SIEMENS

SIRIUS

Industrial Controls

Product Catalogue

2021
Canadian
Edition

siemens.ca/industrialcontrols

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Product ordering notes

Ordering notes

Ordering special versions

For ordering products that differ from the versions listed in the catalogue, the article number specified in the catalogue must be supplemented with "–Z"; the required features must be specified by means of the alphanumeric order codes or in plain text.

Small orders

When small orders are placed, the costs associated with order processing are greater than the order value. We recommend therefore that you combine several small orders. Where this is not possible surcharges may apply.

Standard delivery time (SD)

SD in days (d)
► Preferred type
X On request

Preferred types are available immediately from stock, i.e. are dispatched within 24 hours.

Normal quantities of the products are usually delivered within the specified time following receipt of your order at our branch.

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

The delivery times apply up to the ramp at Siemens AG (products ready for dispatch). The transport times depend on the destination and type of shipping. The standard transport time for Germany is one day.

The delivery times specified here represent the situation in October 2019. They are continuously optimized. For more up-to-the-minute information, please visit www.siemens.com/sirius/mall.

Price units (PU)

The price unit defines the number of units, sets or meters to which the specified price applies.

Packaging sizes (PS)

The packaging size defines the number, e.g. of units, sets or meters, contained in an outer packaging.

Only the quantity defined by the packaging size or a multiple thereof can be ordered.

For multi-unit and reusable packaging information, please visit www.siemens.com/sirius/mall.

Price groups (PG)

Each product is assigned to a price group.

Example

3RA2110-0FA15-1AP0

SD: 2 working days
PG: 41D
Order quantity 1 unit or a multiple thereof

3RA1921-1D

SD: Preferred type
PG: 41B
Order quantity 10 units or a multiple thereof

3SU1900-0AB71-0AB0

SD: 5 working days
PG: 41J
Order quantity 10 units or a multiple thereof

SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
2	**3RA2110-0FA15-1AP0**		1	1 unit	41D
►	**3RA1921-1D**		1	10 units	41B
5	**3SU1900-0AB71-0AB0**		100	10 units	41J

Dimensions

All dimensions in mm.

SIRIUS in the World Wide Web

The most important online services at a glance.

Industrial controls

Homepage
www.siemens.com/sirius

Siemens Industry Online Support – SIOS

Product Support
www.siemens.com/sirius/support

Industry Mall

Catalogue and Ordering System
www.siemens.com/industrymall

Interactive Catalog

Product Catalogue CA 01
www.siemens.com/automation/ca01

Configuring products and systems

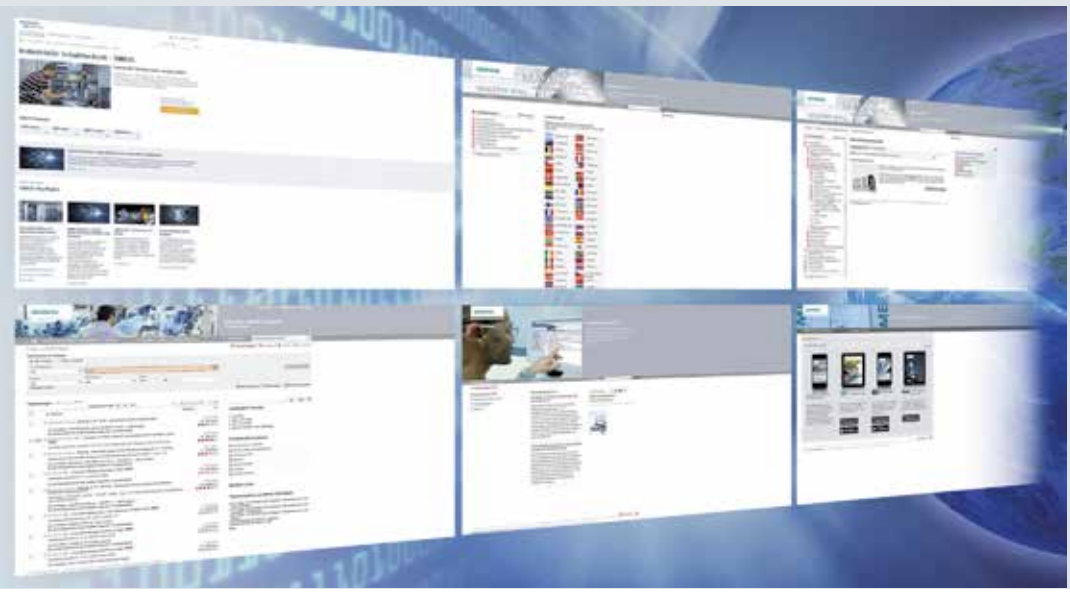
Configurators
www.siemens.com/sirius/configurators

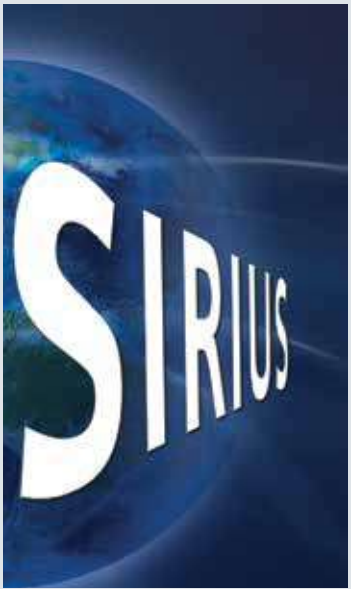
Siemens Industry Online Support App

More information on the Online Support App
www.siemens.com/industry/support-app

Device selection and configuration

TIA Selection Tool
www.siemens.com/tst

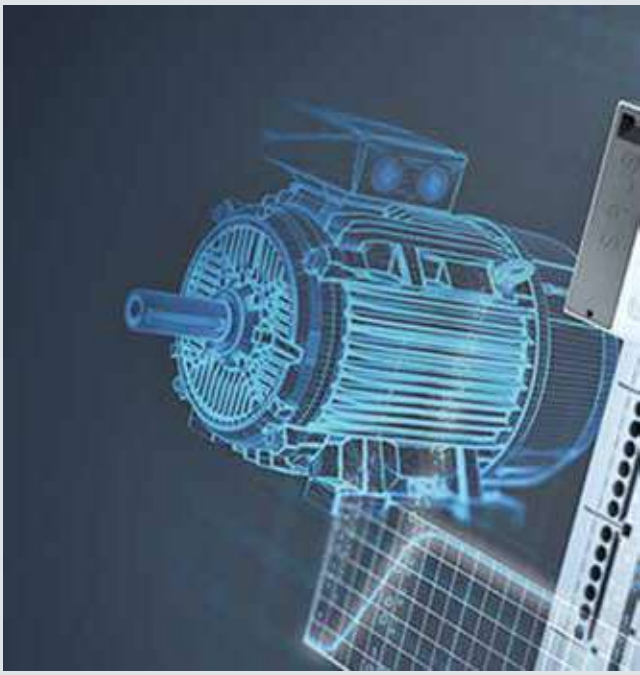




SIRIUS 3RW soft starters

As diverse as your tasks

The strong, harmonized portfolio of soft starters is suited to a wide range of standard – and also fail-safe and ATEX – applications thanks to comprehensive and specific functions. Benefit from intelligent functions such as condition monitoring, automatic parameterization, pump cleaning and integrated braking functions, regardless of the industry you are in.



Strong portfolio
Comprehensive, coordinated soft starter portfolio for simple to demanding starting: Basic, General, High Performance

Efficient switching
Energy-efficient switching and mechanical protection of the drive train thanks to soft starter with hybrid switching technology

Intelligent use
Concentrated, application-specific functionality thanks to intelligent features such as automatic parameterization, pump cleaning and condition monitoring

Ready for the digital future
Support for digital engineering processes with tools and data. Data provision for local visualization or cloud-based analysis

SIRIUS 3RW
Strong, comprehensive portfolio with a wide range of possibilities thanks to a flexible design.

More information, see www.siemens.com/softstarters

Digitalization
The 3RW soft starters help you to realize the full potential of digitalization. This is particularly beneficial when it comes to economic efficiency.

Your application in focus

Pump cleaning and pump stopping mode

The pump cleaning function prevents pumps from blocking and therefore increases your productivity and system availability. The pump stopping mode avoids mechanical loading in the piping system and extends the service life of the equipment.

Electrical ruggedness

Due to the wide control voltage range from 110 to 250 V AC, soft starters have a high degree of electrical ruggedness. This guarantees reliable operation even in the event of falling voltages.

Condition monitoring

The condition monitoring function supports optimal planning of maintenance work on bearings or seals, thereby maximizing availability.

Automatic parameterization

Automatic parameterization simplifies the commissioning and operation of critical applications considerably, even in the case of highly dynamic load characteristics.

Integrated braking functions

Intelligent functions such as soft starter braking ensure a fast and reliable stop without engineering and configuration work.

SIRIUS modular system

Efficiently combined.

More information, see: www.siemens.com/sirius-modular-system

Modular design

Optimally matched and dimensioned products expandable with uniform accessories

Save space

Highest performance on the market based on installation size

Order pre-assembled

Ready-made and tested combinations with short-circuit strength up to 150 kA/400 V

Quick wiring

Comprehensive portfolio for spring-loaded terminals, function blocks for contactor assemblies for reversing and star-delta (wye-delta) starting as well as connectors

Efficient configuration

Configuration data and macros for integration into your CAE systems

Worldwide use

Fulfills all relevant standards and approvals worldwide, also for extreme conditions (e.g. safety, rail and shipping) and is IE3/IE4 ready

TIA Selection Tool

The right product in just a few clicks.

Prime reasons for the TIA Selection Tool

Quick, easy and secure

Components can be selected, configured and ordered quickly, easily and securely from the Siemens automation portfolio.

Intelligent

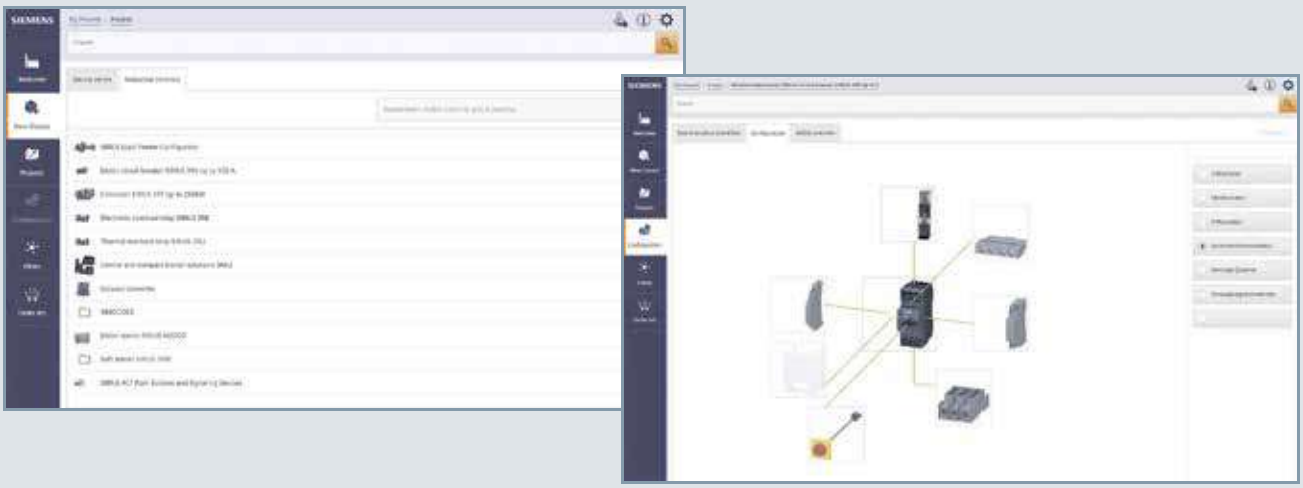
Intelligent selection wizards check the compatibility of the configured components and enable error-free ordering.

Clear

Required modules, devices and networks are automatically generated and clearly compared to one another.

Time-saving

Time savings of 80% in design – thanks to ease of use and intelligent support.



The TIA Selection Tool is a completely paperless solution.

Download it now:

www.siemens.com/tst

For more information, scan the QR code

Integrated Control Panels

The easy way to build the optimum control panel.

We offer practical support in mastering the typical challenges of control panel engineering through a harmonized product portfolio, tools and data for digitalization in engineering, and expert know-how.

Working together for simple and stress-free control panel design

Comprehensive support for all control panel applications

Want to save time and costs? With Integrated Control Panels, it's easy to optimize all aspects of control panel building for your industrial machines and plants. From preparation and dimensioning, design and construction, through to service and support – for greater competitiveness and long-term success.

Expert know-how

The faster route to the ideal control panel with practice-oriented expertise

We support you with exactly the right know-how to give you a competitive edge – both now and in the future.
This includes applying standards and guidelines in day-to-day operations (e.g. UL 508A, IEC 60204-1) as well as efficient engineering and configuration.

- Workshops, web-based training courses and individual consulting on product and application topics
- Literature with practical tips and tricks, including: guidelines, product manuals, white papers

More information, see www.siemens.com/panelbuilding

Tools & data for digitalization in engineering

Maximum efficiency for control panel design

With a range of tools and data-based services, we support you with the digitalization of your business and enable the leverage of all the advantages this offers for control panel design: greater efficiency, flexibility and quality – in every process phase!

- Intelligent selection, dimensioning and design
  www.siemens.com/simaris
  www.siemens.com/tst
- Integrate data efficiently
  www.siemens.com/cax

Harmonized product and system portfolio

Effective savings in control cabinet design

Harmonized product and system portfolio saves construction time. With our coordinated, integrated portfolio of products that includes automation technology, drive train components, industrial controls and matching control panel enclosures, we can reduce your engineering overhead and ensure the harmonious interaction of all devices. These are extensively tested, and are all certified and available for use worldwide – enabling you to remain flexible within the global business environment.

Technical Support

One click – and you have all the information you need.

Industry Online Support – get fast and up-to-date information online

https://support.industry.siemens.com

In Industry Online Support you will find FAQs, manuals, certificates, applications & tools, and much more

Support Request – make our expertise your competitive advantage

https://support.industry.siemens.com/My/ww/en/requests

Call the Customer Interaction Centre at 1-888-303-3353 for 24/7 bilingual support, or email cic.ca@siemens.com.

Conversion tool – the easy and efficient way to find successor products

www.siemens.com/sirius/conversion-tool

Any more questions?

Our experts are there to help you with competent technical advice.

Competent and fast technical advice regarding:

- Product selection
- Conversion from old to new
- Competitor conversion
- Special versions
- Particular requirements
- Commissioning
- Maintenance

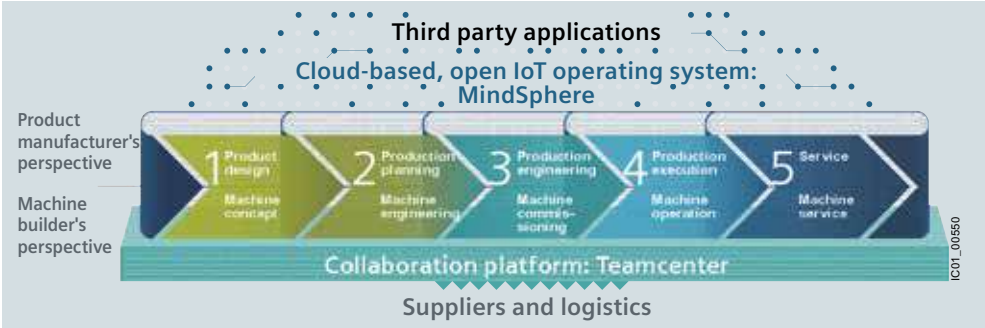
Support Request:
https://support.industry.siemens.com/My/ww/en/requests

Energy-Efficient Controls

SIRIUS brings down energy costs

Overview

Energy management in industry



Overview of the energy management process

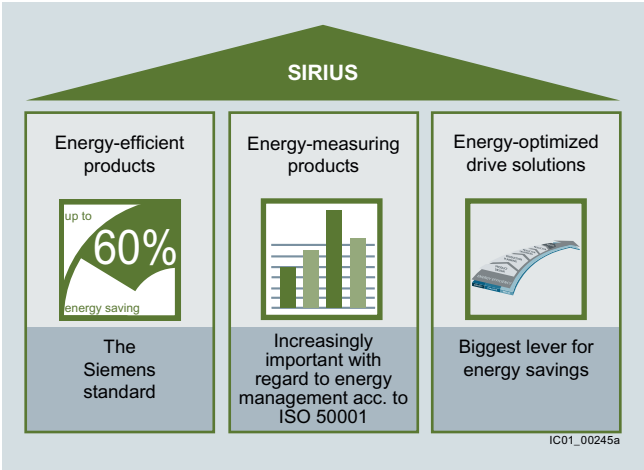
Whether you are a plant operator, planner or machine manufacturer: Energy-efficient production is a challenge and an opportunity in equal measure.

Energy-efficient production as a success factor

In order to harness energy potential, with our vast portfolio, we always maintain a clear view of the overall product development and production process. Because maximum energy efficiency in production can only be achieved through perfect interaction of all components.

That is why it is important to first create an awareness for existing energy-saving potential, recognize (identify) and assess (evaluate) opportunities for optimization through precise analysis. Finally, appropriate measures must be implemented (realized).

With our full-range portfolio of energy-efficient drive solutions, automation and services, you too will reach maximum energy efficiency, higher productivity and lasting competitiveness in your company.



Three columns of energy efficiency with products from the SIRIUS modular system

Energy-efficient products – SIRIUS reduces power loss

SIRIUS controls (3RM motor starter, 3RR2 monitoring relay, 3RB3 overload relay, 3RT2 contactor, 3RW soft starter and 3RV2 motor starter protector/circuit breaker) as well as the ET 200SP motor starters are characterized by extremely low intrinsic power loss. This not only lowers energy costs, but also reduces the amount of waste heat in the control cabinet. This then translates to a higher packing density and a reduction in the required cooling performance.

Energy-measuring products

Energy management can be instrumental in increasing plant productivity to bring about a significant improvement to the competitive ability of a company – in all industries.

Energy data acquisition represents an important component of the overall energy data management process here. Through transparency right down to the loads, it is possible to identify and utilize potential energy savings.

With communication-capable SIRIUS switching devices you can acquire energy data from the drive train without any additional effort.

SIRIUS controls help you make energy flows visible.

Best drive solutions in terms of energy

In order to design processes for optimal energy efficiency, it is not enough to simply measure the energy flow and deploy energy-efficient products. The greatest lever for saving energy can be derived from closely examining the application.

SinaSave energy efficiency tool

Amortization calculator for energy-efficient drive systems

The SinaSave energy efficiency tool determines energy saving potential and amortization times based on your individual conditions of use and therefore offers practical assistance in making decisions about investments in energy-efficient technologies.

From SinaSave version 6 and higher, the drive systems to be compared and the relevant drive component parameters are displayed graphically. An additional expansion are the numerous comparison possibilities for different control types and comprehensive product combinations for drive solutions for pump and fan applications.

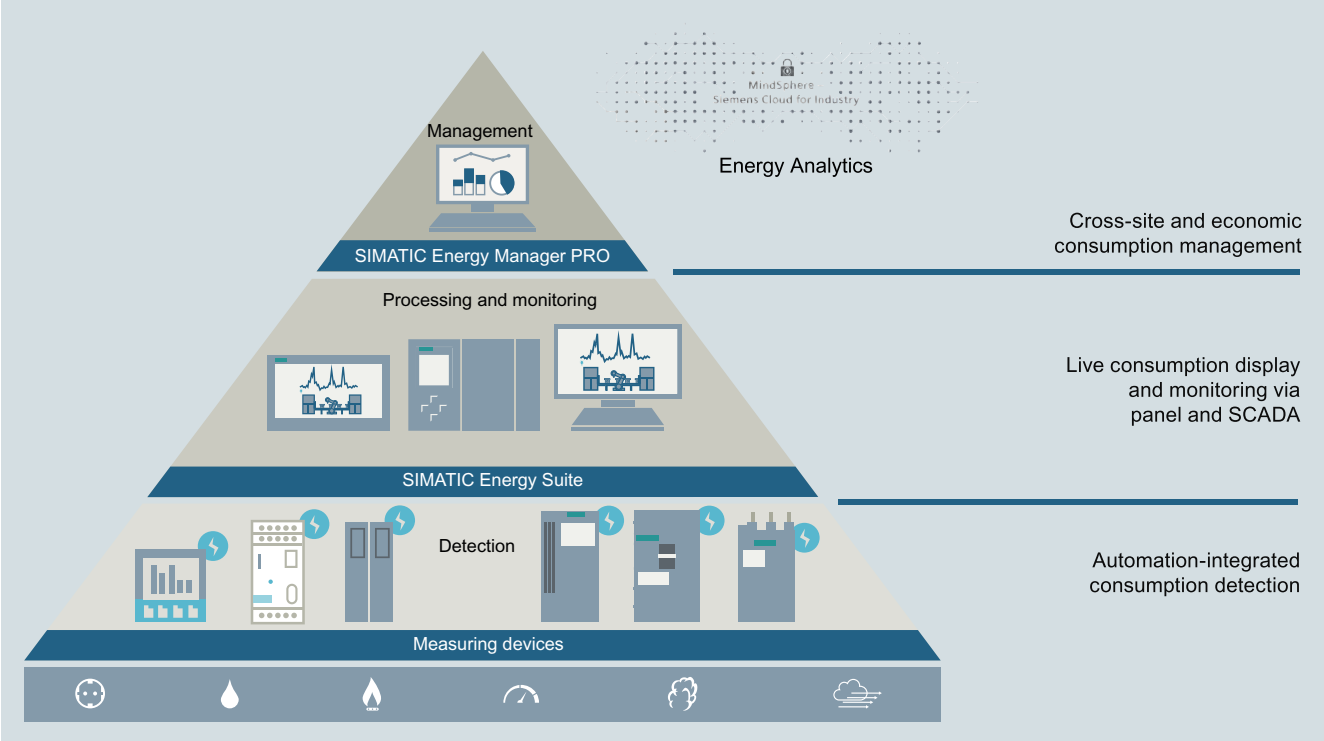
The product portfolio comprises not just SIRIUS controls, but also SIMOTICS motors and SINAMICS inverters and converters, thus offering a comprehensive range of comparison possibilities – according to your individual requirements.

SinaSave, the free amortization calculator for energy-efficient drives, see www.siemens.com/sinasave.

Energy Management with SIMATIC Energy Suite

Integrated energy management

Overview



SIMATIC Energy Suite

High energy consumption and automated production processes are typical for many industries.

If you want to keep your energy costs under control in the long term and you are already focusing on the digital future, it's a good idea to equip your plant with integrated energy measuring technology, thus anchoring energy management into the automation of your production processes – which is where most energy is consumed.
SIMATIC Energy Suite as an integrated option for the TIA Portal efficiently links energy management with automation, thus creating energy transparency in the production system. Considerably simplified configuration of energy-measuring components from the SIMATIC, SENTRON, SINAMICS, SIRIUS and SIMOCODE product families[2] significantly reduces the configuration workload. Thanks to the integrated interface to SIMATIC Energy Manager PRO[1] or cloud-based Service Energy Analytics, you can seamlessly expand the recorded energy data to create a cross-site energy management system.

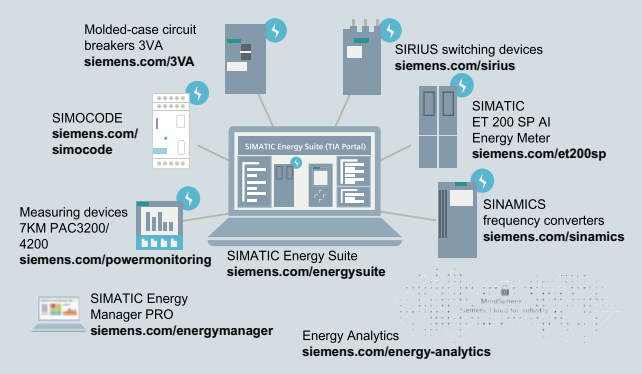
This also enables companies to fulfill all economic and energy management requirements – from purchasing of energy through planning to energy management.

The advantages at a glance:

- Automatic generation of energy management data
- Integration into TIA Portal and automation
- Simple configuration

Highlights

- Simple and intuitive configuration instead of programming
- Automatic generation of the PLC energy program
- Convenient integration of measuring components from the Siemens portfolio and from the portfolios of other manufacturers
- Integrated in the TIA Portal and automation
- Archiving on WinCC Professional or PLC
- Seamless connection to Energy Manager PRO and Energy Analytics



[1] SIMATIC Energy Manager PRO is the innovative successor to SIMATIC B.Data

[2] Products from the SIMATIC, SENTRON, SINAMICS, SIRIUS and SIMOCODE product families. For details on the currently supported devices, see www.siemens.com/energysuite-hardware.

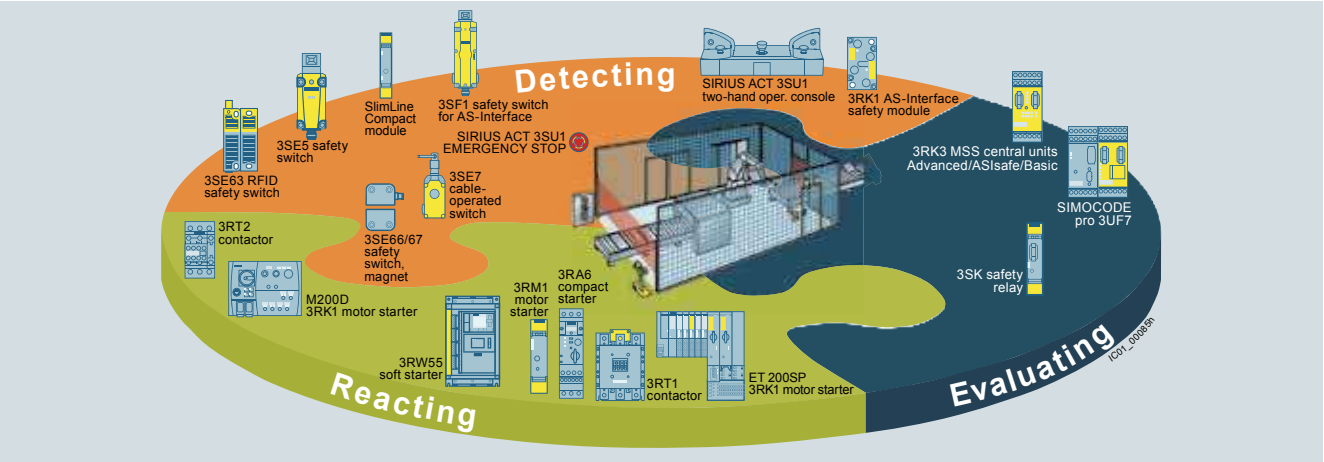
Ready for SIMATIC Energy Suite

For more information on SIMATIC Energy Suite, see www.siemens.com/energysuite

Systematic Industrial Safety Technology

SIRIUS Safety Integrated

Overview



Manufacturers and operators of machines must fulfill numerous requirements: reducing costs, improving productivity, and ensuring the safety of machines. The industrial safety technology from Siemens offers innovative, economical solutions for the functional safety of machinery.

Machine safety – compliance with directives

Before any machines or plants can be supplied or operated, they must meet the fundamental safety requirements of the EU Directives.

In order to ensure compliance with the European Machinery Directive, it is recommended that the suitably harmonized European standards EN 62061 or EN ISO 13849-1 should be applied. This gives manufacturers and operators legal certainty regarding compliance with both national regulations and the EC Directive and this is confirmed by the manufacturer of a machine with the CE marking.

The aim of safety technology is therefore to allow people, machines and the environment to be protected and statutory safety requirements to be satisfied.

The quick and easy way to safe machinery

In addition to the statutory regulations governing the protection of people there are also economic reasons for avoiding personal injury and the resulting down times, and for protecting both machinery and equipment from damage.

Safety Integrated benefits machine manufacturers and plant operators in many ways:

- Lower costs for hardware, assembly and engineering
- Higher availability thanks to faster diagnostics and fewer down times

At the same time, using modular safety concepts allows them to modernize their plants more easily and at lower cost.

Smart controls ensure the functional safety of machinery

Our SIRIUS Safety Integrated[1)] controls are a central element of the Siemens Safety Integrated concept, based on Totally Integrated Automation. Whether for reliable detecting, evaluating and reacting, our SIRIUS Safety Integrated controls provide cost-effective solutions for the safety of your machine or plant. Take the SIRIUS 3SK safety relays for example: They are modularly expandable, and can integrate compact motor starters such as the fail-safe SIRIUS 3RM1 very simply via the device connector (parameterization is performed easily with a screwdriver on the DIP switches or by drag and drop in the engineering software).

Or the SIRIUS 3RK3 Modular Safety System: This provides a high degree of functionality as an autonomous safety control downstream of a standard control, and makes smart safety solutions possible via AS-Interface.

The SIMOCODE pro modular motor management system combines all required protection, monitoring, safety and control functions for motor feeders. It can be connected to fail-safe controllers via PROFIBUS or PROFINET and shut down motors in emergency situations.

SIRIUS Safety Integrated uses fail-safe communication via standard fieldbus systems, such as ASIsafe via AS-Interface and PROFIsafe via PROFIBUS and PROFINET, to solve even networked safety tasks of greater complexity. This opens the door to flexible safety solutions for compact machines or large-scale plants – naturally compliant with current standards up to SIL 3/PL e.

The first integrated ASIsafe connection to the distributed I/O system ensures even more consistency. With the SIMATIC AS-i F-Links, AS-i networks can be connected quite simply to safety controls via PROFIsafe via the SIMATIC ET 200SP. Particular highlights are the new contactors of sizes S6 to S12 with fail-safe control input, the SIRIUS ACT 3SU1 EMERGENCY STOP with PROFINET or PROFIsafe interface, and the fail-safe motor starters for the ET 200SP (see Section 14) and the 3RW55 fail-safe soft starters (see Section 6). With these products, seamless integration into fail-safe control systems is possible.

Your partner for machine and plant safety

With Safety Integrated, Siemens has provided the smart answer to constantly increasing requirements for the functional safety of a machine and for its cost-effectiveness and flexibility. Our comprehensive portfolio of safe controls, control technology and drive technology provides scalable solutions for precisely tailored safety concepts for protecting people, machines and the environment. Our products meet the current safety standards in the industry, including IEC, ISO, NFPA and UL.

1) For more information, see www.siemens.com/safety-integrated. Application Manual "SIRIUS Safety Integrated", see https://support.industry.siemens.com/cs/ww/en/view/81366718.

Systematic Industrial Safety Technology

SIRIUS Safety Integrated

Devices with safety functions

Detecting		Evaluating		Reacting	
Product	Section	Product	Section	Product	Section
3SE position and safety switches	13	**SIMOCODE pro 3UF7**	3	**3RW55 Failsafe soft starters**	7
Flexible thanks to modular design, suitable for offshore applications		Fail-safe expansion modules DM-F Local and DM-F PROFIsafe, safe shutdown of motors up to SIL 3/PL e		3RW55 Failsafe High Performance soft starters with STO	
3SE6 non-contact safety switches	13	**3SK safety relays**	13	**SIRIUS 3RM1 motor starters**	6
RFID switches and magnetically-operated switches, non-contact, vibration-resistant, wear-free, IP69 (K)/IP67		Key modules of a consistent and cost-effective safety chain. Flexible thanks to input and output expansion units		Compact, narrow and fail-safe hybrid motor starters in IP20 Easy configuration and low outlay for storage thanks to wide-setting range of the overload release	
3SU11 EMERGENCY STOP mushroom pushbuttons, 3SU18 two-hand operation console	11	**3TK2810 safety relays**	13	**ET 200SP fail-safe motor starters**	6
• SIRIUS ACT two-hand operation console with user-friendly capacitive sensor keys • High level of flexibility due to direct integration of the SIRIUS ACT EMERGENCY STOP via standardized, fail-safe communication protocols (PROFIsafe, ASIsafe)		Further modules of a consistent and cost-effective safety chain for fail-safe detection of standstill or speed		Compact, fail-safe hybrid motor starters for the ET 200SP system	
3SE7 cable-operated switches, 3SE29, 3SE39 foot switches	11, 13	**3RK3 Modular Safety System (MSS)**	13	**ET 200pro Safety motor starters Solution PROFIsafe**	6
• Foot switches with metal or plastic enclosure in degree of protection IP65 • Cable-operated switches with latching and positive-opening NC contacts, in degree of protection IP65 or IP67		Freely parameterizable safety relay, high flexibility with up to nine additional expansion modules and fail-safe connection to AS-Interface		Communication-capable motor starters in high degree of protection IP65 Special safety modules enable the highest safety levels	

Devices with safety functions for AS-Interface

Detecting

Product	Section
Safety modules/EMERGENCY STOP mushroom pushbuttons	
• K40F and K20F compact safety modules for use in the field	14

• SC17.5F SlimLine Compact safety modules for use in the control cabinet	14

• 3SU1 EMERGENCY STOP mushroom pushbuttons in the enclosure for AS-Interface	11

Detection of safety-related signals via safe input slaves on the AS-Interface bus (field modules in IP67, control cabinet modules in IP20, EMERGENCY STOP mushroom pushbuttons in the enclosure with integrated ASIsafe slave in IP69)

3SF1 mechanical safety switches	13

Flexible thanks to modular design, degree of protection up to IP69K, suitable for offshore applications

Evaluating

Product	Section
CM AS-i Master ST, F-CM AS-i Safety ST for SIMATIC ET 200SP	14

Evaluation and processing of signals via a fail-safe SIMATIC or SINUMERIK control

Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-oriented network transition between PROFINET (or PROFIBUS) and AS-Interface.

Reacting

Product	Section
3RT2 contactors (PLC/F-PLC output), 3RT1 contactors from 55 kW (F-PLC input)	2

Optimum connection to the fail-safe controller as actuator in the safety chain

Considerable simplification of the application in large power ranges thanks to F-PLC input on the 3RT1 contactors

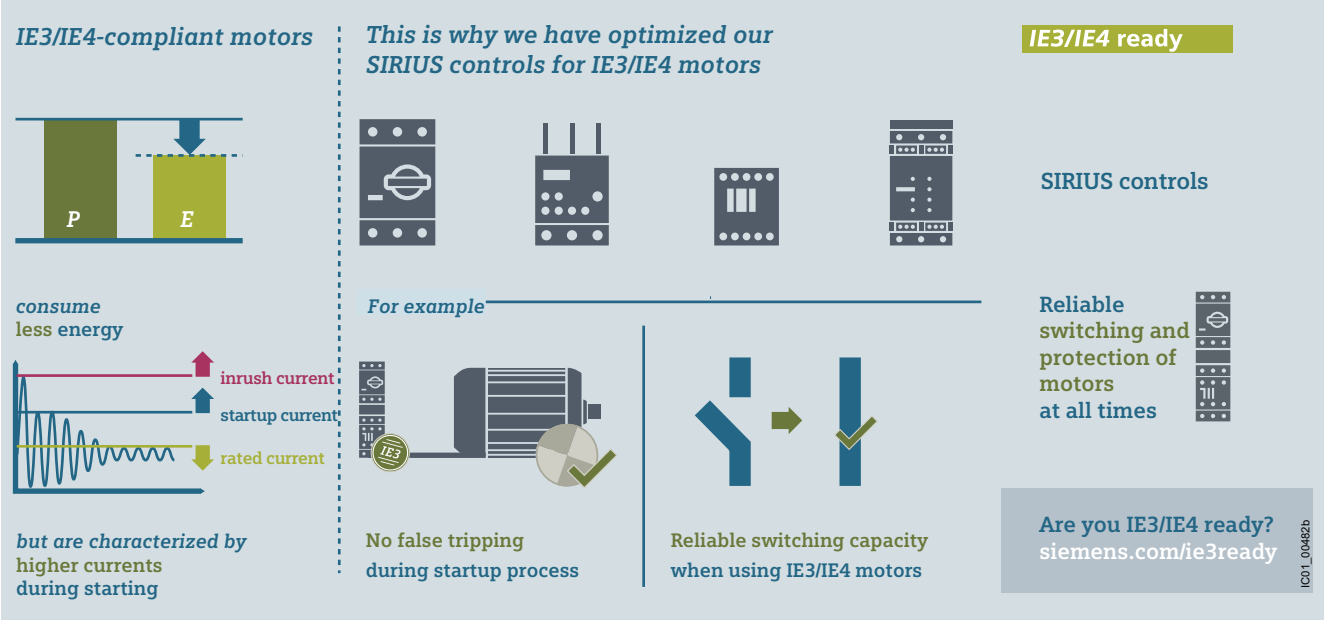
S45F SlimLine safety modules with safety outputs for the safe distributed disconnection of actuators	14

Reaction by safe output modules on the AS-Interface bus or other SIMATIC F-DQ modules

IE3/IE4 ready

SIRIUS controls for reliable switching and protection of IE3/IE4 motors

Overview



IE3/IE4 ready with SIRIUS controls

We are IE3/IE4 ready

IE3/IE4 motors have been mandatory for the power range from 0.75 to 375 kW for line operation in Europe since January 1, 2015.

From an electrical viewpoint, IE3/IE4 motors behave differently than less energy-efficient models – they are characterized by higher startup currents and modified dynamic behavior. This entails certain challenges for our controls.

The latest generation of SIRIUS controls has been fully optimized for IE3/IE4.

They avoid false tripping due to higher inrush currents of IE3/IE4 motors, offer optimized setting ranges for rated currents, and ensure reliable switching and protection in any situation – the best requirements for use of modern IE3/IE4 motors.

Highlights

- Comprehensive range of IE3/IE4 motors for every application
- Siemens offers expertise through extensive analysis of IE3/IE4 motors
- Optimized SIRIUS controls for use with IE3/IE4 motors

More information

- IE3/IE4 ready portal, see www.siemens.com/IE3ready
- Application Manual for controls with IE3/IE4 motors, see https://support.industry.siemens.com/cs/ww/en/view/94770820

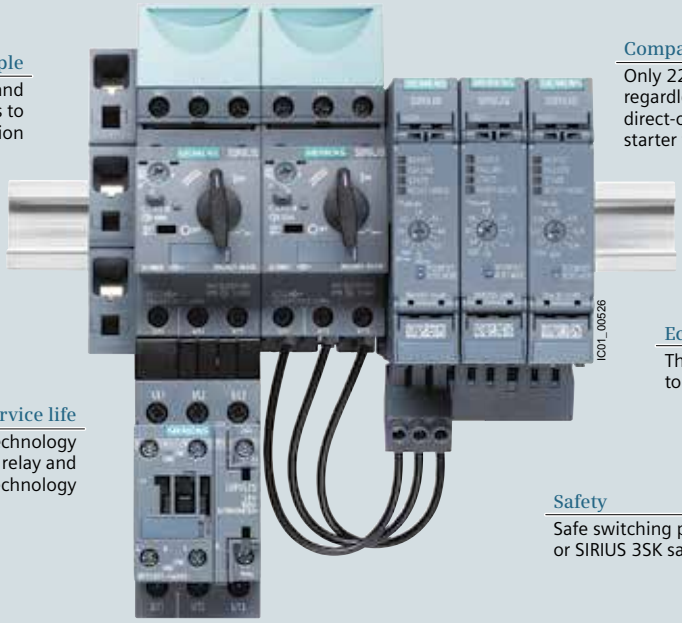
All IE3/IE4 ready products are marked in the catalog with the symbol **IE3/IE4 ready** .

Innovative Technology for Saving Energy

Electronic starting with hybrid switching technology

Overview

SIRIUS 3RV29 infeed system with 3RA2 load feeder and 3RM1 motor starter



Simple
Minimum wiring in the main and control circuits thanks to assembly option

Compact
Only 22.5 mm wide, regardless of whether direct-on-line or reversing starter function

Economical
Thanks to low device variance due to wide setting range

Long service life
Hybrid switching technology uses benefits of relay and semiconductor technology

Safety
Safe switching possible with F-CPU or SIRIUS 3SK safety relays

The hybrid switching technology uses low-wear semiconductor technology for switching the motor on and off, and in the operating phase it relies on energy-saving relay technology.

This ensures durability, especially with high frequency of operation, and thus significantly reduces maintenance costs and extends the life of the motor starters.

In addition, due to the hybrid switching technology, motor starters have lower electromagnetic interference emissions, enabling you to increase your plant availability.

Further energy savings are provided by the integrated electronic overload protection.

This causes a lower intrinsic power loss than comparable motor feeders with thermal overload protection.

In this way, you benefit from reduced heat generation and therefore lower cooling power. And that saves energy.

SIRIUS soft starters 3RW30, 3RW40, 3RW50,3RW52, 3RW55 and 3RW55 Failsafe

Safe
SIL 1 STO without additional safety relay or contactor

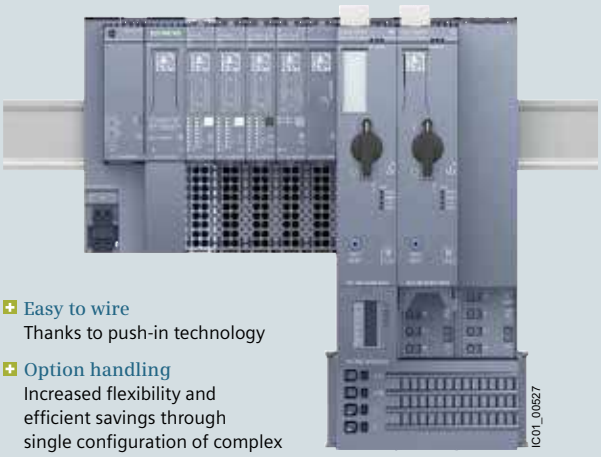
Long service life
Reduced mechanical and electrical load

Energy saving
Reduced temperature rise in the control cabinet thanks to bypass contacts

Simple
Fast and easy commissioning

Innovative Technology for Saving Energy

Electronic starting with hybrid switching technology



Easy to wire
Thanks to push-in technology

Option handling
Increased flexibility and efficient savings through single configuration of complex automation projects

Reduced space requirements
50% slimmer than other distributed I/O systems

Hybrid switching technology
Durable and energy saving, since relay contacts are not subject to loading when switched

Power bus
Supply with power only once, then automatic setup with side-by-side mounting of multiple modules

Quick stop and end position disconnection
Load switch off even at high speed – independent of central controller

Quick installation
Hook in, slide into place and engage

Once it is installed and wired, you simply connect the ET 200SP motor starter to the controller in the TIA Portal ready for parameterization.

Highlights

Use of hybrid switching technology for:

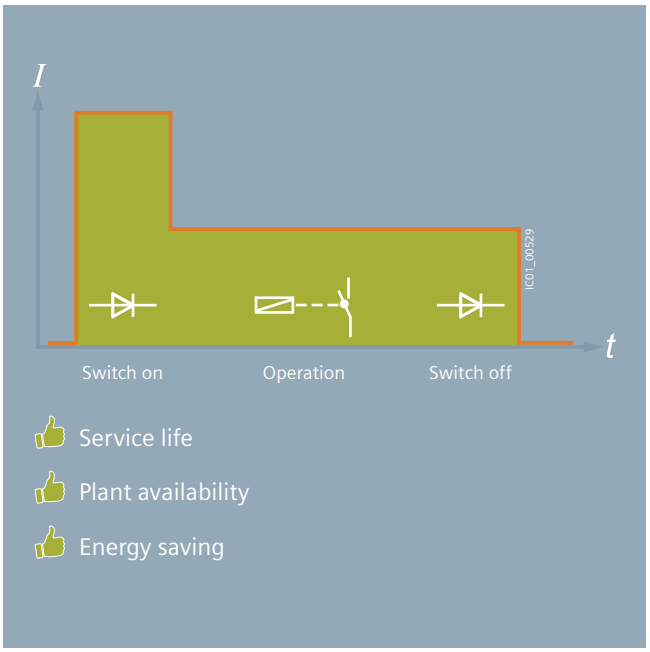
- SIRIUS 3RM1 motor starters
- ET 200SP motor starters
- SIRIUS soft starters

Fail-safe functionality for SIRIUS 3RW55 soft starters, SIRIUS 3RM1 motor starters and ET 200SP:

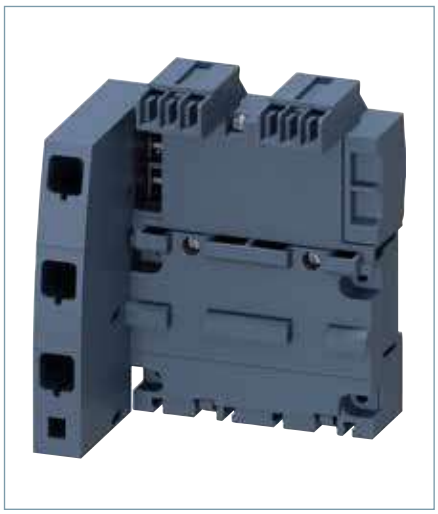
- Maximum safety:
  Safety function up to SIL 3/PL e Cat. 4

Additional benefits for SIRIUS 3RM1 motor starters:

- Using device connectors safety-related group shutdown with reduced wiring is possible
- Direct connection to the 3SK safety relay, without additional wiring



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

Size	Rated Current	Page
S00	up to 16 A	1/4
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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Technical data	1/20
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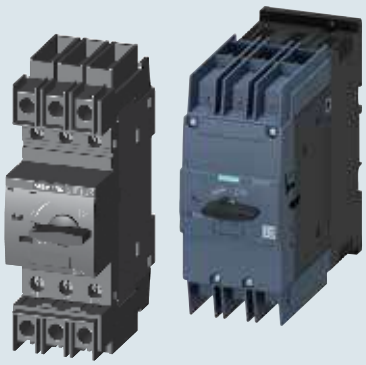
Circuit Breakers 3RV27, 3RV28



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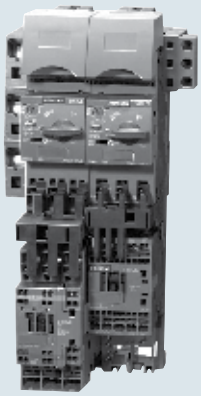
SIRIUS 3RV29 infeed system



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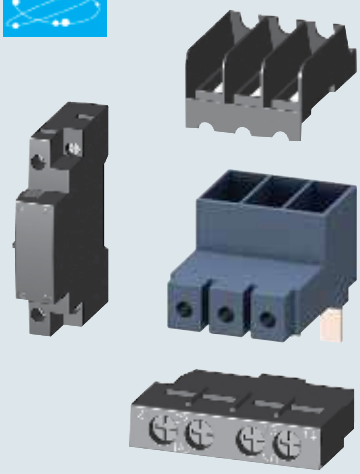
3RV MSP auxiliaries and accessories



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3RV busbar and accessories

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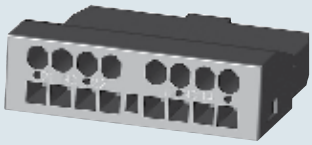
Accessories for motor starter protectors with Spring-Type terminals



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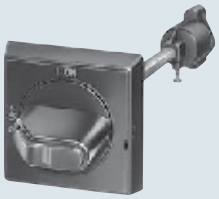
Rotary operating mechanisms



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Enclosures and front plates

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3RV20 Class 10 – up to 40A

Description

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:

– Manual Motor Controller: Motor starter, motor disconnect, control and overload—protection.
– Group Installation: Motor starter only, motor disconnect, control and overload protection.
– Tap conductor Protection in Group Installation acc. NEC: Motor starter only; motor disconnect, control and overload protection.

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.

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: www.usa.siemens.com/controlpaneldesign

Ordering Information

- ON/OFF rotary handle with lockout and visible trip indication.
- Adjustment dial for setting to motor FLA.
- Class 10 overload trip characteristics.
- Short circuit trip at 13 times the maximum setting of the FLA adjustment dial.
- Short circuit current rating:
- Ambient compensated up to 140° F (applies to side by side mounting).
- Phase loss sensitivity.
- Test trip function.
- Terminal versions: screw, spring, ring lug.
- Auxiliaries and Accessories see pages 1/9–1/19.
- General Information see pages 1/31–1/34.
- Technical Data see pages 1/20–1/30.
- Dimensions see page 1/35.

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[1]				Instantaneous short circuit release [A]	UL short-circuit breaking capacity @ 480V [kA]	**Size S00** [2) 4)] Order Number	**Size S0** [2) 4)] Order Number
		115V	230V	200V	230V	460V	**575V**				
	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	—	—	—	—	½	**½**	10	65	**3RV2011-0HA●●**	**3RV2021-0HA●●**
	0.7-1	—	—	—	—	½	**½**	13	65	**3RV2011-0JA●●**	**3RV2021-0JA●●**
	0.9-1.25	—	—	—	—	¾	**¾**	16	65	**3RV2011-0KA●●**	**3RV2021-0KA●●**
	1.1-1.6	—	1/10	—	½	1	**1**	21	65	**3RV2011-1AA●●**	**3RV2021-1AA●●**
	1.4-2	—	⅙	—	½	1	**1 ½**	26	65	**3RV2011-1BA●●**	**3RV2021-1BA●●**
	1.8-2.5	1/10	¼	½	¾	1 ½	**2**	33	65	**3RV2011-1CA●●**	**3RV2021-1CA●●**
	2.2-3.2	⅛	⅓	¾	1	2	**3**	42	65	**3RV2011-1DA●●**	**3RV2021-1DA●●**
	2.8-4	⅙	½	1	1	3	**3**	52	65	**3RV2011-1EA●●**	**3RV2021-1EA●●**
	3.5-5	¼	½	1 ½	1 ½	3	**5**	65	65	**3RV2011-1FA●●**	**3RV2021-1FA●●**
	4.5-6.3	¼	¾	2	2	5	**5**	82	65	**3RV2011-1GA●●**	**3RV2021-1GA●●**
	5.5-8	⅓	1	2	3	5	**7 ½**	104	65	**3RV2011-1HA●●**	**3RV2021-1HA●●**
	7-10	½	1 ½	23	3	7 ½	**10**	130	65	**3RV2011-1JA●●**	**3RV2021-1JA●●**
	9-12.5	¾	2	3	5	7 ½	**10**	163	65	**3RV2011-1KA●●**	**3RV2021-1KA●●**
	10-16	1	2	5	5	10	**—**	208	65	**3RV2011-4AA●●**	**3RV2021-4AA●●**
	13-20	1 ½	3	7 ½	7 ½	15	**—**	260	65	**—**	**3RV2021-4BA●●**
	16-22	1 ½	3	7 ½	7 ½	15	**—**	286	65	**—**	**3RV2021-4CA●●**
	18-25	2	3	7 ½	7 ½	20	**—**	325	65	**—**	**3RV2021-4DA●●**
	23-28	2	5	7 ½	10	20	**—**	364	50	**—**	**3RV2021-4NA●●** [5)]
	27-32	2	5	10	10	20	**—**	400	50	**—**	**3RV2021-4EA●●** [5)]
	30-36 [3)]	3	5	10	10	25	**—**	432	12	**—**	**3RV2021-4PA●●** [6)]
	34-40 [3)]	3	7 ½	10	10	30	**—**	480	12	**—**	**3RV2021-4FA●●** [6)]
	9-12.5	½	1 ½	3	3	7 ½	**10**	163	30	**—**	**3RV2023-1KA●●** [7)]
	11-16	1	2	3	5	10	**10**	208	30	**—**	**3RV2023-4AA●●** [7)]
	14-20	1 ½	3	5	5	10	**15**	260	30	**—**	**3RV2023-4BA●●** [7)]
	17-22	1 ½	3	5	7 ½	15	**20**	286	30	**—**	**3RV2023-4CA●●** [7)]
	20-25	2	3	7 ½	7 ½	15	**20**	325	30	**—**	**3RV2023-4DA●●** [7)]

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

5) Available only with •• = 10, or •• = 15, or •• = 20

6) Available only with •• = 10, or •• = 15

7) Available only with •• = 10, or •• = 20

Description

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.

The 3RV203/204 MSPs are also approved for use as follows:
– Manual Motor Controller: Motor starter, motor disconnect, control and overload protection.
– Group Installation: Motor starter only, motor disconnect, control and overload protection.
– Tap conductor Protection in Group Installation acc. NEC: Motor starter only; motor disconnect, control and overload protection.

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.

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: www.usa.siemens.com/controlpaneldesign

Ordering Information

- ON/OFF rotary handle with lockout and visible trip indication.
- Adjustment dial for setting to motor FLA.
- Class 10 overload trip characteristics.
- Short circuit trip at 13 times the maximum setting of the FLA adjustment dial.
- Short circuit current rating:
- Ambient compensated up to 140° F (applies to side by side mounting).
- Phase loss sensitivity.
- Test trip function.
- Auxiliaries and Accessories see pages 1/9–1/19.
- General Information see pages 1/31–1/34.
- Technical Data see pages 1/20–1/30.
- Dimensions see page 1/35.

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

Illustration	FLA Adjustment Range [A]	Single Phase HP rating 1)		3 Phase HP Rating 1)				Inst. Short-Circuit Release [A]	UL AIC (480V) [kA] 6)	Trip Class 10 Order Number 4)	Trip Class 20 Order Number 4)
		115V	240V	200V	230V	460V	**575V**				
	3RV203 Frame Size S2										
	9.5 - 14	1.5	3	5	5	10	**15**	208	65	**3RV2031-4SA10**	**3RV2031-4SB10**
	12 - 17	1.5	3	5	7.5	15	**15**	260	65	**3RV2031-4TA10**	**3RV2031-4TB10**
	14 - 20	1.5	3	7.5	7.5	15	**20**	260	65	**3RV2031-4BA10**	**3RV2031-4BB10**
	18 - 25	2	5	7.5	10	20	**25**	325	65	**3RV2031-4DA10**	**3RV2031-4DB10**
	22 - 32	3	5	10	10	25	**30**	416	65	**3RV2031-4EA10**	**3RV2031-4EB10**
	28 - 36	3	7.5	15	15	30	**40**	520	65	**3RV2031-4PA10**	**3RV2031-4PB10**
	32 - 40	3	7.5	15	15	30	**40**	585	65	**3RV2031-4UA10**	**3RV2031-4UB10**
	35 - 45	3	10	15	15	40	**50**	650	65	**3RV2031-4VA10**	**3RV2031-4VB10**
	42 - 52	5	10	15	20	40	**50**	741	65	**3RV2031-4WA10**	**3RV2031-4WB10**
	49 - 59	5	15	20	25	50	**60**	845	30	**3RV2031-4XA10**	**3RV2031-4XB10**
	54 - 65	5	15	20	25	50	**60**	845	30	**3RV2031-4JA10**	**3RV2031-4JB10**
	62 - 73	7.5	15	25	30	60	**75**	949	20	**3RV2031-4KA10**	–
	70 - 80	7.5	15	25	30	60	**75**	1040	20	**3RV2031-4RA10**	–
	3RV204 Frame Size S3										
	28 - 40	3	7.5	15	15	30	**40**	520A	65	**3RV2041-4FA10**	**3RV2042-4FB10**
	36 - 50	5	10	15	20	40	**50**	650A	65	**3RV2041-4HA10**	**3RV2042-4HB10**
	45 - 63	5	15	20	25	50	**60**	819A	65	**3RV2041-4JA10**	**3RV2042-4JB10**
	57 - 75	7.5	15	25	25	60	**75**	975A	65	**3RV2041-4KA10**	**3RV2042-4KB10**
	65 - 84	7.5	15	25	30	60	**75**	1170A	65	**3RV2041-4RA10**	**3RV2042-4RB10**
	75 - 93	7.5	20	30	40	75	**100** 3)	1300A	65	**3RV2041-4YA10**	–
	80 - 100	10	25	40	40	75	**100** 3)	1300A	65	**3RV2041-4MA10**	–

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 1/12. 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 1/20 to 1/22 when using an MSP in a Manual Motor Starter or a Manual Self-Protected Combination Motor Controller.

3RV2 Motor Starter Protectors/Circuit Breakers

SIRIUS

3RV21 Class 10 – up to 32A with overload relay function (automatic RESET) *IE3/IE4* ready NEW

Description

3RV21 Motor starter protectors with relay function provide short-circuit protection and auto-RESET in the event of overload in one device.

3RV21 motor starter protectors with overload relay function have the same overload and short-circuit release characteristic as 3RV20 motor starter protectors. However, the overload releases have no effect on the motor starter protectors' latching mechanism. In the event of an overload, the motor starter protector remains on.

The overload release is linked to two auxiliary contacts (1 NO contact + 1 NC contact) mounted on the side; these are switched in the event of an overload. The auxiliary contacts can be evaluated or can be used to disconnect a downstream contactor. The auxiliary contacts are reset automatically once the motor starter protector has cooled down. 3RV21 are CSA/UL certified as manual motor controllers and conform to CLASS 10 according to IEC 60947-4-1.

The tripping characteristic of 3RV21 motor starter protectors is primarily designed for protecting three-phase motors. These motor starter protectors are also suitable for protecting systems.

Ordering Information

- ON/OFF rotary handle with lockout and visible trip indication.
- Adjustment dial for setting to motor FLA.
- Class 10 overload trip characteristics.
- Short circuit trip at 13 times the maximum setting of the FLA adjustment dial.
- Short circuit current rating:
- Ambient compensated up to 140° F (applies to side by side mounting).
- Phase loss sensitivity.
- Test trip function.
- Terminal versions: screw only.
- Auxiliaries and Accessories see pages 1/9–1/19.
- General Information see pages 1/31–1/34.
- Technical Data see pages 1/20–1/30.
- Dimensions see page 1/37-1/38.

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

Illustration	Setting range for thermal overload release	Single-Phase HP Ratings		Three-Phase HP Ratings[1]				Instantaneous electronic release [A]	UL short-circuit breaking capacity @ 480V [kA]	Catalog Number
		115V	230V	200V	230V	460V	575V			
	Size S00[2]									
	0.11 ... 0.16	—	—	—	—	—	—	2.1	100	**3RV2111-0AA10**
	0.14 ... 0.2	—	—	—	—	—	—	2.6	100	**3RV2111-0BA10**
	0.18 ... 0.25	—	—	—	—	—	—	3.3	100	**3RV2111-0CA10**
	0.22 ... 0.32	—	—	—	—	—	—	4.2	100	**3RV2111-0DA10**
	0.28 ... 0.4	—	—	—	—	—	—	5.2	100	**3RV2111-0EA10**
	0.35 ... 0.5	—	—	—	—	—	—	6.5	100	**3RV2111-0FA10**
	0.45 ... 0.63	—	—	—	—	—	—	8.2	100	**3RV2111-0GA10**
	0.55 ... 0.8	—	—	—	—	—	—	10	100	**3RV2111-0HA10**
	0.7 ... 1	—	—	—	—	—	½	13	100	**3RV2111-0JA10**
	0.9 ... 1.25	—	—	—	—	½	½	16	100	**3RV2111-0KA10**
	1.1 ... 1.6	—	1/10	—	—	¾	¾	21	100	**3RV2111-1AA10**
	1.4 ... 2	—	⅛	—	—	¾	1	26	100	**3RV2111-1BA10**
	1.8 ... 2.5	—	⅙	½	½	1	1 ½	33	100	**3RV2111-1CA10**
	2.2 ... 3.2	1/10	¼	½	¾	1 ½	2	42	100	**3RV2111-1DA10**
	2.8 ... 4	⅛	⅓	¾	¾	2	3	52	100	**3RV2111-1EA10**
	3.5 ... 5	⅙	½	1	1	3	3	65	100	**3RV2111-1FA10**
	4.5 ... 6.3	¼	½	1	1 ½	3	5	82	100	**3RV2111-1GA10**
	5.5 ... 8	⅓	1	2	2	5	5	104	100	**3RV2111-1HA10**
	7 ... 10	½	1 ½	2	3	5	7 ½	130	100	**3RV2111-1JA10**
	9 ... 12.5	½	2	3	3	7 ½	10	163	100	**3RV2111-1KA10**
	10 ... 16	1	2	3	5	10	—	208	55	**3RV2111-4AA10**
	Size S0[2]									
	10 ... 16	1 ½	3	5	5	10	—	208	55	**3RV2121-4AA10**
	13 ... 20	1 ½	3	5	7 ½	15	—	260	55	**3RV2121-4BA10**
	16 ... 22	2	3	5	7 ½	15	—	286	55	**3RV2121-4CA10**
	18 ... 25	2	5	7 ½	10	20	—	325	55	**3RV2121-4DA10**
	23 ... 28[4]	3	5	10	10	25	—	364	55	**3RV2121-4NA10**
	27 ... 32[4]	3	7 ½	10	10	30	—	400	55	**3RV2121-4EA10**

3RV2111-4FA10

3RV2111-0BA10

1) Select motor starter protector by motor full load amps. Horsepower ratings are for reference only.
2) Accessories for mounting on the right and 3RV2915 three-phase busbars cannot be used. Accessories can be ordered separately.
3) These products are NOT certified as Type E combination motor controllers. They can only be used as manual motor controllers.
4) Suitable for use with IE3/IE4 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2.
5) 3RV2 MSPs can only be used with Innovations contactors and accessories.

3RV2 Motor Starter Protectors/Circuit Breakers

3RV21 Class 10 – up to 100A with overload relay function (automatic RESET) NEW

Description

3RV21 Motor starter protectors with relay function provide short-circuit protection and auto-RESET in the event of overload in one device.

3RV21 motor starter protectors with overload relay function have the same overload and short-circuit release characteristic as 3RV20 motor starter protectors. However, the overload releases have no effect on the motor starter protectors' breaker latching mechanism. In the event of an overload, the motor starter protector remains on.

The overload release is linked to two auxiliary contacts (1 NO contact + 1 NC contact) mounted on the side; these are switched in the event of an overload. The auxiliary contacts can be evaluated or can be used to disconnect a downstream contactor. The auxiliary contacts are reset automatically once the motor starter protector has cooled down. 3RV21 are CSA/UL certified as manual motor controllers and conform to CLASS 10 according to IEC 60947-4-1.

The tripping characteristic of 3RV21 motor starter protectors is primarily designed for protecting three-phase motors. These motor starter protectors are also suitable for protecting systems.

Ordering Information

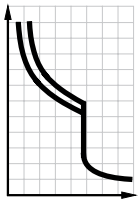
- ON/OFF rotary handle with lockout and visible trip indication.
- Adjustment dial for setting to motor FLA.
- Class 10 overload trip characteristics.
- Short circuit trip at 13 times the maximum setting of the FLA adjustment dial.
- Short circuit current rating:
- Ambient compensated up to 140° F (applies to side by side mounting).
- Phase loss sensitivity.
- Test trip function.
- Terminal versions: screw only.
- Auxiliaries and Accessories see pages 1/9–1/19.
- General Information see pages 1/31–1/34.
- Technical Data see pages 1/20–1/30.
- Dimensions see page 1/37-1/38.

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

Illustration	Setting range for thermal overload release	Single-Phase HP Ratings		Three-Phase HP Ratings[1]				Instantaneous electronic release [A]	UL short-circuit breaking capacity @ 480V [kA]	Catalog Number
		115V	230V	200V	230V	460V	575V			
	Size S2[2]									
3RV2131-4WB10	9.5 ... 14	1.5	3	5	5	10	15	208	65	**3RV2131-4SA10**
	12 ... 17	1.5	3	5	7.5	15	15	260	65	**3RV2131-4TA10**
	14 ... 20	1.5	3	7.5	7.5	15	20	260	65	**3RV2131-4BA10**
	18 ... 25	2	5	7.5	10	20	25	325	65	**3RV2131-4DA10**
	22 ... 32	3	5	10	10	25	30	416	65	**3RV2131-4EA10**
	28 ... 36	3	7.5	15	15	30	40	520	65	**3RV2131-4PA10**
	32 ... 40	3	7.5	15	15	30	40	585	65	**3RV2131-4UA10**
	35 ... 45	3	10	15	15	40	50	650	65	**3RV2131-4VA10**
	42 ... 52	5	10	15	20	40	50	741	65	**3RV2131-4WA10**
	49 ... 59	5	15	20	25	50	60	845	65	**3RV2131-4XA10**
	54 ... 65	5	15	20	25	50	60	845	65	**3RV2131-4JA10**
	62 ... 73	7.5	15	25	30	60	75	949	65	**3RV2131-4KA10**
	70 ... 80[5]	7.5	15	25	30	60	75	1040	65	**3RV2131-4RA10**
	Size S3 with increased switching capacity[2]									
3RV2142-4FA10	28 ... 40	3	7.5	15	15	30	40	520	65	**3RV2142-4FA10**
	36 ... 50	5	10	15	20	40	50	650	65	**3RV2142-4HA10**
	45 ... 63	5	15	20	25	50	60	819	65	**3RV2142-4JA10**
	57 ... 75	7.5	15	25	25	60	75	975	65	**3RV2142-4KA10**
	65 ... 84	7.5	15	25	30	60	75	1170	65	**3RV2142-4RA10**
	75 ... 93	7.5	20	30	40	75	100 [3]	1300	65	**3RV2142-4YA10**
	80 ... 100[6]	10	25	40	40	75	100 [3]	1300	65	**3RV2142-4MA10**

1) Select motor starter protector by motor full load amps. Horsepower ratings are for reference only.
2) Accessories for mounting on the right and 3RV2915 three-phase busbars cannot be used. Accessories can be ordered separately.
3) Shaded ratings apply for group installation only. These ratings do not apply as UL listed manual combination starters.
4) These products are NOT certified as Type E combination motor controllers. They can only be used as manual motor controllers.
5) Suitable for use with IE3/IE4 motors up to a starting current of 720 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S3.
6) Suitable for use with IE3/IE4 motors up to a starting current of 780 A. For higher starting currents we recommend using 3VA circuit breakers.
7) 3RV2 MSPs can only be used with 3RT2 contactors and accessories.

Selection and ordering data



Rated Current[1] [A]	Thermal overload release (non-adjustable) [A]	Short Circuit breaking capacity [kA] 480 VAC	480Y/ 277VAC	600Y/ 347VAC	For Motor Protection[2] Instantaneous Over Current Release [A]	Order Number (Screw Terminals)	Weight [kg]	For Transformer Protection[3] Instantaneous Over Current Release [A]	Order Number (Screw Terminals)	Weight [kg]
Innovations Frame Size S00[4]										
0.16	0.16	—	65	10	2.1	**3RV2711-0AD10**	0.390	3.3	**3RV2811-0AD10**	0.390
0.2	0.2	—	65	10	2.6	**3RV2711-0BD10**	0.390	4.2	**3RV2811-0BD10**	0.390
0.25	0.25	—	65	10	3.3	**3RV2711-0CD10**	0.390	5.2	**3RV2811-0CD10**	0.390
0.32	0.32	—	65	10	4.2	**3RV2711-0DD10**	0.390	6.5	**3RV2811-0DD10**	0.390
0.4	0.4	—	65	10	5.2	**3RV2711-0ED10**	0.390	8.2	**3RV2811-0ED10**	0.390
0.5	0.5	—	65	10	6.5	**3RV2711-0FD10**	0.390	10	**3RV2811-0FD10**	0.390
0.63	0.63	—	65	10	8.2	**3RV2711-0GD10**	0.390	13	**3RV2811-0GD10**	0.400
0.8	0.8	—	65	10	10	**3RV2711-0HD10**	0.390	16	**3RV2811-0HD10**	0.450
1	1	—	65	10	13	**3RV2711-0JD10**	0.450	21	**3RV2811-0JD10**	0.450
1.25	1.25	—	65	10	16	**3RV2711-0KD10**	0.450	26	**3RV2811-0KD10**	0.460
1.6	1.6	—	65	10	21	**3RV2711-1AD10**	0.460	33	**3RV2811-1AD10**	0.460
2	2	—	65	10	26	**3RV2711-1BD10**	0.460	42	**3RV2811-1BD10**	0.460
2.5	2.5	—	65	10	33	**3RV2711-1CD10**	0.460	52	**3RV2811-1CD10**	0.460
3.2	3.2	—	65	10	42	**3RV2711-1DD10**	0.460	65	**3RV2811-1DD10**	0.460
4	4	—	65	10	52	**3RV2711-1ED10**	0.450	82	**3RV2811-1ED10**	0.460
5	5	—	65	10	65	**3RV2711-1FD10**	0.460	104	**3RV2811-1FD10**	0.460
6.3	6.3	—	65	10	82	**3RV2711-1GD10**	0.460	130	**3RV2811-1GD10**	0.460
8	8	—	65	10	104	**3RV2711-1HD10**	0.460	163	**3RV2811-1HD10**	0.460
10	10	—	65	10	130	**3RV2711-1JD10**	0.460	208	**3RV2811-1JD10**	0.460
12.5	12.5	—	65	10	163	**3RV2711-1KD10**	0.460	260	**3RV2811-1KD10**	0.460
15	15	—	65	—	208	**3RV2711-4AD10**	0.470	286	**3RV2811-4AD10**	0.470
Innovations Frame Size S0[4]										
20	20	—	50	—	260	**3RV2721-4BD10**	0.514	325	**3RV2821-4BD10**	0.516
22	22	—	50	—	286	**3RV2721-4CD10**	0.516	364	**3RV2821-4CD10**	0.528
Innovations Frame Size S3[5]										
10	10	65	—	20	150	**3RV2742-5AD10**	0.460	—	—	—
15	15	65	—	20	225	**3RV2742-5BD10**	0.460	—	—	—
20	20	65	—	20	260	**3RV2742-5CD10**	0.460	—	—	—
25	25	65	—	20	325	**3RV2742-5DD10**	0.460	—	—	—
30	30	65	—	20	390	**3RV2742-5ED10**	0.460	—	—	—
35	35	—	65	20	455	**3RV2742-5FD10**	0.460	—	—	—
40	40	—	65	20	520	**3RV2742-5GD10**	0.460	—	—	—
45	45	—	65	20	585	**3RV2742-5HD10**	0.460	—	—	—
50	50	—	65	20	650	**3RV2742-5JD10**	0.460	—	—	—
60	60	—	65	20	780	**3RV2742-5LD10**	0.460	—	—	—
70	70	—	65	10	910	**3RV2742-5QD10**	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 1/23 when using as upstream protection of a Manual Motor Controller or a Manual Motor Controller Suitable for Tap Conductor Protection in Group Installations.

Selection and ordering data

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

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.

Selection and ordering data

	Modular spacing	Number of motor starter protectors that can be connected: Without lateral accessories	Incl. lateral auxiliary switch	With auxiliary trip unit	Rated current I_n at 690 V	For motor starter protectors Size	Order No.	Order quantity	Weight approx.
	mm				A				kg
Three-phase busbar systems for Classic and Innovations[1]									
3RV19 15-1AB	For feeding several motor starter protectors with screw terminals, mounted side-by-side on standard mounting rails, insulated, with touch protection.								
	45[3]	2	--	--	63	S00, S0[2]	**3RV19 15-1AB**	1 unit	0.044
		3				S00, S0[2]	**3RV19 15-1BB**	1 unit	0.071
		4				S00, S0[2]	**3RV19 15-1CB**	1 unit	0.099
		5				S00, S0[2]	**3RV19 15-1DB**	1 unit	0.124
3RV19 15-1BB	55[4]	--	2	--	63	S00, S0[2]	**3RV19 15-2AB**	1 unit	0.048
		--	3			S00, S0[2]	**3RV19 15-2BB**	1 unit	0.079
		--	4			S00, S0[2]	**3RV19 15-2CB**	1 unit	0.111
		--	5			S00, S0[2]	**3RV19 15-2DB**	1 unit	0.140
3RV19 15-1CB		2	--	--	108	S2	**3RV19 35-1A**	1 unit	0.150
		3				S2	**3RV19 35-1B**	1 unit	0.214
		4				S2	**3RV19 35-1C**	1 unit	0.295
3RV19 15-1DB	63[5]	--	--	2	63	S00, S0[2]	**3RV19 15-3AB**	1 unit	0.052
				4		S00, S0[2]	**3RV19 15-3CB**	1 unit	0.120
	75[5]	--	2	2	108	S2	**3RV19 35-3A**	1 unit	0.161
			3	3		S2	**3RV19 35-3B**	1 unit	0.262
			4	4		S2	**3RV19 35-3C**	1 unit	0.369

1) Not suitable for 3RV21 motor starter protectors with overload relay function.
2) Approved for motor starter protectors size S0 with $I_n \leq 32$ A.
3) For 3RV2 motor starter protectors without accessories mounted on the side.
4) 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).
5) 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).

	Version	Modular spacing	For motor starter protectors Size	Order No.	Order quantity	Weight approx.
		mm				kg
Connecting pieces for three-phase busbars				**For Innovations**		
3RV19 15-5DB	For connecting three-phase busbars for motor starter protectors of size S0 (left) to size S00 (right)	45	S00, S0	**3RV19 15-5DB**	1 unit	0.042

	Conductor cross-section, AWG cables, solid or stranded: For **3RV1** MSP	For **3RV2** MSP	Tightening torque	For motor starter protector size	**3RV2 Innovations[2]** Order No.
	AWG	AWG	Nm		
Three-phase feeder terminals					
3RV2925-5AB	**Connection from top**				
	—	10…4	3…4	S00	**3RV2925-5AB**
	—	10…4	3…4	S0	**3RV2925-5AB**
3RV2915-5B	**Connection from below[3]**				
	—	10…4	Input: 4, Output: 2 ... 2.5	S00, S0	**3RV2915-5B**
3RV2935-5A	**Connection from top**				
	14...0	--	4-6	S2	**3RV2935-5A**
Three-phase feeder terminals for constructing "Type E Starters"					**Innovations**
3RV2935-5E	**Connection from top**				
	—	10…4	3-4	S00	**3RV2925-5EB**
	—	10…4	3-4	S0	**3RV2925-5EB**
	8...0	10...2/0	4.5-6	S2	**3RV2935-5E**

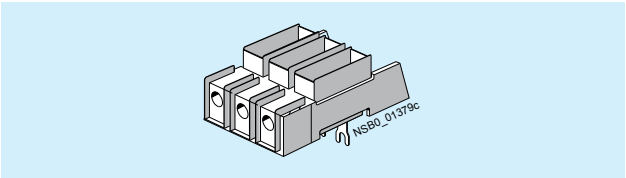
1) Do not mix 3RV1 Classic Accessories with 3RV2 Innovations MSPs
2) Do not mix 3RV2 Innovations Accessories with 3RV1 Classic MSPs
3) This terminal is connected in place of a switch, please take the space requirement into account.

Overview

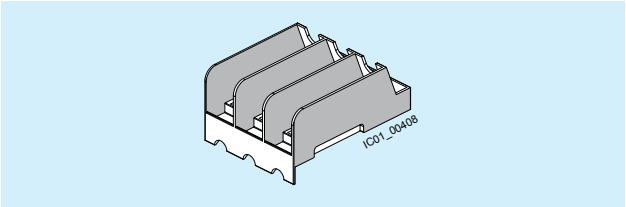
Accessories for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1

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
3RV2031-4B1., 3RV2031-4D.1., 3RV2031-4E1., 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 1/10).

The 3RV29 infeed system also enables the assembly of "Type E Starters", see page 1/16 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 Size	3RT2 contactors; 3RW30, 3RW40 soft starters; 3RF34 solid-state contactors Size	Link modules Screw terminals	Link modules Spring-type terminals
Link modules for connecting switching devices to 3RV2 motor starter protectors/circuit breakers[1)]				
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[2)]	S2[2)]	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[3)]				
3RT2 contactors with AC or DC coil	S00	S00	3RA2911-2FA00	--
	S0	S0	3RA2921-2FA00	--

-- Version not possible

1) 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.

2) 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.

3) 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.

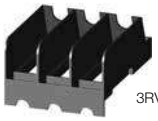
Note:

- 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

Terminal blocks and phase barriers for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508 / UL 60947-4-1

3RV29 28-1H



3RV29 28-1K

3RT1946-4GA07

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"

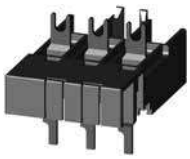
Version	For motor starter protector size	Innovations 3RV2/3RT2 Order No.	Order Quantity
Terminal blocks type E			
For extended clearance and creepage distances (1 and 2 inch)	S00, S0	**3RV29 28-1H**	1 unit
	S0	**–**	1 unit
	S2	**3RV29 35-5E**	1 unit
	S3	**3RT2946-4GA07** [1]	1 unit
Phase barriers			
For extended clearance and creepage distances (1 and 2 inch)	S00, S0	**3RV29 28-1K**	1 unit
	S2	**3RV29 38-1K**	1 unit

Terminal covers for box terminals on 3RV2742 and Type E terminal block 3RT2946-4GA07

3RV2948-1LAA00

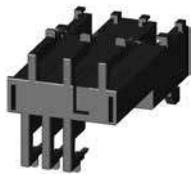
Additional touch protection to be fitted at the box terminals 3RV2742 (2 units required per device) and at Type E terminal block 3RT2946-4GA07			
• Main current level	S3 NEW	**3RV2948-1LA00**	1 unit

Link modules for motor starter protector to contactor [2]



3RA29 21-1AA00

Actuating voltage of contactor	Size 3RT contactor	3RV motor starter protector	Innovations 3RV2/3RT2 Order No.	Order Quantity
For mechanical and electrical connection between motor starter protector and contactor with screw terminals.			**Screw Terminals**	
Single-unit packaging				
AC/DC	S00	S00/S0	**3RA19 21-1DA00**	1 unit
AC	S0	S00/S0	**3RA29 21-1AA00**	1 unit
AC	S2	S2	**3RA29 31-1AA00**	1 unit
AC	S3	S3	**3RA19 41-1AA00**	1 unit
DC	S0	S00/S0	**3RA29 21-1BA00**	1 unit
DC	S2	S2	**3RA29 31-1AA00**	1 unit
DC	S3	S3	**3RA19 41-1AA00**	1 unit
Multi-unit packaging				
AC/DC	S00	S00/S0	**3RA19 21-1D**	10 units
AC	S0	S00/S0	**3RA29 21-1A**	10 units
DC	S0	S00/S0	**3RA29 21-1B**	10 units
AC/DC	S2	S2	**3RA29 31-1A**	5 units
AC/DC	S3	S3	**3RA19 41-1A**	5 units



3RA29 11-2AA00

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	**3RA29 11-2AA00**	1 unit
AC [3]	S0	S0	**3RA29 21-2AA00**	1 unit
DC	S0	S0	**3RA29 21-2AA00**	1 unit
Multi-unit packaging				
AC/DC	S00	S00	**3RA29 11-2A**	10 units
AC [3]	S0	S0	**3RA29 21-2A**	10 units
DC	S0	S0	**3RA29 21-2A**	10 units
Spacers				
For compensating height on AC contactors				
Single-unit packaging	S0	S0	**3RA29 11-1CA00**	1 unit
Multi-unit packaging	S0	S0	**3RA29 11-1C**	5 units

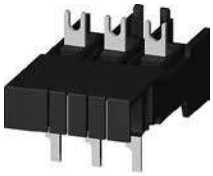
1) Transverse auxiliary switches cannot be installed when using this terminal block
2) The link modules for motor starter protector to contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors
3) A spacer for height compensation on AC contactors size S0 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

Link modules for motor starter protector to soft starter[1) 3)] and motor starter protector to solid-state contactor

Size: 3RW30, 3RW40 soft starters; 3RF34 solid-state contactors	Size: 3RV2 motor starter protectors	Order No.	PU (UNIT, SET, M)	PS*	Weight approx. kg
Connection between motor starter protector and soft starter / solid-state contactor with screw terminals		**Screw terminals**			
Single-unit packaging					
S00	S00/S0	**3RA29 21-1BA00**	1	1 unit	0.068
S0	S00/S0	**3RA29 21-1BA00**	1	1 unit	0.068
S2[3)]	S2	**3RA29 31-1AA00**	1	1 unit	0.104
S3[4)]	S3	**3RA19 41-1A**	1	1 unit	0.104
Multi-unit packaging					
S00	S00/S0	**3RA29 21-1B**	1	10 units	0.068
S0	S00/S0	**3RA29 21-1B**	1	10 units	0.068
S2[3)]	S2	**3RA29 31-1A**	1	5 units	0.104
S3[4)]	S2	**3RA19 41-1A**	1	5 units	0.104
Connection between motor starter protector and soft starter with spring-type terminals		**Spring-type terminals**			
Single-unit packaging					
S00	S00	**3RA29 11-2GA00**	1	1 unit	0.038
S0	S0	**3RA29 21-2GA00**	1	1 unit	0.072
Multi-unit packaging					
S00	S00	**3RA29 11-2G**	1	10 units	0.380
S0	S0	**3RA29 21-2G**	1	10 units	0.720


3RA29 21-1BA00

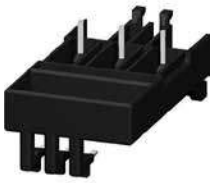
3RA29 21-2GA00

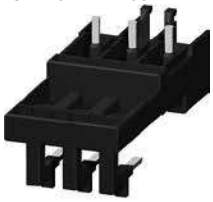
1) The link modules for motor starter protector to soft starter and for motor starter protector to solid-state contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors.

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

Hybrid link modules for motor starter protector to contactor[1)]

Actuating voltage of contactor	Size: 3RT2 contactors	Size: 3RV2 motor starter protectors	Order No.	PU (UNIT, SET, M)	PS*	Weight approx. kg
For mechanical and electrical connection between motor starter protector with screw terminals and contactor with spring-type terminals						
Single-unit packaging						
AC/DC	S00	S00	**3RA29 11-2FA00**	1	1 unit	0.029
AC[2)]/DC	S0	S0	**3RA29 21-2FA00**	1	1 unit	0.056
Multi-unit packaging						
AC/DC	S00	S00	**3RA29 11-2F**	1	10 units	0.290
AC[2)]/DC	S0	S0	**3RA29 21-2F**	1	10 units	0.560
Spacers[2)] for compensating the height on AC contactors						
Single-unit packaging	S0	S0	**3RA29 11-1CA00**	1	1 unit	0.001
Multi-unit packaging	S0	S0	**3RA29 11-1C**	1	5 units	0.001


3RA29 11-2FA00


3RA29 21-2FA00

1) 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.

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

3) 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.

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

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

Selection and ordering data

	Type	Design	For SIRIUS MSP size	Order No.	Order Quantity	Weight approx. (kg)
Isolator module [1]						
3RV2938-1A without padlock; 3RV29 28-1A without padlock		Visible isolating distance for isolating individual motor starter protectors from the network, lockable in isolating position.	S00, S0	**3RV29 28-1A**	1 unit	0.132
			S2 [1]	**3RV29 38-1A**	1 unit	0.368
Auxiliary terminal, 3 pole						
3RT19 46-4F		For connection of auxiliary and control cables to the main conductor connections	S3	**3RT29 46-4F**	1 unit	0.10
Covers						
3RV1 (size S3) with 3RT19 46-4EA1	**Terminal cover** for box terminals	Additional touch guard to be fitted at the box terminals (2 units can be mounted per MSP)	S2	**3RT29 36-4EA2**	1 unit	0.014
			S3	**3RT29 46-4EA2**	1 unit	0.019
3RV29 28-4AA00	**Terminal cover** 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	**3RT19 46-4EA1**	1 unit	0.03
3RV29 08-4AA10	**Terminal cover** for devices with ring lug terminal connection	• Main current level	S00, S0 [2]	**3RV29 28-4AA00**	1 unit	0.01
		• For transverse auxiliary switches	S00, S0 [2]	**3RV29 08-4AA10**	1 unit	0.01
3RV29 08-0P	**Scale cover**	For covering the current setting scale. Packing unit: Bag with 10 scale covers.	S00, S0, S2 [3]	**3RV29 08-0P**	10 units	
			S3	**3RV19 08-0P**	10 units	
Fixing Material						
3RB1900-0B	**Push-in lugs** For screwing the motor starter protector onto mounting plates.	Two units are required for each motor starter protector.	S00	**3RB19 00-0B**	10 units	0.10
Tools for opening spring-type terminals by hand						
3RA29 08-1A	**Screwdriver** 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	**3RA29 08-1A**	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.

Selection and ordering data

Door-coupling rotary operating mechanisms for Classic and Innovations

3RV29 26-0B

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 postion of the motor starter protector. The OFF position can be locked with up to 3 padlocks.

Type	Details	For SIRIUS MSP size	Order No.	Approx. Wt. (kg)
Door-coupling rotary operating mechanisms (black)	Extension shaft 130 mm	S00, S0	**3RV29 26-0B**	0.111
		S2, S3	**3RV29 26-0B**	0.1
	Extension shaft 330 mm	S00, S0	**3RV29 26-0K**	0.324
		S2, S3	**3RV29 26-0K**	0.3
EMERGENCY STOP door-coupling rotary operating mechanisms (red/yellow)	Extension shaft 130 mm	S00, S0	**3RV29 26-0C**	0.110
		S2, S3	**3RV29 26-0C**	0.1
	Extension shaft 330 mm	S00, S0	**3RV29 26-0L**	0.316
		S2, S3	**3RV29 26-0L**	0.3

Door-coupling rotary operating mechanisms for arduous conditions

3RV29 26-2C

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 postion 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.

Type	For SIRIUS MSP size	Order No.	Approx. Wt. (kg)
Door-coupling rotary operating mechanisms (gray)	S00, S0	**3RV29 26-2B**	1.2
	S2	**3RV29 36-2B**	1.6
	S3	**3RV29 46-2B**	1.7
EMERGNCY STOP door-coupling rotary operating mechanisms (red/yellow)	S00, S0	**3RV29 26-2C**	1.2
	S2	**3RV29 36-2C**	1.5
	S3	**3RV29 46-2C**	1.7

Enclosures and front plates
No UL/CSA certification

	Type	Details	For SIRIUS MSP size	Order No.	Approx. Wt. (kg)
Front Plates					
3RV19 23-4B + 3RV19 23-4G	**Molded-plastic front plate** with rotary operating mechanism, lockable. For actuation of 3RV motor starter protectors in any enclosure	For actuation of 3RV MSPs in any enclosure, degree of protection IP55 (front plate)	S00, S0 S2, S3	**3RV19 23-4B**	0.08
	Molded-plastic front plate with EMERGENCY STOP door-coupling rotary operating mechanisms (red/yellow)	EMERGENCY-STOP operation of 3RV MSPs in any enclosure, degree of protection IP55	S00, S0 S2, S3	**3RV19 23-4E**	0.08
	Holders for front plates	Holder is mounted on front plate, MSP size S00 or S0 with or without accessories is snapped in	S00, S0	**3RV19 23-4G**	0.19
Enclosures for wall mounting [2]					
3RV19 23-1CA00	**Molded-plastic enclosure for wall mounting** with rotary operating mechanism, lockable, with metric cable gland	Degree of protection IP55, with N and PE terminals, lockable in 0 position **overall width:**			
		54 mm (for switch + lateral auxiliary switch)	S00, S0	**3RV19 23-1CA00**	0.26
		72 mm (for switch + lateral auxiliary switch + auxiliary release)	S00, S0	**3RV19 23-1DA00**	0.30
3RV19 23-1DA01	**Cast aluminum surface-mount enclosure** with rotary operating mechanism, lockable, with metric cable gland	Degree of protection IP65, with PE terminals,[1] lockable in 0 position **overall width:** **72 mm** (for MSP + lateral auxiliary switch + auxiliary release)	S00, S0	**3RV19 23-1DA01**	1.02
	Cast aluminum surface-mount enclosure with EMERGENCY-OFF rotary operating mechanism, red/yellow, lockable, with metric cable gland	Degree of protection IP65, with PE terminals,[1] lockable in 0 position **overall width:** **72 mm** (for MSP + lateral auxiliary switch + auxiliary release)	S00, S0	**3RV19 23-1GA01**	1.01

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)

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 springtype connection in sizes S00 and S0 (exception: this system cannot be used for the 3RV21).

Siemens now has UL/CSA approvals for using the 3RV27 and 3RV28 UL489 Circuit Breakers with the 3RV2917 Infeed System and with the 3RV1915 comb-busbars. Up until now it was limited to standard 3RV20 MSPs. These new approvals will greatly enhance application flexibility for customers. Not only can they use the bus systems to feed motor loads, they can now feed non-motor loads which should allow the bus systems to feed complete control panel applications. Customers will need to remove the line side terminals on any 3RV27 or 28s that will be fed by the bus system.

