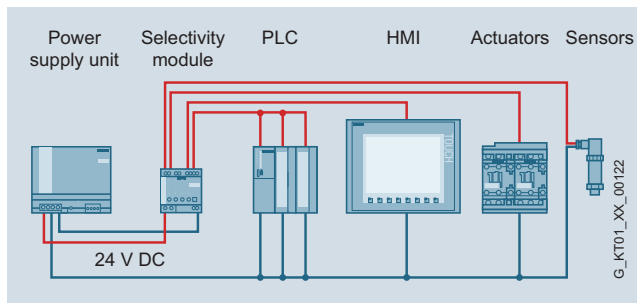
A power supply unit on its own cannot guarantee fault-free 24 V supply. Power failures, extreme variations in the mains voltage, or a faulty load can bring plant operation to a standstill and cause high costs. The add-on modules offer everything from extensive protection against interference on the primary and secondary side right up to complete all-round protection.

**Redundancy modules – for doubling system availability**

SITOP redundancy module

**Advantages of the redundancy modules**

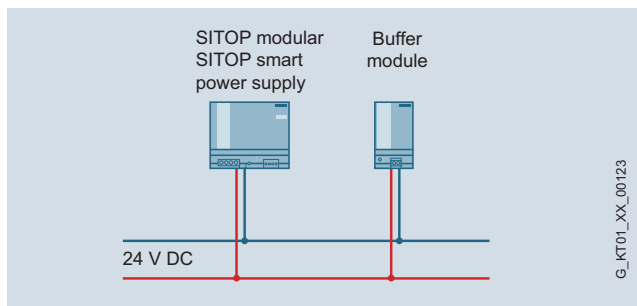
- High availability of the 24 V supply thanks to redundant configuration
- Power is reliably supplied even when a power supply fails
- Compact redundancy modules for power supplies up to 40 A
- Redundancy module 24 V/NEC Class 2 with limiting to 100 VA
- Diagnostic signal via LED and signaling contacts
- Adjustable switching threshold for LED and signaling contacts

**Selectivity modules – for protection of 24 V feeds**

SITOP selectivity module

**Advantages of selectivity modules**

- Reliable detection of overload or short-circuit in the 24 V circuit
- Reliable shutdown in case of overload regardless of cable lengths or cross-sections
- Four load feeders per module
- Versions with adjustable threshold from 0.5 to 3 A or 3 to 10 A
- Sequential connection of feeds is possible to reduce inrush current
- Diagnostics via group signaling contact or single-channel signaling
- Evaluation via free-of-charge SIMATIC S7 function blocks for modules with single-channel signaling

**Buffer module – bridging power failures for as long as seconds**

SITOP buffer module

**Advantages of the buffer module**

Power failures normally only last for fractions of a second, but they can still cause costly and time-consuming damage in sensitive production areas. In combination with SITOP smart and SITOP modular power supply units, the buffer module bridges short voltage dips of this type with its electrolytic capacitors and ensures uninterrupted operation.

**More information**

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

**Overview**

The SITOP PSE202U redundancy modules are the optimal extension for all 24 V power supplies to ensure additional protection from failure of the 24 V supply. The redundancy module continuously monitors the power supply units and, in the event that one unit fails, the other unit automatically takes over the 24 V power supply. Additionally, a signal is sent via a signaling contact that can be evaluated by a controller, PC, or control system.

**Benefits**

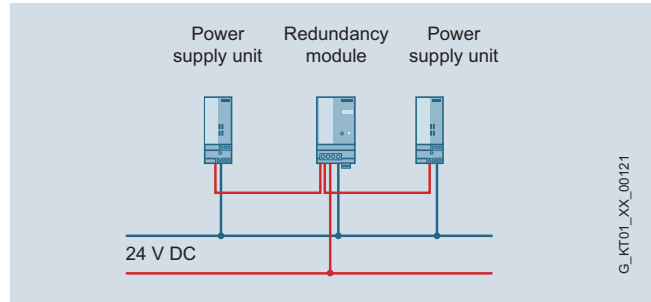
- High availability of the 24 V supply thanks to redundant configuration
- Power is reliably supplied even when a power supply fails
- Compact redundancy modules for power supply units up to 40 A
- Redundancy module 24 V/NEC Class 2 with limiting to 100 VA
- Diagnostic signal via LED and signaling contacts
- Adjustable switching threshold for LED and signaling contacts

**Application**

The redundancy module decouples two 24 V power supplies of the same type so that the loads are still supplied by the second power supply (1 + 1 redundancy) in case one of the two power supplies fails.

Redundancy modules support parallel switching of power supplies of the same type to increase performance while offering redundancy at the same time (N + 1 redundancy).

You can use the NEC Class 2 redundancy module to implement a redundant 24 V supply limited to an output power of 100 VA.

**Design**

For redundant configuration of a 24 V supply, the redundancy module decouples two SITOP 24 V power supplies of the same type by means of diodes in parallel operation. Depending on the output current of the power supplies, 1 to 2 redundancy modules may be required.

**Function**Monitoring

The redundancy module continuously monitors the output voltage of the connected power supplies. The switching threshold of 20 to 25 V can be set on the device. A signal indicates if the output voltage of one of the two power supplies sinks to the set value or below.

Signaling

The LED on the device and a changeover contact signal a faulty power supply.

**Technical specifications** (continued)

Article number	6EP1962-2BA00	6EP1964-2BA00	6EP1961-3BA21
Product	SITOP PSE202U	SITOP PSE202U	SITOP PSE202U
<b>Mechanics</b>			
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals
Connections			
• Supply input	Input, output and ground: removable screw terminal, each 1 x 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	Input, output and ground: removable screw terminal, each 1 x 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	Input, output and ground: 1 screw terminal each for 0.33 ... 10 mm <sup>2</sup> single-core/finely stranded
• Auxiliary	Relay contact: 2 screw terminal for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	Relay contact: 2 screw terminal for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	Relay contact: 3 screw terminal for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
Width of the enclosure	30 mm	30 mm	70 mm
Height of the enclosure	80 mm	80 mm	125 mm
Depth of the enclosure	100 mm	100 mm	125 mm
Weight, approx.	0.125 kg	0.125 kg	0.5 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories	Removable spring-type terminal 6EP1971-5BA00	Removable spring-type terminal 6EP1971-5BA00	-
MTBF at 40 °C	678 210 h	3 273 000 h	6 471 654 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

**Ordering data**

**Article No.**

**SITOP PSE202U redundancy module**

Input/output: 24 V DC/40 A suitable for decoupling two SITOP power supplies with a maximum of 20 A output current

**6EP1961-3BA21**

**SITOP PSE202U redundancy module**

Input/output: 24 V DC/NEC Class 2 suitable for decoupling two SITOP power supplies output power limited < 100 VA

**6EP1962-2BA00**

**SITOP PSE202U redundancy module**

Input/output: 24 V DC/10 A suitable for decoupling two SITOP power supplies with a maximum of 5 A output current

**6EP1964-2BA00**

**Accessories**

**Article No.**

**Device labeling plates**

**3RT1900-1SB20**

**Overview****Selectivity and rapid fault localization in 24 V feeders**

The SITOP PSE200U and SITOP select selectivity modules are the optimal expansion for all 24 V power supplies to distribute the load current to several feeders and to monitor it. Overload and short-circuit in one or more feeders is reliably detected and signaled.

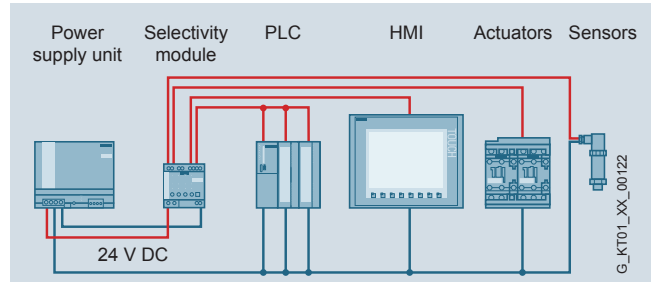
The electronics permit brief current peaks caused, for example, by high inrush currents, but disconnects feeders in the event of an extended overload. This is ensured even on high-resistance lines and in the case of "creeping" short-circuits. In such cases, miniature circuit breakers fail to trip, or trip too late, even if the power supply unit could deliver the required tripping current. The SITOP expansion module continues to supply the intact feeders with 24 V absolutely free of interruptions and feedback – a feature which avoids a possible total system failure.

**Benefits**

- Reliable shutdown in case of overload regardless of cable lengths or cable cross-sections
- 4 load feeders per module with individually adjustable response threshold for each output
- Two versions for remote diagnostics: Group signaling contact or single-channel signaling
- Evaluation via free-of-charge SIMATIC S7 function blocks (S7-1500/1200/300/400) for modules with single-channel signaling (PSE200U)
- LEDs for rapid on-site fault localization
- Remote reset possible from a central location (PSE200U)
- Simple commissioning thanks to manual switch on/off of outputs (PSE200U)
- Sequential connection of feeders to reduce total inrush current
- Sealable transparent cover over adjusters for currents and times protects against maladjustment (PSE200U)

**Application**

The selectivity module is used in conjunction with 24 V power supplies to distribute the load current over several feeders and to monitor the individual currents. Faults in individual circuits caused by overload or short-circuit are detected and selectively switched off so that further load current paths remain unaffected by the fault. This achieves fast fault diagnostics and minimizes downtimes.

**Design**

The selectivity module is specially designed for the response of switched-mode power supply units and the 24 V DC feeders to be supplied. Individual setting of the current allows optimum adaptation to the respective feeder.

**Function**Monitoring

The current per output is monitored by the selectivity modules; if the set threshold of the output is exceeded, the output is switched off according to a predefined time-current characteristic curve. In addition, the supplying 24 V input voltage is constantly being monitored. As soon as this voltage threatens to fail, the path with a higher current than the set threshold is disconnected immediately. All other feeders continue to be supplied without interruption.

Signaling

Signaling of the faulty feeder takes place by the LEDs on the device as well as via group signaling contact or single-channel signaling. The selectivity module with single-channel signaling outputs the status of the 4 outputs cyclically by means of a serial code which can be read in by a digital PLC input.

Free function blocks for SIMATIC S7-300/400/1200/1500 for STEP 7 and TIA Portal as well as SIMOTION CPUs with SIMOTION SCOUT are available for evaluation. This enables simple integration into the S7 diagnostics and host control or HMI systems.

More information, as well as the function blocks for download, can be found at:

SIMATIC S7:

<http://support.automation.siemens.com/WW/view/en/61450284>

SIMOTION:

<http://support.automation.siemens.com/WW/view/en/82555461>

Connection and disconnection of the outputs

During device startup you can select between simultaneous connection of all outputs as well as sequential connection or load-dependent connection of the outputs (to reduce the peak inrush currents).

Each output can be manually connected and disconnected on the device (for example, for commissioning or service). Disconnected outputs can be connected by means of remote reset (24 V input). Prerequisite is that the outputs were not disconnected manually on the device.

## Technical specifications (continued)

Article number	6EP1961-2BA11	6EP1961-2BA31	6EP1961-2BA21	6EP1961-2BA41	6EP1961-2BA00
Product brand name	SITOP PSE200U	SITOP PSE200U	SITOP PSE200U	SITOP PSE200U	SITOP select
Type of current supply	Selectivity module, 4 x 3 A Common signal contact	Selectivity module, 4 x 3 A Single-channel signaling	Selectivity module, 4 x 10 A Common signal contact	Selectivity module, 4 x 10 A Single-channel signaling	Diagnosis module, 4 x 10 A
<b>Mechanics</b>					
Type of electrical connection	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals
• at input	+24 V: 2 screw terminals for 0.5 ... 10 mm <sup>2</sup> ; 0 V: 2 screw terminals for 0.5 ... 4 mm <sup>2</sup>	+24 V: 2 screw terminals for 0.5 ... 10 mm <sup>2</sup> ; 0 V: 2 screw terminals for 0.5 ... 4 mm <sup>2</sup>	+24 V: 2 screw terminals for 0.5 ... 10 mm <sup>2</sup> ; 0 V: 2 screw terminals for 0.5 ... 4 mm <sup>2</sup>	+24 V: 2 screw terminals for 0.5 ... 10 mm <sup>2</sup> ; 0 V: 2 screw terminals for 0.5 ... 4 mm <sup>2</sup>	+24 V: 2 screw terminals for 0.33 ... 10 mm <sup>2</sup> ; 0 V: 2 screw terminals for 0.22 ... 4 mm <sup>2</sup>
• at output	Output 1 ... 4: 1 screw terminal each for 0.5 ... 4 mm <sup>2</sup>	Output 1 ... 4: 1 screw terminal each for 0.5 ... 4 mm <sup>2</sup>	Output 1 ... 4: 1 screw terminal each for 0.5 ... 4 mm <sup>2</sup>	Output 1 ... 4: 1 screw terminal each for 0.5 ... 4 mm <sup>2</sup>	Output 1 ... 4: 1 screw terminal each for 0.22 ... 4 mm <sup>2</sup>
• for signaling contact	3 screw terminals for 0.5 ... 4 mm <sup>2</sup>	1 screw terminals for 0.5 ... 4 mm <sup>2</sup>	3 screw terminals for 0.5 ... 4 mm <sup>2</sup>	1 screw terminals for 0.5 ... 4 mm <sup>2</sup>	2 screw terminals for 0.22 ... 4 mm <sup>2</sup>
• for auxiliary contacts	Remote reset: 1 screw terminal for 0.5 ... 4 mm <sup>2</sup>	Remote reset: 1 screw terminal for 0.5 ... 4 mm <sup>2</sup>	Remote reset: 1 screw terminal for 0.5 ... 4 mm <sup>2</sup>	Remote reset: 1 screw terminal for 0.5 ... 4 mm <sup>2</sup>	-
Width of the enclosure	72 mm	72 mm	72 mm	72 mm	72 mm
Height of the enclosure	80 mm	80 mm	80 mm	80 mm	90 mm
Depth of the enclosure	72 mm	72 mm	72 mm	72 mm	90 mm
Installation width	72 mm	72 mm	72 mm	72 mm	72 mm
Mounting height	180 mm	180 mm	180 mm	180 mm	190 mm
Net weight	0.2 kg	0.2 kg	0.2 kg	0.2 kg	0.4 kg
Mounting type	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Product component belonging to	-	-	-	-	4x blade-type fuse 15 A
Mechanical accessories	Device identification label 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	Device identification label 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	Device identification label 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	Device identification label 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	-
MTBF at 40 °C	755 915 h	755 915 h	540 979 h	540 979 h	378 928 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

## Ordering data

## Article No.

**SITOP PSE200U 3 A**

4-channel selectivity module  
Input: 24 V AC  
Output: 24 V DC/3A per channel  
output current adjustable 0.5 ... 3 A

- With common alarm signal
- With single-channel signaling

**6EP1961-2BA11**  
**6EP1961-2BA31**

**SITOP PSE200U 10 A**

4-channel selectivity module  
Input: 24 V AC  
Output: 24 V DC/10 A per channel  
output current adjustable 3 ... 10 A

- With common alarm signal
- With single-channel signaling

**6EP1961-2BA21**  
**6EP1961-2BA41**

**SITOP select**

**6EP1961-2BA00**

4-channel  
Input: 24 V DC  
Output: 24 V DC/10 A per channel  
Adjustable output current 2 ... 10 A

## Accessories

## Article No.

## Device labels

**3RT1900-1SB20**

**Overview**

The SITOP PSE201U buffer module bypasses short-term power failures lasting a few seconds and can be used with all 24 V power supplies of the SITOP smart or SITOP modular product lines. The buffer module is equipped with maintenance-free capacitors and automatically takes over the 24 V power supply in case of a power supply failure.

The SITOP DC UPS modules offer protection in the event of extended power failures. The maintenance-free **DC UPS with capacitors** are able to reliably supply 24 V for several minutes, and the **DC UPS with battery modules** for several hours.

**Benefits**

- Bridging of short-term power failures in the time range of seconds
- Totally maintenance-free capacitors as energy storage
- Short charging times
- Parallel switching of several buffer modules possible
- Fast mounting onto standard rail and simple wiring

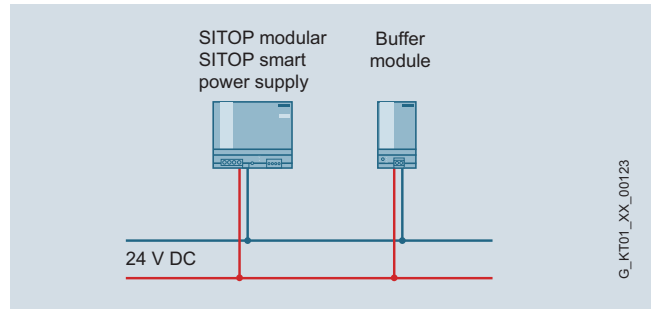
**Application**

With short-term power failures, the load current is backed up without interruption via the buffer module in combination with a SITOP smart or SITOP modular 24 V stabilized power supply.

Buffer times:

- 200 ms at 40 A
- 400 ms at 20 A
- 800 ms at 10 A

You can connect up to 8 buffer modules in parallel to extend the buffer time (max. 10 s).

**Design**

The buffer module is connected in parallel to the output of the SITOP smart or SITOP modular power supply. The connection to the power supply takes place via only 2 cables.

**Function**Buffering

In case of a power failure, the buffer module supplies the load current for the 24 V power supply by means of its energy storage units. Maintenance-free capacitors are used as energy storage units.

Signaling

The LED on the device signals a supply voltage > 20.5 V.



## Technical specifications

<b>Article No.</b>	<b>6EP1961-3BA01</b> <b>SITOP PSE201U buffer module</b>
<b>Input/Output</b>	Stabilized, isolated DC voltage
Rated voltage $U_{in \text{ rated}}$	24 V DC
Voltage range	24 ... 28.8 V
Control input	-
Rated output voltage $U_{out \text{ rated}}$	$U_{in}$ – approx. 1 V
Rated current $I_{out \text{ rated}}$	40 A
Mains buffering	Backup time: <ul style="list-style-type: none"> <li>• With 40 A load current: 200 ms</li> <li>• With 20 A load current: 400 ms</li> <li>• With 10 A load current: 800 ms</li> <li>• With 5 A load current: 1.6 s</li> </ul> Reduces the backup time by 100 ms in combination with 6EP1 437-3BA10.
Buffering time, max.	10 s
<b>Protection and monitoring</b>	
Current limiting, static	Typ. 40 A
Short-circuit protection	Electronically
<b>Signaling/alarm signals</b>	
Status display	Green LED for "Supply voltage > 20.5 V"
Signaling	-
<b>Safety</b>	
Galvanic isolation	Yes, SELV acc. to EN 60950-1
Safety class	Class I
Safety test	Yes
CE marking	Yes
UL/cUL (CSA) approval	UL-Listed (UL 508) File E197259, CSA (CSA C22.2 No. 14, CSA C22.2 No. 107.1)
Explosion protection	-
Degree of protection (EN 60529)	IP20
<b>EMC</b>	
Emitted interference	EN 55022 Class B
Noise immunity	EN 61000-6-2
<b>Operating data</b>	
Ambient temperature range	0 ... +60 °C with natural convection
Transport and storage temperature range	-40 ... +85°C
Humidity class	Climate class 3K3 according to EN 60721, no condensation
<b>Mechanics</b>	
Connections	One screw-type terminal, each for + and - for 0.5 ... 10 mm <sup>2</sup> solid/finely stranded
Dimensions (W x H x D) in mm	70 x 125 x 125
Weight, approx.	1.2 kg
Mounting	Can be snapped onto standard mounting rail EN 60715 35x7.5/15

## Ordering data

## Article No.

<b>SITOP PSE201U buffer module</b>	<b>6EP1961-3BA01</b>
For SITOP smart and SITOP modular buffer time 100 ms to 10 s dependent on load current	
<b>Accessories</b>	
<b>Device labeling plates</b>	<b>3RT1900-1SB20</b>

## Overview



The SITOP inrush current limiter is used to reliably reduce the starting currents that are caused, for example, by transformers or with pulse-controlled power supplies by the rectifier circuit on the input side with capacitor charging.

In 1-phase AC networks, it is supplied with rated voltages of 100 V, 120 V or 230 V and in 2-phase and 3-phase AC networks with rated voltages of 208 V to 480 V on the line side upstream of transformers or power supplies and it limits the inrush current independent of temperature, for example, up to 10 A at 230 V by means of an installed fixed resistor. In static operation, the limit resistance is bypassed after approx. 120 ms to reduce the power losses generated.

## Technical specifications

<b>Article number</b>	<b>6EP1967-2AA00</b>
<b>Input</b>	AC voltage 1-phase, 2-phase, 50/60 Hz
Rated voltage $U_{in \text{ rated}}$	100 ... 480 V AC
Voltage range	85 ... 575 V AC
<b>Output</b>	
Rated voltage $U_{out \text{ rated}}$	In accordance with the supply voltage
Rated current $I_{out \text{ rated}}$	Max. 10 A
Parallel switching for enhanced performance	No
<b>Protection and monitoring</b>	
Current limiting, static	-
Short-circuit protection	Must be ensured with an upstream protective device
<b>Signaling/alarm signals</b>	
Status display	Green LED
Alarm signals	-
<b>Safety</b>	In accordance with EN 60950-1 and EN 50178
Galvanic isolation	No
Safety class	Class II
CE marking	Yes
UL/cUL (CSA) approval	Yes, cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259
Degree of protection (EN 60529)	IP20
<b>EMC</b>	
Emitted interference	EN 61000-6-3
Noise immunity	EN 61000-6-2
<b>Operating data</b>	
Ambient temperature range	0 ... +60 °C with natural convection
Transport and storage temperature range	-40 ... +85 °C
Humidity class	Climate class 3K3 according to EN 60721, no condensation
<b>Mechanics</b>	
Connections	Input and output (L1, N): One screw terminal each for 0.2 ... 2.5 mm <sup>2</sup> , solid/finely stranded
Dimensions (W x H x D) in mm	22.5 x 80 x 91
Weight, approx.	0.12 kg
Mounting	Can be snapped onto standard mounting rail EN 60715 35x7.5/15

## Ordering data

## Article No.

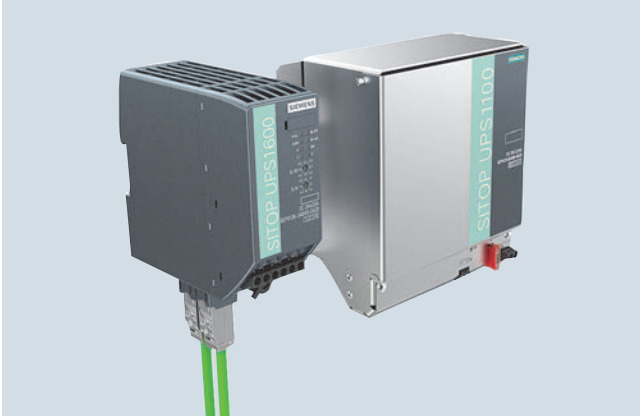
<b>SITOP making current limiter</b>	<b>6EP1967-2AA00</b>
Ballast for SITOP power supplies	
Input:	
100 ... 480 V AC, 10 A max	
Output:	
100 ... 480 V AC, 10 A max	

Ω

# SITOP DC UPS uninterruptible power supplies

## Introduction

### Overview



SITOP offers a comprehensive portfolio to protect against power failures with durations from a few seconds to several hours, ranging from buffer modules to system-integrated DC UPS units. Selection is based on the energy storage unit used, the associated ambient conditions, performance and functionality.

The selection matrix should help you to find the right 24 V buffering for your application:

SITOP modules for 24 V buffering	Buffer module <sup>1)</sup>	UPS500	UPS1600	DC UPS
<b>Energy storage units</b>				
24 V buffering up to	10 s	Minutes	Hours	Hours
Storage medium	Electrolytic capacitors	Double-layer capacitors	Lead-gel batteries, rechargeable lithium iron phosphate batteries	Lead-gel batteries
Lifetime dependent on temperature. The specified time refers to a fall to 50 % of the original capacity in the case of lead batteries and 80 % in the case of capacitors.	0 ... +50 °C: > 8 years	0 ... +50 °C: > 8 years	+20 ... +40 °C: 4 ... 1 years (high-temperature rechargeable battery: +20 ... +60 °C: > 10 ... 1 years)	+20 ... +40 °C: 4 ... 1 years (high-temperature rechargeable battery: +20 ... +60 °C: > 10 ... 1 years)
Temperature range	0 ... +60 °C	0 ... +60 °C	0 ... +40 °C (high-temperature rechargeable battery: -40°...+60°C)	0 ... +40 °C (high-temperature rechargeable battery: -40°...+60°C)
Ventilation required	-	-	•	•
Degree of protection	IP20	IP20/ IP65 (UPS500P)	IP00	IP00
<b>UPS module/electronics</b>				
Degree of protection	IP20	IP20/ IP65 (UPS500P)	IP20	IP20
Max. rated output current	40 A	15 A	40 A	40 A
Max. dynamic overload current	40 A (200 ms)	25 A (200 ms)	120 A (30 ms) / 60 A (5 s/min)	56 A (80 ms)
Interfaces	-	I/O, USB	I/O, USB, Ethernet/ PROFINET	I/O, serial, USB
Information about operation and diagnostics via				
• Signaling contact	-	•	•	•
• OPC servers	-	•	•	•
• Web server	-	-	•	-
• S7 function blocks	-	-	•	-
• WinCC faceplate	-	-	•	-
Shutdown of multiple PCs/ PLCs	-	-	•	-
Starting from the battery, without supply voltage (stand-alone mode)	-	-	•	-
Engineering via				
• Software tool (PC)	-	•	•	•
• TIA Portal	-	-	•	-

<sup>1)</sup> for SITOP smart and SITOP modular power supply units

### More information

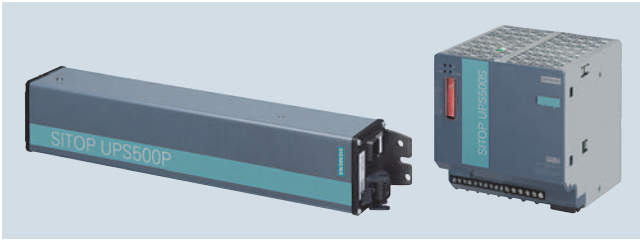
The SITOP Selection Tool offers detailed selection guidance according to criteria such as the required backup time, nominal current or peak current:

<http://www.siemens.com/sitop-selection-tool>

## SITOP DC UPS uninterruptible power supplies

## DC UPS with capacitors

## Overview



SITOP 24 V power supplies can be expanded with a SITOP UPS500 uninterruptible DC power supply (DC UPS) for bridging short-term power failures in the order of minutes. For PC-based automation solutions, the high-capacity double-layer capacitors of the SITOP UPS500 supply enough energy to back up the operation and application data and to shut down software applications in a defined manner. You can increase the buffer times using SITOP PSU501S expansion modules (up to 3).

The IP65 version SITOP UPS500P in long metal housing is ideally suited to distributed use.

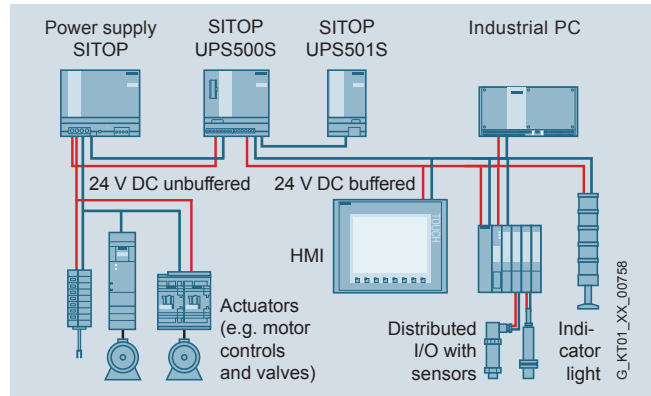
## Benefits

- 24 V buffering for a few minutes to allow data to be backed up and applications to be closed.
- Absolutely maintenance-free
- Long lifetime, even at high temperatures
- High ambient temperatures up to +60 °C
- Short charging times
- No ventilation is required since no gas is emitted
- Distributed applications possible without control cabinet
- Software tool, free of charge, for easy configuring and integrating in PC-based systems

## Application

The high-capacitance double-layer capacitors bridge power failures for a few minutes. The time is normally sufficient, for example, for the safe shutdown of PC-based automation systems. The USB interface and a free software tool enable easy communication with the PC.

The capacitors have an extremely long life even at high temperature, and can be used at ambient temperatures of up to 60 °C. SITOP UPS500P in IP65 degree of protection can also be installed outside the control cabinet in a distributed configuration.



Configuration with SITOP UPS500S: 24 V buffering for backing up process data and performing a controlled shutdown of a PC. To relieve the load on the UPS, the actuators are supplied directly from the power supply unit.

## Design

## SITOP UPS500S

- Compact 24 V/ 15 A basic units with integrated energy storage units of 2.5 or 5 kW
- Digital inputs/outputs and USB interface
- For combination with up to three UPS501S expansion modules (5 kW each) to extend the buffering time
- Metal housing in IP20 degree of protection for mounting on standard rails

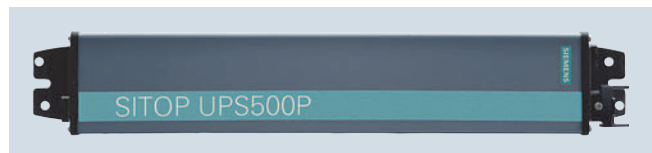


## SITOP UPS501S expansion module

- Additional energy storage (5 kW)
- Up to 3 expansion modules can be connected to a SITOP UPS500S to extend the buffer times
- Can be easily connected to SITOP UPS500S via a user-friendly plug-in system
- Complete with balancing and safety circuits

## SITOP UPS500P

- 24 V/ 7 A basic units with integrated energy storage units of 5 or 10 kW
- USB interface
- Rugged aluminum housing in IP65 degree of protection for distributed applications
- Screw mounting in all mounting positions



## Function

### SITOP DC UPS software tool

Via the USB interface, all relevant messages about the status of the uninterruptible DC power supply can be transmitted to a PC (e.g. SIMATIC IPC). The DC UPS can also be configured via the USB interface.

The SITOP DC UPS software provides the user with a free tool that is extremely easy to use for the purpose of monitoring and configuring the DC UPS. Signals sent from the uninterruptible DC power supply can be processed on the PC. In monitoring mode, the statuses of the uninterruptible DC power supply are visualized on the PC.

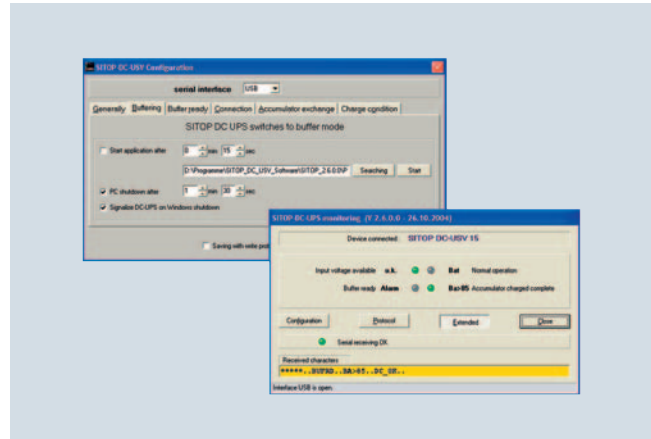
Safe shutdown in the event of a power failure and automatic PC restart are supported. It is also possible to freely define responses to the different operating states of the uninterruptible DC power supply, so that extremely flexible integration into a wide variety of applications is possible.

Overview of configuration possibilities:

- Times for shutting down the PC
- UPS switch-off
- Further processing of all signals, e.g. linking to proprietary software or WinCC flexible
- Monitoring and display of UPS operating status
- OPC server for linking signals to proprietary applications
- Automatic restarting of IPCs when power is restored during shutdown

The software runs under the operating systems Windows 2000, Windows XP, Windows Vista and Windows 7. Free download from:

<http://support.automation.siemens.com/WW/view/en/48946053>



Monitoring and configuration window of software V3 for SITOP DC UPS

# SITOP DC UPS uninterruptible power supplies

## DC UPS with capacitors

### Technical specifications

The UPS500S can be extended to 20 kW using UPS501S expansion modules to extend the buffering time.

The table shows the maximum buffering time for the possible configurations and the two UPS500P units for different load currents.

The charging current can be set to 1 A or 2 A with the UPS500S.

*Selection table SITOP UPS500 (optional with SITOP UPS501S expansion module) and mains buffering times*

Buffering and charging times										
SITOP UPS500S/501S configurations									UPS500P	
Basic unit	2.5 kW	5 kW	2.5 kW	5 kW	2.5 kW	5 kW	2.5 kW	5 kW	5 kW	10 kW
Expansion modules	-	-	1 × 5 KWs	1 × 5 KWs	2 × 5 KWs	2 × 5 KWs	3 × 5 KWs	3 × 5 KWs	-	-
Total energy	2.5 kW	5 kW	7.5 kW	10 kW	12.5 kW	15 kW	17.5 kW	20 kW	5 kW	10 kW
Load current	Buffer times									
0.5 A	134 s	236 s	390 s	478 s	632 s	748 s	851 s	1007 s	284 s	647 s
0.8 A	90 s	167 s	266 s	346 s	440 s	527 s	580 s	706 s	190 s	435 s
1 A	75 s	138 s	219 s	296 s	365 s	414 s	490 s	572 s	153 s	351 s
2 A	38 s	76 s	122 s	156 s	203 s	230 s	265 s	306 s	80 s	152 s
3 A	26 s	52 s	82 s	106 s	136 s	159 s	186 s	213 s	53 s	108 s
4 A	19 s	39 s	61 s	81 s	101 s	120 s	139 s	160 s	40 s	84 s
5 A	15 s	31 s	49 s	65 s	81 s	95 s	111 s	130 s	30 s	68 s
6 A	12 s	26 s	40 s	55 s	67 s	80 s	94 s	106 s	25 s	57 s
7 A	10 s	21 s	34 s	47 s	58 s	69 s	81 s	82 s	21 s	49 s
8 A	8 s	18 s	29 s	40 s	50 s	59 s	69 s	79 s	-	-
10 A	6 s	15 s	23 s	32 s	39 s	47 s	54 s	62 s	-	-
12 A	4 s	12 s	19 s	26 s	32 s	38 s	44 s	52 s	-	-
15 A	3 s	9 s	14 s	20 s	25 s	30 s	35 s	40 s	-	-
Charing current	Charging times									
2 A	54 s	120 s	158 s	223 s	263 s	318 s	355 s	417 s	130 s	360 s
1 A	110 s	205 s	311 s	425 s	503 s	625 s	695 s	816 s	-	-

Important information for selecting the energy storage units:

When the mains buffering times were determined, the discharge period of new or non-aged, completely charged capacitors was used as a basis.

At a continuous ambient temperature of +50 °C, a loss of capacity of approx. 20% must be considered after a service life of 8 years.

## SITOP DC UPS uninterruptible power supplies

## DC UPS with capacitors

## Ordering data

## Article No.

**SITOP UPS500S**

- DC UPS basic device 15 A
- with USB interface and 2.5 kW
  - with USB interface and 5 kW

**6EP1933-2EC41**  
**6EP1933-2EC51**

**SITOP UPS501S**

Expansion module 5 kW for  
UPS500S

**6EP1935-5PG01**

**SITOP UPS500P**

- DC UPS basic device 7 A
- with USB interface and 5 kW
  - with USB interface and 10 kW

**6EP1933-2NC01**  
**6EP1933-2NC11**

## Accessories

## Article No.

**Connector set for UPS500P**

consisting of connector for input  
and output with pre-assembled  
USB cable (2 m long)

**6EP1975-2ES00**

## More information

The SITOP Selection Tool offers detailed selection guidance according to criteria such as the required backup time, nominal current or peak current. Available at:  
<http://www.siemens.com/sitop-selection-tool>

## Overview



By combining one DC UPS module SITOP UPS1600 with at least one UPS1100 battery module and a SITOP power supply unit, longer power failures can be bridged without any interruption. The intelligent battery management automatically detects the UPS1100 energy storage unit, ensures optimized temperature-specific charging and continuous monitoring. The compact DC UPS modules have overload capability, for example, to supply the inrush current of industrial PCs. In stand-alone mode, they support starting from the battery.

The DC UPS communicates openly over a USB or Ethernet/PROFINET port. It is easily integrated into the PC or PLC environment over the two Ethernet/PROFINET ports. Total integration in TIA provides user-friendly engineering in the TIA Portal and is supported with ready-to-use function blocks for S7 user programs and WinCC faceplates for fast visualization.

SITOP UPS Manager supports easy monitoring and configuration in PC systems, e.g. shutdown of several PCs in accordance with the master-slave principle. The integrated web server supports remote monitoring of the DC UPS.

## Benefits

- 24 V buffering for a few hours for the purpose of continuing processes
- Open communication over USB or two Ethernet/PROFINET ports
- High-performance DC UPS modules in space-saving, slim design
- High overload capability for mains and buffering operation
- Starting from the battery module supports stand-alone mode, e.g. for starting generators
- Easy configuration thanks to automatic detection of battery modules
- High reliability and availability due to monitoring of the operational readiness, battery feeder, aging and charging status
- Battery protecting charging due to temperature-specific charging characteristic
- Defined shutdown of several PCs or controllers on one UPS (versions with Ethernet/PROFINET)
- Remote monitoring via integrated web server (versions with Ethernet/PROFINET)
- Time-saving engineering in PC-based systems via SITOP UPS Manager (versions with USB or Ethernet/PROFINET)
- SITOP UPS Manager with OPC UA server facilitates flexible, multi-vendor communication with other systems
- Full integration in TIA saves time and costs during the planning stage and in operation (versions with Ethernet/PROFINET)
- User-friendly engineering in the TIA Portal
- SIMATIC S7 function blocks for easy integration in STEP 7 user programs
- Fast integration in operator control and monitoring with WinCC faceplates
- Direct integration in SIMATIC PCS 7 via SITOP library



# SITOP DC UPS uninterruptible power supplies

## UPS1600 DC UPS modules

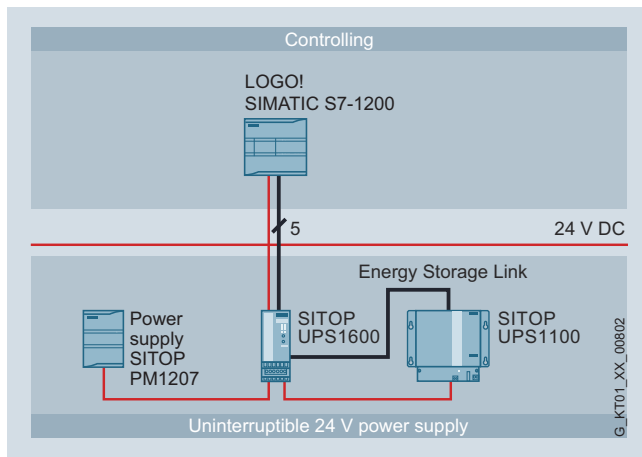
### Application

The battery modules that can be connected in parallel bridge power failures for a few hours. This supports the continued operation of processes or parts of them. The function "Starting from the battery" means that the UPS1600 can also be used in stand-alone mode without connection to the supply.

Depending on the communication requirements between the DC UPS and the automation components to be protected against power failure, the version of UPS1600 can be selected accordingly.

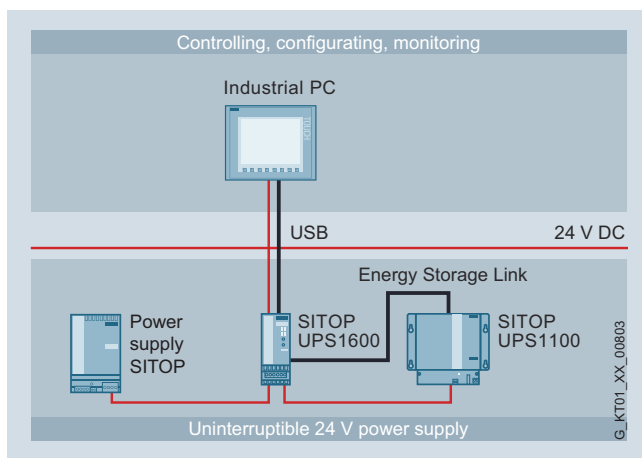
#### Buffering of simple automation applications

In simple applications with mini PLCs (e.g. obstruction lights, stand-alone hydro-electric plants), 24 V buffering is performed by the UPS1600 without a communications interface. The status messages are transferred to the PLC via the digital outputs (isolated).



#### Buffering of applications with automation computer

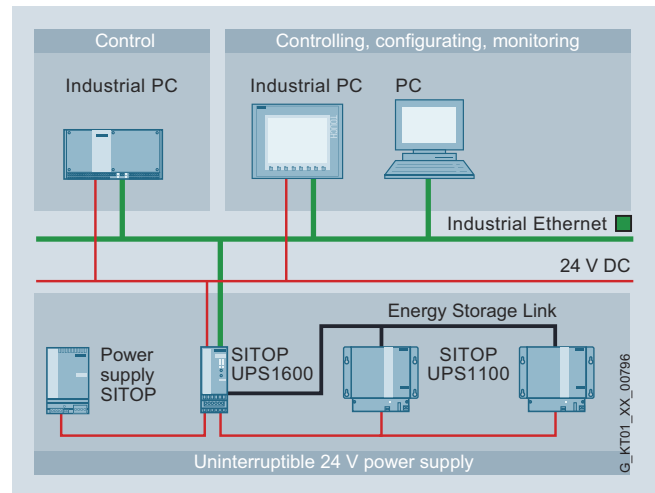
The UPS1600 with a USB interface is used to buffer automation solutions that are controlled by an industrial PC. All operating and configuring data is communicated over the PC interface.



Communication over Ethernet/PROFINET offers the most comprehensive possibilities for diagnostics and system integration. The UPS1600 can be directly integrated into the LAN infrastructure over its two ports.

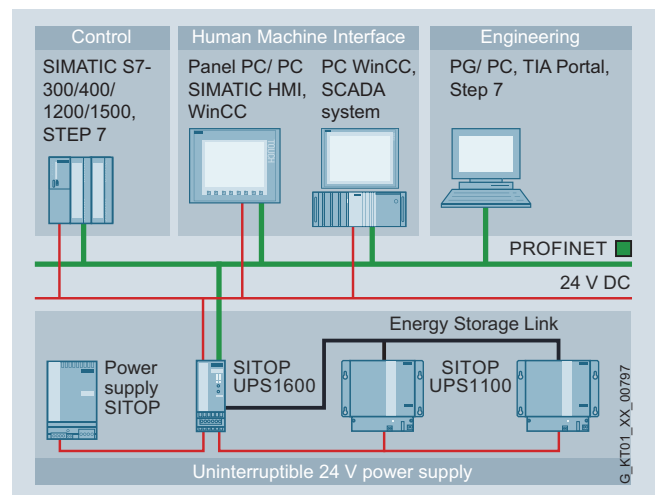
#### Buffering of applications with networked (Industrial Ethernet) automation computers

The UPS1600 with Industrial Ethernet interface protects complex PC-based applications from power failure. Configuration and monitoring is performed using the PC software SITOP UPS Manager. It also supports defined shutdown of several PCs in accordance with the master-slave principle.



#### Buffering of applications with networked (PROFINET) automation components

For buffering sensitive plant components (e.g. a pumping station with telecontrol) or complete controller solutions (e.g. machine tools) that are integrated into a networked automation solution, the UPS1600 with PROFINET is the perfect choice. Total integration in TIA offers unique advantages for engineering and operation (e.g. diagnostics or visualization). For example, in buffer mode, several controllers can be brought to a defined independently of each other.



### Design



- Compact DC UPS modules UPS1600 24 V/10 A, 20A and 40 A with digital inputs and outputs, optionally with USB interface or two Ethernet/PROFINET ports
- UPS1100 battery modules 1.2 Ah, 3.2 Ah, 7 Ah and 12 Ah with lead rechargeable batteries, UPS1100 2.5 Ah battery module with pure-lead rechargeable batteries and UPS1100 5 Ah battery module with lithium-ion technology.

### Function

#### SITOP UPS1600 web server

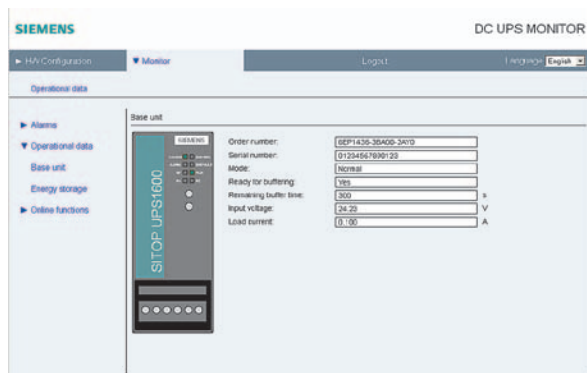
The SITOP UPS1600 with Ethernet/PROFINET has an integrated web server that supports remote monitoring and control of the uninterruptible power supply. Using HTTPS ensures encrypted and safe data transmission.

Remote monitoring and control of:

- Hardware configuration data
- Remote monitoring
- Operating data of the UPS1600 basic unit and the connected UPS1100 battery module
- Alarm messages

Remote access via:

- Firefox 34 or higher, or Internet Explorer 10, 11 (IE 8 with charging of SVG player)
- IP address
- Password



The password-protected web server supports viewing of the configuring and operating data.

#### SITOP UPS1600 software

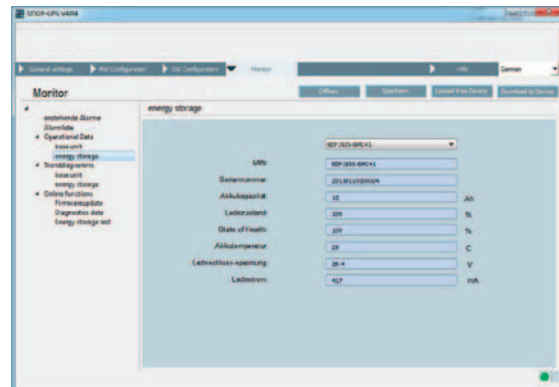
Software tools support convenient integration of the SITOP UPS1600 in both PC-based and PLC-based systems. They make configuring and visualizing the DC UPS easier and the user benefits from the high performance of the SITOP UPS1600.

#### Software for open, PC-based automation systems

##### SITOP UPS Manager

Configuration and monitoring is performed easily using the free PC software SITOP UPS Manager. It enables the reactions of the PC to the operating states of the DC UPS to be freely selected and offers comprehensive diagnostic options:

- Configuration
  - Connection via USB or Ethernet
  - All the relevant parameters can be configured in UPS Manager and transferred to the UPS1600
  - Configuration of "non-coded" rechargeable batteries is possible
  - The reactions of the PC to the operating states of the UPS can be freely selected, e.g. termination of software applications
  - Support for reliable downloading of several PCs according to the master-slave principle
  - The configurations can be saved locally
  - Integrated OPC UA server
  - Updating of the UPS1600 firmware is possible
  - Assignment of IP addresses and device names of the UPS1600
  - Can run under Windows XP, Windows 7 (32-bit and 64-bit) operating systems
- Monitoring
  - Readout and display of alarms, statuses and operating variables of the UPS1600 and the connected energy storage unit
  - Tracing of history in trend diagrams



Monitor window for battery status in SITOP UPS Manager



Trend diagram for load current in SITOP UPS Manager

**Function** (continued)**Software for TIA-based automation systems**

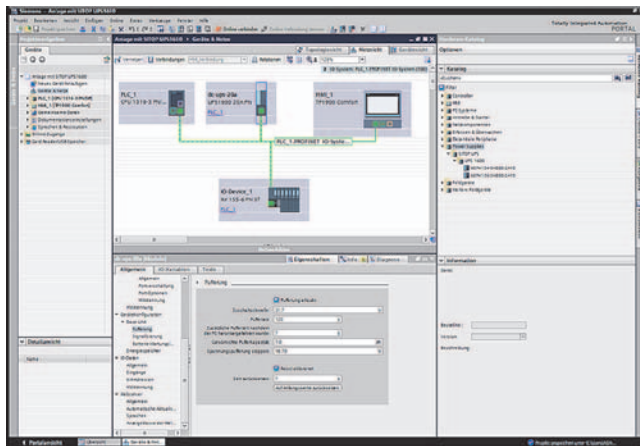
For convenient integration of the DC UPS in the TIA environment, different software modules are available.

Engineering is simple via the TIA Portal. The data for UPS1600 is stored in the hardware catalog version V14 and higher. Special function blocks for SIMATIC S7-300, S7-400, S7-1200 and S7-1500 also support integration in the STEP 7 user program.

The comprehensive diagnostics data of the UPS1600 power supply can be visualized using prepared UPS faceplates for WinCC.

**TIA Portal**

- Convenient and fail-safe integration of SITOP UPS1600 in the PROFINET network by means of drag-and-drop
- Convenient configuration of SITOP UPS1600 basic units with Ethernet/PROFINET and the UPS1100 battery module simply by selecting from the TIA Portal hardware catalog
- Free download of HSP (Hardware Support Package) for TIA Portal version V12 SP1 or higher available at <http://support.automation.siemens.com/WW/view/en/75854606>
- Free GSD file (Generic Station Description) for STEP 7 V 5.5 <http://support.automation.siemens.com/WW/view/en/75854605>



Establishing the PROFINET connection between the SITOP UPS1600 and the controller is easy and fail-safe in the TIA Portal

**STEP 7 function blocks**

Function blocks are available for STEP 7 user programs on SIMATIC S7-300/400/1200/1500. They allow further processing of the DC UPS operating data.

- Function blocks for STEP 7 V5.5
- Function blocks from STEP 7 V12 and higher

Free download:

<http://support.automation.siemens.com/WW/view/en/75854608>

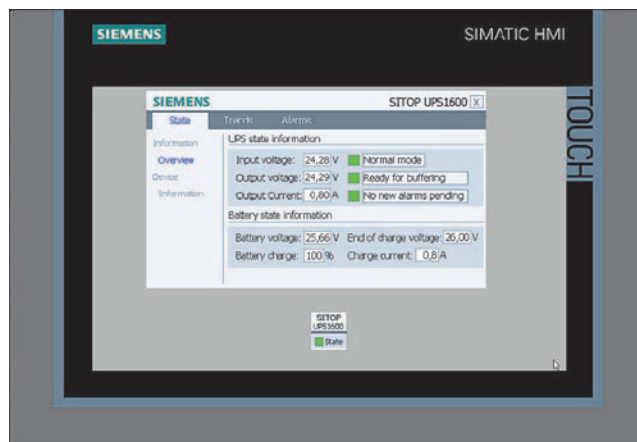
**Faceplates for WinCC**

Ready-to-use faceplates save programming time for visualization of the uninterruptible power supply. The faceplates show all relevant statuses and values of the DC UPS. They are available for the following systems:

- Faceplates for WinCC V7.2
- Faceplates for WinCC flexible 2008 SP3
- Faceplates for WinCC Comfort/Advanced/Professional V12

Free download:

<http://support.automation.siemens.com/WW/view/en/75854608>



The pre-compiled WinCC faceplates show all the relevant UPS data in a clearly comprehensible display. An icon with color coding for the operating state is also available

**Software for SIMATIC PCS 7 process control system**

The SITOP library is available with blocks and faceplates for direct integration into SIMATIC PCS 7. The SW blocks in the SIMATIC S7 supply the faceplate on the user interface of the process control system with operating and diagnostics data, generate messages and ensure connection to the maintenance system of PCS 7. This means that PCS 7 users automatically receive information about operating state conditions, maintenance requirements (e.g. battery replacement) and disturbances (e.g. power failures). This ensures constant transparency of the 24V supply in the control system. The SITOP library supports the following SIMATIC PCS 7 versions:

- SIMATIC PCS 7 V8.0 with SP2
- SIMATIC PCS 7 V8.1
- SIMATIC PCS7 V8.1 with SP1
- SIMATIC PCS7 V8.2 available soon

Free download at:

<https://support.industry.siemens.com/cs/ww/en/view/109476154>

### Technical specifications

The table shows the maximum buffering times for the SITOP UPS1100 battery modules for different load currents:

The SITOP Selection Tool offers detailed selection guidance according to criteria such as the required backup time, load current, peak current and battery connection threshold:  
<http://www.siemens.com/sitop-selection-tool>

Product brand name	SITOP UPS1100	SITOP UPS1100	SITOP UPS1100	SITOP UPS1100	SITOP UPS1100	SITOP UPS1100
Type of power supply	24 V/1.2 Ah	24 V/2.5 Ah high temperature	24 V/3.2 Ah	24 V/5 Ah LiFePo	24 V/7 Ah	24 V/12 Ah
Article No.	6EP4131-0GB00-0AY0	6EP4132-GB00-0AY0	6EP4133-0GB00-0AY0	6EP4133-0JB00-0AY0	6EP4134-0GB00-0AY0	6EP4135-0GB00-0AY0
Load current	Buffer times					
1 A	34 min	1.7 h	2.5 h	5.2 h	5.4 h	10.3 h
2 A	15 min	54.6 min	1 h	2.5 h	2.6 h	4.8 h
3 A	9 min	32.9 min	39 min	1.7 h	1.6 h	3 h
4 A	6 min	20.6 min	27 min	1.25 h	1.2 h	2.3 h
6 A	3.5 min	14.3 min	17.5 min	50.6 min	41 min	1.4 h
8 A	2 min	10.5 min	12 min	37.8 min	28 min	1 h
10 A	1 min	7.2 min	9 min	30.2 min	22 min	48.6 min
12 A	-	6 min	7 min	25.1 min	17 min	40.3 min
14 A	-	4.5 min	5 min	21.6 min	15 min	33.6 min
16 A	-	4.1 min	4 min	18.8 min	12.5 min	26 min
20 A	-	2.9 min	1 min	12.9 min	9.1 min	19.6 min
30 A	-	-	-	-	4.6 min	12.1 min
40 A	-	-	-	-	2.8 min	8.5 min

#### Important information for selecting the battery capacity:

Determination of the mains buffering times is based on the discharge period of new or non-aged, completely charged battery modules at a battery temperature not below +25 °C to the shut-down of the DC UPS.

**Battery aging** reduces the still available battery capacity up until the end of the service life to typically around 50% of the original capacity value when new (1.2 Ah/3.2 Ah/7 Ah, etc.) and the internal resistance increases. When the message "Battery charge > 85%" appears, only around 50% x 85% = approx. 43% of the originally available capacity can be assumed at the end of the battery service life.

At battery temperatures below +25 °C, the available capacity drops approximately by another 30% at +5 °C battery temperature, to approximately 70% of the approximately remaining 43%. There is then only around 30% of the original capacity available.

A significantly larger battery capacity must therefore be selected when configuring the plant: A drop to approx. 50% is compensated for by selecting 1 / approx. 0.5 = approx. double the battery capacity (required as per the table for the relevant load current and the relevant buffering time). Available capacity of approx. 43% is compensated for by selecting 1 / approx. 0.43 = approx. 2.33 times the battery capacity. Available capacity of approx. 30% is compensated for by selecting 1 / approx. 0.3 = approx. 3.33 times the battery capacity.

#### Recommendation:

Instead of installing double the battery capacity, regular battery replacement halfway through the expected service life (reduction of capacity to approx. 50%) can be more advisable for the following reasons: Capacity does not drop below 100% until the halfway point of the expected battery life (or slightly beyond). With regular replacement after this point, only the single battery capacity (instead of double capacity) must be installed due to aging (-> neutral in price with regard to battery module costs, but only requires half the space).

Replacing the battery after half its service life dispenses above all with the large scatter range of the residual capacity at the end of the service life, which is not accurately defined by battery manufacturers (after the full time, many batteries are above, but many are also below the average 50% residual capacity, that is to say, even if double the capacity is installed, the influence of aging at the end of service life is not reliably compensated for, rather only typically) -> When replacing after half the expected service life, the configured buffering time is maintained with considerably greater reliability.

In the case of batteries stored in cool conditions (not above +25 °C) and for not longer than approximately 4 months, the following service life can be assumed, strongly dependent on battery temperature:

Battery temperature	Drop to approx. 50% of residual capacity	Recommendation: Replace (at 100% of residual capacity) all	Alternative recommendation
+20 °C	4 years	2 years	
+30 °C	2 years	1 year	
+40 °C	1 year	0.5 years	Install double capacity and replace (1 x per year)

In normal cases (installation in the coolest location in the control cabinet at approx. +30 °C), the battery should be replaced with single installed battery capacity in accordance with the selection table after 1 year of operation!

After a power failure, the battery module is disconnected from the loads at the end of the selected buffering time either automatically or electronically by opening the On/Off control circuit, and as soon as the 24 V input voltage is available again, it is quickly re-charged with the charge current of the relevant DC UPS module (with I-U charge characteristic: First constant current I for fast charging, and changeover to constant voltage U to maintain the charge when the battery is almost full).

## Technical specifications (continued)

Article number	6EP4134-3AB00-0AY0 6EP4134-3AB00-1AY0 6EP4134-3AB00-2AY0	6EP4136-3AB00-0AY0 6EP4136-3AB00-1AY0 6EP4136-3AB00-2AY0	6EP4137-3AB00-0AY0 6EP4137-3AB00-1AY0 6EP4137-3AB00-2AY0
<b>Product brand name</b>	SITOP UPS1600	SITOP UPS1600	SITOP UPS1600
<b>Type of current supply</b>	DC UPS 24 V/10 A	DC UPS 24 V/20 A	DC UPS 24 V/40 A
<b>Mechanics</b>			
Type of electrical connection	screw-type terminals	screw-type terminals	screw-type terminals
• at input	24 V DC: 2 screw terminals for 0.2 ... 6 mm <sup>2</sup> /24 ... 13 AWG	24 V DC: 2 screw terminals for 0.2 ... 6 mm <sup>2</sup> /24 ... 13 AWG	24 V DC: 2 screw terminals for 0.5 ... 16 mm <sup>2</sup> /20 ... 6 AWG
• at output	24 V DC: 2 screw terminals for 0.2 ... 6 mm <sup>2</sup> /24 ... 13 AWG	24 V DC: 2 screw terminals for 0.2 ... 6 mm <sup>2</sup> /24 ... 13 AWG	24 V DC: 2 screw terminals for 0.5 ... 16 mm <sup>2</sup> /20 ... 6 AWG
• for battery module	24 V DC: 2 screw terminals for 0.2 ... 6 mm <sup>2</sup> /24 ... 13 AWG	24 V DC: 2 screw terminals for 0.2 ... 6 mm <sup>2</sup> /24 ... 13 AWG	24 V DC: 2 screw terminals for 0.5 ... 16 mm <sup>2</sup> /20 ... 6 AWG
• for control circuit and status message	14 screw terminals for 0.2 ... 1.5 mm <sup>2</sup> /24 ... 16 AWG	14 screw terminals for 0.2 ... 1.5 mm <sup>2</sup> /24 ... 16 AWG	14 screw terminals for 0.2 ... 1.5 mm <sup>2</sup> /24 ... 16 AWG
Width of the enclosure	50 mm	50 mm	70 mm
Height of the enclosure	125 mm	125 mm	125 mm
Depth of the enclosure	125 mm	125 mm	150 mm
Required spacing			
• top	50 mm	50 mm	50 mm
• bottom	50 mm	50 mm	50 mm
• left	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm
Net weight	0.38 kg	0.39 kg	0.65 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes	Yes
Mounting type	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories	Battery module	Battery module	Battery module
MTBF at 40 °C	415 574 h	408 654 h	372 738 h
Equipment marking acc. to DIN EN 81346-2	T	T	T
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

## Ordering data

## Article No.

<b>SITOP UPS1600 24 V/ 10 A</b>	<b>6EP4134-3AB00-0AY0</b>
• With USB interface	<b>6EP4134-3AB00-1AY0</b>
• With 2 Ethernet/ PROFINET interfaces	<b>6EP4134-3AB00-2AY0</b>
<b>SITOP UPS1600, 24 V/ 20 A</b>	<b>6EP4136-3AB00-0AY0</b>
• With USB interface	<b>6EP4136-3AB00-1AY0</b>
• With 2 Ethernet/ PROFINET interfaces	<b>6EP4136-3AB00-2AY0</b>
<b>SITOP UPS1600 24 V/ 40 A</b>	<b>6EP4137-3AB00-0AY0</b>
• With USB interface	<b>6EP4137-3AB00-1AY0</b>
• With 2 Ethernet/ PROFINET interfaces	<b>6EP4137-3AB00-2AY0</b>



# SITOP DC UPS uninterruptible power supplies

## UPS1100 battery modules

### Overview



SITOP UPS1100 maintenance-free battery module with 1.2 Ah to 12 Ah and choice of different capacitors (lead, pure lead, lithium iron phosphate = LiFePo) for SITOP UPS1600 DC UPS module. The intelligent UPS1600 battery management charges the UPS1100 with the optimal, temperature-controlled charging characteristics and monitors the status (operating data and diagnostics information) via the energy storage link of the connected battery modules. For longer buffer times, up to six battery modules can be connected in parallel. Mounting onto standard mounting rail or directly to the wall.

### Technical specifications

Article number	6EP4131-0GB00-0AY0	6EP4132-0GB00-0AY0	6EP4133-0GB00-0AY0	6EP4133-0JB00-0AY0	6EP4134-0GB00-0AY0	6EP4135-0GB00-0AY0
Product	SITOP UPS1100	SITOP UPS1100	SITOP UPS1100	SITOP UPS1100	SITOP UPS1100	SITOP UPS1100
Product type	Lead battery	Pure-lead battery	Lead battery	LiFePo battery	Lead battery	Lead battery
Battery capacity	1.2 Ah	2.5 Ah	3.2 Ah	5 Ah	7 Ah	12 Ah
<b>Charging current</b>						
<b>charging voltage</b>						
End-of-charge voltage at DC						
• at -10 °C recommended	28.02 V	28.02 V	28.02 V	28.8 V	28.02 V	28.02 V
• at 0 °C recommended	28.02 V	28.02 V	28.02 V	28.8 V	28.02 V	28.02 V
• at 10 °C recommended	27.8 V	27.8 V	27.8 V	28.8 V	27.8 V	27.8 V
• at 20 °C recommended	27.3 V	27.3 V	27.3 V	28.8 V	27.3 V	27.3 V
• at 30 °C recommended	26.8 V	26.8 V	26.8 V	28.8 V	26.8 V	26.8 V
• at 40 °C recommended	26.6 V	26.6 V	26.6 V	28.8 V	26.6 V	26.6 V
• at 50 °C recommended	26.3 V	26.3 V	26.3 V	28.8 V	26.3 V	26.3 V
• at 60 °C recommended	-	26 V	-	-	-	-
Permissible charging current, max.	0.3 A	5 A	0.8 A	2.1 A	1.75 A	3 A
Rated voltage $V_{out}$ DC	24 V	24 V	24 V	24 V	24 V	24 V
Rated current value $I_{out rated}$	10 A	20 A	20 A	20 A	40 A	40 A
<b>Safety</b>						
Short-circuit protection	Battery fuse 15 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 25 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 25 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 25 A/32 V (FKS blade-type fuse + holder); overcurrent switch-off at 60 A > 30 ms/min and 24 A > 5 s/min	Battery fuse 2x 25 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 2x 25 A/32 V (solid-state circuitry blade-type fuse + support)
Design of the overload protection	Valve control	Valve control	Valve control	Valve control	Valve control	Valve control
Status display	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication

Ordering data	Article No.
<b>SITOP UPS 1100 battery module 1.2 Ah</b> With maintenance-free, sealed lead-acid rechargeable batteries for DC UPS module SITOP UPS1600, 10 A	<b>6EP4131-0GB00-0AY0</b>
<b>SITOP UPS 1100 battery module 3.2 Ah</b> With maintenance-free, sealed lead-acid rechargeable batteries for DC UPS module SITOP UPS1600, 10 A and 20 A	<b>6EP4133-0GB00-0AY0</b>
<b>SITOP UPS 1100 battery module 5 Ah, LiFePo</b> With maintenance-free, sealed rechargeable lithium iron phosphate batteries for DC UPS module SITOP UPS1600, 10 A and 20 A	<b>6EP4133-0JB00-0AY0</b>
<b>SITOP UPS 1100 battery module 7 Ah</b> With maintenance-free, sealed rechargeable lead-acid batteries for DC UPS module SITOP UPS1600, 10 A, 20 A and 40 A	<b>6EP4134-0GB00-0AY0</b>
<b>SITOP UPS 1100 battery module 12 Ah</b> with maintenance-free, sealed rechargeable lead-acid batteries for DC UPS module SITOP UPS1600, 20 A and 40 A	<b>6EP4135-0GB00-0AY0</b>
<b>SITOP UPS 1100 battery module 2.5 Ah, high temperature</b> With maintenance-free, sealed rechargeable pure lead batteries for DC UPS module SITOP UPS1600, 10 A and 20 A	<b>6EP4132-0GB00-0AY0</b>

# SITOP DC UPS uninterruptible power supplies

## DC UPS with battery modules

### Overview



By combining a DC UPS module with at least one 24 V battery module and a SITOP power supply unit, longer power failures can be bridged without any interruption. Even if a greater buffering current is required, the DC UPS with maintenance-free lead battery provides optimum safety. It spans power failures up to several hours long and delivers up to 40 A.

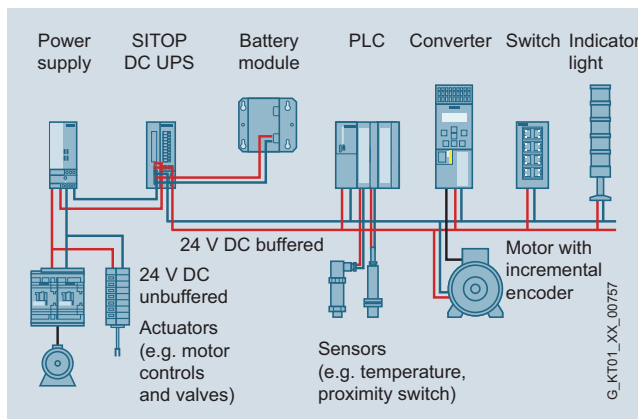
### Benefits

- 24 V buffering for a few hours for the purpose of continuing processes
- Maintenance-free battery modules from 1.2 to 12 Ah
- High reliability and availability due to monitoring of the operational readiness, battery feeder, aging and charging status
- Long operating life of loads and batteries due to integrated battery management
- Settings by means of DIP switches: Battery connection threshold, end-of-charge voltage, charging current, bridging time
- SW tool, free of charge, for easy configuring and integrating in PC-based systems

### Application

These battery modules that can be connected in parallel bridge power failures for a few hours. This enables processes or parts of them to be continued, measured values to be recorded without interruption and communication to be maintained. High-performance industrial PCs that have to be shut down also have somewhat higher energy demands. Especially if a large panel continues to be operated during the shutdown. The DC UPS is used, for example, in machine tool production, in the textile industry, in all types of production lines, bottling plants or also for the obstacle lights of wind power plants.

The serial or USB interface and a free software tool enable easy communication with a PC.



Configuration with SITOP DC UPS and battery module: 24 V buffering to maintain communication, signaling and sensor measured values. To relieve the load on the UPS, the actuators are supplied directly from the power supply unit.

### Design

- DC UPS modules 24 V/6 A, 15 A, 40 A
- Digital inputs/outputs, optionally with serial or USB interface



- Battery modules 1.2 Ah, 3.2 Ah, 7 Ah, 12 Ah with lead rechargeable batteries of corrosion-resistant lead-calcium high-performance grid plates and glass fiber
- Battery module 2.5 Ah with "high-temperature battery" of pure lead





## Function

### SITOP DC UPS software tool

Via the USB interface, all relevant messages about the status of the uninterruptible DC power supply can be transmitted to a PC (e.g. SIMATIC IPC). The DC UPS can also be configured via the USB interface.

The SITOP DC UPS software provides the user with a free tool that is extremely easy to use for the purpose of monitoring and configuring the DC UPS. Signals sent from the uninterruptible DC power supply can be processed on the PC. In monitoring mode, the statuses of the uninterruptible DC power supply are visualized on the PC.

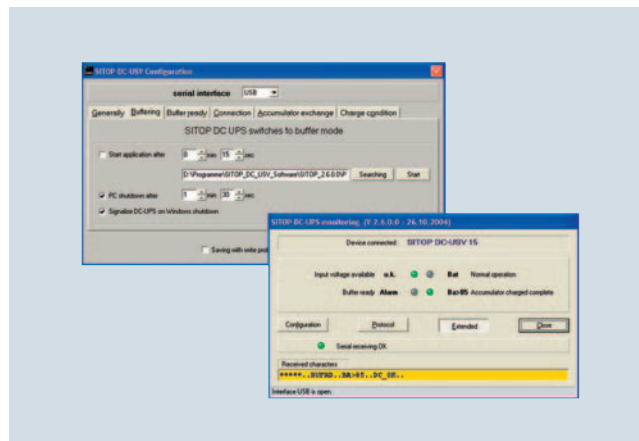
Safe shutdown in the event of a power failure and automatic PC restart are supported. It is also possible to freely define responses to the different operating states of the uninterruptible DC power supply, so that extremely flexible integration into a wide variety of applications is possible.

Overview of configuration possibilities:

- Times for shutting down the PC
- UPS switch-off
- Further processing of all signals, e.g. linking to proprietary software or WinCC flexible
- Monitoring and display of UPS operating status
- OPC server for linking signals to proprietary applications
- Automatic restarting of IPCs when power is restored during shutdown

The software runs under the operating systems Windows 2000, Windows XP, Windows Vista and Windows 7. Free download from:

<http://support.automation.siemens.com/WW/view/en/48946053>



Monitoring and configuration window of software V3 for SITOP DC UPS

# SITOP DC UPS uninterruptible power supplies

## DC UPS with battery modules

### Technical specifications

The table shows the maximum buffering times for the battery modules for different load currents.

The SITOP Selection Tool offers detailed selection guidance according to criteria such as the required backup time, load current, peak current and battery connection threshold:  
<http://www.siemens.com/sitop-selection-tool>

Load current	Battery module 1.2 Ah (6EP1935-6MC01)	Battery module 3.2 Ah (6EP1935-6MD11)	Battery module 7 Ah (6EP1935-6ME21)	Battery module 12 Ah (6EP1935-6MF01)	Battery module 2.5 Ah (6EP1935-6MD31)
1 A	34.5 min	2.6 h	5.4 h	9 h	2 h
2 A	15 min	1 h	2.6 h	4.6 h	1 h
3 A	9 min	39.3 min	1.6 h	2.9 h	37.5 min
4 A	6.5 min	27.1 min	1.2 h	2.2 h	27 min
6 A	3.5 min	17.5 min	41 min	1.2 h	17.6 min
8 A	2 min	12.1 min	28.6 min	53.3 min	12.5 min
10 A	1 min	9 min	21.8 min	43.5 min	8.8 min
12 A	-	7 min	17.3 min	33.3 min	6.8 min
14 A	-	5 min	15.1 min	27.5 min	5.1 min
16 A	-	4 min	12.5 min	23.8 min	4.3 min
20 A	-	1 min	9.1 min	20.1 min	-
25 A	-	-	-	12.6 min	-
30 A	-	-	-	9.1 min	-
35 A	-	-	-	17.1 min. (2 x 12 Ah)	-
40 A	-	-	-	13.5 min. (2 x 12 Ah)	-

#### Important information for selecting the battery capacity:

Determination of the mains buffering times is based on the discharge period of new or non-aged, completely charged battery modules at a battery temperature not below +25 °C to the shut-down of the DC UPS.

**Battery aging** reduces the still available battery capacity up until the end of the service life to typically around 50% of the original capacity value when new (1.2 Ah/3.2 Ah/7 Ah, etc.) and the internal resistance increases. When the message "Battery charge > 85%" appears, only around 50% x 85% = approx. 43% of the originally available capacity can be assumed at the end of the battery service life.

At battery temperatures below +25 °C, the available capacity drops approximately by another 30% at +5 °C battery temperature, to approximately 70% of the approximately remaining 43%. There is then only around 30% of the original capacity available.

A significantly larger battery capacity must therefore be selected when configuring the plant: A drop to approx. 50% is compensated for by selecting 1 / approx. 0.5 = approx. double the battery capacity (required as per the table for the relevant load current and the relevant buffering time). Available capacity of approx. 43% is compensated for by selecting 1 / approx. 0.43 = approx. 2.33 times the battery capacity. Available capacity of approx. 30% is compensated for by selecting 1 / approx. 0.3 = approx. 3.33 times the battery capacity.

#### Recommendation:

Instead of installing double the battery capacity, regular battery replacement halfway through the expected service life (reduction of capacity to approx. 50%) can be more advisable for the following reasons: Capacity does not drop below 100% until the halfway point of the expected battery life (or slightly beyond). With regular replacement after this point, only the single battery capacity (instead of double capacity) must be installed due to aging (-> neutral in price with regard to battery module costs, but only requires half the space).

Replacing the battery after half its service life dispenses above all with the large scatter range of the residual capacity at the end of the service life, which is not accurately defined by battery manufacturers (after the full time, many batteries are above, but many are also below the average 50% residual capacity, that is to say, even if double the capacity is installed, the influence of aging at the end of service life is not reliably compensated for, rather only typically) -> When replacing after half the expected service life, the configured buffering time is maintained with considerably greater reliability.

In the case of batteries stored in cool conditions (not above +25 °C) and for not longer than approximately 4 months, the following service life can be assumed, strongly dependent on battery temperature:

Battery temperature	Drop to approx. 50% of residual capacity	Recommendation: Replace (at 100% of residual capacity) all	Alternative recommendation
+20 °C	4 years	2 years	
+30 °C	2 years	1 year	
+40 °C	1 year	0.5 years	Install double capacity and replace 1 x per year

In normal cases (installation in the coolest location in the control cabinet at approx. +30 °C), the battery should be replaced with single installed battery capacity in accordance with the selection table after 1 year of operation!

- On the DC UPS module 40 A, at least 2 battery modules of 7 Ah or higher must be connected in parallel for output currents > 30 A. When connecting battery modules in parallel, you must ensure identical capacity and aging.
- After a power failure, the battery module is disconnected from the loads at the end of the selected buffering time either automatically or electronically by opening the On/Off control circuit, and as soon as the 24 V input voltage is available again, it is quickly re-charged with the charging current of the relevant DC UPS module (with I-U charge characteristic: First constant current I for fast charging, and changeover to constant voltage U to maintain the charge when the battery is almost full).

## Technical specifications (continued)

Article number	6EP1931-2DC21 6EP1931-2DC31 6EP1931-2DC42	6EP1931-2EC21 6EP1931-2EC31 6EP1931-2EC42	6EP1931-2FC21 6EP1931-2FC42
<b>Product brand name</b>	<b>SITOP DC UPS module</b>	<b>SITOP DC UPS module</b>	<b>SITOP DC UPS module</b>
<b>Type of current supply</b>	<b>DC UPS 24 V/6 A</b>	<b>DC UPS 24 V/15 A</b>	<b>DC UPS 24 V/40 A</b>
<b>Mechanics</b>			
Type of electrical connection	screw-type terminals	screw-type terminals	screw-type terminals
• at input	24 V DC: 2 screw terminals for 1 ... 4 mm <sup>2</sup> /17 ... 11 AWG	24 V DC: 2 screw terminals for 1 ... 4 mm <sup>2</sup> /17 ... 11 AWG	24 V DC: 2 screw terminals for 0.33 ... 10 mm <sup>2</sup> /22 ... 7 AWG
• at output	24 V DC: 4 screw terminals for 1 ... 4 mm <sup>2</sup> /17 ... 11 AWG	24 V DC: 4 screw terminals for 1 ... 4 mm <sup>2</sup> /17 ... 11 AWG	24 V DC: 2 screw terminals for 0.33 ... 10 mm <sup>2</sup> /22 ... 7 AWG
• for battery module	24 V DC: 2 screw terminals for 1 ... 4 mm <sup>2</sup> /17 ... 11 AWG	24 V DC: 2 screw terminals for 1 ... 4 mm <sup>2</sup> /17 ... 11 AWG	24 V DC: 2 screw terminals for 0.33 ... 10 mm <sup>2</sup> /22 ... 7 AWG
• for control circuit and status message	10 screw terminals for 0.5 ... 2.5 mm <sup>2</sup> /20 ... 13 AWG	10 screw terminals for 0.5 ... 2.5 mm <sup>2</sup> /20 ... 13 AWG	10 screw terminals for 0.5 ... 2.5 mm <sup>2</sup> /20 ... 13 AWG
Width of the enclosure	50 mm	50 mm	102 mm
Height of the enclosure	125 mm	125 mm	125 mm
Depth of the enclosure	125 mm	125 mm	125 mm
Required spacing			
• top	50 mm	50 mm	50 mm
• bottom	50 mm	50 mm	50 mm
• left	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm
Net weight	0.4 kg	0.4 kg	1.1 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes	Yes
Mounting type	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories	Battery module	Battery module	Battery module
MTBF at 40 °C	1 085 776 h	791 139 h	522 739 h
Equipment marking acc. to DIN EN 81346-2	T	T	T
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

## Ordering data

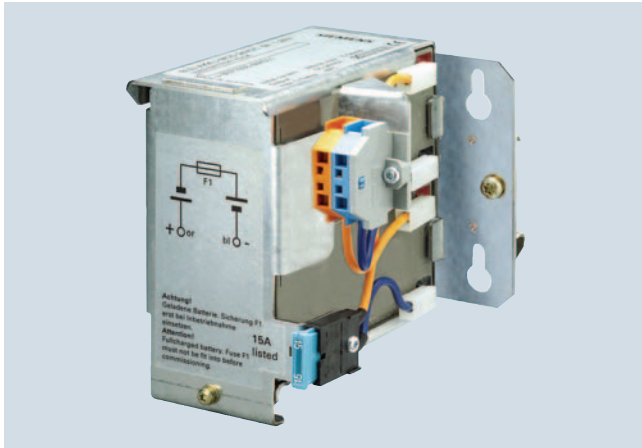
## Article No.

<b>DC UPS module 6 A</b>	<b>6EP1931-2DC21</b>
• with serial interface	<b>6EP1931-2DC31</b>
• with USB interface	<b>6EP1931-2DC42</b>
<b>DC UPS module 15 A</b>	<b>6EP1931-2EC21</b>
• with serial interface	<b>6EP1931-2EC31</b>
• with USB interface	<b>6EP1931-2EC42</b>
<b>DC UPS module 40 A</b>	<b>6EP1931-2FC21</b>
• with USB interface	<b>6EP1931-2FC42</b>

# SITOP DC UPS uninterruptible power supplies

## DC UPS battery modules

### Overview



Maintenance-free battery modules with 1.2 Ah up to 12 Ah (lead-gel accumulator) for ambient temperatures from 0 to +40 °C as well as high-temperature battery module with 2.5 Ah (pure-lead accumulator) for ambient temperatures of -40 °C to +60 °C. The battery modules are completely prewired with battery retainer and terminals. For longer buffer times, the battery modules can be connected in parallel. Mounting onto standard mounting rail or directly to the wall.

### Technical specifications

Article number	6EP1935-6MC01	6EP1935-6MD31	6EP1935-6MD11	6EP1935-6ME21	6EP1935-6MF01
Product	SITOP Battery module				
Product type	Battery module 1.2 Ah	Battery module 2.5 Ah	Battery module 3.2 Ah	Battery module 7 Ah	Battery module 12 Ah
<b>Charging current charging voltage</b>					
End-of-charge voltage at DC					
• at -10 °C recommended	-	29 V	-	-	-
• at 0 °C recommended	-	28.6 V	-	-	-
• at 10 °C recommended	27.8 V	28.3 V	27.8 V	27.8 V	27.8 V
• at 20 °C recommended	27.3 V	27.9 V	27.3 V	27.3 V	27.3 V
• at 30 °C recommended	26.8 V	27.5 V	26.8 V	26.8 V	26.8 V
• at 40 °C recommended	26.6 V	27.2 V	26.6 V	26.6 V	26.6 V
• at 50 °C recommended	26.3 V	26.8 V	26.3 V	26.3 V	26.3 V
• at 60 °C recommended	-	26.4 V	-	-	-
Permissible charging current, max.	0.3 A	5 A	0.8 A	1.75 A	3 A
Rated voltage $V_{out}$ DC	24 V	24 V	24 V	24 V	24 V
<b>Safety</b>					
Short-circuit protection	Battery fuse 7.5 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 15 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 15 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 20 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 20 A/32 V (solid-state circuitry blade-type fuse + support)
Design of the overload protection	Valve control	Valve control	Valve control	Valve control	Valve control
<b>Safety</b>					
Protection class	Class III	Class III	Class III	Class III	Class III
CE mark	Yes	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627
Marine approval	GL, ABS	GL, ABS	GL, ABS	GL, ABS	GL, ABS
Degree of protection (EN 60529)	IP00	IP00	IP00	IP00	IP00

## Technical specifications (continued)

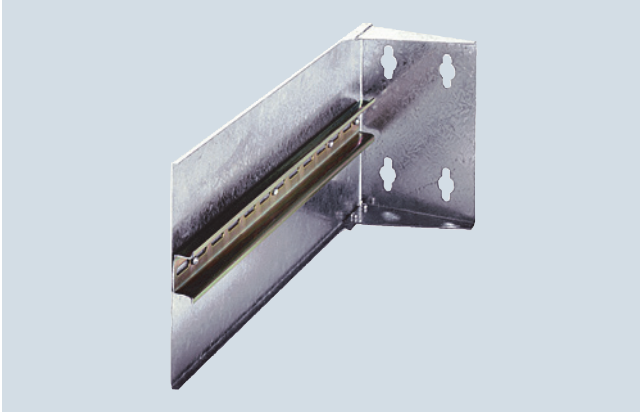
Article number	6EP1935-6MC01	6EP1935-6MD31	6EP1935-6MD11	6EP1935-6ME21	6EP1935-6MF01
Product	SITOP Battery module	SITOP Battery module	SITOP Battery module	SITOP Battery module	SITOP Battery module
Product type	Battery module 1.2 Ah	Battery module 2.5 Ah	Battery module 3.2 Ah	Battery module 7 Ah	Battery module 12 Ah
<b>Mechanics</b>					
Connection technology	spring-loaded terminals	spring-loaded terminals	spring-loaded terminals	spring-loaded terminals	spring-loaded terminals
Connection for power supply unit	1 screw terminal each for 0.08 ... 2.5 mm <sup>2</sup> for + BATT and - BATT	1 screw terminal each for 0.08 ... 2.5 mm <sup>2</sup> for + BATT and - BATT	1 screw terminal each for 0.08 ... 2.5 mm <sup>2</sup> for + BATT and - BATT	1 screw terminal each for 0.08 ... 4 mm <sup>2</sup> for + BATT and - BATT	1 screw terminal each for 0.08 ... 4 mm <sup>2</sup> for + BATT and - BATT
Product component belonging to	Accessories pack with solid-state circuitry fuse 7.5 A	Accessories pack with solid-state circuitry fuse 15 A	Accessories pack with solid-state circuitry fuse 15 A	Accessories pack with solid-state circuitry fuse 20 A and 30 A	Accessories pack with solid-state circuitry fuse 20 A and 30 A
Width of the enclosure	96 mm	265 mm	190 mm	186 mm	253 mm
Height of the enclosure	106 mm	151 mm	151 mm	168 mm	168 mm
Depth of the enclosure	108 mm	91 mm	82 mm	121 mm	121 mm
Installation width	116 mm	285 mm	210 mm	206 mm	273 mm
Installation height	126 mm	171 mm	171 mm	188 mm	188 mm
Weight, approx.	1.8 kg	3.8 kg	3.2 kg	6 kg	9 kg
Installation	snaps onto DIN rail EN 60715 35x7.5/15 or keyhole mounting for hooking in to M4 screws	snaps onto DIN rail EN 60715 35x15 or keyhole mounting for hooking in to M4 screws	snaps onto DIN rail EN 60715 35x7.5/15 or keyhole mounting for hooking in to M4 screws	can be screwed onto flat surface (keyhole mounting for hooking in to M4 screws)	can be screwed onto flat surface (keyhole mounting for hooking in to M4 screws)
Number of cells	12	12	12	12	12
Equipment marking acc. to DIN EN 81346-2	G	G	G	G	G
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

## Ordering data

## Article No.

<b>Battery module 1.2 Ah</b> for DC UPS module 6 A	<b>6EP1935-6MC01</b>
<b>Battery module 2.5 Ah</b> for DC UPS module 6 A and 15 A	<b>6EP1935-6MD31</b>
<b>Battery module 3.2 Ah</b> for DC UPS module 6 A and 15 A	<b>6EP1935-6MD11</b>
<b>Battery module 7 Ah</b> for DC UPS modules 6 A, 15 A and 40 A	<b>6EP1935-6ME21</b>
<b>Battery module 12 Ah</b> for DC UPS modules 6 A, 15 A and 40 A	<b>6EP1935-6MF01</b>

## Overview

**Mounting bracket**

The combination of a SITOP power supply and a 90° mounting bracket results in a minimum surface area requirement on the rear panel of the control cabinet (the width of the power supply becomes the depth, and the depth becomes the width). The mounting bracket is suitable for control cabinets with a depth of 320 mm or more.

**Mounting adapter for standard mounting rail**

The 1-phase 24 V/2 A (6ES7305-1BA80-0AA0) and 24 V/5 A (6ES7307-1EA80-0AA0) power supplies are special mechanical versions for SIMATIC S7-300 and can be mounted on S7 rails.

A mounting adapter (6ES7390-6BA00-0AA0) for mounting on the standard mounting rail EN 60715 35x15 is separately available as an accessory.

The 24 V/ 2 A (6ES7307-1BA01-0AA0), 24 V/ 5 A (6ES7307-1EA01-0AA0) and 10 A (6ES7307-1KA02-0AA0) power supplies are variants for SIMATIC S7-300 and can be mounted on S7 rails.

A mounting adapter (6EP1971-1BA00) for installation on DIN rail EN 60715 35x15/7.5 is separately available as an accessory.

**Connection plug for devices with degrees of protection IP65 and IP67**

For the maintenance-free SITOP UPS500P DC UPS modules (6EP1933-2NC01, 6EP1933-2NC11) in IP65 degree of protection, a connector set (6EP1975-2ES00) for input and output and with a pre-assembled USB cable (2 m long) is available as an accessory.

**Device labels**

Blank device labeling plates (20 mm x 7 mm, pastel turquoise) with Art. No.'s 3RT1 900-1SB20 can be used for identification of the power supplies. The package unit comprises 340 labels on frames, 20 labels per frame. For usability, refer to "Accessories" in the technical data of the respective power supplies.

## Technical specifications

**Mounting bracket 90° for SITOP power Standard 24 V**

Mounting bracket	For a depth of 320 mm
<b>Article number</b>	<b>6EP1971-2BA00</b>
Dimensions (W x H x D) in mm	100 x 150 x 320
Sheet thickness	1.5 mm
Mounting rail, attached	Standard mounting rail EN 60715 35x15
Weight, approx.	0.9 kg
Mounting	Can be screwed onto a flat surface (keyhole mounting for hooking onto M6 screws, drill hole distance 90 mm height, 50 mm side)
Accessories, included	4 M6 combi screws
Suitable, for example, for	SITOP 24 V/20 A (6EP1336-3BA00, 6EP1436-3BA00) SITOP 24 V/40 A (6EP1437-3BA00, 6EP1437-3BA00) SITOP 48 V/20 A (6EP1457-3BA00)

## Ordering data

Ordering data	Article No.
<b>SITOP modular signaling module</b> For 6EP1XXX-3BA00 signaling contacts: Output voltage ok, operational availability ok, remote ON/OFF	<b>6EP1961-3BA10</b>
<b>SITOP power mounting bracket</b> 90 degrees, for Article No.'s: 6EP1336-3BA00, 6EP1436-3BA00, 6EP1337-3BA00, 6EP1437-3BA00, 6EP1457-3BA00	<b>6EP1971-2BA00</b>
<b>SIMATIC S7-300 mounting adapter</b> For snapping the PS 307 onto standard mounting rail 35x15/7.5 mm suitable for 6ES7307-1BA01*, -1EA01*, -1KA02* and higher	<b>6EP1971-1BA00</b>
<b>Connector set</b> For UPS500P 6EP1933-2NC01 and 6EP1933-2NC11 degree of protection IP65 Contents: input plug, output plug, USB cable connection, length 2 m	<b>6EP1975-2ES00</b>
<b>SIMATIC S7-300 mounting adapter</b> for snapping the PS307 onto 35 mm standard rails	<b>6ES7390-6BA00-0AA0</b>
<b>Device labels</b>	<b>3RT1900-1SB20</b>

Overview



Particularly harsh industrial environments demand products with special characteristics - products that are more rugged than standard products.

Siemens offers the perfect answer to these requirements with SIPLUS extreme. SIPLUS product variants are based on the SITOP, LOGO!Power standard power supplies and the power supplies for SIMATIC S7 and expansion modules, and feature the following characteristics:

- Extended ambient temperature range (e.g. -40 ... +70 °C) and conformal coating as protection against extreme and difficult conditions and contact with substances
- DIN EN 50155:  
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category)

Ambient conditions

Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
Relative humidity	100%, condensation/frost permitted. No commissioning in bedewed state.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. conductive sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For further technical specifications, see the standard products, or visit [www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)



Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS LOGO!Power</b>		<b>SIPLUS S7 design</b>	
<b>SIPLUS LOGO!Power 24 V 1.3 A</b>	<b>6AG1331-1SH03-7AA0</b>	<i>For industrial applications with particularly demanding ambient conditions</i>	
Input: 100 ... 240 V AC Output: 24 V DC, 1.3 A		<b>SIPLUS S7-300 PS 305</b>	<b>6AG1305-1BA80-2AA0</b>
Extended temperature range and exposure to media		Input: 24 ... 110 V DC Output: 24 V DC/2 A	
<b>SIPLUS LOGO!Power 24 V 2.5 A</b>	<b>6AG1332-1SH43-7AA0</b>	Extended temperature range and exposure to media	
Input: 100 ... 240 V AC Output: 24 V DC, 2.5 A		<b>SIPLUS S7-300 PS 305 5 A</b>	<b>6AG1307-1EA01-7AA0</b>
Extended temperature range and exposure to media		Incl. connection bracket Input: 120/230 V AC Output: 24 V DC/5 A	
<b>SIPLUS LOGO!Power 24 V 4 A</b>	<b>6AG1332-1SH52-7AA0</b>	Extended temperature range and exposure to media	
Input: 100 ... 240 V AC Output: 24 V DC, 4 A		<b>SIPLUS S7-300 PS 305 10 A</b>	<b>6AG1307-1KA02-7AA0</b>
Extended temperature range and exposure to media		Incl. connection bracket Input: 120/230 V AC Output: 24 V DC/10 A (dimensions 80 x 125 x 120)	
<b>SIPLUS smart</b>		<i>For rolling stock railway applications</i>	
<b>SIPLUS PSU100S 24 V/10 A</b>	<b>6AG1334-2BA20-4AA0</b>	<b>SIPLUS S7-300 PS 305</b>	<b>6AG1305-1BA80-2AA0</b>
Stabilized power supply Input: 120/230 V AC Output: 24 V DC/10 A		Input: 24 ... 110 V DC Output: 24 V DC/2 A	
Extended temperature range and Exposure to media		Conforms to EN 50155	
<b>SIPLUS PSU300S 3-phase, 24 V DC/10 A</b>	<b>6AG1434-2BA10-7AA0</b>	Extended temperature range and exposure to media	
Stabilized power supply Input: 400 ... 500 V 3 AC Output: 24 V DC/20 A		<b>SIPLUS S7-1200 PM 1207 power supply</b>	
Exposure to media		Input: 120/230 V AC Output: 24 V DC, 2.5 A; Derating from + 55 °C to + 70 °C 1.2 A output current	
<b>SIPLUS PSU300S 3-phase, 24 V DC/20 A</b>	<b>6AG1436-2BA10-7AA0</b>	• Ambient temperature -25 ... +70 °C	<b>6AG1332-1SH71-7AA0</b>
Stabilized power supply Input: 400 ... 500 V 3 AC Output: 24 V DC/20 A		• Ambient temperature 0... +60 °C	<b>6AG1332-1SH71-4AA0</b>
Extended Temperature range and exposure To media		Extended temperature range and exposure to media	
<b>SIPLUS modular</b>		<b>SIPLUS S7-1500 PM 1507</b>	
<b>SIPLUS Modular 40 A</b>		Input: 120/230 V AC	
Stabilized power supply Input: 120/230 V AC Output: 24 V DC/40 A		• Output: 24 V DC, 3 A	<b>6AG1332-4BA00-7AA0</b>
• Exposure to media	<b>6AG1337-3BA00-4AA0</b>	• Output: 24 V DC, 8 A	<b>6AG1333-4BA00-7AA0</b>
• Extended temperature range and exposure to media	<b>6AG1337-3BA00-7AA0</b>	Extended temperature range and exposure to media	
<b>SIPLUS PS PSU200M 1-phase and 2-phase, 24 V DC/5 A</b>		<b>SIPLUS S7-1500 system power supply</b>	
Stabilized power supply Input: 120 ... 230 V/230 ... 500 V AC		For supplying the backplane bus of the S7-1500	
• Output: 24 V DC/5 A	<b>6AG1333-3BA10-7AA0</b>	• 24 V DC input voltage, power 25 W	<b>6AG1505-0KA00-7AB0</b>
• Output: 24 V DC / 10 A	<b>6AG1334-3BA10-7AA0</b>	• 24/48/60 V DC input voltage, power 60 W	<b>6AG1505-0RA00-7AB0</b>
Exposure to media		• 120/230 V AC input voltage, power 60 W	<b>6AG1507-0RA00-7AB0</b>
<b>SIPLUS PS PSU8200 3-phase, 24 V DC/40 A</b>	<b>6AG1437-3BA10-7AA0</b>	Extended temperature range and exposure to media	
Stabilized power supply Input: 400 ... 500 V 3 AC Output: 24 V DC/20 A			
Exposure to media			



Ordering data	Article No.	Ordering data	Article No.
<i>SIPLUS DC/DC converter</i>		<b>SIPLUS modular buffer module</b>	
<b>SIPLUS PS 24V/0.375A</b>	<b>6AG1931-2BA00-3AA0</b>	For 6AG1961-3BA01-7AA0; buffer time 100 ms to 10 s, dependent on load current	<b>6AG1961-3BA01-7AA0</b>
DC/DC stabilized power supply Input: 48 ... 220 V DC Output: 24 V DC/0.375 A condensation permissible Exposure to media		<b>SIPLUS PS signaling module modular</b>	<b>6AG1961-3BA10-7AA0</b>
<i>SIPLUS add-on modules</i>		For 6AG1XXX-3BA00 -XXXX signaling contacts: Output voltage ok, operational availability ok, remote ON/OFF Extended temperature range and exposure to media	
<b>SIPLUS PS E202U redundancy module</b>		<b>SIPLUS SITOP signaling module</b>	<b>6AG1961-3BA10-6AA0</b>
Input/output: 24 V DC/40 A suitable for decoupling two SITOP power supplies with a maximum of 20 A output current		Hard gold-plated contacts; for 6AG1XXX-3BA00 -XXXX signaling contacts: Output voltage ok, operational availability ok, remote ON/OFF	
• Extended temperature range and exposure to media	<b>6AG1961-3BA21-7AX0</b>	<i>SIPLUS DC-UPS, uninterruptible power supply</i>	
• Exposure to media	<b>6AG1961-3BA21-4AX0</b>	<b>SIPLUS PS DC UPS module 15 A</b>	<b>6AG1931-2EC21-2AA0</b>
<b>SIPLUS PSE200U 3 A</b>	<b>6AG1961-2BA31-7AA0</b>	Uninterruptible power supply without interface Input: 24 V DC/16 A, Output: 24 V DC/15 A Extended temperature range and exposure to media	
4-channel selectivity module Input: 24 V DC Output: 24 V DC/3A per channel output current adjustable 0.5 ... 3 A Exposure to media		<b>SIPLUS PS DC UPS module 40 A</b>	<b>6AG1931-2FC21-7AA0</b>
<b>SIPLUS PSE200U 10 A</b>	<b>6AG1961-2BA41-7AA0</b>	Uninterruptible power supply without interface; Input: 24 V DC/43 A, Output: 24 V DC/40 A Extended temperature range and exposure to media	
4-channel selectivity module Input: 24 V DC Output: 24 V DC/10 A per channel output current adjustable 3 ... 10 A Exposure to media			

## Power supplies for AS interface

1-phase / 1-2-phase / DC, AS-i 30 V (with data decoupling)

## Overview



AS-Interface power supply unit for 3 A

AS-Interface power supply units feed 30 V DC into the AS-Interface cable and supply the AS-Interface components. They contain performance-optimized data decoupling for separating communication signals and supply voltage. As the result, AS-Interface is able to convey both data and power along a single line. The power packs are overload and short-circuit proof.

**Dimensions**

AS-Interface power supply units have compact dimensions in widths of 50 / 70 / 120 mm. No clearance to other devices is required when mounting.

**Features**

- Higher rating: The power supply units deliver currents of 2.6 to 8 A.
- Integrated data decoupling: As the result, AS-Interface is able to convey both data and power along a single line.
- Integrated ground-fault detection: The power supply units perform the reliable detection and signaling of ground faults according to IEC 60204-1. The AS-Interface voltage can be disconnected automatically in the event of a ground fault.
- Integrated overload detection: An output overload is identified and signaled over a diagnostics LED.
- Diagnostics memory: Any ground faults or overloads on the output side are stored in a diagnostics memory until the device is RESET.
- Remote RESET and remote signaling: A ground fault can be signaled and evaluated by relay contacts over a central control and/or indicator light.
- Diagnostics LEDs: Three different LEDs indicate the status of the AS-Interface power supply locally at the power supply unit.
- Ultra-wide input range / 2-phase connection: The ultra-wide input range of 120 to 500 V of the 8 A version means that the supply units can be used in virtually any network worldwide. In addition, this version dispenses with the need for an N conductor as the device can be connected directly between 2 phases of a network.
- Operation with 24 V DC: The 3 A power supply unit is also available as a version with a 24 V DC input. This power supply unit is suitable for use in battery-operated plants or plants with uninterrupted power supply (UPS).
- Removable terminal blocks in spring-type connection: The power supply units are equipped with three removable terminal blocks for simple device replacement: for the input side, for the output side and for Signal/RESET connections.

## Benefits

- Complete solution for supplying AS-Interface networks while making full use of the maximum possible cable length per AS-i segment
- Only AS-i masters and AS-i slaves need to be connected to the AS-Interface cable to operate AS-Interface
- Compact, room-saving footprint
- Reliable power supply even for large numbers of AS-Interface modules with high power requirements
- Increased safety and savings on additional components owing to the integrated ground fault and overload detection
- Fast fault detection and reduced downtimes thanks to diagnostics memory, remote signaling and remote RESET
- Reduced downtimes as the result of removable terminal blocks which enable the fast exchanging of devices
- Ultra-wide input range of the 8 A version permits single-phase and two-phase operation and removes the need for an N conductor
- Can be used world-wide thanks to, for example, UL/CSA approval (UL 508)
- With the 2.6 A version, the output power is restricted to max. 100 W for use in Class 2 circuits in accordance with NEC (National Electrical Code)

## Ordering data

## Article No.

**AS-Interface power supply units, IP20**

- AS-i single output 30 V DC
- With integrated ground-fault detection
- With spring-type terminals, removable terminals,
- 2.6 A version with output power restricted to max. 100 W (for Class 2 circuits in accordance with NEC)

Dimensions:

Width:  
50 mm (2.6 A / 3 A),  
70 mm (5 A),  
120 mm (8 A);  
Height: 125 mm;  
Depth: 125 mm

• Output current: 2.6 A / max. 100 W Input voltage: 120 / 230 V AC (selectable)	<b>3RX9501-2BA00</b>
• Output current: 3 A Input voltage: 120 / 230 V AC (selectable)	<b>3RX9501-0BA00</b>
• Output current: 3 A Input voltage: 24 V DC	<b>3RX9501-1BA00</b>
• Output current: 5 A Input voltage: 120 / 230 V AC (selectable)	<b>3RX9502-0BA00</b>
• Output current: 8 A Input voltage: 120 / 230 ... 500 V AC (selectable)	<b>3RX9503-0BA00</b>

## More information

More information on AS-Interface, see Catalog IC 10, Chapter 2 "Industrial Communication".

## Power supplies for AS interface

1-phase, 30 V DC (without data decoupling)

## Overview



PSN130S 30 V power supply units for 3 A, 4 A and 8 A

The PSN130S 30 V power supplies feed 30 V DC into the AS-Interface cable and supply the AS-Interface components, but do not include data decoupling. Additional data decoupling units are needed to separate communication signals and supply voltage, see "S22.5 Data Decoupling Modules" or "DCM 1271 Data Decoupling Module", see Accessories, [page 14/4](#)

The power supplies are overload and short-circuit proof.

**Dimensions**

The 30 V power supply units have compact dimensions in widths of 50 and 70 mm. No distances to other devices must be observed during the installation.

**Features**

- Primary-clocked power supplies for connecting to a single-phase AC power supply system
- Power for currents of 3 A, 4 A and 8 A
- The output voltage is floating, and resistant to short-circuits and no-load operation. In the event of an overload, the output voltage will be reduced or switched off. After a short-circuit or overload the devices will start up again automatically.
- In the event of a device fault, the output voltage will be limited to max. 37 V.
- Modular installation devices in degree of protection IP20 and safety class I
- Diagnostics: With an output voltage > 26.5 V DC, the green LED (30V O.K.) is lit and the signaling contact 13-14 is closed.

**Benefits**

- Low-cost alternative solution for supplying AS-Interface networks while making full use of the maximum possible cable length per AS-i segment
- Cost advantage particularly for multiple networks
- Compact, space-saving dimensions
- Reliable power supply even for large numbers of AS-Interface modules with high power requirements
- Can be used worldwide thanks to, for example, UL/CSA approval (UL 508)

## Application



Data decoupling modules S22.5 and DCM 1271

A data decoupling module is also required in order to use a PSN130S 30 V power supply unit for AS-Interface.

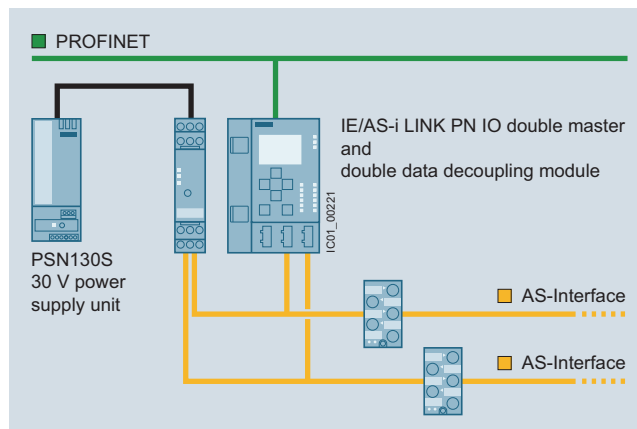
With the aid of the data decoupling module, the AS-Interface network can be supplied with 30 V DC from a standard power supply unit and the transmission of data and power can be realized along one cable.

Alternatively, it is also possible to use a standard 24 V DC power supply unit (AS-i Power24V). However, in this case please note that all components involved must be designed for the reduced voltage and that the maximum length of an AS-i Power24V network is limited to 50 m.

The power supply units must comply with the PELV (Protective Extra Low Voltage) or SELV (Safety Extra Low Voltage) standards, have a residual ripple of < 250 mVpp and in the event of a fault, must limit the output voltage to a maximum of 40 V.

The combination of data decoupling modules and standard power supply units is therefore a cost-efficient alternative to the service-proven AS-Interface power supply units.

The quality of the data signals and the reliable operation of the AS-i network are not negatively affected as the result.

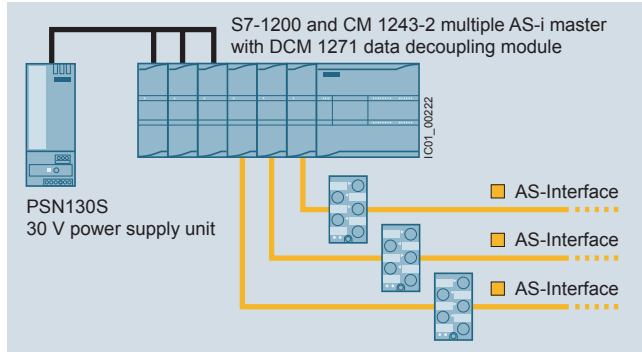
**Configuration examples of AS-Interface networks with a 30 V power supply unit**

Configuration of AS-Interface multiple networks, each with one PSN130S 30 V power supply unit (examples with schematic representation): Double network based on S22.5 double data decoupling module and double master IE/AS-i LINK PN IO

# Power supplies for AS interface

1-phase, 30 V DC (without data decoupling)

## Application (continued)



Configuration of AS-Interface multiple networks, each with one PSN130S 30 V power supply unit (examples with schematic representation): Triple network based on SIMATIC S7-1200 with DCM 1271 data decoupling modules and CM 1243-2 communication processors

## Technical specifications

Product	PSN130S 30 V DC power supply unit			
	Version	3 A	4 A	8 A
<b>Input data</b>				
• Input voltage, rated value $U_e$	V AC	120 / 230 V, single-phase, automatic selection		
• Input voltage range	V AC	85 ... 132 / 174 ... 264		
• Mains frequency	Hz	50 / 60		
• Power consumption at full load, typ.	W	103	139	270
<b>Output data</b>				
• Output voltage, rated value $U_a$	V DC	30		
• Residual ripple	mV <sub>SS</sub>	< 150		
• Output current, rated value at -20 ... +60 °C	A	3	4	8
• Max. output current at +60 ... +70 °C	A	3	3	4
<b>Degree of efficiency in rated conditions</b>				
• Degree of efficiency	%	87	88	90
• Power loss, typ.	W	12	17	25
<b>Protection and monitoring</b>				
• Output overvoltage protection	V	< 37		
• Current limit, typ.	A	4	5,5	11
<b>Safety</b>				
• Electrical separation primary / secondary		Output voltage PELV / SELV according to IEC 60950 and EN 50178		
• Protection class		I		
• Degree of protection		IP20		
<b>Approvals</b>				
• UL		UL 508 / CSA 22.2		
• Pollution degree		IEC 60950		
• Overvoltage category and electrical separation		EN 50178 and IEC 61558		
<b>EMC</b>				
• Emitted interference (class B)		IEC 61000-6-3		
• Line harmonics limit		IEC 61000-3-2		
• Interference immunity		IEC 61000-6-2		
<b>Operating data</b>				
Ambient temperature				
• Operation	°C	-20 ... +70		
• Transport / storage	°C	-40 ... +85		
Pollution degree				
Humidity class				
Climate class according to DIN 50010, relative air humidity max. 100 %, without condensation				
<b>Dimensions and weight</b>				
• Width	mm	50	50	70
• Height x depth	mm	125 x 126.5		
• Weight	kg	0.4	0.4	

## Ordering data

### PSN130S 30 V DC power supply units (without AS-i data decoupling)

Output voltage 30 V DC, with screw terminals, Dimensions: Width: 50 mm (3 A / 4 A), 70 mm (8 A); Height: 125 mm; Depth: 126.5 mm

- Output current: 3 A  
Input voltage: 120 / 230 V AC (automatic selection)
- Output current: 4 A  
Input voltage: 120 / 230 V AC (automatic selection)
- Output current: 8 A  
Input voltage: 120 / 230 V AC (automatic selection)

## Article No.

3RX9511-0AA00

3RX9512-0AA00

3RX9513-0AA00

## Accessories

## Article No.

### Data decoupling modules in enclosure, 22.5 mm

#### S22.5 data decoupling modules

With screw terminals, removable terminals, Dimensions: Width: 22.5 mm; Height: 101 mm; Depth: 115 mm

- Single data decoupling module, 1 x 4 A
- Double data decoupling module, 2 x 4 A

3RK1901-1DE12-1AA0

3RK1901-1DE22-1AA0

With spring-type terminals, removable terminals, Dimensions: Width: 22.5 mm; Height: 105 mm; Depth: 115 mm

- Single data decoupling module, 1 x 4 A
- Double data decoupling module, 2 x 4 A

3RK1901-1DG12-1AA0

3RK1901-1DG22-1AA0

### Data decoupling modules in enclosure for S7-1200

#### DCM 1271 data decoupling module

With screw terminals, removable terminals (included in the scope of supply), Dimensions: Width: 30 mm; Height: 100 mm; Depth: 75 mm

3RK7271-1AA30-0AA0

#### Screw terminals (replacement) for AS-i DCM 1271 data decoupling module

- 5-pole
- 3-pole for connecting the power supply unit

3RK1901-3MA00

3RK1901-3MB00

## More information

For operating instructions and other technical information see <http://support.automation.siemens.com/WW/view/en/64364000>.

More information on AS-Interface, see Catalog IC 10, Chapter 2 "Industrial Communication".

## Why choose the SCALANCE XB family of unmanaged switches?

Designed for simple and cost effective entry into the Industrial Ethernet switch market, the Scalance XB family allows engineers to increase the number of end devices or network segments without the need for configuration.

- Cost-effective solutions starting at \$95
- FastEthernet and Gigabit models for maximum performance
- Seamless integration with SIMATIC design
- Compact design
- Plug-and-Play networking; no configuration required
- Distances up to 26km using Fiber
- DIN and wall mountable

### Reliability

Experience the rugged durability and extended reliability designed into all Siemens Industrial Ethernet products.

- Mean Time Between Failure (MTBF) over 100 years
- UL, CSA, CE and C-Tick Certified
- Large operating temperature range from -10° C to 60° C
- LED-diagnostics conveniently indicate power, link and transmission status on the faceplate

### Fiber Optics

Utilize SCALANCE XB Fiber Optic data transmission to evade electromagnetic interference and reach vast distances with minimal data loss.

- Optical SC-Port available
- Length of fiber-optic transmission:
  - Max. 5 km with Industrial Ethernet FO cables Multimode
  - Max. 26 km with Industrial Ethernet FO cables Singlemode

### Expand your industrial network with Siemens reliable unmanaged switching solutions

### Compact Design

Pocket-sized design allows for convenient placement of your industrial switch inside a panel, especially when space is at a premium.

- Dimensions: 45mm x 100mm x 87mm
- Weight: 165g to 260g

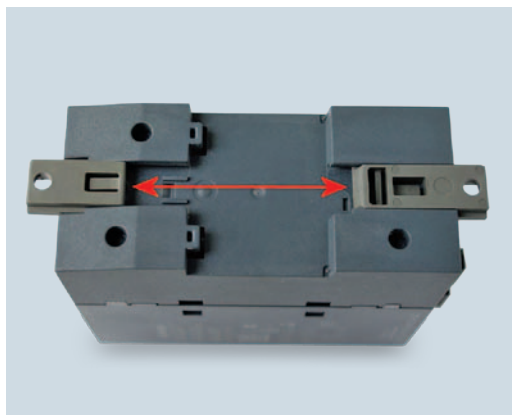
### Flexibility

The SCALANCE XB line offers a comprehensive variety of unmanaged switches: full Gigabit capability and distances reaching up to 26 km with optional Fiber Optic ports. All eight switches come with the innovative dual-purpose DIN and Wall mount.

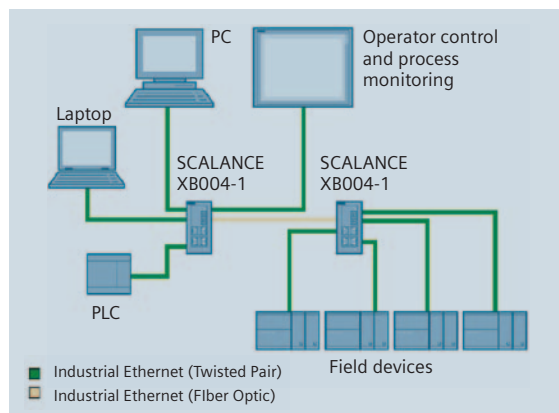
- 4 + 1, 5 and 8 Port models
- RJ45 and SC Fiber Optic connectors
- FastEthernet and Gigabit capability
- Singlemode or Multimode Fiber Optics
- Hybrid DIN/Wall mount

Simply connect your end devices to a SCALANCE XB and allow autosensing, autocrossover detection and autonegotiation features to set data transmission parameters. Large MAC learning tables allow seamless integration of Bus and Star topologies into your Industrial Ethernet network.