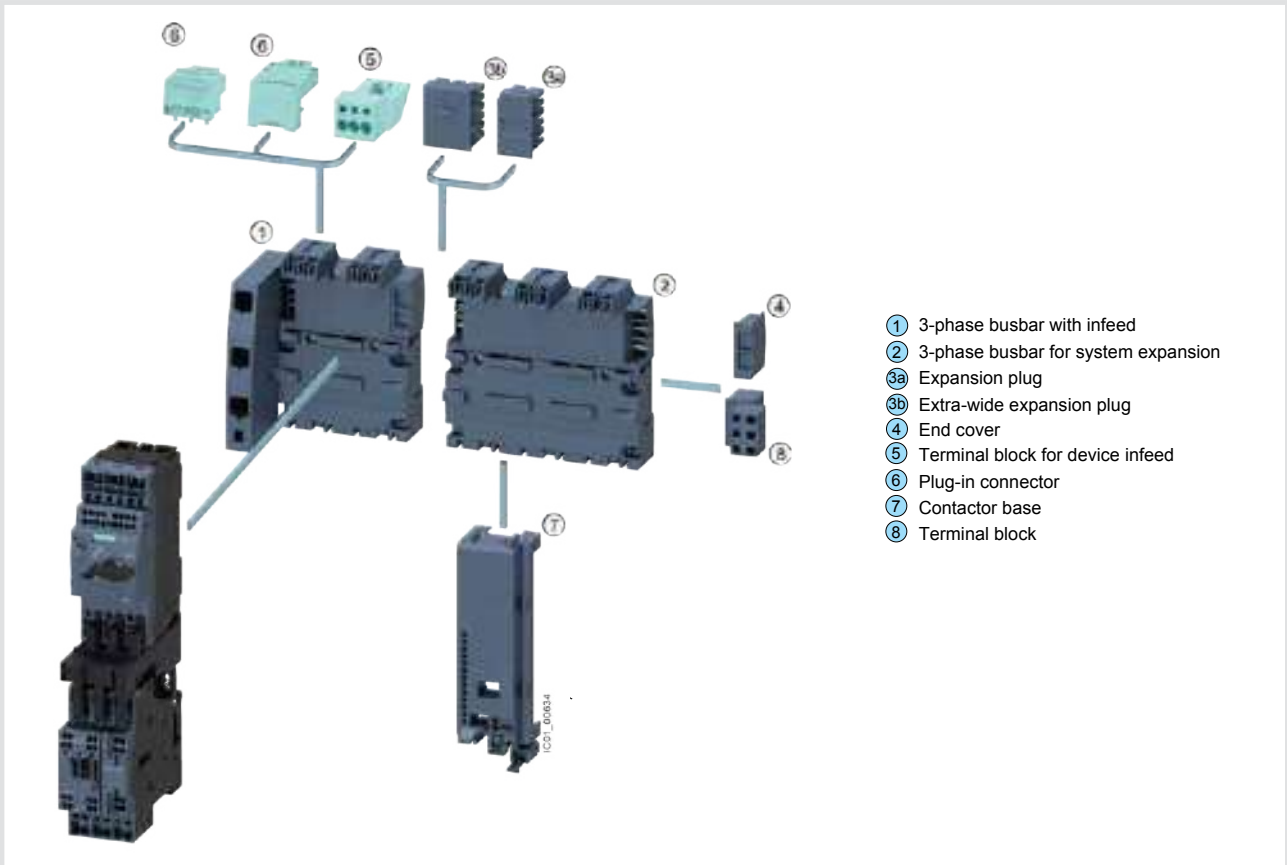
The 3RV29 infeed system is approved in accordance with IEC to 500V. It is also UL approved and authorized for “Self-Protected Combination Motor Controller” (Type E starter) as well as for Type F starter (Type E starter + contactor). The system is based on a basic module complete with a lateral incoming 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 outfeed 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^2 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.

③a *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.

③b *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 *Terminal block for device infeed*

A new addition to the system is a connector for outfeeding to a device slot within a module. This offers the option not only of connecting three-phase loads to the system, but also of integrating single-phase loads into the infeed system.

⑥ *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.

⑦ *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.

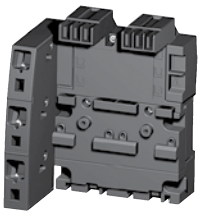
The infeed system is designed for mounting on a 35 mm standard mounting rail with 7.5 mm overall depth. This standard mounting rail gives the contactor base a stable mounting surface to sit on. If standard mounting rails with a depth of 15 mm are used, the spacer connected to the bottom of the contactor 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.

⑧ *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.

Selection and ordering data

	Type	Version	For 3RV20, 3RV23, 3RV24, 3RV27, 3RV28, motor starter protectors	Order No.	Standard Pack Quantity	Weight approx.
			Size			kg
Three-phase busbars with infeed						
 3RV29 17-1A	**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	**3RV29 17-1A**	1 unit	0.369
		• With infeed on the right	S00, S0	**3RV29 17-1E**	1 unit	0.369
Three-phase busbars for system expansion						
3RV29 17-4A	**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	**3RV29 17-4A**	1 unit	0.229
		• For 3 motor starter protectors	S00, S0	**3RV29 17-4B**	1 unit	0.328
Plug-in connectors						
3RV29 17-5AA00	**Plug-in connectors** to make contact with the 3RV2 motor starter protectors	• For spring-type terminals		**Spring-type terminals**		
		- Single-unit packaging	S00[1)] S0[2)]	**3RV29 17-5AA00** **3RV29 27-5AA00**	1 unit 1 unit	0.046 0.059
		- Multi-unit packaging	S00[1)] S0[2)]	**3RV29 17-5A** **3RV29 27-5A**	10 units 10 units	0.046 0.059
3RV29 17-5CA00		• For screw terminals		**Screw terminals**		
		- Single-unit packaging	S00[1)] S0[2)]	**3RV29 17-5CA00** **3RV19 27-5AA00**	1 unit 1 unit	0.029 0.040
		- Multi-unit packaging	S00[1)] S0[2)]	**3RV29 17-5C** **3RV19 27-5A**	10 units 10 units	0.029 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	**3RV29 17-7AA00**	1 unit	0.042
			S00, S0	**3RV29 27-7AA00**	1 unit	0.050

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

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

3RV29 infeed system

	Type	Version	Order No.	Standard Pack Quantity	Weight approx. kg
Terminal blocks					
3RV29 17-5D	**Terminal blocks** For integration of single-phase, two-phase and three-phase components	Single-unit packaging	**3RV29 17-5D**	1 unit	0.049
45 mm standard mounting rails					
3RV19 17-7B	**45 mm standard mounting rails** for mounting onto bus bar adapters	Single-unit packaging	**3RV19 17-7B**	1 unit	0.261
Extra-wide expansion plugs					
3RV29 17-5E	**Extra-wide expansion plugs as accessory**	Single-unit packaging	**3RV29 17-5E**	1 unit	0.037
Expansion plugs					
3RV29 17-5BA00	**Expansion plugs**[1] as spare part	Single-unit packaging	**3RV29 17-5BA00**	1 unit	0.026
End covers					
3RV29 17-6A	**End covers**[2] as spare part	Multi-unit packaging	**3RV29 17-6A**	10 units	0.005
Terminal blocks for device infeed					
3RV2917-5FA00	**Terminal blocks for device infeed** [2]	Single-unit packaging	**3RV2917-5FA00**	1 units	0.010

[1] The expansion plug is included in the scope of supply of the 3RV29 17-4 three-phase busbars for system expansion.

[2] The end cover is included in the scope of supply of the 3RV29 17-1 three-phase busbars with infeed system.

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[1] for FLA[2] max.**		**Rated current I_n**	**240 V AC** UL/CSA I_{bc}[3]		**480 V AC** UL/CSA I_{bc}[3]		**600 V AC** UL/CSA I_{bc}[3]	
Type	V	1-phase	3-phase	A	kA		kA		kA	
Size S00										
3RV2011, 3RV2111, 3RV2311, 3RV2411				0.16 ... 2	65		65		30	
				2.5	65		65		30	
FLA[2] max.	115	1	2	3.2	65		65		30	
16 A,480 V	200	2	3	4	65		65		30	
12.5 A, 600 V	230	2	5	5	65		65		30	
	460	--	10	6.3	65		65		30	
	575/600	--	10	8	65		65		30	
				10	65		65		30	
				12.5	65		65		30	
				16	65		65		—	
Size S0										
3RV2021, 3RV2121, 3RV2321, 3RV2421				0.16 ... 12.5	65		65		30	
				16 ... 25	65		65		--/(30)[4]	
FLA[2] max.	115	3	5	28, 32	65		50		--	
40 A, 480 V	200	5	10	36, 40	65		12		--	
	230	7 1/2	10							
	460	--	30							
	575/600	--	--							
Size S2					**3RV2031**	**3RV2032**	**3RV2031**	**3RV2032**	**3RV2031**	**3RV2032**
				14	65	100	65	100	25	25
3RV2031, 3RV2131, 3RV2331, 3RV2032, 3RV2332				17	65	100	65	100	25	25
				20	65	100	65	100	25	25
FLA [2] MAX. 65A	115/120	5	10	25	65	100	65	100	25	25
600V	200/208	10	20	32	65	100	65	100	25	25
NEMA size 2	230/240	15	25	36	65	100	65	100	25	25
	460/480	—	50	40	65	100	65	100	22	22
	575/600	—	60	45	65	100	65	100	22	22
				52	65	100	65	100	22	22
	a) with max 225A Class J fuse			59	65 [a]	100 [a]	65 [a]	100 [a]	20 [a]	25 [a]
	b) with max 250A Class J fuse			65	65 [b]	100 [b]	65 [b]	100 [b]	20 [b]	25 [b]
Size S3										
3RV20 41/3RV20 42, 3RV21 42, 3RV23 41/3RV23 42				16	65		65		30	
				20	65		65		30	
FLA[2] max. 99 A,	115	7 1/2	--	25	65		65		30	
600 V	200	20	30	32	65		65		30	
NEMA size 3	230	20	40	40	65		65		30	
	460	--	75	50	65		65		30	
	575/600	--	100	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.

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[1] for FLA[2] max.		Rated current I_n	240 V AC UL I_{bc}[3]		Up to 480Y/277V AC UL I_{bc}[3]		Up to 600Y/347V AC UL I_{bc}[3]	
Type	V	1-phase	3-phase	A	kA		kA		kA	
Size S00										
3RV20 11				0.16 ... 0.8	65		65		30	
				1	65		65		30	
FLA[2] max.16 A,	115/120	1	2	1.25	65		65		30	
480 Y / 277 V	200/208	2	3							
NEMA size 0	230/240	2	5	2	65		65		30	
	460/480	--	10	2.5	65		65		30	
	575/600	--	10	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		—	
Size S0										
3RV20 21				0.63 ... 1.6	65		65		30	
				2	65		65		30	
FLA[2] max.	115/120	2	5	2.5	65		65		30	
25 A, 480 Y / 277 V	200/208	3	7.5							
12.5 A, 600 V	230/240	3	10	3.2	65		65		30	
	460/480	3	20	4	65		65		30	
NEMA size 1	575/600	—	—	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		—	
Size S2					**3RV2031**	**3RV2032**	**3RV2031**	**3RV2032**	**3RV2031**	**3RV2032**
				14	65	100	65	100	25	25
3RV2031, 3RV2032, 3RV2431				17	65	100	65	100	25	25
				20	65	100	65	100	25	25
FLA [2] MAX. 65A	115/120	5	10	25	65	100	65	100	25	25
600V	200/208	10	20	32	65	100	65	100	25	25
NEMA size 2	230/240	15	25	36	65	100	65	100	25	25
	460/480	—	50	40	65	100	65	100	22	22
	575/600	—	60	45	65	100	65	100	22	22
				52	65	100	65	100	22	22
				59	65	100	30	42	--	--
				65	65	100	30	42	--	--
Size S3										
3RV20 4.				16	65		65		30	
				20	65		65		30	
FLA[2] max.	115/120	7 1/2	--	25	65		65		30	
100 A, 480 V	200/208	20	30							
75 A, 600 V	230/240	20	40	32	65		65		30	
	460/480	--	75	40	65		65		30	
NEMA size 3	575/600	--	75	50	65		65		30	
				63	65		65		30	
				75	65		65		30	
				90	65		65		--	
				100	65		65		--	

1) HP rating = Power rating in horse power (maximum motor rating).
2) FLA = Full Load Amps/Motor full load current.
3) Complies with "short-circuit breaking capacity" according to UL.

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

Motor starter protectors		hp rating[1] for FLA[2] max.		Rated current I_n	Up to 240 V AC UL/CSA I_{bc}[3]		Up to 480 Y/277 V AC UL/CSA I_{bc}[3]		Up to 600 Y/347 V AC UL/CSA I_{bc}[3]	
Type	V	1-phase	3-phase	A	kA		kA		kA	
Size S00										
3RV2011 + 3RV29 28-1H[4) 5)]				0.16 ... 12.5	65		65		30	
				16	65		65		—	
FLA[2] max. 16 A	115	1	2							
480 V	200	2	3							
NEMA size 0	230	2	5							
	230	—	10							
	575/600	—	10							
Size S0										
3RV2021 + 3RV29 28-1H[4) 5)]				0.63 ... 1.6	65		65		30	
				2	65		65		30	
				2.5	65		65		30	
FLA[2] max.	115	2	5	3.2	65		65		30	
25 A, 480 V	200	3	7.5	4	65		65		30	
12.5 A, 600 V	230	3	10	5	65		65		30	
	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		—	
Size S2					**3RV2031**	**3RV2032**	**3RV2031**	**3RV2032**	**3RV2031**	**3RV2032**
3RV2031/3RV2032 + 3RV2938-1K[4)]				14	65	100	65	100	25	25
				17	65	100	65	100	25	25
				20	65	100	65	100	25	25
FLA[2] MAX. 65A	115/120	5	10	25	65	100	65	100	25	25
600V	200/208	10	20	32	65	100	65	100	25	25
NEMA size 2	230/240	15	25	36	65	100	65	100	25	25
	460/480	—	50	40	65	100	65	100	22	22
	575/600	—	60	45	65	100	65	100	22	22
				52	65	100	65	100	22	22
				59	65	100	20	30	—	—
				65	65	100	20	30	—	—
Size S3										
3RV2041 + 3RT2946-4GA07[4)]				16	65		65		30	
				20	65		65		30	
				25	65		65		30	
FLA[2] max.	115	10	--	32	65		65		30	
100 A, 480 V	200	20	30	40	65		65		30	
75 A, 600 V	230	20	40	50	65		65		30	
	460	--	75							
NEMA size 3	575/600	--	75	63	65		65		30	
				75	65		65		30	
				90	65		65		—	
				100	65		65		—	

Ratings of the auxiliary switches and alarm switches			Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC and signalling switch	Transverse auxiliary switch with 1 changeover contact	Transverse auxiliary switch with 1 NO + 1 NC, 2 NO
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.

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 Type	**Rated current I_n** A	**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
Size S00/S0					
3RV27 11 / 3RV28 11 **3RV27 21 / 3RV28 21**	0.16 … 1.25	65	65	65	10
	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	--
Size S3					
3RV27 42	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.

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[1]			Up to 400 V[1]/415 V AC[2]			Up to 440 V[1]/460 V AC[2] (these values do not apply to 3RV17 42 circuit breakers)			Up to 500 V[1]/525 V AC[2]			Up to 690 V AC[1]		
		I_{cu}	I_{cs}	Max. fuse (gL/gG)	I_{cu}	I_{cs}	Max. fuse (gL/gG)[3]	I_{cu}	I_{cs}	Max. fuse (gL/gG)[3]	I_{cu}	I_{cs}	Max. fuse (gL/gG)[3]	I_{cu}	I_{cs}	Max. fuse (gL/gG)[3][4]
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
Size S00																
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
Size S0																
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
Size S2																
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														
Size S2, with increased switching capacity																
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														
Size S3																
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.

Short-circuit breaking capacity I_{culT} 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_{culT} applies. The specifications in the table below apply to 3RV motor starter protectors.

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

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

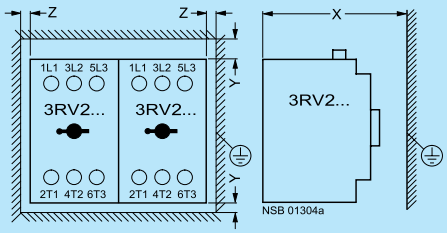
Technical data

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		
			Y	X	at the side Z
Type	size		mm	mm	mm
3RV2.1	S00	up to 690 V	30	70	9
3RV2. 2	S0 [2]	up to 500 V	30	90	9
		up to 690 V	50 [1]	90	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	90	167	10
		up to 400 V	90	167	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.

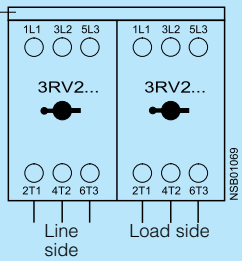
Standard mounting for S0, S2 and S3

Wiring module

Size S0: 3RV19 15-1AB

Size S2: 3RV19 35-1A

Size S3: 3RA19 43-3D
(Caution: The wiring module demands 10 mm spacing between the MSPs)



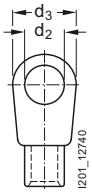
General Data

3RV – up to 80 A

General data						
Type			**3RV2.1.**	**3RV2.2.**	**3RV2.3.**	**3RV27, 3RV28**
Size			S00	S0	S2	S00, S0
Dimensions (W x H x D)						
• Screw terminals		mm	45 x 97 x 91	45 x 97 x 91	55 x 140 x 149	45 x 144 x 92
• Spring-type terminals		mm	45 x 106 x 91	45 x 119 x 91	--	--
Standards						
• 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
Number of poles			3			
Max. rated current $I_{n\ max}$ (= max. rated operational current I_e)		A	16	40	80	22
Permissible ambient temperature						
• Storage/transport		°C	–50 ... +80			
• Operation	I_n: 0.16 ... 32 A	°C	–20 ... +70 (current reduction above +60 °C)		--	
	I_n: 36 ... 40 A	°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)	--
Permissible rated current at inside temperature of control cabinet						
• +60 °C		%	100			
• +70 °C		%	87			
Permissible rated current at ambient temperature of enclosure (applies for motor starter protector/circuit breaker inside enclosure ≤ 32 A)						
• +35 °C		%	100		On request	100
• +60 °C		%	87			87
Rated operational voltage U_e						
• Acc. to IEC		V AC	690 (when a molded-plastic enclosure is used only 500 V)			
• Acc. to UL/CSA		V AC	600			
Rated frequency		Hz	50/60			
Rated insulation voltage U_i		V	690			
Rated impulse withstand voltage U_{imp}		kV	6			
Utilization category						
• IEC 60947-2 (motor starter protector/circuit breaker)			A			
• IEC 60947-4-1 (motor starter)			AC-3			
Trip class CLASS	Acc. to IEC 60947-4-1		10		10/20	--
DC short-circuit breaking capacity (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
Power loss P_V for each motor starter protector/circuit breaker Dependent on the rated current I_n (upper setting range)	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
	I_n: 16 A	W	--	7	10	7
$R_{per\ conducting\ path} = \frac{P}{I^2 \times 3}$	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	--
Shock resistance	Acc. to IEC 60068-2-27	*g*/ms	25/11 (square and sine pulse)			
Degree of protection	Acc. to IEC 60529		IP20			
Touch protection	Acc. to EN 50274		Finger-safe for vertical contact from the front			
Temperature compensation	Acc. to IEC 60947-4-1	°C	–20 ... +60			
Phase failure sensitivity	Acc. to IEC 60947-4-1		Yes (only for 3RV23 motor starter protectors)			No
Explosion protection – Safe operation of motors with "increased safety" type of protection			Yes (only for 3RV20 motor starter protectors)			
EC type test certificate number according to directive 94/9/EC (ATEX)			DMT 02 ATEX F 001 Ex II (2) GD		On request	No

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
Connection type		**Screw terminals**				
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2		M4, Pozidriv size 2
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	⌀ 5 ... 6		⌀ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	3.0 ... 4.5		2.5 ... 3
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded	mm^2	2 x (0.75 ... 2.5)[1], 2 x 4	2 x (1 ... 2.5)[1], 2 x (2.5 ... 10)[1]	2 x (1 ... 25)[1], 1 x (1 ... 35)[1]	2 x (1 ... 35)[1], 1 x (1 ... 50)[1]	2 x (1 ... 10)[1], max. 1 x 25
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1], 1 x 10	2 x (1 ... 16)[1], 1 x (1 ... 25)[1]	2 x (1 ... 25)[1], 1 x (1 ... 35)[1]	1 x (1 ... 16), max. 6 + 16
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1], 2 x (18 ... 12)[1]	2 x (16 ... 12)[1], 2 x (14 ... 8)[1]	2 x (18 ... 3)[1], 1 x (18 ... 2)[1]	2 x (18 ... 2)[1], 1 x (18 ... 1)[1]	2 x (14 ... 10)
Connection type		**Spring-type terminals**				
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5				
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded	mm^2	2 x (0.5 ... 4)	2 x (1 ... 10)	--		
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--		
• Finely stranded with end sleeve (DIN 46228-11)	mm^2	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	--		
Connection type		**Ring terminal lug connections**				
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	--		
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	--		
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	--		
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5	d_2 = min. 4.3, d_3 = max. 12.2	--		
• 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						

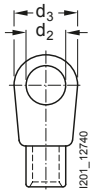


[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

		3RV2.1. S00	3RV2.2. S0	3RV2.3. S2	3RV27, 3RV28 S00, S0
Front transverse auxiliary switches					
		Switching capacity for different voltages			
		1 CO		**1 NO + 1 NC, 2 NO**	
Rated operational current I_e					
• 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		--	
Minimum load capacity	V	17			
	mA	1			
Front transverse solid-state compatible auxiliary switches					
		Switching capacity for different voltages			
		1 CO			
Rated operational voltage U_e	Alternating voltage V	125			
Rated operational current I_e/AC-14	at U_e = 125 V A	0.1			
Rated operational voltage U_e	Direct voltage *L/R* 200 ms V	60			
Rated operational current I_e/DC-13	at U_e = 60 V A	0.3			
Minimum load capacity	V	5			
	mA	1			
Lateral auxiliary switches with signaling switch					
		Switching capacity for different voltages: Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC Signaling switch			
Rated operational current I_e					
• 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			
Minimum load capacity	V	17			
	mA	1			
Auxiliary releases					
		Undervoltage releases		**Shunt releases**	
Power consumption					
• 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		--	
Response voltage					
• Tripping	V	0.35 ... 0.7 x U_s		0.7 ... 1.1 x U_s	
• Pick-up	V	0.85 ... 1.1 x U_s		--	
Opening time maximum	ms	20			
Short-circuit protection for auxiliary and control circuits					
Melting fuses operational class gG	A	10			
Miniature circuit breakers C characteristic	A	6 (prospective short-circuit current < 0.4 kA)			

Conductor cross-sections for auxiliary and control circuits

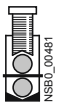
Type		3RV2.11	3RV2.21	3RV2.31, 3RV2.32	3RV27, 3RV28
Size		S00	S0	S2	S00, S0
Connection type		**Screw terminals**			
Terminal screw		M3, Pozidriv size 2			
Operating devices	mm	⌀ 5 ... 6			
Prescribed tightening torque	Nm	0.8 ... 1.2			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]			
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]			
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)[1], 2 x (20 ... 16)[1]			
Connection type		**Spring-type terminals**			
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid or stranded	mm^2	2 x (0.5 ... 2.5)			
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	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			
Connection type		**Ring terminal lug connections**			
Terminal screw		M3, Pozidriv size 2			
Operating devices	mm	⌀ 5 ... 6			
Tightening torque	Nm	0.8 ... 1.2			
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = 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					



[1] 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
Prescribed tightening torque	Nm	2.5 ... 3
Conductor cross-sections		
• Front clamping point connected		
- Solid	mm^2	1 ... 10
- Finely stranded with end sleeve	mm^2	1 ... 16
- Stranded	mm^2	2.5 ... 25
- AWG cables, solid or stranded	AWG	14 ... 3
- Terminal screw		M4
• Rear clamping point connected		
- Solid	mm^2	1 ... 10
- Finely stranded with end sleeve	mm^2	1 ... 16
- Stranded	mm^2	1.5 ... 25
- AWG cables, solid or stranded	AWG	14 ... 6
- Terminal screw		M4
• Both clamping points connected		
- Front clamping point:		
Solid	mm^2	1 ... 10
Finely stranded with end sleeve	mm^2	1 ... 10[1], 1 ... 6[1]
Stranded	mm^2	2.5 ... 10
AWG cables, solid or stranded	AWG	14 ... 6
Terminal screw		M4
- Rear clamping point:		
Solid	mm^2	1 ... 10
Finely stranded with end sleeve	mm^2	1 ... 10[1], 1 ... 16[1]
Stranded	mm^2	2.5 ... 10
AWG cables, solid or stranded	AWG	16 ... 3
Terminal screw		M4



[1] The following can be connected when both clamping points are connected:
- Front 1 ... 10 mm^2 and rear 1 ... 10 mm^2
- Front 1 ... 6 mm^2 and rear 1 ... 16 mm^2

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 verisons.
- 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 s < t_A < 10 s
- CLASS 10 4 s < t_A < 10 s
- CLASS 20 6 s < t_A < 20 s
- CLASS 30 9 s < t_A < 30 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**
SIRIUS MSP or Circuit Breaker	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**
SIRIUS Innovations MSP or Circuit Breaker	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: MPSs and Contactors of the same frame size are made to easily fit together with the use of a link module.

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.

As part of a Combination Motor Contoller, 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

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.

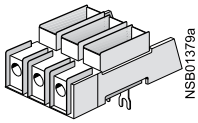
Basic units of size S2 are already compliant with new clearance and creepage distance requirements.

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

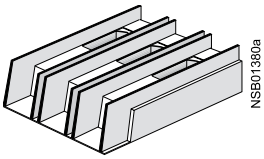
According to CSA, these terminal blocks can be omitted when the device is used as "Combination Motor Controller Type E".

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.

3RV29 28-1H

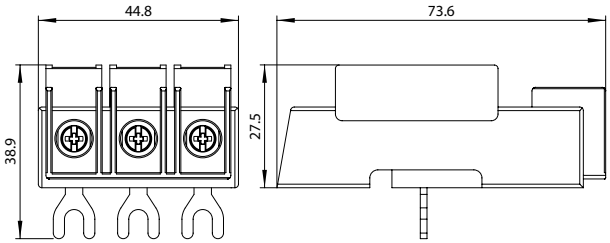


3RT29 46-4GA07

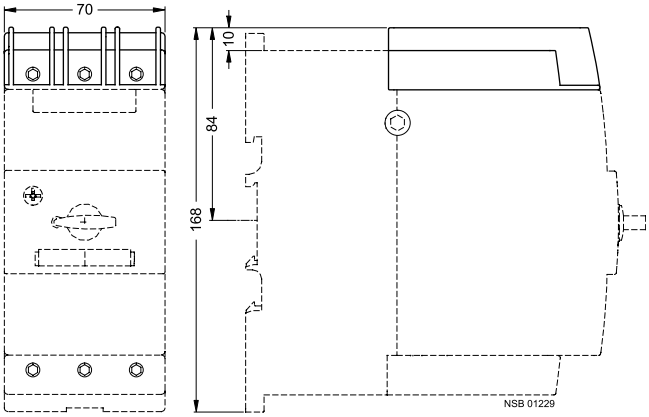


Terminals for "Combination Motor Controller Type E" to UL 508

3RV29 28-1H



3RT29 46-4GA07



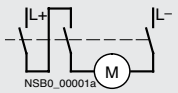
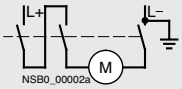
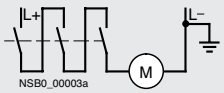
Switching of direct current

3RV motor starter protectors fo r 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[1)] 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.

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

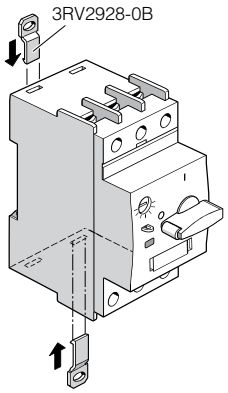
Design

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 baseplate.

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 [2)]

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

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

Characteristics

The time/current 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.

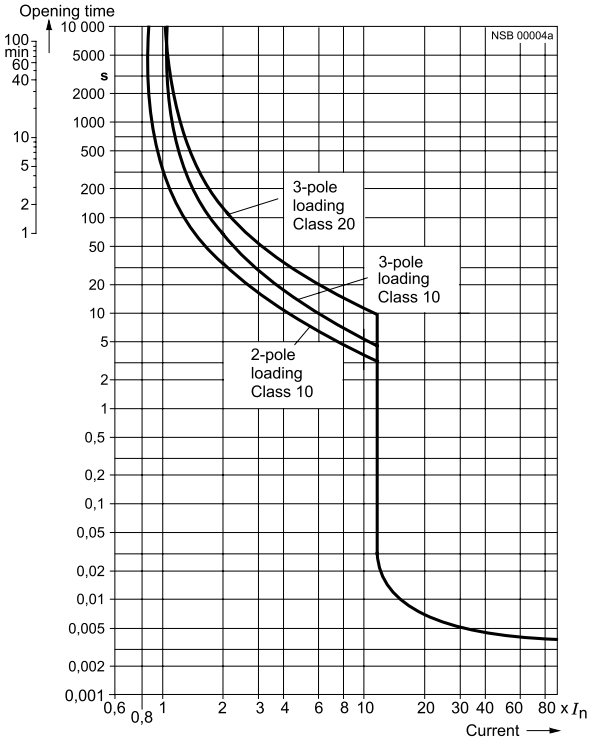
With 2-pole and 3-pole loading, the maximum deviation in the tripping time for 3 times the setting current and upwards is ± 20 % and thus in accordance with DIN VDE 0165.

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 $^2/_3$ 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.

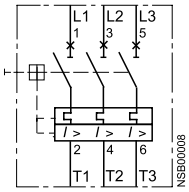
Typical time/current characteristic of 3RV



Circuit diagrams

Internal connections

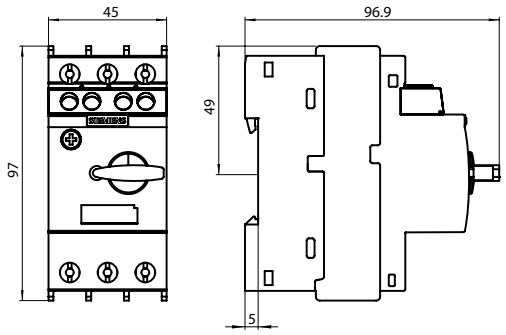
Motor starter protectors 3RV.



Dimension drawings

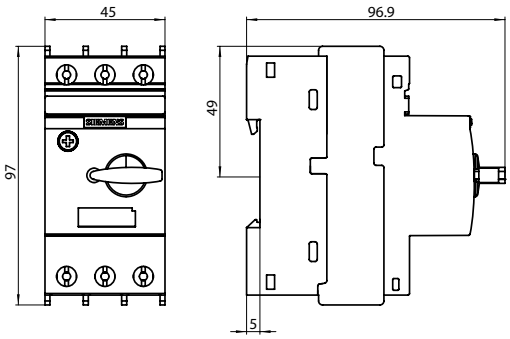
3RV2 MSP, size S00

3RV20 11

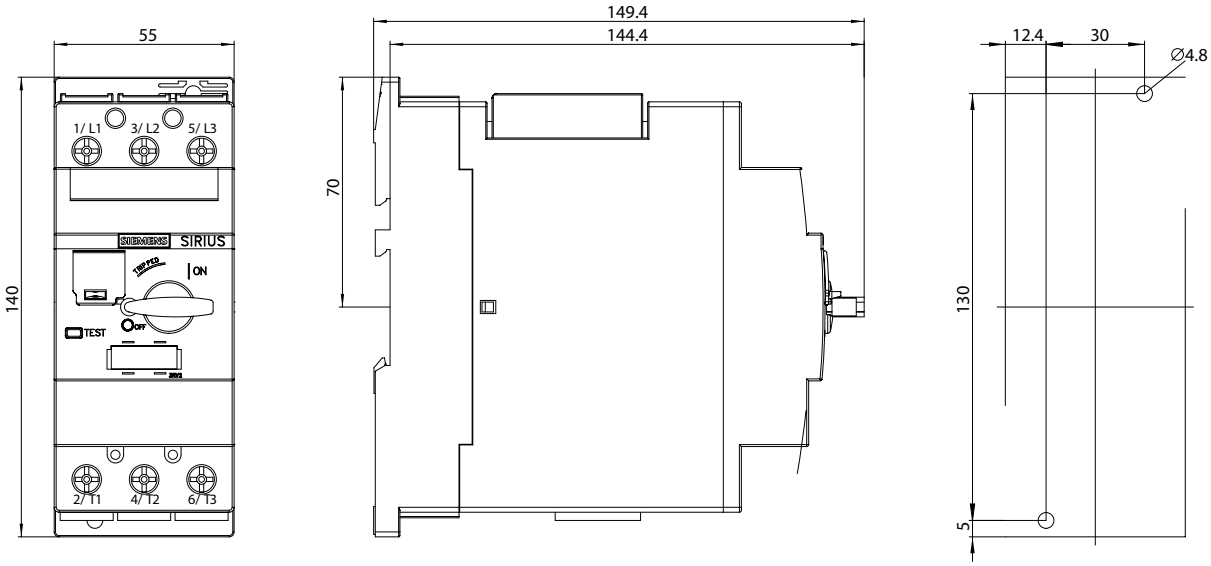


3RV2 MSP, size S0

3RV20 21

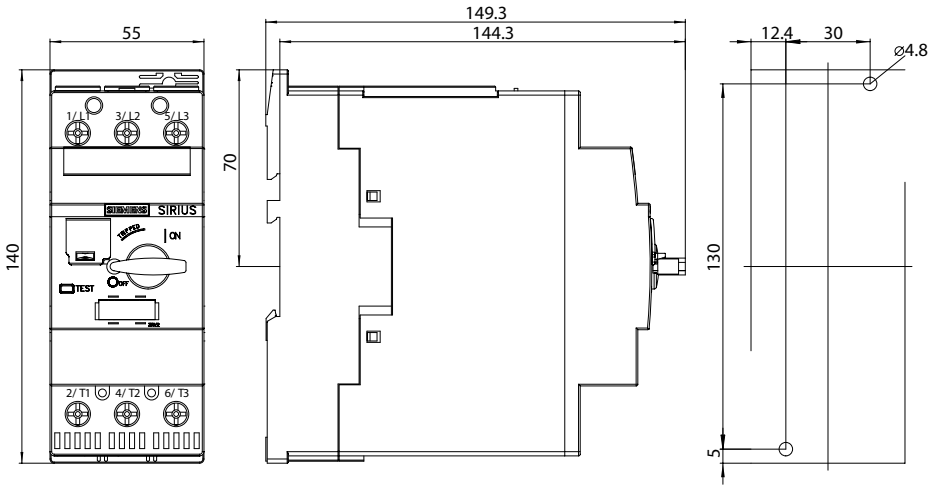


3RV2 MSP, size S2

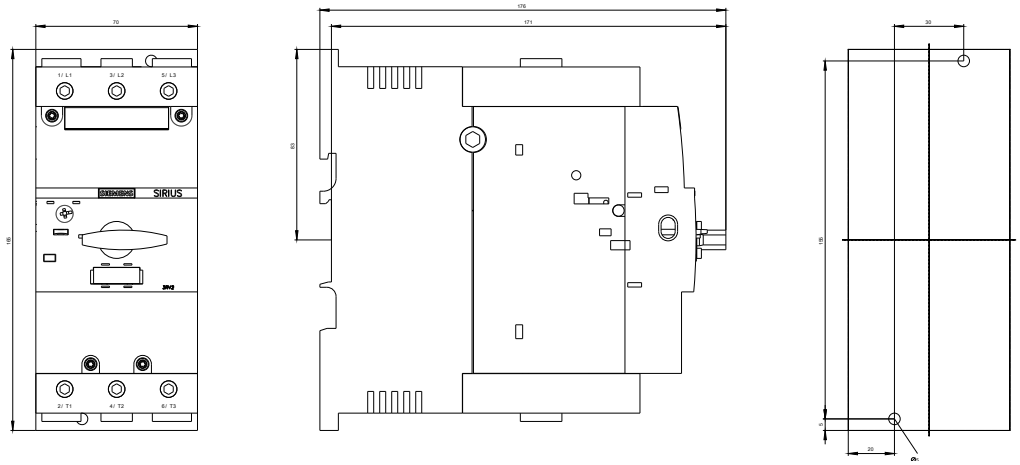


3RV2.31 motor starter protector (<= 45A)

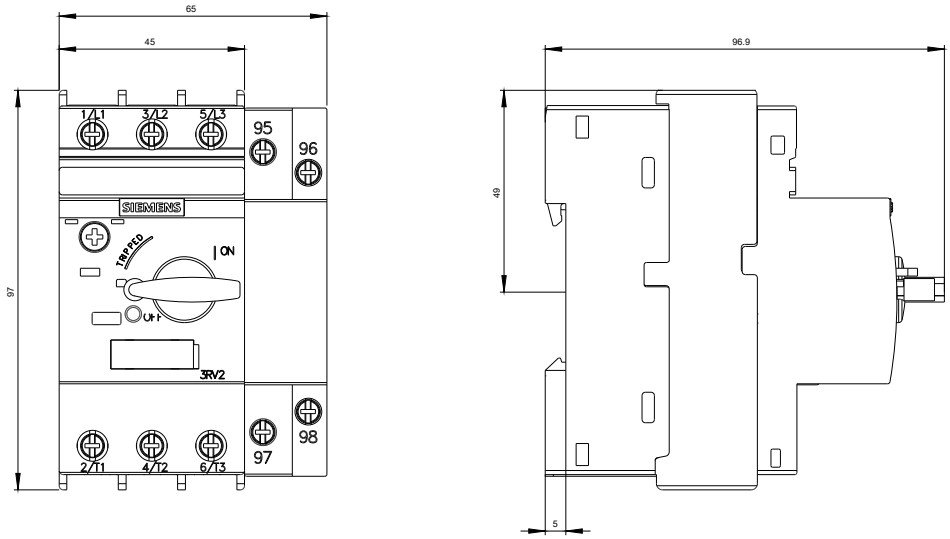
3RV2.32 MSP, size S2



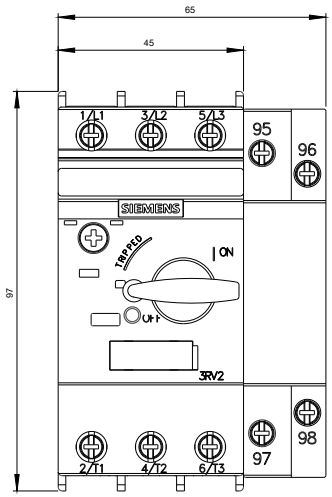
3RV2.4 size S3

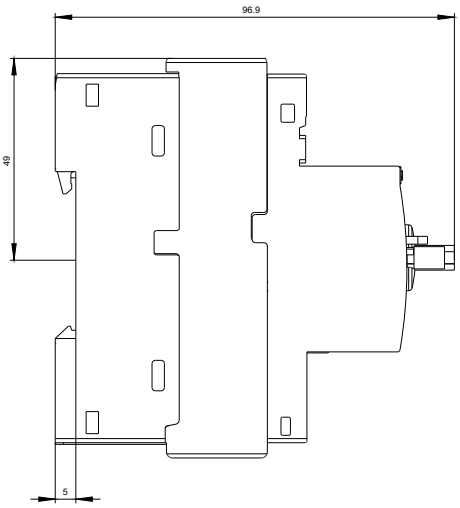


3RV2 MSP, size S00, 3RV2111

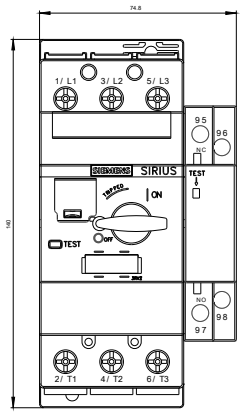


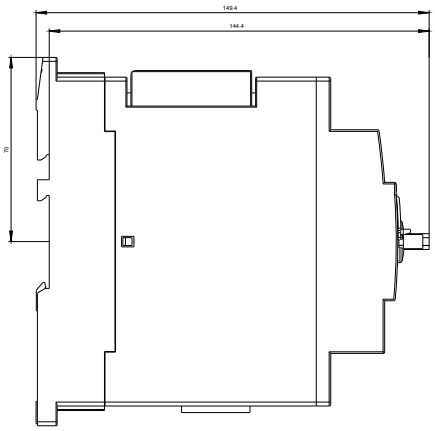
3RV2 MSP, size S0 , 3RV2121

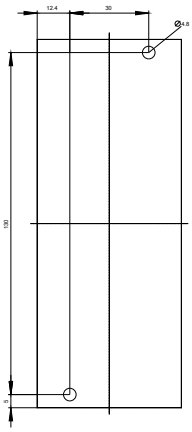




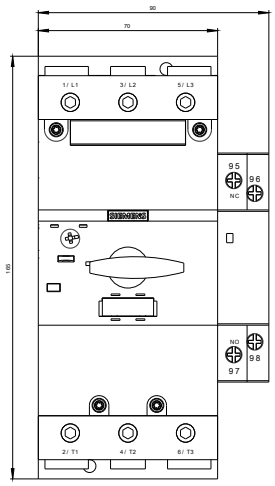
3RV2 MSP, size S2 , 3RV2131

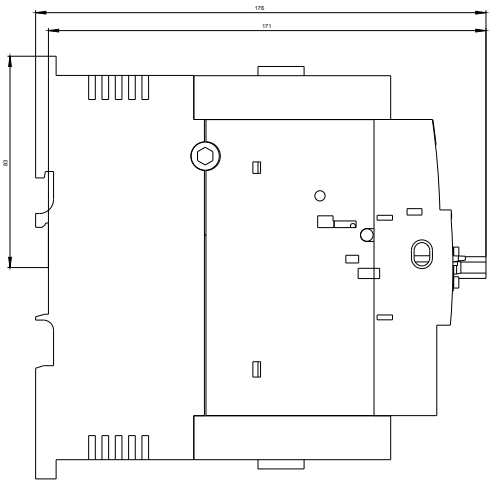


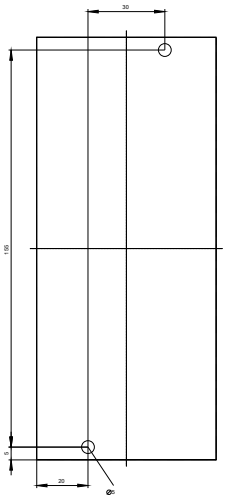




3RV2 MSP, size S3 , 3RV2142

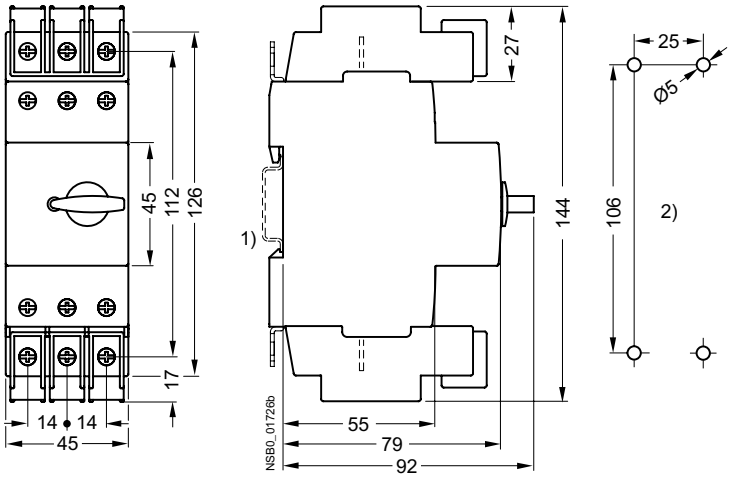






3RV27 and 3RV28 circuit breakers, size S00, S0 and S3

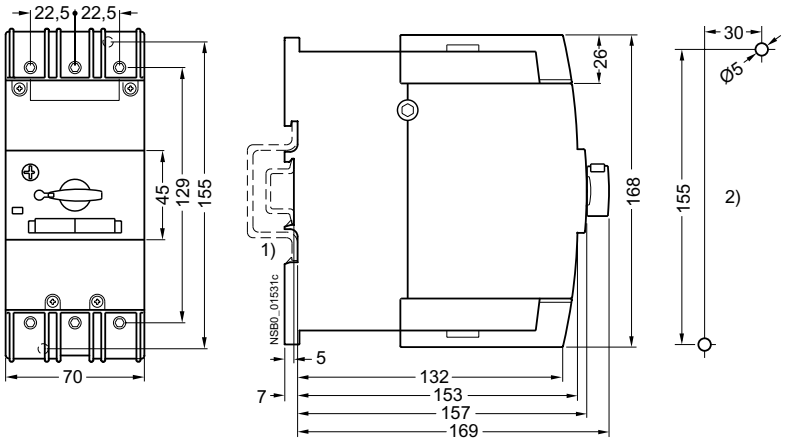
3RV27 21, 3RV28 21



1) Mounting according to EN 60715 to standard mounting rail TH 35.
2) Drilling pattern.

3RV27 circuit breakers, size S3

3RV27 42



1) Mounting according to EN 60715 on TH 35 standard mounting rail, 15 mm deep, or TH 75 standard mounting rail.
2) Drilling pattern.

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.

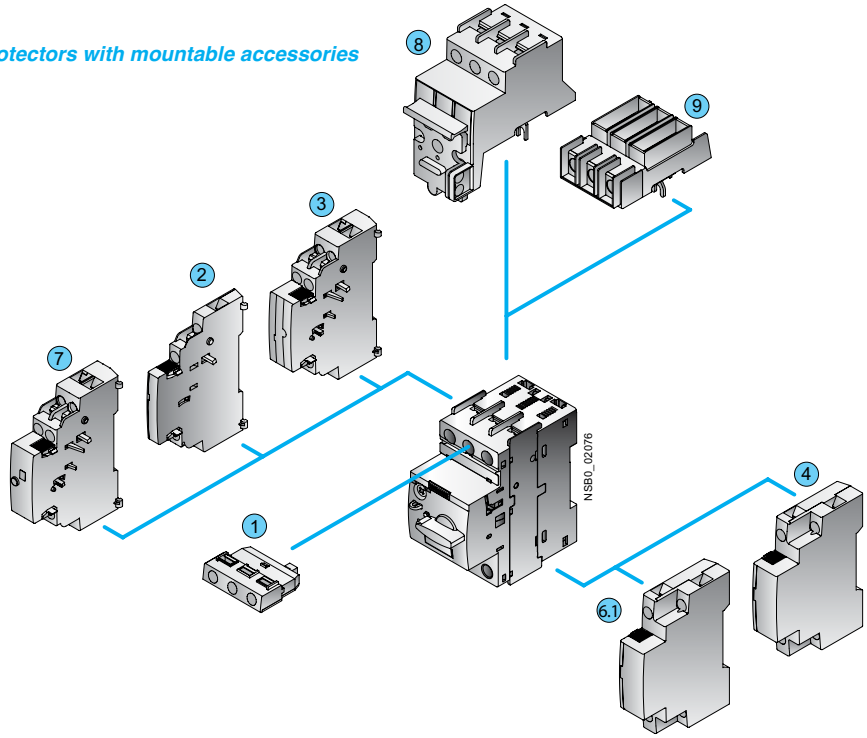
Overview graphic, see page 1/16.

Front side Note: • A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breaker.	**Transverse auxiliary switches, solid-state compatible transverse auxiliary switches** 1 NO + 1 NC or 2 NO or 1 CO	An auxiliary switch block can be inserted transversely on the front. The overall width of the motor starter protectors/circuit breakers remains unchanged.
Left-hand side Notes: • A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breaker. • Lateral auxiliary switches (two contacts) and signaling switches can be mounted separately or together. • The signaling switch cannot be used for the 3RV27 and 3RV28 circuit breakers.	**Lateral auxiliary switches (2 contacts)** 1 NO + 1 NC or 2 NO or 2 NC	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. The width of the lateral auxiliary switch with two contacts is 9 mm.
	Lateral auxiliary switches (4 contacts) 2 NO + 2 NC	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. The width of the lateral auxiliary switch with four contacts is 18 mm.
	Signaling switches Tripping 1 NO + 1 NC Short circuit 1 NO + 1 NC	One signaling switch can be mounted on the left side of each motor starter protector. The signaling switch has two contact systems. One contact system always signals tripping 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 switching off with the actuator. 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. The overall width of the signaling switch is 18 mm.
Right-hand side Notes: • One auxiliary release can be mounted per motor starter protector/circuit breaker. • Accessories cannot be mounted at the right-hand side of the 3RV21 motor starter protectors for motor protection with overload relay function.	**Auxiliary releases**	
	Shunt releases	For remote-controlled tripping of the motor starter protector/circuit breaker. The release coil should only be energized for short periods (see circuit diagrams).
	or	
	Undervoltage releases	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. Particularly suitable for EMERGENCY-STOP disconnection by way of corresponding EMERGENCY-STOP pushbuttons according to DIN EN 60204-1.
	or	
	Undervoltage releases with leading auxiliary contacts 2 NO	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. The overall width of the auxiliary release is 18 mm.
Top Notes: • The isolator module cannot be used for the 3RV27 and 3RV28 circuit breakers. • The isolator module for size S2 - can only be used with 3RV2 motor starter protectors/circuit breakers up to max. 65 A - cannot be used with the transverse auxiliary switch • 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.	**Isolator modules**	Isolator modules can be mounted to the upper connection side of the motor starter protectors. The supply cable is connected to the motor starter protector through the isolator module. 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.

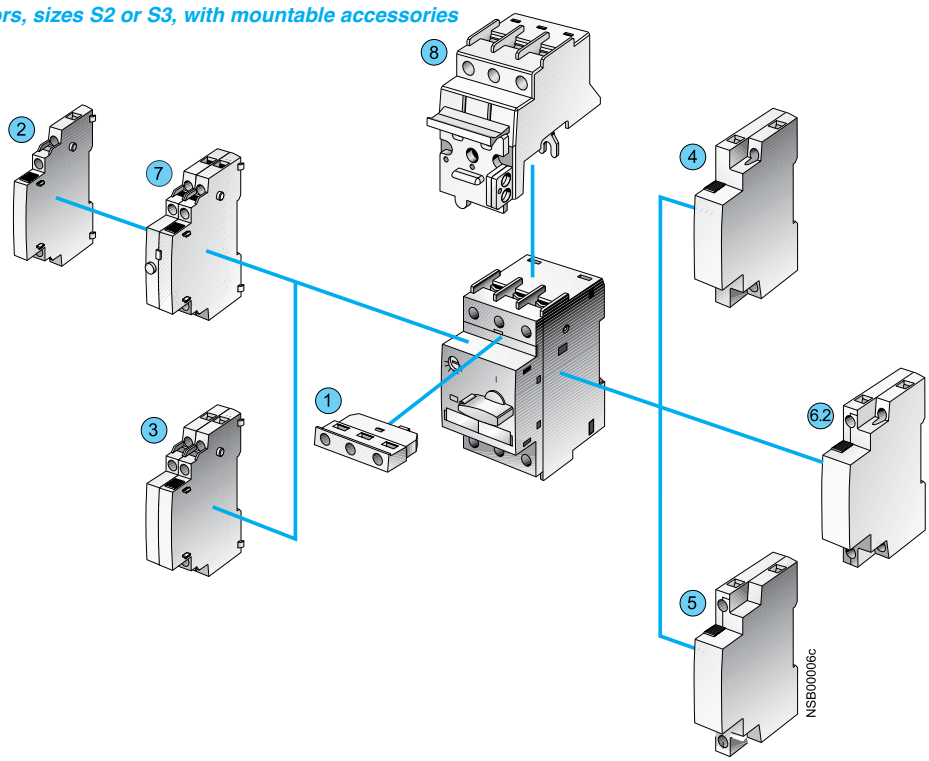
For a complete overview of which accessories can be used for the various motor starter protectors/circuit breakers, see page 7/2

Overview

S00 and S0 motor starter protectors with mountable accessories



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



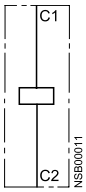
Mountable accessories for all sizes S00 ... S3	Mountable accessories	for sizes	Mountable accessories	for sizes
(1) Transverse auxiliary switch	(6.1) Undervoltage release with leading auxiliary contacts (can not be used with 3RV21 circuit breakers)	S00, S0	(7) Signaling switch (can not be used with 3RV27 and 3RV28 circuit breakers)	S00 ... S3
(2) Lateral auxiliary switch with 2 contacts		S2, S3	(8) Isolator module (can not be used with 3RV27 and 3RV28 circuit breakers)	S0 and S2
(3) Lateral auxiliary switch with 4 contacts	(6.2) Undervoltage release with leading auxiliary contacts		(9) Terminal block E	
(4) Shunt release				
(5) Undervoltage release				

Circuit diagrams

Internal connections

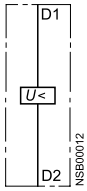
Shunt release

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



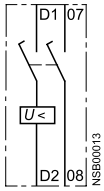
Undervoltage release

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



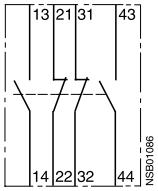
Undervoltage release with leading auxiliary contacts

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



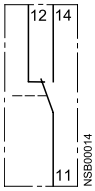
Lateral auxiliary switch with 4 contacts

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

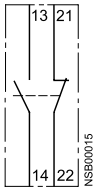


Transverse auxiliary switch

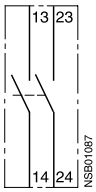
3RV19 01-1D
3RV29 01-1D
3RV19 01-1G
3RV29 01-1G



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

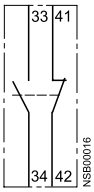


3RV19 01-1F
3RV29 01-1F

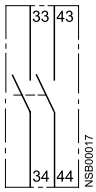


Lateral auxiliary switch with 2 contacts

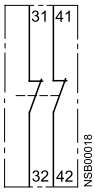
3RV19 01-1A
3RV29 01-1A
3RV19 01-2A
3RV29 01-2A



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

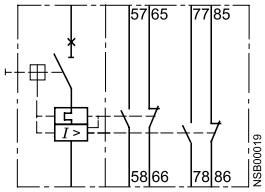


3RV19 01-1C
3RV29 01-1C
3RV19 01-2C
3RV29 01-2C



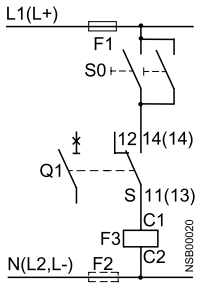
Signallng switch

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

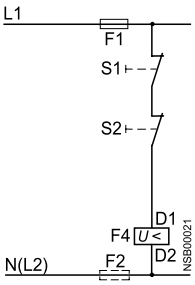


External connections

Shunt release



Undervoltage release

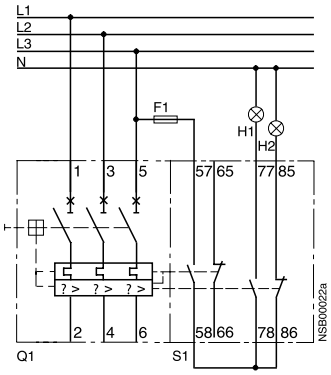


S0; S1; S2	OFF pushbuttons in system
Q1	Motor starter protectors
S	Auxiliary switch of MSP Q1
F1; F2	Fuses (gL/gG) max. 10 A
F3	Shunt release
F4	Undervoltage release

Circuit diagrams

Typical circuits

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



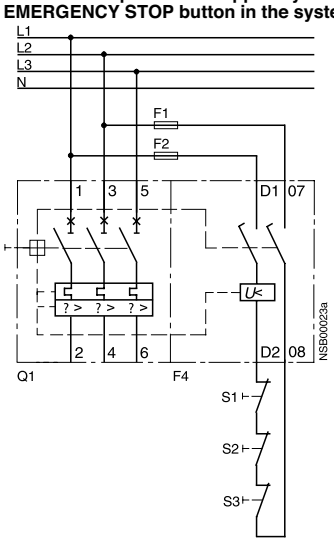
Separate "Tripped" and "Short circuit" signals

H1: "Short circuit" signal

H2: "Overload" or "Tripped by auxiliary release" signal

H1; H2	Indicator lights
F1	Fuses (gL/gG) max. 10 A
Q1	MSP
S1	Signalling switch

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 under-voltage release, thus avoiding power consumption in switched off state.

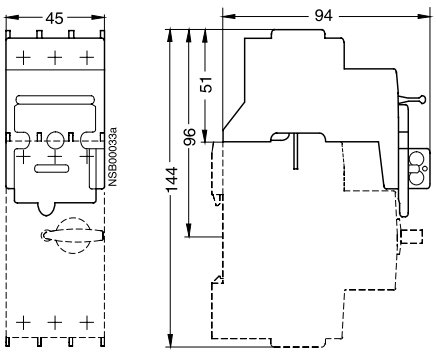
In the "tripped" position of the MSP, these contacts are not guaranteed to open.

F1; F2	Fuses (gL/gG) max. 10 A
Q1	MSP
F4	Undervoltage release
S1; S2, S3	OFF pushbuttons in system

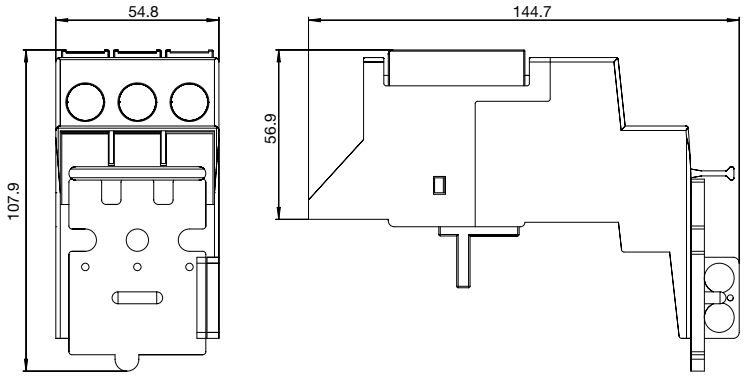
Dimension drawings

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 1/35 and 1/38.

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.

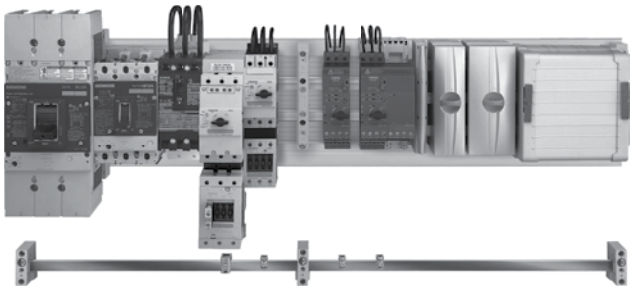
FastBus-busbar adapters for busbar systems with 40 mm centerline spacing are suitable for copper busbars with a width of 12 mm to 15 mm, while those with 60 mm centerline spacing are suitable for widths of 12 mm to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

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

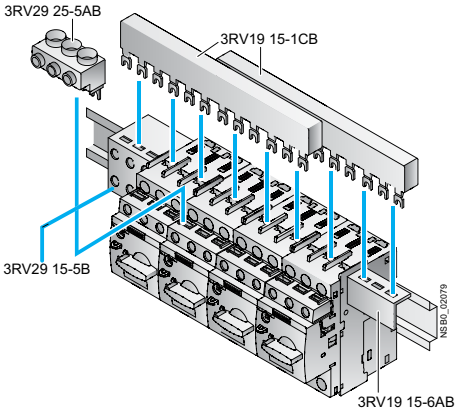


Insulated three-phase busbar system

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.

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.

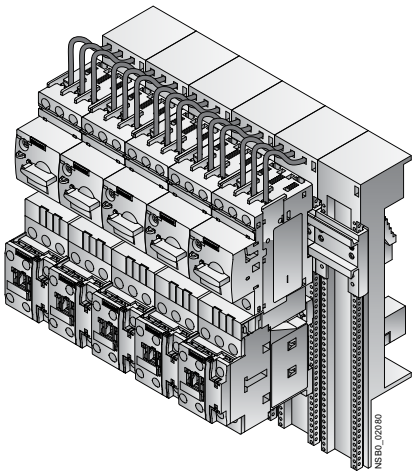
8US busbar adapters for 60 mm systems

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.



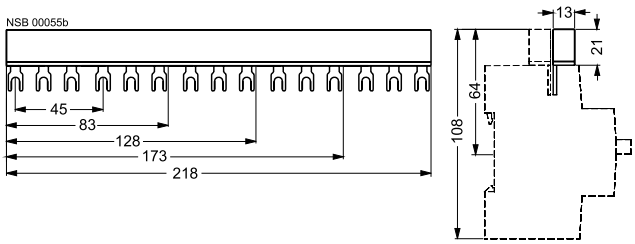
SIRIUS load feeders with busbar adapters snapped onto busbars

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 1/10).

Dimension drawings

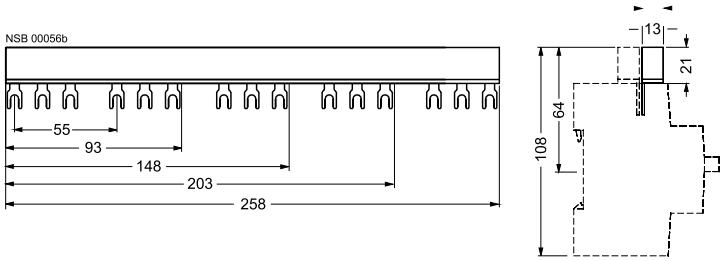
3RV19 15-1.. 3-phase busbar

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



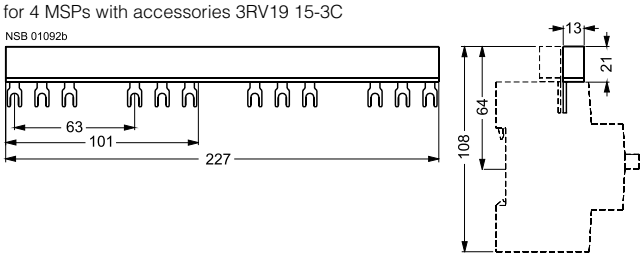
3RV19 15-2.. 3-phase busbar

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



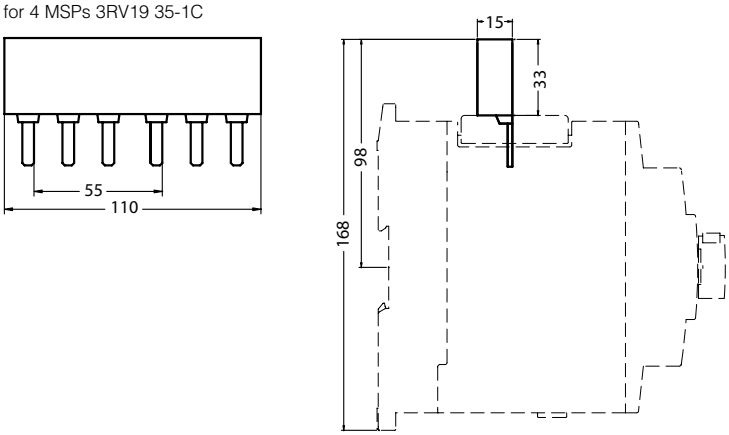
3RV19 15-3.. 3-phase busbar

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

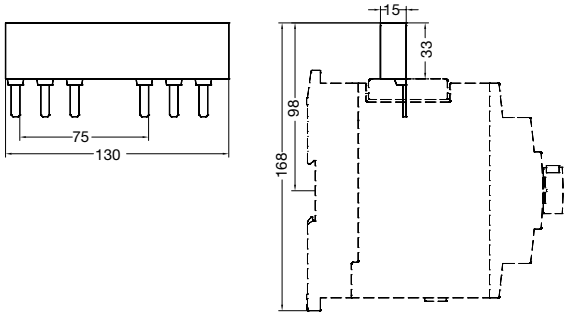
for S2 MSP, modular spacing 55 mm
for 2 MSPs 3RV19 35-1A
for 3 MSPs 3RV19 35-1B
for 4 MSPs 3RV19 35-1C



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

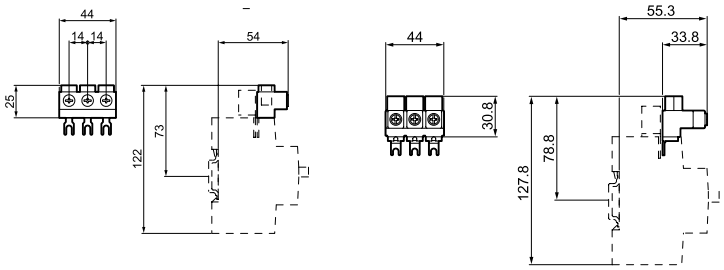


3RV29 25-5AB. 3-phase line-side terminals

connection from above,
size S00 and S0

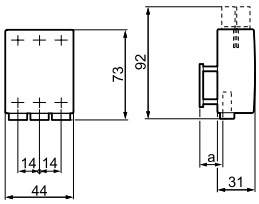
3RV29 35-5B
connection from above,
size S00 and S0

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



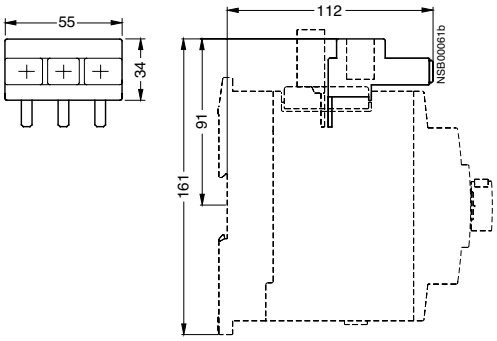
3RV29 25-5EB 3-phase line-side terminal

connection from above,
size S0



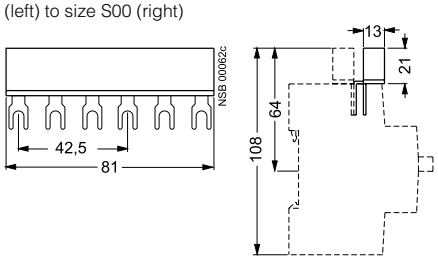
3RV19 35-5A 3-phase line-side terminal

for MSP size S2



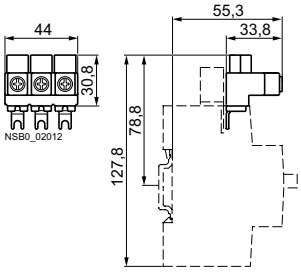
3RV19 15-5DB Connector

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



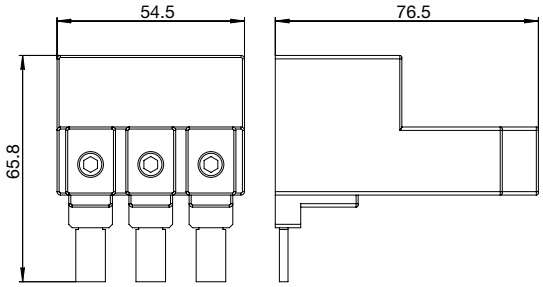
3RV19 25-5EB to construct "Type E Starters"

Connected from top, for motor starter protector size S0



3RV29 35-5E

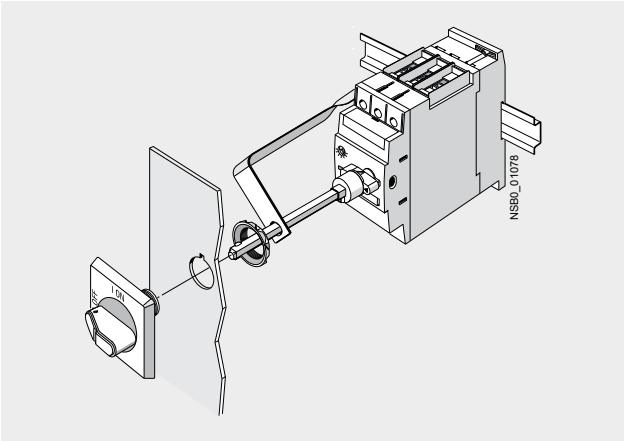
Connected from top, for motor starter protector size S2



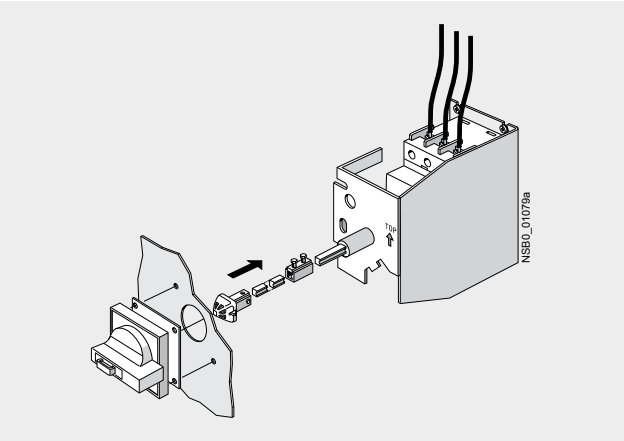
Overview

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

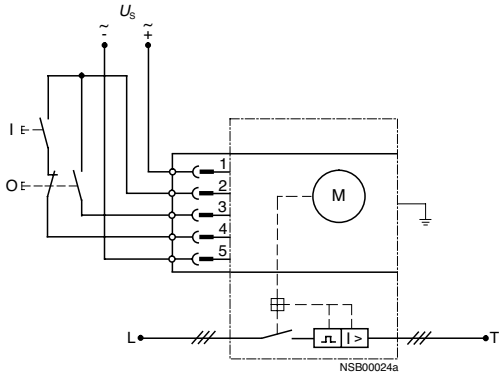


SIRIUS 3RV29 26-2B door-coupling rotary operating mechanism for arduous conditions

Circuit diagrams

Typical circuits

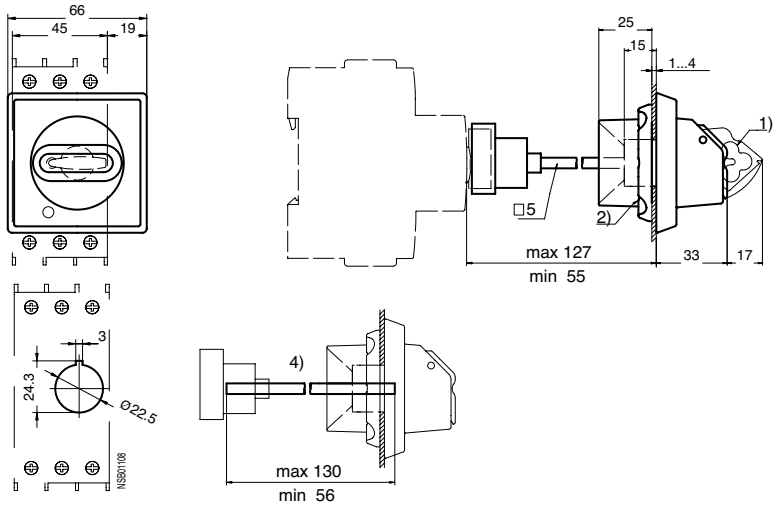
3RV MSP with 3RV19 36/3RV19 46 remote-controlled motorized operating mechanism



Dimensional drawings

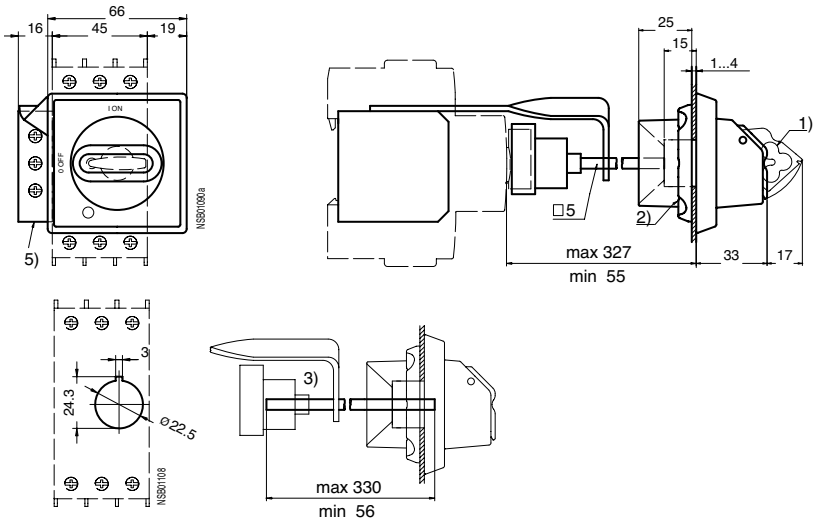
Door coupling rotary mechanism

3RV29 26-0B/3RV29 26-0C short shaft[4]), 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 mm² and bracket for 330 mm shaft.

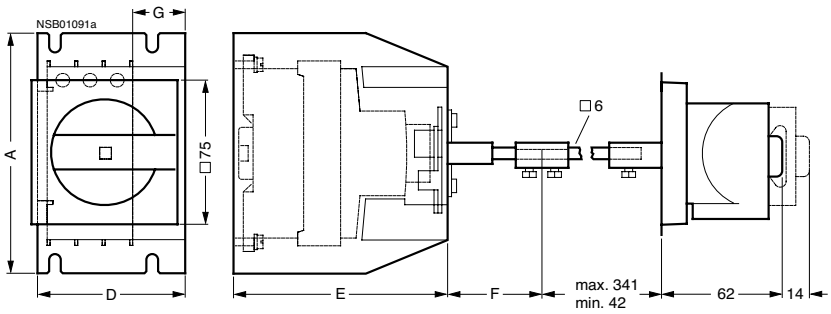
3RV29 26-0K/3RV29 26-0L long shaft (with bracket)[3]), for MSP sizes S00, S0, S2 and S3



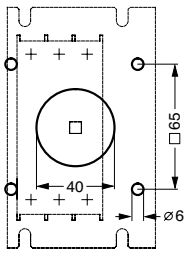
Dimension drawings

3RV29 . 6-2. Door coupling rotary mechanism for heavy duty

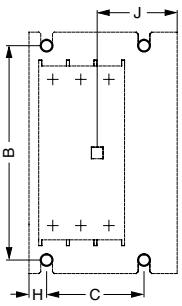
3RV29 26-2., 3RV29 36-2., 3R29 46-2.
for sizes S00, S0, S2 and S3

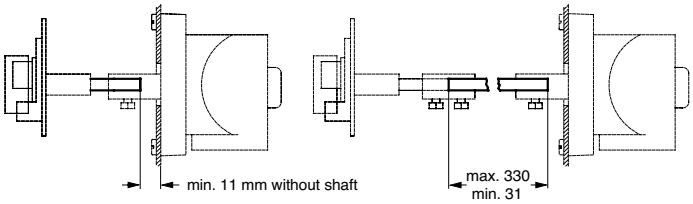


Drilling template, door



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

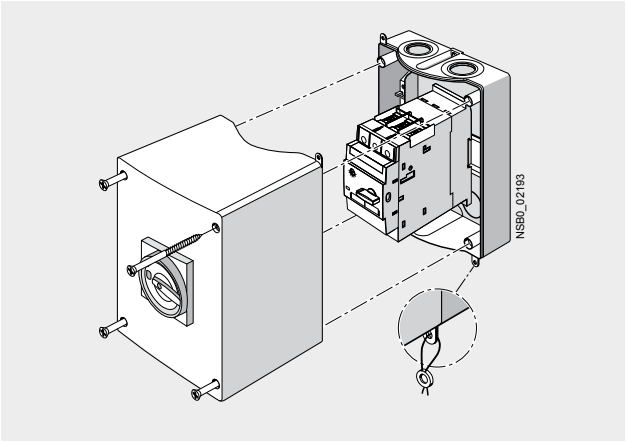
Overview

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 enclosures 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.

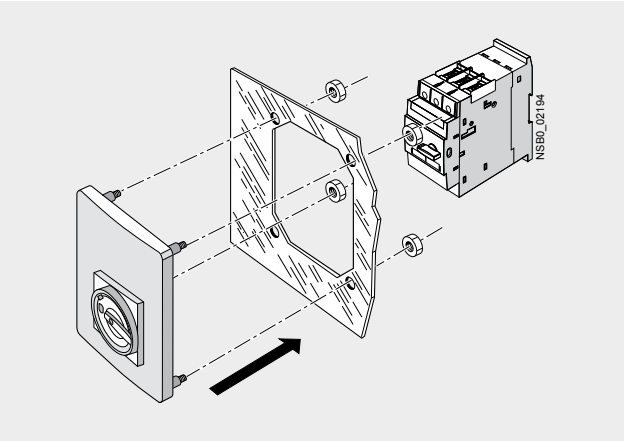
The enclosures can be supplied with either a black rotary operating mechanism or with an EMERGENCY-STOP rotary operating mechanism with a red/yellow knob.

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

No UL/CSA certification

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.

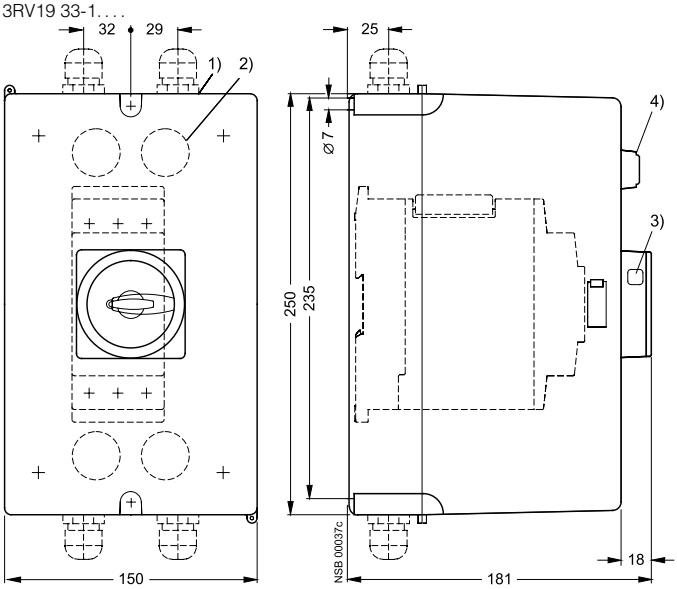


Front plate for size S2

Dimension drawings

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

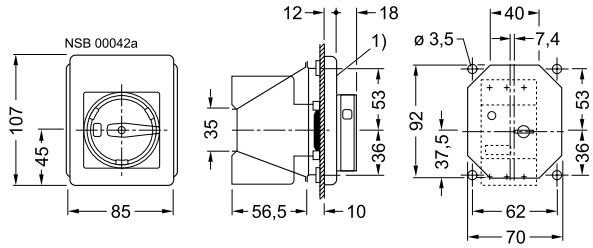
for MSPs of size S2
3RV19 33-1. . . .



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)

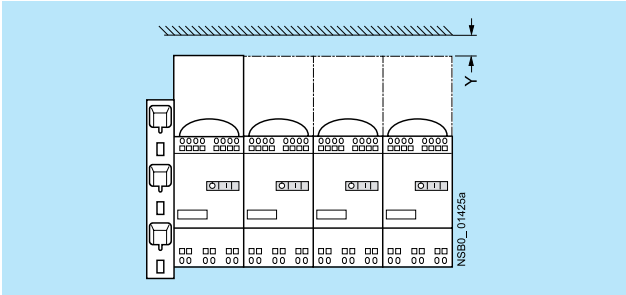


Design

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.

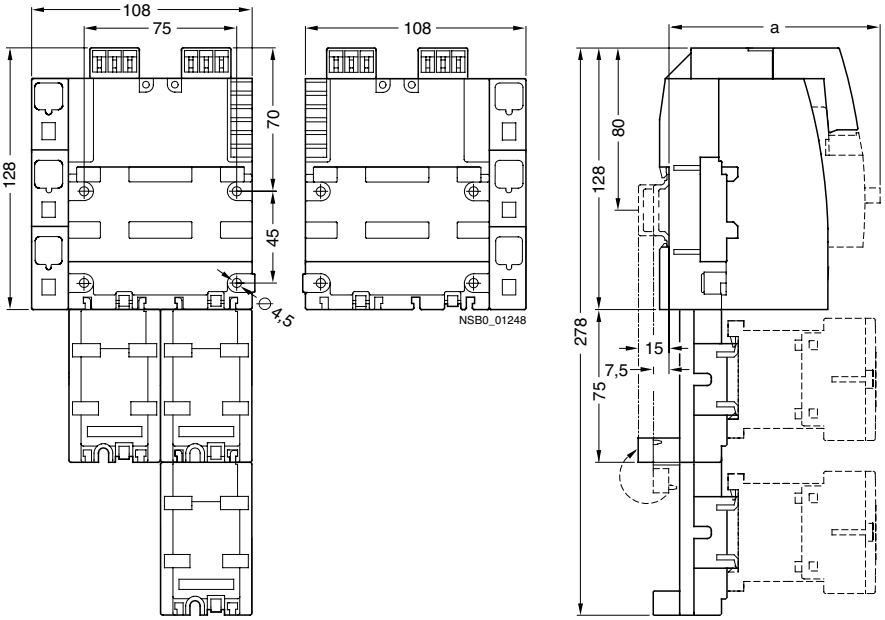


Technical specifications					
Type					3RV29.7
Size					S00, S0
Rated operational voltage *Ue*					
Acc. To IEC		10% overvoltage	V AC	V AC	500
		5% overvoltage	V AC	V	525
Acc. To UL/CSA					600
Rated frequency				Hz	50/60
Rated current In				A	63
Permissible rated current at inside temperature of control cabinet					
Motor starter protectors	Size	Rated current	Inside temperature of control cabinet		
3RV2.11	S00	… 14 A	60 °C	%	100
		> 14 … 16 A	40 °C	%	100
			60 °C	%	87
3RV2.21	S0	… 16 A	60 °C	%	100
		> 16 … 25 A	40 °C	%	100
			60 °C	%	87
		> 25 … 32 A	40 °C	%	87
Permissible ambient temperature					
Storage/transport				°C	-50 ... +80
Operation				°C	-20 … +60
Rated impulse withstand voltage *Uimp*				kV	6
Short-circuit strength					corresponds to the mounted motor starter protector or load feeder
Degree of protection acc. To IEC 60529					IP20 (In the terminal compartment of the infeed without connected IP00 conductor)
Touch protection acc. to IEC 60529					Finger Safe

Conductor cross-sections				
Type		Three-phase busbar with infeed 3RV2917-1A,3RV2917-1E	Terminal block 3RV2917-5D	Terminal block for device infeed 3RV2917-5FA00
Conductor cross-sections (min./max.)				
• Solid or stranded	mm^2	4 … 25	1.5 … 6	1 … 10
• Finely stranded with end sleeve	mm^2	4 … 25	1.5 … 4	1 … 6
• Finely stranded without end sleeve	mm^2	6 … 25	1.5 … 6	--
• AWG cables	AWG	10 … 3	15 … 10	18 … 8

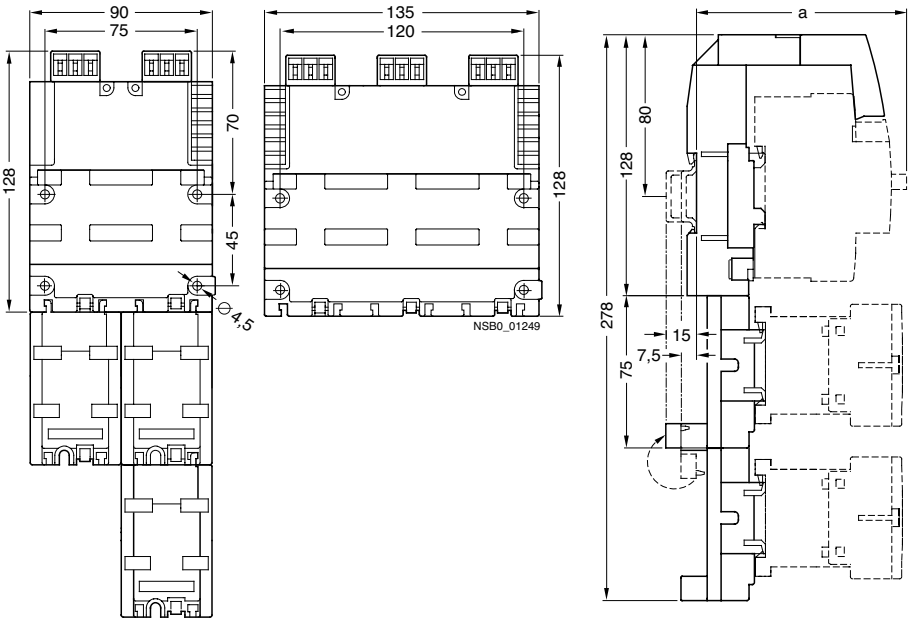
Cage Clamp infeed system

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

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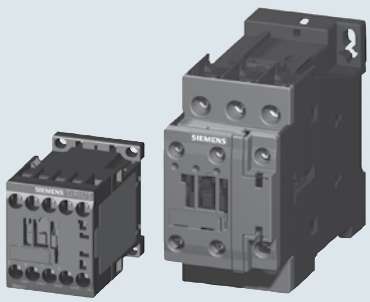
Contactors for switching three-phase motors



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

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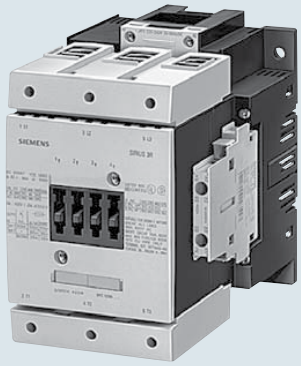

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100 to 400 HP,
sizes S6, S10 and S12

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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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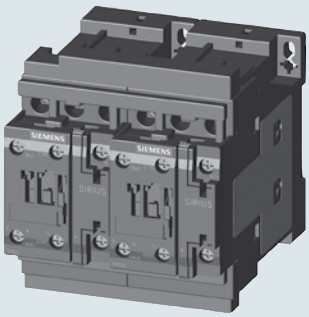

3RA13 / 23 contactor assemblies for reversing, 3 to 75 HP, sizes S00 to S3
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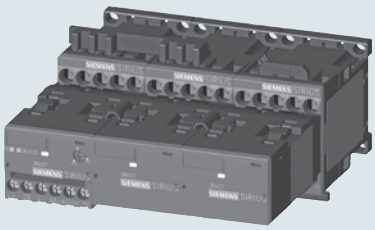

Wye Delta for
customer assembly of
sizes S00 to S12

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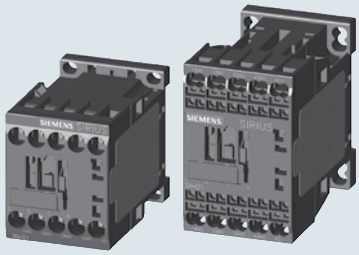

3RT23 contactors, AC-1: 18 to 140 A with 4 NO main contacts, sizes S00 to S3
with screw or spring connections

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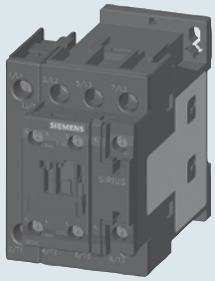

3RT25 contactors, AC-3: 7.5-25 HP with 2 NO + 2 NC main contacts, sizes S00 to S2
with screw or spring connections

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3RT26 capacitor contactors, up to 75 kvar, sizes S00 to S2
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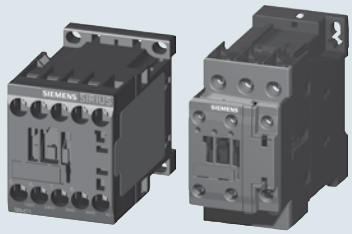

3RT20 coupling relays up to 20 HP (interface,) 3-pole, for switching motors, sizes S00 and S0
with screw or spring connections

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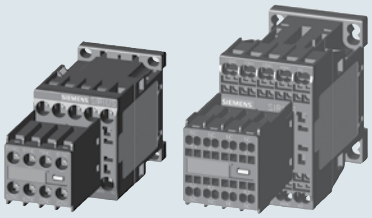

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Contactors for special applications

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

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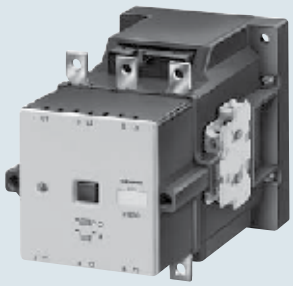

3TB50 to 3TB56 contactors with DC solenoid system, 100 to 300 HP

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3TC Contactors

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• Spare parts	2/57
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3RT1 SIRIUS Nomenclature

3RT1	0	3	5	1	A	B0	1
SIRIUS Contactor	**Application** 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	**Frame** 5 = S6 6 = S10 7 = S12	**Current** Designation Choices = 4,5,6	**Terminal** 2 = Spring Loaded Coil only 6 = Busbar Terminal	**Coil Type** A = AC/DC (S6-S12) N = UC Solid state (S6-S12) P = UC Solid state with RLT (S6-S12)	**Coil Voltage** See Coil Selection Chart page 2/51	**Aux Contacts A)** 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
SIRIUS Innovations Contactor	**Application** 0 = 3 pole Standard 3 = 4 pole NO 5 = 4 pole 2 NO + 2 NC 6 = 3-pole Capacitive	**Frame** 1 = S00 2 = S0 3 = S2 4 = S3	**Current** 3,4,5,6,7,8	**Terminal** 1 = Screw 2 = Spring Loaded 3 = Spring Loaded Coil only 4 = Ring Lug	**Coil Type** A = AC (S0-S3) B = DC N = UC Electronic	**Coil Voltage** See Coil Selection Chart page 2/51	**Aux Contacts A)** 0 = 1NO + 1NC (S0-S3) 1 = 1 NO (S00) 2 = 1 NC (S00) 4 = 2NO + 2NC (S00-S3) A) per EN50012

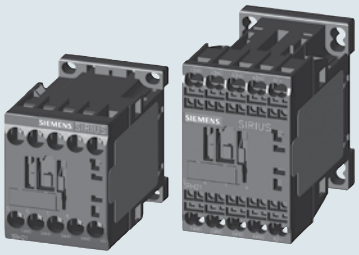
Note: MSPs and Contactors of the same frame size are made to easily fit together with the use of a link module or can be purchased pre-assembled as 3RA starter assemblies. See section 4.

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



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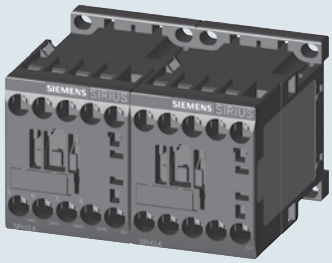

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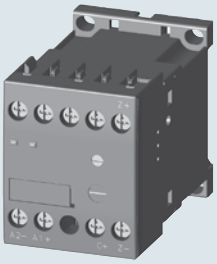
SIRIUS coupling relays (interface)



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Contactors and Contactor Assemblies

Overview

Type		S00 3RT20 1				S0 3RT20 2						S2 3RT20 3			
3RT20 contactors															
Type AC/DC operation		3RT2015 (p. 2/8)	3RT2016	3RT2017	3RT2018	3RT2023 (p. 2/8)	3RT2024	3RT2025	3RT2026	3RT2027	3RT2028	3RT2035 (p. 2/8)	3RT2036	3RT2037	3RT2038
Type AC/DC operation															
Maximum 3-phase horsepower ratings at 460V (UL and CSA listed values)															
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
460 V	HP	3	5	7.5	10	5	7.5	10	15	20	25	30	40	50	50
575 V	**HP**	**5**	**7.5**	**10**	**10**	**7.5**	**10**	**15**	**20**	**25**	**25**	**40**	**50**	**50**	**60**
AC-3															
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
400 V	**kW**	**3**	**4**	**5.5**	**7.5**	**4**	**5.5**	**7.5**	**11**	**15**	**18.5**	**18.5**	**22**	**30**	**37**
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AC-4 (at I_a = 6 x I_e)															
400 V	**kW**	**3**	**4**	**4**	**5.5**	**4**	**5.5**	**7.5**	**7.5**	**11**	**11**	**18.5**	**22**	**30**	**37**
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
AC-1 (40°C, ≤ 690V)															
I_e	**A**	**18**	**22**	**22**	**22**	**40**	**40**	**40**	**40**	**50**	**50**	**60**	**70**	**80**	**90**

Accessories for contactors															
Auxiliary switch blocks	front lateral	3RH29 11 3RH29 11		(p. 2/68) (p. 2/70)		3RH29 11 3RH29 21		(p. 2/68) (p. 2/70)							
Terminal covers		—				—						3RT29 36		(p. 2/79)	
Box terminals		—				—						—			
Surge suppressor		3RT29 16		(p. 2/75)		3RT29 26		(p. 2/75)				3RT29 36		(p. 2/75)	
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 3RB31 13	0.1-16A	(p. 3/22) (p. 3/23)		3RB30 26 3RB31 23	0.1-40A	(p. 3/22) (p. 3/23)				3RB30 36 3RB31 33	12-80A	(p. 3/22) (p. 3/23)	
3RB22/23, solid-state, CLASS 5, 10, 20 and 30		3RB2.83+ 3RB29 06	0.3-25A	(p. 3/34)								3RB22, 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 2/42)				(page 2/44)					(page 2/45)			
460 V	**HP**	**3**	**5**	**7.5**	**10**	**7.5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**50**
Installation kits / wiring connectors		3RA2913-2AA1 (p. 2/83)				3RA2923-2AA1 (p. 2/83)					3RA2933-2AA1 (p. 2/83)			
Mechanical interlocks		3RA2912-2H (p. 2/84)				3RA2922-2H (p. 2/84)					3RA2934-2B (p. 2/82)			

Contactors and Contactor Assemblies

Overview

Type		S3 3RT2. 4			S6 3RT1. 5			S10 3RT1. 6			S12 3RT1. 7		S14 3TF6	
3RT20 contactors														
Type AC/DC operation		3RT2045 (p. 2/8)	3RT2046	3RT2047	3RT1054 (p. 2/9)	3RT1055	3RT1056	3RT1064 (p. 2/9)	3RT1065	3RT1066	3RT1075 (p. 2/9)	3RT1076	—	—
Type AC/DC operation								3RT1264 (p. 2/12)	3RT1265	3RT1266	3RT1275 (p. 2/12)	3RT1276	3TF68 (p. 2/55)	3TF69
Maximum 3-phase horsepower ratings at 460V (UL and CSA listed values)														
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
460 V	HP	60	75	75	100	125	150	150	200	250	300	400	500	700
575 V	**HP**	**60**	**75**	**100**	**125**	**150**	**200**	**200**	**250**	**300**	**400**	**500**	**650**	**860**
AC-3														
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
400 V	**kW**	**37**	**45**	**55**	**55**	**75**	**90**	**110**	**132**	**160**	**200**	**250**	**335**	**450**
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
AC-4 (at I_a = 6 x I_e)														
400 V	**kW**	**37**	**45**	**55**	**55**	**75**	**90**	**110**	**132**	**160**	**200**	**250**	**355**	**400**
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
AC-1 (40°C, ≤ 690V)														
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	3RH29 11		(p. 2/68)	3RH19 21		(p. 2/68)						—	
	lateral	3RH29 21		(p. 2/70)	3RH19 21		(p. 2/70)						3TY7 561	(p. 2/55)
Terminal covers		3RT2946-4EA2		(p. 2/81)	3RT19 56-4EA1/2/3		(p. 2/81)	3RT19 66-4EA1/2/3		(p. 2/81)			3TX7 686/696	(p. 2/56)
Box terminals		—			3RT19 55/56-4G		(p. 2/81)	3RT19 66-4G		(p. 2/81)			—	
Surge suppressor		3RT29 36		(p. 2/75)	3RT19 56-1C (RC element)		(p. 2/75)						3TX7 572	(p. 2/56)
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 3RB31 43	12.5-100A	(p. 3/22) (p. 3/23)	3RB20 56 3RB21 56	50–200A	(p. 3/22) (p. 3/23)	3RB20 66 3RB21 66	50–630A	(p. 3/22) (p. 3/23)	3RB20 66 3RB21 66	160–630A (p. 3/22)	3RB20 66 3RB21 66	160–630A (p. 3/22)
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 (p. 2/46)	3RA23 46	3RA23 47	—			—			—		—	
460 V	**HP**	**60**	**75**	**75**	**100**	**125**	**150**	**150**	**200**	**250**	**300**	**400**	**500**	**700**
Installation kits / wiring connectors		3RA2943-2AA1		(p. 2/83)	3RA1953-2A		(p. 2/83)	3RA1963-2A		(p. 2/83)	3RA1973-2A	(p. 2/83)	3TX7680-1A	
Mechanical interlocks		3RA2934-2B			3RA1954-2A		(p. 2/82)						3TX7686-1A	

Contactors for Switching Motors

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

Selection and ordering data

3RT201.-1A

3RT201. -2A. . .

3RT2028-1N...

3RT2025-2B...

3RT2035-1A...

3RT2045-1A...

Frame Size	Amp Ratings AC3	AC1	Single-phase HP ratings 115V	208V	230V	Three-phase HP ratings 208V	230V	460V	575V	Auxiliary contacts NO	NC	Screw Terminals Order No.	Spring-Loaded Terminals[1] Order No.	Weight approx. kg
3RT 3-pole contactors														
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
										0	1	**3RT2015-1□●●2**	**3RT2015-2□●●2**	
	9	22	0.33	1	1	2	3	5	**7.5**	1	0	**3RT2016-1□●●1**	**3RT2016-2□●●1**	
										0	1	**3RT2016-1□●●2**	**3RT2016-2□●●2**	
	12	22	0.5	1.5	2	3	3	7.5	**10**	1	0	**3RT2017-1□●●1**	**3RT2017-2□●●1**	
										0	1	**3RT2017-1□●●2**	**3RT2017-2□●●2**	
	16	22	1	2	2	3	5	10	**10**	1	0	**3RT2018-1□●●1**	**3RT2018-2□●●1**	
										0	1	**3RT2018-1□●●2**	**3RT2018-2□●●2**	
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**	
	38	50	3	5	5	10	10	25	**25**	1	1	**3RT2028-1□●●0**	**3RT2028-2□●●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[2]	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** **DC Coil = B** **UC Coil = N**	□ **A** **B** **N**	

NEMA SIze	Amp Ratings	Single-phase HP ratings 115V	230V	Three-phase HP ratings 208V	230V	460V	575V	Auxiliary contacts NO	NC	Screw Terminals with AC coil Order No.	Screw Terminals with 24 VDC coil Order No.	Weight approx. kg
NEMA Labeled Contactors												
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 2/51.
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.
For technical data, see page 2/121-2/142.
For description, see page 2/106-2/107.
For int. circuit diagrams, see page 2/195-2/202.
For dimension drawings, see page 2/214-2/217.

AC Coil Selection for 3RT201 through 3RT204

●●Coil Code	C2[2]	H2[3]	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	—	—	—

[2] Use Code **B0** for 3RT201, S00
[3] Use Code **H0** for 3RT201, S00

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

●●Coil Code	A4[4]	B4	W4	E4	F4	G4	M4
DC	12 V	24 V	48 V	60 V	110 V	125 V	220 V

[4] 3RT201 and 3RT202 only

UC Coil Selection for 3RT202

●●Coil Code	B3	F3	P3[4]
UC	21-28V	95-130V	200-280V

UC Coil Selection for 3RT203 & 3RT204

●●	B3	F3	P3[5]
	20-33V	83-155V	175-280V

[5] at upper limit = 1.1 x U_S

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**

3RT1056-6PF35

3RT1054-6SF36

Frame Size	Amp Ratings		Single-phase HP ratings		Three-phase HP ratings				Auxiliary contacts		Screw Terminals on coil and aux.	Spring-type terminals on coil and aux. contacts	Weight approx.
	AC3	AC1	115V	230V	200V	230V	460V	**575V**	NO	NC	Order No.	Order No.	kg
3RT 3-pole Contactors													
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**	
	UC Conventional Coil										**□**	**□**	
	Solid State Operated Coil =										**A**	**A**	
	Solid State Operated Coil with RLT =										**N**	**N**	
	Solid State Operated Coil with RLT =										**P●●5**	**—**	
	Solid State Fail-safe Coil =										**S**	**S**	

NEMA SIze	Amp Ratings	Single-phase HP ratings		Three-phase HP ratings				Auxiliary contacts		Screw Terminals on coil and aux.	Spring-type terminals on coil and aux. contacts	Weight approx.
		115V	230V	200V	230V	460V	**575V**	NO	NC	Order No.	Order No.	kg
NEMA Labeled Contactors												
4	**135**	—	—	40	50	100	**100**	2	2	**3RT1056-6A●●6-0UA0**	**—**	3.5
5	**270**	—	—	75	100	200	**200**	2	2	**3RT1066-6A●●6-0UA0**	**—**	6.7
6	**540**	—	—	150	200	400	**400**	2	2	**3RT1076-6A●●6-0UA0**	**—**	10.5

All coil voltages are in the adjacent table.
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.
For technical data, see page 2/148-2/156.
For description, see page 2/108-2/109.
For int. circuit diagrams, see page 2/201-2/203.
For dimension drawings, see page 2/218-2/219.

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

UC Conventional Coil		
Rated control supply voltage Us **Us min ... Us max**[1]	**3RT1. 5.-.A**	
	3RT1. 6.-.A	
	3RT1. 7.-.A	
Coil Codes	**●●**	
23 ... 26 V AC/DC	B3	
42 ... 48 V AC/DC	D3	
110 ... 127 V AC/DC	F3	
200 ... 220 V AC/DC	M3	
220 ... 240 V AC/DC	P3	
240 ... 277 V AC/DC	U3	
380 ... 420 V AC/DC	V3	
440 ... 480 V AC/DC	R3	
500 ... 550 V AC/DC	S3	
575 ... 600 V AC/DC	T3	

Solid-State Coil			
Rated control supply voltage Us **Us min ... Us max**[1]	**3RT1. 5.-.S**	**3RT1. 5.-.N**	**3RT1. 5.-.P**
	3RT1. 6.-.S	**3RT1. 6.-.N**	**3RT1. 6.-.P**
	3RT1. 7.-.S	**3RT1. 7.-.N**	**3RT1. 7.-.P**
Coil Codes	**●●**	**●●**	**●●**
21 ... 27.3 V AC/DC	—	B3	—
96 ... 127 V AC/DC	F3	F3	F3
200 ... 277 V AC/DC	P3	P3	P3

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

Contactors for Switching Motors with Integrated Safety

SIRIUS

3RT contactors, 3-pole up to 500 HP *NEW*

Contactor with integrated failsafe connection

Features

New Contactors from 125 to 500 HP @ 575V for direct control by fail-safe controllers

- First contactor with fail-safe input
- Certified for use up to the highest safety level
- SIL CL 2 with one / SIL CL 3 with two contactors

Benefits

- Savings on standard outputs in the controller
- Space savings due to elimination of the coupling level
- Less wiring
- Simplified safety assessment

Overview

The size S6 to S12 range of tried and tested contactors from 125 to 500 HP @ 575V has been expanded to include versions suitable for direct control from fail-safe controllers, rendering the coupling level superfluous. The new contactors are also available with non-removable, lateral auxiliary switches, enabling fulfilment of Swiss Accident Insurance Institute (SUVA) requirements.

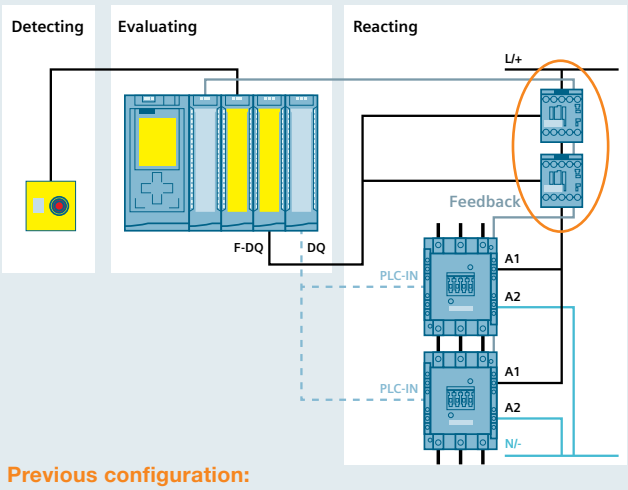
The new contactors constitute the logical extension and further development of the SIRIUS Modular System, serving to promote safe switching. They are the first contactors on the market to be equipped with an input for fail-safe signals. This makes it possible to attain SIL 2 and/or PLc with just one contactor and SIL 3 and/or PLe with two contactors in series according to IEC 62061 and ISO 13849-1.

The big advantage of this solution is that it saves on additional, possibly positively-driven coupling relays and makes evaluation of safety information considerably easier.

This reduction in coupling relays is also a huge plus point for non-safety applications. Whereas previously space, money and wiring expertise were required in order to operate contactors from 100 HP and higher using controllers, both functional and safety switching can now take place by direct activation.

Using the Safety Evaluation Tool you can quickly find the right contactor and safely configure your application.

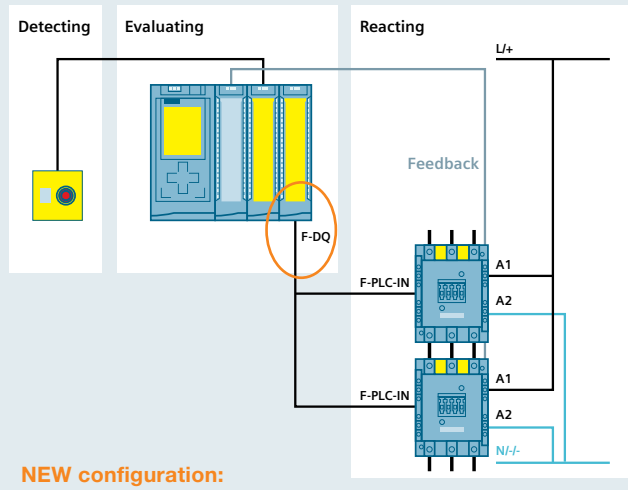
Save space and costs with a direct connection to the controller – no need for coupling relays!



Previous configuration:

3RT1 size S6 for high motor outputs with standard PLC-IN

- Normal switching duty via standard IO and PLC-IN
- Safety-related tripping initated by monitoring coupled links
- Feedback of the two S6 size 3RT1 contacts and the coupling relays via standard IO



NEW configuration:

3RT1 size S6 for high motor outputs with new contactor with fail-safe F-PLC-IN

- A1-A2 supplied via standard power supply (unit)
- Normal switching duty via F-DQ and F-PLC-IN
- Safety-related tripping via the same signal
- Feedback of the two S6 size 3RT1 via standard IO

Contactors for Switching Motors with Integrated Safety

3RT contactors, 3-pole up to 500 HP *IE3/IE4* ready

AC/DC Operation

- Solid-state operating mechanism (with integrated varistor) with fail-safe control input for safety-related applications to SIL CL 3
- 24 V DC control signal input, e.g. for control via the fail-safe output module of a controller (F-PLC) or safety relay
- Attainable Safety Integrity Level (SIL):
  - With one contactor: SIL CL 2 acc. to IEC 62061 or PL c acc. to ISO 13849-1
  - With two contactors in series: SIL CL 3 acc. to IEC 62061 or PL e acc. to ISO 13849-1according to IEC 60947-4-1, test conditions for utilization category AC-1
- Version with removable lateral auxiliary switches or permanently mounted auxiliary switches and additional approval according to SUVA (on request)
- For screw fixing
- Auxiliary and control conductors: Screw or spring-type terminals
- Main conductors: Busbar connections; a connection kit with screws, spring washer and nut is enclosed.

For more information on safety systems, see Section 13 Limit Switches and Safety.

3RT105.-6S.36

3RT106.-6S.36

3RT107.-6S.36

3RT105.-6S.36-3PA0

3RT107.-6S.36-3PA0

Selection and ordering data

See pages 2/9 (contactors with removable auxiliary switches) and 2/25 (contactors with removable auxiliary switches-SUVA).

Contactors for Switching Motors

3RT12 vacuum contactors, 3-pole

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**

3RT12 6 .

3RT12 7 .

Size	Horsepower ratings and utilization categories						Auxiliary contacts, lateral		Rated control supply voltage U_s	Order No.	Weight approx.
	AC-3 Maximum inductive current	Ratings of three-phase motors 200 V	230 V	460 V	**575 V**	AC-1 Maximum resistive current					
	Amps	HP	**HP**	HP	**HP**	Amps	NO	NC	AC/DC V		kg
Conventional operating mechanism											
S10	225	60	**75**	150	**200**	330	2	2	110 ... 127 220 ... 240	**3RT12 64-6AF36** **3RT12 64-6AP36**	6.4
	265	75	**100**	200	**250**	330	2	2	110 ... 127 220 ... 240	**3RT12 65-6AF36** **3RT12 65-6AP36**	
	300	100	**125**	250	**300**	330	2	2	110 ... 127 220 ... 240	**3RT12 66-6AF36** **3RT12 66-6AP36**	
S12	400	125	**150**	300	**400**	610	2	2	110 ... 127 220 ... 240	**3RT12 75-6AF36** **3RT12 75-6AP36**	9.6
	500	150	**200**	400	**500**	610	2	2	110 ... 127 220 ... 240	**3RT12 76-6AF36** **3RT12 76-6AP36**	
Solid-state operating mechanism · for DC 24 V PLC output											
S10	225	60	**75**	150	**200**	330	2	2	96 ... 127 200 ... 277	**3RT12 64-6NF36** **3RT12 64-6NP36**	6.4
	265	75	**100**	200	**250**	330	2	2	96 ... 127 200 ... 277	**3RT12 65-6NF36** **3RT12 65-6NP36**	
	300	100	**125**	250	**300**	330	2	2	96 ... 127 200 ... 277	**3RT12 66-6NF36** **3RT12 66-6NP36**	
S12	400	125	**150**	300	**400**	610	2	2	96 ... 127 200 ... 277	**3RT12 75-6NF36** **3RT12 75-6NP36**	9.6
	500	150	**200**	400	**500**	610	2	2	96 ... 127 200 ... 277	**3RT12 76-6NF36** **3RT12 76-6NP36**	

.

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 2/55.
For auxiliaries and accessories, see page 2/70 .
For spare parts, see page 2/100-2/101.
For technical data, see page 2/157-2/162.
For int. circuit diagrams, see page 2/201
For dimension drawings, see page 2/221.

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 snappped 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 3RT231. 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 3RT232. 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 [1]	Rated control supply voltage U_s	DC Operation Screw Terminals [1]
AC-1 Max resist. current I_e		**UL ratings** AC loads at **600 V**,	Ident-ification No.	Version			Order No.		Order No.
40°C	60°C	60 Hz							
Amps		**Amps**		NO	NC	V AC		V DC	
For screwing and stapping onto 35 mm mounting rail									
Size S00 – Auxiliary switches can be retrofitted									
18	16	**18**	—	—	—	24	**3RT23 16-1AB00**	24	**3RT23 16-1BB40**
						110/120	**3RT23 16-1AK60**	125	**3RT23 16-1BG40**
						220/240	**3RT23 16-1AP60**	220	**3RT23 16-1BM40**
22	20	**20**	—	—	—	24	**3RT23 17-1AB00**	24	**3RT23 17-1BB40**
						110/120	**3RT23 17-1AK60**	125	**3RT23 17-1BG40**
						220/240	**3RT23 17-1AP60**	220	**3RT23 17-1BM40**
Size S0 – Terminal designations according to EN 50012 —1 NO + 1 NC, identification number 11E									
35 [2]	30 [2]	**30**	11E	1	1	24	**3RT23 25-1AC20**	24	**3RT23 25-1BB40**
						110/120	**3RT23 25-1AK60**	125	**3RT23 25-1BG40**
						220/240	**3RT23 25-1AP60**	220	**3RT23 25-1BM40**
40 [2]	35 [2]	**35**	11E	1	1	24	**3RT23 26-1AC20**	24	**3RT23 26-1BB40**
						110/120	**3RT23 26-1AK60**	125	**3RT23 26-1BG40**
						220/240	**3RT23 26-1AP60**	220	**3RT23 26-1BM40**
50 [2]	42 [2]	**38**	11E	1	1	24	**3RT23 27-1AC20**	24	**3RT23 27-1BB40**
						110/120	**3RT23 27-1AK60**	125	**3RT23 27-1BG40**
						220/240	**3RT23 27-1AP60**	220	**3RT23 27-1BM40**
Size S2								V UC	
60	55	**60**	11E	1	1	24	**3RT23 36-1AC20**	20-33	**3RT23 36-1NB30**
						110/120	**3RT23 36-1AK60**	83-155	**3RT23 36-1NF30**
						220/240	**3RT23 36-1AP60**	175-280	**3RT23 36-1NP30**
110	95	**105**	11E	1	1	24	**3RT23 37-1AC20**	20-33	**3RT23 37-1NB30**
						110/120	**3RT23 37-1AK60**	83-155	**3RT23 37-1NF30**
						220/240	**3RT23 37-1AP60**	175-280	**3RT23 37-1NP30**
Size S3								V UC	
140	130	**120**	—	—	—	24	**3RT23 46-1AC20**	20-33	**3RT23 46-1NB30**
						110/120	**3RT23 46-1AK60**	83-155	**3RT23 46-1NF30**
						220/240	**3RT23 46-1AP60**	175-280	**3RT23 46-1NP30**

3RT23 17-1AP60

3RT23 27-1AP60

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 2/51.
For coil voltage tolerance, p. 2/51
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.

For technical data, see page 2/171-2/172.
For in. circuit diagrams, see page 2/196-2/201.
For dimension drawings, see page 2/222.

Contactors for Special Applications

SIRIUS

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.
	IEC Ratings										
Maximum current	Rated power of three phase loads cos Ø = 0.95 (@ 60°C)				Max Current	230/ 240V	460/ 480V	575/ 600V			
Amps	230V kW	400V kW	500V kW	690V kW	Amps	Hp	Hp	Hp			kg
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.

3RT14 7.

Size	Ratings AC-1 utilization category,					UL Rating	Auxiliary contacts, lateral		Rated control supply voltage U_s	Order No.	Weight approx.
		IEC Ratings									
	AC-1 Maximum resistive current	Rated power of three phase loads cos Ø = 0.95 (@ 60°C)				Max Current					
	Amps	230V kW	400V kW	500V kW	690V kW	Amps	NO	NC	AC/DC V		kg
Conventional operating mechanism											
S6	**275**	95	165	205	285	210	2	2	110 ... 127 220 ... 240	**3RT14 56-6AF36** **3RT14 56-6AP36**	3.1
S10	**400**	145	250	315	430	360	2	2	110 ... 127 220 ... 240	**3RT14 66-6AF36** **3RT14 66-6AP36**	5.7
S12	**690**	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											
S6	**275**	95	165	205	285	210	2	2	96 ... 127 200 ... 277	**3RT14 56-6NF36** **3RT14 56-6NP36**	3.1
S10	**400**	145	250	315	430	360	2	2	96 ... 127 200 ... 277	**3RT14 66-6NF36** **3RT14 66-6NP36**	5.7
S12	**690**	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											
S6	**275**	95	165	205	285	210	1	1	96 ... 127 200 ... 277	**3RT14 56-6PF35** **3RT14 56-6PP35**	3.1
S10	**400**	145	250	315	430	360	1	1	200 ... 277	**3RT14 66-6PP35**	5.7
S12	**690**	245	430	535	740	580	1	1	200 ... 277	**3RT14 76-6PP35**	9.1

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 2/51.
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.
For technical data, see page 2/163-2/170.
For int. circuit diagrams, see page 2/201.
For dimension drawings, see page 2/216, 2/218-2/219.

Contactors for Special Applications

SIRIUS

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)

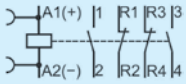
Application

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

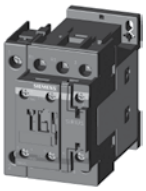
Selection and ordering data

Rating data: AC-2/AC-3 T_U: up to 60°C, Max Current I_e at 400 V	Max motor HP at **460 V**, 60 Hz		AC-1 Max resistive current 40°C	AC-1 Max resistive current 60°C	Auxiliary contacts Version		Rated control supply voltage U_S	**AC Operation** [2] **Screw terminals** Order No.	Rated control supply voltage U_S	**DC Operation** [2] **Screw terminals** Order No.
Amps	**NO**	**NC**	Amps		NO	NC	V AC, 50/60 Hz		V DC	
For screwing and snapping onto 35 mm standard mounting rail										
Size S00 [3] - Auxiliary switches can be retrofitted										
9		**5**	18	16	—	—	24	**3RT25 16-1AB00**	24	**3RT25 16-1BB40**
							110/120	**3RT25 16-1AK60**	125	**3RT25 16-1BG40**
							220/240	**3RT25 16-1AP60**	220	**3RT25 16-1BM40**
12		**7.5** [4]	22	20	—	—	24	**3RT25 17-1AB00**	24	**3RT25 17-1BB40**
							110/120	**3RT25 17-1AK60**	125	**3RT25 17-1BG40**
							220/240	**3RT25 17-1AP60**	220	**3RT25 17-1BM40**
16		**10** [4]	22	20	—	—	24	**3RT25 18-1AB00**	24	**3RT25 18-1BB40**
							110/120	**3RT25 18-1AK60**	125	**3RT25 18-1BG40**
							220/240	**3RT25 18-1AP60**	220	**3RT25 18-1BM40**
Size S0 - Terminal designations according to EN 50012, 1 NO + 1 NC, identification number 11E										
25	**15**	**15**	40	35	1	1	24	**3RT25 26-1AC20**	24	**3RT25 26-1BB40**
							110/120	**3RT25 26-1AK60**	125	**3RT25 26-1BG40**
							220/240	**3RT25 26-1AP60**	220	**3RT25 26-1BM40**
Size S2										
									V UC	
35	**30**	**20**	60	55	1	1	24	**3RT25 35-1AC20**	20-33	**3RT25 35-1NB30**
							110/120	**3RT25 35-1AK60**	83-155	**3RT25 35-1NF30**
							220/240	**3RT25 35-1AP60**	175-280	**3RT25 35-1NP30**
41	**30**	**25**	70	60	1	1	24	**3RT25 36-1AC20**	20-33	**3RT25 36-1NB30**
							110/120	**3RT25 36-1AK60**	83-155	**3RT25 36-1NF30**
							220/240	**3RT25 36-1AP60**	175-280	**3RT25 36-1NP30**

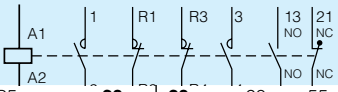
3RT25 16-1AB00



3RT25 26-1AC20



3RT25 35-1AC20



For further voltages, see page 2/51.
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.
For technical data, see page 2/173-2/174.
For int. circuit diagrams, see page 2/196-2/201.
For dimension drawings, see page 2/222.

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.

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

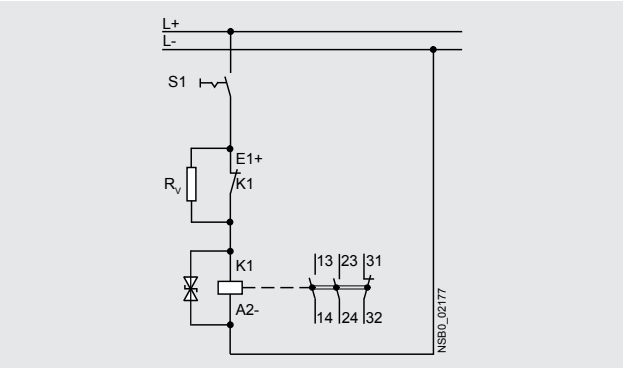
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

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

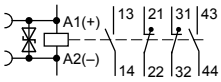
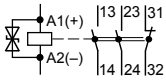
Side-by-side mounting is permitted at ambient temperatures up to 70 °C.

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_u: 70 °C at 230 V	400 V	500 V	690 V	Contacts Version NO	NC	Rated control supply voltage U_s	Spring-type terminals Order No.	Weight approx.
A	A	A	A			V DC		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[1]	24 110	**3RH21 22-2KB40** **3RH21 22-2KF40**	0.300 0.300
With series resistor								
Terminal designations according to EN 50005								
2 NO + 1 NC, identification number **21E**								
								
10	3	2	1	2	1[2]	24 110	**3RH21 22-2KB40-0LA0** **3RH21 22-2KF40-0LA0**	0.300 0.300

[1] It is not possible to mount an auxiliary switch block.

[2] 4-pole auxiliary switch block according to EN 50005 can be mounted.

More information

Contactors	Type		3RH21 ..
Upright mounting position			
• Contactors with series resistor			Special version (on request)
• Contactors without series resistor			Special version (on request)
Ambient temperature			
• During operation		°C	-40 ... +70
• During storage		°C	-55 ... +80
Solenoid coil operating range	DC		0.7 ... 1.25 x U_s
Power consumption of the solenoid coils			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.

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 x 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 x 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

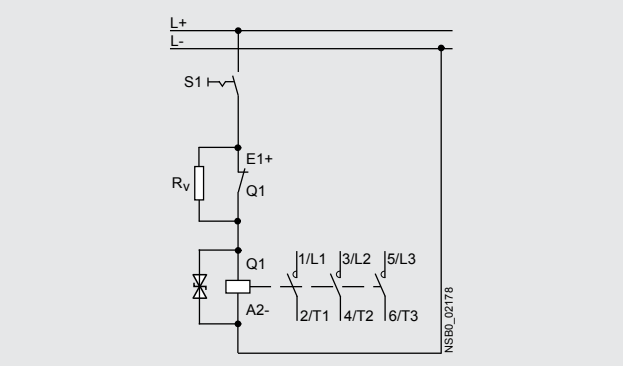
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

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 x 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 x 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 x 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 2/60).

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

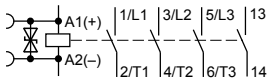
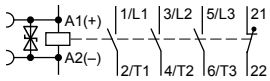
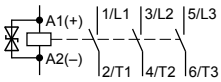
3RT20 motor contactors, 7.5 ... 25 HP

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 AC-3					Auxiliary contacts			Rated control supply voltage U_s	Spring-type terminals		Weight approx.
Operational current I_e at	Ratings of induction motors at				Ident. No.	Version			Order No.		
400 V	200 V	230 V	**460 V**	575 V		NO	NC				
A	HP	HP	**HP**	HP				V DC			kg
3RT20 contactors for switching motors											
Size S00											
Without series resistor[4]											
Terminal designations according to EN 50012 or EN 50005											
• 1 NO, identification number **10E**											
											
• 1 NC, identification number **01**											
											
12	--	3	**7.5**	10	**10E**[1]	1	--	24 125	**3RT20 17-2KB41** **3RT20 17-2KG41**		0.300 0.300
12	--	3	**7.5**	10	**01**[1]	--	1	24 125	**3RT20 17-2KB42** **3RT20 17-2KG42**		0.300 0.300
With series resistor											
											
12	--	3	**7.5**	10	**--**[2]	--	1[3]	24 125	**3RT20 17-2KB42-0LA0** **3RT20 17-2KG42-0LA0**		0.300 0.300
16	--	5	**10**	10	**--**[2]	--	1[3]	24 125	**3RT20 18-2KB42-0LA0** **3RT20 18-2KG42-0LA0**		0.300 0.300

For accessories and spare parts, see page 2/68-2/71.

1) 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.

2) One 4-pole auxiliary switch block according to EN 50005 can be mounted; no distance required up to 70 °C.

3) NC contact cannot be used because it is required for switching the series resistor.

4) 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

Rated data AC-3					Auxiliary contacts			Rated control supply voltage U_s	Spring-type terminals	Weight approx.
Operational current I_e at	Ratings of induction motors at				Ident. No.	Version			Order No.	
400 V	200 V	230 V	460 V	**575 V**		NO	NC			
A	HP	HP	HP	**HP**				V DC		kg
3RT20 contactors for switching motors										
Size S0										
Terminal designations according to EN 50012 1 NO + 1 NC, identification number **11E**										
Without series resistor[1]										
16	--	5	10	**15**	**11E**	1	1	24 125	**3RT20 25-2KB40** **3RT20 25-2KG40**	0.600 0.600
25	--	7.5	15	**20**	**11E**	1	1	24 125	**3RT20 26-2KB40** **3RT20 26-2KG40**	0.600 0.600
32	--	10	20	**25**	**11E**	1	1	24 125	**3RT20 27-2KB40** **3RT20 27-2KG40**	0.600 0.600
With solid-state operating mechanism										
16	--	5	10	**15**	**11E**	1	1	24 125	**3RT20 25-2XB40-0LA2** **3RT20 25-2XG40-0LA2**	0.580 0.580
25	--	7.5	15	**20**	**11E**	1	1	24 125	**3RT20 26-2XB40-0LA2** **3RT20 26-2XG40-0LA2**	0.580 0.580
32	--	10	20	**25**	**11E**	1	1	24 125	**3RT20 27-2XB40-0LA2** **3RT20 27-2XG40-0LA2**	0.580 0.580
38	--	10	25	**25**	**11E**	1	1	24 125	**3RT20 28-2XB40-0LA2** **3RT20 28-2XG40-0LA2**	0.580 0.580

For accessories and spare parts, see page 2/68-2/71.

[1] 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
Ambient temperature						
• During operation		°C	-40 ... +70			
• During storage		°C	-55 ... +80			
Solenoid coil operating range	DC		0.7 ... 1.25 x U_s		0.7 ... 1.3 x U_s	
Power consumption of the solenoid coils			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 2)					Current	Auxiliary contacts, unassigned	Rated control supply voltage U_s 1) 3)	Screw connection Order No.	Weight approx.
	UL capacitor rating at operational voltage									
		200/208	230/240	460/480	575/600					
	Phase	kvar	kvar	kvar	kvar			AC		kg
For screwing and snapping onto 35 mm standard mounting rail										
3RT26 17-1AK63	**• Size S00**									
	1Ø	3.6	4	8.3	10	18	1NO / 1NC	24 V, 50/60 Hz	**3RT26 17-1AB03**	0.24
	3Ø	6.2	6.9	14	17			120 V, 60 Hz	**3RT26 17-1AK63**	
								240 V, 60 Hz	**3RT26 17-1AP63**	
	• Size S0									
	1Ø	4.8	5.3	11	13	24	1NO / 2NC	24 V, 50/60 Hz	**3RT26 25-1AC25**	0.49
	3Ø	8.3	9.1	18	23			120 V, 60 Hz	**3RT26 25-1AK65**	
								240 V, 60 Hz	**3RT26 25-1AP65**	
	1Ø	5.8	6.4	13	16	29	1NO / 2NC	24 V, 50/60 Hz	**3RT26 26-1AC25**	0.49
	3Ø	10	11	22	28			120 V, 60 Hz	**3RT26 26-1AK65**	
								240 V, 60 Hz	**3RT26 26-1AP65**	
3RT2637-1NF35	1Ø	6.6	7.3	15	18	33	1NO / 2NC	24 V, 50/60 Hz	**3RT26 27-1AC25**	0.49
	3Ø	11	13	25	31			120 V, 60 Hz	**3RT26 27-1AK65**	
								240 V, 60 Hz	**3RT26 27-1AP65**	
	1Ø	8.6	9.5	20	24	43	1NO / 2NC	24 V, 50/60 Hz	**3RT26 28-1AC25**	0.59
	3Ø	15	16	33	41			120 V, 60 Hz	**3RT26 28-1AK65**	
								240 V, 60 Hz	**3RT26 28-1AP65**	
	• Size S2									
	1Ø	14	16	33	40	72A	2 NC	23-33 VUC	**3RT26 36-1NB35**	1.11
	3Ø	25	27	55	69			83-155 VUC	**3RT26 36-1NF35**	
								175-280 VUC	**3RT26 36-1NP35**	
	1Ø	20	22	45	54	98A	2 NC	20-33 VUC	**3RT26 37-1NB35**	1.11
	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 2/51.
For auxiliaries and accessories, see page 2/68-2/85.
For technical data, see page 2/175.
For wiring diagram, see page 2/203.
For dimension drawings, see page 2/223.

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
	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.
	AC-3		Ident. no.	Design		Order No.	Order No.	(screw/ spring)
	Maximum inductive current	Maximum[1]) horsepower ratings at 460 V						
	Amps	**HP**		NO	NC			kg
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** × 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**	**10E**	1	–	**3RT20 15-1HB41**	**3RT20 15-2HB41**	0.28/0.30
			01	–	1	**3RT20 15-1HB42**	**3RT20 15-2HB42**	
Diode integrated	7	**3**	**10E**	1	–	**3RT20 15-1J B41**	**3RT20 15-2J B41**	0.28/0.30
			01	–	1	**3RT20 15-1J B42**	**3RT20 15-2J B42**	
Suppressor diode integrated	7	**3**	**10E**	1	–	**3RT20 15-1KB41**	**3RT20 15-2KB41**	0.28/0.30
			01	–	1	**3RT20 15-1KB42**	**3RT20 15-2KB42**	
Diode, varistor or RC element can be mounted	9	**5**	**10E**	1	–	**3RT20 16-1HB41**	**3RT20 16-2HB41**	0.28/0.30
			01	–	1	**3RT20 16-1HB42**	**3RT20 16-2HB42**	
Diode integrated	9	**5**	**10E**	1	–	**3RT20 16-1J B41**	**3RT20 16-2J B41**	0.28/0.30
			01	–	1	**3RT20 16-1J B42**	**3RT20 16-2J B42**	
Suppressor diode integrated	9	**5**	**10E**	1	–	**3RT20 16-1KB41**	**3RT20 16-2KB41**	0.28/0.30
			01	–	1	**3RT20 16-1KB42**	**3RT20 16-2KB42**	
Diode, varistor or RC element can be mounted	12	**7.5**	**10E**	1	–	**3RT20 17-1HB41**	**3RT20 17-2HB41**	0.28/0.30
			01	–	1	**3RT20 17-1HB42**	**3RT20 17-2HB42**	
Diode integrated	12	**7.5**	**10E**	1	–	**3RT20 17-1J B41**	**3RT20 17-2J B41**	0.28/0.30
			01	–	1	**3RT20 17-1J B42**	**3RT20 17-2J B42**	
Suppressor diode integrated	12	**7.5**	**10E**	1	–	**3RT20 17-1KB41**	**3RT20 17-2KB41**	0.28/0.30
			01	–	1	**3RT20 17-1KB42**	**3RT20 17-2KB42**	

For technical data, see page 2/176.
For int. circuit diagrams, see page 2/195-2/200.
For dimension drawings, see page 2/214.

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 Utilization category		Auxiliary contacts			Screw connection	Spring-type connection	Weight approx.
	AC-3		Ident. no.	Design		Order No.	Order No.	(screw/ spring)
	Maximum inductive current	Maximum horsepower ratings at 460 V						
	Amps	**HP**		NO	NC			kg
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 to 1.85** × 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**	1	–	**3RT20 15-1M B41-0KT0**	**3RT20 15-2M B41-0KT0**	0.28/0.30
			01	–	1	**3RT20 15-1M B42-0KT0**	**3RT20 15-2M B42-0KT0**	
Diode integrated	7	**3**	**10E**	1	–	**3RT20 15-1VB41**	**3RT20 15-2VB41**	0.28/0.30
			01	–	1	**3RT20 15-1VB42**	**3RT20 15-2VB42**	
Suppressor diode integrated	7	**3**	**10E**	1	–	**3RT20 15-1SB41**	**3RT20 15-2SB41**	0.28/0.30
			01	–	1	**3RT20 15-1SB42**	**3RT20 15-2SB42**	
Diode, varistor or RC element can be mounted	9	**5**	**10E**	1	–	**3RT20 16-1M B41-0KT0**	**3RT20 16-2M B41-0KT0**	0.28/0.30
			01	–	1	**3RT20 16-1M B42-0KT0**	**3RT20 16-2M B42-0KT0**	
Diode integrated	9	**5**	**10E**	1	–	**3RT20 16-1VB41**	**3RT20 16-2VB41**	0.28/0.30
			01	–	1	**3RT20 16-1VB42**	**3RT20 16-2VB42**	
Suppressor diode integrated	9	**5**	**10E**	1	–	**3RT20 16-1SB41**	**3RT20 16-2SB41**	0.28/0.30
			01	–	1	**3RT20 16-1SB42**	**3RT20 16-2SB42**	
Diode, varistor or RC element can be mounted	12	**7.5**	**10E**	1	–	**3RT20 17-1M B41-0KT0**	**3RT20 17-2M B41-0KT0**	0.28/0.30
			01	–	1	**3RT20 17-1M B42-0KT0**	**3RT20 17-2M B42-0KT0**	
Diode integrated	12	**7.5**	**10E**	1	–	**3RT20 17-1VB41**	**3RT20 17-2VB41**	0.28/0.30
			01	–	1	**3RT20 17-1VB42**	**3RT20 17-2VB42**	
Suppressor diode integrated	12	**7.5**	**10E**	1	–	**3RT20 17-1SB41**	**3RT20 17-2SB41**	0.28/0.30
			01	–	1	**3RT20 17-1SB42**	**3RT20 17-2SB42**	
• Size S0								
Rated control supply voltage U_s = DC 24 V, coil voltage tolerance **0.7 to 1.25** × 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 2/176.
For int. circuit diagrams, see page 2/195-2/200.
For dimension drawings, see page 2/214.

Contactors & Relays for Safety Applications

SIRIUS

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

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 2/25 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 2/20 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	3RH1911
S0	3RT202	3RH2921
	3RT232	
	3RT252	
	3RT262	3RH2921
S2	3RT203	3RH2921
	3RT233	
	3RT253	
	3RT263	
S3	3RT204	3RH2921
	3RT234	
	3RT244	
	3RT264	
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 2/68-2/70.
For control relays, see pages 2/52-2/54.
For auxiliaries contact blocks, see page 2/68-2/70..

Contactors & Relays for Safety Applications

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

Application

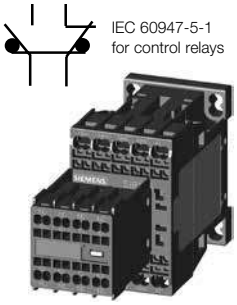
"Safety" Contactors

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 "unitentional 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 "unitentional misuse" as specified in IEC 60292, paragraph 3.12. Tested by SUVA.



3RH22**-2BB40

Application

Frame Size	Max. current AC3 A	Max. current AC1 A	Single-phase HP ratings 115V HP	Single-phase HP ratings 220/240V HP	Three-phase HP ratings 200V HP	Three-phase HP ratings 230V HP	Three-phase HP ratings 460V HP	Three-phase HP ratings 575V HP	Auxiliary contacts Ident. No.	Auxiliary contacts NO	Auxiliary contacts NC	Screw Terminals Order No.	Spring-Type Terminals [1] 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	⅓	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**
	80[4]	90	5	15	20	25	50	**60**	22E	2	2	**3RT2038-1●●●4-3MA0**	**3RT2038-3●●●4-3MA0**
S3	80	120	7 ½	15	25	30	60	**75**	22E	2	2	**3RT2045-1●●●4-3MA0**	**3RT2045-3●●●4-3MA0**
	95	120	10	20	30	30	75	**100**	22E	2	2	**3RT2046-1●●●4-3MA0**	**3RT2046-3●●●4-3MA0**
S6	150	185	--	30	50	60	125	**150**	22E	2	2	**3RT1055-6●●●6-3PA0**	—
	185	215	--	30	60	75	150	**200**	22E	2	2	**3RT1056-6●●●6-3PA0**	—
S10	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**	—
S12	400	430	--	--	125	150	300	**400**	22E	2	2	**3RT1075-6●●●6-3PA0**	—
	500	610	--	--	150	200	400	**500**	22E	2	2	**3RT1076-6●●●6-3PA0**	—

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

Frame Size S00 - S0	●●●
120 V AC	**AK6**
120 V AC, integrated varistor	**CK6**
230 V AC	**AP0**
24 V DC	**BB4**
24 V DC, integrated varistor	**DB4**
24 V DC, integrated diode assy.	**FB4**

Frame Size S2	●●●
120 V AC	**AK6**
120 V AC w/ Varistor	**CK6**
24 V DC w/Varistor	**KB4**

Frame Size S3	●●●
120 V AC **	**AK6**
24V DC w/ integrated varistor	**KB4**
24V AC/DC w/integrated varistor	**NB3**

Frame Size S6 - S10	●●●
	AB3
21-27 V UC*, solid state coil w/ PLC interface	**NB3**
110 … 127 V UC*, conventional coil	**AF3**
Frame Size S6 - S12	**●●●**
96 ... 127, fail-safe coil	**SF3**
200 ... 277, fail-safe coil	**SP3**

*UC coil: accepts DC voltage or AC voltage, 40 to 60 Hz.

Frame Size	Max. current at 240 V [2] A	Rated control supply voltage U_s	Auxiliary contacts Ident. No.	Auxiliary contacts NO	Auxiliary contacts NC	Screw Terminals [3] Order No.	Spring Terminals [3] Order No.
Control relays with permanently mounted auxiliary contact blocks							
S00-S00	**10**	110 V AC, 50 Hz / 120 V AC, 60 Hz	44E	4	4	**3RH2244-1AK60**	**3RH2244-2AK60**
	10	24 V DC	44E	4	4	**3RH2244-1BB40**	**3RH2244-2BB40**
	10	110 V AC, 50 Hz / 120 V AC, 60 Hz	62E	6	2	**3RH2262-1AK60**	**3RH2262-2AK60**
	10	24 V DC	62E	6	2	**3RH2262-1BB40**	**3RH2262-2BB40**

For other voltages see page 2/51.
For accessories, see pages 2/75-2/80.
For spare parts, see pages 2/96-2/99.
For technical data, see pages 2/121-2/142.
For description, see pages 2/106-2/107.
For int. circuit diagrams, see page 2/195-2/201.
For dimension drawings, see pages 2/214-2/221.

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

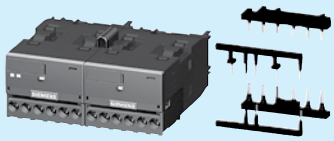
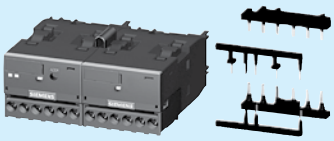
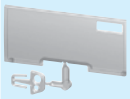
4) Max UL FLA = 65A at 460V

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[1]	SIRIUS function modules for AS-Interface[1]
For direct-on-line starting	Timing relays: ON or OFF-delay with semiconductor output With screw or spring-type terminals 	With screw or spring-type terminals 	With screw or spring-type terminals
For reversing starting	Wiring modules for sizes S00, S0 & S2 With screw or spring-type terminals · (with screw terminals for main and control circuit) 	1 function module for size S00, S0 & S2, screw and spring-type connection, plus the respective wiring modules[1] 	1 function module for size S00, S0 & S2, screw and spring-type connection, plus the respective wiring modules[1] 
For wye-delta starting	1 function module for size S00, S0 & S2, screw and spring-type connection of the contactors, plus the respective wiring modules[2] 	For wye-delta starting: 1 function module for size S00, S0 & S2, plus screw and spring-type connection, plus the respective wiring modules[2] 	For wye-delta starting: 1 function module for size S00, S0 & S2, plus screw and spring-type connection, plus the respective wiring modules[2]
Accessories	Sealable covers 	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 	AS-Interface addressing units Sealable covers

[1] Use of the communication-capable function modules for IO-Link or AS-Interface requires contactors with communication interface (see pages 2/28).

[2] 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 2/39.

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.
		AC3	AC1	115V	230V	208V	230V	460V	**575V**	NO	NC	Order No.	Order No.	kg
3RT 3-pole Contactors														
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**	
		16	22	1	2	3	5	10	**10**	1	0	**3RT2018-1BB41-0CC0**	**3RT2018-2BB41-0CC0**	
										0	1	**3RT2018-1BB42-0CC0**	**3RT2018-2BB42-0CC0**	
3RT2028-1BB40-0CC0	**S0**	**9**	40	1	1	2	3	5	**7.5**	1	1	**3RT2023-1BB40-0CC0**	**3RT2024-2BB40-0CC0**	0.58
		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**	
		32	50	2	5	10	10	20	**25**	1	1	**3RT2027-1BB40-0CC0**	**3RT2027-2BB40-0CC0**	
		38	50	3	5	10	10	25	**25**	1	1	**3RT2028-1BB40-0CC0**	**3RT2028-2BB40-0CC0**	
3RT2038-1NB30-0CC0	**S2**	**40**	60	3	7.5	10	15	30	**40**	1	1	**3RT2035-1NB30-0CC0**	**3RT2035-3NB30-0CC0**	1.122
		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.

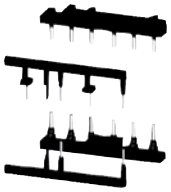
For reversing contactors with communication capability, see pages 2/41-2/45
For accessories, see page 2/29, 2/32, 2/36.
For technical data, see page 2/33, 2/37, 2/38
For description, see page 2/26.
For further information on IO-Link and AS-Interface, see page 2/30-2/31 and 2/34-2/35.

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

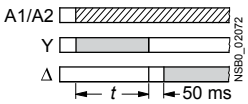
For contactors	Rated control supply voltage U_s [1]	Time setting range *t*	Screw terminals	Weight approx.	Spring-type [2] terminals	Weight approx.
Type	V	s	Order No.	kg	Order No.	kg
Assembly kits for reversing starting						
	Assembly kits for making 3-pole contactor assemblies The assembly kit contains: Mechanical interlock; 2 connecting clips for 2 contactors, wiring modules on the top and bottom					
3RT20 1.	• For size S00		**3RA29 13-2AA1**	0.046	**3RA29 13-2AA2**	0.070
3RT20 2.	• For size S0		**3RA29 23-2AA1**	0.089	**3RA29 23-2AA2**	0.112
3RT20 3.	• For size S2 (w/o mechanical interlock, see pg. 2/45)		**3RA29 33-2AA1**	0.159	**3RA29 33-2AA2**	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		**3RA29 13-2BB1**	0.051	**3RA29 13-2BB2**	0.080
3RT20 2.	• For size S0 (only main circuit for version with spring-type terminals)		**3RA29 23-2BB1**	0.099	**3RA29 23-2BB2**	0.133
3RT20 3.	• For size S2 (only main circuit for version with spring-type terminals)		**3RA29 33-2BB1**	0.242	**3RA29 33-2BB2**	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)	**3RA28 16-0EW20**	0.170	**3RA28 16-0EW20**	0.170
Accessories						
	Sealable covers for 3RA27, 3RA28, 3RA29		**3RA29 10-0**	0.002	**3RA29 10-0**	0.002

[1] AC voltage values apply for 50 Hz and 60 Hz.

[2] 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	3RA28 16-0EW20

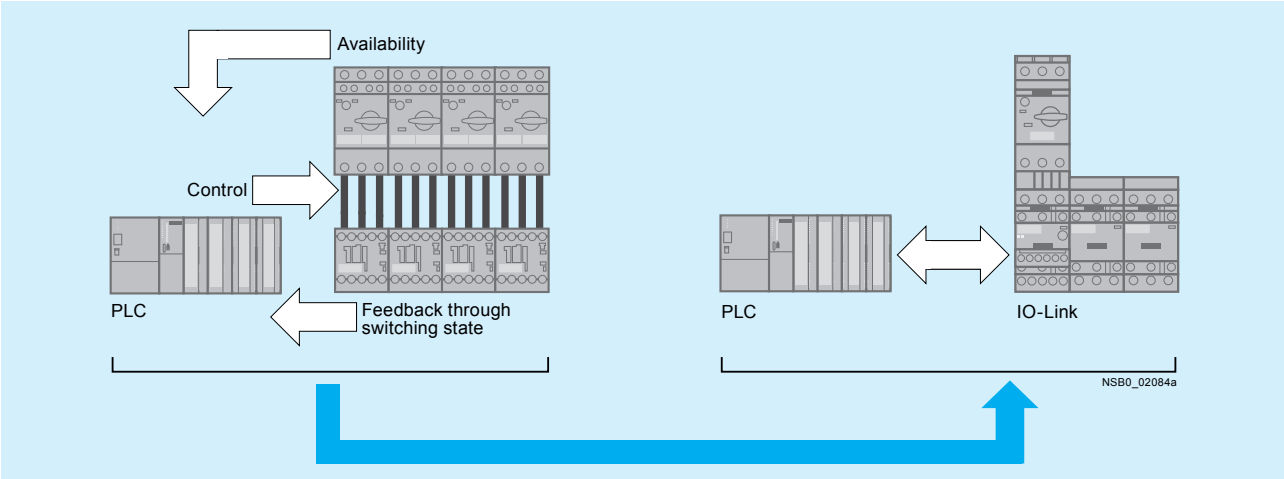


Overview

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:

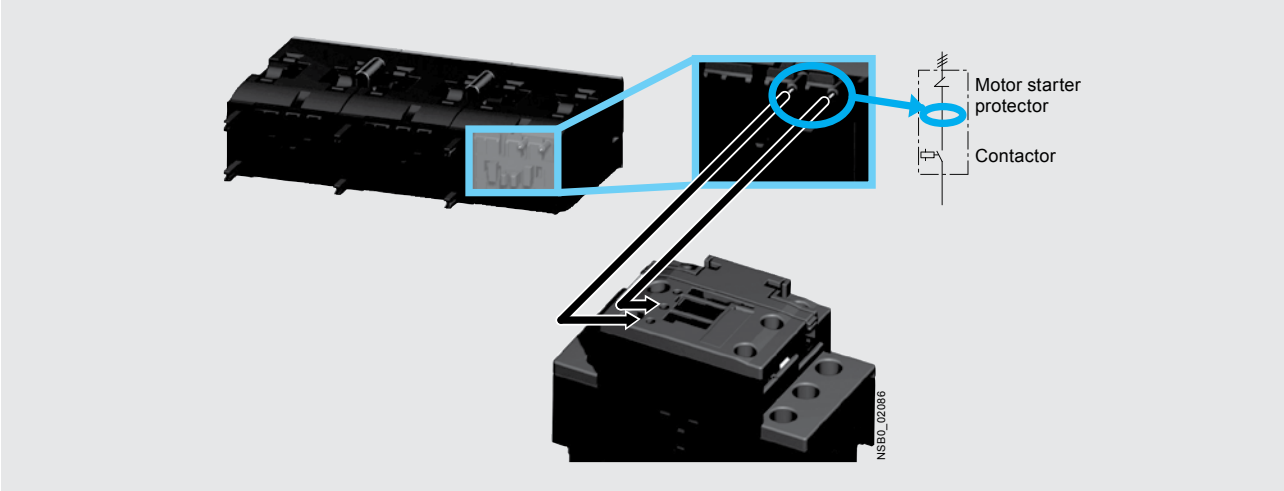
- Availability of the starter in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



Signal transmission through IO-Link

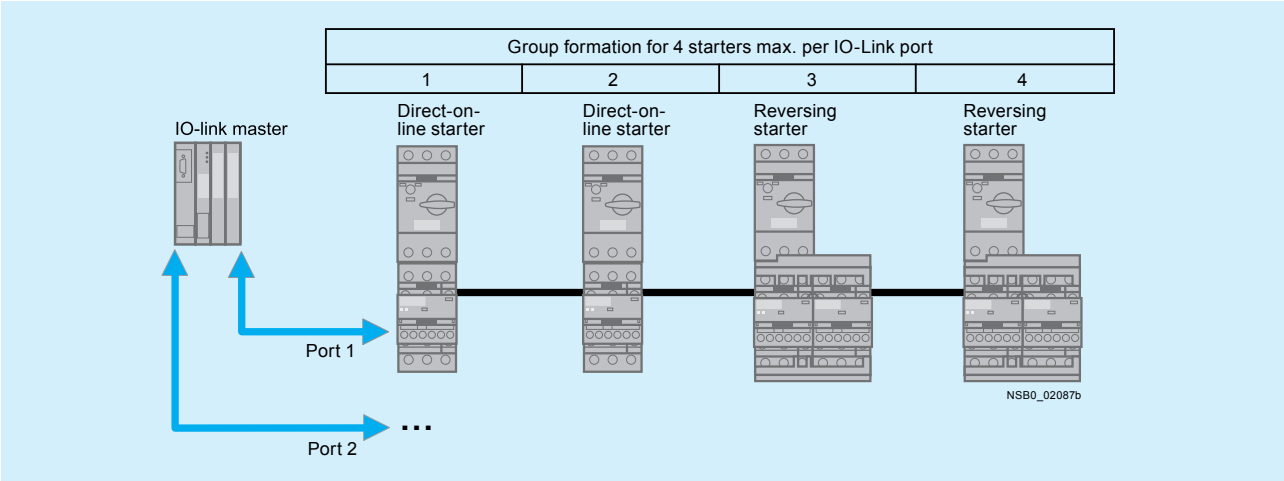
The inquiry from the motor starter protector does not take place through additional wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

This requires the use of communication versions of the contactors with communication interface (see page 2/28).



Availability signal through voltage pick-off

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 a 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

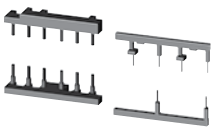
The use of SIRIUS function modules with IO-Link is recommended above all in machines and plants in which there are several motor starters in one control cabinet. Using IO-Link, the connection of these starters to the automation level is easy, quick and error-free. And with IO modules no longer needed, 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 IOLink can be found in Chapter 14 “Industrial Communication”.

Selection and ordering data

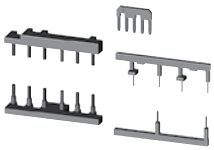
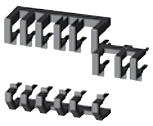
	Version	Screw terminals	Spring-type terminals	Weight
		Order No.	Order No.	kg
Function modules for direct-on-line starting				
3RA2711-1AA00 3RA2711-2AA00	**IO-Link connection** Includes one module connector for assembling an IO-Link group	**3RA2711-1AA00**	**3RA2711-2AA00**	
Function modules for reversing starting[1]				
3RA2711-1BA00 3RA2711-2BA00	**IO-Link connection**, comprising one basic and one coupling module and an additional module connector for assembling an IO-Link group	**3RA2711-1BA00**	**3RA2711-2BA00**	
 3RA2923-2AA1 3RA2923-2AA2	**Assembly kits for making 3-pole contactor assemblies** The assembly kit contains: mechanical interlock, 2 connecting clips for two contactors, wiring modules on the top and bottom			
	• For size S00	**3RA2913-2AA1**	**3RA2913-2AA2**	
	• For size S0			
	- For main, auxiliary and control circuits	**3RA2923-2AA1**	**--**	
	- Only for main circuit[2]	**--**	**3RA2923-2AA2**	
	• For size S2			
	- For main, auxiliary and control circuits	**3RA2933-2AA1**	**--**	
	- Only for main circuit[2]	**--**	**3RA2933-2AA2**	

1) For prewired contactor assemblies for reversing starting with voltage tap-off, see pages 2/42 and 2/45. 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

	Version	Screw terminals	Spring-type terminals	Weight
		Order No.	Order No.	kg
Function modules for wye-delta starting[1)]				
3RA2711-1CA00	**IO-Link connection**, comprising one basic module and two coupling modules, plus an additional module connector for assembling an IO-Link group	**3RA2711-1CA00**	**3RA2711-2CA00**	
 3RA2923-2BB1	**Assembly kits for making 3-pole contactor assemblies[2)]** The assembly kit contains: mechanical interlock, 4 connecting clips for 3 contactors; star jumper, wiring modules on the top and bottom			
	• For size S00	**3RA2913-2BB1**	**3RA2913-2BB2**	
 3RA2923-2BB2	• For size S0			
	- For main, auxiliary and control circuits	**3RA2923-2BB1**	**--**	
	- Only for main circuit[3)]	**--**	**3RA2923-2BB2**	
	• For size S2			
	- For main, auxiliary and control circuits	**3RA2933-2BB1**	**--**	
	- Only for main circuit[3)]	**--**	**3RA2933-2BB2**	

1) For complete contactor assemblies for wye-delta starting including function modules, see pages 2/49 and 2/50.
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 2/28.

	Version	Order No.	Weight
			kg
Accessories			
3RA2711-0EE10	**Module connector set**, comprising: • 2 module connectors, 14-pole, short • 2 interface covers	**3RA2711-0EE10**	
	Module connectors		
	• 14-pole, 9 cm For size jump + 1 space	**3RA2711-0EE06**	
3RA2711-0EE06	• 14-pole, 26 cm For various space combinations	**3RA2711-0EE07**	
	• 14-pole, 33.5 cm For various space combinations	**3RA2711-0EE08**	
3RA2711-0EE15	• 10-pole, 9 cm For separate control signal infeed within an IO-Link group	**3RA2711-0EE16**	
	Interface covers (Set of 5)	**3RA2711-0EE15**	
3RA2910-0	**Sealable covers** For 3RA27, 3RA28, 3RA29	**3RA2910-0**	
Operator panels[1)]			
3RA6935-0A	**Operator panel (set)**, comprising: • 1 x operator panel • 1 x enabling module • 1 x interface cover • 1 x fixing terminal	**3RA6935-0A**	
3RA2711-0EE11	**Connection cable**, length 2 m, 10- to 14-pole For connecting the operator panel to the communication module	**3RA2711-0EE11**	
	Enabling modules (replacement)	**3RA6936-0A**	
	Interface covers (replacement)	**3RA6936-0B**	

1) Suitable only for communication through IO-Link.

For manuals, see http://support.automation.siemens.com/WW/view/en/39319600.

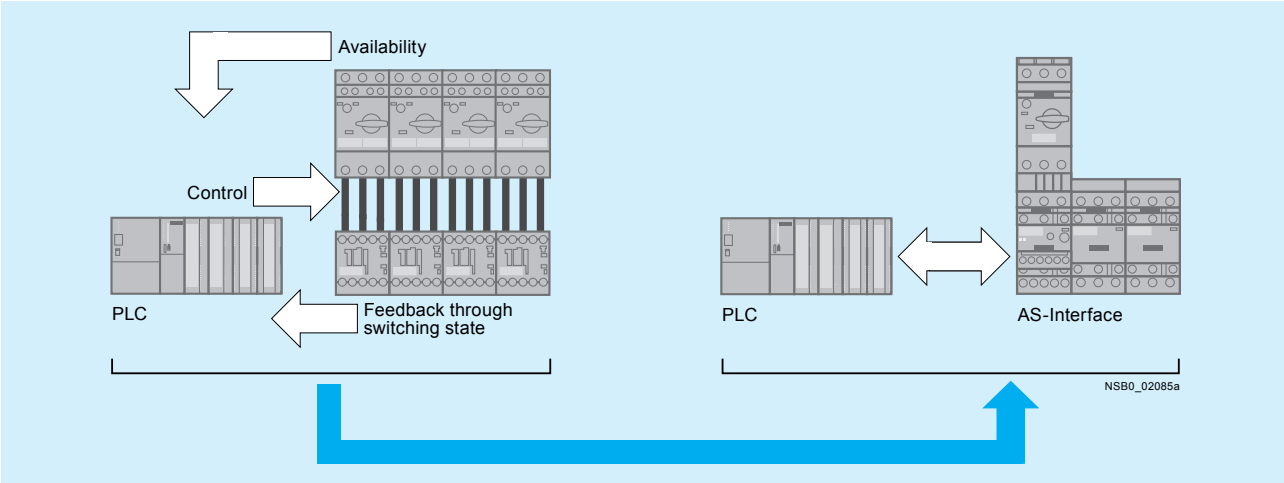
Overview

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 connected 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:

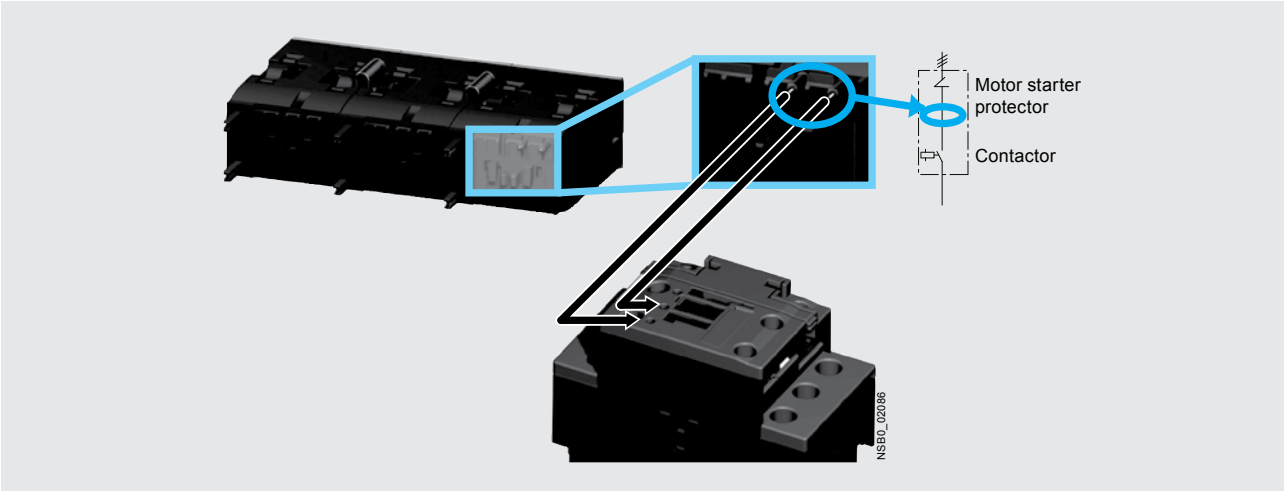
- Availability of the starter in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



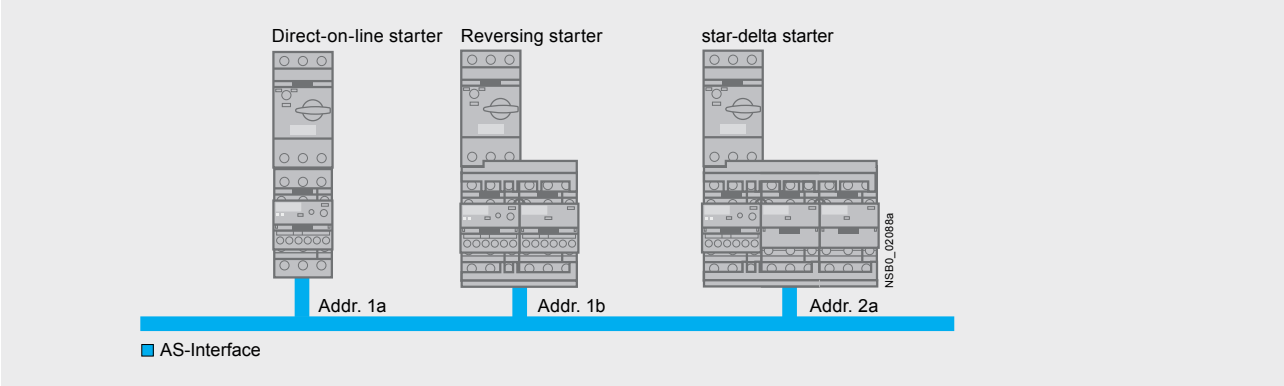
Signal transmission through AS-Interface

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 2/28).



Availability signal through voltage pick-off



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.

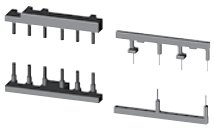
Application

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

Selection and ordering data

	Version	Screw terminals	Spring-type terminals	Weight
		Order No.	Order No.	kg
Function modules for direct-on-line starting				
3RA2712-1AA00	**AS-Interface connection**	**3RA2712-1AA00**	**3RA2712-2AA00**	
3RA2712-2AA00				
Function modules for reversing starting[1]				
3RA2712-1BA00	**AS-Interface connection**, comprising one basic and one coupling module	**3RA2712-1BA00**	**3RA2712-2BA00**	
3RA2712-2BA00				
 3RA2923-2AA1	**Assembly kits for making 3-pole contactor assemblies** The assembly kit contains: mechanical interlock, 2 connecting clips for two contactors, wiring modules on the top and bottom			
	• For size S00	**3RA2913-2AA1**	**3RA2913-2AA2**	
	• For size S0			
	- For main, auxiliary and control current	**3RA2923-2AA1**	**--**	
	- Only for main current	**--**	**3RA2923-2AA2**	
3RA2923-2AA2	• For size S2			
	- For main, auxiliary and control current	**3RA2933-2AA1**	**--**	
	- Only for main current	**--**	**3RA2933-2AA2**	

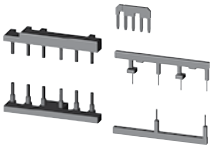
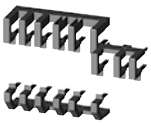
Matching contactors with communications interface required; see page 2/28.

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 2/42 and 2/45. 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

	Version	Screw terminals	Spring-type terminals	Weight
		Order No.	Order No.	kg
Function modules for wye-delta starting[1)]				
3RA2712-1CA00 3RA2712-2CA00	**AS-Interface connection**, comprising one basic module and two coupling modules	**3RA2712-1CA00**	**3RA2712-2CA00**	
 3RA2923-2BB1	**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	**3RA2913-2BB1**	**3RA2913-2BB2**	
 3RA2923-2BB2	• For size S0			
	- For main, auxiliary and control circuits	**3RA2923-2BB1**	**--**	
	- Only for main circuit	**--**	**3RA2923-2BB2**	
	• For size S2			
	- For main, auxiliary and control circuits	**3RA2933-2BB1**	**--**	
	- Only for main circuit	**--**	**3RA2933-2BB2**	

1) For complete contactor assemblies for wye-delta starting including function modules, see pages 2/49 and 2/50.

Matching contactors with communications interface required; see page 2/28.

For matching AS-Interface masters, routers and power supply units, see Chapter 14 “Industrial Communication”.

	Version	Order No.	Weight
			kg
Accessories			
3RA2711-0EE10	**Module connector set**, comprising: • 2 module connectors, 14-pole, short • 2 interface covers	**3RA2711-0EE10**	
3RA2711-0EE06	**Module connectors** • 14-pole, 9 cm For size jump + 1 space	**3RA2711-0EE06**	
3RA2711-0EE15	**Interface covers** (Set of 5)	**3RA2711-0EE15**	
3RA2910-0	**Sealable covers** For 3RA27, 3RA28, 3RA29	**3RA2910-0**	

For manuals, see http://support.automation.siemens.com/WW/view/en/39318922.

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
General data							
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III		V AC	300				
Rated impulse withstand voltage U_{imp}		kV AC	4				
Operating range of excitation			0.85 ... 1.1 x U_s, 0.95 ... 1.05 times the rated frequency				
Overvoltage protection			Varistor integrated				
Rated power		W	1				1
• Power consumption at 230 V AC, 50 Hz		VA	1				2
DIAZED protection	Operational class gG	A	--				4
Switching frequency for load							
• With I_e at 230 V AC		h^{-1}	2 500				--
• With 3RT2 contactor at 230 V AC		h^{-1}	2 500				--
Recovery time		ms	50				150
Minimum ON period		ms	--		35		--
Residual current	Max.	mA	5	--			--
Voltage drop With conducting output	Max.	VA	3.5	--			--
Setting accuracy With reference to upper limit of scale	Typ.		±15 %				
Repeat accuracy	Max.		±1 %				
Electrical endurance							
• With 3RT2028 contactor		Operating cycles	100 000				--
• At AC-15, 250 V, 3 A		Operating cycles	--				100 000
Mechanical endurance		Operating cycles	100 x 10^6				10 x 10^6
Permissible ambient temperature							
• During operation		°C	-25 ... +60				
• During storage		°C	-40 ... +80				
Degree of protection acc. to IEC 60947-1, Appendix C			IP20				
Shock resistance Half-sine acc. to IEC 60068-2-27		*g*/ms	15/11				
Vibration resistance According to IEC 60068-2-6		Hz/mm	10 ... 55/0.35				
Electromagnetic compatibility (EMC)			IEC 61000-6-2, IEC 61000-6-4, IEC 61812-1, IEC 60947-4-1				
Overvoltage protection			Varistor integrated				
Permissible mounting position			Any (see contactor)				
Conductor cross-sections							
Connection type (1 or 2 conductors can be connected)			**Screw terminals**				
• Solid		mm^2	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)				--
• Finely stranded with end sleeve		mm^2	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				--
Connection type (1 or 2 conductors can be connected)			**Spring-type terminals**				
• Operating devices		mm	3.0 x 0.5				--
• Solid		mm^2	2 x (0.25 ... 1.5)				--
• Finely stranded with end sleeve		mm^2	2 x (0.25 ... 1.5)				--
• Finely stranded		mm^2	2 x (0.25 ... 1.5)				--
• AWG cables, solid or stranded		AWG	2 x (24 ... 16)				--

Contactor 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 2/204.

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 1NC 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 2/14 must not be exceeded.

When size S3 contactors are combined with a frontmounted 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.

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 2/42 through 2/46 for complete part numbers.

Maximum horsepower rating at 460 V AC	AC-3 maximum inductive current	Size	Order No.					
			Contactor	Mechanical interlock 2)	Mechanical interlock 3)	Mechanical interlock 4)	Installation kit	**Fully wired and tested contactor assembly**
HP	A							
3	7	**S00**	3RT20 15	3RA29 13-2AA1 6)	–	–	3RA29 13-2AA1 6)	**3RA23 15-8XB30- ...**
5	9		3RT20 16					**3RA23 16-8XB30- ...**
7.5	12		3RT20 17					**3RA23 17-8XB30- ...**
10	16		3RT20 18					**3RA23 18-8XB30- ...**
7.5	12	**S0**	3RT20 24	3RA29 23-2AA1 6)	–	–	3RA29 23-2AA1 6)	**3RA23 24-8XB30- ...**
10	16		3RT20 25					**3RA23 25-8XB30- ...**
15	25		3RT20 26					**3RA23 26-8XB30- ...**
20	32		3RT20 27					**3RA23 27-8XB30- ...**
25	38		3RT20 28					**3RA23 28-8XB30- ...**
30	40	**S2**	3RT20 35	3RA29 34-2B	–	–	3RA29 33-2AA1 7)	**3RA23 35-8XB30-1 . .**
40	50		3RT20 36					**3RA23 36-8XB30-1 . .**
50	65		3RT20 37					**3RA23 37-8XB30-1 . .**
50	80		3RT20 38					**3RA23 38-8XB30-1 . .**
50	65	**S3**	3RT20 44	3RA29 34-2B	–	–	3RA29 43-2AA1 8)	**3RA13 44-8XB30-1 . .**
60	80		3RT20 45					**3RA13 45-8XB30-1 . .**
75	95		3RT20 46					**3RA13 46-8XB30-1 . .**
100	115	**S6**	3RT10 54	–	–	3RA19 54-2A	3RA19 53-2A 9)	**–**
125	150		3RT10 55					
150	185		3RT10 56					
150	225	**S10**	3RT10 64	–	–	3RA19 54-2A	3RA19 63-2A 9)	**–**
200	265		3RT10 65					
250	300		3RT10 66					
300	400	**S12**	3RT10 75	–	–	3RA19 54-2A	3RA19 73-2A 9)	**–**
400	500		3RT10 76					

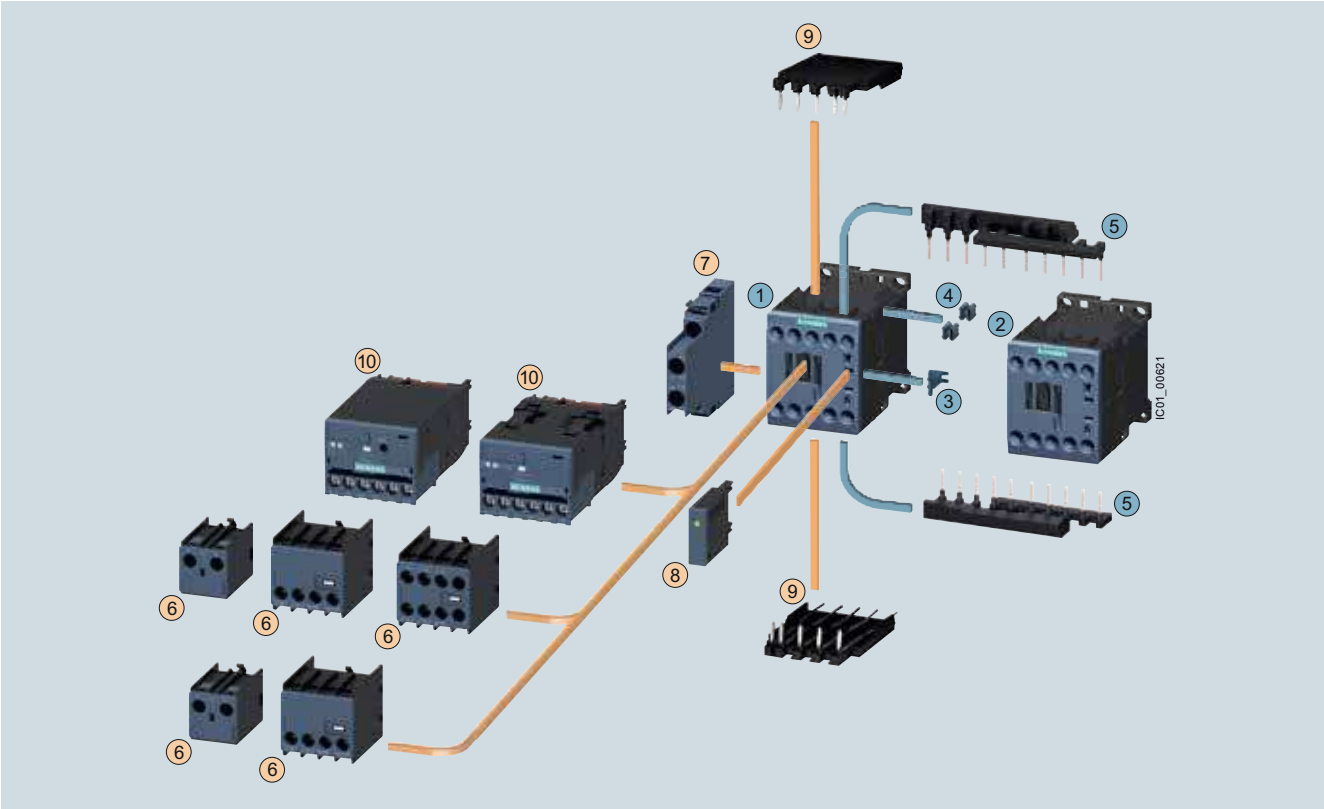
For accessories, see page 2/82-2/85.
For circuit diagrams, see page 2/204.
For dimension drawings, see page 2/224-2/226.

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.

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[1]	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[2]		
	4 Two connecting clips for two contactors[2]		
	5 Wiring modules on the top and bottom for connecting the main current circuits, electrical interlock included[3], interruptible (NC contact interlock)		

[1] Auxiliary switch block according to EN 50005 must be used.

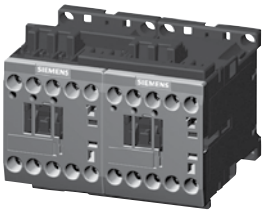
[2] The parts 3 and 4 can only be ordered together as 3RA2912-2H mechanical connectors.

[3] 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.

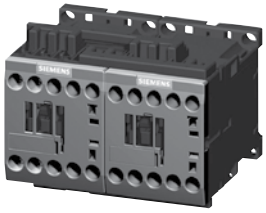
Contactor Assemblies for Switching Motors

3RA23 reversing contactor assemblies

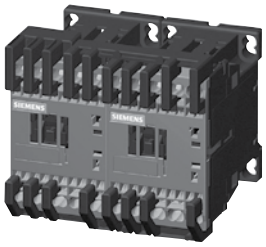
Fully wired and tested contactor assemblies[2] · Size S00 · Up to 10 HP



3RA23 18-8XE30-1BB4



3RA23 1.-8XB30-1A..



3RA23 1.-8XB30-2A..

AC data	UL data									Screw terminals / Spring-type terminals	Weight approx.
Amp ratings	Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage U_s at 50/60 Hz	Auxiliary contacts			
AC2/AC3	115 V	230 V	200 V	230 V	460 V	**575 V**		NO	NC	Order No.	
							V				kg
AC operation, 50/60 Hz											
***Size S00*[1]**											
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[3]											
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

Screw terminals	**1**
Spring-loaded terminals	**2**

For other voltages see page 2/51

For accessories and spare parts, see page 2/68-2/85.

1) For coil operating range, see page 2/51.

2) The contactors integrated in the contactor assemblies have no unassigned auxiliary contacts.

3) For use with 3RA27 and 3RA28 communication modules. See pages 2/26 to 2/33.

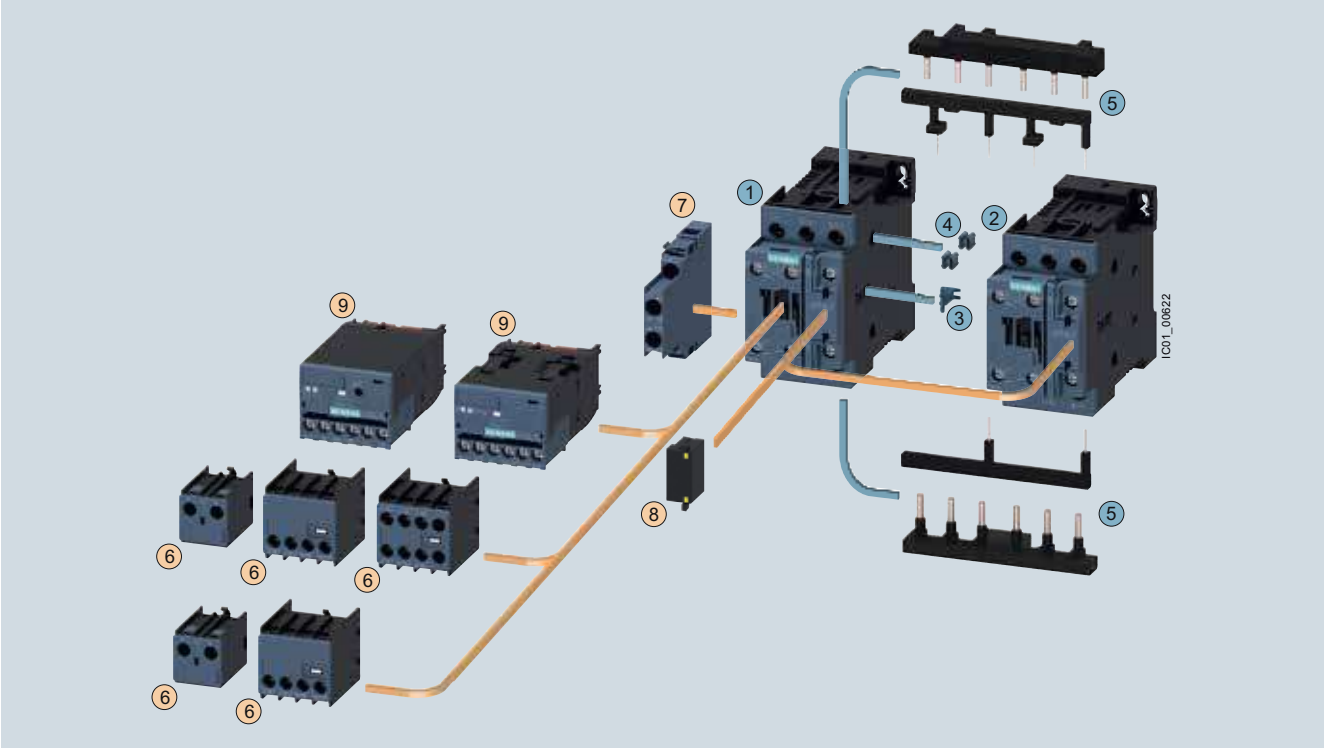
Contactor Assemblies for Switching Motors

SIRIUS

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

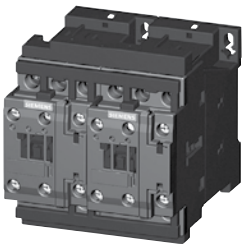
Individual parts		Type Q11	Type Q12
1 2	Contactors, 5.5 kW	3RT2024	3RT2024
1 2	Contactors, 7.5 kW	3RT2025	3RT2025
1 2	Contactors, 11 kW	3RT2026	3RT2026
1 2	Contactors, 15 kW	3RT2027	3RT2027
1 2	Contactors, 18.5 kW	3RT2028	3RT2028
3 ... 5	Assembly kit comprising:	3RA2923-2AA1	
	3 Mechanical interlock[1]		
	4 Two connecting clips for two contactors[1]		
	5 Wiring modules on the top and bottom for connecting the main current circuits, electrical interlock included (NC contact interlock)		

[1] The parts 3 and 4 can only be ordered together as 3RA2922-2H mechanical connectors.

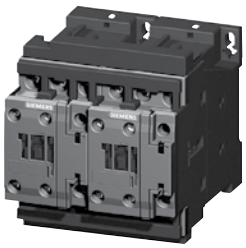
Contactor Assemblies for Switching Motors

3RA23 reversing contactor assemblies

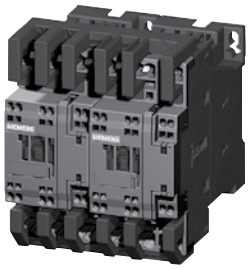
Fully wired and tested contactor assemblies · Size S0 · up to 25 HP



3RA23 24-8XE30-1BB4



3RA23 2.-8XB30-1A..



3RA23 2.-8XB30-2A..

AC data	UL data									Screw terminals / Spring-type terminals	Weight approx.
Amp ratings	Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage U_s at 50/60 Hz	Auxiliary contacts			
AC2/AC3	115 V	230 V	200 V	230 V	**460 V**	**575 V**		NO	NC	Order No.	
							V				kg
AC operation, 50/60 Hz											
Size S0 [1]											
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											
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 [2]											
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

Screw terminals	**1**
Spring-loaded terminals	**2**

For other voltages see page 2/51.