- Easy integration with PROFINET networks
- Data transmission rate detection via autosensing
- Autocrossover and autonegotiation
- MAC address learning tables up to 8 k



Hybrid DIN/wall mount







Mixed star topology with SCALANCE XB004-1

## Fast Ethernet

### SCALANCE XB-000 Industrial Ethernet switches

Unmanaged Industrial Ethernet switches for 10/100 Mbit/s, IP20 degree of protection, including operating instructions, Industrial Ethernet Network manual on CD-ROM





SCALANCE XB005	Ordering Data	Order No.
	5 x 10/100 Mbit/s electrical RJ45 ports	6GK5005-0GA10-1AB2
	8 x 10/100 Mbit/s electrical RJ45 ports	6GK5008-0GA10-1AB2
	4 x 10/100 Mbit/s electrical RJ45 ports and 1 x 100 Mbit/s optical SC port (multimode, glass), up to 5 km	6GK5004-1GL10-1AB2
	4 x 10/100 Mbit/s electrical RJ45 ports and 1 x 100 Mbit/s optical SC port (singlemode, glass), up to 26 km	6GK5004-1GM00-1AB2



## Gigabit

**SCALANCE XB-000 Industrial Ethernet switches**

Unmanaged Industrial Ethernet switches for 10/100/1000 Mbit/s, IP20 degree of protection, including operating instructions, Industrial Ethernet Network manual on CD-ROM

SCALANCE XB005G	Ordering Data	Order No.
	5 x 10/100/1000 Mbit/s electrical RJ45 ports	<b>6GK5005-0GA00-1AB2</b>
SCALANCE XB008G	Ordering Data	Order No.
	8 x 10/100/1000 Mbit/s electrical RJ45 ports	<b>6GK5008-0GA00-1AB2</b>
SCALANCE XB004-1G	Ordering Data	Order No.
	4 x 10/100/1000 Mbit/s electrical RJ45 ports and 1 x 1000 Mbit/s optical SC port (multimode, glass), up to 750 m	<b>6GK5004-1GL00-1AB2</b>
SCALANCE XB004-1LDG	Ordering Data	Order No.
	4 x 10/100/1000 Mbit/s electrical RJ45 ports and 1 x 1000 Mbit/s optical SC port (singlemode, glass), up to 10 km	<b>6GK5004-1GM00-1AB2</b>

## Technical specifications

Interfaces	
Connection of terminal equipment or network components via twisted pair	4, 5 or 8 x 10/100/1000 Mbit/s RJ45 electrical ports
Number of optical ports for fiber-optic cables	1 x 100 or 1 x 1000 Mbit/s optical SC port in multimode and singlemode versions
Connection for power supply	1 x 3 plug-in terminal block
Electrical data	
Power supply Permissible range	+24 V DC +19.2 to +28.8 V DC
Power loss at 24 V DC	1.68 W to 12.5 W
Current consumption at rated voltage	70 mA to 520 mA
Power supply input fuse design	0.6 A / 60 V
Permissible ambient conditions/EMC	
Operating temperature	-10 °C to +60 °C
Transport/storage temperature	-40 °C to +80 °C
Relative humidity in operation	< 95% (no condensation)
Interference immunity	EN 6100-6-2
Emitted interference	EN 6100-6-4
Degree of protection	IP20
Safety certifications	UL, CSA, CE and C-Tick
Construction	
Dimensions (W x H x D)	45mm x 100mm x 87mm
Weight	0.165 kg to 0.260 kg
Installation options	DIN rail, wall mounting

## Accessories

FastConnect	Part Number
TP cable 2 x 2 (per meter)	
IE FC Standard Cable 2x2	6XV1840-2AH10
IE FC Flexible Cable GP 2x2	6XV1870-2B
TP cable 4 x 2 (per meter)	
IE FC TP Standard Cable GP 4 x 2 (AWG24)	6XV1878-2A
IE FL TP Flexible Cable GP 4x2 (AWG24)	6XV1878-2B
Tools	
IE FC Stripping Tool	6GK1901-1GA00
Connectors	
IE FC RJ45 180° Connector	6GK1901-1BB10-2AA0
IE FC RJ45 Plug 180° Gigabit Connector	6GK1901-1BB11-2AA0
Cables	
FO Standard Cable GP 50/125 Fiber-optic Cable pre-assembled for use with multimode switches	
80 m	6XV1873-6AN80
100 m	6XV1873-6AT10
150 m	6XV1873-6AT15
200 m	6XV1873-6AT20
300 m	6XV1873-6AT30
IE Standard Cable TP RJ45/RJ45 TP cable 4x2 with 2 RJ45 connectors	
0.5 m	6XV1870-3QE50
1 m	6XV1870-3QH10
2 m	6XV1870-3QH20
6 m	6XV1870-3QH60
10 m	6XV1870-3QN10
20 m	6XV1871-5BN20
24 V DC Power Supply	
SITOP compact 24 V/0.6 A	6EP1331-5BA00



# FastConnect Cabling System

## Introduction

### FastConnect Cabling System

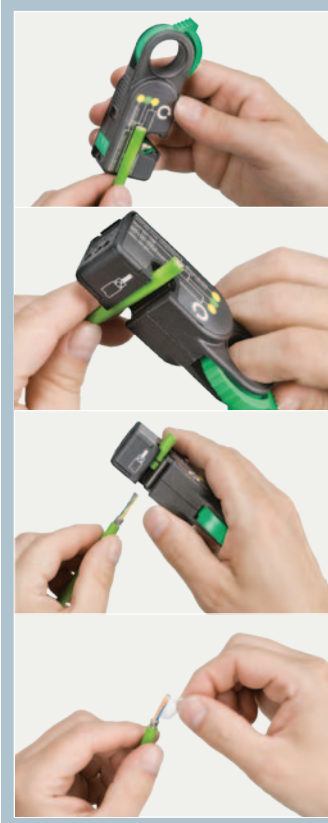
The FastConnect system provides a complete cabling solution for on-site assembly of custom length industrial Ethernet cables. The system comprises of a stripping tool, a full range of connectors, and various cable options.

Regardless of the type of connector you need, the assembly follows the same procedure.

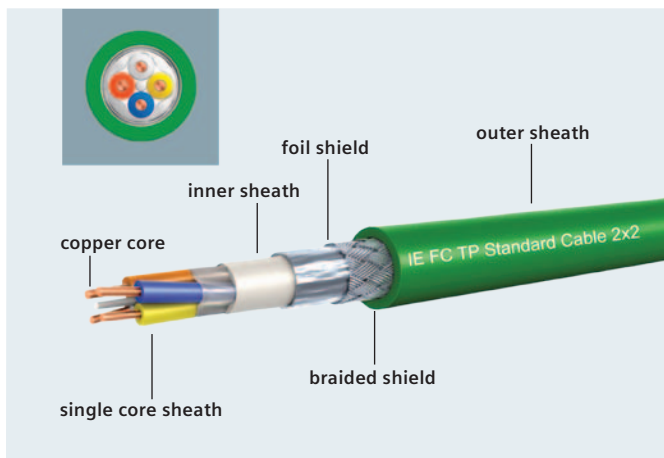
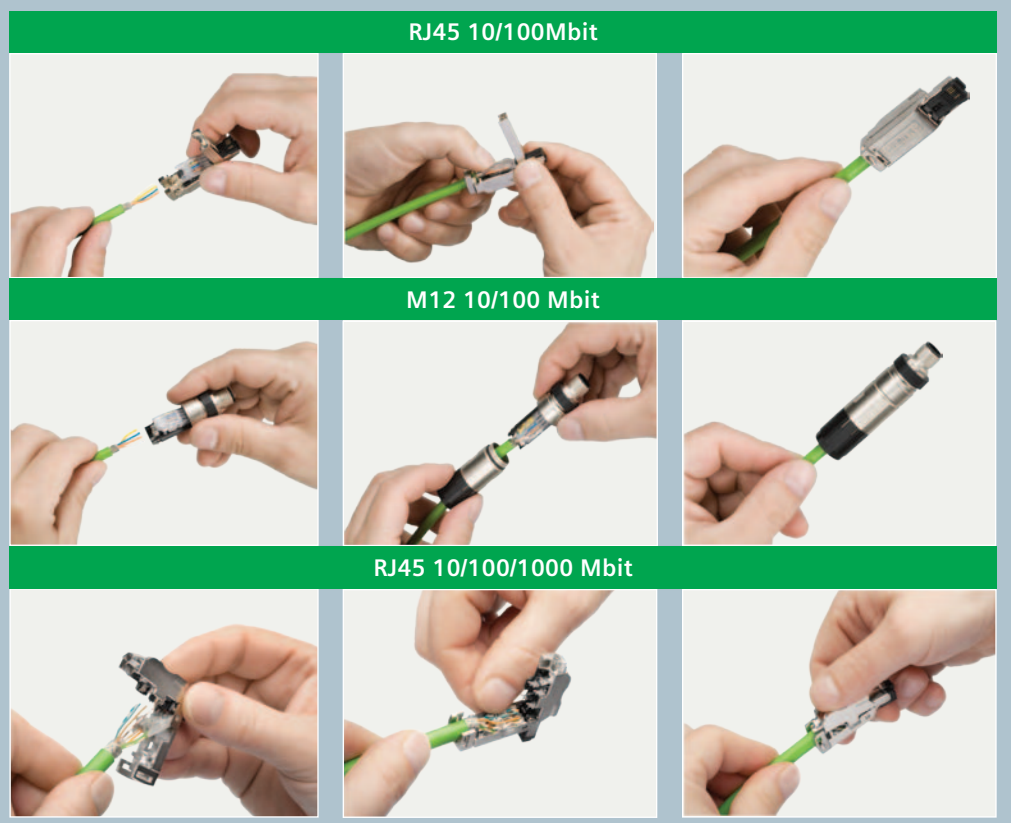
Your benefits:

- Greater flexibility for configuring the optimum cable length with the right connector on site
- Reduced stocking costs for ordering pre-assembled cables
- Easy installation using just one tool
- Easy routing of cables with pre-assembled, angled connectors
- Wiring is simplified due to color coding and the transparent contact cover






#### Cable Preparation






#### Termination




## Connectors for Industrial Ethernet FastConnect System

	Product	Comments	Article no *)	
<b>IE FC RJ45 Plug 2 x 2</b>				
	10/100 FastConnect RJ45 Plug 180	RJ45 data connector; for connecting to IE FC TP cables 2x2, 180° cable outlet	1 pack = 1 piece	6GK1901-1BB10-2AA0
			1 pack = 10 pieces	6GK1901-1BB10-2AB0
			1 pack = 50 pieces	6GK1901-1BB10-2AE0
	10/100 FastConnect RJ45 Plug 90	90° cable outlet;	1 pack = 1 piece	6GK1901-1BB20-2AA0
			1 pack = 10 pieces	6GK1901-1BB20-2AB0
			1 pack = 50 pieces	6GK1901-1BB20-2AE0
	10/100 FastConnect RJ45 Plug 145	145° cable outlet;	1 pack = 1 piece	6GK1901-1BB30-0AA0
			1 pack = 10 pieces	6GK1901-1BB30-0AB0
			1 pack = 50 pieces	6GK1901-1BB30-0AE0
<b>IE FC RJ45 Plug 4 x 2</b>				
	10/100/1000 FastConnect RJ45 Plug (4x2)	RJ45 data connector; for connecting to IE FC TP cables 4x2	1 pack = 1 piece	6GK1901-1BB12-2AA0
			1 pack = 10 pieces	6GK1901-1BB12-2AB0
			1 pack = 50 pieces	6GK1901-1BB12-2AE0
<b>M12 connectors</b>				
	10/100 FastConnect M12 PRO	M12 connector with high degree of protection, 4-pin, D-coded for connection of electrical cables to SCALANCE X208PRO, ET 200 PRO PN or ET 200 eco PN	1 piece	6GK1901-0DB30-6AA0
			8 pieces	6GK1901-0DB30-6AA8
	10/100/1000 FastConnect M12 PRO	M12 connector with high degree of protection, 8-pin, X-coded for connection of electrical cables to SCALANCE W (Gigabit M12 interface),	1 piece	6GK1901-0DB30-6AA0
			8 pieces	6GK1901-0DB30-6AA8

## Cables for Industrial Ethernet FastConnect System

	Product	Comments	Article no *)	
<b>Industrial Ethernet FastConnect cables 2 x 2 at 100 Mbit/s, sold by the meter, in bulk</b>				
	IE FC TP Standard Cable GP 2 x 2 (Type A)	Standard bus cable (4-core) with rigid cores for fast assembly		6XV1840-2AH10
	IE FC TP Flexible Cable GP 2 x 2 (Type B)	Flexible bus cable (4-core), for occasionally moved machine components		6XV1870-2B
	IE FC TP FRNC Cable GP 2 x 2 (Type B)	Flexible, halogen-free bus cable (4-core), for occasionally moved machine components		6XV1871-2F
	IE FC TP Trailing Cable GP 2 x 2 (Type C)	Highly flexible bus cable (4-core) for continuous movement in cable carriers		6XV1870-2D
	IE FC TP Trailing Cable 2 x 2 (Type C)	Highly flexible bus cable (4-core) for continuous movement in cable carriers		6XV1840-3AH10
	IE TP Torsion Cable 2 x 2 (Type C)	Highly flexible bus cable (4-core) for continuous movement when using with robots		6XV1870-2F
	IE FC TP Food Cable 2 x 2 (Type C)	Flexible bus cable (4-core), for food, beverages and tobacco industries		6XV1871-2L
	IE FC TP Marine Cable 2 x 2 (Type B)	Bus cable (4-core), for marine and offshore use		6XV1840-4AH10
	IE TP Ground Cable 2 x 2 (Type C)	Bus cable (4-core) for fixed routing in soil		6XV1871-2G
	IE TP Train Cable GP 2 (Type C)	Bus cable (4-core) for special applications in trains; certified for railway applications		6XV1871-2T
<b>Industrial Ethernet FastConnect cables 4 x 2 at 1000 Mbit/s, sold by the meter, in bulk</b>				
	IE FC TP Standard Cable GP 4 x 2	Standard bus cable (8-core), AWG22, Standard cable with rigid cores for fast assembly, for fixed installation		6XV1870-2E
	IE FC TP Flexible Cable GP 4 x 2	Bus cable (8-core, AWG24) with flexible cores, Flexible cable for quick assembly, for occasionally moving machine parts		6XV1878-2B

## Pre-molded Industrial Ethernet cables

	IE TP Cord RJ45/RJ45	Patch cord, preferred length, pre-assembled with two RJ45 connectors	0.5 m	6XV1870-3QE50
			1.0 m	6XV1870-3QH10
			2.0 m	6XV1870-3QH20
			6.0 m	6XV1870-3QH60
			10 m	6XV1870-3QN10

\*For additional cabling options, please refer to U.S. Part Number NTB-1BK02-0114.

### Overview



#### LOGO! logic module:

- The compact, easy-to-use and low-cost solution for simple control tasks
- Compact, easy to operate, universally applicable without accessories
- "All in one": Integrated display and operator panel
- 36 different functions can be connected at the press of a button or by means of PC software; up to 130 times over
- LOGO! 8: 38/43 different functions can be linked at the press of a button or using PC software; up to 200/400 times
- Functions are easily changed at the press of a button. No more time-consuming rewiring

#### SIPLUS LOGO!:

- The controller for use in the toughest environmental conditions
- With extended temperature range from -40/-25 °C to +70 °C
- Suitable for exposure to media (harmful gas atmosphere)
- Condensation permissible
- With the proven PLC technology of LOGO!
- Easy to handle, program, maintain, and service
- Ideal for use in automotive engineering, environmental engineering, mining, chemical plants, material handling, food industry, etc.

#### Accessories:

- The front panel mounting set also allows simple and reliable installation of the logic modules in front panels; IP65 protection is thus possible.
- In order to ensure dependable operation of SIPLUS devices supplied by the battery in conjunction with combustion engines, it is necessary to put in a SIPLUS upmiter upstream device between the battery and the SIPLUS LOGO!.

For more information, please go to:

<http://www.siemens.com/siplus-extreme>

### General technical data of the SIPLUS LOGO!

Ambient temperature range	-40/-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

#### Ambient conditions

Extended range of environmental conditions

- with reference to ambient temperature, air pressure and altitude
 

Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) //
Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) //
Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
0° C
- At cold restart, min.

Relative humidity

- with condensation, max. 100 %; RH incl. bedewing/frost (no commissioning in bedewed state)

Resistance

- to biologically active substances/ compliance with EN 60721-3-3
 

Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
--
- to chemically active substances/ compliance with EN 60721-3-3
 

Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
--
- to mechanically active substances, compliance with EN 60721-3-3
 

Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.
---

# LOGO! logic module

## LOGO! modular basic variants

### Overview



- The space-saving basic variants
- Interface for the connection of expansion modules, up to 24 digital inputs, 20 digital outputs, 8 analog inputs and 8 analog outputs can be addressed
- All basic units with integrated web server
- Enclosure width 72 mm (4 U)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro CF cards

### Technical specifications

Article number	6ED1052-1CC01-0BA8	6ED1052-1MD00-0BA8	6ED1052-1HB00-0BA8	6ED1052-1FB00-0BA8
	LOGO! 24CE, 8DI(4AI)/4DO, 400 BLOCKS	LOGO! 12/24RCE, 8DI(4AI)/4DO, 400 BLOCKS	LOGO! 24RCE, 8DI/4DO, 400 BLOCKS	LOGO! 230RCE, 8DI/4DO, 400 BLOCKS
<b>Display</b>				
with display	Yes	Yes	Yes	Yes
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)		Yes		
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	10.8 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
<b>Time of day</b>				
<b>Time switching clocks</b>				
• Number	190	190	190	8
• Power reserve	480 h	480 h	480 h	480 h
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
<b>Output current</b>				
• for signal *I* permissible range for 0 to 55 °C, max.	0.3 A	10 A		
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A

# LOGO! logic module

## LOGO! modular basic variants

(continued)

Article number	6ED1052-1CC01-0BA8	6ED1052-1MD00-0BA8	6ED1052-1HB00-0BA8	6ED1052-1FB00-0BA8
LOGO! 24CE, 8DI(4AI)/4DO, 400 BLOCKS	LOGO!12/24RCE, 8DI(4AI)/4DO, 400 BLOCKS	LOGO! 24RCE, 8DI/4DO, 400 BLOCKS	LOGO!230RCE, 8DI/4DO, 400 BLOCKS	
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
<ul style="list-style-type: none"> <li>Limit class B, for use in residential areas</li> </ul>	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Degree of protection acc. to EN 60529				
<ul style="list-style-type: none"> <li>IP20</li> </ul>	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
<b>Marine approval</b>				
<ul style="list-style-type: none"> <li>Marine approval</li> </ul>	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	0 °C 55 °C	0 °C 55 °C	0 °C 55 °C	0 °C 55 °C
<b>Dimensions</b>				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	60 mm	60 mm	60 mm	60 mm

### Ordering data

#### Article No.

#### Article No.

#### LOGO! 8 logic module

##### LOGO! 24CE

Supply voltage 24 V DC, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch  
Ethernet interface;  
400 function blocks can be interlinked, modular expansion capability

6ED1052-1CC01-0BA8

##### LOGO! 12/24RCE

Supply voltage 12...24 V DC, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V) 4 relay outputs 10 A, integral time switch  
Ethernet interface;  
400 function blocks can be interlinked, modular expansion capability

6ED1052-1MD00-0BA8

#### LOGO! 24RCE

Supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch  
Ethernet interface;  
400 function blocks can be interlinked, modular expansion capability

6ED1052-1HB00-0BA8

#### LOGO! 230RCE

Supply voltage 115...230 V AC/DC, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integral time switch  
Ethernet interface;  
400 function blocks can be interlinked, modular expansion capability

6ED1052-1FB00-0BA8

# LOGO! logic module

## LOGO! modular basic variants

Ordering data	Article No.		Article No.
<b>Accessories</b>		<b>LOGO! 8 230V Starter Kit</b>	<b>6ED1057-3BA02-0AA8</b>
<b>LOGO! 8 text display HMI</b>	<b>6ED1055-4MH00-0BA1</b>	With LOGO! 230RCE	
6-line text display, can be connected to all LOGO! 8 basic and pure variants, with 2 Ethernet interfaces; including installation accessories.		<b>LOGO! 8 TDE Starter Kit</b>	<b>6ED1057-3BA10-0AA8</b>
Requires additional 12 V DC or 24 V AC/DC power supply		With LOGO! 12/24RCEO, LOGO! Power 24 V, 1.3 A, LOGO! TDE	
<b>LOGO!Soft Comfort V8</b>	<b>6ED1058-0BA08-0YA1</b>	<b>LOGO! 8 KP300 Basic Starter Kit</b>	<b>6AV2132-0HA00-0AA1</b>
For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD		With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN	
<b>LOGO! 8 Starter Kits</b>		<b>LOGO! 8 KTP400 Basic Starter Kit</b>	<b>6AV2132-0KA00-0AA1</b>
In TANOS Box, with LOGO! 8, LOGO! Soft Comfort V8, WinCC Basic V13, Ethernet cable,		With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic	
<b>LOGO! 8 12/24 V Starter Kit</b>	<b>6ED1057-3BA00-0AA8</b>	<b>LOGO! 8 KTP700 Basic Starter Kit</b>	<b>6AV2132-3GB00-0AA1</b>
With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A		With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic	
		<b>Front panel mounting set</b>	
		Width 4 U	<b>6AG1057-1AA00-0AA0</b>
		Width 4 U, with keys	<b>6AG1057-1AA00-0AA3</b>
		Width 8 U	<b>6AG1057-1AA00-0AA1</b>
		Width 8 U, with keys	<b>6AG1057-1AA00-0AA2</b>



# LOGO! logic module

## LOGO! modular pure variants

### Overview



- Basic variants optimized for costs
- Interface for the connection of expansion modules, up to 24 digital inputs, 20 digital outputs, 8 analog inputs and 8 analog outputs can be addressed
- With connection option for LOGO! TDE text display
- All basic units with integrated web server
- Enclosure width 72 mm (4 U)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro CF cards

### Technical specifications

Article number	6ED1052-2CC01-0BA8	6ED1052-2MD00-0BA8	6ED1052-2HB00-0BA8	6ED1052-2FB00-0BA8
	LOGO! 24CEO, 8DI(4AI)/4DO, 400 BLOCKS	LOGO!12/24RCEO, 8DI(4AI)/4DO, 400 BLOCKS	LOGO! 24RCEO, 8DI/4DO, 400 BLOCKS	LOGO!230RCEO, 8DI/4DO, 400 BLOCKS
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	10.8 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
<b>Time of day</b>				
<b>Time switching clocks</b>				
• Number	190	190	190	8
• Power reserve	480 h	480 h	480 h	480 h
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
<b>Output current</b>				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A

(continued)

Article number	<b>6ED1052-2CC01-0BA8</b> LOGO! 24CEo, 8DI(4AI)/4DO, 400 BLOCKS	<b>6ED1052-2MD00-0BA8</b> LOGO!12/24RCEo, 8DI(4AI)/4DO, 400 BLOCKS	<b>6ED1052-2HB00-0BA8</b> LOGO! 24RCEo, 8DI/4DO, 400 BLOCKS	<b>6ED1052-2FB00-0BA8</b> LOGO!230RCEo, 8DI/4DO, 400 BLOCKS
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
<ul style="list-style-type: none"> <li>Limit class B, for use in residential areas</li> </ul>	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Degree of protection acc. to EN 60529				
<ul style="list-style-type: none"> <li>IP20</li> </ul>	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
<b>Marine approval</b>				
<ul style="list-style-type: none"> <li>Marine approval</li> </ul>	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	0 °C 55 °C	0 °C 55 °C	0 °C 55 °C	0 °C 55 °C
<b>Dimensions</b>				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm

Ordering data	Article No.	Article No.
<b>LOGO! 8 logic module</b>		
<b>LOGO! 24CEo logic module</b>	<b>6ED1052-2CC01-0BA8</b>	<b>LOGO! 24RCEo logic module</b> Supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability
<b>LOGO! 12/24RCEo logic module</b>	<b>6ED1052-2MD00-0BA8</b>	<b>LOGO! 230RCEo logic module</b> Supply voltage 115...230 V AC/DC, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integral time switch; Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability
		<b>6ED1052-2HB00-0BA8</b>
		<b>6ED1052-2FB00-0BA8</b>



# LOGO! logic module

## LOGO! modular pure variants

Ordering data	Article No.		Article No.
<b>Accessories</b>		<b>LOGO! 8 12/24 V Starter Kit</b>	<b>6ED1057-3BA00-0AA8</b>
<b>LOGO! TDE text display</b>	<b>6ED1055-4MH00-0BA1</b>	With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A	
6-line text display, can be connected to all LOGO! 8 basic and pure variants, with 2 Ethernet interfaces; including installation accessories.		<b>LOGO! 8 230V Starter Kit</b>	<b>6ED1057-3BA02-0AA8</b>
Requires additional 12 V DC or 24 V AC/DC power supply		With LOGO! 230RCE	
<b>LOGO!Soft Comfort V8</b>	<b>6ED1058-0BA08-0YA1</b>	<b>LOGO! 8 TDE Starter Kit</b>	<b>6ED1057-3BA10-0AA8</b>
For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD		With LOGO! 12/24RCE0, LOGO! Power 24 V, 1.3 A, LOGO! TDE	
<b>LOGO! 8 Starter Kits</b>		<b>LOGO! 8 KP300 Basic Starter Kit</b>	<b>6AV2132-0HA00-0AA1</b>
In TANOS Box, with LOGO! 8, LOGO! Soft Comfort V8, WinCC Basic V13, Ethernet cable,		With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN	
		<b>LOGO! 8 KTP400 Basic Starter Kit</b>	<b>6AV2132-0KA00-0AA1</b>
		With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic	
		<b>LOGO! 8 KTP700 Basic Starter Kit</b>	<b>6AV2132-3GB00-0AA1</b>
		With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic	

# LOGO! logic module

## LOGO! modular expansion modules

### Overview



- Expansion modules for connection to LOGO! modular
- With digital inputs and outputs, analog inputs, or analog outputs

### Technical specifications

Article number	6ED1055-1CB00-0BA2	6ED1055-1HB00-0BA2	6ED1055-1MB00-0BA2	6ED1055-1FB00-0BA2
	LOGO! DM8 24 EXPANSION MODULE, 2MW, 4DI/4DQ	LOGO! DM8 24R EXPANSION MODULE, 2MW, 4DI/4DQ	LOGO! DM8 12/24R, EXPANSION MODULE, 2MW, 4DI/4DQ	LOGO! DM8 230R, EXPANSION MODULE, 2MW, 4DI/4DQ
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC			Yes	
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	10.8 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC		Yes		
• 115 V AC				Yes
• 230 V AC				Yes
<b>Line frequency</b>				
• permissible range, lower limit		47 Hz		47 Hz
• permissible range, upper limit		63 Hz		63 Hz
<b>Digital inputs</b>				
Number of digital inputs	4	4	4	4
<b>Input voltage</b>				
• Type of input voltage	DC	AC/DC	DC	AC/DC
• for signal "0"	< 5 V DC	< 5 V AC/DC	< 5 V DC	< 40 V AC, < 30 V DC
• for signal "1"	> 12 V DC	> 12 V AC/DC	> 8.5 V	> 79 V AC, > 79 V DC
<b>Input current</b>				
• for signal "0", max. (permissible quiescent current)	0.88 mA	1.1 mA	0.88 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	2.1 mA	2.63 mA	1.5 mA	0.13 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>				
- at "0" to "1", max.	1.5 ms	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	15 ms	1.5 ms	75 ms

# LOGO! logic module

## LOGO! modular expansion modules

(continued)

Article number	<b>6ED1055-1CB00-0BA2</b> LOGO! DM8 24 EXPANSION MODULE, 2MW, 4DI/4DQ	<b>6ED1055-1HB00-0BA2</b> LOGO! DM8 24R EXPANSION MODULE, 2MW, 4DI/4DQ	<b>6ED1055-1MB00-0BA2</b> LOGO! DM8 12/24R, EXPANSION MODULE, 2MW, 4DI/4DQ	<b>6ED1055-1FB00-0BA2</b> LOGO! DM8 230R, EXPANSION MODULE, 2MW, 4DI/4DQ
<b>Digital outputs</b>				
Number of digital outputs	4	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes	No	No	No
Controlling a digital input		Yes	Yes	Yes
<b>Switching capacity of the outputs</b>				
• on lamp load, max.		1 000 W	1 000 W	1 000 W; 500 W at 115V AC
<b>Parallel switching of two outputs</b>				
• for uprating	No	No	No	No
<b>Switching frequency</b>				
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		5 A	5 A	5 A
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Degree of protection acc. to EN 60529				
• IP20	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes		Yes
<b>Marine approval</b>				
• Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Dimensions</b>				
Width	35.5 mm	35.5 mm	35.5 mm	35.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm

(continued)

Article number	<b>6ED1055-1CB10-0BA2</b> LOGO! DM16 24, EXP. MODULE, 4MW, 8DI/8DQ	<b>6ED1055-1NB10-0BA2</b> LOGO! DM16 24R, EXP. MODULE, 4MW, 8DI/8DQ	<b>6ED1055-1FB10-0BA2</b> LOGO! DM16 230R, EXP. MODULE, 4MW, 8DI/8DQ
<b>Installation type/mounting</b>			
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	
• 115 V DC			Yes
• 230 V DC			Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	253 V
Rated value (AC)			
• 24 V AC		No	
• 115 V AC			Yes
• 230 V AC			Yes
<b>Line frequency</b>			
• permissible range, lower limit			47 Hz
• permissible range, upper limit			63 Hz
<b>Digital inputs</b>			
Number of digital inputs	8	8	8
<b>Input voltage</b>			
• Type of input voltage	DC	DC	AC/DC
• for signal "0"	< 5 V DC	< 5 V DC	< 40 V AC, < 30 V DC
• for signal "1"	> 12 V DC	> 12 V DC	> 79 V AC, > 79 V DC
<b>Input current</b>			
• for signal "0", max. (permissible quiescent current)	0.85 mA	0.85 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	3.5 mA	2 mA	0.13 mA
<b>Input delay (for rated value of input voltage)</b>			
<b>for standard inputs</b>			
- at "0" to "1", max.	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	1.5 ms	75 ms
<b>Digital outputs</b>			
Number of digital outputs	8	8; Relays	8; Relays
Short-circuit protection	Yes	No	No
Controlling a digital input	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>			
• on lamp load, max.		1 000 W	1 000 W; 500 W at 115V AC
<b>Parallel switching of two outputs</b>			
• for uprating	No	No	No
<b>Switching frequency</b>			
• with resistive load, max.	10 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz
<b>Relay outputs</b>			
<b>Switching capacity of contacts</b>			
- with inductive load, max.		3 A	3 A
- with resistive load, max.		5 A	5 A

(continued)

Article number	<b>6ED1055-1CB10-0BA2</b> LOGO! DM16 24, EXP. MODULE, 4MW, 8DI/8DQ	<b>6ED1055-1NB10-0BA2</b> LOGO! DM16 24R, EXP. MODULE, 4MW, 8DI/8DQ	<b>6ED1055-1FB10-0BA2</b> LOGO! DM16 230R, EXP. MODULE, 4MW, 8DI/8DQ
<b>EMC</b>			
<b>Emission of radio interference acc. to EN 55 011</b>			
• Limit class B, for use in residential areas	Yes	Yes	Yes
<b>Degree and class of protection</b>			
Degree of protection acc. to EN 60529			
• IP20	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes
<b>Marine approval</b>			
• Marine approval	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C
<b>Dimensions</b>			
Width	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm

Article number	<b>6ED1055-1MA00-0BA2</b> LOGO! AM2 EXPANSION MODULE, 12/24V, 2AI	<b>6ED1055-1MD00-0BA2</b> LOGO! AM2 RDT, 2AI, -50..+200DECR/C
<b>Installation type/mounting</b>		
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>		
Rated value (DC)		
• 12 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
• 24 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
<b>Analog inputs</b>		
Number of analog inputs	2	2; 2 or 3 wire connection
<b>Input ranges</b>		
• Voltage	Yes	No
• Current	Yes	No
• Resistance thermometer	No	Yes; For PT100/PT1000 sensors
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	No
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA	No
<b>Input ranges (rated values), resistance thermometer</b>		
• Pt 100	No	Yes
<b>EMC</b>		
<b>Emission of radio interference acc. to EN 55 011</b>		
• Limit class B, for use in residential areas	Yes	Yes
<b>Degree and class of protection</b>		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes

(continued)

Article number	<b>6ED1055-1MA00-0BA2</b> LOGO! AM2 EXPANSION MODULE, 12/24V, 2AI	<b>6ED1055-1MD00-0BA2</b> LOGO! AM2 RDT, 2AI, -50...+200DECR/C
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
FM approval	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes
according to VDE 0631	Yes	
<b>Marine approval</b>		
• Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	0 °C	0 °C
• max.	55 °C	55 °C
<b>Dimensions</b>		
Width	35.5 mm	35.5 mm
Height	90 mm	90 mm
Depth	58 mm	58 mm

Article number	<b>6ED1055-1MM00-0BA2</b> LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20MA
<b>Installation type/mounting</b>	
Mounting	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>	
Rated value (DC)	
• 12 V DC	No
• 24 V DC	Yes
<b>Analog outputs</b>	
Number of analog outputs	2
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>EMC</b>	
<b>Emission of radio interference acc. to EN 55 011</b>	
• Limit class B, for use in residential areas	Yes
<b>Degree and class of protection</b>	
Degree of protection acc. to EN 60529	
• IP20	Yes

Article number	<b>6ED1055-1MM00-0BA2</b> LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20MA
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
FM approval	Yes
developed in accordance with IEC 61131	Yes
according to VDE 0631	Yes
<b>Marine approval</b>	
• Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C
<b>Dimensions</b>	
Width	35.5 mm
Height	90 mm
Depth	58 mm

### Overview



- The space-saving basic variants
- Interface for connecting expansion modules, up to 24 digital inputs, 20 (16) digital outputs, 8 analog inputs and 8 (2) analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 and 0BA7 basic versions); LOGO! TDE can be connected to LOGO! 8 or higher

### New for LOGO! 8

- All basic units with integrated Web server
- Same enclosure width as LOGO! 0BA6 (4 U)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controller, SIMATIC Panel and PC
- Use of standard micro CF cards

### LOGO! 0BA7 versions:

- Ethernet interface for communication with SIMATIC Controller, SIMATIC Panel and PC
- Networking of max. 8 LOGO! devices
- Use of standard SD card or SIMATIC Memory Card

### Note:

SIPLUS LOGO! 6/7 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1052-1CC01-7BA8	6AG1052-1MD00-7BA8	6AG1052-1HB00-7BA8	6AG1052-1FB00-7BA8
Based on	6ED1052-1CC01-0BA8	6ED1052-1MD00-0BA8	6ED1052-1HB00-0BA8	6ED1052-1FB00-0BA8
	SIPLUS LOGO! 24CE	SIPLUS LOGO! 12/24RCE	SIPLUS LOGO! 24RCE	SIPLUS LOGO! 230RCE
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-10 °C; = Tmin; Startup @ 0 °C	-10 °C; = Tmin; Startup @ 0 °C	-10 °C; = Tmin; Startup @ 0 °C	-10 °C; = Tmin; Startup @ 0 °C
• max.	60 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay
<b>Ambient temperature during storage/transportation</b>				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
<b>Extended ambient conditions</b>				
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)			
• At cold restart, min.	0 °C	0 °C	0 °C	0 °C
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation			
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!			
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!			
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!			

(continued)

Article number	6AG1052-1MD00-2BA7	6AG1052-1FB00-2BA7		
Based on	6ED1052-1MD00-0BA7	6ED1052-1FB00-0BA7		
	SIPLUS LOGO! 12/24RCE	SIPLUS LOGO! 230RCE		
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-25 °C; = Tmin	-25 °C; = Tmin		
• max.	70 °C; = Tmax	70 °C; = Tmax		
<b>Extended ambient conditions</b>				
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)		
<b>Relative humidity</b>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)			
- With condensation, tested in accordance with IEC 60068-2-38, max.				
<b>Resistance</b>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!			
- against biologically active substances / conformity with EN 60721-3-3				
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!			
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!			
Article number	6AG1052-1CC01-2BA6	6AG1052-1MD00-2BA6	6AG1052-1HB00-2BA6	6AG1052-1FB00-2BA6
Based on	6ED1052-1CC01-0BA6	6ED1052-1MD00-0BA6	6ED1052-1HB00-0BA6	6AED1052-1FB00-0BA6
	SIPLUS LOGO! 24C	SIPLUS LOGO! 12/24RC	SIPLUS LOGO! 24RC	SIPLUS LOGO! 230RC
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>				
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)			
- With condensation, tested in accordance with IEC 60068-2-38, max.				
<b>Resistance</b>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!			
- against biologically active substances / conformity with EN 60721-3-3				
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!			
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!			



Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS LOGO! 8 logic module</b>		<b>SIPLUS LOGO! 6 logic module</b>	
<b>SIPLUS LOGO! 24CE</b> Supply voltage 24 V DC, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1CC01-7BA8</b>	<b>SIPLUS LOGO! 24</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch; 200 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1CC01-2BA6</b>
<b>SIPLUS LOGO! 12/24RCE</b> Supply voltage 12...24 V DC, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1MD00-7BA8</b>	<b>SIPLUS LOGO! 12/24RC</b> 12/24 V DC power supply, 8x 12/24 V DC digital inputs, of which 4 can be used in analog mode (0 to 10 V) 4x 10 A relay outputs, integral time switch; 200 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1MD00-2BA6</b>
<b>SIPLUS LOGO! 24RCE</b> Supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1HB00-7BA8</b>	<b>SIPLUS LOGO! 24RC</b> 24 V AC/DC supply voltage, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; 200 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1HB00-2BA6</b>
<b>SIPLUS LOGO! 230RCE</b> Supply voltage 115...230 V AC/DC, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integral time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1FB00-7BA8</b>	<b>SIPLUS LOGO! 230RC</b> Control supply voltage 115/230 V AC/DC, 8 digital inputs 115/230 V AC/DC, 4 relay outputs 10 A, integrated time switch; 200 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1FB00-2BA6</b>
<b>SIPLUS LOGO! 7 logic module</b>		<b>SIPLUS LOGO! 6, 7, 8 accessories</b>	
<b>SIPLUS LOGO! 12/24RCE</b> 12/24 V DC supply voltage, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch; 400 function blocks can be interlinked, Ethernet interface, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1MD00-2BA7</b>	<b>LOGO! PROM</b> Programming device used to simultaneously reproduce program module contents on up to 8 program modules	<b>6AG1057-1AA01-0BA6</b>
<b>SIPLUS LOGO! 230RCE</b> 115/230 V AC/DC supply voltage, 8 digital inputs 115/230 V AC/DC, 4 relay outputs 10 A, integral time switch; 400 function blocks can be interlinked, Ethernet interface, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-1FB00-2BA7</b>	<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	<b>6ED1058-0BA08-0YA1</b>
		<b>LOGO!Soft Comfort V8 Upgrade</b> Upgrade from V1.0 to V8, on DVD	<b>6ED1058-0CA08-0YE1</b>
		<b>Front panel mounting set</b>  Width 4 U Width 8 U Width 8 U, with keys	<b>6AG1057-1AA00-0AA0</b> <b>6AG1057-1AA00-0AA1</b> <b>6AG1057-1AA00-0AA2</b>

Ordering data	Article No.		Article No.
<b>SIPLUS LOGO! 6, 7 accessories</b>		<b>SIPLUS LOGO! 6 accessories</b>	
<b>SIPLUS LOGO! TD text display</b> (Extended temperature range -10 ... +60 °C and medial loading)  4-line text display, can be connected to all LOGO! basic and pure variants as of -0BA6, including connecting cable	<b>6AG1055-4MH00-2BA0</b>	<b>LOGO! PC cable</b> For program transfer between LOGO! and PC	<b>6ED1057-1AA00-0BA0</b>
<b>LOGO! memory card</b> Program module for copying, with know-how protection	<b>6ED1056-1DA00-0BA0</b>	<b>LOGO! USB PC cable</b> For program transfer between LOGO! and PC, including driver on CD-ROM	<b>6ED1057-1AA01-0BA0</b>
<b>LOGO! battery card</b> Battery module for backing up integral real-time clock (not LOGO! 24)	<b>6ED1056-6XA00-0BA0</b>		
<b>LOGO! memory/battery card</b> Combined program and battery module, with know-how protection and for backing up the integral real-time clock (not LOGO! 24)	<b>6ED1056-7DA00-0BA0</b>		

### Overview



- Basic variants optimized for costs
- Interface for connecting expansion modules, up to 24 digital inputs, 16 (20) digital outputs, 8 analog inputs and 2 (8) analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 basic variants)

#### New for SIPLUS LOGO! 8

- All basic units with integrated Web server
- Same enclosure width as LOGO! 0BA6 (4 U)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controller, SIMATIC Panel and PC
- Use of standard micro CF cards

#### Note:

SIPLUS LOGO! 6 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

### Technical specifications

Article number	6AG1052-2CC01-7BA8	6AG1052-2MD00-7BA8	6AG1052-2HB00-7BA8	6AG1052-2FB00-7BA8
Based on	6ED1052-2CC01-0BA8 SIPLUS LOGO! 24CEO	6ED1052-2MD00-0BA8 SIPLUS LOGO! 12/24RCEO	6ED1052-2HB00-0BA8 SIPLUS LOGO! 24RCEO (AC)	6ED1052-2FB00-0BA8 SIPLUS LOGO! 230RCEO
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay
<b>Ambient temperature during storage/transportation</b>				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
<b>Extended ambient conditions</b>				
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)			
• At cold restart, min.	0 °C	0 °C	0 °C	0 °C
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation			
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!			
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!			
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!			

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Article number	6AG1052-2CC01-2BA6	6AG1052-2MD00-2BA6	6AG1052-2HB00-2BA6	6AG1052-2FB00-2BA6
Based on	6ED1052-2CC01-0BA6	6ED1052-2MD00-0BA6	6ED1052-2HB00-0BA6	6ED1052-2FB00-0BA6
	SIPLUS LOGO! 24CO	SIPLUS LOGO! 12/24RCO	SIPLUS LOGO! 24RCO	SIPLUS LOGO! 230RCO
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>				
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)			
<b>Resistance</b>	<p>- against biologically active substances / conformity with EN 60721-3-3 Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!</p> <p>- against chemically active substances / conformity with EN 60721-3-3 Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!</p> <p>- against mechanically active substances / conformity with EN 60721-3-3 Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!</p>			

### Ordering data

Article No.	Article No.
<b>SIPLUS LOGO! 8 logic module</b>	<b>SIPLUS LOGO! 12/24RCEo</b>
<b>SIPLUS LOGO! 24CEo</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integral time switch, Ethernet interface; without display and keyboard; 400 function blocks can be interlinked, modular expansion capability Extended temperature range and exposure to media	12...24 V DC supply voltage, 8 digital inputs 12...24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch, Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability Extended temperature range and exposure to media
<b>SIPLUS LOGO! 230RCEo</b> 115...230 V AC/DC supply voltage, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integral time switch, Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability Extended temperature range and exposure to media	<b>SIPLUS LOGO! 6 logic module</b>
<b>SIPLUS LOGO! 24RCEo</b> 24 V AC/DC supply voltage, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch, Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability Extended temperature range and exposure to media	<b>SIPLUS LOGO! 24o</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability Extended temperature range and exposure to media
	<b>SIPLUS LOGO! 230RCo</b> 115/230 V AC/DC supply voltage, 8 digital inputs 115/230 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability Extended temperature range and exposure to media

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS LOGO! 24RCo</b> 24 V AC/DC supply voltage, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-2HB00-2BA6</b>	<b>SIPLUS LOGO! 6 accessories</b>  <b>SIPLUS LOGO! TD text display</b> (Extended temperature range -10 ... +60 °C and medial loading)  4-line text display, can be connected to all LOGO! basic and pure variants as of -0BA6, including connecting cable	<b>6AG1055-4MH00-2BA0</b>
<b>SIPLUS LOGO! 12/24RCo</b> 12/24 V DC supply voltage, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability  Extended temperature range and exposure to media	<b>6AG1052-2MD00-2BA6</b>	<b>LOGO! memory card</b> Program module for copying, with know-how protection	<b>6ED1056-1DA00-0BA0</b>
<b>SIPLUS LOGO! 6, 8 accessories</b>		<b>LOGO! battery card</b> Battery module for backing up integral real-time clock (not LOGO! 24)	<b>6ED1056-6XA00-0BA0</b>
<b>LOGO! PROM</b> Programming device used to simultaneously reproduce pro- gram module contents on up to 8 program modules	<b>6AG1057-1AA01-0BA6</b>	<b>LOGO! memory/battery card</b> Combined program and battery module, with know-how protection and for backing up the integral real-time clock (not LOGO! 24)	<b>6ED1056-7DA00-0BA0</b>
<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	<b>6ED1058-0BA08-0YA1</b>	<b>LOGO! PC cable</b> For program transfer between LOGO! and PC	<b>6ED1057-1AA00-0BA0</b>
<b>LOGO!Soft Comfort V8 Upgrade</b> Upgrade from V1.0 to V8, on DVD	<b>6ED1058-0CA08-0YE1</b>	<b>LOGO! USB PC cable</b> For program transfer between LOGO! and PC, including driver on CD-ROM	<b>6ED1057-1AA01-0BA0</b>
<b>Front panel mounting set</b>  Width 4 U  Width 8 U  Width 8 U, with keys	<b>6AG1057-1AA00-0AA0</b>  <b>6AG1057-1AA00-0AA1</b>  <b>6AG1057-1AA00-0AA2</b>		

### Overview



- Expansion modules for connection to LOGO! modular
- With digital inputs and outputs, analog inputs, or analog outputs

**Note:**

SIPLUS LOGO! 6 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

### Technical specifications

Article number	6AG1055-1CB00-7BA2	6AG1055-1HB00-7BA2	6AG1055-1MB00-7BA2
Based on	6ED1055-1CB00-0BA2	6ED1055-1HB00-0BA2	6ED1055-1MB00-0BA2
	SIPLUS LOGO! DM8 24 V8	SIPLUS LOGO! DM8 24R V8	SIPLUS LOGO! DM8 12/24R V8
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A
<b>Ambient temperature during storage/transportation</b>			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
<b>Extended ambient conditions</b>			
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)		
• At cold restart, min.	-25 °C	-25 °C	-25 °C
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation		
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!		
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!		
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!		

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Article number	6AG1055-1FB00-7BA2	6AG1055-1NB10-7BA2
Based on	6ED1055-1FB00-0BA2 SIPLUS LOGO! DM8 230R V8	6ED1055-1NB10-0BA2 SIPLUS LOGO! DM16 24R V8
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay
<b>Ambient temperature during storage/transportation</b>		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• At cold restart, min.	-25 °C	-25 °C
<b>Relative humidity</b>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	
- With condensation, tested in accordance with IEC 60068-2-38, max.		
<b>Resistance</b>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	
- against biologically active substances / conformity with EN 60721-3-3		
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	

Article number	6AG1055-1MA00-7BA2
Based on	6ED1055-1MA00-0BA2 SIPLUS LOGO! AM2 V8
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	-25 °C
<b>Relative humidity</b>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
- With condensation, tested in accordance with IEC 60068-2-38, max.	
<b>Resistance</b>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against biologically active substances / conformity with EN 60721-3-3	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Article number	6AG1055-1MM00-7BA2
Based on	6ED1055-1MM00-0BA2 SIPLUS LOGO! AM2 AQ V8
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	-25 °C
<b>Relative humidity</b>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
- With condensation, tested in accordance with IEC 60068-2-38, max.	
<b>Resistance</b>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against biologically active substances / conformity with EN 60721-3-3	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



(continued)

Article number	<b>6AG1055-1CB00-2BY0</b>	<b>6AG1055-1PB00-2BY0</b>	<b>6AG1055-1HB00-2BY0</b>	<b>6AG1055-1MB00-2BY1</b>
Based on	<b>6ED1055-1CB00-0BA0</b>	<b>6ED1055-1CB00-0BA0</b>	<b>6ED1055-1HB00-0BA0</b>	<b>6ED1055-1MB00-0BA1</b>
	SIPLUS LOGO! DM8 24	SIPLUS LOGO! DM8 12/24	SIPLUS LOGO! DM8 24R (-2BY0)	SIPLUS LOGO! DM8 12/24R
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>				
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)			
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!			
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!			
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!			
<hr/>				
Article number	<b>6AG1055-1FB00-2BY1</b>		<b>6AG1055-1NB10-2BA0</b>	
Based on	<b>6ED1055-1FB00-0BA1</b>		<b>6ED1055-1NB10-0BA0</b>	
	SIPLUS LOGO! DM8 230R		SIPLUS LOGO! DM16 24R EXP. MODULE	
<b>Ambient conditions</b>				
<b>Ambient temperature during operation</b>				
• min.	-40 °C; = Tmin		-25 °C; = Tmin	
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use		70 °C; = Tmax; 55 °C @ UL/cUL use	
<b>Extended ambient conditions</b>				
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)		Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)			
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!			
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!			
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!			



(continued)

Article number	<b>6AG1055-1MA00-2BY0</b>
Based on	<b>6ED1055-1MA00-0BA0</b> SIPLUS LOGO! AM2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>	
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Article number	<b>6AG1055-1MM00-2BY1</b>
Based on	<b>6ED1055-1MM00-0BA1</b> SIPLUS_LOGO!_AM2_AQ
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>	
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

### Ordering data

	Article No.
<b>SIPLUS LOGO! 8 expansion modules</b>	
<b>SIPLUS LOGO! DM8 24</b>	
Supply voltage 24 V DC, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A	
Extended temperature range and exposure to media	<b>6AG1055-1CB00-7BA2</b>
<b>SIPLUS LOGO! DM8 230R</b>	
115...230 V AC/DC supply voltage, 4 digital inputs 115...230 V AC/DC, 4 relay outputs 5 A	
Extended temperature range and exposure to media	<b>6AG1055-1FB00-7BA2</b>
<b>SIPLUS LOGO! DM8 24R</b>	
Supply voltage 24 V AC/DC, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A	
Extended temperature range and exposure to media	<b>6AG1055-1HB00-7BA2</b>
<b>SIPLUS LOGO! AM2</b>	
12...24 V DC supply voltage, 2 analog inputs 0 to 10 V or 0 to 20 mA, resolution 10 bit	
Extended temperature range and exposure to media	<b>6AG1055-1MA00-7BA2</b>

### Article No.

<b>SIPLUS LOGO! DM8 12/24R</b>	
12...24 V DC supply voltage, 4 digital inputs 12...24 V DC, 4 relay outputs 5 A	
Extended temperature range and exposure to media	<b>6AG1055-1MB00-7BA2</b>
<b>SIPLUS LOGO! AM2 AQ</b>	
Supply voltage 24 V DC, 2 analog outputs 0 to 10 V, 0/4 to 20 mA	
Extended temperature range and exposure to media	<b>6AG1055-1MM00-7BA2</b>
<b>SIPLUS LOGO! DM16 24R</b>	
Supply voltage 24 V DC, 8 digital inputs 24 V DC, 8 relay outputs 5 A	
Extended temperature range and exposure to media	<b>6AG1055-1NB10-7BA2</b>

Ordering data	Article No.	Article No.
<b>SIPLUS LOGO! 6 expansion modules</b>		<b>SIPLUS LOGO! 6, 8 accessories</b>
<b>SIPLUS LOGO! DM8 24</b> 24 V DC supply voltage, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A Extended temperature range and exposure to media	<b>6AG1055-1CB00-2BY0</b>	<b>LOGO! PROM</b> <b>6AG1057-1AA01-0BA6</b> Programming device used to simultaneously reproduce program module contents on up to 8 program modules
<b>SIPLUS LOGO! DM8 230R</b> 115/230 V AC/DC supply voltage, 4 digital inputs 115/230 V AC/DC, 4 relay outputs 5 A Extended temperature range and exposure to media	<b>6AG1055-1FB00-2BY1</b>	<b>LOGO!Soft Comfort V8</b> <b>6ED1058-0BA08-0YA1</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD
<b>SIPLUS LOGO! DM8 24R</b> 24 V AC/DC supply voltage, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A Extended temperature range and exposure to media	<b>6AG1055-1HB00-2BY0</b>	<b>LOGO!Soft Comfort V8 Upgrade</b> <b>6ED1058-0CA08-0YE1</b> Upgrade from V1.0 to V8, on DVD
<b>SIPLUS LOGO! AM2</b> 12/24 V DC supply voltage, 2 analog inputs 0 ... 10 V or 0 ... 20 mA, 10-bit resolution Extended temperature range and exposure to media	<b>6AG1055-1MA00-2BY0</b>	<b>Front panel mounting set</b> Width 4 U <b>6AG1057-1AA00-0AA0</b> Width 8 U <b>6AG1057-1AA00-0AA1</b> Width 8 U, with keys <b>6AG1057-1AA00-0AA2</b>
<b>SIPLUS LOGO! DM8 12/24R</b> 12/24 V DC supply voltage, 4 digital inputs 12/24 V DC, 4 relay outputs 5 A Extended temperature range and exposure to media	<b>6AG1055-1MB00-2BY1</b>	<b>SIPLUS LOGO! 6 accessories</b>
<b>SIPLUS LOGO! AM2 AQ</b> 24 V DC supply voltage, 2 analog inputs 0 ... 10 V, 0/4 ... 20 mA, 10-bit resolution Extended temperature range and exposure to media	<b>6AG1055-1MM00-2BY1</b>	<b>SIPLUS LOGO! TD text display</b> <b>6AG1055-4MH00-2BA0</b> (Extended temperature range -10 ... +60 °C and medial loading) 4-line text display, can be connected to all LOGO! basic and pure variants as of -0BA6, including connecting cable
<b>SIPLUS LOGO! DM16 24R</b> 24 V DC supply voltage, 8 digital outputs 24 V DC, 8 relay outputs 5 A Extended temperature range and exposure to media	<b>6AG1055-1NB10-2BA0</b>	<b>LOGO! memory card</b> <b>6ED1056-1DA00-0BA0</b> Program module for copying, with know-how protection
<b>SIPLUS LOGO! DM8 12/24</b> 12/24 V DC supply voltage, 4 digital inputs 12/24 V DC, 4 digital outputs 24 V DC, 0.3 A Extended temperature range and exposure to media	<b>6AG1055-1PB00-2BY0</b>	<b>LOGO! battery card</b> <b>6ED1056-6XA00-0BA0</b> Battery module for backing up integral real-time clock (not LOGO! 24)
		<b>LOGO! memory/battery card</b> <b>6ED1056-7DA00-0BA0</b> Combined program and battery module, with know-how protection and for backing up the integral real-time clock (not LOGO! 24)
		<b>LOGO! PC cable</b> <b>6ED1057-1AA00-0BA0</b> For program transfer between LOGO! and PC
		<b>LOGO! USB PC cable</b> <b>6ED1057-1AA01-0BA0</b> For program transfer between LOGO! and PC, including driver on CD-ROM

### Overview



- Expansion module for LOGO! 8 basic versions
- For integrating LOGO! 8 in KNX installations
- With 24 digital inputs, 20 digital outputs as well as 8 analog inputs and outputs for processing process signals via KNX.

### Technical specifications

Article number	<b>6BK1700-0BA20-0AA0</b> LOGO! CMK2000
<b>General information</b>	
Firmware version	
• FW update possible	Yes
<b>Installation type/mounting</b>	
Mounting	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>	
Rated value (DC)	24 V
• 12 V DC	No
• 24 V DC	Yes
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Rated value (AC)	
• 24 V AC	No
<b>Input current</b>	
Current consumption, max.	0.04 A
<b>Power loss</b>	
Power loss, max.	1.1 W
<b>Memory</b>	
Flash	Yes
<b>Time of day</b>	
<b>Clock synchronization</b>	
• supported	Yes
<b>Interfaces</b>	
Transmission rate, max.	100 Mbit/s over Ethernet, 9 600 bit/s over KNX
<b>Protocols</b>	
EIB/KNX	Yes
<b>Web server</b>	
• supported	Yes

Article number	<b>6BK1700-0BA20-0AA0</b> LOGO! CMK2000
<b>Diagnostics indication LED</b>	
• RUN/STOP LED	Yes
<b>EMC</b>	
<b>Emission of radio interference acc. to EN 55 011</b>	
• Limit class B, for use in residential areas	Yes; In accordance with EN 61000-6-3
<b>Degree and class of protection</b>	
Degree of protection acc. to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	No
KC approval	Yes
EAC (formerly Gost-R) according to VDE 0631	Yes
• according to VDE 0631	No
<b>Marine approval</b>	
• Marine approval	No
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	55 °C
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Operation, max.	95 %
<b>Connection method</b>	
Bus connector	KNX terminal 0.6 mm <sup>2</sup> - 1.0 mm <sup>2</sup>
Power supply	2 screw-type terminals: L+, M 0.5 mm <sup>2</sup> - 2.5 mm <sup>2</sup> Screw-type terminal: FE 0.5 mm <sup>2</sup> ... 6.0 mm <sup>2</sup>
<b>Dimensions</b>	
Width	71.5 mm; 4 WU
Height	90 mm
Depth	58.5 mm
<b>Weights</b>	
Weight, approx.	0.14 kg

### Ordering data

### Article No.

<b>LOGO! CMK2000 communication module</b>	<b>6BK1700-0BA20-0AA0</b>
For integrating LOGO! 8 in the KNX building system bus, max. 50 communication objects can be configured; RJ45 port for Ethernet; supply voltage 24 V DC/40 mA	

## contents

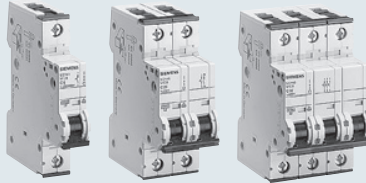
### 5SJ4 Branch Circuit Protectors



<b>5SJ4</b>	Page
<b>Selection and ordering data</b>	
• 1-pole up to 63A	16/4
• 1-pole, 2-pole, 3-pole, 240VAC	16/5
• 1-pole, 2-pole, 3-pole, 480Y/277VAC	16/6
• Additional components	16/7

General data	16/3
Tripping characteristics	16/2
Dimension drawings	16/10
Technical data	16/8

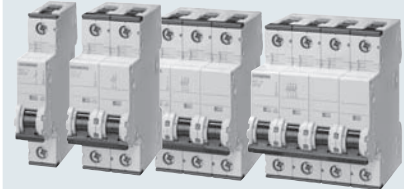
### 5SY4 Supplementary Protectors



<b>5SY4</b>	Page
<b>Selection and ordering data</b>	
• 1-pole, 1-pole+ N, and 2-pole up to 63A	16/13
• 3-pole, 3-pole + N, and 4-pole up to 63A	16/14
• Additional components	16/19
• Accessories	16/21

General data	16/11, 16/22
Tripping characteristics	16/2
Dimension drawings	16/25
Technical data	16/23

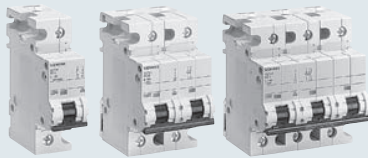
### 5SY6 Supplementary Protectors



<b>5SY6</b>	Page
<b>Selection and ordering data</b>	
• 1-pole, 1-pole+ N, and 2-pole up to 63A	16/15
• 3-pole, 3-pole + N, and 4-pole up to 63A	16/16
• Additional components	16/19
• Accessories	16/21

General data	16/11, 16/22
Tripping characteristics	16/2
Dimension drawings	16/25
Technical data	16/23

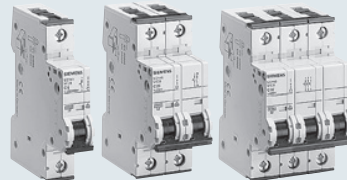
### 5SP Supplementary Protectors



<b>5SP4</b>	Page
<b>Selection and ordering data</b>	
• 1-pole, 2-pole, 3-pole and 4-pole up to 125A	16/17
• Additional components	16/19
• Accessories	16/21

General data	16/11, 16/22
Tripping characteristics	16/2
Dimension drawings	16/25
Technical data	16/23

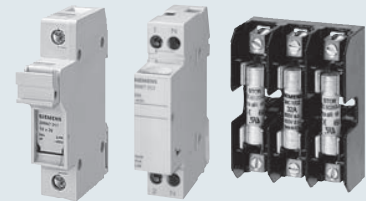
### AC/DC Product Range 5SY5 Supplementary Protectors



<b>5SY5</b>	Page
<b>Selection and ordering data</b>	
• 1-pole, 2-pole up to 63A	16/18
• Additional components	16/17
• Accessories	16/21

General data	16/11
Tripping characteristics	16/2
Dimension drawings	16/25
Technical data	16/23

### 3NW7 Cylindrical Fuse Holders



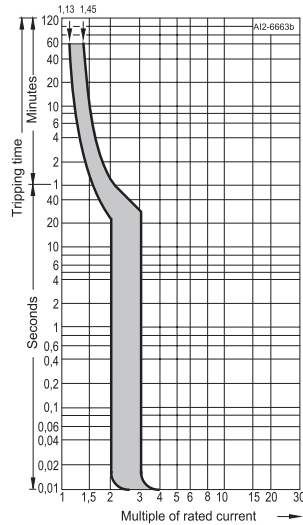
<b>3NW7 and 3NC10</b>	Page
<b>Selection and ordering data</b>	
<b>3NW7</b>	
• 1-, 1+N, 2- and 3-, 3+N and 4-poles up to 100 A	16/27
<b>3NC1038</b>	
• 1-, 2- & 3-pole up to 30 A	16/30

General data	16/26, 16/30
Dimension drawings	16/29, 16/30
Technical data	16/28, 16/30

### Tripping characteristics acc. to EN 60 898

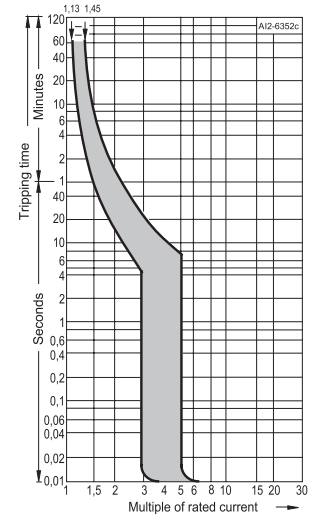
#### Tripping characteristic A, -5

Type A characteristic is designed to protect very sensitive circuits such as semiconductors. Magnetic trip point - 2 to 3 times  $I_n$  rating. Thermal trip point - 1.13 to 1.45 protector rating.



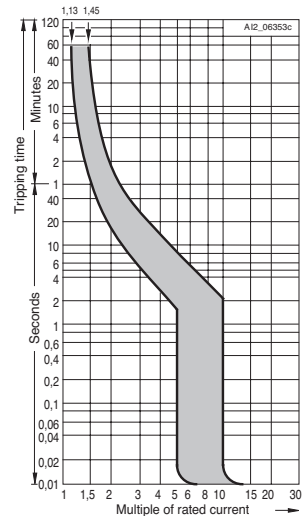
#### Tripping characteristic B, -6

Type B characteristic designed for European residential circuit protection. This characteristic can also be used for protection of computers and electronic equipment. Magnetic trip point - 3 to 5 times  $I_n$  rating. Thermal trip point - 1.13 to 1.45 protector rating.



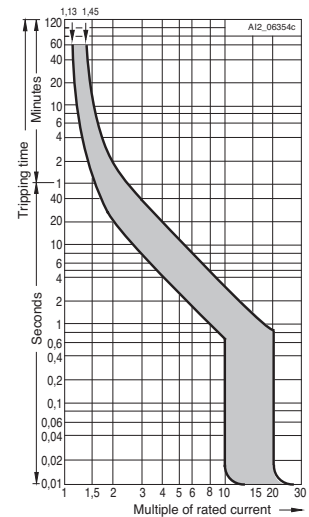
#### Tripping characteristic C, -7

Type C characteristic is for general device protection in control circuits. Magnetic trip point - 5 to 10 times  $I_n$  rating. Thermal trip point - 1.13 to 1.45 protector rating.



#### Tripping characteristic D, -8

Type D characteristic is designed for high inrush loads. Magnetic trip point - 10 to 20 times  $I_n$  rating. Thermal trip point - 1.13 to 1.45 protector rating.






For different ambient temperatures, the current values of the delayed tripping operation change by approximately 5% per 10°K temperature difference. Specifically they increase for temperatures below 25°C (5SJ41), 30°C (5SP, 5SY) and decrease for temperatures above 25°C (5SJ41), 30°C (5SP, 5SY).

For DC voltages the maximum current values of the instantaneous tripping operation increase by a factor of 1.2.

If more than one electrical circuit is loaded in a series of miniature circuit breakers or supplementary protectors, the resulting increase in ambient temperature affects the characteristic curve. In this case an additional correction factor found in the following table must be used.

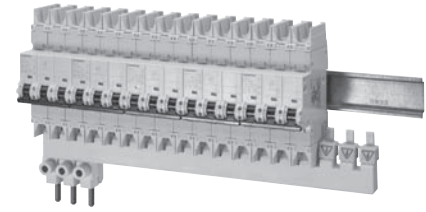
Number	1	2 - 3	4 - 6	> 7
Correction factor K	1.00	0.90	0.88	0.85

## Selection and ordering data

5SJ4 Miniature Circuit Breaker Guide			
Catalog Series	5SJ41...-.HG40	5SJ4...-.HG41	5SJ4...-.HG42
Rated Voltage	240, 120 VAC 60 VDC Same Polarity	240 VAC 60/125 VDC	480Y/277 VAC 60/125 VDC
Number of Poles	1-Pole	1-, 2- and 3-Poles	
Trip Characteristics	B, C, D	C, D	
Rated Current	B Characteristic: 6 to 63 A C and D Characteristic: 0.3 to 63 A		C Characteristic: 0.3 to 40 A D Characteristic: 0.3 to 32 A
Interrupting Ratings <sup>1)</sup>	B Characteristic: 14 kA (6 to 63 A)	—	—
	C Characteristic: 14 kA (0.3 to 40 A) 10 kA (45 to 63 A)		C Characteristic: 10 kA (0.3 to 40 A) <sup>2)</sup>
	D Characteristic: 14 kA (0.3 to 20 A) 10 kA (25 to 63 A)		D Characteristic: 10 kA (0.3 to 32 A) <sup>2)</sup>

1) 14 kA = Type HSJ; 10 kA = Type NSJ.

2) At 240 VAC the Interrupting Rating is the same as the 5SJ4...-.HG40 and .HG41.



5SJ4...-.HG41 Miniature Circuit Breakers

## Certifications:

CE

UL Listed and Certified to Canadian  
Standards  
HACR Rated

## Features

## Features – UL 489

- Suitable for Branch Circuit Protection Applications up to 277 VAC and 60 VDC (1-pole); and, up to 480Y VAC and 125 VDC (2- and 3-pole)
- UL Listed and Certified to Canadian Standards, File E243414
- HACR Rated
- High AC Interrupting Ratings of up to 14,000 (Type HSJ) or 10,000 (Type NSJ) Maximum RMS Symmetrical Amps and, DC interrupting ratings of 10,000 Amps
- 40°C Calibration Base (Industrial Applications)
- Can be used for "field wiring" applications; AWG 14 to AWG 4, Copper (Cu) Only
- Suitable for "reverse feed" applications

## Features – EN/IEC 60 898

- 30°C Calibration Base
- Trip Characteristic B, C and D  
B: Designed for the protection of computers and electronic equipment. Magnetic trip point is 3 to 5 times the MCB rating.  
C: Designed for general device protection in control circuits and all other miniature circuit breaker systems. Magnetic trip point is 5 to 10 times the MCB rating.  
D: Designed for high inrush loads. Magnetic trip point is 10 to 20 times the MCB rating.
- Rated voltage of 24 VAC minimum, 440 VAC Maximum and 60 VDC per pole
- High Interrupting Rating (I<sub>cn</sub>) of up to 10,000 Amps
- 0.75 to 35 mm<sup>2</sup> solid and stranded conductors

## Features – Common

- Depending on the device selected
  - Available with 1-, 2- or 3-poles
  - Available from 0.3 to 63 amps
- Visible Indicator for ON and OFF/Trip
- Touch Protection to EN50274
- DIN Rail Mounting (Standard 35 mm)
- Identical Wire Screw Connections on Line and Load Sides
- Smaller Size than traditional MCCB's

Auxiliary Circuit Switches (AS) are available with One Normally Open + One Normally Closed, Two Normally Open or Two Normally Closed contacts. They are primarily used to signal the miniature circuit breaker's trip mechanism position.

Fault Signal Contacts (FC) are available with One Normally Open + One Normally Closed, Two Normally Open or Two Normally Closed contacts. They are primarily used to signal the automatic tripping of the miniature circuit breaker's trip mechanism; and, trip position.

Shunt Trip Switches (ST) are available in voltages of 110 to 480 VAC and 24 to 60 V AC/DC. They are used for remote tripping of a miniature circuit breaker.

5ST366-.HG busbars, touch protection covers and terminal connectors are intended for use with Siemens lines of 5SJ4...-.HG4. UL 489 Miniature Circuit Breakers. They are UL Recognized (File E32159) with a rating of 115 Amps maximum at 480Y/277 VAC. Busbars are available in 1-, 2- or 3-pole versions.

Touch Protection Covers are used to cover any unused busbar terminals. They are intended to protect a user from live electrical parts.

Terminal Connectors are used to connect electrical conductors up to 1 AWG (50mm<sup>2</sup>) to the busbar terminals. Two versions are available; connect directly to the miniature circuit breaker or direct connection to the busbar.


## 5SJ Branch Circuit Protection

5SJ4 70 mm mounting depth

## Features

**5SJ41...HG40** miniature circuit breakers are designed to comply with UL 489 and CSA 22.2 No. 5-02 standards. They are used in single pole, branch circuit protection applications up to 240 VAC maximum and 60 VDC maximum, same polarity. Refer to Technical Data (page 16/8) for additional information.

## Selection and ordering data

	$I_n$	Characteristic B			Characteristic C			Characteristic D			Weight 1 Item kg
		Order No.	Inter- ruption Type <sup>1)</sup>	List Price \$ 1 item	Order No.	Inter- ruption Type <sup>1)</sup>	List Price \$ 1 item	Order No.	Inter- ruption Type <sup>1)</sup>	List Price \$ 1 item	
	0.3	—	—	—	5SJ4114-7HG40	HSJ	—	5SJ4114-8HG40	HSJ	—	0.155
	0.5	—	—	—	5SJ4105-7HG40	HSJ	—	5SJ4105-8HG40	HSJ	—	
	1	—	—	—	5SJ4101-7HG40	HSJ	—	5SJ4101-8HG40	HSJ	—	
	1.6	—	—	—	5SJ4115-7HG40	HSJ	—	5SJ4115-8HG40	HSJ	—	
	2	—	—	—	5SJ4102-7HG40	HSJ	—	5SJ4102-8HG40	HSJ	—	
	3	—	—	—	5SJ4103-7HG40	HSJ	—	5SJ4103-8HG40	HSJ	—	
	4	—	—	—	5SJ4104-7HG40	HSJ	—	5SJ4104-8HG40	HSJ	—	
	5	—	—	—	5SJ4111-7HG40	HSJ	—	5SJ4111-8HG40	HSJ	—	
	6	5SJ4106-6HG40	HSJ	—	5SJ4106-7HG40	HSJ	—	5SJ4106-8HG40	HSJ	—	
	8	—	—	—	5SJ4108-7HG40	HSJ	—	5SJ4108-8HG40	HSJ	—	
	10	5SJ4110-6HG40	HSJ	—	5SJ4110-7HG40	HSJ	—	5SJ4110-8HG40	HSJ	—	
	13	5SJ4113-6HG40	HSJ	—	5SJ4113-7HG40	HSJ	—	5SJ4113-8HG40	HSJ	—	
	15	5SJ4118-6HG40	HSJ	—	5SJ4118-7HG40	HSJ	—	5SJ4118-8HG40	HSJ	—	
	16	5SJ4116-6HG40	HSJ	—	5SJ4116-7HG40	HSJ	—	5SJ4116-8HG40	HSJ	—	
	20	5SJ4120-6HG40	HSJ	—	5SJ4120-7HG40	HSJ	—	5SJ4120-8HG40	HSJ	—	
	25	5SJ4125-6HG40	HSJ	—	5SJ4125-7HG40	HSJ	—	5SJ4125-8HG40	NSJ	—	
	30	5SJ4130-6HG40	HSJ	—	5SJ4130-7HG40	HSJ	—	5SJ4130-8HG40	NSJ	—	
	32	5SJ4132-6HG40	HSJ	—	5SJ4132-7HG40	HSJ	—	5SJ4132-8HG40	NSJ	—	
	35	5SJ4135-6HG40	HSJ	—	5SJ4135-7HG40	HSJ	—	5SJ4135-8HG40	NSJ	—	
	40	5SJ4140-6HG40	HSJ	—	5SJ4140-7HG40	HSJ	—	5SJ4140-8HG40	NSJ	—	
45	5SJ4145-6HG40	HSJ	—	5SJ4145-7HG40	NSJ	—	5SJ4145-8HG40	NSJ	—		
50	5SJ4150-6HG40	HSJ	—	5SJ4150-7HG40	NSJ	—	5SJ4150-8HG40	NSJ	—		
60	5SJ4160-6HG40	HSJ	—	5SJ4160-7HG40	NSJ	—	5SJ4160-8HG40	NSJ	—		
63	5SJ4163-6HG40	HSJ	—	5SJ4163-7HG40	NSJ	—	5SJ4163-8HG40	NSJ	—		

1) Interrupting Rating to UL489, AC Max. RMS Symmetrical: Type NSJ = 10kA, Type HSJ = 14 kA.






# 5SJ Branch Circuit Protection

5SJ4 70 mm mounting depth

## Features

**5SJ4...-HG41** miniature circuit breakers are designed to comply with UL 489 and CSA 22.2 No. 5-02 standards. They are used in single and multi-pole, branch circuit protection applications up to 240 VAC maximum and 60/125 VDC maximum. Refer to Technical Data (page 16/8) for additional information.

## Selection and ordering data

	$I_n$	Characteristic C Order No.	Interruption Type <sup>1)</sup>	List Price \$ 1 item	Characteristic D Order No.	Interruption Type <sup>1)</sup>	List Price \$ 1 item	Weight 1 item kg
 <p>1-pole</p> <p>1 2</p>	0.3	5SJ4114-7HG41	HSJ		5SJ4114-8HG41	HSJ		0.155
	0.5	5SJ4105-7HG41	HSJ		5SJ4105-8HG41	HSJ		
	1	5SJ4101-7HG41	HSJ		5SJ4101-8HG41	HSJ		
	1.6	5SJ4115-7HG41	HSJ		5SJ4115-8HG41	HSJ		
	2	5SJ4102-7HG41	HSJ		5SJ4102-8HG41	HSJ		
	3	5SJ4103-7HG41	HSJ		5SJ4103-8HG41	HSJ		
	4	5SJ4104-7HG41	HSJ		5SJ4104-8HG41	HSJ		
	5	5SJ4111-7HG41	HSJ		5SJ4111-8HG41	HSJ		
	6	5SJ4106-7HG41	HSJ		5SJ4106-8HG41	HSJ		
	8	5SJ4108-7HG41	HSJ		5SJ4108-8HG41	HSJ		
	10	5SJ4110-7HG41	HSJ		5SJ4110-8HG41	HSJ		
	13	5SJ4113-7HG41	HSJ		5SJ4113-8HG41	HSJ		
	15	5SJ4118-7HG41	HSJ		5SJ4118-8HG41	HSJ		
	16	5SJ4116-7HG41	HSJ		5SJ4116-8HG41	HSJ		
	20	5SJ4120-7HG41	HSJ		5SJ4120-8HG41	HSJ		
	25	5SJ4125-7HG41	HSJ		5SJ4125-8HG41	NSJ		
	30	5SJ4130-7HG41	HSJ		5SJ4130-8HG41	NSJ		
32	5SJ4132-7HG41	HSJ		5SJ4132-8HG41	NSJ			
35	5SJ4135-7HG41	HSJ		5SJ4135-8HG41	NSJ			
40	5SJ4140-7HG41	HSJ		5SJ4140-8HG41	NSJ			
45	5SJ4145-7HG41	NSJ		5SJ4145-8HG41	NSJ			
50	5SJ4150-7HG41	NSJ		5SJ4150-8HG41	NSJ			
60	5SJ4160-7HG41	NSJ		5SJ4160-8HG41	NSJ			
63	5SJ4163-7HG41	NSJ		5SJ4163-8HG41	NSJ			
 <p>2-pole</p> <p>1 3 2 4</p>	0.3	5SJ4214-7HG41	HSJ		5SJ4214-8HG41	HSJ		0.310
	0.5	5SJ4205-7HG41	HSJ		5SJ4205-8HG41	HSJ		
	1	5SJ4201-7HG41	HSJ		5SJ4201-8HG41	HSJ		
	1.6	5SJ4215-7HG41	HSJ		5SJ4215-8HG41	HSJ		
	2	5SJ4202-7HG41	HSJ		5SJ4202-8HG41	HSJ		
	3	5SJ4203-7HG41	HSJ		5SJ4203-8HG41	HSJ		
	4	5SJ4204-7HG41	HSJ		5SJ4204-8HG41	HSJ		
	5	5SJ4211-7HG41	HSJ		5SJ4211-8HG41	HSJ		
	6	5SJ4206-7HG41	HSJ		5SJ4206-8HG41	HSJ		
	8	5SJ4208-7HG41	HSJ		5SJ4208-8HG41	HSJ		
	10	5SJ4210-7HG41	HSJ		5SJ4210-8HG41	HSJ		
	13	5SJ4213-7HG41	HSJ		5SJ4213-8HG41	HSJ		
	15	5SJ4218-7HG41	HSJ		5SJ4218-8HG41	HSJ		
	16	5SJ4216-7HG41	HSJ		5SJ4216-8HG41	HSJ		
	20	5SJ4220-7HG41	HSJ		5SJ4220-8HG41	HSJ		
	25	5SJ4225-7HG41	HSJ		5SJ4225-8HG41	NSJ		
	30	5SJ4230-7HG41	HSJ		5SJ4230-8HG41	NSJ		
32	5SJ4232-7HG41	HSJ		5SJ4232-8HG41	NSJ			
35	5SJ4235-7HG41	HSJ		5SJ4235-8HG41	NSJ			
40	5SJ4240-7HG41	HSJ		5SJ4240-8HG41	NSJ			
45	5SJ4245-7HG41	NSJ		5SJ4245-8HG41	NSJ			
50	5SJ4250-7HG41	NSJ		5SJ4250-8HG41	NSJ			
60	5SJ4260-7HG41	NSJ		5SJ4260-8HG41	NSJ			
63	5SJ4263-7HG41	NSJ		5SJ4263-8HG41	NSJ			
 <p>3-pole</p> <p>1 3 5 2 4 6</p>	0.3	5SJ4314-7HG41	HSJ		5SJ4314-8HG41	HSJ		0.465
	0.5	5SJ4305-7HG41	HSJ		5SJ4305-8HG41	HSJ		
	1	5SJ4301-7HG41	HSJ		5SJ4301-8HG41	HSJ		
	1.6	5SJ4315-7HG41	HSJ		5SJ4315-8HG41	HSJ		
	2	5SJ4302-7HG41	HSJ		5SJ4302-8HG41	HSJ		
	3	5SJ4303-7HG41	HSJ		5SJ4303-8HG41	HSJ		
	4	5SJ4304-7HG41	HSJ		5SJ4304-8HG41	HSJ		
	5	5SJ4311-7HG41	HSJ		5SJ4311-8HG41	HSJ		
	6	5SJ4306-7HG41	HSJ		5SJ4306-8HG41	HSJ		
	8	5SJ4308-7HG41	HSJ		5SJ4308-8HG41	HSJ		
	10	5SJ4310-7HG41	HSJ		5SJ4310-8HG41	HSJ		
	13	5SJ4313-7HG41	HSJ		5SJ4313-8HG41	HSJ		
	15	5SJ4318-7HG41	HSJ		5SJ4318-8HG41	HSJ		
	16	5SJ4316-7HG41	HSJ		5SJ4316-8HG41	HSJ		
	20	5SJ4320-7HG41	HSJ		5SJ4320-8HG41	HSJ		
	25	5SJ4325-7HG41	HSJ		5SJ4325-8HG41	NSJ		
	30	5SJ4330-7HG41	HSJ		5SJ4330-8HG41	NSJ		
32	5SJ4332-7HG41	HSJ		5SJ4332-8HG41	NSJ			
35	5SJ4335-7HG41	HSJ		5SJ4335-8HG41	NSJ			
40	5SJ4340-7HG41	HSJ		5SJ4340-8HG41	NSJ			
45	5SJ4345-7HG41	NSJ		5SJ4345-8HG41	NSJ			
50	5SJ4350-7HG41	NSJ		5SJ4350-8HG41	NSJ			
60	5SJ4360-7HG41	NSJ		5SJ4360-8HG41	NSJ			
63	5SJ4363-7HG41	NSJ		5SJ4363-8HG41	NSJ			

<sup>1)</sup> Interrupting Rating to UL489, AC Max. RMS Symmetrical: Type NSJ = 10kA, Type HSJ = 14 kA.









# 5SJ Branch Circuit Protection

5SJ4 70 mm mounting depth

## Features

**5SJ4...-HG42** miniature circuit breakers are designed to comply with UL 489 and CSA 22.2 No. 5-02 standards. They are used in single and multi-pole, branch circuit protection and feeder applications up to 480Y/277 VAC maximum and 60/125 VDC maximum. Refer to Technical Data (page 16/8) for additional information.

## Selection and ordering data

	$I_n$	Characteristic C Order No.	Interruption Type <sup>1)</sup>	List Price \$ 1 item	Characteristic D Order No.	Interruption Type <sup>1)</sup>	List Price \$ 1 item	Weight 1 item kg
	<b>1-pole</b> 	0.3	5SJ4114-7HG42	NSJ	5SJ4114-8HG42	NSJ	0.155	
		0.5	5SJ4105-7HG42	NSJ	5SJ4105-8HG42	NSJ		
		1	5SJ4101-7HG42	NSJ	5SJ4101-8HG42	NSJ		
		1.6	5SJ4115-7HG42	NSJ	5SJ4115-8HG42	NSJ		
		2	5SJ4102-7HG42	NSJ	5SJ4102-8HG42	NSJ		
		3	5SJ4103-7HG42	NSJ	5SJ4103-8HG42	NSJ		
		4	5SJ4104-7HG42	NSJ	5SJ4104-8HG42	NSJ		
		5	5SJ4111-7HG42	NSJ	5SJ4111-8HG42	NSJ		
		6	5SJ4106-7HG42	NSJ	5SJ4106-8HG42	NSJ		
		8	5SJ4108-7HG42	NSJ	5SJ4108-8HG42	NSJ		
		10	5SJ4110-7HG42	NSJ	5SJ4110-8HG42	NSJ		
		13	5SJ4113-7HG42	NSJ	5SJ4113-8HG42	NSJ		
		15	5SJ4118-7HG42	NSJ	5SJ4118-8HG42	NSJ		
		16	5SJ4116-7HG42	NSJ	5SJ4116-8HG42	NSJ		
		20	5SJ4120-7HG42	NSJ	5SJ4120-8HG42	NSJ		
		25	5SJ4125-7HG42	NSJ	5SJ4125-8HG42	NSJ		
		30	5SJ4130-7HG42	NSJ	5SJ4130-8HG42	NSJ		
32	5SJ4132-7HG42	NSJ	5SJ4132-8HG42	NSJ				
35	5SJ4135-7HG42	NSJ	—	—				
40	5SJ4140-7HG42	NSJ	—	—				
	<b>2-pole</b> 	0.3	5SJ4214-7HG42	NSJ	5SJ4214-8HG42	NSJ	0.310	
		0.5	5SJ4205-7HG42	NSJ	5SJ4205-8HG42	NSJ		
		1	5SJ4201-7HG42	NSJ	5SJ4201-8HG42	NSJ		
		1.6	5SJ4215-7HG42	NSJ	5SJ4215-8HG42	NSJ		
		2	5SJ4202-7HG42	NSJ	5SJ4202-8HG42	NSJ		
		3	5SJ4203-7HG42	NSJ	5SJ4203-8HG42	NSJ		
		4	5SJ4204-7HG42	NSJ	5SJ4204-8HG42	NSJ		
		5	5SJ4211-7HG42	NSJ	5SJ4211-8HG42	NSJ		
		6	5SJ4206-7HG42	NSJ	5SJ4206-8HG42	NSJ		
		8	5SJ4208-7HG42	NSJ	5SJ4208-8HG42	NSJ		
		10	5SJ4210-7HG42	NSJ	5SJ4210-8HG42	NSJ		
		13	5SJ4213-7HG42	NSJ	5SJ4213-8HG42	NSJ		
		15	5SJ4218-7HG42	NSJ	5SJ4218-8HG42	NSJ		
		16	5SJ4216-7HG42	NSJ	5SJ4216-8HG42	NSJ		
		20	5SJ4220-7HG42	NSJ	5SJ4220-8HG42	NSJ		
		25	5SJ4225-7HG42	NSJ	5SJ4225-8HG42	NSJ		
		30	5SJ4230-7HG42	NSJ	5SJ4230-8HG42	NSJ		
32	5SJ4232-7HG42	NSJ	5SJ4232-8HG42	NSJ				
35	5SJ4235-7HG42	NSJ	—	—				
40	5SJ4240-7HG42	NSJ	—	—				
	<b>3-pole</b> 	0.3	5SJ4314-7HG42	NSJ	5SJ4314-8HG42	NSJ	0.465	
		0.5	5SJ4305-7HG42	NSJ	5SJ4305-8HG42	NSJ		
		1	5SJ4301-7HG42	NSJ	5SJ4301-8HG42	NSJ		
		1.6	5SJ4315-7HG42	NSJ	5SJ4315-8HG42	NSJ		
		2	5SJ4302-7HG42	NSJ	5SJ4302-8HG42	NSJ		
		3	5SJ4303-7HG42	NSJ	5SJ4303-8HG42	NSJ		
		4	5SJ4304-7HG42	NSJ	5SJ4304-8HG42	NSJ		
		5	5SJ4311-7HG42	NSJ	5SJ4311-8HG42	NSJ		
		6	5SJ4306-7HG42	NSJ	5SJ4306-8HG42	NSJ		
		8	5SJ4308-7HG42	NSJ	5SJ4308-8HG42	NSJ		
		10	5SJ4310-7HG42	NSJ	5SJ4310-8HG42	NSJ		
		13	5SJ4313-7HG42	NSJ	5SJ4313-8HG42	NSJ		
		15	5SJ4318-7HG42	NSJ	5SJ4318-8HG42	NSJ		
		16	5SJ4316-7HG42	NSJ	5SJ4316-8HG42	NSJ		
		20	5SJ4320-7HG42	NSJ	5SJ4320-8HG42	NSJ		
		25	5SJ4325-7HG42	NSJ	5SJ4325-8HG42	NSJ		
		30	5SJ4330-7HG42	NSJ	5SJ4330-8HG42	NSJ		
32	5SJ4332-7HG42	NSJ	5SJ4332-8HG42	NSJ				
35	5SJ4335-7HG42	NSJ	—	—				
40	5SJ4340-7HG42	NSJ	—	—				

1) Interrupting Rating to UL489, AC Max. RMS Symmetrical: Type NSJ = 10kA.















## 5SJ Branch Circuit Protection

## Additional components for 5SJ4 Branch Circuit Protection

## Features

- For use with the **5SJ4...-HG4** family of miniature circuit breakers
- UL Listed and CSA Certified to UL 489

## Selection and ordering data

			Order No.	List Price \$	Weight 1 item
			1 item		kg
	<b>Auxiliary switches (AS)</b>				
		1 NO + 1 NC	<b>5ST 3010-0HG</b>		0.050
		2 NO	<b>5ST 3011-0HG</b>		
		2 NC	<b>5ST 3012-0HG</b>		
	<b>Fault signal contacts (FC)</b>				
		1 NO + 1 NC	<b>5ST 3020-0HG</b>		0.050
		2 NO	<b>5ST 3021-0HG</b>		
		2 NC	<b>5ST 3022-0HG</b>		
	<b>Shunt trip (ST)</b>				
		110 - 480 VAC	<b>5ST 3030-0HG</b>		0.098
		24 - 60 V AC/DC	<b>5ST 3031-0HG</b>		0.098
	<b>Busbars</b>				
	<b>Fixed lengths, cannot be cut<sup>1)</sup></b>	<b>Length</b>			
	1-Pole	For 6 MCBs For 12 MCBs For 18 MCBs	100 mm 205 mm 310 mm	<b>5ST 3663-0HG</b> <b>5ST 3663-1HG</b> <b>5ST 3663-2HG</b>	0.056 0.112 0.170
	2-Pole	For 3 MCBs For 6 MCBs For 9 MCBs	100 mm 205 mm 310 mm	<b>5ST 3664-0HG</b> <b>5ST 3664-1HG</b> <b>5ST 3664-2HG</b>	0.065 0.137 0.211
	3-Pole	For 2 MCBs For 4 MCBs For 6 MCBs	100 mm 205 mm 310 mm	<b>5ST 3665-0HG</b> <b>5ST 3665-1HG</b> <b>5ST 3665-2HG</b>	0.067 0.155 0.243
	<b>Connection terminals</b>				
	Infeed - MCBs	35 mm <sup>2</sup>	<b>5ST 3666-0HG</b>		0.033
	Infeed - busbars	50 mm <sup>2</sup>	<b>5ST 3666-2HG</b>		0.034
	<b>Touch protection covers<sup>2)</sup></b>	3 x 1 pin	<b>5ST 3666-1HG</b>		0.003

1) Cut-able BusBars Availability to be announced.

2) Always cover all exposed terminals with touch protection covers 5ST3666-1HG.

## Technical data

		5SJ41...-HG40	5SJ4...-HG41	5SJ4...-HG42
<b>Standards Certifications</b>		EN 60898; EN 60947-2; UL 489; CSA C22.2 No. 5-02 CE; cULus, UL File No. E243414		
<b>Tripping characteristic</b>		B, C, D	C, D	
<b>Number of poles</b>		1	1, 2 & 3	
<b>Operating voltage</b>		Min. V AC/DC	24	
- IEC 60898		Max. V DC/pole	60	
		Max. V AC	440	
- UL 489 and CSA C22.2 No. 5-02		Max. V AC	240 Same Polarity	240
		V DC/1P	60	60
		V DC/2P, 3P	—	125
<b>Interrupting rating <sup>1)</sup></b>				
- I <sub>cn</sub> to IEC 60898-1		kA AC	10	
- UL 489 and CSA C22.2 No. 5-02			Type NSJ: 10kA	
AC: Max. RMS Symmetrical		kA AC	Type HSJ: 14kA	
<b>Touch protection to EN 50274</b>		Yes		
<b>Degree of protection to EN 60529</b>		IP20, with connected conductors		
<b>CFC and silicone free</b>		Yes		
<b>Mounting</b>		On standard mounting rail (DIN 35 mm)		
<b>Device depth</b>		mm	70	
<b>Terminals</b>			Yes	
- Identical screw terminals on both line and load sides			31	
- Terminal tightening torque		lb. in.	3.5	
		Nm		
<b>Conductor cross sections</b>		mm <sup>2</sup>	Solid and Stranded: 0.75 to 35	
		mm <sup>2</sup>	Finely Stranded, with end sleeve: 0.75 to 25	
		AWG	14 to 4, 60/75°C, Cu Only	
<b>Calibration Base</b>		°C	40 (UL 489) 30 (EN 60898)	
<b>Average service life, with rated load</b>			20,000 actuations	
<b>Ambient temperature</b>		°C	-25 to 45, occasionally +55, max. 95% humidity	
<b>Storage Temperature</b>		°C	-40 to +75	
<b>Resistance to vibration to IEC 60068-2-6</b>		m/s <sup>2</sup>	60 at 10 Hz to 150 Hz	

1) See Selection and ordering data for specific device interrupting rating

## Busbar &amp; Connecting Terminals

Material Version		Busbars	Connecting Terminals	
		5ST3663	5ST3666-0HG	5ST3666-2HG
		5ST3664		
		5ST3665		
<b>Standards Certifications</b>		UL 489 UL Listed, File No. E243414		
<b>Operating voltage</b>				
- IEC 60898		VAC	690	
- UL 489		VAC	480Y/277 and 240	
<b>Rated current to 40°C</b>		A	115	
<b>Busbar cross section</b>		mm <sup>2</sup>	16 (Copper)	
<b>Conductor cross sections</b>		Solid and Stranded mm <sup>2</sup>	-	2.5 to 35
			-	14 to 2
			-	2.5 to 50
			-	14 to 1
<b>Terminal tightening torque</b>		lb. in.	-	30
		Nm	-	3.3
<b>Temperature Resistance</b>		°C	200 - UL 94-V0/0.4mm	

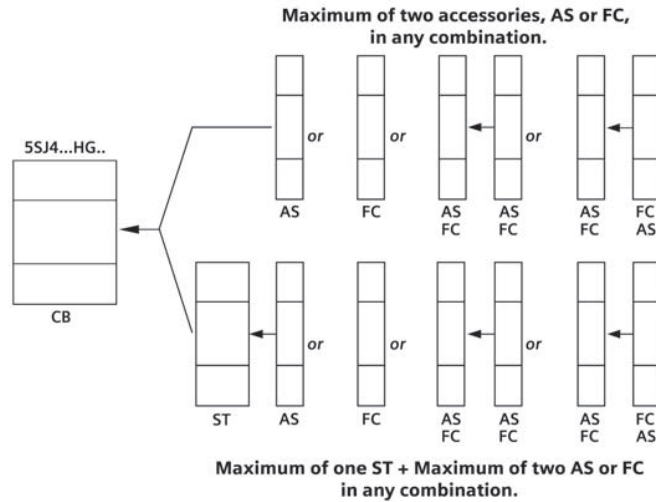
### Technical data

#### Auxiliary Switch (AS), Fault Signal Contacts (FC) and Shunt Trip (ST)

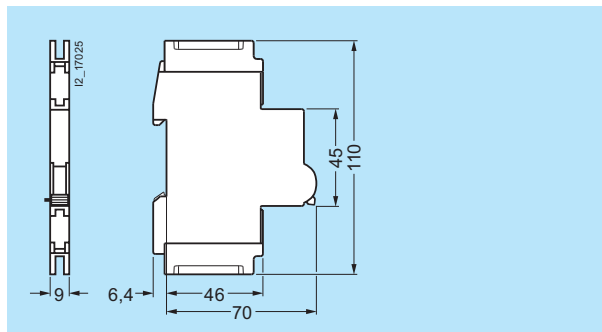
Material Version	AS 5ST301.-0HG	FC 5ST302.-0HG	ST 5ST3030-0HG	5ST3032-0HG
<b>Standards</b>	UL 489; CSA C22.2 No. 5-02 IEC/EN 62019, IEC/EN 60947-5-1		IEC/EN 60947-1	
<b>Certifications</b>	CE, UL 489, CSA, UL File No. E321559			
<b>Rated voltages/load</b>	IEC AC V 400   230 AC A 2   6 (NC:AC13, NO: AC14) DC V 220   110   60   24 DC A 1   1   3   6 (DC 13)		110 to 415 - 110 -	24 to 60 - 24 to 60 -
	UL AC V 480   277   240   120 AC A 1.5   3   4   6 DC V 125   60 DC A 1   3		110 to 480 - - -	24 to 60 - 24 to 60 -
<b>Contact load</b>	min. 50 mA, 24 V		-	-
<b>Conductor cross-sections</b>	AWG mm <sup>2</sup>	22 ... 14 0.5 ... 2.5	22 ... 14 0.5 ... 2.5	
<b>Terminals - terminal tightening torque</b>	Nm lb/in.	0.5 max. 4.5	0.8 max. 6.8	

### Applications

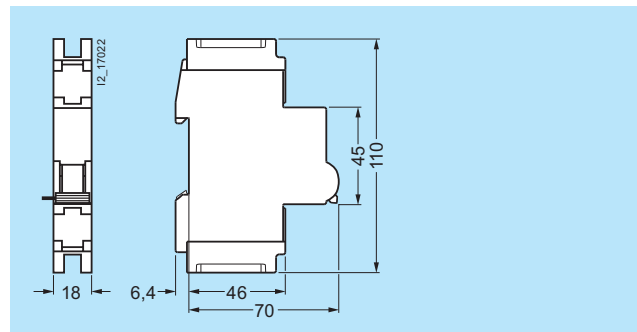
Auxiliary Switch (AS), Fault Signal Contact (FC) and Shunt Trip (ST) accessories are used with 5SJ4...-HG4. miniature circuit breakers (CB) and are mounted to the right of them.



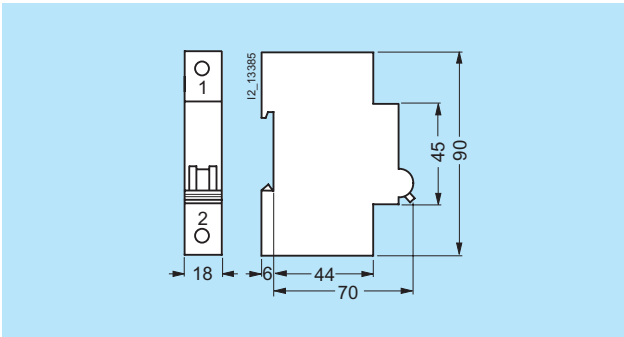
### Dimensions



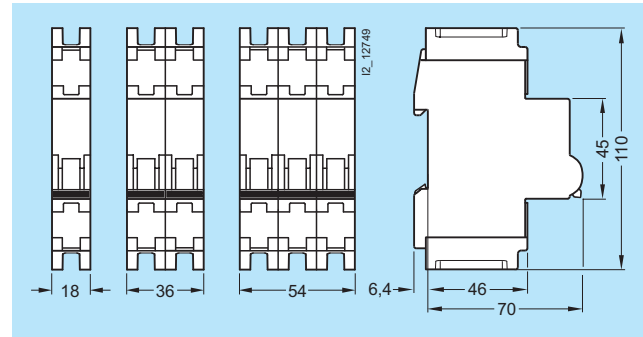
5ST3 010-0HG 5ST3 011-0HG 5ST3 012-0HG  
5ST3 020-0HG 5ST3 021-0HG 5ST3 022-0HG



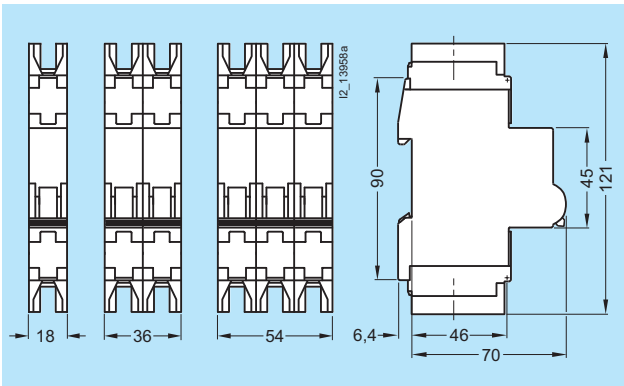
5ST3 030-0HG  
5ST3 031-0HG



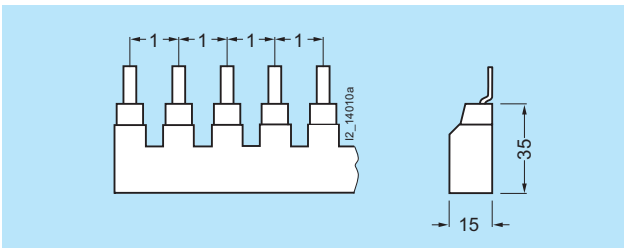
5SJ4...-HG40



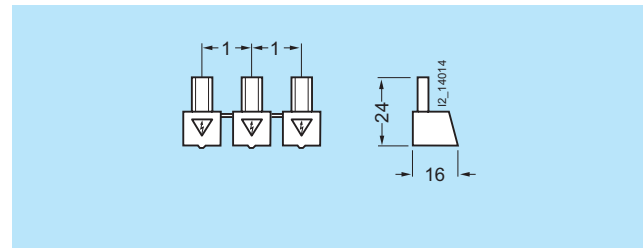
5SJ4...-HG41



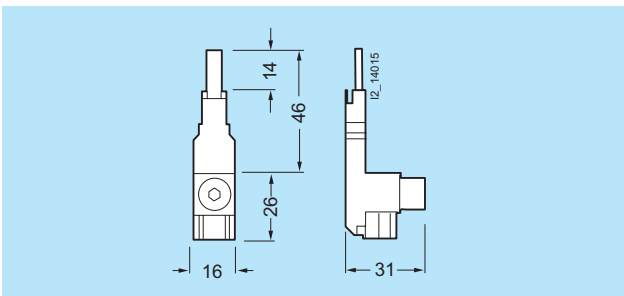
5SJ4...-HG42



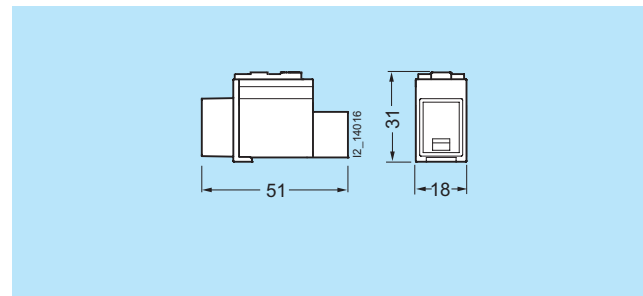
5ST3 663-0HG    5ST3 664-0HG    5ST3 665-0HG  
 5ST3 663-1HG    5ST3 664-1HG    5ST3 665-1HG  
 5ST3 663-2HG    5ST3 664-2HG    5ST3 665-2HG



5ST3 666-1HG



5ST3 666-0HG



5ST3 666-2HG

### Application

Siemens' UL 1077 Supplementary Protectors are designed to provide additional protection along with a branch circuit protection device. Since our Supplementary protectors are made to trip faster than a standard UL 489 Circuit Breaker they are able to provide additional protection for more sensitive devices inside the panel. Supplementary protectors can be used in a number of industrial applications such as to provide selectivity for multiple motor control circuits on the secondary side of a control transformer or power supply by allowing the user to quickly find the problem circuit should a fault occur without having to shut down all of the other control circuits. Supplementary protectors may also be used as a local disconnecting means inside the panel when a branch circuit protection device is already present.

Always remember to follow the National Electric code when wiring your panel for applications within the United States.

### Design

Supplementary protectors are equipped with a delayed overload/time-dependent thermal release (thermal bimetal) for low overcurrents and with an instantaneous electromagnetic release for high overload and short-circuit currents.

The special contact materials used virtually guarantee a long service life and offer a high degree of protection against contact welding.

### Mode of operation

Thanks to the extremely fast contact separation in cases of failures and the rapid quenching of the arc consequently generated in the arcing chamber, supplementary protectors assure a safe and current-limiting off-switching.

The permissible limit- $I^2t$ -values of the energy limitation class 3 specified in EN 60 898 are generally undercut. This guarantees an excellent selectivity towards upstream overcurrent protection devices.

### Features

- High rated breaking capacity of up to 10,000 A acc. to EN 60 898 / up to 15 kA acc. to EN 60 947-2
- Excellent current limiting and selectivity characteristics
- Tripping characteristic A, B, C and D
- Terminals offer protection against contact with fingers or the back of the hand acc. to the German accident prevention regulations VBG 4/ BGV A2
- Combined terminals enable a simultaneous connection of busbars and feeder cables
- Uniform components that can be quickly mounted individually, thanks to their snap-on technique
- The handle locking device virtually prevents any unauthorized operation of the handle

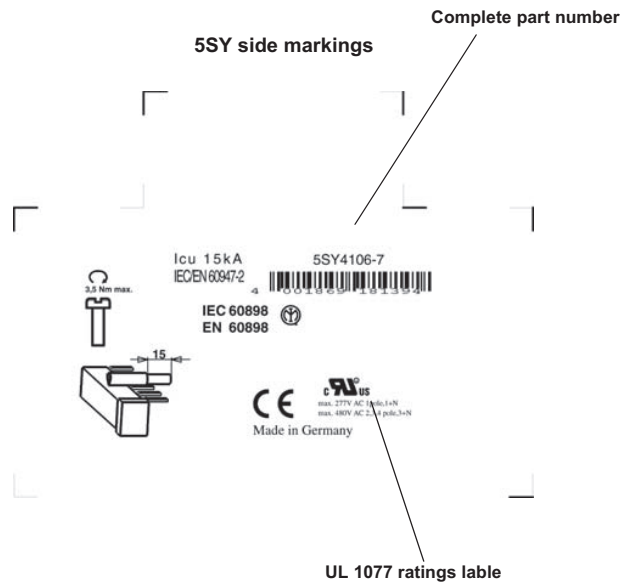
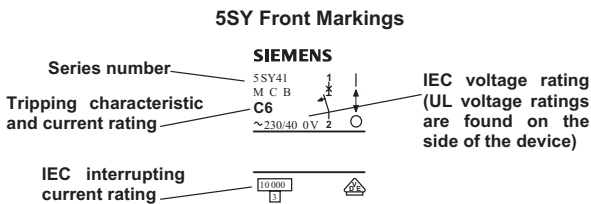
### Features of 5SY

- Rapid connection of the feeder cable in front of the busbar
- Identical terminals at both sides for an optional infeed from the top or the bottom
- No tool required for mounting or dismounting
- Supports a fast and comfortable removal from the assembly
- Trip indication

### Features of 5SP4

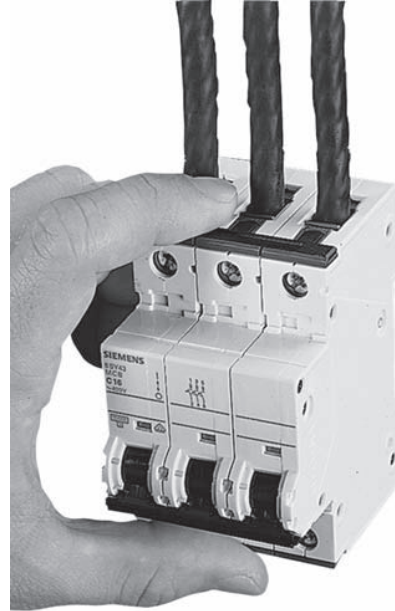
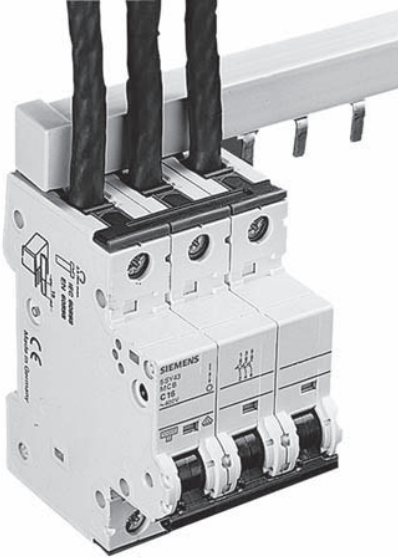
- Disconnection characteristics acc. to EN 60947-3 (DIN VDE 0660 Part 107)
- Main switch characteristics acc. to EN 60 204-1
- Can be screwed onto bases
- Separate switch position indication.

### Device markings



## Overview

### Features of 5SY supplementary protectors

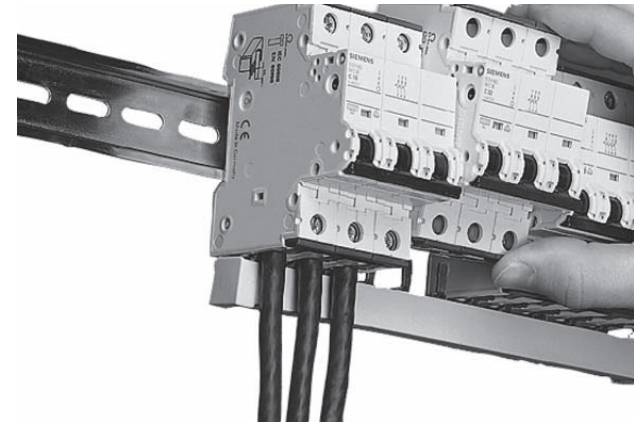
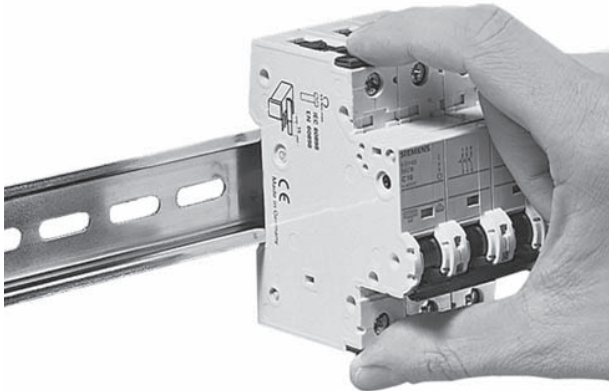


#### Easier, faster, enlarged wiring space

- Identical top and bottom terminals
- Connection of incoming cables vis-à-vis of the busbar
- Enlarged and easily accessible wiring space for the feeder cables
- Comfortable insertion of the incoming cables into the terminal
- Defined, visible and controllable connection of the feeder cables
- Universal infeed with top and bottom busbar mounting options.

#### Protection against contact with clear advantages

- Integrated movable terminal covers located at the feeder cable input
- The terminals are completely closed when screws are fully tightened
- Effective protection against contact, also when the device is fully grabbed



#### Flexible and no use of tools required

- Manually operable quick-assembly and disassembly systems requiring no use of tools
- Fast assembly and disassembly of 5SY supplementary protectors to and from the standard mounting rail.
- All devices can be easily and comfortably replaced at any time.

#### Removal from the assembly

Thanks to the combination of the various features stated above, 5SY supplementary protectors can be easily and rapidly removed from the assembly when circuits need to be changed - with these devices, removal of the busbar is no longer necessary.









# 5SY4 Supplementary Protection

5SY4 70 mm mounting depth

## Features

All 5SY4 designs have been certified to **UL 1077 and CSA 22.2 No. 235-M 89** and can therefore be used as "supplementary protectors" for applications up to 277 V AC (1-pole and 1-pole + N designs) and 480 V AC (2-pole, 3-pole, 3-pole + N and 4-pole designs).

## Selection and ordering data

	$I_n$	MW	Characteristic A		Characteristic B		Characteristic C		Characteristic D		Weight 1 item kg
			Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	
 <p><b>1-pole</b></p> 	A	1	—	—	—	—	—	—	—	—	0.165
	0.3	1	—	—	—	—	5SY4 114-7	5SY4 114-8	—	—	
	0.5	1	5SY4 105-5	—	—	—	5SY4 105-7	5SY4 105-8	—	—	
	1	1	5SY4 101-5	—	—	—	5SY4 101-7	5SY4 101-8	—	—	
	1.6	1	5SY4 115-5	—	—	—	5SY4 115-7	5SY4 115-8	—	—	
	2	1	5SY4 102-5	—	5SY4 102-6	—	5SY4 102-7	5SY4 102-8	—	—	
	3	1	5SY4 103-5	—	—	—	5SY4 103-7	5SY4 103-8	—	—	
	4	1	5SY4 104-5	—	5SY4 104-6	—	5SY4 104-7	5SY4 104-8	—	—	
	5	1	—	—	—	—	5SY4 111-7	—	—	—	
	6	1	5SY4 106-5	—	5SY4 106-6	—	5SY4 106-7	5SY4 106-8	—	—	
	8	1	5SY4 108-5	—	—	—	5SY4 108-7	5SY4 108-8	—	—	
	10	1	5SY4 110-5	—	5SY4 110-6	—	5SY4 110-7	5SY4 110-8	—	—	
	13	1	5SY4 113-5	—	5SY4 113-6	—	5SY4 113-7	5SY4 113-8	—	—	
	15	1	—	—	—	—	5SY4 118-7	—	—	—	
	16	1	5SY4 116-5	—	5SY4 116-6	—	5SY4 116-7	5SY4 116-8	—	—	
	20	1	5SY4 120-5	—	5SY4 120-6	—	5SY4 120-7	5SY4 120-8	—	—	
	25	1	5SY4 125-5	—	5SY4 125-6	—	5SY4 125-7	5SY4 125-8	—	—	
	30	1	—	—	—	—	5SY4 130-7	—	—	—	
	32	1	5SY4 132-5	—	5SY4 132-6	—	5SY4 132-7	5SY4 132-8	—	—	
35	1	—	—	—	—	5SY4 135-7	—	—	—		
40	1	5SY4 140-5	—	5SY4 140-6	—	5SY4 140-7	5SY4 140-8	—	—		
45	1	—	—	—	—	5SY4 145-7	—	—	—		
50	1	5SY4 150-5	—	5SY4 150-6	—	5SY4 150-7	5SY4 150-8	—	—		
60	1	—	—	—	—	5SY4 160-7	—	—	—		
63	1	5SY4 163-5	—	5SY4 163-6	—	5SY4 163-7	5SY4 163-8	—	—		
 <p><b>1-pole + N</b></p> 	A	2	—	—	—	—	—	—	—	0.330	
	0.3	2	—	—	—	—	5SY4 514-7	5SY4 514-8	—		—
	0.5	2	—	—	—	—	5SY4 505-7	5SY4 505-8	—		—
	1	2	5SY4 501-5	—	—	—	5SY4 501-7	5SY4 501-8	—		—
	1.6	2	5SY4 515-5	—	—	—	5SY4 515-7	5SY4 515-8	—		—
	2	2	5SY4 502-5	—	—	—	5SY4 502-7	5SY4 502-8	—		—
	3	2	5SY4 503-5	—	—	—	5SY4 503-7	5SY4 503-8	—		—
	4	2	5SY4 504-5	—	—	—	5SY4 504-7	5SY4 504-8	—		—
	6	2	5SY4 506-5	—	5SY4 506-6	—	5SY4 506-7	5SY4 506-8	—		—
	8	2	5SY4 508-5	—	—	—	5SY4 508-7	5SY4 508-8	—		—
	10	2	5SY4 510-5	—	5SY4 510-6	—	5SY4 510-7	5SY4 510-8	—		—
	13	2	5SY4 513-5	—	5SY4 513-6	—	5SY4 513-7	5SY4 513-8	—		—
	16	2	5SY4 516-5	—	5SY4 516-6	—	5SY4 516-7	5SY4 516-8	—		—
	20	2	5SY4 520-5	—	5SY4 520-6	—	5SY4 520-7	5SY4 520-8	—		—
	25	2	5SY4 525-5	—	5SY4 525-6	—	5SY4 525-7	5SY4 525-8	—		—
32	2	5SY4 532-5	—	5SY4 532-6	—	5SY4 532-7	5SY4 532-8	—	—		
40	2	5SY4 540-5	—	5SY4 540-6	—	5SY4 540-7	5SY4 540-8	—	—		
50	2	5SY4 550-5	—	5SY4 550-6	—	5SY4 550-7	5SY4 550-8	—	—		
63	2	5SY4 563-5	—	5SY4 563-6	—	5SY4 563-7	5SY4 563-8	—	—		
 <p><b>2-pole</b></p> 	A	2	—	—	—	—	—	—	—	0.330	
	0.3	2	—	—	—	—	5SY4 214-7	5SY4 214-8	—		—
	0.5	2	5SY4 205-5	—	—	—	5SY4 205-7	5SY4 205-8	—		—
	1	2	5SY4 201-5	—	—	—	5SY4 201-7	5SY4 201-8	—		—
	1.6	2	5SY4 215-5	—	—	—	5SY4 215-7	5SY4 215-8	—		—
	2	2	5SY4 202-5	—	—	—	5SY4 202-7	5SY4 202-8	—		—
	3	2	5SY4 203-5	—	—	—	5SY4 203-7	5SY4 203-8	—		—
	4	2	5SY4 204-5	—	—	—	5SY4 204-7	5SY4 204-8	—		—
	5	2	—	—	—	—	5SY4 211-7	—	—		—
	6	2	5SY4 206-5	—	5SY4 206-6	—	5SY4 206-7	5SY4 206-8	—		—
	8	2	5SY4 208-5	—	—	—	5SY4 208-7	5SY4 208-8	—		—
	10	2	5SY4 210-5	—	5SY4 210-6	—	5SY4 210-7	5SY4 210-8	—		—
	13	2	5SY4 213-5	—	5SY4 213-6	—	5SY4 213-7	5SY4 213-8	—		—
	15	2	—	—	—	—	5SY4 218-7	—	—		—
	16	2	5SY4 216-5	—	5SY4 216-6	—	5SY4 216-7	5SY4 216-8	—		—
	20	2	5SY4 220-5	—	5SY4 220-6	—	5SY4 220-7	5SY4 220-8	—		—
	25	2	5SY4 225-5	—	5SY4 225-6	—	5SY4 225-7	5SY4 225-8	—		—
	30	2	—	—	—	—	5SY4 230-7	—	—		—
	32	2	5SY4 232-5	—	5SY4 232-6	—	5SY4 232-7	5SY4 232-8	—		—
	35	2	—	—	—	—	5SY4 235-7	—	—		—
40	2	5SY4 240-5	—	5SY4 240-6	—	5SY4 240-7	5SY4 240-8	—	—		
45	2	—	—	—	—	5SY4 245-7	—	—	—		
50	2	5SY4 250-5	—	5SY4 250-6	—	5SY4 250-7	5SY4 250-8	—	—		
60	2	—	—	—	—	5SY4 260-7	—	—	—		
63	2	5SY4 263-5	—	5SY4 263-6	—	5SY4 263-7	5SY4 263-8	—	—		

1 MW = modular width of 18 mm. Depth = 70 mm.





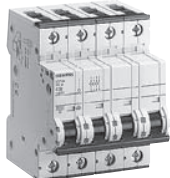



# 5SY4 Supplementary Protection

5SY4 70 mm mounting depth

## Selection and ordering data

All 5SY4 designs have been certified acc. to **UL 1077 and CSA 22.2 No. 235-M 89** and can therefore be used as "supplementary protectors" for applications of up to 277 V AC (1-pole and 1-pole + N designs) and 480 V AC (2-pole, 3-pole, 3-pole + N and 4-pole designs).