For accessories and spare parts, see page 2/68-2/85.

1) For coil operating range, see page 2/51.

2) For use with 3RA27 and 3RA28 communication modules. See pages 2/26 to 2/33.

Contactor Assemblies for Switching Motors

3RA23 reversing contactor assemblies

Selection and ordering data

For Reversing Contactors with communication interface: replace the 8XB30-1NB3 with 8XE30-1NB3.

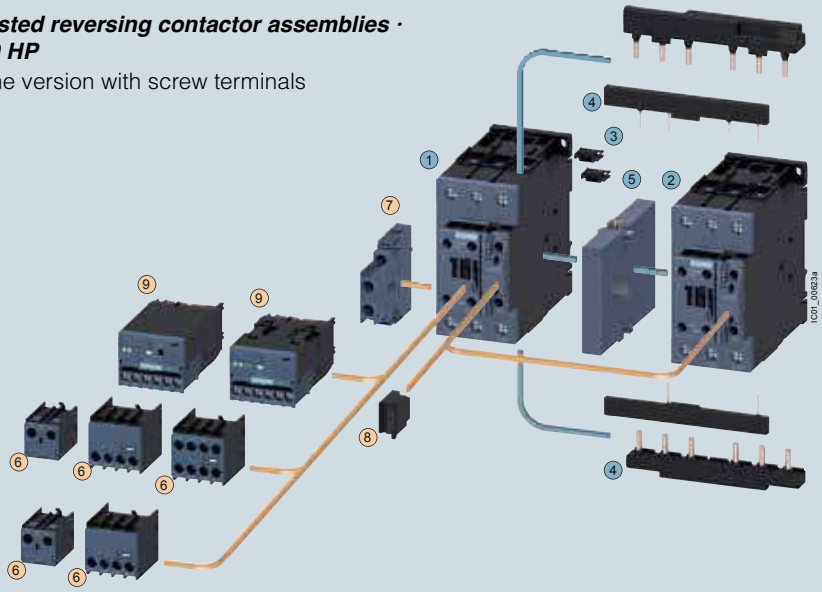
Size S2 · up to 50 HP

AC data Amp ratings AC2/AC3	UL data Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage [1]	Auxiliary contacts		Screw Terminals	Weight approx.
	115 V	230 V	200 V	230 V	460 V	575 V					
A	HP	HP	HP	HP	HP	HP		NO	NC	Order No.	kg
AC operation											
40	3	7.5	10	15	30	**40**	24 V, 50/60 Hz	2	2	**3RA2335-8XB30-1AC2**	1.72
							120 V, 60 Hz	2	2	**3RA2335-8XB30-1AK6**	
							240 V, 60 Hz	2	2	**3RA2335-8XB30-1AP6**	
50	3	10	15	15	40	**50**	24 V, 50/60 Hz	2	2	**3RA2336-8XB30-1AC2**	1.72
							120 V, 60 Hz	2	2	**3RA2336-8XB30-1AK6**	
							240 V, 60 Hz	2	2	**3RA2336-8XB30-1AP6**	
65	5	10	20	20	50	**50**	24 V, 50/60 Hz	2	2	**3RA2337-8XB30-1AC2**	2.548
							120 V, 60 Hz	2	2	**3RA2337-8XB30-1AK6**	
							240 V, 60 Hz	2	2	**3RA2337-8XB30-1AP6**	
80 [1]	5	15	20	25	50	**60**	24 V, 50/60 Hz	2	2	**3RA2338-8XB30-1AC2**	2.548
							120 V, 60 Hz	2	2	**3RA2338-8XB30-1AK6**	
							240 V, 60 Hz	2	2	**3RA2338-8XB30-1AP6**	
AC/DC operation											
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 [1]	5	15	20	25	50	**60**	20-33 AC/DC	2	2	**3RA2338-8XB30-1NB3**	

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	3RA271.-1BA00

For further voltages, see page 2/51.
For overview, see page 2/39-2/40.
For accessories, see page 2/68-2/85.
For circuit diagrams, see page 2/205.
For dimension drawings, see page 2/224.

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	Type Q12
①②	Contactors, 18.5 kW	3RT2035	3RT2035
①②	Contactors, 22 kW	3RT2036	3RT2036
①②	Contactors, 30 kW	3RT2037	3RT2037
①②	Contactors, 37 kW	3RT2038	3RT2038
③④	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	

Contactor Assemblies for Switching Motors

3RA23 reversing contactor assemblies

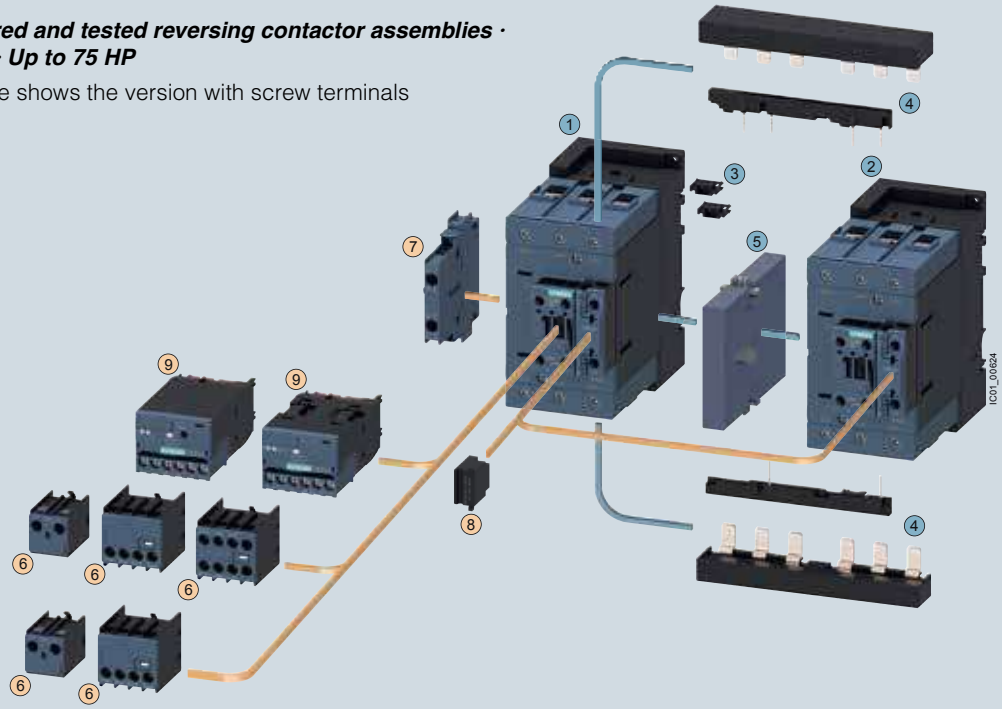
Selection and ordering data

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 [1]	Auxiliary contacts		Fully wired and tested contactor assembly	Weight approx.
	115 V	230 V	200 V	230 V	460 V	**575 V**					
A	HP	HP	HP	HP	HP	**HP**		NO	NC	Order No.	kg
AC operation											
80	5	15	20	25	50	**60**	24 V, 50/60 Hz	0	2	**3RA2345-8XB30-1AC2**	3.9
							120 V, 60 Hz	0	2	**3RA2345-8XB30-1AK6**	
							240 V, 60 Hz	0	2	**3RA2345-8XB30-1AP6**	
95	7.5	15	25	30	60	**75**	24 V, 50/60 Hz	0	2	**3RA2346-8XB30-1AC2**	3.9
							120 V, 60 Hz	0	2	**3RA2346-8XB30-1AK6**	
							240 V, 60 Hz	0	2	**3RA2346-8XB30-1AP6**	
110	10	20	30	30	75	**100**	24 V, 50/60 Hz	0	2	**3RA2347-8XB30-1AC2**	3.9
							120 V, 60 Hz	0	2	**3RA2347-8XB30-1AK6**	
							240 V, 60 Hz	0	2	**3RA2347-8XB30-1AP6**	
AC/DC operation											
80	5	15	20	25	50	**60**	20-33 V AC/DC	0	2	**3RA2345-8XB30-1NB3**	5.7
95	7.5	15	25	30	60	**75**	20-33 V AC/DC	0	2	**3RA2346-8XB30-1NB3**	
110	10	20	30	30	75	**100**	20-33 V AC/DC	0	2	**3RA2347-8XB30-1NB3**	

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
11 Auxiliary switch block, front	3RH2911
12 Auxiliary switch block, lateral	3RH2921
13 Surge suppressors	3RT2936
14 Function module for connection to the control system (the associated module connectors 3RA2711-0EE17 must be ordered separately	3RA271.-1BA00

For further voltages, see page 2/51.
For overview, see page 2/39-2/40.
For accessories, see page 2/68-2/85.
For circuit diagrams, see page 2/205.
For dimension drawings, see page 2/224.

1) Coil voltage tolerance
at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s

Complete reversing contactor assembly

Individual parts	Type Q11	Type 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 2/29 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	Operational current I_e	Motor current		Line/delta contactor	Star contactor	**Order No. complete**
kW	A	A				
5.5	12	9.5 ... 13.8	**S00-S00-S00**	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	**S0-S0-S0**	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	**S2-S2-S0**	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	**S2-S2-S2**	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	Operational current I_e	Motor current		Line/delta contactor	Star contactor	**Order No. complete**
kW	A	A				
5.5	12	9.5 ... 13.8	**S00-S00-S00**	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	**S0-S0-S0**	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

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	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.
kW				A		A	
5.5	3RA28 16-0EW20	3RA29 13-2BB1[1)]	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 23-2BB1[2)]	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	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.
kW				A		A	
5.5	3RA28 16-0EW20	3RA29 13-2BB2[1)]	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[2)]	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		

[1)] 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.

[2)] 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.

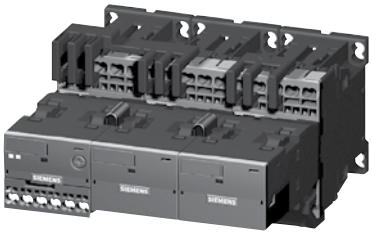
Order No. scheme

Digit of the Order No.	1. - 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)				□												
Power dependent on size (e. g. 25 = 15 kW)					□											
Type of overload relay (8X = without)							□	□								
Assembly (F = ready-assembled, E, H = ready-assembled with communication)									□							
Interlock (3 = mechanical and electrical)										□						
Free auxiliary switches (e. g. S00: 1 = 3 NO total, S0: 2 = 3 NO + 3 NC total)											□					
Connection type (1 = screw, 2 = spring)													□			
Operating range / solenoid coil circuit (e. g. A = AC standard / without)														□		
Rated control supply voltage (e. g. K6 = 110/120 V, 50/60 Hz)															□	□
Example	**3 R A**	**2**	**4**	**2**	**5**	**–**	**8**	**X**	**F**	**3**	**2**	**–**	**1**	**A**	**K**	**6**

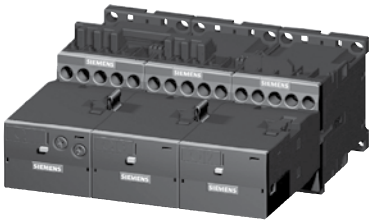
3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

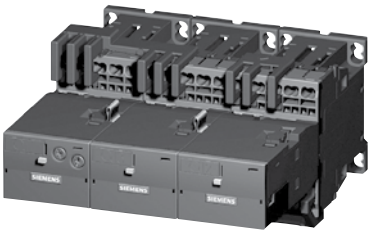
Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW



3RA24 1.-8XE31-2BB4



3RA24 1.-8XF31-1A.0



3RA24 1.-8XF31-2A.0

Rated data AC-3					Rated control supply voltage U_s [1] 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	**400 V**	500 V	690 V					
A	kW	**kW**	kW	kW	V		kg		kg
AC operation, 50/60 Hz									
12	3.3	**5.5**	7.2	9.2	24 AC	**3RA24 15-8XF31-1AB0**	0.910	**3RA24 15-8XF31-2AB0**	0.910
					110/120 AC	**3RA24 15-8XF31-1AF0**	0.850	**3RA24 15-8XF31-2AF0**	0.910
					220/240 AC	**3RA24 15-8XF31-1AP0**	0.850	**3RA24 15-8XF31-2AP0**	0.910
16	4.7	**7.5**	10.3	9.2	24 AC	**3RA24 16-8XF31-1AB0**	0.910	**3RA24 16-8XF31-2AB0**	0.910
					110/120 AC	**3RA24 16-8XF31-1AF0**	0.850	**3RA24 16-8XF31-2AF0**	0.910
					220/240 AC	**3RA24 16-8XF31-1AP0**	0.850	**3RA24 16-8XF31-2AP0**	0.910
25	5.5	**11**	11	11	24 AC	**3RA24 17-8XF31-1AB0**	0.850	**3RA24 17-8XF31-2AB0**	0.910
					110/120 AC	**3RA24 17-8XF31-1AF0**	0.850	**3RA24 17-8XF31-2AF0**	0.910
					220/240 AC	**3RA24 17-8XF31-1AP0**	0.850	**3RA24 17-8XF31-2AP0**	0.910
DC operation									
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
For IO-Link connection									
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
For AS-Interface connection									
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.

For other voltages see page 2/51.

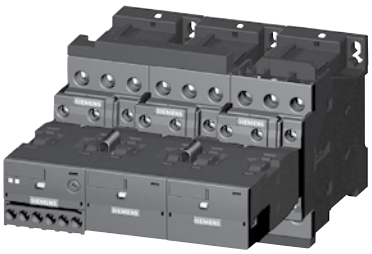
[1] Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_s; at 60 Hz: 0.85 ... 1.1 x U_s.

3RA24 Contactor Assemblies for Wye-Delta Starting

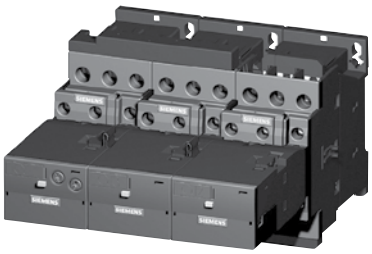
SIRIUS

3RA24 complete units, 5.5 ... 22 kW

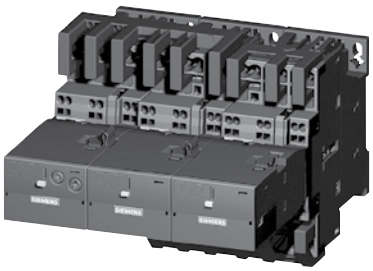
Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW



3RA24 2.-8XE32-1BB4



3RA24 2.-8XF32-1A.2



3RA24 2.-8XF32-2A.2

Rated data AC-3					Rated control supply voltage U_s [1] 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	**400 V**	500 V	690 V					
A	kW	**kW**	kW	kW	V		kg		kg
AC operation, 50/60 Hz									
25	7.1	**11**	15.6	19	24 AC 110/220 AC 220/240 AC	**3RA24 23-8XF32-1AC2** **3RA24 23-8XF32-1AK6** **3RA24 23-8XF32-1AP6**	1.370 1.370 1.370	**3RA24 23-8XF32-2AC2** **3RA24 23-8XF32-2AK6** **3RA24 23-8XF32-2AP6**	1.530 1.530 1.530
32 / 40	11.4	**15 / 18.5**	19	19	24 AC 110/220 AC 220/240 AC	**3RA24 25-8XF32-1AC2** **3RA24 25-8XF32-1AK6** **3RA24 25-8XF32-1AP6**	1.370 1.370 1.370	**3RA24 25-8XF32-2AC2** **3RA24 25-8XF32-2AK6** **3RA24 25-8XF32-2AP6**	1.530 1.530 1.530
50	--	**22**	19	19	24 AC 110/220 AC 220/240 AC	**3RA24 26-8XF32-1AC2** **3RA24 26-8XF32-1AK6** **3RA24 26-8XF32-1AP6**	1.390 1.390 1.390	**3RA24 26-8XF32-2AC2** **3RA24 26-8XF32-2AK6** **3RA24 26-8XF32-2AP6**	1.550 1.550 1.550
DC operation									
25	7.1	**11**	15.6	19	24 DC	**3RA24 23-8XF32-1BB4**	1.940	**3RA24 23-8XF32-2BB4**	2.100
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	**3RA24 25-8XF32-1BB4**	1.940	**3RA24 25-8XF32-2BB4**	2.100
50	--	**22**	19	19	24 DC	**3RA24 26-8XF32-1BB4**	1.960	**3RA24 26-8XF32-2BB4**	2.120
For IO-Link connection									
25	7.1	**11**	15.6	19	24 DC	**3RA24 23-8XE32-1BB4**	1.940	**3RA24 23-8XE32-2BB4**	2.100
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	**3RA24 25-8XE32-1BB4**	1.940	**3RA24 25-8XE32-2BB4**	2.100
50	--	**22**	19	19	24 DC	**3RA24 26-8XE32-1BB4**	1.960	**3RA24 26-8XE32-2BB4**	2.120
For AS-Interface connection									
25	7.1	**11**	15.6	19	24 DC	**3RA24 23-8XH32-1BB4**	1.960	**3RA24 23-8XH32-2BB4**	2.120
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	**3RA24 25-8XH32-1BB4**	1.960	**3RA24 25-8XH32-2BB4**	2.120
50	--	**22**	19	19	24 DC	**3RA24 26-8XH32-1BB4**	1.980	**3RA24 26-8XH32-2BB4**	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.

For other voltages see page 2/51 .

[1] Coil operating range at 50 Hz: 0.8 ... 1.1 x U_s ; at 60 Hz: 0.85 ... 1.1 x U_s.

Selection and ordering data

Contactor type Rated control supply voltage U_S			3RT201 3RA211	3RT231 3RT251	3RT202 3RA212	3RT232 3RT252	3RT2617 3RT2627 3RT2637	3RT203 3RA213	3RT233 3RT253	3RT104 3RT134 3RT144 3RA114
			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 [1]										
Coils for 50 Hz (exception: size S00: 50 and 60 Hz [2]	**24 V AC**		B0	B0	B0	B0	B0	B0	B0	B0
	42 V AC		D0	D0	D0	--	--	D0	--	D0
	48 V AC		H0	H0	H0	--	--	H0	--	H0
	110 V AC		F0	F0	F0	F0	F0	F0	F0	F0
	230 V AC		P0	P0	P0	P0	P0	P0	P0	P0
	400 V AC		V0	V0	V0	V0	V0	V0	V0	V0
Coils for 50 and 60 Hz [2]	**24 V AC**		B0	B0	C2	C2	C2	C2	C2	C2
	42 V AC		D0	D0	D2	D2	--	D2	D2	D2
	48 V AC		H0	H0	H2	H2	--	H2	H2	H2
	110 V AC		F0	F0	G2	G2	G2	G2	G2	G2
	208 V AC		M2	M2	M2	M2	M2	M2	M2	M2
	220 V AC		N2	N2	N2	N2	N2	N2	N2	N2
	230 V AC		P0	P0	L2	L2	L2	L2	L2	L2
	240 V AC		P2	P2	P2	P2	P2	P2	P2	P2
For USA and Canada [3]	50 Hz:	60 Hz:								
	110 V AC	**120 V AC**	K6	K6	K6	K6	K6	K6	K6	K6
	220 V AC	**240 V AC**	P6	P6	P6	P6	P6	P6	P6	P6
		277 V AC	—	—	—	U6	—	U6	U6	U6
		480 V AC	V6	—	V6	—	—	V6	V6	V6
		600 V AC	—	—	—	T6	—	T6	T6	T6
For Japan	50/60 Hz[4]:	60 Hz[5]:								
	100 V AC	**110 V AC**	G6	G6	G6	G6	G6	G6	G6	G6
	200 V AC	**220 V AC**	N6	N6	N6	N6	N6	N6	N6	N6
	400 V AC	**440 V AC**	R6	R6	R6	R6	R6	R6	R6	R6
DC Operation [1]										
	12 V DC		A4	A4	—	—	—	—	—	—
	24 V DC		B4	B4	B4	B4	—	—	—	—
	42 V DC		D4	D4	D4	D4	—	—	—	—
	48 V DC		W4	W4	W4	W4	—	—	—	—
	60 V DC		E4	E4	E4	E4	—	—	—	—
	72 V DC		J8	J8	J8	J8	—	—	—	—
	80 V DC		—	—	—	—	—	—	—	—
	110 V DC		F4	F4	F4	F4	—	—	—	—
	125 V DC		G4	G4	G4	G4	—	—	—	—
	220 V DC		M4	M4	M4	M4	—	—	—	—
	230 V DC		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 $U_{s\,min}$ ... $U_{s\,max}$ [6]	**Contactor type**	**--**	**3RT2. 2.-.N**	Rated control supply voltage $U_{s\,min}$ ... $U_{s\,max}$ [6]	**Contactor type**	**3RT2. 3.-.N**	**3RT2. 2.-.N**
	Size	**S00**	**S0**		**Size**	**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[7]		--	P3	175 ... 280 V AC/DC		P3	P3

1) 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).

2) Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_S
at 60 Hz: 0.85 ... 1.1 x U_S

3) 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

4) 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

5) Coil operating range
at 60 Hz: 0.8 ...1.1 x U_S

6) Coil operating range for S0: 0.7 x $U_{s\,min}$ ... 1.3 x $U_{s\,max}$
Coil operating range for S2: 0.8 x $U_{s\,min}$ ...1.1 x $U_{s\,max}$

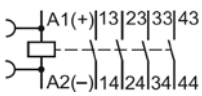
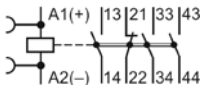
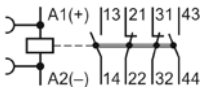
7) The following applies to S0 and $U_{s\,max}$ = 280 V: Upper limit =1.1 x $U_{s\,max}$

Selection and ordering data
AC and DC operation

3RH11 . . -1 . . . .

3RH11 . . -2 . . . .

Size S00 – Terminal designations according to EN 50011

	Rated current at **240 V** NEMA A600/Q600	Auxiliary contacts Ident-ification No.	Version NO	Version NC	Rated control supply voltage U_S	**AC Operation Screw Terminals**[1) 2)]	Rated control supply voltage U_S	**DC Operation Screw Terminals**[1) 2]
	Amps		NO	NC	V AC 50/60 Hz[3)]	**Order No.**	V DC	**Order No.**
For screw and snap-on mounting onto TH 35 standard mounting rail								
	10	40E	4	—	24 110/120 220/240	**3RH2140-1AB00** **3RH2140-1AK60** **3RH2140-1AP60**	24 110 220	**3RH2140-1BB40** **3RH2140-1BF40** **3RH2140-1BM40**
	10	31E	3	1	24 110/120 220/240	**3RH2131-1AB00** **3RH2131-1AK60** **3RH2131-1AP60**	24 110 220	**3RH2131-1BB40** **3RH2131-1BF40** **3RH2131-1BM40**
	10	22E	2	2	24 110/120 220/240	**3RH2122-1AB00** **3RH2122-1AK60** **3RH2122-1AP60**	24 110 220	**3RH2122-1BB40** **3RH2122-1BF40** **3RH2122-1BM40**

Notes:
For further voltages, see page 2/51.
For accessories, see pages 2/68-2/79.
For technical data, see pages 2/190-2/193.
For overview, see page 2/118.
For position terminals, see page 2/207-2/208.
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

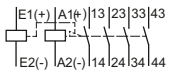
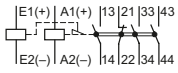
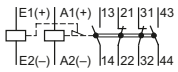
The contactor coil and the coil of the release solenoid are both designed for uninterrupted duty.

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

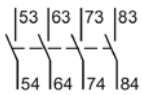
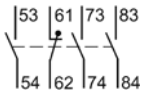
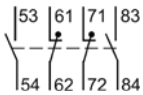
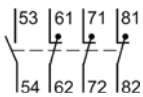
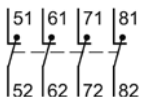
Size S00 – Terminal designations according to EN 5001

	Rated current at **240 V** AC-14, AC-15 **NEMA A600/Q600** Amps	Aux. contacts Ident. No.	Aux. contacts Version NO	Aux. contacts Version NC	Rated control supply voltage U_S V AC	**AC Operation Screw Terminals**[1] **Order No.**	Rated control supply voltage U_S V DC	**DC Operation Screw Terminals Order No.**
For screw and snap-on mounting onto TH 35 standard mounting rail								
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	**3RH2440-1AB00** **3RH2440-1AK60** **3RH2440-1AP60** **3RH2440-1AP00**	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	**3RH2431-1AB00** **3RH2431-1AK60** **3RH2431-1AP60** **3RH2431-1AP00**	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	**3RH2422-1AB00** **3RH2422-1AK60** **3RH2422-1AP60** **3RH2422-1AP00**	24 110 125 220	**3RH2422-1BB40** **3RH2422-1BF40** **3RH2422-1BG40** **3RH2422-1BM40**

For accessories for 3RH24, see below and page 2/68-2/79
For technical data, see page 2/190-2/193.
For overview, see page 2/118.
For position of terminals, see page 2/207-2/208.
For dimension drawings, see page 2/230.

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 NO	Contacts Version NC	Weight approx. kg.	**Screw Terminals Order No.**	**Spring Terminals Order No.**
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**
	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**
3RH2911-2GA40 	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 2/68-2/79

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

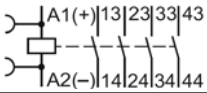
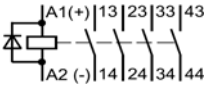
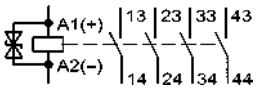
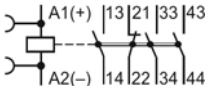
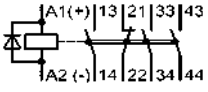
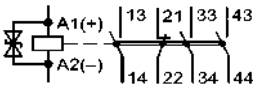
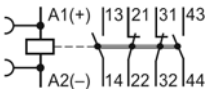
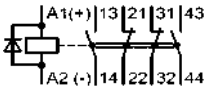
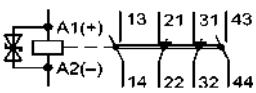
	Surge suppressor	Rated current at **240 V** NEMA A600/Q600	Auxiliary contacts Ident-ification No.	Version NO	Version NC	**Screw Terminals**[1] **Order No.**	**Spring Terminals**[1] **Order No.**	Weight approx.
		Amps		NO	NC			kg.
For screw and snap-on mounting onto TH 35 standard mounting rail								
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)	Diode, varistor, or RC element can be mounted	10	**40E**	4	—	**3RH2140-1HB40**	**3RH2140-2HB40**	0.300
		10	**31E**	3	1	**3RH2131-1HB40**	**3RH2131-2HB40**	0.300
		10	**22E**	2	2	**3RH2122-1HB40**	**3RH2122-2HB40**	0.300
	Diode integrated	10	**40E**	4	—	**3RH2140-1JB40**	**3RH2140-2JB40**	0.300
		10	**31E**	3	1	**3RH2131-1JB40**	**3RH2131-2JB40**	0.300
		10	**22E**	2	2	**3RH2122-1JB40**	**3RH2122-2JB40**	0.300
	Suppressor diode integrated	10	**40E**	4	—	**3RH2140-1KB40**	**3RH2140-2KB40**	0.300
		10	**31E**	3	1	**3RH2131-1KB40**	**3RH2131-2KB40**	0.300
		10	**22E**	2	2	**3RH2122-1KB40**	**3RH2122-2KB40**	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)	Diode, varistor, or RC element can be mounted	10	**40E**	4	—	**3RH2140-1MB40-0KT0**	**3RH2140-2MB40-0KT0**	0.300
		10	**31E**	3	1	**3RH2131-1MB40-0KT0**	**3RH2131-2MB40-0KT0**	0.300
		10	**22E**	2	2	**3RH2122-1MB40-0KT0**	**3RH2122-2MB40-0KT0**	0.300
	Diode integrated	10	**40E**	4	—	**3RH2140-1VB40**	**3RH2140-2VB40**	0.300
		10	**31E**	3	1	**3RH2131-1VB40**	**3RH2131-2VB40**	0.300
		10	**22E**	2	2	**3RH2122-1VB40**	**3RH2122-2VB40**	0.300
	Suppressor diode integrated	10	**40E**	4	—	**3RH2140-1SB40**	**3RH2140-2SB40**	0.300
		10	**31E**	3	1	**3RH2131-1SB40**	**3RH2131-2SB40**	0.300
		10	**22E**	2	2	**3RH2122-1SB40**	**3RH2122-2SB40**	0.300

3RH2140-1HB40

3RH2140-2SB40

For technical data, see 2/194.
For position of terminals, see 2/207-2/208.
For dimension drawings, see 2/230.

1) Ring lug terminals are also available. Replace the 8th digit of the order number with a "4", e.g. 3RH2140-4HB40

	Suppressor element mountable	Diode integrated	Suppressor diode integrated
40E			
31E			
22E			

Contactors for Switching Motors

3TF68 and 3TF69 vacuum contactors, 3-pole

Selection and ordering data

Maximum inductive current AC-3	Maximum power ratings UL Ratings 200 V	230 V	460 V	**575 V**	IEC ratings 1000 V	Max. resistive current AC-1	Auxiliary contacts		Rated control supply voltage [1]	Order No.	Weight approx.
A	HP	HP	HP	**HP**	**kW**	A	NO	NC	V		kg
AC operation [2] [3]											
3TF68	**Size 14** **Auxiliary and control conductors: screw terminals** **Main conductor: bar connections** **• AC Operation**										
630	200	250	500	**600**	600	700	4	4	110-132, 50/60 Hz	**3TF6844-■CF7**	15
630	200	250	500	**600**	600	700	4	4	200-240, 50/60 Hz	**3TF6844-■CM7**	15
820	290	350	700	**860**	800	910	4	4	110-132, 50/60 Hz	**3TF6944-■CF7**	19
820	290	350	700	**860**	800	910	4	4	200-240, 50/60 Hz	**3TF6944-■CM7**	19
									UL ratings shown in above table:	**■=0**	
									For IEC use only up to 1000 V:	**■=8**	
	• DC Operation										
630	200	250	500	**600**	600	700	3	3	24 V DC	**3TF6833-■DB4**	16.9
820	290	350	700	**860**	800	910	3	3	24 V DC	**3TF6933-■DB4**	20.9
									UL ratings shown in above table:	**■=1**	
									For IEC use only up to 1000 V:	**■=8**	

Accessories and Spare parts for 3TF68 and 3TF69 vacuum contactors

Selection and ordering data

Details		For contactor type	Order No.	Weight approx.
Coils				
3TY7	**AC Operation** The coils are fitted with varistors for damping surges as standard; the coil is supplied with the closing electronics included.	3TF68 3TF69	**3TY7683-0C●●** **3TY7693-0C●●**	0.65
	DC Operation Reversing contactors are required for size 14 contactors: Contactor type / Reversing contactor type 3TF68 and 3TF69: 3TC44 (70 mm wide, 85 mm high) The coils are supplied without a reversing contactor. **●● For rated control supply voltages, see page 2/104.**	3TF68 3TF69	**3TY7683-0D●●** **3TY7693-0D●●**	0.56
Vacuum interrupters				
	In order to ensure reliable operation of the contactors, only Siemens original replacement interrupters should be used. 3 vacuum interrupters with mouning parts per set.	3TF68 3TF69	**3TY7680-0B** **3TY7690-0B**	3.2 3.5
Auxiliary switch blocks with screw terminals				
3TY7561-1.	1 NO and 1 NC — First auxiliary switch block, left or right. Replacement type for: 3TY7561-1A, -1B	3TF68 / 3TF69	**3TY7561-1AA00**	0.042
	1 NO and 1 NC — First auxiliary switch block, left or right late break	3TF68 / 3TF69	**3TY7561-1EA00**	0.042
	1 NO and 1 NC — Second auxiliary switch block, left or right. Replacement type for: 3TY7 561-1K, -1L	3TF68 / 3TF69	**3TY7561-1KA00**	0.042
	Auxiliary switches for coil reconnection, for DC economy circuit with screw connections			
	1 NC — Auxiliary switch block late break	3TF68 / 3TF69	**3TY7681-1G**	0.042
	Solid-state compatible auxiliary switch block with screw terminals For mounting onto the side of contactors. For use in dusty atmosphere and electronic circuits with rated operational currents I_e AC-14 and DC-13 from 1 mA to 300 mA at 3 V to 60 V.	3TF68 / 3TF69	**3TY7561-1UA00**	0.042

For accessories, see page 2/55-2/56.
For technical data, see page 2/177-2/182.
For description, see page 2/119.
For internal circuit diagrams, see page 2/216.
For position of terminals, see page 2/213
For dimension drawings, see page 2/227.

1) For further voltages, see page 2/104.
2) Surge suppression integrated: fitted with varistor.
3) For EMC, see description on page 2/119.
3TF68/69 vacuum contactors are supplied with integrated surge suppression for the main conducting paths (for description, see page 2/119). 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 Size	Type	Design	Order No.	Weight approx. kg	Std. Pack Qty
Interface for control by PLC						
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	**3TX7 090-0D**	0.1	1
Terminal covers						
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) **3TX7 686-0A** **3TX7 696-0A**	0.17	1 set = 2 units
Link for paralleling (star jumper) · 3-pole, without terminal [1])						
3TX7 680-0D	**14**	3TF68		**3TX7 680-0D**	0.26	1
	• Cover plate for paralleling link					
	14	3TF68	A cover plate must be used in order to protect against inadvertent contact (DIN VDE 0106 Part 100).	**3TX7 680-0E**	0.18	1
Box terminals for laminated copper bars						
3TX7570-1E	**• Without auxiliary conductor terminal**					
	14	3TF68	With single covers for protection against inadvertent contact (EN 50274)	**3TX7 570-1E**	0.6	1
	• With auxiliary conductor terminal					
	14	3TF69	Conductor cross-sections for auxiliary conductors: Solid: 2 × (0.75 ... 2.5) mm² Finely stranded with end sleeve: 2 × (0.5 ... 2.5) mm² Solid or stranded: 2 × (18 ... 12) AWG Tightening torque: 0.8 Nm ... 1.4 Nm (7 ... 12 lb.in)	**3TX7 690-1F**	2.0	1
Surge suppressors — Varistors						
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.	*Rated control supply voltage, V DC* 24 … 48 48 … 127 127 … 240	**3TX7 572-3G** **3TX7 572-3H** **3TX7 572-3J**	0.09 0.09 0.09	1 1 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 2/183-2/186.
- Dimensions see page 2/227.

3TC44

3TC52

	Frame Size	Ampere Rating Open	Ampere Rating Enclosed	2 Pole DC HP Ratings (DC-3, DC-5) 115 V	230 V	500 V	575 V	Auxiliary contacts NO	NC	AC-Operated Order No.	DC-Operated Order No.
3TC DC Contactors											
	2	40	40	5	10	15	15	2	2	**3TC4417–0B††**	**3TC4417–0A††**
	4	75	68	8	18	40	45	2	2	**3TC4817–0B††**	**3TC4817–0A††**
	8	220	200	25	50	100	100	2	2	**3TC5217–0B††**	**3TC5217–0A††**
	12	330	300	40	75	150	150	2	2	**3TC5617–0B††**	**3TC5617–0A††**

	Device	Frame Size	Catalog Number					
Coils, AC			**24V AC**	**120V AC**	**220/240V AC**	**277V AC**	**480V AC**	**600V AC**
3TY6483-0AK6	3TC	3TC4417-0B††	**3TY7403-0AC2**	**3TY7403-0AK6**	**3TY7403-0AP6**	**3TY7403-0AU1**	**3TY7403-0AV0**	**3TY7403-0AS0**
		3TC4817-0B††	**3TY6483-0AC1**	**3TY6483-0AK6**	**3TY6483-0AP6**	**3TY6483-0AP0**	**3TY6483-0AV0**	**3TY6483-0AS0**
		3TC5217-0B††		**3TY6523-0AK6**	**3TY6523-0AP6**	**3TY6523-0AP0**	**3TY6523-0AV0**	
		3TC5617-0B††		**3TY6566-0AK6**		**3TY6566-0AP0**	**3TY6566-0AV0**	**3TY6566-0AS0**
Coils, DC			**24V DC**	**48V DC**	**110V DC**	**125V DC**	**230V DC**	
3TY6483-0BB4	3TC	3TC4417-0A††	**3TY6443-0BB4**		**3TY6443-0BF4**	**3TY6443-0BG4**		
		3TC4817-0A††	**3TY6483-0BB4**	**3TY6483-0BW4**	**3TY6483-0BF4**	**3TY6483-0BG4**		
		3TC5217-0A††	**3TY6523-0BB4**		**3TY6523-0BF4**	**3TY6523-0BG4**	**3TY6523-0BP4**	
		3TC5217-0A††	**3TY6563-0BB4**		**3TY6563-0BF4**	**3TY6563-0BG4**	**3TY6563-0BP4**	

	Frame size	Contactor type	Mounting position	Solid state	Order No.
Auxiliary Contact Blocks with 1 NO + 1 NC contacts [2]					
3TY6501-1A	2, 4	3TC44 or 3TC48	1st block, left or right	—	**3TY6501-1AA00**
			2nd block, left or right	Yes[3]	**3TY7561-1UA00**
	4	3TC48	2nd block, left[5]	—	**3TY6501-1K**
			2nd block, right[5]	—	**3TY6501-1L**
	8, 12	3TC52 or 3TC56	1st block, left	—	**3TY6561-1A**
			1st block, right	—	**3TY6561-1B**
			2nd block, left[5]	—	**3TY6561-1K**
			2nd block, right[5]	—	**3TY6561-1L**

	Device Type	Frame Size	Catalog Number
Main Contacts [1]			
3TY2480-0A	3TC	3TC44	**3TY2440-0A**
		3TC48	**3TY2480-0A**
		3TC52	**3TY2520-0A**
		3TC56	**3TY2560-0A**
Arc Chutes			
3TY2482-0A	3TC	3TC44	**3TY2442-0A**
		3TC48	**3TY2482-0A**
		3TC52	**3TY2522-0A**
		3TC56	**3TY2562-0A**

Coil Suffix Table ††

Replace †† in the contactor Order No. with a coil code from the table below.

V AC 50/60 Hz	Code
24	C1
120	K1*
240	P1
460	V0
600	S0

*Use suffix K2 for 3TC44.

V DC	Code
24	B4
36	V4
48	W4
60	E4
72	J8
110	F4
125	G4
220	M4
230	P4

1) Main contact kits for size 3TC48 and larger include springs. Smaller sizes do not.

2) On DC operated contactors the maximum number of auxiliary contacts is 2 NO, 2 NC.

3) For use in dusty atmosphere and electronic circuits with rated operational currents I_e AC-14 and DC-13 from 1 mA to 300 mA at 3V to 60V. With 1 changeover contact.

4) Discount Code: DC Contactors

5) Can only be mounted on AC-operated contactors.

DC Contactor Replacement Parts

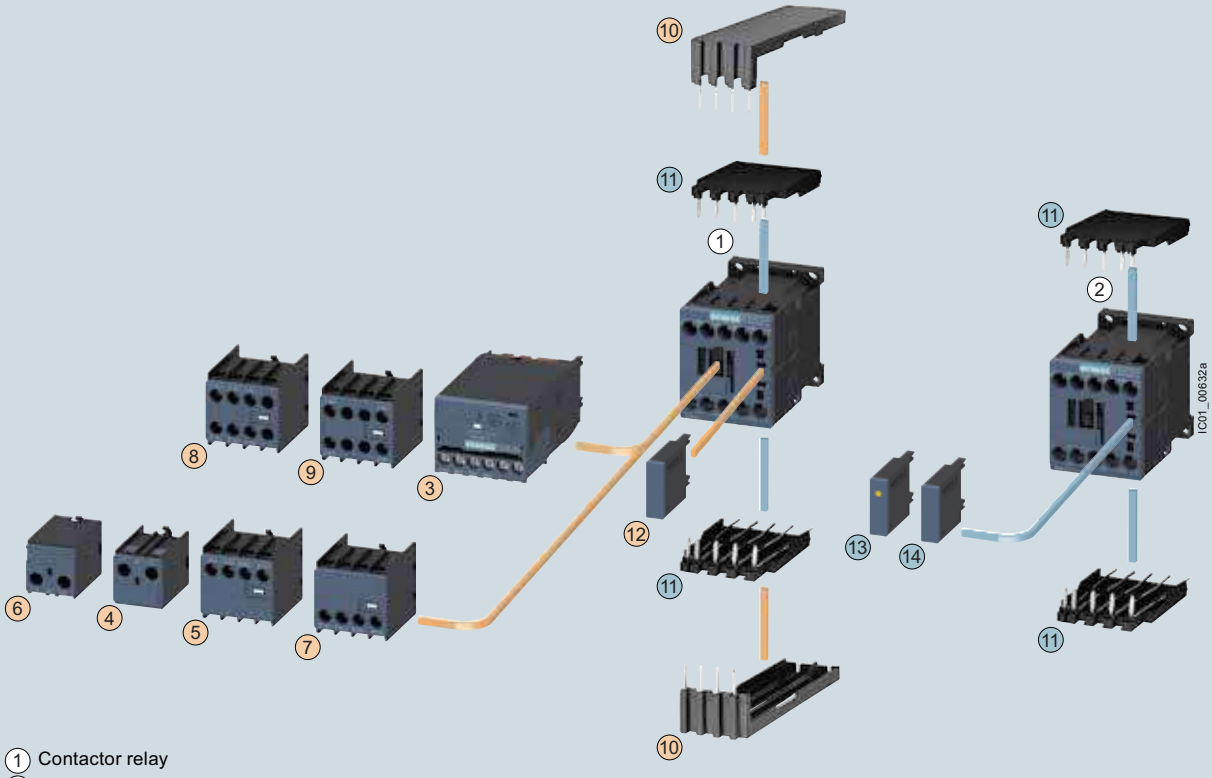
SIRIUS

General Purpose - Type 3TC

	For contactors Size	Type	Version	Rated control supply voltage U_s V AC	V DC	Order No.	Std. Pack Qty
Surge suppressors · Varistors							
3TX7 402-3.	**2**	3TC44[1]	**Varistors**[2] with line spacer, for mounting onto the coil terminal	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600	24 ... 70 70 ... 150 150 ... 250	**3TX7 402-3G** **3TX7 402-3H** **3TX7 402-3J** **3TX7 402-3K** **3TX7 402-3L**	1 1 1 1 1
3TX7 462-3.	**4**	3TC48	**Varistors**[2] for sticking onto the contactor base or for mounting separately	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600	24 ... 70 70 ... 150 150 ... 250	**3TX7 462-3G** **3TX7 462-3H** **3TX7 462-3J** **3TX7 462-3K** **3TX7 462-3L**	1 1 1 1 1
	8 and 12	3TC52, 3TC56	**Varistor** for sticking onto the contactor base or for mounting separately	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600		**3TX7 462-3G** **3TX7 462-3H** **3TX7 462-3J** **3TX7 462-3K** **3TX7 462-3L**	1 1 1 1 1
3TX7 522-3.	**8 and 12**	3TC52, 3TC56	**Varistors**[2] for separate screw connection or snapping onto TH 35 standard mounting rail		24 ... 70 70 ... 150 150 ... 250	**3TX7 522-3G** **3TX7 522-3H** **3TX7 522-3J**	1 1 1
Surge suppressors · RC elements							
3TX7 462-3., 3TX7 522-3.	**4**	3TC48	**RC elements** For lateral snapping onto auxiliary switch or TH 35 standard mounting rail	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600	24 ... 70 70 ... 150 150 ... 250	**3TX7 462-3R** **3TX7 522-3R** **3TX7 462-3S** **3TX7 522-3S** **3TX7 462-3T** **3TX7 522-3T** **3TX7 462-3U** **3TX7 462-3V**	
	8 and 12	3TC52, 3TC56	**RC elements** For lateral snapping onto auxiliary switch or TH 35 standard mounting rail	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600		**3TX7 522-3R** **3TX7 522-3S** **3TX7 522-3T** **3TX7 522-3U** **3TX7 522-3V**	
Surge suppressors · Diodes							
3TX7 462-3.	**4 to 12**	3TC48, 3TC52, . 3TC56	**Diode assemblies**[3] (diode and Zener diode) for DC solenoid system, for sticking onto the contactor base or for mounting separately		24 ... 250	**3TX7 462-3D**	
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			**3TX6 506-3B**	1 set= 6 units
	10 and 14	3TC52, 3TC56				**3TX6 546-3B**	1 set= 6 units

[1] The connection piece for mounting the surge suppressor must be bent slightly.
[2] Includes the peak value of the alternating voltage on the DC side.
[3] Not for DC economy circuit.

Contactor relays and coupling relays – Size S00 with accessories



1 Contactor relay
2 Coupling contactor relay for auxiliary circuits

3 3RA28 function module
4 1-pole auxiliary switch block, cable entry from the top
5 2-pole auxiliary switch block, cable entry from the top
6 1-pole auxiliary switch block, cable entry from the bottom
7 2-pole auxiliary switch block, cable entry from the bottom
8 4-pole auxiliary switch block
(terminal designations according to EN 50011 or EN 50005)
9 2-pole auxiliary switch block, solid-state compatible version
(terminal designations according to EN 50005)

10 Solder pin adapter for contactor relays with 4-pole auxiliary switch block
11 Solder pin adapter
12 Additional load module for increasing the permissible residual current
13 Surge suppressor with LED
14 Surge suppressor without LED

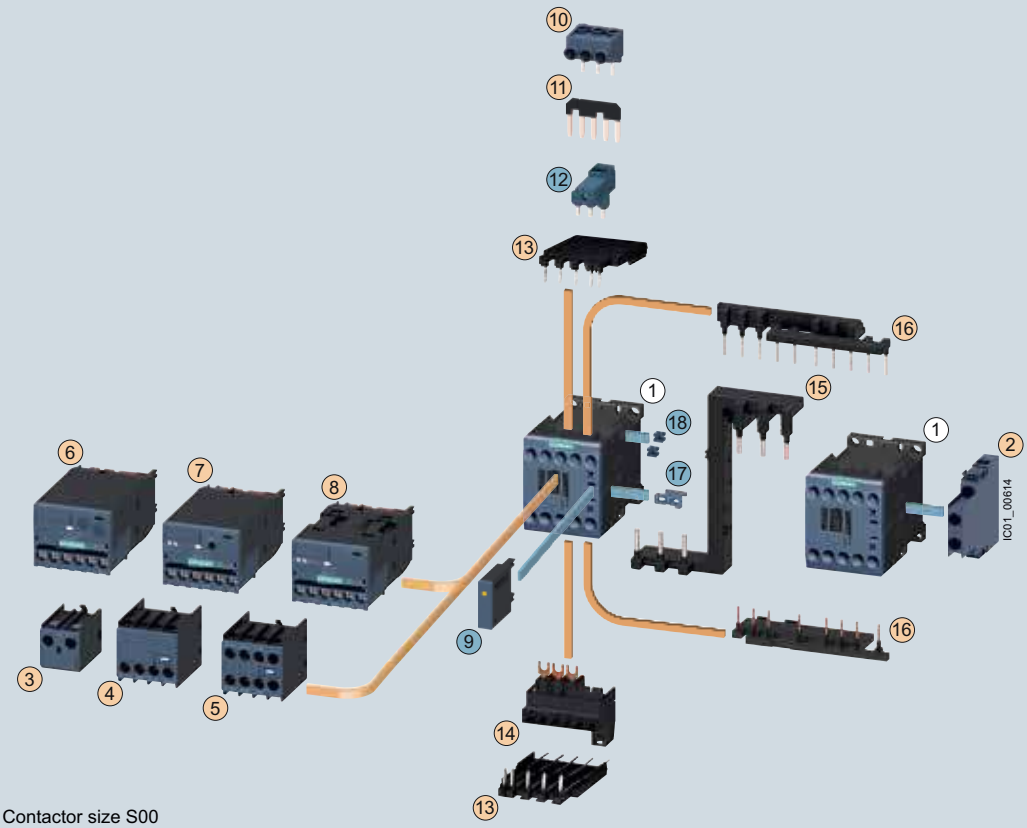
For contactor relays
For increasing the permissible residual current

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:

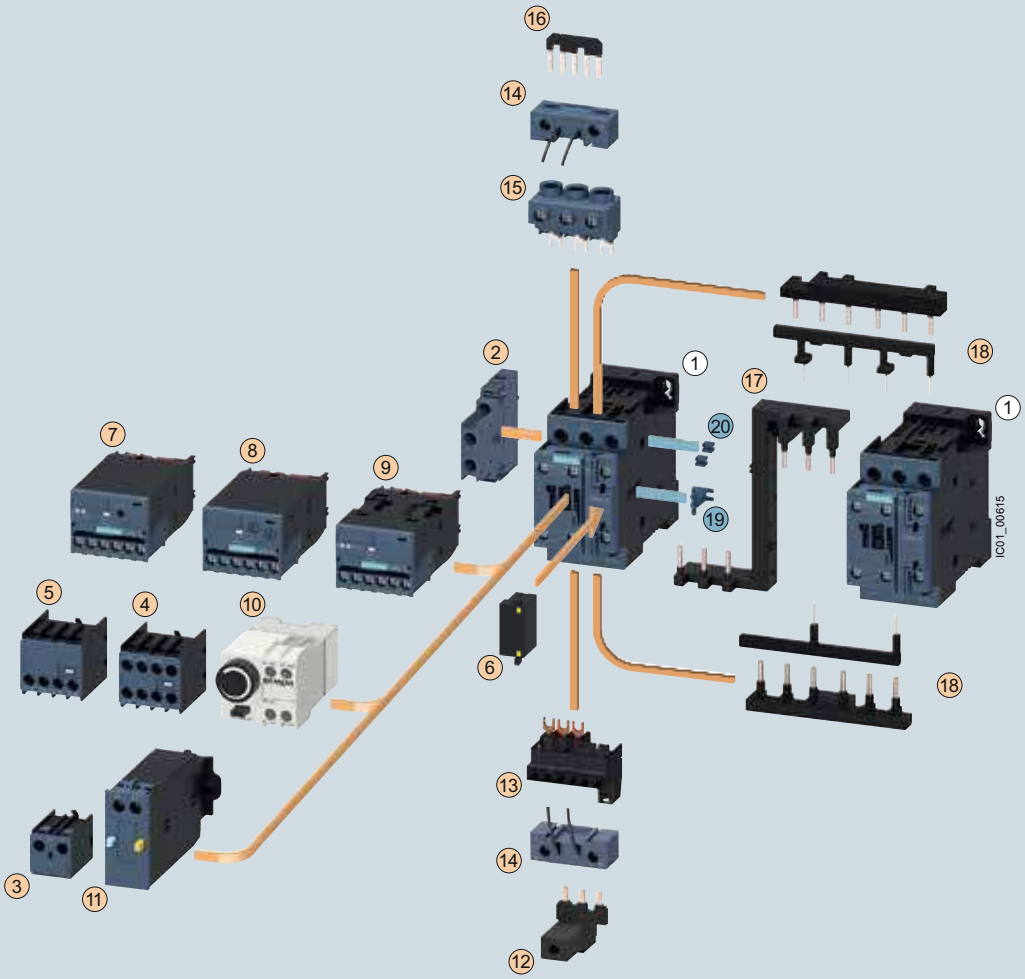
(16) Wiring modules on the top and bottom for connecting the main, auxiliary and control current paths, electrical interlock[1] included (NC contact interlock), can be broken off (NC contact interlock)
(17) Mechanical interlocks[2]
(18) Two connecting clips for two contactors[2]

For contactors
For contactors and coupling contactors

[1] 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.

[2] The parts (17) and (18) can only be ordered together as 3RA2912-2H mechanical connectors.

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
(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

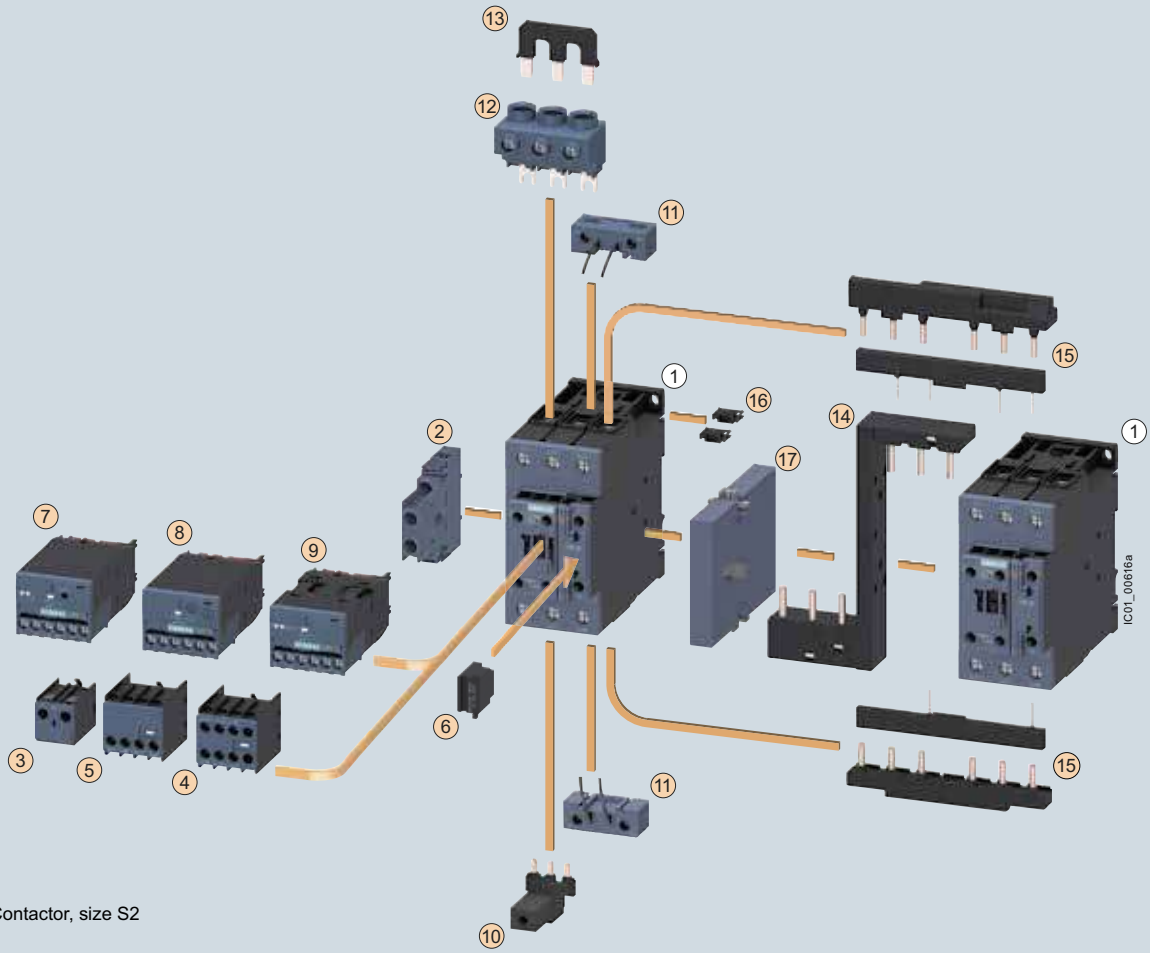
Assembly kit 3RA2923-2AA1 comprising:

(18) Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included (NC contact interlock)
(19) Mechanical interlocks [1)]
(20) Two connecting clips for two contactors [1)]

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)

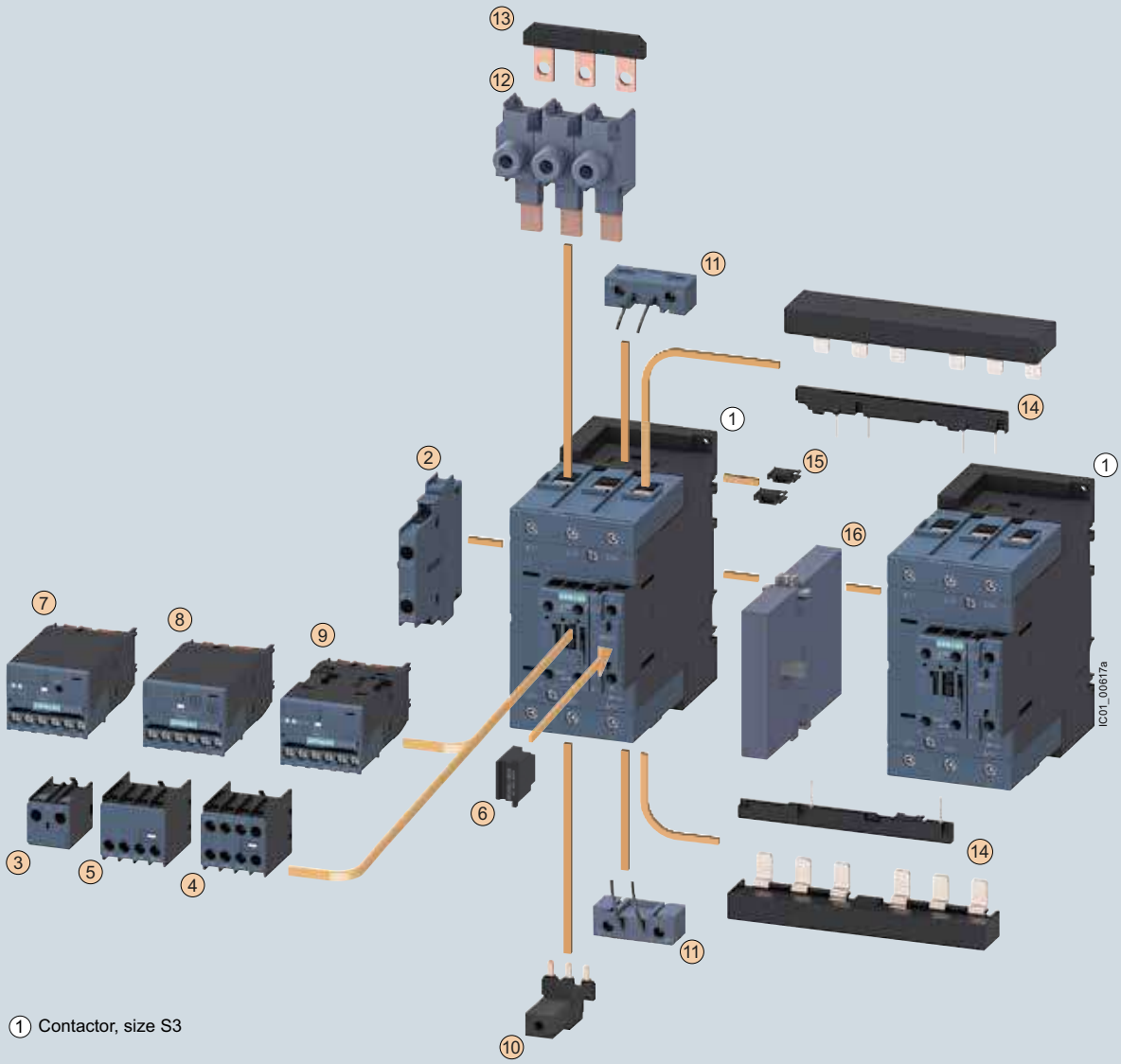
16 Two connecting clips for two contactors

To be ordered separately:

17 Mechanical interlocks

Accessories see pages 2/68 to 2/83.

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 infeed 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[1] included, can be broken off (NC contact interlock)
(15) Two connectors for two contactors

To be ordered separately:
(16) Mechanical interlock

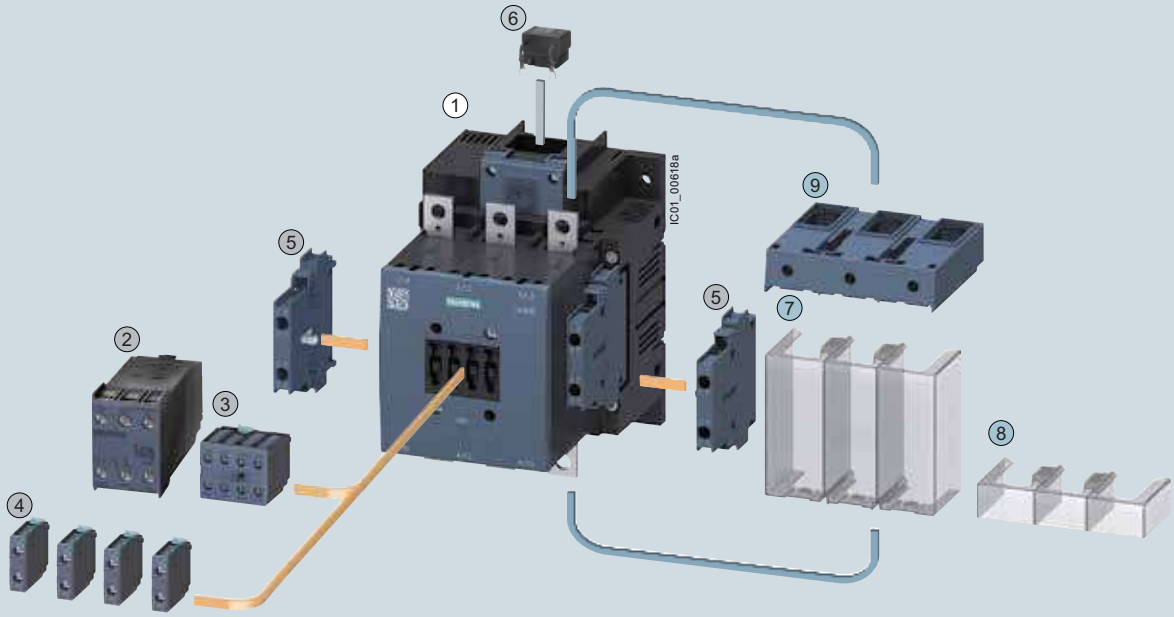
[1] 3RT201. contactors with one NC contact in the basic unit are required for the electrical interlock. An additional NO contact is required for momentary-contact operation.

Accessories see pages 2/68 to 2/83.

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

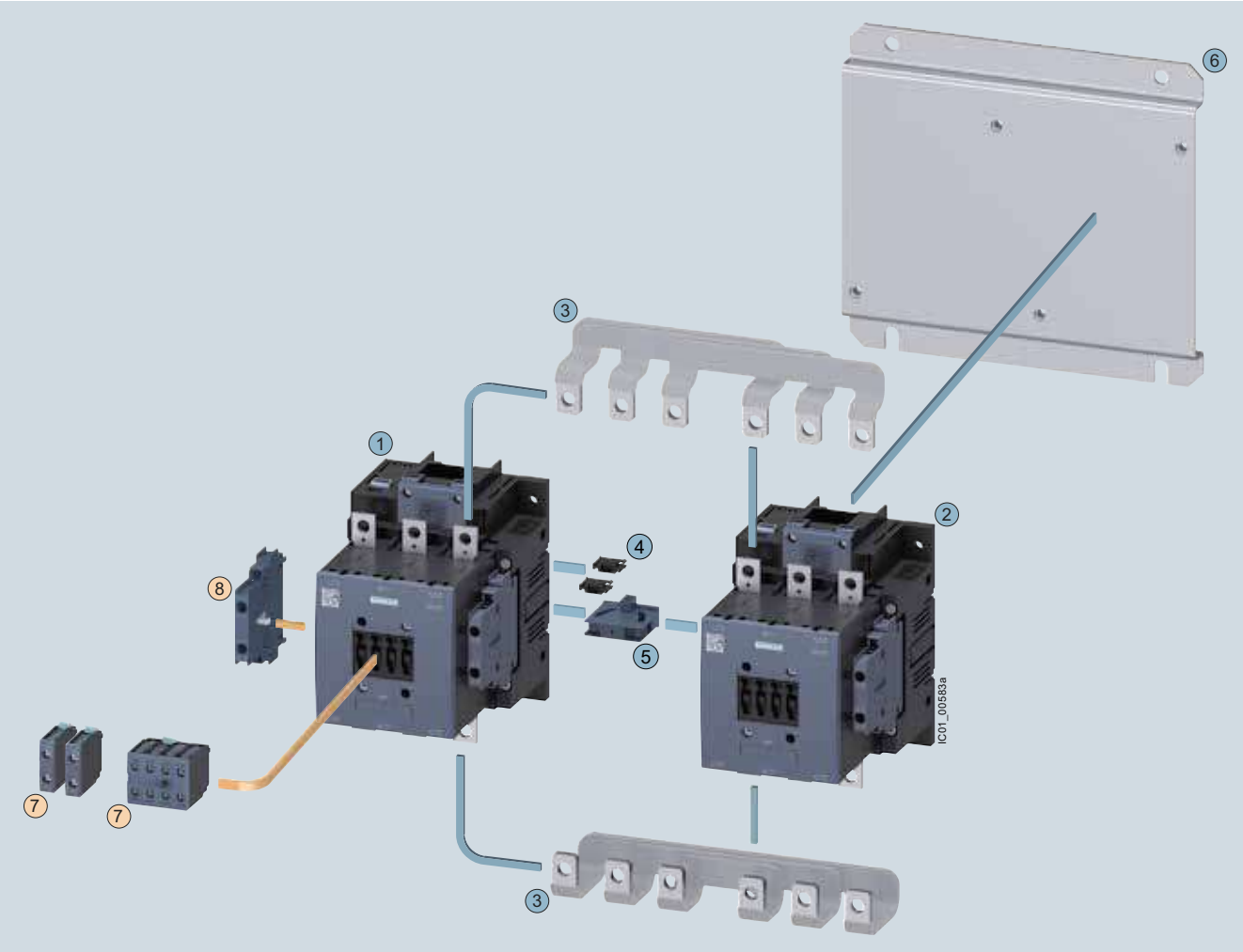
(7) Terminal cover for cable lug and busbar connection
(8) Terminal cover for box terminal
(9) Box terminal block

Accessories identical for sizes S6 to S12
Different accessories for sizes S6 and S10/S12

For accessories see pages 2/68 to 2/85.

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

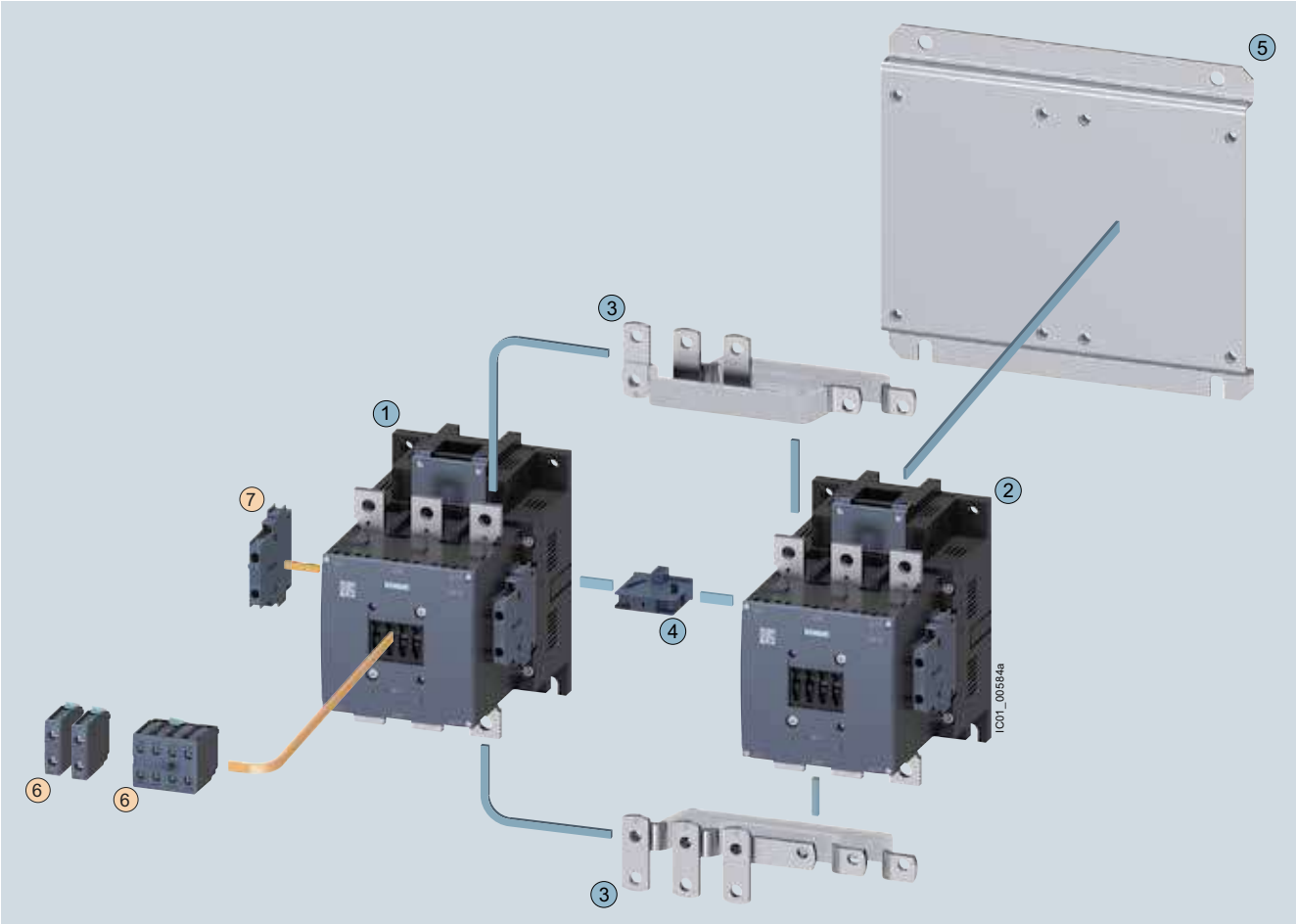
Reversing contactor assembly for customer assembly

Individual parts		Type Q11	Type Q12
1 2	Contactors, 55 kW	3RT1.54	3RT1.54
1 2	Contactors, 75 kW	3RT1.55	3RT1.55
1 2	Contactors, 90 kW	3RT1.56	3RT1.56
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)	3RA1953-2A	
4	Two connectors for two contactors	3RA1932-2D	
5	Mechanical interlock (must be ordered separately)	3RA1954-2A	
6	Base plate for reversing contactor assemblies	3RA1952-2A	

For accessories see pages 2/68-2/85.

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

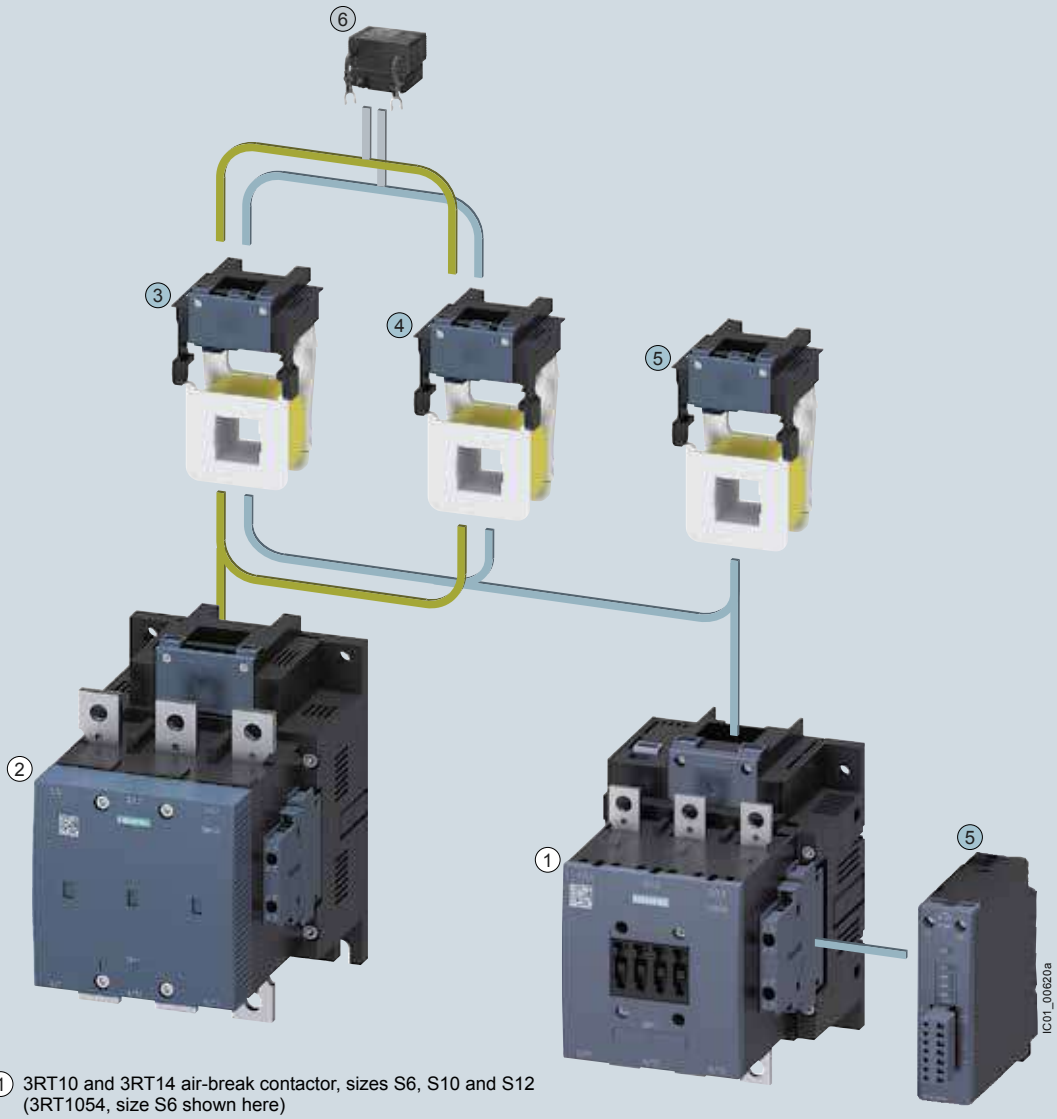
Reversing contactor assembly for customer assembly

Individual parts		Type Q11	Type 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 2/68-2/85.

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 2/75,
withdrawable coils see page 2/100.

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 3) 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Connections position	Auxiliary contacts Version				Screw Terminals1) Order No.	Spring Terminals1) Order No.
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 2)									
For assembling contactors with 2, 3, 4, or 5 auxiliary contacts									
3RT2.1, Ident. No. 10E	**11E**			–	1	–	–	**3RH2911-1HA01**	**3RH2911-2HA01**
	12E			–	2	–	–	**3RH2911-1HA02**	**3RH2911-2HA02**
	13E			–	3	–	–	**3RH2911-1HA03**	**3RH2911-2HA03**
	21E			1	–	–	–	**3RH2911-1HA10**	**3RH2911-2HA10**
	21E			1	1	–	–	**3RH2911-1HA11**	**3RH2911-2HA11**
	22E			1	2	–	–	**3RH2911-1HA12**	**3RH2911-2HA12**
	23E			1	3	–	–	**3RH2911-1HA13**	**3RH2911-2HA13**
	31E			2	–	–	–	**3RH2911-1HA20**	**3RH2911-2HA20**
	31E			2	1	–	–	**3RH2911-1HA21**	**3RH2911-2HA21**
	32E			2	2	–	–	**3RH2911-1HA22**	**3RH2911-2HA22**
	41E			3	–	–	–	**3RH2911-1HA30**	**3RH2911-2HA30**
	41E			3	1	–	–	**3RH2911-1HA31**	**3RH2911-2HA31**
Size S0 to S3									
For assembling contactors with 3, 4, or 5 auxiliary contacts									
3RT2.2, Ident. No. 11E	**12E**			–	1	–	–	**3RH2911-1HA01**	**3RH2911-2HA01**
	13E			–	2	–	–	**3RH2911-1HA02**	**3RH2911-2HA02**
3RT2.3,	**14E**			—	3	—	—	**3RH2911-1HA03**	**3RH2911-2HA03**
3RT2.4	**21E**			1	–	–	–	**3RH2911-1HA10**	**3RH2911-2HA10**
	22E			1	1	–	–	**3RH2911-1HA11**	**3RH2911-2HA11**
	23E			1	2	–	–	**3RH2911-1HA12**	**3RH2911-2HA12**
	24E			1	3	–	–	**3RH2911-1HA13**	**3RH2911-2HA13**
	31E			2	–	–	–	**3RH2911-1HA20**	**3RH2911-2HA20**
	32E			2	1	–	–	**3RH2911-1HA21**	**3RH2911-2HA21**
	33E			2	2	—	—	**3RH2911-1HA22**	**3RH2911-2HA22**
	41E			3	–	–	–	**3RH2911-1HA30**	**3RH2911-2HA30**
	42E			3	1	–	–	**3RH2911-1HA31**	**3RH2911-2HA31**
Auxiliary switch blocks for snapping onto the front according to EN 50012									
Sizes S6 to S12									
4-pole									
3RT1.5 ... 3RT1.7	**22**		(with location digits 5, 6, 7, 8)	2	2	–	–	**3RH1921-1XA22-0MA0**	**3RH1921-2XA22-0MA0**

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/207-2/211.
For int. circuit diagrams see page 2/195.
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 2/53.

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 15/7

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 [3] 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Connections position	Auxiliary contacts Version				Screw Terminals[1] Order No.	Spring Terminals[1] Order No.
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** [1]			–	4	–	–	**3RH2911-1FA04**	**3RH2911-2FA04**
3RT2.4	**11** [2]			–	–	1	1	**3RH2911-1FB11**	**3RH2911-2FB11**
3RH21,	**22** [2]			1	1	1	1	**3RH2911-1FB22**	**3RH2911-2FB22**
3RH24	**22** [2]			–	–	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**	**–**
3RT2.4			Bottom	–	1	–	–	**3RH2911-1BA01**	**–**
3RH21,	**11**		Top	1	1	–	–	**3RH2911-1LA11**	**–**
3RH24			Bottom	1	1	–	–	**3RH2911-1MA11**	**–**
	20		Top	2	–	–	–	**3RH2911-1LA20**	**–**
			Bottom	2	–	–	–	**3RH2911-1MA20**	**–**
Sizes S6 to S12									
Single-pole auxiliary switch blocks (also compliant with EN 5001[2]									
3RT1.5 ...	–			1	–	–	–	**3RH1921-1CA10**	**3RH1921-2CA10**
3RT1.7	–			–	1	–	–	**3RH1921-1CA01**	**3RH1921-2CA01**
	–			–	–	1	–	**3RH1921-1CD10**	**–**
	–			–	–	–	1	**3RH1921-1CD01**	**–**

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/207-2/211.
For int. circuit diagrams see page 2/195.

1) Mounting is permitted only on basic units which have no integrated NC contact.

2) Version with early make and delayed break contacts

3) UL ratings: See appendix page 15/7

Accessories for 3RT contactors / 3RH control relays

Laterally mountable auxiliary switch blocks

Selection and ordering data

3RH2911-1DA02

3RH2911-2DA02

3RH19 21-1EA. .
-1KA. .

3RH2921-1DA02

For contactors/ control relays	Rated operational Current [5] 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Mountable to contactor/ contactor relay side	Auxiliary contacts Version NO	Auxiliary contacts Version NC	Screw Terminals[1] Order No.	Spring Terminals[1] Order No.
Type							
Laterally mountable auxiliary switch blocks according to EN 50012							
Laterally mountable auxiliary switch block, 2-pole							
Size S00 [1) 2)]							
3RT2.1,	A600/Q600	**12E**	right or left	–	2	**3RH2911-1DA02**	**3RH2911-2DA02**
Ident. No. 10E	A600/Q600	**21E**	right or left	1	1	**3RH2911-1DA11**	**3RH2911-2DA11**
Size S00 to S3							
3RT2.1	A600/Q600	**13E**	right or left	–	2	**3RH2921-1DA02**	**3RH2921-2DA02**
3RT2.2[3)], Ident. No. 11E	A600/Q600	**22E**	right or left	1	1	**3RH2921-1DA11**	**3RH2921-2DA11**
3RT2.3[4)],	A600/Q600	**31E**	right or left	2	–	**3RH2921-1DA20**	**3RH2921-2DA20**
3RT2.4[4)].							
First laterally mountable auxiliary switch block, 2-pole							
Sizes S6 to S12							
3RT1.5 ... 3RT1.7	A600/Q600		right or left	1	1	**3RH1921-1DA11**	**3RH1921-2DA11**
Second laterally mountable auxiliary switch block, 2-pole							
Sizes S6 to S12							
3RT1.5 ... 3RT1.7	A300/Q300		right or left	1	1	**3RH1921-1JA11**	**3RH1921-2JA11**
Laterally mountable auxiliary switch blocks according to EN 50005							
First laterally mountable auxiliary switch block, 2-pole							
Sizes S00 [1) 2)]							
3RT2.1.	A600/Q600	**02**	right or left	–	2	**3RH2911-1DA02**	**3RH2911-2DA02**
Ident.No. 10E	A600/Q600	**11**	right or left	1	1	**3RH2911-1DA11**	**3RH2911-2DA11**
	A600/Q600	**20**	right or left	2	–	**3RH2911-1DA20**	**3RH2911-2DA20**
Sizes S00 to S3							
3RT2.1	A600/Q600	**02**	right or left	–	2	**3RH2921-1DA02**	**3RH2921-2DA02**
3RT2.2[3)],	A600/Q600	**11**	right or left	1	1	**3RH2921-1DA11**	**3RH2921-2DA11**
3RT2.3[4)],	A600/Q600	**20**	right or left	2	–	**3RH2921-1DA20**	**3RH2921-2DA20**
3RT2.4[4)]							
Sizes S6 to S12							
3RT1.5 ... 3RT1.7	A300/Q300		right or left	–	2	**3RH1921-1EA02**	**3RH1921-2EA02**
	A300/Q300		right or left	1	1	**3RH1921-1EA11**	**—**
	A300/Q300		right or left	2	–	**3RH1921-1EA20**	**3RH1921-2EA20**
Second laterally mountable auxiliary switch block, 2-pole							
Sizes S6 to S12							
3RT1.5 ... 3RT1.7	A300/Q300		right or left	–	2	**3RH1921-1KA02**	**3RH1921-2KA02**
	A300/Q300		right or left	1	1	**3RH1921-1KA11**	**—**
	A300/Q300		right or left	2	–	**3RH1921-1KA20**	**3RH1921-2KA20**

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/207-2/211.
For int. circuit diagrams see pages 2/195-2/200.

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) 3RH2921-1DA.. lateral auxiliary switches can only be mounted onto 3RT26 capacitor contactors of sizes S2 and S3.

5) UL ratings: See appendix page 15/7

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

3RH29 21-2DE11

For contactors/ control relays	Contactor with HS block Ident. No.	Mountable to contactor/ contactor relay side	Auxiliary contacts Version NO	NC	NO	NC	Screw Terminals[1] Order No.	Spring Terminals[1] Order No.
Type								
Solid-state compatible auxiliary switch blocks for snapping onto the front according to EN 50005 [1]								
Sizes S00 to S3								
3RT2.1,	**02**		–	–	–	2	**3RH2911-1NF02**	**3RH2911-2NF02**
3RT2.2...3RT2.4	**11**		1	–	–	1	**3RH2911-1NF11**	**3RH2911-2NF11**
3RH21, 3RH24	**20**		2	–	–	–	**3RH2911-1NF20**	**3RH2911-2NF20**
Solid-state compatible auxiliary switch blocks, laterally mountable, according to EN 50012								
First laterally mountable auxiliary switch block, 2-pole								
Size S00 [2]								
3RT2. 1., Ident. No. 10E	**21E**	right	1	–	–	1	**–**	**3RH2911-2DE11**
Size S0 to S3								
3RT2.2....3RT2.4 Ident. No. 10E	**22E**	right	1	–	–	1	**–**	**3RH2921-2DE11**
Sizes S6 to S12								
3RT1.5 ... 3RT1.7		right or left	1	–	–	1	**–**	**3RH1921-2DE11**
Second laterally mountable auxiliary switch block, 2-pole								
Sizes S6 to S12								
3RT1.5 ... 3RT1.7		right or left	1	–	–	1	**–**	**3RH1921-2JE11**
Solid-state compatible auxiliary switch blocks, laterally mountable, according to EN 50005								
Size S00								
3RT2. 1., Ident. No. 10E	**11**	right or left	1	–	–	1	**–**	**3RH2911-2DE11**
Size S0 to S2								
3RT2. 2., 3RT2. 3	**11**	right or left	1	–	–	1	**–**	**3RH2921-2DE11**

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/207 -2/211.
For int. circuit diagrams see pages 2/195-2/200.

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	Spring Terminals
	Type	V	Sec		Order No.	Order No.
Time-delay, solid-state auxiliary switch blocks for snapping onto the front according to DIN 46199-5						
	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.					
	Sizes S00 to S3					
3RA2813-1AW10	3RT2., 3RH21 [2] 3RH24	**ON-delay (varistor integrated)**				
		24 … 240 AC/DC	0.05 … 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	**3RA2813-1AW10** **3RA2813-1FW10**	**3RA2813-2AW10** **3RA2813-2FW10**
		OFF-delay with auxiliary voltage (varistor integrated)				
		24 … 240 AC/DC	0.05 … 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	**3RA28 14-1AW10** **3RA28 14-1FW10**	**3RA28 14-2AW10** **3RA28 14-2FW10**
		OFF-delay without auxiliary voltage[3] (varistor integrated)				
		24 … 240 AC/DC	0.05 … 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	**3RA2815-1AW10** **3RA2815-1FW10**	**3RA2815-2AW10** **3RA2815-2FW10**
	Sizes S6 to S12					
3RT1926-2FJ11	3RT10, 3RT13, 3RT14, 3RT15	**ON-delay (varistor integrated)**				
		24 AC/DC [4]	0.05 … 1	1 NO + 1 NC	**3RT19 26-2EJ11**	–
			0.5 … 10	1 NO + 1 NC	**3RT19 26-2EJ21**	–
			5 … 100	1 NO + 1 NC	**3RT19 26-2EJ31**	–
		100 … 127 AC [4]	0.05 … 1	1 NO + 1 NC	**3RT19 26-2EC11**	–
			0.5 … 10	1 NO + 1 NC	**3RT19 26-2EC21**	–
			5 … 100	1 NO + 1 NC	**3RT19 26-2EC31**	–
		200 … 240 AC [4]	0.05 … 1	1 NO + 1 NC	**3RT19 26-2ED11**	–
			0.5 … 10	1 NO + 1 NC	**3RT19 26-2ED21**	–
			5 … 100	1 NO + 1 NC	**3RT19 26-2ED31**	–
		OFF-delay without auxiliary voltage [5]				
		24 AC/DC [4]	0.05 … 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2FJ11** **3RT19 26-2FJ21** **3RT19 26-2FJ31**	– – –
		100 … 127 AC [4]	0.05 … 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2FK11** **3RT19 26-2FK21** **3RT19 26-2FK31**	– – –
		200 … 240 AC [4]	0.05 … 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2FL11** **3RT19 26-2FL21** **3RT19 26-2FL31**	– – –
		WYE-delta function				
		24 AC/DC [4] 100 … 127 AC [4] 200 … 240 AC [4]	1.5 … 30 1.5 … 30 1.5 … 30	each have: 1 NO delayed 1 NO instant interval 50ms	**3RT19 26-2GJ51** **3RT19 26-2GC51** **3RT19 26-2GD51**	– – –

For technical data, see pages 2/187-2/188.
For int. circuit diagrams, see page 2/203.
For position of terminals, see page 2/211.

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 [1]	Time setting range t	Screw terminals	Spring-type terminals	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				
3RT20.., 3RT23.., 3RT25.., 3RH21 [2], 3RH24	24 ... 240	0.05 ...100 (1, 10, 100; selectable)	**3RA2811-1CW10**	**3RA2811-2CW10**	
3RT203.	24 ... 90	0.05 ...100 (1, 10, 100; selectable)	**3RA2831-1DG10**	**3RA2831-2DG10**	
	90 ... 240		**3RA2831-1DH10**	**3RA2831-2DH10**	
	OFF-delay with control signal Varistor integrated				
3RT20.., 3RT23.., 3RT25.., 3RH21 [2], 3RH24	24 ... 240	0.05 ...100 (1, 10, 100; selectable)	**3RA2812-1DW10**	**3RA2812-2DW10**	
3RT203.	24 ... 90	0.05 ...100 (1, 10, 100; selectable)	**3RA2832-1DG10**	**3RA2832-2DG10**	
	90 ... 240		**3RA2832-1DH10**	**3RA2832-2DH10**	

1) AC voltage values apply for 50 Hz and 60 Hz.

2) Cannot be fitted onto coupling relays.

For description, see page 2/121.
For technical data, see page 2/187.
For circuit diagrams, see page 2/203.