	$I_n$	MW	Characteristic A		Characteristic B		Characteristic C		Characteristic D		Weight 1 item kg
			Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	
 <p><b>3-pole</b></p> 	A										
	0.3	—	—	—	—	—	—	—	—	—	0.495
	0.5	5SY4 305-5	—	—	—	—	5SY4 314-7	—	5SY4 314-8	—	
	1	5SY4 301-5	—	—	—	—	5SY4 305-7	—	5SY4 305-8	—	
	1.6	5SY4 315-5	—	—	—	—	5SY4 301-7	—	5SY4 301-8	—	
	2	5SY4 302-5	—	—	—	—	5SY4 315-7	—	5SY4 315-8	—	
	3	5SY4 303-5	—	—	—	—	5SY4 302-7	—	5SY4 302-8	—	
	4	5SY4 304-5	—	—	—	—	5SY4 303-7	—	5SY4 303-8	—	
	5	—	—	—	—	—	5SY4 304-7	—	5SY4 304-8	—	
	6	5SY4 306-5	—	—	—	—	5SY4 311-7	—	—	—	
	8	5SY4 308-5	—	—	5SY4 306-6	—	5SY4 306-7	—	5SY4 306-8	—	
	10	5SY4 310-5	—	—	—	—	5SY4 308-7	—	5SY4 308-8	—	
	13	5SY4 313-5	—	—	5SY4 310-6	—	5SY4 310-7	—	5SY4 310-8	—	
	15	—	—	—	—	—	5SY4 313-7	—	5SY4 313-8	—	
	16	5SY4 316-5	—	—	5SY4 313-6	—	5SY4 313-7	—	—	—	
	20	5SY4 320-5	—	—	—	—	5SY4 318-7	—	5SY4 316-8	—	
	25	5SY4 325-5	—	—	5SY4 316-6	—	5SY4 316-7	—	5SY4 316-8	—	
30	—	—	—	—	—	5SY4 320-7	—	5SY4 320-8	—		
32	5SY4 332-5	—	—	5SY4 320-6	—	5SY4 320-7	—	5SY4 320-8	—		
35	—	—	—	—	—	5SY4 325-7	—	5SY4 325-8	—		
40	5SY4 340-5	—	—	5SY4 325-6	—	5SY4 325-7	—	—	—		
45	—	—	—	—	—	5SY4 330-7	—	—	—		
50	5SY4 350-5	—	—	5SY4 332-6	—	5SY4 332-7	—	5SY4 332-8	—		
60	—	—	—	—	—	5SY4 335-7	—	—	—		
63	5SY4 363-5	—	—	5SY4 340-6	—	5SY4 340-7	—	5SY4 340-8	—		
						5SY4 345-7	—	—	—		
						5SY4 350-7	—	5SY4 350-8	—		
						5SY4 360-7	—	—	—		
						5SY4 363-7	—	5SY4 363-8	—		
 <p><b>3-pole + N</b></p> 	A										
	0.3	—	—	—	—	—	—	—	—	—	0.660
	0.5	—	—	—	—	—	—	—	—	—	
	1	5SY4 601-5	—	—	—	—	5SY4 614-7	—	5SY4 614-8	—	
	1.6	5SY4 615-5	—	—	—	—	5SY4 605-7	—	5SY4 605-8	—	
	2	5SY4 602-5	—	—	—	—	5SY4 601-7	—	5SY4 601-8	—	
	3	5SY4 603-5	—	—	—	—	5SY4 615-7	—	5SY4 615-8	—	
	4	5SY4 604-5	—	—	—	—	5SY4 602-7	—	5SY4 602-8	—	
	6	5SY4 606-5	—	—	—	—	5SY4 603-7	—	5SY4 603-8	—	
	8	5SY4 608-5	—	—	—	—	5SY4 604-7	—	5SY4 604-8	—	
	10	5SY4 610-5	—	—	5SY4 606-6	—	5SY4 606-7	—	5SY4 606-8	—	
	13	5SY4 613-5	—	—	—	—	5SY4 608-7	—	5SY4 608-8	—	
	16	5SY4 616-5	—	—	5SY4 610-6	—	5SY4 610-7	—	5SY4 610-8	—	
	20	5SY4 620-5	—	—	—	—	5SY4 613-7	—	5SY4 613-8	—	
	25	5SY4 625-5	—	—	5SY4 613-6	—	5SY4 613-7	—	5SY4 613-8	—	
	32	5SY4 632-5	—	—	5SY4 616-6	—	5SY4 616-7	—	5SY4 616-8	—	
	40	5SY4 640-5	—	—	5SY4 616-6	—	5SY4 616-7	—	5SY4 616-8	—	
50	5SY4 650-5	—	—	5SY4 620-6	—	5SY4 620-7	—	5SY4 620-8	—		
63	5SY4 663-5	—	—	5SY4 620-6	—	5SY4 620-7	—	5SY4 620-8	—		
						5SY4 625-7	—	5SY4 625-8	—		
						5SY4 632-7	—	5SY4 632-8	—		
						5SY4 640-7	—	5SY4 640-8	—		
						5SY4 650-7	—	5SY4 650-8	—		
						5SY4 663-7	—	5SY4 663-8	—		
 <p><b>4-pole</b></p> 	A										
	0.3	—	—	—	—	—	—	—	—	—	0.660
	0.5	—	—	—	—	—	—	—	—	—	
	1	5SY4 401-5	—	—	—	—	5SY4 414-7	—	5SY4 414-8	—	
	1.6	5SY4 415-5	—	—	—	—	5SY4 405-7	—	5SY4 405-8	—	
	2	5SY4 402-5	—	—	—	—	5SY4 401-7	—	5SY4 401-8	—	
	3	5SY4 403-5	—	—	—	—	5SY4 415-7	—	5SY4 415-8	—	
	4	5SY4 404-5	—	—	—	—	5SY4 402-7	—	5SY4 402-8	—	
	6	5SY4 406-5	—	—	—	—	5SY4 403-7	—	5SY4 403-8	—	
	8	5SY4 408-5	—	—	—	—	5SY4 404-7	—	5SY4 404-8	—	
	10	5SY4 410-5	—	—	5SY4 406-6	—	5SY4 406-7	—	5SY4 406-8	—	
	13	5SY4 413-5	—	—	—	—	5SY4 408-7	—	5SY4 408-8	—	
	16	5SY4 416-5	—	—	5SY4 410-6	—	5SY4 410-7	—	5SY4 410-8	—	
	20	5SY4 420-5	—	—	—	—	5SY4 413-7	—	5SY4 413-8	—	
	25	5SY4 425-5	—	—	5SY4 413-6	—	5SY4 413-7	—	5SY4 413-8	—	
	32	5SY4 432-5	—	—	5SY4 416-6	—	5SY4 416-7	—	5SY4 416-8	—	
	40	5SY4 440-5	—	—	5SY4 420-6	—	5SY4 420-7	—	5SY4 420-8	—	
50	5SY4 450-5	—	—	5SY4 420-6	—	5SY4 420-7	—	5SY4 420-8	—		
63	5SY4 463-5	—	—	5SY4 425-6	—	5SY4 425-7	—	5SY4 425-8	—		
						5SY4 432-7	—	5SY4 432-8	—		
						5SY4 440-7	—	5SY4 440-8	—		
						5SY4 450-7	—	5SY4 450-8	—		
						5SY4 463-7	—	5SY4 463-8	—		

1 MW = modular width of 18 mm. Depth = 70 mm.


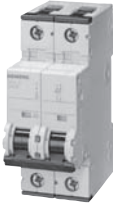
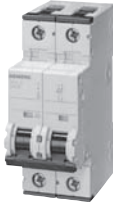
# 5SY6 Supplementary Protection

5SY6 70 mm mounting depth

## Features

All 5SY6 designs have been certified to **UL 1077 and CSA 22.2 No. 235-M 89** and can therefore be used as “supplementary protectors” for applications up to 277 V AC (1-pole and 1-pole + N designs) and 480 V AC (2-pole, 3-pole, 3-pole + N and 4-pole designs). The only difference between 5SY4 and 5SY6 is the IEC 60898-1 Interrupting Rating. 5SY4 has 10kA and 5SY6 has 6kA Interrupting rating according to IEC 60898-1. However, UL Interrupting ratings are the same for 5SY4 and 5SY6.

## Selection and ordering data

	$I_n$	Mounting width	DT	Characteristic B			Characteristic C			PU (UNIT, SET, M)	PS/ P. unit	PG	Weight per PU approx. kg
				Order No.	Price per PU	PG DT	Order No.	Price per PU	PG				
	A	MW <sup>1)</sup>											
<b>MCBs 6000 A</b> <b>1-Pole, 230/400 V AC</b> 	0.3	1	—				<b>5SY6 114-7</b>		1	1 unit	001	0.167	
	0.5		—				<b>5SY6 105-7</b>		1	1/12 units	001	0.165	
	1		—				<b>5SY6 101-7</b>		1	1/12 units	001	0.164	
	1.6		—				<b>5SY6 115-7</b>		1	1 unit	001	0.162	
	2		<b>5SY6 102-6</b>		001	▶	<b>5SY6 102-7</b>		1	1/12 units	001	0.153	
	3		—				<b>5SY6 103-7</b>		1	1/12 units	001	0.145	
	4		<b>5SY6 104-6</b>		001	▶	<b>5SY6 104-7</b>		1	1/12 units	001	0.160	
	5		—				<b>5SY6 111-7</b>		1	1/12 units	001	0.160	
	6		▶ <b>5SY6 106-6</b>		001	▶	<b>5SY6 106-7</b>		1	1/12 units	001	0.160	
	8		—				<b>5SY6 108-7</b>		1	1/12 units	001	0.158	
	10		▶ <b>5SY6 110-6</b>		001	▶	<b>5SY6 110-7</b>		1	1/12 units	001	0.158	
	13		<b>5SY6 113-6</b>		001		<b>5SY6 113-7</b>		1	1/12 units	001	0.148	
	15		—				<b>5SY6 118-7</b>		1	1/12 units	001	0.160	
	16		▶ <b>5SY6 116-6</b>		001	▶	<b>5SY6 116-7</b>		1	1/12 units	001	0.158	
	20		<b>5SY6 120-6</b>		001		<b>5SY6 120-7</b>		1	1/12 units	001	0.162	
	25		<b>5SY6 125-6</b>		001		<b>5SY6 125-7</b>		1	1/12 units	001	0.163	
	30		—				<b>5SY6 130-7</b>		1	1/12 units	001	0.160	
32		<b>5SY6 132-6</b>		001		<b>5SY6 132-7</b>		1	1/12 units	001	0.149		
40		<b>5SY6 140-6</b>		001		<b>5SY6 140-7</b>		1	1/12 units	001	0.150		
50		<b>5SY6 150-6</b>		001		<b>5SY6 150-7</b>		1	1/12 units	001	0.168		
63		<b>5SY6 163-6</b>		001		<b>5SY6 163-7</b>		1	1/12 units	001	0.172		
<b>1-Pole + N, 230 V AC</b> 	0.3	2	—				<b>5SY6 514-7</b>		1	1 unit	001	0.328	
	0.5		—				<b>5SY6 505-7</b>		1	1 unit	001	0.325	
	1		—				<b>5SY6 501-7</b>		1	1 unit	001	0.321	
	1.6		—				<b>5SY6 515-7</b>		1	1 unit	001	0.318	
	2		<b>5SY6 506-6</b>		001		<b>5SY6 502-7</b>		1	1 unit	001	0.324	
	3		—				<b>5SY6 503-7</b>		1	1 unit	001	0.314	
	4		<b>5SY6 510-6</b>		001		<b>5SY6 504-7</b>		1	1 unit	001	0.314	
	6		<b>5SY6 513-6</b>		001		<b>5SY6 506-7</b>		1	1/6 units	001	0.310	
	8		—				<b>5SY6 508-7</b>		1	1 unit	001	0.310	
	10		<b>5SY6 510-6</b>		001		<b>5SY6 510-7</b>		1	1/6 units	001	0.301	
	13		<b>5SY6 513-6</b>		001		<b>5SY6 513-7</b>		1	1/6 units	001	0.320	
	15		—				<b>5SY6 218-7</b>		1	1/12 units	001	0.160	
	16		<b>5SY6 516-6</b>		001		<b>5SY6 516-7</b>		1	1/6 units	001	0.302	
	20		<b>5SY6 520-6</b>		001		<b>5SY6 520-7</b>		1	1 unit	001	0.316	
	25		<b>5SY6 525-6</b>		001		<b>5SY6 525-7</b>		1	1 unit	001	0.318	
	32		<b>5SY6 532-6</b>		001		<b>5SY6 532-7</b>		1	1 unit	001	0.319	
	40		<b>5SY6 540-6</b>		001		<b>5SY6 540-7</b>		1	1 unit	001	0.318	
50		<b>5SY6 550-6</b>		001		<b>5SY6 550-7</b>		1	1 unit	001	0.323		
63		<b>5SY6 563-6</b>		001		<b>5SY6 563-7</b>		1	1 unit	001	0.343		
<b>2-Pole, 400 V AC</b> 	0.3	2	—				<b>5SY6 214-7</b>		1	1 unit	001	0.328	
	0.5		—				<b>5SY6 205-7</b>		1	1 unit	001	0.324	
	1		—				<b>5SY6 201-7</b>		1	1/6 units	001	0.302	
	1.6		—				<b>5SY6 215-7</b>		1	1 unit	001	0.317	
	2		—			▶	<b>5SY6 202-7</b>		1	1/6 units	001	0.324	
	3		—				<b>5SY6 203-7</b>		1	1/6 units	001	0.320	
	4		—			▶	<b>5SY6 204-7</b>		1	1/6 units	001	0.300	
	5		—				<b>5SY6 211-7</b>		1	1/12 units	001	0.160	
	6		<b>5SY6 206-6</b>		001	▶	<b>5SY6 206-7</b>		1	1/6 units	001	0.292	
	8		—				<b>5SY6 208-7</b>		1	1 unit	001	0.309	
	10		<b>5SY6 210-6</b>		001	▶	<b>5SY6 210-7</b>		1	1/6 units	001	0.310	
	13		<b>5SY6 213-6</b>		001		<b>5SY6 213-7</b>		1	1 unit	001	0.318	
	15		—				<b>5SY6 218-7</b>		1	1/12 units	001	0.160	
	16		<b>5SY6 216-6</b>		001	▶	<b>5SY6 216-7</b>		1	1/6 units	001	0.291	
	20		<b>5SY6 220-6</b>		001		<b>5SY6 220-7</b>		1	1/6 units	001	0.300	
	25		<b>5SY6 225-6</b>		001		<b>5SY6 225-7</b>		1	1/6 units	001	0.308	
	30		—				<b>5SY6 230-7</b>		1	1/12 units	001	0.160	
	32		<b>5SY6 232-6</b>		001		<b>5SY6 232-7</b>		1	1/6 units	001	0.318	
	40		<b>5SY6 240-6</b>		001		<b>5SY6 240-7</b>		1	1 unit	001	0.318	
50		<b>5SY6 250-6</b>		001		<b>5SY6 250-7</b>		1	1 unit	001	0.330		
63		<b>5SY6 263-6</b>		001		<b>5SY6 263-7</b>		1	1 unit	001	0.340		

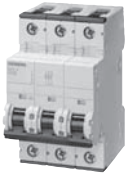


<sup>1)</sup> 1 MW (modular width) = 18 mm.

\* Availability to be announced

# 5SY6 Supplementary Protection

5SY6 70 mm mounting depth (cont.)

## Selection and ordering data

	$I_n$	Mounting width	DT	Characteristic B			Characteristic C			PU (UNIT, SET, M)	PS* / P. unit	PG	Weight per PU approx. kg
				Order No.	Price per PU	PG DT	Order No.	Price per PU					
<b>MCBs 6000 A</b> <b>3-Pole, 400 V AC</b> 	0.3	3	▶	—		001 ▶	5SY6 314-7		1	1 unit	001	0.489	
	0.5			5SY6 305-7			1		1 unit	001	0.481		
	1			5SY6 301-7			1		1 unit	001	0.473		
	1.6			5SY6 315-7			1		1 unit	001	0.471		
	2			5SY6 302-7			1		1/4 units	001	0.480		
	3			5SY6 303-7			1		1 unit	001	0.465		
	4			5SY6 304-7			1		1/4 units	001	0.458		
	5			5SY6 311-7			1		1/12 units	001	0.160		
	6			5SY6 306-6			1		1/4 units	001	0.435		
	8			5SY6 308-7			1		1 unit	001	0.461		
	10			5SY6 310-6			1		1/4 units	001	0.443		
	13			5SY6 313-6			1		1 unit	001	0.471		
	15			—			1		1/12 units	001	0.160		
	16			5SY6 316-6			1		1/4 units	001	0.437		
	20			5SY6 320-6			1		1/4 units	001	0.455		
	25			5SY6 325-6			1		1/4 units	001	0.464		
	30			—			1		1/12 units	001	0.160		
32	5SY6 332-6	1	1/4 units	001	0.459								
40	5SY6 340-6	1	1/4 units	001	0.472								
50	5SY6 350-6	1	1/4 units	001	0.489								
63	5SY6 363-6	1	1/4 units	001	0.488								
<b>3-Pole + N, 400 V AC</b> 	0.3	4		—	001	5SY6 614-7		1	1 unit	001	0.631		
	0.5			5SY6 605-7		1		1 unit	001	0.643			
	1			5SY6 601-7		1		1 unit	001	0.623			
	1.6			5SY6 615-7		1		1 unit	001	0.631			
	2			5SY6 602-7		1		1 unit	001	0.632			
	3			5SY6 603-7		1		1 unit	001	0.590			
	4			5SY6 604-7		1		1 unit	001	0.620			
	6			5SY6 606-6		1		1 unit	001	0.609			
	8			5SY6 608-7		1		1 unit	001	0.607			
	10			5SY6 610-6		1		1 unit	001	0.611			
	13			5SY6 613-6		1		1/3 units	001	0.630			
	16			5SY6 616-6		1		1/3 units	001	0.613			
	20			5SY6 620-6		1		1 unit	001	0.623			
	25			5SY6 625-6		1		1 unit	001	0.622			
	32			5SY6 632-6		1		1 unit	001	0.628			
	40			5SY6 640-6		1		1 unit	001	0.629			
	50			5SY6 650-6		1		1 unit	001	0.655			
63	5SY6 663-6	1	1 unit	001	0.671								
<b>4-Pole, 400 V AC</b> 	0.3	4		—	001	5SY6 414-7		1	1 unit	001	0.640		
	0.5			5SY6 405-7		1		1 unit	001	0.641			
	1			5SY6 401-7		1		1 unit	001	0.634			
	1.6			5SY6 415-7		1		1 unit	001	0.620			
	2			5SY6 402-7		1		1 unit	001	0.642			
	3			5SY6 403-7		1		1 unit	001	0.625			
	4			5SY6 404-7		1		1 unit	001	0.615			
	6			5SY6 406-6		1		1 unit	001	0.612			
	8			5SY6 408-7		1		1 unit	001	0.605			
	10			5SY6 410-6		1		1/3 units	001	0.603			
	13			5SY6 413-6		1		1 unit	001	0.628			
	16			5SY6 416-6		1		1/3 units	001	0.620			
	20			5SY6 420-6		1		1/3 units	001	0.598			
	25			5SY6 425-6		1		1/3 units	001	0.625			
	32			5SY6 432-6		1		1/3 units	001	0.627			
	40			5SY6 440-6		1		1/3 units	001	0.628			
	50			5SY6 450-6		1		1 unit	001	0.651			
63	5SY6 463-6	1	1/3 units	001	0.673								

<sup>1)</sup> 1 MW (modular width) = 18 mm.


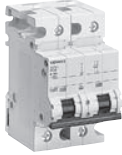
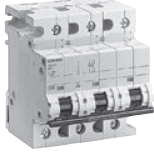
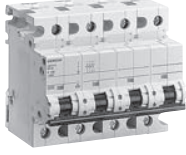
# Supplementary Protection, High-Current Product Range

## 5SP4 70 mm mounting depth

### Features

5SP4 designs have been certified to **UL 1077 and CSA 22.2 No. 235-M 89** and can therefore be used as "supplementary protectors" for applications of up to 277 V AC (1-pole designs) and 480 V AC (2-pole, 3-pole, and 4-pole designs).

### Selection and ordering data

	$I_n$	MW	Characteristic B		Characteristic C		Characteristic D		Weight 1 item kg
			Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	
 <p><b>1-pole</b></p> <p>1 2</p>	80	1.5	<b>5SP4 180-6</b>		<b>5SP4 180-7</b>		<b>5SP4 180-8</b>	0.258	
	100		<b>5SP4 191-6</b>		<b>5SP4 191-7</b>		<b>5SP4 191-8</b>		
	125		<b>5SP4 192-6</b>		<b>5SP4 192-7</b>		-		
 <p><b>2-pole</b></p> <p>1 3 2 4</p>	80	3	<b>5SP4 280-6</b>		<b>5SP4 280-7</b>		<b>5SP4 280-8</b>	0.516	
	100		<b>5SP4 291-6</b>		<b>5SP4 291-7</b>		<b>5SP4 291-8</b>		
	125		<b>5SP4 292-6</b>		<b>5SP4 292-7</b>		-		
 <p><b>3-pole</b></p> <p>1 3 5 2 4 6</p>	80	4.5	<b>5SP4 380-6</b>		<b>5SP4 380-7</b>		<b>5SP4 380-8</b>	0.762	
	100		<b>5SP4 391-6</b>		<b>5SP4 391-7</b>		<b>5SP4 391-8</b>		
	125		<b>5SP4 392-6</b>		<b>5SP4 392-7</b>		-		
 <p><b>4-pole</b></p> <p>1 3 5 7 2 4 6 8</p>	80	6	<b>5SP4 480-6</b>		<b>5SP4 480-7</b>		<b>5SP4 480-8</b>	1.032	
	100		<b>5SP4 491-6</b>		<b>5SP4 491-7</b>		<b>5SP4 491-8</b>		
	125		<b>5SP4 492-6</b>		<b>5SP4 492-7</b>		-		

1 MW = modular width of 18 mm.  
Depth = 70 mm.



# Supplementary Protection, AC/DC Product Range

5SY5 70 mm mounting depth

### Features

- Operating voltage to EN 60898 and EN 60947-2
  - 220 V DC/pole max.
  - 440 V AC max.
- Standards: EN 60 898-1, DIN VDE 0641 Part 11, IEC 60 898
- Additional components can be retrofitted.
- **Devices do not comply with UL1077**

### Selection and ordering data

	$I_n$	MW <sup>1)</sup>	Characteristic B		Characteristic C		Weight 1 item kg
			Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	
 <p><b>1-pole</b></p> <p>*1 2</p>	A	1	-	-	5SY5 114-7	-	0.147
	0.3	-	-	5SY5 105-7	-		
	0.5	-	-	5SY5 101-7	-		
	1	-	-	5SY5 115-7	-		
	1.6	-	5SY5 102-6	5SY5 102-7			
	2	-	-	5SY5 103-7	-		
	3	-	-	5SY5 104-7	-		
	4	-	5SY5 106-6	5SY5 106-7			
	6	-	-	5SY5 108-7	-		
	8	-	5SY5 110-6	5SY5 110-7			
	10	-	5SY5 113-6	5SY5 113-7			
	13	-	5SY5 116-6	5SY5 116-7			
	16	-	5SY5 120-6	5SY5 120-7			
	20	-	5SY5 125-6	5SY5 125-7			
	25	-	5SY5 132-6	5SY5 132-7			
	32 <sup>1)</sup>	-	5SY5 140-6	5SY5 140-7			
40	-	5SY5 150-6	5SY5 150-7				
50	-	5SY5 163-6	5SY5 163-7				
63	-						
 <p><b>2-pole</b></p> <p>*1 *3 2 4</p>	A	2	-	-	5SY5 214-7	-	0.304
	0.3	-	-	5SY5 205-7	-		
	0.5	-	-	5SY5 201-7	-		
	1	-	-	5SY5 215-7	-		
	1.6	-	-	5SY5 202-7	-		
	2	-	-	5SY5 203-7	-		
	3	-	-	5SY5 204-7	-		
	4	-	5SY5 206-6	5SY5 206-7			
	6	-	-	5SY5 208-7	-		
	8	-	5SY5 210-6	5SY5 210-7			
	10	-	5SY5 213-6	5SY5 213-7			
	13	-	5SY5 216-6	5SY5 216-7			
	16	-	5SY5 220-6	5SY5 220-7			
	20	-	5SY5 225-6	5SY5 225-7			
	25	-	5SY5 232-6	5SY5 232-7			
	32	-	5SY5 240-6	5SY5 240-7			
40	-	5SY5 250-6	5SY5 250-7				
50	-	5SY5 263-6	5SY5 263-7				
63	-						

1) MW = modular width of 18 mm.  
Depth = 70 mm.

# Supplementary Protection

Additional components for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors

### Features

- UL Recognized to UL 1077 (5ST3 010, 011, 012, 020, 021 & 022)
- Individual retrofitting possible
- Assembly via factory-fitted clips
- Short-circuit protection via supplementary protectors of characteristic B or C and  $I_n = 6 A$  or  $6 A gL$  fuses
- Low output versions in accordance with EN 61131-2 for controlling PLCs

### Design

#### Auxiliary switches (AS) and fault signal contacts (FC) (5ST30.0, 5ST30.1, 5ST30.2)

- Min. contact load: 50 mA, 24 V
- Max. contact load:  
NO contacts:  
2 A, 400 V AC, AC-14  
6 A, 230 V AC, AC-14  
1 A, 220 V DC, DC-13  
1 A, 110 V DC, DC-13  
3 A, 60 V DC, DC-13  
6 A, 24 V DC, DC-13  
NC contacts:  
2 A, 400 V AC, AC-13  
6 A, 230 V AC, AC-13  
1 A, 220 V DC, DC-13  
1 A, 110 V DC, DC-13  
3 A, 60 V DC, DC-13  
6 A, 24 V DC, DC-13

- Connectable to *instabus EIB* and AS-Interface bus via binary inputs

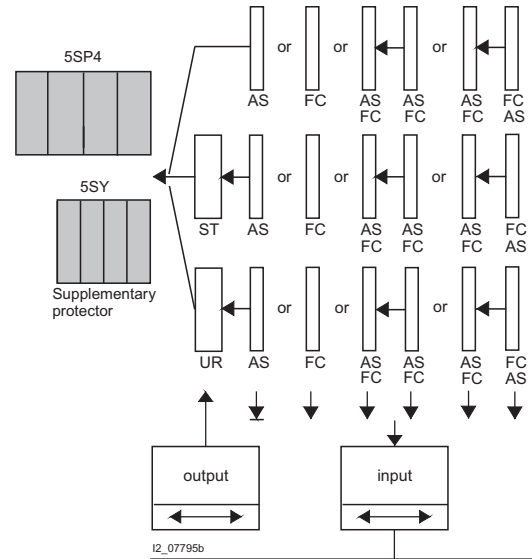
#### Auxiliary switches (AS) with low output (5ST3013, 5ST3014, 5ST3015)

- Area of application: 1mA / 5 V DC to 50 mA / 30 V DC











### Application

Indication of the supplementary protectors' switching state:

- AS: ON/OFF
- FC: tripped



### Selection and ordering data

	MW	Order No.	List Price \$ 1 item	Price group	Weight 1 item kg
	<b>Auxiliary switches (AS) for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors</b>				
		1 NO + 1 NC, 0.5	<b>5ST3 010</b> <b>5ST3 013</b>		0.050
		1 NO + 1 NC, low output <sup>1)</sup>			
		2 NO	<b>5ST3 011</b> <b>5ST3 014</b>		
		2 NO, low output <sup>1)</sup>			
		2 NC	<b>5ST3 012</b> <b>5ST3 015</b>		
	<b>Fault signal contacts (FC) for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors</b>				
		1 NO + 1 NC 0.5	<b>5ST3 020</b>		0.050
		2 NO	<b>5ST3 021</b>		
		2 NC	<b>5ST3 022</b>		

<sup>1)</sup>Not UL Rated.

# Supplementary Protection

## Additional components for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors

### Features


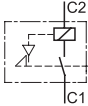
#### Shunt trips

- Response limits acc. to DIN VDE 0660 Part 100, 7.2.1.4
- Suitable for voltages: 110 to 415 V AC, 110 V AC, 24 to 48 V AC/DC

### Application

Remote tripping of the supplementary protectors

### Selection and ordering data

		MW	Order No.	List Price \$	Price group	Weight 1 item
				1 item		kg
	<b>Shunt trips (ST) for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors 1)</b> 	110-415 V AC 1	<b>5ST3 030</b> <b>5ST3 031</b>			0.098
		24-48 V AC/DC 1				

### Features


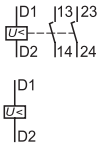
#### Undervoltage releases

- Response limits acc. to DIN VDE 0660 Part 100, 7.2.1.3
- Suitable for voltages: 230 V AC, 110 V DC, 24 V DC
- Connectable to *instabus EIB* and AS-Interface bus via binary inputs.

### Application

- Applicable as remote trip in an EMERGENCY-OFF loop
- Assures disconnection of the control circuit acc. to EN 60 204
- In cases of interrupted or insufficient voltage, the undervoltage release trips the supplementary protector or prevents it from switching on.

### Selection and ordering data

		MW	Order No.	List Price \$	Price group	Weight 1 item
				1 item		kg
	<b>Undervoltage releases (UR) for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors 1)</b> 	230 V AC 1	<b>5ST3 040</b> <b>5ST3 041</b> <b>5ST3 042</b>			0.115
		110 V DC 24 V DC				
		230 V AC 1	<b>5ST3 043</b> <b>5ST3 044</b> <b>5ST3 045</b>			
		110 V DC 24 V DC				

1) Not UL/CSA Rated.

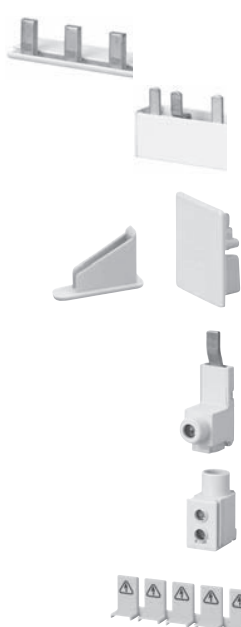
## Supplementary Protection Accessories

## Accessories for 5SY and 5SP supplementary protectors

## Features

- For use with 5SY and 5SP supplementary protectors
- UL and CSA Certified to UL 508

## Selection and ordering data



	Length mm	For use with 5SY			For use with 5SP <sup>3)</sup>		
		Order No.	List Price \$ 1 item	Weight 1 item kg	Order No.	List Price \$ 1 item	Weight 1 item kg
<b>Busbars<sup>2)</sup> without end caps (can be cut)</b>							
1-pole	1000	<b>5ST3 701-0HG</b>		0.330	<b>5ST3 701-2HG</b>		0.450
1-pole + AS or FC <sup>1)</sup>		<b>5ST3 703-0HG</b>			-		
2-pole	1000	<b>5ST3 705-0HG</b>		0.508	<b>5ST3 705-2HG</b>		0.690
2-pole + AS or FC <sup>1)</sup>		<b>5ST3 707-0HG</b>			-		
3-pole	1000	<b>5ST3 710-0HG</b>		0.800	<b>5ST3 710-2HG</b>		1.090
3-pole + AS or FC <sup>1)</sup>		<b>5ST3 712-0HG</b>			-		
<b>Busbar End Caps</b>							
1-pole		<b>5ST3 748-0HG</b>		0.001	<b>5ST3 748-0HG</b>		0.001
2- & 3- pole		<b>5ST3 750-0HG</b>			<b>5ST3 750-0HG</b>		
<b>Connection terminals</b>							
	Wire size						
Infeed - MCBs	6 - 35 mm <sup>2</sup> 10 - 1/0 AWG	<b>5ST3 770-0HG</b>		0.035	<b>5ST3 770-0HG</b>		0.035
Infeed - busbars	1.5 - 50 mm <sup>2</sup> 14 - 1 AWG	<b>5ST3 770-1HG</b>		0.016	<b>5ST3 770-1HG</b>		0.016
<b>Touch protection covers<sup>2)</sup></b>							
	5 x 1 pin	<b>5ST3 655-0HG</b>		0.003	<b>5ST3 655-0HG</b>		0.003

1) Used with appropriate pole supplementary protector + 1 auxiliary switch (AS) or 1 fault signal contact (FC).

2) Always cover all exposed terminals with touch protection covers 5ST3655-0HG.

3) Maximum 100 A for infeed at the start of a busbar.

## Technical Data

		5ST3 7...0HG	5ST3 7...2HG	5ST3 770-0HG	5ST3 770-1HG
<b>Standards</b>		UL 508, CSA C22.2 No. 14-M 95,			
Certifications		UL 508 File No. E328403 CSA			
<b>Operational voltage</b>					
• IEC	V AC	690			
• UL 508	V AC	600			
<b>Rated current</b>	A	-	-	115	
<b>Maximum busbar current <math>I_b</math> per phase</b>					
• Infeed at the start of the busbar	A	80	100	-	-
• Infeed at the center of the busbar	A	160	200	-	-
<b>Busbar cross-section</b>	mm <sup>2</sup> Cu	18	25	-	-
<b>Conductor cross-sections</b>					
	AWG	-	-	10-1/0	14-1
	mm <sup>2</sup>	-	-	6-35	1.5-50
<b>Terminals - terminal tightening torque</b>					
	Nm	-	-	5	3.5
	lbs/in	-	-	50	35



## Supplementary Protection Accessories

## Accessories for 5SY and 5SP supplementary protectors

## Technical Data







Busbar system <sup>1)</sup>

- Acc. to DIN 57 606 and DIN 57 659
- Load for one-side/central infeed:  
80 A/130 A for 16 mm<sup>2</sup>

- Pin-type connections
- Single and multi-phase
- Cu: 16 mm<sup>2</sup> and fully insulated
- Lug spacing: 18 mm

- No additional connection terminal required for stranded connections up to 35 mm<sup>2</sup>
- Excellent accessibility of the feeder cables
- Busbars do not comply with UL1077

## Selection and ordering data

	Length mm	Order No.	List Price \$ 1 item	Price group	Weight 1 item kg
<b>Accessories for 5SY4, 5SY5 miniature circuit-breakers</b>					
		<b>Busbars 16mm<sup>2</sup></b>			
		Fully insulated (Do not cut):			
	214	5ST3 700			0.040
		5ST3 702			
		5ST3 704			0.060
		5ST3 706			
		5ST3 708			0.100
		5ST3 711			
		5ST3 713			
		5ST3 715			0.150
		Without end caps (Can be cut):			
	1016	5ST3 701			0.190
		5ST3 703			
		5ST3 705			0.290
		5ST3 707			
		5ST3 710			0.430
		5ST3 712			
		5ST3 714			
		5ST3 716			0.700
		<b>End caps</b> for lateral insulation of cut-to-length busbars			
		5ST3 748			0.001
		5ST3 750			0.001
		5ST3 718			0.001
<b>Accessories for 5SY4, 5SY5, 5SP4 supplementary protectors</b>					
		<b>Handle locking device</b> applicable with all types of poles; sealable against unintended on- and off-switching; padlock with a shackle of max. 3 mm		1 item	0.008
		<b>Terminal cover</b> applicable with all types of poles; as an additional cover for screw openings; prevents removal of the device from the standard mounting rail; sealable		1 item	0.001
		<b>Padlock</b> for handle locking device 5ST3 801		1 item	0.027
		<b>Locking mechanism</b> consisting of 5ST3 801 handle locking device and 5ST3 802 padlock		1 item	0.035
		<b>Inscription labels (white) for 5SY4, 5SY5, 5SP4 miniature circuit-breakers</b> 15 x 9 mm, 3 frames containing 44 labels each, attachable to the lower casing collar • Self-adhesive		1 item	0.038

1) Not UL/CSA Rated.

## Technical data

		5SY4	5SY6	5SY5	5SP4
<b>Standards</b>		EN60898 EN 60947-2 UL 1077; CSA C22.2 No. 235	EN60898 EN 60947-2 UL 1077; CSA C22.2 No. 235	EN60898 EN 60947-2	EN60898 EN 60947-2 UL 1077; CSA C22.2 No. 235
<b>Certifications</b>		cE; cURus, UL File No. E116386	cE; cURus, UL File No. E116386	Not UL/CSA Rated	cE; cURus, UL File No. E106582
<b>Tripping characteristic</b>		A, B, C, D	B, C	B, C	B, C, D
<b>Number of poles</b>		1, 1+N, 2, 3, 3+N, 4	1, 1+N, 2, 3, 3+N, 4	1, 2	1, 2, 3, 4
<b>Operating voltage</b> – EN 60898, EN 60947-2  – UL 1077 and CSA 22.2 No. 235	Min. V AC/DC	24	24	24	24
	Max. V DC/pole	60 <sup>1)</sup>	60 <sup>1)</sup>	250	60 <sup>1)</sup>
	Max. V AC	400	400	400	400
	Max. V AC V DC/pole	480Y/277 —	480Y/277	—	480Y/277
<b>Interrupting rating</b>					
$I_{cn}$ to IEC/EN 60898-1	kA AC	10	6	10	10
$I_{cn}$ to IEC/EN 60898-2	kA AC	10	10	10	10
– UL 1077 and CSA 22.2 No. 235 AC: Max. RMS Symmetrical	120/240, 240 V: kA AC	14	14	Not UL Rated	14
	240 V: kA AC	7.5	7.5		7.5
	277 V: kA AC	5	5		5
	480 V: kA AC	5	5		5
<b>Touch Protection to EN 50274-1</b>		Yes			
<b>Degree of protection to EN 60529</b>		IP20, with connected conductors			
<b>CFC and silicone free</b>		Yes			
<b>Mounting</b>					
– Snap-on mounting		Yes			—
– Standard mounting rail and mounting		—			Yes
<b>Device Depth</b>	mm	70			
<b>Terminals</b>					
– Tunnel Terminals at both ends		—	—	—	Yes
– Combined terminals at both ends		Yes	Yes	Yes	—
– Terminal, solid, stranded or finely stranded with end sleeve	mm <sup>2</sup>	0.75 to 25			
– Terminal tightening torque	lb. in.	22 to 26			
	Nm	2.5 to 3			
<b>Conductor cross sections</b>					
– Solid and stranded	mm <sup>2</sup>	0.75 to 35			0.75 to 50
– Finely stranded, with end sleeve	mm <sup>2</sup>	0.75 to 25			0.75 to 35
	AWG	14 to 4			14 to 2
<b>Calibration Base</b>	°C	30 (EN 60898)			
<b>Average service life, with rated load</b>	Operations	20,000	20,000	20,000 (above 40A: 10, 000)	20,000
<b>Ambient temperature</b>	°C	-25 to 45, occasionally +55, max. 95% humidity			
<b>Storage Temperature</b>	°C	-40 to +75			
<b>Resistance to vibration to IEC 60068-2-6</b>	m/s <sup>2</sup>	60 at 10 Hz to 150 Hz			

1) The operating voltage 60 V DC/pole takes into account a battery charging voltage with peak value of 72 V.

# Supplementary Protection, General Data

## Tripping characteristics and breaking capacity

### Tripping characteristics

#### Tripping performance at an ambient temperature of 30 °C

Tripping characteristic	Standards	Thermal release				Electromagnetic release		
		Test currents:		tripping time		hold	trips at the latest at	tripping time
		low test current	high test current	$63 A \geq I_n$	$63 A \leq I_n$	$I_4$	$I_5$	$t$
A		$1.13 \times I_n$	$1.45 \times I_n$	$> 1 h$ $< 1 h$	$> 2 h$ $< 2 h$	$2 \times I_n$	$3 \times I_n$	$\geq 0.1 s$ $< 0.1 s$
B	IEC 60 898/EN 60 898 DIN VDE 0641 Part 11	$1.13 \times I_n$	$1.45 \times I_n$	$> 1 h$ $< 1 h$	$> 2 h$ $< 2 h$	$3 \times I_n$	$5 \times I_n$	$\geq 0.1 s$ $< 0.1 s$
C		$1.13 \times I_n$	$1.45 \times I_n$	$> 1 h$ $< 1 h$	$> 2 h$ $< 2 h$	$5 \times I_n$	$10 \times I_n$	$\geq 0.1 s$ $< 0.1 s$
D		$1.13 \times I_n$	$1.45 \times I_n$	$> 1 h$ $< 1 h$	$> 2 h$ $< 2 h$	$10 \times I_n$	$20 \times I_n$	$\geq 0.1 s$ $< 0.1 s$

(IEC 60 898:  $50 \times I_n$ )

### Breaking capacity

Breaking capacity ratings for UL1077 are broken down in four main line voltages that are tested. These voltages shown in the table below.

For IEC ratings, there are special requirements with regard to the breaking capacity.

The values are standardized and determined according to the testing conditions of EN 60 898 and DIN VDE 0641 Part 11.

The most usual values are  $6\ 000$  and  $10\ 000$ .

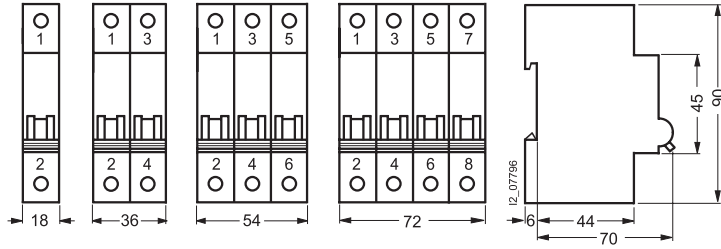
For other test conditions, other values can be specified which lie above those of EN 60 898 and DIN VDE 0641 Part 11.

An example of another standard is EN 60 947-2 or DIN VDE 0660 Part 101 for MCBs.

### Interrupting Rating

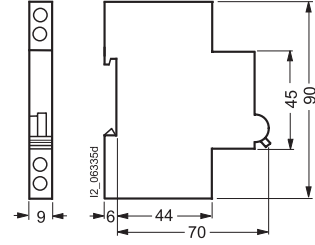
Rated current	$I_n$ [A]	UL 1077		EN 60 898 (IEC 60 898)		EN 60 947-2 (IEC 60 947-2)		
		1-pole 120/240 V AC (in pairs) 240 V AC	1-pole 240 V AC	1-pole 230 V AC	2-, 3-, 4-pole 400 V AC	1-pole 230 V AC	2-, 3-, 4-pole 400 V AC	
5SP4	80 - 125	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]	
5SY4	0.3 - 63	14	7.5	5	5	5	5	
		14	7.5	5	5	5	5	
Rated current	$I_n$ [A]	UL 1077		EN 60 898-2		EN 60 898-2		
		1-pole 65 V DC	2-pole 125 V DC	1-pole 230 V AC	2-pole 400 V AC	1-pole 220 V DC	2-pole 440 V DC	
5SP4	80 - 125	$I_{cn}$ [A]	$I_{cn}$ [A]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	
5SY4	0.3 - 63	400	600	10	10	15	15	
		400	600	10	10	15	15	
Rated current	$I_n$ [A]	EN 60 898 (IEC 60 898)		EN 60 947-2 (IEC 60 947-2)		EN 60 947-2 (IEC 60 947-2)		
		1-pole 230 V AC	2-, 3-, 4-pole 400 V AC	1-pole 230 V AC	2-, 3-, 4-pole 400 V AC	1-pole 230 V AC	2-, 3-, 4-pole 400 V AC	
		5SP4	80 - 125	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]
		5SY4	0.3 ...6	10	10	10	10	15
	8 ...32	10	10	20	20	20		
	40 ...63	10	10	15	15	15		
Rated current	$I_n$ [A]	EN 60 898-2		EN 60 898-2		EN 60 898-2		
		1-pole 230 V AC	2-pole 400 V AC	1-pole 230 V AC	2-pole 400 V AC	1-pole 220 V DC	2-pole 440 V DC	
5SY5	0.5 - 63	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	
		10	10	15	15	15	15	

### 5SY4, 5SY5, 5SY6 supplementary protectors

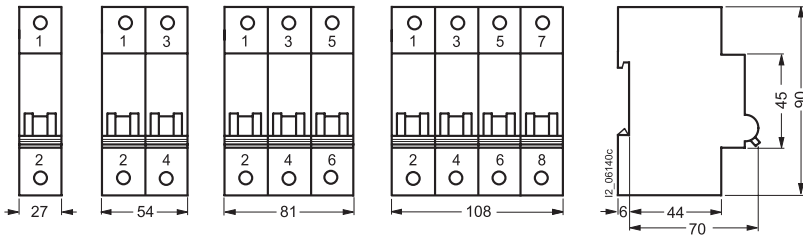


### 5ST3 auxiliary switch 5ST3 fault signal contact

can be used with 5SY4, 5SY5, 5SY6, 5SP4

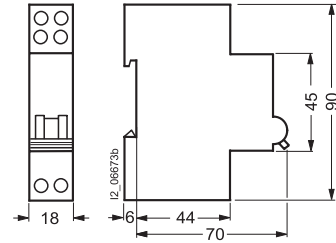


### 5SP4 supplementary protectors



### 5ST3 shunt trip 5ST3 undervoltage release

can be used with 5SY4, 5SY5, 5SY6, 5SP4



## General Data

## 3NW7 Cylindrical Fuse Holders

## Key Common Features

- Meets a wide variety of fuse sizes
- Multi-pole configurations
- Standard 35 mm (DIN) rail mounting
- Housing material meets UL-94-V0, self-extinguishing
- Meets UL 512 and CSA C22.2, No. 39 certifications
- CE Mark
- No tools required for insertion or removal of fuses
- Finger safe design
- With or without Blown Fuse Indicator
- Draw design includes spare fuse holder

## Description

Depending on the cylindrical\* fuse size selected 3NW7 fuse holders are available in 1, 1 + N, 2, 3, 3 + N and 4 pole configurations. Fuse sizes include 13/32" x 1-1/2" (Class CC and Midget), 8 mm x 32 mm, 10 mm x 38 mm, 14 mm x 51 mm and 22 x 58 mm.

Class CC fuse holders are UL Listed for branch circuit protection according to UL 512 and CSA C22.2, No. 39. They incorporate a rejection feature that only allows Class CC fuses to be used.

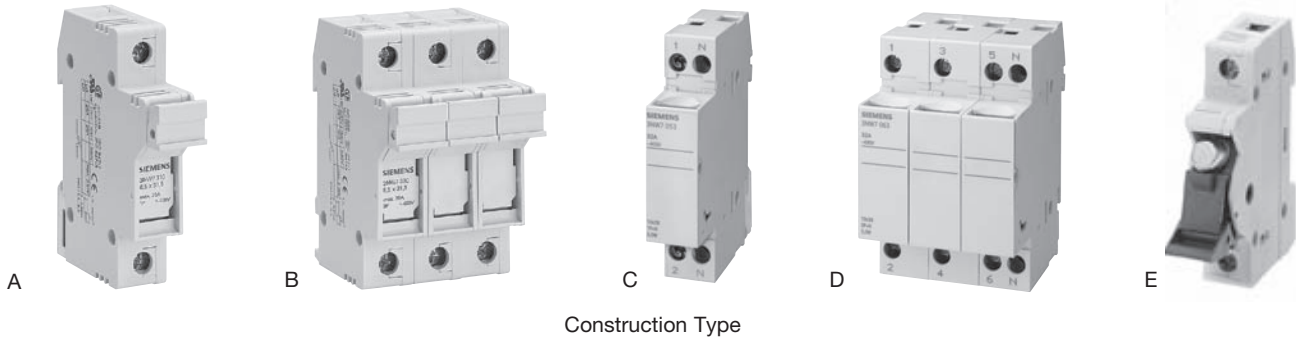
Midget, 8 mm x 32 mm, 10 mm x 38 mm, 14 mm x 51 mm, and 22 x 58 mm fuse holders are UL Recognized (refer to Technical Data for specific fuse holder certifications) as supplementary protectors according to UL 512 and CSA C22.2, No. 39. Supplementary protectors are designed to provide additional protection

along with branch circuit protection devices. All fuse holders are equipped with either a fuse handle or draw mechanism for easy insertion and removal of cylindrical type fuses. During insertion and removal the fuses are isolated from the power/control circuit. Their compact size requires less space than typical open-type fuse holders and they mount directly onto standard 35 mm mounting rails.

Fuse holders for 8 mm x 32 mm, 10 mm x 38 mm fuses in the 1 + N draw design occupy the same mounting space as 1 pole designs. This unique design saves space when compared to the typical handle type fuse holder which requires two poles.

3NW7 Cylindrical Fuse Holders

Selection and ordering data



Construction Type

Class CC Fuse Holders: UL Listed for Branch Circuit Protection<sup>3)</sup>

No. of Poles	I <sub>n</sub> A	Fuse Size mm x mm	Without Blown Fuse Indicator				With Blown Fuse Indicator <sup>2)</sup>			
			Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg	Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg
1	30	Class CC 10.3 x 38.1 (13/32" x 1-1/2")	3NW7513-0HG	—	E <sup>1)</sup>	0.056	—	—	—	
2			3NW7523-0HG	—		0.118	—	—	—	
3			3NW7533-0HG	—		0.172	—	—	—	

Midget Class Fuse Holders: UL Recognized for Supplementary Protection

No. of Poles	I <sub>n</sub> A	Fuse Size mm x mm	Without Blown Fuse Indicator				With Blown Fuse Indicator <sup>2)</sup>			
			Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg	Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg
1	30	Midget Class 10.3 x 38.1 (13/32" x 1-1/2")	3NW7013	—	C & D <sup>1)</sup>	0.056	3NW7014	—	C & D <sup>1)</sup>	0.059
1 + N			3NW7053	—		0.069	3NW7054	—		0.072
2			3NW7023	—		0.118	3NW7024	—		0.123
3			3NW7033	—		0.172	3NW7034	—		0.180
3 + N			3NW7063	—		0.185	3NW7064	—		0.193

Other Supplementary Protectors (Refer to page 16/26 for UL and CSA status)

No. of Poles	I <sub>n</sub> A	Fuse Size mm x mm	Without Blown Fuse Indicator				With Blown Fuse Indicator <sup>2)</sup>			
			Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg	Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg
1	20	8 x 32	3NW7313	—	C	0.056	3NW7314	—	C	0.059
	32	10 x 38	3NW7013	—	C	0.056	3NW7014	—	C	0.059
	50	14 x 51	3NW7111	—	A	0.095	3NW7112	—	A	0.095
	100	22 x 58	3NW7211	—	A	0.145	3NW7212	—	A	0.145
1 + N	20	8 x 32	3NW7353	—	C & D <sup>1)</sup>	0.069	3NW7354	—	C & D <sup>1)</sup>	0.072
	32	10 x 38	3NW7053	—	C & D <sup>1)</sup>	0.069	3NW7054	—	C & D <sup>1)</sup>	0.072
	50	14 x 51	3NW7151	—	A & B <sup>1)</sup>	0.215	3NW7152	—	A & B <sup>1)</sup>	0.215
	100	22 x 58	3NW7251	—	A & B <sup>1)</sup>	0.330	3NW7252	—	A & B <sup>1)</sup>	0.330
2	20	8 x 32	3NW7323	—	C & D <sup>1)</sup>	0.118	3NW7324	—	C & D <sup>1)</sup>	0.123
	32	10 x 38	3NW7023	—	C & D <sup>1)</sup>	0.118	3NW7024	—	C & D <sup>1)</sup>	0.123
	50	14 x 51	3NW7121	—	A & B <sup>1)</sup>	0.195	3NW7122	—	A & B <sup>1)</sup>	0.195
	100	22 x 58	3NW7221	—	A & B <sup>1)</sup>	0.300	3NW7222	—	A & B <sup>1)</sup>	0.300
3	20	8 x 32	3NW7333	—	C	0.172	3NW7334	—	D	0.180
	32	10 x 38	3NW7033	—	D	0.172	3NW7034	—	D	0.180
	50	14 x 51	3NW7131	—	B	0.295	3NW7132	—	B	0.295
	100	22 x 58	3NW7231	—	B	0.691	3NW7232	—	B	0.480
3 + N	20	8 x 32	3NW7363	—	C & D <sup>1)</sup>	0.185	3NW7364	—	C & D <sup>1)</sup>	0.193
	32	10 x 38	3NW7063	—	C & D <sup>1)</sup>	0.185	3NW7064	—	C & D <sup>1)</sup>	0.193
	50	14 x 51	3NW7161	—	A & B <sup>1)</sup>	0.315	3NW7162	—	A & B <sup>1)</sup>	0.315
	100	22 x 58	3NW7261	—	A & B <sup>1)</sup>	0.475	3NW7262	—	A & B <sup>1)</sup>	0.475

1) Same Mechanical Design - Other Pole Types Not Shown  
2) LED is "ON" when fuse is blown (open)

3) UL 508 busbar available; 5ST3701-0HG, 5ST3705-0HG, 5ST3710-0HG.  
See page 16/19.

## Technical data

Type		Class CC 3NW75.3-0HG	Midget 3NW70.3, 3NW70.4	3NW73..	3NW70..	3NW71..	3NW72..
Fuse size	mm x mm	10.3 x 38.1	10.3 x 38.1	8 x 32	10 x 38	14 x 51	22 x 58
	inch x inch	13/32" x 1-1/2"	13/32" x 1-1/2"	-	-	-	-
Standards		UL512, CSA C22.2		IEC 60269-1, -2, -3 NF C 60-200, NF C 63-210, -211 NBN C 63269-2-1 CEI 32-4, -12		UL512, CSA C22.2	IEC 60269-1, -2, -3 NF C 60-200, NF C 63-210, -211 NBN C 63269-2-1 CEI 32-4, -12
Certifications		UL Listed, Certified to Canadian Standards	UL Recognized, Certified to Canadian Standards	Not UL / CSA Rated		UL Recognized, Certified to Canadian Standards	Not UL / CSA Rated
UL file no.		E171267		-		E171267	-
Rated voltage	U <sub>n</sub> V AC	-	-	400	690		
	UL/CSA V AC	600	600	400	600		
	UL V DC	-	600 <sup>1)</sup>	-	-		
Rated current	A	30	30	20	32	50	100
Rated breaking capacity	kA	Fuse Selection Dependent		20	100		
Touch protection to BGV AC		Yes					
Degree of protection to IEC 60529		IP20, with connected conductors					
Operating temperature range	°C	-5 to +40; 90% max. humidity at +20					
<b>Conductor cross sections</b>							
Solid	mm <sup>2</sup>	1.5 to 25	0.5 to 10	0.5 to 10		2.5 to 10	4 to 10
Stranded	mm <sup>2</sup>	1.5 to 25	0.5 to 10	0.5 to 10		2.5 to 25	4 to 50
Finely Stranded	mm <sup>2</sup>	-	0.5 to 10	0.5 to 10		2.5 to 16	4 to 35
UL/CSA	AWG	18 to 4	20 to 10	-	20 to 10	6 to 10	-
Terminal Tightening Torque	Nm	-	-	1.2		2	2.5
	lb. in.	-	-	10.9		18.2	22.7

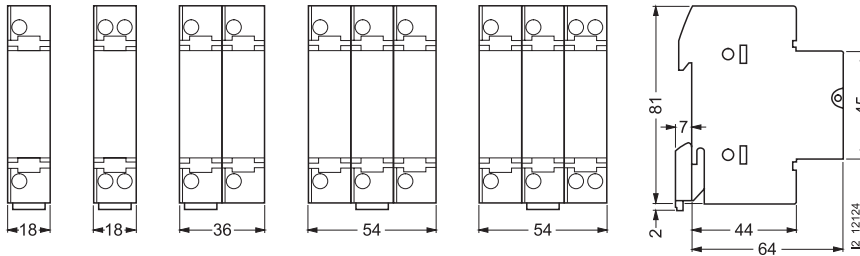
1) UL Recognized 600 V DC to meet the requirements of the US Solar Industry.

3NW7 Cylindrical fuse holders

Dimensional drawings

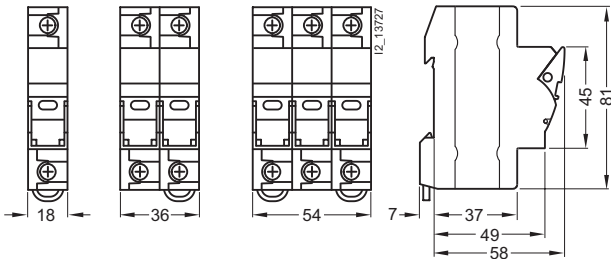
Typical Construction Type C & D

3NW73: Fuse Size 8 mm x 32 mm  
 3NW70: Fuse Size 10 mm x 38 mm



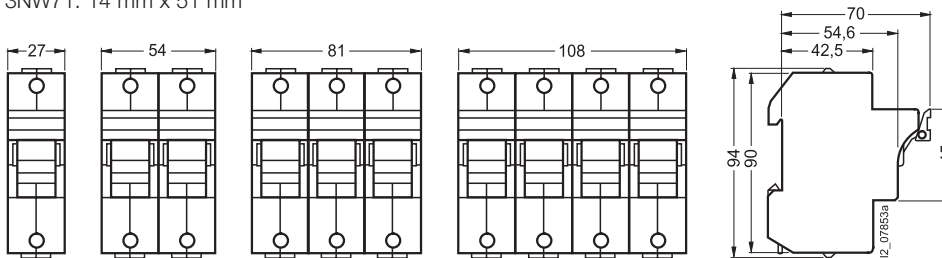
Typical Construction Type E

3NW75.3: Fuse Size 13/32" x 1-1/2", Class CC

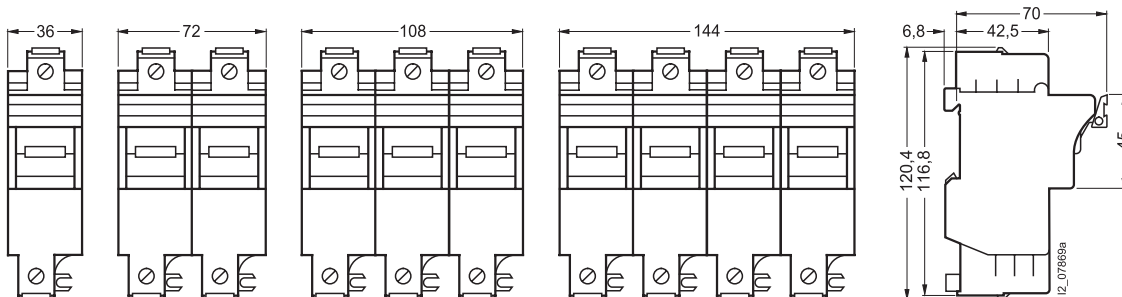


Typical Construction Type A & B

3NW71: 14 mm x 51 mm



3NW72: 22 mm x 58 mm





# Supplementary Protection

## 3NC10 Open Cylindrical Fuse Holders

### Features

3NC1038 open fuse holders have been certified in accordance with UL 512 and can be used with 13/32" x 1-1/2" (10 x 38 mm) fuses up to 600 V AC, 30 Amperes maximum.

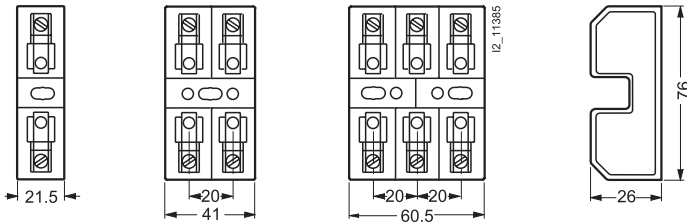
- Type M Supplementary Fuse Holder for use with 13/32" x 1-1/2" (10 x 38 mm) Fuses
- Typical Supplementary Fuses: Bussmann KTK, FNQ, FNM, BAF and BAN. Includes MIDGET Class Fuses
- Ampere Rating: 32A
- Voltage Rating: 600 V
- Withstand Rating: 10,000 RMS Symmetrical (or interrupting rating of the fuse used, whichever is lower)
- Wire Range: 18 to 4 AWG
- UL Recognized, UL 512, Fuse Holder
- UL Flammability: 94VO
- Holder Material: Thermoplastic
- Surface Mounted



### Selection and ordering

Description	Number of poles	Order Number	List Price \$	Weight Item kg
Cylindrical Fuse Holder	1	<b>3NC1038-1</b>		0.042
Type M, Supplementary Fuses for 13/32" x 1-1/2" (10 x 38 mm)	2	<b>3NC1038-2</b>		0.077
	3	<b>3NC1038-3</b>		0.113

### Dimensions



# Molded Case Circuit Breakers

Industrial Controls Product Catalog 2017

## contents

### 240V Circuit Breakers



#### BQ Breakers

##### Selection and ordering data

	240V
BQ	10KAIC
BQH	22KAIC
HBQ	65KAIC

1-, 2- & 3-pole up to 125A for circuit protection up to 240 volt circuits (UL)

Information	Page
General Data	17/9–17/10
Accessories	17/104–17/111



#### QR Breakers

##### Selection and ordering data

	240V
QR2	10KAIC
QRH2	22KAIC
HQR2	42KAIC
HQR2H	65KAIC

2- & 3-pole up to 225A for circuit protection up to 240 volt circuits (UL)

Information	Page
General Data	17/11
Accessories	17/104–17/111

### 600/347V Circuit Breakers



#### CQD Breakers

##### Selection and ordering data

	480/277V	600/347V
CQD	14KAIC	—
CQD-6	—	10KAIC

1-, 2- & 3-pole up to 100A for circuit protection up to 600/347V (CSA) & 480/277V (UL) circuits

Information	Page
General Data	17/12
Internal Accessories	17/14
External Accessories	17/104–17/111

### 600/347V Circuit Breakers



#### GG Breakers

##### Selection and ordering data

	480V	600/347V
NGG	25KAIC	14KAIC
HGG	35KAIC	14KAIC
LGG	65KAIC	14KAIC

1-, 2- & 3-pole up to 125A for circuit protection up to 600/347 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/13
Internal Accessories	17/14
External Accessories	17/104–17/111

### 600V Circuit Breakers



#### DG VL Breakers

##### Selection and ordering data

	480V	600Y/347V
NDG	35KAIC	18KAIC
HDG	65KAIC	18KAIC
LDG	100KAIC	18KAIC

2- & 3-pole up to 150A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
Breakers & Trip Units	17/17–17/19
Internal Accessories	17/23
External Accessories	17/43–17/57



#### FG VL Breakers

##### Selection and ordering data

	480V	600V
NFG	35KAIC	18KAIC
HFG	65KAIC	20KAIC
LFG	100KAIC	25KAIC

2- & 3-pole up to 150A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/20–17/22
Internal Accessories	17/23
External Accessories	17/43–17/57

contents

600V Circuit Breakers



**JG VL Breakers**

**Selection and ordering data**

	480V	600V
NJG	35KAIC	25KAIC
HJG	65KAIC	25KAIC
LJG	100KAIC	25KAIC

2- & 3-pole up to 400A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/24-17/26
Internal Accessories	17/30
External Accessories	17/43-17/57



**LG VL Breakers**

**Selection and ordering data**

	480V	600V
NLG	35KAIC	18KAIC
HLG	65KAIC	18KAIC
LLG	100KAIC	18KAIC

2- & 3-pole up to 600A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/27-17/29
Internal Accessories	17/30
External Accessories	17/43-17/57



**MG VL Breakers**

**Selection and ordering data**

	480V	600V
NMG	35KAIC	25KAIC
HMG	65KAIC	35KAIC
LMG	100KAIC	50KAIC

2- & 3-pole up to 800A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/31-17/33
Internal Accessories	17/39
External Accessories	17/43-17/57

600V Circuit Breakers



**NG VL Breakers**

**Selection and ordering data**

	480V	600V
NNG	35KAIC	25KAIC
HNG	65KAIC	35KAIC
LNG	100KAIC	65KAIC

2- & 3-pole up to 1200A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/34-17/36
Internal Accessories	17/39
External Accessories	17/43-17/57



**PG VL Breakers**

**Selection and ordering data**

	480V	600V
NPG	35KAIC	25KAIC
HPG	65KAIC	35KAIC
LPG	100KAIC	65KAIC

2- & 3-pole up to 1600A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

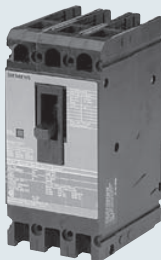
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**VL Circuit Breakers:  
Additional Information**

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## 600V Circuit Breakers

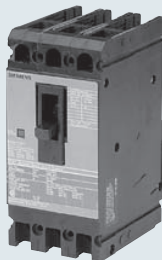


**Sentron ED Breakers**  
**Selection and ordering data**

	240V	480V	600V
ED2	10KAIC	—	—
ED4	65KAIC	18KAIC	—
ED6	65KAIC	25KAIC	18KAIC

1-, 2- & 3-pole up to 125A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/63
Internal Accessories	17/65
External Accessories	17/104-17/111



**Sentron HED/CED Breakers**  
**Selection and ordering data**

	480V	600V
HED4	42KAIC	—
CED6	200KAIC	100KAIC

1-, 2- & 3-pole up to 125A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/64
Internal Accessories	17/65
External Accessories	17/104-17/111



**Sentron FD Breakers**  
**Selection and ordering data**

	480V	600V
FD6	35KAIC	22KAIC
HFD6	65KAIC	25KAIC
HHFD6	100KAIC	25KAIC
CFD6	200KAIC	100KAIC

2- & 3-pole up to 250A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/66-17/67
Internal Accessories	17/68
External Accessories	17/104-17/111

## 600V Circuit Breakers



**Sentron JD Breakers**  
**Selection and ordering data**

	240V	480V	600V
JD2	65KAIC	—	—
JD6, SJD6-A	65KAIC	35KAIC	25KAIC
HHJD6	200KAIC	100KAIC	50KAIC
CJD6, SCJD6-A	200KAIC	150KAIC	100KAIC
HJD6, SHJD6-A	100KAIC	65KAIC	35KAIC

2- & 3-pole up to 400A for circuit protection up to 600 volt circuits (UL/CSA)

Information	Page
General Data	17/69-17/71
Internal Accessories	17/72
External Accessories	17/104-17/111



**Sentron LD Breakers**  
**Selection and ordering data**

	480V	600V
LD6, SLD6-A	35KAIC	25KAIC
HLD6, SHLD6-A	65KAIC	25KAIC
HHL6	100KAIC	50KAIC
CLD6, SCLD6-A	150KAIC	100KAIC

2- & 3-pole up to 600A for circuit protection up to 600 volt circuits (UL/CSA)

Information	Page
General Data	17/73-17/75
Internal Accessories	17/76
External Accessories	17/104-17/111



**Sentron LMD Breakers**  
**Selection and ordering data**

	480V	600V
LMD6	50KAIC	25KAIC
HLMD6	65KAIC	50KAIC

2- & 3-pole up to 800A for circuit protection up to 600 volt circuits (UL/CSA)

Information	Page
General Data	17/77-17/78
Internal Accessories	17/79
External Accessories	17/104-17/111

## contents

### 600V Circuit Breakers



#### Sentron MD Breakers

##### Selection and ordering data

	480V	600V
MD, SMD6	50KAIC	25KAIC
HMD, SHMD6	65KAIC	50KAIC
CMD, SCMD6	100KAIC	65KAIC

2- & 3-pole up to 800A for circuit protection up to 600 volt circuits (UL/CSA)



#### Sentron ND Breakers

##### Selection and ordering data

	480V	600V
ND, SND6	50KAIC	25KAIC
HND, SHND6	65KAIC	50KAIC
CND, SCND6	100KAIC	65KAIC

2- & 3-pole up to 1600A for circuit protection up to 600 volt circuits (UL/CSA)



#### Sentron PD Breakers

##### Selection and ordering data

	480V	600V
PD, SPD6	50KAIC	25KAIC
HPD, SHPD6	65KAIC	50KAIC
CPD	100KAIC	65KAIC

2- & 3-pole up to 1600A for circuit protection up to 600 volt circuits (UL/CSA)

### 600V Circuit Breakers



#### Sentron RD Breakers

##### Selection and ordering data

	480V	600V
RD	50KAIC	25KAIC
HRD	65KAIC	50KAIC

2- & 3-pole up to 2000A for circuit protection up to 600 volt circuits (UL/CSA)

#### Sentron Circuit Breakers: Additional Information

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Introduction

Ordering

In the FD through RD frames, you may order molded case circuit breakers three basic ways:

- As separately ordered frames, trip units and lugs
- As frame, trip unit and lugs ordered as one catalog number and shipped unassembled or assembled
- As Frame and Trip Unit shipped assembled and with the trip unit made non-removable, in compliance with UL 489 requirements that to be reverse fed the circuit breaker must not have an interchangeable trip unit.

These two options are described in the following:

**Components Ordered Separately**

To get the components for a 3-pole, 400 Amp standard interrupting circuit breaker, you would order the frame (JD63F400), the trip unit (JD63T400) and six lugs (TA2J6500). This option is normally useful only if you stock and use large volumes of product and wish to reduce your inventory cost. You may stock, for example, a smaller number of frames (JD63F400) and a variety of trip units (JD63T300, JD63T350, etc.) and assemble breakers as you need them.

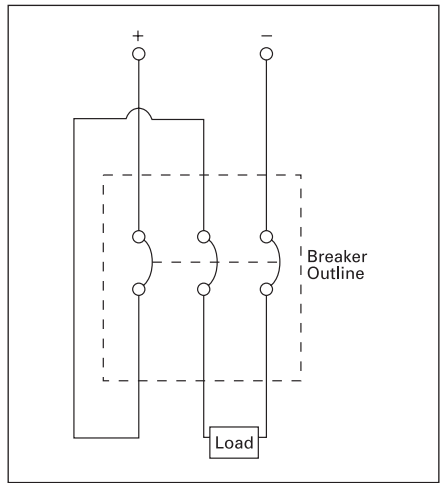
**Frame, Trip Unit and Lugs Ordered Together**

If you order the catalog number JD63B400, you will receive a frame, a trip unit and 6 lugs in separate packages. By suffixing this number with "L" (e.g. JD63B400L), you will receive frame, trip unit and lugs assembled in one container. Pursuant to UL 489, a product ordered thus will have the markings "LINE" and "LOAD", and may not be "reverse fed" (with power flowing from the "OFF" end of the breaker toward the "ON" end).

**Non-Interchangeable Trip Breakers**

If you place an "X" after the frame size designator (e.g. JXD63B400), you will receive a frame and trip unit assembled, with the trip unit made non-removable. If you suffix an "L" to this catalog number (e.g. JXD63B400L), you will receive the breaker, non-removable trip unit and lugs assembled. Unless you anticipate a specific need to change the breaker's ampere rating in the future, this is the preferred ordering method, as the products are assembled to Siemens' specifications in our factories. These breakers are suitable for use reverse fed according to UL 489, since the trip unit is not removable.

The smaller frames (QJ, ED and below) do not have removable trip units, and consequently are shipped only as assembled products. To add lugs, see the ordering instructions on each product's catalog page.

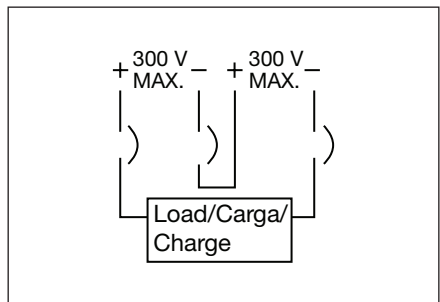


500V DC Wiring Configuration

**Connecting Breakers for DC Application**

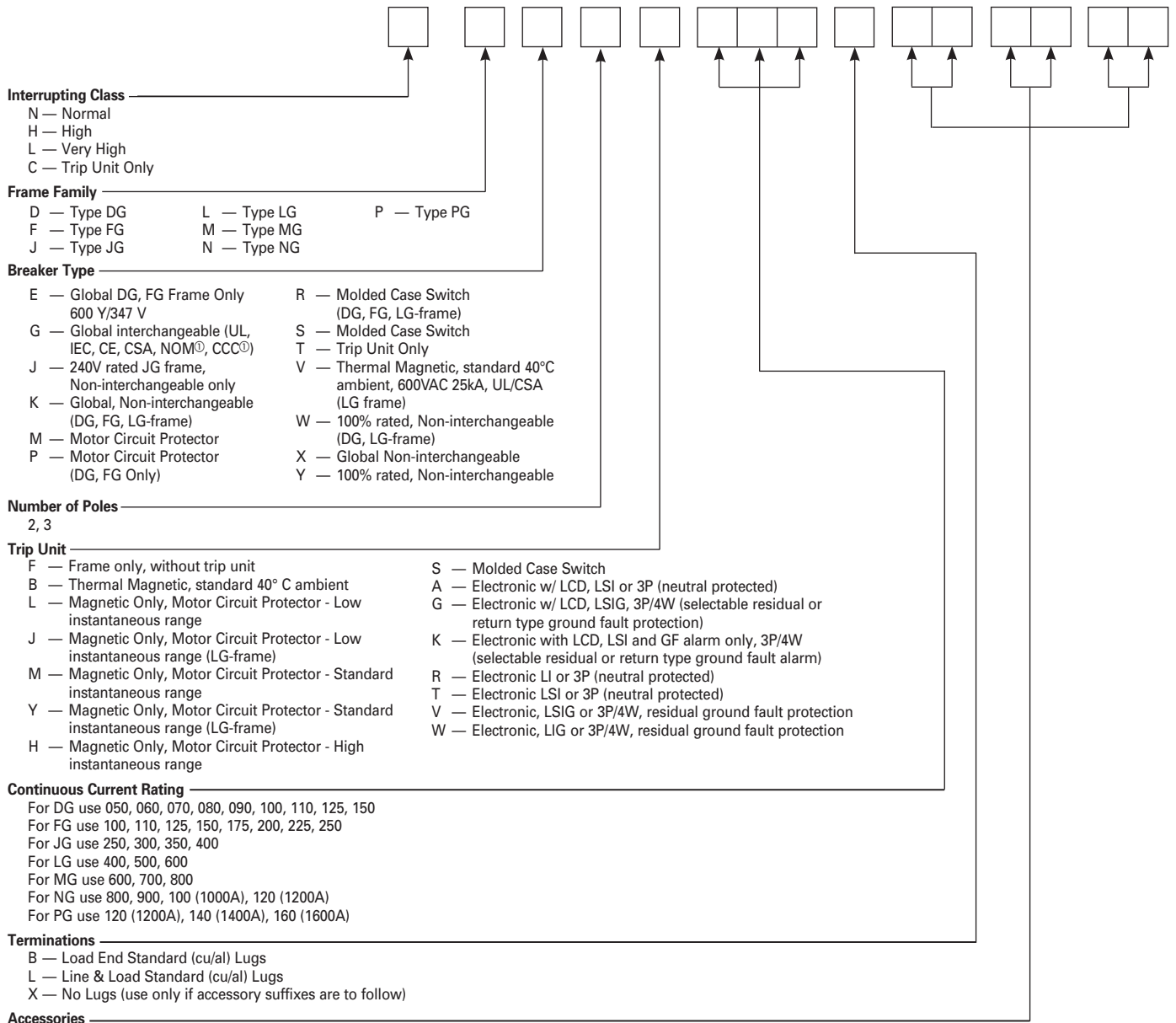
Most Siemens thermal magnetic trip MCCBs are applicable on direct current (dc) systems. Generally, for 250 V dc systems a two pole breaker is used, with one pole on each leg of the supply circuit. For three pole breakers applied on 500 V undergrounded DC systems, it is important to connect the power supply "zig-zag" through the breaker as shown in the figure below. This assures that the Voltage between phases on the breaker terminals is uniformly distributed.

See below for an alternative connection diagram. For a list of Sentron breakers with the DC ratings, please refer to pages Speedfax pages 7-11 to 7-16.



# Catalog Numbering System

## Selection/Application



**Auxiliary and Alarm Switch Combinations**

Suffix	Description
A1	1 Alarm (includes 1NO & 1NC switch with a 2 Aux./1 Alarm Base, for frames DG to LG)
A2	2 Aux (1NO & 1NC switch with a 3 Aux. Base, for frames DG to LG)
A3	2 Aux + 1 Alarm (2NO & 2NC switches with a 2 Aux./1 Alarm Base, for frames DG to LG)
A3	2 Aux + 2 Alarm (2NO & 2NC switches with a 2 Aux./2 Alarm Base, for frames MG to PG)
A4	4 Aux (2NO & 2NC switches with a 4 Aux. Base, for frames MG to PG)

**Note:** A1 and A3 include 1NO and 1NC switch for alarm purposes, only one of these switches may be used as there is only one space for an alarm.

**Shunt Trips**

RB — 24 VDC	RM — 48-60 VAC
RC — 48-60 VDC	RN — 110-127 VAC
RD — 110-127 VDC	RS — 208-277 VAC
RE — 250 VDC	RV — 380-600 VAC

**Under Voltage Releases**

UA — 12 VDC	UN — 110-127 VAC
UB — 24 VDC	UP — 208 VAC
UC — 48 VDC	UR — 220-250 VAC
UD — 110-127 VDC	US — 277 VAC
UE — 220-250 VDC	UT — 380-415 VAC
UG — 60 VDC	UU — 440-480 VAC
UK — 24 VAC	

LCD = Liquid Crystal Display  
 LI = Long Delay & Instantaneous trip functions  
 LSI = Long Delay, Short Delay, & Instantaneous trip functions  
 LSI G = Long Delay, Short Delay, Instantaneous, & Ground Fault trip functions  
 GF = Ground Fault  
 3P = 3-pole  
 4W = 4-wire

© Select Frames



# Catalog Numbering System

## Selection

If ordering factory-installed accessories or special modifications, you must order a 15-digit catalog number. See the examples below for a detailed explanation. The 15 digit number is achieved by placing X's in positions not being occupied by an accessory/modification. Contact Siemens for circuit breakers configured with accessories.

### Auxiliary Switch Example:

**H F G 3 B 2 0 0 L A 2 X X X X**

Standard 9-digit      Aux. Switch      Completes Cat #

### Shunt Trip / UVR Example:

**H F G 3 B 2 0 0 L X X U N X X**

Standard 9-digit      UVR      Completes Cat #

### Shunt Trip / Auxiliary Switch Example:

**H F G 3 B 2 0 0 L A 2 R N X X**

Standard 9-digit      Aux. Switch      Shunt Trip      Completes Cat #

### Non-Interchangeable Trip Breakers Example:

**H F X 3 B 2 0 0 L**

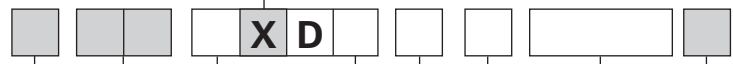
Standard 9-digit



# Catalog Numbering System

## Selection/Application

If used on 250A frame and above means non-interchangeable trip breaker with factory assembled frame and trip. Solid state trip and current limiting (S or C in first character) are non-interchangeable only, and the "X" is omitted.



**Trip Unit Type**

- Omitted — Thermal-Magnetic
- S — Sensitrip® Electronic Trip

**Sentron Series Type/Interrupting Range**

- Omitted — Standard Rating
- H — High IC Rating
- HH — Extra High IC Rating
- C — Highest IC Rating and Current Limiting

**Frame Identifier**

- E — Type ED
- F — Type FD
- J — Type JD
- L — Type LD
- LM — Type LMD
- M — Type MD
- N — Type ND
- P — Type PD
- R — Type RD

**Maximum Voltage**

- 2 — 240 Vac
- 4 — 480 Vac
- 6 — 600 Vac

**Number of Poles**

- 1
- 2
- 3
- A — used to indicate advanced electronic trip unit with maintenance mode capability (always 3 poles)
- B — used to indicate basic electronic trip unit (always 3 poles)

**(Specific Application Type)**

- B — Standard 40°C Breaker
- M — Calibrated for 50°C Application
- F — Frame Only
- T — 40°C Trip Unit Only
- W — 50°C Trip Unit Only
- S — Molded Case Switch
- L — Low Instantaneous Range ETI Breaker
- A — Standard Range ETI Breaker
- H — High Instantaneous Range ETI Breaker

**Maximum Continuous Current Rating**

- ED Frame — 015, 020, 025, 030, 035, 040, 045, 050, 060, 070, 080, 090, 100, 110, 125
- FD Frame — 070, 080, 090, 100, 110, 125, 150, 175, 200, 225, 250
- JD Frame — 200, 225, 250, 300, 350, 400
- LD Frame — 250, 300, 350, 400, 450, 500, 600
- LMD Frame — 500, 600, 700, 800
- MD Frame — 500, 600, 700, 800
- ND Frame — 900, 100 (1000A), 120 (1200A)
- PD Frame — 120 (1200A), 140 (1400A), 160 (1600A)
- RD Frame — 160 (1600A), 180 (1800A), 200 (2000A)

**Suffix**

- L — where applicable indicates a breaker shipped with line/loads lugs installed
- A — used with a switch to show automatic self protection
- Y — 400 Hertz
- H — 100% rated
- P — Load side lugs only
- NAV — Navel Ratings

**NOTE:**

- Position omitted if not used.

# Lug-In/Lug-Out with INSTA-WIRE

## Selection

All BQ/BQH/HBQ circuit breakers are supplied with load side lugs. If line side lugs are required, add suffix "L" to catalog number. Consult Siemens for any additional charge. All standard circuit breakers are calibrated for 40°C maximum ambient application.

Continuous Current Rating @ 40° C	Type BQ <sup>①</sup>	Type BQH	Type HBQ
	10,000A IR Catalog Number	22,000A IR Catalog Number	65,000A IR Catalog Number

### 1-Pole (120V AC)<sup>⑤</sup>

Rating	Type BQ	Type BQH	Type HBQ
15	BQ1B015 <sup>④</sup>	BQ1B015H <sup>④</sup>	HB1B015 <sup>④</sup>
20	BQ1B020 <sup>④</sup>	BQ1B020H <sup>④</sup>	HB1B020 <sup>④</sup>
25	BQ1B025	BQ1B025H	HB1B025
30	BQ1B030	BQ1B030H	HB1B030
35	BQ1B035	BQ1B035H	HB1B035
40	BQ1B040	BQ1B040H	HB1B040
45	BQ1B045	—	HB1B045
50	BQ1B050	BQ1B050H	HB1B050
60	BQ1B060 <sup>⑥</sup>	BQ1B060H	HB1B060
70	BQ1B070	BQ1B070H	HB1B070

### 2-Pole (Common-Trip 120/240V AC)<sup>⑥</sup>

Rating	Type BQ	Type BQH	Type HBQ
15	BQ2B015	BQ2B015H	HB2B015
20	BQ2B020	BQ2B020H	HB2B020
25	BQ2B025	BQ2B025H	HB2B025
30	BQ2B030	BQ2B030H	HB2B030
35	BQ2B035	BQ2B035H	HB2B035
40	BQ2B040	BQ2B040H	HB2B040
45	BQ2B045	—	HB2B045
50	BQ2B050	BQ2B050H	HB2B050
60	BQ2B060 <sup>⑥</sup>	BQ2B060H	HB2B060
70	BQ2B070	BQ2B070H	HB2B070
80	BQ2B080	BQ2B080H	HB2B080
90	BQ2B090	BQ2B090H	HB2B090
100	BQ2B100	BQ2B100H	HB2B100
110	BQ2B110	—	HB2B110
125	BQ2B125	BQ2B125H	HB2B125

### 2-Pole (Common-Trip 240V AC)<sup>③⑥</sup>

Rating	Type BQ	Type BQH	Type HBQ
15	BQ2H015	—	—
20	BQ2H020	—	—
30	BQ2H030	—	—
40	BQ2H040	—	—
50	BQ2H050	—	—
60	BQ2H060	—	—
70	BQ2H070	—	—
80	BQ2H080	—	—
90	BQ2H090	—	—
100	BQ2H100	—	—

### 3-Pole (Common-Trip 240V AC)<sup>⑦</sup>

Rating	Type BQ	Type BQH	Type HBQ
15	BQ3B015	BQ3B015H	HB3B015
20	BQ3B020	BQ3B020H	HB3B020
25	BQ3B025	BQ3B025H	HB3B025
30	BQ3B030	BQ3B030H	HB3B030
35	BQ3B035	BQ3B035H	HB3B035
40	BQ3B040	BQ3B040H	HB3B040
45	BQ3B045	BQ3B045H	HB3B045
50	BQ3B050	BQ3B050H	HB3B050
60	BQ3B060	BQ3B060H	HB3B060
70	BQ3B070	BQ3B070H	HB3B070
80	BQ3B080	BQ3B080H	HB3B080
90	BQ3B090	BQ3B090H	HB3B090
100	BQ3B100	BQ3B100H	HB3B100

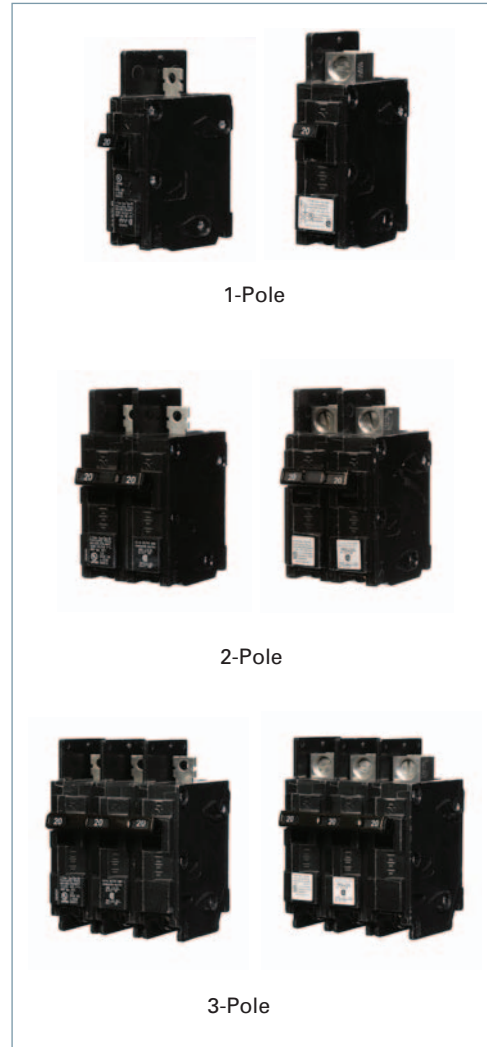
### BQ / BQH / HBQ Internal Accessories

Description	Catalog Number	Field/Factory Installed
120VAC Shunt Trip	add suffix...00S01	Factory
24VAC Shunt Trip	add suffix...00S07	Factory
120V Auxiliary Switch	add suffix...01 <sup>②</sup>	Factory

■ Built to order. Allow 2-3 weeks for delivery  
 ① UL Listed for use with 60/75° wire through 40 amps,  
 UL listed for use with 75° wire only for 50 amps  
 and above, HACR rated.

② 1A and 1B contacts.  
 ③ UL Listed for use on 3-phase grounded "B" systems —  
 10,000 for this application.  
 ④ UL Listed for frequent switching  
 applications (SWD). 120V AC Fluorescent Lighting.

⑤ Shipped 12 per sleeve.  
 ⑥ Shipped 6 per sleeve.  
 ⑦ Shipped 4 per sleeve.  
 ⑧ UL Listed 5KA IR.  
 ⑨ Refer to Table A on page 17/100



### Factory Modifications

Description	Catalog Number
Line Side Lugs	add suffix...L
Quick Connect Lug	add suffix...QX
400Hz Calibration	add suffix...Y <sup>⑧</sup>
Marine 50° C Ambient Calibration	add suffix...M
Fungus Proofing	add suffix...F

For external accessories, please refer to page 17/105

# DIN Rail Mounted Circuit Breakers

## Selection/Dimensions

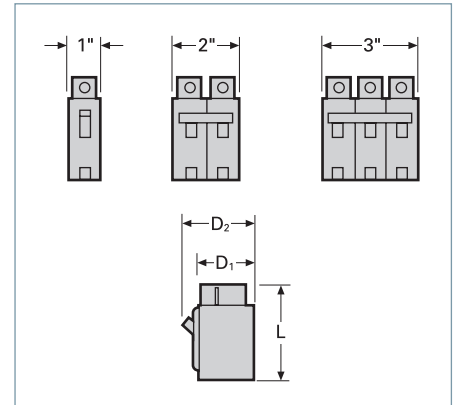
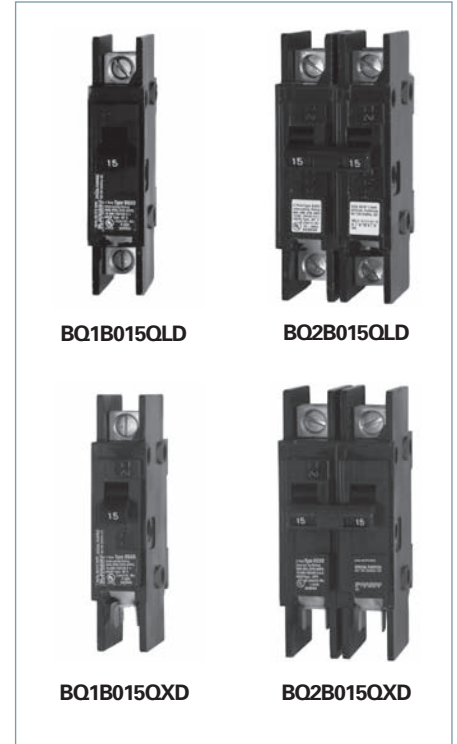
Breaker Type	Ampere Rating	Catalog Number	Line Side Connector	Load Side Connector	Interrupting Ratings (KA) (RMS Symmetrical Amperes) Volts AC	
					120	120/240

### 1-Pole DIN Rail (120V AC)

<b>BQLD</b> 1-Pole 120V DIN Rail	10	BQ1B010QLD	TC1Q1	TC1Q1	10	
	15	BQ1B015QLD	TC1Q1	TC1Q1	10	
	20	BQ1B020QLD	TC1Q1	TC1Q1	10	
	25	BQ1B025QLD	TC1Q1	TC1Q1	10	
	30	BQ1B030QLD	TC1Q1	TC1Q1	10	
	35	BQ1B035QLD	TC1Q1	TC1Q1	10	
	40	BQ1B040QLD	TC1Q1	TC1Q1	10	
<b>BQXD</b> 1-Pole 120V DIN Rail	45	BQ1B045QLD	TA1Q1	TA1Q1	10	
	50	BQ1B050QLD	TA1Q1	TA1Q1	10	
	60	BQ1B060QLD	TA1Q1	TA1Q1	10	
	10	BQ1B010QXD	TC1Q1	Quick-Connect	10	
	15	BQ1B015QXD	TC1Q1	Quick-Connect	10	
	20	BQ1B020QXD	TC1Q1	Quick-Connect	10	
	25	BQ1B025QXD	TC1Q1	Quick-Connect	10	
30	BQ1B030QXD	TC1Q1	Quick-Connect	10		
35	BQ1B035QXD	TC1Q1	Quick-Connect	10		
40	BQ1B040QXD	TC1Q1	Quick-Connect	10		
45	BQ1B045QXD	TA1Q1	Quick-Connect	10		
50	BQ1B050QXD	TA1Q1	Quick-Connect	10		
60	BQ1B060QXD	TA1Q1	Quick-Connect	10		

### 2-Pole DIN Rail (120/240V AC)

<b>BQLD</b> 2-Pole 120/240V DIN Rail	10	BQ2B010QLD	TC1Q1	TC1Q1		10
	15	BQ2B015QLD	TC1Q1	TC1Q1		10
	20	BQ2B020QLD	TC1Q1	TC1Q1		10
	25	BQ2B025QLD	TC1Q1	TC1Q1		10
	30	BQ2B030QLD	TC1Q1	TC1Q1		10
	35	BQ2B035QLD	TC1Q1	TC1Q1		10
	40	BQ2B040QLD	TC1Q1	TC1Q1		10
<b>BQXD</b> 2-Pole 120/240V DIN Rail	45	BQ2B045QLD	TA1Q1	TA1Q1		10
	50	BQ2B050QLD	TA1Q1	TA1Q1		10
	60	BQ2B060QLD	TA1Q1	TA1Q1		10
	10	BQ2B010QXD	TC1Q1	Quick-Connect		10
	15	BQ2B015QXD	TC1Q1	Quick-Connect		10
	20	BQ2B020QXD	TC1Q1	Quick-Connect		10
	25	BQ2B025QXD	TC1Q1	Quick-Connect		10
30	BQ2B030QXD	TC1Q1	Quick-Connect		10	
35	BQ2B035QXD	TC1Q1	Quick-Connect		10	
40	BQ2B040QXD	TC1Q1	Quick-Connect		10	
45	BQ2B045QXD	TA1Q1	Quick-Connect		10	
50	BQ2B050QXD	TA1Q1	Quick-Connect		10	
60	BQ2B060QXD	TA1Q1	Quick-Connect		10	



### Lugs For Use with BQXD<sup>®</sup>

Circuit Breaker Amp. Rtg.	Cab. Per Lug	Lug Wire Range AWG	Catalog Number
10-40	1	#16-#6 Cu #12-#6 Al	TC1Q1 <sup>①②</sup>
45-125	1	#8-#1 Cu #6-#1/0 Al	TA1Q1

### Finger Safe Terminal Shield

Protects against accidental contact with lugs—1 per lug. Fits line and load end.

Catalog Number	Qty
BQFS2	2
BQFS1K	1000

Enclosures	
Type	Catalog Number <sup>®</sup>
1	EB3100S <sup>③④</sup>
3R	WB3100

Breaker Type	Amperes	Dimensions (inches)		
		L	D1	D2
BQ, BQH	15-50	3 $\frac{3}{4}$	2 $\frac{3}{8}$	3
BQ, BQH	55-125	4	2 $\frac{3}{8}$	3
HBO	15-125	4	2 $\frac{3}{8}$	3
BQXD	15-60	4 $\frac{1}{2}$	2 $\frac{3}{8}$	3

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

① UL Listed for use with 60/75° wire through 40 amps, UL listed for use with 75° wire only for 50 amps and above, HACR rated.

② Connector has steel construction.

③ Surface mounted indoor. If flush mounting is required, replace suffix "S" in catalog number with suffix "F".

④ Neutral included in enclosure.

⑤ Enclosure will not accept circuit breakers with shunt trips or auxiliary switches installed.

⑥ Type BQXD uses TA1Q1 or TC1Q1 lugs on line side of circuit breaker.

For external accessories, please refer to pages 17/105, 17/107 to 17/112

# QR 250 Frame

## Selection/Dimensions

Continuous Current Rating @ 40°C	2-Pole 240V AC Catalog Number	3-Pole 240V AC Catalog Number
----------------------------------	-------------------------------	-------------------------------

### Type QR2<sup>②</sup>

100	QR22B100	QR23B100
125	QR22B125	QR23B125
150	QR22B150	QR23B150
175	QR22B175	QR23B175
200	QR22B200	QR23B200
225	QR22B225	QR23B225
250	QR22B250	QR23B250

### Type QRH2<sup>②</sup>

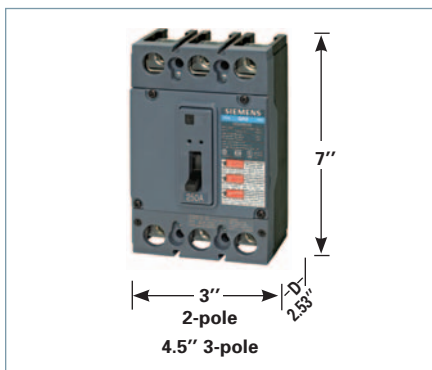
100	QRH22B100■	QRH23B100
125	QRH22B125	QRH23B125
150	QRH22B150	QRH23B150
175	QRH22B175■	QRH23B175
200	QRH22B200	QRH23B200
225	QRH22B225	QRH23B225
250	QRH22B250	QRH23B250

### Type HQR2<sup>②</sup>

100	HQR22B100■	HQR23B100
125	HQR22B125	HQR23B125
150	HQR22B150	HQR23B150
175	HQR22B175■	HQR23B175
200	HQR22B200	HQR23B200
225	HQR22B225	HQR23B225
250	HQR22B250	HQR23B250

### Type HQR2H<sup>②</sup>

100	HQR22B100H	HQR23B100H
125	HQR22B125H	HQR23B125H
150	HQR22B150H	HQR23B150H
175	HQR22B175H	HQR23B175H
200	HQR22B200H	HQR23B200H
225	HQR22B225H	HQR23B225H
250	HQR22B250H	HQR23B250H



### Ordering Information

Load side 3TA1QR300 lugs are mounted and included when circuit breaker is ordered. For line and load lugs (3TA1QR300) installed at no additional charge, add suffix "L" to catalog number.

**50°C Calibration** - See page 17/104.  
**400HZ** - See page 17/104.

### Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
2	1	3.2
3	1	4.5

### Lugs For 75°C Wire<sup>①</sup>

Catalog Number	Lug Body	Lug Wire Range
3TA1QR300	Al	#3 - 300 Kcmil Al/Cu
3TC1QR250	Cu	#3 - 300 Kcmil Cu ONLY
CCQ250	CMP	#6 AWG - 350kcmil Al/Cu

### Enclosures (Neutral Included)

Type	Catalog Number
1	QR2N1(S) or (F)
3R	QR2N3R3
12	QR2N12
4X	QR2N4X
4X316	QR2N4X316

### UL 489 Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (kA) Volts AC (50/60 Hz)
	240
QR2	10
QRH2	25
HQR2	65
HQR2H	100

■ Built to order. Allow 2-3 weeks for delivery.

① See **Note: A** page 17/42.  
**Note:** QR breakers are UL Listed for reverse feed applications.  
② HACR rated.

For external accessories, please refer to pages 17/107 to 17/112

# CQD 100A Frame

## Selection/Dimensions

### Type CQD (Cable In - Cable Out) DIN Rail Mount<sup>③</sup>

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	277V AC 125V DC	480V/277V AC 125/250V DC	480V/277V AC
	Catalog Number	Catalog Number	Catalog Number
15	CQD115 <sup>①②</sup>	CQD215 <sup>②</sup>	CQD315 <sup>②</sup>
20	CQD120 <sup>①②</sup>	CQD220 <sup>②</sup>	CQD320 <sup>②</sup>
25	CQD125 <sup>②</sup>	CQD225 <sup>②</sup>	CQD325 <sup>②</sup>
30	CQD130 <sup>②</sup>	CQD230 <sup>②</sup>	CQD330 <sup>②</sup>
35	CQD135 <sup>②■</sup>	CQD235 <sup>②■</sup>	CQD335 <sup>②</sup>
40	CQD140 <sup>②■</sup>	CQD240 <sup>②</sup>	CQD340 <sup>②</sup>
45	CQD145 <sup>②■</sup>	CQD245 <sup>②■</sup>	CQD345 <sup>②■</sup>
50	CQD150 <sup>②■</sup>	CQD250 <sup>②</sup>	CQD350 <sup>②</sup>
60	CQD160 <sup>■</sup>	CQD260	CQD360
70	CQD170 <sup>■</sup>	CQD270	CQD370
80	CQD180 <sup>■</sup>	CQD280	CQD380
90	CQD190 <sup>■</sup>	CQD290 <sup>■</sup>	CQD390
100	CQD1100 <sup>■</sup>	CQD2100	CQD3100

### Shipping Weights

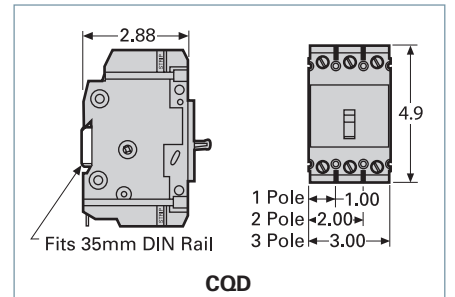
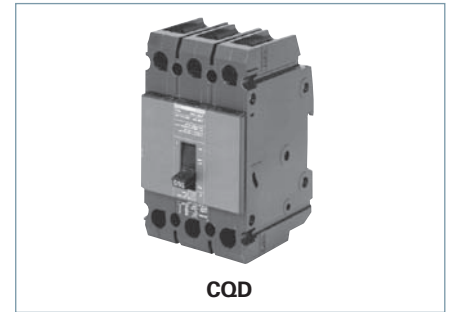
Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	0.5 (0)
2	1	1.0 (0)
3	1	1.5 (1)

### Lugs For 60/75°C Wire

Amps	Wire Size
15-40	#14-#6 AWG Cu #12-#6 AWG Al
45-100	#8-#1 AWG Cu #6-#1/0 AWG Al

### Interrupting Ratings

Breaker Type	Number of Poles	RMS Symmetrical Amperes (KA)						
		Volts AC (50/60 Hz)					Volts DC	
		120	240	277	480/277	600/347	125	125/250
CQD (UL)	1	65	—	14	—	—	14	—
	2	—	65	—	14	—	—	14
	3	—	65	—	14	—	—	—



For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

② HID rated.

① SWD rated.

③ HACR rated.

Note: CQD breakers are UL Listed for reverse feed applications.

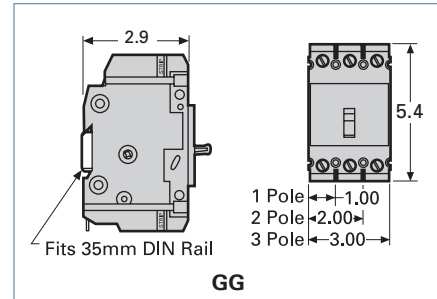
Accessories pages 17/14 and 17/107 to 17/112

# GG 125A Frame

## Selection/Dimensions

### Type NGG (Cable In - Cable Out)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	NGG1B015L <sup>①②</sup>	NGG2B015L <sup>②</sup>	NGG3B015L <sup>②</sup>
20	NGG1B020L <sup>①②</sup>	NGG2B020L <sup>②</sup>	NGG3B020L <sup>②</sup>
25	NGG1B025L <sup>②</sup>	NGG2B025L <sup>②</sup>	NGG3B025L <sup>②</sup>
30	NGG1B030L <sup>②</sup>	NGG2B030L <sup>②</sup>	NGG3B030L <sup>②</sup>
35	NGG1B035L <sup>②</sup>	NGG2B035L <sup>②</sup>	NGG3B035L <sup>②</sup>
40	NGG1B040L <sup>②</sup>	NGG2B040L <sup>②</sup>	NGG3B040L <sup>②</sup>
45	NGG1B045L <sup>②</sup>	NGG2B045L <sup>②</sup>	NGG3B045L <sup>②</sup>
50	NGG1B050L <sup>②</sup>	NGG2B050L <sup>②</sup>	NGG3B050L <sup>②</sup>
60	NGG1B060L	NGG2B060L	NGG3B060L
70	NGG1B070L	NGG2B070L	NGG3B070L
80	NGG1B080L	NGG2B080L	NGG3B080L
90	NGG1B090L	NGG2B090L	NGG3B090L
100	NGG1B100L	NGG2B100L	NGG3B100L
110	NGG1B110L	NGG2B110L	NGG3B110L
125	NGG1B125L	NGG2B125L	NGG3B125L



Line and load lugs are included as standard. If no lugs are required, remove the "L" suffix. HACR rated.

Suitable for screws or DIN rail mounting.

### Type HGG (Cable In - Cable Out)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	HGG1B015L <sup>①②</sup>	HGG2B015L <sup>②</sup>	HGG3B015L <sup>②</sup>
20	HGG1B020L <sup>①②</sup>	HGG2B020L <sup>②</sup>	HGG3B020L <sup>②</sup>
25	HGG1B025L <sup>②</sup>	HGG2B025L <sup>②</sup>	HGG3B025L <sup>②</sup>
30	HGG1B030L <sup>②</sup>	HGG2B030L <sup>②</sup>	HGG3B030L <sup>②</sup>
35	HGG1B035L <sup>②</sup>	HGG2B035L <sup>②</sup>	HGG3B035L <sup>②</sup>
40	HGG1B040L <sup>②</sup>	HGG2B040L <sup>②</sup>	HGG3B040L <sup>②</sup>
45	HGG1B045L <sup>②</sup>	HGG2B045L <sup>②</sup>	HGG3B045L <sup>②</sup>
50	HGG1B050L <sup>②</sup>	HGG2B050L <sup>②</sup>	HGG3B050L <sup>②</sup>
60	HGG1B060L	HGG2B060L	HGG3B060L
70	HGG1B070L	HGG2B070L	HGG3B070L
80	HGG1B080L	HGG2B080L	HGG3B080L
90	HGG1B090L	HGG2B090L	HGG3B090L
100	HGG1B100L	HGG2B100L	HGG3B100L
110	HGG1B110L	HGG2B110L	HGG3B110L
125	HGG1B125L	HGG2B125L	HGG3B125L

### Type LGG (Cable In - Cable Out)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	LGG1B015L <sup>①②</sup>	LGG2B015L <sup>②</sup>	LGG3B015L <sup>②</sup>
20	LGG1B020L <sup>①②</sup>	LGG2B020L <sup>②</sup>	LGG3B020L <sup>②</sup>
25	LGG1B025L <sup>②</sup>	LGG2B025L <sup>②</sup>	LGG3B025L <sup>②</sup>
30	LGG1B030L <sup>②</sup>	LGG2B030L <sup>②</sup>	LGG3B030L <sup>②</sup>
35	LGG1B035L <sup>②</sup>	LGG2B035L <sup>②</sup>	LGG3B035L <sup>②</sup>
40	LGG1B040L <sup>②</sup>	LGG2B040L <sup>②</sup>	LGG3B040L <sup>②</sup>
45	LGG1B045L <sup>②</sup>	LGG2B045L <sup>②</sup>	LGG3B045L <sup>②</sup>
50	LGG1B050L <sup>②</sup>	LGG2B050L <sup>②</sup>	LGG3B050L <sup>②</sup>
60	LGG1B060L	LGG2B060L	LGG3B060L
70	LGG1B070L	LGG2B070L	LGG3B070L
80	LGG1B080L	LGG2B080L	LGG3B080L
90	LGG1B090L	LGG2B090L	LGG3B090L
100	LGG1B100L	LGG2B100L	LGG3B100L
110	LGG1B110L	LGG2B110L	LGG3B110L
125	LGG1B125L	LGG2B125L	LGG3B125L

### Shipping Weights

Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	.75 (0.34)
2	1	1.3 (0.59)
3	1	2.0 (0.98)

### Lugs For 60/75°C Wire

NGG		
Ampere Rating	Wire Size	Catalog Number
15-30A	#14-#6 AWG Cu	TC1Q1 (qty. 1)
	#12-#6 AWG Al	3TC1Q1 (qty. 3)
35-125A	#8-1/0 AWG Cu #8-2/0 AWG Al	3TC1GG20 (qty. 3)
15-125A	Nut Keeper plate w/ screw (for crimp terminals)	TNKG3 (qty. 3)

### Interrupting Ratings (max. RMS symmetrical amperes kA)

Breaker Type	Poles	UL489 Volts AC							IEC 60947-2 (Ics = 50%Icu)				
									Volts DC		Volts AC		Volts DC
		120	240	277	347	480	600Y/347	125	125/250	240	415	125/250	
NGG	1	65	—	25	14	—	—	14	—	25	—	—	
	2,3	—	65	—	—	25	14	—	14 <sup>①</sup>	65	—	14	
HGG	1	65	—	35	22	—	—	14	—	—	—	—	
	2,3	—	65	—	—	35	22	—	14 <sup>①</sup>	—	—	—	
LGG	1	65	—	65	25	—	—	14	—	—	—	—	
	2,3	—	65	—	—	65	25	—	14 <sup>①</sup>	—	—	—	

For inches / millimeters conversion, see Application Data section.

① SWD rated.

② HID rated at 15-50A 1-pole @ 277 VAC; 2 & 3-pole @ 480 VAC

Accessories pages 17/14 and 17/107 to 17/112

17 MOLDED CASE CIRCUIT BREAKERS



# Accessories<sup>①</sup>

## Selection

### Shunt Trip

Control Voltage		BQD, BQD6, CQD, NGG, HGG, LGG, NGB, HGB and LGB Catalog Number
V AC	V DC	
120	—	CQDST120
240	—	CQDST240▲
277	—	CQDST277▲
480	—	CQDST480▲
600	—	CQDST600
—	12	CQDST12
—	24	CQDST24
—	48	CQDST48
—	125	CQDST125

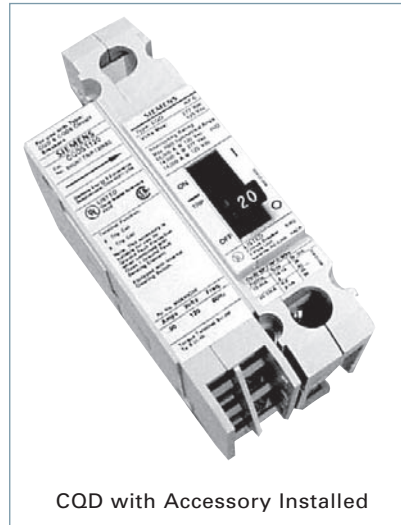


### Auxiliary Switch

Maximum Voltage		Number of Contacts	BQD, BQD6, CQD, NGG, HGG, LGG, NGB, HGB and LGB Catalog Number
AC	DC		
240	125	1A-1B	CQDA1
240	125	2A-2B	CQDA2

### Alarm Switch

Maximum Voltage		BQD, BQD6, CQD, NGG, HGG, LGG, NGB, HGB and LGB Catalog Number
AC	DC	
240	125	CQDBA



### Shunt Trip and Auxiliary Switch Combinations

Shunt Trip Voltage		BQD, BQD6, CQD, NGG, HGG, LGG, NGB, HGB and LGB Catalog Number
AC	DC	
24	—	CQDST24AAS▲
120	—	CQDST120AAS▲
240	—	CQDST240AAS▲
277	—	CQDST277AAS▲
480	—	CQDST480AAS▲
600	—	CQDST600AAS▲
—	12	CQDST12DAS▲
—	24	CQDST24DAS▲
—	48	CQDST48DAS▲
—	125	CQDST125DAS▲

### Alarm and Auxiliary Switch Combinations

For Breaker	Catalog Number
BQD, BQD6, CQD, NGG, HGG, LGG, NGB, HGB and LGB	CQDA1BA▲

▲ Built to order. Allow 6-8 weeks for delivery.

① Adds 1-pole space for accessory.

# Trip Unit Overview

## Selection

The interchangeability of the VL circuit breaker trip units allow for easy conversion from any of 3 types of protection. They are thermal-magnetic, electronic, or electronic with a built-in LCD. The thermal-magnetic trip unit features an adjustable magnetic trip setting. The electronic trip units are microprocessor based true RMS sensing devices and are available with a variety of adjustable trip settings, configurations, and infor-

mation menus. With precise control over the circuit breaker functions and access to system status, diagnostics, and information, these trip units allow for unsurpassed flexibility in circuit coordination.

An example of coordination is the out of the box Ground Fault function on the Model 555 trip units. The pick-up and time delay settings are set at the

factory for each frame and do not overlap with the settings on the other frames. Therefore, when VL breakers are used together in a system the GF protection is automatically coordinated. The user also has the ability to program a custom coordination scheme with adjustable settings on both the 555 and 586 trip units.

Trip Unit Functions	VL Trip Units							
	Model 525	Model 555				Model 586		
	Thermal-magnetic	Electronic LI	Electronic LIG	Electronic LSI	Electronic LSIG	Electronic with LCD LSI	Electronic with LCD LSI	Electronic with LCD LSI + G alarm only
Continuous Current Setting ( $I_r$ )	Fixed	◆	◆	◆	◆	◆	◆	◆
Long Time Delay ( $t_r$ )	□	◆	◆	◆	◆	◆	◆	◆
Instantaneous Function	●	●	●	●	●	(ON/OFF)	(ON/OFF)	(ON/OFF)
Instantaneous Pickup ( $I_i$ )	◆	◆	◆	◆	◆	◆	◆	◆
Short Time Function	□	□	□	●	●	(ON/OFF)	(ON/OFF)	(ON/OFF)
Short Time Pick-up ( $I_{sd}$ )	□	□	□	◆	◆	◆	◆	◆
Short Time Delay ( $t_{sd}$ )	□	□	□	◆	◆	◆	◆	◆
Ground Fault Pick-up ( $I_g$ )	□	□	◆	□	◆	□	◆	□
Ground Fault Delay ( $t_g$ )	□	□	◆	□	◆	□	◆	□
Ground Fault Alarm Pick-up	□	□	□	□	□	□	◆	◆
Ground Fault Alarm Delay	□	□	□	□	□	□	◆	◆
Alarm & Status Indicator	□	●	●	●	●	●	●	●
Built-in Display (LCD)	□	□	□	□	□	●	●	●
Pre-Trip Alarm <sup>①</sup>	□	●	●	●	●	●	●	●
Last Trip Information	□	● <sup>①</sup>	● <sup>①</sup>	● <sup>①</sup>	● <sup>①</sup>	●	●	●
Zone Selective <sup>①</sup>	□	●	●	●	●	●	●	●
Communications <sup>①</sup>	□	●	●	●	●	●	●	●

◆ Adjustable setting  
 ● This feature is included  
 □ Feature is not included.  
 ① Requires a COMPRO20 or COMMOD21 module in a communication system.

### Continuous Amps Rating ( $I_r$ )

This setting is the continuous current that the breaker will carry without tripping. It can be set up to 100% of the trip unit's nominal rating ( $I_n$ ).

### Long Time Delay ( $t_r$ )

Sometimes referred to as the "overload" position, this function controls the breaker's "pause-in-tripping" time. It allows low level, temporary inrush currents such as those encountered when starting a motor to pass without tripping. The time delay begins when the current reaches  $6 \times I_r$ .

### Instantaneous Pick-up ( $I_i$ )

This function sets the breaker to trip instantaneously during high fault conditions. This function may be turned on for Model 586 trip units. Turning this function off will enable an instantaneous trip

override function to ensure self protection of circuit breaker.

### Short Time Pick-Up ( $I_{sd}$ )

This function controls the level of fault current the breaker will carry for a short time without tripping, thus allowing downstream devices to clear short circuits ahead of up-stream protection. It may be defeated (turned-off) on Model 586 trip units.

### Short Time Delay ( $t_{sd}$ )

This controls the interval of time the breaker will remain closed against a fault (at the Short Time Pick-up current level) without tripping. The time delay may be set at fixed points or at short time intervals based on  $I^2t$  curves. This function is used with the Short Time Pick-up to achieve selectivity and better system coordination.

### Ground Fault Pick-Up ( $I_g$ )

This setting controls the level of ground fault current that will cause the breaker to trip. Model 555 Electronic Trip Units act on the residual current to sense ground current. The Model 586 Electronic Trip Unit is programmable and allows the user to select either the residual current method or direct detection (via a separate current transformer) to detect ground current.

### Ground Fault Time Delay ( $t_g$ )

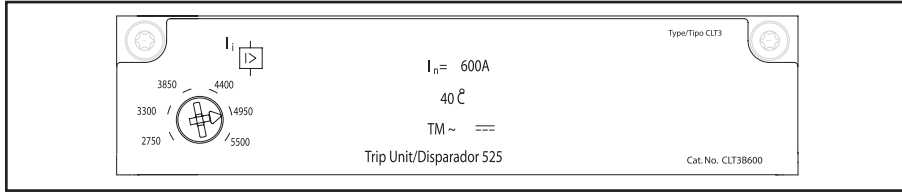
This controls the interval of time the breaker will remain closed after a ground fault is detected (at the Ground Fault Pick-up current level) without tripping.



# General Information

## Selection

**Thermal-Magnetic** trip units, Model 525, combine the inverse time element design for low level overloads, and instantaneous magnetic action for short circuit protection. The standard unit has preset overload protection and an adjustable instantaneous trip setting, with 6 set points. Thermal-Magnetic trip units are available throughout the VL family, from 50 to 1600A.



## Electronic Trip Units

Electronic trip units are available through the VL family, from 60A (which can be set as low as 30A) up through 1600A. They are also available in four trip configurations (LI, LIG, LSI, LSIG) and features can include a built-in LCD display.

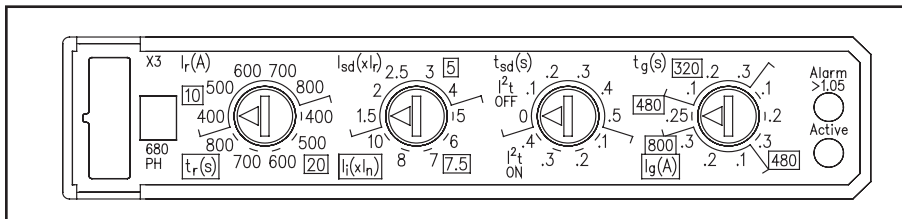
On the Model 555 Electronic Trip Unit a flashing LED confirms that the

microprocessor is in operating and another indicates an overload condition. For ease-of-use and to insure proper coordination, the set points for the continuous current are shown on the face of these trip units in amps.

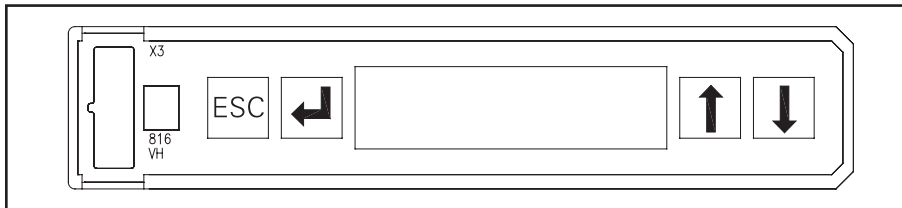
On the Model 586, the LCD version, the current in each phase is continuously shown on the display. Unlike many

displays, no secondary or auxiliary voltage is required as long as the breaker is energized and a minimal load current is present. These trip units can also indicate the "last trip" status (date, time, amps) when they're connected to a PC via one of our communications modules. Without being connected via a communication module, the last trip status can be viewed on Model 586 trip units (no time stamp).

## Typical Trip Unit Labeling and Adjustment Positions



Model 555 Electronic Trip Unit with LSIG trip functions



Model 586 Electronic Trip Unit has an LCD display

# DG 150A Frame, VL Series

## Selection

### Ordering Information

#### Complete Assembled Breaker

A complete factory assembled DG breaker includes the frame, trip unit, and standard line and load connectors, all factory installed and shipped as a complete breaker. Assembled breakers are only available with standard connectors.

For DC applications, use thermal magnetic trip unit only.

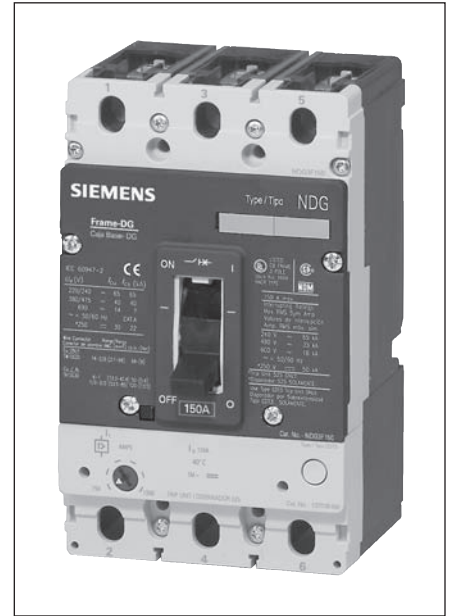
Breakers are suitable for reverse feed applications.

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

For 100% rated breakers with a non-interchangeable trip unit, change the 3rd character of the catalog number to "W". Available in electronic and electronic with LCD only.

HACR rated.



### Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	4.1 (105)	6.9 (175)	3.4 (81)	4.2(107)

### Approx. Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	3.7 (1.7)	2.2 (1.0)	2.6 (1.2)	5.9 (2.7)

### Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)										
		UL 489					IEC 60947-2					
		Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
		240	480	600Y/347	250	500	220/240		380/415		690	
					I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>		
N	NDGB	65	35	18	30	18	65	65	40	40	12	6
H	HDGB	100	65	18	30	18	100	75	70	70	12	6
L	LDGB	200	100	18	30	18	200	150	100	75	12	6

### Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Steel	30-150	#8-1/0 Cu	1	3TW1DG20 <sup>②</sup>
Aluminum	30-150	#6-3/0 Al/Cu	1	3TA1DG30 <sup>①②</sup>
Copper	30-150	#6-3/0 Cu	1	3TC1DG30 <sup>②④</sup>
<b>Distribution Lugs</b>				
	30-150	#14-#2 Al/Cu (3pcs. Max)	3	3TA3DG02 <sup>②</sup>
	30-150	#14-#4 Cu, #14-#6 Al	6	3TA6DG04 <sup>②</sup>
<b>Compression Lugs</b>				
	30-150	#14-2/0 kcmil Al/Cu	-	2CLD20 <sup>③</sup>
	30-150	#14-2/0 kcmil Al/Cu	-	3CLD20 <sup>②</sup>

- ① Standard connector supplied with complete breakers.
- ② Kit consists of 3 terminal connectors.
- ③ 2 Lugs for 2-pole breakers.
- ④ Required for 100% rated DG breakers. Requires 90°C Cu cable sized at 75°C ampacity

### DG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I <sub>n</sub> )	Instantaneous Overcurrent Setting (I <sub>b</sub> )	
	Min.	Max.
50	450	600
60	450	600
70	450	700
80	450	800
90	500	1000
100	500	1000
110	550	1100
125	625	1250
150	800	1600

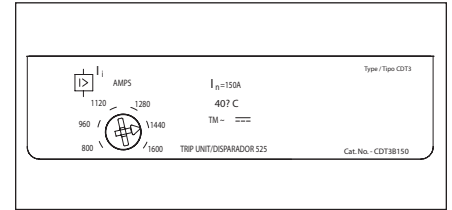
Note: Each breaker has 6 trip settings in this range.

17 MOLDED CASE CIRCUIT BREAKERS

External Accessories pages 17/43 through 17/57

# DG 150A Thermal-Magnetic Trip Unit

## Selection



Model 525 Trip Unit

### DG 150A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
50	NDK2B050L	HDK2B050L	LDK2B050L
60	NDK2B060L	HDK2B060L	LDK2B060L
70	NDK2B070L	HDK2B070L	LDK2B070L
80	NDK2B080L	HDK2B080L	LDK2B080L
90	NDK2B090L	HDK2B090L	LDK2B090L
100	NDK2B100L	HDK2B100L	LDK2B100L
110	NDK2B110L	HDK2B110L	LDK2B110L
125	NDK2B125L	HDK2B125L	LDK2B125L
150	NDK2B150L	HDK2B150L	LDK2B150L

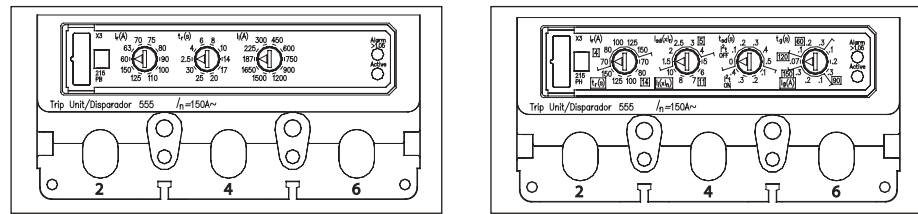
### DG 150A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
50	NDK3B050L	HDK3B050L	LDK3B050L
60	NDK3B060L	HDK3B060L	LDK3B060L
70	NDK3B070L	HDK3B070L	LDK3B070L
80	NDK3B080L	HDK3B080L	LDK3B080L
90	NDK3B090L	HDK3B090L	LDK3B090L
100	NDK3B100L	HDK3B100L	LDK3B100L
110	NDK3B110L	HDK3B110L	LDK3B110L
125	NDK3B125L	HDK3B125L	LDK3B125L
150	NDK3B150L	HDK3B150L	LDK3B150L

A - Consult with Siemens for availability.

# DG 150A Electronic Trip Units

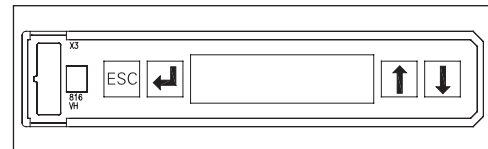
## Selection



Model 555 Trip Units

### DG 150A Frame 3-Pole Electronic Trip Unit<sup>①</sup>

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
ELECTRONIC LI TRIP			
60	NDK3R060L	HDK3R060L	LDK3R060L
100	NDK3R100L	HDK3R100L	LDK3R100L
150	NDK3R150L	HDK3R150L	LDK3R150L
ELECTRONIC LSI TRIP			
60	NDK3T060L	HDK3T060L	LDK3T060L
100	NDK3T100L	HDK3T100L	LDK3T100L
150	NDK3T150L	HDK3T150L	LDK3T150L
ELECTRONIC LSIG TRIP			
60	NDK3V060L	HDK3V060L	LDK3V060L
100	NDK3V100L	HDK3V100L	LDK3V100L
150	NDK3V150L	HDK3V150L	LDK3V150L
ELECTRONIC LIG TRIP			
60	NDK3W060L	HDK3W060L	LDK3W060L
100	NDK3W100L	HDK3W100L	LDK3W100L
150	NDK3W150L	HDK3W150L	LDK3W150L



Model 586 Trip Unit

### DG 150A Frame 3-Pole Electronic LCD Trip Unit<sup>①</sup>

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
LCD ELECTRONIC LSI TRIP			
60	NDK3A060L	HDK3A060L	LDK3A060L
100	NDK3A100L	HDK3A100L	LDK3A100L
150	NDK3A150L	HDK3A150L	LDK3A150L
LCD ELECTRONIC LSIG TRIP			
60	NDK3G060L	HDK3G060L	LDK3G060L
100	NDK3G100L	HDK3G100L	LDK3G100L
150	NDK3G150L	HDK3G150L	LDK3G150L
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY			
60	NDK3K060L	HDK3K060L	LDK3K060L
100	NDK3K100L	HDK3K100L	LDK3K100L
150	NDK3K150L	HDK3K150L	LDK3K150L

<sup>①</sup> Due to the location of the magnetic tripping solenoid, the left accessory pocket is not available for accessories.

# FG 250A Frame, VL Series

## Selection/Dimensions

### Ordering Information

#### Complete Assembled Breaker

A complete factory assembled FG breaker includes the frame, trip unit, and standard line and load connectors, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For DC applications, use thermal magnetic trip unit only.

Breakers are suitable for reverse feed applications.

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

HACR rated.



### Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)										
	UL 489					IEC 60947-2					
	Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
	240	480	600Y/347	250	500	220/240		380/415		690	
					I <sub>CU</sub>	I <sub>CS</sub>	I <sub>CU</sub>	I <sub>CS</sub>	I <sub>CU</sub>	I <sub>CS</sub>	
NFG	65	35	18	30	18	65	65	40	40	12	6
HFG	100	65	18	30	18	100	75	70	70	12	6
LFG	200	100	18	30	18	200	150	100	75	12	6

### Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Steel	50-250	#4-350 kcmil Cu	1	3TW1FG350 <sup>Ⓢ</sup>
Aluminum <sup>Ⓢ</sup>	50-250	#4-350 kcmil Al/Cu	1	3TAW1FG350 <sup>Ⓢ</sup>
Copper	50-250	#4-350 kcmil Cu	1	3TCW1FG350 <sup>Ⓢ</sup>
Distribution Lugs				
	50-250	#12-2/0 Cu/Al	3	3TA3FG20 <sup>Ⓢ</sup>
	50-250	#14-#4 Cu/Al	6	3TA6FG04 <sup>Ⓢ</sup>

- Ⓢ Standard connector supplied with complete breakers.
- Ⓢ Kit consists of 3 terminal connectors.
- Ⓢ 2 Lugs for 2-pole breakers.
- Ⓢ 3 Lugs for 3-pole breakers.

### FG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I <sub>n</sub> )	Instantaneous Overcurrent Setting (I <sub>i</sub> )	
	Min.	Max.
100	625	1250
110	800	1600
125	800	1600
150	800	1600
175	1000	2000
200	1000	2000
225	1250	2500
250	1250	2500

Note: Each breaker has 6 trip settings in this range.

### Dimensions, inches (mm)

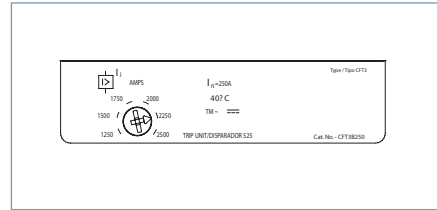
Number of Poles	Width	Length	Depth	To Handle D1
2, 3	4.1 (105)	6.9 (175)	3.4 (81)	4.2 (107)

### Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	4.0 (1.8)	2.2 (1.0)	2.6 (1.2)	6.2 (2.8)

# FG 250A Thermal-Magnetic Trip Unit

## Selection



Model 525 Trip Unit

### FG 250A Frame 2-Pole with Thermal-Magnetic Trip Unit

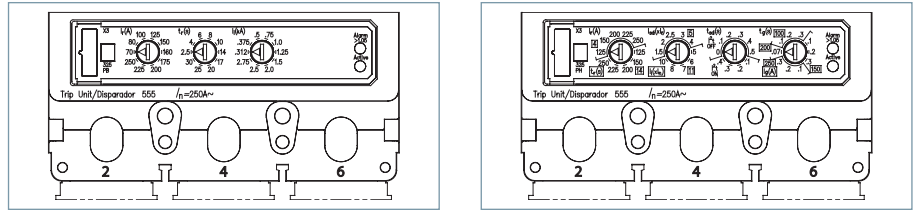
Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
100	NFK2B100L	HFK2B100L	LFK2B100L
110	NFK2B110L	HFK2B110L	LFK2B110L
125	NFK2B125L	HFK2B125L	LFK2B125L
150	NFK2B150L	HFK2B150L	LFK2B150L
175	NFK2B175L	HFK2B175L	LFK2B175L
200	NFK2B200L	HFK2B200L	LFK2B200L
225	NFK2B225L	HFK2B225L	LFK2B225L
250	NFK2B250L	HFK2B250L	LFK2B250L

### FG 250A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
100	NFK3B100L	HFK3B100L	LFK3B100L
110	NFK3B110L	HFK3B110L	LFK3B110L
125	NFK3B125L	HFK3B125L	LFK3B125L
150	NFK3B150L	HFK3B150L	LFK3B150L
175	NFK3B175L	HFK3B175L	LFK3B175L
200	NFK3B200L	HFK3B200L	LFK3B200L
225	NFK3B225L	HFK3B225L	LFK3B225L
250	NFK3B250L	HFK3B250L	LFK3B250L

# FG 250A Electronic 3-Knob & LCD Trip Units

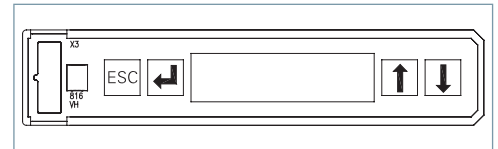
## Selection



Model 555 Trip Units

### FG 250A Frame 3-Pole Electronic Trip Unit<sup>Ⓢ</sup>

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
ELECTRONIC LI TRIP			
100	NFK3R100L	HFK3R100L	LFK3R100L
150	NFK3R150L	HFK3R150L	LFK3R150L
250	NFK3R250L	HFK3R250L	LFK3R250L
ELECTRONIC LSI TRIP			
100	NFK3T100L	HFK3T100L	LFK3T100L
150	NFK3T150L	HFK3T150L	LFK3T150L
250	NFK3T250L	HFK3T250L	LFK3T250L
ELECTRONIC LSIG TRIP			
100	NFK3V100L	HFK3V100L	LFK3V100L
150	NFK3V150L	HFK3V150L	LFK3V150L
250	NFK3V250L	HFK3V250L	LFK3V250L
ELECTRONIC LIG TRIP			
100	NFK3W100L	HFK3W100L	LFK3W100L
150	NFK3W150L	HFK3W150L	LFK3W150L
250	NFK3W250L	HFK3W250L	LFK3W250L



Model 586 Trip Unit

### FG 250A Frame 3-Pole Electronic LCD Trip Unit<sup>Ⓢ</sup>

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
LCD ELECTRONIC LSI TRIP			
100	NFK3A100L	HFK3A100L	LFK3A100L
150	NFK3A150L	HFK3A150L	LFK3A150L
250	NFK3A250L	HFK3A250L	LFK3A250L
LCD ELECTRONIC LSIG TRIP			
100	NFK3G100L	HFK3G100L	LFK3G100L
150	NFK3G150L	HFK3G150L	LFK3G150L
250	NFK3G250L	HFK3G250L	LFK3G250L
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY			
100	NFK3K100L	HFK3K100L	LFK3K100L
150	NFK3K150L	HFK3K150L	LFK3K150L
250	NFK3K250L	HFK3K250L	LFK3K250L

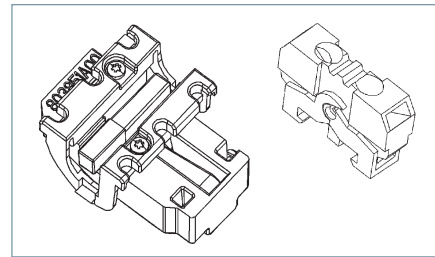
<sup>Ⓢ</sup> Due to the location of the magnetic tripping solenoid, the left accessory pocket is not available for accessories.

# Internal Accessories for DG 150A and FG 250A Frames

## Selection

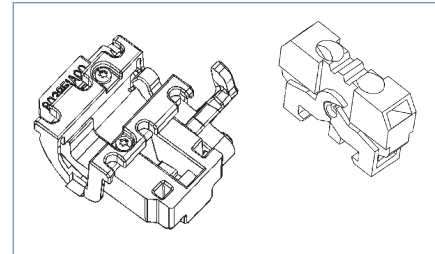
### Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket <sup>①</sup>	Catalog Number
1 Alarm Switch 1A/B <sup>③</sup> Bases AMBL2 & AMBL3	Left, Right <sup>②</sup>	ASKL1
2 Aux. Switches 1A + 1B Bases AMBL1	Left, Right	ASKL2
2 Aux. + 1 Alarm Switches 1A + 1B, 1A/B <sup>③</sup> Bases AMBL2 & AMBL3	Left, Right <sup>②</sup>	ASKL3



### Auxiliary/Alarm Switch Mounting Base Only

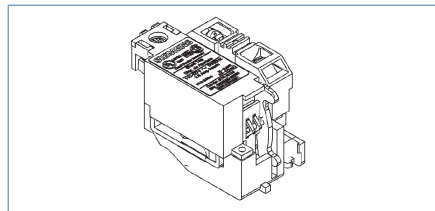
Description	Mounting Pocket	Catalog Number
Up to 3 Auxiliary Switches	Left, Right	AMBL1
2 Aux. + 1 Alarm Switch	Left Pocket Only	AMBL2
2 Aux. + 1 Alarm Switch	Right Pocket Only	AMBL3



### Auxiliary/Alarm Switch Only

Common to DG - PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	ASWPA
1 Normally Closed Contact (1B)	ASWPB



### Shunt Trips

Description	Mounting Pocket	Catalog Number
24 VDC	Right Pocket Only	STRLB24DC
48-60 VDC		STRLC60DC
110-127 VDC		STRLD125DC
220-250 VDC		STRLE250DC
48-60 VAC		STRLM60
110-127 VAC		STRLN120
208-277 VAC		STRLS277
380-600 VAC		STRLV600



### Undervoltage Release

Description	Mounting Pocket	Catalog Number
12 VDC	Right Pocket Only	UVRLA12DC
24 VDC		UVRLB24DC
48 VDC		UVRLC48DC
60 VDC		UVRLG60DC
110-127 VDC		UVRLD125DC
220-250 VDC		UVRLE250DC
24 VAC		UVRL24
110-127 VAC		UVRLN120
220-240 VAC		UVRLR240
208 VAC		UVRLP208
277 VAC		UVRLS277
380-415 VAC		UVRLT415
440-480 VAC		UVRLU480

① Refer to the "Accessory Locations" chart on page 17/58 for guidelines and limitations about which pockets may be used for accessory combinations.  
 ② These kits include two bases, one for mounting switches in the left pocket and another for mounting in the right.  
 ③ Includes 1A and 1B contact for alarm purposes, only one of which may be installed at any time.  
 'A' refers to a normally open contact (open when the breaker contacts are open).  
 'B' refers to a normally closed contact (closed when the breaker contacts are open).



# JG 400A Frame, VL Series

## Selection/Dimensions

### Ordering Information

#### Complete Assembled Breaker

A complete factory assembled JG breaker includes the frame, trip unit, and standard line and load connectors, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For any other configuration, order the frame, trip unit, and terminals as separate items.

For DC applications, use thermal magnetic trip unit only.

For reverse feed applications, select non-interchangeable trip breakers only.

For non-interchangeable trip breakers, change the third digit of the catalog number to "X" for standard breakers.

For 100% rated breakers with a non-interchangeable trip unit, change the 3<sup>rd</sup> character of the catalog number to "Y" (3-pole only).

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

HACR rated.



Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	5.5 (139)	11 (279)	4.2 (102)	5.4 (138)

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	9.3 (4.2)	4.0 (1.8)	4.0 (1.8)	12.6 (5.7)

### Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)										
		UL 489 AIR (File E10848)					IEC 60947-2					
		Volts AC (50/60 Hz)					Volts DC					
		240	480	600	250	500	220/240			380/415		690
		I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	
N	NJGA	65	35	25	30	25	65	65	45	45	12	6
H	HJGA	100	65	25	30	35	100	75	70	70	15	8
L	LJGA	200	100	25	30	35	200	150	100	75	15	8

### Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Steel	70-400	1/0-600 kcmil Cu	1	3TW1JG600 <sup>②</sup>
Aluminum	70-400	3/0-250 kcmil Al/Cu	2	3TA2JG250 <sup>①②</sup>
Aluminum	70-400	250-750 kcmil Al	1	3TA1JG750 <sup>②</sup>
Aluminum	70-400	3/0-600 kcmil Cu	1	3TA1JG750 <sup>②</sup>
Copper	70-400	3/0-600 kcmil Cu	1	TC1JG750 <sup>③</sup>
Copper	70-400	3/0-250 kcmil Cu	2	TC2JG250 <sup>③</sup>
Distribution Lugs				
	70-400	#14-4 Cu	12	3TA12JG04 <sup>②</sup>
	70-400	#14-2/0 Al/Cu	6	3TA6JG20 <sup>②</sup>
Compression Lugs				
	70-400	#6-350 kcmil	—	3CLJ350 <sup>②</sup>
	70-400	250-600 kcmil	—	3CLJ600 <sup>②</sup>

① Standard construction supplied for each breaker.

② Kit consists of 3 terminal connectors.

③ Required for 100% rated JG breakers. Requires 90°C Cu cable sized at 75°C ampacity.

### JG Thermal-Magnetic, Instantaneous Trip Adjustment Range

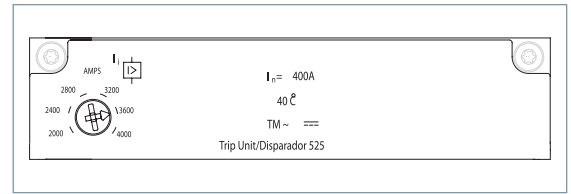
Trip Unit Continuous Amp Rating (I <sub>n</sub> )	Instantaneous Overcurrent Setting (I <sub>i</sub> )	
	Min.	Max.
250	1250	2500
300	1500	3000
350	1750	3500
400	2000	4000

Note: Each breaker has 6 trip settings in this range.

External Accessories pages 17/43 through 17/57

# JG 400A Thermal-Magnetic Trip Unit

## Selection



Model 525 Trip Unit

### JG 400A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NJG2F400	HJG2F400	LJG2F400	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
250	NJG2B250L	HJG2B250L	LJG2B250L	CJT2B250
300	NJG2B300L	HJG2B300L	LJG2B300L	CJT2B300
350	NJG2B350L	HJG2B350L	LJG2B350L	CJT2B350
400	NJG2B400L	HJG2B400L	LJG2B400L	CJT2B400

### JG 400A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NJG3F400	HJG3F400	LJG3F400	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
250	NJG3B250L	HJG3B250L	LJG3B250L	CJT3B250
300	NJG3B300L	HJG3B300L	LJG3B300L	CJT3B300
350	NJG3B350L	HJG3B350L	LJG3B350L	CJT3B350
400	NJG3B400L	HJG3B400L	LJG3B400L	CJT3B400

### JJ 400A Frame 240V max., 2-pole with Thermal-Magnetic Non-Interchangeable Trip Unit<sup>①</sup>

Continuous Ampere Rating	N-Interrupting Class
	Catalog Number
	COMPLETE BREAKER
250	NJJ2B250
300	NJJ2B300
350	NJJ2B350
400	NJJ2B400

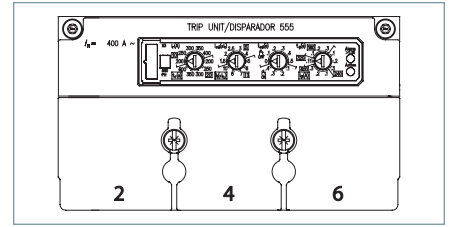
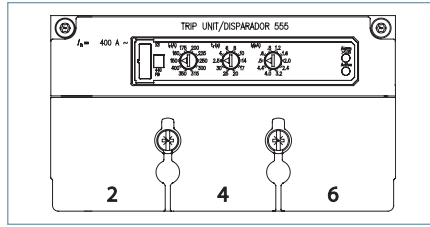
### JJ 400A Frame 240V max., 3-pole with Thermal-Magnetic Non-Interchangeable Trip Unit<sup>①</sup>

Continuous Ampere Rating	N-Interrupting Class
	Catalog Number
	COMPLETE BREAKER
250	NJJ3B250
300	NJJ3B300
350	NJJ3B350
400	NJJ3B400

<sup>①</sup> Terminal connectors must be ordered separately.  
Breaker Type NJJA.

# JG 400A Electronic 3-Knob & LCD Trip Units

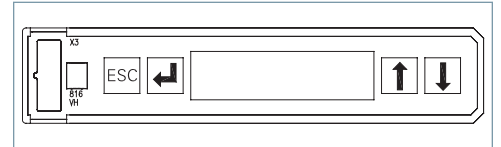
## Selection



Model 555 Trip Units

## JG 400A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NJG3F400	HJG3F400	LJG3F400	
COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER				TRIP UNIT ONLY
ELECTRONIC LI TRIP				
250	NJG3R250L	HJG3R250L	LJG3R250L	CJT3R250
400	NJG3R400L	HJG3R400L	LJG3R400L	CJT3R400
ELECTRONIC LSI TRIP				
250	NJG3T250L	HJG3T250L	LJG3T250L	CJT3T250
400	NJG3T400L	HJG3T400L	LJG3T400L	CJT3T400
ELECTRONIC LSIG TRIP				
250	NJG3V250L	HJG3V250L	LJG3V250L	CJT3V250
400	NJG3V400L	HJG3V400L	LJG3V400L	CJT3V400
ELECTRONIC LIG TRIP				
250	NJG3W250L	HJG3W250L	LJG3W250L	CJT3W250
400	NJG3W400L	HJG3W400L	LJG3W400L	CJT3W400



Model 586 Trip Unit

## JG 400A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NJG3F400	HJG3F400	LJG3F400	
COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER				TRIP UNIT ONLY
LCD ELECTRONIC LSI TRIP				
250	NJG3A250L	HJG3A250L	LJG3A250L	CJT3A250
400	NJG3A400L	HJG3A400L	LJG3A400L	CJT3A400
LCD ELECTRONIC LSIG TRIP				
250	NJG3G250L	HJG3G250L	LJG3G250L	CJT3G250
400	NJG3G400L	HJG3G400L	LJG3G400L	CJT3G400
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY				
250	NJG3K250L	HJG3K250L	LJG3K250L	CJT3K250
400	NJG3K400L	HJG3K400L	LJG3K400L	CJT3K400

# LG 600A Frame, VL Series

## Selection/Dimensions

### Ordering Information

**Complete Assembled Breaker**

A complete factory assembled LG breaker includes the frame, trip unit, and standard line and load lugs, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For DC applications, use thermal magnetic trip unit only.

Breakers are suitable for reverse feed applications.

For special applications, refer to page 17/62.

Mounting hardware is included with each breaker.

For 100% rated breakers, change the 3rd character of the catalog number to "W". Available on 400/500 Amp only (3-pole only).

HACR rated.



### Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1												
					RMS Symmetrical Amperes (KA)											
		UL 489			IEC 60947-2											
		Volts AC (50/60 Hz)			Volts DC			Volts AC (50/60 Hz)								
								220/240			380/415			690		
		240	480	600	250	500	I <sub>CU</sub>	I <sub>CS</sub>	I <sub>CU</sub>	I <sub>CS</sub>	I <sub>CU</sub>	I <sub>CS</sub>	I <sub>CU</sub>	I <sub>CS</sub>		
2, 3	5.5 (139)	11 (279)	4.2 (102)	5.4 (138)												
Ext. Shield		13.6 (345.5)														

### Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	17.4 (7.9)	3.5 (1.6)	4.2 (1.9)	20.9 (9.5)

### Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)																
		UL 489						IEC 60947-2										
		Volts AC (50/60 Hz)						Volts DC										
		240		480		600		250		500		220/240		380/415		690		
										I <sub>CU</sub>		I <sub>CS</sub>		I <sub>CU</sub>		I <sub>CS</sub>		
N	NLGB	65	35	18	30	25	65	65	45	45	12	6						
H	HLGB	100	65	18 <sup>①</sup>	30	35	100	75	70	70	15	8						
L	LLGB	200	100	18	30	35	200	150	100	75	15	8						

① Special 600Vac 25kA thermal-magnetic version (Type HLGC) available, see page 17/28.

### Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number <sup>③</sup>
Aluminum	150-600	#2-600 kcmil Al/Cu	2 (load side)	3TA2LG600LD <sup>②</sup>
Aluminum	150-600	#2-600 kcmil Al/Cu	2 (line side)	3TA2LG600LN <sup>②</sup>
Copper	150-600	#2-600 kcmil Cu	2 (load side)	3TC2LG600LD <sup>⑤</sup>
Copper	150-600	#2-600 kcmil Cu	2 (line side)	3TC2LG600LN <sup>⑤</sup>
Compression Lugs				
	150-600	#6-350 kcmil Al/Cu	—	6CLL350 <sup>④</sup>
	150-600	250-750 kcmil Al/Cu	—	3CLL750 <sup>③</sup>
	150-600	250-600 kcmil Al/Cu	—	6CLL600 <sup>⑤</sup>

③ Standard construction supplied for each breaker.

② Kit consists of 3 terminal connectors.

⑤ Kit consists of 6 lugs for Line or Load end.

④ Required for 100% rated LG breakers. Requires 90°C Cu cable sized at 75°C ampacity.

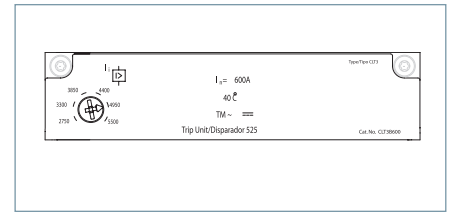
### LG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I <sub>n</sub> )	Instantaneous Overcurrent Setting (I <sub>t</sub> )	
	Min.	Max.
400	2000	4000
500	2500	5000
600	2750	5500

Note: Each breaker has 6 trip settings.

## LG 600A Thermal-Magnetic Trip Unit

## Selection



Model 525 Trip Unit

## LG 600A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	NLK2B400L	HLK2B400L	LLK2B400L
500	NLK2B500L	HLK2B500L	LLK2B500L
600	NLK2B600L	HLK2B600L	LLK2B600L

LG 600A Frame 3-Pole with Thermal-Magnetic Trip Unit<sup>①</sup>

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	NLK3B400L	HLK3B400L	LLK3B400L
500	NLK3B500L	HLK3B500L	LLK3B500L
600	NLK3B600L	HLK3B600L	LLK3B600L

Type HLCG 600A Frame 2-Pole with Thermal-Magnetic Trip Unit , 600Vac 25kA only<sup>②</sup>

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	—	HLV2B400L	—
500	—	HLV2B500L	—
600	—	HLV2B600L	—

Type HLCG 600A Frame 3-Pole with Thermal-Magnetic Trip Unit , 600Vac 25kA only<sup>①②</sup>

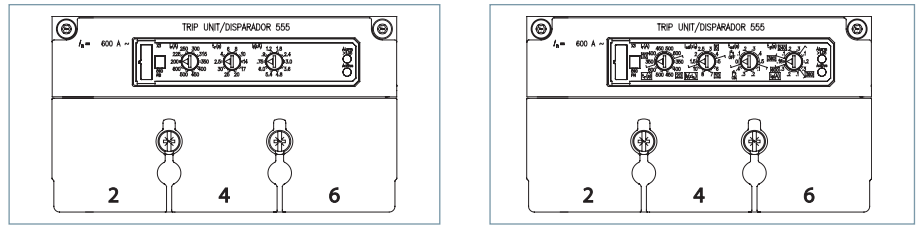
Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	—	HLV3B400L	—
500	—	HLV3B500L	—
600	—	HLV3B600L	—

① For 100% rated 400A or 500A versions, change the third character of the catalog number to "Z".

② Consult sales office for availability.

# LG 600A Electronic Trip Units

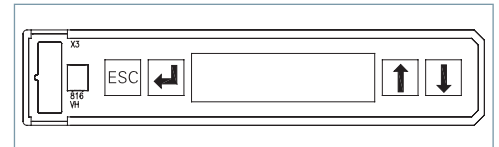
## Selection



Model 555 Trip Unit

### LG 600A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
<b>COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER</b>			
<b>ELECTRONIC LI TRIP</b>			
400	NLK3R400L	HLK3R400L	LLK3R400L
600	NLK3R600L	HLK3R600L	LLK3R600L
<b>ELECTRONIC LSI TRIP</b>			
400	NLK3T400L	HLK3T400L	LLK3T400L
600	NLK3T600L	HLK3T600L	LLK3T600L
<b>ELECTRONIC LSIG TRIP</b>			
400	NLK3V400L	HLK3V400L	LLK3V400L
600	NLK3V600L	HLK3V600L	LLK3V600L
<b>ELECTRONIC LIG TRIP</b>			
400	NLK3W400L	HLK3W400L	LLK3W400L
600	NLK3W600L	HLK3W600L	LLK3W600L



Model 586 Trip Unit

### LG 600A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
<b>COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER</b>			
<b>ELECTRONIC LSI TRIP</b>			
400	NLK3A400L	HLK3A400L	LLK3A400L
600	NLK3A600L	HLK3A600L	LLK3A600L
<b>ELECTRONIC LSIG TRIP</b>			
400	NLK3G400L	HLK3G400L	LLK3G400L
600	NLK3G600L	HLK3G600L	LLK3G600L
<b>ELECTRONIC LSI TRIP + GF ALARM ONLY</b>			
400	NLK3K400L	HLK3K400L	LLK3K400L
600	NLK3K600L	HLK3K600L	LLK3K600L

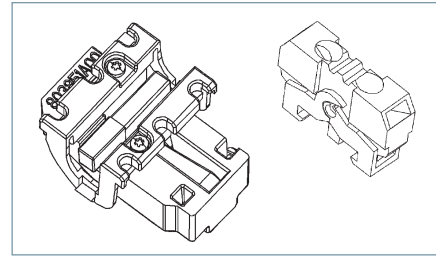
17 MOLDED CASE CIRCUIT BREAKERS

# Internal Accessories for JG 400A and LG 600A Frames

## Selection

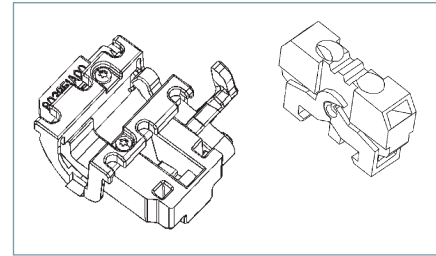
### Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket <sup>①</sup>	Catalog Number
1 Alarm Switch 1A/B <sup>③</sup> Bases AMBL2 & AMBL3	Left, Right <sup>②</sup>	ASKL1
2 Aux. Switches 1A + 1B Bases AMBL1	Left, Right	ASKL2
2 Aux. + 1 Alarm Switches 1A + 1B, 1A/B Bases AMBL2 & AMBL3	Left, Right <sup>②</sup>	ASKL3



### Auxiliary/Alarm Switch Mounting Base Only

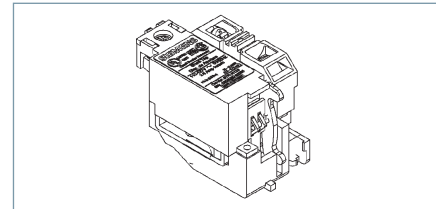
Description	Mounting Pocket	Catalog Number
Up to 3 Auxiliary Switches	Left, Right	AMBL1
2 Aux. + 1 Alarm Switch	Left Pocket Only	AMBL2
2 Aux. + 1 Alarm Switch	Right Pocket Only	AMBL3



### Auxiliary/Alarm Switch Only

Common to DG - PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	ASWPA
1 Normally Closed Contact (1B)	ASWPB



### Shunt Trips

Description	Mounting Pocket	Catalog Number
24 VDC	Right Pocket Only	STRLB24DC
48-60 VDC		STRLC60DC
110-127 VDC		STRLD125DC
220-250 VDC		STRLE250DC
48-60 VAC		STRLM60
110-127 VAC		STRLN120
208-277 VAC		STRLS277
380-600 VAC		STRLV600



### Undervoltage Release

Description	Mounting Pocket	Catalog Number
12 VDC	Right Pocket Only	UVRLA12DC
24 VDC		UVRLB24DC
48 VDC		UVRLC48DC
60 VDC		UVRLG60DC
110-127 VDC		UVRLD125DC
220-250 VDC		UVRLE250DC
24 VAC		UVRLI24
110-127 VAC		UVRLN120
220-240 VAC		UVRLR240
208 VAC		UVRLP208
277 VAC		UVRLS277
380-415 VAC		UVRLT415
440-480 VAC		UVRLU480

① Refer to the "Accessory Locations" chart on page 17/58 for guidelines and limitations about which pockets may be used for accessory combinations.

② Includes 1A and 1B contact for alarm purposes, only one of which may be installed at any time.

'A' refers to a normally open contact (open when the breaker contacts are open).

'B' refers to a normally closed contact (closed when the breaker contacts are open).

External Accessories pages 17/43 through 17/57

# MG 800A Frame, VL Series

## Selection/Dimensions

### Ordering Information

#### Complete Assembled Breaker

A complete factory assembled MG breaker includes the frame, trip unit, and standard line and load lugs, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For any other configuration, order the frame, trip unit, and terminals as separate items.

For DC applications, use thermal magnetic trip unit only.

For reverse feed applications, select non-interchangeable trip breakers only. For non-interchangeable trip breakers, change the third digit of the catalog number to "X" for standard breakers.

For 100% rated breakers with a non-interchangeable trip unit, change the 3<sup>rd</sup> character of the catalog number to "Y".

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.  
HACR rated.



Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	7.5 (190)	16 (406)	4.7 (119)	5.9 (151)

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit	Complete Breaker
2, 3	31.3 (14.2)	4.0 (1.8)	35.3 (16.0)

### Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)										
		UL 489					IEC 60947-2					
		Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
		240	480	600	250	500	220/240		380/415		690	
					I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>		
N	NMG	65	35	25	22	35	65	65	50	50	20	10
H	HMG	100	65	35	25	50	100	75	70	70	30	15
L	LMG	200	100	50	42	65	200	150	100	75	35	17

### Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Aluminum	200-800A	1/0-500 kcmil Al/Cu	3	3TA3MG500 <sup>①②</sup>
Aluminum	200-800A	500-750 kcmil Al/Cu	2	3TA2MG750 <sup>③</sup>
Copper	200-800A	1/0-500 kcmil Cu	3	TC3MG500 <sup>③④</sup>
Aluminum	200-800A	#2-600 kcmil Al/Cu	3	3TA3MG600 <sup>②④</sup>

① Standard connector supplied with complete breakers.

② Kit consists of 3 terminal connectors.

③ Consists of one terminal.

④ Includes extended terminal cover.

⑤ Required for 100% rated MG breakers. Requires 90°C Cu cable sized at 75°C ampacity.

### MG Thermal-Magnetic, Instantaneous Trip Adjustment Range

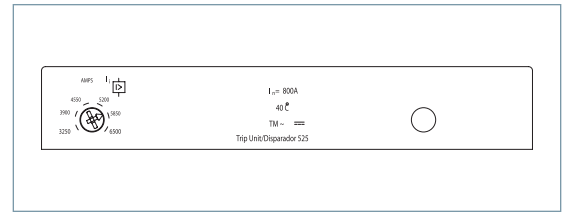
Trip Unit Continuous Amp Rating (I <sub>n</sub> )	Instantaneous Overcurrent Setting (I <sub>t</sub> )	
	Min.	Max.
600	3000	6000
700	3250	6500
800	3250	6500

Note: Each breaker has 6 trip settings.



# MG 800A Thermal-Magnetic Trip Unit

## Selection



Model 525 Trip Unit

### MG 800A Frame 2-Pole with Thermal-Magnetic Trip Unit

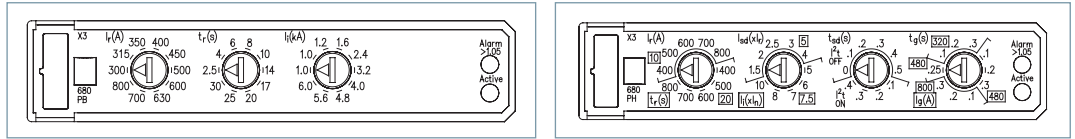
Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	TRIP UNIT ONLY	
	Catalog Number	Catalog Number	Catalog Number		Catalog Number
	FRAME ONLY				
	NMG2F800	HMG2F800	LMG2F800		
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER				
600	NMG2B600L	HMG2B600L	LMG2B600L	CMT2B600	
700	NMG2B700L	HMG2B700L	LMG2B700L	CMT2B700	
800	NMG2B800L	HMG2B800L	LMG2B800L	CMT2B800	

### MG 800A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	TRIP UNIT ONLY	
	Catalog Number	Catalog Number	Catalog Number		Catalog Number
	FRAME ONLY				
	NMG3F800	HMG3F800	LMG3F800		
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER				
600	NMG3B600L	HMG3B600L	LMG3B600L	CMT3B600	
700	NMG3B700L	HMG3B700L	LMG3B700L	CMT3B700	
800	NMG3B800L	HMG3B800L	LMG3B800L	CMT3B800	

# MG 800A Electronic 3-Knob & LCD Trip Units

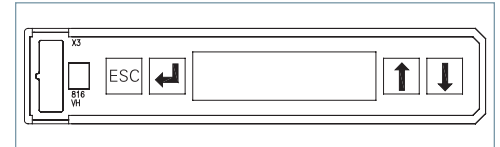
## Selection



Model 555 Trip Units

### MG 800A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NMG3F800	HMG3F800	LMG3F800	
<b>COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER</b>				
<b>TRIP UNIT ONLY</b>				
<b>ELECTRONIC LI TRIP</b>				
600	NMG3R600L	HMG3R600L	LMG3R600L	CMT3R600
800	NMG3R800L	HMG3R800L	LMG3R800L	CMT3R800
<b>ELECTRONIC LSI TRIP</b>				
600	NMG3T600L	HMG3T600L	LMG3T600L	CMT3T600
800	NMG3T800L	HMG3T800L	LMG3T800L	CMT3T800
<b>ELECTRONIC LSIG TRIP</b>				
600	NMG3V600L	HMG3V600L	LMG3V600L	CMT3V600
800	NMG3V800L	HMG3V800L	LMG3V800L	CMT3V800
<b>ELECTRONIC LIG TRIP</b>				
600	NMG3W600L	HMG3W600L	LMG3W600L	CMT3W600
800	NMG3W800L	HMG3W800L	LMG3W800L	CMT3W800



Model 586 Trip Unit

### MG 800A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NMG3F800	HMG3F800	LMG3F800	
<b>COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER</b>				
<b>TRIP UNIT ONLY</b>				
<b>LCD ELECTRONIC LSI TRIP</b>				
600	NMG3A600L	HMG3A600L	LMG3A600L	CMT3A600
800	NMG3A800L	HMG3A800L	LMG3A800L	CMT3A800
<b>LCD ELECTRONIC LSIG TRIP</b>				
600	NMG3G600L	HMG3G600L	LMG3G600L	CMT3G600
800	NMG3G800L	HMG3G800L	LMG3G800L	CMT3G800
<b>LCD ELECTRONIC LSI TRIP + GF ALARM ONLY</b>				
600	NMG3K600L	HMG3K600L	LMG3K600L	CMT3K600
800	NMG3K800L	HMG3K800L	LMG3K800L	CMT3K800

17 MOLDED CASE CIRCUIT BREAKERS

# NG 1200A Frame, VL Series

## Selection/Dimensions

### Ordering Information

#### Complete Assembled Breaker with Lugs

A complete factory assembled NG breaker includes the frame, trip unit, and standard line and load lugs, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For any other configuration, order the frame, trip unit, and terminals as separate items.

For DC applications, use thermal magnetic trip unit only.

For reverse feed applications, select non-interchangeable trip breakers only. For non-interchangeable trip breakers, change the third digit of the catalog number to "X" for standard breakers.

For 100% rated breakers with a non-interchangeable trip unit, change the 3<sup>rd</sup> character of the catalog number to "Y".

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

A Toggle Handle Extension is included with each frame or complete breaker.

HACR rated.



Dimensions, inches (mm)

Number of Poles	W	L	D	To Handle D1
2, 3	9 (229)	16 (406)	6 (152)	8.1 (207)

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit	Complete Breaker
2, 3	46.3 (21.0)	8.8 (4.0)	55.1 (25.0)

### Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)										
		UL 489					IEC 60947-2					
		Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
		240	480	600	250	500	220/240	380/415	690	I <sub>CU</sub>	I <sub>CS</sub>	
N	NNG	65	35	25	22	35	65	35	50	25	20	10
H	HNG	100	65	35	25	50	100	50	70	35	30	15
L	LNG	200	100	65	42	65	200	100	100	50	35	17

### Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Aluminum	300-1200A	1/0-500 kcmil Al/Cu	4	3TA4NG500 <sup>③④</sup>
Aluminum	300-1200A	500-750 kcmil Al/Cu	3	3TA3NG750 <sup>④</sup>
Copper	300-1200A	1/0-500 kcmil Cu	4	3TC4NG500 <sup>②④</sup>
Aluminum	300-1200A	1/0-500 kcmil Al/Cu	4	3TA4NG500H <sup>②④</sup>
Compression Lugs				
	300-1200A	1/0-500 kcmil Al/Cu	—	12CLN500 <sup>①</sup>

- ① Total of 12 connectors (4 per phase Line or Load).
- ② For 100% rated NG breakers. Requires 90°C Cu cable sized at 75°C ampacity.
- ③ Standard connector provided with complete breakers.
- ④ Kit consists of 3 terminal connectors.

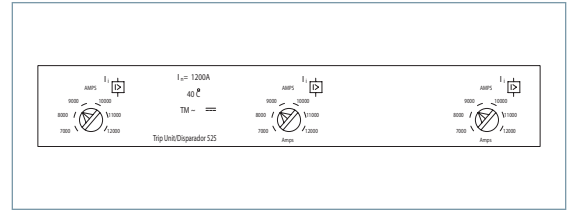
### NG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I <sub>n</sub> )	Instantaneous Overcurrent Setting (I <sub>t</sub> )	
	Min.	Max.
800	4000	8000
900	5000	10000
1000	5000	10000
1200	7000	12000

Note: Each breaker has 6 trip settings.

# NG 1200A Thermal-Magnetic Trip Unit

## Selection



Model 525 Trip Unit

### NG 1200A Frame 2-Pole with Thermal-Magnetic Trip Unit

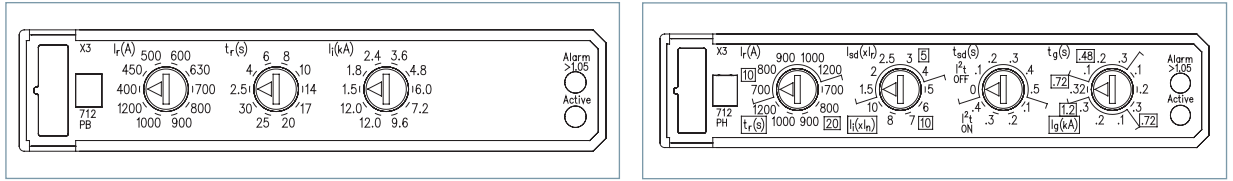
Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NNG2F120	HNG2F120	LNG2F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
800	NNG2B800L	HNG2B800L	LNG2B800L	CNT2B800
900	NNG2B900L	HNG2B900L	LNG2B900L	CNT2B900
1000	NNG2B100L	HNG2B100L	LNG2B100L	CNT2B100
1200	NNG2B120L	HNG2B120L	LNG2B120L	CNT2B120

### NG 1200A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NNG3F120	HNG3F120	LNG3F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
800	NNG3B800L	HNG3B800L	LNG3B800L	CNT3B800
900	NNG3B900L	HNG3B900L	LNG3B900L	CNT3B900
1000	NNG3B100L	HNG3B100L	LNG3B100L	CNT3B100
1200	NNG3B120L	HNG3B120L	LNG3B120L	CNT3B120

# NG 1200A Electronic Trip Units

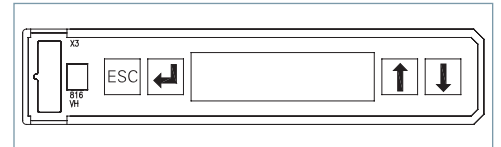
## Selection



Model 555 Trip Units

## NG 1200A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NNG3F120	HNG3F120	LNG3F120	
COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER				TRIP UNIT ONLY
<b>ELECTRONIC LI TRIP</b>				
800	NNG3R800L	HNG3R800L	LNG3R800L	CNT3R800
1000	NNG3R100L	HNG3R100L	LNG3R100L	CNT3R100
1200	NNG3R120L	HNG3R120L	LNG3R120L	CNT3R120
<b>ELECTRONIC LSI TRIP</b>				
800	NNG3T800L	HNG3T800L	LNG3T800L	CNT3T800
1000	NNG3T100L	HNG3T100L	LNG3T100L	CNT3T100
1200	NNG3T120L	HNG3T120L	LNG3T120L	CNT3T120
<b>ELECTRONIC LSIG TRIP</b>				
800	NNG3V800L	HNG3V800L	LNG3V800L	CNT3V800
1000	NNG3V100L	HNG3V100L	LNG3V100L	CNT3V100
1200	NNG3V120L	HNG3V120L	LNG3V120L	CNT3V120
<b>ELECTRONIC LIG TRIP</b>				
800	NNG3W800L	HNG3W800L	LNG3W800L	CNT3W800
1000	NNG3W100L	HNG3W100L	LNG3W100L	CNT3W100
1200	NNG3W120L	HNG3W120L	LNG3W120L	CNT3W120



Model 586 Trip Unit

## NG 1200A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NNG3F120	HNG3F120	LNG3F120	
COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER				TRIP UNIT ONLY
<b>LCD ELECTRONIC LSI TRIP</b>				
800	NNG3A800L	HNG3A800L	LNG3A800L	CNT3A800
1000	NNG3A100L	HNG3A100L	LNG3A100L	CNT3A100
1200	NNG3A120L	HNG3A120L	LNG3A120L	CNT3A120
<b>LCD ELECTRONIC LSIG TRIP</b>				
800	NNG3G800L	HNG3G800L	LNG3G800L	CNT3G800
1000	NNG3G100L	HNG3G100L	LNG3G100L	CNT3G100
1200	NNG3G120L	HNG3G120L	LNG3G120L	CNT3G120
<b>LCD ELECTRONIC LSI TRIP + GF ALARM ONLY</b>				
800	NNG3K800L	HNG3K800L	LNG3K800L	CNT3K800
1000	NNG3K100L	HNG3K100L	LNG3K100L	CNT3K100
1200	NNG3K120L	HNG3K120L	LNG3K120L	CNT3K120

# PG 1600A Frame, VL Series & Thermal-Magnetic Trip Unit

## Selection/Dimensions

### Ordering Information

A complete factory assembled PG breaker includes the frame and trip unit only. The connectors must be ordered as separate items.

PG thermal-magnetic breakers sold as non-interchangeable only.

For any other configuration, order the frame, trip unit, and connectors as separate items.

Connectors require a Breaker Lug Mounting Assembly or Breaker Mounting Base and must be ordered as a separate item.

For DC applications, use Thermal magnetic trip unit only.

For reverse feed applications select non-interchangeable trip breakers only. Change the third digit of the catalog number to "X" for non-interchangeable trip breakers.

For 100% rated breakers with a non-interchangeable trip unit, change the 3<sup>rd</sup> character of the catalog number to "Y".

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

A Toggle Handle Extension is included with each frame or complete breaker.



Dimensions, inches (mm)

Number of Poles	W	L	D	To Handle D1
2, 3	9 (229)	16 (406)	6 (152)	8.1 (207)

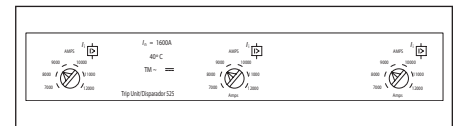
Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit	Complete Breaker
2, 3	60.2 (27.3)	8.8 (4.0)	69.0 (31.3)

### PG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I <sub>n</sub> )	Instantaneous Overcurrent Setting (I <sub>i</sub> )	
	Min.	Max.
1200	7000	12000
1400	7000	12000
1600	7000	12000

Note: Each breaker has 6 trip settings in this range.



Model 525 Trip Unit

### Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)										
		UL 489					IEC 60947-2 <sup>®</sup> (ETU only)					
		Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
		240	480	600	250	500	220/240		380/415		690	
					I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>		
N	NPG	65	35	25	22	35	65	35	50	25	20	10
H	HPG	100	65	35	25	50	100	50	70	35	30	15
L	LPG	200	100	65	42	65	200	100	100	50	35	17

### Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per phase	Catalog Number
Aluminum	1200-1600A	1/0-750 kcmil Al/Cu	6	3TA6PG750 <sup>①③</sup>
Aluminum	1200-1600A	300-600 kcmil Al/Cu	5	TA5P600 <sup>②④</sup>
Aluminum	1200-1600A	600-750 kcmil Al/Cu	4	TA4P750 <sup>②④</sup>
Aluminum	1200-1600A	300-600 kcmil Al/Cu	6	TA6R600 <sup>②④</sup>
Copper	1200-1600A	300-600 kcmil Cu	5	TC5R600 <sup>②④⑤</sup>

### Mounting Arrangement

Description	Catalog Number
Lug Mounting Assembly	LMAP1600
Breaker Mounting Base (Front Connect)	MBPG1600
Breaker Mounting Base (Rear Connect)	MBPG1601

### PG 1600A Frame 3-Pole with Thermal-Magnetic Trip Unit<sup>®</sup>

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
1200	NPX3B120	HPX3B120	LPX3B120
1400	NPX3B140	HPX3B140	LPX3B140
1600	NPX3B160	HPX3B160	LPX3B160

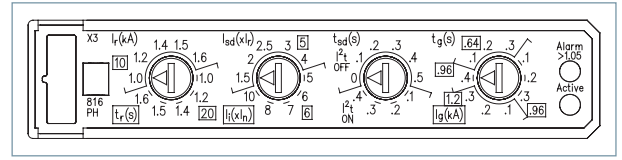
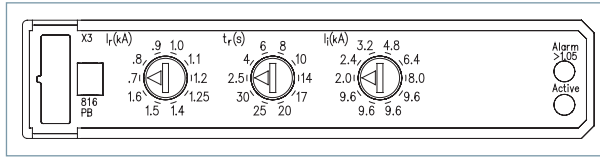
① Requires Lug Mounting Assembly LMAP1600.  
 ② Requires Breaker Mounting Base MBPG1600 Kit or MBPG1601.  
 ③ Consists of 3 connectors.

④ Consists of 1 connector.  
 ⑤ Required for 100% rated PG breakers. Requires 90°C cable sized at 75°C ampacity.  
 ⑥ IEC 60947-2: ONLY applies to Electronic Trip Units (ETUs).

External Accessories pages 17/43 through 17/57

# PG 1600A Electronic Trip Units

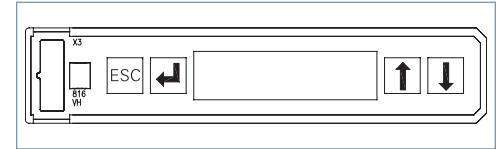
## Selection



Model 555 Trip Unit

### PG 1600A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NPG3F160	HPG3F160	LPG3F160	
COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER				TRIP UNIT ONLY
<b>ELECTRONIC LI TRIP</b>				
1200	NPG3R120	HPG3R120	LPG3R120	CPT3R120
1600	NPG3R160	HPG3R160	LPG3R160	CPT3R160
<b>ELECTRONIC LSI TRIP</b>				
1200	NPG3T120	HPG3T120	LPG3T120	CPT3T120
1600	NPG3T160	HPG3T160	LPG3T160	CPT3T160
<b>ELECTRONIC LSIG TRIP</b>				
1200	NPG3V120	HPG3V120	LPG3V120	CPT3V120
1600	NPG3V160	HPG3V160	LPG3V160	CPT3V160
<b>ELECTRONIC LIG TRIP</b>				
1200	NPG3W120	HPG3W120	LPG3W120	CPT3W120
1600	NPG3W160	HPG3W160	LPG3W160	CPT3W160



Model 586 Trip Unit

### PG 1600A Frame 3-Pole Electronic LCD Trip Unit

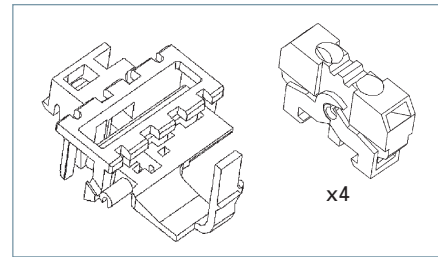
Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			
	NPG3F160	HPG3F160	LPG3F160	
COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER				TRIP UNIT ONLY
<b>LCD ELECTRONIC LSI TRIP</b>				
1200	NPG3A120	HPG3A120	LPG3A120	CPT3A120
1600	NPG3A160	HPG3A160	LPG3A160	CPT3A160
<b>LCD ELECTRONIC LSIG TRIP</b>				
1200	NPG3G120	HPG3G120	LPG3G120	CPT3G120
1600	NPG3G160	HPG3G160	LPG3G160	CPT3G160
<b>LCD ELECTRONIC LSI TRIP + GF ALARM ONLY</b>				
1200	NPG3K120	HPG3K120	LPG3K120	CPT3K120
1600	NPG3K160	HPG3K160	LPG3K160	CPT3K160

17 MOLDED CASE CIRCUIT BREAKERS

Selection

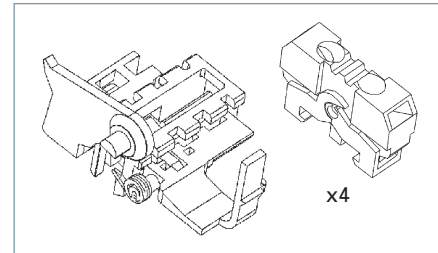
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket <sup>①</sup>	Catalog Number
2 Aux. + 2 Alarm Switches 2A + 2B Base AMBP2	Left Pocket Only	ASKP3
4 Aux. Switches 2A + 2B Base AMBP1	Left, Right	ASKP4



Auxiliary/Alarm Switch Mounting Base Only

Description	Mounting Pocket <sup>①</sup>	Catalog Number
Up to 4 Auxiliary Switches 2 Aux. + 2 Alarm Switches	Left, Right Left Pocket Only	AMBP1 AMBP2



Auxiliary/Alarm Switch Only

Common to DG-PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	ASWPA
1 Normally Closed Contact (1B)	ASWPB

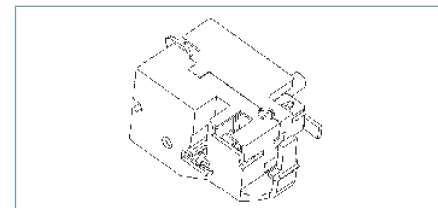
Shunt Trips

Description	Mounting Pocket	Catalog Number
24 VDC	Right Pocket Only	STRPB24DC
48-60 VDC		STRPC60DC
110-127 VDC		STRPD125DC
220-250 VDC		STRPE250DC
48-60 VAC		STRPM60
110-127 VAC		STRPN120
208-277 VAC		STRPS277
380-600 VAC		STRPV600



Undervoltage Release

Description	Mounting Pocket	Catalog Number
12 VDC	Right Pocket Only	UVRPA12DC
24 VDC		UVRPB24DC
48 VDC		UVRPC48DC
60 VDC		UVRPG60DC
110-127 VDC		UVRPD125DC
220-250 VDC		UVRPE250DC
110-127 VAC		UVRPN120
220-240 VAC		UVRPR240
208 VAC		UVRPP208
277 VAC		UVRPS277
380-415 VAC		UVRPT415
440-480 VAC		UVRPU480



① Refer to the "Accessory Locations" chart on page 17/58 for guidelines and limitations about which pockets may be used for accessory combinations.

'A' refers to a normally open contact (open when the breaker contacts are open).

'B' refers to a normally closed contact (closed when the breaker contacts are open).



## Molded Case Switch

## Selection

## General

Typically a molded case switch is used when a compact load-break switch is needed for disconnect purposes. The VL line of molded case switches from Siemens is made of the same materials and components as the VL circuit breakers but do not provide overcurrent protection. Each molded case

switch has a fixed instantaneous self-protecting trip element which may open the switch under high fault conditions.

## Application Note

Overcurrent protection must be provided by an appropriate overcurrent protective device located upstream from

the molded case switch. Also, the short-circuit current rating of the switch is limited to the interrupting rating of the upstream protective device or the ratings in the table below, **whichever is less.**

## Ordering Information

Each type VL molded case switch accepts the same terminals and accessories as the equivalent VL circuit breakers.

All type VL molded case switches are suitable for reverse feed applications.

Mounting hardware and standard line and load terminals are included on ratings through 250A. For 400 – 1600A ratings, order the lugs separately.

All ratings are UL listed and CSA certified.

## Molded Case Switch

Maximum Ampere Rating / Frame	2-Pole	3-Pole	Short-Circuit Current Rating <sup>①</sup>			Self Protective Instantaneous Override
	Catalog Number	Catalog Number	240V	480V	600V	
150A / DG 250A / FG	HDR2S150 HFR2S250	HDR3S150 HFR3S250	100k 100k	65k 65k	20k 20k	2,500A 3,500A
400A / JG 600A / LG	HJS2S400 HLR2S600	HJS3S400 HLR3S600	100k 100k	65k 65k	25k 18k	4,400A 5,500A
800A / MG 1200A / NG	HMS2S800 HNS2S120	HMS3S800 HNS3S120	100k 100k	65k 65k	35k 35k	6,500A 12,000A
1600A / PG	—	HPS3S160	100k	65k	35k	14,000A

Maximum Ampere Rating / Frame	3-Pole	Short-Circuit Current Rating <sup>①</sup>			Self Protective Instantaneous Override
	Catalog Number	240V	480V	600V	
250A / FG	LFR3S250	200k	100k	25k	3,500A
400A / JG 600A / LG	LJS3S400 LLR3S600	200k 200k	100k 100k	25k 18k	4,400A 5,500A
800A / MG 1200A / NG	LMS3S800 LNS3S120	200k 200k	100k 100k	65k 65k	6,500A 12,000A
1600A / PG	LPS3S160	200k	100k	65k	14,000A

<sup>①</sup>The Short-Circuit Current Rating is the maximum available current of the circuit where the switch is used, when protected by an appropriate overcurrent protective device.

## Motor Circuit Protectors

## Selection

## General

## Protection of Motor Circuits

Molded case circuit breakers are used in motor circuits as a disconnecting means and for short-circuit protection. They should be used in conjunction with motor-running, over-current protection devices, and should permit the motor to start without nuisance tripping from motor-inrush current. The circuit breaker should have a continuous current rating of not less than 115% of the motor full-load current.

The recommended motor circuit protectors listed have continuous-current ratings of at least 115% of motor full-load currents. The trip setting positions are approximately 11 times motor full-load current. The suggested trip settings may need to be adjusted upward to no higher than 1300% of full-load current for non-design E type motors, and no greater than 1700% of full-load current for design E motors, to allow for motor startup due to in-rush current.

## Breaker Mounted Immediately Ahead of Motor Starter

Siemens motor circuit protectors are recommended for use in combination motor starters to provide selective short-circuit protection for the motor branch circuit. The adjustable instantaneous trip feature of the Siemens motor circuit protector provides for a trip setting slightly above the peak motor in-rush current. With this setting, no delay is introduced in opening the circuit when a fault occurs. This circuit breaker has no time-delay trip element. Therefore it must be used in conjunction with, and immediately ahead of, the motor-running overcurrent protection device.

Important: The information below does not apply to all motor applications: it is recommended that the user refer to the National Electrical Code (NEC) for specific needs.

**Table 1 (When Breaker is Mounted Immediately Ahead of Motor Starter)**

3-Phase Induction Type Motors (Siemens motor circuit protectors for branch circuit use with alternating-current combination, full voltage motor starters)

Motor Full Load Amperes	Trip Setting (A)	Catalog Number <sup>①</sup>
35-50	450	HDP3L150L
42-60	540	
48-70	630	
55-80	720	
62-90	810	
69-100	900	
58-83	750	HDP3M150L
69-100	900	
81-117	1050	
92-133	1200	
104-150	1350	
115-150 <sup>②</sup>	1500	
96-139	1250	HDP3H150L
115-150 <sup>②</sup>	1500	
135-150 <sup>②</sup>	1750	
135-150 <sup>②</sup>	2000	
135-150 <sup>②</sup>	2250	
135-150 <sup>②</sup>	2500	
46-67	600	HFP3L250L
55-80	720	
65-93	840	
74-107	960	
83-120	1080	
92-133	1200	
77-111	1000	HFP3M250L
92-133	1200	
108-156	1400	
123-178	1600	
138-200	1800	
154-222	2000	
135-194	1750	HFP3H250L
162-210	2100	
188-220	2450	
215-241	2800	
242-250 <sup>②</sup>	3150	
242-250 <sup>②</sup>	3500	

① Motor circuit protectors rated 150A and 250A are supplied with line and load lugs installed. If lugs are required on 400A to 1200A motor circuit breakers, order required lugs separately.

Motor Full Load Amperes	Trip Setting (A)	Catalog Number <sup>①</sup>
96-139	1250	HJM3L400
115-167	1500	
135-194	1750	
154-222	2000	
173-250	2250	
192-278	2500	
154-222	2000	HJM3M400
185-267	2400	
215-311	2800	
246-356	3200	
277-400	3600	
308-400 <sup>②</sup>	4000	
154-222	2000	HLM3J600
185-267	2400	
215-311	2800	
246-356	3200	
277-400	3600	
308-444	4000	
212-306	2750	HLM3Y600
254-367	3300	
296-428	3850	
338-489	4400	
381-550	4950	
423-600	5500	
250-361	3250	HMM3M800
292-422	3800	
335-483	4350	
385-556	5000	
442-638	5740	
500-722	6500	
385-556	5000	HNM3M120
462-667	6000	
538-778	7000	
615-889	8000	
692-1000	9000	
769-1111	10,000	

② These settings are provided for starting currents greater than 11X but not to exceed 17X. Full Load Amps ( FLA ) not to exceed ampere rating of MCP.

## 600 Volt DC Circuit Breakers

## Selection

## General

Siemens UL Listed non-interchangeable trip DC Thermal/magnetic Molded Case Circuit Breakers shown below are for use in grounded & ungrounded general DC circuits and ungrounded battery supply circuits of UPS systems. These breakers are rated at 600Vdc closed circuit and feature rated interruption levels from 42,000 to 65,000 amperes as indicated in

the table. This family of circuit breakers is rated from 50 to 1600 Amperes.

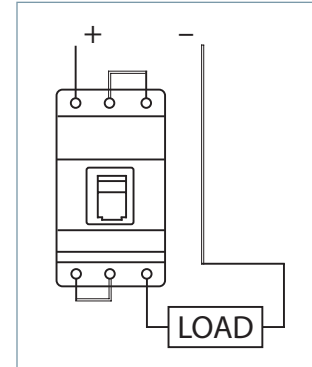
Types HDGD through HPGD circuit breakers are provided with an adjustable magnetic over-current function located on the face of the circuit breaker. Contact Siemens for specific magnetic over-current values.

To properly use these UL Listed circuit breakers at 600Vdc and the indicated

interruption level, it is necessary to connect the terminals of the 3 pole circuit breaker in a series configuration as shown in the diagram below.

Types HDGD through HPGD use the same internal and external accessories as the standard DG through PG frames and associated types. Consult the individual frame section for accessory information.

Frame	Type	Continuous Ampere Rating	Catalog Number (3-pole) <sup>①</sup>	Short-Circuit Current Rating 600VDC <sup>②</sup>
DG	HDGD	50	HDC3B050	42K
		60	HDC3B060	42K
		70	HDC3B070	42K
		80	HDC3B080	42K
		90	HDC3B090	42K
		100	HDC3B100	42K
		110	HDC3B110	42K
		125	HDC3B125	42K
FG	HFGD	150	HDC3B150	42K
		100	HFC3B100	42K
		150	HFC3B150	42K
		175	HFC3B175	42K
		200	HFC3B200	42K
JG	HJGD	250	HFC3B250	42K
		300	HFC3B300	42K
		350	HFC3B350	42K
		400	HFC3B400	42K
LG	HLGD	250	HJC3B250	65K
		300	HJC3B300	65K
		350	HJC3B350	65K
MG	HMGD	400	HJC3B400	65K
		400	HLC3B400	65K
		500	HLC3B500	65K
NG	HNGD	600	HLC3B600	65K
		600	HMC3B600	65K
		700	HMC3B700	65K
		800	HMC3B800	65K
PG	HPGD	800	HNC3B800	65K
		900	HNC3B900	65K
		1000	HNC3B1000	65K
		1200	HNC3B1200	65K
PG	HPGD	1200	HPC3B1200	65K
		1400	HPC3B1400	65K
		1600	HPC3B1600	65K

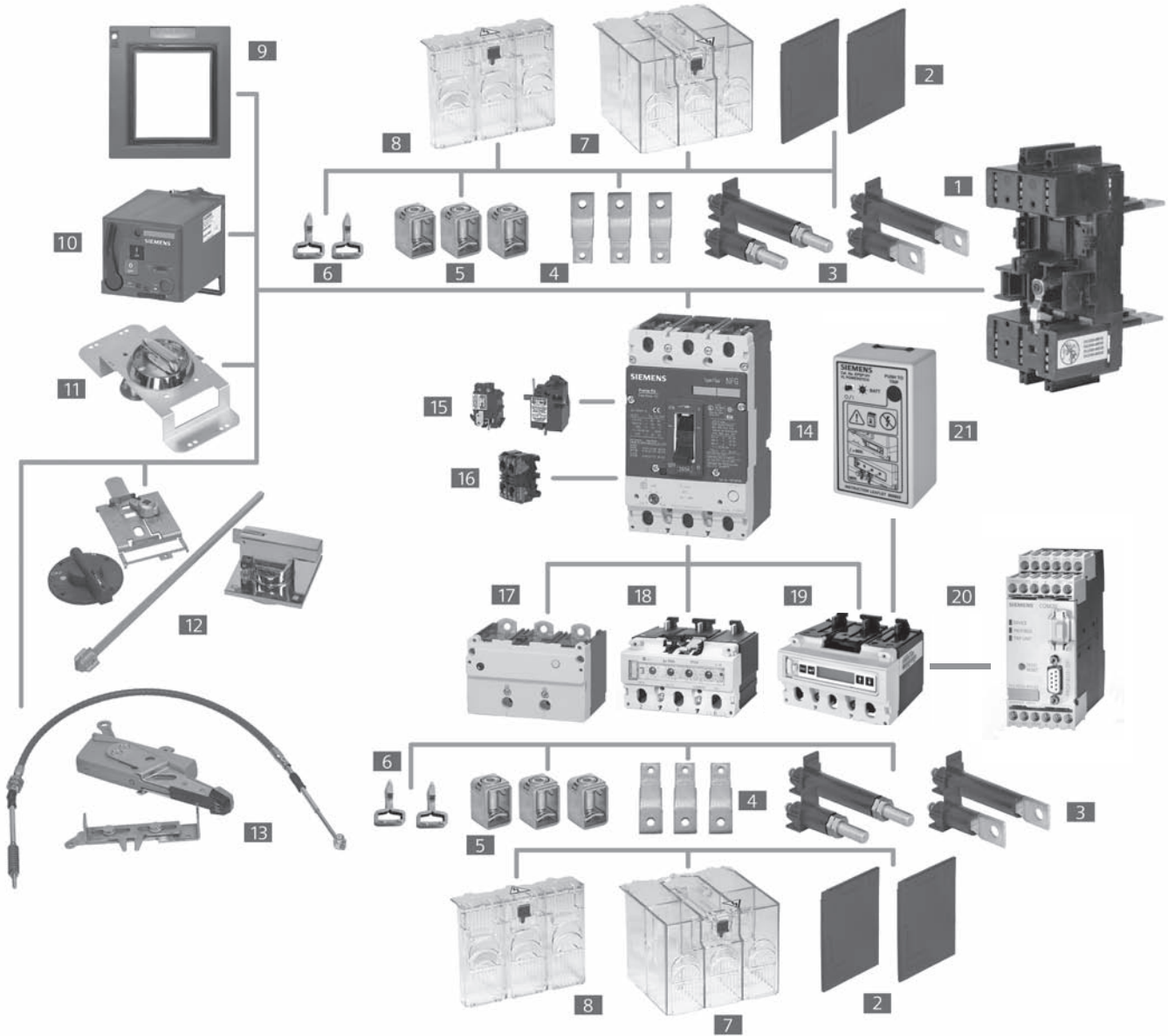


<sup>①</sup> Terminal connectors must be ordered separately; see page 17/90.

<sup>②</sup> Standard VL breakers DG - PG feature DC ratings up to 500V for ungrounded UPS applications. Consult the individual frame section for more information.

# Modularity To Support All Your Application Needs

## Modules and More: VL Circuit Breakers with Optional Accessories





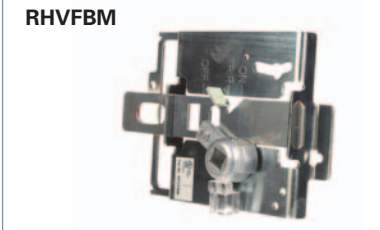


- 1** Base for Plug-In or Draw-Out
- 2** Interphase Barriers
- 3** Rear Terminals – Flat and Round
- 4** Bus Extensions
- 5** Terminal Connectors
- 6** Plug-In Terminal Blades
- 7** Extended Terminal Shield
- 8** Standard Terminal Shield

- 9** Cover Frame for Door Cutout
- 10** Stored Energy Operator
- 11** Rotary Handle Operator
- 12** Variable Depth Rotary Operator
- 13** Max Flex Operator
- 14** Circuit Breaker
- 15** Shunt Trip or Undervoltage Releases
- 16** Auxiliary/Alarm Switches

- 17** Thermal Magnetic Trip Unit (525)
- 18** Electronic Trip Unit (555)
- 19** Elec. Trip Unit with LCD (586)
- 20** Communication Module with ZSI
- 21** Electronic Trip Unit Tester and LCD Power Supply

# Operating Mechanisms

## Selection

		For DG to FG Frame 150 to 250 A	For JG to LG Frame 400 A to 600 A	
	Description	Catalog Number	Catalog Number	
 <p><b>RHFF</b></p>	<p><b>Through-Door Rotary Handle Operator Kit</b> Fixed depth and the handle is mounted directly on the circuit breaker. Lockable knob (for up to 3 padlocks). NEMA 1, 12</p>	RHFF	RHFL	
	<p>Red Handle Version with red knob, yellow indicator plate NEMA 1, 12</p>	RHFFEM	RHFLEM	
 <p><b>RHVF12</b></p>	<p><b>Door-Mounted Rotary Handle Operator Kit</b> Variable depth, door mounted handle. Includes knob with masking frame, indicator plate, detachable door coupling, 12" shaft, and breaker mounted rotary operator. Lockable knob (for up to 3 padlocks). NEMA 1, 12</p>	RHVF12	RHVL12	
	<p><b>Auxiliary Switch Kits</b> For Direct or Extended Rotary Handle Operators (RHF and RHV). Form C, Early Break type2 Aux. Switch Kit<sup>Ⓞ</sup> Includes 1 switch with 5' wire For Door-Mounted Operator For Through-Door Operator</p>	— RHSFA1F	— RHSFA1F	RHSLA1 RHSLA1F
 <p><b>RHVFBM</b></p>	<p>Includes 2 switches with 5' wire For Door-Mounted Operator For Through-Door Operator</p>	— RHSFA2F	— RHSFA2F	RHSLA2 RHSLA2F
	<p><b>Door-Mounted Rotary Operator Mechanism</b> Breaker mechanism only</p>	RHVFBM	RHVFBM	RHVLBM
 <p><b>RHVM3RH</b></p>	<p><b>Door-Mounted Rotary Handle Only</b> Standard version NEMA 1, 12 NEMA 3R NEMA 4X Red Handle version</p>	RHVM12H RHVM3RH RHVM4XH RHVMEMH	RHVM12H RHVM3RH RHVM4XH RHVMEMH	
	<p><b>NFPA-79 Handle Kit</b> Intermediate handle for NFPA-79 compliance with door-mounted rotary operator</p>	RHVF79H	RHVF79H	RHVM79H
 <p><b>RHVMS12</b></p>	<p><b>Extension Shaft Only, for Door Mounted Operator</b> 2 inches (50.8mm) 3 inches (76.2mm) 12 inches (304.8 mm) 16 inches (406.4 mm) 24 inches (609.6mm) w/ support bracket</p>	RHVMS02 — RHVMS12 RHVMS16 RHVMS24	RHVMS02 — RHVMS12 RHVMS16 RHVMS24	
	<p><b>RHVM12H</b></p>	RHVM12H	RHVM12H	

Ⓞ During manual operation, Early Break auxiliary switch contacts open before the breaker opens.

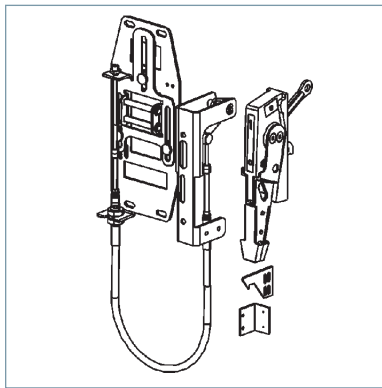
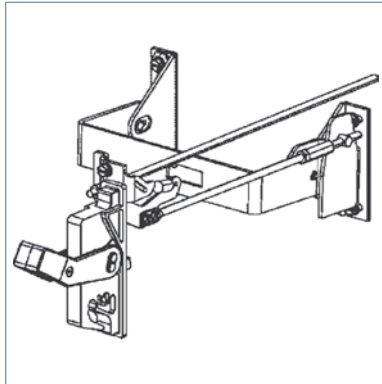
# Operating Mechanisms

## Selection

Description	For MG Frame 800 A		For NG to PG Frame 1200 to 1600 A	
	Catalog Number		Catalog Number	
<b>Through-Door Rotary Handle Operator Kit</b> Fixed depth, breaker mounted. For direct fitting to the circuit breaker. Lockable with up to 3 padlocks. NEMA 1, 12	—	—	—	—
Red Handle version with red knob, yellow indicator plate NEMA 1, 12	—	—	—	—
<b>Door-Mounted Rotary Handle Operator Kit</b> Variable depth, door mounted handle. Includes knob with masking frame, indicator plate, detachable door coupling, 12" shaft, and breaker mounted rotary operator. Lockable knob (for up to 3 padlocks). NEMA 1, 12	<b>RHVM12</b>		—	—
<b>Auxiliary Switch Kits</b> For Direct or Extended Rotary Handle Operators (RHF and RHV). Early Break type2 Aux. Switch Kit Includes 1 switch with 5' wire For Door-Mounted Operator For Through-Door Operator	<b>RHSMA1</b>	—	<b>RHSPA1</b>	—
Includes 2 switches with 5' wire For Door-Mounted Operator For Through-Door Operator	<b>RHSMA2</b>	—	<b>RHSPA2</b>	—
<b>Door-Mounted Rotary Operator Mechanism</b> Breaker mechanism only	<b>RHVMBM</b>		<b>RHVPBM</b>	
<b>Door-Mounted Rotary Handle Only</b> Standard version NEMA 1, 12 NEMA 3R NEMA 4X Red Handle version	<b>RHVM12H</b> <b>RHVM3RH</b> <b>RHVM4XH</b> <b>RHVEMH</b>		<b>RHVP3RH</b> <b>RHVP3RH</b> <b>RHVP4XH</b> <b>RHVPEMH</b>	
<b>NFPA-79 Handle Kit</b> Intermediate handle for NFPA-79 compliance with door-mounted rotary operator	<b>RHVM79H</b>		<b>RHVP79H</b>	
<b>Extension Shaft Only, for Door Mounted Operator</b> 2 inches (50.8mm) 3 inches (76.2mm) 12 inches (304.8 mm) 16 inches (406.4 mm) 24 inches (609.6mm) w/ support bracket	<b>RHVMS02</b> — <b>RHVMS12</b> <b>RHVMS16</b> <b>RHVMS24</b>	—	— <b>RHVPS03</b> <b>RHVPS12</b> — <b>RHVPS24</b>	— — —

# Operating Mechanisms

## Selection



Description	For DG and FG Frame 150 to 250 A	For JG and LG Frame 400 to 600 A
	Catalog Number	Catalog Number
<b>Variable Depth Flange Mounted Operator Kit</b> Adjustable from 8" to 16" Complete kit, includes handle and variable depth operator. NEMA 1, 3R, 12 NEMA 4X IEC Black Handle NEMA 1, 3R, 12 NEMA 4X	FHVF3R FHVF4X FHVF3RB FHVF4XB	FHVL3R FHVL4X FHVL3RB FHVL4XB
<b>Max-Flex™, Variable Depth Flange Mounted Operator Kit</b> Complete kit, includes plastic handle, breaker operator, and cable. NEMA 1, 3R, 12 For DG and FG operators, the cable is 36", all others are 48" May be right- or left-hand mounted	MFKF3R	MFKL3R
<b>Handle Only, for Max-Flex™ Variable Depth</b> NEMA 1, 3R, 12 Plastic NEMA 1, 3R, 12 Steel - epoxy coated NEMA 4, 4X Steel - chrome plated Solid color (all gray) Plastic <sup>①</sup> NEMA 1, 3R, 12 Solid color (black handle) Steel epoxy coated <sup>①</sup> NEMA 1, 3R, 12	MFHM3R MFHM3RS MFHM4X MFHM3RB MFHM3RSB	MFHM3R MFHM3RS MFHM4X MFHM3RB MFHM3RSB
<b>Breaker Operator Mechanism Only, for Max-Flex™</b>	MFMF	MFML
<b>Cable Only, for Max-Flex™ Variable Depth</b> 36" 48" 60" 72" 84" 96" 120" 144"	MFCF036 MFCF048 MFCF060 MFCF072 MFCF084 MFCF096 MFCF120 MFCF144	MFCM036 MFCM048 MFCM060 MFCM072 MFCM084 MFCM096 MFCM120 MFCM144
<b>Handle Auxiliary Switch</b> Form C (1NO - 1NC), early break <sup>②</sup> 1 Aux. switch 2 Aux. switch	MFSFA1 MFSFA2	MFSLA1 MFSLA2

① Max-Flex™ handles are available with solid gray or black handles instead of the customary "Red for On" flange handle.

The black handle is preferred for IEC markets, where red handles have a specific meaning.

② During manual operation, Early Break aux. contacts open before the breaker opens.



# Operating Mechanisms

## Selection

Description	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
	Catalog Number	Catalog Number	Catalog Number
<b>Variable Depth Flange Mounted Operator Kit</b> Adjustable from 8" to 16" Complete kit, includes handle and variable depth operator. NEMA 1, 3R, 12 NEMA 4X IEC Black Handle NEMA 1, 3R, 12 NEMA 4X	— — — —	— — — —	
<b>Max-Flex™, Variable Depth Flange Mounted Operator Kit</b> Complete kit, includes plastic handle, breaker operator, and cable. NEMA 1, 3R, 12 For DG and FG operators, the cable is 36", all others are 48" May be right- or left-hand mounted	<b>MFKM3R</b>	<b>MFKP3RS</b>	<b>MFKP3RS</b>
<b>Handle Only, for Max-Flex™ Variable Depth</b> NEMA 1, 3R, 12 Plastic NEMA 1, 3R, 12 Steel - epoxy coated NEMA 4, 4X Steel - chrome plated Solid color (all gray) Plastic <sup>①</sup> NEMA 1, 3R, 12 Solid color (black handle) Steel epoxy coated <sup>①</sup> NEMA 1, 3R, 12	<b>MFHM3R</b> <b>MFHM3RS</b> <b>MFHM4X</b>  <b>MFHM3RB</b>  <b>MFHM3RSB</b>	— <b>MFHP3RS</b> <b>MFHP4X</b>  —  <b>MFHP3RSB</b>	— <b>MFHP3RS</b> <b>MFHP4X</b>  —  <b>MFHP3RSB</b>
<b>Breaker Operator Mechanism Only, for Max-Flex™</b>	<b>MFMM</b>	<b>MFMP</b>	<b>MFMP</b>
<b>Cable Only, for Max-Flex™ Variable Depth</b> 36" 48" 60" 72" 84" 96" 120" 144"	<b>MFCM036</b> <b>MFCM048</b> <b>MFCM060</b> <b>MFCM072</b> <b>MFCM084</b> <b>MFCM096</b> <b>MFCM120</b> <b>MFCM144</b>	— <b>MFCP048</b> <b>MFCP060</b> <b>MFCP072</b>  — <b>MFCP096</b> <b>MFCP120</b> <b>MFCP144</b>	— <b>MFCP048</b> <b>MFCP060</b> <b>MFCP072</b>  — <b>MFCP096</b> <b>MFCP120</b> <b>MFCP144</b>
<b>Handle Auxiliary Switch</b> Form C (1NO - 1NC), early break <sup>②</sup> 1 Aux. switch 2 Aux. switch	<b>MFSPA1</b> <b>MFSPA2</b>	<b>MFSPA1</b> <b>MFSPA2</b>	<b>MFSPA1</b> <b>MFSPA2</b>

① Max-Flex™ handles are available with solid gray or black handles instead of the customary "Red for On" flange handle.

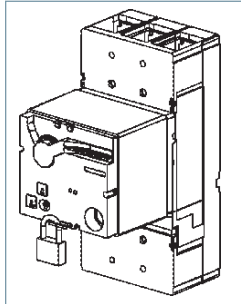
The black handle is preferred for IEC markets, where red handles have a specific meaning.

② During manual operation, Early Break aux. contacts open before the breaker opens.



# Operating Mechanisms

## Selection



**Description**

**Stored Energy and Motor Operators**

Lockable with up to 3 padlocks.

AC Voltage	DC Voltage
—	24
42-48	42-48
60	60
110-127	110-127
220-250	220-250

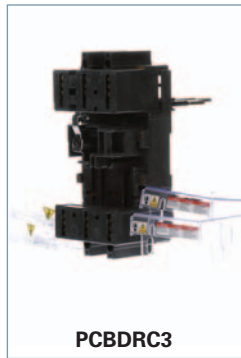
**Cylinder Locks for Field Installation**

For DG to FG Frame  
150 to 250 A

**Catalog Number**

Stored Energy Type  
SEAFB  
SEAFM  
SEAFY  
SEAFN  
SEAFR  
CLKF

## Plug-In and Draw-Out Bases



**Description**

**Plug-in Mounting Base Assembly**

Includes base, terminal blade kit, sec. terminal block assembly, base trip interlock, and mounting hardware.

**Rear Connected**

3-pole

**Front Connected**

3-pole

For DG Frame  
150 A

**Catalog Number**

PCBDR3

PCBDFC3

For FG Frame  
250 A

**Catalog Number**

PCBFRC3

PCBFFC3

**Draw-out Assembly**

Includes base, position indicator switch, socket, base trip interlock, crank handle, connectors, and necessary shields.

**Rear Connected**

3-pole

**Front Connected**

3-pole

(Draw-out assembly includes side plates and all hardware)

DCADR3

DCADFC3

DCAFR3

DCAFFC3

**Hex Wrench** for racking draw-out assembly and position indicator

DCHP

DCHP

**Position Indicator Switch**

Form "C" switch to indicate breaker engaged/de-engaged position.<sup>①</sup>

DCIP

DCIP

**Secondary Terminal Block Assy.**

Accessory connections for plug-in or draw-out breakers. Pre-wired plug and block with 8 terminal points.<sup>②</sup>

PCTF83

PCTF83

**Plug-In Spare Breaker Kit**

Set of 6 terminal blades, 2 terminal shield, & 1 trip interlock

PCXD3

PCXF3

**Draw-out Spare Breaker Kit**

Set of 6 terminal blades, & 1 trip interlock

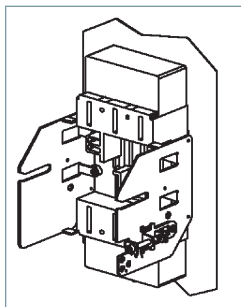
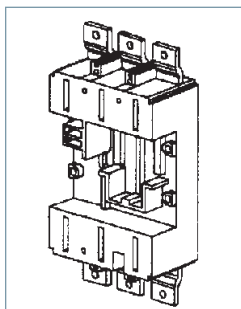
DCXD3

DCXF3

**Spare Breaker Trip Interlock**

PCXFT

PCXFT



① Up to 2 position indicator switches may be mounted per plug-in or draw-out base.

② Up to 2 plugs per breaker (16 terminal points) may be mounted on DG, and FG breakers. Up to 3 plugs per breaker (24 terminal points) may be mounted on JG, LG, MG, NG, and PG breakers.

# Operating Mechanisms

## Selection

For JG to LG Frame  
400 to 600 A

For MG Frame  
800 A

For NG to PG Frame  
1200 to 1600 A

Catalog Number	Catalog Number	Catalog Number
<b>Stored Energy Type</b> SEALB SEALM SEALY SEALN SEALR CLKP	<b>Stored Energy Type</b> SEAMB SEAMM SEAMY SEAMN SEAMR CLKP	<b>Motor Operator Type</b> MTRPB MTRPM MTRPY MTRPN MTRPR CLKP

For JG Frame  
400 A

For LG Frame  
600 A

For MG Frame  
800 A

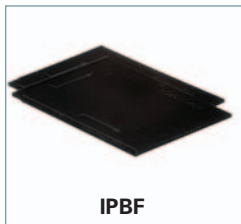
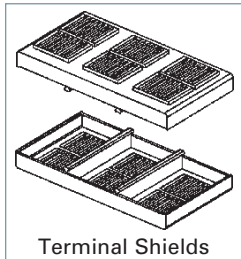
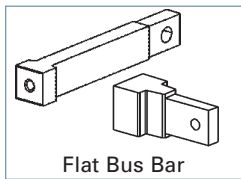
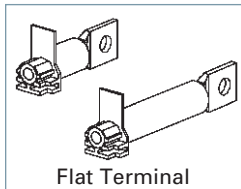
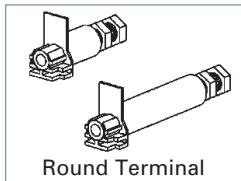
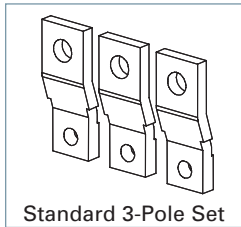
For NG Frame  
1200 A

For PG Frame  
1600 A

Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
PCBJRC3	PCBLRC3	PCBMRC3	PCBNRC3	—
PCBJFC3	PCBLFC3	—	—	—
DCAJRC3	DCALRC3	—	—	—
DCAJFC3	DCALFC3	—	—	—
DCHP	DCHP	—	—	—
DCIP	DCIP	—	—	—
PCTL83	PCTL83	—	—	—
PCXJ3	PCXL3	—	—	—
DCXJ3	DCXL3	—	—	—
PCXLT	PCXLT	—	—	—

# Connections

## Selection



Description	For DG Frame 150 A	For FG Frame 250 A
	Catalog Number	Catalog Number
<b>Front Bus Bar Connections</b> Includes nut keeper plates and shield. Standard (straight) 3-Pole Set Bus Bar Connection Strap Kit Includes 6 - Bus Bars, 6 Nut Keepers & Shields 100% rated applications	FBCE3 — —	FBCE3 — —
<b>Rear-Connecting Studs</b> Short length round term. (1piece) Long length round term. (1piece) 3-Pole round term. kit, 2 short + 1 long Short length flat term. (1piece) Long length flat term. (1piece) 3-Pole flat term. kit, 2 short + 1 long Flat bus bar type (1 piece) 3-Pole set of flat bus bar	RTLDSR RTLDLR SRTDR3 RTLDSF RTLDLF SRTDF3 — —	RTLFSR RTLFLR SRTFR3 RTLFSF RTLFLF SRTFF3 — —
<b>Terminal Shields</b> Includes 2 terminal shields. 3-Pole Standard Shield 3-Pole Extended Shield	TSSF3 TSLF3	TSSF3 TSLF3
<b>Interphase Barriers</b> Set of 2 barriers Also fits plug-in and draw-out bases.	IPBF	IPBF
<b>Lug Mounting Assy.</b>	—	—
<b>Breaker Mounting Base</b> Front connected Rear connected	— —	— —

# Connections

## Selection

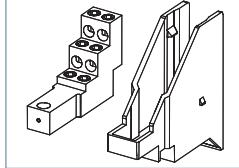
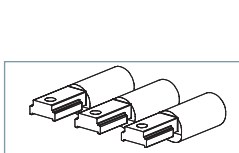
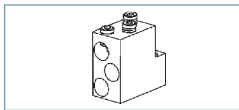
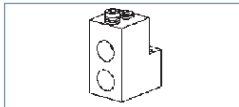
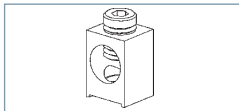
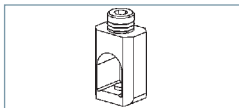
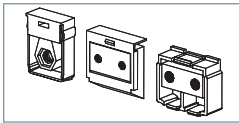
For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
FBCJ3 —	FBCL3 —	FBCM3 —	SSBP SSBPH	SSBP SSBPH
RTLJSR RTLJLR SRTJR3 RTLJSF RTLJLF SRTJF3 — —	— — — — — — RTLLSF SRTL3F3	— — — — — — RTLMSF SRTMF3	— — — — — — RTLNSF SRTNF3	— — — — — — — —
TSSL3 TSLL3	— —	TSSM3 TSLM3	TSSP3 TSLP3	TSSP3 TSLP3
IPBM	IPBM	IPBM	IPBP	IPBP
—	—	—	—	LMAP1600 <sup>®</sup>
— —	— —	— —	— —	MBPG1600 MBPG1601

© Not for use with standard AI terminals. Use Standard Shield for rear connection and Extended Shield for bus-bar connection.

© Kit includes connection for one side of breaker only. Order quantity 2 if connecting line and load side.

# Connections

## Selection



**Note:** pictures provide graphical representations only.

Description	For DG Frame 150 A	For FG Frame 250 A
	Catalog Number	Catalog Number
<b>Nut Keeper Plates</b> For ring/tongue terminal or bus bar connections. (For metric threads on other than the JG frame, change "TNK" to "TMK") 1 Nut Keeper Plate Kit of 3	<b>TNKD</b> <b>TNKD3</b>	<b>TNKF</b> <b>TNKF3</b>
<b>Mechanical Lugs</b> <i>Steel Wrap Around Body (Cu Wire Only)</i> Cable Size; (cables per phase) Single Lug Kit of 3	#8-1/0; 1-hole <b>TW1DG20</b> <b>3TW1DG20</b>	#4-350 kcmil; 1-hole <b>TW1FG350</b> <b>3TW1FG350</b>
<i>Aluminum Body (Al or Cu Wire)</i> Cable Size; (cables per phase) Single Lug Kit of 2  Kit of 3  Cable Size; (cables per phase)  Single Lug Kit of 2 Kit of 3  Cable Size; (cables per phase) Single Lug	#6-3/0; 1-hole <b>TA1DG30</b> —  <b>3TA1DG30</b>  —  —  —  —	#4-350 kcmil; 1-hole <b>TAW1FG350</b> —  <b>3TAW1FG350</b>  —  —  —  —
<i>Copper Body (Cu Wire Only)</i> Cable Size; (cables per phase) Single Lug Kit of 2  Kit of 3  Cable Size; (cables per phase) Single Lug	#6-3/0; 1-hole <b>TC1DG30</b> <sup>Ⓞ</sup> —  <b>3TC1DG30</b> <sup>Ⓞ</sup>  —  —	#4-350 kcmil; 1-hole <b>TCW1FG350</b> <sup>Ⓞ</sup> —  <b>3TCW1FG350</b> <sup>Ⓞ</sup>  —  —
<b>Compression Lugs</b> Cable Size; (cables per phase) Kit of 2 Kit of 3  Cable Size; (cables per phase) Kit of 2 Kit of 3  Cable Size; (cables per phase) Kit of 3	#14-2/0; 1-cable <b>2CLD20</b> <b>3CLD20</b>  —  —  —	#4-350 kcmil; 1-cable — <b>3CLF350</b>  —  —  —
<b>Distribution Lugs (Cu Wire Only)</b> Cable Size; (cables per phase) Single Lug Kit of 3 Cable Size; (cables per phase) Single Lug Kit of 3	#14-#2; 3-hole <b>TA3DG02</b> <b>3TA3DG02</b> #14-#4; 6-hole <b>TA6DG04</b> <b>3TA6DG04</b>	#14-#1; 2-hole and #14-2/0; 1-hole <b>TA3FG20</b> <b>3TA3FG20</b> #14-#4; 6-hole <b>TA6FG04</b> <b>3TA6FG04</b>
<b>Control Wire Terminals</b> Control Wire Terminal (Single) Control Wire Terminal (Kit of 3)	— —	— —

Ⓞ Required for 100% rated breakers. Requires 90°C cable sized at 75°C ampacity.

# Connections

## Selection

For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
<b>TMKJ</b> <b>TMKJ3</b> <i>metric only</i>	<b>TNKL</b> <b>TNKL3</b>	<b>TNKM</b> <b>TNKM3</b>	<b>TNKP</b> <b>TNKP3</b>	<b>TNKP</b> <b>TNKP3</b>
1/0-600 kcmil; 1-hole <b>TW1JG600</b> <b>3TW1JG600</b>	— — —	— — —	— — —	— — —
3/0-250 kcmil; 2-hole <b>TA2JG250</b> — <b>3TA2JG250</b> — AL: 250-750 kcmil CU: 3/0-600 kcmil; 1-hole <b>TA1JG750</b> — <b>3TA1JG750</b> — — —	#2-600 kcmil; 2-hole — — <b>3TA2LG600LD</b> <sup>①</sup> <b>3TA2LG600LN</b> <sup>②</sup> — AL: 250-750 kcmil CU: 3/0-600 kcmil; 1-hole <b>TA1JG750</b> (400A max) <b>3TA1JG750</b> (400A max) — — —	1/0-500 kcmil; 3-hole <b>TA3MG500</b> <b>3TA3MG500</b> — 500 -750 kcmil; 2-hole <b>TA2MG750</b> — <b>3TA2MG750</b> — #2-600 kcmil; 3-hole — <b>3TA3MG600</b> <sup>③</sup> (Kit of 3)	1/0-500 kcmil; 4-hole — <b>2TA4NG500</b> — <b>3TA4NG500</b> <b>3TA4NG500H</b> <sup>③</sup> — 500 -750 kcmil; 3-hole <b>2TA3NG750</b> <b>3TA3NG750</b> — —	1/0-750 kcmil; 6-hole — — <b>3TA6PG750</b> <sup>④</sup> — 600-750 kcmil; 4-hole <b>TA4P750</b> <sup>④</sup> — — 300-600 kcmil; 5; 6-hole <b>TA5P600</b> <sup>④</sup> <b>TA6R600</b> <sup>④</sup> —
3/0-250 kcmil; 2-hole <b>TC2JG250</b> <sup>③</sup> — — 3/0-750 kcmil; 1-hole <b>TC1JG750</b> <sup>③</sup>	#2-600 kcmil; 2-hole — — <b>3TC2LG600LD</b> <sup>①③</sup> <b>3TC2LG600LN</b> <sup>②③</sup> — —	1/0-500 kcmil; 3-hole <b>TC3MG500</b> <sup>③</sup> — — — —	1/0-500 kcmil; 4-hole — — <b>3TC4NG500</b> <sup>③</sup> — — —	— — — — 300-600 kcmil; 5-hole <b>TC5R600</b> <sup>③④</sup>
#6-350 kcmil; 1-cable — <b>3CLJ350</b> — 250-600 kcmil; 1-cable <b>3CLJ600</b> — —	#6-350 kcmil; 2-cable — <b>6CLL350</b> (kit of 6) — 250-750 kcmil; 1-cable <b>3CLL750</b> — 250-600 kcmil; 2-cable <b>6CLL600</b> (kit of 6) —	— — — — — —	1/0-500 kcmil; 4-cable — <b>12CLN500</b> (kit of 12) — — — — —	— — — — — —
#14-#4; 12-hole <b>TA12JG04</b> <b>3TA12JG04</b> #14-2/0; 6-hole <b>TA6JG20</b> <b>3TA6JG20</b>	— — — — — —	— — — — — —	— — — — — —	— — — — — —
<b>TA2JG250PT</b> —	— <b>3TA2LG600LNPT</b>	<b>TA3MG500PT</b> —	— <b>3TA4NG500PT</b>	— —

17

MOLDED CASE  
CIRCUIT BREAKERS

All lug kits include the nut keepers.

① Mounted on Load Side Only.

② Mounted on Line Side Only.

③ Required for 100% rated breakers. Requires 90°C cable

sized at 75°C ampacity.

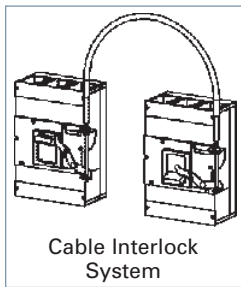
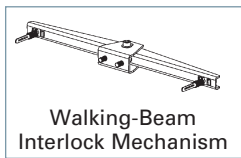
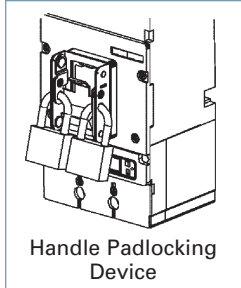
④ Requires extended modified shield.

⑤ Used only with LMAP1600 mounting base.

⑥ Used only with MBPG1600 or MBPG1601 mounting base.

# General

## Selection



Description	For DG Frame 150 A	For FG Frame 250 A
	Catalog Number	Catalog Number
<b>Handle Padlocking Device</b> To padlock breaker toggle in the "OFF" position. Accepts up to 3 padlocks with 5–8 mm shackles.	HPLF	HPLF
<b>Handle Blocking Device</b> For holding the handle in the "ON" position. Not a lockout/tagout device.	HBDF	HBDF
<b>Walking-Beam Interlock Mechanism</b> Provides mechanical interlocking between two adjacent circuit breakers. Fixed mounted breakers	WBMFFM	WBMFFM
Note: Both breakers must be of the same frame size.		
<b>Cable Interlock Mechanism</b> Provides mechanical interlocking between 2 circuit-breakers - includes operator mechanism for one circuit breaker only. Combination with the next larger or smaller frame size is possible.	CBTF	CBTF
<b>Interlock Cable</b> Cable only, to connect 2 circuit breakers. Cable length 18 in. .46m (recommended up to 250A) Cable length 36 in. .91m (recommended from 400–800A) Cable length 54 in. 1.37m (recommended from 1200–1600A)	CBCF18 CBCM36 CBCP54	CBCF18 CBCM36 CBCP54
<b>Mounting Screw Kit</b> Includes the necessary hardware to mount a circuit breaker to the user's prepared surface Kit with 2 screws (SAE thread) Kit with 4 screws (SAE thread)	MSKF2 MSKF4	MSKF2 MSKF4
<b>Trip Adjustment Sealing Cover</b> Includes a trip unit cover to prevent tampering or adjustment of trip settings. Seal not included. Thermal-Magnetic Trip Units	3VL97008BL00 TSCFTM	3VL97008BL00 TSCFTM

# General

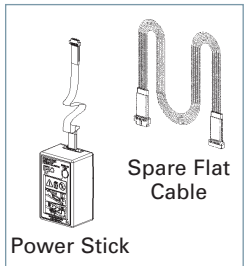
## Selection

For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
HPLL	HPLL	HPLM	HPLP	HPLP
HBDL	HBDL	HBDM	HBDP	HBDP
WBMLFM	WBMLFM	WBMMFM	WBMPFM	WBMPFM
CBTL	CBTL	CBTM	CBTP	CBTP
— CBCM36 CBCP54	— CBCM36 CBCP54	— CBCM36 CBCP54	— — CBCP54	— — CBCP54
— MSKL4	— MSKL4	— MSKM4	— MSKP4	— MSKP4
3VL97008BL00 TSLTLM	3VL97008BL00 TSLTLM	3VL97008BL00 TSCMTM	3VL97008BL00 —	3VL97008BL00 —



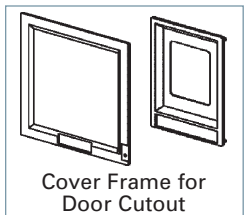
# Ground Sensors & Electronic Accessories

## Selection



Description	For DG Frame 150 A	For FG Frame 250 A
	Catalog Number	Catalog Number
<b>Neutral Current Transformer (Ground Sensor, N-pole)</b>		
Neutral = 35/60A	NGSD060	—
Neutral = 100A	NGSF100	NGSF100
Neutral = 150A	NGSF150	NGSF150
Neutral = 250A	—	NGSJ250
Neutral = 400A	—	—
Neutral = 600A	—	—
Neutral = 800A	—	—
Neutral = 1000/1200A	—	—
Neutral = 1600A	—	—
<b>Communications &amp; Electronics</b>		
Portable Test Set.	ELTPHB	ELTPHB
Power Stick - Hand held, battery operated power supply for LCD trip units. (Requires two 9V batteries.) Trip testing for both 555 & 586 trip units.	EPSP18V	EPSP18V
Spare flat cable for Power Stick.	COMPCA	COMPCA
COM20 Profibus Communications Module with ZSI for electronic trip units (order cable separately)	COMPRO20	COMPRO20
COM21 Modbus Communications Module with ZSI for electronic trip units (order cable separately)	COMMOD21	COMMOD21
Cable for COM20/21, 1.5 m (4.9 ft)	COMKIT3	COMKIT3
Cable for COM20/21, 3.0 m (9.8 ft)	COMKIT6	COMKIT6
Addressing Plug - assigns a field bus address without a PC by plugging into COM20/21	3UF79100AA000	3UF79100AA000

## Door Cutouts & Extensions



<b>Cover Frame for Door Cutout</b> For fixed or plug-in mounted circuit breakers. (IP30) 2-Pole & 3-Pole	<b>BZLF3</b>	<b>BZLF3</b>
For breakers with stored energy operator. (IP40)	<b>BZLFRHSE</b>	<b>BZLFRHSE</b>
Circuit-breaker draw-out mounted and toggle handle operated. Kit includes cover frame (bezel) and escutcheon as needed. (IP40) (not for use with rotary handle or stored energy operator)	<b>BZLFBDC</b>	<b>BZLFBDC</b>
<b>Toggle Handle Extension</b> For spare or replacement. (One is included with each NG - PG frame.)	—	—

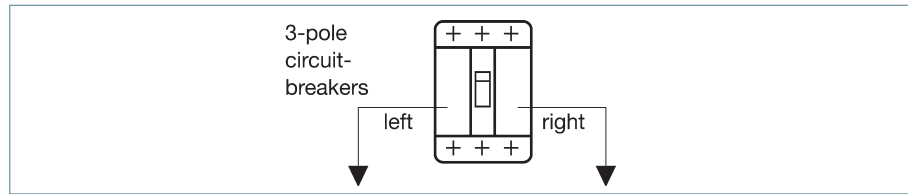
# Ground Sensors & Electronic Accessories

## Selection

For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
NGSJ250	—	—	—	—
NGSL400	NGSL400	—	—	—
—	NGSM600	NGSM600	—	—
—	—	NGSN800	NGSN800	—
—	—	—	NGSP120	NGSP120
—	—	—	—	NGSP160
ELTPHB	ELTPHB	ELTPHB	ELTPHB	ELTPHB
EPSP18V	EPSP18V	EPSP18V	EPSP18V	EPSP18V
COMPCA	COMPCA	COMPCA	COMPCA	COMPCA
COMPRO20	COMPRO20	COMPRO20	COMPRO20	COMPRO20
COMMOD21	COMMOD21	COMMOD21	COMMOD21	COMMOD21
COMKIT4	COMKIT4	COMKIT5	COMKIT5	COMKIT5
COMKIT7	COMKIT7	COMKIT8	COMKIT8	COMKIT8
3UF79100AA000	3UF79100AA000	3UF79100AA000	3UF79100AA000	3UF79100AA000
BZLL3	BZLL3	BZLM3	BZLP3	BZLP3
BZLLRHSE	BZLLRHSE	BZLMRHSE	BZLPRHSE	BZLPRHSE
BZLLBDC	BZLLBDC	BZLMBDC	BZLPBDC	BZLPBDC
THEL	THEL	THEM	THEP	THEP

# Accessory Locations

## Selection



### Locations of Internally Mounted Accessories

Frame Family	Left Pocket	Right Pocket
<b>DG*, FG*, JG, LG</b> 150 to 600A	Up to 3 Auxiliary Switches	Shunt Trip <b>or</b> UVR <b>or</b> up to 3 Auxiliary Switches <b>or</b> up to 2 Auxiliary Switches + 1 Alarm Switch
	Up to 2 Auxiliary Switches + 1 Alarm Switch	Shunt Trip <b>or</b> UVR <b>or</b> up to 3 Auxiliary Switches <b>or</b> up to 2 Auxiliary Switches + 1 Alarm Switch
<b>MG, NG, PG</b> 800 to 1600A	Up to 4 Auxiliary Switches	Shunt Trip <b>or</b> UVR <b>or</b> up to 4 Auxiliary Switches
	Up to 2 Auxiliary Switches + 2 Alarm Switches	Shunt Trip <b>or</b> UVR <b>or</b> up to 4 Auxiliary Switches

\* Except DG and FG breakers with Electronic Trip Units. Due to the location of the Magnetic Latch, the Left Pocket is not available for accessories.

#### Accessory Information

- Aux. Switch is an Auxiliary Switch, 1A or 1B contact
- Alarm Switch has 1A or 1B contact
- UVR is an Undervoltage Release
- The standard location for factory mounted Auxiliary and Alarm Switches is the Left Pocket

#### Accessory Maximums

##### DG, FG, JG, LG Maximum Accessories:

- Maximum of six (6) switches total
- DG, FG Maximum of two (2) Alarm Switches, one each in the Left and Right Pockets. JG, LG Max. of 1 Alarm, Left only

##### MG, NG, PG Maximum Accessories:

- Maximum of eight (8) switches total
- Maximum of two (2) Alarm Switches, Left Pocket only

#### For applications using COMMOD20 and COMMOD21 for communication using Modbus or Profibus

##### DG, FG

COMKIT3 & COMKIT6 provide auxiliary contact kit. May add only one or two contact blocks for Alarm or Auxiliary function.

##### JG, LG

COMKIT4 & COMKIT7 provide auxiliary contact kit mounted in left pole pocket. One contact block can be added for Auxiliary function. Right pole pocket available for other release or an additional Auxiliary contact kit.

##### MG, NG, PG

COMKIT5 & COMKIT8 provide auxiliary contact kit mounted in Left pole pocket. Two contact blocks can be added for Auxiliary function and one for Alarm function. Right pole pocket available for other release or an additional Auxiliary Contact kit.