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

Accessories for 3RT contactors / 3RH control relays

Function modules, delay blocks, and mechanical latching blocks

Selection and ordering data

	For contactors Type	Rated control supply voltage U_s [1] V	Time setting range t sec	**Screw Terminals** [2] Order No.	Weight approx. kg
Off-delay device					
3RT2916-2B.01	***Sizes S00 to S2***				
	For contactors with DC operation. Non-adjustable delay time				
	3RT2., 3RH2. . .-1BF40	110 AC/DC	S00: > 0.1 S0: > 0.08; S2: > 0.25	**3RT2916-2BK01**	0.150
	3RT2., 3RH2. . .-1BM40	220 ... 230 AC/DC	S00: > 0.5 S0: > 0.3; S2: > 0.8	**3RT2916-2BL01**	0.150
	3RT2., 3RH2. . .-1BB40	24 DC	S00: > 0.2 S0: > 0.1; S2: > 0.1	**3RT2916-2BE01**	0.150
3RT2916-2BE01	***Sizes S3***				
	3RT2. 4	24 DC	S3: 70 fixed	**3RT2916-2BE01**	0.093
Pneumatic delay blocks, terminal designation according to EN 50005 [4]					
3RT2926-2PA01	***Size S0***				
	For snapping onto the front of contactors [5] **Auxiliary contacts 1 NO and 1 NC**				
	With ON-delay 3RT2. 2	– –	0.1 ... 30 1 ... 60	**3RT2926-2PA01** **3RT2926-2PA11**	0.080 0.080
	With OFF-delay 3RT2. 2	– –	0.1 ... 30 1 ... 60	**3RT2926-2PR01** **3RT2926-2PR11**	0.080 0.080
Mechanical latching blocks					
3RT2926-3AB31	**For mounting onto the front of contactors** **The contactor remains in the energized state even after voltage failure**				
	Size S0				
	3RT2. 2	24 AC/DC	–	**3RT2926-3AB31**	0.100
		110 AC/DC	–	**3RT2926-3AF31**	0.100
		230 AC/DC	–	**3RT2926-3AP31**	0.100

For description, see page 2/121.
For technical data, see page 2/187.
For circuit diagrams, see page 2/203.

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

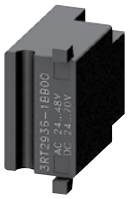
Surge suppressors

Selection and ordering data

For contactors Type	Version	Rated control supply voltage U_s [1] AC operation V AC	DC operation V DC	Order No.	Weight 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)				
3RT2.1, 3RH2.	**Varistors**	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.	**RC elements**	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.	**Noise suppression diodes**	--	12 ... 250	**3RT2916-1DG00**	
3RT2.1, 3RH2.	**Diode assemblies** (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)				
3RT2.2	**Varistors**	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	**RC elements**	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	**Diode assembly** 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)				
3RT2.3.	**Varistors**	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.	**RC elements**	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.	**Diode assembly** for DC operation	--	24	**3RT2936-1ER00**	
		--	30 ... 250	**3RT2936-1ES00**	

3RT2916-1B.00

3RT2926-1E.00


3RT2936-1B.00

3RT2936-1E.00

[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

Selection and ordering data

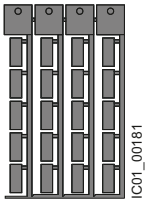
	For contactors	Version	Rated control supply voltage U_s [1] AC operation	DC operation		Order No.	Weight approx.
	Type		V AC	V DC	mW		kg
Surge suppressors without LED (also for spring-type terminals)							
3RT1936-1C. 00	***Sizes S6, S10, S12***	**For plugging onto the conventional or solid-state coil**					
	3RT1. 5, 3RT1. 6 3RT1. 7	**RC element**	24 … 48	24 … 70		**3RT1956-1CB00**	0.03
			48 …127	70 … 150		**3RT1956-1CC00**	0.03
			127 … 240	150 … 250		**3RT1956-1CD00**	0.03
			240 … 400	–		**3RT1956-1CE00**	0.03
			400 … 600	–		**3RT1956-1CF00**	0.03
Surge suppressors with LED (also for spring-type terminals)							
3RT2916-1J.00	***Size S00***	**For plugging onto the front side of the contactors (with and without auxiliary switch block)**					
	3RT2.1, 3RH2.	**Varistor**	24 … 48	12 … 24	10 … 120	**3RT2916-1JJ00**	0.010
			48 …127	24 … 70	20 … 470	**3RT2916-1JK00**	0.010
			127 … 240	70 … 150	50 … 700	**3RT2916-1JL00**	0.010
			—	150 ... 250	160 … 950	**3RT2916-1JP00**	0.010
	3RT2.1, 3RH2.	**Noise suppression diode**	—	24 … 70	20 … 470	**3RT2916-1LM00**	0.010
			—	50 … 150	50 … 700	**3RT2916-1LN00**	0.010
			—	150 … 250	160 … 950	**3RT2916-1LP00**	0.010
3RT2926-1MR00	***Size S0***	**For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)**					
	3RT2. 2	**Varistor**	24 … 48	12 … 24	10 … 120	**3RT2926-1JJ00**	0.010
			48 …127	24 … 70	20 … 470	**3RT2926-1JK00**	0.010
			127 … 240	70 … 150	50 … 700	**3RT2926-1JL00**	0.010
	3RT2. 2	**Diode assembly**	—	24	20 … 470	**3RT2926-1MR00**	0.010
3RT2936-1J.00	***Size S2 and S3***	**For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)**					
	3RT2.3.	**Varistor**	24 … 48	12 … 24	10 … 120	**3RT2936-1JJ00**	0.010
			48 …127	24 … 70	20 … 470	**3RT2936-1JK00**	0.010
			127 … 240	70 … 150	50 … 700	**3RT2936-1JL00**	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
Main conducting path surge suppression module for 3RT12 vacuum contactors					
	Sizes S10 and S12 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 ... ≤ 690 V AC		**3RT1966-1PV3**	0.18
		Rated operational voltage $U_e \leq 1000$ V AC		**3RT1966-1PV4**	0.36
Auxiliary conductor terminal, 3-pole					
3RT2946-4F	***Size S3*** 3RT204.	For connecting auxiliary and control leads to the main conductor terminals (for one side).		**3RT2946-4F**	
Blank Labels					
3RT29 00- 1SB20  IC01_00181		Unit labeling plates 20 mm x 7 mm, pastel PC labeling system for individual inscription of unitlabeling plates available from: murrplastik Systems, Inc.	340 units	**3RT2900-1SB20**	0.200
		10 mm x 7 mm	816 units	**3RT2900-1SB10**	0.294

Links for paralleling

3RT1916-4BB31

3RT1916-4BB41

3RT1936-4BB31

3RT1956-4BA31

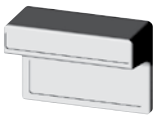
Size	For contactors Type	Maximum resistive current Ie/AC-1 (at 60 °C) of contactors A	Max. conductor cross sections	**Screw Terminals** Order No.	Standard package quantity	Weight approx. kg
S00	3RT201.	3-pole, with terminal 1), 2)	4 AWG, stranded	**3RT1916-4BB31**		0.015
S0	3RT202.		0 AWG, stranded	**3RT2926-4BB31**		0.042
S2	3RT203.		95 mm2	**3RT1936-4BB31**		0.139
S3	3RT204.	3-pole, with through hole (WYE jumpers) 1), 2)	185 mm2	**3RT1946-4BB31**		0.205
S6	3RT1. 5		—	**3RT1956-4BA31**		0.159
S10/S12	3RT1. 6 3RT1. 7		—	**3RT1966-4BA31**		0.541
S00	3RT231. 3RT251.	4-pole, with terminal 1), 2)	4 AWG, stranded	**3RT1916-4BB41**		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

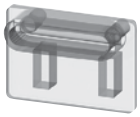
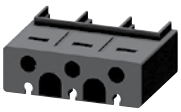
Selection and ordering data

	For contactors Type	Version	Order No.	Weight
EMC suppression modules; 3-phase, up to 10 HP				
	Size S00 (for contactors with AC or DC operation)			
			Screw terminals	
3RT2916-1PA.	3RT201	**RC elements** (3 x 220 Ω/0.22 µF)		
		Up to 400 V	**3RT2916-1PA1**	
		Up to 575 V	**3RT2916-1PA2**	
		Up to 690 V	**3RT2916-1PA3**	
	3RT201	**Varistors**		
		Up to 400 V	**3RT2916-1PB1**	
		Up to 575 V	**3RT2916-1PB2**	
		Up to 690 V	**3RT2916-1PB3**	
Coupling links for control by PLC				
	Size S0			
3RH2924-1GP11	3RT2. 2	**For mounting onto the coil terminals of the contactors (only for contactors with screw terminals)** 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	**For mounting on the front side of contactors with AC, DC or AC/DC operation** 24 V DC control, 17 ... 30 V DC operating range	**3RH2914-1GP11**	
			Spring-type terminals	
		24 V DC control, 17 ... 30 V DC operating range	**3RH2914-2GP11**	
Additional load modules				
	Size S00			
3RT2916-1GA00	3RT2. 1, 3RH2.	**For plugging onto the front side of the contactors with or without auxiliary switch blocks** 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..	**For snapping into the location hole of an inscription label on the front of a contactor** 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.	**3RT2926-1QT00**	
Control kit				
	Sizes S00 to S3			
 3RT2916-4MC00		**For manual operation of the contactor contacts** for start-up and service		
	3RT2. 1, 3RH2.		**3RT2916-4MC00**	
	3RT2. 2		**3RT2926-4MC00**	
	3RT2. 3		**3RT2936-4MC00**	

Accessories for 3RT contactors / 3RH control relays

Terminals, covers, adapters, connectors

Selection and ordering data

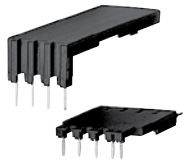
	For contactors Type	Version	Order No.	Weight
Sealable covers				
	Sizes S00 to S3			
 3RT2916-4MA10	3RT2.1, 3RT2.2, 3RT2.3, 3RT2.4, 3RH2.[1]	Sealable covers for preventing manual operation (Not suitable for coupling relays)	**3RT2916-4MA10**	
Connection modules for contactors with screw terminals				
	Sizes S00 and S0			
 3RT1926-4RD01		**Adapters for contactors** Ambient temperature $T_{u\ max}$ = 60 °C	**Screw terminals**	
	3RT2.1, 3RH2.	Size S00, rated operational current I_e at AC-3/400 V: 20 A	**3RT1916-4RD01**	
	3RT2.2	Size S0, rated operational current I_e at AC-3/400 V: 25 A	**3RT1926-4RD01**	
 3RT1900-4RE01	3RT2.1, 3RT2.2, 3RH2.	**Plugs for contactors** Size S00, S0	**3RT1900-4RE01**	
Terminal covers for contactors with box terminals				
	Size S2			
 3RT2936-4EA2		**Covers for box terminals**		
	3RT203	For 3-pole contactors	**3RT2936-4EA2**	
	3RT233, 3RT253	For 4-pole contactors (see Chapter 4)	**3RT2936-4EA4**	
Coil connection modules				
	Sizes S0 and S2			
 3RT2926-4RA11	3RT2.2, 3RT2.3	Connection from top Connection from below Connection diagonally	**3RT2926-4RA11** **3RT2926-4RB11** **3RT2926-4RC11**	
			Spring-type terminals	
 3RT2926-4RA12	3RT2.2	Connection from top Connection from below	**3RT2926-4RA12** **3RT2926-4RB12**	
Covers for contactors with ring cable lug connections				
	Size S00			
			Ring terminal lug connections	
 3RT2916-4EA13	3RT2.1, 3RH2	**Covers for ring terminal lug connections** Single covers	**3RT2916-4EA13**	
	Size S0			
 3RT2926-4EB13	3RT2.2	**Covers for ring terminal lug connections** Set for one device, comprising 4 single covers: - 2 x 3RT2926-4EB13 - 2 x 3RV2928-4AA00	**3RT2926-4EB13**	

1) Exception: contactors and contactor relays with auxiliary switch block mounted onto the front.

Accessories for 3RT contactors / 3RH control relays

SIRIUS

Terminals, covers, adapters, connectors

	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			
			Screw terminals	
3RT1916-4KA1	3RT2.1, 3RH21	Assembly kit for soldering contactors onto a printed circuit board. For 1 contactor, 1 set is required.	**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			
 3RT1916-4KA2	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**	
Safety main current connectors for 2 contactors				
	Sizes S00 to S2			
3RA2926-1A		**For series connection of 2 contactors**		
	3RT2.1		**3RA2916-1A**	
	3RT2.2		**3RA2926-1A**	
	3RT2.3		**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 Size	Type	Design	Order No.	Weight approx. 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		
	S3	3RT2. 4	16 mm² / 10 AWG (solid), 70 mm² / 0 AWG (stranded)	**3RT19 46-4G**	
	S6	3RT1. 5 (3RB205)	up to 70 mm² / 2/0 AWG up to 120 mm² / 4/0 AWG	**3RT19 55-4G** **3RT19 56-4G**	0.23 0.26
	S10, S12	3RT1. 6, 3RT1. 7 (3RB206)	240 mm² - 500 mm² / 500 MCM - 750 MCM with auxiliary conductor connection	**3RT19 66-4G**	0.64
Covers for contactors with screw connections					
3RT29 36-4EA2			**Terminal cover for box terminals**		
	S2	3RT20 3	Additional shock-hazard protection for mounting on the box terminals (2 units required per contactor)	**3RT29 36-4EA2**	0.012
	S3	3RT20 4		**3RT19 46-4EA2**	
	S6	3RT1 . 5	Length: 25 mm	**3RT19 56-4EA2**	0.016
	S10, S12	3RT1 . 6, 3RT1 . 7	Length: 30 mm	**3RT19 66-4EA2**	
			Terminal cover for cable lug and busbar connection		
3RT19 46-4EA1	**S3**	3RT20 4 3RT24 4	For complying with the phase clearances and as shock-hazard protection in the case of a distant box terminal [1] (2 units required per contactor)	**3RT19 46-4EA1**	0.028
	S6	3RT1 . 5	Length: 100 mm	**3RT19 56-4EA1**	0.05
	S10, S12	3RT1 . 6, 3RT1 . 7	Length: 120 mm	**3RT19 66-4EA1**	
			For covering bars between the contactor and 3RB20 overload relay or wiring connector for contactor assemblies		
	S6	3RT1 . 5	Length: 27 mm	**3RT19 56-4EA3**	0.018
	S10, S12	3RT1 . 6, 3RT1 . 7	Length: 42 mm	**3RT19 66-4EA3**	

	Design	Order No.	Package quantity	Weight approx. kg
Insulation stop for securely holding back the conductor insulation on conductors up to 1 mm² (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	**3RT2916-4JA02**	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	**3RT1916-4JA02**	20 strips	0.010
Tool for opening spring-type terminals				
3RA2908-1A	**Screwdriver** for all SIRIUS devices with spring-type terminals Length: approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray//black, partially insulated	**3RA2908-1A**	1 unit	0.045

1) Refer to the note on page 2/142, conductor cross-sections.

Accessories

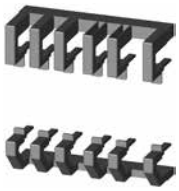
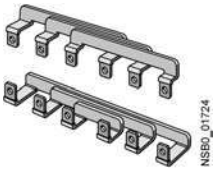
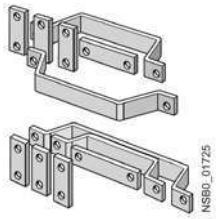
	For contactors Type	Size	Design	Order No.	Weight approx. kg
Mechanical interlocks					
3RA19 24-2B	3RT2.3	**S2**	**laterally mountable** for 3RT2 S2 contactors only. There are no NC auxiliary contacts. Use the integrated NC auxiliary on the contactor.	**3RA2934-2B**	0.04
	3RT204, 3RT234, 3RT245	**S3** [1]	**laterally mountable** 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	**3RA2934-2B**	0.05
3RA19 54-2C	3RT204 to 3RT105	**S3 to S6**	**adapter to mechanically** 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.	**3RA1954-2G**	
3RA19 54-2A	3RT1. 5 to 3RT1. 7	**S6, S10, S12**	**laterally mountable** 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.	**3RA1954-2A**	0.02
Baseplates				1 unit	
3RA1972-2A	3RT10 5	**S6**	for customer mounting of contactor assemblies for reversing	**3RA1952-2A**	1.3
	3RT1. 6	**S10**		**3RA1962-2A**	2.4
	3RT1. 7	**S12**		**3RA1972-2A**	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.
Assembly kits for making 3-pole contactor assemblies						
3RA2913-2AA1	3RT201	**S00**	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	**3RA2913-2AA1**	**3RA2913-2AA2**	1 kit
3RA2923-2AA2 	3RT202	**S0**	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 [1)] • Only for main circuit [2)]	**3RA2923-2AA1** **–**	**–** **3RA2923-2AA2**	1 kit 1 kit
3RA2933-2AA1	3RT203	**S2**	The installation kit contains: 2 connecting clips for 2 contactors, Wiring modules on the top and bottom • Only for main circuit [3)]	**3RA2933-2AA1** **–**	**–** **3RA2933-2AA2**	1 kit 1 kit
3RA2943-2AA1	3RT204	**S3**	The installation kit contains: 2 connecting clips for 2 contactors, Wiring modules on the top and bottom and the mechanical interlock	**3RA2943-2AA1**	**–**	
3RA19 53-2A 	3RT105	**S6**	The installation kit contains: Wiring modules on the top and bottom (for connection with box terminal)	**3RA19 53-2A**	**–**	1 kit
	3RT105 3RT1. 6 3RT1. 7	**S6** **S10** **S12**	The installation kit contains: Wiring modules on the top and bottom (for connection without box terminals)	**3RA1953-2M** **3RA1963-2A** **3RA1973-2A**		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.

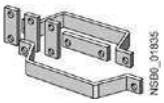
2) Version in size S0 with spring-type terminals: Only the wiring modules for the main circuit are included. No connectors are included for the auxiliary and control circuit.

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.

Contactor Assemblies for Switching Motors

3RA13, 3RA23 reversing contactor assemblies

Accessories

	For contactors Type	Size	Contactor gap for interlock	Version	Screw Terminals Order No.	Spring Terminals Order No.	Pkg. qty.
Wiring modules							
3RA2913-3DA1	3RT201	**S00-S00**	0 mm	Top (in-phase) Bottom (phase reversal)	**3RA2913-3DA1** **3RA2913-3EA1**	**3RA2913-3DA2** **3RA2913-3EA2**	1 1
	3RT202	**S0-S0**	0 mm	Top (in-phase) Bottom (phase reversal)	**3RA2923-3DA1** **3RA2923-3EA1**	**3RA2923-3DA2** **3RA2923-3EA2**	1 1
3RA2913-3EA1	3RT203	**S2-S2**	10 mm	Top (in-phase) Bottom (phase reversal)	**3RA1933-3D** **3RA1933-3E**	**3RA1933-3D** **3RA1933-3E**	1 1
	3RT204	**S3-S3**	10 mm	Top (in-phase) Bottom (phase reversal)	**3RA1943-3D** **3RA1943-3E**	**3RA1943-3D** **3RA1943-3E**	1 1
3RA1953-3D	3RT105	**S6-S6**	10 mm	Top (in-phase, for connection with box terminal)	**3RA1953-3D**	**3RA1953-3D**	1
3RA1953-3P 				Top (with phase reversal, for connection without box terminal)	**3RA1953-3P**	**3RA1953-3P**	1

	For contactors Type	Size	Contactor gap for interlock	Interlock Type	Version	Order No.	Pkg. qty.
Mechanical connectors[1]							
3RA29. 2-2H	3RT201	**S00-S00**	0 mm	Laterally mountable	For 3-pole contactors and 4-pole contactors	**3RA2912-2H**	1 set
	3RT202	**S0-S0**	0 mm	Laterally mountable	For 3-pole contactors and 4-pole contactors	**3RA2922-2H**	1 set
3RA2932-2C	3RT203	**S2-S2**	0 mm	Laterally mountable	For 3-pole contactors	**3RA2932-2C**	5 sets
			10 mm	Laterally mountable	For 3-pole contactors	**3RA2932-2D**	5 sets
3RA2932-2D	3RT233			Laterally mountable	For 4-pole contactors	**3RA2932-2G**	5 sets
	3RT2. 4	**S3-S3**	0 mm	Mountable on front	For 3-pole contactors	**3RA2932-2C**	10 sets
3RA2932-2G			10 mm	Laterally mountable	For 3-pole contactors	**3RA2932-2D**	10 sets
					For 4-pole contactors	**3RA2942-2G**	10 sets
3RA1942-2G	3RT1. 5	**S6-S6**	10 mm	Laterally mountable	Top (with phase reversal, for connection without box terminal)	**3RA1932-2D**	10 sets

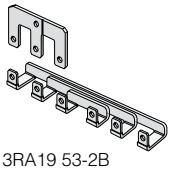
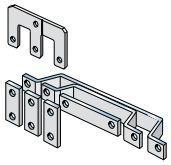
Note: Standard package quantities may change. Check Industry Mall for current package quantities.

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.

Contactor Assemblies for Switching Motors

WYE-delta accessories

Accessories

	Design	Sizes	Order No.		Weight approx. kg
Installation kits [1) 2)]					
 3RA19 53-2B	The installation kit contains: Mechanical interlock, 4 connecting clips, WYE jumper, Wiring connectors on the top and bottom,- For main, auxiliary, and control circuits [3)]	**S00-S00-S00**	**3RA2913-2BB1**	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 [3)]	**S0-S0-S0**	**3RA2923-2BB1**	1 set	0.10
		S2-S2-S0	**3RA2933-2C**	1 set	0.16
		S2-S2-S2	**3RA2933-2BB1**		0.16
 3RA19 53-2N, 3RA19 63-2B, 3RA19 73-2B	The installation kit contains: WYE jumper on the top Wiring jumper on the bottom	**S3-S3-S2**	**3RA2943-2C**		0.33
		S3-S3-S3	**3RA2943-2BB1**		0.16
		S6-S6-S6	**3RA1953-2B**		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.)	**S6-S6-S6**	**3RA1953-2N**		0.60
		S10-S10-S10	**3RA1963-2B**		1.80
		S12-S12-S12	**3RA1973-2B**		2.20
3-phase feeder terminal					
	Feeder terminal block for the line contactor for large conductor cross-sections			1 unit	
	Conductor cross-section: 6 mm², 10 AWG	**S00**	**3RA2913-3K**		0.02
	Conductor cross-section: 16 mm², 6 AWG	**S0**	**3RV2925-5AB**		0.04
	Conductor cross-section: 70 mm², 2/0 AWG	**S2**	**3RV2935-5A**		0.10
1-phase feeder terminals					
	Conductor cross-section: 95 mm²	**S3**	**3RA2943-3L**		0.280
3-phase busbar					
	For in-phase bridging of all input terminals of the line contactor (K1)	**S0**	**3RV1915-1AB**	1 unit	0.03
	and the delta contactor (K3)	**S2**	**3RV2935-5E**		0.15
Link for paralleling, 3-pole (WYE jumpers)					
3RT19 26-4BA31	Without terminal (the links for paralleling can be reduced by one pole)	**S00** [1)]	**3RT1916-4BA31**	1 unit	0.010
		S0 [1)]	**3RT1926-4BA31**		0.020
		S2	**3RT1936-4BA31**		0.02
		S3	**3RT1946-4BA31**		0.02
		S6 [4)]	**3RT1956-4BA31**		0.15
		S10, S12 [4)]	**3RT1966-4BA31**		
Baseplates					
	For customer assembly of WYE-delta contactor assemblies with a **laterally mounted** time-delay			1 unit	
	Side-by-side mounting	**S2 S2 S0**	**3RA2932-2F**		0.45
	10 mm clearance between K3 and K2	**S2 S2 S2**	**3RA2932-2F**		0.48
	Side-by-side mounting	**S3 S3 S2**	**3RA2942-2F**		0.72
	Side-by-side mounting	**S3 S3 S3**	**3RA2942-2F**		0.72
	10 mm clearance between K1, K3 and K2	**S. S. S.**		1 unit	
		S6 S6 S3	**3RA1952-2E**		2.0
		S6 S6 S6	**3RA1952-2F**		2.1
		S10 S10 S6	**3RA1962-2E**		
		S10 S10 S10	**3RA1962-2F**		
		S12 S12 S10	**3RA1972-2E**		
		S12 S12 S12	**3RA1972-2F**		

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 2/47 for more information.

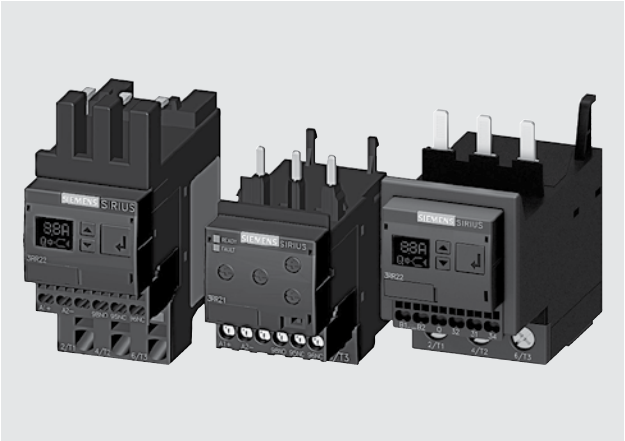
3) Also requires quantity (1) 3RA2816-0EW20 function module set for all control functions. See page 2/47.

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

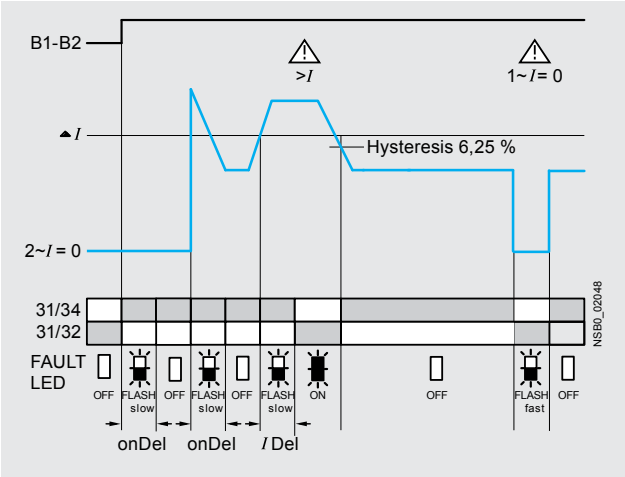
- Monitoring of current overshoot and undershoot
- Monitoring of broken conductors
- Monitoring of no-load operation and load shedding, e.g. in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g. on conveyor belts or cranes due to an excessive load
- Monitoring the 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

Technical specifications

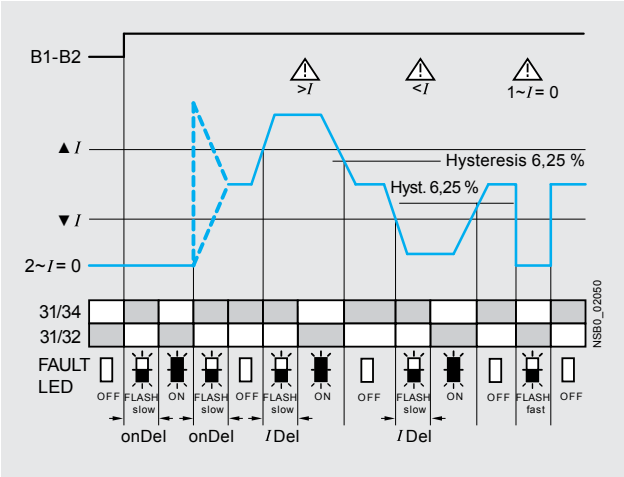
Function charts of 3RR214.-.A.30 basic variants, analog dial adjustable

Closed-circuit principle upon application of the control supply voltage

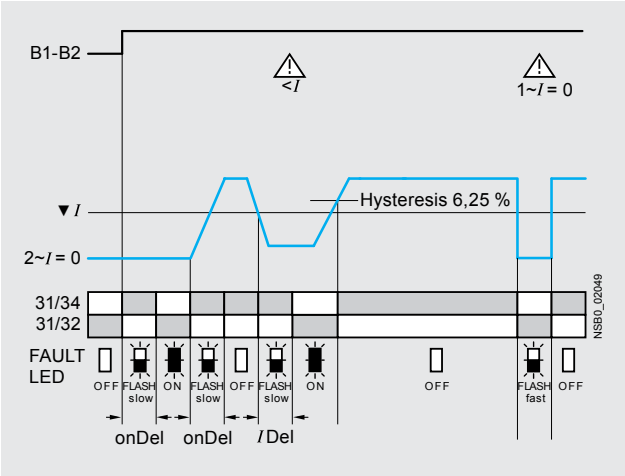
Current overshoot



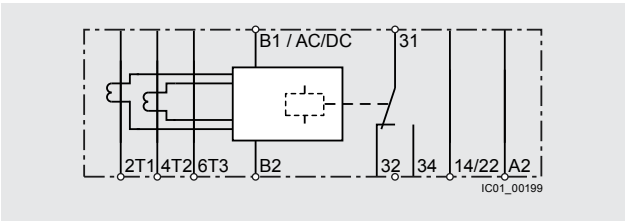
Range monitoring



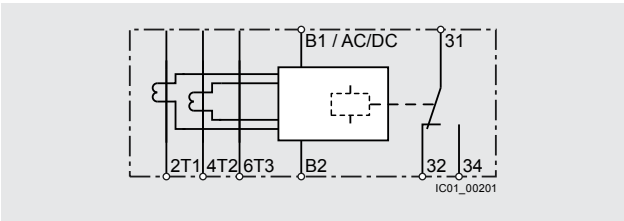
Current undershoot



Circuit diagrams



3RR2141-1A.30



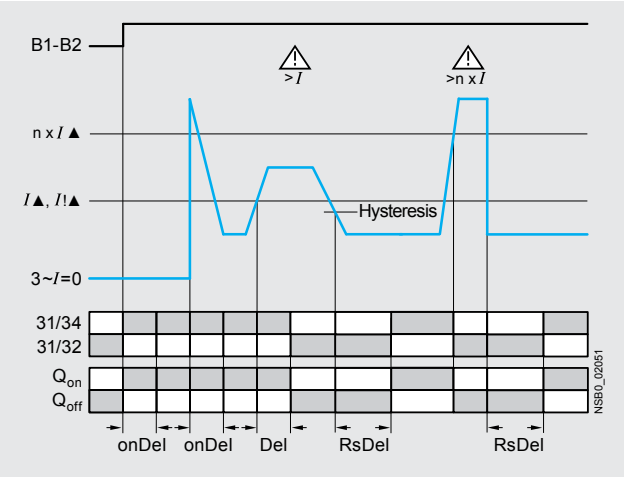
3RR2141-2A.30, 3RR2142-.A.30, 3RR2143-.A.30

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.

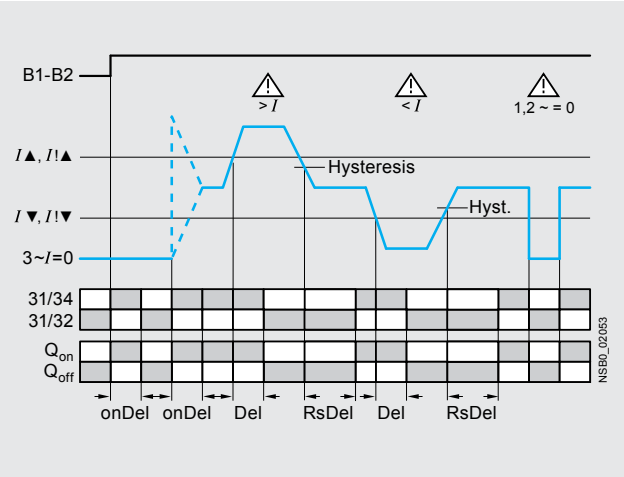
Function charts of 3RR224.-.F.30 standard versions, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

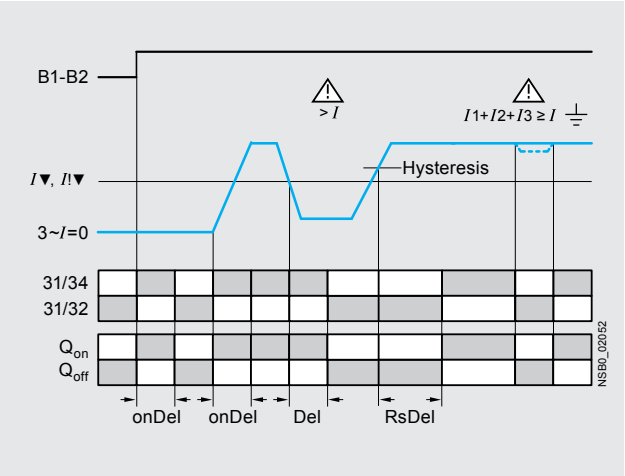
Current overshoot



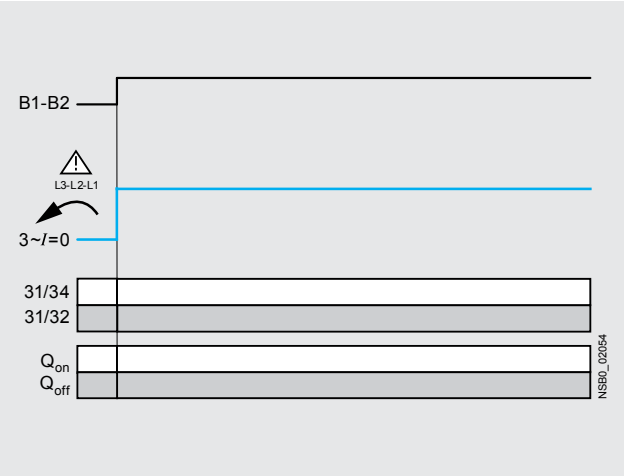
Range monitoring



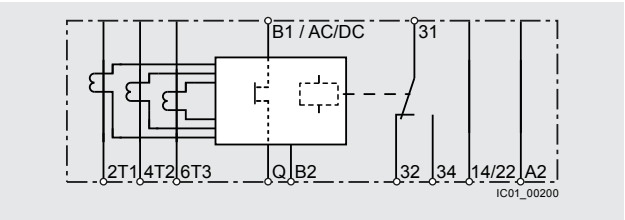
Current undershoot with residual current monitoring



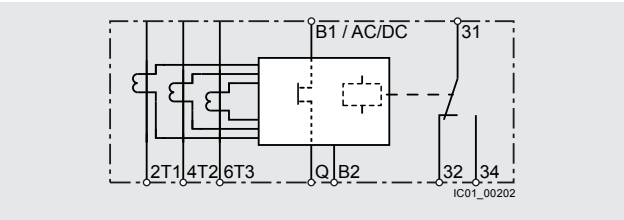
Phase sequence monitoring



Circuit diagrams



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

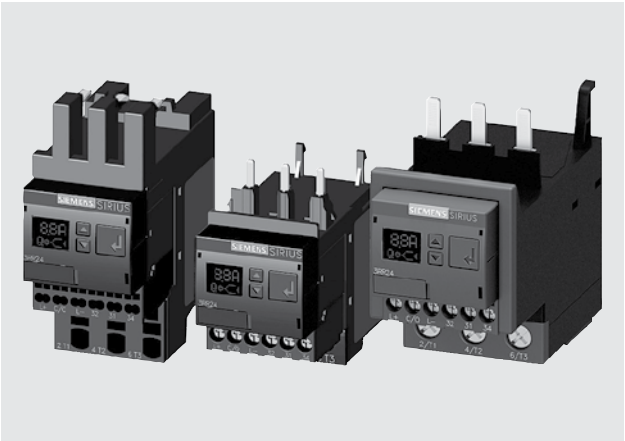
3RR2242-1FW30

3RR2141-2AA30

3RR2243-3FW30

Size	Measuring range	Hysteresis	Control supply voltage U_s	Screw terminals	Spring-type terminals
	A	A	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					
S00	1.6 ... 16	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	**3RR2141-1AA30** **3RR2141-1AW30**	**3RR2141-2AA30** **3RR2141-2AW30**
S0	4 ... 40	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	**3RR2142-1AA30** **3RR2142-1AW30**	**3RR2142-2AA30** **3RR2142-2AW30**
S2	8 ... 80	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	**3RR2143-1AA30** **3RR2143-1AW30**	**3RR2143-3AA30** **3RR2143-3AW30**
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					
S00	1.6 ... 16	0.1 ... 3	24 AC/DC 24 ... 240 AC/DC	**3RR2241-1FA30** **3RR2241-1FW30**	**3RR2241-2FA30** **3RR2241-2FW30**
S0	4 ... 40	0.1 ... 8	24 AC/DC 24 ... 240 AC/DC	**3RR2242-1FA30** **3RR2242-1FW30**	**3RR2242-2FA30** **3RR2242-2FW30**
S2	8 ... 80	0.2 ... 16	24 AC/DC 24 ... 240 AC/DC	**3RR2243-1FA30** **3RR2243-1FW30**	**3RR2243-3FA30** **3RR2243-3FW30**

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.

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.

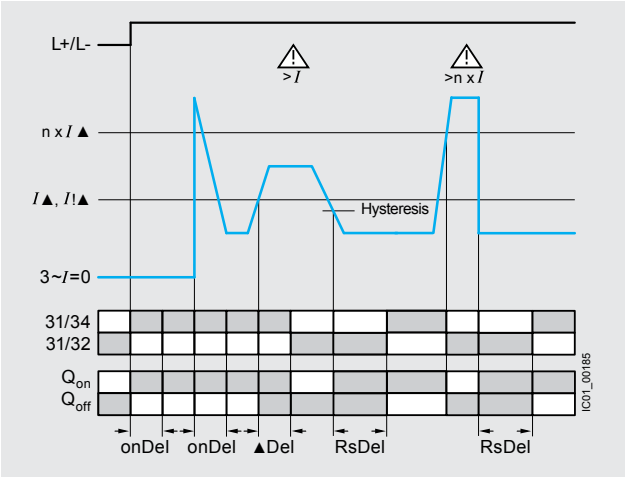
The monitoring relays can either relieve the controller of monitoring tasks or, as a second monitoring entity in parallel to and independent of the controller, increase the reliability in the process or in the system. In addition, the elimination of AI and IO modules allows the width of the controller to be reduced despite significantly expanded functionality.

Technical specifications

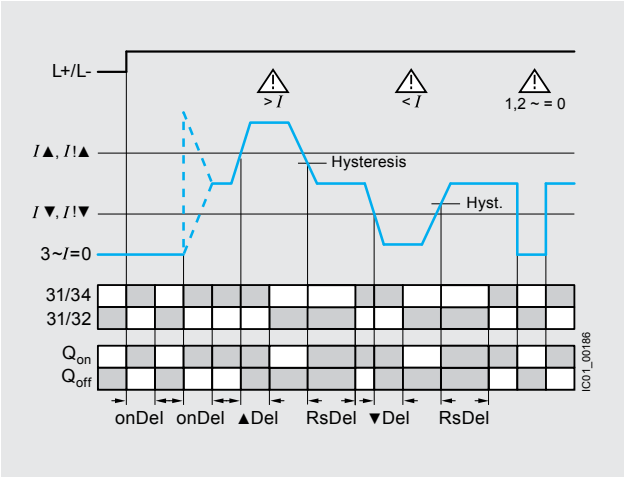
Function charts of 3RR24 for IO-Link, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

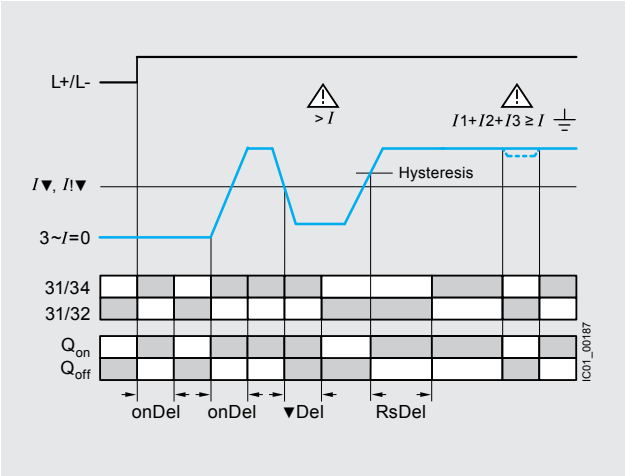
Current overshoot



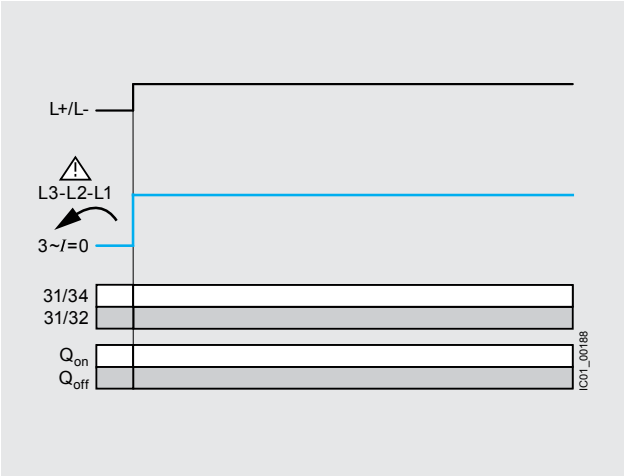
Range monitoring



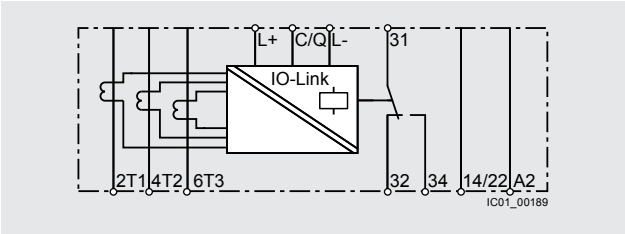
Current undershoot with residual current monitoring



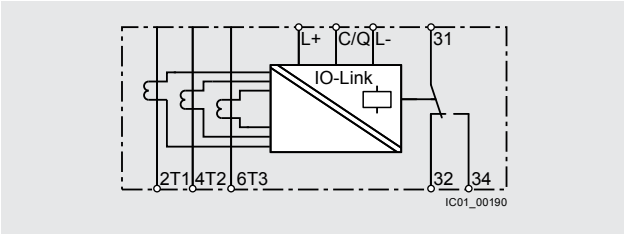
Phase sequence monitoring



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.

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

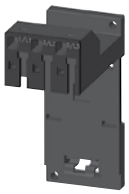
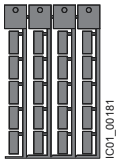
3RR2443-3AA40

Size	Measuring range	Hysteresis	Control supply voltage U_s	Screw terminals	Spring-type terminals
	A	A	V	Order No.	Order No.
• Digitally adjustable • LC display • Open or closed-circuit principle • 1 CO contact • 1 semiconductor output (in SIO mode) • 3-phase current monitoring • Active current or apparent current monitoring • Current unbalance monitoring • Phase sequence monitoring • Residual current monitoring • Blocking current monitoring • Operating hours counter • Operating cycles counter • Reclosing delay time 0 ... 300 min • Start-up delay 0 ... 999.9 s • Separate settings for warning and alarm thresholds					
S00	1.6 ... 16	0.1 ... 3	24 DC	**3RR2441-1AA40**	**3RR2441-2AA40**
S0	4 ... 40	0.1 ... 8	24 DC	**3RR2442-1AA40**	**3RR2442-2AA40**
S2	8 ... 80	0.2 ... 16	24 DC	**3RR2443-1AA40**	**3RR2443-3AA40**

Contactor Assemblies for Switching Motors

Current Monitoring Relay Accessories

Accessories

	Use	Version	Size	Order No.	Standard Pack Quantity
Terminal supports for stand-alone installation[1)]					
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 terminals**	
		• Screw connection	S00	**3RU2916-3AA01**	1 unit
			S0	**3RU2926-3AA01**	1 unit
			S2	**3RU2936-3AA01**	1 unit
 3RU2926-3AC01				**Spring-type terminals**	
		• Spring-type connection	S00	**3RU2916-3AC01**	1 unit
			S0	**3RU2926-3AC01**	1 unit
Blank labels					
 3RT2900-1SB20	For 3RR21, 3RR22, 3RR24	**Unit labeling plates** For SIRIUS devices 20 mm x 7 mm, titanium gray		**3RT2900-1SB20**	340 units
Sealable covers					
3RR2940	For 3RR21, 3RR22, 3RR24	**Sealable covers** For securing against unintentional or unauthorized adjustment of settings		**3RR2940**	5 units
	For 3RR21	**Sealing foil** For securing against unauthorized adjustment of setting knobs		**3TK2820-0AA00**	1 unit
Tools for opening spring-type terminals					
3RA2908-1A	For auxiliary circuit connections	**Screwdrivers** For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated		**Spring-type terminals**	
				3RA2908-1A	1 unit

[1)] The accessories are identical to those of the 3RU21 thermal overload relays and the 3RB3 electronic overload relays, see Chapter 3 "Overload Relays".

Contactor 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	Contactor		Max. current	Overload relay		Required DIN rail kit	NEMA 1 Enclosure
A	Non-reversing	Reversing	A	Thermal	Solid-state	Order No.	Order No.
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**
		High - Off - Low		**49SDSB3**
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 2/39.
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.

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.
Size	Type	50 Hz	50/60 Hz	60 Hz		
		V	V	V		kg
Solenoid coils · AC operation						
S0	3RT20 23, 3RT20 24, 3RT20 25	24	--	--	**3RT29 24-5AB01**	0.100
		42	--	--	**3RT29 24-5AD01**	0.100
		48	--	--	**3RT29 24-5AH01**	0.100
		110	--	--	**3RT29 24-5AF01**	0.100
		230	--	--	**3RT29 24-5AP01**	0.100
		400	--	--	**3RT29 24-5AV01**	0.100
		--	24	--	**3RT29 24-5AC21**	0.100
		--	42	--	**3RT29 24-5AD21**	0.100
		--	48	--	**3RT29 24-5AH21**	0.100
		--	110	--	**3RT29 24-5AG21**	0.100
		--	220	--	**3RT29 24-5AN21**	0.100
		--	230	--	**3RT29 24-5AL21**	0.100
		110	--	120	**3RT29 24-5AK61**	0.100
		220	--	240	**3RT29 24-5AP61**	0.100
		--	100	110	**3RT29 24-5AG61**	0.100
		--	200	220	**3RT29 24-5AN61**	0.100
		--	400	440	**3RT29 24-5AR61**	0.100
S0	3RT20 26, 3RT20 27, 3RT20 28	24	--	--	**3RT29 26-5AB01**	0.100
		42	--	--	**3RT29 26-5AD01**	0.100
		48	--	--	**3RT29 26-5AH01**	0.100
	3RT23 25, 3RT23 26, 3RT23 27	110	--	--	**3RT29 26-5AF01**	0.100
		230	--	--	**3RT29 26-5AP01**	0.100
		400	--	--	**3RT29 26-5AV01**	0.100
	3RT25 26	--	24	--	**3RT29 26-5AC21**	0.100
		--	42	--	**3RT29 26-5AD21**	0.100
		--	48	--	**3RT29 26-5AH21**	0.100
		--	110	--	**3RT29 26-5AG21**	0.100
		--	208	--	**3RT29 26-5AM21**	0.100
		--	220	--	**3RT29 26-5AN21**	0.100
		--	230	--	**3RT29 26-5AL21**	0.100
		110	--	120	**3RT29 26-5AK61**	0.100
		220	--	240	**3RT29 26-5AP61**	0.100
		--	100	110	**3RT29 26-5AG61**	0.100
		--	200	220	**3RT29 26-5AN61**	0.100
		--	400	440	**3RT29 26-5AR61**	0.100
		500	--		**3RT29 26-5AQ21**	0.100
			277		**3RT29 26-5AU61**	0.100
			480		**3RT29 26-5AV61**	0.100
			600		**3RT29 26-5AT61**	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	Rated control supply voltage U_s 50 Hz	50/60 Hz	60 Hz	DC	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Type	V	V	V		d					
Solenoid coils · AC operation										
Size S2										
3RT203.-.A, 3RT233.-.A, 3RT253.-.A	24	--	--	--	5	**3RT2934-5AB01**		1	1 unit	41B
	42	--	--	--	5	**3RT2934-5AD01**		1	1 unit	41B
	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
Size S3 NEW										
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
Solenoid coils · AC/DC operation, with varistor										
Size S2										
3RT203.-.A, 3RT233.-.A, 3RT253.-.A	--	20 ... 33	--	20 ... 33	5	**3RT2934-5NB31**		1	1 unit	41B
	--	30 ... 42	--	30 ... 42	5	**3RT2934-5ND31**		1	1 unit	41B
	--	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
Size S3 NEW										
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.

Spare parts for 3RT1 contactors

Selection and ordering data

	For contactor Size	Type	Rated control supply voltage U_s	Screw connection Order No.	Spring-type connection Order No.	Weight approx. kg
Coils · AC operation						
3RT19 34-5A . 01	**S2**	3RT10 33 3RT10 34	24 V, 50 Hz	**3RT19 34-5AB01**	**3RT19 34-5AB02**	0.088
			42 V, 50 Hz	**3RT19 34-5AD01**	**3RT19 34-5AD02**	
			48 V, 50 Hz	**3RT19 34-5AH01**	**3RT19 34-5AH02**	
			110 V, 50 Hz	**3RT19 34-5AF01**	**3RT19 34-5AF02**	
			230 V, 50 Hz	**3RT19 34-5AP01**	**3RT19 34-5AP02**	
			400 V, 50 Hz	**3RT19 34-5AV01**	**3RT19 34-5AV02**	
			42 V, 50/60 Hz	**3RT19 34-5AD21**	**3RT19 34-5AD22**	
			48 V, 50/60 Hz	**3RT19 34-5AH21**	**3RT19 34-5AH22**	
			24 V, 50/60 Hz	**3RT19 34-5AC21**	**3RT19 34-5AC22**	
			110 V, 50/60 Hz	**3RT19 34-5AG21**	**3RT19 34-5AG22**	
			208 V, 50/60 Hz	**3RT19 34-5AM21**	**3RT19 34-5AM22**	
			220 V, 50/60 Hz	**3RT19 34-5AN21**	**3RT19 34-5AN22**	
			230 V, 50/60 Hz	**3RT19 34-5AL21**	**3RT19 34-5AL22**	
			110 V, 50 Hz/120 V, 60 Hz	**3RT19 34-5AK61**	**3RT19 34-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 34-5AP61**	**3RT19 34-5AP62**	
			277 V, 60 Hz	**3RT19 34-5AU61**	**3RT19 34-5AU62**	
			480 V, 60 Hz	**3RT19 34-5AV61**	**3RT19 34-5AV62**	
			600 V, 60 Hz	**3RT19 34-5AT61**	**3RT19 34-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 34-5AG61**	**3RT19 34-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 34-5AN61**	**3RT19 34-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 34-5AR61**	**3RT19 34-5AR62**	
		3RT10 35, 3RT10 36, 3RT13 3 ., 3RT15 3 .	24 V, 50 Hz	**3RT19 35-5AB01**	**3RT19 35-5AB02**	0.088
			42 V, 50 Hz	**3RT19 35-5AD01**	**3RT19 35-5AD02**	
			48 V, 50 Hz	**3RT19 35-5AH01**	**3RT19 35-5AH02**	
			110 V, 50 Hz	**3RT19 35-5AF01**	**3RT19 35-5AF02**	
			230 V, 50 Hz	**3RT19 35-5AP01**	**3RT19 35-5AP02**	
			400 V, 50 Hz	**3RT19 35-5AV01**	**3RT19 35-5AV02**	
			24 V, 50/60 Hz	**3RT19 35-5AC21**	**3RT19 35-5AC22**	
			42 V, 50/60 Hz	**3RT19 35-5AD21**	**3RT19 35-5AD22**	
			48 V, 50/60 Hz	**3RT19 35-5AH21**	**3RT19 35-5AH22**	
			110 V, 50/60 Hz	**3RT19 35-5AG21**	**3RT19 35-5AG22**	
			208 V, 50/60 Hz	**3RT19 35-5AM21**	**3RT19 35-5AM22**	
			220 V, 50/60 Hz	**3RT19 35-5AN21**	**3RT19 35-5AN22**	
			230 V, 50/60 Hz	**3RT19 35-5AL21**	**3RT19 35-5AL22**	
			110 V, 50 Hz/120 V, 60 Hz	**3RT19 35-5AK61**	**3RT19 35-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 35-5AP61**	**3RT19 35-5AP62**	
			277 V, 60 Hz	**3RT19 35-5AU61**	**3RT19 35-5AU62**	
			480 V, 60 Hz	**3RT19 35-5AV61**	**3RT19 35-5AV62**	
			600 V, 60 Hz	**3RT19 35-5AT61**	**3RT19 35-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 35-5AG61**	**3RT19 35-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 35-5AN61**	**3RT19 35-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 35-5AR61**	**3RT19 35-5AR62**	

Spare parts for 3RT1 contactors

Selection and ordering data

	For contactor Size	Type	Rated control supply voltage U_s	Screw connection Order No.	Spring-type connection Order No.	Weight approx. kg
Coils · AC operation						
3RT19 44-5A . 01	**S3**	3RT10 44	24 V, 50 Hz	**3RT19 44-5AB01**	**3RT19 44-5AB02**	0.130
			42 V, 50 Hz	**3RT19 44-5AD01**	**3RT19 44-5AD02**	
			48 V, 50 Hz	**3RT19 44-5AH01**	**3RT19 44-5AH02**	
			110 V, 50 Hz	**3RT19 44-5AF01**	**3RT19 44-5AF02**	
			230 V, 50 Hz	**3RT19 44-5AP01**	**3RT19 44-5AP02**	
			400 V, 50 Hz	**3RT19 44-5AV01**	**3RT19 44-5AV02**	
			24 V, 50/60 Hz	**3RT19 44-5AC21**	**3RT19 44-5AC22**	
			42 V, 50/60 Hz	**3RT19 44-5AD21**	**3RT19 44-5AD22**	
			48 V, 50/60 Hz	**3RT19 44-5AH21**	**3RT19 44-5AH22**	
			110 V, 50/60 Hz	**3RT19 44-5AG21**	**3RT19 44-5AG22**	
			208 V, 50/60 Hz	**3RT19 44-5AM21**	**3RT19 44-5AM22**	
			220 V, 50/60 Hz	**3RT19 44-5AN21**	**3RT19 44-5AN22**	
			230 V, 50/60 Hz	**3RT19 44-5AL21**	**3RT19 44-5AL22**	
			110 V, 50 Hz/120 V, 60 Hz	**3RT19 44-5AK61**	**3RT19 44-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 44-5AP61**	**3RT19 44-5AP62**	
			277 V, 60 Hz	**3RT19 44-5AU61**	**3RT19 44-5AU62**	
			480 V, 60 Hz	**3RT19 44-5AV61**	**3RT19 44-5AV62**	
			600 V, 60 Hz	**3RT19 44-5AT61**	**3RT19 44-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 44-5AG61**	**3RT19 44-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 44-5AN61**	**3RT19 44-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 44-5AR61**	**3RT19 44-5AR62**	
3RT19 45-5A . 01		3RT10 45, 3RT10 46, 3RT13 4 ., 3RT14 46	24 V, 50 Hz	**3RT19 45-5AB01**	**3RT19 45-5AB02**	0.130
			42 V, 50 Hz	**3RT19 45-5AD01**	**3RT19 45-5AD02**	
			48 V, 50 Hz	**3RT19 45-5AH01**	**3RT19 45-5AH02**	
			110 V, 50 Hz	**3RT19 45-5AF01**	**3RT19 45-5AF02**	
			230 V, 50 Hz	**3RT19 45-5AP01**	**3RT19 45-5AP02**	
			400 V, 50 Hz	**3RT19 45-5AV01**	**3RT19 45-5AV02**	
			24 V, 50/60 Hz	**3RT19 45-5AC21**	**3RT19 45-5AC22**	
			42 V, 50/60 Hz	**3RT19 45-5AD21**	**3RT19 45-5AD22**	
			48 V, 50/60 Hz	**3RT19 45-5AH21**	**3RT19 45-5AH22**	
			110 V, 50/60 Hz	**3RT19 45-5AG21**	**3RT19 45-5AG22**	
			208 V, 50/60 Hz	**3RT19 45-5AM21**	**3RT19 45-5AM22**	
			220 V, 50/60 Hz	**3RT19 45-5AN21**	**3RT19 45-5AN22**	
3RT19 45-5AP02			230 V, 50/60 Hz	**3RT19 45-5AL21**	**3RT19 45-5AL22**	
			110 V, 50 Hz/120 V, 60 Hz	**3RT19 45-5AK61**	**3RT19 45-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 45-5AP61**	**3RT19 45-5AP62**	
			277 V, 60 Hz	**3RT19 45-5AU61**	**3RT19 45-5AU62**	
			480 V, 60 Hz	**3RT19 45-5AV61**	**3RT19 45-5AV62**	
			600 V, 60 Hz	**3RT19 45-5AT61**	**3RT19 45-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 45-5AG61**	**3RT19 45-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 45-5AN61**	**3RT19 45-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 45-5AR61**	**3RT19 45-5AR62**	
Coils · DC operation						
3RT19 44-5BM42	**S2**	3RT10 3 ., 3RT13 3 ., 3RT15 3 .	24 V	**3RT19 34-5BB41**	**3RT19 34-5BB42**	0.558
			42 V	**3RT19 34-5BD41**	**3RT19 34-5BD42**	
			48 V	**3RT19 34-5BW41**	**3RT19 34-5BW42**	
			60 V	**3RT19 34-5BE41**	**3RT19 34-5BE42**	
			110 V	**3RT19 34-5BF41**	**3RT19 34-5BF42**	
			125 V	**3RT19 34-5BG41**	**3RT19 34-5BG42**	
			220 V	**3RT19 34-5BM41**	**3RT19 34-5BM42**	
			230 V	**3RT19 34-5BP41**	**3RT19 34-5BP42**	
	S3	3RT10 4 ., 3RT13 4 ., 3RT14 4 .	24 V	**3RT19 44-5BB41**	**3RT19 44-5BB42**	0.916
			42 V	**3RT19 44-5BD41**	**3RT19 44-5BD42**	
			48 V	**3RT19 44-5BW41**	**3RT19 44-5BW42**	
			60 V	**3RT19 44-5BE41**	**3RT19 44-5BE42**	
			110 V	**3RT19 44-5BF41**	**3RT19 44-5BF42**	
			125 V	**3RT19 44-5BG41**	**3RT19 44-5BG42**	
			220 V	**3RT19 44-5BM41**	**3RT19 44-5BM42**	
			230 V	**3RT19 44-5BP41**	**3RT19 44-5BP42**	

Spare parts for 3RT1 contactors

Selection and ordering data

	For contactor Size	Type	Rated control supply voltage $U_{s\,min}$ to $U_{s\,max}$ AC/DC V	Order No.	Weight approx. kg
Withdrawable coils					
	Conventional operating mechanism				
3RT19 55-5A . . .	**S6**	3RT10 5, 3RT14 5	23 ... 26 42 ... 48 110 ... 127 200 ... 220 220 ... 240 240 ... 277 380 ... 420 440 ... 480 500 ... 550 575 ... 600	**3RT19 55-5AB31** **3RT19 55-5AD31** **3RT19 55-5AF31** **3RT19 55-5AM31** **3RT19 55-5AP31** **3RT19 55-5AU31** **3RT19 55-5AV31** **3RT19 55-5AR31** **3RT19 55-5AS31** **3RT19 55-5AT31**	0.49
	S10	3RT10 6, 3RT14 6	23 ... 26 42 ... 48 110 ... 127 200 ... 220 220 ... 240 240 ... 277 380 ... 420 440 ... 480 500 ... 550 575 ... 600	**3RT19 65-5AB31** **3RT19 65-5AD31** **3RT19 65-5AF31** **3RT19 65-5AM31** **3RT19 65-5AP31** **3RT19 65-5AU31** **3RT19 65-5AV31** **3RT19 65-5AR31** **3RT19 65-5AS31** **3RT19 65-5AT31**	0.65
		3RT12 6 Vacuum contactor	23 ... 26 42 ... 48 110 ... 127 200 ... 220 220 ... 240 240 ... 277 380 ... 420 440 ... 480 500 ... 550 575 ... 600	**3RT19 66-5AB31** **3RT19 66-5AD31** **3RT19 66-5AF31** **3RT19 66-5AM31** **3RT19 66-5AP31** **3RT19 66-5AU31** **3RT19 66-5AV31** **3RT19 66-5AR31** **3RT19 66-5AS31** **3RT19 66-5AT31**	
	S12	3RT10 7, 3RT14 7, 3RT12 7 Vacuum contactor	23 ... 26 42 ... 48 110 ... 127 200 ... 220 220 ... 240 240 ... 277 380 ... 420 440 ... 480 500 ... 550 575 ... 600	**3RT19 75-5AB31** **3RT19 75-5AD31** **3RT19 75-5AF31** **3RT19 75-5AM31** **3RT19 75-5AP31** **3RT19 75-5AU31** **3RT19 75-5AV31** **3RT19 75-5AR31** **3RT19 75-5AS31** **3RT19 75-5AT31**	1.1
Withdrawable coils					
	Solid-state operating mechanism · for DC 24 V PLC output				
3RT19 55-5N . . .	**S6**	3RT10 5, 3RT14 5	21 ... 27.3 96 ... 127 200 ... 277	**3RT19 55-5NB31** **3RT19 55-5NF31** **3RT19 55-5NP31**	0.49
	S10	3RT10 6, 3RT14 6	21 ... 27.3 96 ... 127 200 ... 277	**3RT19 65-5NB31** **3RT19 65-5NF31** **3RT19 65-5NP31**	0.65
		3RT12 6 Vacuum contactor	21 ... 27.3 96 ... 127 200 ... 277	**3RT19 66-5NB31** **3RT19 66-5NF31** **3RT19 66-5NP31**	
	S12	3RT10 7, 3RT14 7, 3RT12 7 Vacuum contactor	21 ... 27.3 96 ... 127 200 ... 277	**3RT19 75-5NB31** **3RT19 75-5NF31** **3RT19 75-5NP31**	1.1
	Solid-state operating mechanism · for DC 24 V PLC output/PLC relay output, with remaining lifetime indication (withdrawable coil with lateral electronics module)				
	S6	3RT10 5, 3RT14 5	96 ... 127 200 ... 277	**3RT19 55-5PF31** **3RT19 55-5PP31**	1.1
	S10	3RT10 6, 3RT14 6	96 ... 127 200 ... 277	**3RT19 65-5PF31** **3RT19 65-5PP31**	1.1
	S12	3RT10 7, 3RT14 7	96 ... 127 200 ... 277	**3RT19 75-5PF31** **3RT19 75-5PP31**	1.1

Spare parts for 3RT1 contactors

Selection and ordering data

For contactor Size	Type	Design	Order No.	Weight approx. kg	Pack.
Arc chutes					
S2	3RT20 3 . 3RT20 3 .	For AC coil contactors only For UC (AC/DC) coil contactors only	**3RT29 36-7A** **3RT29 36-7B**		1 unit
S3	3RT10 4 ., 3RT14 46		**3RT19 46-7A**		
S6	3RT10 54 3RT10 55 3RT10 56		**3RT19 54-7A** **3RT19 55-7A** **3RT19 56-7A**	0.72	
S10	3RT10 64 3RT10 65 3RT10 66		**3RT19 64-7A** **3RT19 65-7A** **3RT19 66-7A**	1.24	
S12	3RT10 75 3RT10 76		**3RT19 75-7A** **3RT19 76-7A**	1.4	
S6 **S10** **S12**	3RT14 56 3RT14 66 3RT14 76		**3RT19 56-7B** **3RT19 66-7B** **3RT19 76-7B**	0.72 1.24 1.4	
Contacts with fixing parts					
• for contactors with 3 main contacts					
S2	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)	**3RT29 35-6A** **3RT29 36-6A** **3RT29 37-6A** **3RT29 38-6A**		1 set
S3	3RT10 44 3RT10 45 3RT10 46		**3RT19 44-6A** **3RT19 45-6A** **3RT19 46-6A**		
S6	3RT10 54 3RT10 55 3RT10 56		**3RT19 54-6A** **3RT19 55-6A** **3RT19 56-6A**	0.28	
S10	3RT10 64 3RT10 65 3RT10 66		**3RT19 64-6A** **3RT19 65-6A** **3RT19 66-6A**	0.48	
S12	3RT10 75 3RT10 76		**3RT19 75-6A** **3RT19 76-6A**	0.9	
S3	3RT14 46	Main contacts (3 NO) for AC-1 utilization category (1 set = 3 moving and 6 fixed contacts with fixing parts)	**3RT19 46-6D**		
S6 **S10** **S12**	3RT14 56 3RT14 66 3RT14 76		**3RT19 56-6D** **3RT19 66-6D** **3RT19 76-6D**	0.28 0.48 0.9	
• for 3RT12 vacuum contactors					
S10	3RT12 64 3RT12 65 3RT12 66	3 vacuum interrupters with fixing parts	**3RT19 64-6V** **3RT19 65-6V** **3RT19 66-6V**	1.4	1 set
S12	3RT12 75 3RT12 76		**3RT19 75-6V** **3RT19 76-6V**	1.5	
• for contactors with 4 main contacts					
S2	3RT23 36 3RT23 37	Main contacts (4 NO contacts) for utilization category AC-1	**3RT29 36-6E** **3RT29 37-6E**		1 set
S3	3RT13 44 3RT13 46	(1 set = 4 moving and 8 fixed contacts with fixing parts)	**3RT19 44-6E** **3RT19 46-6E**		

Rated control supply voltages for coils

Selection and ordering data

Coil type Rated control supply voltage U_s	Control supply voltage at	3TY6 503-0A.. 3TY6 523-0A.. 3TY6 543-0A.. 3TY6 566-0A..	3TB50 3TB52 3TB54 3TB56	3TY7 683-0C.. 3TY7 693-0C..	3TF68 3TF69
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** [1]		**–**	
AC 240 V	**AC 288 V**	**U0**		**–**	
AC 400/380 V	**AC 480/460 V**	**V0** [1]		**–**	
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** [2]	
AC 380 V ... 460 V		**–**		**Q7**	
AC 500 V ... 600 V		**–**		**S7**	

Coil type Rated control supply voltage U_s	3TY6 503-0B.. 3TY6 523-0B.. 3TY6 543-0B.. 3TY6 563-0B..	3TB50 3TB52 3TB54 3TB56	3TY7 683-0D.. 3TY7 693-0D..	3TF68 3TF69
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[1)]

3TY6463-0AK6

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

Coils, DC

3TY6483-0BB4

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	—	—	—	—	—	—	—

Main Contacts (Includes 3 Moving and 6 Fixed Contacts)[2)]

3TY6500-0A

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

Select Complete Catalog Number From Above[1)]	
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

Coils, AC Type 3TF and CRL†F

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	460V 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 CRL†F

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[1])	
3TF69	3TY7690-0B[1])	

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.

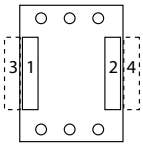
3TF Contactors and 3TH Control Relays

Spare parts

Auxiliary Contact Blocks

3TY7561-1A

Illustration	Frame Size	Auxiliary Contacts NO	Auxiliary Contacts NC	NO/Early Make	NC/Early Break	Auxiliary Contact Mounting Position	Position	Block Location	Obsolete Catalog No	Current Catalog
	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	1	1	—	—		3	Left	3TY7561-1K	3TY7561-1KA00
	2nd Aux Contact Block	1	1	—	—		4	Right	3TY7561-1L	3TY75611KA00
	3TF46 to 3TF68	1	1	—	—		3	Left	3TY7561-1U	3TY7561-1UA00
	For Electronic Circuits	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[1)]

Type	Frame Size	Auxiliary Contacts NO	Auxiliary Contacts NC	Normally Open/ Early Make	Normally Closed/ Late Break	Block Location	Catalog No
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 ≤ 110 V and currents ≤ 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 ≥ 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).

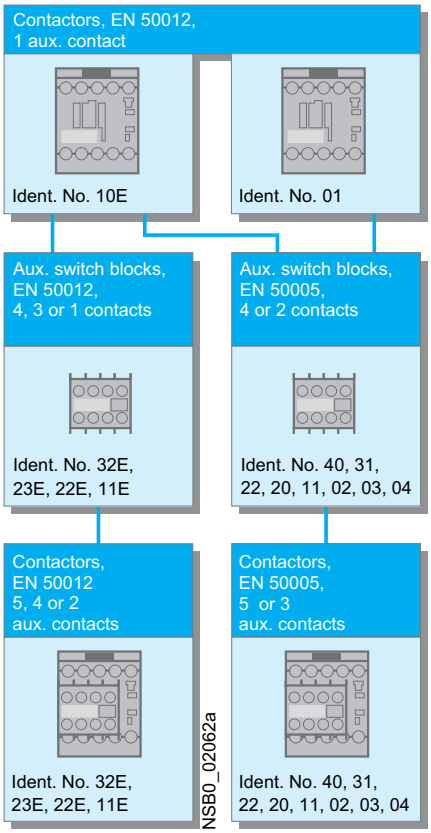
The plug-in direction of the diodes and diode assemblies is determined by a coding device. Exceptions: 3RT29 26-1E.00 and 3RT19 36-1T.00; in these cases the plug-in direction is identified by "+" and "–".

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.

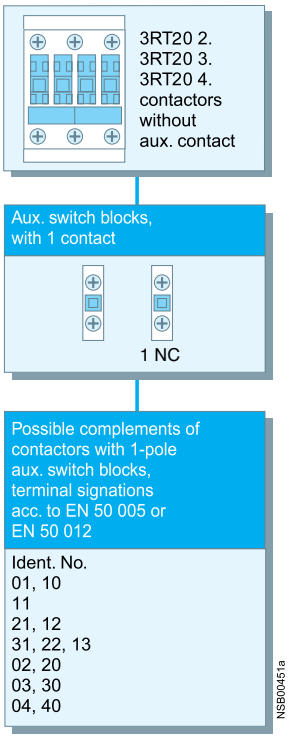
The solid-state compatible 3RH29 11-1NF.. auxiliary switch blocks for size S00 contactors contain two enclosed contact elements. They are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in dusty atmosphere. The contacts do not have positively-driven operation.

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.

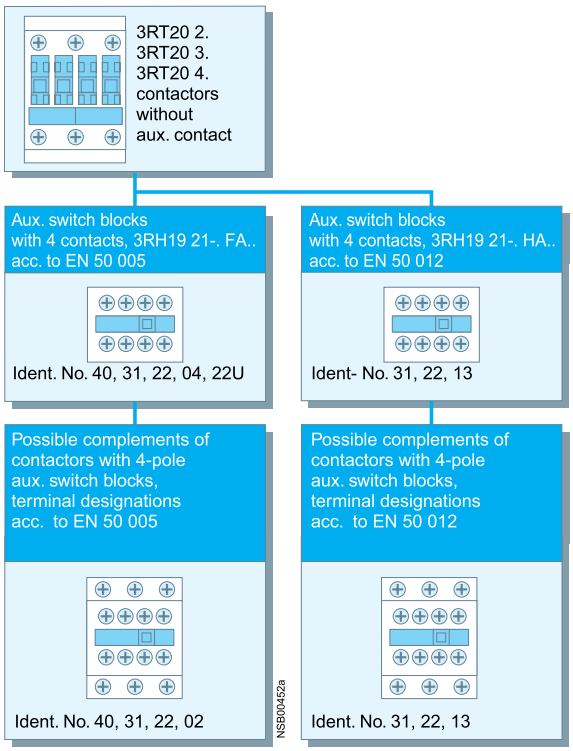
Contactors for Switching Motors

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 2/13 to 2/15.

Contactors for Switching Motors

3RT1 contactors, 3-pole, sizes S6 to S12

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 laterallv

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 × U_s:
  On account of the broad range for the rated control supply voltage and the additionally allowed coil voltage tolerance of 0.8 × $U_{s\,min}$ to 1.1 × $U_{s\,max}$, an extended coil voltage tolerance of at least 0.7 to 1.25 × 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 ≥ 0.8 × $U_{s\,min}$, the electronics reliably switch the contactor on and as of ≤ 0.5 × $U_{s\,min}$ 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

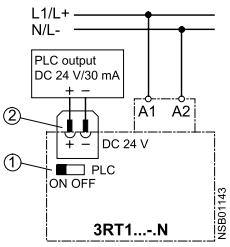
Note:
In connection with converters, the control cables should be installed separately from the load cables to the converter.

3RT1...-.N: for DC 24 V PLC output

2 control options:

- Control without an interface directly via a DC 24 V /≥ 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.

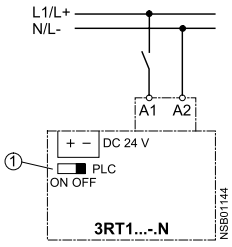
Note:
Before start-up, the sliding-dolly switch for PLC operation must be moved to the "PLC ON" position (setting ex works: "PLC OFF").



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).



$ Sliding-dolly switch, must be in PLC "OFF" position

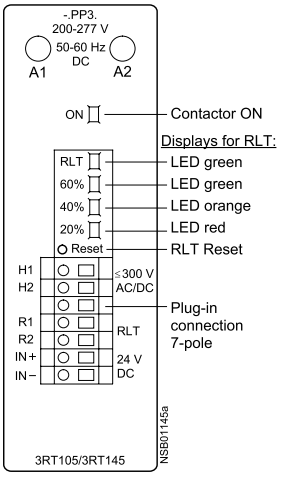
Contactors for Switching Motors

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.

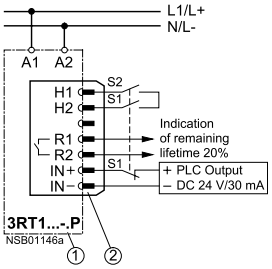
  Permissible current carrying capacity of relay output R1/R2:
  – I_e/AC-15/24 to 230 V: 3 A
  – I_e/DC-13/24 V: 1 A

- 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 /≥ 30 mA PLC output (EN 61 131-2) via terminals IN+/IN-.

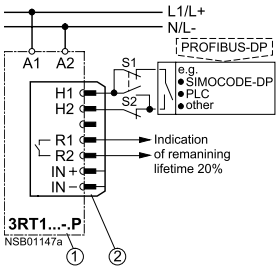


Electronics module of 3RT1 ...-.P contactor
Plug-in connection, 7-pole
S1 Changeover switch from automatic control via PLC semiconductor output to local control
S2 Local control option

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.

Contactor Assemblies for Switching Motors

Contactor 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

Calculated horsepower ratings at 460 V AC			Size				Accessories for customer assembly	
HP	Operat. current I_e A	Motor current A		Line/delta contactor	WYE contactor		Time-delay relay	Installation kit A double infeed
30	50	9.5 ... 13.8 12.1 ... 17.2 15.5 ... 21.5 19 ... 27.6 24.1 ... 34 31 ... 43 37.9 ... 55.2 48.3 ... 65	**S2-S2-S0**	3RT2028 3RT2935	3RT2026		3RP2574-1N.30	3RA2933-2C [3])
50 **60**	80 86	62.1 ... 77.8 69 ... 86	**S2-S2-S2**	3RT2036	3RT2035			3RA2933-2BB1 [3])
75	115	31 ... 43.1 37.9 ... 55.2 48.3 ... 69 62.1 ... 77.6 77.6 ... 108.6	**S3-S3-S2**	3RT2045	3RT2035		3RP2574-1N.30	3RA2943-2C [3])
100	150	98.3 ... 129.3 120.7 ... 150		3RT2045	3RT2036			
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 2/85.
For circuit diagrams, see page 2/205.

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.

Contactor Assemblies for Switching Motors

Contactor assemblies for WYE-delta starting

			Overload relay, thermal		Overload relay, solid-state	
Installation kit B for single infeed	WYE jumper	Baseplates	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 [4])	3RT1926-4BA31	3RA2932-2E	5.5 ... 8	3RU2136-1HB	–	–
			7 ... 10	3RU2136-1JB0	12.5 ... 50	3RB3036-1UB0
			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		
	3RT1936-4BA31	3RA2932-2F	36 ... 45	3RU2136-4GB0		
			40 ... 50	3RU2136-4HB0		
3RA1943-3D [4])	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		
			70 ... 90	3RU2146-4LB0	32 ... 115	3RB3046-1XB0
			80 ... 100 [7])	3RU2146-4MB0		
3RA1953-3D [5])	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.

Contactor Assemblies for Switching Motors

Contactor assemblies for WYE-delta starting

Application

WYE-delta starting can only be used either if the motor normally operates in a Δ (delta) connection or starts softly or if the load torque during Y starting is low and does not increase sharply. On the Y step the motors can carry approximately 50 % (class KL 16) or 30 % (class KL 10) of their rated torque; the starting torque is approximately $^1/_3$ of that during direct on-line starting. The starting current is approximately 2 to 2.7 times the rated motor current.

The changeover from Y to Δ 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 [1]) 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

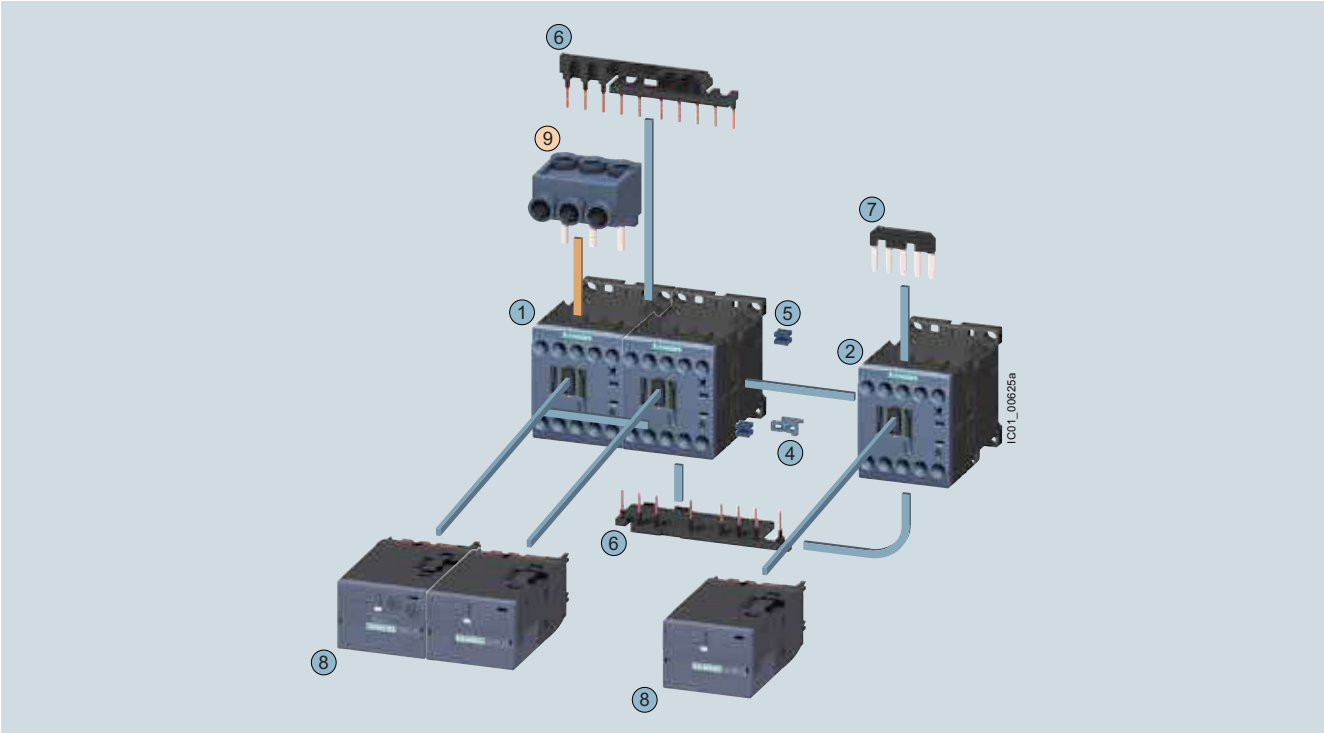
The contactors are fitted with varistors as standard.

1) Exception:
The mechanical interlock between the delta and WYE contactors is included in the installation kit for size S00 contactor assemblies.

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[1]	3RA2913-3K	2/85

Complete contactor assembly for star-delta (wye-delta) starting

Individual parts		Type Q11[2]	Q13	Q12	Page
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			2/85
	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			2/29

1) Part 9 can only be mounted in the case of contactors with screw terminal.
2) 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.

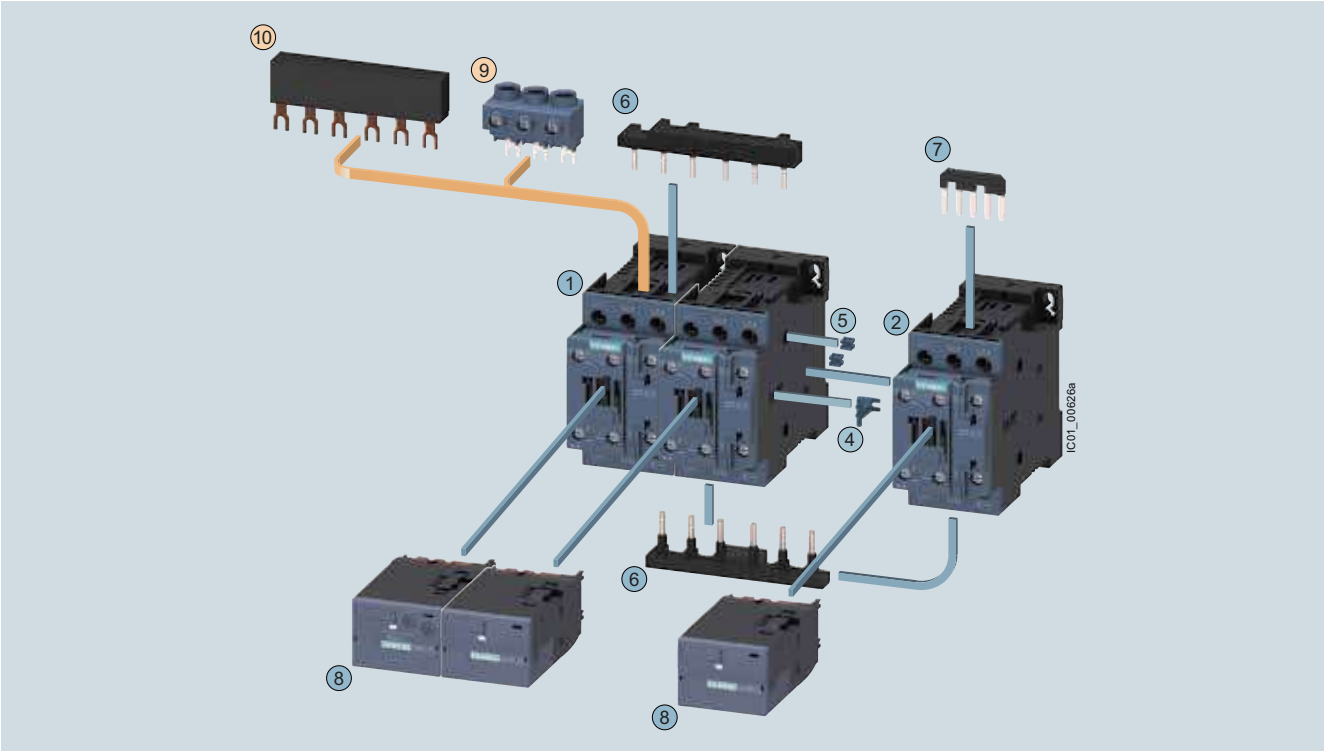
Contactor Assemblies for Switching Motors

SIRIUS

Contactor 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[1]	3RV2925-5AB	2/85
10 Three-phase busbar[1]	3RV1915-1AB	1/8

Complete contactor assembly for star-delta (wye-delta) starting

Individual parts	Type Q11	Type Q13	Type Q12	Page
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			2/85
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			2/29

[1] The parts 9 and 10 can only be mounted with contactors with screw terminal, the 6 wiring modules must be removed beforehand.

Note:

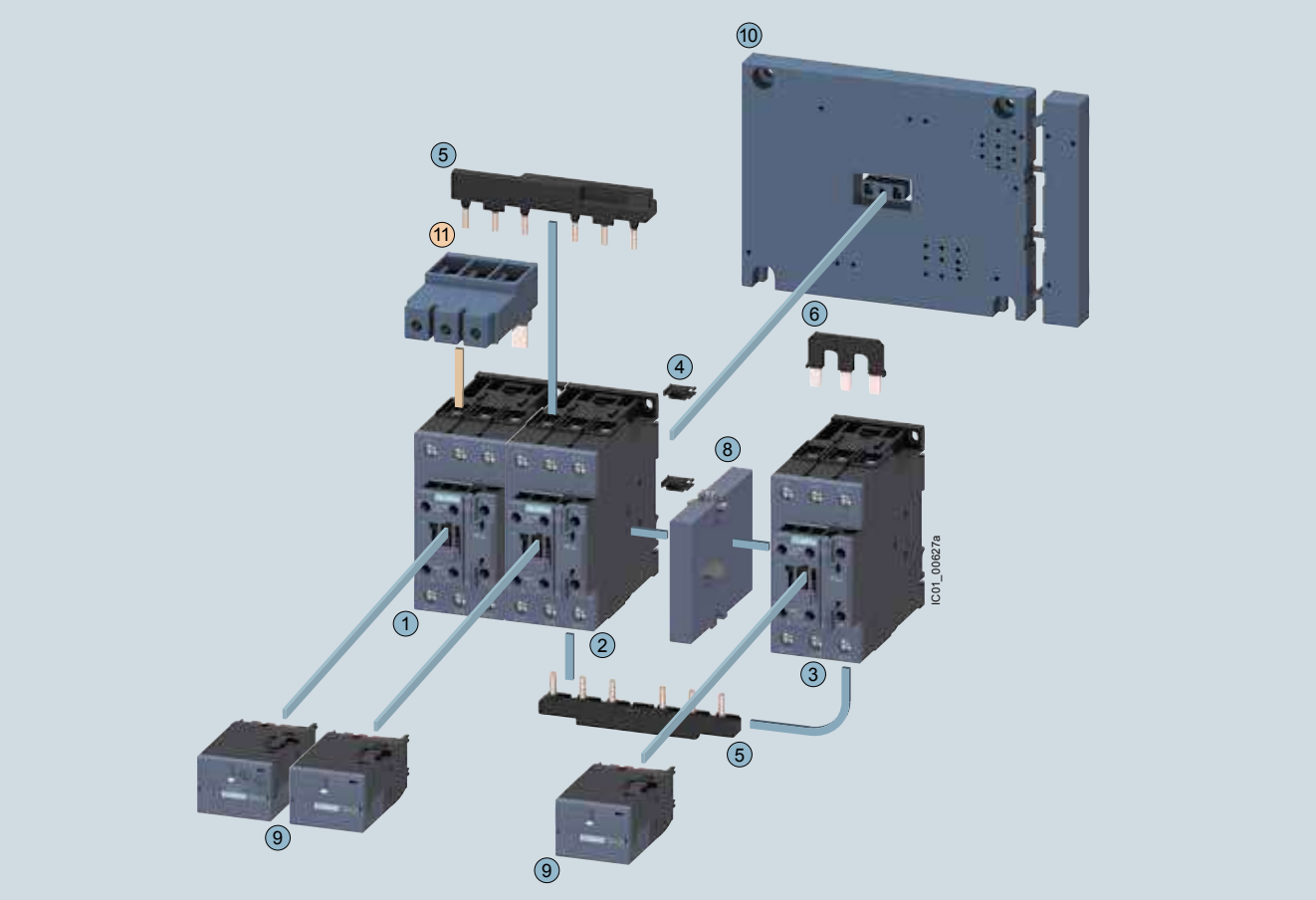
When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

Contactor Assemblies for Switching Motors

Contactor 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	Type Q13	Type 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		

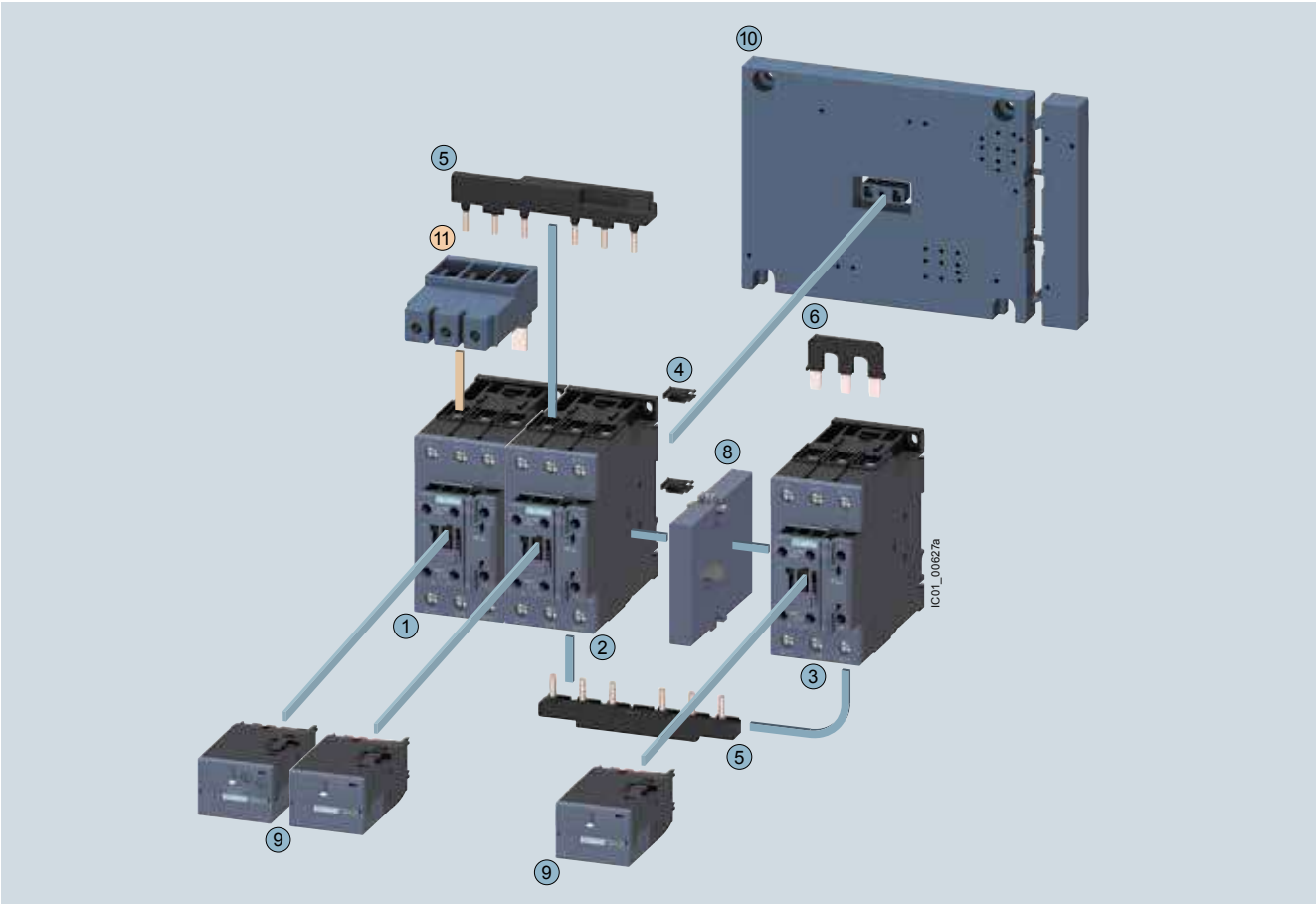
For overview, see page 2/112.
For circuit diagrams, see page 2/205.