Selection

Suffix for factory mounted Switch Combinations

If the frame is:	And you need these functions:	Then add this suffix:	Device Catalog Number
DG, FG, JG or LG	1 Alarm Switch 1 NO Alarm 1 NC Alarm	A1	ASKL1
DG, FG, JG or LG	2 Aux. Switches 1 NO + 1 NC Aux. Contacts	A2	ASKL2
DG, FG, JG or LG	2 Aux. + 1 Alarm Switches 1NO + 1NC Aux. and 1NC Alarm 2NO Aux. and 1NC Alarm	A3	ASKL3
MG, NG or PG	2 Aux. + 2 Alarm Switches 1NO + 1NC Aux. and 1NO + 1NC Alarm 2NO Aux. and 2NC Alarm 2NC Aux. and 2NO Alarm	A3	ASKP3
MG, NG or PG	4 Aux. Switches 2NO + 2NC Aux.	A4	ASKP4

Suffix for factory mounted Shunt Trips

If the frame is:	And you need these functions:	Then add this suffix:	Device Catalog Number
DG, FG, JG or LG	24V DC 48-60V DC 110-127V DC 220-250V DC 48-60V AC 110-127V AC 208-277V AC 380-600V AC	RB RC RD RE RM RN RS RV	STRLB24DC STRLC60DC STRLD125DC STRLE250DC STRLM60 STRLN120 STRLS277 STRLV600
MG, NG or PG	24V DC 48-60V DC 110-127V DC 220-250V DC 48-60V AC 110-127V AC 208-277V AC 380-600V AC	RB RC RD RE RM RN RS RV	STRPB24DC STRPC60DC STRPD125DC STRPE250DC STRPM60 STRPN120 STRPS277 STRPV600

Suffix for factory mounted Undervoltage Releases

If the frame is:	And you need these functions:	Then add this suffix:	Device Catalog Number
DG, FG, JG or LG	12V DC 24V DC 48V DC 60V DC 110-127V DC 220-250V DC 24V AC 110-127V AC 220-240V AC 208V AC 277V AC 380-415V AC 440-480V AC	UA UB UC UG UD UE UK UN UR UP US UT UU	UVRLA12DC UVRLB24DC UVRLC48DC UVRLG60DC UVRLD125DC UVRLE250DC UVRLL24 UVRLN120 UVRLR240 UVRLP208 UVRLS277 UVRLT415 UVRLU480
MG, NG or PG	12V DC 24V DC 48V DC 60V DC 110-127V DC 220-250V DC 110-127V AC 220-240V AC 208V AC 277V AC 380-415V AC 440-480V AC	UA UB UC UG UD UE UN UR UP US UT UU	UVRPA12DC UVRPB24DC UVRPC48DC UVRPG60DC UVRPD125DC UVRPE250DC UVRPN120 UVRPR240 UVRPP208 UVRPS277 UVRPT415 UVRPU480

## Technical Data

## Selection

		DG	FG	JG	LG	MG	NG	PG
<b>Max rated continuous current</b>		150	250	400	600	800	1200	1600
Rated operational voltage								
NEMA	V AC	600	600	600	600	600	600	600
IEC	V AC	690	690	690	690	690	690	690
Rated Impulse Withstand Voltage								
Main conducting paths	kV	8	8	8	8	8	8	8
Auxiliary circuits	kV	4	4	4	4	4	4	4
Ambient Temperature Range	°C	-25 to +75	-25 to +75	-25 to +75	-25 to +75	-25 to +75	-25 to +75	-25 to +75
High Ambient Derating (thermal-mag.)	50°C	93%	93%	93%	93%	95%	95%	95%
	60°C	86%	86%	86%	86%	86%	86%	80%
	70°C	80%	80%	80%	80%	80%	80%	74%
Operating Cycles		20,000	20,000	20,000	10,000	5,000	3,000	3,000
Max switching rate (per hour)		120	120	120	60	60	30	30
Power loss (at max. rated current)								
Thermal-magnetic	W	15 – 48	32 – 80	60 – 175	85 – 230	170 – 250	150 – 220	200 – 260
Electronic trip unit	W	40	60	90	160	250	210	260
IEC <sup>①</sup>								
Time constant t = 10 ms								
1 current path								
2 current paths in series								
3 current paths in series								
Up to 250V DC		—	—	—	—	—	—	—
440V DC								
600V DC								
NEMA								
Time constant t = 8 ms								
2 poles switching								
1 current path								
250V DC Max. <sup>②</sup>		30	30	30	30	42	42	42
3 poles switching								
2 current paths in series								
500V DC Max. <sup>②</sup>		18	25	35	35	65	65	65
<b>Accessories</b>								
Auxiliary/ Alarm Switch								
Current rating (1 or 2 switches)		10	10	10	10	10	10	10
Current rating (3 or 4 same switch)	A	5	5	5	5	5	5	5
Shunt Trip								
Pick-up voltage	V	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1
Power Consumption (short-time) at:								
48 – 60 V AC	VA	401 – 501	401 – 501	401 – 501	401 – 501	401 – 501	401 – 501	401 – 501
110 – 127 V AC	VA	424 – 489	424 – 489	424 – 489	424 – 489	424 – 489	424 – 489	424 – 489
208 – 277 V AC	VA	533 – 736	533 – 736	533 – 736	533 – 736	533 – 736	533 – 736	533 – 736
380 – 600 V AC	VA	408 – 645	408 – 645	408 – 645	408 – 645	408 – 645	408 – 645	408 – 645
24 V DC	W	594	594	594	594	594	594	594
48 – 60 V DC	W	740 – 925	740 – 925	740 – 925	740 – 925	740 – 925	740 – 925	740 – 925
110 – 127 V DC	W	559 – 648	559 – 648	559 – 648	559 – 648	559 – 648	559 – 648	559 – 648
220 – 250 V DC	W	722 – 820	722 – 820	722 – 820	722 – 820	722 – 820	722 – 820	722 – 820
Max. Operating time	ms	50	50	50	50	50	50	50

<sup>①</sup> Consult Siemens for short circuit values.

<sup>②</sup> Review individual frame and type values.

## Technical Data

## Selection

		DG	FG	JG	LG	MG	NG	PG
<b>Undervoltage Trip</b>								
Drop voltage (percentage)	V	35% – 70%	35% – 70%	35% – 70%	35% – 70%	35% – 70%	35% – 70%	35% – 70%
Pick-up voltage (percentage)	V	70% – 85%	70% – 85%	70% – 85%	70% – 85%	70% – 85%	70% – 85%	70% – 85%
Power consumption (continuous) at:								
110 – 127 V AC	VA	1	1	1	1	1.1	1.1	1.1
220 – 250 V AC	VA	2.1	2.1	2.1	2.1	2.1	2.1	2.1
208 V AC	VA	1.2	1.2	1.2	1.2	1.2	1.2	1.2
277 V AC	VA	1.4	1.4	1.4	1.4	1.4	1.4	1.4
380 – 415 V AC	VA	1.9	1.9	1.9	1.9	1.9	1.9	1.9
440 – 480 V AC	VA	2.2	2.2	2.2	2.2	2.2	2.2	2.2
500 – 525 V AC	VA	2.5	2.5	2.5	2.5	2.5	2.5	2.5
600 V AC	VA	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Max. opening time	ms	50	50	50	50	50	50	50
<b>Motorized Operating Mechanism</b>								
Motor with stored energy mechanism (synchronizable)		X	X	X	X			
Motor Operator						X	X	X
Max. switching rate (per hour)		120	120	120	60	60	30	30
Command duration	ms	20 – 50	20 – 50	20 – 50	20 – 50	20 – 50	—	—
Closing time	ms	<100	<100	<100	<100	<100	<5,000	<5,000
Charging time	s	<5	<5	<5	<5	<5	<5	<5
Break time	s	<5	<5	<5	<5	<5	<5	<5
Power consumption	VA/W	<500						
Inrush (A)								
Control Voltages								
		110 – 127 V AC						
		220 – 250 V AC						
		24 V DC						
		48 V DC						
		60 V DC						
Operating Range		85 – 110% of rated control voltage						

# Unusual Operating Conditions

## Reference

**Note:** The information provided on this and the next page is intended for reference and recommendation only. Because several variables can act on a circuit breaker’s performance at the same time, the data below is based less on controlled testing, than on experience and engineering judgment. Contact Siemens for further information on special conditions and treatment.

### High Ambient Temperatures

Because thermal-magnetic trip breakers are temperature sensitive and calibrated for a specific ambient of 40° C (104° F) (average enclosure temperature), a higher ambient will cause the breaker to trip at lower current than its nameplate rating, in other words, causing the breaker to “derate” (see Table 1). Similarly, the current carrying capacity of a circuit conductor is based upon a certain ambient temperature, a higher ambient will reduce its current carrying capacity, causing it to “derate.” Thus, with a fluctuating temperature, a thermal-magnetic breaker will derate nearly parallel with its connected circuit conductors and maintain close circuit protection. If the application temperature exceeds 40° C (104° F) and is known, either a breaker specially calibrated for the higher ambient or one oversized according to Table 1 may be selected. In a case such as this, the circuit conductors should be oversized as well.

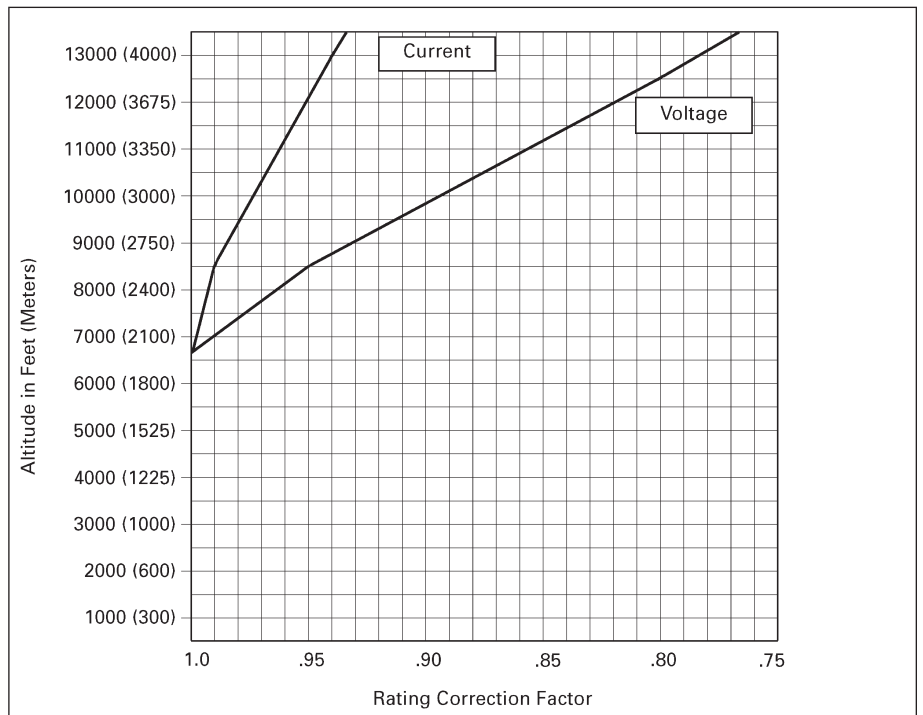
Siemens Electronic Trip Unit Breakers are insensitive to temperature changes. However, they do include circuitry to protect the components from abnormally high temperatures.

### Altitude

Reduced air density at altitudes greater than 6600 ft. (2000 meters) affects the ability of a molded case circuit breaker to transfer heat and interrupt faults. Therefore, circuit breakers applied at these altitudes should have interrupting, insulation and continuous currents derated as indicated in Figure 1.

**Table 1 – Temperature derating data for thermal-magnetic breakers**

Reference Ampere Rating at 40° C (104° F)	Ampere Rating at:		Siemens Breaker Frames
	50° C (122° F)	60° C (140° F)	
50	46	42	DG
60	56	52	
70	65	60	
90	84	78	
100	94	87	
125	114	100	
150	136	120	
175	159	140	
200	182	160	
225	205	180	
250	235	220	
300	276	252	FG
350	325	301	
400	372	340	JG
500	468	435	
600	564	525	
700	658	613	LG
800	754	704	
900	828	749	MG
1000	900	825	
1200	1090	1000	NG
1400	1304	1148	
1600	1500	1320	PG



**Figure 1 – Altitude adjustment**

# ED 125A Frame, Sentron Series

## Selection

### Ordering Instructions

- All ED Frame Sentron circuit breakers are supplied with load side lugs. If line side lugs are required, add "L" suffix to catalog number. Consult Siemens sales office for any additional charge
- 50°C Calibration, 400HZ - see page 17/104. All ED frame circuit breakers may be reverse connected

### Type ED2<sup>⑤</sup>

#### Blue Label

Continuous Current Rating @ 40°C	1-Pole		2-Pole		3-Pole
	120V AC	125V DC	240V AC	125V DC 250V DC	240V AC
	Catalog Number		Catalog Number		Catalog Number
15	ED21B015 <sup>④</sup> ■		ED22B015		ED23B015
20	ED21B020 <sup>④</sup> ■		ED22B020		ED23B020
25	ED21B025■		ED22B025■		ED23B025■
30	ED21B030■		ED22B030		ED23B030
35	ED21B035■		ED22B035■		ED23B035■
40	ED21B040■		ED22B040		ED23B040
45	ED21B045■		ED22B045■		ED23B045■
50	ED21B050■		ED22B050		ED23B050
60	ED21B060■		ED22B060		ED23B060
70	ED21B070■		ED22B070		ED23B070
80	ED21B080■		ED22B080■		ED23B080
90	ED21B090■		ED22B090■		ED23B090■
100	ED21B100■		ED22B100		ED23B100

### Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
<b>ED2, ED4, ED6, HED4, HHED6</b>		
1	30	38
2	10	25
3	10	38
<b>CED6</b>		
2	5	20
3	5	30

### Lugs

Ampere Rating	No. of Poles	Catalog Number	Wire Range
<b>Aluminum Body Lugs</b>			
All 15–25A	1, 2, 3	Line/Load SA1E025	#14–#10 Cu #12–#10 Al
All 30–100A	1, 2, 3	Line Side LN1E100	#10–1/0 Cu/Al
ED2, 4, CED6 30–60A	1	Load Side LD1E060	#10–#4 Cu/Al
ED2, 4, CED6 70–100A	1	Load Side LD1E100	#6–#1/0 Cu/Al
ED2, 4, HED4, HHED6 30–100A	2, 3	Load Side LN1E100	#10–1/0 Cu/Al
ED6 20–50A	2, 3	Line Side LN1E100	#10–1/0 Cu/Al
All 110, 125A	2, 3	Line/Load TA1E6125	#3–3/0 Cu #1–2/0 Al
<b>Copper Body Lugs</b>			
All 30–125A	1, 2, 3	Line/Load TC1ED6150 <sup>③</sup>	#10–1/0 Cu only
<b>Compression Lugs</b>			
All ED, HHED, CED		CCE125	2/0

### Type ED4<sup>⑤</sup>

#### Blue Label

Continuous Current Rating @ 40°C	1-Pole		2-Pole		3-Pole
	120V AC	125V DC	480V AC	250V DC	480V AC
	Catalog Number		Catalog Number		Catalog Number
15	ED41B015 <sup>④</sup>		—		ED43B015
20	ED41B020 <sup>④</sup>		ED42B020		ED43B020
25	ED41B025		ED42B025		ED43B025
30	ED41B030		ED42B030		ED43B030
35	ED41B035■		ED42B035■		ED43B035
40	ED41B040		ED42B040		ED43B040
45	ED41B045■		ED42B045■		ED43B045
50	ED41B050		ED42B050		ED43B050
60	ED41B060		ED42B060		ED43B060
70	ED41B070		ED42B070		ED43B070
80	ED41B080■		ED42B080■		ED43B080
90	ED41B090■		ED42B090■		ED43B090
100	ED41B100		ED42B100		ED43B100
110	ED41B110		ED42B110■		ED43B110
125	—		ED42B125		ED43B125

### Type ED6<sup>⑤</sup>

#### Blue Label

Continuous Current Rating @ 40°C	1-Pole <sup>①</sup>		2-Pole		3-Pole		3-Pole
	347V AC		600V AC	250V DC	600V AC	500V DC	600V DC
	Catalog Number		Catalog Number		Catalog Number		Catalog Number
15	ED61B015	—	—	—	—	—	ED63D015L
20	ED61B020	ED62B020	—	ED63B020	—	—	ED63D020L
25	ED61B025	ED62B025■	—	ED63B025	—	—	ED63D025L
30	ED61B030	ED62B030	—	ED63B030	—	—	ED63D030L
35	ED61B035	—	—	ED63B035	—	—	ED63D035L
40	ED61B040	—	—	ED63B040	—	—	ED63D040L
45	ED61B045■	—	—	ED63B045	—	—	ED63D045L
50	ED61B050	—	—	ED63B050	—	—	ED63D050L
60	ED61B060	—	—	ED63B060	—	—	ED63D060L
70	ED61B070■	—	—	ED63B070	—	—	—
80	ED61B080	—	—	ED63B080	—	—	—
90	ED61B090	—	—	ED63B090	—	—	—
100	ED61B100■	—	—	ED63B100	—	—	—
110	—	—	—	ED63B110	—	—	—
125	—	—	—	ED63B125	—	—	—

### Enclosures (Neutral Included)<sup>⑥</sup>

Type	Catalog Number
1 (Surface)	E2N1S (15–100A)
1 (Flush)	E2N1F (15–100A)
3R	E2N3R (15–100A)
4–4X	ED6SS4 (15–100A)
4–4X	ED6S4 (15–100A)
4–4X (316SS)	ED6S4316 (15–100A)
7–9	EA (15–60A)
7–9	EB (70–100A)
12	E2N12 (15–100A)
1 (Surface)	CED6N1S <sup>②</sup>
1 (Flush)	CED6N1F <sup>②</sup>
3R	CED6N3R <sup>②</sup>
12	CED6N12 <sup>②</sup>

Note: ED frame circuit breakers qualified to UL 489 Supplement SB "Naval"— See page 17/104 for additional information

■ Built to order. Allow 2–3 weeks for delivery.  
 ◎ CSA Certified only (Not UL)

② For CED types and all 110–125 ampere ED frames.

③ See Note: A, page 17/100.

④ SWD rated.

⑤ HACR rated.

⑥ Not for use with HHED6 breakers.

Modifications page 17/103

Accessories pages 17/65 and 17/107 to 17/112



# HED/CED 125A Frame Sentron Series

## Selection/Dimensions

### Type HED4<sup>5</sup>

**Black Label**

Continuous Current Rating @ 40°C	1-Pole		2-Pole		3-Pole
	277V AC	125V DC	480V AC	250V DC	480V AC
	Catalog Number		Catalog Number		Catalog Number
15	HED41B015 <sup>①</sup>		HED42B015		HED43B015
20	HED41B020 <sup>①</sup>		HED42B020		HED43B020
25	HED41B025		HED42B025■		HED43B025
30	HED41B030		HED42B030		HED43B030
35	HED41B035■		HED42B035■		HED43B035
40	HED41B040		HED42B040		HED43B040
45	HED41B045■		HED42B045■		HED43B045
50	HED41B050■		HED42B050		HED43B050
60	HED41B060■		HED42B060■		HED43B060
70	HED41B070■		HED42B070■		HED43B070
80	HED41B080■		HED42B080■		HED43B080
90	HED41B090■		HED42B090■		HED43B090
100	HED41B100■		HED42B100■		HED43B100
110	—		HED42B110■		HED43B110
125	—		HED42B125■		HED43B125

FIGURE 1 - ED, HED, HHED

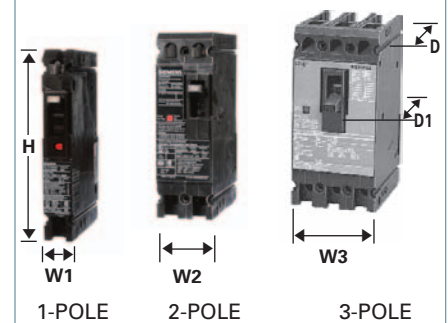
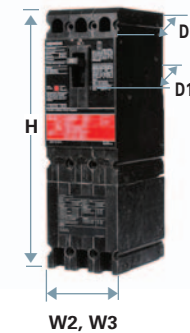


FIGURE 2 - CED (3-Pole shown)



Dimensions (in inches)

Breaker Type	W1	W2	W3	H	D	D1
Figure 1 ED2, ED4, ED6, HED4, ED6 ETI <sup>③</sup>	1	2	3	6.35	3.92	4.56
Figure 1 HHED6	—	2	3	6.53	3.92	4.56
Figure 2 CED6, CED6 ETI <sup>③</sup>	—	2	3	9.58	3.92	4.56

### Fuseless Current Limiting

#### Type HHED6<sup>5</sup>

**Black Label**

#### Type CED6<sup>5</sup>

**Red Label**

Continuous Current Rating @ 40°C	3-Pole		2-Pole	3-Pole
	600V AC		600V AC, 250V DC	600V AC, 500V DC <sup>②</sup>
	Catalog Number <sup>④</sup>		Catalog Number	Catalog Number
15	HHED63B015A		CED62B015	CED63B015
20	HHED63B020		CED62B020■	CED63B020
25	HHED63B025		—	—
30	HHED63B030		CED62B030■	CED63B030
35	HHED63B035		—	—
40	HHED63B040		—	CED63B040
45	HHED63B045		—	—
50	HHED63B050		—	CED63B050
60	—		CED62B060■	CED63B060
70	—		CED62B070■	CED63B070
80	—		CED62B080■	CED63B080
90	—		CED62B090■	CED63B090
100	—		CED62B100■	CED63B100
110	—		—	CED63B110■
125	—		CED62B125■	CED63B125

### Interrupting Ratings

Breaker Type	UL 489 AIR (File #E10848)										IEC 947-2					
	RMS Symmetrical Amperes (KA)										Volts AC (50/60Hz)					
	Volts AC					Volts DC					220/240		380/415		500	
	120	240	277	347	480	600	125	250	500 <sup>②</sup>	600	Icu	Ics	Icu	Ics	Icu	Ics
ED2 (1-P)	10	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—
ED2 (2, 3-P)	—	10	—	—	—	—	—	5 (2-P)	—	—	—	—	—	—	—	—
ED4 (1-P)	65	—	22	—	—	—	30	—	—	—	—	—	—	—	—	—
ED4 (2, 3-P)	—	65	—	—	18	—	—	30 (2-P)	—	—	—	—	—	—	—	—
ED6 (1P)	—	—	—	30 <sup>④</sup>	—	—	—	30	—	—	—	—	—	—	—	—
ED6 (2, 3-P)	—	65	—	—	25	18	—	—	18 (3-P)	65	17	35	9	18	5	
ED6 (3-P)	—	—	—	—	—	—	—	—	10	—	—	—	—	—	—	
HED4 (1-P) (15-30A)	100	—	65	—	—	—	30	—	—	—	—	—	—	—	—	
HED4 (1-P) (35-100A)	100	—	25	—	—	—	30	—	—	—	—	—	—	—	—	
HED4 (2, 3-P)	—	100	—	—	42	—	—	30 (2-P)	—	—	—	—	—	—	—	
HHED6 (2, 3-P)	—	100	—	—	65	18 <sup>④</sup>	—	—	—	—	—	—	—	—	—	
CED6 (2, 3-P)	—	200	—	—	200	100	—	50 (2-P)	30 (3-P)	—	—	—	—	—	—	

■ Built to order. Allow 2-3 weeks for delivery.

①SWD rated.

②When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.

③ ED6-ETI, CED6-ETI, see page 17/91 for ordering information.

④ Single Pole 15-30A 30KA @ 347V non-UL.  
35-100A 18KA @ 347V non-UL.

⑤ HACR rated.

⑥ HHED63B015A is rated 18KAIC at 600/347V.

# Accessories

## Selection

Accessories for:

**ED 125A Frame**



### Combinations

Available only when ordered together. Only one module can be added to a breaker. Additional accessories, which always attach to the left pole, cannot be added to the combination later. Adds 1 inch pole space.

### Equipment Ground Sensing

A field addable kit containing 30mA or 5 mA ground fault accessory module, current transformer with 24 inch leads, and current transformer mounting equipment. Current transformer to mount in gutter of lighting panel or any control panel. Accessory module operates from separate 120V control power source.

Both 30MA and 5MA devices are equipment protection devices only. Do not use for personnel protection.



### Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch	1 Shunt Trip and 1 Auxiliary Switch and 1 Alarm Switch	1 Shunt Trip and 1 Alarm Switch	1 Shunt Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
24		S17ED60	—	—	—	—
48		S18ED60	—	—	—	—
120		S01ED60	S01ED62A	S01ED62AB	S01ED62B	S01ED62AA
208		—	S02ED62A▲	S02ED62AB▲	S02ED62B▲	S02ED62AA▲
240		S03ED60	S03ED62A	S03ED62AB	S03ED62B▲	S03ED62AA▲
277		S15ED60▲	S15ED64A▲	S15ED64AB▲	S15ED64B▲	—
480		S04ED60	S04ED64A▲	S04ED64AB▲	S04ED64B▲	—
	12	S16ED60▲	S16ED62A▲	—	—	—
	24	S07ED60	S07ED62A	S07ED62AB▲	S07ED62B▲	S07ED62AA▲
	48	S09ED60▲	S09ED62A▲	S09ED62AB▲	S09ED62B▲	S09ED62AA▲
	125	S11ED60▲	S11ED62A▲	S11ED62AB▲	S11ED62B▲	S11ED62AA▲
	250	S13ED60▲	S13ED62A▲	S13ED62AB▲	S13ED62B▲	S13ED62AA▲

### Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 1 Auxiliary Switch and 1 Alarm Switch	1 Undervoltage Trip and 1 Alarm Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
120		U01ED60	U01ED62A	U01ED62AB▲	U01ED62B▲	U01ED62AA▲
208		U02ED60▲	U02ED62A▲	U02ED62AB▲	U02ED62B▲	U02ED62AA▲
240		U03ED60	U03ED62A▲	U03ED62AB▲	U03ED62B▲	U03ED62AA▲
277		U16ED60▲	U16ED64A▲	U16ED64AB▲	U16ED64B▲	—
480		U06ED60▲	U06ED64A▲	U06ED64AB▲	U06ED64B▲	—
600		U08ED60▲	—	—	—	—
	24	U13ED60	U13ED62A▲	U13ED62AB▲	U13ED62B▲	U13ED62AA▲
	48	U14ED60▲	U14ED62A▲	U14ED62AB▲	U14ED62B▲	U14ED62AA▲
	125	U10ED60▲	U10ED62A▲	U10ED62AB▲	U10ED62B▲	U10ED62AA▲
	250	U12ED60▲	U12ED62A▲	—	—	U12ED62AA▲

### Auxiliary Switch Combinations

Maximum Voltage		1 Auxiliary Switch	1 Alarm Switch and 1 Auxiliary Switch	2 Auxiliary Switches	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number
240	250	A01ED62	A01ED62B	A02ED62	A02ED62B
480		A01ED64	A01ED64B	—	—

Maximum Voltage		1 Auxiliary Switch	
AC	DC	Catalog Number	
	12	A01EDLV	Gold Plated Contacts—for PLC use

### Alarm Switch Only

Maximum Voltage		1 Alarm Switch	
AC	DC	Catalog Number	
240	250	B00ED62	
480		B00ED64	

### Ground Fault Sensing Relay Kit — Equipment Protection Only

For Use With Breaker Frame	Number of Poles	Description	Catalog Number	
			30mA	5mA
CED6, ED2, ED4 ED6, EFC, EFF, HED4, HHED6	1, 2, 3	Basic Kit	GF01ED60	GF01ED65
		Basic Kit with Normally Open Bell Alarm	GF01ED60B0	GF01ED65B0▲
		Basic Kit with Normally Closed Bell Alarm	GF01ED60BC	GF01ED65BC▲

▲ Built to order. Allow 6–8 weeks for delivery.

# FD 250A Frame Sentron Series

## Selection

### Type FXD6-A<sup>①④</sup>

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker – Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole	3-Pole
	Catalog Number	Catalog Number
70	FXD62B070■	FXD63B070
80	FXD62B080■	FXD63B080
90	FXD62B090■	FXD63B090
100	FXD62B100	FXD63B100
110	FXD62B110■	FXD63B110
125	FXD62B125	FXD63B125
150	FXD62B150	FXD63B150
175	FXD62B175	FXD63B175
200	FXD62B200	FXD63B200
225	FXD62B225	FXD63B225
250	FXD62B250	FXD63B250

### Type FD6-A<sup>⑥</sup>

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

#### 2-Pole 600V AC, 250V DC<sup>②</sup>

70	FD62B070■	FD62F250	FD62T070■
80	FD62B080■		FD62T080■
90	FD62B090■		FD62T090■
100	FD62B100■		FD62T100■
110	FD62B110■		FD62T110■
125	FD62B125■		FD62T125■
150	FD62B150		FD62T150
175	FD62B175■		FD62T175■
200	FD62B200		FD62T200
225	FD62B225■		FD62T225■
250	FD62B250■		FD62T250■

#### 3-Pole 600V AC, 500V DC<sup>③</sup>

70	FD63B070■	FD63F250	FD63T070■
80	FD63B080■		FD63T080■
90	FD63B090■		FD63T090■
100	FD63B100		FD63T100
110	FD63B110■		FD63T110■
125	FD63B125		FD63T125
150	FD63B150		FD63T150
175	FD63B175		FD63T175
200	FD63B200		FD63T200
225	FD63B225		FD63T225
250	FD63B250		FD63T250

### Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)										
	UL 489 AIR (File E10848)						IEC 947-2				
	Volts AC (50/60Hz)			Volts DC			Volts AC (50/60Hz)				
	240	480	600	250	500 <sup>⑤</sup>	220/240	380/415	500	lcs	lcs	
FXD6-A, FD6-A	65	35	22	30 (2-P)	18 (3-P)	65	33	35	9	—	—
HFXD6, HFD6	100	65	25	30 (2-P)	25 (3-P)	100	50	65	33	—	—
HHFD6, HHFXD6	200	100	25	—	—	—	—	—	—	—	—
CFD6	200	200	100	30 (2-P)	50 (3-P)	—	—	—	—	—	—

### Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							±20% Tolerance High
	±20% Tolerance Low	2	3	4	5	6	7	
70-90	600	640	690	730	770	810	850	900
100-110	700	770	840	920	990	1060	1140	1200
125-150	800	900	1000	1100	1200	1300	1400	1500
175-200	900	1060	1210	1370	1520	1780	1930	2000
225-250	1100	1300	1500	1700	1900	2100	2300	2500

Note: FD frame qualified to UL489 supplement SB "NAVAL". See page 17/103 for additional information.

### Ordering Information

#### Complete Breaker Unassembled with Lugs

Prices of FD6, HFD6, and HHFD6 breakers includes frame, trip and both line and load lugs (TA1FD350A). When ordered by these catalog numbers, the customer will receive the frame, trip, and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

#### Complete Breaker Assembled with-out Lugs

Prices of FXD6, HFXD6, HHFXD6, and CFD6 includes frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA1FD350A) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).  
**50°C Applications** see page 17/103.  
**400 Hz Applications** see page 17/103.

### Lugs For 75°C Wire<sup>⑤</sup>

Catalog Number	Wire Range
TA1FD350A	#6–350 kcmil Cu #4–350 kcmil Al
TC1FD350	#6–350 kcmil Cu
<b>Compression Lug</b>	
CCF250	350 kcmil Cu/Al

### Enclosures

Type	Catalog Number
1	F6N1S(F)
3R	F6N3R
4-4X	FD6SS4
7-9	EC2
12	F6N12
Neutral <sup>④</sup>	N250

Modifications page 17/103  
 Enclosures Section 6  
 Accessories pages 17/68 and 17/24 to 17/27

■ Built to order. Allow 2–3 weeks for delivery.

- ① Type FXD6-A circuit breakers are UL Listed for reverse fed applications.
- ② 2-pole units are 3-pole width.
- ③ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.
- ④ Order neutral as separate item.
- ⑤ See **Note: A**, page 17/31.
- ⑥ HACR rated.

# FD 250A Frame Sentron Series

## Selection/Dimensions

### Type HFD6, Type HFXD6<sup>②③④⑤</sup>

**Black Label**

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number
<b>2-Pole 600V AC, 250V DC (3-Pole Width)</b>			
70	HFD62B070■	HFD62F250	FD62T070■
80	HFD62B080■		FD62T080■
90	HFD62B090■		FD62T090■
100	HFD62B100■		FD62T100■
110	HFD62B110■		FD62T110■
125	HFD62B125■		FD62T125■
150	HFD62B150■		FD62T150■
175	HFD62B175■		FD62T175■
200	HFD62B200■		FD62T200■
225	HFD62B225■		FD62T225■
250	HFD62B250■		FD62T250■

### 3-Pole 600V AC, 500V DC<sup>①</sup>

70	HFD63B070■	HFD63F250	FD63T070■
80	HFD63B080■		FD63T080■
90	HFD63B090■		FD63T090■
100	HFD63B100■		FD63T100■
110	HFD63B110■		FD63T110■
125	HFD63B125■		FD63T125■
150	HFD63B150■		FD63T150■
175	HFD63B175■		FD63T175■
200	HFD63B200■		FD63T200■
225	HFD63B225■		FD63T225■
250	HFD63B250■		FD63T250■

### Type HHFD, HHFXD6<sup>②③⑤</sup>

#### 3-Pole 600V AC, Extra High Interrupting

70	HHFD63B070■	HHFD63F250	FD63T070■
80	HHFD63B080■		FD63T080■
90	HHFD63B090■		FD63T090■
100	HHFD63B100■		FD63T100■
110	HHFD63B110■		FD63T110■
125	HHFD63B125■		FD63T125■
150	HHFD63B150■		FD63T150■
175	HHFD63B175■		FD63T175■
200	HHFD63B200■		FD63T200■
225	HHFD63B225■		FD63T225■
250	HHFD63B250■		FD63T250■

### Type CFD6-A<sup>③⑤</sup>

#### Fuseless Current Limiting

**Red Label**

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)	
Continuous Current Rating @ 40°C	3-Pole 600V AC/500V DC
	Catalog Number
70	CFD63B070■
80	CFD63B080■
90	CFD63B090■
100	CFD63B100■
110	CFD63B110■
125	CFD63B125■
150	CFD63B150■
175	CFD63B175■
200	CFD63B200■
225	CFD63B225■
250	CFD63B250■

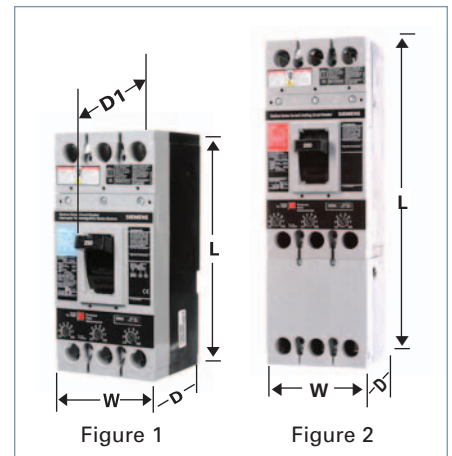
■ Built to order. Allow 2-3 weeks for delivery.

① When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.

② For non-interchangeable trip 3-pole HFD6 type circuit

breaker, change prefix identifier from HFD6 to HFXD6. Price equals frame and trip prices combined, e.g. price of HFXD63B250 equals price of HFD63F250 plus price of FD63T250. Order lugs separately.

③ Type HFXD6, HHFXD6, CFD6 are UL Listed for reverse feed applications.



### Dimensions (in inches)

Breaker Type	W	L	D	D1 (to handle)
Figure 1 FXD6-A, FD6-A, HFD6, HFXD6, HHFD6, FD6-ETI <sup>④</sup>	4.50	9.50	4	5.25
Figure 2 CFD6, CFD6-ETI <sup>④</sup>	4.50	14.25	4	5.25

### Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
<b>FD6-A, HFD6, HHFD6, FXD6-A Assembled Circuit Breaker (less connectors)</b>		
2	1	8.6
3	1	10
<b>FD6-A, HFD6, HHFD6 Frame Only</b>		
2	1	7.5
3	1	8.7
<b>FD6 Trip Unit Only</b>		
2	1	1.1
3	1	1.3
<b>CFD6 Assembled Circuit Breaker (less terminals)</b>		
3	1	16

17 MOLDED CASE CIRCUIT BREAKERS

④ FXD6, ETI, CFD6, ETI — See page 17/91 for ordering information.

⑤ HACR rated.

# Internal Accessories

## Selection

Accessories:  
for FD, FFC & FFF 250A Frames



### Shunt Trip Combinations

Control Voltage		1 Shunt Trip
AC	DC	Catalog Number
24		S17FD60
120		S01FD60
240		S03FD60
277		S15FD60▲
480		S04FD60
600		S06FD60▲
	12	S16FD60▲
	24	S07FD60
	48	S09FD60▲
	125	S11FD60
	250	S13FD60▲

### Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
120		U01FD60	W01FD64
208		U02FD60▲	W02FD64▲
240		U03FD60	W03FD64▲
277		U16FD60▲	W16FD64▲
480		U06FD60▲	W06FD64▲
600		U08FD60▲	—
	24	U13FD60	W13FD64
	48	U14FD60▲	W14FD64▲
	125	U10FD60▲	W10FD64▲
	250	U12FD60▲	W12FD64▲

### Auxiliary Switch Combinations

Voltage		1 Auxiliary Switch	2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number
240		A01FD62	A02FD62
480		A01FD64	A02FD64
	12	A01FDLV	Gold Plated Contacts - for PLC use

### Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
480	250	B00FD64	C01FD64

▲ Built to order. Allow 6-8 weeks for delivery.

ⓄAuxiliary switch application is for 480V AC maximum.

**Note:** Old F-frame accessories cannot be used in new Sentron line. Likewise, new FD-frame accessories cannot be used on old F-frame circuit breakers.



# JD 400A Frame Sentron Series

## Selection

### Type JXD2-A<sup>④</sup>

240V AC, 2-Pole 250V DC Only

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width) Catalog Number	3-Pole Catalog Number
200	JXD22B200■	JXD23B200
225	JXD22B225■	JXD23B225
250	JXD22B250■	JXD23B250
300	JXD22B300	JXD23B300
350	JXD22B350■	JXD23B350
400	JXD22B400	JXD23B400

### Type JXD6-A<sup>①④</sup>

600V AC, 2-Pole 250V DC, 3-Pole 500V DC<sup>②</sup>

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width) Catalog Number	3-Pole Catalog Number
200	JXD62B200■	JXD63B200
225	JXD62B225■	JXD63B225
250	JXD62B250■	JXD63B250
300	JXD62B300	JXD63B300
350	JXD62B350■	JXD63B350
400	JXD62B400	JXD63B400

### Type JD6-A<sup>④</sup>

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

2-Pole 600V AC, 250V DC (3-Pole Width)

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
200	JD62B200■	JD62F400	JD62T200■
225	JD62B225■		JD62T225■
250	JD62B250■		JD62T250■
300	JD62B300■		JD62T300■
350	JD62B350■		JD62T350■
400	JD62B400		JD62T400

3-Pole 600V AC, 500V DC<sup>②</sup>

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
200	JD63B200	JD63F400	JD63T200
225	JD63B225		JD63T225
250	JD63B250		JD63T250
300	JD63B300		JD63T300
350	JD63B350		JD63T350
400	JD63B400		JD63T400

### Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)							
	UL 489 AIR (File E10848)				IEC 947-2			
	Volts AC (50/60Hz)			Volts DC		Volts AC (50/60Hz)		
	240	480	600	250	500 <sup>②</sup>	220/240	380/415	500
JXD2-A	65	—	—	30 (2-P)	—	—	—	—
JXD6-A, JD6-A	65	35	25	30 (2-P)	25 (3-P)	65	33	40
HJD6-A, HJXD6-A	100	65	35	30 (2-P)	35 (3-P)	100	50	65
HHJD6, HHJXD6	200	100	50	—	—	—	—	—
CJD6-A	200	150	100	30 (2-P)	50 (3-P)	—	—	—

### Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	+20% Tolerance Low	2	3	4	5	6	7	+20% Tolerance High
200-300	1250	1430	1610	1790	1960	2140	2320	2500
350-400	2000	2290	2570	2860	3140	3430	3710	4000

■ Built to order. Allow 2-3 weeks for delivery.

① Type JXD2 and JXD6 circuit breakers are UL Listed for reverse feed applications.

② When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③ See Note: A, page 17/31.

④ HACR rated.

Note: JD frame qualified to UL489 supplement B "NAVAL." See page 17/103 for additional information.

### Ordering Information

#### Complete Breaker Unassembled with Lugs

Prices of JD6, HJD6, and HHJD6 breakers include frame, trip and both line and load lugs (TA2J6500). When ordered by these catalog numbers, the customer will receive the frame, trip, and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

#### Complete Breaker Assembled with-out Lugs

Prices of JXD6, HJXD6, HHJXD6, and CJD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA2J6500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

#### 100% Rated (3-pole only)

Types JXD6 and HJXD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. ■ 100% rated JD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs TC1J6600 or TC2J6500.

50°C Applications see page 17/103.

400Hz Applications see page 17/103.

### Lugs For 75°C Wire<sup>③</sup>

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2	#3/0-500 kcmil Cu #4/0-500 kcmil Al
TA1L6750	1	500-750 kcmil Al 500-600 kcmil Cu
TC1J6600	1	#3/0-600 kcmil Cu
TC2J6500	1, 2	#3/0-500 kcmil Cu
<b>Compression Lug</b>		
CCL600	1	500 kcmil Cu/Al

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Accessories pages 17/72 and 17/107 to 17/112

# JD 400A Frame Sentron Series

## Selection/Dimensions

### Type HJD6-A, HJXD6-A<sup>②④⑥</sup>

**Black Label**

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number
<b>2-Pole 600V AC, 250V DC (3-Pole Width)</b>			
200	HJD62B200■	HJD62F400■	JD62T200■
225	HJD62B225■		JD62T225■
250	HJD62B250■		JD62T250■
300	HJD62B300■		JD62T300■
350	HJD62B350■		JD62T350■
400	HJD62B400■		JD62T400■

### 3-Pole 600V AC, 500V DC<sup>①②⑤</sup>

200	HJD63B200■	HJD63F400	JD63T200
225	HJD63B225■		JD63T225
250	HJD63B250■		JD63T250
300	HJD63B300■		JD63T300
350	HJD63B350■		JD63T350
400	HJD63B400■		JD63T400

### Type HHJD6, HHJXD6<sup>②④⑥</sup>

**Black Label**

<b>2-Pole 600V AC (3-Pole Width)</b>			
200	HHJD62B200■	HHJD62F400■	JD62T200■
225	HHJD62B225■		JD62T225■
250	HHJD62B250■		JD62T250■
300	HHJD62B300■		JD62T300■
350	HHJD62B350■		JD62T350■
400	HHJD62B400■		JD62T400■

### 3-Pole 600VAC

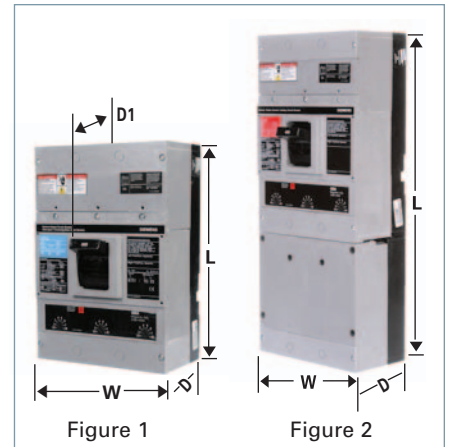
200	HHJD63B200	HHJD63F400	JD63T200
225	HHJD63B225		JD63T225
250	HHJD63B250		JD63T250
300	HHJD63B300		JD63T300
350	HHJD63B350		JD63T350
400	HHJD63B400		JD63T400

### Type CJD6-A<sup>⑤⑥</sup>

Fuseless Current Limiting

**Red Label**

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	Catalog Number
200	For 2-pole application use outside poles of 3-pole circuit breaker	CJD63B200■
225		CJD63B225■
250		CJD63B250■
300		CJD63B300■
350		CJD63B350■
400		CJD63B400■



Dimensions (in inches)

Breaker Type	W	L	D	To Handle D1
Figure 1 JXD2-A, JXD6-A, JD6-A HJD6-A, HJXD6-A, HHJD6, HJD6, HJXD6, HHJXD6, JXD6-ETI <sup>③</sup> , SJD6, SHJD6	7.5	11	4	5.44
Figure 2 CJD6, CJD6-ETI <sup>③</sup> , SCJD6	7.5	17.86	4	5.44

### Enclosures (Except SCJD6)

Type	Catalog Number
1	J6N1
3R	J6N3R
12	J6N12
4X	LD6SS4
7, 9 (200-250A)	EC4
7, 9 (300-400A)	EE
Neutral	W60992

### Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
<b>JXD2, JXD6, JD6, HJD6, HHJD6 Assembled Breaker (less terminals)</b>		
2	1	17.5
3	1	19.5
<b>JD6, HJD6, HHJD6 Frame Only</b>		
2	1	14
3	1	15.5
<b>JD6 Trip Unit Only</b>		
2	1	3.5
3	1	4
<b>CJD6 Complete Assembled Breaker (less terminals)</b>		
3	1	31.5

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

2-pole units available in 3-pole construction.

⑥ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③ For non-interchangeable 3-pole HJD6 or HHJD6 type circuit breaker change the prefix identifier to HJXD6 or HHJXD6. Price equals price of frame plus price of trip, e.g. price of HJXD63B400 equals price of HJD63F400 plus price of JD63T400. Order lugs separately.

③ JXD6-ETI, CJD6-ETI see page 17/91 for ordering information.

④ Type HJXD6, HHJXD6 Circuit Breakers are UL listed for reverse fed applications.

⑤ CE applies to non-interchangeable type HJXD6-A only.

⑥ HACR rated.

# SJD 400A Frame Digital Solid State Sentron Sensitrip IV Series

## Selection

### Type SJD6-B

Blue Label

### Type SHJD6-B

Black Label

### Current Limiting

### Type SCJD6-B

Red Label

Max Current Rating	3-Pole, 600V AC		3-Pole, 600V AC		3-Pole, 600V AC	
	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)
200	SJD6A200LI	SJD6B200LI	SHJD6A200LI	SHJD6B200LI	SCJD6A200LI	SCJD6B200LI
300	SJD6A300LI	SJD6B300LI	SHJD6A300LI	SHJD6B300LI	SCJD6A300LI	SCJD6B300LI
400	SJD6A400LI	SJD6B400LI	SHJD6A400LI	SHJD6B400LI	SCJD6A400LI	SCJD6B400LI
200	SJD6A200LIG	SJD6B200LIG	SHJD6A200LIG	SHJD6B200LIG	SCJD6A200LIG	SCJD6B200LIG
300	SJD6A300LIG	SJD6B300LIG	SHJD6A300LIG	SHJD6B300LIG	SCJD6A300LIG	SCJD6B300LIG
400	SJD6A400LIG	SJD6B400LIG	SHJD6A400LIG	SHJD6B400LIG	SCJD6A400LIG	SCJD6B400LIG
200	SJD6A200LSI	SJD6B200LSI	SHJD6A200LSI	SHJD6B200LSI	SCJD6A200LSI	SCJD6B200LSI
300	SJD6A300LSI	SJD6B300LSI	SHJD6A300LSI	SHJD6B300LSI	SCJD6A300LSI	SCJD6B300LSI
400	SJD6A400LSI	SJD6B400LSI	SHJD6A400LSI	SHJD6B400LSI	SCJD6A400LSI	SCJD6B400LSI
200	SJD6A200LSIG	SJD6B200LSIG	SHJD6A200LSIG	SHJD6B200LSIG	SCJD6A200LSIG	SCJD6B200LSIG
300	SJD6A300LSIG	SJD6B300LSIG	SHJD6A300LSIG	SHJD6B300LSIG	SCJD6A300LSIG	SCJD6B300LSIG
400	SJD6A400LSIG	SJD6B400LSIG	SHJD6A400LSIG	SHJD6B400LSIG	SCJD6A400LSIG	SCJD6B400LSIG

## SJD 400A Frame – 100% Rated<sup>②</sup>

Blue Label

Black Label

Max Current Rating	3-Pole, 600V AC		3-Pole, 600V AC	
	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)
200	SJD6A200LIH	SJD6B200LIH	SHJD6A200LIH	SHJD6B200LIH
300	SJD6A300LIH	SJD6B300LIH	SHJD6A300LIH	SHJD6B300LIH
400	SJD6A400LIH	SJD6B400LIH	SHJD6A400LIH	SHJD6B400LIH
200	SJD6A200LIGH	SJD6B200LIGH	SHJD6A200LIGH	SHJD6B200LIGH
300	SJD6A300LIGH	SJD6B300LIGH	SHJD6A300LIGH	SHJD6B300LIGH
400	SJD6A400LIGH	SJD6B400LIGH	SHJD6A400LIGH	SHJD6B400LIGH
200	SJD6A200LSIH	SJD6B200LSIH	SHJD6A200LSIH	SHJD6B200LSIH
300	SJD6A300LSIH	SJD6B300LSIH	SHJD6A300LSIH	SHJD6B300LSIH
400	SJD6A400LSIH	SJD6B400LSIH	SHJD6A400LSIH	SHJD6B400LSIH
200	SJD6A200LSIGH	SJD6B200LSIGH	SHJD6A200LSIGH	SHJD6B200LSIGH
300	SJD6A300LSIGH	SJD6B300LSIGH	SHJD6A300LSIGH	SHJD6B300LSIGH
400	SJD6A400LSIGH	SJD6B400LSIGH	SHJD6A400LSIGH	SHJD6B400LSIGH

### Ordering Information

Pricing information for all Digital Sentron Series SJD Frames is for complete breaker only - price required lugs as separate items - lugs are suitable for 75°C Wire.

**SJD6-B and SCJD6-B are acceptable for reverse connection application.**  
**SHJD6-B are not acceptable for reverse connection application.**

### Shipping Weights

Breaker Type	Number per Carton	Shipping Weight (lbs)
SJD6-B	1	20
SHJD6-B	1	20
SCJD6-B	1	33

### Lugs for 75°C Wire<sup>①</sup>

Catalog Number	No. of cables per connector	Wire Range
TA2J6500	2	#3/0-500 kcmil Cu
	2	#4/0-500 kcmil Al
TA1L6750	1	500-750 kcmil Al
	1	500-600 kcmil Cu
TC1J6600	1	#3/0-600 kcmil Cu
TC2J6500	2	#3/0-500 kcmil Cu
TA2J630	2	#4-#3/0 Cu/Al
Compression Lug		
CCL600	1 (pc.)	#1/0-500 kcmil Cu/Al

### Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Pick Up	Short Time Pick Up	Short Time Fixed Delay	Short Time I <sup>2</sup> t Delay	Ground Fault Pick Up	Ground Fault Delay
LI	LI	✓	✓	✓					
LIG	LIG	✓	✓	✓				✓	✓
LSI	LSI	✓	✓	✓	✓	✓	✓		
LSIG	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

### Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SJD6-B	65	35	25
SHJD6-B	100	65	35
SCJD6-B	200	150	100

### Neutral Transformers

Ampere Rating	Catalog Number
200	N02SJD
300	N03SJD
400	N04SJD

**Note:** "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire systems.  
 For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

All breakers built to order. Allow 2-3 weeks for delivery.  
 ① For additional information, see **Note: A**, page 17/100.  
 ② Refer to the NEC for proper application of 100% rated devices.  
 ③ Advanced trip unit equipped with DAS / Maintenance Mode. Requires customer-supplied 24V external power supply, maintenance switch and light.

Accessories pages 17-72 and 17/107 to 17/112



## Internal Accessories

## Selections

Accessories for:

JD 400A Frame  
LD 600A Frame  
LMD 800A Frame  
SJD 400A Frame  
SLD 600A Frame



## Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
24		S17JLD6	—
48		S18JLD6▲	—
120		S01JLD6	S01JLD62A
240		S03JLD6	S03JLD62A
277		S15JLD6▲	S15JLD64A▲
480		S04JLD6	—
	12	S16JLD6▲	S16JLD62A▲
	24	S07JLD6	S07JLD62A
	48	S09JLD6▲	S09JLD62A
	125	S11JLD6	S11JLD62A▲
	250	S13JLD6▲	S13JLD62A▲

## Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01JLD6	U01JLD62A	U01JLD62AA
208		U02JLD6▲	U02JLD62A▲	U02JLD62AA▲
240		U03JLD6	U03JLD62A▲	U03JLD62AA▲
480		U06JLD6	U06JLD64A▲	U06JLD64AA▲
	24	U13JLD6	U13JLD62A	U13JLD62AA
	48	U14JLD6▲	U14JLD62A▲	U14JLD62AA▲
	125	U10JLD6▲	U10JLD62A▲	U10JLD62AA▲
	250	U12JLD6▲	U12JLD62A▲	U12JLD62AA▲

## Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01JLD64	A02JLD64
—	12	A01JLDLV	A02JLDLV

## Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B01JLD64	A01JLD64B	A02JLD64B

## ETU Testing Unit

Breaker Type	Description	Catalog Number
SJD, SLD, SMD, SND, SPD	Power Stick	EPSP18V
	Spare cable for Power Stick	COMPCA

The EPSP18V Power Stick is a hand-held, battery-operated power supply that can be used for trip testing the Sensitrip IV electronic trip units. Requires two 9V batteries.

**Note:** Accessory modules can only be added to right side pole of solid state SJD and SLD frame circuit breakers. No accessories can be added if mechanical interlock is used. All accessories on this page are useable on superseded JD2, JJ6, JL6, HJ6, SJL, LJ6, LL6, HL6 and SLL circuit breakers.

▲ Built to order. Allow 6–8 weeks for delivery.

# LD 600A Frame Sentron Series

## Selection

Type LXD6-A <sup>①④</sup>			Blue Label	
Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)				
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width)		3-Pole	
	600V AC	250V DC	600V AC	500V DC
	Catalog Number		Catalog Number	
450	LXD62B450■		LXD63B450	E
500	LXD62B500■		LXD63B500	
600	LXD62B600		LXD63B600	

Type LD6-A <sup>④</sup>			Blue Label	
Interchangeable Trip				
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only	
	Catalog Number	Catalog Number	Catalog Number	

### 2-Pole 600V AC, 250V DC (3-Pole Width)

Current Rating	Catalog Number	Frame Only	Trip Unit Only
250	LD62B250■	LD62F600	JD62T250■
300	LD62B300■		JD62T300■
350	LD62B350■		JD62T350■
400	LD62B400		JD62T400
450	LD62B450■		LD62T450■
500	LD62B500■		LD62T500■
600	LD62B600		LD62T600

### 3-Pole 600V AC, 500V DC<sup>②</sup>

Current Rating	Catalog Number	Frame Only	Trip Unit Only
250	LD63B250	LD63F600	JD63T250
300	LD63B300		JD63T300
350	LD63B350		JD63T350
400	LD63B400		JD63T400
450	LD63B450		LD63T450
500	LD63B500		LD63T500
600	LD63B600		LD63T600

## Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)										
	UL 489 AIR (File E10848)					IEC 947-2					
	Volts AC (50/60Hz)			Volts DC		Volts AC (50/60Hz)					
	240	480	600	250	500 <sup>③</sup>	220/240		380/415		500	
					(lcu)	(lcs)	(lcu)	(lcs)	(lcu)	(lcs)	
LD6-A, LXD6-A	65	35	25	30 (2-P)	25 (3-P)	65	33	40	20	—	—
HLD6-A, HLXD6-A	100	65	35	30 (2-P)	35 (3-P)	100	50	65	33	—	—
HHL6, HHLXD6	200	100	50	—	—	—	—	—	—	—	—
CLD6-A	200	150	100	—	50 (3-P)	—	—	—	—	—	—

## Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
	250-300	1250	1430	1610	1790	1960	2140	2320
350-450	2000	2290	2570	2860	3140	3430	3710	4000
500-600	3000	3430	3800	4290	4710	5140	5570	6000

■ Built to order. Allow 2-3 weeks for delivery.

① Type LXD6A circuit breakers are UL Listed for reverse fed applications.

② When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③ See Note: A, page 17/100.

④ HACR rated.

Note: LD frame qualified to UL489 supplement SB "NAVAL". See page 17/103 for additional information.

Modifications page 17/103  
Accessories pages 17/76 and 17/107 to 17/112

## Ordering Information

### Complete Breaker Unassembled with Lugs

Prices of LD6, HLD6, and HHL6 breakers include frame, trip, and both line and load lugs (TA2J6500). When ordered by these catalog numbers, the customer will receive the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

### Complete Breaker Assembled without Lugs

Prices of LXD6, HLXD6, HHLXD6, and CLD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA2J6500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

### 100% Rated (3-pole only)

Types LXD6 and HLXD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. 100% rated LD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs TC1J6600 or TC2J6500.

50°C Applications see page 17/103.

400Hz Applications see page 17/103.

## Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
<b>LXD6, LD6, HLD6, HHL6 Assembled Breaker (less terminals)</b>		
2	1	17.5
3	1	19.5
<b>LD6, HLD6, HHL6 Frame Only</b>		
2	1	14
3	1	15.5
<b>LD6, HHL6 Trip Unit Only</b>		
2	1	3.5
3	1	4
<b>CLD6 Complete Assembled Breaker (less terminals)</b>		
3	1	31.5

## Lugs For 75°C Wire<sup>③</sup>

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2	#3/0 500 kcmil Cu #4/0 500 kcmil Al
TC2J6500	2	#3/0-500 kcmil Cu
TA1L6750	1	500-750 kcmil Al
	1	500-600 kcmil Cu
TC1J6600	1	#3/0-600 kcmil Cu
<b>Compression Lug</b>		
CCL600	1	500 kcmil Cu/Al

# LD 600A Frame Sentron Series

## Selection/Dimensions

### Type HLD6-A, HLXD6-A<sup>②③⑥</sup>

**Black Label**

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

#### 2-Pole 600V AC, 250V DC (3-Pole Width)

Current Rating	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
250	HLD62B250■	HLD62F600■	JD62T250■
300	HLD62B300■		JD62T300■
350	HLD62B350■		JD62T350■
400	HLD62B400■		JD62T400■
450	HLD62B450■		LD62T450■
500	HLD62B500■		LD62T500■
600	HLD62B600■		LD62T600■

#### 3-Pole 600V AC, 500V DC<sup>①⑤</sup>

Current Rating	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
250	HLD63B250■	HLD63F600■	JD63T250■
300	HLD63B300■		JD63T300■
350	HLD63B350■		JD63T350■
400	HLD63B400■		JD63T400■
450	HLD63B450■		LD63T450■
500	HLD63B500■		LD63T500■
600	HLD63B600■		LD63T600■

### Type HHL6, HHLXD6<sup>②③⑥</sup>

**Black Label**

#### 2-Pole 600V AC (3-Pole Width)

Current Rating	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
250	HHL62B250■	HHL62F600■	JD62T250■
300	HHL62B300■		JD62T300■
350	HHL62B350■		JD62T350■
400	HHL62B400■		JD62T400■
450	HHL62B450■		HHL62T450■
500	HHL62B500■		HHL62T500■
600	HHL62B600■		HHL62T600■

#### 3-Pole 600V AC

Current Rating	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
250	HHL63B250■	HHL63F600■	JD63T250■
300	HHL63B300■		JD63T300■
350	HHL63B350■		JD63T350■
400	HHL63B400■		JD63T400■
450	HHL63B450■		HHL63T450■
500	HHL63B500■		HHL63T500■
600	HHL63B600■		HHL63T600■

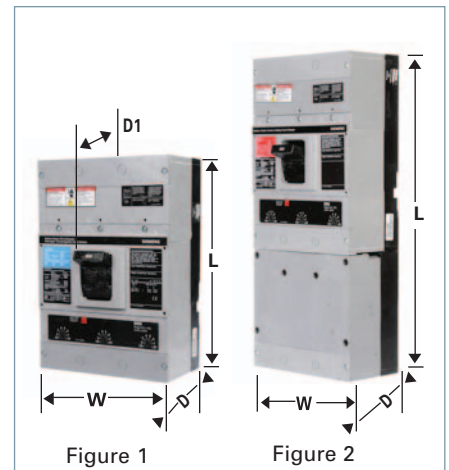
### Type CLD6-A<sup>③④</sup>

**Fuseless Current Limiting**

**Red Label**

#### Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)

Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	Catalog Number
450	For 2-pole application use outside poles of 3-pole circuit breaker	CLD63B450■
500		CLD63B500■
600		CLD63B600■



Dimensions (in inches)

Breaker Type	W	L	D	To Handle D1
Figure 1 LXD6-A, LD6-A HLD6-A HHL6, HHLXD6, LXD6-ETI <sup>②</sup> , SLD6, SHLD6	7.5	11	4	5.44
Figure 2 CLD6, CLD6-ETI <sup>②</sup> , SCLD6	7.5	17.86	4	5.44

Enclosures: (except SCLD6)

Type	Catalog Number
1	LD6N1
3R	LD6N3R
12	LD6N12
4X	LD6SS4
7,9	ED6
Neutral	W60993

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

③ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

④ For complete assembled 3-pole HLD6 or HHL6 type circuit breaker change the prefix identifier HLD6 or HHL6 to HLXD6 or HHLXD6. Price is sum of frame and trip units prices, e.g. price of HLXD63B400 is the price of HLD63F600 plus the price of LD63T600. Order the terminal connectors separately.

⑤ Type HLXD6, HHLXD6, & CLD6 Circuit Breakers are UL Listed for reverse feed applications.  
⑥ LXD6-ETI, CLD6-ETI see page 17/91 for ordering information.  
⑦ CE Applies to non-interchangeable type HLXD only.  
⑧ HACR rated.

# SLD 600A Frame Digital Solid State Sentron Sensitrip IV Series

## Selection

### Type SLD6-B

Blue Label

### Type SHLD6-B

Black Label

### Current Limiting

### Type SCLD6-B

Red Label

Max Current Rating	3-Pole, 600V AC		3-Pole, 600V AC		3-Pole, 600V AC	
	Catalog Number (Advanced trip unit)①	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit)①	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit)①	Catalog Number (Basic trip unit)
300	SLD6A300LI	SLD6B300LI	SHLD6A300LI	SHLD6B300LI	SCLD6A300LI	SCLD6B300LI
400	SLD6A400LI	SLD6B400LI	SHLD6A400LI	SHLD6B400LI	SCLD6A400LI	SCLD6B400LI
500	SLD6A500LI	SLD6B500LI	SHLD6A500LI	SHLD6B500LI	SCLD6A500LI	SCLD6B500LI
600	SLD6A600LI	SLD6B600LI	SHLD6A600LI	SHLD6B600LI	SCLD6A600LI	SCLD6B600LI
300	SLD6A300LIG	SLD6B300LIG	SHLD6A300LIG	SHLD6B300LIG	SCLD6A300LIG	SCLD6B300LIG
400	SLD6A400LIG	SLD6B400LIG	SHLD6A400LIG	SHLD6B400LIG	SCLD6A400LIG	SCLD6B400LIG
500	SLD6A500LIG	SLD6B500LIG	SHLD6A500LIG	SHLD6B500LIG	SCLD6A500LIG	SCLD6B500LIG
600	SLD6A600LIG	SLD6B600LIG	SHLD6A600LIG	SHLD6B600LIG	SCLD6A600LIG	SCLD6B600LIG
300	SLD6A300LSI	SLD6B300LSI	SHLD6A300LSI	SHLD6B300LSI	SCLD6A300LSI	SCLD6B300LSI
400	SLD6A400LSI	SLD6B400LSI	SHLD6A400LSI	SHLD6B400LSI	SCLD6A400LSI	SCLD6B400LSI
500	SLD6A500LSI	SLD6B500LSI	SHLD6A500LSI	SHLD6B500LSI	SCLD6A500LSI	SCLD6B500LSI
600	SLD6A600LSI	SLD6B600LSI	SHLD6A600LSI	SHLD6B600LSI	SCLD6A600LSI	SCLD6B600LSI
300	SLD6A300LSIG	SLD6B300LSIG	SHLD6A300LSIG	SHLD6B300LSIG	SCLD6A300LSIG	SCLD6B300LSIG
400	SLD6A400LSIG	SLD6B400LSIG	SHLD6A400LSIG	SHLD6B400LSIG	SCLD6A400LSIG	SCLD6B400LSIG
500	SLD6A500LSIG	SLD6B500LSIG	SHLD6A500LSIG	SHLD6B500LSIG	SCLD6A500LSIG	SCLD6B500LSIG
600	SLD6A600LSIG	SLD6B600LSIG	SHLD6A600LSIG	SHLD6B600LSIG	SCLD6A600LSIG	SCLD6B600LSIG

## Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Pick Up	Short Time Pick Up	Short Time Fixed Delay	Short Time I <sup>2</sup> t Delay	Ground Fault Pick Up	Ground Fault Delay
LI	LI	✓	✓	✓					
LIG	LIG	✓	✓	✓				✓	✓
LSI	LSI	✓	✓	✓	✓	✓	✓		
LSIG	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

## Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SLD6-B	65	35	25
SHLD6-B	100	65	35
SCLD6-B	200	150	100

## Neutral Transformers

Ampere Rating	Catalog Number
300	N03SJD
400	N04SJD
500	N05SLD
600	N06SLD

## Ordering Information

Pricing information for all Digital Sentron Series SLD Frames is for complete breaker only – price required lugs as separate items – lugs are suitable for 75°C Wire.

**SLD6 and SCLD6 are acceptable for reverse connection application.**

**SHLD6 are not acceptable for reverse connection application.**

## Shipping Weights

Breaker Type	Number per Carton	Shipping Weight (lbs)
SLD6-B	1	20
SHLD6-B	1	20
SCLD6-B	1	33

**Note:** "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits.  
For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

For ordering information and terminal connectors see page 17/73; for enclosures, see page 17/74.

**100% Rated** – Not available in SLD6 Frame.

All breakers built to order. Allow 2-3 weeks for delivery.

① Advanced trip unit equipped with DAS / Maintenance Mode. Requires customer-supplied 24V external power supply, maintenance switch and light.

## Internal Accessories

## Selection

Accessories for:

JD 400A Frame  
LD 600A Frame  
LMD 800A Frame  
SJD 400A Frame  
SLD 600A Frame



## Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
24		S17JLD6	—
48		S18JLD6▲	—
120		S01JLD6	S01JLD62A
240		S03JLD6	S03JLD62A
277		S15JLD6▲	S15JLD64A▲
480		S04JLD6	—
	12	S16JLD6▲	S16JLD62A▲
	24	S07JLD6	S07JLD62A
	48	S09JLD6▲	S09JLD62A
	125	S11JLD6	S11JLD62A▲
	250	S13JLD6▲	S13JLD62A▲

## Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01JLD6	U01JLD62A	U01JLD62AA
208		U02JLD6▲	U02JLD62A▲	U02JLD62AA▲
240		U03JLD6	U03JLD62A▲	U03JLD62AA▲
480		U06JLD6	U06JLD64A▲	U06JLD64AA▲
	24	U13JLD6	U13JLD62A	U13JLD62AA
	48	U14JLD6▲	U14JLD62A▲	U14JLD62AA▲
	125	U10JLD6▲	U10JLD62A▲	U10JLD62AA▲
	250	U12JLD6▲	U12JLD62A▲	U12JLD62AA▲

## Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01JLD64	A02JLD64
—	12	A01JLDLV	A02JLDLV

## Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B01JLD64	A01JLD64B	A02JLD64B

## ETU Testing Unit

Breaker Type	Description	Catalog Number
SJD, SLD, SMD, SND, SPD	Power Stick	EPSP18V
	Spare cable for Power Stick	COMPCA

The EPSP18V Power Stick is a hand-held, battery-operated power supply that can be used for trip testing the Sensitrip IV electronic trip units. Requires two 9V batteries.

**Note:** Accessory modules can only be added to right side pole of solid state SJD and SLD frame circuit breakers. No accessories can be added if mechanical interlock is used. All accessories on this page are useable on superseded JD2, JJ6, JL6, HJ6, SJL, LJ6, LL6, HL6 and SLL circuit breakers.

▲ Built to order. Allow 6–8 weeks for delivery.

# LMD 800A Frame Sentron Series

## Selection/Dimensions

### Type LMXD6<sup>①④</sup>

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width) Catalog Number	3-Pole Catalog Number
500	—	LMXD63B500■
600	LMXD62B600■	LMXD63B600
700	LMXD62B700■	LMXD63B700
800	LMXD62B800	LMXD63B800

### Type LMD6<sup>④</sup>

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number
<b>2-Pole 600V AC, 250V DC (3-Pole Width)</b>			
500	LMD62B500■	LMD62F800■	LMD62T500■
600	LMD62B600■		LMD62T600■
700	LMD62B700■		LMD62T700■
800	LMD62B800■		LMD62T800■
<b>3-Pole 600V AC, 500V DC<sup>②</sup></b>			
500	LMD63B500■	LMD63F800	LMD63T500■
600	LMD63B600■		LMD63T600■
700	LMD63B700■		LMD63T700■
800	LMD63B800		LMD63T800

### Instantaneous Adjustment Trip Range

Ampere Rating	Nominal Instantaneous Values							
	Low +/- 20% Tolerance	2	3	4	5	6	7	High +/- 20% Tolerance
500-600	3000	3430	3860	4290	4710	5140	5570	6000
700-800	3200	3500	3700	4200	4700	6400	7300	8000

### Ordering Information

#### Complete Breaker Unassembled with Lugs

Prices of LMD6 and HLMD6 breakers include frame, trip, and both line and load lugs (TA3K500). These catalog numbers include the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

#### Complete Breaker Assembled without Lugs

Prices of LMXD6 and HLMXD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA3K500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

**50°C Applications** see page 17/103.

**400Hz Applications** see page 17/103.

### Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
<b>LMD6, HLMD6, LMXD6, HLMXD6 Complete Breaker (less terminals)</b>		
2	1	53
3	1	61.5
<b>LMD6, HLMD6 Frame Only</b>		
2	1	42.25
3	1	46
<b>LMD6, HLMD6 Trip Unit Only</b>		
2	1	4.5
3	1	6.5

### Lugs<sup>③</sup> for 75°C Wire

Catalog Number	Cables per Lug	Wire Range
TA2K500	1, 2	#1-500 kcmil Cu/Al
TA3K500	1-3	#1/0-500 kcmil Cu/Al
TA2N750	1, 2	500-750 kcmil Cu/Al

■ Built to order. Allow 2-3 weeks for delivery.

① LMXD6 circuit breakers are UL Listed for reverse connected applications.

② When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500VDC ungrounded UPS systems only.

③ See **Note: A**, page 17/100.

④ HACR rated.

Modifications page 17/103  
Accessories pages 17/79 and 17/107 to 17/112



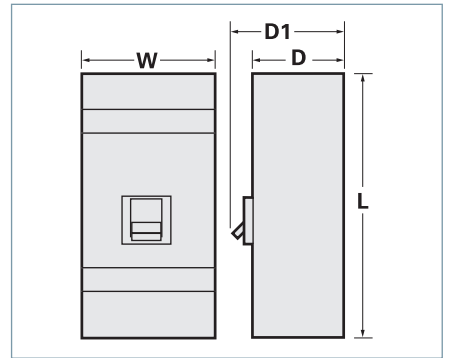
# LMD 800A Frame Sentron Series

## Selection/Dimensions

Type HLMXD6 <sup>①④</sup>		Black Label
<b>Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)</b>		
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	
500	For 2-pole application use outside poles of 3-pole circuit breaker	HLMXD63B500■
600		HLMXD63B600■
700		HLMXD63B700■
800		HLMXD63B800■



Type HLMD6 <sup>④</sup>		Black Label	
<b>Interchangeable Trip</b>			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled	Frame Only	Trip Unit Only
	Catalog Number		
<b>2-Pole 600V AC, 250V DC (3-Pole Width)</b>			
500	HLMD62B500■	HLMD62F800■	LMD62T500■
600	HLMD62B600■		LMD62T600■
700	HLMD62B700■		LMD62T700■
800	HLMD62B800■		LMD62T800■
<b>3-Pole 600V AC, 500V DC<sup>③</sup></b>			
500	HLMD63B500■	HLMD63F800■	LMD63T500■
600	HLMD63B600■		LMD63T600■
700	HLMD63B700■		LMD63T700■
800	HLMD63B800■		LMD63T800■



### Interrupting Ratings

Breaker Type	UL 489A IR				
	RMS Symmetrical Amperes (KA)				
	Volts AC			Volts DC	
	240	480	600	250	500
LMD6, LMXD6	65	50	25	30 (2-P)	25 (3-P)
HLMD6, HLMXD6	100	65	50	30 (2-P)	50 (3-P)

### Dimensions (in inches)

Breaker Type	W	L	D	D1
LMD6, LMXD6, HLMD6, HLMXD6, LMXD6-ETI <sup>②</sup>	7.5	16	4.5	5.93

### Enclosures

Type	Catalog Number
1	LMD1
3R	LMD3R
12	LMD12■
Neutral	W63623

For inches / millimeters conversion, see Application Data section.

- Built to order. Allow 2-3 weeks for delivery.
- ① HLMXD6 circuit breakers are UL Listed for reverse connection applications.
- ② LMXD6-ETI, see page 17/91 for catalog information.

- ③ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500VDC ungrounded UPS systems only.
- ④ HACR rated.

# Internal Accessories

## Selection

Accessories for:

- JD 400A Frame
- LD 600A Frame
- LMD 800A Frame
- SJD 400A Frame
- SLD 600A Frame



Sensitrip Ammeter



The Ammeter Display Units plug into the Sensitrip Trip Unit and displays the phase current flowing in the breaker. They are powered by the breaker's CT's with replaceable battery back-up for maintaining trip and max logs.

The SADU reads currents, current imbalance, current demand, and trip status.

### Ammeter Mounting Kit

The Ammeter may also be panel or door mounted using the SADURMK18 remote mounting kit.

## Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
24		S17JLD6	—
48		S18JLD6▲	—
120		S01JLD6	S01JLD62A
240		S03JLD6	S03JLD62A
277		S15JLD6▲	S15JLD64A▲
480		S04JLD6	—
	12	S16JLD6▲	S16JLD62A▲
	24	S07JLD6	S07JLD62A
	48	S09JLD6▲	S09JLD62A
	125	S11JLD6	S11JLD62A▲
	250	S13JLD6▲	S13JLD62A▲

## Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01JLD6	U01JLD62A	U01JLD62AA
208		U02JLD6▲	U02JLD62A▲	U02JLD62AA▲
240		U03JLD6	U03JLD62A▲	U03JLD62AA▲
480		U06JLD6	U06JLD64A▲	U06JLD64AA▲
	24	U13JLD6	U13JLD62A	U13JLD62AA
	48	U14JLD6▲	U14JLD62A▲	U14JLD62AA▲
	125	U10JLD6▲	U10JLD62A▲	U10JLD62AA▲
	250	U12JLD6▲	U12JLD62A▲	U12JLD62AA▲

## Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01JLD64	A02JLD64
—	12	A01JLDLV	A02JLDLV

## Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B01JLD64	A01JLD64B	A02JLD64B

## Plug-in Ammeter Display Units

Breaker Type	Description	Catalog Number
SJD, SLD	Display Unit	SADU
	Remote Mounting Kit	SADURMK18

**Note:** Accessory modules can only be added to right side pole of solid state SJD and SLD frame circuit breakers. No accessories can be added if mechanical interlock is used. All accessories on this page are useable on superseded JD2, JJ6, JL6, HJ6, SJL, LJ6, LL6, HL6 and SLL circuit breakers.

▲ Built to order. Allow 6–8 weeks for delivery.



# MD 800A Frame Sentron Series

## Selection

Type MXD6 <sup>①⑥</sup>		Blue Label	
<b>Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)</b>			
Continuous Current Rating @ 40°C	2-Pole <sup>②</sup>		3-Pole
	Catalog Number		Catalog Number
600	MXD62B600■	MXD63B600	
700	MXD62B700■	MXD63B700	
800	MXD62B800■	MXD63B800	

Type MD6 <sup>⑥</sup>		Blue Label	
<b>Interchangeable Trip</b>			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled with Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

<b>2-Pole 600V AC, 250V DC<sup>②</sup></b>			
500	MD62B500■	MD62F800■	MD62T500■
600	MD62B600■		MD62T600■
700	MD62B700■		MD62T700■
800	MD62B800■		MD62T800■

<b>3-Pole 600V AC, 500V DC<sup>③</sup></b>			
500	MD63B500	MD63F800	MD63T500
600	MD63B600		MD63T600
700	MD63B700		MD63T700
800	MD63B800		MD63T800

<b>Lugs<sup>④</sup></b>			
Catalog Number	Cables Per Lug	Lugs Per Kit	Wire Range
TA2K500	1-2	1	#1-500 kcmil Cu/Al
TA3K500	1-3	1	1/0-500 kcmil Cu/Al
TC2K500	1-2	1	#1-500 kcmil Cu
TC3K350	1-3	1	#1-350 kcmil Cu
<b>Kits</b>			
2TA2N8750	1-2	2	500-750 kcmil Cu/Al
3TA2N8750		3	
2TA3N8750	1-3	2	500-750 kcmil Cu/Al
3TA3N8750		3	
2TA4N8500	1-4	2	250-500 kcmil Cu/Al
3TA4N8500		3	
2TA4P8500	1-4	2	250-500 kcmil Cu/Al
3TA4P8500		3	

<b>Instantaneous Adjustment Trip Range</b>								
Ampere Rating	Nominal Instantaneous Values							
	Low +/- 20% Tolerance	2	3	4	5	6	7	High +/- 20% Tolerance
500	3000	3430	3860	4280	4710	5140	5570	6000
600-800	4000	4570	5140	5710	6280	6850	7420	8000

<p><b>Ordering Information</b></p> <p><b>Complete Breaker Unassembled with Lugs</b> Pricing information for MD6 and HMD6 breakers includes frame, trip, and both line and load lugs (TA3K500). When ordered by these catalog numbers, the customer will receive the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.</p> <p><b>Complete Breaker Assembled without Lugs</b> Prices of MXD6, HMXD6 and CMD6 include frame with non-interchangeable trip units installed only. Order required lugs separately. For line and load lugs (TA3K500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).</p> <p><b>100% Rated<sup>③</sup> 3-Pole Only</b> Types MXD6, HMXD6 and CMD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. 100% rated MD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs 3TA4P8500 or 3TA2N8750.</p> <p><b>50°C Applications</b> see page 17/104. <b>400Hz Applications</b> see page 17/104.</p>
--

<b>Shipping Weights</b>		
Number of Poles	Number per Carton	Shipping Weight (lbs.)
<b>MD6, HMD6, HMXD6, CMD6 Complete Breaker Assembled (less lugs)</b>		
2	1	53
3	1	61.5
<b>MD6, HMD6 Frame Only</b>		
2	1	42.25
3	1	46
<b>MD6, HMD6 Trip Unit Only</b>		
2	1	4.5
3	1	6.5
<b>SMD6 Breaker</b>		
3	1	61.5

<b>Enclosures</b>	
Type	Catalog Number
1	MND61
3R	MND63
12	MND612■
Neutral	W63623

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Accessories pages 17/79 and 17/107 to 17/112

■ Built to order. Allow 2-3 weeks for delivery.  
 ①MXD6 circuit breakers are UL Listed for reverse connection applications.  
 ②2-pole units available in 3-pole width only.  
 ③ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.  
 ④ See **Note: A**, page 17/100.  
 ⑤ 80% rated breakers with the CE mark will also be marked in the 100% rated version.  
 ⑥ HACR rated.  
**Note:** MD frame qualified to UL489 supplement B "NAVAL". See page 17/103 for additional information.

# MD 800A Frame Sentron Series

## Selection/Dimensions

Type HMXD6 <sup>①⑤</sup>		Black Label	
<b>Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)</b>			
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC	
	Catalog Number	Catalog Number	
600	For 2-pole application use outside poles of 3-pole circuit breaker	HMXD63B600■	
700		HMXD63B700■	
800		HMXD63B800	

Type HMD6 <sup>⑤</sup>		Black Label	
<b>Interchangeable Trip</b>			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

### 2-Pole 600V AC, 250V DC<sup>②</sup>

500	HMD62B500■	HMD62F800■	MD62T500■
600	HMD62B600■		MD62T600■
700	HMD62B700■		MD62T700■
800	HMD62B800■		MD62T800■

### 3-Pole 600V AC, 500V DC<sup>④</sup>

500	HMD63B500	HMD63F800	MD63T500
600	HMD63B600		MD63T600
700	HMD63B700		MD63T700
800	HMD63B800		MD63T800

### Type CMD6<sup>①⑤</sup>

Fuseless Current Limiting		Red Label	
<b>Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)</b>			
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC	
	Catalog Number	Catalog Number	
600	For 2-pole application use outside poles of 3-pole circuit breaker	CMD63B600■	
700		CMD63B700■	
800		CMD63B800	

## Interrupting Ratings

Breaker Type	UL 489 AIR—File E10848					IEC 947-2 AIR					
	RMS Symmetrical Amperes (KA)					Volts AC (50/60HZ)					
	Volts AC			Volts DC		220/240		380/415		500	
	240	480	600	250	500 <sup>⑥</sup>	(lcu)	(lcs)	(lcu)	(lcs)	(lcu)	(lcs)
MD6, MXD6	65	50	25	30 (2-P)	25 (3-P)	65	33	40	20	—	—
HMD6, HMXD6	100	65	50	30 (2-P)	50 (3-P)	100	50	65	33	—	—
CMD6	200	100	65	—	50 (3-P)	—	—	—	—	—	—

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

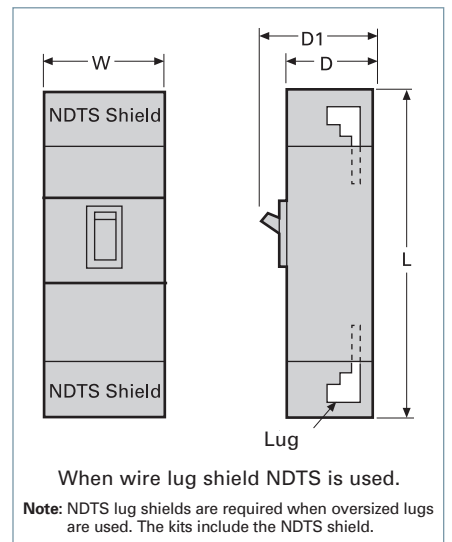
①HMXD6 and CMD circuit breakers are UL listed for reverse connection applications.

②2-pole units available in 3-pole width only.

③MXD6-ETI, CMD6-ETI see page 17/91 for catalog information.

④When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

⑤ HACR rated.



## Dimensions (in inches)

Breaker Type	W	L	D	(To Handle) D1
MD6, MXD6, HMD6, HMXD6, CMD6, MXD6-ETI, CMD6-ETI, SMD6-B, SHMD6-B, and SCMD6-B	9	16	6	8.25
with lug shields	9	24	6	8.25

17 MOLDED CASE CIRCUIT BREAKERS

# SMD 800A Frame Digital Solid State Sentron Sensitrip IV Series<sup>®</sup>

## Selection

### Type SMD6

Blue Label

### Type SHMD6-B

Black Label

### Current Limiting

### Type SCMD6-B

Red Label

Max Current Rating	3-Pole, 600V AC		3-Pole, 600V AC		3-Pole, 600V AC	
	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)
600	SMD6A600LI	SMD6B600LI	SHMD6A600LI	SHMD6B600LI	SCMD6A600LI	SCMD6B600LI
700	SMD6A700LI	SMD6B700LI	SHMD6A700LI	SHMD6B700LI	SCMD6A700LI	SCMD6B700LI
800	SMD6A800LI	SMD6B800LI	SHMD6A800LI	SHMD6B800LI	SCMD6A800LI	SCMD6B800LI
600	SMD6A600LIG	SMD6B600LIG	SHMD6A600LIG	SHMD6B600LIG	SCMD6A600LIG	SCMD6B600LIG
700	SMD6A700LIG	SMD6B700LIG	SHMD6A700LIG	SHMD6B700LIG	SCMD6A700LIG	SCMD6B700LIG
800	SMD6A800LIG	SMD6B800LIG	SHMD6A800LIG	SHMD6B800LIG	SCMD6A800LIG	SCMD6B800LIG
600	SMD6A600LSI	SMD6B600LSI	SHMD6A600LSI	SHMD6B600LSI	SCMD6A600LSI	SCMD6B600LSI
700	SMD6A700LSI	SMD6B700LSI	SHMD6A700LSI	SHMD6B700LSI	SCMD6A700LSI	SCMD6B700LSI
800	SMD6A800LSI	SMD6B800LSI	SHMD6A800LSI	SHMD6B800LSI	SCMD6A800LSI	SCMD6B800LSI
600	SMD6A600LSIG	SMD6B600LSIG	SHMD6A600LSIG	SHMD6B600LSIG	SCMD6A600LSIG	SCMD6B600LSIG
700	SMD6A700LSIG	SMD6B700LSIG	SHMD6A700LSIG	SHMD6B700LSIG	SCMD6A700LSIG	SCMD6B700LSIG
800	SMD6A800LSIG	SMD6B800LSIG	SHMD6A800LSIG	SHMD6B800LSIG	SCMD6A800LSIG	SCMD6B800LSIG

## SMD 800A Frame – 100% Rated<sup>①</sup>

Blue Label

Black Label

### Current Limiting

Red Label

Max Current Rating	3-Pole, 600V AC		3-Pole, 600V AC		3-Pole, 600V AC	
	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>③</sup>	Catalog Number (Basic trip unit)
600	SMD6A600LIH	SMD6B600LIH	SHMD6A600LIH	SHMD6B600LIH	SCMD6A600LIH	SCMD6B600LIH
700	SMD6A700LIH	SMD6B700LIH	SHMD6A700LIH	SHMD6B700LIH	SCMD6A700LIH	SCMD6B700LIH
800	SMD6A800LIH	SMD6B800LIH	SHMD6A800LIH	SHMD6B800LIH	SCMD6A800LIH	SCMD6B800LIH
600	SMD6A600LIGH	SMD6B600LIGH	SHMD6A600LIGH	SHMD6B600LIGH	SCMD6A600LIGH	SCMD6B600LIGH
700	SMD6A700LIGH	SMD6B700LIGH	SHMD6A700LIGH	SHMD6B700LIGH	SCMD6A700LIGH	SCMD6B700LIGH
800	SMD6A800LIGH	SMD6B800LIGH	SHMD6A800LIGH	SHMD6B800LIGH	SCMD6A800LIGH	SCMD6B800LIGH
600	SMD6A600LSIH	SMD6B600LSIH	SHMD6A600LSIH	SHMD6B600LSIH	SCMD6A600LSIH	SCMD6B600LSIH
700	SMD6A700LSIH	SMD6B700LSIH	SHMD6A700LSIH	SHMD6B700LSIH	SCMD6A700LSIH	SCMD6B700LSIH
800	SMD6A800LSIH	SMD6B800LSIH	SHMD6A800LSIH	SHMD6B800LSIH	SCMD6A800LSIH	SCMD6B800LSIH
600	SMD6A600LSIGH	SMD6B600LSIGH	SHMD6A600LSIGH	SHMD6B600LSIGH	SCMD6A600LSIGH	SCMD6B600LSIGH
700	SMD6A700LSIGH	SMD6B700LSIGH	SHMD6A700LSIGH	SHMD6B700LSIGH	SCMD6A700LSIGH	SCMD6B700LSIGH
800	SMD6A800LSIGH	SMD6B800LSIGH	SHMD6A800LSIGH	SHMD6B800LSIGH	SCMD6A800LSIGH	SCMD6B800LSIGH

### Ordering Information

Pricing information for all Digital Sentron Series MD frames is for complete breaker only. Price requires lugs or lug kits as separate items. Lugs are suitable for 75°C wire or as noted. Connector wire ranges and cavities are established in conjunction with Table 6.1.4.2.1 of UL 489 standards. Choose actual connector for circuit breakers based on customer requirements.

### Recommended Terminal Connectors

Breaker Frame	Ampere Rating	Connector or Connector Kit
MD	500-600	TA2K500
MD	700-800	TA3K500

Types SMD6-B, SHMD6-B and SCMD6-B are acceptable for reverse connection applications

### Lugs for 75°C Wire<sup>②</sup>

Catalog Number	Cables per Lug	Wire Range	Each kit contains the following:
TA2K500	2	#1-500 kcmil Cu/Al	
TA3K500	3	#1-500 kcmil Cu/Al	
TC2K500	2	#1-500 kcmil Cu	
TC3K350	3	#1-350 kcmil Cu	3TA3N8750 - 3 connectors plus 1 NDTs end barrier
Kits (3 lugs/kit)			
3TA4N8500	4	250-500 kcmil Cu/Al	3TA2N8750 - 3 connectors plus 1 NDTs end barrier
3TA4P8500	4	250-500 kcmil Cu/Al	
3TA2N8750	2	500-750 kcmil Cu/Al	
3TA3N8750	3	500-750 kcmil Cu/Al	

### Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Pick Up	Short Time Pick Up	Short Time Delay	Ground Fault Pick Up	Ground Fault Delay
LI	LI	✓	✓	✓				
LIG	LIG	✓	✓	✓			✓	✓
LSI	LSI	✓	✓	✓	✓	✓		
LSIG	LSIG	✓	✓	✓	✓	✓	✓	✓

**Note:** "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits. For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

① Use 2-3TA4P8500 for 3-pole. These kits are rated for 90°C wire. 90°C Cu only cable must be used, and sized per 75°C ampacity.  
② For additional information, see **Note: A**, page 17/100.

③ Advanced trip unit equipped with DAS / Maintenance Mode. Requires customer-supplied 24V external power supply, maintenance switch and light.

All breakers built to order. Allow 2-3 weeks for delivery.

### Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SMD6-B	65	50	25
SHMD6-B	100	65	50
SCMD6-B	200	100	65

### Neutral Transformers

Ampere Rating	Catalog Number
600	N06SMDA
700	N07SMDA
800	N08SMDA

Accessories pages 17/90 and 17/107 to 17/112

# ND 1200A Frame Sentron Series

## Selection

### Type NXD6<sup>①⑧</sup>

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	Catalog Number
900	NXD62B900■	NXD63B900
1000	NXD62B100■	NXD63B100
1200	NXD62B120■	NXD63B120

### Type ND6<sup>⑧</sup>

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled with Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

#### 2-Pole 600V AC, 250V DC<sup>②</sup>

Continuous Current Rating @ 40°C	Complete Breaker Unassembled with Lugs	Frame Only	Trip Unit Only
800	ND62B800■	ND62F120	MD62T800■
900	ND62B900■		ND62T900■
1000	ND62B100■		ND62T100■
1200	ND62B120		ND62T120

#### 3-Pole 600V AC, 500V DC<sup>③</sup>

Continuous Current Rating @ 40°C	Complete Breaker Unassembled with Lugs	Frame Only	Trip Unit Only
800	ND63B800	ND63F120	MD63T800
900	ND63B900		ND63T900
1000	ND63B100		ND63T100
1200	ND63B120		ND63T120

## Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)										
	UL 489 A IR					IEC 947-2					
	Volts AC			Volts DC		Volts AC (50/60HZ)					
	240	480	600	250	500 <sup>④</sup>	220/240		380/415		500	
					(lcu)	(lcs)	(lcu)	(lcs)	(lcu)	(lcs)	
ND6, NXD6	65	50	25	30 (2-P)	25 (3-P)	65	33	40	20	—	—
HND6, HNXD6	100	65	50	30 (2-P)	50 (3-P)	100	50	65	33	—	—
CND6	200	100	65	—	50 (3-P)	—	—	—	—	—	—

## Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
	800	4000	4570	5140	5710	6280	6850	7420
900-1200	5000	5715	6430	7145	7860	8575	9290	10000

■ Built to order. Allow 2-3 weeks for delivery.

①NXD6 circuit breakers are UL listed for reverse connection applications.

②2-pole units available in 3-pole width only.

③When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500VDC ungrounded UPS systems only.

④Use 2 - 3TA4P8500 kits for 3-pole, or 2 - 2TA4P8500 kits for 2-pole. Rated for 90°C cable. Use for 100% rated breakers.

⑤Use 2 - 3TA4N8500 for 3-pole or 2 - 2TA4N8500 for 2-pole. Rated for 75°C cable.

⑥See **Note: A**, page 17/100.

⑦80% rated breakers with the CE mark will also be marked in the 100% rated version.

⑧HACR rated.

**Note:** ND frame qualified to UL489 supplement B "NAVAL". See page 17/103 for additional information.

## Ordering Information

### Complete Breaker Unassembled with Lugs

Prices of ND6 and HND6 breakers include frame, trip, and both line and load lugs (3TA4N8500). These catalog numbers are the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

### Complete Breaker Assembled without Lugs

Prices of NXD6, HNXD6, and CND6 include frame with non-interchangeable trip units installed only. Order required terminal connectors separately. For line and load lugs (3TA4N8500) installed, add suffix "L" to catalog number (add 2 times list price of lug kit).

### 100% Rated (3-Pole only)<sup>⑦</sup>

Types NXD6, HNXD6 and CND6 breakers are available with 100% ratings. To order, add suffix "H" to catalog number, and add 10% to list price. 100% rated ND breakers require 90°C Cu cable sized at 75°C ampacity and lug kit 3TA4P8500 or 3TA3N8750.

**50°C Applications** see page 17/103.

**400Hz Applications** see page 17/103.

## Lugs<sup>④</sup>

Catalog Number	Cables per Lug	Wire Range
TA2K500	2	#1-500 kcmil Cu/Al
TA3K500	3	#1-500 kcmil Cu/Al
TC2K500	2	#1-500 kcmil Cu
TC3K350	3	#1-350 kcmil Cu

### Kits (2 Kits required per breaker)

2TA4P8500 <sup>④</sup>	4	250-500 kcmil Cu/Al
3TA4P8500 <sup>④</sup>		
2TA4N8500 <sup>⑤</sup>	4	250-500 kcmil Cu/Al
3TA4N8500 <sup>⑤</sup>		
2TA2N8750	2	500-750 kcmil Cu/Al
3TA2N8750		
2TA3N8750	3	500-750 kcmil Cu/Al
3TA3N8750		

## Enclosures

Type	Catalog Number
1	MND61
3R	MND63
12	MND612■
Neutral	W63623

Modifications page 17/103

Accessories pages 17/86 and 17/107 to 17/112

# ND 1200A Frame Sentron Series

## Selection/Dimensions

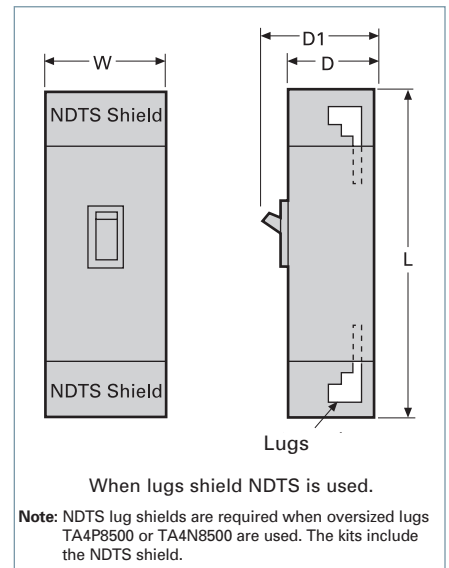
Type HNXD6 <sup>①④</sup>		<b>Black Label</b>	
<b>Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)</b>			
Continuous Current Rating @ 40°C	2-Pole	3-Pole	
	Catalog Number	Catalog Number	
900	For 2-pole application use outside poles of 3-pole circuit breaker	HNXD63B900	
1000		HNXD63B100	
1200		HNXD63B120	

Type HND6 <sup>④</sup>		<b>Black Label</b>	
<b>Interchangeable Trip</b>			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled with Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

<b>2-Pole 600V AC, 250V DC<sup>②</sup></b>			
800	For 2-pole application use outside poles of 3-pole circuit breaker		
900			
1000			
1200			

<b>3-Pole 600V AC, 500V DC<sup>③</sup></b>			
800	HND63B800	HND63F120	MD63T800
900	HND63B900		ND63T900
1000	HND63B100		ND63T100
1200	HND63B120		ND63T120

Type CND6 <sup>①④</sup>		<b>Red Label</b>	
<b>Fuseless Current Limiting</b>			
<b>Non-Interchangeable Trip (Assembled Circuit Breaker)</b>			
Continuous Current Rating @ 40°C	2-Pole	3-Pole	
	Catalog Number	Catalog Number	
900	For 2-pole application, use outside poles of 3-pole circuit breaker	CND63B900■	
1000		CND63B100	
1200		CND63B120	



### Dimensions (in inches)

Breaker Type	W	L	D	D1
ND6, NXD6, HND6, HNXD6, CND6, SND6-B, SHND6-B, and SCND6-B	9	16	6	8.25
with NDTS lug shield	9	24	6	8.25

### Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
<b>ND6, HND6, NXD6, HNXD6, CND6 Assembled Breaker (less terminals)</b>		
2	1	53
3	1	61.5
<b>ND6, HND6 Frame Only</b>		
2	1	42.25
3	1	46
<b>ND6, HND6 Trip Unit Only</b>		
2	1	4.5
3	1	6.5

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

① HNXD6 and CND6 circuit breakers are UL Listed for reverse connection applications.

② 2-pole units available in 3-pole width only.

③ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

④ HACR rated.



# SND 1200A Frame Digital Solid State Sentron Sensitrip IV Series<sup>2</sup>

## Selection

### Type SND6-B

Blue Label

### Type SHND6-B

Black Label

### Current Limiting

### Type SCND6-B

Red Label

Max Current Rating	3-Pole, 600V AC		3-Pole, 600V AC		3-Pole, 600V AC	
	Catalog Number (Advanced trip unit) <sup>3</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>3</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>3</sup>	Catalog Number (Basic trip unit)
800	SND6A800LI	SND6B800LI	SHND6A800LI	SHND6B800LI	SCND6A800LI	SCND6B800LI
1000	SND6A100LI	SND6B100LI	SHND6A100LI	SHND6B100LI	SCND6A100LI	SCND6B100LI
1200	SND6A120LI	SND6B120LI	SHND6A120LI	SHND6B120LI	SCND6A120LI	SCND6B120LI
800	SND6A800LIG	SND6B800LIG	SHND6A800LIG	SHND6B800LIG	SCND6A800LIG	SCND6B800LIG
1000	SND6A100LIG	SND6B100LIG	SHND6A100LIG	SHND6B100LIG	SCND6A100LIG	SCND6B100LIG
1200	SND6A120LIG	SND6B120LIG	SHND6A120LIG	SHND6B120LIG	SCND6A120LIG	SCND6B120LIG
800	SND6A800LSI	SND6B800LSI	SHND6A800LSI	SHND6B800LSI	SCND6A800LSI	SCND6B800LSI
1000	SND6A100LSI	SND6B100LSI	SHND6A100LSI	SHND6B100LSI	SCND6A100LSI	SCND6B100LSI
1200	SND6A120LSI	SND6B120LSI	SHND6A120LSI	SHND6B120LSI	SCND6A120LSI	SCND6B120LSI
800	SND6A800LSIG	SND6B800LSIG	SHND6A800LSIG	SHND6B800LSIG	SCND6A800LSIG	SCND6B800LSIG
1000	SND6A100LSIG	SND6B100LSIG	SHND6A100LSIG	SHND6B100LSIG	SCND6A100LSIG	SCND6B100LSIG
1200	SND6A120LSIG	SND6B120LSIG	SHND6A120LSIG	SHND6B120LSIG	SCND6A120LSIG	SCND6B120LSIG

## SND 1200A Frame – 100% Rated<sup>1</sup>

### Type SND6-B

Blue Label

### Type SHND6-B

Black Label

### Current Limiting

### Type SCND6-B

Red Label

Max Current Rating	3-Pole, 600V AC		3-Pole, 600V AC		3-Pole, 600V AC	
	Catalog Number (Advanced trip unit) <sup>3</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>3</sup>	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit) <sup>3</sup>	Catalog Number (Basic trip unit)
800	SND6A800LIH	SND6B800LIH	SHND6A800LIH	SHND6B800LIH	SCND6A800LIH	SCND6B800LIH
1000	SND6A100LIH	SND6B100LIH	SHND6A100LIH	SHND6B100LIH	SCND6A100LIH	SCND6B100LIH
1200	SND6A120LIH	SND6B120LIH	SHND6A120LIH	SHND6B120LIH	SCND6A120LIH	SCND6B120LIH
800	SND6A800LIGH	SND6B800LIGH	SHND6A800LIGH	SHND6B800LIGH	SCND6A800LIGH	SCND6B800LIGH
1000	SND6A100LIGH	SND6B100LIGH	SHND6A100LIGH	SHND6B100LIGH	SCND6A100LIGH	SCND6B100LIGH
1200	SND6A120LIGH	SND6B120LIGH	SHND6A120LIGH	SHND6B120LIGH	SCND6A120LIGH	SCND6B120LIGH
800	SND6A800LSIH	SND6B800LSIH	SHND6A800LSIH	SHND6B800LSIH	SCND6A800LSIH	SCND6B800LSIH
1000	SND6A100LSIH	SND6B100LSIH	SHND6A100LSIH	SHND6B100LSIH	SCND6A100LSIH	SCND6B100LSIH
1200	SND6A120LSIH	SND6B120LSIH	SHND6A120LSIH	SHND6B120LSIH	SCND6A120LSIH	SCND6B120LSIH
800	SND6A800LSIGH	SND6B800LSIGH	SHND6A800LSIGH	SHND6B800LSIGH	SCND6A800LSIGH	SCND6B800LSIGH
1000	SND6A100LSIGH	SND6B100LSIGH	SHND6A100LSIGH	SHND6B100LSIGH	SCND6A100LSIGH	SCND6B100LSIGH
1200	SND6A120LSIGH	SND6B120LSIGH	SHND6A120LSIGH	SHND6B120LSIGH	SCND6A120LSIGH	SCND6B120LSIGH

## Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Pick Up	Short Time Pick Up	Short Time Fixed Pick Up	Short Time I <sup>2</sup> t Delay	Ground Fault Pick Up	Ground Fault Delay
LI	LI	✓	✓	✓					
LIG	LIG	✓	✓	✓				✓	✓
LSI	LSI	✓	✓	✓	✓	✓	✓		
LSIG	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

## Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SND6-B	65	50	25
SHND6-B	100	65	50
SCND6-B	200	100	65

## Neutral Transformers

Ampere Rating	Catalog Number
800	N08SMDA
1000	N10SNDA
1200	N12SNDA

For inches / millimeters conversion, see Application Data section.

For ordering information and terminal connectors, and enclosures, see page 17/83.

**Note:** "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits.  
For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

All breakers built to order. Allow 2-3 weeks for delivery.

<sup>1</sup> Use 2-3TA4P8500 for 3-pole. These kits are rated for 90°C wire. 90°C Cu only cable must be used, and sized per 75°C ampacity.

<sup>2</sup> SND6, SHND6 and SCND6 circuit breakers are UL Listed for reverse connection applications.

<sup>3</sup> Advanced trip unit equipped with DAS / Maintenance Mode. Requires customer-supplied 24V external power supply, maintenance switch and light.

## Internal Accessories

## Selection

Accessories for:

MD/SMD 800A Frame  
 ND/SND 1200A Frame  
 PD/SPD 1600A Frame  
 RD 2000A Frame



S01MN6

Accessory modules can mount in either left hand or right hand poles of all circuit breakers, including solid state. Exception: when mechanical interlock is used. Accessories cannot be mounted in left pole.

## Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
120		S01MN6	S01MN64A
208		S02MN6▲	—
240		S03MN6	S03MN64A▲
277		S15MN6▲	S15MN64A▲
480		S04MN6▲	S04MN64A▲
600		S06MN6▲	—
	12	S16MN6▲	S16MN64A▲
	24	S07MN6	S07MN64A
	48	S09MN6▲	—
	125	S11MN6	S11MN64A▲
	250	S13MN6▲	S13MN64A▲

## Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01MN6	U01MN64A	U01MN64AA
208		U02MN6▲	U02MN64A▲	U02MN64AA▲
240		U03MN6▲	U03MN64A▲	U03MN64AA▲
277		U15MN6▲	U15MN64A▲	U15MN64AA▲
480		U04MN6▲	U04MN64A▲	U04MN64AA▲
600		U06MN6▲	—	—
	24	U07MN6	U07MN64A	U07MN64AA
	48	U09MN6▲	U09MN64A▲	U09MN64AA▲
	125	U11MN6▲	U11MN64A▲	U11MN64AA▲
	250	U13MN6▲	U13MN64A▲	U13MN64AA▲

## Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01MN64	A02MN64
—	12	A01MNDLV▲	A02MNDLV▲

## Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B00MN64	A01MN64B	A02MN64B

## ETU Testing Unit

Breaker Type	Description	Catalog Number
SJD, SLD, SMD, SND, SPD	Power Stick	EPSP18V
	Spare cable for Power Stick	COMPCA

The EPSP18V Power Stick is a hand-held, battery-operated power supply that can be used for trip testing the Sensitrip IV electronic trip units. Requires two 9V batteries.

▲ Built to order. Allow 6–8 weeks for delivery.

# PD 1600A Frame Sentron Series

## Selection

### Type PXD6<sup>②</sup> Non-Interchangeable Trip<sup>⑤</sup>

3-Pole 600V AC, 250-500V DC<sup>①</sup>

Blue Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only)		Mounting Assembly	Lugs (6 required)
	Catalog Number		Catalog Number	Catalog Number
1200	PXD63B120■		MB9301 -or- MBR9302	TA5P600
1400	PXD63B140■			
1600	PXD63B160			

### Type PD6 Interchangeable Trip<sup>⑤</sup>

3-Pole 600V AC, 250-500V DC<sup>①</sup>

Blue Label

Continuous Current Rating @ 40°C	Complete Breaker Unassembled	Frame Only	Trip Unit Only	Mounting Assembly	Lugs (6 required)
	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1200	PD63B120■	PD63F160	PD63T120■	MB9301	TA5P600
1400	PD63B140		PD63T140	-or- MBR9302	
1600	PD63B160		PD63T160		

### Type HPXD6<sup>②</sup> Non-Interchangeable Trip<sup>⑤</sup>

3-Pole 600V AC, 250-500V DC<sup>①</sup>

Blue Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only)	
	Catalog Number	
1200	HPXD63B120■	
1400	HPXD63B140■	
1600	HPXD63B160	

### Type HPD6 Interchangeable Trip<sup>⑤</sup>

3-Pole 600V AC, 250-500V DC<sup>①</sup>

Black Label

Continuous Current Rating @ 40°C	Complete Breaker Unassembled	Frame Only	Trip Unit Only	Mounting Assembly	Lugs (6 required)
	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1200	HPD63B120■	HPD63F160	PD63T120■	MB9301	TA5P600
1400	HPD63B140		PD63T140	-or- MBR9302	
1600	HPD63B160		PD63T160		

### Type CPD6 Non-Interchangeable Trip<sup>⑤</sup>

Fuseless Current Limiting  
3-Pole 600V AC, 250-500V DC<sup>①</sup>

Red Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only)	
	Catalog Number	
1200	CPD63B120■	
1400	CPD63B140■	
1600	CPD63B160■	

### Interrupting Ratings

Breaker Type	UL 489 A IR				
	RMS Symmetrical KA				
	Volts AC			Volts DC <sup>①</sup>	
	240	480	600	250	500
PD6, PXD6	65	50	25	30 (2P)	25 (3P)
HPD6, HPXD6	100	65	50	30 (2P)	50 (3P)
CPD6	200	100	65	30 (2P)	50 (3P)

■ Built to order. Allow 2-3 weeks for delivery.

▲ Built to order. Allow 6-8 weeks for delivery.

① Use two outside poles of a 3-pole circuit breaker for 250V

② When wired as shown on page 17/5, this circuit breaker is

UL listed and rated for use on 500V DC ungrounded UPS systems only.

③ PXD6, HPXD6 and CPD6 type circuit breakers are UL Listed for reverse feed applications.

④ For additional information See **Note: A**, page 17/100.

### Ordering Instructions

#### Complete Breaker Unassembled with Lugs

Prices of PD6, HPD6, RD6, and HRD6 type breakers include frame, trip, mounting base (MB9301), and both line and load lugs (PD Frame – TA5P600, RD Frame – TC5R600). When ordered by these catalog numbers, the customer will receive the frame, trip, mounting assembly and lugs separately packaged. For applications requiring different mounting base or lugs, order individual items as needed.

#### Complete Breaker Assembled without Lugs

Prices of PXD6, HPXD6, RXD6, HRXD6 and CPD6 type breakers include frame with non-interchangeable trip unit installed only. Order required mounting base and lugs separately.

#### 100% Rated (3-Pole only)

Types PXD6, HPXD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. 100% PD breakers require 90° C cable sized at 75° C ampacity and TC5R600 lugs. RD 2000A Frames not available with 100% ratings.

50°C Applications see page 17/103.

400HZ Applications see page 17/103.

### Lugs (6 required per breaker)<sup>④</sup>

Catalog Number	No of Cables per Connector	Wire Range
TA5P600	1-5	300-600 kcmil Cu/Al
TC5R600	1-5	300-600 kcmil Cu only
TA4P750▲	1-4	600-750 kcmil Cu/Al
TA6R600	1-6	300-600 kcmil Cu/Al

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# SPD 1600A Frame Digital Solid State Sentron Sensitrip IV Series

## Selection/Dimensions

### Type SPD6-B

#### Blue Label

### Type SHPD6-B

#### Black Label

Max Current Rating	3-Pole, 600V AC		3-Pole, 600V AC	
	Catalog Number (Advanced trip unit)®	Catalog Number (Basic trip unit)	Catalog Number (Advanced trip unit)®	Catalog Number (Basic trip unit)
1400	SPD6A140LI	SPD6B140LI	SHPD6A140LI	SHPD6B140LI
1600	SPD6A160LI	SPD6B160LI	SHPD6A160LI	SHPD6B160LI
1400	SPD6A140LIG	SPD6B140LIG	SHPD6A140LIG	SHPD6B140LIG
1600	SPD6A160LIG	SPD6B160LIG	SHPD6A160LIG	SHPD6B160LIG
1400	SPD6A140LSI	SPD6B140LSI	SHPD6A140LSI	SHPD6B140LSI
1600	SPD6A160LSI	SPD6B160LSI	SHPD6A160LSI	SHPD6B160LSI
1400	SPD6A140LSIG	SPD6B140LSIG	SHPD6A140LSIG	SHPD6B140LSIG
1600	SPD6A160LSIG	SPD6B160LSIG	SHPD6A160LSIG	SHPD6B160LSIG

### Ordering Information

Pricing information for all Digital Sentron Series PD frame unit is for breaker only. Price required mounting block assembly and necessary terminal connectors as separate items.

**SPD6-B and SHPD6-B are acceptable for reverse connection applications.**

### Lugs<sup>①</sup>

Catalog Number	No. of cables per connector	Wire Range
TA5P600	1-5 pcs.	300-600 kcmil Cu/Al
TC5R600	1-5 pcs.	300-600 kcmil Cu Only
TA6R600	1-6 pcs.	300-600 kcmil Cu/Al

### Neutral Transformers

Ampere Rating	Catalog Number
1400	N14SPD
1600	N16SPD

### Enclosure

Type	Catalog Number
1	PRD6N1

### Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Pick Up	Short Time Pick Up	Short Time Fixed Delay	Short Time I <sup>2</sup> t Delay	Ground Fault Pick Up	Ground Fault Delay
LI	LI	✓	✓	✓					
LIG	LIG	✓	✓	✓				✓	✓
LSI	LSI	✓	✓	✓	✓	✓	✓		
LSIG	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

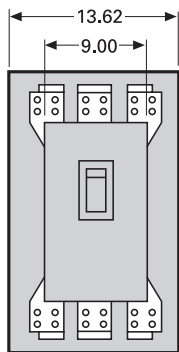
### Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489		
	240V AC	480V AC	600V AC
SPD6-B	65	50	25
SHPD6-B	100	65	50

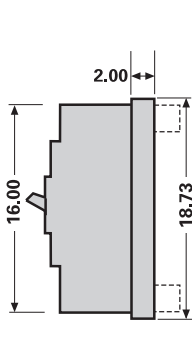
### Mounting Block (Required)<sup>②</sup>

Catalog Number
MB9301
MBR9302

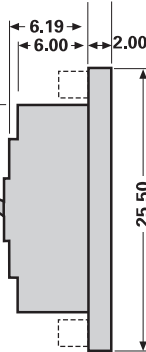
### All PD, RD Frames:



MB9301 (shown)  
MBR9302



MBR9302



MB9301



MBR9302



MB9301

For inches / millimeters conversion, see Application Data section.

**Note:** "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits.  
For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

All breakers built to order. Allow 2-3 weeks for delivery.  
① For additional information, see **Note: A**, page 17/100.  
② The PD frame circuit breaker requires the use of a connect-all mounting assembly to allow for placing into service.

③ Advanced trip unit equipped with DAS / Maintenance Mode. Requires customer-supplied 24V external power supply, maintenance switch and light.

# RD 2000A Frame Sentron Series

## Selection

### Type RXD6<sup>④</sup>

3-Pole 600V AC, 250-500V DC<sup>①</sup>

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker Only Without Lugs)			
Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only)		Lugs (6 required)
	Catalog Number		Catalog Number
1600	RXD63B160		TC5R600
1800	RXD63B180		
2000	RXD63B200		
		Mounting Assembly	
		Catalog Number	
		MB9301	
		-or-	
		MBR9302	

### Type RD6<sup>④</sup>

3-Pole 600V AC, 250-500V DC<sup>①</sup>

Blue Label

Interchangeable Trip (Unassembled Circuit Breaker with Lugs)					
Continuous Current Rating @ 40°C	Complete Breaker Unassembled	Frame Only	Trip Unit Only	Mounting Assembly	Lugs (6 required)
	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1600	RD63B160■	RD63F200	RD63T160■	MB9301	TC5R600
1800	RD63B180		RD63T180	-or-	
2000	RD63B200		RD63T200	MBR9302	

### Type HRXD6<sup>④</sup>

Black Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only)	
	Catalog Number	
1600	HRXD63B160■	
1800	HRXD63B180■	
2000	HRXD63B200	

### Type HRD6<sup>④</sup>

Black Label

Continuous Current Rating @ 40°C	Complete Breaker Unassembled	Frame Only	Trip Unit Only	Mounting Assembly	Lugs (6 required)
	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1600	HRD63B160■	HRD63F200	RD63T160■	MB9301	TC5R600
1800	HRD63B180		RD63T180	-or-	
2000	HRD63B200		RD63T200	MBR9302	

### Interrupting Ratings

Breaker Type	UL 489 A IR					
	RMS Symmetrical KA					
	Volts AC			Volts DC <sup>①</sup>		
	240	480	600	250	500	
RD6, RXD6	65	50	25	30 (2P)	25 (3P)	
HRD6, HRXD6	100	65	50	30 (2P)	50 (3P)	

### Instantaneous Adjustment Trip Range (PD / RD Frames)

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
	1200-2000	5000	5715	6430	7145	7860	8575	9790

■ Built to order. Allow 2-3 weeks for delivery.

▲ Built to order. Allow 6-8 weeks for delivery.

① Use two outside poles of a 3-pole circuit breaker for 250V DC applications.

④ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

⑤ RXD6 and HRXD6 type circuit breakers are UL Listed for reverse feed applications.

⑥ HACR rated.

⑦ For additional information See **Note: A**, page 17/100  
**Note:** RD frame qualified to UL489 supplement B "NAVAL". See page 17/103 for additional information.

⑧ For required mounting base (MB9301 or MBR9302) see page 17/88.



RXD63B200

### Mounting Block<sup>⑧</sup>

Catalog Number	Connection Points
MB9301	Front
MBR9302	Rear

### Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
<b>PXD6, HPXD6, RXD6, HRXD6, CPD6 Assembled Breakers</b>		
3	1	61.5
<b>PD6, HPD6, RD6, HRD6 Frame Only</b>		
3	1	55.0
<b>PD6, RD6 Trip Unit Only</b>		
3	1	6.5
<b>Mounting Assembly</b>		
MB9301	1	53.0
MBR9302	1	50.9

### Lugs (6 required per breaker)<sup>⑧</sup>

Catalog Number	No of Cables per Connector	Wire Range
TC5R600	1-5	300-600 kcmil Cu only
TA6R600	1-6	300-600 kcmil Cu/Al

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# Internal Accessories

## Selection/Dimensions

Accessories for:

- MD/SMD 800A Frame
- ND/SND 1200A Frame
- PD/SPD 1600A Frame
- RD 2000A Frame



**S01MN6**

Accessory modules can mount in either left hand or right hand poles of all circuit breakers, including solid state. Exception: when mechanical interlock is used. Accessories cannot be mounted in left pole.

### Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
120		S01MN6	S01MN64A
208		S02MN6▲	—
240		S03MN6	S03MN64A▲
277		S15MN6▲	S15MN64A▲
480		S04MN6▲	S04MN64A▲
600		S06MN6▲	—
	12	S16MN6▲	S16MN64A▲
	24	S07MN6	S07MN64A
	48	S09MN6▲	—
	125	S11MN6	S11MN64A▲
	250	S13MN6▲	S13MN64A▲

### Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01MN6	U01MN64A	U01MN64AA
208		U02MN6▲	U02MN64A▲	U02MN64AA▲
240		U03MN6▲	U03MN64A▲	U03MN64AA▲
277		U15MN6▲	U15MN64A▲	U15MN64AA▲
480		U04MN6▲	U04MN64A▲	U04MN64AA▲
600		U06MN6▲	—	—
	24	U07MN6	U07MN64A	U07MN64AA
	48	U09MN6▲	U09MN64A▲	U09MN64AA▲
	125	U11MN6▲	U11MN64A▲	U11MN64AA▲
	250	U13MN6▲	U13MN64A▲	U13MN64AA▲

### Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01MN64	A02MN64
—	12	A01MNDLV▲	A02MNDLV▲

### Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B00MN64	A01MN64B	A02MN64B

### ETU Testing Unit

Breaker Type	Description	Catalog Number
SJD, SLD, SMD, SND, SPD	Power Stick	EPSP18V
	Spare cable for Power Stick	COMPCA

The EPSP18V Power Stick is a hand-held, battery-operated power supply that can be used for trip testing the Sensitrip IV electronic trip units. Requires two 9V batteries.

▲ Built to order. Allow 6–8 weeks for delivery.

# Magnetic Trip Only — ETI Motor Circuit Protector

## Selection

Breaker Type	Ampere Rating	Instantaneous Trip Range <sup>②</sup>		Complete Circuit Breaker Without Lugs <sup>⑤</sup>		
		Minimum <sup>③</sup>	Maximum <sup>③</sup>	Catalog Number 2-Pole	Catalog Number 3-Pole	
<b>HEM</b>	3	9	33	—	HEM3M003L	
	7	21	77	—	HEM3M007L	
	15	45	165	—	HEM3M015L	
	30	90	330	—	HEM3M030L	
	50	150	550	—	HEM3M050L	
	70	210	770	—	HEM3M070L	
	100	300	1100	—	HEM3M100L	
SHIPPING:					3.7 lbs. each	
<b>ED6-A</b> 600V AC 250V DC	1	2.6	9	—	ED63A001	
	2	7	22	—	ED63A002	
	3	10	35	—	ED63A003	
	5	16	54	—	ED63A005	
	10	30	100	—	ED63A010	
	25	55	180	—	ED63A025	
	30	80	270	—	ED63A030	
	40	115	375	—	ED63A040	
	50	180	600	—	ED63A050	
	100	315	1000	—	ED63A100	
	125	500	1250	—	ED63A125	
	SHIPPING:					3.8 lbs. each
	<b>CED6-A</b> 600V AC 250V DC	1	2.6	9	—	CED63A001■
2		7	22	—	CED63A002■	
3		10	35	—	CED63A003■	
5		16	54	—	CED63A005■	
10		30	100	—	CED63A010■	
25		55	180	—	CED63A025■	
30		80	270	—	CED63A030■	
40		115	375	—	CED63A040■	
50		180	600	—	CED63A050■	
100		315	1000	—	CED63A100■	
125		500	1250	—	CED63A125■	
SHIPPING:					6 lbs. each	
<b>FXD6<sup>④</sup></b> 600V AC 250V DC		150	400	800	—	FXD63L150■
	150	800	1500	—	FXD63A150	
	150	1100	2500	—	FXD63H150	
	250	1100	2500	—	FXD63A250	
	SHIPPING:					9 lbs. each
<b>CFD6<sup>④</sup></b> 600V AC 250V DC	150	400	800	—	CFD63L150■	
	150	800	1500	—	CFD63A150■	
	150	1100	2500	—	CFD63H150■	
	250	1100	2500	—	CFD63A250■	
	SHIPPING:					12 lbs. each
<b>JXD6(A)<sup>①</sup></b> 600V AC 250V DC	400	1250	2500	—	JXD63L400	
	400	2000	4000	JXD62H400■	JXD63H400	
SHIPPING:					16 lbs. each	
<b>CJD6<sup>①</sup></b> 600V AC 250V DC	400	1250	2500	—	CJD63L400■	
	400	2000	4000	—	CJD63H400■	
SHIPPING:					29.5 lbs. each	
<b>LXD6(A)<sup>①</sup></b> 600V AC 250V DC	600	2000	4000	LXD62L600■	LXD63L600■	
	600	3000	6000	—	LXD63H600■	
SHIPPING:					16 lbs. each	
<b>CLD6<sup>①</sup></b> 600V AC 250V DC	600	2000	4000	—	CLD63L600■	
	600	3000	6000	—	CLD63H600■	
SHIPPING:					31.5 lbs. each	
<b>LMXD6<sup>④</sup></b> 600V AC 250V DC	800	2800	6000	—	LMXD63L800■	
	800	3200	8000	—	LMXD63A800	
SHIPPING:					35 lbs. each	
<b>MXD6<sup>④</sup></b> 600V AC 250V DC	800	3000	6000	—	MXD63L800■	
	800	4000	8000	—	MXD63A800■	
	800	5000	10000	—	MXD63H800	
SHIPPING:					33 lbs. each	
<b>CMD6<sup>④</sup></b> 600V AC 250V DC	800	3000	6000	—	CMD63L800■	
	800	4000	8000	—	CMD63A800■	
	800	5000	10000	—	CMD63H800■	
SHIPPING:					80 lbs. each	

### Important Information

ETI interrupting ratings are determined through combination tests with properly sized overload relays and contactors.

⑤ **Connectors included when ordering by circuit breaker catalog number for HEM, ED and CED6 ETIs. Order ETI circuit breaker and lugs (2 per pole) separately for the FXD6, CFD6, MXD6, CMD6, JXD6, CJD6, LXD6 and CLD6 ETI's.**

■ Built to order. Allow 2-3 weeks for delivery.

② 2-pole available in 3-pole width only.

② When applied on DC Circuits — Trip levels will increase approximately +15 to 20%.

③ Tolerance -20%/+30% for lowest setting. All other set-

tings are -20%/+20%

④ For 2-pole application use outside poles of 3-pole circuit breaker.

Lug Information pages 17/100 to 17/102  
Accessories pages 17/107 to 17/112  
Application data pages 17/92 to 17/93

# Motor Circuits

## Application

### General

#### Protection of Motor Circuits

Molded case circuit breakers are used in motor circuits as a disconnecting means and for short-circuit protection. They should be used in conjunction with motor-running, over-current-protection devices, and should permit the motor to start without nuisance tripping from motor-inrush current. The circuit breaker should have a continuous-current rating of not less than 115% of the motor full-load current.

The recommended motor circuit protectors (Siemens ETI instantaneous only circuit breakers) listed have

continuous-current ratings of at least 115% of motor full-load currents. The trip-setting positions are approximately 11 times motor full-load currents. The suggested trip settings may have to be adjusted upward to no higher than 1300% of full-load current for non-design E type motors, and no greater than 1700% of full load current for design E motors, to allow for motor start-up due to inrush currents.

#### Breaker Mounted Immediately Ahead of Motor Starter

Siemens ETI motor circuit protectors are recommended for use in combination motor starters to provide selective short-circuit protection for the motor

branch circuit. The adjustable instantaneous-trip feature of the Siemens ETI motor circuit protector provides for a trip setting slightly above the peak motor-inrush current. With this setting, no delay is introduced in opening the circuit when a fault occurs. This circuit breaker has no time-delay trip element. Therefore it must be used in conjunction with, and immediately ahead of, the motor-running overcurrent protective device.

Important: The information below does not apply to all motor applications: it is recommended that the user refer to the National Electrical Code (NEC) for specific needs.

**Table 1 (When Breaker is Mounted Immediately Ahead of Motor Starter)**

3-Phase Induction Type Motors (Siemens ETI motor circuit protectors for branch circuit use with alternating-current combination, full voltage motor starters).

Motor Full Load Amperes	Catalog Number	ETI Trip Setting	
		Adjustment	Amperes
0.69 – 0.91	HEM3M003L	A (min)	9
1.1 – 1.3		B	15
1.6 – 1.7		C	21
2.0 – 2.2		D	27
2.3 – 2.5		E	30
2.6 – 2.8		F (max)	33
1.5 – 2.0	HEM3M007L	A (min)	21
2.6 – 3.1		B	35
3.7 – 3.9		C	49
4.8 – 5.2		D	63
5.3 – 5.7		E	70
5.8 – 6.1		F (max)	77
3.4 – 4.5	HEM3M015L	A (min)	45
5.7 – 6.8		B	75
8.0 – 9.1		C	100
10.4 – 11.4		D	135
11.5 – 12.6		E	150
12.7 – 13.0		F (max)	165
3.9 – 9.1	HEM3M030L	A (min)	90
11.5 – 13.7		B	150
16.1 – 18.3		C	210
20.7 – 22.9		D	270
23.0 – 25.2		E	300
25.3 – 26.1		F (max)	330
11.5 – 15.2	HEM3M050L	A (min)	150
19.2 – 22.9		B	250
26.9 – 30.6		C	350
34.6 – 38.3		D	450
38.4 – 42.1		E	500
42.2 – 43.5		F (max)	550
16.1 – 30.6	HEM3M070L	A (min)	210
26.9 – 32.2		B	350
37.6 – 42.9		C	490
48.4 – 53.7		D	630
53.8 – 59.1		E	700
59.2 – 60.9		F (max)	770
23.0 – 30.9	HEM3M100L	A (min)	300
38.4 – 46.0		B	500
53.8 – 61.4		C	700
69.2 – 76.8		D	900
76.9 – 84.5		E	1000
84.6 – 87.0		F (max)	1100
.20 – .33	ED63A001 CED63A001	Low	2.6
.34 – .45		2	4.5
.46 – .56		3	6
.57 – .68		4	7.5
.69 – .81		High	9
.53 – .83	ED63A002 CED63A002	Low	7
.84 – 1.14		2	11
1.15 – 1.45		3	15
1.46 – 1.68		4	19
1.69 – 2.00	High	22	
.76 – 1.29	ED63A003 CED63A003	Low	10
1.30 – 1.75		2	17
1.76 – 2.29		3	23
2.30 – 2.68		4	30
2.69 – 3.18		High	35
1.23 – 1.99	ED63A005 CED63A005	Low	16
2.00 – 2.75		2	26
2.76 – 3.52		3	36
3.53 – 4.14		4	46
4.15 – 4.90		High	54
2.30 – 3.83	ED63A010 CED63A010	Low	30
3.84 – 5.37		2	50
5.38 – 6.52		3	70
6.53 – 7.68		4	85
7.69 – 9.10		High	100
4.23 – 6.91	ED63A025 CED63A025	Low	55
6.92 – 9.61		2	90
9.62 – 11.91		3	125
11.92 – 13.83		4	155
13.84 – 16.40	High	180	
6.15 – 10.37	ED63A030 CED63A030	Low	80
10.38 – 14.22		2	135
14.23 – 18.06		3	185
18.07 – 20.75		4	235
20.76 – 24.50	High	270	
8.84 – 14.22	ED63A040 CED63A040	Low	115
14.23 – 19.60		2	185
19.61 – 24.99		3	255
25.00 – 28.83		4	325
28.84 – 34.00	High	375	
13.84 – 23.06	ED63A050 CED63A050	Low	180
23.07 – 31.52		2	300
31.53 – 39.99		3	410
40.00 – 46.14		4	520
46.15 – 54.50	High	600	
24.23 – 41.52	ED63A100 CED63A100	Low	315
41.53 – 56.91		2	540
56.92 – 68.45		3	740
68.46 – 76.91		4	890
76.92 – 90.90		High	1000
38.46 – 55.37	ED63A125 CED63A125	Low	500
55.38 – 70.75		2	720
70.76 – 84.60		3	920
84.61 – 96.14		4	1100
96.15 – 113.60		High	1250
30.76 – 35.37	FXD63L150 CFD63L150	Low	400
35.38 – 39.99		2	460
44.51 – 49.23		4	580
53.84 – 58.45		6	700
58.46 – 63.06		7	760
63.07 – 74.50		High	820
61.53 – 69.22		FXD63A150 CFD63A150	Low
69.23 – 76.91	2		911
84.61 – 92.29	4		1100
100.00 – 108.00	6		1300
108.00 – 115.00	7		1400
115.00 – 136.00	High		1500
85.00 – 100.00	FXD63A250 CFD63A250		Low
100.00 – 115.00		2	1300
131.00 – 146.00		4	1700
162.00 – 177.00		6	2100
177.00 – 192.00		7	2300
192.00 – 227.00		High	2500
95.00 – 110.00		JXD63L400 CJD63L400	Low
110.00 – 124.00	2		1430
138.00 – 151.00	4		1790
165.00 – 178.00	6		2140
178.00 – 192.00	7		2320
192.00 – 227.00	High		2500
154.00 – 176.00	JXD63H400 CJD63H400		Low
176.00 – 198.00		2	2290
220.00 – 242.00		4	2860
264.00 – 285.00		6	3430
285.00 – 308.00		7	3710
308.00 – 326.00		High	4000
155.00 – 176.00		LXD63L600 CLD63L600	Low
176.00 – 198.00	2		2290
220.00 – 242.00	4		2860
264.00 – 285.00	6		3430
285.00 – 308.00	7		3710
308.00 – 326.00	High		4000
231.00 – 264.00	LXD63H600 CLD63H600		Low
264.00 – 292.00		2	3430
330.00 – 362.00		4	4290
395.00 – 428.00		6	5140
428.99 – 462.00		7	5570
462.00 – 490.00		High	6000
215.00 – 238.00		LMD63L800	Low
238.00 – 261.00	2		3100
261.00 – 284.00	3		3400
308.00 – 369.00	5		4000
369.00 – 423.00	6		4800
423.00 – 462.00	7		5500
462.00 – 490.00	High		6000
246.00 – 269.00	LMD63A800	Low	3200
269.00 – 284.00		2	3500
284.00 – 323.00		3	3700
362.00 – 492.00		5	4700
492.00 – 562.00		6	6400
562.00 – 616.00		7	7300
616.00 – 660.00		High	8000
231.00 – 264.00	MXD63L800 CMD63L800	Low	3000
264.00 – 292.00		2	3430
292.00 – 330.00		3	3800
362.00 – 395.00		5	4710
428.00 – 462.00		7	5570
462.00 – 490.00		High	6000
308.00 – 352.00		MXD63A800 CMD63A800	Low
352.00 – 442.00	2		4570
442.00 – 447.00	3		5740
483.00 – 527.00	5		6280
571.00 – 616.00	7		7240
616.00 – 660.00	High		8000
385.00 – 440.00	MXD63H800 CMD63H800		Low
495.00 – 550.00		3	6430
605.00 – 660.00		5	7860
660.00 – 695.00		6	8575

Note: Lowest instantaneous settings have a -20%/+30% tolerance and all other settings have a -20%/+20% tolerance.



# Motor Circuits

## Application

### Breaker Mounted at a Distance From Motor Starter

ET thermal-magnetic circuit breakers conform to the National Electrical Code table 430-152 requirements for motor branch and feeder circuit protection when properly applied in conjunction with motor-running overcurrent protective devices. The recommended

circuit-breaker ratings in Table 2 provide adequate time delay for starting the majority of three phase induction motors.

To determine the ampere ratings of the ET breaker to protect a motor feeder, add the rating of the ET breaker used to protect the largest motor branch circuit in the group to the full-load currents of the remaining motors in the group.

### Interrupt Ratings

For normal commercial purposes, available fault current can conveniently be obtained in the Interrupting Selector Tables.

**Table 2 (When Breaker is Mounted at a Distance From Motor Starter)**

3-Phase Induction Type Motors (EQ and ET circuit breakers (thermal-magnetic trip) for branch breaker use with alternating-current combination motor starters).

Motor Horsepower Rating	200 and 208V Motors			230V Motors			460V Motors			575V Motors		
	240V Circuit Breaker Data <sup>①</sup>			240V Circuit Breaker Data <sup>①</sup>			480V Circuit Breaker Data <sup>①</sup>			600V Circuit Breaker Data <sup>①</sup>		
	Breaker Type	Catalog Number	Ampere Rating	Breaker Type	Catalog Number	Ampere Rating	Breaker Type	Catalog Number	Ampere Rating	Breaker Type	Catalog Number	Ampere Rating
½	BQ <sup>②</sup>	BQ3B015	15	BQ <sup>②</sup>	BQ3B015	15	ED4	ED43B015	15	ED6	ED63B015	15
¾		BQ3B015	15		BQ3B015	15		ED43B015	15		ED63B015	15
1		BQ3B015	15		BQ3B015	15		ED43B015	15		ED63B015	15
1½		BQ3B015	15		BQ3B015	15		ED43B015	15		ED63B015	15
2		BQ3B020	20		BQ3B015	15		ED43B015	15		ED63B015	15
3	BQ3B030	30	BQ3B020	20	BQ3B015	15	ED43B015	15	ED63B015	15		
5	BQ <sup>②</sup>	BQ3B040	40	BQ <sup>②</sup>	BQ3B030	30	ED4	ED43B015	15	ED6	ED63B015	15
7½		BQ3B060	60		BQ3B050	50		ED43B030	30		ED63B020	20
10		BQ3B070	70		BQ3B070	70		ED43B030	30		ED63B030	30
15		BQ3B100	100		BQ3B090	90		ED43B040	40		ED63B035	35
20		BQ3B100	100		BQ3B100	100		ED43B050	50		ED63B050	50
25	FXD6	FXD63B125	125	FXD6	FXD63B125	125	FXD6	FXD63B090	90	FXD6	FXD63B060	60
30		FXD63B150	150		FXD63B150	150		FXD63B100	100		FXD63B070	70
40		FXD63B175	175		FXD63B175	175		FXD63B125	125		FXD63B090	90
50		FXD63B200	200		FXD63B200	200		FXD63B150	150		FXD63B100	100
50		FXD63B225	225		FXD63B225	225		FXD63B150	150		FXD63B100	100
60	JXD2	JXD23B300	300	—	—	—	FXD6, FD6	FXD63B150	150	FXD6	FXD63B100	100
75	JXD2	JXD23B400	400	JXD2	JXD23B350	350	FXD6, FD6	FXD63B200	200	FXD6, FD6	FXD63B125	125
100	JXD2	JXD23B400	400	JXD2	JXD23B400	400	FD6 <sup>③</sup> JD6 <sup>③</sup>	FD63B250 JD63B250	250 250	FXD6, FD6	FD63B175	175
125	LD6 <sup>③</sup> or LMD6	LD63B600 LMD63B600	600	LD6 <sup>③</sup> or LMD6	LD63B500 or LMD63B500	500	JD6 <sup>③</sup>	JD63B300	300	FXD6, FD6 OR JD6 <sup>③</sup>	FXD63B200 JD63B200	200 200
150	LD6 <sup>③</sup> or LMD6	LD63B600 or LMD63B600	600	LMD6	LD63B600 or LMD63B600	600	JD6 <sup>③</sup>	JD63B300	300	FXD6 or JD6 <sup>③</sup>	FXD63B225 JD63B225	225 225
200	LMD6	LMD63B800	800	LMD6	LMD63B800	800	JD6 <sup>③</sup>	JD63B350	350	JD6 <sup>③</sup>	JD63B300	300
250	—	—	—	—	—	—	JD6 <sup>③</sup>	JD63B400	400	JD6 <sup>③</sup>	JD63B400	400
300	—	—	—	—	—	—	LD6 <sup>③</sup> or LMD6	LD63B600 or LMD63B600	600	JD6 <sup>③</sup>	JD63B400	400
350	—	—	—	—	—	—	LMD6	LMD63B700	700	LD6 <sup>③</sup> or LMD6	LD63B500 or LMD63B500	500
400	—	—	—	—	—	—	LMD6	LMD63B800	800	LD6 <sup>③</sup> or LMD6	LD63B600 or LMD63B600	600
500	—	—	—	—	—	—	—	—	—	LMD6	LMD63B800	800

①The selection of breakers for this table is in accordance with Article 430, 2005 National Electric Code. Recommended circuit breakers are for full voltage starting, special consideration is necessary for reduced voltage starting.

②For panelboard applications, substitute the BL breaker for the BQ, ED2 circuit breakers may also be used.

③For non-interchangeable trip applications, substitute the FXD6 for the FD6, the JXD6 for the JD6, or the LXD6 for the LD6.

# Adjustable Installments Magnetic Trip Settings

## Application

Breaker Type	Maximum Continuous Amperes	Nominal AC Adjustable Trip Range								ETI Motor Circuit Protector Catalog Number	Thermal Magnetic Catalog Number	
		Low	2	3	4	5	6	7	High	3-Pole	2-Pole	3-Pole
HEM	3	9	15	21	27	30	—	—	33	HEM3M003L	—	—
	7	21	35	49	63	70	—	—	77	HEM3M007L	—	—
	15	45	75	100	135	150	—	—	165	HEM3M015L	—	—
	30	90	150	210	270	300	—	—	330	HEM3M030L	—	—
	50	150	250	350	450	500	—	—	550	HEM3M050L	—	—
	70	210	350	490	630	700	—	—	770	HEM3M070L	—	—
	100	300	500	700	900	1000	—	—	1100	HEM3M100L	—	—
ED6	1	2.6	4.5	6	7.5	—	—	—	9	ED63A001	—	—
	2	7	11	15	19	—	—	—	22	ED63A002	—	—
	3	10	17	23	30	—	—	—	35	ED63A003	—	—
	5	16	26	36	46	—	—	—	54	ED63A005	—	—
	10	30	50	70	85	—	—	—	100	ED63A010	—	—
	25	55	90	125	155	—	—	—	180	ED63A025	—	—
	30	80	135	185	235	—	—	—	270	ED63A030	—	—
	40	115	185	255	325	—	—	—	375	ED63A040	—	—
	50	180	300	410	520	—	—	—	600	ED63A050	—	—
	100	315	540	740	890	—	—	—	1000	ED63A100	—	—
	125	500	720	920	1100	—	—	—	1250	ED63A125	—	—
	CED6	1	2.6	4.5	6	7.5	—	—	—	9	CED63A001■	—
2		7	11	15	19	—	—	—	22	CED63A002■	—	—
3		10	17	23	30	—	—	—	35	CED63A003■	—	—
5		16	26	36	46	—	—	—	54	CED63A005■	—	—
10		30	50	70	85	—	—	—	100	CED63A010■	—	—
25		55	90	125	155	—	—	—	180	CED63A025■	—	—
30		80	135	185	235	—	—	—	270	CED63A030■	—	—
40		115	185	255	325	—	—	—	375	CED63A040■	—	—
50		180	300	410	520	—	—	—	600	CED63A050	—	—
100		315	540	740	890	—	—	—	1000	CED63A100	—	—
125		500	720	920	1100	—	—	—	1250	CED63A125	—	—
FXD6-A		70	600	640	690	730	770	810	850	900	—	FXD62B070
	80	600	640	690	730	770	810	850	900	—	FXD62B080	FXD63B080
	90	600	640	690	730	770	810	850	900	—	FXD62B090	FXD63B090
	100	700	770	840	920	990	1060	1140	1200	—	FXD62B100	FXD63B100
	110	700	770	840	920	990	1060	1140	1200	—	FXD62B110	FXD63B110
	125	800	900	1000	1100	1200	1300	1400	1500	—	FXD62B125	FXD63B125
	150	400	460	520	580	640	700	760	820	FXD63L150	—	—
	150	800	900	1000	1100	1200	1300	1400	1500	FXD63A150	FXD62B150	FXD63B150
	150	1100	1300	1500	1700	1900	2100	2300	2500	FXD63H150	—	—
	175	900	1060	1210	1370	1520	1780	1930	2000	—	FXD62B175	FXD63B175
	200	900	1060	1210	1370	1520	1780	1930	2000	—	FXD62B200	FXD63B200
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD62B225	FXD63B225
250	1100	1300	1500	1700	1900	2100	2300	2500	FXD63A250	FXD62B250	FXD63B250	
FD6-A	70	600	640	690	730	770	810	850	900	—	FD62B070	FD63B070
	80	600	640	690	730	770	810	850	900	—	FD62B080	FD63B080
	90	600	640	690	730	770	810	850	900	—	FD62B090	FD63B090
	100	700	770	840	920	990	1060	1140	1200	—	FD62B100	FD63B100
	110	700	770	840	920	990	1060	1140	1200	—	FD62B110	FD63B110
	125	800	900	1000	1100	1200	1300	1400	1500	—	FD62B125	FD63B125
	150	800	900	1000	1100	1200	1300	1400	1500	—	FD62B150	FD63B150
	175	900	1060	1210	1370	1520	1780	1930	2000	—	FD62B175	FD63B175
	200	900	1060	1210	1370	1520	1780	1930	2000	—	FD62B200	FD63B200
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	FD62B225	FD63B225
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	FD62B250	FD63B250
	HFD6	70	600	640	690	730	770	810	850	900	—	HFD62B070
80		600	640	690	730	770	810	850	900	—	HFD62B080	HFD63B080
90		600	640	690	730	770	810	850	900	—	HFD62B090	HFD63B090
100		700	770	840	920	990	1060	1140	1200	—	HFD62B100	HFD63B100
110		700	770	840	920	990	1060	1140	1200	—	HFD62B110	HFD63B110
125		800	900	1000	1100	1200	1300	1400	1500	—	HFD62B125	HFD63B125
150		800	900	1000	1100	1200	1300	1400	1500	—	HFD62B150	HFD63B150
175		900	1060	1210	1370	1520	1780	1930	2000	—	HFD62B175	HFD63B175
200		900	1060	1210	1370	1520	1780	1930	2000	—	HFD62B200	HFD63B200
225		1100	1300	1500	1700	1900	2100	2300	2500	—	HFD62B225	HFD63B225
250		1100	1300	1500	1700	1900	2100	2300	2500	—	HFD62B250	HFD63B250
HHFD6		70	600	640	690	730	770	810	850	900	—	—
	80	600	640	690	730	770	810	850	900	—	—	HHFD63B080
	90	600	640	690	730	770	810	850	900	—	—	HHFD63B090
	100	700	770	840	920	990	1060	1140	1200	—	—	HHFD63B100
	110	700	770	840	920	990	1060	1140	1200	—	—	HHFD63B110
	125	800	900	1000	1100	1200	1300	1400	1500	—	—	HHFD63B125
	150	800	900	1000	1100	1200	1300	1400	1500	—	—	HHFD63B150
	175	900	1060	1210	1370	1520	1780	1930	2000	—	—	HHFD63B175
	200	900	1060	1210	1370	1520	1780	1930	2000	—	—	HHFD63B200
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	—	HHFD63B225
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	—	HHFD63B250
	CFD6	70	600	640	690	730	770	810	850	900	—	CFD62B070
80		600	640	690	730	770	810	850	900	—	CFD62B080	CFD63B080
90		600	640	690	730	770	810	850	900	—	CFD62B090	CFD63B090
100		700	770	840	920	990	1060	1140	1200	—	CFD62B100	CFD63B100
110		700	770	840	920	990	1060	1140	1200	—	CFD62B110	CFD63B110
125		800	900	1000	1100	1200	1300	1400	1500	—	CFD62B125	CFD63B125
150		400	460	520	580	640	700	760	820	CFD63L150	—	—
150		800	900	1000	1100	1200	1300	1400	1500	CFD63A150	CFD62B150	CFD63B150
150		1100	1300	1500	1700	1900	2100	2300	2500	CFD63H150	—	—
175		900	1060	1210	1370	1520	1780	1930	2000	—	CFD62B175	CFD63B175
200		900	1060	1210	1370	1520	1780	1930	2000	—	CFD62B200	CFD63B200
225		1100	1300	1500	1700	1900	2100	2300	2500	—	CFD62B225	CFD63B225
250	1100	1300	1500	1700	1900	2100	2300	2500	CFD63A250	CFD62B250	CFD63B250	

Note: Tolerances for instantaneous trip points meet UL 489 (7.3). Nominal AC instantaneous trip points are given in the tables. For DC instantaneous trip points, add 15% to nominal values.

Instantaneous trip adjustment is made through the breaker cover on all frame breakers. To change instantaneous trip point on circuit breaker, depress indicating knob, then rotate to desired position.

■ Built to order. Allow 2–3 weeks for delivery.

# Adjustable Instantaneous Magnetic Trip Settings

## Application

Breaker Type	Maximum Continuous Amperes	Nominal AC Adjustable Trip Range								ETI Motor Circuit Protector Catalog Number		Thermal Magnetic Catalog Number		
		Low	2	3	4	5	6	7	High	3-Pole	2-Pole	3-Pole		
JXD2(A)	200	1250	1430	1610	1790	1960	2140	2320	2500	—	JXD22B200	JXD23B200		
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	JXD22B225	JXD23B225		
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	JXD22B250	JXD23B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	JXD22B300	JXD23B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	JXD22B350	JXD23B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	JXD22B400	JXD23B400		
JXD6(A)	200	1250	1430	1610	1790	1960	2140	2320	2500	—	JXD62B200	JXD63B200		
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	JXD62B225	JXD63B225		
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	JXD62B250	JXD63B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	JXD62B300	JXD63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	JXD62B350	JXD23B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	JXD62B400	JXD23B400		
JD6(A)	200	1250	1430	1610	1790	1960	2140	2320	2500	—	JD62B200	JD63B200		
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	JD62B225	JD63B225		
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	JD62B250	JD63B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	JD62B300	JD63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	JD62B350	JD63B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	JXD63L400 JXD63H400	JD62B400	JD63B400		
HJD6(A)	200	1250	1430	1610	1790	1960	2140	2320	2500	—	HJD62B200	HJD63B200		
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	HJD62B225	HJD63B225		
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	HJD62B250	HJD63H250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	HJD62B300	HJD63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	HJD62B350	HJD63B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	HJD62H400	HJD63B400		
HHJD6	200	1250	1430	1610	1790	1960	2140	2320	2500	—	HHJD62B200	HHJD63B200		
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	HHJD62B225	HHJD63B225		
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	HHJD62B250	HHJD63B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	HHJD62B300	HHJD63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	HHJD62B350	HHJD63B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	HHJD62B400	HHJD63B400		
CJD6	200	1250	1430	1610	1790	1960	2140	2320	2500	—	—	CJD63B200		
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	—	CJD63B225		
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	CJD63B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	CJD63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	CJD63B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	CJD63H400 CJD63L400	—	CJD63B400		
LXD6(A)	450	2000	2290	2570	2860	3140	3430	3710	4000	—	LXD62B450	LXD63B450		
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	LXD62B500	LXD63B500		
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	LXD62B600	LXD63B600		
LD6(A)	250	1250	1430	1610	1790	1960	2140	2320	2500	—	LD62B250	LD63B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	LD62B300	LD63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	LD62B350	LD63B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	LD62B400	LD63B400		
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	LD62B450	LD63B450		
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	LD62B500	LD63B500		
600	2000	2290	2570	2860	3140	3430	3710	4000	LXD63L600 LXD63H600	—	—			
600	3000	3430	3860	4290	4710	5140	5570	6000	—	LD62B600	LD63B600			
HLD6(A)	250	1250	1430	1610	1790	1960	2140	2320	2500	—	HLD62B250	HLD63B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	HLD62B300	HLD63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	HLD62B350	HLD63B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	HLD62B400	HLD63B400		
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	HLD62B450	HLD63B450		
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	HLD62B500	HLD63B500		
600	3000	3430	3860	4290	4710	5140	5570	6000	—	HLD62B600	HLD63B600			
HHL6	250	1250	1430	1610	1790	1960	2140	2320	2500	—	HHL62B250	HHL63B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	HHL62B300	HHL63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	HHL62B350	HHL63B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	HHL62B400	HHL63B400		
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	HHL62B450	HHL63B450		
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	HHL62B500	HHL63B500		
600	3000	3430	3860	4290	4710	5140	5570	6000	—	HHL62B600	HHL63B600			
CLD6	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	CJD63B250		
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	CJD63B300		
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	CJD63B350		
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	CLD63B400		
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	—	CLD63B450		
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	CLD63B500		
600	2000	2290	2570	2860	3140	3430	3710	4000	CLD63L600 CLD63H600	—	—			
600	3000	3430	3860	4290	4710	5140	5570	6000	—	—	CLD63B600			
LMXD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LMXD63B500		
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LMXD63B600		
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	—	LMXD63B700		
	800	2800	3100	3400	3700	4000	4800	5500	6000	—	—	LMXD63B800		
	800	3200	3500	3700	4200	4700	6400	7300	8000	LMXD63L800 LMXD63A800	—	—		
LMD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LMD63B500		
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LMD63B600		
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	—	LMD63B700		
	800	3200	3500	3700	4200	4700	6400	7300	8000	—	—	LMD63B800		

17 MOLDED CASE CIRCUIT BREAKERS



# Adjustable Instantaneous Magnetic Trip Settings

## Application

Breaker Type	Maximum Continuous Amperes	Nominal AC Adjustable Trip Range								ETI Motor Circuit Protector Catalog Number	Thermal Magnetic Catalog Number		
		Low	2	3	4	5	6	7	High		3-Pole	2-Pole	3-Pole
HLMXD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	HLMXD63B500	
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	—	HLMXD63B600	
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	—	HLMXD63B700	
	800	3200	3500	3700	4200	4700	6400	7300	8000	—	—	HLMXD63B800	
HLMD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	HLMD62B500	HLMD63B500	
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	HLMD62B600	HLMD63B600	
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	HLMD62B700	HLMD63B700	
	800	3200	3500	3700	4200	4700	6400	7300	8000	—	HLMD62B800	HLMD63B800	
MD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	MD62B500	MD63B500	
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	MD62B600	MD63B600	
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	MD62B700	MD63B700	
	800	3000	3430	3860	4280	4710	5140	5570	6000	MXD63L800	—	—	
	800	4000	4570	5140	5710	6280	6850	7420	8000	MXD63A800	MD62B800	MD63B800	
800	5000	5715	6430	7145	7860	8575	9290	10000	MXD63H800	—	—		
MXD6	500	3000	3430	3860	4280	4710	5140	5570	6000	—	MXD62B500	MXD63B500	
	600	3000	3430	3860	4280	4710	5140	5570	6000	—	MXD62B600	MXD63B600	
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	MXD62B700	MXD63B700	
	800	3000	3430	3860	4280	4710	5140	5570	6000	MXD63L800	—	—	
	800	4000	4570	5140	5710	6280	6850	7420	8000	MXD63A800	MXD62B800	MXD63B800	
800	5000	5715	6430	7145	7860	8575	9290	10000	MXD63H800	—	—		
HMD6	500	3000	3430	3860	4280	4710	5140	5570	6000	—	HMD62B500	HMD63B500	
	600	3000	3430	3860	4280	4710	5140	5570	6000	—	HMD62B500	HMD63B600	
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	HMD62B700	HMD63B700	
	800	4000	4570	5140	5710	6280	6850	7420	8000	—	HMD62B800	HMD63B800	
HMXD6	500	3000	3430	3860	4280	4710	5140	5570	6000	—	—	HMXD63B500	
	600	3000	3430	3860	4280	4710	5140	5570	6000	—	—	HMXD63B600	
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	—	HMXD63B700	
	800	4000	4570	5140	5710	6280	6850	7420	8000	—	—	HMXD63B800	
CMD6	400	3000	3430	3860	4280	4710	5140	5570	6000	—	—	—	
	500	3000	3430	3860	4280	4710	5140	5570	6000	—	—	—	
	600	3000	3430	3860	4280	4710	5140	5570	6000	—	—	CMD63B600	
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	—	CMD63B700	
	800	3000	3430	3860	4280	4710	5140	5570	6000	CMD63L800	—	—	
	800	4000	4570	5140	5710	6280	6850	7420	8000	CMD63A800	—	CMD63B800	
800	5000	5715	6430	7145	7860	8575	9290	10000	CMD63H800	—	—		
ND6	800	4000	4570	5140	5710	6280	6850	7420	8000	—	ND62B800	ND63B800	
	900	5000	5715	6430	7145	7860	8575	9290	10000	—	ND62B900	ND63B900	
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	ND62B100	ND63B100	
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	ND62B120	ND63B120	
NXD6	900	5000	5715	6430	7145	7860	8575	9290	10000	—	NXD62B900	NXD63B900	
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	NXD62B100	NXD63B100	
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	NXD62B120	NXD63B120	
HND6	800	4000	4570	5140	5710	6280	6850	7420	8000	—	HND62B800	HND63B800	
	900	5000	5715	6430	7145	7860	8575	9290	10000	—	HND62B900	HND63B900	
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	HND62B100	HND63B100	
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	HND62B120	HND63B120	
HNXD6	900	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HNXD63B900	
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HNXD63B100	
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HNXD63B120	
CND6	800	4000	4570	5140	5710	6280	6850	7420	8000	—	—	CND63B800	
	900	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CND63B900	
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CND63B100	
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CND63B120	
PD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PD63B120	
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PD63B140	
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PD63B160	
PXD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PXD63B120	
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PXD63B140	
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PXD63B160	
HPD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPD63B120	
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPD63B140	
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPD63B160	
HPXD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPXD63B120	
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPXD63B140	
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPXD63B160	
CPD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CPD63B120	
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CPD63B140	
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CPD63B160	
RD6	1800	5000	5715	6430	7145	7860	8575	9290	10000	—	—	RD63B180	
	2000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	RD63B200	
RXD6	1800	5000	5715	6430	7145	7860	8575	9290	10000	—	—	RXD63B180	
	2000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	RXD63B200	
HRD6	1800	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HRD63B180	
	2000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HRD63B200	
HRXD6	1800	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HRXD63B180	
	2000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HRXD63B200	

# Molded Case Switch — Circuit Disconnect

## Selection

Maximum Frame Amp Rating	2-Pole	3-Pole	Self-Protective Instantaneous Override ±20% <sup>③</sup>
	Catalog Number	Catalog Number	
100	BQ2S060 ■ BQ2S100 ■	BQ3S060 ■ BQ3S100 ■	1000 1000
125	ED22S100A ■ ED42S100A ■ ED42S125A ■ ED62S100A ■ — CED62S100A ■ CED62S125A ■ — —	ED23S100A ED43S100A ED43S125A ED63S100A ED63S125A CED63S100A ■ CED63S125A ■ HES3S100L HES3S125L	1000 1000 1000 1000 1000 1000 1000 1250 1250
225	—	HQR23S250HA	2000
250	FXD62S250A HFXD62S250A ■ ①	FXD63S250A HFXD63S250A ■ CFD63S250A ■	3200 3200 3200
400	JXD22S400A ■ — — ①	JXD23S400A JXD63S400A HJXD63S400A ■ CJD63S400A ■	6000 6000 6000 6000
600	— — ①	LXD63S600A HLXD63S600A ■ CLD63S600A ■	6000 6000 6000
800	— — ①	LMXD63S800A ■ MXD63S800A CMD63S800A	8000 8000 8000
1200	— ①	NXD63S120A CND63S120A ■	10000 10000
1600	①	PXD63S160A <sup>⑤</sup>	10000
2000	①	RXD63S200A ■ <sup>⑤</sup>	10000

### Ordering Information

Order by catalog number. Switches include frame and self protective trip unit only. Order lugs separately from pages 17/100 to 17/102.

■ Built to order. Allow 2–3 weeks for delivery.  
 ① For 2-pole application use outside poles of 3-pole circuit breaker.  
 ② For additional lugs see pages 17/31 to 17/102.

③ Molded case switches up to R frame contain a self protecting instantaneous element, which may open circuit above their override set point.  
 ④ UL file E57556 Volume 1, section 2 and CSA LR 42022-51.  
 ⑤ Requires mounting block MB9301 or MBR9302.

Lugs pages 17/100 to 17/102  
 Accessories pages 17/107 to 17/112

# Digital Solid State Sentron Sensitrip IV Series

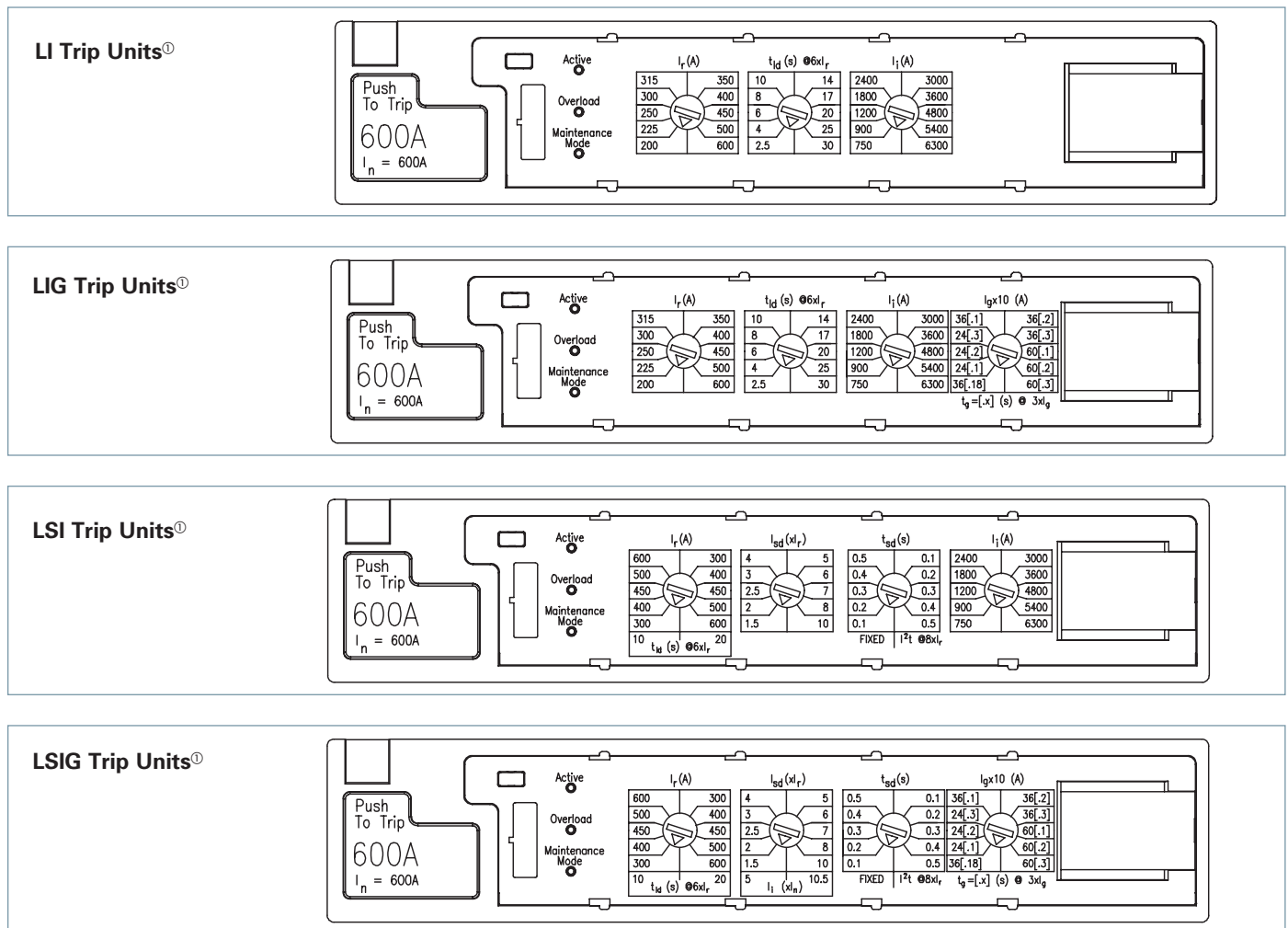
## Technical

The Sentron Sensitrip IV circuit breaker is a true RMS current sensing device. Digital microprocessor circuitry within the electronic trip unit provides more precise control over the circuit breaker functions. This control allows circuit coordination flexibility not available with thermal magnetic circuit breakers.

### Functions available in Sentron Sensitrip circuit breakers

Catalog Number Suffix	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Pickup	Short Time Pickup	Short Time Fixed Delay	Short Time I <sup>2</sup> t Delay	Ground Fault Pickup	Ground Fault Delay
LI	LI	✓	✓	✓					
LIG	LIG	✓	✓	✓				✓	✓
LSI	LSI	✓	✓	✓	✓	✓	✓		
LSIG	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

### Typical Trip Unit Labeling and Adjustment Positions for the Sentron Sensitrip Circuit Breaker.



- I<sub>n</sub> = Maximum circuit breaker ampere rating
- I<sub>r</sub> = Continuous current rating expressed in amperes
- I<sub>i</sub> = Instantaneous pickup expressed in amperes
- I<sub>sd</sub> = Short time pickup expressed in multiples of I<sub>r</sub>

- I<sub>g</sub> = Ground fault pickup expressed in amperes
- t<sub>sd</sub> = Short time delay - either fixed or I<sup>2</sup>t time delay function
- t<sub>ld</sub> = Long time delay - I<sup>2</sup>t time delay function
- t<sub>g</sub> = Ground fault delay - I<sup>2</sup>t time delay function

NOTE: Frame rating (I<sub>n</sub>) of 600A shown as an example. Trip unit settings will vary based on the specific frame rating (I<sub>n</sub>) of the device.

① Schematic of advanced trip unit shown. Basic trip units are identical but do not include DAS / Maintenance Mode functionality.

# Digital Solid State Sentron Sensitrip IV Series

## Technical

**A. Adjustable "Continuous Amps" Rating Switch**  
All Sensitrip IV solid state molded case circuit breakers have an adjustable ampere rating switch. Adjustments made to this switch change the continuous current rating of the breaker.

**B. Adjustable "Long Time Delay" Switch**  
All Sensitrip IV circuit breakers have an adjustable long time delay switch to allow for selection of long time delays of fixed time intervals at six times the setting of the adjustable "continuous amps" rating switch.

**C. Adjustable "Instantaneous Pick-Up" Switch**  
Sensitrip IV circuit breakers with an adjustable instantaneous pick up switch allow selection of a specific instantaneous trip setting.

**D. Adjustable "Short Time Pick-Up" Switch (Optional)**  
Sensitrip IV circuit breakers with an adjustable short time pick-up switch allow for selection of short time pick-up in a range from 1.5 to 10 times the setting of the maximum current rating.

**E. Adjustable "Short Time Delay" Switch (Optional)**  
Sensitrip IV circuit breakers with an adjustable short time delay switch also contain a switch for adjustment in time delay. The adjustable short time delay switch allows for either of two modes of short time delays. One range of settings enables the breaker to be set for fixed time delays and the other range of settings enables the breaker to be set for short time delays based on I<sup>2</sup>t curves.

**Adjustable "Ground Fault Pick-Up" Switch**  
Sensitrip IV circuit breakers containing the optional equipment ground fault protection have a ground fault pick-up setting. The ground fault pick-up settings allow for one of three time delays based on I<sup>2</sup>t curves. For 3-phase, 4-wire systems, an external neutral transformer is required with an ampere rating equal to the trip unit ampere rating.

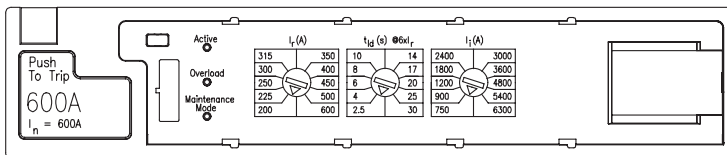
**Ground Fault Pick-up (I<sub>g</sub>)**  
Ground Fault Delay @ I<sup>2</sup>T @ 3 x I<sub>g</sub> (t<sub>g</sub>)

**Legend:**  
I<sub>n</sub> = Maximum circuit breaker ampere rating  
I<sub>r</sub> = Continuous current rating expressed in amperes  
I<sub>i</sub> = Instantaneous pickup expressed in amperes  
I<sub>std</sub> = Short time pickup expressed in multiples of I<sub>r</sub>  
I<sub>g</sub> = Ground fault pickup expressed in amperes  
t<sub>sd</sub> = Short time delay - either fixed or I<sup>2</sup>t time delay function  
t<sub>ld</sub> = Long time delay - I<sup>2</sup>t time delay function  
t<sub>g</sub> = Ground fault delay - I<sup>2</sup>t time delay function

### Examples of Adjustment Settings

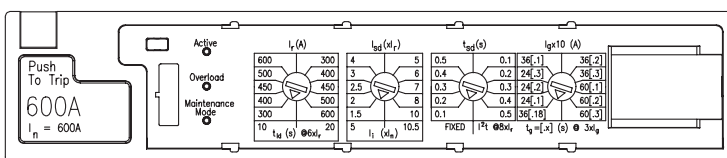
#### Catalog Number SLD6A600LI

	Frame Rating (I <sub>n</sub> )	Switch 1	Switch 2	Switch 3
		Continuous Current Setting (I <sub>r</sub> )	Long Time Delay Setting (t <sub>ld</sub> )	Instantaneous Pickup Setting (I <sub>i</sub> )
<b>Setting</b>	600A	200	2.5	750
<b>Description</b>	600A max current rating	200A	2.5 sec to trip @ 6 x I <sub>r</sub> [6 x 200A = 1200A]	750A



#### Catalog Number SLD6A600LSIG

	Frame Rating (I <sub>n</sub> )	Switch 1		Switch 2		Switch 3	Switch 4	
		Cont. Current Setting (I <sub>r</sub> )	Long Time Delay Setting (t <sub>ld</sub> )	Short Time Pickup Setting (I <sub>std</sub> )	Instantaneous Pickup Setting (I <sub>i</sub> )	Short Time Delay Setting (t <sub>sd</sub> )	Ground Fault Pickup Setting (I <sub>g</sub> )	Ground Fault Delay Setting (t <sub>g</sub> )
<b>Setting</b>	600A	300	10	1.5	5	0.1	36 [.18]	36 [.18]
<b>Description</b>	600A max current rating	300A	10 sec @ 6 x I <sub>r</sub> [6 x 300A = 1800A]	1.5 x I <sub>r</sub> [1.5 x 200A = 300A]	5 x I <sub>n</sub> [5 x 600A = 3,000A]	0.1 sec	I <sub>g</sub> = 36 x 10 [36 x 10 = 360A]	0.18 sec @ 3 x I <sub>g</sub> [3 x 360 = 1,080A]



17 MOLDED CASE CIRCUIT BREAKERS

## Mechanical Lug

## Selection

For Use With Type(s)	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Wire Range	Catalog Number
BQ, BQH, BQHF BQE, BQF, BL, BLH, HBL, HBQ Switching Neutrals BG, BLG	<b>Line Side</b>			
	15-40	1 1	#14-#6 AWG Cu #12-#6 AWG Al	TC1Q1 <sup>①②</sup>
	45-125	1 1	#8-#1 AWG Cu #6-#1/0 AWG Al	TA1Q1 <sup>②</sup>
	<b>Load Side</b>			
	15-20	1 1	#14-#10 AWG Cu #12-#10 AWG Al	Lugs are integral to Circuit Breaker
	25-35	1 1	#14-#6 AWG Cu #12-#6 AWG Al	Lugs are integral to Circuit Breaker
	40-50	1 1	#8-#6 AWG Cu #8-#4 AWG Al	Lugs are integral to Circuit Breaker
	55-70 *exceptions in Table A	1 1	#8-#4 AWG Cu #8-#2 AWG Al	Lugs are integral to Circuit Breaker
	80-100	1 1	#4-#1/0 AWG Cu #2-#1/0 AWG Al	Lugs are integral to Circuit Breaker
	110-125	1 1	#2-#1/0 AWG Cu #1/0-#2/0 AWG Al	Lugs are integral to Circuit Breaker
BQD, CQD BQD6, CQD6	<b>Line Side (CQD, CQD6) &amp; Load Side</b>			
	15-40	1	#14-#6 AWG Cu #12-#6 AWG Al	Integral
	45-100	1	#8-#1 AWG Cu #6-#1/0 AWG Al	Integral
NGG, HGG, LGG	15-30	1	#14-#6 AWG Cu #12-#6 AWG Al	TC1Q1
	15-30	1	#14-#6 AWG Cu #12-#6 AWG Al	3TC1Q1 (pkg. of 3)
	35-125	1	#8-#1/0 AWG Cu #8-#2/0 AWG Al	3TC1GG20 (pkg. of 3)
	15-125	—	NUT KEEPER PLATE	TNKG3 <sup>③</sup> (pkg. of 3)
NEG, HEG	15-125	1	#14-3/0 AWG Cu	3TW1EG30 (pkg. of 3)
	15-125	1	#14-1/0 AWG Cu/Al	3TA1EG10 (pkg. of 3)
	15-125	1	#6-3/0 AWG Cu/Al	3TA1EG30 (pkg. of 3)
	15-125	—	Nut Keeper Kit (3-pole)	TNKE3 (pkg. of 3)
	15-125	—	Nut Keeper Kit (4-pole)	TNKE4 (pkg. of 4)

Connector wire ranges and cavities are established in conjunction with Table 6.1.4.2.1 of UL 489 standards.

Table A

For Use With Type(s)	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Wire Range	Number of Poles
BQ, BL, QP	<b>Load Side</b>			
	55-60	1	#8-#4 AWG Cu-Al #3 AWG requires 22 or 65 kAIC	This exception is applicable to 1- and 2-pole only

## Note:

(A) Molded case circuit breakers having a rated ampacity of 125 amperes or less are to be connected with 60 or 75°C wire. Circuit breakers having a rated ampacity greater than 125 amperes shall only be cabled with 75°C cable unless otherwise indicated on the circuit breaker label. Exceptions to this rule are outlined in article 110-14 C(1)(2) of the 2005 National Electrical Code.

(B) Connector wire ranges and cavities are established in conjunction with Table 6.1.4.2.1 of UL 489 standards.

① Lug is steel.

② Sold in package of six.

③ One nut keeper plate is required with each lug on the NGG breaker.

## Aluminum Body Lugs for Copper or Aluminum Wire

## Selection

For Use With Type(s)	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Wire Range	Catalog Number
QR2, QR2H, HQR2, HQR2H	100-250	1	#3-300 Kcmil Al/C	<b>3TA1QR300</b> (3 lugs per kit)
All 2, 3-pole ED2, ED4, ED6, ED6 ETI, HED4, HHED6	15-25	1	#14-#10 AWG (Cu) #12-#10 AWG (Al)	<b>SA1E025</b>
	30-100	1	#10-#1/0 (Cu or Al)	<b>LN1E100</b>
	110-125	1	#3-3/0 (Cu) #1-2/0 (Al)	<b>TA1E6125</b>
CED6 All 1-pole ED, HED	30-60	1	#10-4 (Cu or Al)	<b>LD1E060</b> (Load Side)
	70-100	1	#4-#1/0 (Cu or Al)	<b>LD1E100</b> (Load Side)
FXD6-A, FD6-A, HFD6, CFD6 HHFD6	70-250	1	#6 AWG-350 kcmil (Cu) #4 AWG-350 kcmil (Al)	<b>TA1FD350A</b>
SJD6-B, SHJD6-B SCJD6-B	65-200	1-2	#4 AWG-3/0 (Cu or Al)	<b>TA2J630</b>
JXD2(A), JXD6(A), JD6(A), SJD6-B, HJD6(A), HJXD6(A) HHJXD6, HHJD6, SHJD6-B, CJD6, SCJD6-B	200-400	1-2	3/0-500 kcmil (Cu) 4/0-500 kcmil (Al)	<b>TA2J6500</b>
LXD6(A), LD6(A), SLD6-B, HLD6(A), HLXD6(A), HHLXD6, HHL6, SHLD6-B, CLD6, SCLD6-B	250-600	1-2	3/0-500 kcmil (Cu) 4/0-500 kcmil (Al)	<b>TA2J6500</b>
LMD6 <sup>①</sup> , LMXD6 <sup>①</sup> , HLM6 <sup>①</sup> , HLMXD6 <sup>①</sup> , MD6, MXD6, SMD6-B, HMD6, HMXD6, SHMD6-B, CMD6, SCMD6-B	500-600	1-2	#1-500 kcmil (Cu or Al)	<b>TA2K500</b>
		1-3	1/0-500 kcmil (Cu or Al)	<b>TA3K500</b>
	500-800	1-2	500-750 kcmil (Cu or Al)	<b>TA2N750<sup>②</sup></b>
ND6, NXD6, SND6-B, HND6, HNXD6, SHND6-B, CND6, SCND6-B	800-1200	1-4	250-500 kcmil (Cu or Al)	<b>2TA4P8500<sup>③</sup></b> <b>3TA4P8500<sup>④</sup></b>
			250-500 kcmil (Cu or Al)	<b>2TA4N8500<sup>③</sup></b> <b>3TA4N8500<sup>④</sup></b>
PD6, HPD6, CPD6 PXD6, HPXD6, SPD6-B, SHPD6-B	1200-1600	1-5	300-600 kcmil (Cu or Al)	<b>TA5P600</b>
PD6, PXD6, HPD6, HPXD6, SPD6-B, SHPD6-B, RD6, RXD6, HRD6, HRXD6, STD	1200-2000	1-6	300-600 kcmil (Cu or Al)	<b>TA6R600</b>

① Use TA2K500 or TA3K500 only.  
② Used for 100% rated MD/ND frame breakers.  
Rated for 90° C cable.

③ Contains 2 connectors plus 1 NDTs end barrier.  
④ Contains 3 connectors plus 1 NDTs end barrier.

## Optional Mechanical Lugs

## Selection

For Use With Type	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Material	Lug Wire Range	Qty Per Catalog No	Catalog Number
QR2, QR2H, HQR2, HQR2H	100-250	1	Cu	#3 - 300 Kcmil Cu ONLY)	3	3TC1QR2520 (3 lugs per kit)
ED, HED 1, 2 & 3-pole	1, 2 & 3-pole 30-125	1	Cu	#10-#1/0 (Cu)	1	TC1ED6150
HFD6, HHFD6, CFD6, F(X)D6-A	70-250	1	Cu	#6 AWG-350 kcmil (Cu)	1	TC1FD350
J(X)D2(A), J(X)D6(A), HJD6(A), HHJD6, SHJD6-B, L(X)D6(A), HHL6, SCD6-B, HLD6(A), SHLD6-B, CJD6, CLD6, SCJD6-B, SCLD6-B	200-600	1 1-2	Cu	3/0-600 kcmil (Cu) 3/0-500 kcmil (Cu)	1 1	TC1J6600 <sup>①</sup> TC2J6500 <sup>①</sup>
SMD6-B, M(X)D6, HM(X)D6, HMD6,	500-600	1-2 1-3	Cu	#1 AWG-500 kcmil (Cu) #1 AWG-350 kcmil (Cu)	1 1	TC2K500 TC3K350
CMD6, SCMD6-B, SND6-B, N(X)D6, HN(X)D6,	700-800	1-2	Al	500-750 kcmil (Cu) 500-750 kcmil (Al)	2 3	2TA2N8750 3TA2N8750
SHND6-B, CND6, SCND6-B	800-1200	1-3	Al	500-750 kcmil (Cu) 500-750 kcmil (Al)	2 3	2TA3N8750 3TA3N8750
R(X)D6, HR(X)D6	1600-2000	1-5	Cu	300-600 kcmil (Cu)	1	TC5R600
P(X)D6, HP(X)D6, CPD6, SPD6-B, SHPD6-B	1200-1600	1-4	Al	600-750 kcmil (Cu/Al)	1	TA4P750▲

## Compression Lugs

For Circuit Breaker Types	Ampere Rating	Poles	Lugs Per Kit	Lug Wire Size	Catalog Number
Lugs (contains indicated number of lugs and necessary hardware per kit)					
ED2, ED4, ED6, HED4, HHED6, CED6	15-125	1, 2, 3	1	#2/0 AWG Cu/Al	CCE125
QR2, QR2H, HQR2, HQR2H	100-250	2-3	1	#6 - 350kcmil Al/Cu	CCQ250
F(X)D6-A, HF(X)D6, HHF(X)D6, CFD6	125-250	2, 3	1	350 kcmil	CCF250
JXD2-A, J(X)D6-A, HJ(X)D6-A, HHJ(X)D6-A, CJD6, SJD6-B, SHJD6-B, SCJD6-B, L(X)D6-A, HL(X)D6-A, CLD6, SLD6-B, SHLD6-B, SCLD6-B	200-600	2, 3	1	500 kcmil	CCL600
Kits (contain lugs and hardware for complete line or load end of 2 or 3-pole breaker)					
M(X)D6, HM(X)D6, CMD6, SMD6-B, SHMD6-B, SCMD6-B	500-800	2 3	6 9	500 kcmil	CCM800K2 CCM800K3
N(X)D6, HN(X)D6, CND6, SND6-B, SHND6-B, SCND6-B	900-1200	2 3	8 12		CCN1200K2 CCN1200K3

Distribution Lugs<sup>②</sup>

For Circuit Breaker Types	Ampere Rating	Poles	Lugs Per kit	Wires Per Lug	Lug Wire Size	Catalog Number
NGG, HGG, LGG	15-125	1,2,3	1	6	#6-#4 AL #14-#4 Cu	TA6GG04
NEG, HEG	15-125	1,2,3	3	3	#14-#2 AWG Cu	3TA3EG02
NEG, HEG	15-125	1,2,3	3	6	#14-#6 AWG Cu	3TA6EG06
ED2, ED4, ED6, HED4, HHED6, CED6	15-125	1,2,3	1	6	#14-#4 AWG Cu #6-#4 AWG Al	TA6ED06
F(X)D6-A, HF(X)D6, HHF(X)D6, CFD6	70-250	2,3	1	6	#14-#4 AWG Cu #6-#4 AWG Al	TA6FD04
JXD2-A, J(X)D6-A, HJ(X)D6-A, HHJ(X)D6-A, CJD6-A, SJD6-B, SHJD6-B, SCJD6-B, L(X)D6-A, HL(X)D6-A, CLD6-A, SLD6-B, SHLD6-B, SCLD6-B	200-600	2,3	1	6	#14-2/0 AWG Cu #6-2/0 AWG Al	TA6JD20

▲ Built to order. Allow 6-8 weeks for delivery.

① Used for 100% rated JD/LD frame circuit breakers.

② Special purpose wire connectors, not for general use.



# Modifications

## General Selection

A variety of internal and external accessories, as well as modifications, are available to adapt Siemens circuit breakers to special installation requirements. UL listed internal accessories for 100 through 2000A circuit breakers are field-addable.

Internal accessories fine tune an electrical distribution system, allowing control of the circuit breakers to meet special application requirements. For example, emergency situations may dictate tripping critically placed circuit breakers quickly. Shunt trips accomplish this conveniently and efficiently. Or, when voltage drops are a concern, undervoltage trips automatically open the circuit breaker at a predetermined voltage level.

A wide range of external operating and mounting accessories is also available. For example, face, shallow, and back mounting plates are ideal for tailoring BQ circuit breakers to OEM applications. A complete line of operating handles and handle-blocking devices meet switchboard, enclosure and safety needs. Plug-in mounting assemblies, which simplify switchboard mounting of circuit breakers and permit breaker removal without disconnecting bus or cable connections, are available.

### UL 489 Supplement SB Naval Use Breakers

Breakers tested to UL 489 Supplement SB are qualified for use on non combat and auxiliary naval vessels.

Siemens molded case breakers, including BL, NGB and Sentron ED through RD frames can be labeled "NAVAL" in compliance with UL 489 Supplement SB.

Supplement SB testing comprises two sets of vibration tests. The first is to find mechanical resonances in the product and to subject the breaker to extreme testing at each resonant frequency. The second is a swept frequency test, in which the frequency of excitation is changed in intervals of 1Hz, and held at each frequency for five minutes. The excitation frequencies run from 4 to 33Hz, and the test is conducted in each of the three orthogonal axes of the breaker.

During these tests, the breaker must not trip from the closed position, nor may the contacts touch from the open position. Calibration and insulation resistance are also verified during the test.

For detailed information, refer to UL 489, Supplement SB.

#### 50°C Ambient Calibration — Not UL listed and not available for solid state, 100% rated breakers or 400HZ calibrated breakers.

- For BL Type Circuit Breakers
  - Add suffix 'M' to catalog number (Example: B120M).....No Charge
- For BQ and ED Frame Circuit Breakers
  - Replace 'B' in catalog number with 'M'.....No Charge (Example: BQ3M060, ED63M060)
- For FD, JD, LD, LMD, MD, ND, PD, and RD Frame Circuit Breakers
  - Non-Interchangeable Trip (3-pole only) .....No Charge
  - Replace 'B' in catalog number with 'M' (Example: FXD63M225, JXD63M400)

#### 400 HZ Calibration

- UL Listed (5KA IR)
  - For BQ & BL Type Circuit Breakers (200A max.).....Add 25% to list price
  - Add suffix 'Y' to catalog number
- Not UL Listed
  - For all other Circuit Breakers, see derating tables on page 17/114 and order standard circuit breakers.

#### Fungus Proofing

- All BQD, CQD, GB, GG, ED, FD, JD, LD, LMD, MD, ND, PD, RD, DG, FG, JG, LG, MG, NG, and PG Frame Circuit Breakers are inherently fungus resistant and do not require special treatment.
- For BL, and BQ Type Circuit Breakers.....Add \$10.00 net per pole
  - Consult Sales Office for Availability
- For all other Circuit Breaker Types.....Add \$160.00 net per device
  - Consult Sales Office for Availability

**Certificate of Compliance with Test Report (catalog number CERT OF COMP.)** Add \$210.00 net  
 Certificate of compliance testing must be performed on the actual device being shipped. The certificate cannot be provided after initial shipment. Order for devices with COC requirement must be placed directly with the factory by the sales office and shipped directly to the end user.

### Ordering Information

For "NAVAL" label, add **\$75.** net per catalog number per order. Order must be placed directly with the factory by Siemens Sales Office.

Types	UL File
BQD/CQD	E10848, Vol 10, Sec 1
GG	E10848, Vol 10, Sec 2
GB	E10848, Vol 10, Sec 3
ED2, ED4, IIED4, HED6	E10848, Vol 4, Sec 11
CED6	E10848, Vol 4, Sec 13
FD6, FXD6, HFD6, HFXD6	E10848, Vol 4, Sec 17
CFD6	E10848, Vol 4, Sec 18
JXD2, JD6, JXD6, LXD6, LD6, HJD6, HJXD6, HLD6, HLXD6	E10848, Vol 4, Sec 8
HHJD6, HHJXD6, HHL6, HHLXD6	E10848, Vol 4, Sec 20
CJD6, CLD6	E10848, Vol 4, Sec 14
MD6, MXD6, HMD6, HMXD6, CMD6, ND6, NXD6, HND6, HNXD6, CND6	E10848, Vol 4, Sec 15
PD6, PXD6, HPD6, HPXD6, CPD6, RD6, RXD6, HRD6, HRXD6	E10848, Vol 4, Sec 19



# Internal Accessories

## General

### Feature Combinations

The available feature combinations are shown in the chart below. For applications requiring combinations of features not listed in this chart, consult the sales office for availability.

Breakers	Modules Per Breaker	Avail. On Breaker Poles	ST	ST/AUX	ST/ALSW	ST/AUX/ALSW	UVT	UVT/AUX	UVT/ALSW	UVT/AUX/ALSW	AUX	AUX/ALSW	ALSW	Elect. Bell Alarm	Ground fault	Grd fault w/Bell
QP, BQ, BL <sup>①</sup>	1	1, 2, 3	1	—	—	—	—	—	—	—	1,2	—	—	—	—	—
BQD, CQD, GB, GG	1	2, 3	1	1/1	—	—	—	—	—	—	1,2	1/1	1	—	—	—
QR	1, 2	2, 3	1	1/1	—	—	—	—	—	—	2	—	—	—	—	—
All ED	1	1, 2, 3	1	1/1,1/2	1/1	1/1/1	1	1/1, 1/2	1/1	1/1/1	1, 2	1/1, 2/1	1	—	1	1
All FD	2	2, 3	1	—	—	—	1	1/1	—	—	1, 2	1/1	1	—	—	—
All JD, LD, LMD <sup>②</sup>	2	2, 3	1	1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 1/2	1, 2	—	—	—
SJD, SHJD, SCJD,SLD, SHLD, SCLD <sup>③</sup>	1	3	1	1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 1/2	1, 2	—	—	—
All MD, ND, PD, RD Including Electronic trip <sup>④</sup>	2	2, 3	1	1/1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 2/1	1, 2	—	—	—
STD <sup>⑤</sup>	6	3	1	—	—	—	1	—	—	—	1 NC / 1 NO, 2 NC / 2 NO, 3 NC / 3 NO, 4 NC / 4 NO, 5 NC / 5 NO, 6 NC / 6 NO	—	1	1	—	—

#### Shunt Trip (ST)

One or all critical circuit breakers may be tripped from a distant control point by use of a shunt trip device. A shunt trip operates through an auxiliary switch contact; when the breaker opens, current is not maintained on the shunt trip coil.

#### Undervoltage Trip (UVT)

When voltage drops to a value below 35% of the nominal coil rating, the undervoltage trip device automatically opens the breaker. The operation is instantaneous, and the circuit breaker cannot be reclosed until the

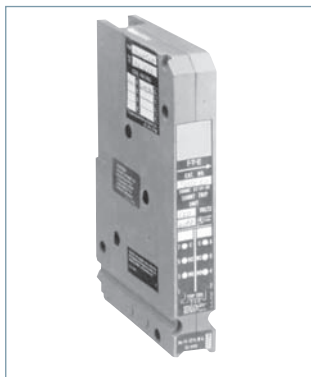
voltage returns to 85% of line voltage. The undervoltage trip, which is continuously energized, must be energized before the circuit breaker can be closed.

#### Auxiliary Switch (AUX)

For applications requiring remote "on" or "off" indication (or electrical interlocking), auxiliary switches are available. Each switch comprises an "A" (open when circuit breaker is open) and a "B" (closed when circuit breaker is open) contact with a common connection. (Form C)

#### Alarm Switch (ALSW)

The alarm switch contact is closed when the circuit breaker is opened automatically by an overload, short circuit, shunt trip or undervoltage trip. The alarm switch contact is open when the circuit breaker is reset.



For ED Frames



For FD Frames



For JD and LD Frames

① Factory assembled only  
② If mechanical interlock is installed, no accessory module can be installed in the right pocket.

③ If mechanical interlock is installed, no accessory module can be installed.  
④ If mechanical interlock is installed, no accessory module can be installed in the left pocket.

⑤ One module per column.

## Circuit Breaker Accessories ④⑤⑥⑦⑧⑨

Catalog Number	For Use With Breaker Type	Number of Poles	Standard Package
<b>Padlocking Device</b> For locking breaker in "OFF" position. Note "ON" position does not affect breaker functionally			
ECPLD1	Type QP, BL, QAF2, QPF2, QE, QT-Duplex, BQ, BQXD	1P	3 Pieces
ECPLD1R	Type QP, BL, QAF2, QPF, QE, QT-Duplex, BQ, BQXD (Red Color)	1P	3 Pieces
ECPLD2	Type QP, BL, QAF2, QPF, QE, QT-Triplex & Quadplex, BQ, BQXD	2P	3 Pieces
ECPLD2R	Type QP, BL, QAF2, QPF, QE, QT-Triplex & Quadplex, BQ, BQXD (Red Color)	2P	3 Pieces
ECPLD3	Type QP, BL, QAF2, QPF, QE, BQ	3P	1 Piece
US2:ECPLD3R	Type QP, BL, QAF2, QPF, QE, BQ (Red Color)	3P	1 Piece
ECQLD3	Type QP, BL, BQ, BQXD	1P	10 Pieces
ECQLD4	Type QT-Duplex	QT-Duplex Breakers	10 Pieces
ECQLN3 <sup>②</sup>	150-225 MBKA, QN, QNR	n/a	1 Piece
ECQTH4	Type QP, BL, BQH	Designed for (3) 1P Breakers	1 Piece
<b>Handle Tie</b> Provide simultaneous swiching of 2 adjacent handles.			
ECQTH2	Type QT Duplex	Designed for (2) QT Duplex Breakers	25 Pieces
ECQTH3	Type QP, BL	2P	50 Pieces
<b>Mechanical Interlock<sup>①</sup></b>			
ECQML12	Type QP, BL, BQ Interlock Bracket	Designed for 1" Breaker	10 Pieces
<b>Handle Blocking Device</b> For holding breaker in "ON" or "OFF" position. Not a lockout/tagout device			
ECQL1	Type QP, BL, BQ, BQXD	1P	10 Pieces
ECBX231M	Type QT-Duplex	1/2" Breakers	10 Pieces
<b>Main Breaker Retainer</b>			
ECMBR1 <sup>③</sup>	EQ Load Centers		1 Piece
ECMBR2	Ultimate Load Centers		1 Piece
<b>Mounting Accessories</b>			
MB120	Type BQ, BQH Mounting Clips	1P	20 Pieces
FP9508	Type BQ, BQH FACE MOUNT PLATE	1P	10 Pieces
FP9555	Type BQ, BQH FACE MOUNT PLATE	2P	10 Pieces
FP9556	Type BQ, BQH FACE MOUNT PLATE	3P	10 Pieces
SMB6R	Type BQ MOUNTING BRACKET	1P, 2P, 3P	6 Pieces
TCH65K	Type BQ MOUNTING ADAPTER		500 Pieces
BR2	Type BQ, BQH, BQXD Back Mounting Plates	2P	10 Pieces
BR3	Type BQ, BQH, BQXD Back Mounting Plates	3P	10 Pieces
BR4	Type BQ, BQH, BQXD Back Mounting Plates	4P	10 Pieces
I0204ML1125CU	Type QP Back Mounting Plates	1P, 2P	10 Pieces
I0303ML3100CU	Type QP Back Mounting Plates	3P	10 Pieces
<b>Replacement Lugs</b>			
TA1Q1	Type BQ, NGG 100A AI Cu LGS	n/a	6 Pieces
TC1Q1	Type BQ, NGG 40A AI Cu LUGS	n/a	6 Pieces
<b>Finger Shield</b>			
BQFS1K	Type BQXD Finger Shield (Bulk Pack)	n/a	1000 Pieces
BQFS2	Type BQXD Finger Shield	n/a	2 Pieces
<b>Filler Plate</b>			
ECQF3	1" Filler Plate	n/a	5 Pieces

① For a complete list of standby power mechanical interlock kits, see the Standby Generator Section

② For use with Ultimate Load Center Main Breakers

③ Not suitable for use on 15-50A, 10 AIC Type QP Circuit Breakers

④ QP Type includes QPH, HQP

⑤ BL Type includes BLH, HBL

⑥ BQ Type includes BQH, HBO

⑦ QAF2 Type includes QAFH2, BAF2, BAFH2, QFGA2, QFGAH2, BFGA2, BFGAH2

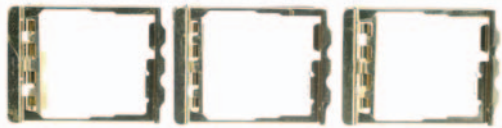
⑧ QPF Type includes QPHF, BLF, BLHF

⑨ QE Type includes QEH, BLE, BLEH

**Padlocking Device**



ECPLD1



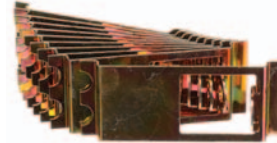
ECPLD2



ECPLD1R/2R/3R (Single pole pictured. 2-/3-pole available)



ECQLD3



ECQLD4



ECQTH4

**Handle Tie**



ECQTH2



ECQTH3

**Handle Blocking Device**

ECQL1



ECBX231M



**Main Breaker Retainer**

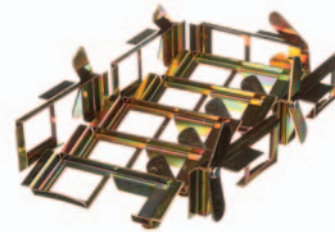


ECMBR1



ECMBR2

**Mechanical Interlock**



ECQML12

**Mounting Accessories**



MB120



SMB6R



I0204ML1125



FP9508



FP9555



FP9556

# External Accessories

## Selection

### Handle Ties with Padlock Device

Provide simultaneous switching of 2 or 3 adjacent handles.  
Do not provide common trip.

For Use With Breaker Frame(s)	Catalog Number	Standard Package	Wt Lb/Std Pkg
BQD, NGB, HGB, LGB	<b>BQDHT2</b>	10	½
	<b>BQDHT3</b>	10	½

### Padlocking Devices

For locking breaker in "OFF" position.

All QR	<b>HPLQR</b>	1	¼
All BQD, CQD, NGB, HGB, LGB	<b>BQDPLD</b>	1	⅝
NGG, HGG, LGG	<b>HPLG</b>	1	¼
EB, 1- thru 3-pole	<b>HPLEB</b>	1	⅝
EG, 3- and 4-pole only	<b>HPLE</b>	1	¼
All ED	<b>ED2HPL</b>	1	¼
All FD	<b>FD6PL1</b>	1	¼
All JD, LD, LMD	<b>JD6HPL</b>	1	¼
All MD, ND, PD, RD	<b>MN6PLD</b>	1	¼

### Handle Blocking Devices

For holding breaker in "ON" or "OFF" position.  
Not a lockout/tagout device.

All QR	<b>HBLQR</b>	1	1
All BQD, CQD, GG, GB	<b>BQDHBD</b>	1	¼
EG	<b>HBDE</b>	1	¼
All ED	<b>E2HBL</b>	1	¼
All FD	<b>FD6HB1</b>	1	½
All JD, LD, LMD	<b>JD6HBL</b>	1	½
All MD, ND, PD, RD	<b>MN6BL</b>	1	½

### Handle Extensions

For replacement. One extension shipped with breaker.

All MD, ND, PD, RD	<b>EX11</b>	1	2
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### Terminal Shields

Breaker Type	Poles	Catalog Number	Standard Package
NGG	3	<b>TSSG3A</b>	1
HGG, LGG	1	<b>TSSG61</b>	1
	2	<b>TSSG62</b>	1
	3	<b>TSSG63</b>	1



FD Padlocking Device  
**FD6PL1**



FD Handle Blocking Device  
**FD6HB1**



Handle Extension  
**EX11**

■ Built to order. Allow 2-3 weeks for delivery.

Ⓞ Sold only in standard package quantities.

# External Accessories

## Selection

### Face Mounting Plates

For Use With Breaker Frame(s)	Number of Poles	Catalog Number	Standard Package	Wt Lb/Std Pkg
CQD, CQD6	1	CQDFMB1	1	¼
	2	CQDFMB2■	1	¼
	3	CQDFMB3■	1	¼
NGG, HGG, LGG	1	FMPG1	1	¼
	2	FMPG2	1	¼
	3	FMPG3	1	¼

### Back Mounting Plates

ED2, ED4, ED6, HED4, HED6	1	E2BMB	1	¼
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### Mounting Screw Kits

CQD, CQD6	CQDSMK <sup>①</sup>	1	1¼
NGG, HGG, LGG	MSKG4 <sup>①</sup>	1	¼
All QR	MSQR3	1	⅓
All ED (CED6 requires 2 kits)	MSE6 <sup>①</sup>	1	¼
	MSE6100 <sup>②</sup>	100 <sup>②</sup>	1
All FD (CFD6 requires 2 kits)	MSF6 <sup>①</sup>	1	¼
	MSF650 <sup>②</sup>	50 <sup>②</sup>	1
All EG 1-pole	MSKE1	—	—
All EG 2-pole	MSKE2	—	—
All EG 3 or 4-pole	MSKE4	—	—
All JD, LD	MSJ6 <sup>①</sup>	1	¼
All LMD	MSLMD	1	¼
All MD, ND,	MSMN	1	¼
All PD, RD	MSPR6	1	2



Mounting Screw Kit  
MSE6



Mechanical Interlock  
MI5444

### "MI" Mechanical Interlocks

For Use With Breaker Type(s)	Panel <sup>②</sup> Mounted	Plug-in Mounted	Standard Package	Wt Lb Std Pkg
All EG (Sliding Bar)	HSBE	—	1	—
All QR (Sliding Bar)	SBMIQR	—	1	1½
All FD	MI5444	MI5444	1	—
All JD, LD	MI5413 <sup>④</sup>	—	1	1
All LMD	MI5406 <sup>④</sup> ■	—	1	1
All MD	MI5404 <sup>⑤</sup> ■	—	1	3
All ND	MI5404 <sup>⑤</sup> ■	—	1	3
All PD, RD	MI5405 <sup>⑤</sup> ▲	—	—	—

■ Built to order. Allow 2–3 weeks for delivery.

▲ Built to order. Allow 6–8 weeks for delivery.

① Kit consists of 4 screws and washers.

② Consists of 1 screw and washers (order 100).

③ Consists of 1 screw and washers (order 50).

④ With mechanical interlock in place, no accessory can be installed into circuit breaker right pole.

⑤ Addition of the mechanical interlock will prevent accessory installation in the left pole.

⑥ Sold only in standard package quantities. Multiply List Price Each times package quantity for full price.

⑦ Mechanical interlock is not designed for use within Siemens panelboards.



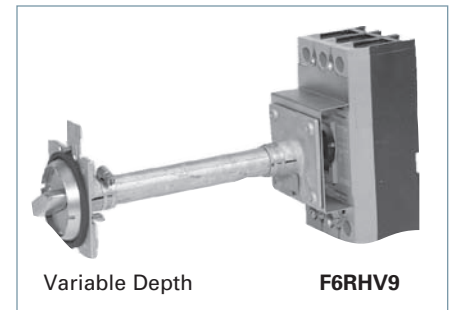
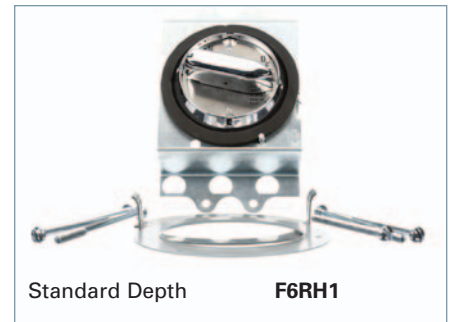
# External Accessories

## Selection

### Rotary Door Mounted Operating Handles

Types 1, 3, 3R, 12, 4 4X

For Use With Breaker Frames	Complete Mechanism		Handle Only	Breaker Operator	Shaft Only	
	Catalog Number		Catalog Number	Catalog Number	Length (inches)	Catalog Number
	Standard Depth	Variable Depth				
EG	RHVE64X	RHVE124X	—	—	—	—
ED <sup>①</sup>	CRHOESD	CRHOEVD	CRHOH <sup>③</sup>	RHOEBO	2	RHOSSD
FD	CRHOFSD	CRHOFVD		RHOFBO	12	RHOSVD
JD, LD	CRHOJSD	CRHOJVD		RHOJBO	16	RHOSXD
LMD	CRHOLMSD	CRHOLMVD		RHOLMBO		
MD, ND PD, RD	RHONSD	RHONVD	RHOH <sup>③</sup>	RHONBO <sup>④</sup>	3 12 24	RHONSSD▲ RHONSVD RHONSXD



### Rotary Door Mounted Operating Handles

Types 1 & 12

For Use With Breaker Frames	Standard Depth Catalog Number	Variable Depth Catalog Number	Handle and Shaft Catalog Number	Breaker Operator Catalog Number
CQD, NGG, HGG, LGG	—	RHOCQVD	RHOH6Z <sup>②</sup>	CQDOP
ED	D11CEU1	D11CEU2	—	—
FD	D11CFU1▲	D11CFU2	—	—
JD, LD	—	D11CJU2	—	—

For CQD, NGG, HGG and LGG red emergency handle, order assembly RHOCQVDE (includes handle and operator).▲ For CQD, NGG, HGG and LGG in a NEMA 3R enclosure, order CQDOP34 operator, RHOH handle and RHOSVD shaft. For CQD, NGG, HGG and LGG in a NEMA 4 or 4X enclosure, order CQDOP34 operator, RHOH4 handle and RHOSVD shaft.

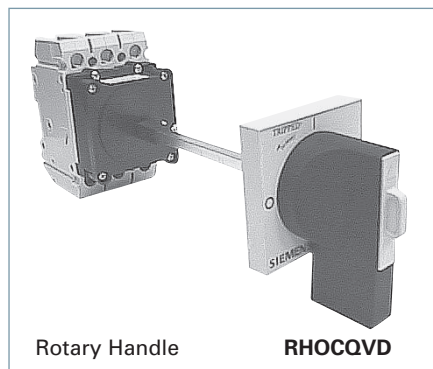
### Through Door Mounted Operating Handles<sup>②</sup>

Types 1 & 12

For Use With Breaker Frames	Standard Depth Catalog Number	Variable Depth Catalog Number
CQD, NGG, HGG, LGG	FMHOS	—
EG (3 & 4-Pole only)	RHFESD	—
EG (red handle)	RHFESDEM	—
ED	E2RH1	E2RHV9
FD	F6RH1	F6RHV9

### Door Latch Kits

Type	Catalog Number	
	Right Hand	Left Hand
2 point latch	DKR2	DKL2■
3 point latch	DKR3	DKL3■



④ For extended shaft support order catalog number RHONSB2.  
⑤ Length of shaft is 300mm (11.8 inches).

■ Built to order. Allow 2-3 weeks for delivery.  
▲ Built to order. Allow 6-8 weeks for delivery.  
① For use on 3-pole ED frame only.

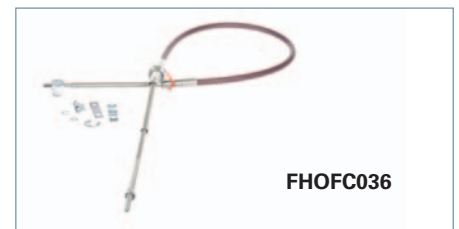
② Meets the requirements of NFPA 79, section 5.3.3.1 for locking external operator disconnecting devices.  
③ For 3 or 3R, order shaft and breaker operator as shown, and handle RHOH. For 4 & 4X, order handle RHOH4. Consult sales office for additional EG operator shaft lengths.

# External Accessories

## Selection

### Max-Flex™, Flange Mounted Variable Depth Operators<sup>③</sup>

Frames	NEMA Type	Complete Kit Catalog Number	Handle Only Catalog Number	Breaker Operator Catalog Number	36" Cable Catalog Number
GG	1, 3 (R), 12	MFKG3R3	MFHG3R	MFMG	MFCF036
	4 (x)	MFKG4X3	MFHG4X		
EG	1, 3 (R), 12	MFKE3 <sup>④</sup>	—	—	—
	4 (x)	MFKE4X3	—		
ED	1, 3 (R), 12	FHOE036 <sup>①</sup>	FHOH	FHOEBO <sup>①</sup>	FHOEC036
	4 (x)	—	FHOH4		
FD	1, 3 (R), 12	FHOF036	FHOH	FHOFBO	FHOF036
	4 (x)	—	FHOH4		
JD, LD, SJD, SLD	1, 3 (R), 12	FHOJ036	FHOH	FHOJBO	FHOJC036
	4 (x)	—	FHOH4		
LMD	1, 3 (R), 12	FHOLM036	FHOH	FHOLMBO	FHOJC036
	4 (x)	—	FHOH4		
MD, ND, PD, RD, SMD, SND, SPD	1, 3 (R), 12	FHON048	FHOHN	FHONBO	FHONC048 <sup>②</sup>
	4 (x)	—	FHOHN4		



Max-Flex™ handles are available with solid black handles instead of the customary "red for on" flange handle. These are preferred for use in IEC markets, where red handles have specific meaning. Order components separately, appending the letter "i" to the catalog number (e.g. FHOHI).

### Alternate Length Cable Only

	ED	FD	JD/LD/LMD	MD/ND/PD/RD
Inches	Catalog Number	Catalog Number	Catalog Number	Catalog Number
48	FHOEC048	FHOFC048	FHOJC048	FHONC048
60	FHOEC060	FHOFC060	FHOJC060	FHONC060
72	FHOEC072	FHOFC072	FHOJC072	FHONC072
96	FHOEC096	FHOFC096	FHOJC096	FHONC096
120	FHOEC120▲	FHOFC120	FHOJC120▲	FHONC120▲
144	FHOEC144▲	FHOFC144▲	FHOJC144▲	FHONC144▲

### Handle Auxiliary Switch

For use with Max-Flex and Rotary Door operators (FHOH and RHOH). 1 NO and 1 NC contact (Form C).

For Use With	Catalog Number
ED, FD, JD, LD, LMD, ND, PD, RD, SD, Max Flex	HAS1

### Fixed Depth Flange Mounting

Frames	Minimum Enclosure Depth	NEMA Type	Left Hand Mount	Right Hand Mount
			Catalog Number	Catalog Number
ED <sup>⑤</sup>	6.44	1, 3R, 12	FDFBEL▲	FDFBER▲
			FDFBEL4▲	FDFBER4▲
FD	6.44	1, 3R, 12	FDFBFL▲	FDFBFR▲
			FDFBFL4▲	FDFBFR4▲

Max-Flex™ handles are available with solid black handles instead of the customary "Red for On" flange handle. These are preferred for use in IEC markets, where red handles have specific meaning. Order components separately, appending the letter "i" to the catalog number (e.g. FHOHI).

▲ Built to order. Allow 6-8 weeks for delivery.

① For 1- or 2-pole breaker order FHOE036 complete kit or FHOEBO breaker operator only. Use MFHM3R handle.

② 48 inch cable is standard length for M through R frame Max-Flex operators.

③ Meets requirements of NFPA 79, section 5.3.3.1 for locking external operator disconnecting devices

④ Consult sales office for additional cable lengths for EG Flex Shaft Operators. For 3-Pole only.

⑤ 3-Pole ED only.

# External Accessories

## Selection/Dimensions

### Telemand® Motor Operator

Breaker Frame	AC Voltage	Hinged to Open Down Catalog Number
ED except CED	120	MOE6120
	240	MOE6240▲

ED motor operator opens downward.

Breaker Frame	DC Voltage	Hinged to Open Right Catalog Number	AC Voltage	Hinged to Open Right Catalog Number
FD	24	MOF6024DC▲	120	MOF6120
	48	MOF6048DC▲	240	MOF6240
	125	MOF6125DC▲		
JD, LD	24	MOJ6024DC▲	120	MOJ6120
	48	MOJ6048DC▲	240	MOJ6240
	125	MOJ6125DC▲		
LMD	24	MOLMD6024DC▲	120	MOLMD6120
	48	MOLMD6048DC▲	240	MOLMD6240
	125	MOLMD6125DC▲		
MD, ND, PD, RD	—	—	120	EMOPL120MN
	—	—	240	EMOPL240MN

To order FD through RD motor operators with Left side hinges, add "L" to catalog number (e.g. MOF6120L). List prices are the same.▲



Telemand Motor Operator

### Dimensions

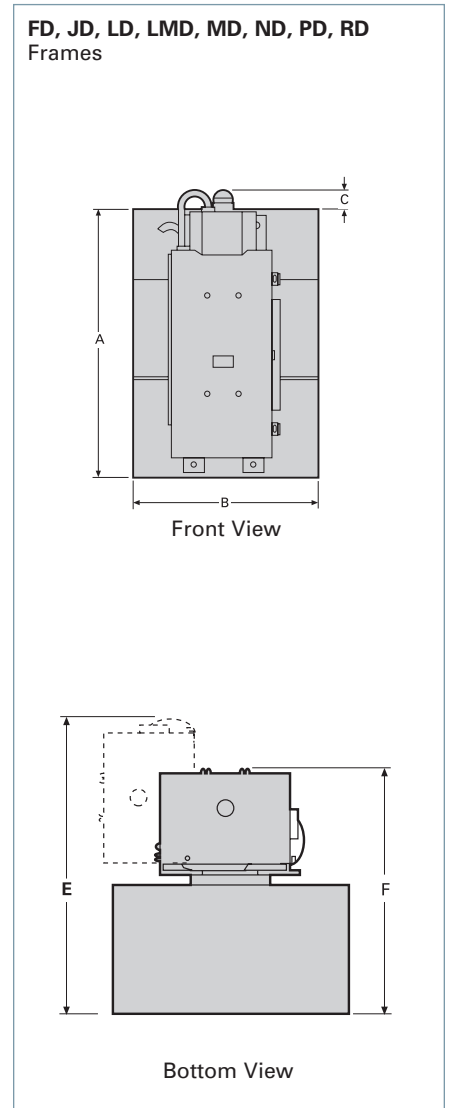
Frame	A	B	C	D	E	F
ED	7.04	4.31	—	4.31	13.84	8.84
FD	9.50	4.55	1.60	6.84	9.70	7.58
JD, LD, LMD	11.00	7.50	0.79	8.34	9.85	7.74
MD, ND, PD, RD	16.00	9.00	—	9.83	13.13	10.13

### Operating Currents

Catalog Number	On			Off			Reset (Amps)
	In-Rush (Amps)	Running (Amps)	Time (msec)	In-Rush (Amps)	Running (Amps)	Time (msec)	
MOE6120	10.25	2.3	550	10	2.3	400	2.3
MOE6240	5.2	1.1	500	5	1	330	1.1
MOF6120/L	13.6	5.5	200	13.6	5.5	175	5.5
MOF6240/L	7.6	3.5	200	7.6	3.5	185	3.5
MOLMD6120/L	13.6	6	210	13.6	6	185	6
MOJ6120/L	13.6	6	210	13.6	6	185	6
MOJ6240/L	7.6	3.5	217	7.6	3.5	185	3.5
EMOPL120MN	15	5.5	500	15	5.5	500	5.5
EMOPL240MN	7.6	3.25	500	7.6	3.25	500	3.25

For inches / millimeters conversion, see Application Data section.

▲ Built to order. Allow 6-8 weeks for delivery.



Front View

Bottom View

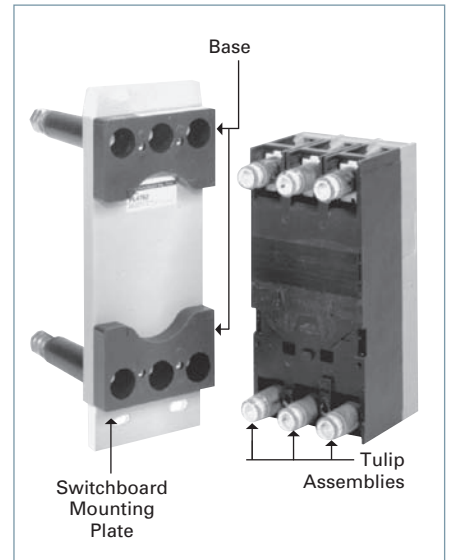


# External Accessories

## Selection

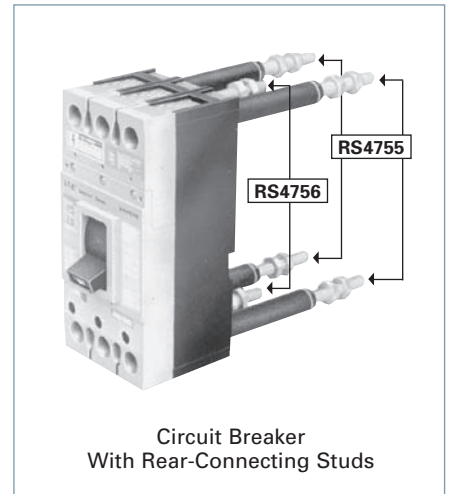
### Plug-In Mounting Assemblies, Including Base and Tulip Assemblies

For Use With Breaker Frames	Poles	Line Side	Load Side	Steel Switchboard Mounting Plate <sup>①</sup> Catalog Number
		Catalog Number <sup>②</sup>	Catalog Number <sup>②</sup>	
EG	3	PCBERC3 <sup>③</sup>	—	—
	4	PCBERC4 <sup>③</sup>	—	
All ED except CED	2	PC2637▲	PC2638▲	PL2616
	3	PC2657	PC2658	
CED	2	PC2637▲	PC2638▲	PL2617
	3	PC2657	PC2658	
All FD except CFD	2	PC4753▲	PC4753▲	PL4762
	3	PC4754	PC4754	
CFD	2	PC4753▲	PC4753▲	PL4763
	3	PC4754	PC4754	
All JD except CJD	2	PC5777▲	PC5777▲	PL5796
	3	PC5778	PC5778	
Kit CJD, SCJD	3	PCCJD	PCCJD	PL5797
All LD except CLD	2	PC5660▲	PC5660▲	PL5680
	3	PC5661	PC5661	
Kit CLD, SCLD	3	PCCLD	PCCLD	PL5797
All MD	2	PC5662▲	PC5662▲	PL9698
	3	PC5663	PC5663	
All ND	2	PC5664 <sup>③</sup> ▲	PC5664 <sup>③</sup> ▲	PL9699
	3	PC5666 <sup>③</sup>	PC5666 <sup>③</sup>	



### Tulip Assemblies Separately

For Frame	2-Pole	3-Pole
	Catalog Number	Catalog Number
ED	TCE2▲	TCE3▲
FD	TCF2▲	TCF3▲
JD	TCJ2▲	TCJ3▲
LD	TCL2▲	TCL3▲
MD	TCM2▲	TCM3▲
ND	TCN2▲	TCN3▲



### Rear-Connecting Studs

For Use With Breaker Frames	Ampere Rating	Description	Extension Behind Breaker (inches)	Line Side	Load Side
				Catalog Number <sup>④</sup>	Catalog Number <sup>④</sup>
All ED	100	Line Side (Short)	2.38	RS2643 <sup>⑤</sup> ▲	—
	100	Load Side (Short)	2.38	—	RS2644 <sup>⑤</sup> ▲
	100	Line Side (Long)	4.88	RS2641 <sup>⑤</sup> ▲	—
	100	Load Side (Long)	4.88	—	RS2642 <sup>⑤</sup> ▲
All FD	250	Short	3.12	RS4756 <sup>⑤</sup> ▲	RS4756 <sup>⑤</sup> ▲
	250	Long	7.06	RS4755 <sup>⑤</sup> ▲	RS4755 <sup>⑤</sup> ▲
All JD	400	Short	5.85	RS5774▲	RS5774▲
	400	Long	11.20	RS5773▲	RS5773▲
All LD	600	Short	5.85	RS5784▲	RS5784▲
	600	Long	11.20	RS5783▲	RS5783▲
CJD, SCJD CLD, SCLD	Add required shield kit.				CLRSJL3
LM(X)D6, HLM(X)D6	800	Short	5.85	RS5788▲	RS5788▲
		Long	11.20	RS5787▲	RS5787▲
All MD, ND	1200	Short	5.50	RS5786▲	RS5786▲
		Long	8.00	RS5785▲	RS5785▲

▲ Built to order. Allow 6-8 weeks for delivery.

①Furnished at no extra charge when ordered with plug-in mounting assembly.

②Each piece catalog number consists of (1) mounting block assembly and required tulip assemblies (2) for 2-pole, (3) for 3-pole

③For vertical bus mounting — for horizontal, substitute PC5665 for PC5664 and PC5667 for PC5666.

④Price includes one current stud, insulating tube, stud nuts and terminal shields, when required.

⑤For proper electrical clearance, studs must alternate between short and long stud lengths on circuit breaker poles (e.g. SLSLSL or LSLSL).

⑥Plug-in assembly for EG breakers include line and load side in one assembly.

# Unusual Operating Conditions

## Reference

**Note:** The information provided on this and the next page is intended for reference and recommendation only. Because several variables can act on a circuit breaker’s performance at the same time, the data below is based less on controlled testing, than on experience and engineering judgment. Contact Siemens for further information on special conditions and treatment.

### High Ambient Temperatures

Because thermal-magnetic trip breakers are temperature sensitive and calibrated for a specific ambient of 40° C (104° F) (average enclosure temperature), a higher ambient will cause the breaker to trip at lower current than its nameplate rating, in other words, causing the breaker to “derate” (see Table 1). Similarly, the current carrying capacity of a circuit conductor is based upon a certain ambient temperature, a higher ambient will reduce its current carrying capacity, causing it to “derate.” Thus, with a fluctuating temperature, a thermal-magnetic breaker will derate nearly parallel with its connected circuit conductors and maintain close circuit protection. If the application temperature exceeds 40° C (104° F) and is known, either a breaker specially calibrated for the higher ambient or one oversized according to Table 1 may be selected. In a case such as this, the circuit conductors should be oversized as well. Siemens Sensitrip® IV and Type SB Encased Systems Breakers are insensitive to temperature changes. However, they do include circuitry to protect the components from abnormally high temperatures.

### Moisture — Corrosion

For atmospheres having high moisture content and / or where fungus growth is prevalent, a special preventive treatment may be required.

Where the air is heavily laden with corrosive elements, breakers made with special corrosion-resistant finishes may be required.

### Altitude

Reduced air density at altitudes greater than 6600 ft. (2000 meters) affects the ability of a molded case circuit breaker to transfer heat and interrupt faults. Therefore, circuit breakers applied at these altitudes should have interrupting, insulation and continuous currents derated as indicated in Figure 1.

**Table 1 — Temperature Derating Data for Thermal-Magnetic Breakers**

Reference Ampere Rating at 40°C (104°F)	Ampere Rating at:		Siemens Breaker Frames
	50°C (122°F)	60°C (140°F)	
15	13	11	BQ, BL, BQD, CQD, GG, GB, ED
20	18	16	
25	23	21	
30	28	26	
35	30	28	
40	37	34	
50	46	42	
60	56	52	
70	65	60	
90	84	78	
100	94	87	
125	114	100	
150	136	120	
175	159	140	
200	182	160	
225	205	180	
250	235	220	
300	276	252	
350	325	301	
400	372	340	
500	468	435	
600	564	525	
700	658	613	
800	754	704	
900	828	749	
1000	900	825	
1200	1090	1000	
1400	1304	1148	
1600	1500	1320	
1800	1690	1485	
2000	1880	1650	
			QR
			FD
			JD
			LD
			MD
			ND
			PD
			RD

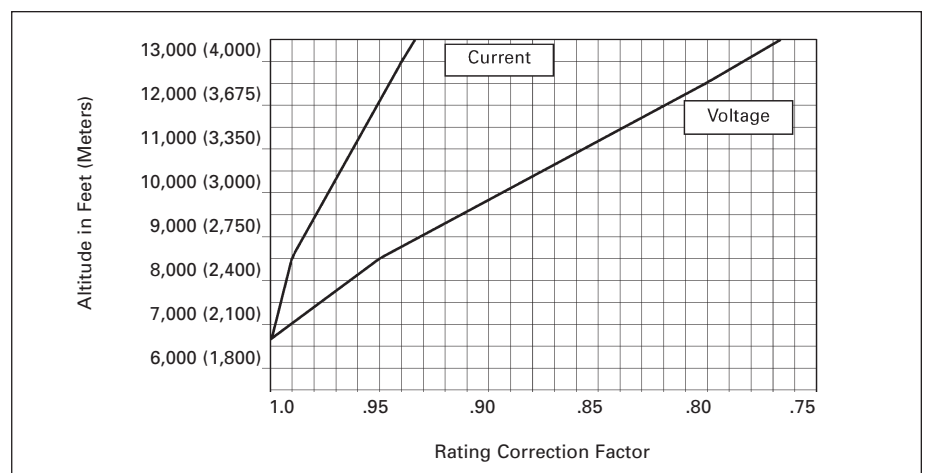


Figure 1 — Altitude Adjustment

# Unusual Operating Conditions

## Reference

### 400 Hz Systems<sup>①</sup>

Siemens molded case circuit breakers can be applied for overcurrent protection on 400Hz systems, commonly used to power computer installations, aircraft, military and other specialty equipment. Below are basic guidelines.

#### Circuit Breaker Derating Required

This table lists the maximum continuous current carrying capacity for Siemens breakers at 400Hz. Due to the increased resistance of the copper sections resulting from the skin effect produced by eddy currents at these frequencies, circuit breakers in many cases require derating. The thermal derating on these devices is based upon 100%, three phase application in open air in a maximum of 40°C (104°F) with 48 in. (1219 mm) of the specified cable or bus at the line and load side. Additional derating of not less than 20% will be required if the circuit breaker is to be utilized in an enclosure. Further derating may be required if the enclosure

ambient temperature exceeds 40°C (104°F).

#### Cable and Bus Sizing

The cable and bus sizes to be utilized at 400Hz are not based on standard National Electric Codes tables for 60Hz application. Larger cross sections are necessary at 400Hz. All bus bars specified are based upon mounting the bars in the vertical plane to allow maximum air flow. All bus bars are spaced at a minimum of 0.25 in. (6 mm) apart. Mounting of bus bars in the horizontal plane will necessitate additional drafting. Edgewise orientation of the bus may change the maximum ratings indicated. If additional information is required for other connections of cable or bus, contact Siemens for information.

#### Application Recommendations

It is recommended that temperatures be measured on the line and load terminals or T-connectors of the center pole. These

are usually the hottest terminals with a balanced load. A maximum temperature of 75°C (35°C over a maximum ambient of 40°C) would verify the particular application. Temperature profiles taken on these breakers can be correlated to ensure that the hottest points within the breaker are within the required temperature limits.

#### Factory Configuration

When required, molded case circuit breakers may be factory calibrated for 400Hz application. These breakers are specially labeled for 400Hz usage and their nameplate current rating will include the necessary derating factory. The highest "Maximum Continuous Amperes" rating at 400Hz, found in the table below approximates the highest specially calibrated 400Hz nameplate ampere rating available for a given frame size. Contact Siemens for ordering information on other breakers applied in 400Hz systems.

### 400Hz Breakers

Siemens Breaker Type	Maximum Continuous Ampere Rating At 40°C (104°F) <sup>②</sup>			75°C (167°F) Copper Cable per Pole	
	60HZ		400HZ	No of Pieces	Wire Size
	Open Air	Open Air <sup>③</sup>	Enclosed After Derating		
ED2, ED4, ED6, BOD, HED4, HED6, CED6, GG, GB	15	15	12	1	#14
	20	20	16	1	#12
	25	25	20	1	#10
	30	30	24	1	#10
	35	35	28	1	#10
	40	40	32	1	#8
	45	43	34	1	#8
	50	48	38	1	#8
	60	57	46	1	#6
	70	67	54	1	#4
	80	76	61	1	#4
	90	86	69	1	#3
	100	95	76	1	#3
QR2, QR2H, HQR2, HQR2H, FD6, FXF6, HFD6, HFXD6, CFD6	110	105	84	1	#2
	125	119	95	1	#1
	70	63	50	1	#4
	80	72	58	1	#4
	90	80	64	1	#3
	100	90	72	1	#3
	110	95	75	1	#2
	125	105	84	1	#1
	150	125	100	1	#1/0
	175	140	112	1	#2/0
JXD2, JD6, JXD6, HJD6, HJXD6, HHJD6, HHJXD6, CJJD6	200	160	128	1	#3/0
	225	180	144	1	#4/0
	250	200	160	1	250 kcmil
	200	170	136	1	#3/0
	225	190	152	1	#4/0
	250	210	168	1	250 kcmil
	300	240	192	1	350 kcmil
	350	260	208	1	500 kcmil
	400	300	240	2	#3/0
	JD6, JXD6, HJD6, HJXD6 100% Rated	200	170	170	2
225		190	190	2	#4/0
250		210	210	1	250 kcmil
300		240	240	1	350 kcmil
350		260	260	1	500 kcmil
400		300	300	2	#3/0

Siemens Breaker Type	Maximum Continuous Ampere Rating At 40°C (104°F) <sup>②</sup>			75°C (167°F) Copper Cable per Pole	
	60HZ		400/415HZ	No of Pieces	Wire Size
	Open Air	Open Air <sup>③</sup>	Enclosed After Derating		
LD6, LXD6, HLD6, HLXD6, HHL6, HHLXD6, CLD6	250	210	168	1	250 kcmil
	300	240	192	1	350 kcmil
	350	260	208	1	500 kcmil
	400	300	240	2	#3/0
	450	340	272	2	#4/0
	500	375	300	2	250 kcmil
	600	420	336	2	350 kcmil
	250	210	210	1	250 kcmil
LD6, LXD6, HLD6, HLXD6, 100% Rated	300	240	240	1	350 kcmil
	350	260	260	1	500 kcmil
	400	300	300	2	#3/0
	450	340	340	2	#4/0
	500	375	375	2	250 kcmil
	600	420	420	2	350 kcmil
	500	400	320	2	250 kcmil
	600	430	360	2	350 kcmil
MD6, MXD6, HMD6, HMXD6, CMD6	700	500	400	3	250 kcmil
	800	560	448	3	300 kcmil
	500	400	400	2	250 kcmil
	600	430	430	2	350 kcmil
MD6, MXD6, HMD6, HMXD6, CMD6 100% Rated	700	500	500	3	250 kcmil
	800	560	560	3	300 kcmil
	800	560	448	3	300 kcmil
	900	600	480	3	350 kcmil
ND6, NXD6, HND6, HNXD6, CND6	1000	650	520	3	400 kcmil
	1200	780	624	4	350 kcmil
	900	600	600	3	350 kcmil
	1000	650	650	3	400 kcmil
ND6, NXD6, HND6, HNXD6, CND6 100% Rated	1200	780	780	4	350 kcmil
	1200	780	624	4	400 kcmil
	1400	850	680	4	500 kcmil
	1600	960	768	5	500 kcmil
PD6, PXD6, HPD6, HFXD6, CPD6	1200	780	780	4	400 kcmil
	1400	850	850	4	500 kcmil
	1600	960	960	5	500 kcmil
	1600	960	768	5	500 kcmil
PD6, PXD6, HPD6, HFXD6, CPD6 100% Rated	1800	960	960	5	500 kcmil
	1800	1080	864	5	500 kcmil
	2000	1200	960	6	500 kcmil
	RD6, RDX6, HRD6, HRXD6 80% Rated				

①The information provided on this page is intended for reference and recommendation only. Because several variables can act on a circuit breaker's performance at the same time, the data above is based less on

controlled testing, than on experience and engineering judgment. Contact Siemens for further information on special conditions and treatment.  
②Additional derating may be required if the ambient

temperature is greater than 40°C (104°F).  
③Calculated after derating to compensate for the heating of the copper conductor, caused by the skin effect generated by eddy currents produced at 400/415Hz.

# Unusual Operating Conditions

## Reference

### Unusual Operating Conditions 400 Hz Systems

#### Circuit Breaker Derating Required

This table lists the maximum continuous current carrying capacity for Siemens breakers at 400Hz. Due to the increased resistance of the copper sections resulting from the skin effect produced by eddy currents at these frequencies, circuit breakers in many cases require derating. The thermal derating on these devices is based upon 100%, three phase application in open air in a maximum of 40°C (104° F) with 48 in. (1219 mm) of the specified cable or bus at the line and load side. Additional derating of not less than 20% will be required if the circuit breaker is to be utilized in an enclosure. Further derating may be required if the enclosure ambient temperature exceeds 40°C(104° F).

#### Cable and Bus Sizing

The cable and bus sizes to be utilized at 400Hz are not based on standard National Electric Codes tables for 60Hz application. Larger cross sections are necessary at 400Hz. All bus bars specified are based upon mounting the bars in the vertical plane to allow maximum air flow. All bus bars are spaced at a minimum of 0.25 in. (6 mm) apart. Mounting of bus bars in the horizontal plane will necessitate additional drafting. Edgewise orientation of the bus may change the maximum ratings indicated. If additional information is required for other connections of cable or bus, contact Siemens for information.

#### Application Recommendations

It is recommended that temperatures be measured on the line and load terminals or T-connectors of the center pole. These are usually the hottest terminals with a balanced load. A maximum temperature of 75°C (35°C over a maximum ambient of 40°C) would verify the particular application. Temperature profiles taken on these breakers can be correlated to ensure that the hottest points within the breaker are within the required temperature limits.

#### Interrupting Rating

Circuit breakers used in 400 Hz systems are limited to a 5000 A interrupting rating. If higher ratings are required, consult Siemens.

Breaker type	Maximum continuous ampere rating at 40°C (104°F)②			75°C (167F) Copper cable per pole	
	60HZ		Enclosed after derating	No of pieces	Wire size
	Open air	Open air③			
DG	50	48	38	1	#8
	60	57	46	1	#6
	70	63	50	1	#4
	80	72	58	1	#4
	90	80	64	1	#3
	100	90	72	1	#3
	110	95	75	1	#2
	125	105	84	1	#1
	150	125	100	1	#1/0
FG	100	90	72	1	#3
	110	95	75	1	#2
	125	105	84	1	#1
	150	125	100	1	#1/0
	175	140	112	1	#2/0
	200	160	128	1	#3/0
	225	180	144	1	#4/0
	250	200	160	1	250 kcmil
JG	250	210	168	1	250 kcmil
	300	240	192	1	350 kcmil
	350	260	208	1	500 kcmil
	400	300	240	2	#2/0
JG 100% Rated	250	210	210	1	250 kcmil
	300	240	240	1	350 kcmil
	350	260	260	1	500 kcmil
	400	300	300	2	#3/0
LG	400	300	240	2	#3/0
	500	375	300	2	250 kcmil
	600	420	336	2	350 kcmil

Breaker type	Maximum continuous ampere rating at 40°C (104°F)②			75°C (167F) Copper cable per pole	
	60HZ		Enclosed after derating	No of pieces	Wire size
	Open air	Open air③			
LG	400	300	240	2	#3/0
	500	375	300	2	250 kcmil
	600	420	336	2	350 kcmil
MG	600	430	360	2	350 kcmil
	700	500	400	3	250 kcmil
	800	560	448	3	300 kcmil
MG 100% Rated	600	430	430	2	350 kcmil
	700	500	500	3	250 kcmil
	800	560	560	3	300 kcmil
NG	800	560	448	3	300 kcmil
	900	600	480	3	350 kcmil
	1000	650	520	3	400 kcmil
	1200	780	624	4	350 kcmil
NG 100% Rated	900	600	600	3	350 kcmil
	1000	650	650	3	400 kcmil
	1200	780	780	4	350 kcmil
	1200	780	624	4	400 kcmil
PG	1400	850	680	4	500 kcmil
	1600	960	768	5	500 kcmil
	1200	780	780	4	400 kcmil
PG 100% Rated	1400	850	850	4	500 kcmil
	1600	960	960	5	500 kcmil

① The information provided on this page is intended for reference and recommendation only. Because several variables can act on a circuit breaker's performance at the same time, the data above is based less on controlled testing, than on experience and engineering

judgment. Contact Siemens for further information on special conditions and treatment.  
② Additional derating may be required if the ambient temperature is greater than 40°C (104°F).

③ Calculated after derating to compensate for the heating of the copper conductor, caused by the skin effect generated by eddy currents produced at 400/415HZ.