Contactor Assemblies for Switching Motors

SIRIUS

Contactor 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

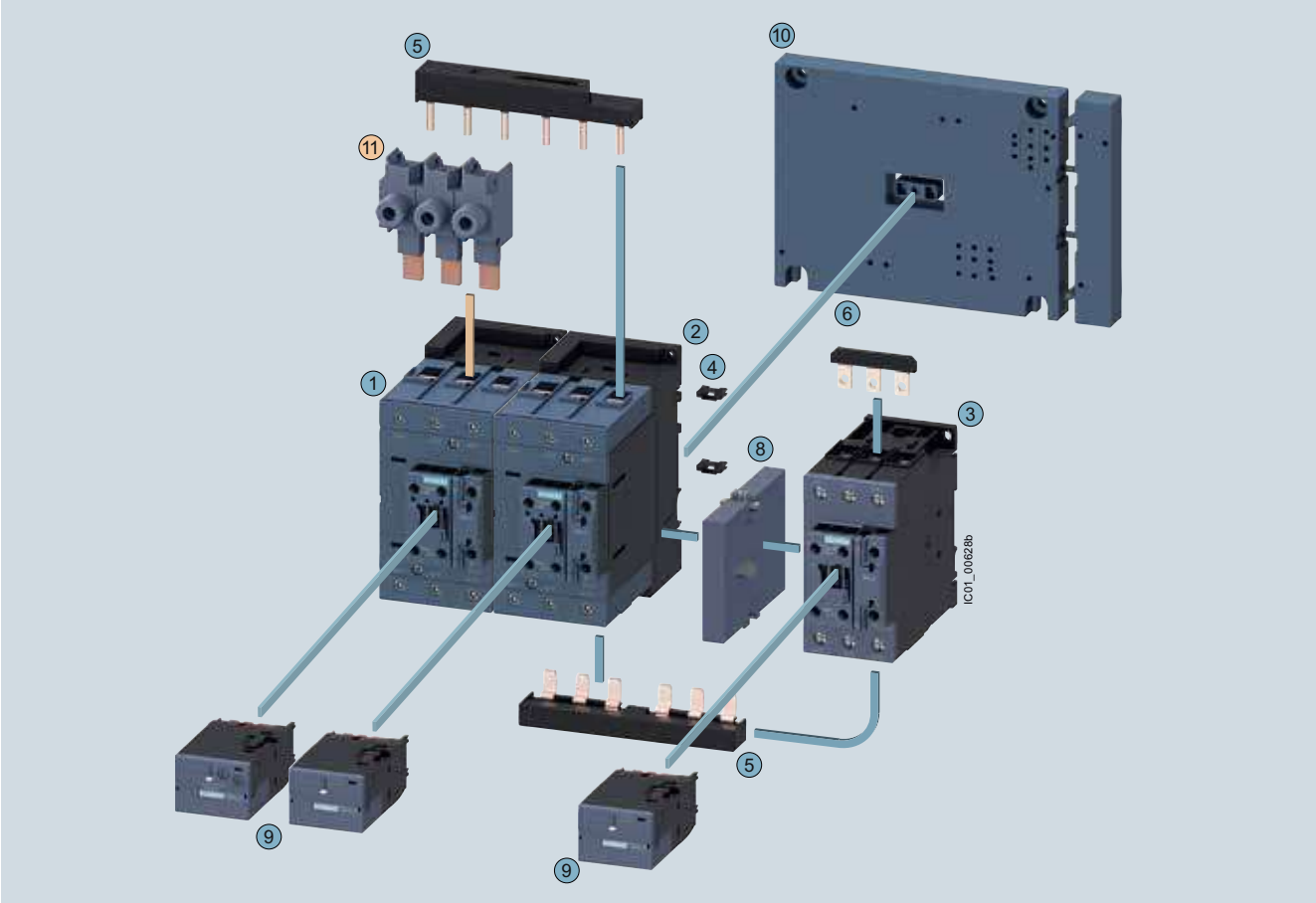
Individual parts		Type Q11	Type Q13	Type Q12
1 2 3	Contactors, 55 kW	3RT2037	3RT2037	3RT2035
4 ... 7	Assembly kit S2-S2-S2 comprising:	3RA2933-2BB1		
	4 Four connectors for three contactors (not required for fully pre-wired contactor assemblies for star-delta (wye-delta) starting)			
	5 Wiring modules 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 2/112.
For circuit diagrams, see page 2/205.

Contactor Assemblies for Switching Motors

Contactor assemblies for WYE-delta starting

Size S3-S3-S2 · up to 150 A, 100 HP



Mountable accessories (optional)

To be ordered separately	Type
11 Single-phase infeed terminal (3 units are required)	3RA2943-3L

Complete contactor assembly for star-delta (wye-delta) starting

Individual parts		Type Q11	Type Q13	Type 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		

[1] 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 2/112.
For circuit diagrams, see page 2/205.

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 ≥ 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.

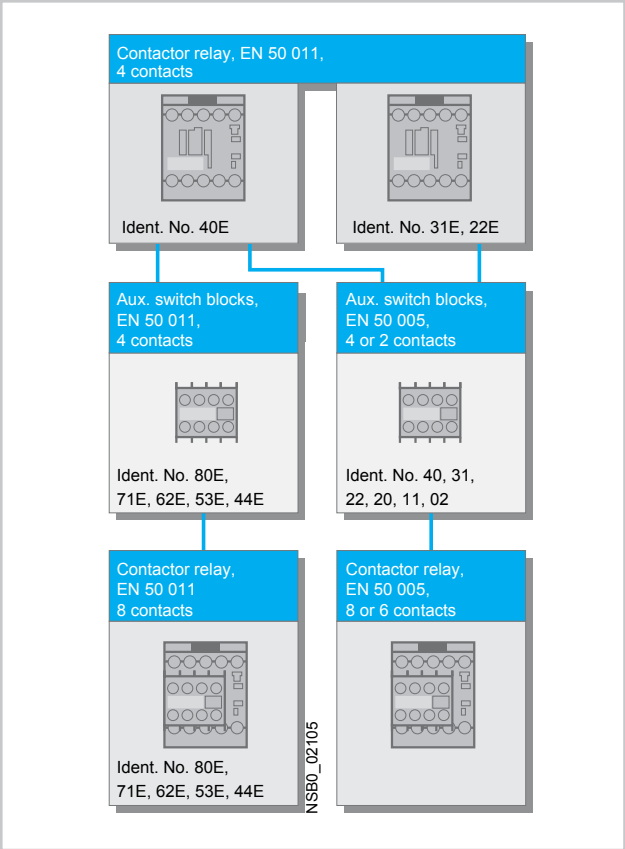
The contactor relays with 4 contacts according to EN 50011, with the identification number 40E, can be extended with 80E to 44E auxiliary switch blocks to obtain contactor relays with 8 contacts according to EN 50011. The identification numbers 80E to 44E on the auxiliary switch blocks apply to the complete 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 ≥ 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).

Contactor 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 Surge	3 4	2 kV 6 kV
	200 V ... 276 V	Burst Surge	4 4	4 kV 5 kV
	380 V ... 600 V	Burst Surge	4 4	4 kV 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

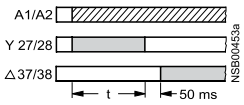
Solid-state, time-delay auxiliary switch box

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 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 can 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

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.

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)

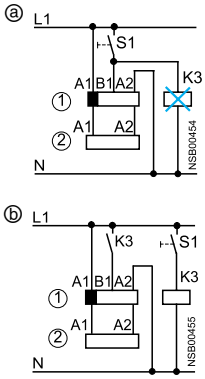
The time-delay block for size S0 to S3 contactors is plugged into coil terminals A1 and A2 on top of each contactor; the time-delay relay is connected both electrically and mechanically by means of pins.

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 ⓐ).

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 ⓑ.

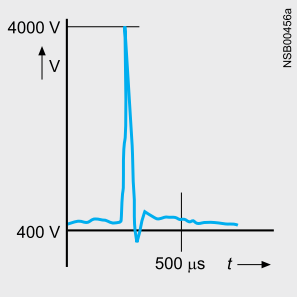


Time-delay block
Contactor

Accessories for 3RT / 3RH Contactors

3-phase EMC interference suppression module for size S00 contactor

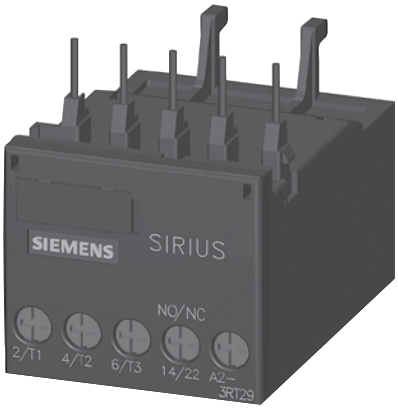
A so-called backr-e.m.f. (electromotive force) is produced when motors or various inductive loads are turned off. Voltage peaks of up to 4 000 V may occur as a result, with a frequency spectrum from 1 kHz to 10 MHz and a rate of voltage variation from 0.1 to 20 V/ns.

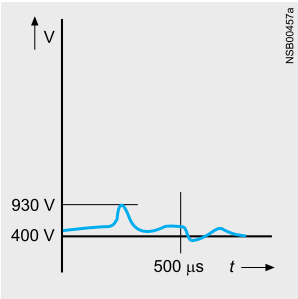


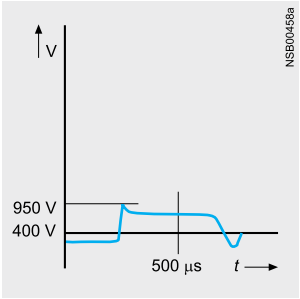
The connection between the main conducting path and the EMC interference suppression module enables contact arcing, which is responsible for contact erosion and the majority of clicking noises, to be reduced; this in turn is conducive to an electromagnetically compatible design.

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.

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 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.

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.

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.

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.

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.

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

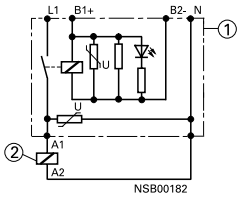
The 3RH29 24-1GP11 interface has an integrated surge suppressor (varistor) for the contactor coil being switched.

Mounting

The 3RH29 24-1GP11 interface is mounted directly on the contactor coil.

Terminal diagram

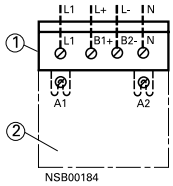
3RH19/29 24-1GP1
with surge suppression



①Interface
②Contactor

Connection example

3RH19/29 24-1GP1
with surge suppression



①Interface
②Contactor

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16134/td FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16134/faq	Manuals, see • System Manual "SIRIUS Modular System – System Overview", https://support.industry.siemens.com/cs/WW/en/view/60311318 • Manual "SIRIUS – SIRIUS 3RT Contactors/Contactor Assemblies", https://support.industry.siemens.com/cs/WW/en/view/60306557 • Application Manual "Controls with IE3/IE4 Motors", https://support.industry.siemens.com/cs/ww/en/view/94770820

Type			Contactors		
			3RT2		3RT1
Size			S00 to S2	S3	S6 to S12
Rated data of the auxiliary contacts					
According to IEC/EN 60947-5-1 Data applies to integrated auxiliary contacts and conventional contacts in the auxiliary switch blocks					
Rated insulation voltage U_i (pollution degree 3)		V	690	1 000 (3RT20..-0CC0: 690)	--
• For laterally mountable auxiliary switch blocks		V	690	690	500
• For front mountable auxiliary switch blocks		V	690	690	690
Conventional thermal current I_{th} = rated operational current I_e/AC-12		A	10		
AC load					
Rated operational current I_e/AC-15/AC-14					
• For rated operational voltage U_e	Up to 230 V	A	10[1]	6	6
	400 V	A	3		3
	500 V	A	2		2
	690 V	A	1		1[2]
DC load					
Rated operational current I_e/DC-12					
• For rated operational voltage U_e	24 V	A	10		10
	60 V	A	6		6
	110 V	A	3		3
	125 V	A	2		2
	220 V	A	1		1
	440 V	A	0.3		0.3
	600 V	A	0.15		0.15[2]
Rated operational current I_e/DC-13					
• For rated operational voltage U_e	24 V	A	10[1]		10[3]
	60 V	A	2		2
	110 V	A	1		1
	125 V	A	0.9		0.9
	220 V	A	0.3		0.3
	440 V	A	0.14		0.14
	600 V	A	0.1		0.15[2]
Contact reliability at 17 V, 1 mA Acc. to IEC/EN 60947-5-4			Frequency of contact faults < 10^{-8} i.e. < 1 fault per 100 million operating cycles		

1) 3RH22, 3RH29, 3RT2…-….4, 3RT2…-….6: I_e = 6 A at AC-15/AC-14 and DC-13.
2) For laterally mountable auxiliary switch blocks, only the rated operational voltages up to 500 V apply.
3) For laterally mountable auxiliary switch blocks, DC-13/at 24 V: Max. 6 A.

Type	3RT contactors
Size	S00 to S12

Contact 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.

Sizes S00 to S3

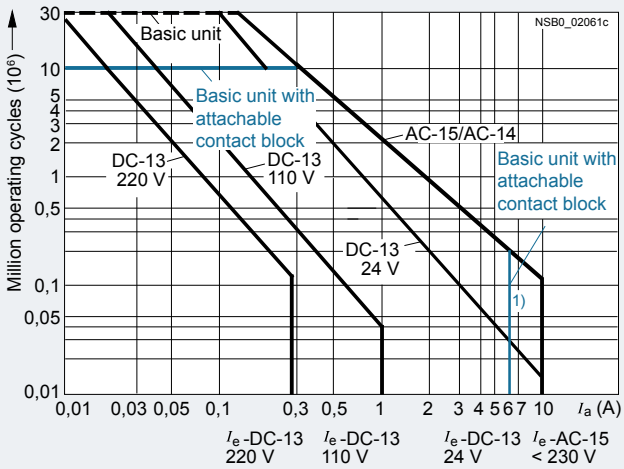


Diagram legend:
I_a = Breaking current
I_e = Rated operational current

The characteristic curves apply to:
- Integrated auxiliary contacts on 3RT2.
- 3RH2911, 3RH2921 auxiliary switch blocks[1)]

Sizes S6 to S12

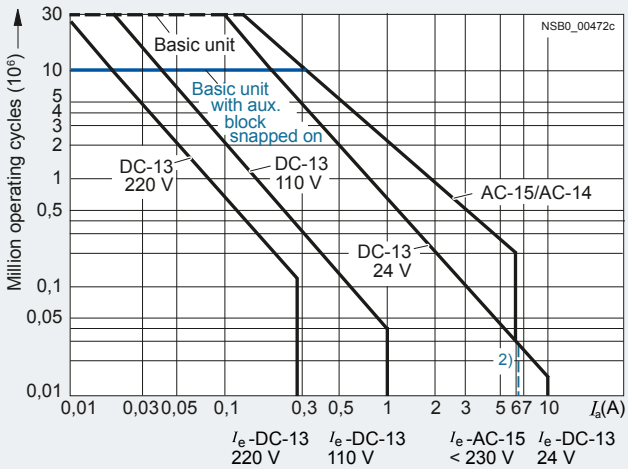


Diagram legend:
I_a = Breaking current
I_e = Rated operational current

The characteristic curves apply to:
- Integrated auxiliary contacts on 3RT10
- 3RH1911, 3RH1921 auxiliary switch blocks[3)]

1) 3RH22, 3RH29, 3RT2…-….4, 3RT2…-….6: I_e = 6 A at AC-15/AC-14 and DC-13, 3RT2.4: I_e = 6 A at AC-15/AC-14.

2) For laterally mountable auxiliary switch blocks, DC-13/at 24 V: Max. 6 A.

3) For laterally mountable auxiliary switch blocks, only the rated operational voltages up to 500 V apply.

Type	3RT2 contactors
Size	S00 and S0

Contact 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 6 times the rated operational current) and is intended for a contact endurance of approximately 200 000 operating cycles.

If a shorter contact endurance is sufficient, the rated operational current I_e/AC-4 can be increased.

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:

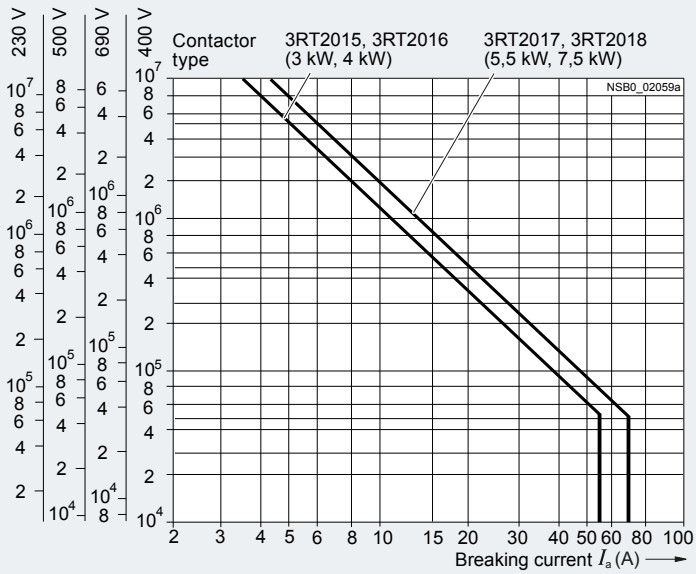
$$X = \frac{A}{1 + \frac{C}{100} \cdot \frac{A}{B} - 1}$$

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 = multiple of I_e) in operating cycles
- C Inching operations as a percentage of total switching operations

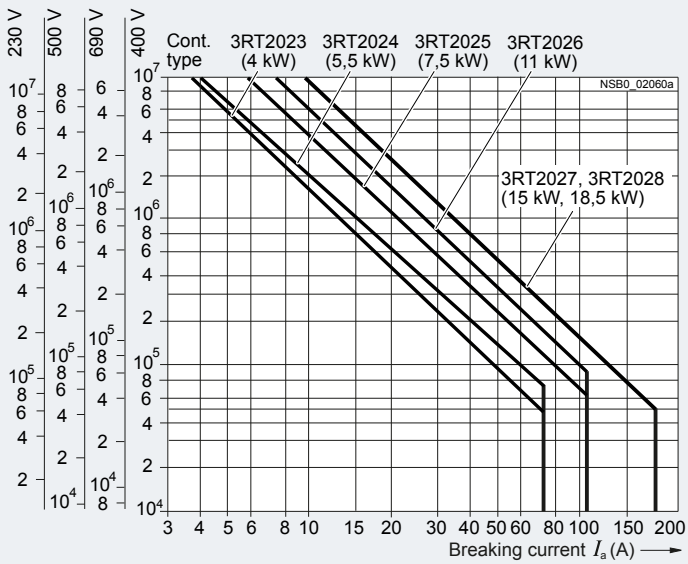
Size S00

Operating cycles at



Size S0

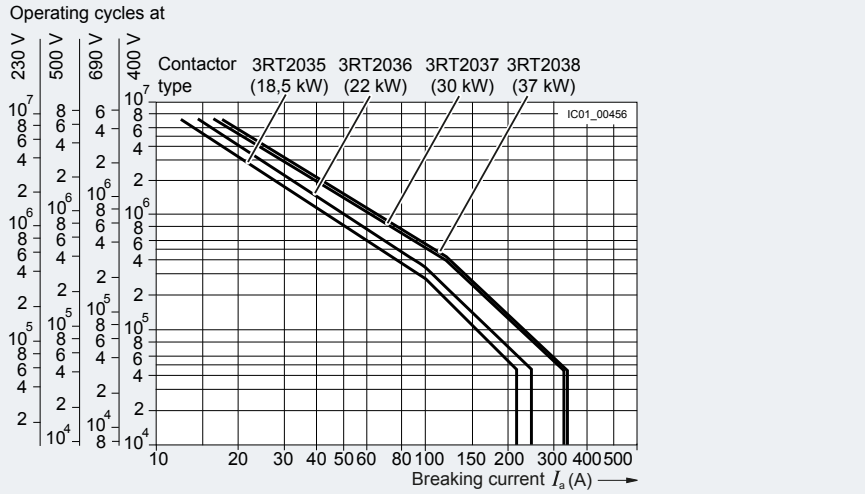
Operating cycles at



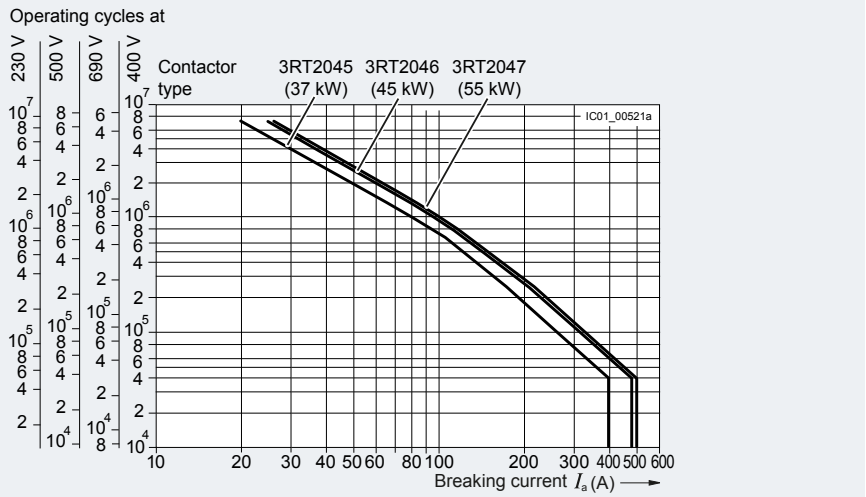
Type	**3RT2 contactors**
Size	**S2 to S12**

Contact endurance of the main contacts

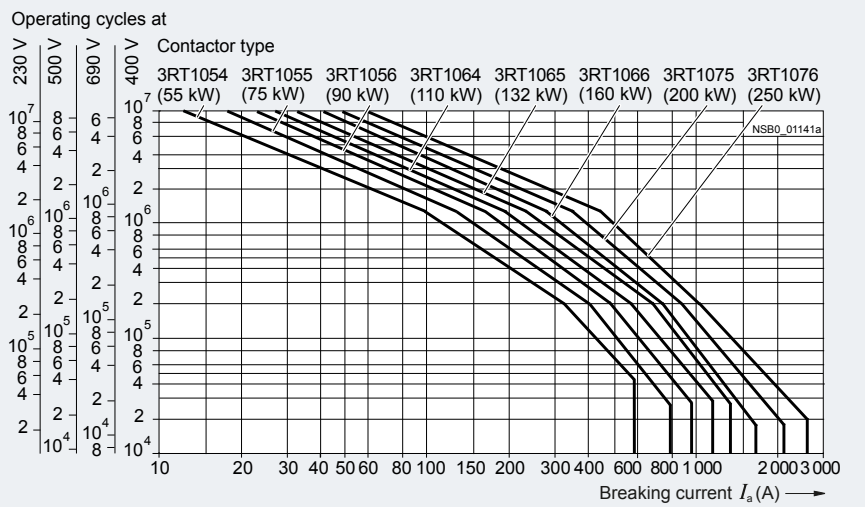
Size S2



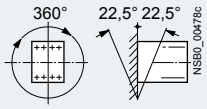
Size S3



Sizes S6 to S12



SIRIUS 3RT contactors, 3-pole up to 500 HP

		Contactors	
Type		3RT2015, 3RT2016	3RT2017, 3RT2018
Size		S00	
General data			
Dimensions (W x H x D)			
• Basic unit			
- Screw terminals	mm	45 x 58 x 73	
- Spring-type terminals	mm	45 x 70 x 73	
• Basic unit with mounted auxiliary switch block			
- Screw terminals	mm	45 x 58 x 117	
- Spring-type terminals	mm	45 x 70 x 121	
• Basic unit with mounted function module or solid-state time-delayed auxiliary switch block			
- Screw terminals	mm	45 x 58 x 147	
- Spring-type terminals	mm	45 x 70 x 147	
Permissible mounting position			
The contactors are designed for operation on a vertical mounting surface.			
Upright mounting position		Special version required	
Mechanical endurance			
• Basic unit	Operating cycles	30 million	
• Basic unit with mounted auxiliary switch block	Operating cycles	10 million	
• Basic unit with solid-state compatible auxiliary switch block	Operating cycles	5 million	
Electrical endurance		For contact endurance of the main contacts, see page 3/20.	
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 IEC 60947-1, Appendix N	V	400	
Mirror contacts			
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.			
• 3RT2.1. (removable auxiliary switch block)		Yes, this applies to both the basic unit as well as to between the basic unit and the mounted auxiliary switch block acc. to IEC 60947-4-1, Appendix F	
• 3RH2919-.NF.. solid-state compatible auxiliary switch blocks		No mirror contact for size S00	
Ambient temperature			
• During operation	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
Degree of protection acc. to IEC 60529			
• On front		IP20 (screw terminals and spring-type terminals)	
• Connecting terminal		IP20 (screw terminals and spring-type terminals)	
Touch protection acc. to IEC 60529		Finger-safe (screw terminals and spring-type terminals)	
Shock resistance			
• Rectangular pulse			
- AC operation	g/ms	6.7/5 and 4.2/10	7.3/5 and 4.7/10
- DC operation	g/ms	6.7/5 and 4.2/10	7.3/5 and 4.7/10
• Sine pulse			
- AC operation	g/ms	10.5/5 and 6.6/10	11.4/5 and 7.3/10
- DC operation	g/ms	10.5/5 and 6.6/10	11.4/5 and 7.3/10

		Contactors	
Type		3RT2015, 3RT2016	3RT2017, 3RT2018
Size		S00	
Short-circuit protection			
Main circuit			
• Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE acc. to IEC/EN 60947-4-1			
- Type of coordination "1"	A	35	50
- Type of coordination "2"	A	20	25
- Weld-free (test conditions acc. to IEC 60947-4-1)	A	10	
• Miniature circuit breaker (up to 230 V) with C characteristic Short-circuit current 1 kA, type of coordination "1"	A	10	
Auxiliary circuit			
Short-circuit test acc. to IEC/EN 60947-5-1			
• With fuse links, operational class gG: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current I_k = 1 kA	A	10	
• With 230 V miniature circuit breaker, C characteristic with short-circuit current I_k = 400 A	A	6	
Short-circuit protection for contactors with overload relays		See "Configuring the SIRIUS Modular System – Selection data for Fuseless and Fused Load Feeders", https://support.industry.siemens.com/cs/ww/en/view/39714188	
Short-circuit protection for fuseless load feeders		See 3RA2 load feeders on page 8/4 onwards	
Control			
Solenoid coil operating range			
• 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	
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)			
• AC operation, 50/60 Hz, standard version			
- Closing	VA	27/24.3	37/33
- P.f.		0.8/0.75	
- Closed	VA	4.2/3.3	5.7/4.4
- P.f.		0.25/0.25	
• AC operation, 50 Hz, for 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	
• AC operation, 60 Hz, for 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	
• DC operation (closing = closed)	W	4	
Permissible residual current of the electronics (with 0 signal)			
• AC operation		< 3 mA x (230 V/U_s)[1]	< 4 mA x (230 V/U_s)[1]
• DC operation		< 10 mA x (24 V/U_s)[1]	
Operating times at 1.0 x U_s[2]			
Total break time = Opening delay + Arcing time			
• 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	
- Opening delay	ms	7 ... 12	
• Arcing time	ms	10 ... 15	

1) The 3RT2916-1GA00 additional load module is recommended for higher residual currents, see page 3/114.

2) The OFF-delay times of the NO contacts and the ON-delay times of the NC contacts increase if the contactor coils are attenuated against voltage peaks (suppression diode 6x to 10x; diode assembly 2x to 6x; suppression diode +1 to 5 ms; varistor +2 to 5 ms).

			Coupling contactors		
Type			3RT201.-.HB4.	3RT201.-.JB4.	3RT201.-.KB4.
Size			S00		
Control					
Solenoid coil operating range			0.7 ... 1.25 x U_s		
Power consumption of the solenoid coils (for cold coil) Closing = Closed	At U_s 24 V DC	W	2.8		
Permissible residual current of the electronics (with 0 signal)			< 6 mA x (24 V/U_s)		
Upright mounting position			On request		
Overvoltage configuration of the solenoid coil			No overvoltage damping	Built-in diode	Built-in suppressor diode
Operating times					
• Closing delay					
- ON-delay NO		ms	35 ... 60		
- OFF-delay NC		ms	25 ... 40		
• Opening delay					
- ON-delay NO		ms	7 ... 20	38 ... 65	7 ... 20
- OFF-delay NC		ms	20 ... 30	55 ... 75	20 ... 30

			Coupling contactors		
Type			3RT201.-1MB4.-0KT0	3RT201.-1VB4.	3RT201.-1SB4.
Size			S00		
Control					
Solenoid coil operating range			0.85 ... 1.85 x U_s		
Power consumption of the solenoid coils (for cold coil) Closing = Closed	At U_s 24 V DC	W	1.6		
Permissible residual current, upright mounting position			On request		
Overvoltage configuration of the solenoid coil			No overvoltage damping	Built-in diode	Built-in suppressor diode
Operating times					
• Closing delay					
- ON-delay NO		ms	25 ... 90		
- OFF-delay NC		ms	15 ... 80		
• Opening delay					
- ON-delay NO		ms	5 ... 20	20 ... 80	5 ... 20
- OFF-delay NC		ms	10 ... 30	30 ... 90	10 ... 30

			Contactors			
Type			3RT2015	3RT2016	3RT2017	3RT2018
Size			S00			
Rated data of the main contacts						
Load rating with AC						
Utilization category AC-1, switching resistive loads						
• Rated operational currents I_e	At 40 °C up to 690 V	A	18	22		
	At 60 °C up to 690 V	A	16	20		
• Rated power for AC loads[1] P.f. = 0.95 (at 60 °C)	230 V	kW	6	7.5		
	400 V	kW	10.5	13		
	690 V	kW	18	22		
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm^2	2.5	4		
	At 60 °C	mm^2	2.5			
Utilization categories AC-2 and AC-3						
• Rated operational currents I_e	Up to 400 V	A	7	9	12	16
	440 V	A	7	9	11	14
	500 V	A	6	7.7	9.2	12.4
	690 V	A	4.9	6.7		8.9
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V	kW	1.5	2.2	3	4
	400 V	kW	3	4	5.5	7.5
	690 V	kW	4	5.5		7.5
Thermal load capacity	10 s current	A	56	72	96	128
Power loss per conducting path	At I_e/AC-3	W	0.42	0.7	1.24	2.2
Utilization category AC-4 (at $I_a = 6 \times I_e$)[2]						
• Maximum values						
- Rated operational current I_e	Up to 400 V	A	6.5	8.5		11.5
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	Up to 400 V	kW	3	4		5.5
• The following applies to a contact endurance of about 200 000 operating cycles:						
- Rated operational currents I_e	Up to 400 V	A	2.6	4.1		5.5
	690 V	A	1.8	3.3		4.4
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 230 V	kW	0.67	1.1		1.5
	400 V	kW	1.15	2		2.5
	690 V	kW	1.15	2.5		3.5

1) Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

2) The data applies to 3RT2516 and 3RT2517 contactors (2 NO + 2 NC) up to a rated operational voltage of 400 V only.

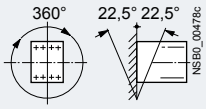
			Contactors	
Type			3RT2015	3RT2016 to 3RT2018
Size			S00	
Rated data of the main contacts (continued)				
Load rating with DC				
Utilization category DC-1, switching resistive loads (*L/R* 1 ms)				
• Rated operational currents I_e (at 60 °C)				
- 1 conducting path	Up to 24 V	A	15	20
	60 V	A	15	20
	110 V	A	1.5	2.1
	220 V	A	0.6	0.8
	440 V	A	0.42	0.6
	600 V	A	0.42	0.6
- 2 conducting paths in series	Up to 24 V	A	15	20
	60 V	A	15	20
	110 V	A	8.4	12
	220 V	A	1.2	1.6
	440 V	A	0.6	0.8
	600 V	A	0.5	0.7
- 3 conducting paths in series	Up to 24 V	A	15	20
	60 V	A	15	20
	110 V	A	15	20
	220 V	A	15	20
	440 V	A	0.9	1.3
	600 V	A	0.7	1
Utilization category DC-3/DC-5, shunt-wound and series-wound motors (*L/R* 15 ms)				
• Rated operational currents I_e (at 60 °C)				
- 1 conducting path	Up to 24 V	A	15	20
	60 V	A	0.35	0.5
	110 V	A	0.1	0.15
	220 V	A	--	
	440 V	A	--	
	600 V	A	--	
- 2 conducting paths in series	Up to 24 V	A	15	20
	60 V	A	3.5	5
	110 V	A	0.25	0.35
	220 V	A	--	
	440 V	A	--	
	600 V	A	--	
- 3 conducting paths in series	Up to 24 V	A	15	20
	60 V	A	15	20
	110 V	A	15	20
	220 V	A	1.2	1.5
	440 V	A	0.14	0.2
	600 V	A	0.14	0.2
Switching frequency				
Switching frequency *z* in operating cycles/hour				
Contactors without overload relays				
• No-load switching frequency	AC/DC	h^{-1}	10 000	
• Switching frequency *z* during rated operation[1)]				
- I_e/AC-1	At 400 V	h^{-1}	1 000	
- I_e/AC-2	At 400 V	h^{-1}	750	
- I_e/AC-3	At 400 V	h^{-1}	750	
- I_e/AC-4	At 400 V	h^{-1}	250	
Contactors with overload relays				
• Mean value		h^{-1}	15	

1) Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \ (I_e/I') \ (U_e/U')^{1.5}$ 1/h.

Type		**Contactors**
Size		**3RT2015 to 3RT2018**
		S00
Conductor cross-sections		
Main conductors, auxiliary conductors and coil terminals (1 or 2 conductors can be connected)		**Screw terminals**
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]; max. 2 x 4
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]; 2 x 12
• Terminal screw		M3 (for Pozidriv size 2; 5 ... 6)
• Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)
Main conductors, auxiliary conductors and coil terminals[2] (1 or 2 conductors can be connected)		**Spring-type terminals**
• Operating devices	mm	3.0 x 0.5
• Solid or stranded	mm^2	2 x (0.5 ... 4)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 2.5)
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)
Auxiliary conductors for front and laterally mounted auxiliary switches[2] (1 or 2 conductors can be connected)		
• Operating devices	mm	3.0 x 0.5
• Solid or stranded	mm^2	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)

1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

2) Max. external diameter of the cable insulation: 3.6 mm. On spring-type terminals with conductor cross-sections 1 mm^2, an insulation stop must be used, see page 3/115.

		Contactors	
Type		3RT2023 to 3RT2025	3RT2026 to 3RT2028
Size		S0	
General data			
Dimensions (W x H x D)			
AC operation			
• Basic unit			
- Screw terminals	mm	45 x 85 x 97	
- Spring-type terminals	mm	45 x 102 x 97	
• Basic unit with mounted auxiliary switch block			
- Screw terminals	mm	45 x 85 x 141	
- Spring-type terminals	mm	45 x 102 x 145	
• Basic unit with mounted function module or solid-state time-delayed auxiliary switch block			
- Screw terminals	mm	45 x 85 x 171	
- Spring-type terminals	mm	45 x 102 x 171	
DC operation			
• Basic unit			
- Screw terminals	mm	45 x 85 x 107	
- Spring-type terminals	mm	45 x 102 x 107	
• Basic unit with mounted auxiliary switch block			
- Screw terminals	mm	45 x 85 x 151	
- Spring-type terminals	mm	45 x 102 x 155	
• Basic unit with mounted function module or solid-state time-delayed auxiliary switch block			
- Screw terminals	mm	45 x 85 x 181	
- Spring-type terminals	mm	45 x 102 x 181	
Permissible mounting position			
The contactors are designed for operation on a vertical mounting surface.			
Upright mounting position		Special version required, also applies to 3RT202.-.K.40 coupling contactors	
Mechanical endurance			
• Basic unit and basic unit with mounted auxiliary switch block	Operating cycles	10 million	
• Basic unit with solid-state compatible auxiliary switch block	Operating cycles	5 million	
Electrical endurance		For contact endurance of the main contacts, see page 3/20.	
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 IEC 60947-1, Appendix N)	V	400	
Mirror contacts			
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	
• 3RT2.2. (removable auxiliary switch block)		Yes, acc. to IEC 60947-4-1, Appendix F	
Permissible ambient temperature			
• During operation	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
Degree of protection acc. to IEC 60529			
• On front		IP20 (screw terminals and spring-type terminals)	
• Connecting terminal		IP20 (screw terminals and spring-type terminals)	
Touch protection acc. to IEC 60529		Finger-safe (screw terminals and spring-type terminals)	
Shock resistance			
• 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	
• 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	

		Contactors		
Type		3RT2023 to 3RT2025	3RT2026	3RT2027, 3RT2028
Size		S0		
Short-circuit protection				
Main circuit				
• Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE acc. to IEC/EN 60947-4-1				
- Type of coordination "1"	A	63	100	125
- Type of coordination "2"	A	25	35	50
- Weld-free (test conditions according to IEC 60947-4-1)	A	10	16	
• Miniature circuit breaker with C characteristic (short-circuit current 3 kA, type of coordination "1")	A	25	32	40
Auxiliary circuit				
• Fuse links, operational class gG: DIAZED, type 5SB; NEOZED, type 5SE (weld-free protection at I_k 1 kA)	A	10		
• 230 V miniature circuit breaker, C characteristic (short-circuit current I_k < 400 A)	A	10		
Short-circuit protection for contactors with overload relays		See "Configuring the SIRIUS Modular System – Selection data for Fuseless and Fused Load Feeders", https://support.industry.siemens.com/cs/ww/en/view/39714188		
Short-circuit protection for fuseless load feeders		See 3RA2 load feeders on page 8/4 onwards		

		Contactors				
Type		3RT2023 to 3RT2025	3RT2026 to 3RT2028	3RT202.-.NB3	3RT202.-.NF3..	3RT202.-.NP3
Size		S0				
Control						
Type of operating mechanism		AC or DC		AC/DC		
Solenoid coil operating range	AC/DC	0.8 ... 1.1 x U_s [1]		0.7 ... 1.3 x U_s [2]		
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)						
• AC operation, 50 Hz, standard version						
- Closing	VA	65	77	6.6	11.9	12.7
- P.f.		0.82		0.98		
- Closed	VA	7.6	9.8	1.9	1.6	3.9
- P.f.		0.25		0.86	0.79	0.51
• AC operation, 50/60 Hz, standard version						
- Closing	VA	68/67	81/79	6.6/6.7	11.9/12.0	12.7/14.7
- P.f.		0.72/0.74		0.98/0.98		
- Closed	VA	7.9/6.5	10.5/8.5	1.9/2.0	1.6/1.8	3.9/4.3
- P.f.		0.25/0.28		0.86/0.82	0.79/0.74	0.51/0.56
• AC operation, 50 Hz, for USA/Canada						
- Closing	VA	65	77	--		
- P.f.		0.82	0.82	--		
- Closed	VA	7.6	9.8	--		
- P.f.		0.25	0.28	--		
• AC operation, 60 Hz, for USA/Canada						
- Closing	VA	73	87	--		
- P.f.		0.76		--		
- Closed	VA	7.2	9.4	--		
- P.f.		0.28		--		
• DC operation (closing = closed)	W	5.9/5.9		5.9/1.4	10.2/1.3	14.3/1.9
Permissible residual current of the electronics (with 0 signal)						
• AC operation	mA	< 6 mA x (230 V/U_s)		< 7 mA x (230 V/U_s)		
• DC operation	mA	< 16 mA x (24 V/U_s)				
Operating times at 1.0 x U_s [3]						
• AC operation						
- Closing delay	ms	10 ... 18	10 ... 17	65 ... 80	50 ... 70	60 ... 80
- Opening delay	ms	4 ... 16		30 ... 45	35 ... 45	30 ... 50
• DC operation						
- Closing delay	ms	55 ... 80		60 ... 80	56 ... 70	60 ... 80
- Opening delay	ms	16 ... 17		30 ... 45	35 ... 45	30 ... 50
• Arcing time	ms	10				

[1] 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.

[2] The following applies to $U_{s\,max}$ = 280 V: Upper limit = 1.1 x $U_{s\,max}$.

[3] 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: 2x to 6x).

SIRIUS 3RT contactors, 3-pole up to 500 HP

			Coupling contactors
Type			3RT202.-.KB4.
Size			S0
Control			
Solenoid coil operating range			0.7 ... 1.25 x U_s
Power consumption of the solenoid coils (for cold coil) Closing = Closed	At U_s 24 V DC	W	4.5
Permissible residual current of the electronics (with 0 signal)			< 10 mA x (24 V/U_s)
Overvoltage configuration of the solenoid coil			Built-in varistor U
Operating times			
• Closing delay			
- ON-delay NO		ms	65 ... 90
- OFF-delay NC		ms	55 ... 80
• Opening delay			
- ON-delay NO		ms	19 ... 21
- OFF-delay NC		ms	25 ... 31

			Contactors					
Type			3RT2023	3RT2024	3RT2025	3RT2026	3RT2027	3RT2028
Size			S0					
Rated data of the main contacts								
Load rating with AC								
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[1] P.f. = 0.95 (at 60 °C)	230 V	kW	13.3				15.5	
	400 V	kW	23				27.5	
	690 V	kW	40				47.5	
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm^2	10					
	At 60 °C	mm^2	10					
Utilization categories AC-2 and 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	
	690 V	A	9		13		21	
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V	kW	2.2	3	4	5.5	7.5	11
	400 V	kW	4	5.5	7.5	11	15	18.5
	690 V	kW	7.5		11		18.5	
Thermal load capacity	10 s current	A	80	110	150	200	260	300
Power loss per conducting path	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 x I_e)								
• Maximum values:								
- Rated operational current I_e	Up to 400 V	A	8.5	12.5	15.5		22	
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V	kW	4	5.5	7.5		11	
• The following applies to a contact endurance of about 200 000 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 Hz and 60 Hz	At 110 V	kW	0.5	0.73	1	1.2	1.6	
	230 V	kW	1.1	1.5	2	2.5	3.4	
	400 V	kW	2	2.6	3.5	4.4	6	
	690 V	kW	2.5	4.6	6	7.7	10.3	

[1] Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

Type			Contactors 3RT2023 to 3RT2025	3RT2026 to 3RT2028
Size			S0	
Rated data of the main contacts (continued)				
Load rating with DC				
Utilization category DC-1, switching resistive loads (*L/R* 1 ms)				
• Rated operational currents I_e (at 60 °C)				
- 1 conducting path	Up to 24 V	A	35	
	60 V	A	20	
	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	35	
	60 V	A	35	
	110 V	A	35	
	220 V	A	5	
	440 V	A	1	
	600 V	A	0.8	
- 3 conducting paths in series	Up to 24 V	A	35	
	60 V	A	35	
	110 V	A	35	
	220 V	A	35	
	440 V	A	2.9	
	600 V	A	1.4	
Utilization category DC-3/DC-5, shunt-wound and series-wound motors (*L/R* 15 ms)				
• Rated operational currents I_e (at 60 °C)				
- 1 conducting path	Up to 24 V	A	20	
	60 V	A	5	
	110 V	A	2.5	
	220 V	A	1	
	440 V	A	0.09	
	600 V	A	0.06	
- 2 conducting paths in series	Up to 24 V	A	35	
	60 V	A	35	
	110 V	A	15	
	220 V	A	3	
	440 V	A	0.27	
	600 V	A	0.16	
- 3 conducting paths in series	Up to 24 V	A	35	
	60 V	A	35	
	110 V	A	35	
	220 V	A	10	
	440 V	A	0.6	
	600 V	A	0.6	
Switching frequency				
Switching frequency *z* in operating cycles/hour				
Contactors without overload relays				
• No-load switching frequency	AC	h^{-1}	5 000	
	DC	h^{-1}	1 500	
• Switching frequency *z* during rated operation[1)]				
- I_e/AC-1	At 400 V	h^{-1}	1 000	
- I_e/AC-2	At 400 V	h^{-1}	1 000	750
- I_e/AC-3	At 400 V	h^{-1}	1 000	750
- I_e/AC-4	At 400 V	h^{-1}	300	250
Contactors with overload relays				
• Mean value		h^{-1}	15	

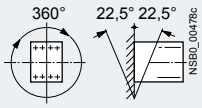
1) Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \ (I_e/I') \ (U_e/U')^{1.5}$ 1/h.

SIRIUS 3RT contactors, 3-pole up to 500 HP

Type		**Contactors**
		3RT2023 to 3RT2028
Size		**S0**
Conductor cross-sections		
Main conductors (1 or 2 conductors can be connected)		**Screw terminals**
• Solid or stranded	mm^2	2 x (1 ... 2.5)[1]; 2 x (2.5 ... 10)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (1 ... 2.5)[1]; 2 x (2.5 ... 6)[1]; 1 x 10
• AWG cables, solid or stranded	AWG	2 x (16 ... 12)[1]; 2 x (14 ... 8)[1]
• Terminal screws		M4 (for Pozidriv size 2; 5 ... 6)
- Tightening torque	Nm	2 ... 2.5 (18 ... 22 lb.in)
Auxiliary conductors (1 or 2 conductors can be connected)		
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]
• Terminal screws		M3 (for Pozidriv size 2; 5 ... 6)
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)
Main conductors[2] (1 or 2 conductors can be connected)		**Spring-type terminals**
• Operating devices	mm	3.0 x 0.5
• Solid or stranded	mm^2	2 x (1 ... 10)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (1 ... 6)
• Finely stranded without end sleeve	mm^2	2 x (1 ... 6)
• AWG cables, solid or stranded	AWG	2 x (18 ... 8)
Auxiliary conductors[2] (1 or 2 conductors can be connected)		
• Operating devices		3.0 x 0.5
• Solid or stranded	mm^2	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)

[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

[2] Max. external diameter of the cable insulation: 3.6 mm. On spring-type terminals with conductor cross-sections 1 mm^2, an insulation stop must be used, see page 3/115.

Type		Contactors 3RT2035	3RT2036	3RT2037	3RT2038
Size		S2			
General data					
Dimensions (W x H x D)					
• Basic unit - Screw/spring-type terminals	mm	55 x 114 x 130			
• Basic unit with mounted auxiliary switch block - Screw terminals - Spring-type terminals	 mm mm	 55 x 114 x 174 55 x 114 x 178			
• Basic unit with mounted function module or solid-state time-delayed auxiliary switch block - Screw/spring-type terminals	mm	55 x 114 x 204			
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.					
Upright mounting position		Special version required			
Mechanical endurance					
• Basic units and basic units with mounted auxiliary switch block	Operating cycles	10 million			
• Basic units with solid-state compatible auxiliary switch block	Operating cycles	5 million			
Electrical endurance		For contact endurance of the main contacts, see page 3/21 onwards.			
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 IEC 60947-1, Appendix N)	V	400			
Mirror contacts 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			
• 3RT2.3. (removable auxiliary switch block)		Yes, acc. to IEC 60947-4-1, Appendix F			
Permissible ambient temperature					
• During operation	°C	-25 ... +60			
• During storage	°C	-55 ... +80			
Degree of protection acc. to IEC 60529					
• On front		IP20			
• Connecting terminal		IP00 (for higher degree of protection, use additional terminal covers)			
Touch protection acc. to IEC 60529		Finger-safe for vertical touching from the front			
Shock resistance					
• Rectangular pulse - AC operation - DC operation	 g/ms g/ms	 11.8/5 and 7.4/10 7.7/5 and 4.5/10			
• Sine pulse - AC operation - DC operation	 g/ms g/ms	 18.5/5 and 11.6/10 12/5 and 7/10			
Short-circuit protection					
Main circuit					
• Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE acc. to IEC/EN 60947-4-1 - Type of coordination "1" - Type of coordination "2" - Weld-free (test conditions acc. to IEC 60947-4-1)	 A A A	 160 80 16	 25	 250 125 50	 160
Auxiliary circuit					
• Fuse links, operational class gG: DIAZED, type 5SB; NEOZED, type 5SE (weld-free protection at I_k 1 kA)	A	10			
• 230 V miniature circuit breaker, C characteristic (short-circuit current I_k < 400 A)	A	10			
Short-circuit protection for contactors with overload relays		See "Configuring the SIRIUS Modular System – Selection data for Fuseless and Fused Load Feeders", https://support.industry.siemens.com/cs/ww/en/view/39714188			
Short-circuit protection for fuseless load feeders		See 3RA2 load feeders, from page 8/4 onwards			

SIRIUS 3RT contactors, 3-pole up to 500 HP

Type		Contactors 3RT203.-.A...	3RT203.-.N.3.	Coupling contactors 3RT203.-.KB4.
Size		S2		
Control				
Type of operating mechanism		AC	AC/DC	DC
Solenoid coil operating range				
• AC operation[1]		0.8 ... 1.1 x U_s	--	
• AC/DC operation[1]		--	0.8 ... 1.1 x U_s	--
• DC operation		--		0.8 ... 1.2 x U_s
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)				
• 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, 60 Hz, for USA/Canada				
- Closing	VA	212	--	
- P.f.		0.67	--	
- Closed	VA	18.5	--	
- P.f.		0.37	--	
• AC/DC operation				
- Closing for AC operation	VA	--	40	--
- P.f.		--	0.95	--
- Closed for AC operation	VA	--	2	--
- P.f.		--	0.95	--
• DC operation				
- Closing for DC operation	W	--	23[2]	21.5
- Closed for DC operation	W	--	1	1
Permissible residual current of the electronics (with 0 signal)				
• AC/DC operation	mA	--	< 20	--
• DC operation	mA	--		< 20
Overvoltage configuration of the solenoid coil		--	Built-in varistor U	Built-in varistor U
Operating times at 0.7 ... 1.25 x U_s[3]				
Total break time = Opening delay + Arcing time				
• DC operation				
- Closing delay	ms	--		45 ... 60
- Opening delay	ms	--		35 ... 55
Operating times at 1.0 x U_s[3]				
• AC operation				
- Closing delay	ms	12 ...22	35 ... 80	--
- Opening delay	ms	10 ...18	30 ... 55	--
• DC operation				
- Closing delay	ms	--	35 ... 80	35 ... 80
- Opening delay	ms	--	30 ... 55	30 ... 55
• Arcing time	ms	10 ... 20		

1) 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.

2) In the case of AC/DC coils, increased starting currents (2.6 A on average) occur during the first 200 ms. For direct control from a PLC, we recommend special 3RT203.-.KB4. coupling contactors with adapted power consumption, suitable for a PLC output current of 2 A (see page 3/62).

3) 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: 2x to 6x).

Contactors for Switching Motors

SIRIUS 3RT contactors, 3-pole up to 500 HP

			Contactors			
Type			3RT2035	3RT2036	3RT2037	3RT2038
Size			S2			
Rated data of the main contacts						
Load rating with AC						
Utilization category AC-1, switching resistive loads						
• Rated operational current I_e	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[1] 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_e	At 40 °C	mm^2	16	25		35
	At 60 °C	mm^2	16		25	
Utilization categories AC-2 and AC-3						
• Rated operational currents I_e	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		47	58
• Rated power for slipring 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		37	45
Thermal load capacity	10 s current	A	400	420	520	640
Power loss per conducting path	At I_e/AC-3	W	2.2	4	3.8	5.7
Utilization category AC-4 (for $I_a = 6 \times I_e$)						
• Maximum values						
- Rated operational current I_e	Up to 400 V	A	35	41	55	
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V	kW	18.5	22	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

[1] Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

Type			Contactors 3RT2035	3RT2036	3RT2037	3RT2038
Size			S2			
Rated data of the main contacts (continued)						
Load rating with DC						
Utilization category DC-1, switching resistive loads (*L/R* 1 ms)						
• 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	45			
	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			
Utilization category DC-3/DC-5, shunt-wound and series-wound motors (*L/R* 15 ms)						
• 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	1			
	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			
Switching frequency						
Switching frequency *z* in operating cycles/hour						
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[1]						
- I_e/AC-1	At 400 V	h^{-1}	1 200	1 000	800	700
- I_e/AC-2	At 400 V	h^{-1}	750	600	400	350
- I_e/AC-3	At 400 V	h^{-1}	1 000	800	700	500
- I_e/AC-4	At 400 V	h^{-1}	300	250	200	150
Contactors with overload relays						
• Mean value		h^{-1}	15			

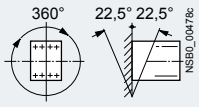
[1] Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \ (I_e/I') \ (U_e/U')^{1.5}$ 1/h.

SIRIUS 3RT contactors, 3-pole up to 500 HP

Type		**Contactors**
		3RT2035 to 3RT2038
Size		**S2**
Conductor cross-sections		
Main conductors (1 or 2 conductors can be connected)		**Screw terminals**
• Solid or stranded	mm^2	2 x (1 ... 35)[1]; 1 x (1 ... 50)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (1 ... 25)[1]; 1 x (1 ... 35)[1]
• AWG cables, solid or stranded	AWG	2 x (18 ... 2)[1]; 1 x (18 ... 1)[1]
• Terminal screws		Pozidriv size 2; 5 ... 6
- Tightening torque	Nm	3 ... 4.5 (27 ... 40 lb.in)
Auxiliary conductors and control conductors (1 or 2 conductors can be connected)		
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]
• Terminal screws		M3 (for Pozidriv size 2; 5 ... 6)
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)
Auxiliary and control conductors[2] (1 or 2 conductors can be connected)		**Spring-type terminals**
• Operating devices	mm	3.0 x 0.5
• Solid or stranded	mm^2	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)

[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

[2] Max. external diameter of the cable insulation: 3.6 mm. On spring-type terminals with conductor cross-sections 1 mm^2, an insulation stop must be used, see page 3/115.

		Contactors		
Type		3RT2045	3RT2046	3RT2047
Size		S3		
General data				
Dimensions (W x H x D)				
• Basic unit - Screw/spring-type terminals	mm	70 x 140 x 152		
• Basic unit with mounted auxiliary switch block - Screw terminals - Spring-type terminals	 mm mm	 70 x 140 x 196 70 x 140 x 200		
• Basic unit with mounted function module or solid-state time-delayed auxiliary switch block - Screw/spring-type terminals	mm	70 x 140 x 226		
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.				
Upright mounting position		Special version required		
Mechanical endurance				
• Basic units and basic units with mounted auxiliary switch block	Operating cycles	10 million		
• Basic units with solid-state compatible auxiliary switch block	Operating cycles	5 million		
Electrical endurance		For contact endurance of the main contacts, see page 3/21.		
Rated insulation voltage U_i (pollution degree 3)	V	1 000 (3RT20..-.....-0CC0: 690)		
Rated impulse withstand voltage U_{imp}	kV	6		
Protective separation between the coil and the main contacts (acc. to IEC 60947-1, Appendix N)	V	690		
Mirror contacts 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		
• 3RT2.4. (removable auxiliary switch block)		Yes, acc. to IEC 60947-4-1, Appendix F		
Permissible ambient temperature				
• During operation	°C	-25 ... +60		
• During storage	°C	-55 ... +80		
Degree of protection acc. to IEC 60529				
• On front		IP20		
• Connecting terminal		IP00 (for higher degree of protection, use additional terminal covers)		
Touch protection acc. to IEC 60529		Finger-safe for vertical touching from the front		
Shock resistance				
• Rectangular pulse - AC operation - DC operation	 *g*/ms *g*/ms	 10.3/5 and 6.7/10 6.7/5 and 4.0/10 (3RT204.-.KB40: 6.3/5 and 3.6/10)		
• Sine pulse - AC operation - DC operation	 *g*/ms *g*/ms	 16.3/5 and 10.5/10 10.6/5 and 6.3/10 (3RT204.-.KB40: 9.8/5 and 5.6/10)		
Short-circuit protection				
Main circuit				
• Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE acc. to IEC/EN 60947-4-1 - Type of coordination "1" - Type of coordination "2" - Weld-free (test conditions according to IEC 60947-4-1)	 A A A	 250 160 On request	 160	 200
Auxiliary circuit				
• Fuse links, operational class gG: DIAZED, type 5SB; NEOZED, type 5SE (weld-free protection at I_k 1 kA)	A	10		
• 230 V miniature circuit breaker, C characteristic (short-circuit current I_k < 400 A)	A	10		
Short-circuit protection for contactors with overload relays		See "Configuring the SIRIUS Modular System – Selection data for Fuseless and Fused Load Feeders", https://support.industry.siemens.com/cs/ww/en/view/39714188		
Short-circuit protection for fuseless load feeders		See 3RA2 load feeders, from page 8/4 onwards		

Contactors for Switching Motors

SIRIUS 3RT contactors, 3-pole up to 500 HP

		Contactors		Coupling contactors
Type		3RT204.-.A...	3RT204.-.N.3.	3RT204.-.KB4.
Size		S3		
Control				
Type of operating mechanism		AC	AC/DC	DC
Solenoid coil operating range				
• AC operation[1]		0.8 ... 1.1 x U_s	--	
• AC/DC operation[1]		--	0.8 ... 1.1 x U_s	--
• DC operation		--		0.8 ... 1.2 x U_s
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)				
• AC operation, 50 Hz, standard version				
- Closing	VA	296	--	--
- P.f.		0.61	--	--
- Closed	VA	19	--	--
- P.f.		0.38	--	--
• AC operation, 50/60 Hz, standard version				
- Closing	VA	348/296	--	--
- P.f.		0.62/0.55	--	--
- Closed	VA	25/18	--	--
- P.f.		0.35/0.41	--	--
• AC operation, 60 Hz, for USA/Canada				
- Closing	VA	326	--	--
- P.f.		0.62	--	--
- Closed	VA	22	--	--
- P.f.		0.38	--	--
• AC/DC operation				
- Closing for AC operation	VA	--	163	--
- P.f.		--	0.95	--
- Closed for AC operation	VA	--	3.1	--
- P.f.		--	0.95	--
• DC operation				
- Closing for DC operation	W	--	76[2]	25
- Closed for DC operation	W	--	1.8	0.9
Permissible residual current of the electronics (with 0 signal)				
• AC/DC operation	mA	--	< 20	--
• DC operation	mA	--		< 20
Overvoltage configuration of the solenoid coil		--	Built-in varistor U	Built-in varistor U
Operating times at 0.8 ... 1.2 x U_s[3]				
Total break time = Opening delay + Arcing time				
• DC operation				
- Closing delay	ms	--		50 ... 70
- Opening delay	ms	--		38 ... 57
Operating times for 1.0 x U_s[3]				
• AC operation				
- Closing delay	ms	15 ...25	50 ... 70	--
- Opening delay	ms	11 ...20	38 ... 57	--
• DC operation				
- Closing delay	ms	--	50 ... 70	--
- Opening delay	ms	--	38 ... 57	--
• Arcing time	ms	10 ... 20		

1) 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.

2) In the case of AC/DC coils, increased starting currents (2.6 A on average) occur during the first 200 ms. For direct control from a PLC, we recommend special 3RT204.-.KB4. coupling contactors with adapted power consumption, suitable for a PLC output current of 2 A (see page 3/62).

3) 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: 2x to 6x).

Contactors for Switching Motors

SIRIUS 3RT contactors, 3-pole up to 500 HP

			Contactors		
Type			3RT2045	3RT2046	3RT2047
Size			S3		
Rated data of the main contacts					
Load rating with AC					
Utilization category AC-1, switching resistive loads					
• Rated operational current I_e	At 40 °C up to 690 V	A	125	130	
	At 60 °C up to 690 V	A	105	110	
• Rated power for AC loads[1] P.f. = 0.95 (at 60 °C)	230 V	kW	40	42	
	400 V	kW	69	72	
	690 V	kW	119	125	
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm^2	50		
	At 60 °C	mm^2	35		
Utilization categories AC-2 and AC-3					
• Rated operational currents I_e	Up to 400 V	A	80	95	110
	500 V	A	80	95	110
	690 V	A	58	78	98
	1 000 V	A	30		
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V	kW	22	22	30
	400 V	kW	37	45	55
	690 V	kW	55	75	90
	1 000 V	kW	37		
Thermal load capacity	10 s current	A	760		880
Power loss per conducting path	At I_e/AC-3	W	5.3	6.6	7.9
Utilization category AC-4 (for $I_a = 6 \times I_e$)					
• Maximum values					
- Rated operational current I_e	Up to 400 V	A	66	80	97
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V	kW	37	45	55
• The following applies to a contact endurance of about 200 000 operating cycles:					
- Rated operational currents I_e	Up to 400 V	A	34	42	46
	690 V	A	24	30	36
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 110 V	kW	4.9	6.1	6.7
	230 V	kW	10.4	12	14
	400 V	kW	17.9	22	24.3
	690 V	kW	21.8	27.4	32.9

[1] Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

Type			Contactors 3RT2045	3RT2046	3RT2047
Size			S3		
Rated data of the main contacts (continued)					
Load rating with DC					
Utilization category DC-1, switching resistive loads (*L/R* 1 ms)					
• Rated operational currents I_e (at 60 °C)					
- 1 conducting path	Up to 24 V	A	100		
	60 V	A	60		
	110 V	A	9		
	220 V	A	2		
	440 V	A	0.6		
	600 V	A	0.4		
- 2 conducting paths in series	Up to 24 V	A	100		
	60 V	A	100		
	110 V	A	100		
	220 V	A	10		
	440 V	A	1.8		
	600 V	A	1.0		
- 3 conducting paths in series	Up to 24 V	A	100		
	60 V	A	100		
	110 V	A	100		
	220 V	A	80		
	440 V	A	4.5		
	600 V	A	2.6		
Utilization category DC-3/DC-5, shunt-wound and series-wound motors (*L/R* 15 ms)					
• Rated operational currents I_e (at 60 °C)					
- 1 conducting path	Up to 24 V	A	40		
	60 V	A	6		
	110 V	A	2.5		
	220 V	A	1		
	440 V	A	0.15		
	600 V	A	0.06		
- 2 conducting paths in series	Up to 24 V	A	100		
	60 V	A	100		
	110 V	A	100		
	220 V	A	7		
	440 V	A	0.42		
	600 V	A	0.16		
- 3 conducting paths in series	Up to 24 V	A	100		
	60 V	A	100		
	110 V	A	100		
	220 V	A	35		
	440 V	A	0.8		
	600 V	A	0.35		
Switching frequency					
Switching frequency *z* in operating cycles/hour					
Contactors without overload relays					
• No-load switching frequency	AC	h^{-1}	5 000		
	AC/DC	h^{-1}	1 000		
• Switching frequency *z* during rated operation[1]					
- I_e/AC-1	At 400 V	h^{-1}	900		
- I_e/AC-2	At 400 V	h^{-1}	400	350	
- I_e/AC-3	At 400 V	h^{-1}	1 000	850	
- I_e/AC-4	At 400 V	h^{-1}	300	250	200
Contactors with overload relays					
• Mean value		h^{-1}	15		

[1] Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \ (I_e/I') \ (U_e/U')^{1.5}$ 1/h.

Contactors for Switching Motors

SIRIUS 3RT contactors, 3-pole up to 500 HP

Type		**Contactors**
		3RT2045 to 3RT2047
Size		**S3**
Conductor cross-sections		
Main conductors (1 or 2 conductors can be connected)		**Screw terminals**
• Solid	mm^2	2 x (2.5 ... 16)[1]
• Stranded	mm^2	2 x (6 ... 16)[1]; 2 x (10 ... 50)[1]; 1 x (10 ... 70)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (2.5 ... 35)[1]; 1 x (2.5 ... 50)[1]
• AWG cables, solid or stranded	AWG	2 x (10 ... 1/0)[1]; 1 x (10 ... 2/0)[1]
• Terminal screws		Hexagon socket, size 4
- Tightening torque	Nm	4.5 ... 6 (40 ... 53 lb.in)
Auxiliary conductors and control conductors (1 or 2 conductors can be connected)		
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]
• Terminal screws		M3 (for Pozidriv size 2; 5 ... 6)
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)
Auxiliary and control conductors[2] (1 or 2 conductors can be connected)		**Spring-type terminals**
• Operating devices	mm	3.0 x 0.5
• Solid or stranded	mm^2	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)

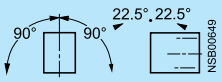
[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

[2] Max. external diameter of the conductor insulation: 3.6 mm. On spring-type terminals with conductor cross-sections 1 mm^2, an insulation stop must be used, see page 3/115.

Contactors for Switching Motors

3RT10.5. contactors

Technical data

Contactor	Size Type		S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
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 when stored	°C °C	–25 ... +60/+55 with AS-Interface –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 *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
Conductor cross-sections			See page 2/150		
Electromagnetic compatibility (EMC)			See page 2/108		
Short-circuit protection of contactors without overload relays			See Part 4.		
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] Type of coord. "2" [1] Weld-free [2]	A A A	355 315 80	355 315 160	
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		

Contactor	Size Type		S6 3RT10 5.			
Control circuit						
Coil voltage tolerance	AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$			
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)			Conventional op. mechanism		Solid-state op. mechanism	
			$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	Closing	VA	250	300	190	280
	p.f.		0.9	0.9	0.8	0.8
	Closed	VA	4.8	5.8	3.5	4.4
	p.f.		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
PLC control input (EN 61 131-2/Type 2)			DC 24 V/≤ 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 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time	ms	20 ... 95		95 ... 135	35 ... 75
	opening time	ms	40 ... 60		80 ... 90	80 ... 90
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time	ms	25 ... 50		100 ... 120	40 ... 60
	opening time	ms	40 ... 60		80 ... 90	80 ... 90
Arcing time		ms	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

3RT10.5. contactors

Technical data

Contactor / Size / Type			S6 3RT10 54		S6 3RT10 55		S6 3RT10 56	
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 [1] 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 $I_{e\ load}$	at 40 °C	mm²	70		95		95	
	60 °C	mm²	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 [2]	A	1100		1300		1480	
Power loss per conducting path	at I_e/AC-3/500 V	W	7		9		13	
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: $P_x = P_{n30} \cdot \frac{30}{x}$	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	

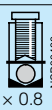
1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

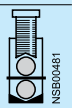
2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

Technical data

Contactor	Size Type		S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
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
	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
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
	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					
Operating frequency *z* 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	
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\ \text{V}}{U'}\right)^{1.5}$ 1/h					
Contactors with overload relays (mean value)		1/h	60	60	

Contactor	Size Type		S6 3RT10 5.		
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 55-4G box terminal (75 HP)		Front terminal connected	Back terminal connected	Both terminals connected
	finely stranded with end sleeve	mm²	16 ... 70	16 ... 70	max. 1 × 50, 1 × 70
	Finely stranded without end sleeve	mm²	16 ... 70	16 ... 70	max. 1 × 50, 1 × 70
	Stranded	mm²	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. x width × thickness)	mm	min. 3 × 9 × 0.8	min. 3 × 9 × 0.8	
		mm	max. 6 × 15.5 × 0.8	max. 6 × 15.5 × 0.8	max. 2 × (6 × 15,5 × 0.8)
	with 3RT19 56-4G box terminal				
	Finely stranded with end sleeve	mm²	16 ... 120	16 ... 120	max. 1 × 95, 1 × 120
	Finely stranded without end sleeve	mm²	16 ... 120	16 ... 120	max. 1 × 95, 1 × 120
	Stranded	mm²	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)		
	Without box terminal/busbar connection				
	Finely stranded with cable lug	mm²	16 ... 95	If cable lugs acc. to DIN 46 235 are connected, as of a conductor cross-section of 95 mm² a 3RT19 56-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm²	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)		
	Auxiliary conductor:				
	Solid	mm²	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	mm²	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)		

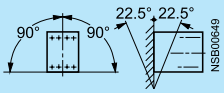




Contactors for Switching Motors

3RT10.6. contactors

Technical data

Contactor	Size Type		S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
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 when stored	°C °C	–25 ... +60/+55 with AS-Interface –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 *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
Conductor cross-sections			See page 2/153		
Electromagnetic compatibility (EMC)			See page 2/108		
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] Type of coord. "2" [1] Weld-free [2]	A A A	500 400 250		
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		

Contactor	Size Type		S10 3RT10 6.			
Control circuit						
Coil voltage tolerance	AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$			
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)			Conventional op. mechanism		Solid-state op. mechanism	
			$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	closing	VA	490	590	400	530
	p.f.		0.9	0.9	0.8	0.8
	closed	VA	5.6	6.7	4	5
	p.f.		0.9	0.9	0.5	0.4
DC operation	closing	W	540	650	440	580
	closed	W	6.1	7.4	3.2	3.8
PLC control input (EN 61 131-2/Type 2)			DC 24 V /≤ 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 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time	ms	30 ... 95		105 ... 145	45 ... 80
	opening time	ms	40 ... 80		80 ... 100	80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time	ms	35 ... 50		110 ... 130	50 ... 65
	opening time	ms	50 ... 80		80 ... 100	80 ... 100
Arcing time		ms	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	
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 [1] 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 $I_{e\ load}$	at 40 °C	mm²	150		185			
	60 °C	mm²	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 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		280	
	1000 V	kW	90		132		132	
Thermal loading capacity	10 s current [2]	A	1800		2400		2400	
Power loss per conducting path	at I_e/AC-3/500 V	W	17		18		22	
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: $P_x = P_{n30} \cdot \frac{30}{x}$	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
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

Technical data

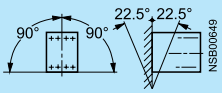
Contactor	Size Type		S10 3RT10 64			S10 3RT10 65			S10 3RT10 66
Main circuit									
Load ratings with DC									
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)									
Rated operational current I_e (at 60 °C)									
	Number of conducting paths connected in series		1	2	3	1	2	3	
	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	
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	
	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									
Operating frequency *z* in operating cycles per hour									
Contactors 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
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\,V}{U'}\right)^{1.5}$ 1/h	for AC-4	1/h	130			130			130
Contactors with overload relays (mean value)		1/h	60			60			60

Contactor	Size Type		S10 3RT10 6.		
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	mm²	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	
		mm	max. 20 × 24 × 0.5	max. 20 × 24 × 0.5	max. 2 × (20 × 24 × 0.5)
	– Terminal screws		M 12 (hexagon sokket, A/F 5)		
	– Tightening torque	Nm	20 ... 22 (180 ... 195 lb.in)		
	Without box terminal/busbar connection				
	Finely stranded with cable lug	mm²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm²	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)		
	Auxiliary conductor:				
	Solid	mm²	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	mm²	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

Contactor	Size Type		S12 3RT10 75	S12 3RT10 76
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 when stored	°C °C	–25 ... +60/+55 with AS-Interface –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 *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections			See page 2/156	
Electromagnetic compatibility (EMC)			See page 2/108	
Short-circuit protection				
Main circuit 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
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	
Control circuit				
Coil voltage tolerance	AC/DC (UC)		$0.8 \times U_{s\,min}$ ... $1.1 \times U_{s\,max}$	

			Conventional op. mechanism		Solid-state op. mechanism	
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)			$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	closing p.f. closed p.f.	VA VA 	700 0.9 7.6 0.9	830 0.9 9.2 0.9	560 0.8 5.4 0.8	750 0.8 7 0.8
DC operation	closing closed	W W	770 8.5	920 10	600 4	800 5

PLC control input (EN 61 131-2/Type 2)			DC 24 V/≤ 30 mA	
Operating times (Break-time = opening time + arcing time)			Conventional op. mechanism	Solid-state op. mechanism Operation via A1/A2 / PLC input
– at $0.8 \times U_{s\,min}$ ... $1.1 \times U_{s\,max}$	closing time opening time	ms ms	45 ... 100 60 ... 100	120 ... 150 / 60 ... 90 80 ... 100 / 80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time	ms ms	50 ... 70 70 ... 100	125 ... 150 / 65 ... 80 80 ... 100 / 80 ... 100
Arcing time		ms	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

3RT10.7. contactors

Technical data

Contactor / Size / Type			S12 3RT10 75		S12 3RT10 76	
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 [3])	
	at 60 °C up to 1000 V	A	200		200	
Ratings of three-phase loads [1]) 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 $I_{e\ load}$	at 40 °C	mm²	2 × 150		2 × 185	
	60 °C	mm²	240		2 × 185	
AC-2 and AC-3 utilization categories						
Rated operational currents I_e	up to 500 V	A	400		500 [4])	
	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 [2])	A	3200		4000	
Power loss per conducting path	at I_e/AC-3/500 V	W	35		55	
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: $P_x = P_{n\,30} \cdot \frac{30}{x}$	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
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).

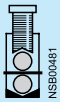
2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

3) Ambient temperature 50 °C for 3RT10 76-.N contactor

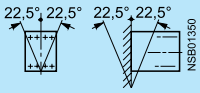
4) Ambient temperature 55 °C for 3RT10 76-.N contactor

Technical data

Contactor	Size Type		S12 3RT10 75			S12 3RT10 76
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	
	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) **Rated operational current I_e** (at 60 °C)						
	Number of conducting paths connected in series		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						
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	700			500
	for AC-2	1/h	200			170
	for AC-3	1/h	500			420
	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

Contactor	Size Type		S12 3RT10 7.		
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185 
	Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	mm²	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 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)		
	Without box terminal/busbar connection				
	Finely stranded with cable lug	mm²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm²	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)		
	Auxiliary conductor:				
	Solid	mm²	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	mm²	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)		

Technical data

Contactor	Size Type		S10 3RT12 64	S10 3RT12 65	S10 3RT12 66
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 when stored	°C °C	–25 ... +60/+55 with AS-Interface –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 *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
Conductor cross-sections			See page 2/159		
Electromagnetic compatibility (EMC)			See page 2/108		
Short-circuit protection					
Main circuit 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 0660Part 102)	Type of coord. "1" [1] Type of coord. "2" [1] Weld-free [2]	A A A	500 500 400		
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		
Control circuit					
Coil voltage tolerance	AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$		
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)			Conventional op. mechanism $U_{s\,min}$	 $U_{s\,max}$	Solid-state op. mechanism $U_{s\,min}$	 $U_{s\,max}$
AC operation	closing p.f. closed p.f.	VA VA 	530 0.9 6.1 0.9	630 0.9 7.4 0.9	420 0.8 4.3 0.8	570 0.8 5.6 0.8
DC operation	closing closed	W W	580 6.8	700 8.2	460 3.4	630 4.2
PLC control input (EN 61 131-2/Type 2)			DC 24 V/≤ 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 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time opening time	ms ms	30 ... 95 40 ... 80		105 ... 145 80 ... 100	45 ... 80 80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time	ms ms	35 ... 50 50 ... 80		110 ... 130 80 ... 100	50 ... 65 80 ... 100
Arcing time		ms	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

3RT12.6. vacuum contactors

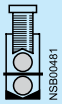
Technical data

Contactor / Size / Type			S10 3RT12 64		S10 3RT12 65	S10 3RT12 66
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 [1] 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	mm²	185			
	60 °C	mm²	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 [2]	A	1800		2120	2400
Power loss per conducting path	at I_e/AC-3	W	9		12	14
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: $P_x = P_{n\,30} \cdot \frac{30}{x}$	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		
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						
Operating frequency *z* 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': $z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\ V}{U'}\right)^{1.5}$ 1/h	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	
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.

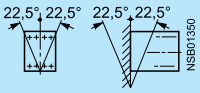
Technical data

Contactor	Size Type		S10 3RT12 6.		
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185 
	Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	mm²	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. 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)		
	Without box terminal/busbar connection				
	Finely stranded with cable lug Stranded with cable lug	mm² mm²	50 ... 240 70 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil		
	Connecting bar (max. width) – Terminal screws – Tightening torque	mm Nm	25 M 10 × 30 (A/F 17) 14 ... 24 (124 ... 210 lb.in)		
	Auxiliary conductor:				
	Solid	mm²	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	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded – Terminal screws – Tightening torque	AWG Nm	2 × (18 ... 14) M 3 (PZ 2) 0.8 ... 1.2 (7 ... 10.3 lb.in)		

Contactors for Switching Motors

3RT12.7. contactors

Technical data

Contactor	Size Type		S12 3RT12 75	S12 3RT12 76
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 when stored	°C °C	–25 ... +60/+55 with AS-Interface –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 *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections			See page 2/162	
Electromagnetic compatibility (EMC)			See page 2/108	
Short-circuit protection				
Main circuit 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 0660Part 102)	Type of coord. "1" [1] Type of coord. "2" [1] Weld-free [2]	A A A	800 800 500	
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	
Control circuit				
Coil voltage tolerance	AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)			Conventional op. mechanism $U_{s\,min}$ / $U_{s\,max}$	Solid-state op. mechanism $U_{s\,min}$ / $U_{s\,max}$
AC operation	closing p.f. closed p.f.	VA VA 	700 / 830 0.9 / 0.9 7.6 / 9.2 0.9 / 0.9	560 / 750 0.8 / 0.8 5.4 / 7 0.8 / 0.8
DC operation	closing closed	W W	770 / 920 8.5 / 10	600 / 800 4 / 5
PLC control input (EN 61 131-2/Type 2)			DC 24 V/≤ 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 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time opening time	ms ms	45 ... 100 60 ... 100	120 ... 150 / 60 ... 90 80 ... 100 / 80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time	ms ms	50 ... 70 70 ... 100	125 ... 150 / 65 ... 80 80 ... 100 / 80 ... 100
Arcing time		ms	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

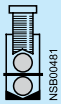
Technical data

Contactor	Size Type		S12 3RT12 75	S12 3RT12 76
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	mm²	2 × 185	
	60 °C	mm²	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.

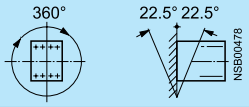
Technical data

Contactor	Size Type		S12 3RT12 7.		
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185 
	Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	mm²	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	
		mm	max. 20 × 24 × 0.5	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)		
	Without box terminal/busbar connection				
	Finely stranded with cable lug	mm²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm²	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)		
	Auxiliary conductor:				
	Solid	mm²	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	mm²	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 Type		**S3** **3RT24 46**
General data			
Permissible mounting position 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 × U_s
Upright mounting position:			
	AC operation		Special design required. Positions 13 ... 16 of the Order No. must be changed to **-1AA0**. Additional charge.
	DC operation		–
Mechanical endurance		Oper. cycles	10 million
Electrical endurance AC-1 utilization category at I_e		Oper. cycles	0.5 million
Rated insulation voltage U_i (pollution degree 3)		V	1000
Rated impulse withstand voltage U_{imp}		kV	6
Safe isolation between coil and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])		V	690
Permissible ambient temperature	in operation when stored	°C °C	–25 ... +60 –55 ... +80
Degree of protection 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
Conductor cross-sections			See page 2/165
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			
Coil voltage tolerance	AC/DC		0.8 ... 1.1 × U_s

Power consumption of the coils (with coil in cold state and 1.0 × U_s)			**Standard design**		**For USA and Canada**	
AC operation		Hz	50	50/60	50	60
	closing p.f. closed p.f.	VA VA 	270 0.68 22 0.27	298 /274 0.7 / 0.62 27 / 20 0.29/ 0.31	270 0.68 22 0.27	300 0.52 21 0.29
DC operation	closing = closed	W	15			
Operating times at 0.8 ... 1.1 × U_s [1] Break-time = opening time + arcing time						
AC operation	closing time opening time	ms ms	17 ... 90 10 ... 25			
DC operation	closing time opening time	ms ms	90 ... 230 14 ... 20			
Arcing time		ms	10 ... 15			
Operating times at 1.0 × U_s [1]						
AC operation	closing time opening time	ms ms	18 ... 30 11 ... 23			
DC operation	closing time opening time	ms ms	100 ... 120 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.

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

Technical data

Contactor	Size Type			S3 3RT24 46		
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 $I_{e\ load}$	at 40 °C	mm²		50		
	at 60 °C	mm²		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		
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':						

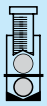
$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\,\text{V}}{U'}\right)^{1.5} \text{ 1/h}$$

Contactors for Special Applications

3RT24 contactors, 3-pole, for switcing resistive loads (AC-1)

Technical data

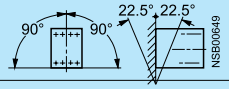
Contactor	Size Type		S3 3RT24 46		
Conductor cross-sections					
Screw connections (1 or 2 conductor connections possible)	**Main conductor:** With box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	2.5 ... 50	2.5 ... 50	max. 2×35
	Finely stranded without end sleeve	mm²	4 ... 50	10 ... 50	max. 2×35
	Solid	mm²	2.5 ... 16	2.5 ... 16	max. 2×16
	Stranded	mm²	4 ... 70	10 ... 70	max. 2×50
	Ribbon cable (qty. × width × thickness)	mm	6 × 9 × 0.8	6 × 9 × 0.8	2×(6×9×0.8)
	AWG conductor connections	AWG	10 ... 2/0	10 ... 2/0	2 × (10 ... 1/0)
	– Terminal screws		M 6 (hexagon socket)		
	– Tightening torque	Nm	4 ... 6 (36 ... 53 lb.in)		
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 necessary to comply with the phase clearance	
	Without box terminal with cable lugs				
	Finely stranded with cable lug	mm²	10 ... 50[1])	If conductors larger than 25 mm² are connected, a 3RT19 46-4EA1 terminal cover is necessary to comply with the phase clearance	
	Stranded with cable lug	mm²	10 ... 70[1])		
	AWG conductor connections, solid or stranded	AWG	7 ... 1/0		
	Auxiliary conductor:				
	Solid	mm²	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	mm²	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)		



Contactors for Special Applications

3RT14 contactors, 3-pole, for switching resistive loads (AC-1)

Technical data

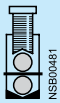
Contactor	Size Type			S6 3RT14 56
General data				
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.				
Mechanical endurance			Oper. cycles	10 million
Electrical endurance AC-1 utilization category at I_e			Oper. cycles	0.5 million
Rated insulation 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
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –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			*g*/ms	8.5/5 and 4.2/10
Sine pulse			*g*/ms	13.4/5 and 6.5/10
Conductor cross-sections				See page 2/167
Electromagnetic compatibility (EMC)				See page 2/108
Short-circuit protection				
Main circuit				
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
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
Control circuit				
Coil voltage tolerance		AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$

Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				Conventional op. mechanism		Solid-state op. mechanism	
				$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	closing		VA	250	300	190	280
	p.f.			0.9	0.9	0.8	0.8
	closed		VA	4.8	5.8	3.5	4.4
	p.f.			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
PLC control input (EN 61 131-2/Type 2)				DC 24 V/≤ 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 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time		ms	20 ... 95		95 ... 135	35 ... 75
	opening time		ms	40 ... 60		80 ... 90	80 ... 90
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time		ms	25 ... 50		100 ... 120	40 ... 60
	opening time		ms	40 ... 60		80 ... 90	80 ... 90
Arcing time			ms	10 ... 15		10 ... 15	10 ... 15

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
	at 60 °C up to 690 V	A	250
	at 1000 V	A	100
Ratings of three-phase loads p.f. = 0.95 (at 60 °C)	at 230 V	kW	95
	400 V	kW	165
	500 V	kW	205
	690 V	kW	285
	1000 V	kW	165
Minimum conductor cross-section with $I_{e\,load}$	at 40 °C	mm²	2 × 70
	at 60 °C	mm²	120
Power loss per conducting path	at I_e/AC-1	W	20

3RT14 contactors, 3-pole, for switching resistive loads (AC-1)

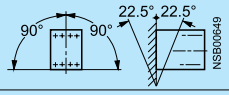
Technical data

Contactor	Size Type			S6 3RT14 56		
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 slipring 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 ≤ 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 ≤ 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	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':						
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\,V}{U'}\right)^{1,5}$ 1/h						
Conductor cross-sections						
Screw connections	**Main conductor:** with 3RT19 55-4G box terminal			Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²		10 ... 70	10 ... 70	max. 1×50, 1×70
	Finely stranded without end sleeve	mm²		10 ... 70	10 ... 70	max. 1×50, 1×70
	Stranded	mm²		16 ... 70	16 ... 70	max. 2 × 70
	AWG conductor connections, solid or stranded			6 ... 2/0 NSB00479	6 ... 2/0 NSB00480	max. 2 × 1/0  NSB00481
	Ribbon cable (qty. × width × thickness)	mm		min. 3 × 9 × 0.8	min. 3 × 9 × 0.8	
		mm		max. 6 × 15.5 × 0.8	max. 6 × 15.5 × 0.8	max. 2 × (6 × 15.5 × 0.8)
	with 3RT19 56-4G box terminal					
	Finely stranded with/without end sleeve	mm²		10 ... 120	10 ... 120	max. 1 × 95, 1 × 120
	Stranded	mm²		16 ... 120	16 ... 120	max. 2 × 120
	AWG conductor connections, solid or stranded	AWG		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)		
	Without box terminal/busbar connection					
	Finely stranded with cable lug	mm²		16 ... 95	If cable lugs acc. to DIN 46 235 are connected, as of a conductor cross-section of 95 mm² a 3RT19 56-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm²		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)		
	Auxiliary conductor:					
	Solid	mm²		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	mm²		2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG		2 × (18 ... 14)		
	– Terminal screws			M 3 (PZ2)		
	– Tightening torque	Nm		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

Contactor	Size Type		S10 3RT14 66	S12 3RT14 76
General data				
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.				
Mechanical endurance		Oper. cycles	10 million	
Electrical endurance AC-1 utilization category at I_e		Oper. cycles	0.5 million	
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	
Permissible ambient temperature	in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –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 *g*/ms	 8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections			See page 2/170	
Electromagnetic compatibility (EMC)			See page 2/108	
Short-circuit protection				
Main circuit				
Fuse links, utilization category gL/gG, NH, Type 3NA	Type of coordination "1"	A	500	800
Fuse links, utilization category gR, SITOR, Type 3NE	Type of coordination "2"	A	500	710
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	

Contactor	Size Type		S10 3RT14 66			
Control circuit						
Coil voltage tolerance	AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$			
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)			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	490 0.9	590 0.9	400 0.8	530 0.8
	closed p.f.	VA	5.6 0.9	6.7 0.9	4 0.5	5 0.4
DC operation	closing closed	W W	540 6.1	650 7.4	440 3.2	580 3.8
PLC control input (EN 61 131-2/Type 2)			DC 24 V/≤ 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 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time opening time	ms ms	30 ... 95 40 ... 80		105 ... 145 80 ... 200	45 ... 80 80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time	ms ms	35 ... 50 50 ... 80		110 ... 130 80 ... 100	50 ... 65 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)

Technical data

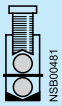
Contactor	Size Type		S12 3RT14 76			
Control circuit						
Coil voltage tolerance	AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$			
Power consumption of solenoid mechanism			Conventional op. mechanism		Solid-state op. mechanism	
(with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)			$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	closing	VA	700	830	560	750
	p.f.		0.9	0.9	0.8	0.8
	closed	VA	7.6	9.2	5.4	7
	p.f.		0.9	0.9	0.8	0.8
DC operation	closing	W	770	920	600	800
	closed	W	8.5	10	4	5
PLC control input (EN 61 131-2/Type 2)			DC 24 V/≤ 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 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time	ms	45 ... 100		120 ... 150	60 ... 90
	opening time	ms	60 ... 100		80 ... 100	80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	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

Contactor	Size Type		S10 3RT14 66			S12 3RT14 76		
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	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 $I_{e\,load}$	at 40 °C	mm²	240			2 × 240		
	at 60 °C	mm²	240			2 × 240		
Power loss per conducting path	at I_e/AC-1	W	27			55		
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	138			170		
Ratings of slipring 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								
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)								
	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
	60 V	A	380	380	380	500	500	500
	110 V	A	33	380	380	33	500	500
	220 V	A	3.8	380	380	3.8	500	500
	440 V	A	0.9	4	11	0.9	4	11
	600 V	A	0.6	2	5.2	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		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
	60 V	A	11	380	380	11	500	500
	110 V	A	3	380	380	3	500	500
	220 V	A	0.6	2.5	380	0.6	2.5	500
	440 V	A	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

1) Ambient temperature 50 °C for 3RT14 76-.N contactor

3RT14 contactors, 3-pole, for switching resistive loads (AC-1)

Technical data

Contactor	Size Type		S10 3RT14 66	S12 3RT14 76
Main circuit				
Operating frequency				
Operating frequency *z* 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': $z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\,V}{U'}\right)^{1.5}$ 1/h				
Conductor cross-sections				
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected / Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185 / min. 2 × 50, max. 2 × 185 
	Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185 / min. 2 × 50, max. 2 × 185
	Stranded	mm²	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. 2 × 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)	
	Without box terminal/busbar connection			
	Finely stranded with cable lug	mm²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and DIN 46 235 as of a conductor cross-section of 185 mm², a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.
	Stranded with cable lug	mm²	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)	
	Auxiliary conductor:			
	Solid	mm²	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	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)	
	AWG conductor connections, solid or stranded	AWG	2 × (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)[3]	Width	mm	45 x 57.5 x 73		60 x 85 x 97		
General data							
Permissible mounting position[1]							
Mechanical endurance		Operating cycles	30 million		10 million		
Electrical endurance at I_e/AC-1		Operating cycles	Approx. 0.5 million				
Rated insulation voltage U_i (pollution degree 3)		V	690				
Permissible ambient temperature	• During operation • During storage	°C °C	-25 ... +60 -55 ... +80				
Degree of protection Acc. to EN 60947-1, Appendix C	Device Connection range		IP20				IP20 IP00
Touch protection acc.to EN 50274			Finger-safe				
Short-circuit protection of contactors without overload relays							
Main circuit 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"[1] • Type of coordination "2"[1] • Weld-free	A A A	35 20 10		63 20 16		
Control							
Solenoid coil operating range							
• AC operation	- At 50 Hz - At 60 Hz		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		-- --		
• DC operation	- At 50 °C - At 60 °C		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		-- --		
• AC/DC operation			--		0.8 ... 1.1 x U_s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)							
• 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		
Operating times for 0.8 ... 1.1 x U_s[2] Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay - Opening delay	ms 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 ms	30 ... 100 7 ... 13		50 ... 170 15 ... 17.5		
• Arcing time		ms	10 ... 15		10		
Main circuit							
AC capacity							
Utilization category AC-1, switching resistive loads							
• Rated operational currents I_e	At 40 °C, up to 690 V At 60 °C, up to 690 V	A A	18 16	22 20	35 30	40 35	50 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_e	At 40 °C At 60 °C	mm^2 mm^2	2.5 2.5	2.5 2.5	10 10	10 10	10 10
Utilization category AC-3							
• Rated operational currents I_e	At 60 °C, up to 400 V	A	9	12	15.5	17	17
• Rated power for slipring or squirrel-cage motors at 60 Hz	At 460 V	HP	5	5	10	10	10

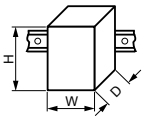
1) In accordance with the corresponding 3-pole 3RT2. contactors.