# Safety and Disconnect Switches

Industrial Controls Product Catalog 2017

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## Heavy Duty Safety Switch Standards and Ratings

### Standards

- UL98 approved per file #E4776
- Suitable for use as service entrance equipment (where applicable)
- Meets NEMA standard KS-1-1990 for Type HD switches
- Seismic qualification – all switches have been tested and comply with the 2007 California Building Code CBC (Zone 4)

### Ratings

- 30-1200A, 240V and 600V AC and DC
- 2, 3, 4 and 6 pole fusible and non-fusible
- All HD safety switches are both HP and load break rated
- Enclosures are available to meet NEMA 1, 3R, 12 & 4/4X requirements

### Safety Switch AIC Ratings When Protected by Fuses

- 30-600A – 10,000 AIC with Class H fuses
- 30-600A – 200,000 AIC with Class R, J or T fuses
- 800 & 1200A – 200,000 AIC with Class L or T fuse

### Fuse Provisions supplied in fusible switches

- 30 & 60A 240V – Class H standard, Class R with kit
- 100-600A 240V – Class H standard, Class J by moving load base, Class R with kit
- 30-600A 600V - Class H standard, Class J by moving load base, Class R with kit
- 100 & 200A - Class T with kit
- 400 & 600A - Class H standard, Class J & T by moving load base, Class R with kit
- 800A – Class L standard, Class T by moving load base
- 1200A – Class L standard, Class T with kit (240V max)

### Non-Fusible Safety Switch AIC Ratings When Protected by a Circuit Breaker<sup>①②</sup>

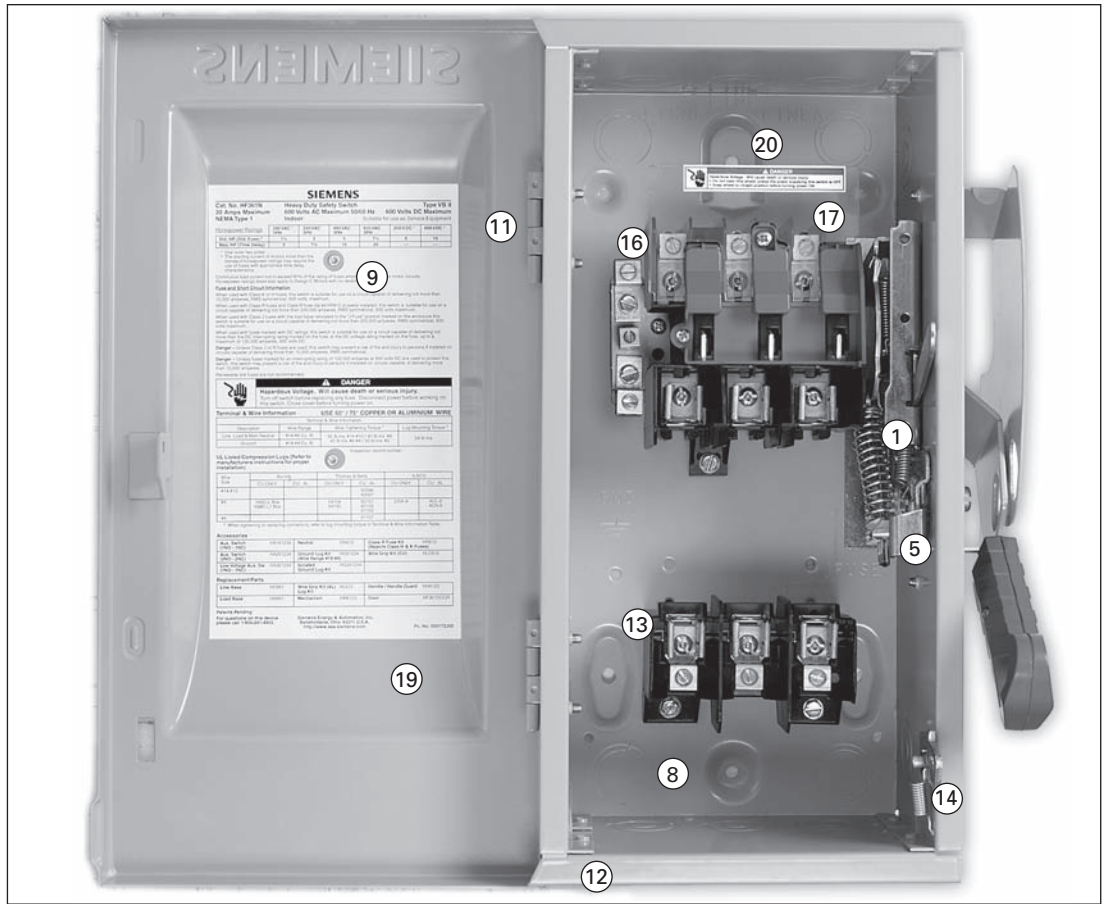
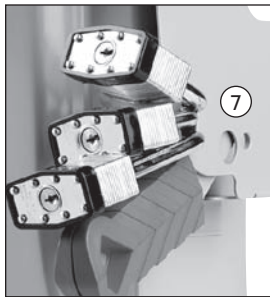
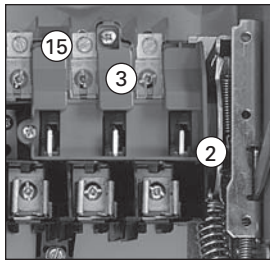
Breaker Frame	Non-Fused Switch	UL Listed Short Circuit Current Rating
NEG, NGB, ED4	30 DT (240V)	18 kA Thru 240 VAC
NEB, NEG, NGG, NGB, ED4	60-100A GD & DT (240V)	18 kA Thru 240 VAC
NEB, NEG, NGG, NGB, ED4	30-100A HD & DT (600V)	18 kA Thru 480 VAC
ED6	30-100A HD & DT (600V)	18 kA Thru 600 VAC
FD6-A, JD6-A	200A HD & DT (600V)	18 kA Thru 600 VAC
JD6-A, LD6-A	400A GD & DT (240V)	18 kA Thru 240 VAC
JD6-A, LD6-A	400A HD & DT (600V)	18 kA Thru 600 VAC
LD6-A	600A GD & DT (240V)	25kA Thru 240 VAC
LD6-A	600A HD & DT (600V)	25kA Thru 600 VAC
NNG	1200A HD & DT (600V)	25 kA Thru 600 VAC

① All switches above are rated at 10 KA when protected by any UL Listed CB  
 ② Circuit breaker trip rating must not exceed switch ampere rating



# Heavy Duty Safety Switches

## Features



1. Quick-make, quick-break operating mechanism that ensures positive operation.
2. Visible blade, double-break switching action.
3. Arc chutes dissipate heat and prolong switch life.
4. Highly visible red handle grip. Designed for hook stick operation.
5. Defeatable dual cover interlock.
6. Center punch provided for field drilling to allow ON padlocking.
7. Handle can be padlocked in the OFF position with up to (3) padlocks with 5/16" hasps.
8. Generous top, bottom and side gutters that meet or exceed NEC wire-bending space requirements.
9. Informative door labeling which includes replacement parts list.
10. Tangential knockouts through 600A for easy conduit lineup.
11. Side-hinged door that opens past 180 degrees for easier wiring.
12. Unique enclosure design increases rigidity and prevents cuts and scrapes to conductors and installer's hands.
13. Spring reinforced fuse clips that assure reliable contact for cool operation.
14. Door latch securely holds door closed and allows cover padlocking.
15. Front removable mechanical lugs that are suitable for CU/Al 60 or 75° C conductors.
16. Lugs are field convertible to copper body and to a wide variety of compression connectors.
17. Hinged clear line terminal shield with probe holes for inspecting or testing line side terminals.
18. Embossed aluminum nameplate on Heavy Duty Switches provides highly visible ON/OFF indication.
19. Drawn cover for increased rigidity and resistance to abuse.
20. Top key hole and bottom mounting holes provide easy 2 or 3 point mounting.

# Heavy Duty Safety Switches

## Selection



System	Ampere Rating	Indoor — Type 1		Outdoor — Type 3R		Horsepower Rating <sup>①</sup>					
		Catalog Number	Ship Wt. (lbs.) Std. Pkg	Catalog Number	Ship Wt. (lbs.) Std. Pkg	240V AC				250 Volt DC	
						1-Phase, 2-Wire	2-Phase, 4-Wire	3-Phase, 3-Wire			
Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	Std.			

### 240 Volt Fusible<sup>⑤</sup>

#### 2-Pole, 2-Fuse, and Solid Neutral<sup>③</sup> (Also used for 2-Pole, 2-Wire Applications) 240 Volt AC/250 Volt DC

	30	HF221N	12	HF221NR	13	1½	3	—	—	3	7½	5
	60	HF222N	18	HF222NR	19	3	10	—	—	7½	15	10
	100	HF223N	23	HF223NR	24	7½	15	—	—	15	30	20
	200	HF224N	47	HF224NR	48	15	—	—	—	25	60	40
	400	HF225NA	91.1	HF225NRA	91.1	15	—	—	—	50	125	50
	600	HF226NA	95.6	HF226NRA	95.6	15	—	—	—	75	200	50
	800	HF227N	365	HF227NR	365	—	—	—	—	100	250	50
	1200	HF228N■	385	HF228NR■	385	—	—	—	—	100	250	50

#### 3-Pole, 3-Fuse, and Solid Neutral (Also used for 3-Pole, 3-Wire Applications) 240 Volt AC/250 Volt DC

	30	HF321N	14	HF321NR	15	1½	3	—	—	3	7½	5
	60	HF322N	19	HF322NR	20	3	10	—	—	7½	15	10
	100	HF323N	25	HF323NR	26	7½	15	—	—	15	30	20
	200	HF324N	49	HF324NR	50	15	—	—	—	25	60	40
	400	HF325NA	94.6	HF325NRA	94.6	15	—	—	—	50	125	50
	600	HF326NA	99.6	HF326NRA	99.6	15	—	—	—	75	200	50
	800	HF327N	375	HF327NR	375	—	—	—	—	100	250	50
	1200	HF328N	395	HF328NR	388	—	—	—	—	100	250	50

### 240 Volt Fusible<sup>⑤</sup>

#### 2-Pole, 2-Fuse<sup>④</sup> 240 Volt AC/250 Volt DC

	Ampere Rating	Type 4/4X Stainless <sup>②</sup>		Type 12 Industrial <sup>⑥</sup>								
		Cat. No.	Ship Wt. (lbs.) Std. Pkg	Cat. No.	Ship Wt. (lbs.) Std. Pkg	1-Phase, 2-Wire	2-Phase, 4-Wire	3-Phase, 3-Wire		250 Volt DC		
Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	Std.
	30	HF221S	13	HF221J	13	1½	3	—	—	3	7½	5
	60	HF222S	19	HF222J	19	3	10	—	—	7½	15	10
	100	HF223S	24	HF223J	24	7½	15	—	—	15	30	20
	200	HF224S	48	HF224J	48	15	—	—	—	25	60	40

#### 3-Pole, 3-Fuse<sup>④</sup> (Also used for 2-Pole, 2-Wire Applications in 400–800A Ratings) 240 Volt AC/250 Volt DC

	30	HF321S	14	HF321J	14	1½	3	—	—	3	7½	—
	60	HF322S	20	HF322J	20	3	10	—	—	7½	15	10
	100	HF323S	25	HF323J	25	7½	15	—	—	15	30	20
	200	HF324S	49	HF324J	49	15	—	—	—	25	60	40
	400	HF325SA	93	HF325JA	93	15	—	—	—	50	125	50
	400	HF325SSA	93	—	—	15	—	—	—	50	125	50
	600	HF326SA	98	HF326JA	98	15	—	—	—	75	200	50
	600	HF326SSA	98	—	—	15	—	—	—	75	200	50
	800	HF327S■	370	HF327J■	365	—	—	—	—	100	250	50

■ Built to order. Allow 3-5 weeks for delivery.

① Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

② Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.

③ These switches are UL-listed for application on grounded B-phase systems and are suitable for 3-phase motor applications.

④ When a neutral is required use a field installed neutral kit.

⑤ Suitable for use as service entrance equipment.

⑥ Also rated Type 3S/3R.

⑦ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 18/9.



# Heavy Duty Safety Switches

## Selection



System	Ampere Rating	Indoor — Type 1		Outdoor — Type 3R		Horsepower Rating <sup>④</sup>								250 Volt DC	600 Volt DC
		Catalog Number	Ship Wt. (lbs.) Std. Pkg	Catalog Number	Ship Wt. (lbs.) Std. Pkg	480V AC		600V AC		250 Volt DC	600 Volt DC				
						1-Phase, 2-Wire	3-Phase, 3-Wire	1-Phase, 2-Wire	3-Phase, 3-Wire						

### 600 Volt Fusible<sup>③</sup>

2-Pole, 2-Fuse <sup>③</sup>						480 Volt AC/600 Volt AC/600 Volt DC									
	30	HF261	15	HF261R	15	3	7½	—	—	3	10	—	—	5	15
	60	HF262	20	HF262R	20	5	20	—	—	10	25	—	—	10	30
	100	HF263	26	HF263R	27	10	30	—	—	15	40	—	—	20	50

3-Pole, 3-Fuse						480 Volt AC/600 Volt AC/250 Volt DC <sup>①</sup>									
	30	HF361	14	HF361R	15	3	7½	5	15	3	10	7½	20	5	—
	30	HF361L <sup>②</sup>	19	HF361RL <sup>②</sup>	20	3	7½	5	15	3	10	7½	20	5	—
	60	HF362	19	HF362R	20	5	20	15	30	10	25	15	50	10	30 <sup>⑤</sup>
	60	—	—	HF362RL <sup>②</sup>	25	5	20	15	30	10	25	15	50	10	30 <sup>⑤</sup>
	100	HF363	24	HF363R	25	5	20	25	60	15	40	30	75	20	50 <sup>⑤</sup>
	200	HF364	48	HF364R	49	25	50	50	125	30	50	60	150	40	50
	400	HF365A <sup>①</sup>	93	HF365RA <sup>①</sup>	157	—	—	100	250	—	—	125	350	50	—
	600	HF366A <sup>①</sup>	98	HF366RA <sup>①</sup>	161	—	—	150	400	—	—	200	500	50	—
800	HF367	365	HF367R	365	—	—	200	500	—	—	250	500	50	—	
1200	HF368	383	HF368R	385	—	—	200	500	—	—	250	500	50	—	

3-Pole, 3-Fuse and Solid Neutral						480 Volt AC/600 Volt AC/250 Volt DC <sup>①</sup>									
	30	HF361N	14	HF361NR	15	3	7½	5	15	3	10	7½	20	5	—
	60	HF362N	19	HF362NR	20	5	20	15	30	10	25	15	50	10	30 <sup>⑤</sup>
	100	HF363N	25	HF363NR	26	10	30	25	60	15	40	30	75	20	50 <sup>⑤</sup>
	200	HF364N	49	HF364NR	50	25	50	50	125	30	50	60	150	40	50
	400	HF365NA	94.6	HF365NRA	94.6	—	—	100	250	—	—	125	350	50	—
	600	HF366NA	99.6	HF366NRA	99.6	—	—	150	400	—	—	200	500	50	—
	800	HF367N	375	HF367NR	375	—	—	250	500	—	—	250	500	50	—
	1200	HF368N	395	HF368NR	388	—	—	250	500	—	—	250	500	50	—

### 600 Volt Fusible<sup>③</sup> (For 2-Pole Applications use outside poles of 3-Pole Switches)

2-Pole, 2-Fuse <sup>③</sup>						480 Volt AC/600 Volt AC/600 Volt DC									
	30	Type 4/4X Stainless <sup>⑥</sup>		Type 12 Industrial <sup>⑥</sup>		3	7½	—	—	3	10	—	—	5	15
		HF261S	15	HF261J■	15										
		HF262S	20	HF262J■	20										
100	HF263S■	27	HF263J■	27	10	30	—	—	15	40	—	—	20	50	

3-Pole, 3-Fuse						480 Volt AC/600 Volt AC/250 Volt DC <sup>①</sup>									
	30	HF361S	13	HF361J	14	—	—	5	15	—	—	7½	20	5	—
	60	HF362S	20	HF362J	20	—	—	15	30	—	—	15	50	10	30 <sup>⑤</sup>
	100	HF363S	25	HF363J	25	—	—	25	60	—	—	30	75	20	50 <sup>⑤</sup>
	200	HF364S	49	HF364J	49	—	—	50	125	—	—	60	150	40	50
	400	HF365SA <sup>①</sup>	93	HF365JA <sup>①</sup>	93	—	—	100	250	—	—	125	350	50	—
	400	HF365SSA	93	—	—	—	—	100	250	—	—	125	350	50	—
	600	HF366SA <sup>①</sup>	98	HF366JA <sup>①</sup>	98	—	—	150	400	—	—	200	500	50	—
	600	HF366SSA	98	—	—	—	—	150	400	—	—	200	500	50	—
	800	HF367S	370	HF367J■	365	—	—	200	500	—	—	250	500	50	—
	1200	HF368S■	388	HF368J■	388	—	—	250	500	—	—	250	500	50	—

■ Built to order. Allow 3-5 weeks for delivery.  
 ① 60-600A 3-Pole switches are also rated 600V DC.  
 ② Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.  
 ③ Use 3-Pole switch for 200A applications.  
 ④ Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.  
 ⑤ Suitable for use as service entrance equipment except on 1200 Amp solidly grounded wye systems per NEC 230.95.  
 ⑥ Also rated Type 3S/3R.  
 ⑦ Indicates oversized enclosure (30A switch with 60A lugs in a 60A enclosure or 60A switch with 100A lugs in a 100A enclosure).  
 ⑧ 600V DC & 600V DC horsepower rating shown requires (2) poles to be connected in series.  
 ⑨ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 18/9..

# Heavy Duty Safety Switches

## Selection



System	Ampere Rating	Indoor — Type 1		Outdoor — Type 3R		Horsepower Rating							
		Catalog Number	Ship Wt. (lbs.)	Catalog Number	Ship Wt. (lbs.)	240 Volt		480 Volt		600 Volt		250V DC	600V DC
						1-Phase	3-Phase	1-Phase	3-Phase	1-Phase	3-Phase		

### 600 Volt Non-Fusible<sup>④</sup>

#### 2-Pole<sup>③</sup>

#### 480 Volt AC / 600 Volt AC / 600 Volt DC

	30	HNF261	12	HNF261R	13	—	—	7½	—	10	—	5	15
	60	HNF262	19	HNF262R	20	—	—	20	—	25	—	10	30
	100	HNF263	24	HNF263R	25	—	—	30	—	40	—	20	50

#### 3-Pole

#### 480 Volt AC / 600 Volt AC / 250 Volt DC

	30	HNF361	12	HNF361R	13	5	10	7½	20	10	30	5	—
	30	—	—	HNF361RL <sup>⑥</sup>	19	5	10	7½	20	10	30	5	—
	60	HNF362H <sup>②</sup>	11	HNF362RH <sup>②</sup>	11	10	20	20	50	20	40	10	—
	60	HNF362 <sup>①</sup>	18	HNF362R <sup>①</sup>	19	10	20	20	50	25	60	10	30 <sup>②</sup>
	60	—	—	HNF362RL <sup>⑥</sup>	24	10	20	20	50	25	60	10	30 <sup>②</sup>
	100	HNF363 <sup>①</sup>	23	HNF363R <sup>①</sup>	24	15	40	30	75	40	100	20	50 <sup>②</sup>
	200	HNF364 <sup>①</sup>	46	HNF364R <sup>①</sup>	47	15	60	50	125	50	150	40	50
	400	HNF365A <sup>①</sup>	75	HNF365RA <sup>①</sup>	75	15	125	50	250	50	350	50	—
	600	HNF366A <sup>①</sup>	77	HNF366RA <sup>①</sup>	77	15	200	50	400	50	500	50	—
	800	HNF367	295	HNF367R	295	15	250	50	500	50	500	50	—
1200	HNF368	305	HNF368R	307	15	250	50	500	50	500	50	—	

### 600 Volt Non-Fusible<sup>④</sup>

#### 2-Pole<sup>③</sup>

#### 480 Volt AC / 600 Volt AC / 600 Volt DC

	Ampere Rating	Type 4 / 4X Stainless <sup>⑥</sup>		Type 12 Industrial <sup>⑤</sup>		240V	480V	600V	250V DC	600V DC		
		Cat. No.	Ship Wt. (lbs.)	Cat. No.	Ship Wt. (lbs.)							
30	HNF261S	13	HNF261J	13	—	—	7½	—	10	—	5	15
60	HNF262S	20	HNF262J	20	—	—	20	—	25	—	10	30
100	HNF263S■	25	HNF263J■	25	—	—	30	—	40	—	20	50

#### 3-Pole

#### 480 Volt AC / 600 Volt AC / 250 Volt DC

	30	HNF361S	13	HNF361J	13	5	10	7½	20	10	30	5	—
	60	HNF362SH <sup>②</sup>	15	HNF362JH <sup>②</sup>	14	10	20	20	50	20	40	10	—
	60	HNF362S <sup>①</sup>	19	HNF362J <sup>①</sup>	19	10	20	20	50	25	60	10	30 <sup>②</sup>
	100	HNF363S <sup>①</sup>	24	HNF363J <sup>①</sup>	24	15	40	30	75	40	100	20	50 <sup>②</sup>
	200	HNF364S <sup>①</sup>	47	HNF364J <sup>①</sup>	47	15	60	50	125	50	150	40	50
	400	HNF365SA <sup>①</sup>	75	HNF365JA <sup>①</sup>	75	15	125	50	250	50	350	50	—
	400	HNF365SSA	75	—	—	15	125	50	250	50	350	50	—
	600	HNF366SA <sup>①</sup>	77	HNF366JA <sup>①</sup>	77	15	200	50	400	50	500	50	—
	600	HNF366SSA	77	—	—	15	200	50	400	50	500	50	—
	800	HNF367S	295	HNF367J■	295	15	250	50	500	50	500	50	—
1200	HNF368S■	310	HNF368J■	310	15	250	50	500	50	500	50	—	

■ Built to order. Allow 3-5 weeks for delivery.

① 60-600A 3-Pole switches are also rated 600V DC.

② Compact switch (11.1"H, 6.6"W box less cover and handle).

Short circuit withstand rating—100,000 RMS sym. amps.

③ Use 3-Pole switch for 200A application.

④ Suitable for use as service entrance equipment except for 1200 when used on a 480 or 600V grounded wye system.

⑤ Also rated type 3S / 3R.

⑥ Indicates oversized enclosure (30A switch in a 60A enclosure or a 60A switch in a 100A enclosure).

⑦ 600V DC and 600V DC horsepower rating shown requires (2) poles to be connected in series.

⑧ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 18/9.

# Heavy Duty Safety Switches

## Type 3R, 4/4X, & 12 with Viewing Window

### Description




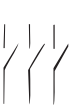


30–600A, 3-pole 600V max. in fusible and non-fusible versions in Type 4/4X stainless steel and Type 12 enclosures.

All allow viewing of visible blade position. 30–200A also allow viewing of indicating type fuses.

### Features

- Rugged installer-friendly enclosure design features a gasket flange with continuously welded seams
- Tool-free cover latches
- Two, three and four point mounting
- Metal handle with large insulating grip features a positive stop in both ON and OFF position
- Ground lugs provided as standard
- Type 12 enclosures are fabricated from galvanized steel and are also rated for 3R/3S outdoor applications
- Type 4X stainless steel switches (30–200A) are provided with stainless steel interior parts
- The widest range of accessories available including 200% neutrals, gold plated PLC auxiliary contacts and isolated ground kits



System	Ampere Rating	Catalog Number	Ship Wt. (lbs.)	Maximum Horsepower Rating <sup>②</sup>					
				240V AC		480V AC	600V AC	250V DC	600V DC
				1-Phase, 2-Wire	3-Phase, 3-Wire	3-Phase, 3-Wire	3-Phase, 3-Wire	—	—
<b>3-Pole, 3-Wire Fusible, Type 3R<sup>④</sup></b>				<b>600 Volt AC / 250 Volt DC<sup>①</sup></b>					
	30	HF361RW	17	3	7½	15	20	5	—
	60	HF362RW	22	10	15	30	50	10	30 <sup>⑤</sup>
<b>3-Pole, 3-Wire Non-Fusible, Type 3R<sup>④</sup></b>				<b>600 Volt AC / 250 Volt DC<sup>①</sup></b>					
	30	HNF361RW	14	3	10	20	30	5	—
	60	HNF362RW	21	10	20	50	60	10	30 <sup>⑤</sup>
<b>3-Pole, 3-Wire Fusible, Type 12<sup>③④</sup></b>				<b>600 Volt AC / 250 Volt DC<sup>①</sup></b>					
	30	HF361JW	17	3	7½	15	20	5	—
	60	HF362JW	22	10	15	30	50	10	30 <sup>⑤</sup>
	100	HF363JW	26	15	30	60	75	20	50 <sup>⑤</sup>
	200	HF364JW	53	—	60	125	150	40	50
	400	HF365JWA	93	—	125	250	350	50	—
	600	HF366JWA	98	—	200	400	500	50	—
<b>3-Pole, 3-Wire Non-Fusible, Type 12<sup>③④</sup></b>				<b>600 Volt AC / 250 Volt DC<sup>①</sup></b>					
	30	HNF361JW	14	3	10	20	30	5	—
	60	HNF362JW	21	10	20	50	60	10	30 <sup>⑤</sup>
	100	HNF363JW	25	15	40	75	100	20	50 <sup>⑤</sup>
	200	HNF364JW	51	15	60	125	150	40	50
	400	HNF365JWA	75	15	125	250	350	50	—
<b>3-Pole, 3-Wire Fusible, Type 4X Stainless Steel<sup>④⑥</sup></b>				<b>600 Volt AC / 250 Volt DC<sup>①</sup></b>					
	30	HF361SW	17	3	7½	15	20	5	—
	60	HF362SW	23	10	15	30	50	10	30 <sup>⑤</sup>
	100	HF363SW	28	15	30	60	75	20	50 <sup>⑤</sup>
	200	HF364SW	55	—	60	125	150	40	50
	400	HF365SWA	75	15	125	250	350	50	—
	400	HF365SSWA	75	15	125	250	350	50	—
<b>3-Pole, 3-Wire Non-Fusible, Type 4X Stainless Steel<sup>④⑥</sup></b>				<b>600 Volt AC / 250 Volt DC<sup>①</sup></b>					
	30	HNF361SW	15	3	10	20	30	5	—
	60	HNF362SW	23	10	20	50	60	10	30 <sup>⑤</sup>
	100	HNF363SW	27	15	40	75	100	20	50 <sup>⑤</sup>
	200	HNF364SW	54	15	60	125	150	40	50
	400	HNF365SWA	75	15	125	250	350	50	—
	400	HNF365SSWA	75	15	125	250	350	50	—

① 200A switches are also rated 600V DC.

② Maximum HP ratings listed apply only when time delay fuses are used.

③ Also rated 3S/3R for outdoor use.

④ All switches are suitable for use as service entrance equipment. Use outside poles of 3-pole switch for 2-pole application.

⑤ 600V DC and 600V DC horsepower rating shown requires (2) poles to be connected in series.

⑥ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 18/9.

# Heavy Duty Safety Switches

## Type VBII 4 & 6 Pole – Heavy Duty Safety Switches

### Application

4 & 6-pole Switches are commonly used as a disconnecting means for two-speed, two-winding motors. Fused switches provide both over current and short circuit protection. Non-fusible switches normally provide a local disconnection means for two-speed motors which are remote from their motor controller. 4-pole switches are also used in 3-phase, 4-wire circuits when a switching neutral is required. All 4 & 6-pole switches are service entrance rated.

### Description

4 & 6-pole switches are available in 30-200A ratings and in both fusible and non-fusible versions. 4-pole switches are supplied with either Type 1 or Type 12/3R enclosures. 6-pole switches are available with either Type 12/3R or Type 4X stainless steel enclosures.

### Standards

- UL & CUL listed under file #E4776
- Meets UL98 for enclosed switches
- 4 & 6-Pole switches are suitable for use as service entrance
- Meets NEMA Standard KS-1 for enclosed switches
- Meets NEC wire bending space requirements

### Features

- Visible blade, double break switching action
- Highly visible ON/OFF indication
- Defeatable dual cover interlock
- Padlock option in OFF position
- All copper current carrying parts<sup>①</sup>
- Tangenital knockouts (Type 1, 4-pole switches)



HNF662J

### 4-Pole Type VBII Switches<sup>①②</sup>

System	Amp Rating	Indoor Type 1		Type 12/3R Industrial <sup>③</sup>		Horsepower Ratings <sup>③</sup>								
		Catalog Number	Ship Wt. (lbs.)	Catalog Number	Ship Wt. (lbs.)	240V, 2Ø, 4W		240V 3Ø		480V, 3Ø		600V, 3Ø		250V DC
						Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	

#### Fusible 600 Volt AC, 250 Volt DC — 4-Pole, 4 Fuse<sup>④</sup>

	30	HF461	36	HF461J	36	3	10	3	7½	5	15	7½	20	5
	60	HF462	40	HF462J	40	7½	20	7½	15	15	30	15	50	10
	100	HF463	43	HF463J	43	15	30	15	30	25	60	30	75	20
	200	HF464	88	HF464J	88	25	50	25	60	50	125	60	150	40

#### Non-fusible 600 Volt AC, 250 Volt DC — 4-Pole

	30	HNF461	32	HNF461J	32	—	10	—	10	—	20	—	30	5
	60	HNF462	34	HNF462J	34	—	20	—	20	—	50	—	60	10
	100	HNF463	36	HNF463J	36	—	30	—	40	—	75	—	100	20
	200	HNF464	78	HNF464J	78	—	50	—	60	—	125	—	150	4

### 6-Pole Type VBII Switches<sup>①②⑤</sup>

System	Amp Rating	Type 12/3R Industrial		Type 4X Stainless Steel		Horsepower Ratings <sup>③</sup>							
		Catalog Number	Ship Wt. (lbs.)	Catalog Number	Ship Wt. (lbs.)	240V 3Ø		480V, 3Ø		600V, 3Ø		250V DC	
						Std.	Max.	Std.	Max.	Std.	Max.		

#### Fusible 600 Volt AC, 250 Volt DC — 6-Pole, 6 Fuse<sup>④</sup>

	30	HF661J	37	HF661S	37	3	7½	5	15	7½	20	5
	60	HF662J	41	HF662S	41	7½	15	15	30	15	50	10
	100	HF663J	44	HF663S	44	15	30	25	60	30	75	20
	200	HF664J	90	HF664S	90	25	60	50	125	60	150	40

#### Non-fusible 600 Volt AC, 250 Volt DC — 6-Pole

	30	HNF661J	33	HNF661S	33	—	10	—	20	—	30	5
	60	HNF662J	35	HNF662S	35	—	20	—	50	—	60	10
	100	HNF663J	37	HNF663S	37	—	40	—	75	—	100	20
	200	HNF664J	80	HNF664S	80	—	60	—	125	—	150	40

■ Built to order. Allow 3-5 weeks for delivery.

① Lugs are aluminum alloy as standard. Optional copper body lugs are available.

② All 4 & 6-pole VBII switches are suitable for use as service equipment when a neutral is installed or equipment ground kit is properly connected.

③ Dual horsepower ratings: Std. – applies when non-time-delay fuses are installed. Max. – applies when time delay fuses are installed.

④ Fusible switches accept Class H Fuses as the standard. Class R & J fuses can also be installed and increase the rating from 10,000 to 200,000 AIC. For

Class J, the load base is moved upward. For Class R fuses, rejection kits are required.

⑤ Supplied with factory installed ground lugs.

# Heavy Duty Safety Switches

## Special Application Switches / Interlocked Receptacle Switches

### Application

Receptacle Safety Switches provide cord connection protection of heavy-duty portable equipment (welders, infrared ovens, batch feeders, portable conveyors, assembly line fixtures and tools, refrigerator trucks, etc.) under load or fault conditions.

### Standards

All receptacle switches are UL listed under file #E4776. Those with a viewing window are also CSA certified under file #1079316.

### Description<sup>①②</sup>

Type 12 and 4/4X Receptacle Safety Switches are available with 3-phase, 4-wire grounded type Crouse-Hinds Arkite™ 2 or Pyle-National receptacle, pre-wired and mounted with interlock linkage to the switch mechanism. Insertion or removal of the plug is prevented by the interlock linkage while the switch is in the "ON" position. Receptacle prevents operation of switch if incorrect plug is inserted.



HF362JCH

### Crouse-Hinds Interlocked Receptacle Switches

Ampere Rating <sup>③</sup>	Type 12 <sup>⑤</sup>	Type 4/4X <sup>⑥</sup>	Shipping Wt. (lbs.) Std. Pkg.	Accepts Crouse-Hinds Arkite <sup>®</sup> Plug Catalog Number
	Catalog Number	Catalog Number		

#### 240V Fusible, 3-Pole, 3-Wire

30	HF321JCH	HF321SCH▲	23	APJ3485 & NPJ3485
60	HF322JCH	HF322SCH▲	30	APJ6485 & NPJ6485
100	HF323JCH	HF323SCH▲	36	APJ10487 & NPJ10487

#### 600V Fusible, 3-Pole, 3-Wire

30	HF361JCH	HF361SCH	24	APJ3485 & NPJ3485
60	HF362JCH	HF362SCH	30	APJ6485 & NPJ6485
100	HF363JCH	HF363SCH▲	36	APJ10487 & NPJ10487

#### 600V Non-Fusible, 3-Pole, 3-Wire

30	HNF361JCH▲	HNF361SCH▲	22	APJ3485 & NPJ3485
60	HNF362JCH	HNF362SCH	29	APJ6485 & NPJ6485
100	HNF363JCH▲	HNF363SCH▲	35	APJ10487 & NPJ10487

#### 600V Fusible, 3-Pole, 3-Wire with Viewing Window

30	HF361JCHW▲	HF361SCHW▲	24	APJ3485 & NPJ3485
60	HF362JCHW	HF362SCHW	30	APJ6485 & NPJ6485
100	HF363JCHW▲	HF363SCHW▲	36	APJ10487 & NPJ10487

#### 600V Non-Fusible, 3-Pole, 3-Wire with Viewing Window

30	HNF361JCHW▲	HNF361SCHW▲	22	APJ3485 & NPJ3485
60	HNF362JCHW	HNF362SCHW▲	29	APJ6485 & NPJ6485
100	HNF363JCHW▲	HNF363SCHW▲	35	APJ10487 & NPJ10487

### Pyle-National Interlocked Receptacle Switches 3-Poles Fusible and Non-Fusible

Ampere Rating		Voltage Rating	Type 12 Catalog Number <sup>⑤</sup>	Type 12 Stainless Steel Catalog Number <sup>⑥</sup>	Shipping Wt. (lbs.) Std. Pkg.	Accepts Pyle-National QuelArc™ <sup>②③</sup> Plugs Plug Catalog Number
Switch	Receptacle					
30	30	600 (F)	HF361JPN▲	HF361SPN▲	23	JPD-83046
		600 (N-F)	HNF361JPN	HNF361SPN	21	
60	60	240 (F)	HF322JPN▲	—	28	JPD-116046
		600 (F)	HF362JPN▲	HF362SPN▲	28	
		600 (N-F)	HNF362JPN	HNF362SPN	27	

▲ Built to order. Allow 6–8 weeks for delivery.

⑤ Arkite™ is a registered trademark of the Crouse-Hinds Company. Plugs are not sold or supplied by Siemens.

⑥ Indicates plug with maximum diameter cable bushing.

⑥ QuelArc™ is a registered trademark of the Pyle-National Company.

② Ampere rating of both switch and receptacle.

③ Also rated Type 3R/3S.

④ Enclosure is constructed of Type 304 stainless steel.



# Heavy Duty Safety Switches

Special Application Safety Switches / Type VBII Non-Metallic & 316 Grade Stainless Steel

## Application

Siemens Non-metallic and 316 grade stainless steel switches provide a superior level of corrosion resistance to assure trouble free performance in the most severe conditions. 316 grade stainless steel provides increased corrosion resistance when compared to 304 grade, especially in atmospheres containing a high level of chlorine commonly encountered in marine and waste management applications. Our non-metallic enclosures are constructed from fiberglass reinforced polyester and are extremely resistant to a wide range

of corrosive atmospheres. They allow a wide range of operating temperatures and their insulating properties virtually eliminate problems caused by internal condensation.

## Description

30-200A, 600V Max, fusible and non-fusible switches are available in both non-metallic and 316 grade stainless steel versions. All are supplied with factory installed ground bars as standard. Viewing windows are also available in the stainless offering.



## Type 4/4X Non-Metallic

Ampere Rating	Catalog Number	Ship Weight Std. pkg. (lbs.)	Horsepower Rating—3-Phase						250 Volts DC	600 Volts DC
			240 Volt AC		480 Volt AC		600 Volt AC			
			Std.	Max.	Std.	Max.	Std.	Max.		
<b>3-Pole, 4-Wire, 240 Volt Fusible, Type 4X<sup>⑤</sup></b>										
30	HF321NX	21	3	7½	—	—	—	—	5	—
60	HF322NX▲	22	7½	15	—	—	—	—	10	—
<b>3-Pole, 4-Wire, 600 Volt AC Fusible, Type 4X<sup>②③⑤</sup></b>										
30	HF361NX	21	3	7½	5	15	7½	20	5	15 <sup>④</sup>
60	HF362NX	22	7½	15	15	30	15	50	10	30 <sup>④</sup>
100	HF363NX▲ <sup>①</sup>	39	15	30	25	60	30	75	20	50 <sup>④</sup>
200	HF364NX▲ <sup>①</sup>	83	25	60	50	125	60	150	40	50
<b>3-Pole, 3-Wire, 600 AC Volt Non-Fusible,<sup>①</sup> Type 4X<sup>②③</sup></b>										
30	HNF361X	20	—	7½	—	20	—	30	5	15 <sup>④</sup>
60	HNF362X	20	—	15	—	50	—	60	10	30 <sup>④</sup>
100	HNF363X▲	38	—	30	—	75	—	100	20	50 <sup>④</sup>
200	HNF364X▲	81	—	60	—	125	—	150	40	50

## Type 4/4X 316 Grade Stainless Steel

Ampere Rating	Standard Catalog Number	With Viewing Window Catalog Number	Ship Weight (lbs.)	Horsepower Rating—3-Phase						250 Volts DC	600 Volts DC
				240 Volt AC		480 Volt AC		600 Volt AC			
				Std.	Max.	Std.	Max.	Std.	Max.		
<b>240V AC, 250V DC Fusible 3-Pole, 3-Wire</b>											
30	HF321SS▲	—	15	3	7½	—	—	—	—	5	—
60	HF322SS▲	—	19	7½	15	—	—	—	—	10	—
100	HF323SS▲	—	27	15	30	—	—	—	—	20	—
200	HF324SS▲	—	48	25	60	—	—	—	—	40	—
<b>600V AC, 250V DC Fusible 3-Pole, 3-Wire<sup>③</sup></b>											
30	HF361SS	HF361SSW	17	3	7½	5	15	7½	20	5	—
60	HF362SS	HF362SSW▲	21	7½	15	10	30	15	50	10	30 <sup>④</sup>
100	HF363SS	HF363SSW▲	28	15	30	25	60	30	75	20	50 <sup>④</sup>
200	HF364SS	HF364SSW▲	54	25	60	50	125	60	150	40	50
<b>600V AC, 250 V DC Non-Fusible 3-Pole, 3-Wire<sup>①③</sup></b>											
30	HNF361SS	HNF361SSW	15	—	10	—	20	—	30	5	—
60	HNF362SS	HNF362SSW▲	21	—	20	—	50	—	60	10	30 <sup>④</sup>
100	HNF363SS	HNF363SSW▲	26	—	40	—	75	—	100	20	50 <sup>④</sup>
200	HNF364SS	HNF364SSW▲	51	—	60	—	125	—	150	40	50

▲ Built to order. Allow 6–8 weeks for delivery.

① Also used for 240 volt applications.

② Add "L" to end of catalog number for switches less line & load lugs with mounting hardware for crimp type or copper body lugs.

③ 200A switches are also rated 600V DC max.

④ 600V DC voltage and horsepower rating shown requires (2) poles to be connected in series.

⑤ Supplied with factory installed neutral.

# Heavy Duty Safety Switches

## Enclosed Solar Photovoltaic (PV) Switches

### Application

Solar disconnect switches are designed to be used in the DC portion of photovoltaic power generation circuits. They incorporate powerful magnets within the switch line base which work in combination with a double break switching action to quickly dissipate the very hot arc that is generated when a 600V DC circuit is opened under load. These circuits are defined by article 690 of the NEC which requires the grounded conductor to be at ground potential at all times and therefore cannot be switched.

### Description

30-200A switches are available in both Type 1 and 3R enclosures and in both fusible and non-fusible versions. They are provided with an additional door mounted warning label as required by the NEC and are supplied with a factory installed equipment ground bar. They are built to UL98 requirements but are UL listed in file number E335018 as UL1741 photovoltaic disconnect switches. They are 3 pole switches that are approved to switch 3 separate 600V DC circuits (one per pole). The design incorporates

many of the standard VBII switch features including a rolled out enclosure front flange, a large metal operating handle, oversized line and load lugs and large wire gutters. 1000VDC photovoltaic switches are UL98B listed for solar applications and comply with article 690 of the NEC. The new 400-600Amp switches are also UL98B listed at 600VDC and come in NEMA Type 3R.

### Solar Photovoltaic Enclosed Disconnect Switches

Ampere Rating	Indoor – Type 1		Outdoor – Type 3R		Rated Isc Per NEC Article 690
	Catalog Number	Ship Wt* Std. Pkg.	Catalog Number	Ship Wt* Std. Pkg.	
<b>Negative Ground 3 Pole 3 Wire Fusible 600Volt DC</b>					
30	HF361PV	14	HF361RPV	15	19.2 A
60	HF362PV	20	HF362RPV	21	38.4 A
100	HF363PV▲	25	HF363RPV	26	64.0 A
200	HF364PV▲	49	HF364RPV	50	128.0 A
<b>Negative Ground 3 Pole 3 Wire Non-Fusible 600Volt DC</b>					
30	HNF361PV	12	HNF361RPV	13	24.0 A
60	HNF362PV	19	HNF362RPV	20	48.0 A
100	HNF363PV▲	24	HNF363RPV	25	80.0 A
200	HNF364PV▲	47	HNF364RPV	48	160.0 A
<b>NEW Positive and Negative Ground, 1 Pole, Fusible 1000 Volt DC</b>					
200	HF1104NPV▲	52	HF1104NRPV▲	53	128.0A
<b>NEW Positive and Negative Ground, 1 Pole, Non-Fusible 1000 Volt DC</b>					
200	HNF1104NPV▲	50	HNF1104NRPV▲	51	160.0A
<b>Positive Ground 3 Pole 3 Wire Fusible 600Volt DC</b>					
30	HF361PVPG	14	HF361RPVPG	15	19.2 A
60	HF362PVPG▲	20	HF362RPVPG	21	38.4 A
100	HF363PVPG▲	25	HF363RPVPG▲	26	64.0 A
200	HF364PVPG▲	49	HF364RPVPG▲	50	128.0 A
<b>Positive Ground 3 Pole 3 Wire Non-Fusible 600Volt DC</b>					
30	HNF361PVPG	12	HNF361RPVPG	13	24.0 A
60	HNF362PVPG▲	19	HNF362RPVPG	20	48.0 A
100	HNF363PVPG▲	24	HNF363RPVPG▲	25	80.0 A
200	HNF364PVPG▲	47	HNF364RPVPG▲	48	160.0 A
<b>NEW Positive and Negative Ground, 2 Wire, 600Volt DC, Type 3R</b>					
Amperage Rating	No. Poles	Fuse Type	Catalog Number	Ship Wt* Std. Pkg	Rated Isc Per NEC Article 690
400A	1	Fusible	HF165NRPV▲	165	256A
400A	1	Non-fusible	HNF165NRPV▲	127	256A
400A	2	Fusible	HF265NRPV▲	325	256A
400A	2	Non-fusible	HNF265NRPV▲	315	256A
600A	1	Fusible	HF166NRPV▲	167	384A
600A	1	Non-fusible	HNF166NRPV▲	129	384A
600A	2	Fusible	HF266NRPV▲	327	384A
600A	2	Non-fusible	HNF266NRPV▲	315	384A

▲ Built to order. Allow 6-8 weeks for delivery.

\* In pounds (lbs)

Note: All disconnects are rated at 10,000 AIC per UL requirements when used with or protected by Class K, J or R fuses rated at 600VDC.



HF361PV



HNF361RPV



HF362RPV

# Heavy Duty Safety Switches

## Accessories



HR612

### Class R Fuse Clip Kits

All General Duty and Heavy Duty Switches are field convertible to accept Class R Fuse Clip Kits. The kits prevent the installation of Class H and K fuses (one kit required per 3-pole switch).

### Class R Fuse Clip Kits

Catalog Number	Description
GSRK321	30A, 240V Kit (GD only)
HR21	30A, 240V Kit (HD only)
HR612	30A, 600V Kit/60A, 240V Kit
HR62	60A, 600V Kit
HR63	100A Kit
HR64	200A Kit
HR65A	400A Kit
HR66A	600A Kit

### Class J Fusing

All 30-600A, 600V and 100-600A, 240V fusible Heavy Duty Switches are field convertible to accept Class J fuses by moving the load base to a pre-drilled J fuse position. All 100-600A, 240V fusible General Duty switches can also be field converted to accept Class J fuses.

### Class J Fuse Kits

Catalog Number	Description
HJ66A	600A, 240V/600V Kit

### Internal Shield Kits (for fusible switches)

Kits provide a clear plastic inner door to prevent accidental contact with live parts. Test probe holes are provided and fuses can be replaced without removal of kit.

### **NEW** Internal Shield Kits <sup>Ⓜ</sup>

Switch Ampere Rating	Kit Catalog Number
30A HD	HSK61SSW
60A HD	HSK62SSW
100A HD	HSK63SSW
200A HD	HSK64SSW

▲ Built to order. Allow 6-8 weeks for delivery.

Ⓜ One kit per pole required.



HT63

### Class T Fuse Adapter Kits

All 100-600A, General Duty and 100-200Amp and 1200Amp Heavy Duty Switches are field convertible to accept Class T fuses. 800A switches are field convertible to accept Class T fuses by moving the load base to a pre-drilled T fuse position.

### Class T Fuse Adapter Kits<sup>Ⓜ</sup>

Catalog Number	Description
HT23	100A, 240V Kit
HT63	100A, 600V Kit
HT24	200A, 240V Kit
HT64▲	200A, 600V Kit
HT25A	400A, 240V Kit
HT65A	400A, 600V Kit
HT26A	600A, 240V Kit
HT66A	600A, 600V Kit
TFAK82	1200A, 240V Kit



HN612

### Neutral Kits

Standard Neutral Kits can be field installed in General and Heavy Duty Switches.

### Neutral Kits

Switch Ampere Rating	Kit Catalog Number
30 GD	W410190
30 HD, 60 GD	HN612
60, 100 HD, 100 GD	HN623
200	HN64
400 & 600	HN656A
800 & 1200	HN678

Ⓜ Not designed for use in Non-metallic 4X safety switches. Not designed for use with Auxiliary Contacts.



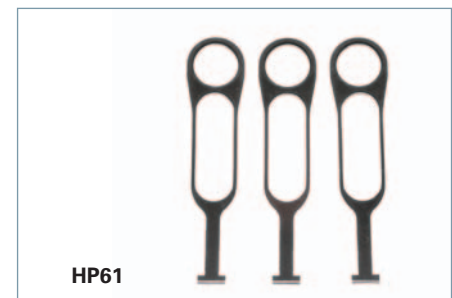
HN264

### 200% Neutral Kits

UL listed 200% Neutrals are available on 100-600A Heavy Duty Switches. They are typically used with non-linear transformers or where increased neutral ampacity/lug capacity is required.

### 200% Neutral Kits

Switch Ampere Rating	Kit Catalog Number	Wire Range Line & Load Lugs (Cu/Al)
100	HN263	(2) #14-1/0 AWG
200	HN264	(2) #6 AWG-300 Kcmil
400	HN656A	(2) 1/0 AWG-600 Kcmil (2) #6 AWG-300 Kcmil
600	HN678A	(2) 1/0 AWG-600 Kcmil (2) #6 AWG-300 Kcmil



HP61

### Fuse Puller Kits

Fuse Puller Kits are field installable in 30-100A Type VBII Heavy Duty Switches (one kit required per 3-pole switch).

### Fuse Puller Kits

Switch Ampere Rating	Fuse Puller Kit Catalog Number
30	HP61
60	HP62▲
100	HP63▲



## Heavy Duty Safety Switches

## Accessories



HA261234



HA261234



HLC612

HG261234

## Auxiliary Contacts

Auxiliary Contacts are available only for Heavy Duty Switches. The auxiliary contacts are available in 1 normally open and 1 normally closed or 2 normally open and 2 normally closed configurations. Siemens offers a PLC Auxiliary Switch (30-200A) that has very low resistance for low voltage and current typical in PLC circuits. All auxiliary contacts make after and break before main switch contacts.

## Auxiliary Contacts

Switch Ampere	Aux. Switch Catalog Number	Kit Ampere Rating			Horsepower Rating	
		125V AC Max.	250V AC Max.	28V DC Max.	125V AC Max.	250V AC Max.
30-600	HA161234	10	10	7	1/2	3/4
800-1200	HA165678	10	10	—	1/2	3/4

## With 1 NO &amp; 1 NC Isolated Contacts

30-600	HA161234	10	10	7	1/2	3/4
800-1200	HA165678	10	10	—	1/2	3/4

## With 2 NO &amp; 2 NC Isolated Contacts

30-600	HA261234	10	10	7	1/2	3/4
800-1200	HA265678	10	10	7	1/2	3/4

## Low Current PLC Type with 1 NO &amp; 1 NC Gold Plated Contacts

30-600	HA361234	10	10	7	1/2	3/4
800-1200	HA365678	10	10	—	1/2	3/4

## Copper Lug Kits

Heavy duty switches are UL approved to accept field installed copper lug kits.

## Copper Lug Kits

Switch Ampere Rating	Copper Lug Catalog Number	Description
30-60	HLC612	(9) Lugs/Kit #14-4 AWG Cu
100	HLC63▲	(9) Lugs/Kit #14-1/0 AWG Cu
200	HLC64▲	(9) Lugs/Kit #6 AWG-300 Kcmil Cu
400-600	HCU656A■	(1) Lugs/Kit #1/0 AWG-600 Kcmil Cu
800-1200	HLC65678	(1) Lugs/Kit #1/0 AWG-600 Kcmil Cu

▲ Built to order. Allow 6-8 weeks for delivery.

■ Purchase field replacement kit along with lugs.

## NEW Quick Connects

They provide two point control power take-off capability and are normally used on two poles on the line side when it is required to have control power available when the switch is in the OFF position. They provide a mounting provision for standard ¼" quick connect terminal. Installed in the line or load side. 30A VBII switches have lugs UL listed to accept (2) wires per pole as standard so a 30A kit is not required.

## Quick Connects

Catalog Number	Description
HCO62	60A 2 wire quick connect kit
HCO63	100A 2 wire quick connect kit
HCO64	200A 2 wire quick connect kit

## Isolated Ground Kits

Isolated Ground Kits are available on 30-600A Heavy Duty Switches. They are normally used on circuits with a high content of computer or other electronic loading which require a ground which is isolated from the building ground and neutral circuits. The kit includes both isolated and grounded terminals as listed below.

## Isolated Ground Kits

Switch Ampere Rating	Catalog Number	Number of Terminals		Wire Range Per Terminal (Cu/Al)
		Isolated	Grounded	
30-200	HG261234	2	2	#14-4 AWG
400-600	HG2656A	4	4	2/0-14 AWG 2/0-6 AWG

## Equipment Ground Kits

Equipment Ground Lug Kits are available for all General and Heavy Duty Switches. They are field installable in Type 1 and Type 3R Switches and are factory installed as standard in Type 4 / 4X and Type 12 and also in all VBII 4&6-pole Switches.

## Equipment Ground Kits

Switch Ampere Rating	Catalog Number	Number of Terminals	Wire Range Per Terminal (Cu/Al)
30A GD	GSGK60	2	#14-8 AWG
60-200 GD	HG61234	2	#14-4 AWG
30-200 HD	HG61234	2	#14-4 AWG
400 & 600	HG656A	4	2/0-6 AWG
800-1200	HG678	8	#6 AWG-250 Kcmil

# Heavy Duty Safety Switches

## Hub and Lug Data

### Interchangeable Hubs

Conduit hubs are available for Type 3R, 12 and 4 / 4X applications. 30-200A Type 3R Switches are provided with a conduit hub provision and a removable hub plate on their top rainshed.

Conduit Size (inches)	Catalog Number	Used On
-----------------------	----------------	---------

#### Type 3R<sup>①</sup>

Cover	Catalog Number	Used On
3/4	ECHA000	30A GD Only
1	ECHA075	
1 1/4	ECHA100	
1 1/4	ECHA125	
3/4	ECHS000	60–200A GD 30–200A HD
1	ECHS075	
1	ECHS100	
1 1/4	ECHS125	
1 1/2	ECHS150	
2	ECHS200	
2 1/2	ECHS250	
2 1/2	ECHV250	400–1200A
3	ECHV300	
3 1/2	ECHV350	
4	ECHV400	

#### Type 4/4X<sup>②</sup>

Cover	Catalog Number	Used On
3/4	SSH075	30–200A
1	SSH100	
1 1/4	SSH125	
1 1/2	SSH150	
2	SSH200	
2 1/2	SSH250	400–600A
3	SSH300	
3 1/2	SSH350	
4	SSH400	

**Note:** 30 thru 200A. Type 3R Switches have removable hub plates on rainshed. 400A and larger Type 3R Switches have no provisions for mounting hubs. Drill or punch hole in the field to accommodate hub size desired.

### Field Replacement Kits and Neutral Barrier Kits

All Heavy Duty Switches are field convertible for (Crimp) type lugs. When compression lugs are required for 30-100A switches, a neutral barrier kit is required for 1-Phase, 3W or 3-Phase, 4W applications. When compression lugs are required on 400-1200A switches, lug mounting kits are required.

#### Field Replacement Kits and Neutral Barrier Kits

Switch Ampere Rating	Catalog Number	Kit Description
30	HCL612	Neutral Barrier Kit
60 & 100	HCL623	Neutral Barrier Kit
400	HCM65A	240V/600V Fusible Kit
400	HNCM65A	240/600V Non-Fusible Kit
600	HCM66A	240V/600V Fusible Kit
600	HNCM66A	240V/600V Non-Fusible Kit
800 & 1200 <sup>③</sup>	HCL65678	1 Pole, Compression Lug Mounting Kit

#### Lugs

30 & 60A Switches are suitable for use with 60° or 75°C wire. 100–1200A are suitable for use with 75°C rated wire.

#### Multiple Padlock Accessory

A tamper-proof device to provide for multiple padlocking to meet OSHA or plant requirements. Accepts up to 6 1/4" padlocks. Catalog number **SL0420**. Standard Carton-12.



SSH125

ECHV300

ECHS200

SL0420

■ Built to order. Allow 3-4 weeks for delivery.

- ① Hubs suitable for 3R Switches.
- ② Also suitable for Type 12 applications.
- ③ Neutral Barrier kits are required on 30-100A switches only and only with 1-Phase / 3W or 3-Phase / 4W loads. Compression Lugs mounting kits are required on 400-1200A switches only.
- ④ Provides mounting for a single line or load lug.
- ⑤ Provides mounting for (2) compression lugs per phase on line or load.
- ⑥ Line base lugs (only) are UL approved to accept #14-6 CU/Al cable.
- ⑦ Max. wire size for height reduced switches is 500 kcmil (Cu/Al).
- ⑧ All but 60A GD & Compact HD NF switches are also UL approved for #2 Cu/Al conductors.
- ⑨ All 200A Heavy Duty Switches have a wire range & wire bending space for (1) #6-300 Kcmil (Cu/Al).
- ⑩ Also for 30A oversized heavy duty switches.
- ⑪ Also for 60A oversized heavy duty switches.

### Wire Ranges (Line, Load and Standard Neutral)

Switch Ampere Rating	Wire Range with Wire Bending Space Per NEC Requirements	Lug Wire Range
30GD	#14-8 AWG (Cu/Al) <sup>⑥</sup>	#14-6 AWG (Cu/Al)
30HD	#14-6 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
60 <sup>⑧⑨</sup>	#14-3 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
100 <sup>⑩</sup>	#14-1/0 AWG (Cu/Al)	#14-1/0 AWG (Cu/Al)
200 <sup>⑩</sup>	#6 AWG-250 Kcmil (Cu/Al)	#6 AWG-300 Kcmil (Cu/Al)
400 <sup>⑩</sup>	(1) 1/0 AWG-600 Kcmil (Cu/Al) (2) 1/0 AWG-500 Kcmil (Cu/Al)	(2) 1/0 AWG-600 Kcmil (Cu/Al)
600 <sup>⑩</sup>	(1) 1/0 AWG-600 Kcmil (Cu/Al) (2) 1/0 AWG-500 Kcmil (Cu/Al)	(2) 1/0 AWG-600 Kcmil (Cu/Al)
800	(3) 1/0 AWG-750 Kcmil (Cu/Al) Line Load (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral	(3) 1/0 AWG-750 Kcmil (Cu/Al) Line Load (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral
1200	(4) 3/0 AWG-750 Kcmil (Cu/Al) Line Load (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral	(4) 1/0 AWG-750 Kcmil (Cu/Al) Line Load (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral

## Enclosed Switches

## Rotary Disconnect Switches in Non-Metallic Enclosures

## Description

16–125A non-fusible switches are available in fiberglass reinforced polycarbonate enclosures which are UL approved as Type 12 & 4X and for either indoor or outdoor use. All are horsepower and load break rated. All are panel mounted and are either supplied with factory installed aux. contacts or will accept contact kits. All are compact in size while providing ample wiring space for copper line & load conductors.



## Siemens Enclosed Rotary Disconnect Switches

- 16–125A, Non-Fusible
- 600VAC max. rated
- Available in both Type 12 and 4X non-metallic enclosures
- Both screw and hinged cover designs available
- Listed and marked “suitable for use as motor disconnect” per NEC Section 430-109
- Screw cover switches are UL listed under File No. E47705 and are CSA certified under File No. 203576
- IEC 60947-3 rated and CE marked (enclosures are IP65 rated)
- HP rated
- Hinged door switches are UL listed for multiple line and load conductors per phase in 30–100A ratings. They are UL & CUL listed under File No. E191706
- Rotary handles are available in black, red, and yellow and in pistol grip designs
- 16–63A screw cover switches have factory installed ground bars. All hinge cover switches accept ground lug kits
- Screw cover switches are provided with knockouts
- Padlockable in OFF position with up to (3) padlocks

Ampere Rating	Catalog Number		Shipping Weight <sup>①</sup>	Horsepower Ratings			
	3 Pole, 3 Wire	3 Pole, 3 Wire with (1) NO & (1) NC Aux. Contact <sup>⑧⑨</sup>		240V AC		480V AC	600V AC
				1 Phase	3 Phase	3 Phase	3 Phase

Non-Fusible, Type 1, 4X & 12K<sup>②</sup> with Screw Cover and Black Rotary Handle 600V AC Max.<sup>⑤</sup>

16	3LD2064-0TB51-0US2	3LD2064-1GP51-0US2	1	1½	3	7½	10
25	3LD2164-0TB51-0US2	3LD2164-1GP51-0US2	1	3	7½	10	15
30	3LD2264-0TB51-0US2	3LD2264-1GP51-0US2	1	3	7½	15	20
30	—	3LD2264-1TS51-0US2 <sup>⑥▲</sup>	1	3	7½	15	20
30	—	3LD2264-2TW51-0US2 <sup>⑦▲</sup>	1	3	7½	15	20
63	3LD2565-0TB51-0US2	3LD2565-1GP51-0US2▲	3	10	15	40	50
100	3LD2766-0TB51-0US2	3LD2766-1GP51-0US2▲	6	—	30	60	75
125	3LD2866-0TB51-0US2	3LD2866-1GP51-0US2▲	6	—	40	75	100

Non-Fusible, Type 1, 4X & 12K<sup>②</sup> with Screw Cover and Red and Yellow Rotary Handle 600V AC Max.<sup>⑤</sup>

16	3LD2064-0TB53-0US2	3LD2064-1GP53-0US2	1	1½	3	7½	10
25	3LD2164-0TB53-0US2	3LD2164-1GP53-0US2	1	3	7½	10	15
30	3LD2264-0TB53-0US2	3LD2264-1GP53-0US2	1	3	7½	15	20
30	—	3LD2264-1TS53-0US2 <sup>⑥▲</sup>	1	3	7½	15	20
30	—	3LD2264-2TW53-0US2 <sup>⑦▲</sup>	1	3	7½	15	20
63	3LD2565-0TB53-0US2	3LD2565-1GP53-0US2▲	3	10	15	40	50
100	3LD2766-0TB53-0US2▲	3LD2766-1GP53-0US2▲	6	—	30	60	75
125	3LD2866-0TB53-0US2▲	3LD2866-1GP53-0US2▲	6	—	40	75	100

▲ Built to order. Allow 6–8 weeks for delivery.

① Carton quantity of (1). Shipping weight in pounds (lbs.).

② Approved for indoor/outdoor use. No cover interlock provided.

③ 30 and 60A switches are also rated 600V AC.

④ Also rated as Type 12 and UL approved for both indoor and outdoor use. Defeatable cover interlock provided.

⑤ Screw cover enclosures are constructed from Makrolon 9425.

Hinged cover enclosures are constructed from fiberglass reinforced polycarbonate.

⑥ Switch is supplied with (2) NO and no NC aux. contacts.

⑦ Switch is supplied with (4) NO and no NC aux. contacts. Ground bar is not provided or available.

⑧ Aux. contacts break about 3 Ms before and make about 3 Ms after main switch contacts.

⑨ 6P, 25A, switch with 1 NO & 1 NC aux. contacts and a black operating handle is also available. Order catalog number 3LD2165-4VD51 (Discount Code: Pilot Devices).

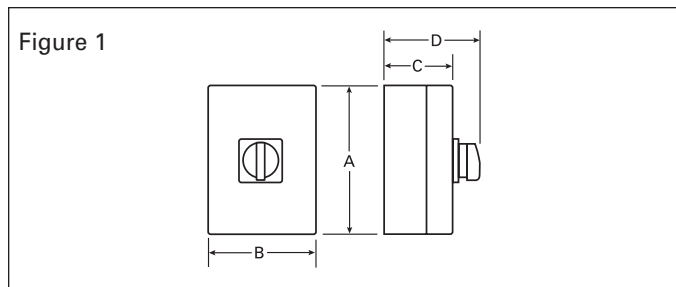
# Enclosed Switches

## Rotary Disconnect Switches

### Enclosed Disconnect Switch Dimensions (Inches)\*

Catalog Number	Ampere Rating	Fig. No.	Dimensions			
			A	B	C	D
3LD2064-	16	1	5.52 <sup>④</sup>	3.94	3.19	4.57
3LD2164-	25		5.52 <sup>④</sup>	3.94	3.19	4.57
3LD2264-	30		5.52 <sup>④</sup>	3.94	3.19	4.57
3LD2565-	63		6.93 <sup>⑤</sup>	5.75	4.10	5.87
3LD2766-	100		11.90	8.35	5.36	7.13
3LD2866-	125		11.90	8.35	5.36	7.13

Note: 3LD2 Type switches only have top and bottom end KOs as follows:  
 16-30A - 1/2" & 3/4", 63A - 3/4" & 1", 100 & 25A - 1" & 1 1/4"



### UL and CUL Short Circuit Withstand Ratings

Ampere Rating	Short Circuit Withstand Rating and Fuse Class				
	With Line Side Fusing			With Load Side Fusing <sup>①</sup>	
	5 kA at 600V Max	10 kA at 600V Max	18 kA at 480V Max	5 kA at 480V Max	18 kA at 480V Max
16	RK5 (50A Max)	—	—	—	—
25 & 30	RK5 (80A Max)	—	—	—	—
63	RK5 (175A Max)	—	—	—	—
100 & 125	—	RK5 (200A Max)	—	—	—

### 3LD2 Type Switches<sup>②</sup>

16	RK5 (50A Max)	—	—	—	—
25 & 30	RK5 (80A Max)	—	—	—	—
63	RK5 (175A Max)	—	—	—	—
100 & 125	—	RK5 (200A Max)	—	—	—

### HNF Type Switches

30	—	H, K & RK5 (100A Max)	J, T & CC (100A Max)	H, K & RK5 (30A Max)	Ferraz Shawmut A50P or lower let-through semiconductor fuses (60A Max)
60	—	H, K & RK5 (150A Max)		H, K & RK5 (60A Max)	Ferraz Shawmut A50P or lower let-through semiconductor fuses (100A Max)
100	⑥	⑥			

① For use as supplemental protection on the load side of the branch circuit over current protective device.  
 ② Ground lug kit has two lugs for #14-4 Cu/Al wire.  
 ③ Factory installed ground lugs supplied as follows: 16-30A #14-10 Cu, 63A #14-8 Cu. Ground lug not provided and is not available on catalog numbers 3LD2264-2TW51-0US2 and 3LD2264-2TW53-0US2.  
 ④ 6.38 inches high including mounting feet.  
 ⑤ 7.85 inches high including mounting feet.  
 ⑥ 60 & 100A HNF switches are rated 10kA at 480V max. with line side Class H, K & RK5 150A max. fuses.  
 ⑦ Wire range (1) #14-2 AWG 60/75 °C Cu only.  
 ⑧ 16-63A 3LD switches are also rated 5kA at 600VAC max when protected by a 3RV type MSP of the same or lesser ampere rating.

\*For inches / millimeters conversion, multiply inches by 25.4.

### Wire ranges 60/75°C Cu Only

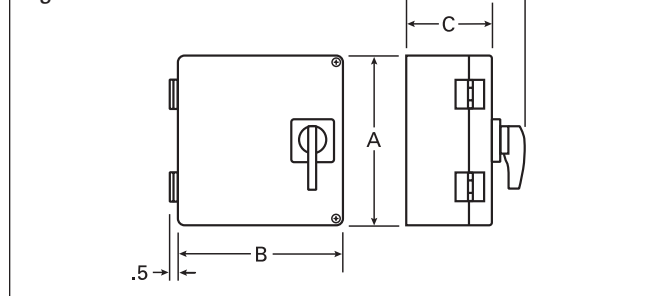
#### 3LD2 Type Switches<sup>③</sup>

16 Amps	(1) #18-10 AWG
25-30 Amps	(1) #14-10 AWG
63 Amps	(1) #14-6 AWG
100-125 Amps	(1) #12-1 AWG

#### HNF Type Switches

30 Amps	(1) #14-#10 AWG Solid (1) #14-#4 AWG Stranded Up to (4) #12 AWG Solid Up to (3) #12 AWG Stranded Up to (6) #14 AWG Stranded Up to (4) #14 AWG Stranded with (1) #10 AWG Stranded
60 & 100 Amps	(1) #14-#10 AWG Solid (1) #14-#1 AWG Stranded (2) #6 AWG Stranded Up to (3) #8 AWG Stranded Up to (6) #10 AWG Stranded Up to (6) #12 AWG Solid

Figure 2



### IEC Fuse and Withstand Ratings

Ampere Rating	gG Fuse Size	Short Circuit Rating
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#### 3LD2 Screw Cover Switches

16	20A	5k Arms
25	25A	10k Arms
32	50A	10k Arms
63	63A	15k Arms
100	100A	20k Arms
125	125A	20k Arms

#### HNF Hinged Cover Switches

30	63A	10k Arms
60	100A	10k Arms
100	100A	10k Arms

### Accessories

Switch Ampere Rating	Catalog Number	Description
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#### 3LD2 Type Switches<sup>③</sup>

16-30A	3LD9220-2C	Neutral Kit
63A	3LD9250-2CA	Neutral Kit
100-125A	3LD9280-2C	Neutral Kit

#### HNF Type Switches

30-100A	GSGK60	Ground Lug Kit <sup>②</sup>
30A	LBRA1	Auxiliary Contact Kit (1 NO-1 NC)
60-100A	LBRA2	Auxiliary Contact Kit (1 NO-1 NC)
30-100A	HF63CX <sup>⑦</sup>	Neutral Kit



## Disconnect Switches

## Compact Non-Fusible — Rotary and Toggle

## Features

- 16–250 Ampere, to 100 hp, 480V & 600V
- Rotary and Toggle actuation models
- LBR Type switches are padlockable in the OFF position and are UL & CUL listed under File No. E191706 as manual motor controllers per UL Standard UL508
- 3LD2 Type switches are padlockable in the OFF position and are UL listed under File No. E47705 per UL508 and are CSA certified under File No. 203576
- Base, DIN-rail and door mounting
- Multiple conductor, distribution terminal type rating LBR & LBT Type (40A -100A only)
- IEC 947-1 rated, CE marked
- Listed and marked “suitable as motor disconnect” per NEC Section 430-109

## Application

Siemens Load Break Switches are listed as manual motor controllers and are suitable as motor disconnects. They are load break rated and act as enclosure disconnects when short circuit protection is provided upstream of the switch. If upstream over current protection is not provided, use a Siemens fusible Type VBII, CFS or MCS Disconnect Switch.

## Ordering Information

**Door Mounted Switches (Rotary Type Only)** — Order either complete “3LD2” assemblies or individual “LBR” components as follows:

**Complete Assemblies** include switch, handle, and shaft. Certain 25 and 32A assemblies are also available with factory installed neutral blocks and/or aux. contacts. These accessories can also be ordered as field installed kits.

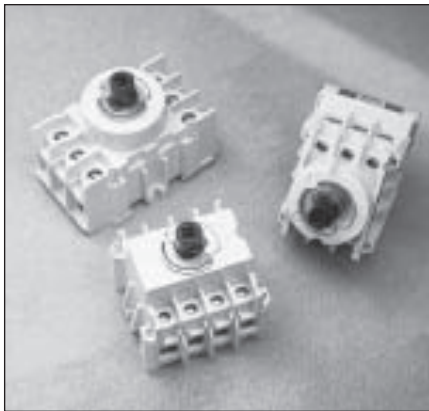
**Individual Components** are ordered as follows:

**25A** — LBR3025D switch + LBRH3 or 4 handle.

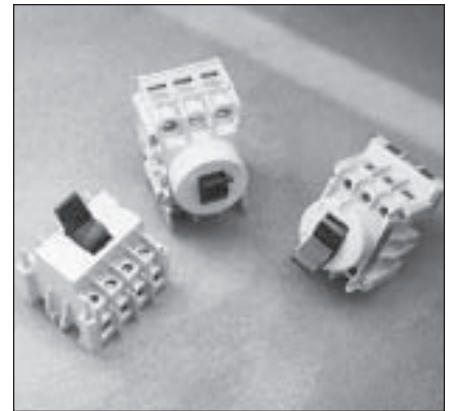
**40–100A** — LBR switch + LBRH3 or 4 handle + LBRD1.

Notes: (LBR Type switches only)

1. Aux contacts are available as field installed kits on 25A units only.
2. Lugs on 25A units face to the rear and lugs on 40–100A units face toward the front.



Type LBR Rotary Switches



Type LBT Toggle Switches



3LD2254-0TK51

**Base/DIN Rail Mounted Switches (Rotary or Toggle Type)** — Order individual components as follows:

**Toggle** — Order the LBT switch required and a toggle switch cover plate if needed.

**Rotary, Base Mounted with Door Mounted Handle** — Order “LBR” switch + door mounted handle + shaft + any accessories.

**Rotary, Base Mounted with Direct Mounted Handle** — Order “LBR” switch + direct mounted handle.

## Short Circuit Withstand Ratings

Switch Rating & Type	Max. Line Side Fuse Rating
----------------------	----------------------------

**5kA with Line Side Class H, K, or RK5 Fuses**

25 & 32A 3LD2	80A Max. at 600V AC Max.
63A 3LD2	175A Max. at 600V AC Max.

**10kA with Line Side Class H, K, or RK5 Fuses<sup>②</sup>**

25A LBR	30A Max. at 480V AC Max.
40A, 4P LBR & LBT	60A Max. at 480V AC Max.
40 & 60A, 3P LBR & LBT	100A Max. at 480V AC Max.
80 & 100A LBR & LBT	150A Max. at 480V AC Max.

**18kA with Line Side Class J, T, or CC Fuses**

40–100A, 3P LBR & LBT	100A Max. at 480V AC Max.
-----------------------	---------------------------

Note: 3LD2 switches are also rated 5kA at 600V AC Max. when protected by a 3RV motor starter with a FLA rating equal to or less than the switch ampere rating.

Door Mounted Complete Assemblies (Operator, Shaft, & Switch) 600V AC Max.<sup>②</sup>

Shaft Mounted	4 Hole Mounted	Number of Poles	Ampere Rating	AC Horsepower Ratings				
				120V 1Ø	240V 1Ø 3Ø		480V 3Ø	600V 3Ø
—	3LD2003-1TP53 <sup>③</sup>	3	16	½	1½	3	7½	10
3LD2154-0TK 3LD2154-1TP 3LD2154-1TL 3LD2154-2EP	3LD2103-0TK 3LD2103-1TP 3LD2103-1TL 3LD2103-2EP	3 3 <sup>①</sup> 3 + N 3 + N <sup>①</sup>	25	2	3	7½	10	15
3LD2254-0TK 3LD2254-1TL	3LD2203-0TK 3LD2203-1TL	3 3 + N	32	2	3	10	20	20
3LD2555-0TK	3LD2504-0TK	3	63	—	10	15	40	50
—	3LD2704-0TK	3	100	—	—	30	60	75
—	3LD2804-0TK	3	125	—	—	40	75	100

<sup>①</sup> Includes auxiliary contacts (1 NO and 1 NC).

<sup>②</sup> Handles are IP65 rated and are also UL listed for Type 1, 4X and 12 applications.

<sup>③</sup> Add 51 for a black handle or 53 for a red & yellow handle to the end of the catalog number.

<sup>④</sup> 100-250A 3LD2 switches are rated 10kA when protected by 200A Max. Class RK5 fuses.

# Disconnect Switches

## Compact Non-Fusible — Rotary and Toggle

### 3LD Type Base Mounted Complete Assemblies (Operator, Shaft, & Switch) 600V AC Max.②

Handle mounting②			Number of Poles	Ampere Rating	AC Horsepower Ratings				
Shaft (center hole)	4 Hole (no defeat)	4 Hole (with defeat)			120V	240V	480V	600V	
Catalog Number	Catalog Number	Catalog Number			10	10	30	30	30
—	3LD2013-0TK5_	3LD2017-0TK1 3LD2017-1TL1	3 3 + N	16	½	1½	3	7½	10
3LD2144-0TK5 3LD2144-1TL5	3LD2113-0TK5 3LD2113-1TL5	—	3 3 + N	25	2	3	7½	10	15
3LD2244-0TK5 3LD2244-1TL53	3LD2213-0TK5 3LD2213-1TL53	3LD2217-0TK1 3LD2217-1TL1	3 3 + N	32	2	3	10	20	20
3LD2545-0TK5 —	3LD2514-0TK5 —	3LD2517-0TK1 3LD2517-1TL1	3 3 + N	63	3	10	15	40	50
—	3LD2714-0TK5	—	3	100	—	—	30	60	75
—	3LD2814-0TK5	—	3	125	—	—	40	75	100
—	3LD2318-0TK1	—	3	160	—	—	40	75	75
—	3LD2418-0TK1	—	3	250	—	—	50	100	75



Base Mount  
**3LD2217-0TK13**

### Accessories for Front Mounted 3LD2 Switches

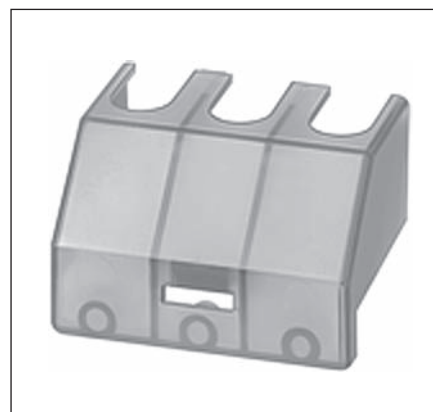
Catalog Number	Description	Switches Used With
3LD9200-5B③ 3LD9200-5BF③	1 NO, 1 NC Aux. Contact 1 NO, 1 NC Aux. with Gold Plated Contacts	25-125A 25-125A
3LD9220-2B 3LD9250-2BA 3LD9280-2B	Neutral/Ground Terminal Neutral/Ground Terminal Neutral/Ground Terminal	25 & 32A 63A 100 & 125A
3LD9220-0B 3LD9250-0BA 3LD9280-0B	4th Pole (leading ON, lagging OFF) 4th Pole (leading ON, lagging OFF) 4th Pole (leading ON, lagging OFF)	25 & 32A 63A 100 & 125A
3LD9224-1B④ 3LD9284-1B④ 3LD9224-3B④ 3LD9284-3B④	Black Handle (4 hole mtg.) Black Handle (4 hole mtg.) Red/Yellow Handle (4 hole mtg.) Red/Yellow Handle (4 hole mtg.)	25 & 32A 63-125A 25 & 32A 63-125A
3LD9224-1D④ 3LD9284-1D④ 3LD9224-3D④ 3LD9284-3D④	Black Handle (shaft mtg.)④ Black Handle (shaft mtg.)④ Red/Yellow Handle (shaft mtg.)④ Red/Yellow Handle (shaft mtg.)④	25 & 32A 63-125A 25 & 32A 63-125A
3LD9221-2A④ 3LD9221-0A④ 3LD9251-0A④	Terminal Cover 1P (Pack of 4) Terminal Cover 3P (Pack of 4) Terminal Cover 3P (Pack of 4)	25 & 32A 25 & 32A 63A



**3LD9220-2C**

### Accessories for Base Mounted 3LD2 Switches

3LD9200-5C③ 3LD9200-5CF③	1 NO, 1 NC Aux. Contact 1 NO, 1 NC Aux. with Gold Plated Contacts	25-250A 25-250A
3LD9220-2C 3LD9250-2CA 3LD9280-2C 3LD9240-2C	Neutral/Ground Terminal Neutral/Ground Terminal Neutral/Ground Terminal Neutral/Ground Terminal	25 & 32A 63A 100 & 125A 160 & 250A
3LD9220-0C 3LD9250-0CA 3LD9280-0C 3LD9240-0C	4th Pole (leading ON, lagging OFF) 4th Pole (leading ON, lagging OFF) 4th Pole (leading ON, lagging OFF) 4th Pole (leading ON, lagging OFF)	25 & 32A 63A 100 & 125A 160 & 250A
3LD9224-1B④ 3LD9284-1B④ 3LD9224-3B④ 3LD9284-3B④	Black Handle (4 hole mtg. no defeat) Black Handle (4 hole mtg. no defeat) Red/Yellow Handle (4 hole mtg. no defeat) Red/Yellow Handle (4 hole mtg. no defeat)	25 & 32A 63-125A 25 & 32A 63-125A
3LD9224-1D④ 3LD9284-1D④ 3LD9224-3D④ 3LD9284-3D④	Black Handle (shaft mtg.) Black Handle (shaft mtg.) Red/Yellow Handle (shaft mtg.) Red/Yellow Handle (shaft mtg.)	25 & 32A 63-125A 25 & 32A 63-125A
3LD9221-2A④ 3LD9221-0A④ 3LD9251-0A④	Terminal Cover 1P (Pack of 4) Terminal Cover 3P (Pack of 4) Terminal Cover 3P (Pack of 4)	25 & 32A 25 & 32A 63A



**3LD9251-0A**

**Note:** 3LD2 shaft lengths allow the following maximum enclosure depths from the switch mounting surface to the outside of the cover:

16-32A, 15.25"  
63-125A, 15.75"  
160 & 250A, 23.70"

① Handles and line side terminal covers are supplied as standard with 3LD2 switches.  
② Add suffix 1 for a black or 3 for a red & yellow handle to the catalog number (except 3LD2244-1TL53 & 3LD2213-1TL53). Handles are IP65 rated and are also listed by UL for Type 1, 4X and 12 applications.

③ Aux. contacts break about 30 Ms before and make about 3 Ms after main switch contacts.  
Ratings 10A at 120V AC  
6A at 240V AC  
1.4A at 480V AC

④ Can be used as replacement handles on enclosed 3LD2 switches.  
⑤ Base mounted switches with direct mount handles are also available (3LD2330-0TK1\_⑤ rated 160A and 3LD2430-0TK1\_⑤ rated 250).

# Disconnect Switches

## Compact Non-Fusible — Rotary and Toggle

### Individual Components and Assemblies

Recommended for Basemount. For Door mounting only, use LBRD1.<sup>®</sup>

#### Rotary and Toggle Switches

Catalog Number	Switch Type	No. of Poles	Ampere Rating	Max AC Volt	AC Horsepower Ratings					
					115V		240V		480V	600V
					1Ø	3Ø	1Ø	3Ø	3Ø	3Ø
LBR3040 <sup>®</sup>	Rotary	3	40	600	2	3	7½	20	25	
LBR3060 <sup>®</sup>	Rotary	3	60	480	2	5	10	25	—	
LBR3080 <sup>®</sup>	Rotary	3	80	600	3	10	20	40	50	
LBR3100 <sup>®</sup>	Rotary	3	100	480	5	15	25	50	—	
LBR4040	Rotary	4	40	480	2	3	7½	20	—	
LBT3040	Toggle	3	40	600	2	3	7½	20	25	
LBT3060	Toggle	3	60	480	2	5	10	25	—	
LBT3080	Toggle	3	80	600	3	10	20	40	50	
LBT3100	Toggle	3	100	480	5	15	25	50	—	
LBT4040	Toggle	4	40	480	2	3	7½	20	—	

#### Standard and Heavy Duty Rotary Switch Door Handles



#### LBR Type Handles

Catalog Number	Used on Rotary Switches	NEMA Type	Mounting	Marking	Color	Cover Interlock Supplied	Padlockable
<b>Standard Duty</b>							
LBRH2 <sup>®</sup>	All	1	Door	ON/OFF	Black	No	No
LBRH3 <sup>®</sup>	All	1, 3R, 12, 4X	Door	O/I, ON/OFF	Black	Yes <sup>①</sup>	Yes
LBRH4 <sup>®</sup>	All	1, 3R, 12, 4X	Door	O/I, ON/OFF	Red/Yel	Yes <sup>②</sup>	Yes
LBRH9 <sup>®</sup>	All (Pistol Grip Type)	1, 3R, 12, 4X	Door	O/I, ON/OFF	Black	Yes	Yes
LBRH10 <sup>®</sup>	All (Pistol Grip Type)	1, 3R, 12, 4X	Door	O/I, ON/OFF	Red/Yel	Yes	Yes
LBRH5	25 Amps	1	Direct Mount	O/I	Black	—	Yes
LBRH6	3-Pole, 40-60 Amps	1	Direct Mount	O/I	Black	—	Yes
LBRH7	3-Pole, 80-100 Amps	1	Direct Mount	O/I	Black	—	Yes
LBRH8	4-Pole, 40-60 Amps	1	Direct Mount	O/I	Black	—	Yes
<b>Heavy Duty</b>							
CFSH10B12	All	1, 3R, 12	Door	O/I, ON/OFF	Black	Yes	Yes
CFSH10R12	All	1, 3R, 12	Door	O/I, ON/OFF	Red/Yel	Yes	Yes

#### LBR Type Rotary Shafts

Catalog No	Length In. (mm)
<b>For Standard Duty Handles</b>	
LBR5040	1.57 (40)
LBR5050	1.97 (50)
LBR5055	2.17 (55)
LBR5080	3.15 (80)
LBR5120	4.72 (120)
LBR5180	7.09 (180)
LBR5305	12.00 (305)
<b>For Heavy Duty Handles</b>	
CFSS5200H	7.9 (200)
CFSS5400H	15.7 (400)

#### Rotary Shafts



#### LBR Type Handles



#### Rotary and Toggle Switches



#### Auxiliary Switch Kits

Used on Rotary Switch	Catalog Number	Contact Arrangement
LBR3040, LBR3060	LBRA1 <sup>®④</sup>	1 NO/1 NC with common point
LBR3080, LBR3100	LBRA2 <sup>®④</sup>	1 NO/1 NC with common point

#### LBR Type Rotary Switch Door Mounting Kit (For use with LBRH3 & LBRH4 only)

Used on Rotary Switch	Catalog Number
40-100 Amps	LBRD1 <sup>®</sup>

#### LBR/LBT Neutral Kit<sup>⑤</sup>

Used with Catalog Number	Catalog Number
All	HF63CX



#### LBR Type Toggle Switch Cover Plate

Used on Toggle Switches	Catalog Number
LBT3040, LBT3060 LBT3080, LBT3100 LBT4040	LBTCP1 LBTCP2 LBTCP3

<sup>①</sup>No cover interlock defeat mechanism provided. To eliminate cover interlock, order additional catalog number LBRDC1.

<sup>②</sup>LBRH2 is IP54 rated. All others are IP65.

<sup>③</sup>Ratings

15.1A resistive at 250V AC max.  
.5A at 125V DC  
.25A at 250V DC  
.5 HP at 250V AC max.

<sup>④</sup>Auxiliary switch contacts break about 30 Ms before and make about 3 Ms after main switch contacts.

<sup>⑤</sup>Lug wire ranges:

HF63CX—(1) #14-2 AWG 60/75°C Cu only

<sup>⑥</sup>Only door mountable and for use with LBRH3 & 4 handles only.

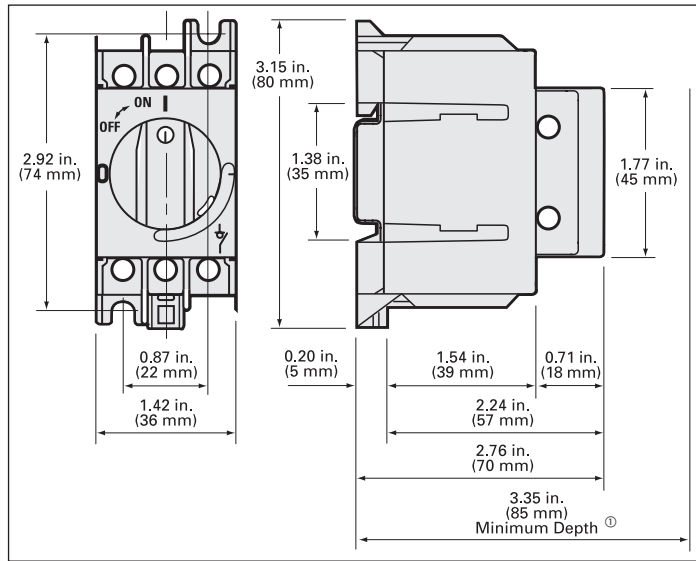
<sup>⑦</sup>For door mounting of 40-100A LBR switches use door mounting kit LBRD1 & LBRH3 or 4 handle.

<sup>⑧</sup>LBRD1 does not require shaft.

# Disconnect Switches

Compact Non-Fusible — Rotary and Toggle

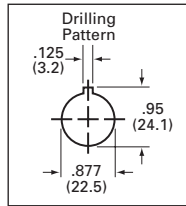
## Dimension Drawings and Wire Ranges



**LBR 3025**

### Wire Ranges 60/75°C Cu only

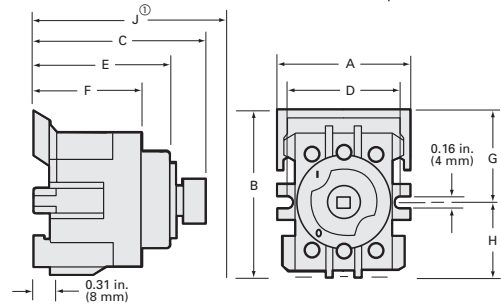
25 Amps LBR	(1) #14 - #10 AWG Solid (1) #14 - #8 AWG Stranded
40 & 60 Amps LBR & LBT	(1) #14 - #10 AWG Solid (1) #14 - #4 AWG Stranded UP to (4) #12 AWG Solid Up to (3) #12 AWG Stranded Up to (6) #14 AWG Stranded Up to (4) #14 AWG Stranded with (1) #10 AWG Stranded
80 & 100 Amps LBR & LBT	(1) #14 - #10 AWG Solid (1) #14 - #1 AWG Stranded (2) #6 AWG Stranded Up to (3) #8 AWG Stranded Up to (6) #10 AWG Stranded Up to (6) #12 AWG Solid
16A, 3LD20 25A, 3LD21 32A, 3LD22 63A, 3LD25 100, 125A, 3LD2 160, 250A, 3LD2	(1) #18-10 AWG (1) #14-8 AWG (1) #14-8 AWG (1) #14-6 AWG (1) #12-1 AWG (1) #1-400 MCM



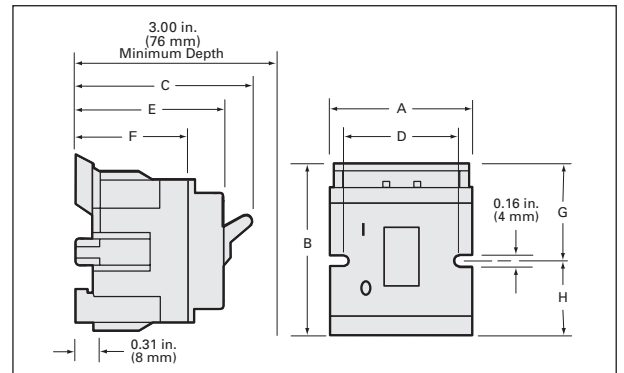
**Shaft Mounted 3LD2 Handle Cutout (4-hole pattern)**

### Dimension J Minimum Depth<sup>①</sup>

Switch	Dimension J
LBR 40-100A	3.35 (85)
3LD2 25 & 32A Front Shaft Mounted	3.07 (78)
3LD2 63 Front Shaft Mounted	3.35 (85)
3LD2 16-32A Front 4-hole Mounted	2.13 (54)
3LD2 63A Front 4-hole Mounted	2.48 (63)
3LD2 100 & 125A Front 4-hole Mounted	2.56 (65)
3LD2 25 & 32A Base w/shaft Mtg. Handle	6.46 (164)
3LD2 63A Base w/shaft Mtg. Handle	6.77 (172)
3LD2 16-32A Base w/4-hole Mtg. Handle	5.59 (142)
3LD2 63A Base w/4-hole Mtg. Handle	5.99 (152)
3LD2 100-250A Base w/4-hole Mtg. Handle	6.07 (154)



**LBR 40-100 Amps & 3LD2 16-250A**



**LBT Toggle — 40-100 Amps**

Switch Type	Switch Catalog Number	Dimensions Inches (mm)							
		A	B	C	D	E	F	G	H
Rotary	LBR3040	2.00 (51)	2.72 (69)	2.72 (69)	1.78 (45)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Rotary	LBR3060	2.00 (51)	2.72 (69)	2.72 (69)	1.78 (45)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Rotary	LBR3080	2.09 (53)	3.32 (84)	2.92 (74)	1.97 (50)	2.29 (58)	1.69 (42)	1.66 (42)	1.66 (42)
Rotary	LBR3100	2.09 (53)	3.32 (84)	2.92 (74)	1.97 (50)	2.29 (58)	1.69 (42)	1.66 (42)	1.66 (42)
Rotary	LBR4040	2.42 (61)	2.72 (69)	2.72 (69)	2.28 (58)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Rotary Front Mtg.	3LD20 <sup>②</sup>	1.89 (48)	1.97 (50)	1.97 (50)	—	—	—	—	—
Rotary Front Mtg.	3LD21 & 2 <sup>②</sup>	1.81 (46)	2.17 (55)	1.97 (50)	—	—	—	—	—
Rotary Front Mtg.	3LD25 <sup>②</sup>	2.36 (60)	2.52 (64)	2.32 (59)	—	—	—	—	—
Rotary Front Mtg.	3LD27 & 8 <sup>②</sup>	2.40 (61)	3.27 (83)	2.40 (61)	—	—	—	—	—
Rotary Base Mtg.	3LD20 <sup>②</sup>	1.89 (48)	1.97 (50)	2.29 (58)	—	—	—	—	—
Rotary Base Mtg.	3LD21 & 2 <sup>②</sup>	1.81 (46)	2.17 (55)	2.29 (58)	—	—	—	—	—
Rotary Base Mtg.	3LD25 <sup>②</sup>	2.36 (60)	2.52 (64)	2.68 (68)	—	—	—	—	—
Rotary Base Mtg.	3LD27 & 8 <sup>②</sup>	2.80 (71)	3.27 (83)	2.76 (70)	—	—	—	—	—
Rotary Base Mtg.	3LD23 & 4	4.41 (112)	5.83 (148)	4.10 (104)	—	—	—	—	—
Toggle	LBT3040	2.00 (51)	2.72 (69)	2.75 (70)	1.78 (45)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Toggle	LBT3060	2.00 (51)	2.72 (69)	2.75 (70)	1.78 (45)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Toggle	LBT3080	2.09 (53)	3.32 (84)	2.90 (74)	1.97 (50)	2.29 (58)	1.69 (42)	1.66 (42)	1.66 (42)
Toggle	LBT3100	2.09 (53)	3.32 (84)	2.90 (74)	1.97 (50)	2.29 (58)	1.69 (42)	1.66 (42)	1.66 (42)
Toggle	LBT4040	2.42 (61)	2.72 (69)	2.75 (70)	2.28 (58)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)

① Depth from outside of cover to back of switch.

② Handle front plate dimensions:  
3LD 16-32A—2.64 inches square  
3LD 63-125—3.55 inches square



# Disconnect Switches

## Type VBII (30-600A) with Flange Mounted Operating Handle

### Features

- 30-600A, 600VAC and DC ratings
- 240 & 600V AC switches are UL Recognized under file number E121152, Vol. 3 and CSA certified under file number 154852
- 600V DC Photovoltaic switches are UL Recognized under file number E335018, Vol. 3 and are rated to switch 3 separate 600V DC circuits
- Visible blade quick make and break switching action
- Panel and Flange mounted assemblies facilitate installation
- Panel mounted switches are variable depth
- Short circuit rating of 10,000 AIC with class H fuse, and of 200,000 AIC with class R or J fuses. PV switches are rated 10,000 AIC at 600V DC with 600V DC rated class K, J or R fuses.
- Flange mounted handles rated as Type 1, 3R & 12 or 4X are padlockable in the off position with up to (3) padlocks with 5/16 hasps
- Meets UL98 requirements and suitable for both main and branch circuit applications
- A complete line of aux contacts are available
- Load break and horsepower rated
- Defeatable cover interlock standard with all handles
- Meets NFPA79 requirements
- Seismic qualified — complies with the 2010 California Building Code (CBC) — and with the International Building Code (IBC) — Compliance Level SDS = 1.85 g



VBFS361, VBLK1 & VBH1



VBFS363F



VBNFS365, VBLK4 & VBH2

### Ordering Information

1. Determine the ratings required (amps, volts, HP, Fusible, NF), the mounting needed (Panel or Flange), and select the appropriate switch.
2. For panel mounted switches with a rigid operating shaft (30-600A), order panel mounted switch, flange mounted operating handle & rigid linkage kit based on depth required.
3. For panel mounted switches with a Max-Flex operator, order panel mounted switch, Max-Flex Handle & Adapter Kit and drive cable.
4. Select accessories if required.

# Disconnect Switches

## Type VBII Switch, Handle and Linkage Kit Selection

### Switches—for Standard 600V Max AC or DC Applications

Switch Ampere Rating	Max. AC Voltage Rating	Catalog Number	Horsepower Rating, Switches and 3-Phase <sup>④</sup>						600 Volts DC (max) <sup>⑤</sup>
			240 Volts AC		480 Volts AC		600 Volts AC		
			Standard	Max.	Standard	Max.	Standard	Max.	
<b>Fusible Panel Mounted Variable Depth Switches - 3-Pole<sup>⑥</sup></b>									
30	240	VBFS321	3	7 1/2	—	—	—	—	— <sup>①</sup>
60	240	VBFS322	7 1/2	15	—	—	—	—	— <sup>②</sup>
30	600	VBFS361	—	—	5	15	7 1/2	20	15 <sup>③</sup>
60	600	VBFS362	—	—	15	30	15	50	30 <sup>③</sup>
100	600	VBFS363	—	—	25	60	30	75	50 <sup>③</sup>
200	600	VBFS364	—	—	50	125	60	150	50
400	600	VBFS365	—	—	100	250	125	350	— <sup>⑨</sup>
600	600	VBFS366	—	—	150	400	200	500	— <sup>⑨</sup>
<b>Non-fusible Panel Mounted Variable Depth Switches - 3-Pole<sup>⑥</sup></b>									
30	600	VBNFS361	—	10	—	20	—	30	15 <sup>③</sup>
60	600	VBNFS362	—	20	—	50	—	60	30 <sup>③</sup>
100	600	VBNFS363	—	40	—	75	—	100	50 <sup>③</sup>
200	600	VBNFS364	—	60	—	125	—	150	50
400	600	VBNFS365	—	125	—	250	—	300	— <sup>⑨</sup>
600	600	VBNFS366	—	200	—	400	—	500	— <sup>⑨</sup>
<b>Fusible Flange Mounted Switches - 3-Pole<sup>⑥</sup></b>									
30	240	VBFS321F	3	7 1/2	—	—	—	—	— <sup>①</sup>
60	240	VBFS322F	7 1/2	15	—	—	—	—	— <sup>②</sup>
30	600	VBFS361F	—	—	5	15	7 1/2	20	15 <sup>③</sup>
60	600	VBFS362F	—	—	15	30	15	50	30 <sup>③</sup>
100	600	VBFS363F	—	—	50	60	30	75	50 <sup>③</sup>
200	600	VBFS364F	—	—	100	125	60	150	50
<b>Non-fusible Flange Mounted Switches - 3-Pole<sup>⑥</sup></b>									
30	600	VBNFS361F	—	10	—	20	—	30	15 <sup>③</sup>
60	600	VBNFS362F	—	20	—	50	—	60	30 <sup>③</sup>
100	600	VBNFS363F	—	40	—	75	—	100	50 <sup>③</sup>
200	600	VBNFS364F	—	60	—	125	—	150	50

Note: Fusible switches include fuse provisions for Class H Fuses. The load base can be moved to pre-drilled holes for Class J Fuses on all 600V switches. If Class R Fuses are required, add a Class R Fuse Clip Kit.

### Switches—for Photovoltaic Applications, 600VDC Max.<sup>⑦</sup>

(for use in negative ground systems only)

Switch Ampere Rating	Catalog Number	Rated I <sub>sc</sub> per NEC Article 690
<b>Fusible Panel Mounted Variable Depth Switches—3 Pole<sup>⑧⑨</sup></b>		
30	VBFS361PV	19.2A
60	VBFS362PV	38.4A
100	VBFS363PV	64.0A
<b>Non-Fusible Panel Mounted Variable Depth Switches—3 Pole<sup>⑧</sup></b>		
30	VBNFS361PV	24.0A
60	VBNFS362PV	48.0A
100	VBNFS363PV	80.0A
<b>Fusible Flange Mounted Variable Depth Switches—3 Pole (Includes Type 1, 3R and 12 Rated Operating Handle)<sup>⑧⑨</sup></b>		
30	VBFS361FPV	19.2A
60	VBFS362FPV	38.4A
100	VBFS363FPV	64.0A
<b>Non-Fusible Flange Mounted Variable Depth Switches—3 Pole (Includes Type 1, 3R and 12 Rated Operating Handle)<sup>⑧</sup></b>		
30	VBNFS361FPV	24.0A
60	VBNFS362FPV	48.0A
100	VBNFS363FPV	80.0A

- ① Rated 5 HP at 250V DC.
- ② Rated 10 HP at 250V DC.
- ③ 600V DC & 600V DC horsepower rating shown requires (2) poles to be connected in series.
- ④ Std. - applies when non-time delay fuses are used. Max. - applies when time delay fuses are used.
- ⑤ Includes line base, load base, operating mechanism and line and load lugs. Order operating handle and linkage kits from tables on pages 18/21 or 18/22.
- ⑥ Includes line base, load base, operating mechanism line and load lugs plastic operating handle and required linkage.
- ⑦ All photovoltaic switches are rated to be used with 3 separate 600V DC circuits.
- ⑧ Fusible switches accept Class K or R fuses as standard and Class J fuses by relocating the load base.
- ⑨ Rated 250V DC max and 50HP at 250V DC.

### Cable Kit

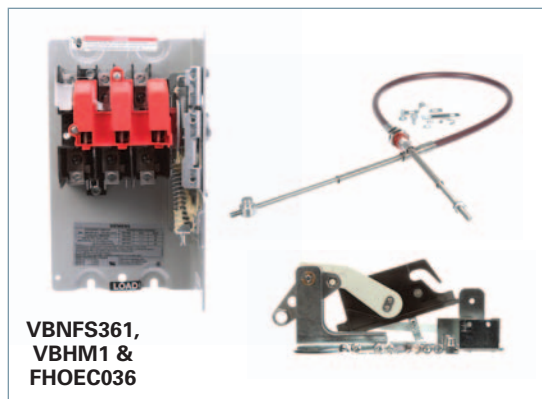
For use with 30-200A panel mounted switches and Max-Flex handle and adapter kit.

Catalog Number	Description
FHOEC036	36" long drive cable
FHOEC048	48" long drive cable

### Max-Flex™ Handle and Adapter Kit

(Type 1, 12, 3R & 4X) Use with 30-200A panel mounted switches and cable kit.

Catalog Number	Operating Handle Description
<b>Plastic Handles</b>	
VBHM1	30-200A Type 1, 3R, 12 and 4X
<b>Metal Handles</b>	
VBH112	30-200A Type 1, 3R and 12
VBH14	30-200A Type 4X



## Disconnect Switches

## Accessories Type VBII

## Flange Mounted Operating Handles

For use with Panel Mounted Switches. Plastic handle is included with Flange Mounted Switches as standard.

Catalog Number	Operating Handle Description
<b>Plastic Handles</b>	
VBH1	30-200A Type 1, 3R & 12
VBH14X	30-200A Type 4X
<b>Metal Handles</b>	
VBH112	30-200A Type 1, 3R & 12
VBH14	30-200A Type 4X
VBH2	400A Type 1 & 12
VBH2R	400 & 600A Type 1, 3R & 12
VBH24X	400 & 600A Type 4X



HR612

## Class R Fuse Clip Kits

These kits prevent the installation of Class H and K fuses (one kit required per switch).

## Class R Fuse Clip Kits

Catalog Number	Description
HR21	30A, 240V Kit (HD only)
HR612	30A, 600V Kit/60A, 240V Kit
HR62	60A, 600V Kit
HR63	100A Kit
HR64	200A Kit
HR656	400A/600A Kit

## Internal Door Latch Kits

For use with enclosures with door mounted latching bar. Required when a flange mounted switch is mounted in a Hoffmann or Rittal enclosure provided with an AB cutout.

Catalog Number	Description
DKR2	2 point (for use with enclosures less than 40" high)
DKR3	3 point (for use with enclosures 40" or larger in height)

## Rigid Linkage Kits

For use with Panel Mounted Switches. Not required for Flange Mounted Switches.

Catalog Number	Switch Ampere Rating	Enclosure Depth <sup>①</sup>	
		Min	Max.
VBLK1	30-200	6.94 <sup>②</sup>	6.94 <sup>②</sup>
VBLK2	30-200	6.94 <sup>②</sup>	19.0
VBLK3	400 & 600	9.00	8.75
VBLK4	400 & 600	9.00	19.0



HT63

## Class T Fuse Adapter Kits

100-600A fusible switches are field convertible to accept Class T fuses. 400-600A switches are field convertible to accept Class T fuses by moving the load base to a pre-drilled T fuse position.

Class T Fuse Adapter Kits<sup>③</sup>

Catalog Number	Description
HT23	100A, 240V Kit
HT63	100A, 600V Kit
HT24	200A, 240V Kit
HT64▲	200A, 600V Kit

## Class J Fuse Provisions

All 30-600A, 600V fusible switches are field convertible to accept Class J fuses by moving the load base to a pre-drilled J fuse position.

## Window Kits (Type 1, 12, 3R and 4x)

Allows viewing of visible blades and of indicating fuses through 200A.

Catalog Number	Description
VBWK1	30A Window Kit
VBWK2	60 & 100A Window Kit
VBWK3	200-600A Window Kit

## NEW Quick Connects

They provide two point control power take-off capability and are normally used on two poles on the line side when it is required to have control power available when the switch is in the OFF position. They provide a mounting provision for standard 1/4" quick connect terminal. Installed in the line or load side. 30A VBII switches have lugs UL listed to accept (2) wires per pole as standard so a 30A kit is not required.

Catalog Number	Description
HCO62	60A 2 wire quick connect kit
HCO63	100A 2 wire quick connect kit
HCO64	200A 2 wire quick connect kit



HN612

Neutral Kits<sup>④</sup>

Standard Neutral Kits can be field installed in 30-100A switches.

## Neutral Kits

Switch Ampere Rating	Kit Catalog Number
30A 600V, 60A 240V	HN612
60A, 600V & 100A	HN623

200% Neutral Kits<sup>④</sup>

UL listed 200% Neutrals are available on 60 & 100A switches. They are typically used with non-linear transformers or where increased neutral ampacity/lug capacity is required.

## 200% Neutral Kits

Switch Ampere Rating	Kit Catalog Number	Wire Range Line & Load Lugs (Cu/Al)
60 & 100A	HN263	(2) #14-1/0 AWG

▲ Built to order. Allow 6-8 weeks for delivery.

① Dimensions (min. & max.) from enclosure mounting pan to outside surface of enclosure handle mounting flange.

② 7.12 for 200A switches.

③ One kit per pole required.

④ UL approved (not CSA certified).

## Disconnect Switches

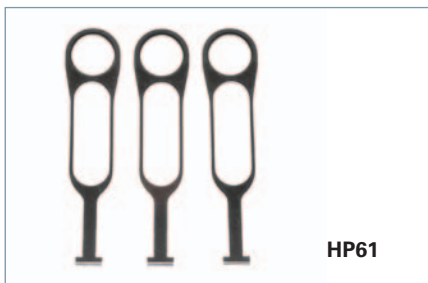
## Type VBII Accessories



HA161234



HA261234



HP61



HLC612



HSK61

▲ Built to order. Allow 6-8 weeks for delivery.

## Auxiliary Contacts

The auxiliary contacts are available in 1 normally open and 1 normally closed or 2 normally open and 2 normally closed configurations. Siemens offers a PLC Auxiliary Switch (30-200A) that has very low resistance for low voltage and current typical in PLC circuits. All auxiliary contacts make after and break before main switch contacts.

Switch Ampere Rating	Aux. Switch Catalog Number	Kit Ampere Rating			Kit Horsepower Rating		
		125V AC Max.	250V AC Max.	28V DC Max.	125V AC Max.	250V AC Max.	28V DC Max.

## With 1 NO &amp; 1 NC Isolated Contacts

30-200	HA161234	10	10	—	1/2	3/4	—
400-600	HA165678	10	10	—	1/2	3/4	—

## With 2 NO &amp; 2 NC Isolated Contacts

30-200	HA261234	10	10	7	1/2	3/4	—
400-600	HA265678	10	10	7	1/2	3/4	—

## Low Current PLC Type with 1 NO &amp; 1 NC Gold Plated Contacts

30-200	HA361234	10	10	—	1/2	3/4	—
400-600	HA365678	10	10	—	1/2	3/4	—

## Fuse Puller Kits

Fuse Puller Kits are field installable in 30-100A Type VBII Heavy Duty Switches (one kit required per 3-pole switch).

Switch Ampere Rating	Fuse Puller Kit Catalog Number
30	HP61
60	HP62▲
100	HP63▲

## Copper Lug Kits

All switches are UL approved to accept field installed copper lug kits.

Switch Ampere Rating	Copper Lug Catalog Number	Description
30-60	HLC612	(9) Lugs/Kit #14-4 AWG Cu
100	HLC63▲	(9) Lugs/Kit #14-1/0 AWG Cu
200	HLC64▲	(9) Lugs/Kit #6 AWG-300 Kcmil Cu
400-600A	HLC65678	(1) Lugs/Kit #1/0 AWG-600 Kcmil Cu

## Equipment Ground Kits

Equipment Ground Lug Kits are available for all switches.

Switch Ampere Rating	Catalog Number	Number of Terminals	Wire Range Per Terminal (Cu/Al)
30-200	HG61234	2	#14-4 AWG
400 & 600	HG656	4	#6 AWG-250 Kcmil

**NEW** Internal Shield Kits (for fusible switches)

Kits provide a "skirt" that encloses the VBII switch and also a clear plastic inner door to prevent accidental contact with live parts. Test probe holes are provided and fuses can be replaced without removal of kit.

Switch Ampere Rating	Shield Kit Catalog Number
30A	HSK61
60-100A	HSK623
200A	HSK64

# Disconnect Switches

## Type VBII Lug Wire Ranges & Dimensions

### Lugs

30 & 60A switches are suitable for use with 60° or 75°C wire. 100–600A switches are suitable for use with 75°C rated wire. All switches are supplied with factory installed line and load lugs.

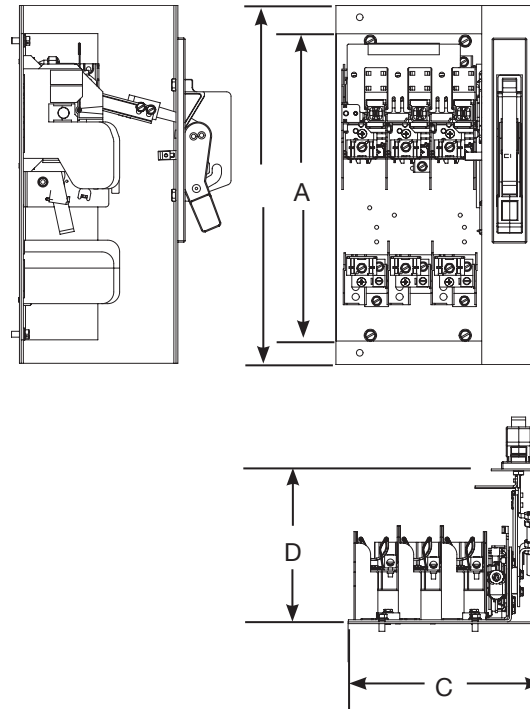
### Wire Ranges (Line, Load and Standard Neutral)

Switch Ampere Rating	UL Approved Wire Range	Lug Wire Range
30	#14-6 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
60	#14-2 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
100	#14-1/0 AWG (Cu/Al)	#14-1/0 AWG (Cu/Al)
200	#6 AWG-300 Kcmil (Cu/Al)	#6 AWG-300 Kcmil (Cu/Al)
400	1/0 AWG-750 Kcmil (Cu/Al) or (2) 1/0 AWG-250 Kcmil (Cu/Al)	(1) 1/0 AWG-750 Kcmil (Cu/Al) or (2) 1/0 AWG-250 Kcmil (Cu/Al)
600	(2) 1/0 AWG-750 Kcmil (Cu/Al) or (4) 1/0 -250 Kcmil (Cu/Al)	(2) 1/0 AWG-750 Kcmil (Cu/Al) or (4) 1/0 AWG-250 Kcmil (Cu/Al)

### Approximate Dimensions

Mounting bracket shown with handle installed is supplied with Flange Mounted Switches only. All Panel Mounted Switches have a "L" shaped mounting pan with a line base, load base (if fusible) and mechanism installed.

Catalog Number	Dimensions				
	A	B	C <sup>Ⓞ</sup>	D (min)	D (max)
<b>Fusible, Panel Mounted</b>					
VBFS321	11.88	N/A	7.47	6.94	19
VBFS322	13.12	N/A	8.50	6.94	19
VBFS361, PV	11.88	N/A	7.47	6.94	19
VBFS362, PV	13.12	N/A	8.50	6.94	19
VBFS363, PV	13.12	N/A	8.50	6.94	19
VBFS364	17	N/A	12.33	7.12	19
VBFS365	26.25	N/A	16.50	8.63	19
VBFS366	26.25	N/A	16.50	8.63	19
<b>Non-fusible, Panel Mounted</b>					
VBNS361, PV	9.79	N/A	7.47	6.94	19
VBNS362, PV	9.79	N/A	8.50	6.94	19
VBNS363, PV	9.79	N/A	8.50	6.94	19
VBNS364	10.77	N/A	12.33	7.12	19
VBNS365	13	N/A	16.50	8.63	19
VBNS366	13	N/A	16.50	8.63	19
<b>Fusible, Flange Mounted</b>					
VBFS321F	11.88	14.08	7.47	7.27	N/A
VBFS322F	13.12	15.83	8.85	7.27	N/A
VBFS361F, PV	11.88	14.08	7.47	7.27	N/A
VBFS362F, PV	13.12	15.83	8.85	7.27	N/A
VBFS363F, PV	13.12	15.83	8.85	7.27	N/A
VBFS364F	17	18.20	12.68	7.57	N/A
<b>Non-fusible, Flange Mounted</b>					
VBNS361F, PV	9.79	11.78	7.47	7.27	N/A
VBNS362F, PV	9.79	11.78	8.85	7.27	N/A
VBNS363F, PV	9.79	11.78	8.85	7.27	N/A
VBNS364F	10.77	11.97	12.68	7.57	N/A



<sup>Ⓞ</sup> Dimension C for panel mounted switches indicates the minimum width from the left hand edge of the switch mounting pan to the right hand inside surface of the enclosure.

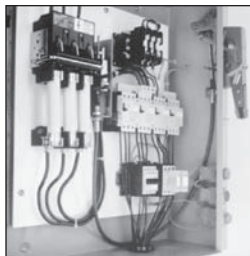


# Disconnect Switches

Type MCS (30-200A) — Switches, Fuse and No Fuse Kits

## Features

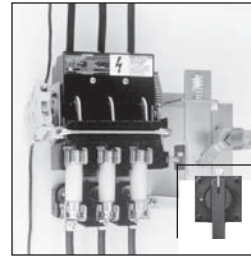
- 30, 60, 100 and 200 Ampere Switches
- UL Recognized (file # E121152 vol. 1 & 2) and CSA Certified
- Simple Mounting — with an integral switch and over center mechanism
- Horsepower & load break rated
- Compact Size
- Visible Blade Contacts
- Rugged Construction — with a short circuit current rating of 10,000 amps with Class H or 200,000 amps at 600V maximum AC, when fused with Class R or Class J fuses
- Available with three operator handle options, allowing flexible placement of switch
- Field Installable Auxiliary Contacts
- Flexible Fuse Class Configurations
- Flange mounted handles meet NFPA79 requirements



Type MCS Disconnect Switch with Max-Flex™ handle operator



Type MCS Disconnect Switch with fixed-depth, flange-mounted handle



Type MCS Disconnect Switch with rotary handle

## Ordering Information

1. Select the basic switch size you need (30, 60, 100 or 200 ampere).
2. Check the switch selected against the maximum horsepower rating required for our application. "L" or "R" suffix on switch catalog numbers denotes left or right-handed mechanism drive.
3. Choose either fuse or no fuse kit from chart below.
4. Check "Minimum Dimensions" on page 18/26 for installation space requirements.
5. Select from the list of handle operators, the type which best suits your application. Handle operators can be selected from the next page.

## Basic Switches

Switch Ampere Rating	Maximum Voltage Rating	Catalog Number Right Hand	Catalog Number Left Hand	Maximum Horsepower Rating, 3 Phase <sup>④</sup>						250 Volts DC (max) <sup>④</sup>
				240 Volts AC		480 Volts AC		600 Volts AC		
				Standard Fuse	Time Delay Fuse	Standard Fuse	Time Delay Fuse	Standard Fuse	Time Delay Fuse	
30	600	MCS603R	MCS603L	3	7½	5	15	7½	20	5
60	600	MCS606R	MCS606L	7½	15	15	30	15	50	10
100	600	MCS610R	MCS610L▲	15	30	25	60	30	75	20
200	600	MCS620R	MCS620L▲	25	60	50	125	60	150	40

## Fuse And No Fuse Kits (Includes load base plus line and load fuse clips)<sup>①</sup>

Basic Switch Ampere Rating	Switch Catalog Number	Kit Description	No Fuse Kits		For Class H	For Class J	For Class R	Lug Wire Size
			Standard	Cu Only <sup>②</sup>	Catalog Number <sup>①</sup>	Catalog Number <sup>①</sup>	Catalog Number <sup>①</sup>	
			Catalog Number	Catalog Number				
30	MCS603R or MCS603L	No Fuse	TMK606	—	—	—	—	#14 to #4 AWG Cu/Al
		30A, 250V	—	—	FCK203▲	—	FCRK203	
		30A, 600V	—	—	FCK206	FCJK603	FCRK206	
		60A, 250V	—	—	FCK206	—	FCRK206	
60	MCS606R or MCS606L	60A, 600V	—	—	FCK606	FCJK606	FCRK606	#14 to #4 AWG Cu/Al
		No Fuse	TMK606	—	—	—	—	
		60A, 250V	—	—	FCK206	—	FCRK206	
		60A, 600V	—	—	FCK606	FCJK606	FCRK606	
100	MCS610R or MCS610L	100A, 250V	—	—	OFCK661▲	OFCK661▲	③	#14 to #2/0 AWG Cu/Al
		100A, 600V	—	—	OFCK661▲	OFCK661▲	③	
		200A, 250V	—	—	OFCK661▲	OFCK661▲	③	
		200A, 600V	—	—	OFCK661▲	OFCK661▲	③	
200	MCS620R or MCS620L	No Fuse	TMK620	TMK620C▲	—	—	—	#6 to 300 kcmil Cu/Al
		200A, 250V	—	—	FCK620	FCJK620	③	
		200A, 600V	—	—	FCK620	FCJK620	③	
		200A, 600V	—	—	FCK620	FCJK620	③	

▲ Built to order. Allow 6-8 weeks for delivery.

① For "copper only" connectors, order as follows:

**Fusible**—order standard switch, standard fuse kit and copper only no fuse kit.

**Non-Fusible**—order standard switch and copper only no fuse kit.

② Includes both line and load lugs.

③ For Class R fuses order Class H kit from this table and the Class R conversion kit from the next page.

④ HP ratings for time delay fuses and for 250V DC also apply to Non-fusible switches.

## Disconnect Switches

## Type MCS (30-200A)

## Auxiliary Switch Kits

Switch Catalog Number	Contact Arrangement	
	1 NO/1 NC Catalog Number	2 NO/2 NC Catalog Number
MCS603R	MCSAKR136	MCSAKR236
MCS603L	MCSAKL136	MCSAKL236▲
MCS606R	MCSAKR136	MCSAKR236
MCS606L	MCSAKL136	MCSAKL236▲
MCS610R	MCSAK116	MCSAK216
MCS610L	MCSAK116	MCSAK216
MCS620R	MCSAK126	MCSAK226
MCS620L	MCSAK126	MCSAK226

## Class R Fuse Conversion Kits

Fuse Clip Rating	Catalog Number
100A, 600V	SSRK33
200A, 600V	SSRK34

## Fuse Ejector Kits

Switch Catalog Number	Fuse Ejector Kit Catalog Number
MCS610	FE100▲
MCS620	FE200▲

## Handle Operators

Fixed Depth, Flange Mounted, Types 1, 3, 3R, 12<sup>①⑥</sup>

Switch Catalog Number	Complete Handle Mechanism Catalog Number	Handle Only Catalog Number	Switch Operator Only Catalog Number
MCS603R	FDFS06R	FDH10	FDS06R
MCS603L	FDFS06L	FDH10	FDS06L
MCS606R	FDFS06R	FDH10	FDS06R
MCS606L	FDFS06L	FDH10	FDS06L
MCS610R	FDFS06R	FDH10	FDS06R
MCS610L	FDFS06L	FDH10	FDS06L
MCS620R	FDFS20R	FDH20	FDS20R
MCS620L	FDFS20L	FDH20	FDS20L

Variable Depth, Flange Mounted Max-Flex™, Types 1, 3, 3R, 12<sup>②</sup>

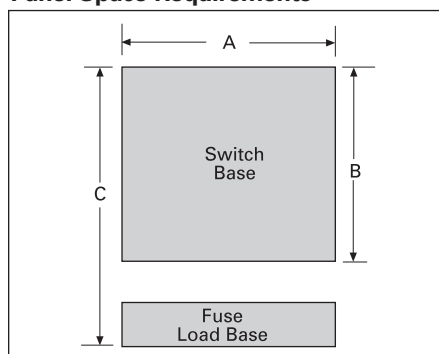
Switch Catalog Number	Complete Handle Mechanism Catalog Number	Handle Only Catalog Number	Switch Operator Only Catalog Number	Cable Only <sup>③</sup> Catalog Number
MCS603R	FHOS06036R	FHOHS	FHOS06R	FHOEC036
MCS603L	FHOS06036L	FHOHS	FHOS06L	FHOEC036
MCS606R	FHOS06036R	FHOHS	FHOS06R	FHOEC036
MCS606L	FHOS06036L	FHOHS	FHOS06L	FHOEC036
MCS610R	FHOS06036R	FHOHS	FHOS06R	FHOEC036
MCS610L	FHOS06036L	FHOHS	FHOS06L	FHOEC036
MCS620R	FHOS20036R	FHOHS	FHOS20R	FHOJC036
MCS620L	FHOS20036L	FHOHS	FHOS20L	FHOJC036

Variable Depth Rotary, Through-The-Door-Mounted, Types 1, 12<sup>④⑤</sup>

Variable Depth				Shaft Only Variable Depth
MCS603R	CRHOS06VD	CRHOH	RHOS06	RHOSVD
MCS606R	CRHOS06VD	CRHOH	RHOS06	RHOSVD
MCS610R	CRHOS06VD	CRHOH	RHOS06	RHOSVD
MCS620R	CRHOS20VD	RHOH	RHOS20	RHOSVD

## MCS Disconnect Switch Panel Space Requirements

## Panel Space Requirements



## Minimum Dimensions (inches\*)

Switch Catalog Number	Size	"A"	"B"	"C"	Fuse Class
MCS603	30A/240V	6.13	5.52	8.11	H, K, R
	30A/600V	6.13	5.52	10.11	H, K, R
	30A/600V	6.13	5.52	8.48	J
MCS606	60A/240V	6.13	5.52	7.86	H, K, R
	60A/600V	6.13	5.52	10.38	H, K, R
	60A/600V	6.13	5.52	8.35	J
MCS610	100A/240V	7.38	7.59	11.85	H, K, R
	100A/600V	7.38	7.59	13.85	H, K, R
	100A/600V	7.38	7.59	10.6	J
MCS620	200A/240V	9.17	9.00	14.7	H, K, R
	200A/600V	9.17	9.00	17.2	H, K, R
	200A/600V	9.17	9.00	13.32	J

"A" – Dimension is measured from each cross bail pin.

"B" – Dimension is measured from line side barrier to load side barrier.

"C" – Dimension is measured from line side terminal of switch to load side terminal of fuse load base.

▲ Built to order. Allow 6–8 weeks for delivery.

①For Type 4 and 4X applications, order handle only  
Catalog Number  
100A - FDH104      200A - FDH204

②For Type 4 and 4X applications, order handle only  
Catalog Number FHOHS4

③Standard cable length is 36 inches. Alternate lengths are available as follows:

Length	Amps	Cat. No.
48"	30–100	FHOEC048
60"	30–100	FHOEC060
48"	200	FHOJC048
60"	200	FHOJC060

④For Type 4 and 4X applications, order handle only  
Catalog Number RHOH4

⑤For Type 3 and 3R applications, order handle only  
Catalog Number RHOH

⑥Min. enclosure depth from mounting pan to handle mounting surfaces: 30-100A 6.44 Inches  
200A 10.93 Inches

\*For millimeters multiply inches by 25.4.

# Disconnect Switches

## Type CFS Compact Fusible Switches

### Features

- 30 - 800A ratings
- UL Listed under file #E121152 & CSA Certified under file #222227
- Door mounted rotary handles with defeatable cover interlock
- Meets UL requirements for both main and branch circuit applications
- Compact size
- 100kA with Class CC fuses or up to 200kA with Class J fuses
- Load break and horsepower rated
- Quick make and break operation
- All handles are padlockable with up to (3) padlocks with 5/16" hasps in the OFF position
- Catalog number **CFS361C5**, **CFS361J5** and **CNFS361** can be DIN-rail mounted and can be either front or side operated with standard rotary handles.
- All CFS part numbers ending in N can be either front or side operated with standard rotary handles.
- Handles are available in Type 1, 3R, 4/4X & 12 ratings
- NFPA 79 field installed kits are available
- 30-400A, 200kA switches are provided with quick connect terminal provisions for voltage sensing or for 10A max. control circuits
- Fusible switches, 3-pole 600V AC Max. 30-100A & 600-800A switches are also rated 250V DC Max when poles are field connected in series.



### Ordering information

1. Select the panel mounted switch required based on Ampere, HP and AIC requirements. Switches with a right hand mechanism are standard, 30-100A switches with a left hand mechanism are available.
2. Select handle based on environmental rating required.
3. Select operating shaft (200 or 400mm in length). For enclosure depths of 9.0" or less from panel mounting surface to inside of door use 200mm long shafts. For deeper enclosures use 400mm long shafts. 30A 100kA switches can be used in 10" deep enclosures (panel to inside of door) with 200mm shaft and CFSH5N handles.

Note: Be sure to check shaft and handle compatibility with the switch selected by using information provided in the selection tables.

4. Line & load lugs are provided as standard on 30-100A switches. Terminal kits are available for 200-800A switches if needed.

5. Auxiliary contact are available if needed as follows.
  - A. 30A switch CFS361C5 and non-fusible 30A switch CNFS361 will accept up to (4) aux contacts
  - B. 30A switch CFS361J5 will accept up to (2) aux contacts without an aux contact holder. If more than (2) aux contacts are required order aux contacts PLUS aux contact holder kit CFSAXUH1. All other switches will accept up to (4) aux contacts.
6. If non-fusible switch is required order a shorting bar for 60-600A switches or catalog number CNFS361 for 30A.
7. 30-100A switches are designed to prevent inadvertent contact with live parts and shields are not required. 200 & 400A switches are not supplied with terminal shields. They are available as field installed kits for both line and load terminals. 400-800A switches are supplied as standard with line shields and terminal shroud kits are available for the load side.



## Disconnect Switches

## Type CFS Compact Fusible Switches

Fusible switches, 3-pole 600V AC Max. 30-100A & 600-800A switches are also rated 250V DC Max when poles are field connected in series<sup>⑤</sup>

Switch ampere rating	Catalog number	Fuse provisions provided	Max horsepower ratings				AC short circuit rating
			240V 3Ø AC	480V 3Ø AC	600V 3Ø AC	250V DC	

## Standard – with right hand mounted mechanism

30 <sup>①</sup>	CFS361C5	Class CC	7.5	15	20	5 <sup>③</sup>	100kA
30 <sup>①</sup>	CFS361J5	Class J	7.5	15	20	5 <sup>③</sup>	100kA
30 <sup>①</sup>	CFS361JN	Class J	7.5	15	20	5 <sup>③</sup>	200kA
30 <sup>①</sup>	CNFS361 <sup>②⑥</sup>	None	7.5	15	20	5 <sup>③</sup>	65kA
60 <sup>①</sup>	CFS362JN1	Class J	15	30	50	10 <sup>③</sup>	100kA
60 <sup>①</sup>	CFS362JN	Class J	15	30	50	10 <sup>③</sup>	200kA
100 <sup>①</sup>	CFS363JN		30	60	75	20 <sup>③</sup>	
200 <sup>②</sup>	CFS364JN <sup>④</sup>		60	125	150	–	
400 <sup>②</sup>	CFS365JN <sup>④</sup>		125	250	350	–	
600 <sup>②</sup>	CFS366J <sup>④⑤</sup>		200	400	500	–	
800 <sup>②</sup>	CFS367L <sup>④⑤</sup>	Class L	200	400	500	–	200kA

Optional – with left hand mounted mechanism<sup>⑤</sup>

30 <sup>①</sup>	CFS361JLN	Class J	7.5	15	20	5 <sup>③</sup>	200kA
60 <sup>①</sup>	CFS362JLN		15	30	50	10 <sup>③</sup>	
100 <sup>①</sup>	CFS363JLN		30	60	75	20 <sup>③</sup>	

Operating shafts for 30-400A switches<sup>⑤</sup>

Catalog number	Shaft length in. (mm)	Switch & handle compatibility
CFSS5200N	7.9 (200)	5mm x 5mm for use with CFS361C5, CFS361J5 & CNFS361 switches & with "CFSS5" handles only
CFSS5400N	15.7 (400)	
CFSS5200HN	7.9 (200)	5mm x 5mm for use with all "CFSS10" handles & with CFS361C5, CFS361J5 & CNFS361 switches only
CFSS5400HN	15.7 (400)	
CFSS10200HN	7.9 (200)	10mm x 10mm for use with all "CFSS10" handles & with all 30-400A switches except CFS361C5, CFS361J5 & CNFS361
CFSS10400HN	15.7 (400)	

Compact rotary operating handles – door mounted (for use with CFS361C5, CFS361J5 & CNFS361 switches only)<sup>⑥</sup>

Catalog number	Color	UL Type	Operating shaft compatibility
CFSH5B12N	Blue & Black	1, 3R & 12	CFSS5200N or CFSS5400N
CFSH5R12N	Yellow & Red		
CFSH5B4N	Blue & Black	1, 3R, 12 & 4/4X	
CFSH5R4N	Yellow & Red		

Rotary operating handles - door mounted (for use with CFSS5200HN, CFSS5400HN, CFSS10200HN & CFSS10400HN)

Catalog number	Color	Description
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Type 1, 3R & 12<sup>⑦</sup>

CFSH10B12N	Blue & Black	Heavy duty pistol grip (2.75" long for use with 30A switches & CFS362JN1)
CFSH10R12N	Yellow & Red	
CFSH10BL12N	Blue & Black	Heavy duty pistol grip (4.92" long for 30-400A switches)
CFSH10RL12N	Yellow & Red	

Type 1, 3R, 4/4X & 12<sup>⑦</sup>

CFSH10B4N	Blue & Black	Heavy duty pistol grip (2.75" long for use with 30A switches & CFS362JN1)
CFSH10R4N	Yellow & Red	
CFSH10BL4N	Blue & Black	Heavy duty pistol grip (4.92" long for 30-400A switches)
CFSH10RL4N	Yellow & Red	

① Line and load lugs included.

② Line and load lugs are not included.

Order from table on next page if required.

③ DC HP rating shown requires (3) poles to be connected in series.

④ CFS364JN & CFS365JN can be rotated 180° for left hand operation as standard.

⑤ Catalog numbers CFS361C5, CFS361J5 & CNFS361 accept 5mm x 5mm operating shafts. All other 30-400A switches accept 10mm x 10mm operating shafts.



CFS361J5



CFSS5400N



CFSH5B12N

⑥ Compact pistol grip design (2.75" long) with defeatable cover interlock. Cover can be opened when handle is padlocked in the OFF position.

⑦ Defeatable cover interlock provided. Cover cannot be opened when handle is padlocked in the OFF position.

⑧ Catalog number CNFS361 is a non-fusible switch.

⑨ 4 pole 600 & 800A switches, CFS466J & CFS467L are also available.

⑩ CFS366J and CFS367L are rated 250 & 600V DC when (2) poles are connected in series.

⑪ CNFS361 is rated 65kA when protected by Class J or CC 30A max. fuses.

## Disconnect Switches

## Type CFS Compact Fusible Switches

600 & 800A rotary operating handles - door mounted  
(8.27" long)<sup>②</sup>

Catalog number	Color	UL Type
CFSH12BL12	Blue & Black	1, 3R & 12
CFSH12RL12	Yellow & Red	1, 3R & 12
CFSH12BL4	Blue & Black	1, 3R, 12 & 4/4X
CFSH12RL4	Yellow & Red	1, 3R, 12 & 4/4X

600 & 800A operating shafts (cross section 12 x 12 mm)

Catalog number	Shaft length in. (mm)	Enclosure depth (switch mounting surface to door OD)
CFSS12200H	12.59 (320)	10.43 – 16.68 in.
CFSS12400H	15.75 (400)	10.43 – 19.84 in.

## Type CFS fusible switch accessories

Catalog number	Description
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Terminals<sup>①</sup>

CFSL200	200A lug kit (6 lugs per kit) (1)#6-3/0
CFSL400N	400A lug kit (6 lugs per kit) (1)#2-600kcmil (for CFS365JN only)
CFSL400	600-800A lug kit (6 lugs per kit) (2)#2-600kcmil

## Shorting bars (no fuse kits)

CFSSB60	60A shorting bar kit (3 links per kit)
CFSSB100	100A shorting bar kit (3 links per kit)
CFSSB200	200A shorting bar kit (3 links per kit)
CFSSB400	400A shorting bar kit (3 links per kit)
CFSSB680	600 & 800A shorting bar kit (1 link per kit)

## Auxiliary contacts (NEMA ratings AC A600 DC N600)

CFSAUXH1 <sup>②</sup>	Aux contact holder (CFS361J5, CFS361C5 & CNFS361)
CFSAUX1NO	Aux contact 1 NO (30-800A Sws)
CFSAUX1NC	Aux contact 1 NC (30-800A Sws)
CFS11AUX	1NO, 1NC aux contact kit (side mount for 200kA switches)
CFS22AUX	2NO, 2NC aux contact kit (side mount for 200kA switches)

## Terminal shrouds (line or load)

CFSTS200N <sup>③</sup>	200A shroud kit (line or load 3-pole kit)
CFSTS400N <sup>③</sup>	400A shroud kit (line or load 3-pole kit for CFS365JN only)
CFSTS680 <sup>③</sup>	600/800A 3-pole shroud kit
CFSTS6804 <sup>③</sup>	600/800A 4-pole shroud kit

## 30A compact switch kits

CFSPK	Shaft padlocking kit for 30A compact switch when door is open <sup>④</sup>
CFSH5CDM	Direct mount handle kit for CFS361C5 & CNFS361
CFSH5JDM	Direct mount handle kit for CFS361J5

## NFPA 79 kits

(if auxiliary contacts are needed, see table on page 7)

Kits provide an operating shaft suitable for use with all heavy duty handles (not for use with CFSH5 handles). Kits also provide an internal operating handle and an internal OFF padlocking provision.

CFSNFPA1 <sup>⑤</sup>	For use with CFS361C5, CFS361J5 & CNFS361
CFSNFPA2N <sup>⑤</sup>	For use with CFS361JN, CFS361CN, CFS362JN1, CFS362JN, CFS363JN & CFS364JN
CFSNFPA3N <sup>⑤</sup>	For use with CFS365JN only

<sup>①</sup> Supplied as standard on 30-100A switches

<sup>②</sup> CFS361C5 and CNFS361 will accept (4) aux contacts without an aux contact holder. CFS361J5 will accept (2) aux contacts without an aux contact holder.

<sup>③</sup> Supplied as standard on all but 30A, 65kA & 100kA compact switches.

<sup>④</sup> 12.6 in. (320 mm) long operating shaft included

<sup>⑤</sup> 12.7 in. (323 mm) long operating shaft included

<sup>⑥</sup> Line side terminal shrouds supplied with switch



CFSL200 &amp; 400



CFSAUX1NC



CFSSB100 - CFSSB400

<sup>⑦</sup> Defeatable cover interlock included. Cover cannot be opened when the handle is padlocked in the OFF position.

<sup>⑧</sup> Neither line or load terminal shrouds are supplied as standard with new style 200 & 400A switches.

## Disconnect Switches

## Type CFS Compact Fusible Switches

## UL &amp; CSA technical characteristics and panel space requirements

Catalog number	Amps	Fuse Class	AC short circuit rating	Electrical endurance	Mechanical endurance	Panel space requirements - in. (mm)		
						Height	Width	Depth <sup>①</sup>
CFS361C5	30	CC	100kA	6000	10000	4.56 (116)	3.78 (96)	6.00 (152)
CFS361J5	30	J	100kA	6000	10000	4.56 (116)	4.15 (105)	6.00 (152)
CFS361JN	30	J	200kA	6000	10000	5.35 (136)	5.89 (150)	6.00 (152)
CFS361JLN	30	J	200kA	6000	10000	5.35 (136)	5.89 (150)	6.00 (152)
CNFS361	30	None	65kA <sup>②</sup>	6000	10000	4.56 (116)	3.78 (96)	6.00 (152)
CFS362JN1	60	J	100kA	6000	10000	5.35 (136)	5.89 (150)	6.00 (152)
CFS362JN	60	J	200kA	6000	10000	7.32 (186)	5.89 (150)	6.00 (152)
CFS362JLN	60	J	200kA	6000	10000	7.32 (186)	5.89 (150)	6.00 (152)
CFS363JN	100	J	200kA	6000	10000	7.32 (186)	5.89 (150)	6.00 (152)
CFS363JLN	100	J	200kA	6000	10000	7.32 (186)	5.89 (150)	6.00 (152)
CFS364JN	200	J	200kA	6000	8000	11.46 (291)	7.72 (196)	6.00 (152)
CFS365JN	400	J	200kA	1000	6000	15.35 (390)	10.19 (259)	8.00 (203)
CFS366J	600	J	200kA	1000	5000	11.81 (300)	14.33 (364)	11 (280)
CFS466J	600	J	200kA	1000	5000	11.81 (300)	18.03 (458)	11 (280)
CFS367L	800	L	200kA	500	3500	11.81 (300)	14.33 (364)	11 (280)
CFS467L	800	L	200kA	500	3500	11.81 (300)	18.03 (458)	11 (280)

## Wire ranges line &amp; load lugs

Switch	Amperage Rating	UL approved wire size (75° C)
CFS361J5	30	(1)#14-10
CFS361C5	30	(1)#14-10
CNFS361	30	(1)#14-10
CFS361JN	30	(1)#14-6
CFS362JN1	60	(1)#14-6
CFS362JN	60	(1)#12-1
CFS363JN	100	(1)#12-1
CFS364JN	200	(1)#3/0
CFS365JN	400	(1)600MCM
CFS366J	600	(2)350 MCM
CFS367L	800	(2)600 MCM

## Auxiliary contact capability when an NFPA79 kit is used

Switch	NFPA79 kit	Aux contacts that can be installed
CNFS361	CFSNFPA1	(2) Total, CFS AUX1NO or CFS AUX1NC
CFS361C5		
CFS361J5	CFSNFPA2N	(2) Total, CFS AUX1NO or (1) CFS AUX1NC
CFS361JN		
CFS362JN1		
CFS362JN		
CFS363JN		
CFS364JN	CFSNFPA3N	(2) Total, CFS AUX1NO or CFS AUX1NC <sup>③</sup>
CFS365JN		

① Minimum dimensions from mounting surface to inside of cover. Dimensions shown can be decreased if aux contacts are not required.

② CNFS361 is rated 65kA when protected by 30A max. Class J or CC fuses.

③ For additional auxiliary contacts use side mounted CFS11AUX or CFS22AUX.

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## Standards and Approvals

## UL and CSA file numbers and guide card numbers

Most control equipment listed in this catalog is designed, manufactured and tested in accordance with the relevant UL and CSA standards as listed on pages 19/2 and 19/3.

Equipment	SEC	CSA		UL-listed		UL-recognized			
		①	②	①	②	③	④	⑤	
		Guide No.	File No.	Guide No.	File No.	Guide No.	File No.	File No.	
3RV motor starter protectors	1	Class 3211 05	LR 12730	NLRV	NLRV7	E 47705	-	-	-
3RV as self-protected controller (Type E)	1	Class 3211 08	LR 12730	NKJH	NKJH7	E 156943	-	-	-
3RV17, 18, 27 & 28 as circuit breakers	1	Class 1432 01	LR 12730	DIVQ	DIVQ7	E 235044	-	-	-
3RA13 & 23 reversing contactors	2	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	NLDX2	NLDX8	E 31519
3RH control relays	2	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3RT contactors	2	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	NLDX2	NLDX8	E 31519
3TB contactors	2	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	NLDX2	-	E 31519
3TC4 DC Contactors	2	-	-	NLDX	NLDX7	E 31519	-	-	-
3TC5 DC Contactors	2	-	-	NLDX	-	E 31519	-	-	-
3TF6 contactors	2	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	NLDX2	-	E 31519
3TX7 surge suppressors	2	Class 3211 03	LR 12730	-	-	-	NKCR2	NKCR8	E 31519
3RB20 / 21 solid-state overload relay	3	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3RB22, 23 & 24 solid-state overload relay	3	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3RB30 / 31 solid-state overload relay	3	-	-	NKCR	NKCR7	E 44653	-	-	-
3RU21 thermal overload relay	3	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3UF7 SIMOCODE intelligent overload relay	3	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3RA*1 & *2 combination starters	4	Class 3211 05	LR12730	NLDX	NLDX7	E 31519	-	-	-
3RA6 compact starter as manual motor controller	4	Class 3211 05	LR 12730	NLRV	NLRV7	E 47705	-	-	-
3RA6 compact starter as self protected controller (Type E)	4	Class 3211 08	LR 12730	NKJH	NKJH7	E 156943	-	-	-
8US1 busbar components	5	-	-	NMTR	NMTR7	E328403	-	-	-
8US1 busbar adapter shoes	5	<sup>2)</sup>	<sup>2)</sup>	-	-	-	NMTR2	NMTR8	E 328403
FB busbar adapter system	5	<sup>2)</sup>	<sup>2)</sup>	-	-	-	NMTR2	NMTR8	E 160776
3RM1 hybrid motor starter	6	-	-	NMFT	NMFT7	E 143112	-	-	-
3RW30 Soft starters	7	Class 3211 06	LR 12730	NMFT	NMFT7	E 143112	-	-	-
3RW30/31 Soft starters	7	Class 3211 06	LR 12730	NMFT	NMFT7	E 143112	-	-	-
3RW40/44 Soft starters	7	Class 3211 06	-	NMFT	NMFT7	E 143112	-	-	-
73 enclosed soft starters	7	-	-	NJAV	NJAV7	E 43399	-	-	-
74 combination soft starters	7	-	-	NJAV	NJAV7	E 43399	-	-	-
3RF20, 21 & 22	8	-	-	NMFT	NMFT7	E 143112	NRNT2	NRNT8	E44653
3RF23 & 24	8	-	-	NRNT	NRNT7	E44653	-	-	-
3RF24 & 34 solid-state contactors	8	Class 3211 07	LR12730	NMFT	-	E 143112	-	-	-
11 manual starters	9	Class 3211	LR 6535	NLVR	NLRV7	E 10590	-	-	-
14, 22, 30, 40, 43 starters & contactors	9	Class 3211	LR 6535	NLDX	NLDX7	E 14900	-	-	-
17, 18, 25, 26, 32 combination starters	9	Class 3211	LR 6535	NKJH	NKJH7	E 185287	-	-	-
36, 37 reduced voltage starters	9	Class 3211	LR 6535	NLDX	NLDX7	E 14900	-	-	-
83, 84, 85, 87, 88 pump control panels	9	Class 3211	LR 6535	NKJH	NKJH7	E 185287	-	-	-
48, 958 overload relays ESP200	9	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
49 field kits	9	Class 3211	ELR 535	NLDX	-	E 14900	NLDX2	-	E 14900
CLM lighting contactors	9	-	-	NRNT	NRNT7	E 27683	-	-	-
LC lighting contactors - open	9	-	-	NLDX	NLDX7	E 14900	-	-	-
LC lighting contactors - enclosed	9	-	-	NRNT	NRNT7	E 27683	-	-	-
LEN00B, C, D, E lighting - open	9	-	-	NLDX	-	E 31519	-	-	-
LEN00F, G, H, lighting - open	9	-	-	NRNT	NRNT7	E 27683	-	-	-
LE lighting contactors - enclosed	9	-	-	NRNT	NRNT7	E 27683	-	-	-
MMS manual switches	9	-	-	NLRV	-	E10590	NLRV2	-	E 10590
SMF manual starters	9	-	-	NLRV	-	E10590	NLRV2	-	E 10590
3SB2 16mm pushbuttons and indicator lights	10	Class 3211 03	LR 12730	-	-	-	NKCR2	-	E 44653
3SU1 22mm pushbuttons and indicator lights	10	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
50 standard duty pilot devices	10	Class 3211	LR 6535	NKCR	NKCR7	E 22655	NKCR2	NKCR8	E 22655
51 hazardous location pilot devices	10	Class 3218	LR 23889	NOIV	NOIV7	E 39935	-	-	-
52 30 mm pilot devices	10	Class 3211	LR 6535	NKCR	NKCR7	E 22655	-	-	-
8WD signal columns	-	-	-	NMTR	NMTR7	E 148698	-	-	-
3RN1 thermistor motor protection	11	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3RP2 electronic time-delay relay	11	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3RQ3 coupling relays & interfaces	11	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3RS10, 11, 20 & 21 temperature monitoring relay	11	-	-	NKCR	NKCR7	E 44653	-	-	-
3RS17 interface converter	11	<sup>1)</sup>	<sup>1)</sup>	NKCR	NKCR7	E 44653	-	-	-

<sup>1)</sup> c® listing for Canada, instead of CSA certification.

<sup>2)</sup> c® recognition for Canada, instead of CSA certification.

## Standards and Approvals

UL and CSA file numbers and guide card numbers / On-line resources for Industrial Control products

Equipment	SEC	CSA		UL-listed			UL-recognized		
		Guide No.	File No.	Guide No.	c <sup>®</sup>	File No.	Guide No.	c <sup>®</sup>	File No.
3RS18 coupling relays	11			NKCR	NKCR7	E 44653			
3RS70 signal converters	11	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3TG10 power relay	11	<sup>1)</sup>	<sup>1)</sup>	NLDX	NLDX7	E 31519	-	-	-
3TX71 plug-in relays	11	-	-	-	-	-	NLDX2	NLDX8	E 14900
3TX71 sockets	11	-	-	-	-	-	SWIV2	SWIV8	E 196786
3UG monitoring relay	11	<sup>1)</sup>	<sup>1)</sup>	NKCR	NKCR7	E 44653	-	-	-
7PV time-delay relay	11	Class 2211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
8WA1 Terminal blocks	12	-	-	-	-	-	XCFR2	-	E 80027
8WA2 & 8WH Terminal blocks	12	Class 3211	LR50181	-	-	-	XCFR2	XCFR8	E 80027
3RK3 MSS	13	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
3SE03 North American (NEMA) limit switches	13	-	-	NKCR	-	E 47512	-	-	-
3SE2 hinge switches	13			NKCR	NKCR7	E 44653			
3SE5 limit switches	13	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	NKCR2	NKCR8	E 44653
3SE6 magnetic monitoring system	13			NKCR	NKCR2	E 44653			
3SE7 rope pull switches	13	<sup>1)</sup>	<sup>1)</sup>	NKCR	-	E 44653	-	-	-
3SK safety relays	13			NKCR	NKCR7	E 44653			
3TK28 safety relay	13	<sup>1)</sup>	<sup>1)</sup>	NKCR	NKCR7	E 44653	-	-	-
AS-Interface components for control circuits, e.g. AS-Interface modules, gateways	14	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	-	-	-
AS-Interface components for power cir-cuits, e.g. AS-Interface motor starters, PROFIBUS motor starters	14	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	-	-	-
6ED1 programmable relays	15			NRAQ	NRAQ7	E 217227			
6EP1 DC power supplies	15	<sup>1)</sup>	<sup>1)</sup>	NRAQ	NRAQ7	E 143289	NRAQ2	NRAQ8	E 143289
6GK5 ethernet switches	15			NWQG	NWQG7	E 115352			
5SJ4 circuit breakers	16	-	-	DIVQ	DIVQ7	E 243414	-	-	-
5ST Aux switch, fault signal contact, shunt trip, busbar	16	-	-	DIHS	DIHS7	E 321559	DIHS2	DIHS8	E 321559
5SY4 supplementary protectors	16	<sup>2)</sup>	<sup>2)</sup>	-	-	-	QVNU2	QVNU8	E 116386
3NW70 Fuse Holder	16	-	-	-	-	-	IZLT2	IZLT8	E 171267
3NW75 Class CC Fuse Holder	16	-	-	IZLT	IZLT7	E 171267	-	-	-
Sentron circuit breakers	17	Class 1432-01	LR 13077	DIVQ	DIVQ7	E 10848	DKPU2	-	<sup>3)</sup> E10848
VL circuit breakers	17	Class 1432-01	LR 13077	DIVQ	DIVQ7	E 10848	DKPU2	-	<sup>3)</sup> E10848
WL circuit breakers	17	-	-	DIVQ	DIVQ7	E 231263	-	-	-
3LD2 disconnect switches	18	<sup>1)</sup>	230576	NLRV	NLRV7	E 47705	-	-	-
CFS fusible disconnect switches	18	-	222227	WHTY	-	E 121152	WHTY2	-	E 121152
LBR and LBT disconnect switches	18	-	<sup>1)</sup>	NLRV	-	E 191706	-	-	-
MCS disconnect switches	18	-	154852	-	-	-	WHTY2	-	E 121152
VBIl disconnect switches	18	-	154852	-	-	-	WHTY2	-	E 121152
VBIl safety switches	18	-	<sup>4)</sup>	WIAX	WIAX7	E 4776	-	-	-

<sup>1)</sup> c<sup>®</sup> listing for Canada, instead of CSA certification.

<sup>2)</sup> c<sup>®</sup> recognition for Canada, instead of CSA certification.

<sup>3)</sup> Instantaneous only circuit breakers (ETI or MCP).

<sup>4)</sup> CSA labeled SWS available on request.

## On-Line Resources for Industrial Control Products

## Controls Website

- with links to all sites listed below plus much more

[www.usa.siemens.com/controls](http://www.usa.siemens.com/controls)

## Siemens Industrial Controls Catalog

- with updates to the print Catalog

[www.usa.siemens.com/iccatalog](http://www.usa.siemens.com/iccatalog)

## Siemens Industry Mall

- Quickly search for Siemens control products  
 - Configure products for your application  
 - Create and export a complete Bill of Material for your system  
 - Find helpful technical information, such as:  
 \* Instruction Sheets & Manuals  
 \* 2D & 3D Dimension Drawings

[www.usa.siemens.com/industrymall](http://www.usa.siemens.com/industrymall)

## Industrial Control Panels for North America

- Learn the secrets of control panel design  
 - Improve efficiency in construction and operation of your control panels

[www.usa.siemens.com/controlpaneldesign](http://www.usa.siemens.com/controlpaneldesign)

## Short Circuit Current Ratings (SCCR) to meet UL508A &amp; NEC

- Find the latest High Short Circuit testing for combinations of Siemens Power Distribution & Control Products

<http://www.usa.siemens.com/sccr>

## Siemens Service and Support Website

- Get answers to technical and application questions  
 - Receive training on the latest innovations

<http://support.automation.siemens.com/US>



## General Information

## NEMA enclosure descriptions

**NEMA Standard Publications****No. 250-1979****Type 1**

Type 1 enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment in locations where unusual service conditions do not exist. The enclosures shall meet the rod entry and rust resistance design tests.

**Type 3**

Type 3 enclosures are intended for outdoor use, primarily to provide a degree of protection against wind-blown dust, rain and sleet, and to be undamaged by the formation of ice on the enclosure. They shall meet rain, external icing, dust, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

**Type 3R**

Type 3R enclosures are intended for outdoor use, primarily to provide a degree of protection against falling rain, and to be undamaged by the formation of ice on the enclosure. They shall meet rod entry, rain, external icing, and rust resistance design tests. They are not intended to provide protection against conditions such as dust, internal condensation, or internal icing.

**Type 4**

Type 4 enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose directed water, and to be undamaged by the formation of ice on the enclosure. They shall meet hosedown, external icing, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

**Type 4X**

Type 4X enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water, and to be undamaged by the formation of ice on the enclosure. They shall meet hosedown, external icing, and corrosion resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

Shall be manufactured of American Iron and Steel Institute Type 304 Stainless steel, polymerics, or materials with equivalent corrosion resistance to provide a degree of protection against specific corrosive agents.

**Type 6**

Type 6 enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against the entry of water during occasional temporary submersion at a limited depth.

Type 6P enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against the entry of water during prolonged submersion at a limited depth.

**Type 7**

Type 7 enclosures are for indoor use in locations classified as Class I, Groups C or D, as defined in the National Electrical Code.

Type 7 enclosures shall be capable of withstanding the pressures resulting from an internal explosion of specified gases and contain such an explosion sufficiently that an explosive gas-air mixture existing in the atmosphere surrounding the enclosure will not be ignited. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting explosive gas-air mixtures in the

surrounding atmosphere. Enclosures shall meet explosion, hydrostatic, and temperature design tests.

**Type 9**

Type 9 enclosures are intended for indoor use in locations classified as Class II Groups E, F or G, as defined in the National Electrical Code.

Type 9 enclosures shall be capable of preventing the entrance of dust. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting or discoloring dust on the enclosure or igniting dust-air mixtures in the surrounding atmosphere. Enclosures shall meet dust penetration and temperature design tests, and aging of gaskets (if used).

**Class I**—Flammable gases or vapors.

**Class II**—Combustible dust.

**Class III**—Ignitable fibers or flyings.

**Division I**—Normal situation; the hazard would be expected to be present in everyday repair and maintenance.

**Division II**—Abnormal situation; the material is expected to be confined within closed containers or closed systems and will be present only during accidental rupture, breakage or unusual faulty operation.

**Groups**

**Class I**—Gases and vapors are designed for use in groups C and D, depending on the ignition temperature of the substance, its explosion pressure and other flammable characteristics.

**Class II**—Dust locations are designed for use in groups E, F, and G, according to the ignition temperature and conductivity of the hazardous substance.

**Type 12**

Type 12 enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids. They shall meet drip, dust, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation.

Siemens NEMA 12 may be field modified for outdoor use. NEMA 3 requires the use of watertight conduit hubs. NEMA 3R requires the use of watertight conduit hubs at a level above the lowest live part and drain holes of 1/8" diameter shall be added at the bottom of the enclosure.

**Type 13**

Type 13 enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil and non-corrosive coolant. They shall meet oil explosion and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation.



Type 1



Type 3/3R



Type 4/4X



Type 4X



Type 3, 4, 7 &amp; 9



Type 12 &amp; 13

# General Information

## IEC enclosure descriptions

### Comparison of NEMA Enclosures

This table summarizes the information provided on the previous page.

Provides a Degree of Protection Against the Following Environmental Conditions	1	3R	4	4X	12	13
Incidental contact with the enclosed equipment	X	X	X	X	X	X
Rain, snow, and sleet	—	X	X	X	—	—
Windblown dust	—	—	X	X	—	—
Falling dirt	X	—	X	X	X	X
Falling liquids and light splashing	—	—	X	X	X	X
Circulating dust, lint, fibers, and flyings	—	—	X	X	X	X
Settling airborne dust, lint, fibers, and flyings	—	—	X	X	X	X
Hosedown and splashing water	—	—	X	X	—	—
Oil and coolant seepage	—	—	—	—	X	X
Oil or coolant spraying and splashing	—	—	—	—	—	X
Corrosive agents	—	—	—	X	—	—

### IEC Environmental Enclosure Ratings for Global Applications

IEC enclosures use a two digit numbering system to define the degree of protection they provide. The first digit specifies the degree of protection against incidental contact and penetration of solid objects. The second digit specifies the level of protection against the ingress of water.

**Example:** An IP65 enclosure is dust tight and protected against water jets. An IP66 enclosure is dust tight and protected against powerful water jets.

First Numeral	Second Numeral
<b>Protection of persons against access to hazardous parts and protection against penetration of solid foreign objects.</b>	<b>Protection against ingress of water under test conditions specified in IEC 529.</b>
0 Non-protected	0 Non-protected
1 Back of hand; objects greater than 50 mm in diameter	1 Vertically falling drops of water
2 Finger; objects greater than 12.5 mm in diameter	2 Vertically falling drops of water with enclosure tilted 15 degrees
3 Tools or objects greater than 2.5 mm in diameter	3 Spraying water
4 Tools or objects greater than 1 mm in diameter	4 Splashing water
5 Dust-protected (Dust may enter but must not interfere with operation of the equipment or impair safety)	5 Water jets
6 Dust tight (No dust observable inside enclosure at end of test)	6 Powerful water jets
	7 Temporary submersion
	8 Continuous submersion

### Comparison of NEMA Type Numbers to IEC Classification Designations

This table shows the IP classification designation to which NEMA enclosures may be applied. The table cannot be used to convert IEC designations to NEMA type numbers.

NEMA Enclosure Type Number	IEC Enclosure Classification Designation
1	IP10
3	IP54
3R	IP54
4 and 4X	IP56
6 and 6P	IP67
12	IP52
13	IP54



## General Information

## IEC contactor utilization categories

Contactors designed for international applications are tested and rated per IEC 947-4. The IEC rating system is broken down into different utilization categories that define the value of the current that the contactor must make, maintain, and break. The following category definitions are the most commonly used for IEC Contactors.

Ratings for Siemens contactors per these categories can be found in Section 3.

## AC Categories

## AC-1

This applies to all AC loads where the power factor is at least 0.95. These are primarily non-inductive or slightly inductive loads. Breaking remains easy.

## AC-3

This category applies to squirrel cage motors where the breaking of the power contacts would occur while the motor is running. On closing, the contactor experiences an inrush which is 5 to 8 times the nominal motor current, and at this instant, the voltage at the terminals is approximately 20% of the line voltage. Breaking remains easy.

## AC-4

This applies to the starting and breaking of a squirrel cage motor during an inch or plug reverse. On energization, the contactor closes on an inrush current approximately 5 to 8 times the nominal current. On de-energization, the contactor breaks the same magnitude of nominal current at a voltage that can be equal to the supply voltage. Breaking is severe.

## DC Categories

## DC-1

This applies to all DC loads where the time constant (L/R) is less than or equal to one msec. These are primarily noninductive or slightly inductive loads.

## DC-2

This applies to the breaking of shunt motors while they are running. On closing, the contactor makes the inrush current around 2.5 times the nominal rated current. Breaking is easy.

## DC-3

This applies to the starting and breaking of a shunt motor during inching or plugging. The time constant shall be less than or equal to 2 msec. On energization, the contactor sees current similar to that in Category DC-2. On de-energization, the contactor

will break around 2.5 times the starting current at a voltage that may be higher than the line voltage. This would occur when the speed of the motor is low because the back e.m.f. is low. Breaking is severe.

## DC-5

This applies to the starting and breaking of a series motor during inching or plugging. The time constant being less than or equal to 7.5 msec. On energization, the contactor sees about 2.5 times the nominal full load current. On de-energization, the contactor breaks the same amount of current at a voltage which can be equal to the line voltage. Breaking is severe.

## Special Contactor Utilization Categories

Some contactors also have ratings for the following specialty utilization categories.

For specific applications, please contact your local Siemens sales office.

Kind of Current	Utilization Categories	Typical Applications
AC	AC-2	Slip-ring motors: starting, switching off
	AC-5a	Switching of electric discharge lamp controls
	AC-5b	Switching of incandescent lamps
	AC-6a	Switching of transformers, welders
	AC-6b	Switching of capacitor banks
	AC-7a	Slightly inductive loads in household appliances and similar applications
	AC-7b	Motor-loads for household applications
	AC-8a	Hermetic refrigerant compressor motor <sup>1)</sup> control with manual resetting of overload releases
	AC-8b	Hermetic refrigerant compressor motor <sup>1)</sup> control with automatic resetting of overload releases
DC	DC-6	Switching of incandescent lamps

## Electrical Quantities Symbols According to DIN, VDE and IEC

Symbol	Characteristic Electrical Quantity	Symbol	Characteristic Electrical Quantity
$U_i$	Rated insulation voltage to DIN VDE 0110/DIN VDE 0660	$I_{scw}$	Rated short-time current withstand capacity to IEC 947-1
$U_e$	Rated operational voltage	$I_p$	Test current (general) to DIN VDE 0660, prospective current to DIN VDE 0636
$U_c$	Rated control voltage (IEC 947-1) at which an operating mechanism or release is rated, e.g. coil voltage to DIN VDE 0660 Part 102	$I_n$	Breaking current (r.m.s. value) to DIN VDE 0102
$U_s$	Rated control supply voltage (Control voltage) to DIN VDE 0660 Part 102, IEC 947-1	$i_p$	Peak short-circuit current (maximum instantaneous value) to DIN VDE 0102
$U_0$	No-load voltage to IEC 947-2, -3, -5	$I_k$	Sustained (symmetrical) short-circuit current (r.m.s. value), DIN VDE 0102.
$U_r$	Power-frequency recovery voltage (IEC 947-.)	$I_{sc}$	Rated short-time withstand current to DIN VDE 0660
$U_o$	Transformer no-load voltage to DIN VDE 0532	$i_p$	Let-through current of fuses and rapidly operating switching devices (maximum instantaneous value during the break time) to DIN VDE 0102
$U_k$	Short-circuit impedance voltage to DIN VDE 0532	$I_o$	No-load current at the input side of a transformer (unloaded output side) to DIN VDE 0532
$U_{kr}$	Rated value of the impedance voltage in % to DIN VDE 0102, 01.90	$I_x$	Current carrying capacity (ampacity)
$I_n$	Rated current to IEC 947-.	$I_{sr}$	Rated rotor operational current (DIN VDE 0660, IEC 947-1)
$I_{th}$	Eight-hour-current to DIN VDE 0660, conventional free-air thermal current to IEC 947- (defined as eight-hour-current) thermally equivalent short-time current (r.m.s. value) to DIN VDE 0103	$I_r$	Setting current ("current setting") to DIN VDE 0660
$I_{the}$	Conventional enclosed thermal current	$I_B$	Take-over current
$I_u$	Rated uninterrupted current to IEC 947-1	R	Ohmic resistance
$I_s$	Rated operational current	$S_k^*$	Initial symmetrical AC short-circuit power (simplified: apparent short-circuit power)
$I_s$	Selectivity (discrimination) limit current (DIN VDE 0660, IEC 947-1)	X	Reactance, reactive impedance
$I_{cm}$	Rated short-circuit making capacity to IEC 947-1	Z	Impedance (apparent resistance)
$I_{cn}$	Rated short-circuit breaking capacity to IEC 947-1	x	Factor to determine the peak short-circuit current $i_p$
$I_{cm}$	Rated ultimate short-circuit breaking capacity to IEC 947-1		

1) Hermetic refrigerant compressor motor is a combination consisting of a compressor and a motor, both of which are enclosed in the same housing, with no external shaft or shaft seals, the motor operating in the refrigerant.

# General Information

## NEMA and IEC control circuit classifications

### AC-Control Circuit Classifications—NEMA

NEMA designates Control Circuit Rating with a code letter (for current) and a voltage code.

Ratings & Test Values for AC Control Circuit Contacts at 50 or 60Hz

Contact Rating Designation	Thermal Continuous Test Current, Amperes	Maximum Current, Amperes								Voltamperes	
		120 Volts		240 Volts		480 Volts		600 Volts		Make	Break
		Make	Break	Make	Break	Make	Break	Make	Break		
A150	10	60	6	—	—	—	—	—	—	7200	720
A300	10	60	6	30	3	—	—	—	—	7200	720
A600	10	60	6	30	3	15	1.5	12	1.2	7200	720
B150	5	30	3	—	—	—	—	—	—	3600	360
B300	5	30	3	15	1.5	—	—	—	—	3600	360
B600	5	30	3	15	1.5	7.5	0.75	6	0.6	3600	360
C150	2.5	15	1.5	—	—	—	—	—	—	1800	180
C300	2.5	15	1.5	7.5	0.75	—	—	—	—	1800	180
C600	2.5	15	1.5	7.5	0.75	3.75	0.375	3	0.3	1800	180
D150	1	3.6	0.6	—	—	—	—	—	—	432	72
D300	1	3.6	0.6	1.8	0.3	—	—	—	—	432	72
E150	0.5	1.8	0.3	—	—	—	—	—	—	216	36

### DC-Control Circuit Classifications—NEMA

Rating codes for DC Control Circuit Contacts

Contact Rating Designation <sup>1)</sup>	Thermal Continuous Test Current, Amperes	Maximum Make or Break <sup>2)</sup> Current, Amperes			Maximum Make or Break Voltamperes at 300 Volts or Less
		125 Volt	250 Volt	301 to 600 Volt	
		N150	10	2.2	
N300	10	2.2	1.1	—	275
N600	10	2.2	1.1	0.4	275
P150	5	1.1	—	—	138
P300	5	1.1	0.55	—	138
P600	5	1.1	0.55	0.2	138
Q150	2.5	0.55	—	—	69
Q300	2.5	0.55	0.27	—	69
Q600	2.5	0.55	0.27	0.1	69
R150	1	0.22	—	—	28
R300	1	0.22	0.11	—	28

### Control Circuit Classifications—IEC<sup>3)</sup>

IEC 947-5-1 Uses Utilization Categories AC-15 to Specify Control Circuit Ranges.

Current at each voltage is specified by the manufacturer, not by the standard.

AC Control Circuit Utilization Categories per IEC 947-5-1	Make				Break				DC Control Circuit Utilization Categories per IEC 947-5-1	Make		Break	
	I <sub>o</sub> /U <sub>o</sub>		U/U <sub>o</sub>		I <sub>o</sub> /U <sub>o</sub>		U/U <sub>o</sub>			I <sub>o</sub> /U <sub>o</sub>	U/U <sub>o</sub>	I <sub>o</sub> /U <sub>o</sub>	U/U <sub>o</sub>
	I <sub>o</sub>	U <sub>o</sub>	I <sub>o</sub>	U <sub>o</sub>	I <sub>o</sub>	U <sub>o</sub>	I <sub>o</sub>	U <sub>o</sub>					
AC-12	1	1	1	1	1	1	1	1	1	1	1	1	
AC-13	2	1	1	1	1	1	1	1	1	1	1	1	
AC-14	6	1	1	1	1	1	1	10	1	1	1	1	
AC-15	10	1	1	1	1	1	1	10	1	1	1	1	

### Example of a Typical IEC Control Circuit Ratings Table<sup>4)</sup>

AC			DC		
I <sub>o</sub> /AC-12 (Continuous Amps)	U <sub>o</sub> AC Voltage	I <sub>o</sub> /AC-15 Amps	Voltage	I <sub>o</sub> /DC-12	I <sub>o</sub> /DC-13
10	24V	6A	24	6A	3A
	110V	6A	60	5A	1.5A
	220/230V	6A	110	2.5A	0.7A
	380/440V	4A	230	1A	0.3A

1)The numerical suffix designates the maximum voltage design values, which are to be 600, 300, and 150 volts for suffixes 600, 300, and 150 respectively. Test voltage shall be 600, 250, or 125 volts. MLLDLL.

2)For maximum ratings at 300 volts or less, the maximum make and break ratings are to be obtained by dividing the volt-ampere rating by the application voltage, but the current value is not to exceed the thermal continuous test current.

3) I<sub>o</sub> Rated operational current  
U<sub>o</sub> Rated operational voltage  
I Current to be made or broken  
U Voltage before make

4)Example: A control circuit contact having an AC-15 rating of 6 amps at 230 volts is capable of making 60 amps and breaking 6 amps at 230 volts. KRE.

## General Information

## Ampere ratings for 3 phase AC induction motors

## 3 Phase

Amperes 60Hz						Amperes 60Hz					
Hp	Syn Speed RPM	200 Volts	230 Volts	460 Volts	575 Volts	Hp	Syn Speed RPM	200 Volts	230 Volts	460 Volts	575 Volts
¼	1800	1.09	0.95	0.48	0.38	25	3600	69.9	60.8	30.4	24.3
	1200	1.61	1.40	0.70	0.56		1800	74.5	64.8	32.4	25.9
	900	1.84	1.60	0.80	0.64		1200	75.4	65.6	32.8	26.2
⅓	1800	1.37	1.19	0.60	0.48	30	900	77.4	67.3	33.7	27.0
	1200	1.83	1.59	0.80	0.64		3600	84.8	73.7	36.8	29.4
	900	2.07	1.80	0.90	0.72		1800	86.9	75.6	37.8	30.2
½	1800	1.98	1.72	0.86	0.69	40	1200	90.6	78.8	39.4	31.5
	1200	2.47	2.15	1.08	0.86		900	94.1	81.8	40.9	32.7
	900	2.74	2.38	1.19	0.95		3600	111	96.4	48.2	38.5
¾	1800	2.83	2.46	1.23	0.98	50	1800	116	101	50.4	40.3
	1200	3.36	2.82	1.46	1.17		1200	117	102	50.6	40.4
	900	3.75	3.26	1.63	1.30		900	121	105	52.2	41.7
1	3600	3.22	2.80	1.40	1.12	60	3600	138	120	60.1	48.2
	1800	4.09	3.56	1.78	1.42		1800	143	124	62.2	49.7
	1200	4.32	3.76	1.88	1.50		1200	145	126	63.0	50.4
	900	4.95	4.30	2.15	1.72		900	150	130	65.0	52.0
1 ½	3600	5.01	4.36	2.18	1.74	75	3600	164	143	71.7	57.3
	1800	5.59	4.86	2.43	1.94		1800	171	149	74.5	59.4
	1200	6.07	5.28	2.64	2.11		1200	173	150	75.0	60.0
	900	6.44	5.60	2.80	2.24		900	177	154	77.0	61.5
2	3600	6.44	5.60	2.80	2.24	100	3600	206	179	89.6	71.7
	1800	7.36	6.40	3.20	2.56		1800	210	183	91.6	73.2
	1200	7.87	6.84	3.42	2.74		1200	212	184	92.0	73.5
	900	9.09	7.90	3.95	3.16		900	222	193	96.5	77.5
3	3600	9.59	8.34	4.17	3.34	125	3600	266	231	115	92.2
	1800	10.8	9.40	4.70	3.76		1800	271	236	118	94.8
	1200	11.7	10.2	5.12	4.10		1200	275	239	120	95.6
	900	13.1	11.4	5.70	4.55		900	290	252	126	101
5	3600	15.5	13.5	5.76	5.41	150	3600	—	292	146	116
	1800	16.6	14.4	7.21	5.78		1800	—	293	147	117
	1200	18.2	15.8	7.91	6.32		1200	—	298	149	119
	900	18.3	15.9	7.92	6.33		900	—	305	153	122
7 ½	3600	22.4	19.5	9.79	7.81	200	3600	—	343	171	137
	1800	24.7	21.5	10.7	8.55		1800	—	348	174	139
	1200	25.1	21.8	10.9	8.70		1200	—	350	174	139
	900	26.5	23.0	11.5	9.19		900	—	365	183	146
10	3600	29.2	25.4	12.7	10.1	250	3600	—	458	229	184
	1800	30.8	25.8	13.4	10.7		1800	—	452	226	181
	1200	32.2	28.0	14.0	11.2		1200	—	460	230	184
	900	35.1	30.5	15.2	12.2		900	—	482	241	193
15	3600	41.9	36.4	18.2	14.5	300	3600	—	559	279	223
	1800	45.1	39.2	19.6	15.7		1800	—	568	284	227
	1200	47.6	41.4	20.7	16.5		1200	—	573	287	229
	900	51.2	44.5	22.2	17.8		900	—	600	300	240
20	3600	58.0	50.4	25.2	20.1	400	1800	—	278	339	271
	1800	58.9	51.2	25.6	20.5		1200	—	684	342	274
	1200	60.7	52.8	26.4	21.1		1800	—	896	448	358
	900	63.1	54.9	27.4	21.9						

Full load ampere ratings of motors vary depending upon a number of factors. The full load currents listed above are “average values” for horsepower rated motors of several manufacturers at the most commonly rated voltages and speeds. These “average values” along with the similar values listed in the N.E.C. should be used as a guide only for selecting suitable components for the motor branch circuit. The rated full load current shown on the motor nameplate

may vary considerably from the listed value, depending on the specified motor design.

**Note: RPM shown for 60Hz motors. For 50Hz motors, multiply the 60HZ FLA value by 1.2.**

#### Overload Relay Selection Multi-Speed/Part-Winding/Wye-Delta

Special attention should be given to the selection of the overload relay adjustment range for multi-speed, part-winding and wye-delta controllers, as follows:

**Multi-Speed Controllers:** Each speed requires a separate set of overloads. The adjustment range must be selected on the basis of the full-load current for each particular speed.

**Part-Winding Controllers:** Each winding of the motor must have its own set of overloads. The adjustment range should be selected on the basis of one-half the motor full-load current; that is, the full load current of each winding current.

**Wye-Delta Controllers:** Only one set of overloads is required. Since the overload relay is located electrically “inside the delta connection,” the adjustment range must be selected on the basis of the full-load motor current (delta connection) divided by 1.73.

**Single Phase:** See page 9/120 for ampere ratings of single phase AC induction motors.

# General Information

## Metric to US conversions

### Wire Conversion Table

#### Comparison of Cross-sectional Areas to Metric and US Standards

Metric Cross-sectional Areas (in line with VDE)		American Wire Gauge	
Cross-sectional Area mm <sup>2</sup>	Equivalent Metric C.S.A. mm <sup>2</sup>	AWG or MCM	
0.75	0.635		<b>19 AWG</b>
	0.823		<b>18</b>
	1.04		<b>17</b>
1.5	1.31		<b>16</b>
	1.65		<b>15</b>
	2.08		<b>14</b>
2.5	2.62		<b>13</b>
	3.31		<b>12</b>
4	4.17		<b>11</b>
	5.26		<b>10</b>
6	6.63		<b>9</b>
	8.37		<b>8</b>
10	10.55		<b>7</b>
	13.30		<b>6</b>
16	16.77		<b>5</b>
	21.15		<b>4</b>
25	26.67		<b>3</b>
	33.63		<b>2</b>
35	42.41		<b>1</b>
	53.48		<b>1/0</b>
50	67.43		<b>2/0</b>
	85.03		<b>3/0</b>
70	107.20		<b>4/0</b>
	126.64		<b>250 MCM</b>
150	152.00		<b>300</b>
	177.35		<b>350</b>
185	202.71		<b>400</b>
	253.35		<b>500</b>
240	304.00		<b>600</b>
	354.71		<b>700</b>
400	405.35		<b>800</b>
	506.71		<b>1000</b>
625			

### Other Conversions

Power Conversions		
1 kilowatt (kW)	=	1.341 horsepower (hp)
1 horsepower (hp)	=	0.7457 kilowatt (kW)
Dimensions Conversions		
1 inch (in.)	=	25.4 millimeters (mm)
1 inch (in.)	=	2.54 centimeters (cm)
1 centimeter (cm)	=	0.3937 inches (in.)
1 meter (m)	=	39.37 inches (in.)
Weight Conversions		
1 ounce (oz.)	=	28.35 grams (g)
1 pound (lb.)	=	0.454 kilograms (kg)
1 kilogram (kg)	=	2.205 pounds (lbs.)
Temperature Conversions		
100 Celsius	=	212 Fahrenheit
80 Celsius	=	176 Fahrenheit
60 Celsius	=	140 Fahrenheit
40 Celsius	=	104 Fahrenheit
20 Celsius	=	68 Fahrenheit
0 Celsius	=	32 Fahrenheit
Torque		
1 Newton-meter (Nm)	=	8.85 pound-inches (lb. in.)

# General Information

## Electrical formulas and grounding requirements

### Electrical Formulas for Finding Amperes, Horsepower, Kilowatts and kVA

To Find	Single-Phase	Alternating Current Two-Phase <sup>1)</sup> , Four-Wire	Three-Phase	Direct Current
Kilowatts	$\frac{I \times E \times pf}{1000}$	$\frac{I \times E \times 2 \times pf}{1000}$	$\frac{I \times E \times 1.73 \times pf}{1000}$	$\frac{I \times E}{1000}$
kVA	$\frac{I \times E}{1000}$	$\frac{I \times E \times 2}{1000}$	$\frac{I \times E \times 1.73}{1000}$	—
Horsepower (Output)	$\frac{I \times E \times \% \text{ EFF} \times pf}{746}$	$\frac{I \times E \times 2 \times \% \text{ EFF} \times pf}{746}$	$\frac{I \times E \times 1.73 \times \% \text{ EFF} \times pf}{746}$	$\frac{I \times E \times \% \text{ EFF}}{746}$
Amperes when Horsepower is Known	$\frac{HP \times 746}{E \times \% \text{ EFF} \times pf}$	$\frac{HP \times 746}{2 \times E \times \% \text{ EFF} \times pf}$	$\frac{HP \times 746}{1.73 \times E \times \% \text{ EFF} \times pf}$	$\frac{HP \times 746}{E \times \% \text{ EFF}}$
Amperes when Kilowatts is Known	$\frac{KW \times 1000}{E \times pf}$	$\frac{KW \times 1000}{2 \times E \times pf}$	$\frac{KW \times 1000}{1.73 \times E \times pf}$	$\frac{KW \times 1000}{E}$
Amperes when kVA is Known	$\frac{kVA \times 1000}{E}$	$\frac{kVA \times 1000}{2 \times E}$	$\frac{kVA \times 1000}{1.73 \times E}$	—

### Average Efficiency and Power Factor Values of Motors

When the actual efficiencies and power factors of the motors to be controlled are not known, the following approximations may be used.

#### Efficiencies<sup>3)</sup>

Type	Power Factor
DC motors, 35 horsepower and less	80% to 85%
DC motors, above 35 horsepower	85% to 90%
Synchronous motors (at 100% power factor)	92% to 95%
"Apparent" Efficiencies (= Efficiency x Power Factor); Three-phase induction motors, 25 horsepower and less	70%
Three-phase induction motors above 25 horsepower	80%

### Fault-Current Calculation on Low-Voltage AC Systems

In order to determine the maximum interrupting rate of the circuit breakers in a distribution system, it is necessary to calculate the current which could flow under a three-phase bolted short circuit condition. For a three-phase system the maximum available fault current at the secondary side of the transformer can be obtained by use of the formula:

$$I_{sc} = \frac{kVA \times 100}{KV \times \sqrt{3} \times \% Z}$$

where:

$I_{sc}$  = Symmetrical RMS amperes of fault current.

kVA = Kilovolt-ampere rating of transformers.

KV = Secondary voltage in kilovolts.

% Z = Percent impedance of primary line and transformer.

### Minimum Size Grounding Conductors for Grounding Raceways and Equipment (From NEC Table 250-95<sup>2)</sup>)

Rating or Setting of Automatic Overcurrent Device in Circuit Ahead of Equipment, Conduit etc., Not Exceeding (Amperes)	Size	
	Copper Wire Number	Aluminum or Copper Clad Aluminum Wire Number
15	14	12
20	12	10
30	10	8
40	10	8
60	10	8
100	8	6
200	6	4
300	4	2
400	3	1
500	2	1/0
600	1	2/0
800	1/0	3/0
1000	2/0	4/0
1200	3/0	250 kcmil
1600	4/0	350 kcmil
2000	250 kcmil	400 kcmil
2500	350 kcmil	600 kcmil
3000	400 kcmil	600 kcmil
4000	500 kcmil	800 kcmil
5000	700 kcmil	1200 kcmil
6000	800 kcmil	1200 kcmil

### Grounding Electrode Conductor for AC Systems (From NEC Table 250-94<sup>2)</sup>)

Size of Largest Service Entrance Conductor or Equivalent Area for Parallel Conductors		Size of Grounding Electrode Conductor	
Copper	Aluminum or Copper Clad Aluminum	Copper	Aluminum or Copper Clad Aluminum
2 or smaller	1/0 or smaller	8	6
1 or 1/0	2/0 or 3/0	6	4
2/0 or 3/0	4/0 or 250 kcmil	4	2
Over 3/0 to 350 kcmil	Over 250 kcmil to 500 kcmil	2	1/0
Over 350 kcmil to 600 kcmil	Over 500 kcmil to 900 kcmil	1/0	3/0
Over 600 kcmil to 1100 kcmil	Over 900 kcmil to 1750 kcmil	2/0	4/0
Over 1100 kcmil	Over 1750 kcmil	3/0	250 kcmil

1)In three-wire, two-phase circuits the current in the common conductor is 1.41 times that in either other conductor.

E = Volts I = Amperes  
% EFF = Percent Efficiency pf = Power Factor

2)Additional information and exceptions are stated in Article 250—Grounding, National Electric Code.

3)These figures may be decreased slightly for single-phase and two-phase induction motors.

# General Information

## NEMA and IEC terminal markings

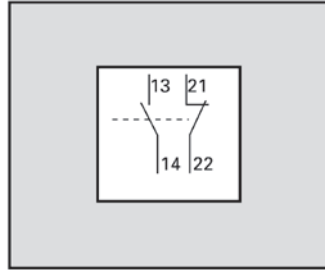
### Symbols and Terminal Markings—IEC

Per DIN standards, the terminals of auxiliary contacts on contactors and control devices are marked with a two digit number. Terminals that belong together are marked with the same location digit (first digit).

The second digits (called the function digits) identify the function of each contact per the following designation.

Type of Contact	Function Digits
Normally Open	3 and 4
Normally Closed	1 and 2
Normally Open (Special Function)	5 and 6 i.e. Time-Delay or Overload
Normally Closed (Special Function)	7 and 8 Contacts

#### Example:

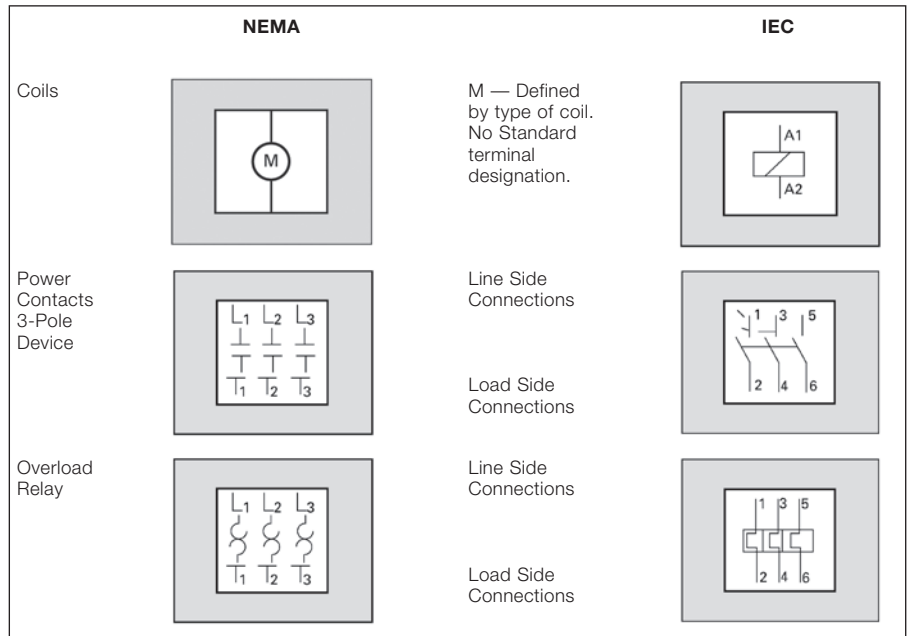


1. The numbers 13 and 14 represent an auxiliary contact
2. The number 1 identifies that this is the first contact in the sequence
3. The numbers 3 and 4 identify this as a normally open contact
4. The numbers 21 and 22 represent another auxiliary contact
5. The number 2 identifies that this is the second contact in the sequence
6. The numbers 1 and 2 identify this as a normally closed contact

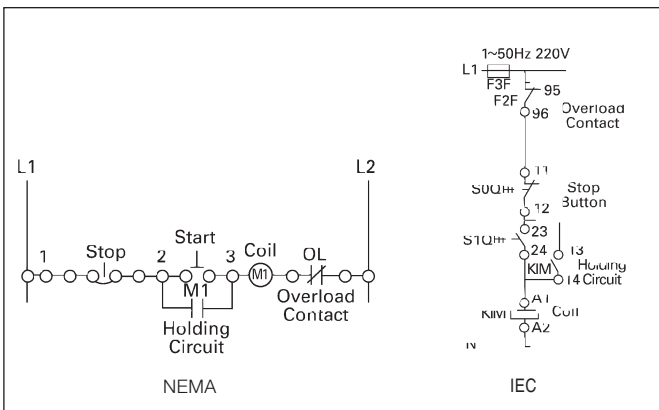
### Symbols and Terminal Markings

Control Circuits	NEMA	IEC
Normally Open (NO)		
Normally Closed (NC)		
<b>Time Delay Circuits</b>		
On Delay Normally Open (Timed Closed)		
Normally Closed (Timed Open)		
Off Delay Normally Open (Timed Open)		
Normally Closed (Timed Closed)		

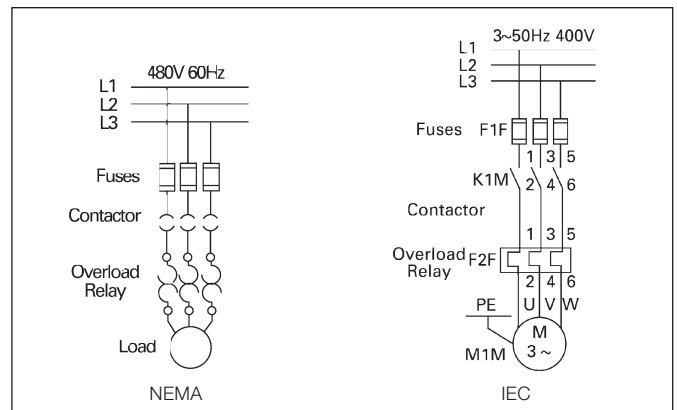
### NEMA and IEC Comparisons Contactor/Starter Markings



### Control Circuit Schematic



### Power Circuit Schematic



# General Information

## Electrical symbols

<b>Disconnect</b> 	<b>Circuit Interrupter</b> 	<b>Circuit Breaker</b> Thermal 	<b>Limit Switch—Spring Return</b> Normally Open 		Normally Closed 	Neutral Position 	<b>Maintained</b> 
			Held Closed 	Held Open 			

<b>Liquid Level</b> Normally Open 		Normally Closed 		<b>Vacuum &amp; Pressure</b> Normally Open 		Normally Closed 		<b>Temperature Activated</b> Normally Open 		Normally Closed 		<b>Flow (Air, Water, etc.)</b> Normally Open 		Normally Closed 	
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<b>Push Buttons</b> Normally Open 		Normally Closed 	Double Circuit 	Mushroom Head 	Maintained 	<b>Foot Switch</b> Normally Open 		Normally Closed 
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<b>Selector Switch</b>  J - K - L A1 A2 B1 B2 x Indicates Contacts Closed	<b>Lamps</b> PUSH TO TEST  Denote Lens Color by Letter	<b>Time Delay Contact</b> Normally Open 				Normally Open 	Normally Closed 	Normally Closed 
--	---	--	--	--	--	-------------------	---------------------	---------------------

<b>General Contacts</b> Normally Open 		Normally Closed 	<b>Conductors</b> Not Connected 		Connected 	<b>Magnet Coil</b> 	<b>Control Transformer</b> 	<b>Meter</b> VM AM 
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<b>Ground</b> 	<b>Full Wave Rectifier</b> 	<b>Horn, Siren</b> 	<b>Bell, Buzzer</b> 	<b>Motor</b> 3 Phase 	<b>Overload Relay</b> Thermal 	<b>Fuse</b> 
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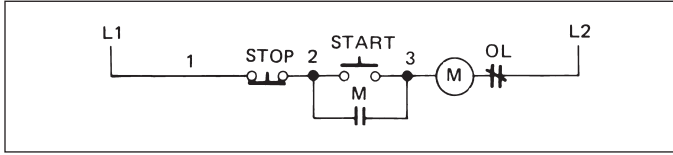
<b>Auto Transformer</b> 	<b>Resistor</b> Adjustable 		Fixed 	<b>Location of Relay Contacts</b>  ICR (2 - 3 - 4) Numbers in parentheses designate the location of relay contacts. A line underneath a location number signifies a normally closed contact.
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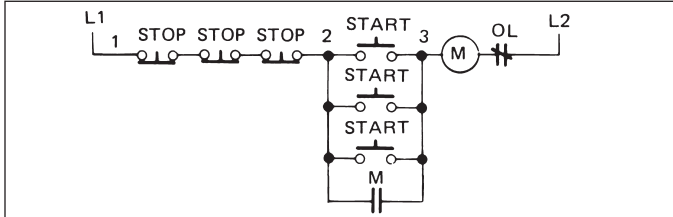
# General Information

## Control circuit schematics

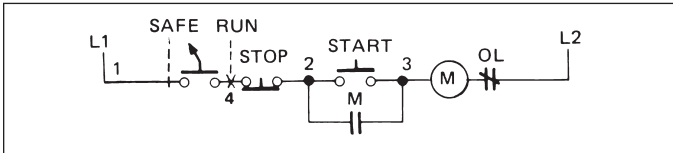
**Figure 1** Three Wire Control Giving Low Voltage Protection Using Single Two Button Station



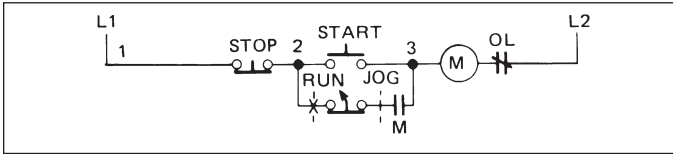
**Figure 2** Three Wire Control Giving Low Voltage Protection Using Multiple Two Button Stations



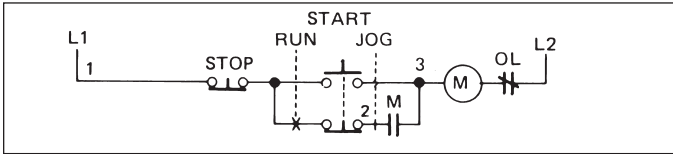
**Figure 3** Three Wire Control Giving Low Voltage Protection with Safe-Run Selector Switch



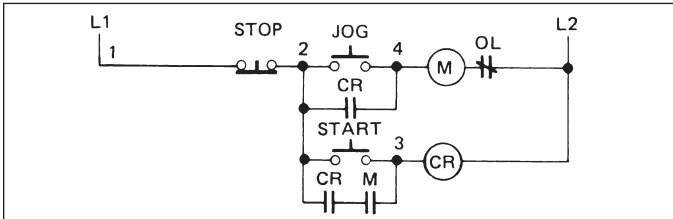
**Figure 4** Three Wire Control for Jog or Run Using Start Stop Push Buttons and Jog-Run Selector Switch



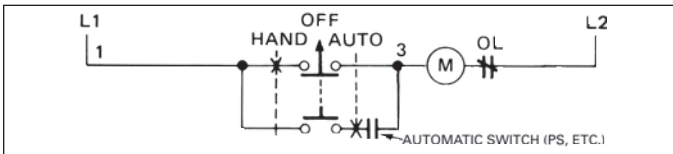
**Figure 5** Control for Jog or Run Using Stop Push Button and Jog-Run Selector Push Selector Switch. Selector Push Contacts are Shown for "Run" (Three Wire Operation). Rotate Switch Sleeve and Selector Contact Opens Between "2" and "Stop" Button (Two Wire Operation)



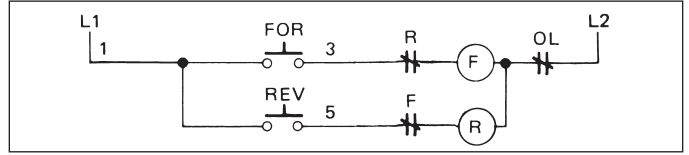
**Figure 6** Three Wire Control for Jogging, Start, Stop Using Push Buttons



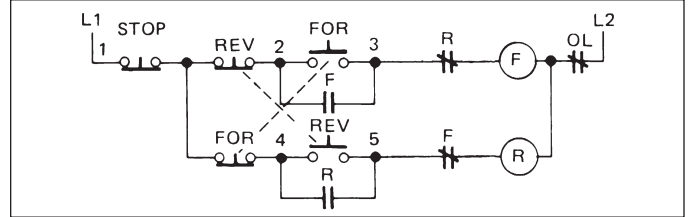
**Figure 7** Two Wire Control Giving Low Voltage Release Only Using Hand-Off-Auto Selector Switch



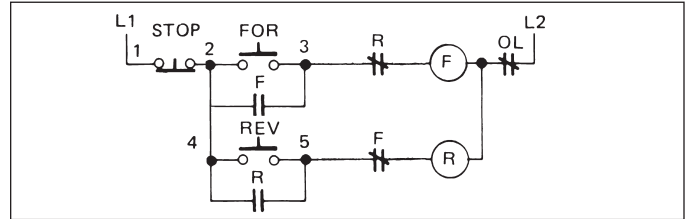
**Figure 8** Two Wire Control for Reversing Jogging Using Single Two Button Station



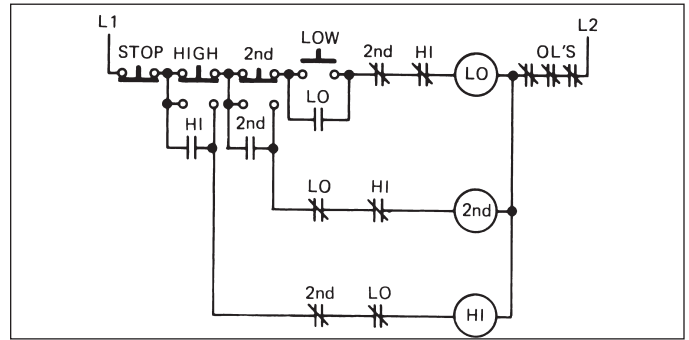
**Figure 9** Three Wire Control for Instant Reversing Applications Using Single Three Button Station



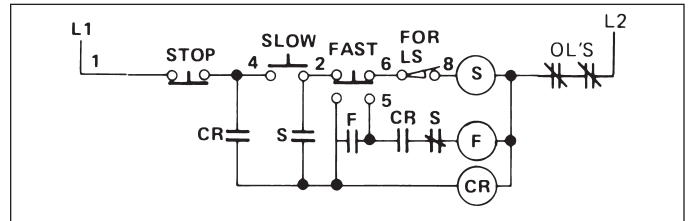
**Figure 10** Three Wire Control for Reversing After Stop Using Single Three Button Station



**Figure 11** Control for Three Speed with Selective Circuitry to Insure the Stop Button is Pressed Before Going to a Lower Speed



**Figure 12** Three Wire Control for Two Speed with a Compelling Relay to Insure Starting on Slow Speed

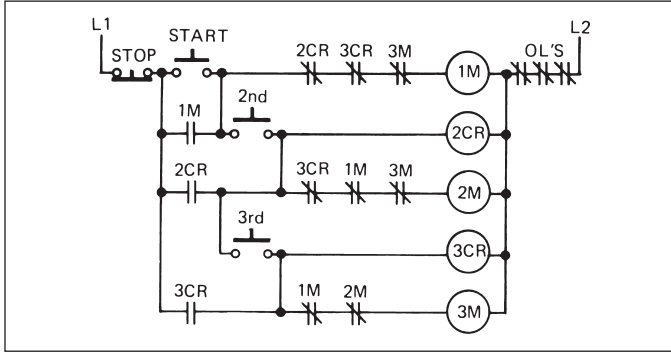




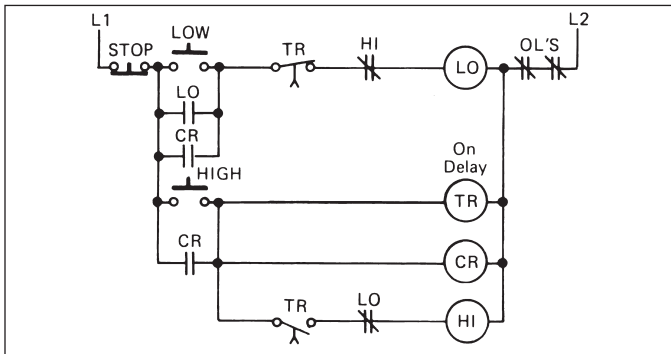
# General Information

## Control circuit schematics and wiring diagrams with transformers

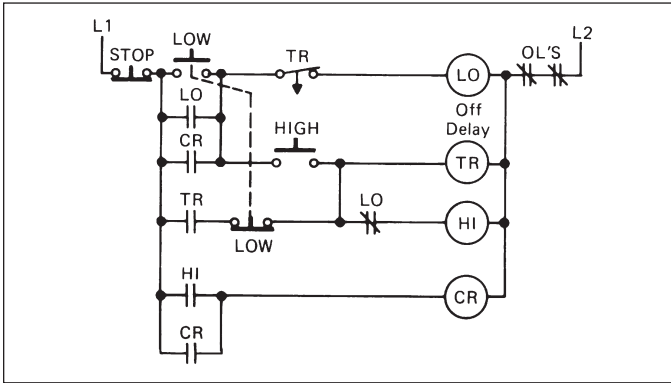
**Figure 13** Control for Three Speed with a Compelling Relay to Insure Starting on Low Speed



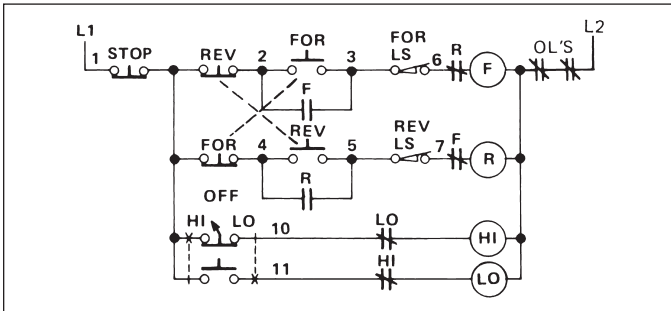
**Figure 14** Control for Two Speed to Provide Automatic Acceleration from Low to High Speed



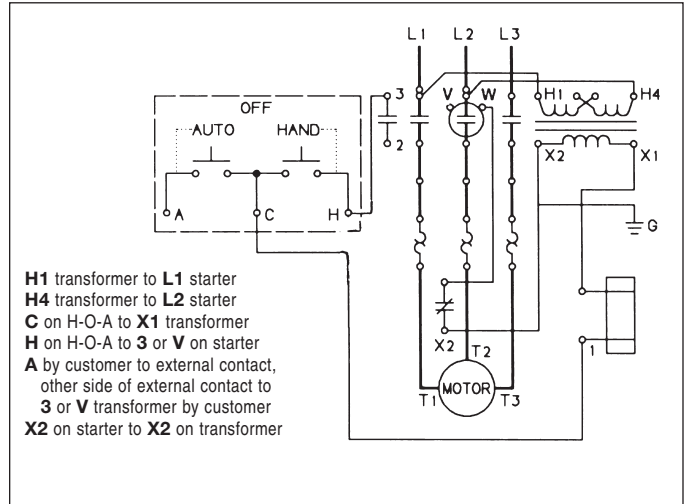
**Figure 15** Control for Two Speed to Provide Automatic Deceleration from High to Low Speed



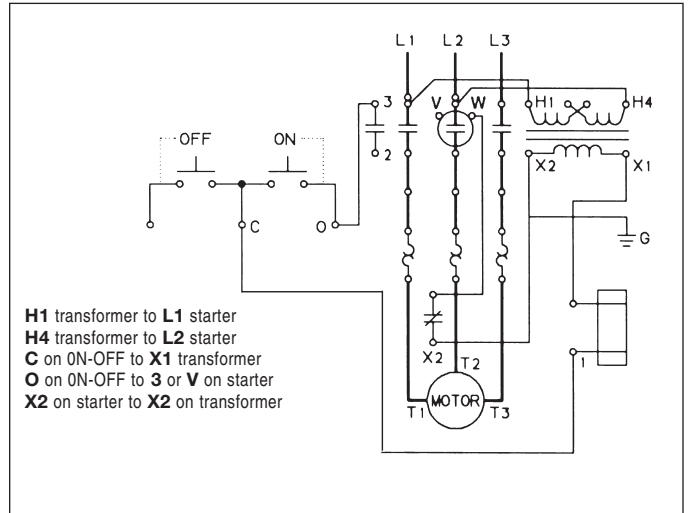
**Figure 16** Control for Two Speed Reversing Starter Using Forward, Reverse, Stop Push Buttons and High-Low-Off Selector Switch



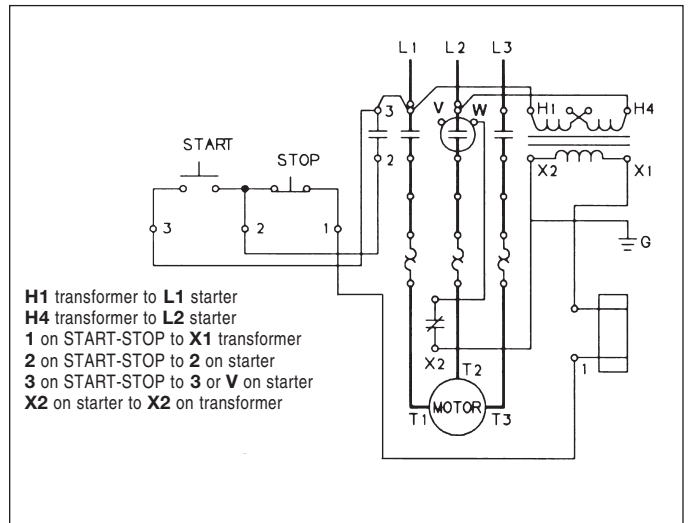
**Size 0-2½ Starter with Transformer and 3 Position Selector Switch**



**Size 0-2½ Starter with Transformer and 2 Position Selector Switch**



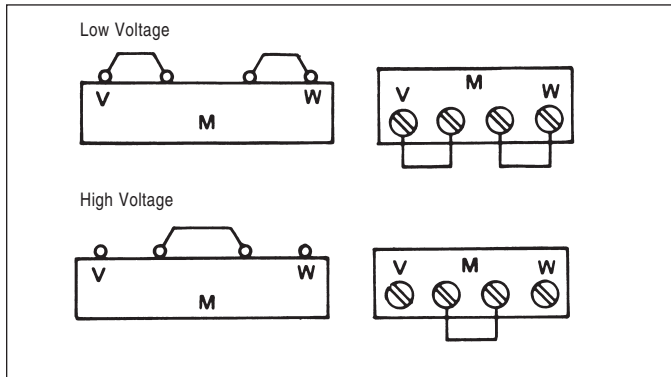
**Size 0-2½ Starter with Transformer and START-STOP Push Button**



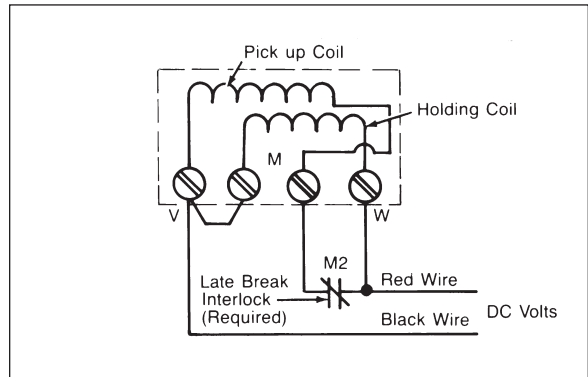
# General Information

## Pilot control

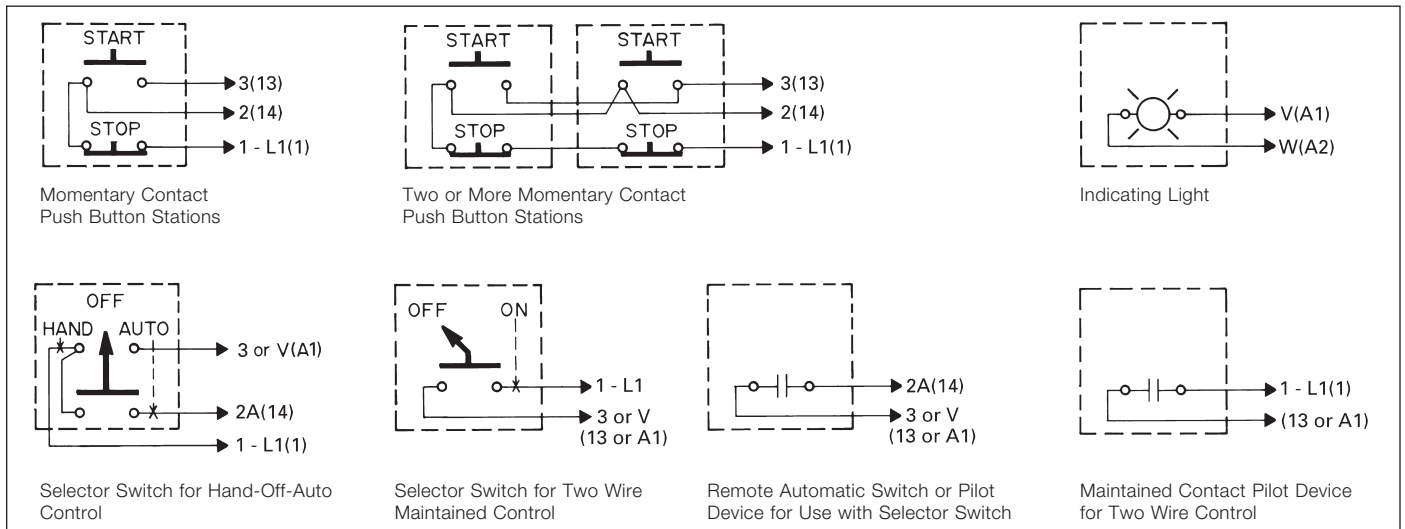
### AC Coil—NEMA Size 0-4



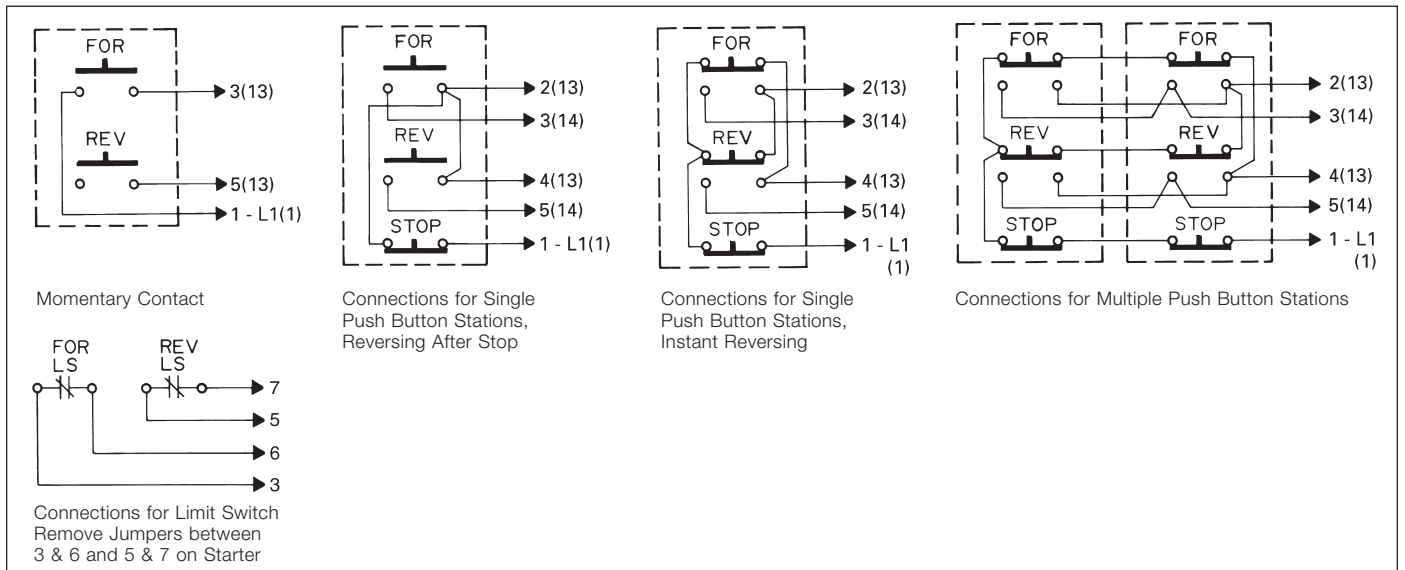
### DC Coil—NEMA Size 0-4



**Non Reversing Pilot Control** Terminal Markings shown in ( ) indicate IEC Style. For separate control voltage source remove Jumper A shown individual in wiring diagrams. Connect separate voltage source to terminal 1 on the pilot device as shown and to the terminal **X2** on the overload relay, or **W(A2)** on the coil if there is no overload.



**Reversing Pilot Control** For Separate control voltage source remove Jumper A shown in individual wiring diagrams. Connect separate voltage source to terminal 1 on the pilot device as shown and to the terminal **X2** on the overload relay, or **W(A2)** on the coil if there is no overload.



## International Control Equipment (IEC)

## Quick reference list

Siemens is a manufacturer of equipment for the global market and manufactures products for global applications. The products listed in Sections 1 through 18 of this catalog are the products best suited for application in the U.S., Canada and Mexico.

There are a host of other Industrial Control products that can be made available for export applications or for replacement in OEM equipment imported in to the U.S. The most common Siemens components are listed in the table below. We refer to these as Industrial Control Equipment components or ICE products.

If you are trying to identify a Siemens ID that is not listed in the Catalog Number Index on pages 0/12 to 0/15 of this catalog or in the table below, please contact our Call Center at 800-241-4453 or 423-262-5700. The Siemens Call Center maintains an extensive data base on all Siemens Operating Companies, and they can direct you for the appropriate support.

Catalog Number Prefix	Description	Catalog Number Prefix	Description	Catalog Number Prefix	Description
<b>2CC</b>	Low-Pressure Axial Ventilator Fan	<b>3WY3</b>	3WN Accessories	<b>4FL</b>	Transformer Voltage Regulator
<b>2CF7</b>	Medium-Pressure Radial-flow Fan	<b>4AC</b>	Bell transformers, power supply units	<b>4NC</b>	Window-type Current Transformer
<b>2CQ</b>	Medium-Pressure Axial Ventilator Fan	<b>4AJ</b>	Standard Transformers	<b>4PK</b>	Reactance coils with layer winding of copper flat wire
<b>2CT</b>	Low-Pressure Axial Ventilator Fan	<b>4AM</b>	Control Transformer	<b>5SA</b>	DIAZED Fuse Links (E16) Miniature Fuses <sup>1)</sup>
<b>3KA</b>	Disconnect Switch	<b>4AN</b>	Single-phase transformers YUI 1 (UI)	<b>5SB</b>	DIAZED Fuse Links, Size II and III <sup>1)</sup>
<b>3KE</b>	Disconnect Switch	<b>4AP</b>	Transformer for rectifier operation	<b>5SC</b>	DIAZED Fuse Links, Size IV and V <sup>1)</sup>
<b>3KL</b>	Load Disconnect Switch w/Fuses	<b>4AT</b>	Safety Isolation Transformer, 1 phase	<b>5SD</b>	DIAZED Fuses
<b>3KM</b>	Load Disconnect Switch w/Fuses	<b>4AU</b>	Safety Isolation Transformer, 3 phase	<b>5SE</b>	Fuses <sup>1)</sup>
<b>3KX</b>	3KE4 Accessories	<b>4AV</b>	Special Transformers and DC power supplies	<b>5SF</b>	DIAZED Fuse Base
<b>3KY</b>	3KL Accessories	<b>4AW</b>	Ring core transformers	<b>5SG</b>	NEOZED & MINIZED Fuse Disconnectors
<b>3NA</b>	LV HRC Fuses	<b>4AX</b>	Non-Siemens transformers	<b>5SH</b>	DIAZED Fuse Accessories
<b>3NC</b>	SITOR Semiconductor fuse-links to 1000 V <sup>1)</sup>	<b>4AY</b>	Transformer housings, accessories and spare parts	<b>5SM</b>	Residual Current Protective Devices <sup>1)</sup>
<b>3ND1</b>	LV HRC Fuses	<b>4BT</b>	Transformer > 16 kVA, 1 Phase	<b>5SQ</b>	Miniature Circuit Breaker
<b>3ND2</b>	LV HRC Fuses	<b>4BU</b>	Transformer > 16 kVA, 3 Phase	<b>5SU</b>	Ground Fault and Line-Prot. Circuit Breaker
<b>3NE</b>	SITOR Semiconductor fuse-links to 2500 V <sup>1)</sup>	<b>4BV</b>	Special Transformers	<b>5SV8</b>	SFJ Fault and Line-Prot. Circuit Breaker
<b>3NG1</b>	LV HRC Fuses	<b>4BX</b>	Transformer, 3-phase	<b>5SW</b>	Wall Enclosure
<b>3NH</b>	Fuse Bases	<b>4CH</b>	Variac 1 Phase	<b>5SZ</b>	Ground Fault Circuit Breakers
<b>3NJ</b>	Fused Disconnect Switch	<b>4CJ</b>	Variac 3 Phase	<b>5TE</b>	Toggle Switch
<b>3NP</b>	Fused Disconnect Switch	<b>4CP</b>	Pillar-type, Variac, 1ph	<b>5TG</b>	Signal Light
<b>3NW1</b>	Fuse Material to BS and NF Standards <sup>1)</sup>	<b>4CQ</b>	Pillar-type, Variac, 3ph	<b>5TT</b>	Switch Relay
<b>3NW6</b>	Cylindrical Fuses	<b>4EA</b>	Reactance Coils with Iron-Core Reactors	<b>7KM</b>	Meters
<b>3NW8</b>	Fuse Material to BS and NF Standards	<b>4EF</b>	Reactance Coils with Iron-Core Reactors	<b>7KT</b>	Time meters, impulsing meters and accessories
<b>3NX</b>	Accessories and spare parts for NH-fuses	<b>4EJ</b>	Reactance Coils with Iron-Core Reactors	<b>7LF</b>	Digital time switches and accessories
<b>3NY</b>	3NP Accessories	<b>4EM</b>	Single-phase reactance coils YEI 1 (EI)	<b>7LQ</b>	Quarz-controlled time switches
<b>3TK</b>	Specialty Contactor	<b>4EN9</b>	Choke	<b>7PV</b>	Timers
<b>3UL22</b>	Summation Current Transformers	<b>4EP</b>	Line Reactor	<b>7ZX</b>	Instruction Manual <sup>1)</sup>
<b>3VU2</b>	Phase Out Announced	<b>4ET</b>	Single-phase reactance coils YUI 1 (UI)	<b>8JH</b>	Distribution Enclosure Accessories
<b>3VX</b>	Circuit Breaker Accessories and Components	<b>4EU</b>	Three-phase reactance coils YUI 2 (3UI)	<b>8UB</b>	Handle Accessories
<b>3WX</b>	3W Accessories	<b>4EV</b>	RFI Suppression Choke	<b>8WC</b>	Distribution System Accessories
<b>3WY1</b>	3WF Accessories	<b>4FB</b>	Power supplies	<b>8ZX</b>	Instruction Sheets <sup>1)</sup>
<b>3WY2</b>	3WE Accessories	<b>4FK</b>	Magnetic Voltage Regulator 1 phase	<b>LZX</b>	Plug-in Relays <sup>1)</sup>

<sup>1)</sup> Standard Control Product - Not Considered ICE Product.

# Connection Technology

## Spring loaded terminal technique

### Spring Loaded Terminals

As an alternative to screw-type terminals, many products may be supplied with spring loaded terminals. With this screwless connection technique, the wires are clamped securely against shock and vibration by a spring clamp. Solid, stranded and finely-stranded wires can be connected with or without end sleeves.

Each terminal connection is equipped with two independently operated spring clamps. Each spring can accept one wire. The clamping force of the spring automatically adjusts to the size of the wire and compensates for

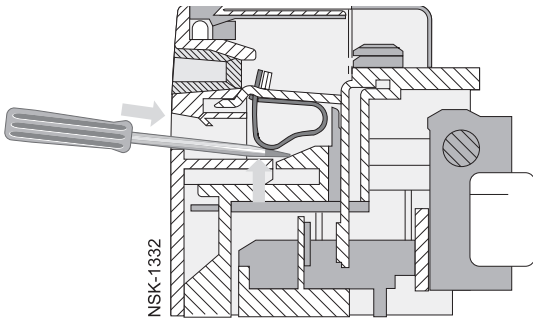
any deformation of the wire, such as settling of the strands. The flat clamping face of the spring presses the wire against the current bar without damaging the wire. To prevent stranded or finely-stranded wire from being divided, the end can be tinned or amalgamated using ultrasound.

The terminal is opened by inserting the screwdriver. The wire is then inserted and will remain clamped after the screwdriver is removed (see below). The chromium-nickel steel of the spring clamp provides corrosion-resistant contact of the wire-end in the clamp.

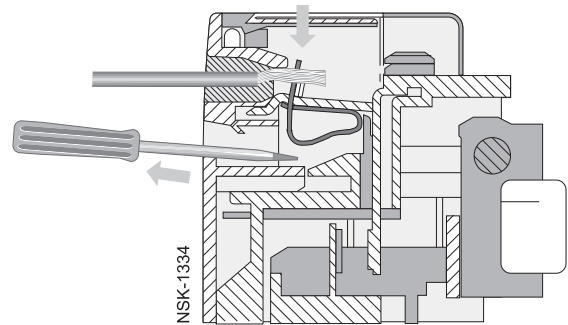
Advantages:

- Quick: The connection is made easily without the need to add on wire end sleeves or torque down terminal screws—reducing wiring time
- Reliable: The terminal is gas-tight and resistant to shock and vibration—for maximum contact reliability
- Maintenance-free: With the spring loaded terminals, there is no need to inspect the connections following transport—eliminating time-consuming and costly inspection

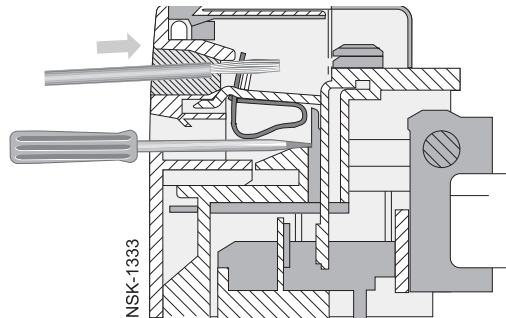
Step 1:  
Insert screwdriver;  
spring opens.



Step 2:  
The screwdriver holds the spring open;  
insert the wire.



Step 3:  
Remove the screwdriver; the spring  
closes and the wire is securely clamped.



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## Standard terms and conditions of sale

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**2. PRICING & PAYMENT.** The prices shall be: (a.) as stated in Siemens' proposal, or if none are stated, (b.) Siemens' standard prices in effect at the time of release for shipment. In the event of a price increase or decrease, the price of Products on order shall be adjusted to reflect such increase or decrease. This does not apply to a shipment held by request of Buyer. Products already shipped are not subject to price increase or decrease.

Discounts, if any, are as specified on the latest discount sheets issued from time to time. Cash discounts are not applicable to notes or trade acceptances, to pre-paid transportation charges when added to Siemens' invoices or to discountable items if there are undisputed past due items on the account. Cash discounts shall only be allowed on that portion of the invoice paid within the normal discount period.

(a) Payment - Unless otherwise stated, all payments shall be net 30 days from invoice date payable in United States Dollars.

(b) Credit Approval - All orders are subject to credit approval by Siemens. The amount of credit or terms of payment may be changed or credit withdrawn by Siemens at any time for any reason without advance notice. Siemens may, in its discretion, withhold further manufacture or shipment; require immediate cash payments for past and future shipments; or require other security satisfactory to Siemens before further manufacture or shipment is made; and may, if shipment has been made, recover the Products from the carrier, pending receipt of such assurances.

(c) Installment Shipment - If these terms require or authorize delivery of Products in separate shipments to be separately accepted by Buyer, Buyer may only refuse such portion of such shipment that fails to comply with the requirements of these terms. Buyer may not refuse to receive any lot or portion of hereunder for failure of any other lot or portion of a lot to be delivered or to comply with these terms, unless such right of refusal is expressly provided for on the face hereof. Buyer shall pay for each lot in accordance with the terms hereof. Payment shall be made for the Products without regard to whether Buyer has made or may make any inspection of the Products. Products held for Buyer are at Buyer's sole risk and expense.

(d) Taxes, Shipping, Packing, Handling - Except to the extent expressly stated in these terms, Siemens' prices do not include any freight, storage, insurance, taxes, excises, fees, duties or other government charges related to the Product, and Buyer shall pay such amounts or reimburse Siemens for any amounts Siemens pays. If Buyer claims a tax or other exemption or direct payment permit, it shall provide Siemens with a valid exemption certificate or permit and indemnify, defend and hold Siemens harmless from any taxes, costs and penalties arising out of same. Siemens' prices include the costs of its standard domestic packing only. Any deviation from this standard packing (domestic or export), including U.S. Government sealed packing, shall result in extra charges. To determine such extra charges, consult Siemens' sales offices. Any and all increases, changes, adjustments or surcharges (including, without limitation, fuel surcharges) which may be in connection with the freight charges, rates or classification included as part of these terms, shall be for the Buyer's account. Orders of less than \$400 are subject to a \$25 handling fee.

(e) Finance Charge - Buyer agrees to pay FINANCE CHARGES on the unpaid balance of all overdue invoices, less any applicable payments and credits, from the date each invoice is due and payable at an ANNUAL PERCENTAGE RATE of EIGHTEEN PERCENT (18%), or the highest applicable and lawful rate on such unpaid balance, whichever is lower.

(f) Disputed Invoice - In the event Buyer disputes any portion or all of an invoice, it shall notify Siemens in writing of the amount in dispute and the reason for its disagreement within 21 days of receipt of the invoice. The undisputed portion shall be paid when due, and FINANCE CHARGE on any unpaid portion shall accrue, from the date due until the date of payment, to the extent that such amounts are finally determined to be payable to Siemens.

(g) Collection - Upon Buyer's default of these terms, Siemens may, in addition to any other rights or remedies at contract or law, subject to any cure right

of Buyer, declare the entire balance of Buyer's account immediately due and payable or foreclose any security interest in Products delivered. If any unpaid balance is referred for collection, Buyer agrees to pay Siemens, to the extent permitted by law, reasonable attorney fees in addition to all damages otherwise available, whether or not litigation is commenced or prosecuted to final judgment, plus any court costs or expenses incurred by Siemens, and any FINANCE CHARGES accrued on any unpaid balance owed by Buyer.

**3. DELIVERY; TITLE; RISK OF LOSS.** Product shall be delivered F.O.B. Siemens point of shipment with title to the Product and risk of loss or damage for the Product passing to Buyer at that point. Buyer shall be responsible for all transportation, insurance and related expenses including any associated taxes, duties or documentation. Siemens may make partial shipments. Shipping dates are approximate only and Siemens shall not be liable for any loss or expense (consequential or otherwise) incurred by Buyer or Buyer's customers if Siemens fails to meet the specified delivery schedule. A 5% handling charge will be added to the price for all Product furnished from a local branch.

**4. DEFERMENT AND CANCELLATION.** Buyer shall have no deferment rights and Buyer shall be liable for cancellation charges, which shall include without limitation a) payment of the full product price for any finished Product or works in progress; b) payment for raw materials ordered pursuant to a firm purchase order; and c) such other direct costs incurred by Siemens as a result of such cancellation.

**5. FORCE MAJEURE / DELAYS.** If Siemens suffers delay in performance due to any cause beyond its reasonable control, including without limitation acts of God, strikes, labor shortage or disturbance, fire, accident, war or civil disturbance, delays of carriers, failure of normal sources of supply, or acts of government, the time of performance shall be extended a period of time equal to the period of the delay and its consequences. Siemens will give to Buyer notice within a reasonable time after Siemens becomes aware of any such delay

**6. BUYER'S REQUIREMENTS.** Timely performance by Siemens is contingent upon Buyer's supplying to Siemens all required technical information and data, including drawing approvals, and all required commercial documentation.

**7. LIMITED WARRANTY.** (a.) Limited Product Warranty Statements. For each Product purchased from Siemens or an authorized reseller, Siemens makes the following limited warranties: (i) the Product is free from defects in material and workmanship, (ii) the Product materially conforms to Siemens' specifications that are attached to, or expressly incorporated by reference into, these terms, and (iii) at the time of delivery, Siemens has title to the Product free and clear of liens and encumbrances (collectively, the "Limited Warranties"). Warranties with respect to software which may be furnished by Seller as part of the Product, if any, are expressly set forth elsewhere in these terms. The Limited Warranties set forth herein do not apply to any software furnished by Siemens. If software is furnished by Siemens, then the attached Software License/Warranty Addendum shall apply.

(b.) Conditions to the Limited Warranties. The Limited Warranties are conditioned on (i) Buyer storing, installing, operating and maintaining the Product in accordance with Siemens' instructions, (ii) no repairs, modifications or alterations being made to the Product other than by Siemens or its authorized representatives, (iii) using the Product within any conditions or in compliance with any parameters set forth in specifications that are attached to, or expressly incorporated by reference into, these terms, (iv) Buyer discontinuing use of the Product after it has, or should have had, knowledge of any defect in the Product, (v) Buyer providing prompt written notice of any warranty claims within the warranty period described below, (vi) at Siemens' discretion, Buyer either removing and shipping the Product or non-conforming part thereof to Siemens, at Buyer's expense, or Buyer granting Siemens access to the Products at all reasonable times and locations to assess the warranty claims, and (vii) Buyer not being in default of any payment obligation to Siemens under these terms.

(c.) Exclusions from Limited Warranty Coverage. The Limited Warranties specifically exclude any equipment comprising part of the Product that is not manufactured by Siemens or not bearing its nameplate. To the extent permitted, Siemens hereby assigns any warranties made to Siemens for such equipment. Siemens shall have no liability to Buyer under any legal theory for such equipment or any related assignment of warranties. Additionally, any Product that is described as being experimental, developmental, prototype, or pilot is specifically excluded from the Limited Warranties and is provided to Buyer "as is" with no warranties of any kind. Also excluded from the Limited Warranties are normal wear and tear items including any expendable items that comprise part of the Product, such as fuses and light bulbs and lamps.



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(e.) Remedies for Breach of Limited Warranty. Buyer's sole and exclusive remedies for any breach of the Limited Warranties are limited to Siemens' choice of repair or replacement of the Product, or non-conforming parts thereof, or refund of all or part of the purchase price. The warranty on repaired or replaced parts of the Product shall be limited to the remainder of the original warranty period. Unless otherwise agreed to in writing by Siemens, (i) Buyer shall be responsible for any labor required to gain access to the Product so that Siemens can assess the available remedies and (ii) Buyer shall be responsible for all costs of installation of repaired or replaced Products. All exchanged Products replaced under this Limited Warranty will become the property of Siemens.

(f.) Transferability. The Limited Warranties shall be transferable during the warranty period to the initial end-user of the Product.

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Siemens will have no duty or obligation to Buyer under this Article to the extent that the Product is (a) supplied according to Buyer's design or instructions wherein compliance therewith has caused Siemens to deviate from its normal course of performance, (b) modified by Buyer or its contractors after delivery, (c) combined by Buyer or its contractors with devices, methods, systems or processes not furnished hereunder and by reason of said design, instruction, modification, or combination a suit is brought against Buyer. In addition, if by reason of such design, instruction, modification or combination, a suit or proceeding is brought against Siemens, Buyer shall protect Siemens in the same manner and to the same extent that Siemens has agreed to protect Buyer under the provisions of the Section above.

THIS ARTICLE IS AN EXCLUSIVE STATEMENT OF ALL THE DUTIES OF THE PARTIES RELATING TO PATENTS AND COPYRIGHTS, AND DIRECT OR CONTRIBUTORY PATENT OR COPYRIGHT AND OF ALL THE REMEDIES OF BUYER RELATING TO ANY CLAIMS, SUITS, OR PROCEEDINGS INVOLVING PATENTS AND COPYRIGHTS.

**10. COMPLIANCE WITH LAWS.** Buyer agrees to comply with all applicable laws and regulations relating to the purchase, resale, exportation, transfer, assignment, disposal or use of the goods.

**11. CHANGES IN WORK.** Siemens shall not implement any changes in the scope of work unless Buyer and Siemens agree in writing to the details of the change and any resulting price, schedule or other contractual modifications. Any change to any law, rule, regulation, order, code, standard or requirement which requires any change hereunder shall entitle Siemens to an equitable adjustment in the prices and any time of performance.

**12. NON-WAIVER OF DEFAULT.** Each shipment made hereunder shall be considered a separate transaction. In the event of any default by Buyer, Siemens may decline to make further shipments. If Siemens elects to continue to make shipments, Siemens' actions shall not constitute a waiver of any default by Buyer or in any way affect Siemens' legal remedies for any such default. Any waiver of Siemens to require strict compliance with the provisions of this contract shall be in writing and any failure of Siemens to require such strict compliance shall not be deemed a waiver of Siemens' right to insist upon strict compliance thereafter.

**13. FINAL WRITTEN AGREEMENT; MODIFICATION OF TERMS.** These terms, together with any quotation, purchase order or acknowledgement issued or signed by Siemens, comprise the complete and exclusive agreement between the parties (the "Agreement") and supersede any terms contained in Buyer's documents, unless separately signed by Siemens. These terms may only be modified by a written instrument signed by authorized representatives of both parties.

**14. ASSIGNMENT.** Neither party may assign the Agreement, in whole or in part, nor any rights or obligations hereunder without the prior written consent of the other; provided however that Siemens may assign its rights and obligations under these terms to its affiliates and Siemens may grant a security interest in the Agreement and/or assign proceeds of the Agreement without Buyer's consent.

**15. APPLICABLE LAW AND JURISDICTION.** These terms are governed and construed in accordance with the laws of the State of Delaware, without regard to its conflict of laws principles. The application of the United Nations Convention on Contracts for the International Sale of Goods is excluded. BUYER WAIVES ALL RIGHTS TO A JURY TRIAL IN ANY ACTION OR PROCEEDING RELATED IN ANY WAY TO THESE TERMS.

**16. SEVERABILITY.** If any provision of these terms is held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions will not in any way be affected or impaired, and such provision will be deemed to be restated to reflect the original intentions of the parties as nearly as possible in accordance with applicable law.

**17. EXPORT COMPLIANCE.** Buyer acknowledges that Siemens is required to comply with applicable export laws and regulations relating to the sale, exportation, transfer, assignment, disposal, and usage of the Products provided under the Contract, including any export license requirements. Buyer agrees that such Products shall not at any time directly or indirectly be used, exported, sold, transferred, assigned or otherwise disposed of in a manner which will result in non-compliance with such applicable export laws and regulations. It shall be a condition of the continuing performance by Siemens of its obligations hereunder that compliance with such export laws and regulations be maintained at all times. BUYER AGREES TO INDEMNIFY AND HOLD SIEMENS HARMLESS FROM ANY AND ALL COSTS, LIABILITIES, PENALTIES, SANCTIONS AND FINES RELATED TO NON-COMPLIANCE WITH APPLICABLE EXPORT LAWS AND REGULATIONS.



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