2) With size S00, DC operation: Operating times at 0.85 ... 1.1 x U .

3) Dimensions for devices with screw terminals. Size S0 for AC operation. DC operation: Depth + 10mm.

3RT23 contactors, 4-pole (4 NO), for switching resistive loads

Technical specifications



Type			**3RT23 36**	**3RT23 44**	**3RT23 46**
Size			**S2**	**S3**	**S3**
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					
Permissible mounting position[1]					
Mechanical endurance		Operating cycles	10 million		
Electrical endurance at I_e/AC-1		Operating cycles	Approx. 0.5 million		
Rated insulation voltage U_i (pollution degree 3)		V	690		
Permissible ambient temperature					
• During operation		°C	-25 ... +60		
• During storage		°C	-55 ... +80		
Degree of protection acc. to IEC 60947-1, Appendix C	Device Connection range		IP20		
Touch protection acc. to EN 50274			Finger-safe		
Short-circuit protection of contactors without overload relays					
Main circuit					
Fuse links, operational class gG:	• Type of coordination "1"[1]	A	on request	250	250
LV HRC, 3NA; DIAZED, 5SB; NEOZED, 5SE	• Type of coordination "2"[1]	A	on request	125	160
according to IEC 60947-4-1/EN 60947-4-1	• Weld-free	A	on request	63	100
Control circuit					
Coil operating range (AC/DC)			0.8 ... 1.1 x U_s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)					
• 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.		0.69/0.65	0.72/0.62	
	- Closed	VA	17.2/16.5	27/20	
	- P.f.		0.36/0.3	0.29/0.31	
• DC operation	- Closing = Closed	W		15	
Operating times for 0.8 ... 1.1 x U_s[2] 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					
Utilization category AC-1, switching resistive loads					
• Rated operational currents I_e	At 40 °C, up to 690 V	A	60	110	140
	At 60 °C, up to 690 V	A	55	100	120
• Rated power for AC loads P.f. = 0.95 (at 40 °C)	At 230 V	kW	21	42	53
	400 V	kW	36	72	92
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm²	16	50	50
	At 60 °C	mm²	25	50	50
Utilization categories AC-2 and AC-3					
• Rated operational currents I_e	At 60 °C, up to 400 V	A		--	--
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V	kW		--	--
	400 V	kW		--	--

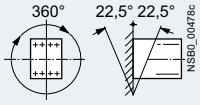
[1] In accordance with the corresponding 3-pole 3RT1 contactors.

[2] With size S00, DC operation: Operating times for 0.85 ... 1.1 x U_s

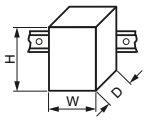
Contactors for Special Applications

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

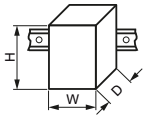
Technical specifications

Type		3RT2516	3RT2517	3RT2518	3RT2526	3RT2535	3RT2536
Size		S00			S0	S2	
General technical specifications							
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.							
Upright mounting position		 Special version required					
Mechanical endurance	Operating cycles	30 million			10 million		
Electrical endurance at I_e/AC-1	Operating cycles	Approx. 0.5 million					
Rated insulation voltage U_i (Pollution degree 3)	V	690					
Permissible ambient temperature							
• During operation	°C	-25 ... +60				-25 ... +60	
• During storage	°C	-55 ... +80				-55 ... +80	
Degree of protection acc. to IEC 60947-1, Appendix C		IP20					
Touch protection acc. to EN 50274		Finger-safe					
Short-circuit protection							
Main circuit 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)[1]		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		3RT2526
Size		S0
Dimensions (W x H x D) for AC operation[1)2)]	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[1)2)]	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



1) Dimensions for devices with screw terminals/spring-type terminals.

2) 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	
Control circuit									
Solenoid coil operating range									
• 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}	
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)			see 3RT2316	see 3RT2317		see 3RT2326		see 3RT233	
Operating times for 0.8 to 1.1 x U_s (Total break time = Opening delay + Arcing time)			see 3RT2316	see 3RT2317		see 3RT2326		see 3RT233	
Main circuit									
Load rating with AC									
Utilization category AC-1 Switching resistive loads									
• 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 p.f. = 0.95 (at 60 °C)	at 230 V	kW	6	7.5		13.3		21	23
	400 V	kW	10.5	13		23		36	39
• Minimum conductor cross-section for loads with I_e	at 40 °C	mm^2	2.5	2.5		10		16	25
Utilization categories AC-2 and AC-3						AC[1]	DC[1]		
• Rated operational currents I_e (at 60 °C)	NO up to 400 V	A	9	12	16	25	25	35	41
	NC up to 400 V	A	9	9	9	25	20	35	41
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	NO at 230 V	kW	2.2	3	4	5.5	5.5	11	
	NC at 230 V	kW	2.2	2.2	2.2	5.5	5.5	11	
	NO at 400 V	kW	4	5.5	7.5	11	11	18.5	22
	NC at 400 V	kW	4	4	4	11	7.5	18.5	22
Load rating with DC									
Utilization category DC-1 Switching resistive loads (*L/R* ≤ 1 ms)									
• 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	
Utilization category DC-3/DC-5[2] Shunt-wound and series-wound motors (*L/R* ≤ 15 ms)									
• 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	

1) 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.

2) 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.

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			**3RT16 17-.A..3**	**3RT16 27-.A..1**	**3RT16 47-.A..1**
Size			**S00**	**S0**	**S3**
Dimensions (W x H x D) including auxiliary switches and connecting cables		mm	45 x 101 x 105	45 x 100 x 130	70 x 167 x 183
General technical specifications					
Capacitor rating at rated power (utilization category AC-6b)	230 V, 50/60 Hz	kvar	3 … 7.5	3.5 … 15	3.5 … 30
	400 V, 50/60 Hz	**kvar**	**5 … 12.5**	**6 … 25**	**5 … 50**
	525 V, 50/60 Hz	kvar	7.5 … 15	7.8 … 30	7.5 … 60
	690 V, 50/60 Hz	kvar	10 … 21	10 … 42	10 … 84
Auxiliary contacts mounted (unassigned)			1 NO + 1 NC	1 NO	
Auxiliary contacts mountable (lateral), not for sizes S00 and S0			--		2 NC + 2 NO or 1 NO + 1 NC
Max. switching frequency		h^{-1}	180	100	
Electrical endurance		Operating cycles	> 250000	> 150000	> 100000
Ambient temperature		°C	60		
Short-circuit protection			1.6 ... 2.2 x I_e		
Coil operating range			0.8 … 1.1 x U_s		
Conductor cross-sections (1 or 2 conductors connectable)					
Main conductors			**Screw terminals**		
• Solid		mm²	2 x (0.5 ... 1.5)[2]; 2 x (0.75 ... 2.5)[2] according to IEC 60947; max. 2 x (1 ... 4)[2]	2 x (1 ... 2.5)[2]; 2 x (2.5 ... 6)[2] according to IEC 60947; max. 1 x 10 [1)2)]	--
• Finely stranded with end sleeve		mm²	2 x (0.5 ... 1.5)[2]; 2 x (0.75 ... 2.5)[2]	2 x (1 ... 2.5)[2]; 2 x (2.5 ... 6) [1)2)]	--
• 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	--

1) 3RV19 25-5AB feeder terminal for 16 mm².

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

More information

All technical specifications not mentioned in the table below are identical to those of the 3RT20 contactors for switching motors (see 2/130-2/130)

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						
Mechanical endurance		Operating cycles	30 million			10 million
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400			
Control						
Solenoid coil operating range			0.7 ... 1.25 x U_s			
Power consumption of the solenoid coil (for cold coil) Closing = Closed	At U_s 17 V	W	1.6			2.3
	24 V	W	2.8			4.5
	30 V	W	4.4			7
Permissible residual current of the electronics (for 0 signal)			< 10 mA x (24 V/U_s)			< 6 mA x (24 V/U_s)
Overvoltage configuration of the solenoid coil			Without overvoltage damping	With diode	With suppressor diode	With varistor U
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					
Mechanical endurance		Operating cycles	30 million		
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400		
Control					
Solenoid coil operating range			0.85 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed	At U_s 24 V	W	1.6		
Permissible residual current, upright mounting position			On request		
Overvoltage configuration of the solenoid coil			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

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 2/56).

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 ≥ 1 mA at a voltage ≥ 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		
Rated data of the auxiliary contacts		Acc. to IEC 60947-5-1		
Rated insulation voltage U_i (pollution degree 3)	V	690		
Conventional thermal current I_{th} **= Rated operational current** I_e**/AC-12**	A	10		
AC load **Rated operational current** I_e**/AC-15/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		
DC load **Rated operational current** I_e**/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		
Rated operational current I_e**/DC-13** • For rated operational voltage U_e			Auxiliary contacts with delayed NC contact:	NS = No specification
- At 24 V	A	10	6	
- At 60 V	A	5	NS	
- At 110 V	A	1.14	0.98	
- At 125 V	A	0.98	NS	
- At 220 V	A	0.48	NS	
- At 440 V	A	0.13	NS	
- At 600 V	A	0.07	0.07	
CSA and UL rated data of the auxiliary contacts				
Rated voltage, max.	V AC	600		
Switching capacity		A 600, P 600		

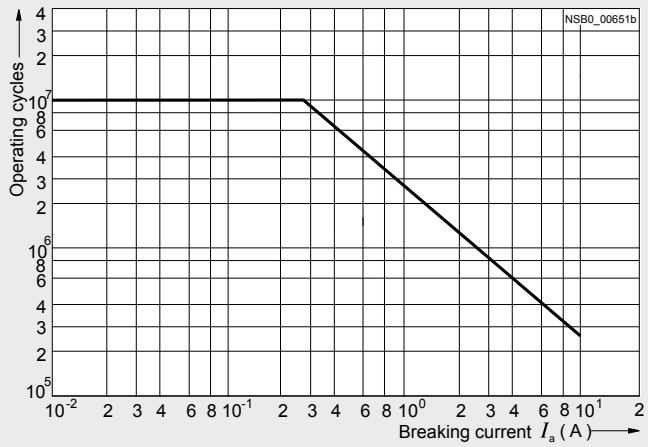
Contactor

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.



3TF68 and 3TF69

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

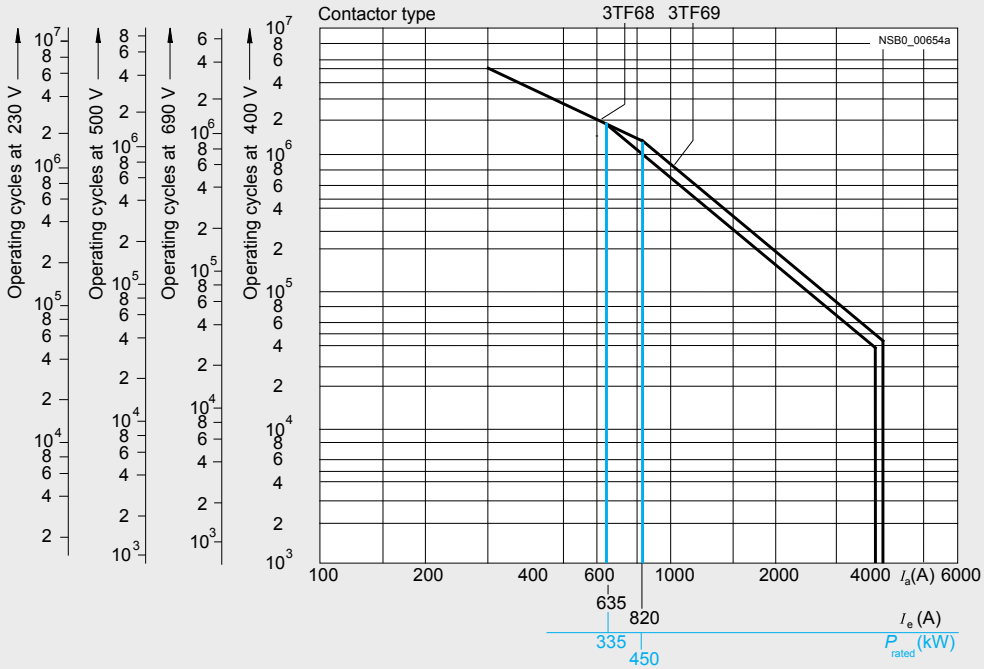
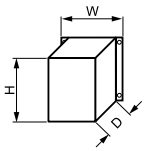


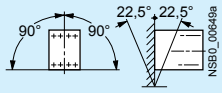
Diagram legend:
P_{rated} = Rated power for squirrel-cage motors at 400 V
I_a = Breaking current
I_e = Rated operational current

3TF68 and 3TF69 Vacuum contactors

Type		**3TF68**	**3TF69**
Size		**14**	**14**
Dimensions (W x H x D)	mm	230 x 276 x 237	230 x 295 x 237



General data

Permissible mounting position, installation instructions[1) 2)] The contactors are designed for operation on a vertical mounting surface.			
Mechanical endurance	Operating cycles	5 million	
Electrical endurance	Operating cycles	[3)]	
Rated insulation voltage U_i (pollution degree 3)	kV	1	
Rated impulse withstand voltage U_{imp}	kV	8	
Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N	kV	1	
Mirror contacts 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	
Permissible ambient temperature			
• During operation[5)]	°C	-25 ... +55	
• During storage	°C	-55 ... +80	
Degree of protection acc. to IEC 60947-1, Appendix C		IP00/open (where applicable, use additional terminal covers)	
Touch protection acc. to EN 50274		Finger-safe with cover	
Shock resistance			
• 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
Conductor cross-sections		See page 2/182.	
Electromagnetic compatibility (EMC)		See page 2/108.	

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[4)]	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	

1) To easily replace the laterally mounted auxiliary switches it is recommended to maintain a minimum distance of 30 mm between the contactors.

2) 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.

3) See "Endurance of the auxillary contacts", page 2/178.

4) Test conditions according to IEC 60947-4-1.

5) 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_e = 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
Control				
Coil operating range			0.8 x $U_{s\ min}$ ... 1.1 x $U_{s\ max}$	
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)				
• AC operation, $U_{s\ max}$	- Closing	VA/p.f.	1850/1	950/0.98
	- Closed	VA/p.f.	49/0.15	30.6/0.31
• AC operation, $U_{s\ min}$	- Closing	VA/p.f.	1200/1	600/0.98
	- Closed	VA/p.f.	13.5/0.47	12.9/0.43
• DC economy circuit[1]	- Closing at 24 V	W	1010	960
	- Closed	W	28	20.6
For contactors of type 3TF68/69..-.**Q**:				
• AC operation, $U_{s\ min}$[2]	- Closing	VA/p.f.	1000/0.99	1150/0.99
	- Closed	VA/p.f.	11/1	11/1
Operating times for 0.8 ... 1.1 x U_s (Total break time = Opening delay + Arcing time)			(Values apply to cold and warm coil)	
• AC operation	- Closing delay	ms	70 ... 120 (22 ... 65)[3]	80 ... 120
	- Opening delay	ms	70 ... 100	70 ... 80
• DC economy circuit	- Closing delay	ms	76 ... 110	86 ... 280
	- Opening delay	ms	50	19 ... 25
• Arcing time		ms	10 ... 15	10
For contactors of type 3TF68/69..-.**Q**:				
• AC operation	- Closing delay	ms	35 ... 90	45 ... 160
	- Opening delay	ms	65 ... 90	30 ... 80
Operating times for 1.0 x U_s (Total break time = Opening delay + Arcing time)				
• AC operation	- Closing delay	ms	80 ... 100 (30 ... 45)[3]	85 ... 100
	- Opening delay	ms	70 ... 100	70
• DC economy circuit	- Closing delay	ms	80 ... 90	90 ... 125
	- Opening delay	ms	50	19 ... 25
Minimum command duration for closing	Standard	ms	120	120
	Reduced make-time	ms	90	--
Minimum interval time between two ON commands		ms	100	300

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
Electromagnetic compatibility						
Rated control supply voltage U_s	V AC	110 ... 132	200 ... 240	230 ... 277	380 ... 460	500 ... 600
Overvoltage type acc. to IEC 60801		Burst/Surge				
Degree of severity acc. to IEC 60801						
• Burst		3	4	4	4	4
• Surge		4	4	4	4	4
Overvoltage resistance						
• 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
Main circuit				
AC capacity				
Utilization category AC-1 **Switching resistive loads**				
• 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^2	2 x 240	$I_e \geq 800$ A: 2 x 60 x 5 (copper busbars)
	At 55°C	mm^2	2 x 185	$I_e < 800$ A: 2 x 240
Utilization categories AC-2 and AC-3				
• Rated operational currents I_e	Up to 690 V	A	630	820
	1000 V	A	435	580
• Rated power for slipring 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
Thermal load capacity	10 s current	A	5 040	7 000
Power loss per conducting path	At I_e/AC-3	W	45	70
Utilization category AC-4 (for $I_a = 6 \times I_e$)				
• 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[1]	kW	210	250
	690 V[1]	kW	278	335
	1000 V[1]	A	290	350
Switching frequency				
Switching frequency z 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

[1] 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
Conductor cross-sections			
Main conductors:		**Screw terminals**	
• Busbar connections			
- Finely stranded with cable lug	mm^2	50 ... 240	50 ... 240
- Stranded with cable lug	mm^2	70 ... 240	50 ... 240
- Solid or stranded	AWG	2/0 ... 500 MCM	2/0 ... 500 MCM
- Connecting bar (max. width)	mm	50	60 ($U_e \leq 690$ V) 50 ($U_e > 690$ V)
• Terminal screw		M10 x 30	M12 x 40
- Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)	20 ... 35 (177 ... 310 lb.in)
• With box terminal[1]			
- Connectable copper bars			
- Width	mm	15 ... 25	15 ... 38
- Max. thickness	mm	1 x 26 or 2 x 11	1 x 46 or 2 x 18
- Terminal screw		A/F 6 (hexagon socket)	A/F 8 (hexagon socket)
- Tightening torque	Nm	25 ... 40	35 ... 50
	lb.in	221 ... 354	266 ... 443
Auxiliary conductors:			
• Solid	mm^2	2 x (0.5 ... 1)[2]/2 x (1 ... 2.5)[2]	
• Finely stranded with end sleeve	mm^2	2 x (0.5 ... 1)[2]/2 x (0.75 ... 2.5)[2]	
• Pin-end connector acc. to DIN 46231	mm^2	2 x (1 ... 1.5)	
• Solid or stranded	AWG	2 x (18 ... 12)	
• Tightening torque	Nm	0.8 ... 1.4	
	lb.in	7 ... 12	

1) See "Accessories and Spare Parts", page 2/56.

2) 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
CSA and UL rated data			
Rated insulation voltage	V AC	600	600
Uninterrupted current			
• Open and enclosed	A	630	820
Maximum horsepower ratings (CSA and UL approved values)			
• Rated power for induction motors at 60 Hz			
- At 200 V	hp	231	290
- At 230 V	hp	266	350
- At 460 V	hp	530	700
- At 575 V	hp	664	860
NEMA/EEMAC ratings			
SIZE	hp	6	7
• Uninterrupted current			
- Open	A	600	820
- Enclosed	A	540	810
• Rated power for induction motors at 60 Hz			
- At 200 V	hp	150	--
- At 230 V	hp	200	300
- At 460 V	hp	400	600
- At 575 V	hp	400	600
Overload relays	Type	3RB12 .	
• Setting range	A	200 ... 820	

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

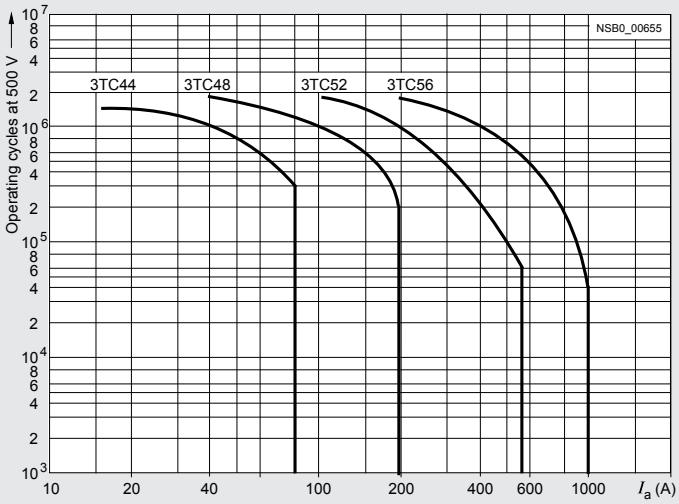
.

Technical specifications

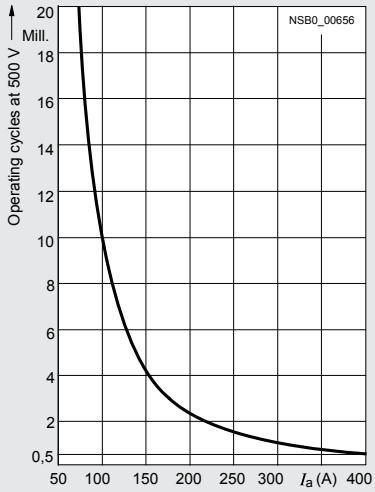
Contactors	Type		3TC4 and 3TC7	3TC5
Rated data of the auxiliary contacts				
Rated insulation voltage U_i (pollution degree 3)		V	690	
Conventional thermal current I_{th} = Rated operational current I_e/AC-12		A	10	10
AC load **Rated operational current I_e/AC-15/AC-14** • For rated operational voltage 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	--	--
DC load **Rated operational current I_e/DC-12** • 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
Rated operational current I_e/DC-13 • 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

Contactors	Type	3TC44 ... 3TC56
CSA and UL rated data of the auxiliary contacts		
Rated voltage, max.	V AC	600
Switching capacity		A 600, P 600

Contactors	Type	3TC44 ... 3TC78
Contact endurance of the main contacts		

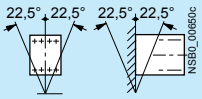


3TC44 to 3TC56 contactors



3TC74 and 3TC78 contactors

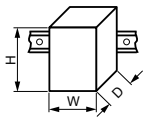
Legend for the diagrams:
I_a = Breaking current

Contactors	Type Size	3TC44 2	3TC48 4	3TC52 8	3TC56 12
General technical specifications					
Permissible mounting positions The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance	Operating cycles	10 million			
Electrical endurance	Operating cycles	1)			
Rated insulation voltage U_i (pollution degree 3)	V	800		1000	
Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N	V	Up to 300		Up to 660	
Mirror contacts[2)] 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			
Permissible ambient temperature					
• During operation	°C	-25 ... +55			
• During storage	°C	-50 ... +80			
Degree of protection acc. to IEC 60947-1, Appendix C		IP00/open, for AC operation, coil assembly IP40			
Shock resistance Rectangular pulse	*g*/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.

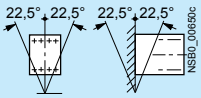
2) For 3TC44, one NC contact each must be connected in series for the right and left auxiliary switch block respectively.

3TC contactors



Type			3TC44	3TC48	3TC52	3TC56
Size			2	4	8	12
Dimensions (W x H x D)						
• DC operation		mm	70 x 85 x 141	100 x 183 x 180	135 x 238 x 232	160 x 279 x 310
• AC operation		mm	70 x 85 x 100	100 x 183 x 154	135 x 238 x 200	160 x 279 x 251
Control circuits						
Coil operating range			0.8 ... 1.1 x U_s			
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)						
• 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	--	--	--
Operating times (for 0.8 ... 1.1 x U_s) 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[1]	ms	10 ... 25	17 ... 28	22 ... 35	40 ... 110
• AC operation	- Closing delay	ms	10 ... 40	20 ... 50	20 ... 50	20 ... 50
	- Opening delay[1]	ms	5 ... 25	5 ... 30	10 ... 30	10 ... 30
• Arcing time	- DC-1	ms	20			
	- DC-3/DC-5	ms	30			
Main circuit						
Load rating with DC						
Utilization category DC-1, switching resistive loads (L/R ≤ 1 ms)						
• Rated operational currents I_e (at 55 °C)	Up to U_e 750 V	A	32	75	220	400
• Minimum conductor cross-section		mm^2	6	25	95	240
• Rated power at U_e	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
Utilization category DC-3 and DC-5 Shunt-wound and series-wound motors (L/R ≤ 15 ms)						
• Rated operational currents I_e (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_e	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
Switching frequency						
Switching frequency *z* in operating cycles/hour						
AC/DC operation						
• With resistive load DC-1		h^{-1}	1500	1000		
• For inductive load DC-3/DC-5		h^{-1}	750	600		
Conductor cross-sections (1 or 2 conductors connectable)						
Main conductors:			**Screw terminals**			
• Solid		mm^2	2 x (2.5 ... 10)	2 x (6 ... 16)	--	--
• Finely stranded with end sleeve		mm^2	2 x (1.5 ... 4)	--	--	--
• Stranded with cable lug		mm^2	2 x 16	2 x 35	2 x 120	2 x 150
• Pin-end connector acc. to DIN 46231		mm^2	2 x (1 ... 6)	--	--	--
• Busbars		mm	--	15 x 2.5	25 x 4	2 x (25 x 3)
• Terminal screw			M5	M6	M10	M10
Auxiliary conductors:						
• Solid		mm^2	2 x (1 ... 2.5)			
• Finely stranded with end sleeve		mm^2	2 x (0.75 ... 1.5)			

[1] 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			**3TC74**	**3TC78**
Design			**1-pole contactors**	**2-pole contactors**
Dimensions		mm	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.				
Mechanical endurance	Operating cycles		30 million	
Electrical endurance	Operating cycles		1)	
Rated insulation voltage U_i (pollution degree 3)		V	1500	
Rated impulse withstand voltage U_{imp}		kV	8	
Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N		V	630	
Permissible ambient temperature		°C	-25 ... +55	
Degree of protection 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)			(The values apply up to and including 15 % undervoltage, 10 % overvoltage, as well as when the coil is cold and warm)	
• 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	
Main circuit				
Load rating with DC				
Utilization category DC-1, switching resistive loads ($L/R \leq 1$ ms)				
• Rated operational current I_e/DC-1 (at 55 °C)		A	500	500
• Minimum conductor cross-section		mm²	2 x 150	2 x 150
• Rated power	At 220 V	kW	110	110
	440 V	kW	220	220
	600 V	kW	300	300
	750 V	kW	375	375
	1200 V	kW	—	600
	1500 V	kW	—	750
• Critical currents, without arc extinction	At 440 V	A	≤ 7	—
	600 V	A	≤ 13	—
	750 V	A	≤ 15	—
	≤ 800 V	A	—	≤ 7
	1200 V	A	—	≤ 13
	1500 V	A	—	≤ 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^{-1}	750	1000
• For inductive load DC-3/DC-5		h^{-1}	500	500

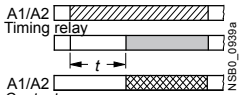
1) Endurance see page 2/184..

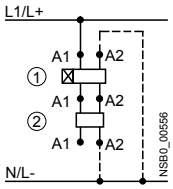
2) See Selection and ordering data.

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		
General data							
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to EN 60664-1		V AC	250				
Permissible ambient temperature							
• During operation		°C	-25 ... +60				
• During storage		°C	-40 ... +80				
Degree of protection acc. to EN 60947-1, Appendix C • Cover • Terminals			 IP40 IP20				
Shock resistance Half-sine acc. to IEC 60068-2-27		g/ms	15/11				
Vibration resistance according to IEC 60068-2-6		Hz/mm	10 ... 55/0.35				
EMC tests	Basic specification		IEC 61000-6-4				
Conductor connections							
• Solid		mm^2	2 x (0.5 ... 1.5), 2 x (0.75 ... 4)				
• Finely stranded with end sleeve		mm^2	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				
Permissible mounting positions			Any				
Control							
Operating range of excitation			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		
Rated power		W	1		2		
• Power consumption at 230 V AC, 50 Hz		VA	1		4		
Overvoltage protection			Varistor integrated in timing relay		--		
Recovery time		ms	50		150		
Minimum ON period		ms	35		200 (with OFF-delay)		
Setting accuracy With reference to upper limit of scale	Typ.	%	±15				
Repeat accuracy	Max.	%	±1				
Load side							
Rated operational currents I_e							
• 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		
Short-time loading capacity	Up to 10 ms	A	10		--		
DIAZED protection gG operational class		A	--		4		
Residual current	Max.	mA	5		--		
Voltage drop With conducting output	Max.	VA	3.5		--		
Mechanical endurance		Operating cycles	100×10^6		10×10^6		
Switching frequency for load							
• With I_e at 230 V AC		h^{-1}	200		2500		
• With 3RT20 16 contactor at 230 V AC		h^{-1}	2500		5000		

Function	Function chart
	Timing relay energized Contact closed Contact open
Solid-state timing relay blocks	**1 NO contact (semiconductor output)**
ON-delay, two-wire design (varistor integrated)	3RT19 26-2C





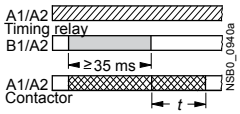
A2 can be connected to N(L-) using either the contactor or the timing relay.

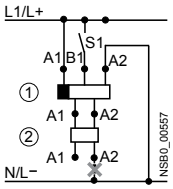
- - - - To be connected optionally

① Timing relay block

② Contactor

OFF-delay with auxiliary voltage (varistor integrated)	3RT19 26-2D





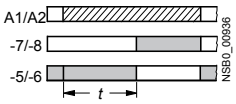
A2 must only be connected to N(L--) from the timing relay.

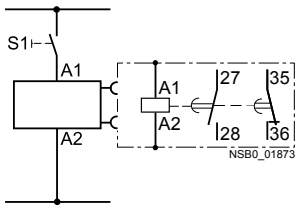
✕ Do not connect

① Timing relay block

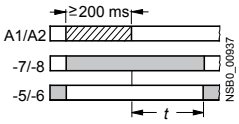
② Contactor

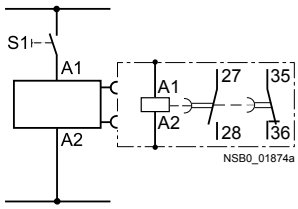
Solid-state time-delay auxiliary switch blocks	**1 NO + 1 NC**
ON-delay	3RT19 26-2E



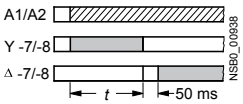


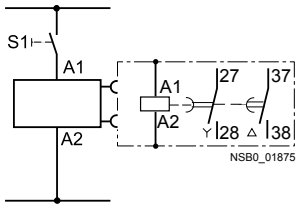
OFF-delay without auxiliary voltage	3RT19 26-2F



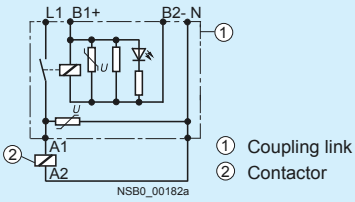


Solid-state time-delay auxiliary switch blocks	**2 NO**
Wye-delta function: 1 NO delayed, 1 NO instantaneous, dead time 50 ms (varistor integrated)	3RT19 26-2G

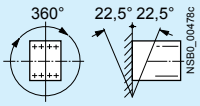
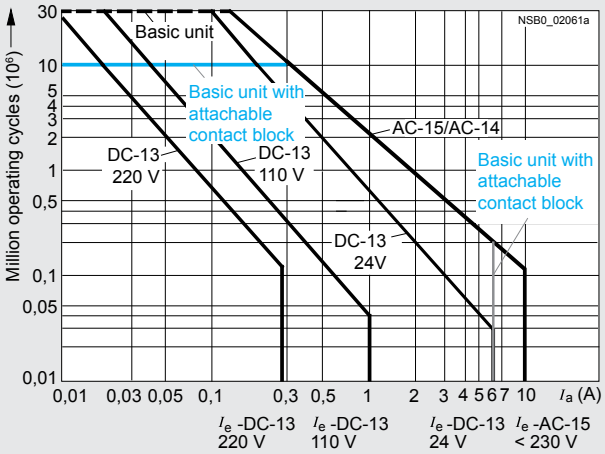




Accessories – 3RT1 contactors

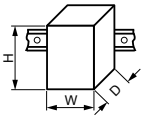
Contactor	Type		3RH19 24, 3TX7 090 Coupling links for mounting on contactors acc. to IEC 60947/EN 60947
General data			
Rated insulation voltage U_i (pollution degree 3)		V	300
Protective separation between coil and contacts acc. to IEC 60947-1, Appendix N		V AC	Up to 300
Permissible ambient temperature			
• During operation		°C	-25 ... +60
• During storage		°C	-40 ... +80
Degree of protection acc. to IEC 60947-1, Appendix C			
• Connections			IP20
• Enclosure			IP40
Circuit diagram			
Conductor cross-sections			
• Solid		mm²	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve		mm²	2 x (0.5 ... 1.5)
Terminal screws			M3
Control side			
Rated control supply voltage U_s		V DC	24
Operating range		V DC	17 ... 30
Power consumption at U_s		W	0.5
Nominal current input		mA	20
Release voltage		V	≥ 4
Function display			Yellow LED
Protection circuit			Varistor
Load side			
Mechanical endurance	Operating cycles		20×10^6
Electrical endurance at I_e	Operating cycles		1×10^5
Switching frequency	Operating cycles	h^{-1}	5000
Make-time		ms	Approx. 7
Break-time		ms	Approx. 4
Bounce time		ms	Approx. 2
Contact material			AgSnO
Switching voltage	AC/DC	V	24 ... 250
Permissible residual current of the electronics (with 0 signal)		mA	2.5

Technical specifications

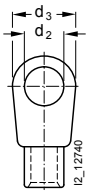
Contactor relays	Type	**3RH2**
	Size	**S00**
Permissible mounting positions		
The contactor relays are designed for operation on a vertical mounting surface.		
Upright mounting position		Special version required (3RH21 22-2K.40 coupling relays and contactor relays with extended operating range on request)
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[1] • 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

[1] I_e = 6 A for AC-15/AC-14.

3RH2 control relays – size S00



Type		3RH21	3RH22	3RH24
Size		S00	S00	S00
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				
Mechanical endurance				
• 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		
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 contacts in the basic unit acc. to IEC 60947-1, Appendix N	V	400		
Permissible ambient temperature				
• During operation	°C	-25 ... +60		
• During storage	°C	-55 ... +80		
Degree of protection acc. to IEC 60947-1, Appendix C		IP20, coil assembly IP40		
Touch protection acc. to EN 50274		Finger-safe		
Shock resistance				
• 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		
Short-circuit protection				
• 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		
Conductor cross-sections				
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)		**Screw terminals**		
• Solid	mm²	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1] according to IEC 60947; max. 2 x (0.5 ... 4)		
• Finely stranded with end sleeve	mm²	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]		
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]		
• Terminal screw - Tightening torque	Nm	M3 (for standard screwdriver size 2 or Pozidriv 2) 0.8 ... 1.2 (7 ... 10.3 lb.in)		
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)		**Spring-type terminals**		
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5		
• Solid	mm²	2 x (0.5 ... 4)		
• Finely stranded with end sleeve	mm²	2 x (0.5 ... 2.5)		
• Finely stranded without end sleeve	mm²	2 x (0.5 ... 2.5)		
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)		
Auxiliary conductors for front and laterally mounted auxiliary switches				
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5		
• Solid	mm²	2 x (0.5 ... 2.5)		
• Finely stranded with end sleeve	mm²	2 x (0.5 ... 1.5)		
• Finely stranded without end sleeve	mm²	2 x (0.5 ... 2.5)		
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)		
Auxiliary conductor and coil terminals		**Ring terminal lug connection**		
• Terminal screw	mm	M3, Pozidriv size 2		
• Operating devices	Nm	Ø 5 ... 6		
• Tightening torque	mm	0.8 ... 1.2		
• Usable ring terminal lugs - DIN 46234 without insulation sleeve	mm	d_2 = min. 3.2		
- 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	mm	d_3 = max. 7.5		



[1] 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 2/81.

An insulation stop must be used for conductor cross-sections ≤1 mm², see Accessories, page 2/81.

3RH2 control relays – size S00

Contactor relays	Type		3RH2.
	Size		S00
Control circuits			
Coil operating range			
• 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
Power consumption of the solenoid coils (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
Permissible residual current of the electronics (with 0 signal)			
• For AC operation[1]			< 4 mA x (230 V/U_s)
• For DC operation			< 10 mA x (24 V/U_s)
Operating times[2]			
Total break time = OFF-delay + Arcing time			
Values apply with coil in cold state and at operating temperature for operating range			
AC operation			
• 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
DC operation			
• 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		ms	10 ... 15
Dependence of the switching frequency z' on the operational current I' and operational voltage U':			
$z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$			

1) The 3RT29 16-1GA00 additional load module is recommended for higher residual currents (see page 2/76).

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).

3RH2 control relays – size S00

Contactor relays	Type Size		3RH2. S00
Load side			
AC capacity			
Rated operational currents I_e			
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
Load rating with DC			
Rated operational currents I_e			
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
Switching frequency			
Switching frequency *z* in operating cycles/hour			
• For rated operation For utilization category	AC-12/DC-12 AC-15/AC-14 DC-13	h^{-1} h^{-1} h^{-1}	1000 1000 1000
• No-load switching frequency		h^{-1}	10000
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$			
CSA and UL rated data			
Basic units and auxiliary switch blocks			
• 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

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**
Control circuits				
Coil operating range		0.7 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed				
• At U_s = 17 V	W	1.4		
• At U_s = 24 V	W	2.8		
• At U_s = 30 V	W	4.4		
Permissible residual current of the electronics for 0 signal		< 10 mA x (24 V/U_s)		
Overvoltage configuration of the solenoid coil		No overvoltage damping	With diode	With suppressor diode
Operating times				
• **Closing** 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		
• **Opening** at 17 ... 30 V				
- OFF-delay NO	ms	7 ... 20	38 ... 65	7 ... 20
- ON-delay NC	ms	20 ... 30	55 ... 75	20 ... 30
Upright mounting position		Request required		

Contactor type		**3RH21 ..-.MB40-0KT0**	**3RH21 ..-.VB40**	**3RH21 ..-.WB40**
Size		**S00**	**S00**	**S00**
Control circuits				
Coil operating range		0.85 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed at U_s = 24 V	W	1.6		
Permissible residual current of the electronics for 0 signal		< 8 mA x (24 V/U_s)		
Overvoltage configuration of the solenoid coil		Diode, varistor or RC element, attachable	Built-in diode	Built-in suppressor diode
Control circuits				
Operating times				
• 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	5 ... 20
- ON-delay NC	ms	10 ... 30	30 ... 90	10 ... 30
Upright mounting position		Request required		

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

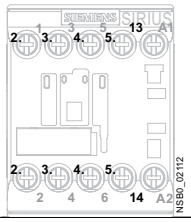
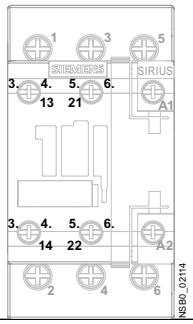
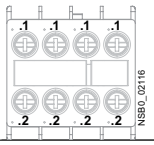
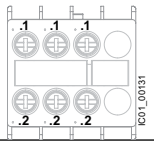
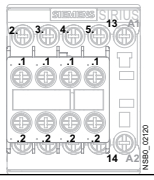
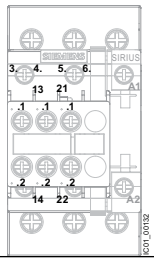
The auxiliary switch blocks of the 3RH29 series for mounting on the front and side can be used for power contactors as well as for contactor relays.

The possible combinations of basic unit and mounted auxiliary switch block can be found in the tables below.

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).

Auxiliary contacts NO	Auxiliary contacts NC	Version	3-pole contactors 3RT20 1 S00	3RT20 1 S00	3RT20 2 S0	Order No.
			10	01	11	
			2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	
			According to EN 50012[1]			
Auxiliary switches without NO contact						
--	1		11	02	12	**3RH29 11-.HA01**
--	2		12	03	13	**3RH29 11-.HA02**
--	3		13	04	14	**3RH29 11-.HA03**
--	4		14	--		**3RH29 11-.FA04**
Auxiliary switch with 1 NO contact						
1	--		20	11	21	**3RH29 11-.HA10**
1	1		21	12	22	**3RH29 11-.HA11**

1) Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

	Example 1	Example 2
Type	**3RT20 motor contactor, S00 with 1 NO**	**3RT20 motor contactor, S0 with 1 NO + 1 NC**
		
Sequence digit	2. 3. 4. 5.	3. 4. 5. 6.
Type	**Auxiliary switch with 4 NC, 3RH29 11-.FA04**	**Auxiliary switch with 3 NC, 3RH29 11-.HA03**
		
Function digit	.1 .1 .1 .1 .2 .2 .2 .2	.1 .1 .1 .2 .2 .2
Type	**3RT20 motor contactor, S00 with auxiliary switch block**	**3RT20 motor contactor, S0 with auxiliary switch block**
		
Terminal design.	13 21 31 41 51 14 22 32 42 52	13 21 31 41 51 14 22 32 42 52
Type	**Ident. No. 14**	**Ident. No. 14**

Additional auxiliary switch blocks

	3-pole contactors			4-pole contactors				Contactor relays			
Auxiliary contacts	S00		S0	S00		S0/S2		S00			
Version	3RT20 1	3RT20 1	3RT20 2	3RT23 1	3RT25 1	3RT23	3RT25	3RH21, 3RH24	3RH21, 3RH24	3RH21, 3RH24	
NO NC	10	01	11	--	--	11	11	40E	31E	22E	
	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	
	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[1]			According to EN 50012[1]				According to EN 50011[1]			Order No.
Without NO contact											
-- 1	11	02	12	01	01	12	12	41X	32X	23X	**3RH29 11-.HA01**
-- 2	12	03	13	02	02	13	--	42E	33X	24	**3RH29 11-.HA02**
-- 3	13	04	14	03	--	--	--	43	34	--	**3RH29 11-.HA03**
-- 4	14	--	--	--	--	--	--	44E	--	--	**3RH29 11-.FA04**
With 1 NO contact											
1 --	20	11	21	10	10	21	21	50E	41E	32E	**3RH29 11-.HA10**
1 1	21	12	22	11	11	22	22	51X	42X	33X	**3RH29 11-.HA11**
1 2	22	13	23	12	12	23	--	52	43	34	**3RH29 11-.HA12**
1 3	23	14	24	13	--	--	--	53X	44X	--	**3RH29 11-.HA13**
With 2 NO contacts											
2 --	30	21	31	20	20	31	31	60E	51X	42X	**3RH29 11-.HA20**
2 1	31	22	32	21	21	32	32	61	52	43	**3RH29 11-.HA21**
2 2	32	23	33	22	22	33	--	62X	53	44X	**3RH29 11-.HA22**
2 2	32	23	33	22	22	33	--	62X	53	44X	**3RH29 11-.FA22**

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Additional auxillary switch blocks

Auxiliary contacts Version NO	NC		3-pole contactors S00 3RT20 1 10	 3RT20 1 01	 S0 3RT20 2 11	4-pole contactors S00 3RT23 1 --	 3RT25 1 --	 S0/S2 3RT23 11	 3RT25 11	Contactor relays S00 3RH21, 3RH24 40E	 31E	 22E	Order No.
			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	
			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[1]			According to EN 50012[1]				According to EN 50011[1]			
Front auxiliary switches with 3 NO contacts													
3	--	.3 .3 .3 / .4 .4 .4	40	31	41	30	30	41	41	70	61	52	**3RH29 11-.HA30**
3	1	.1 .3 .3 .3 / .2 .4 .4 .4	41	32	42	31	31	42	42	71X	62X	53X	**3RH29 11-.HA31**
Front auxiliary switches with 4 NO contacts													
4	--	.3 .3 .3 .3 / .4 .4 .4 .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			
Front auxiliary switches with make-before-break													
--	1	.7 .5 / .8 .6	21	12	22	11	11	22	22	51	42	33	**3RH29 11-.FB11**
--	2	.3 .1 .5 .7 / .4 .2 .6 .8	32	23	33	22	22	33	--	62	53	44	**3RH29 11-.FB22**
--	3	.7 .7 .5 .5 / .8 .8 .6 .6	32	23	33	22	22	33	--	62	53	44	**3RH29 11-.FC22**
Front auxiliary switches with complete inscription[2]													
1	--	73 / 74	20	11	21	10	10	21	21	50	41	32	**3RH29 11-1AA10**
1	--	73 / 74	20	11	21	10	10	21	21	50	41	32	**3RH29 11-1BA10**
--	1	71 / 72	11	02	12	01	01	12	12	41	32	23	**3RH29 11-1AA01**
--	1	71 / 72	11	02	12	01	01	12	12	41	32	23	**3RH29 11-1BA01**
1	1	73 81 / 74 82	21	12	22	11	11	22	22	51	42	33	**3RH29 11-1LA11**
1	1	73 81 / 74 82	21	12	22	11	11	22	22	51	42	33	**3RH29 11-1MA11**
2	--	73 83 / 74 84	30	21	31	20	20	31	31	60	51	42	**3RH29 11-1LA20**
2	--	73 83 / 74 84	30	21	31	20	20	31	31	60	51	42	**3RH29 11-1MA20**

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

[2] Terminals from the top or bottom.

Additional auxillary switch blocks

Auxiliary contacts			3-pole contactors			4-pole contactors				Contactor relays			
Version			S00		S0	S00		S0/S2		S00			
			3RT20 1	3RT20 1	3RT20 2	3RT23 1	3RT25 1	3RT23	3RT25	3RH21, 3RH24			
NO	NC		10	01	11	--	--	11	11	40E	31E	22E	
			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	
			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[1]			Order No.
Front auxiliary switches with complete inscription (for contactor relays)													
4	--	53 63 73 83 54 64 74 84	--	--	--	--	--	--	--	80E	--	--	**3RH29 11-.GA40**
3	1	53 61 73 83 54 62 74 84	--	--	--	--	--	--	--	71E	--	--	**3RH29 11-.GA31**
2	2	53 61 71 83 54 62 72 84	--	--	--	--	--	--	--	62E	--	--	**3RH29 11-.GA22**
1	3	53 61 71 81 54 62 72 82	--	--	--	--	--	--	--	53E	--	--	**3RH29 11-.GA13**
--	4	51 61 71 81 52 62 72 82	--	--	--	--	--	--	--	44E	--	--	**3RH29 11-.GA04**
Front auxiliary switches with complete inscription, special version													
4	--	53 63 73 83 54 64 74 84	50	41	51	40	40	51	51	80E	71X	62X	**3RH29 11-.XA40 -0MA0**
3	1	53 61 73 83 54 62 74 84	41	32	42	31	31	42	42	71E	62X	53	**3RH29 11-.XA31 -0MA0**
2	2	53 61 71 83 54 62 72 84	32	23	33	22	22	33	--	62E	53	44X	**3RH29 11-.XA22 -0MA0**
--	4	51 61 71 81 52 62 72 82	14	--	--	--	--	--	--	44E	--	--	**3RH29 11-.XA04 -0MA0**
Front auxiliary switches, Solid-state compatible													
--	2	.1 .1 .2 .2	12	03	13	02	02	13	--	42	33	24	**3RH29 11-.NF02**
1	1	.3 .1 .4 .2	21	12	22	11	11	22	22	51	42	33	**3RH29 11-.NF11**
2	--	.3 .3 .4 .4	30	21	31	20	20	31	31	60	51	42	**3RH29 11-.NF20**

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Additional auxillary switch blocks

Auxiliary contacts				3-pole contactors			4-pole contactors				Contactor relays			
Version				S00		S0	S00		S0/S2		S00			
				3RT20 1	3RT20 1	3RT20 2	3RT23 1	3RT25 1	3RT23	3RT25	3RH21, 3RH24			
NO	NC			10	01	11	--	--	11	11	40E	31E	22E	
				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	
				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	
		Left	Right	According to EN 50012[1]			According to EN 50012[1]				According to EN 50011[1]			Order No.
Lateral auxiliary switches for size S00														
--	2		21 31 22 32	12	--	--	02	02	--	--	--	--	--	**3RH29 11-.DA02**
--	2	41 51 42 52	21 31 22 32	14	--	--	--	--	--	--	--	--	--	**3RH29 11-.DA02**
1	1		21 33 22 34	21	--	--	11	11	--	--	--	--	--	**3RH29 11-.DA11**
1	1	41 53 42 54	21 33 22 34	32	--	--	22	22	--	--	--	--	--	**3RH29 11-.DA11**
2	--		23 33 24 34	30	--	--	20	20	--	--	--	--	--	**3RH29 11-.DA20**
2	--	43 53 44 54	23 33 24 34	50	--	--	40	40	--	--	--	--	--	**3RH29 11-.DA20**
2 1	-- 1	43 53 44 54	21 33 22 34	41	--	--	31	31	--	--	--	--	--	**3RH29 11-.DA20 + 3RH29 11-.DA11**
2 --	-- 2	43 53 44 54	21 31 22 32	32	--	--	22	22	--	--	--	--	--	**3RH29 11-.DA20 + 3RH29 11-.DA02**
1 --	1 2	41 53 42 54	21 31 22 32	23	--	--	13	--	--	--	--	--	--	**3RH29 11-.DA11 + 3RH29 11-.DA02**
Lateral auxiliary switches for size S00 to S3														
--	2		31 41 32 42	12	03	13	02	02	13	--	--	--	--	**3RH29 21-.DA02**
--	2	51 61 52 62	31 41 32 42	14	--	--	--	--	--	--	--	--	--	**3RH29 21-.DA02**
1	1		31 43 32 44	21	12	22	11	11	22	22	--	--	--	**3RH29 21-.DA11**
1	1	51 63 52 64	31 43 32 44	32	23	33	22	22	33	--	--	--	--	**3RH29 21-.DA11**
2	--		33 43 34 44	30	21	31	20	20	31	31	--	--	--	**3RH29 21-.DA20**
2	--	53 63 54 64	33 43 34 44	50	41	51	40	40	51	51	--	--	--	**3RH29 21-.DA20**

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Additional auxillary switch blocks

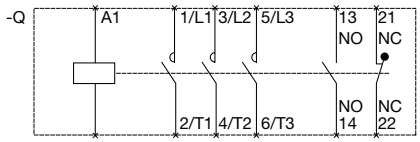
Auxiliary contacts Version NO NC			3-pole contactors S00 3RT20 1 10	3RT20 1 01	S0 3RT20 2 11	4-pole contactors S00 3RT23 1 --	3RT25 1 --	S0/S2 3RT23 11	3RT25 11	Contactor relays S00 3RH21, 3RH24 40E	31E	22E	
			13 / 14	21 / 22	13 21 / 14 22			13 21 / 14 22	13 21 / 14 22	13 23 33 43 / 14 24 34 44	13 21 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	Order No.
			According to EN 50012[1]			According to EN 50012[1]				According to EN 50011[1]			
Lateral auxiliary switches for size S00 to S3													
2	--	53 63 / 54 64; 31 43 / 32 44	41	32	42	31	31	42	42	--	--	--	**3RH29 21-.DA20 + 3RH29 21-.DA11**
1	1												
2	--	53 63 / 54 64; 31 41 / 32 42	32	23	33	22	22	33	--	--	--	--	**3RH29 21-.DA20 + 3RH29 21-.DA02**
--	2												
1	1	51 63 / 52 64; 31 41 / 32 42	23	14	24	13	--	--	--	--	--	--	**3RH29 21-.DA11 + 3RH29 21-.DA02**
--	2												
Lateral auxiliary switches for contactor relays													
--	2	51 61 / 52 62	--	--	--	--	--	--	--	42Z	33X	24	**3RH29 21-.DA02**
1	1	51 63 / 52 64	--	--	--	--	--	--	--	51X	42X	33X	**3RH29 21-.DA11**
2	--	53 63 / 54 64	--	--	--	--	--	--	--	60Z	51X	42X	**3RH29 21-.DA20**
Lateral auxiliary switches, Solid-state compatible for size S00													
1	1	23 31 / 24 32	21	--	--	11	11	--	--	--	--	--	**3RH29 11-2DE11**
1	1	41 53 / 42 54; 23 31 / 24 32	32	--	--	22	22	--	--	--	--	--	**3RH29 11-2DE11**
Lateral auxiliary switches, Solid-state compatible for size S00 to S3													
1	1	33 41 / 34 42	21	12	22	11	11	22	22	--	--	--	**3RH29 21-2DE11**
1	1	51 63 / 52 64; 33 41 / 34 42	32	23	33	22	22	33	--	--	--	--	**3RH29 21-2DE11**
Lateral auxiliary switches, Solid-state compatible for contactor relays													
1	1	51 63 / 52 64	--	--	--	--	--	--	--	51X	42X	33X	**3RH29 21-.DE11**

[1] 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)

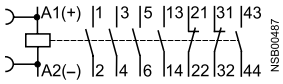
Sizes S6 to S12
Terminal designations according to EN 50 012

3RT10 5 to 3RT10 7, 3RT12, 3RT14 contactors



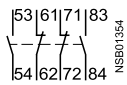
3RT1. 5, 3RT1. 6, 3RT1. 7 contactors (sizes S6, S10, S12)
With 3RH19 21-1DA11 2-pole auxiliary switch blocks, laterally mountable

2 NO + 2 NC



3RH19 21-. ../-.XA..4-pole auxiliary switch blocks, for snapping onto the front [2])

2 NO + 2 NC
22



3RH19 21-. DA11, 3RH19 21-2DE11 first laterally mountable auxiliary switch block (solid-state compatible)

1 NO + 1 NC
left

1 NO + 1 NC
right

3RH19 21-. JA11, 3RH19 21-2JE11 second laterally mountable auxiliary switch block (solid-state compatible)
(only for sizes S3 to S12)

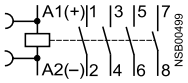
1 NO + 1 NC
left

1 NO + 1 NC
right

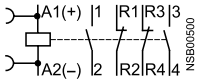
Contactors with 4 main contacts, sizes S3
Terminal designations acc. to EN 50 005

3RT13/23 and 3RT15/25 contactors

4 NO



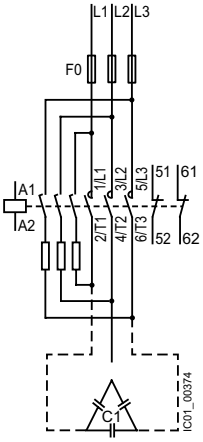
2 NO + 2 NC



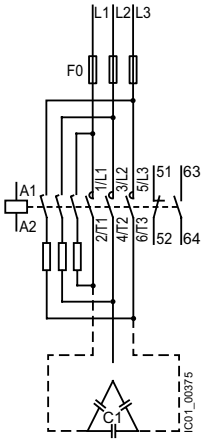
(3RH19 21 auxiliary switch blocks acc. to EN 50 005 can be snapped on)

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**

Diode

Diode assembly

Varistor

RC element

Diode with LED

Varistor with LED

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

Internal circuit diagrams (applicable to screw connection and Spring-type terminal connection)

Accessories for size S6[1] to S12 contactors
Terminal designations acc. to EN 50 005

3RH19 21-. CA.. auxiliary switch blocks, single-pole,
for snapping onto the front [2])

1 NO

1 NC

(terminal designations according to EN 50 005 or EN 50 012)

3RH19 21-1CD.. auxiliary switch blocks, single-pole,
with make-before-break contacts, for snapping onto the front [1])

1 NO

1 NC

Accessories for size S0 to S12 contactors
Terminal designations acc. to EN 50 005

3RH19 21-. EA.. first laterally mountable auxiliary switch blocks (left)

2 NO

1 NO + 1 NC

2 NC

3RH19 21-. EA.. first laterally mountable auxiliary switch blocks (right)

2 NO

1 NO + 1 NC

2 NC

3RH19 21-. KA.. second laterally mountable auxiliary switch blocks (left)
(only for sizes S3 to S12)

2 NO

1 NO + 1 NC

2 NC

3RH19 21-. KA.. second laterally mountable auxiliary switch blocks (right)
(only for sizes S3 to S12)

2 NO

1 NO + 1 NC

2 NC

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.

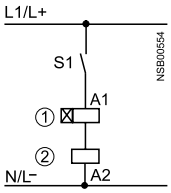
2) Not for 3RT12. vacuum contactors

Circuit diagrams

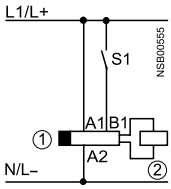
Accessories for size S3 contactors and control relays

Solid-state time-delay blocks
(see configuring aid on page 2/38)

3RT19 16-2C...
ON-delay
Size S00

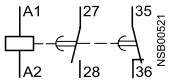


3RT19 16-2D...
OFF-delay (with auxiliary voltage)
Size S00

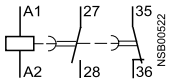


Sizes S2 to S12
3RT19 16-2E.../2F.../2G... solid-state, time-delay auxiliary switch blocks

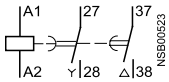
1 NO + 1 NC
ON-delay



1 NO + 1 NC
OFF-delay

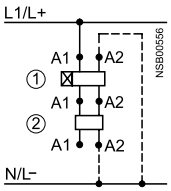


2 NO
WYE-delta function



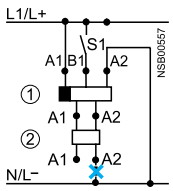
(Integrated varistors not shown)

3RT19 26-2C...
ON-delay
Sizes S0 to S3



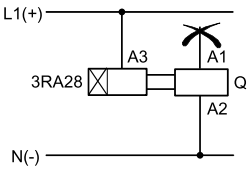
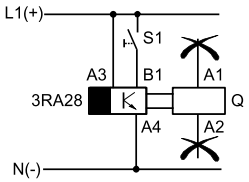
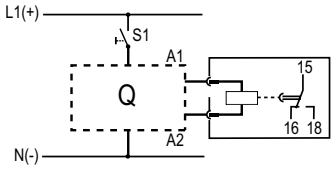
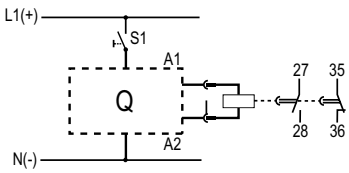
A2 can be connected to N(L–) via either the contactor or the time-delay relay.
- - - optional connection

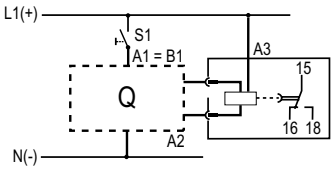
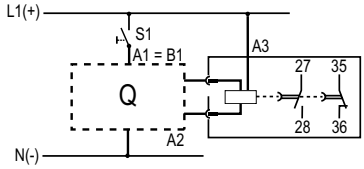
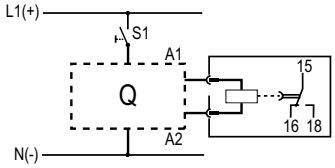
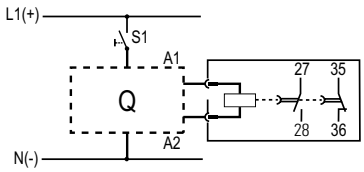
3RT19 26-2D...
OFF-delay (with auxiliary voltage)
Sizes S0 to S3



A2 can only be connected to N(L–) via the time-delay relay.
x don't connect

① Time-delay block
② Contactor

Designation	Circuit diagram
3RA2811-.CW10 ON-delay	
3RA2812-.DW10 OFF-delay with auxillary voltage	
3RA2813-.AW10 ON-delay, 1 CO contact	
3RA2813-.FW10 ON-delay, 1 NC contact/ 1 NO contact	

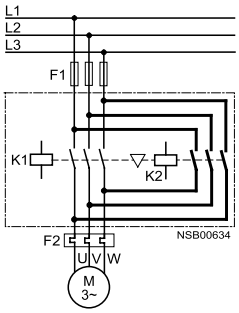
Designation	Circuit diagram
3RA2814-.AW10 OFF-delay, 1 CO contact	
3RA2814-.FW10 OFF-delay with auxillary voltage, 1 NC contact/ 1 CO contact	
3RA2815-.AW10 OFF-delay without auxillary voltage, 1 CO contact	
3RA2815-.FW10 OFF-delay without auxillary voltage, 1 NC contact/ 1 NO contact	

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.

3RA23 contactor assemblies for reversing

Circuit diagrams

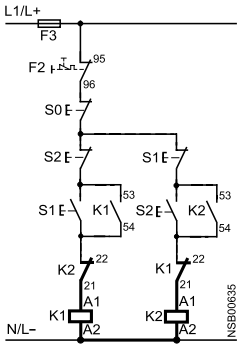
Size S00 to S0
Main circuit



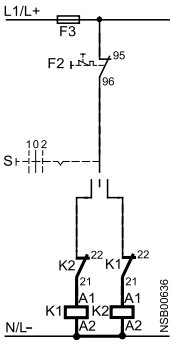
The 3RA2913-2AA. (S00) and 3RA2913-2AA (S0) installation kit contains wiring connectors for connecting the main conducting paths, the mechanical interlock and two connecting clips for the contactors.

Control circuit (sizes S00 and S0)
(terminal designations of contactors according to EN 50 012)

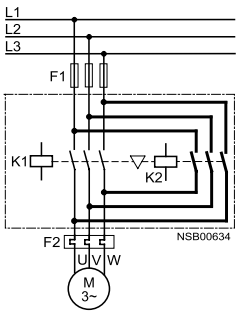
for momentary-contact operation



for maintained-contact operation



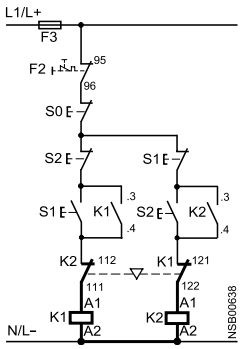
Sizes S2 to S3
Main circuit



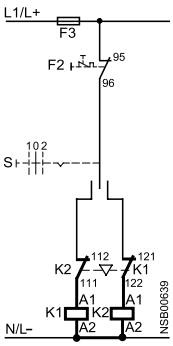
The 3RA19 .3-2A installation kits contain, among other things, the wiring connectors on the top and bottom for connecting the main conducting paths.

Control circuit
(terminal designations of contactors according to EN 50 005)

for momentary-contact operation



for maintained-contact operation



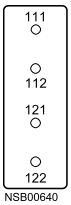
The 3RA19 24-2B mechanical interlock contains one NC contact for the NC contact interlock for each contactor

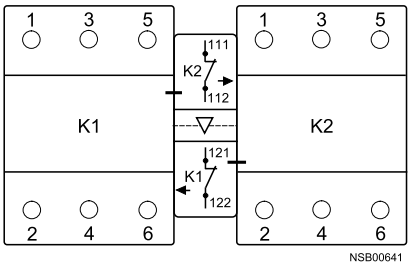
Position of terminals

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





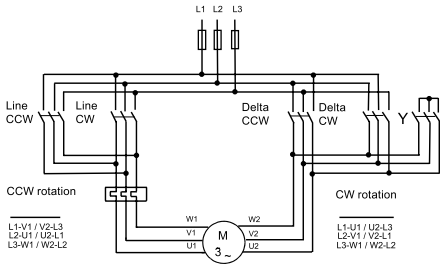
S0 "OFF" button
S1 "Clockwise ON" button
S2 "Counterclockwise ON" button
S "CW-OFF-CCW" button

K1 Clockwise contactor
K2 Counterclockwise contactor

F1 Fuses for main circuit
F3 Fuses for control circuit
F2 Overload relay

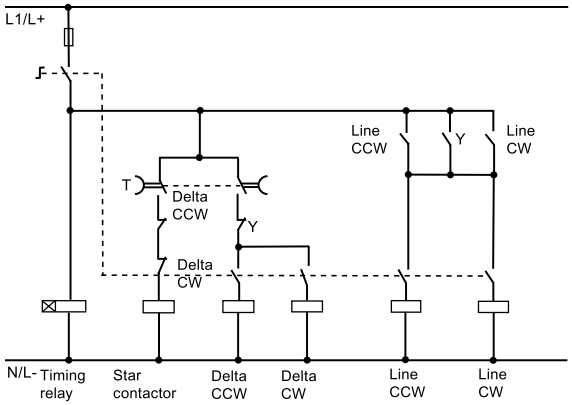
Circuit diagrams

Size S00 / S0
Main circuit



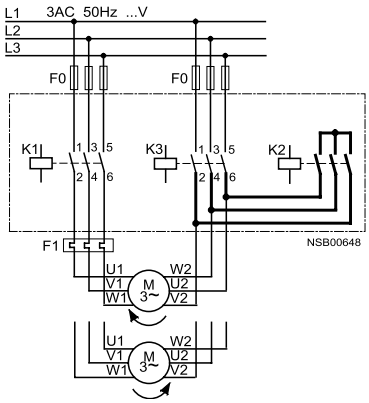
Control circuits
with 3RA2816-0EW20 function module (set of three)

snapped onto the front



Sizes S2 to S3
Main circuit

Sizes S2 and S3

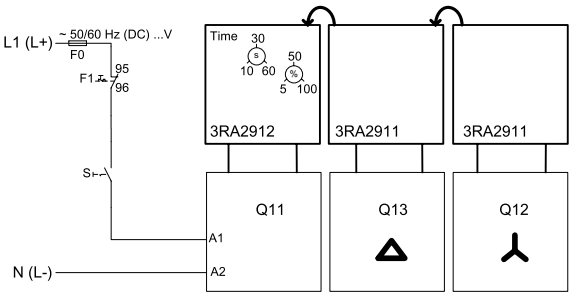


S0 "OFF" button
S1 "ON" button
S Maintained-contact switch

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

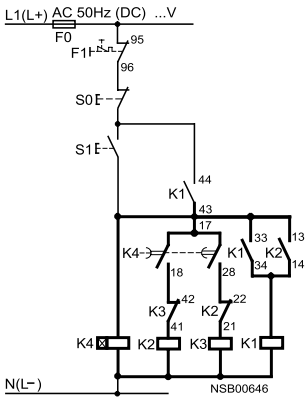
3RA2816-0EW20



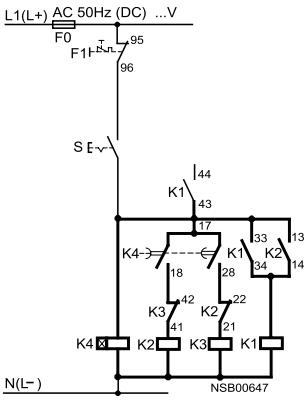
Control circuits
with 3RP15 7. time-delay relay,

laterally mounted (typical circuits)

for momentary-contact operation



for maintained-contact operation

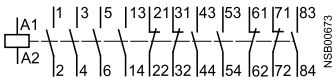


Contact element 17/18 is only closed on the star step; the contact element is open on the delta step and when de-energized.

Internal circuit diagrams

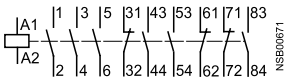
3TF68 44 and 3TF69 44 contactors

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

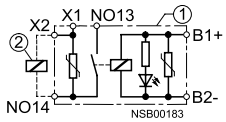
Auxiliary switch blocks
3TY7 561-1AA00
first auxiliary switch block
left or right
mounted on left mounted on right

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

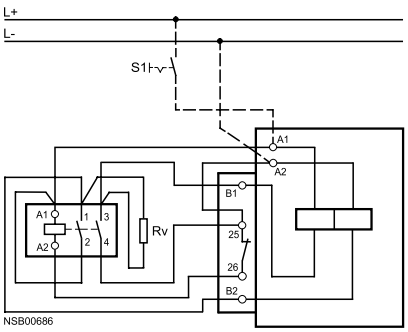
Auxiliary switch blocks
3TY7 561-1.
solid-state compatible aux. switch block
mounted on left mounted on right

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 switcing auxillary circuits

Terminal diagrams

DC operation

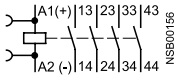
L+ is to be connected to coil terminal A1.

3RH21 coupling relays for auxiliary circuits, size S00
Terminal designations according to EN 50 011

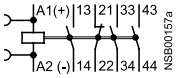
(it is not possible to snap on an auxiliary switch block)

Surge suppressor can be mounted

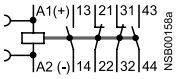
4 NO
Ident no.: 40E



3 NO + 1 NC
31E

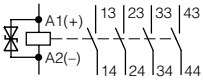


2 NO + 2 NC
22E

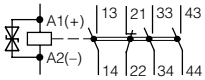


Suppressor Diode integrate

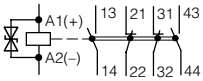
4 NO
Ident no.:40E



3 NO + 1 NC
31E

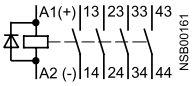


2 NO + 2 NC
22E

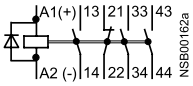


Diode integrated

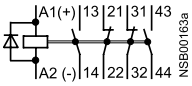
4 NO
Ident no.:40E



3 NO + 1 NC
31E



2 NO + 2 NC
22E

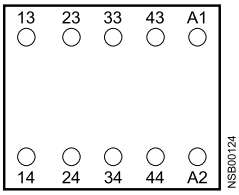


Position of terminals

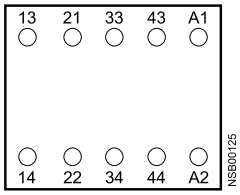
Size S00

3RH21 coupling relays

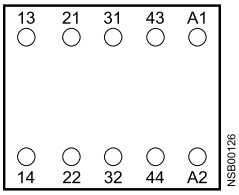
4 NO
Ident no.: 40E



3 NO + 1 NC
31E

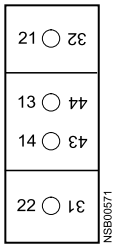


2 NO + 2 NC
22E

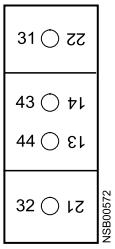


3RH19 21-. DA11 first laterally mountable auxiliary switch block [1])
mountable on left or right

1 NO + 1 NC
left

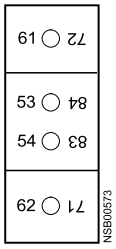


right

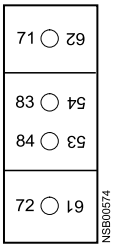


3RH19 21-. JA11 second laterally mountable auxiliary switch block [1])
mountable on left or right
(only for sizes S3 to S12)

1 NO + 1 NC
left



right



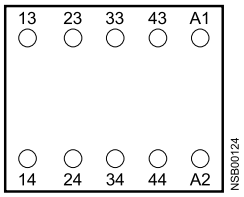
1) Note the location digit.
Can only be used if no 4-pole auxiliary switch block is snapped onto the front.

3RH2 Terminal Designations

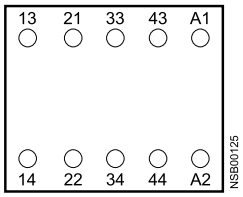
Terminal designations according to EN 50 011

3RH21 control relays

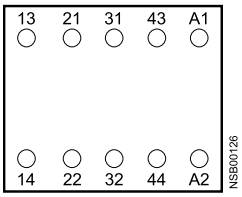
4 NO
Ident no.:40E



3 NO + 1 NC
31E

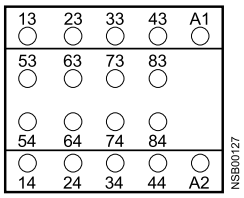


2 NO + 2 NC
22E

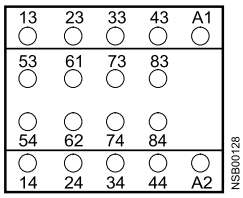


3RH21 40 control relays
with 3RH19 11-1GA.. auxiliary switch blocks snapped onto the front

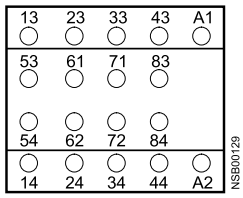
8 NO
Ident no.:80E



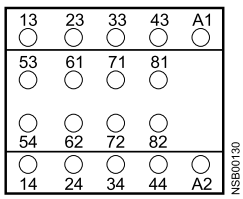
7 NO + 1 NC
71E



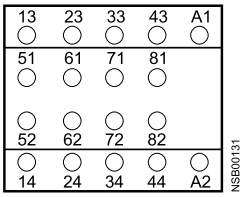
6 NO + 2 NC
62E



5 NO + 3 NC
53E

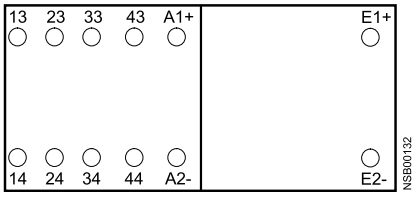


4 NO + 4 NC
Ident no.:44E

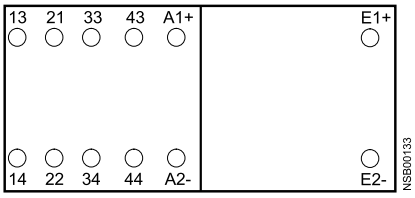


3RH24 latched control relays

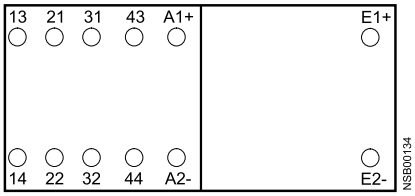
4 NO
Ident no.: 40E



3 NO + 1 NC
31E



2 NO + 2 NC
Ident no.: 22E

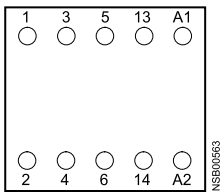


Position of terminals (applicable to screw connection and Cage Clamp connection)

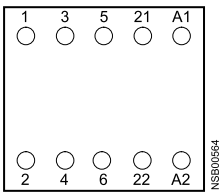
Size S0 0
Terminal designations according to EN 50 012

3RT20 1 contactors, 3RT20 1 coupling relays,

1 NO
Ident. no. 10E

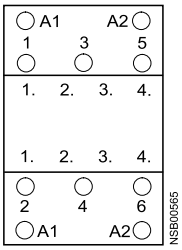


1 NC
01



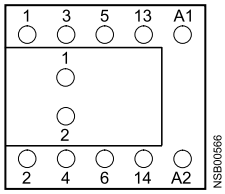
Sizes S3 to S12
Terminal designations according to EN 50 012

3RT 20 3,
3RT20 4, 3RT124 46 contactors,

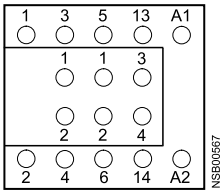


3RT20 1 contactors (with 1 NO)
with auxiliary switch blocks snapped onto the front
3RH19 11-. H . . .

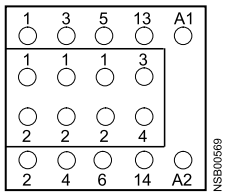
1 NO + 1 NC
Ident. no.: 11



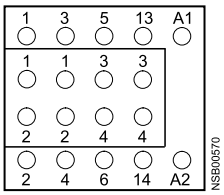
2 NO + 2 NC
22



2 NO + 3 NC
Ident. no.: 23

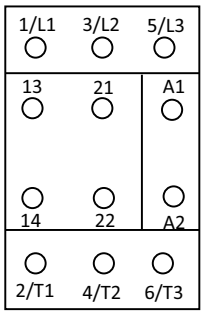


3 NO + 2 NC
32

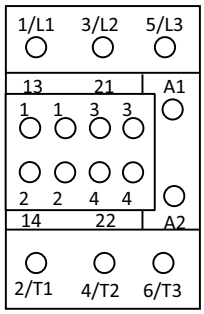


Size S0
Terminal designations according to EN 50 012

3RT20 2 Contactors with 1NO + 1NC
3RT20 2 Coupling Relays

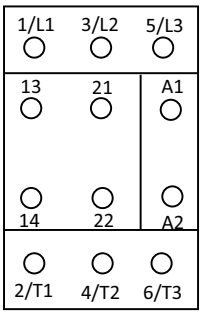


3RT20 2 Contactors with 3NO + 3NC

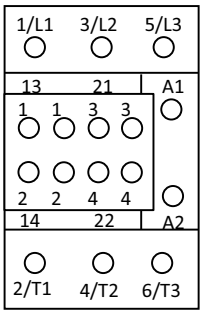


Size S2
Terminal designations according to EN 50 012

3RT20 3 Contactors with 1NO + 1NC
3RT20 3 Coupling Relays



3RT20 3 Contactors with 3NO + 3NC

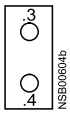


Position of terminals (applicable to screw connection and Spring-type connection)

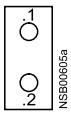
Accessories for size S3 to S12 contactors
Terminal designations according to EN 50 005 or EN 50 012

3RH19 21-. CA.. auxiliary switch blocks, single-pole,
for snapping onto the front

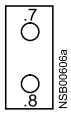
1 NO



1 NC

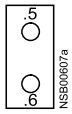


1 NO



with extended contact-making

1 NC



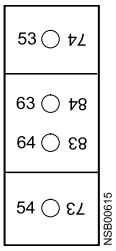
with extended contact-making

Position of terminals

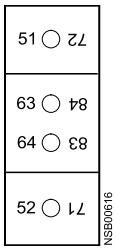
Accessories for size S2 to S12 contactors
Terminal designations acc. to EN 50 005

3RH19 21-. EA.. first laterally mountable auxiliary switch blocks (left)

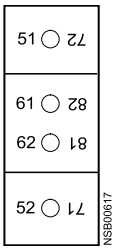
2 NO



1 NO + 1 NC

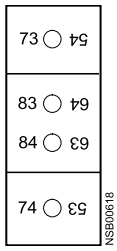


2 NC

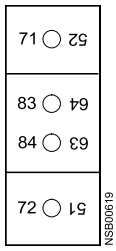


3RH19 21-. EA.. first laterally mountable auxiliary switch blocks (right)

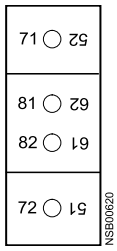
2 NO



1 NO + 1 NC

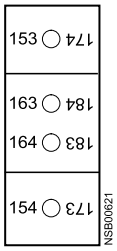


2 NC

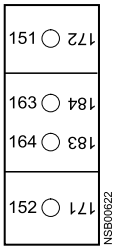


3RH19 21-. KA.. second laterally mountable auxiliary switch blocks (left)
(only for sizes S3 to S12; can only be used if no auxiliary switches are snapped onto the front)

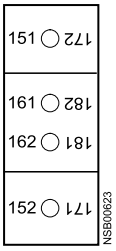
2 NO



1 NO + 1 NC

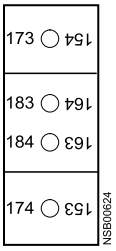


2 NC

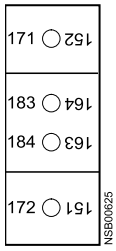


3RH19 21-. KA.. second laterally mountable auxiliary switch blocks (right)
(only for sizes S3 to S12; can only be used if no auxiliary switches are snapped onto the front)

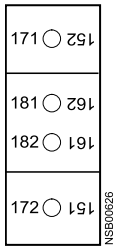
2 NO



1 NO + 1 NC



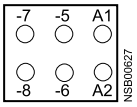
2 NC



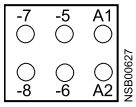
Accessories for size S3 to S12 contactors
Terminal designations acc. to DIN 46 199 Part 5

3RT19 26-2E.../2F.../2G... solid-state, time-delay auxiliary switch blocks

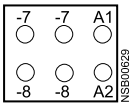
1 NO + 1 NC
ON-delay



1 NO + 1 NC
OFF-delay

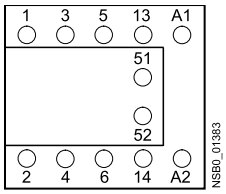


2 NO
Star-delta function



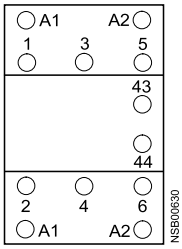
3RT26 capacitor contactors

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.

Position of terminals (applicable to screw connection and Spring-type terminal connection)

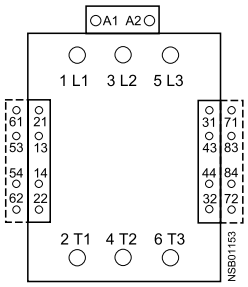
Sizes S6 to S12

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)

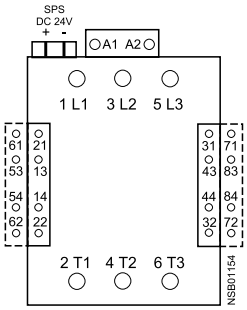
2 NO + 2 NC or 4 NO + 4 NC



- 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)

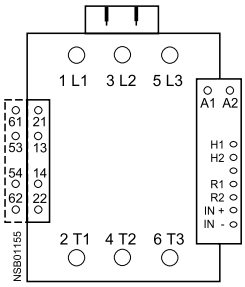
2 NO + 2 NC or 4 NO + 4 NC



- 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)

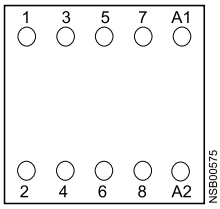
1 NO + 1 NC or 2 NO + 2 NC



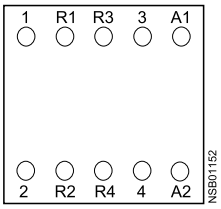
Contactors with 4 main contacts, size S00
Terminal designations acc. to EN 50 005

3RT23 and 3RT25 contactor s

4 NO



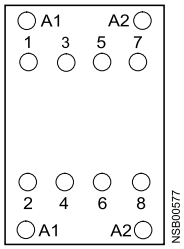
2 NO + 2 NC



Contactors with 4 main contacts, sizes S2 to S3
Terminal designations acc. to EN 50 005

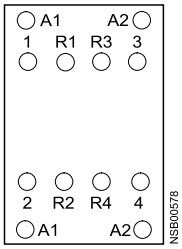
3RT13 and 3RT15 contactors

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

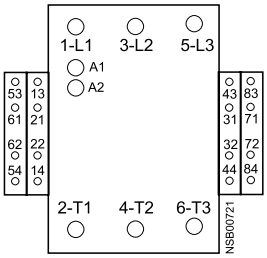


3TF68 and 3TF69 vacuum contactors, 3-pole

Position of terminals

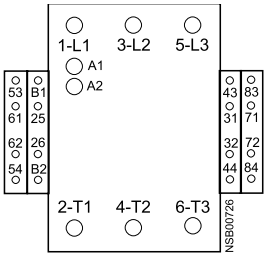
AC operation

3TF68 and 3TF69 contactors
4 NO + 4 NC



DC operation

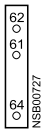
3TF68 and 3TF69 contactors
3 NO + 3 NC
max. complement of auxiliary switches



Solid-state compatible auxiliary switch blocks
3TY7 561-1. for lateral mounting onto size 6 to 14 contactors

mounted on left

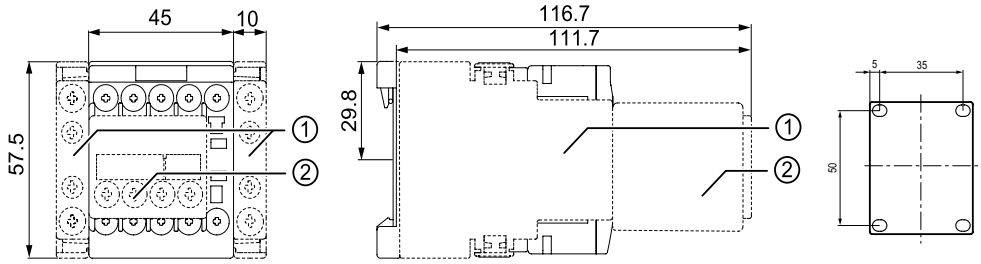
mounted on right



Dimension drawings

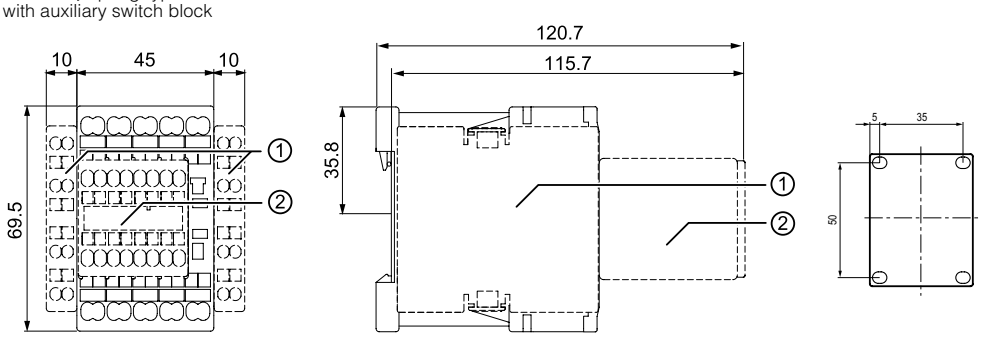
3RT2.1.-1 contactor and 3RH21..-1 contactor relays
Size S00 and NEMA Size 0, screw connection
with surge suppressor and auxiliary switch block

Lateral clearance from earthed parts = 6 mm



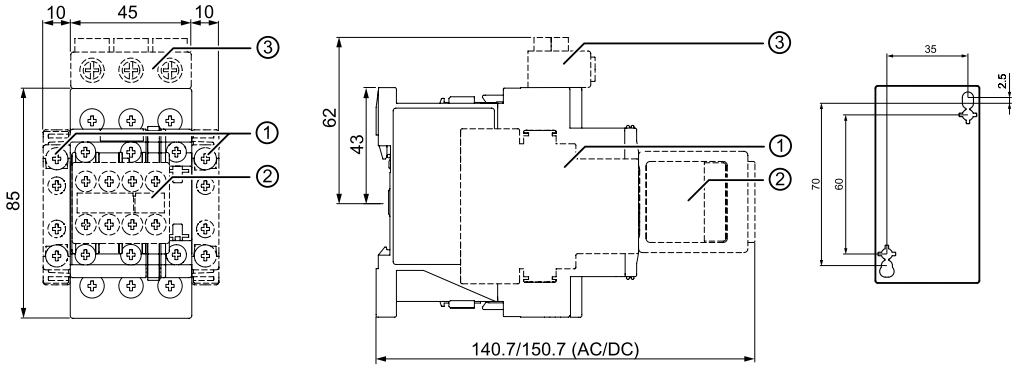
1) Laterally mountable auxiliary switch block 3RH2911-1DA.. / -1DE.. / -1EE..
2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..

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

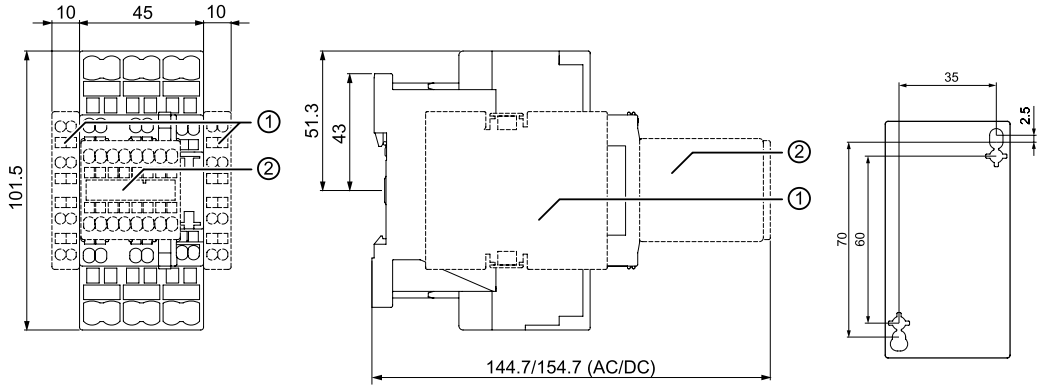


1) Laterally mountable auxiliary switch block 3RH2921-1DA.. / -1DE..
2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..
3) 3-phase infeed terminal 3RV2925-5AB

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

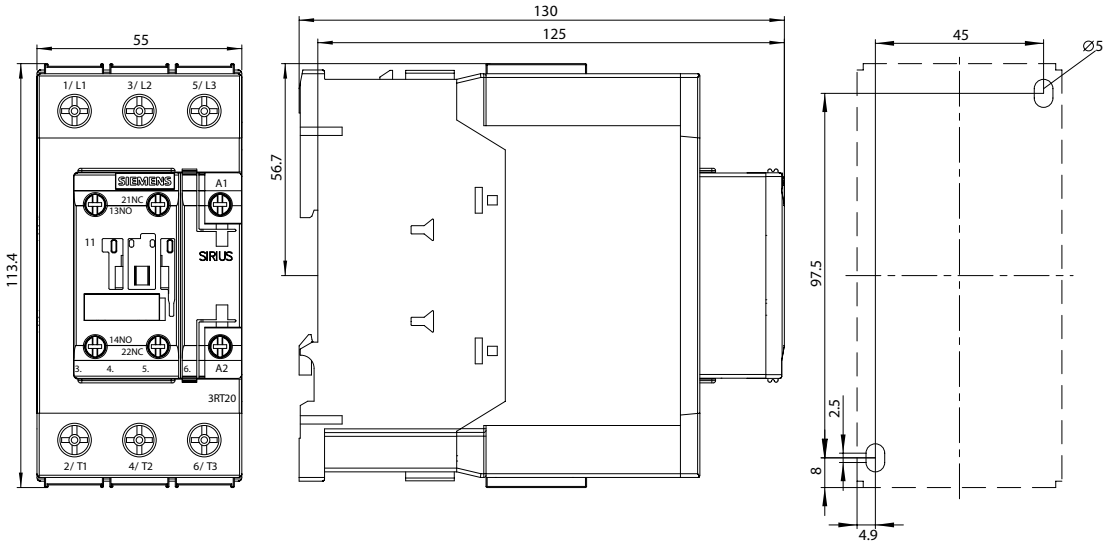
Dimension drawings

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



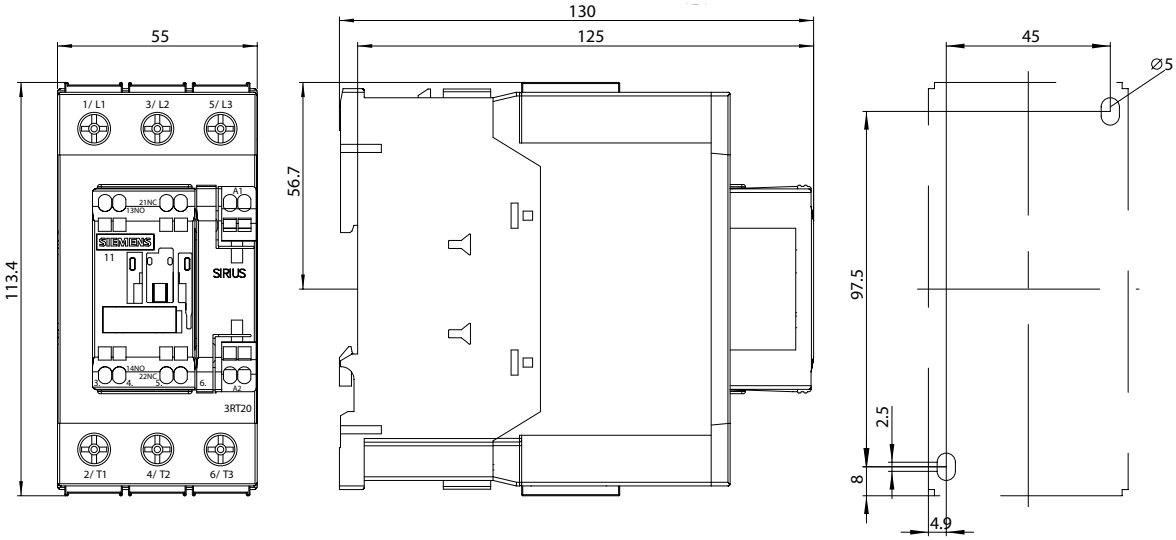
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

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

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

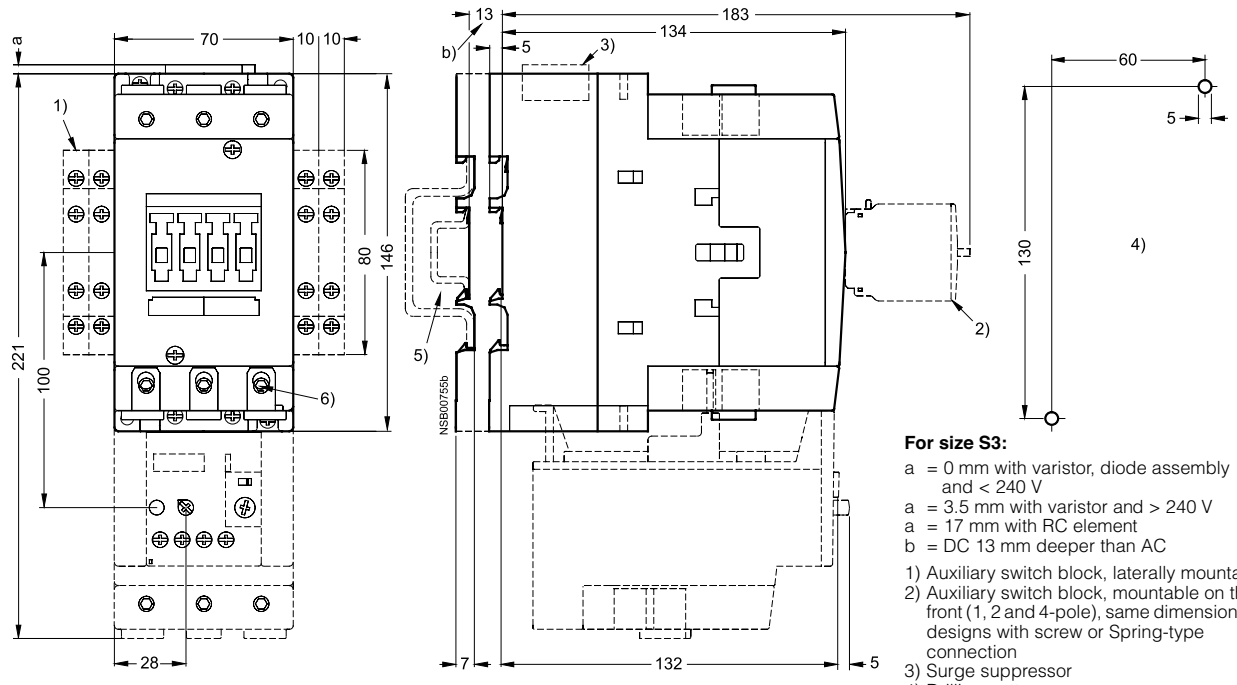
For size S2:

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:

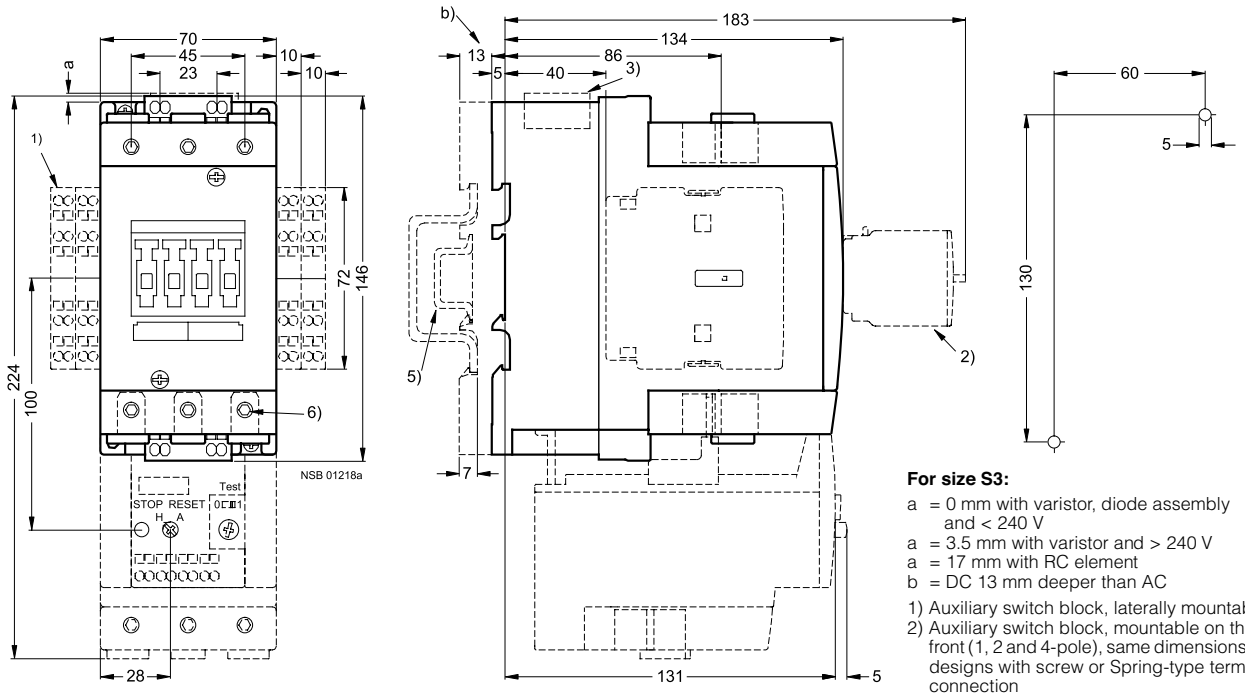
a = 0 mm with varistor, diode assembly and < 240 V
a = 3.5 mm with varistor and > 240 V
a = 17 mm with RC element
b = DC 13 mm deeper than AC

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

Dimension drawings

3RT20 4 contactors,
Size S3, Spring-type terminal connection with surge suppressor, auxiliary switch blocks and mounted overload relay



For size S3:

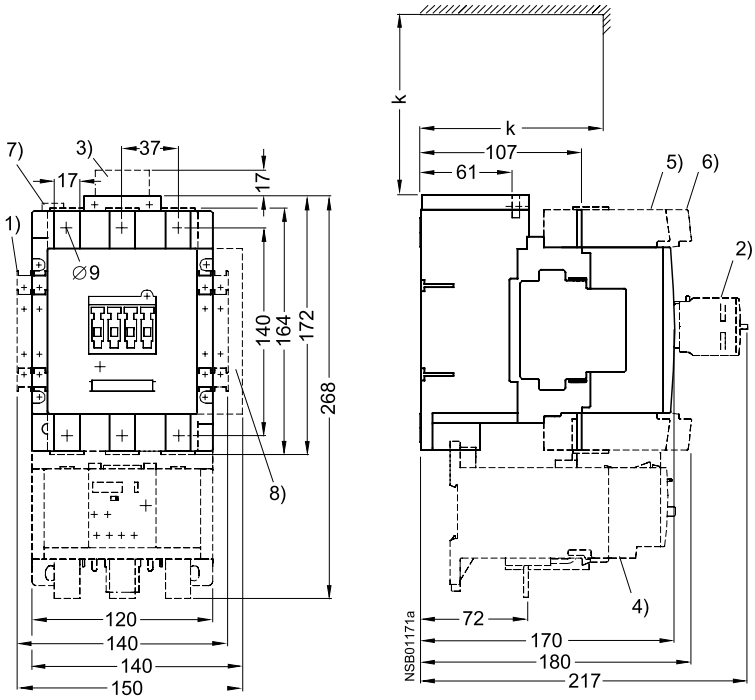
a = 0 mm with varistor, diode assembly and < 240 V
a = 3.5 mm with varistor and > 240 V
a = 17 mm with RC element
b = DC 13 mm deeper than AC

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 terminal 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

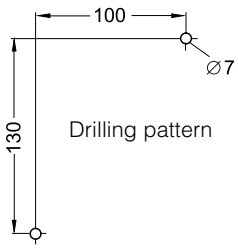
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

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:

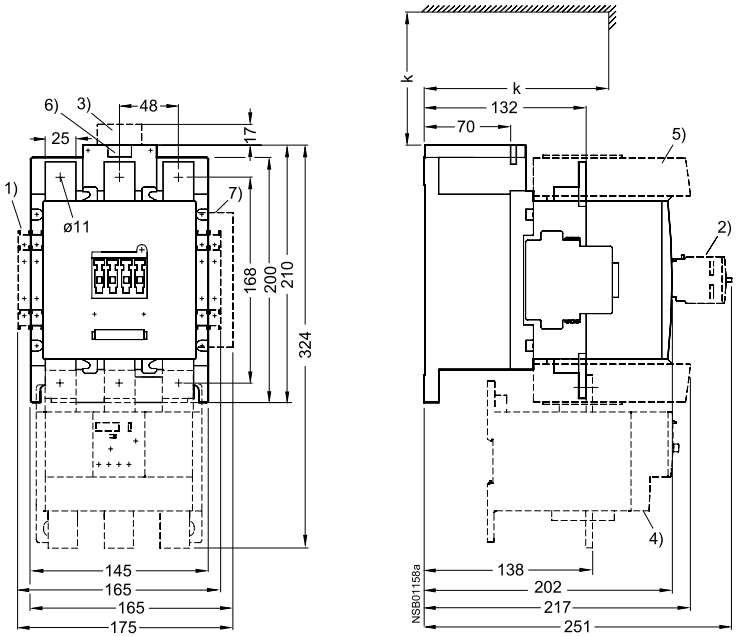
k = 120 mm (minimum clearance for removing the withdrawable coil)

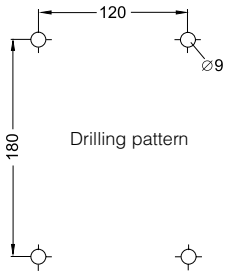
1) Second auxiliary switch block, laterally mountable
2) Auxiliary switch block, mountable on the front
3) RC element
4) 3RB10 overload relay, mounted
5) 3RT19 55-4G box terminal block (hexagon socket 4 mm)
6) 3RT19 56-4G box terminal block (hexagon socket 4 mm)
7) PLC connection DC 24 V and changeover 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

Dimension drawings

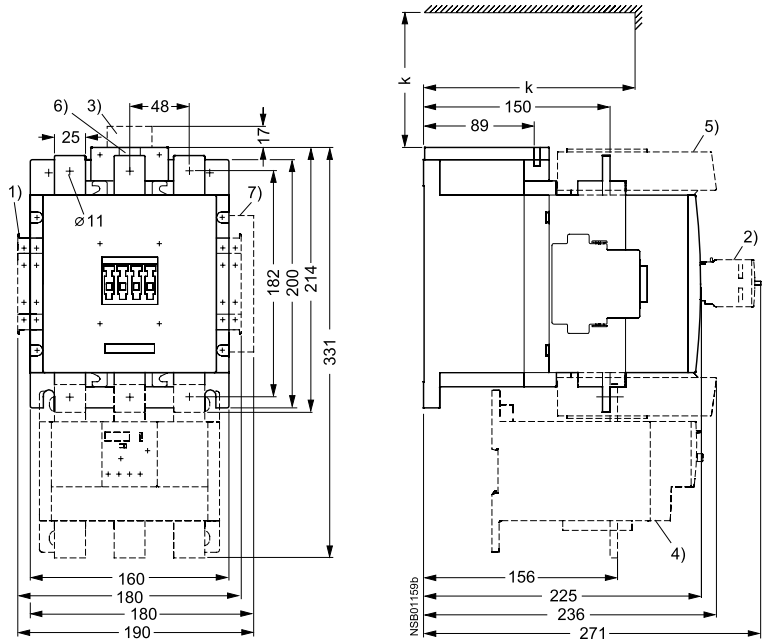
3RT10 6, 3RT14 6 contactors
Size S10
with auxiliary switch block, laterally mountable and mountable on the front,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication

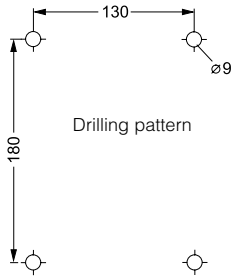




3RT10 7, 3RT14 7 contactors
Size S12
with auxiliary switch block, laterally mountable and mountable on the front,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication

For sizes S10 and S12:
Clearance from earthed parts with directly mounted overload relay:
lateral: 10 mm
front: 20 mm





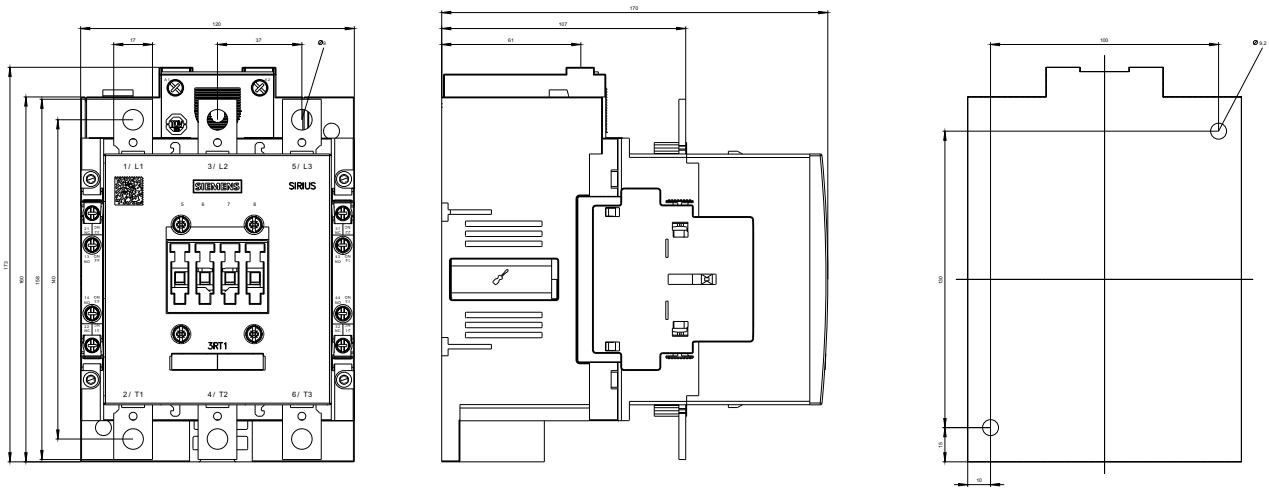
For sizes S10 and S12:
k = 150 mm (minimum clearance for removing the withdrawable coil)

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)

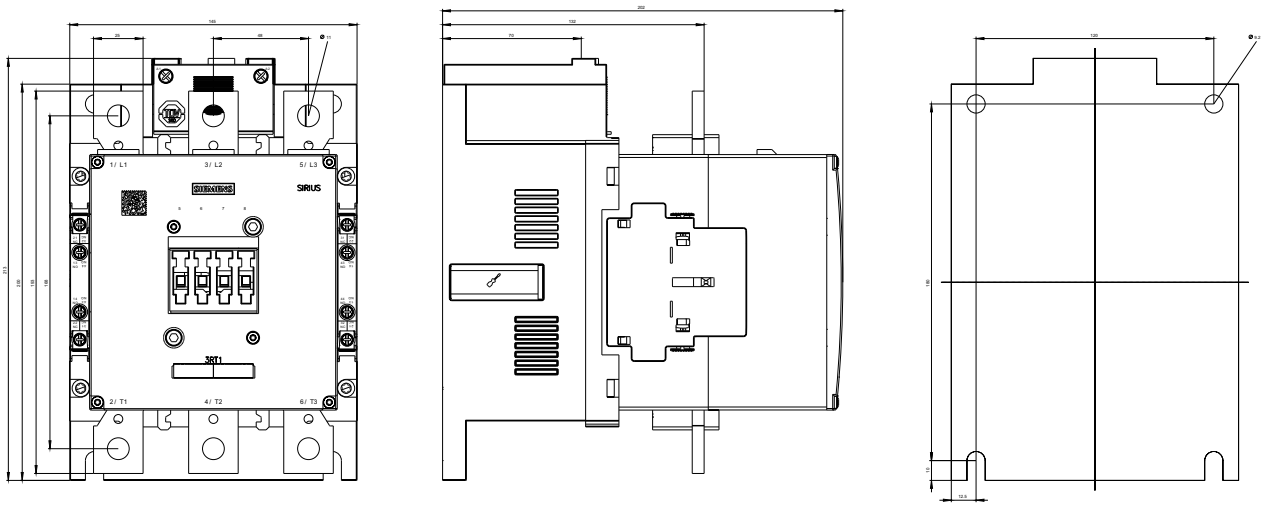
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

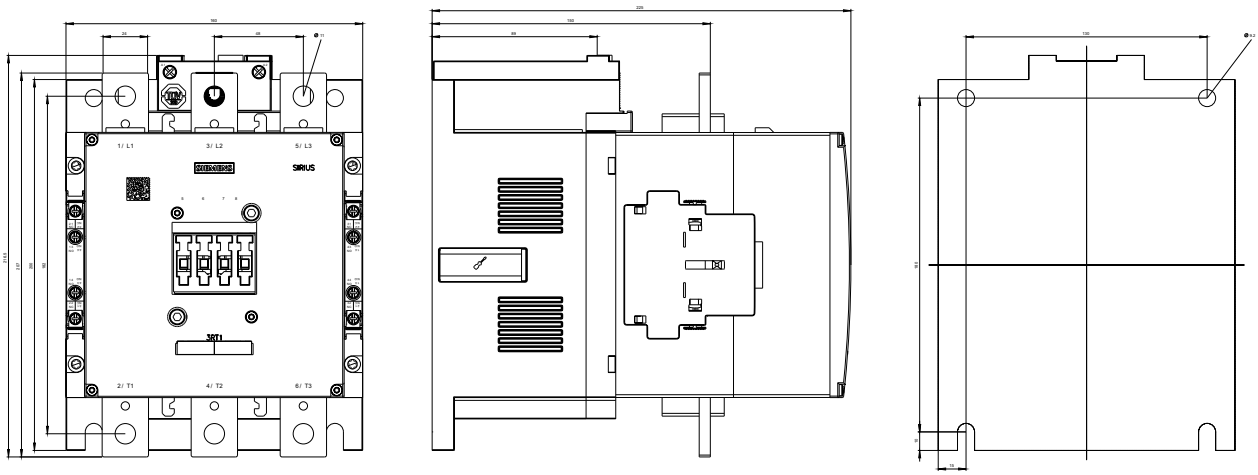
3RT10 contactors with integrated safety
Size S6



Size S10

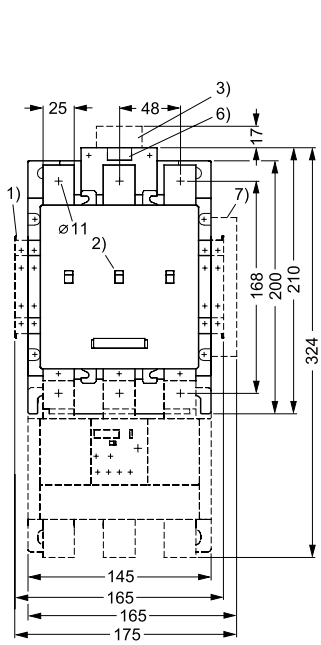


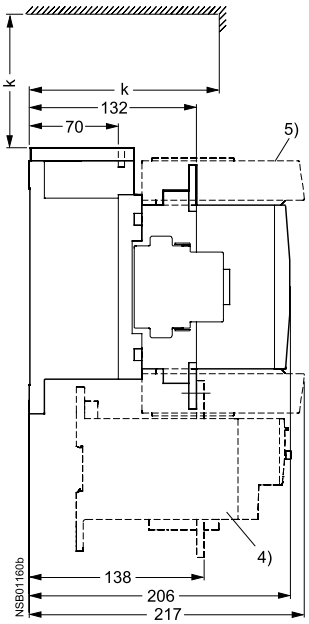
Size S12

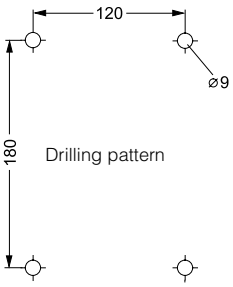


Dimension drawings

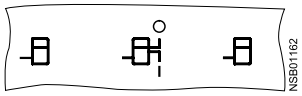
3RT12 6 vacuum contactors
Size S10
with auxiliary switch block, laterally mountable,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication



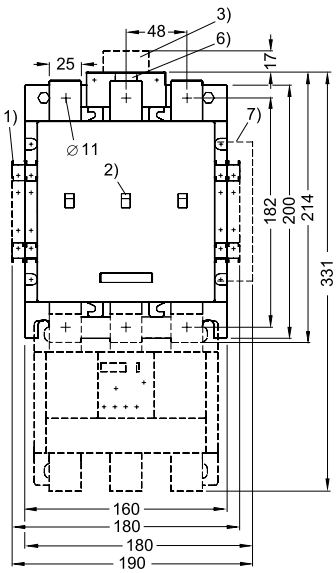


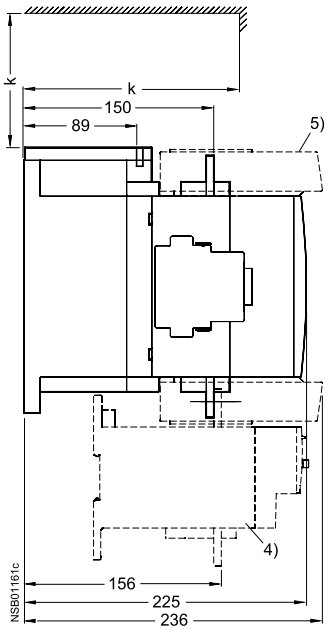


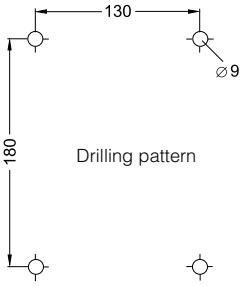
Detail
Contact erosion indicator for vacuum interrupters



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:

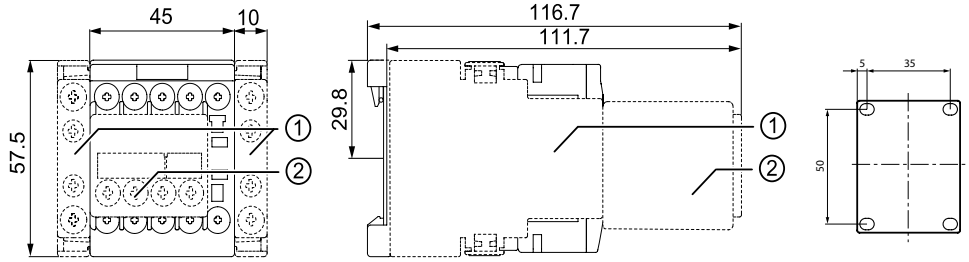
k = 150 mm (minimum clearance for removing the withdrawable coil)

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

Dimension drawings

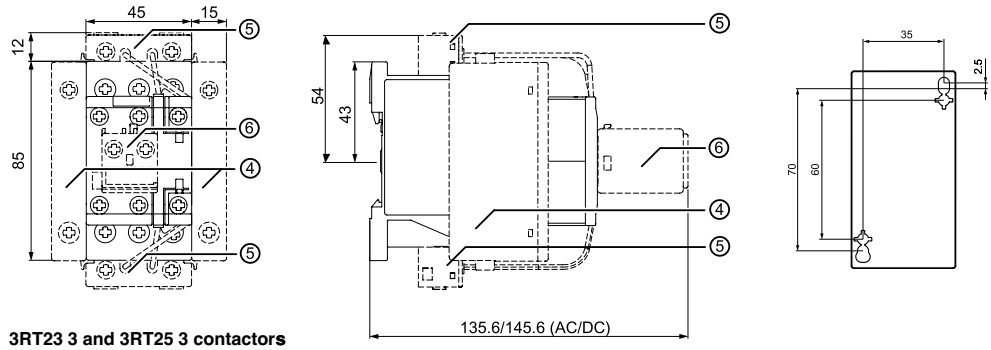
3RT23 1 and 3RT25 1 contactors
Size S00, screw connection
with surge suppressor and auxiliary switch block



Lateral clearance from earthed parts = 6 mm

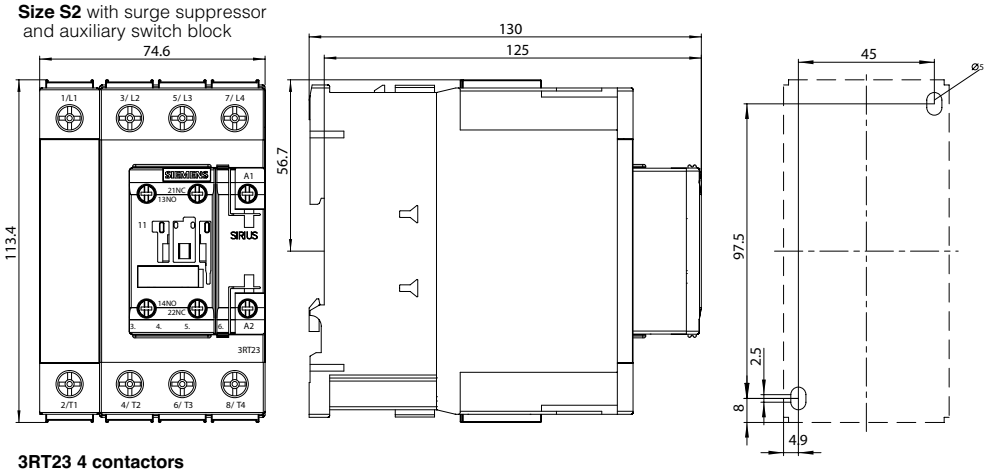
For size S00:
1) Laterally mountable auxiliary switch block 3RH2911-1DA.. / -1DE.. / -1EE..
2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..

3RT23 2 and 3RT25 2 contactors
Size S0 with coil terminal module
and auxiliary switch block



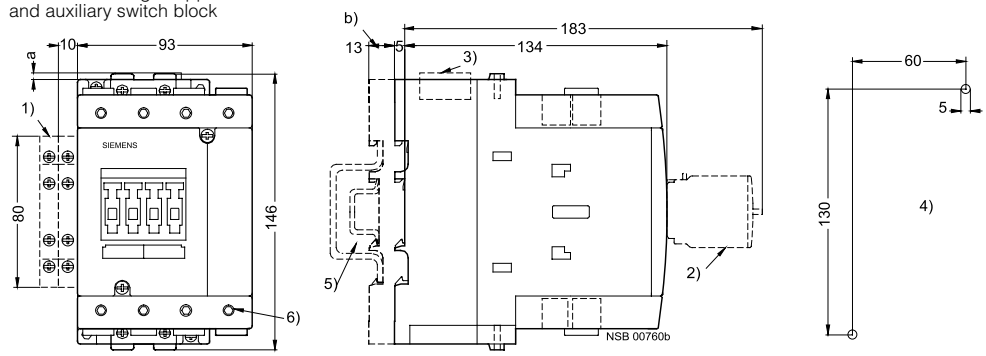
For size S0:
4) 4-pole contactor for switching 4 resistive loads 3RT232. 4-pole pole-changing contactor for changing the polarity of hoisting gear motors (2 NO contacts and 2 NC contacts) 3RT252.
5) Coil terminal module 3RT2926-4RA11/-4RB11
6) Auxiliary switch block for mounting on the front 3RH2911-1AA.. / -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

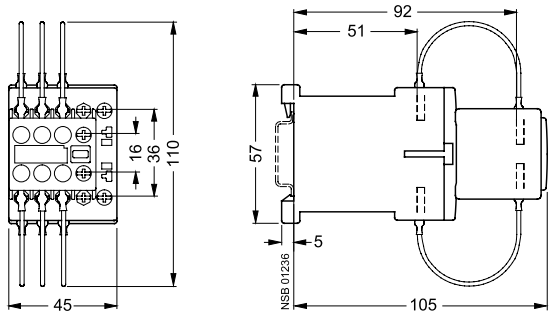
3RT23 4 contactors
Size S3 with surge suppressor
and auxiliary switch block



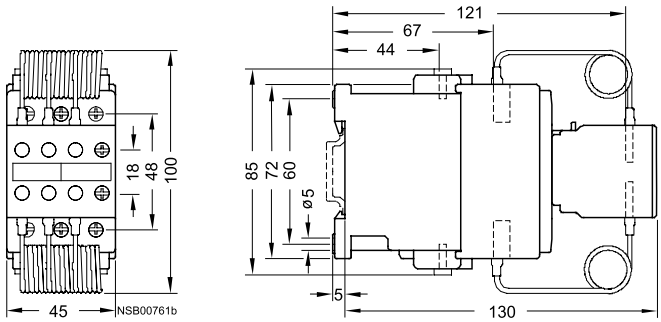
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

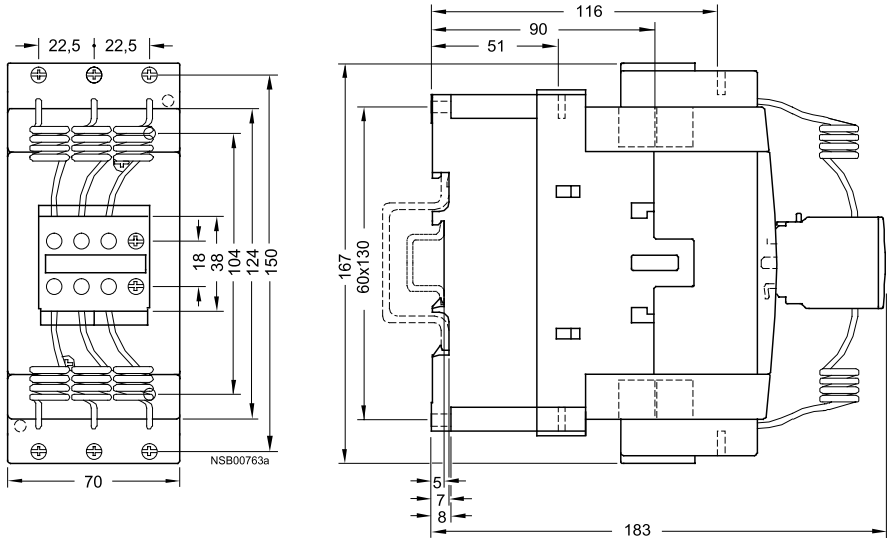
3RT16 17 capacitor contactors
Size S00



3RT16 27 capacitor contactors
Size S0



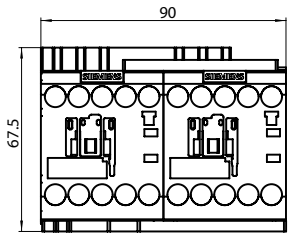
3RT16 47 capacitor contactors
Size S3

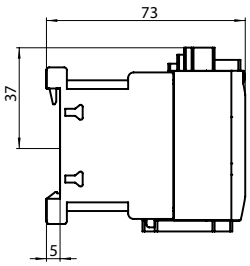


For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

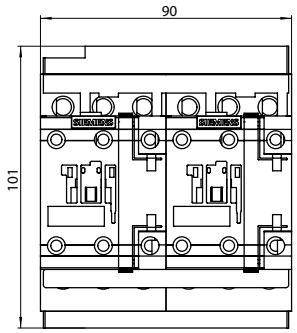
Dimension drawings

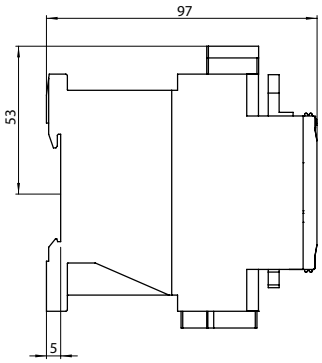
Size S00 / 3RA231



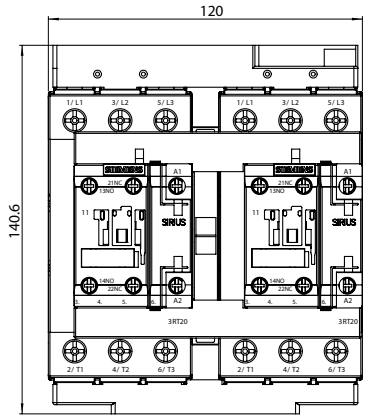


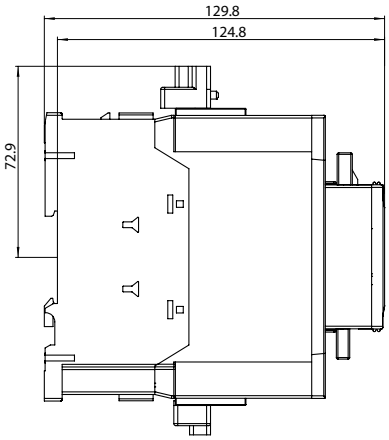
Size S0 / 3RA232



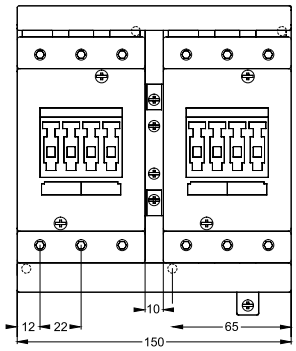


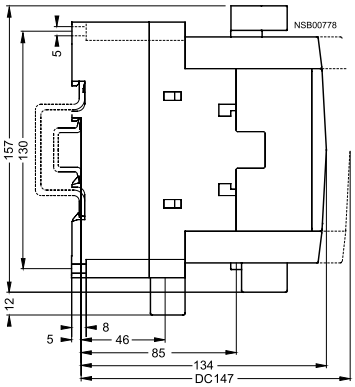
Size S2 / 3RA233





Size S3 / 3RA234



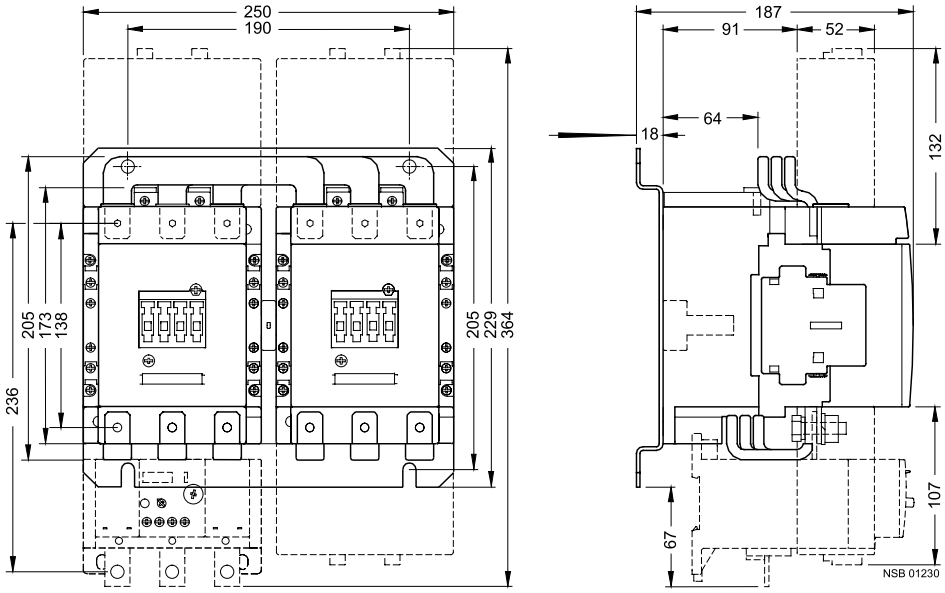


For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

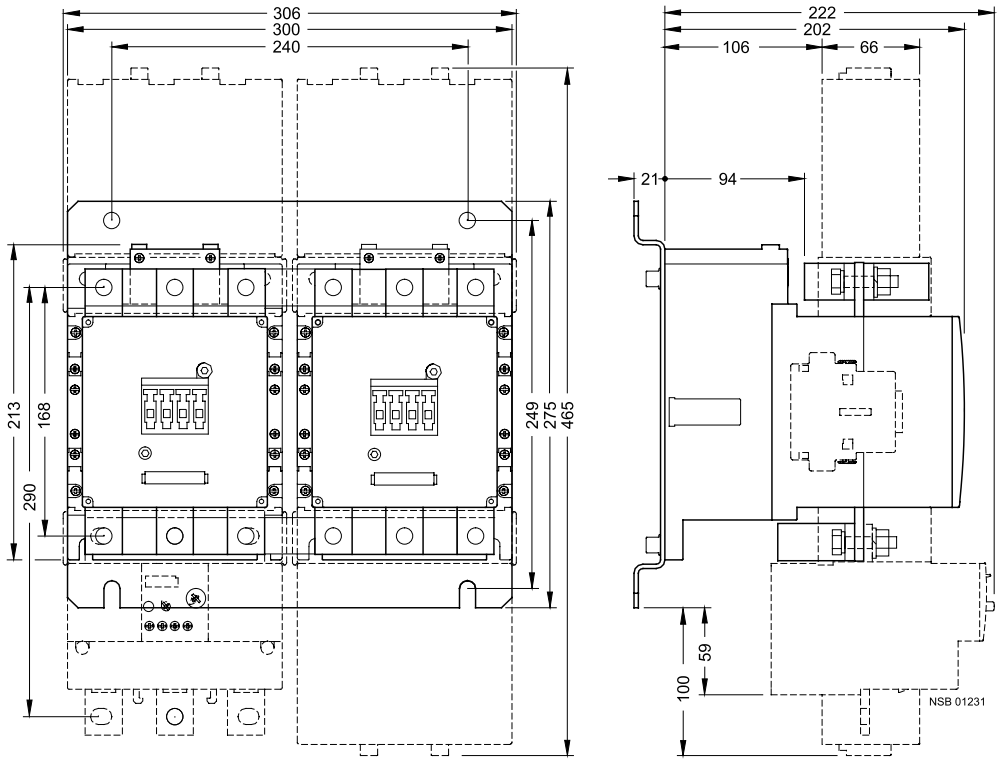
3RA13 contactor assemblies for reversing

Dimension drawings

Size S6



Size S10

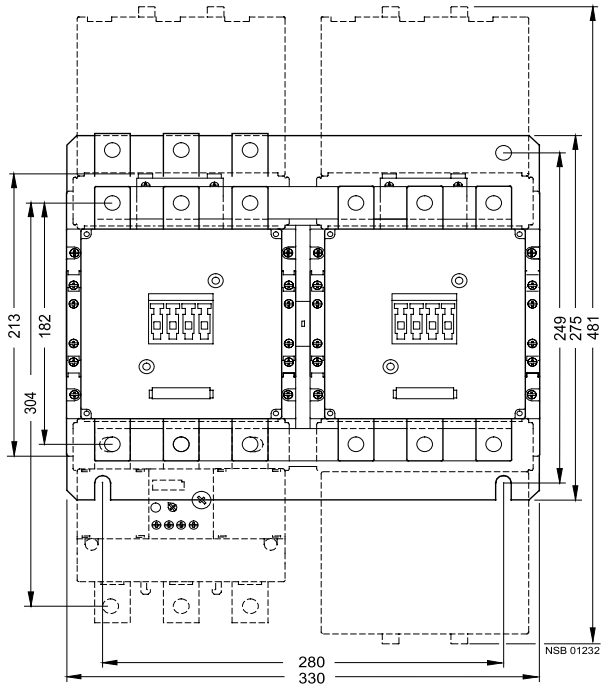


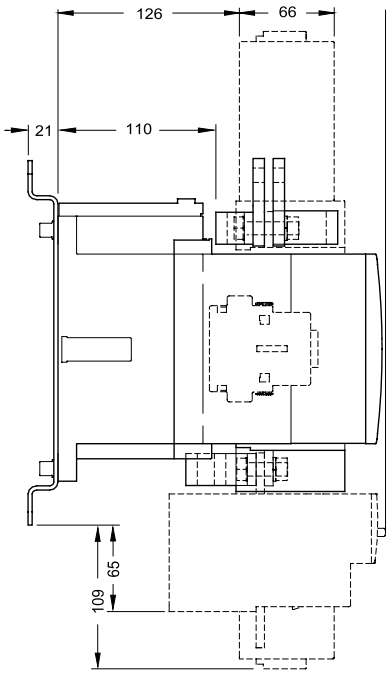
The assemblies shown on this page are for customer assembly with individual components.

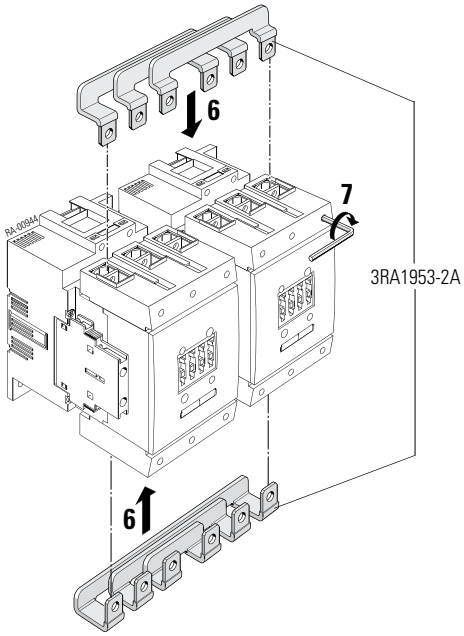
3RA13 contactor assemblies for reversing

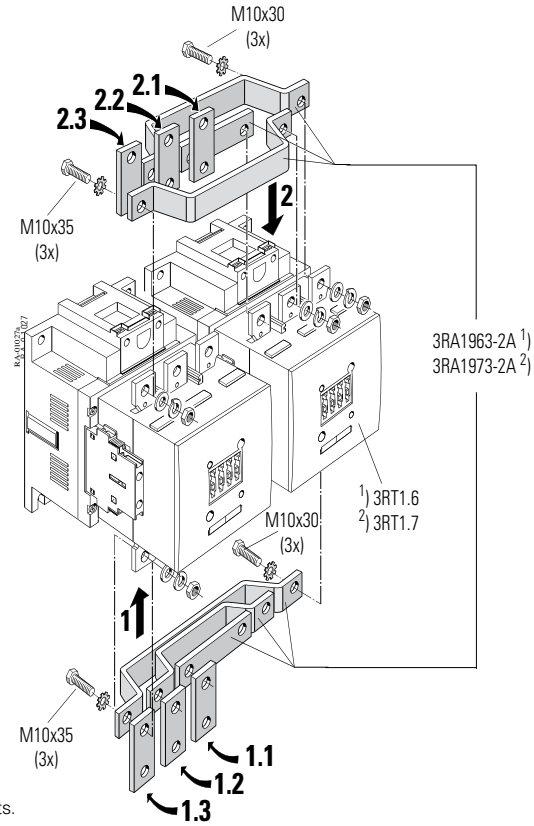
Dimension drawings

Size S12





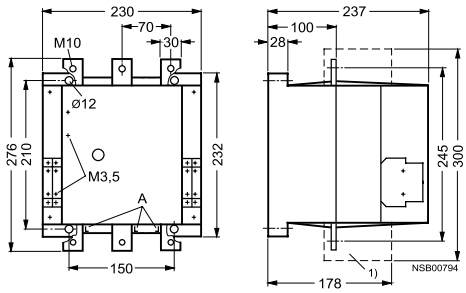




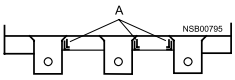
The assemblies shown on this page are for customer assembly with individual components.

Dimension drawings

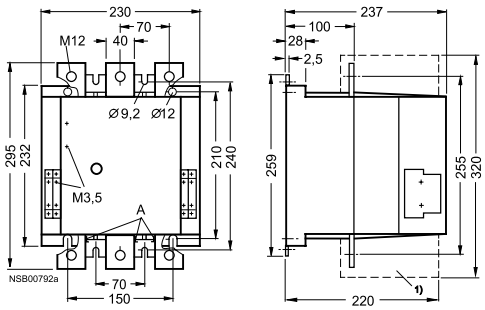
3TF68 vacuum contactors



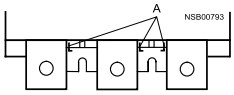
Detail
A = Contact erosion indicator for vacuum interrupter contacts



3TF69 vacuum contactors

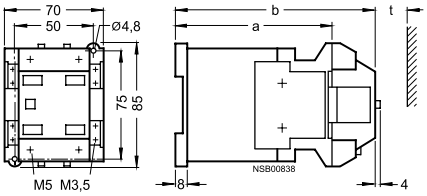


Detail
A = Contact erosion indicator for vacuum interrupter contacts



3TC4 and 3TC5 contactors

3TC44 contactors
Size 2, AC and DC operation

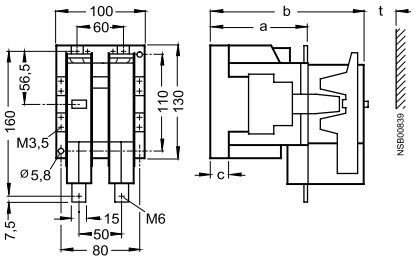


t = minimum clearance from insulated components: 15 mm (600 V and 750 V)

from grounded components: 30 mm (600 V and 750 V)

	a	b
DC operation	109	141
AC operation	68	100

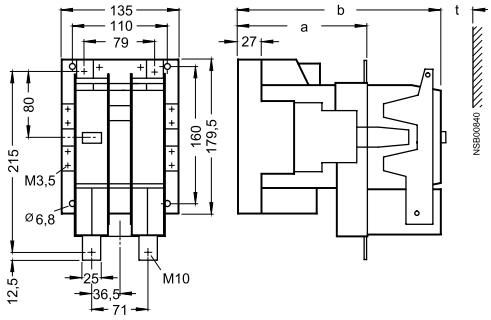
3TC48 contactors
Size 4, AC and DC operation



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

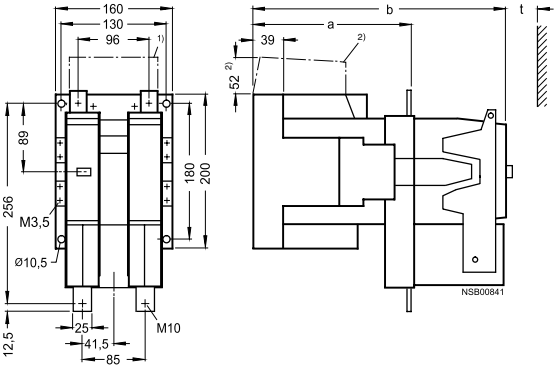


t = minimum clearance from insulated components: 20 mm (600 V and 750 V)

from grounded components: 70 mm (600 V and 750 V)

	a	b
DC operation	147	232
AC operation	115	200

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)

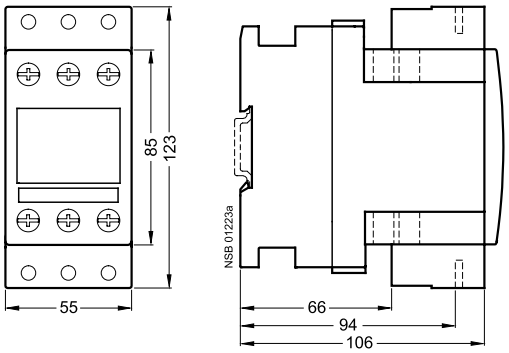
	a	b
DC operation	200	310
AC operation	141	251

1) With box terminals for laminated copper bars (accessories).

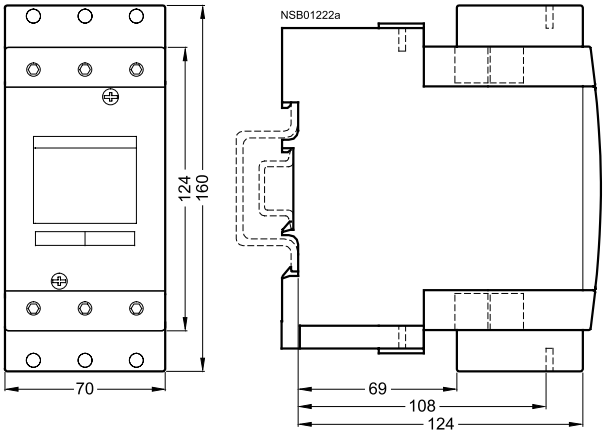
2) DC operation only

Dimension drawings

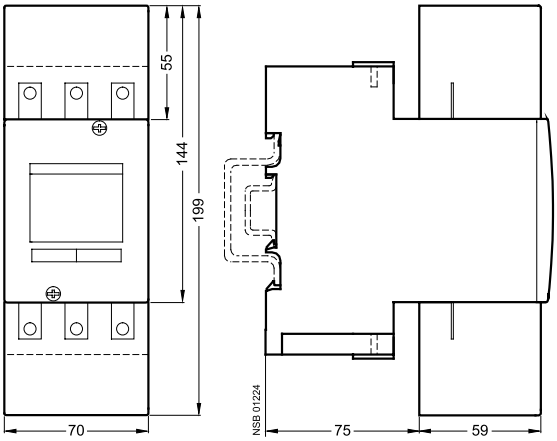
Terminal cover for box terminals for size S2, 3RT29 36-4EA2



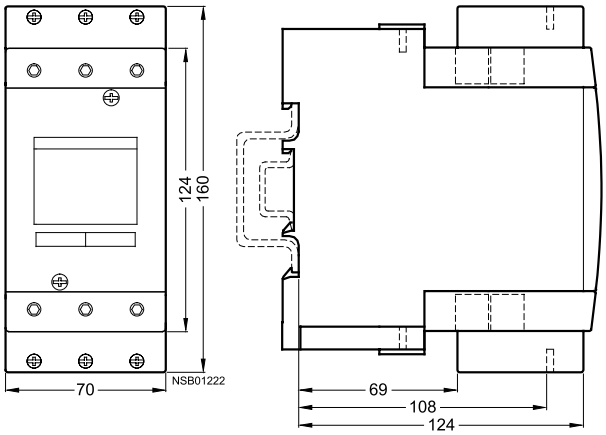
Terminal cover for box terminals for size S3, 3RT19 46-4EA2



Terminal cover for cable lug and bar connection for size S3, 3RT19 46-4EA1



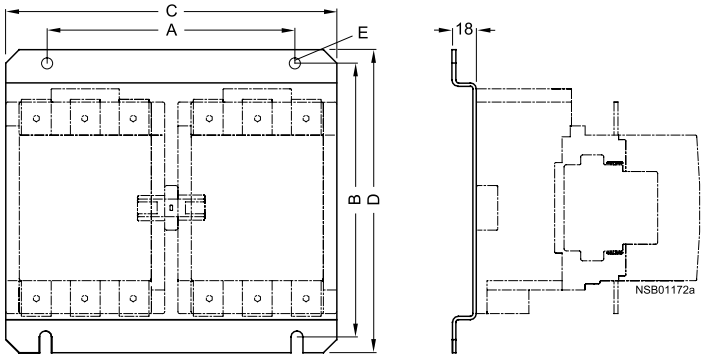
Auxiliary conductor terminal, 3-pole 3RT19 46-4F Size S3
mounted on contactor



For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

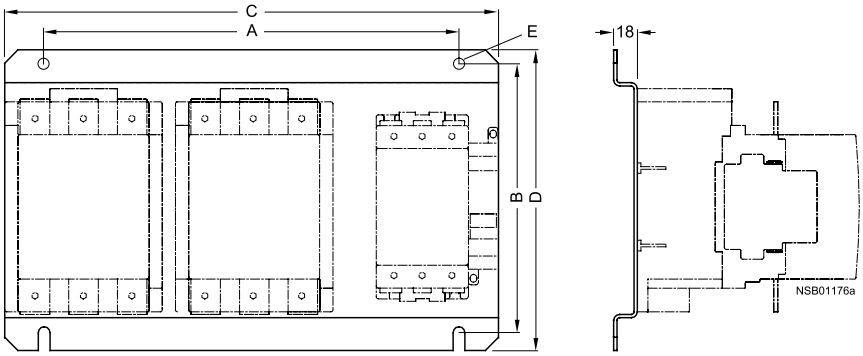
Dimension drawings

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

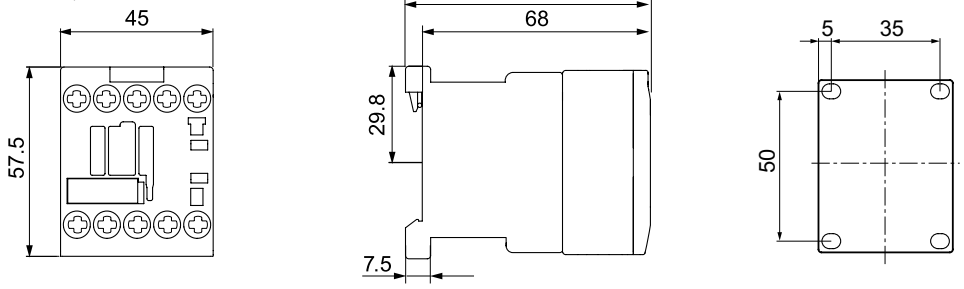


	A	B	C	D	E
S6-S6-S3	316	205	376	229	9
S6-S6-S6	343	205	403	229	9
S10-S10-S6	393	250	453	275	11
S10-S10-S10	423	250	483	275	11
S12-S12-S10	450	250	510	275	11
S12-S12-S12	465	250	525	275	11

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

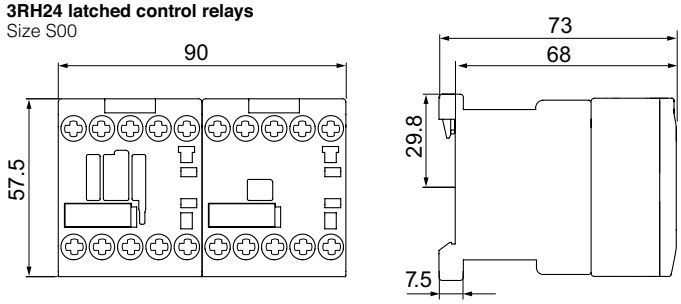
Dimension drawings

3RH21 control relays
Size S00, with screw connections



Lateral clearance from earthed parts = 6 mm

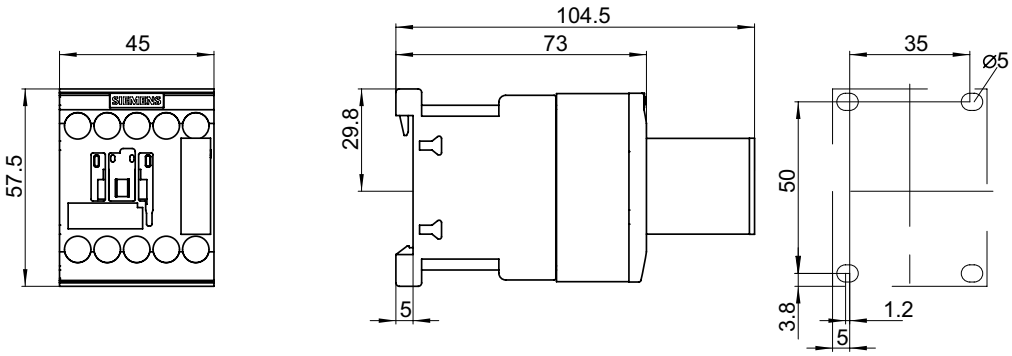
3RH24 latched control relays
Size S00



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

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Thermal overload relays

3RU21 overload relays up to 100 A with screw connection, CLASS 10

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Technical data	3/12 - 3/14
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Solid state overload relays

3RB24 overload relays up to 630A with IO-Link current monitoring

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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

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3RB22/23 overload relays up to 820 A for full motor protection, CLASS 5 to CLASS 30 adjustable

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3UF7 SIMOCODE Pro Motor management and control devices

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General data

Overview

Features	3RU21	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
General data						
Sizes	S00 ... S3	S00 ... S3	S6 ... S12	S00 ... S12	S00 ... S12	• Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, etc., ...) • 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 • Simplify configuration
Seamless current range	0.11 ... 100 A	0.1 ... 100 A	50 ... 630 A	0.3 ... 630 A (up to 820 A)[1]	0.3 ... 630 A (up to 820 A)[1]	• Allows easy and consistent configuration with one series of overload relays (for small to large loads)
Protection functions						
Tripping due to overload	✓	✓	✓	✓	✓	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload
Tripping due to phase unbalance	✓	✓	✓	✓	✓	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to phase unbalance
Tripping due to phase failure	✓	✓	✓	✓	✓	• Minimizes heating of induction motors during phase failure
Protection of single-phase loads	✓	—	—	✓	✓	• Enables the protection of single-phase loads
Tripping in the event of overheating by **integrated thermistor motor protection function**	—[2]	—[2]	—[2]	✓	✓	• 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 • Eliminates the need for additional special equipment • Saves space in the control cabinet • Reduces wiring outlay and costs
Tripping in the event of a ground fault by **internal ground-fault detection (activatable)**	—	✓ (only 3RB31)	✓ (only 3RB21)	✓	✓	• Provides optimum protection of loads against high-resistance short circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc. • Eliminates the need for additional special equipment • Saves space in the control cabinet • Reduces wiring outlay and costs

✓ Available
— Not available

[1] 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 a 3UF18 68-3GA00 (820 A/1 A) series transformer.

[2] 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
Features						
RESET function	✓	✓	✓	✓	✓	• Allows manual or automatic resetting of the device
Remote RESET function	✓ (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)	• Allows the remote resetting of the device
TEST function for auxiliary contacts	✓	✓	✓	✓	✓	• Allows easy checking of the function and wiring
TEST function for electronics	—	✓	✓	✓	✓	• Allows checking of the electronics
Status display	✓	✓	✓	✓	✓	• Displays the current operating state
Large current adjustment button	✓	✓	✓	✓	✓	• Makes it easier to set the relay exactly to the correct current value
Integrated auxiliary contacts (1 NO + 1 NC)	✓	✓	✓	✓ (2 ×)	--	• Allows the load to be switched off if necessary • Can be used to output signals
Integrated auxiliary contacts (1 CO and 1 NO in series)	—	—	—	—	✓	• Enables the controlling of contactors directly from the higher-level control system through IO-Link
IO-Link connection	—	—	—	—	✓	• Reduction of wiring in the control cabinet • Enables communication
Connection of optional hand-held device	—	—	—	—	✓	• Enables local operation
Communication capability through IO-Link						
Full starter functionality through IO-Link	—	—	—	—	✓	• Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and wye-delta starting)
Reading out of diagnostics functions	—	—	—	—	✓	• Enables the reading out of diagnostics information such as overload, open circuit, ground fault, etc.
Reading out of current values	—	—	—	—	✓	• Enables the reading out of current values and their direct processing in the higher-level control system
Reading out all set parameters	—	—	—	—	✓	• Enables the reading out of all set parameters, e.g. for plant documentation

✓ Available

— Not available

General data

Features	3RU21	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Design of load feeders						
Short-circuit strength up to 100 kA at 690 V (in conjunction with the corre-sponding fuses or the corre-sponding motor starter protector)	✓	✓	✓	✓	✓	• Provides optimum protection of the loads and operating personnel in the event of short circuits due to insulation faults or faulty switching operations
Electrical and mechanical matching to 3RT contactors	✓	✓	✓	✓[1)]	✓[1)]	• Simplifies configuration • Reduces wiring outlay and costs • Enables stand-alone installation as well as space-saving direct mounting
Straight-through trans-formers for main circuit[2)] (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)	✓ (S6)	✓ (S00 ... S6)	✓ (S00 ... S6)	• Reduces the contact resistance (only one point of contact) • Saves wiring costs (easy, no need for tools, and fast) • Saves material costs • Reduces installation costs
Spring-type connection sys-tem for main cir-cuit[2)]	✓ (S00, S0)	✓ (S00, S0)	—	—	—	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
Spring-type connection sys-tem for auxiliary circuits[2)]	✓	✓	✓	✓	✓	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
Ring terminal lug connection method for main and auxiliary circuits[2)]	✓ (S00, S0)	—	—	—	—	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
Full starter functionality through IO-Link	—	—	—	—	✓	• Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and wye-delta starting)
Starter function	—	—	—	—	✓	• Integration of feeders via IO-Link in the control system up to 630 A or 820 A

✓ Available
— Not available

1) Exception: up to size S3, only stand-alone installation is possible.
2) Alternatively available for screw terminals.

General data

Features	3RU21	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Other features						
Temperature compensation	✓	✓	✓	✓	✓	• Allows the use of the relays at high temperatures without derating • Prevents premature tripping • Allows compact installation of the control cabinet without distance between the devices/load feeders
Very high long-term stability	✓	✓	✓	✓	✓	• Provides safe protection for the loads even after years of use in severe operating conditions
Wide setting ranges	—	✓ (1:4)	✓ (1:4)	✓ (1:10)	✓ (1:10)	• Minimize the configuration outlay and costs • Minimize storage overheads, storage costs, tied-up capital
Fixed trip class	CLASS 10 CLASS 10A	3RB30: CLASS 10E or CLASS 20E	3RB20: CLASS 10E or CLASS 20E			• Optimum motor protection for standard starts
Trip classes adjustable on the device CLASS 5E, 10E, 20E, 30E	—	3RB31: ✓	3RB21: ✓	✓	✓	• Enables solutions for very fast starting motors requiring special protection (e.g. Ex motors) • Enables heavy starting solutions • Reduces the number of versions
Low power loss	—	✓	✓	✓	✓	• Reduces energy consumption and energy costs (up 98 % less energy is used than for thermal overload relays). • Minimizes temperature rises of the contactor and control cabinet – in some cases this may eliminate the need for control-gear cabinet cooling. • Direct mounting to contactor saves space, even for high motor currents (i.e. no heat decoupling is required).
Internal power supply	—[1]	✓	✓	—	—	• Eliminates the need for configuration and connecting an additional control circuit
Supplied from an external voltage through IO-Link	—	—	—		✓	• Eliminates the need for configuration and connecting an additional control circuit
Overload warning	—	—	—	✓	✓	• 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 • Allows the imminent tripping of the relay to be signaled • 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
Analog output	—	—	—	✓	✓	• Allows the output of an analog output signal for actuating moving-coil instruments, feeding programmable logic controllers or transfer to bus systems • Eliminates the need for an additional measuring transducer and signal converter

✓ Available
— Not available

[1] 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 measure-ment	Current range	**Contactors** (type, size, rating in HP)							
				3RT20 1.	**3RT20 2.**	**3RT20 3.**	**3RT20 4.**	**3RT20 5.**	**3RT20 6.**	**3RT20 7**	**3TF68/ 3TF69**
				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[1)]											
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[1)]											
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[1)]											
3RB20	3RB20 5	Integrated	50 … 200	—	—	—	—	✓	—	—	—
	3RB20 6	Integrated	55 … 630						✓	✓	✓
	3RB20 1 + 3UF18	Integrated	630 … 820	—	—	—	—	—	—	—	✓
SIRIUS 3RB21 solid-state overload relays[1)]											
3RB21	3RB21 5	Integrated	50 … 200	—	—	—	—	✓	—	—	—
	3RB21 6	Integrated	55 … 630						✓	✓	✓
	3RB21 1 + 3UF18	Integrated	630 … 820	—	—	—	—	—	—	—	✓

✓ Can be used

— Cannot be used

[1)] "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 measure-ment	Current range	**Contactors** (type, size, rating in HP)							
			3RT20 1	**3RT20 2**	**3RT20 3**	**3RT20 4**	**3RT20 5**	**3RT20 6**	**3RT20 7**	**3TF68/ 3TF69**
			S00	S0	S2	S3	S6	S10	S12	Size 14
Type	Type	A	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[1)]										
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	—	—	—	—	—	—	—	✓

3RB22, 3RB23

3RB24

✓ Can be used

— Cannot be used

1) "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

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.

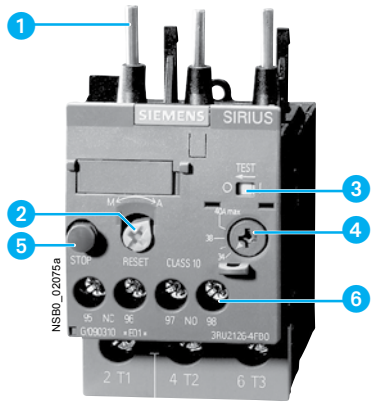
Control circuit

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 –40 °C to +60 °C. For temperatures from +60 °C to +80 °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 °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 relay 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:

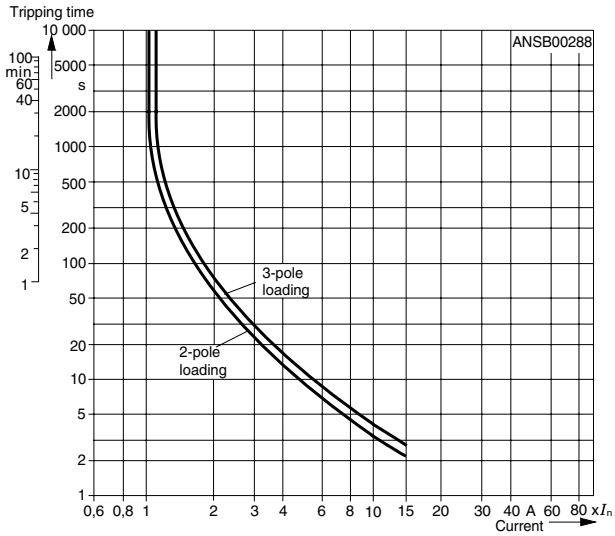
CLASS	Tripping times
10A	2 s to 10 s
10	4 s to 10 s
20	6 s to 20 s
30	9 s to 30 s

Thermal Overload Relays

3RU21 up to 100 A, CLASS 10

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



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_e, 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 *UPDATED*

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

Type	Mounting Type	Ltr
Screw	Direct to Contactor	B0
Screw[1]	Stand Alone	B1
Spring[2]	Direct to Contactor	C0
Spring[1] [2]	Stand Alone	C1
Ring Lug	Direct to Contactor	J0

†† Terminal Types II

Type	Mounting Type	Ltr
Screw	Direct to Contactor	B0
Screw [4]	Stand Alone	B1
Spring [3]	Direct to Contactor	D0
Spring [3] [4]	Stand Alone	D1

3RU2116-1GB0

3RU2116-1GC0

3RU2126-4NB0

3RU2136-4RB1

3RU2146-4JB0

Thermal Overload Relays up to 40A Frame Size S00 and S0 ••

Setting Range A	Order No.	Setting Range A	Order No.	Weight approx. (screw/ spring) kg
Frame Size S00: For mounting directly to 3RT201 contactors or for stand-alone installation				
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••**			
Frame Size S0: For mounting directly to 3RT202 contactors or for stand-alone installation				
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 A	Order No.	Setting Range A	Order No.	Weight approx. (screw/ spring) kg
Frame Size S2: For mounting directly to 3RT203 contactors [4]				
5.5 - 8	**3RU2136-1H††**	14 - 20	**3RU2136-4B††**	0.34
7 - 10	**3RU2136-1J††**	18 - 25	**3RU2136-4D††**	
9 - 12.5	**3RU2136-1K††**	22 - 32	**3RU2136-4E††**	
11 - 16	**3RU2136-4A††**	28 - 40	**3RU2136-4F††**	
36 - 45	**3RU2136-4G††**	54 - 65	**3RU2136-4J††**	
40 - 50	**3RU2136-4H††**	62 -73	**3RU2136-4K††**	
47 - 57	**3RU2136-4Q††**	70 - 80	**3RU2136-4R††**	
Frame Size S3: For mounting directly to 3RT104 contactors [4]				
28 - 40	**3RU2146-4F††**	57 - 75	**3RU2146-4K††**	
36 - 50	**3RU2146-4H††**	70 - 90	**3RU2146-4L††**	
45 - 63	**3RU2146-4J††**	80 - 100[5]	**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.

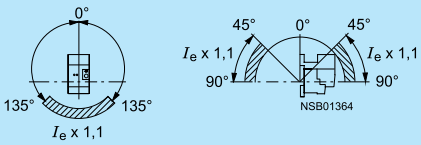
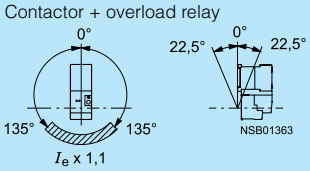
Accessories

	Design		for type Size	Order No.	Weight approx kg
Terminal brackets for stand-alone installation [1]					
3RU29 36-3AA01	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 S0 S2 S3	**3RU29 16-3AA01** **3RU29 26-3AA01** **3RU29 36-3AA01** **3RU29 46-3AA01**	0.04 0.05 0.18 0.28
		Spring Loaded terminals	S00 S0	**3RU29 16-3AC01** **3RU29 26-3AC01**	0.04 0.06
Mechanical RESET					
3RU29 00-1A with pushbutton, and reset plunger	**Resetting plunger, holder, and former overload reset adapter**		S00 to S3	**3RU29 00-1A**	0.038
	Pushbuttons with extended stroke IP 65 ∅ 22 mm, 12 mm hub		S00 to S3	**3SU1200-0FB10-0AA0**	0.020
	Extension plungers For compensation of the distance bewteen the pushbutton and the unlatching button of the relay		S00 to S3	**3SU1900-0KG10-0AA0**	0.004
Cable release with holder for RESET					
3RU29 00-1	For drilled hole ∅ 6.5 mm in the control panel max. control panel thickness 8 mm	Length 400 mm Length 600 mm	S00 to S3 S00 to S3	**3RU29 00-1B** **3RU29 00-1C**	0.063 0.073
Module for remote RESET, electrical					
3RU19 00-2A.71	Operating range 0.85 to 1.1 × U_s 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
Terminal cover					
3RT2936-4EA2	Covers for devices with screw terminals (box terminals) Additional touch protection for fastening to the box terminals				0.040
	• Main current level		S2 S3	**3RT29 36-4EA2** **3RT29 46-4EA2**	0.020 0.025
Sealable covers					
3RV29 08-0P	For covering the rotary setting dials. Order in multiples of 10.		S00 to S2	**3RV29 08-0P**	0.100
Tool for opening Spring Loaded terminal connections					
3RA2908-1A	Suitable up to a For all SIRIUS devices with spring-type terminals • Length: approx. 200 mm; 3.0 × 0.5 mm (green)			**3RA2908-1A**	0.045

[1] The accessories are identical to those of the 3RB30/3RB31 solid-state overload relays.

3RU21 up to 100 A, CLASS 10

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**
General data						
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 Reset possibilities after tripping Recovery time	 on automatic RESET on manual RESET on remote RESET	 min min min	 Manual, remote and automatic RESET [1] depending on the level of tripping current and the tripping characteristic depending on the level of tripping current and the tripping characteristic depending on the level of tripping current and the tripping characteristic			
Features Indication of status on the device TEST function RESET button STOP button			 Yes, using the slide "TEST function/ON-OFF indicator" Yes Yes 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 Ⓔx II (2) GD		On request	
Ambient temperatures Storage/transport Operation Temperature compensation Permissible rated current at	 Internal cabinet temperature of 60 °C Internal cabinet temperature of 70 °C	 °C °C °C % %	 –55 to +80 –40 to +70 up to +60 100 (over +60°C, the current must be reduced) 87			 –55 to +80 –40 to +70 up to +60 100 (over +60°C, current reduction is not required) 87
Repeat terminals Repeat coil terminal Auxiliary switch repeat terminal			 Yes Yes	 Not required Not required		
Degree of protection	acc. to IEC 60529		IP 20			IP 20 [2]
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 • Interference immunity • Emitted interference			 Not relevant 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  Contactor + overload relay  			
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.

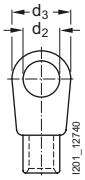
Thermal Overload Relays

3RU21 up to 100 A, CLASS 10

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		Yes			
	AC		Yes, frequency range up to 400 Hz			
Current setting		A	0.11– 0.16 to 11 – 16	1.8 – 2.5 to 34 – 40	5.5 - 8.0 up to 70-80	28 - 40 to 80 – 100
Power loss per device (max.)		W	4.8 ... 7.5	5.7 ... 9.6	10.5 ... 18.9	13.5 ... 21
Short-circuit protection	With fuse without contactor		See selection and ordering data			
	With fuse and contactor		See technical data (short-circuit protection with fuses / circuit-breaker for motor feeders)			
Protective separation between main and auxiliary current paths Acc. to IEC 60947-1,		V				
• Screw terminals or ring terminal lug connections			440	690: Setting ranges ≤ 25 A 440: Setting ranges > 25 A	690	690
• Spring - type terminals			440		690	690

Connection of the main circuit						
Connection type			**Screw terminals**			**Screw terminals with box terminal**
Terminal screw			M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2	4 mm Allen screw
Operating devices		mm	Ø 5 ... 6	Ø 5 ... 6	Ø 5 ... 6	4 mm Allen screw
Prescribed tightening torque		Nm	0.8 ... 1.2	2 ... 2.5	3 ... 4.5	4.5 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded		mm^2	2 x (0.5 ... 1.5)[1] 2 x (0.75 ... 2.5)[1] max. 2 x 4	2 x (1 ... 2.5)[1] 2 x (2.5 ... 10)[1]	2 x (2.5 ... 35)[1] 1 x (2.5 ... 50)[1]	2 x (2.5 ... 16)[1] 2 x (10 ... 50)[1] 1 x (10 ... 70)[1]
• Finely stranded with end sleeve (DIN 46228)		mm^2	2 x (0.5 ... 1.5)[1] 2 x (0.75 ... 2.5)[1]	2 x (1 ... 2.5)[1] 2 x (2.5 ... 6)[1] max. 1 x 10	2 x (1 ... 25)[1] 1 x (1 ... 35)[1]	2 x (2.5 ... 35)[1] 1 x (2.5 ... 50)[1]
• AWG cables, solid or stranded		AWG	2 x (20 ... 16)[1] 2 x (18 ... 14)[1] 2 x 12	2 x (16 ... 12)[1] 2 x (14 ... 8)[1]	2 x (18 ... 2)[1] 1 x (18 ... 1)[1]	2 x (10 ... 1/0)[1] 1 x (10 ... 2/0)[1]
Removable box terminals[2]						
• With copper bars[3]		mm	--	--	--	2 x 12 x 4
• With cable lugs[4]						
- Terminal screw			--	--	--	M6
- Prescribed tightening torque		Nm	--	--	--	4.5 ... 6
- Usable ring terminal lugs		mm	--	--	--	d_2 = min. 6.3 d_3 = max. 19
Connection type			**Spring-loaded terminals**			
Operating devices		mm	3.0 x 0.5 and 3.5 x 0.5			
Conductor cross-sections (min./max.), 1 conductor can be connected						
• Solid or stranded		mm^2	1 x (0.5 ... 4)	1 x (1 ... 10)	--	
• Finely stranded without end sleeve		mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)	--	
• Finely stranded with end sleeve (DIN 46228)		mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)	--	
• AWG cables, solid or stranded		AWG	1 x (20 ... 12)	1 x (18 ... 8)	--	
• Max. external diameter of the conductor insulation		mm	3.6	6.4	--	



1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.
2) Cable lug and busbar connection possible after removing the box terminals.
3) If bars larger than 12 mm x 10 mm are connected, a 3RT2946-4EA2 cover is needed to maintain the required phase clearance.
4) If conductors larger than 25 mm^2 are connected, the 3RT2946-4EA2 cover is needed to maintain the required phase clearance.

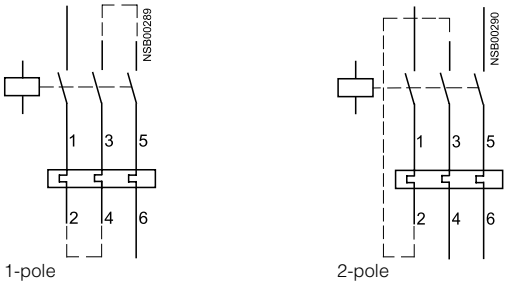
Technical data

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 • 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			
Type			**3RU21 16**	**3RU21 26**	**3RU21 36**	**3RU11 46**
Size			**S00**	**S0**	**S2**	**S3**
Width			**45 mm**	**45 mm**	**55 mm**	**70 mm**
NC, NO AC-15	Rated operational current I_e at U_e: • 24 V	A	3			
	• 120 V	A	3			
	• 125 V	A	3			
	• 230 V	A	2			
	• 400 V	A	1			
	• 600 V	A	0.75			
	• 690 V	A	0.75			
NC, NO for DC DC-13	Rated operational current I_e at U_e: • 24 V	A	1			
	• 110 V	A	0.22			
	• 125 V	A	0.22			
	• 220 V	A	0.11			
Conventional thermal current I_{th}		A	6			
Contact reliability	(suitable for PLC; 17 V, 5 mA)		Yes			
Short-circuit protection						
With fuse	Utilization cat. gL/gG	A	6			
	fast	A	10			
With miniature circuit-breaker (C characteristic)		A	6 (up to $I_k \leq 0.5$ kA; $U \leq 260$ V)			
Reliable operational voltage for protective separation between auxiliary current paths	acc. to IEC 60947-1	V	440			
CSA, UL, UR rated data						
Auxiliary circuit – Switching capacity			B600, R300			
Conductor cross-sections for auxiliary circuit						
Connection type			**Screw terminals**			
Terminal screw			M3, Pozidriv size 2			
Operating devices		mm	∅5 ... 6			
Prescribed tightening torque		Nm	0.8 ... 1.2			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded		mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]			
• Finely stranded with end sleeve (DIN 46228)		mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]			
• AWG cables, solid or stranded		AWG	2 x (20 ... 16)[1], 2 x (18 ... 14)[1]			
Connection type			**Spring-loaded terminals**			
Operating devices		mm	3.0 x 0.5 and 3.5 x 0.5			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded		mm^2	2 x (0.5 ... 2.5)			
• Finely stranded without end sleeve		mm^2	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve (DIN 46228)		mm^2	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			

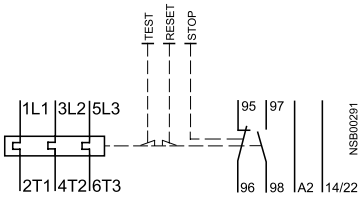
[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

Circuit diagrams

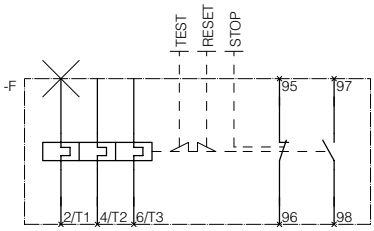
Protection of DC motors



3RU21 16 overload relay



3RU21 26 to 3RU21 46 overload relays

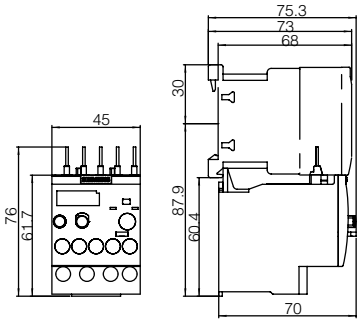


Dimension drawings

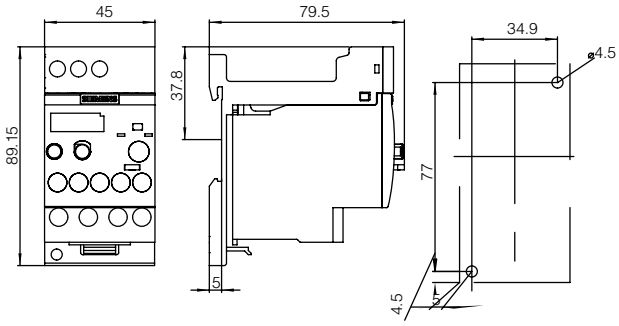
Screw connection

Lateral clearance to grounded components: at least 6 mm.

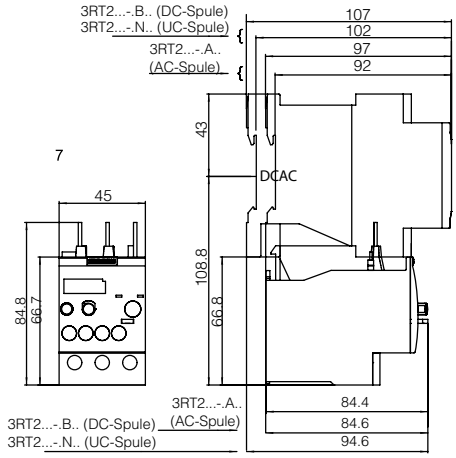
3RU21 16-..B0
Size S00



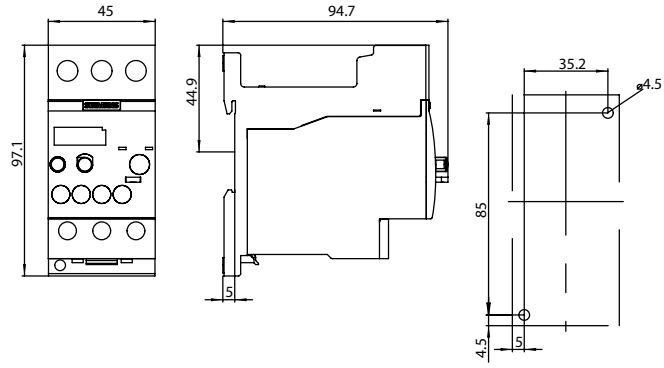
3RU21 16-..B1
Size S00
with adapter for installation as a single unit with accessories



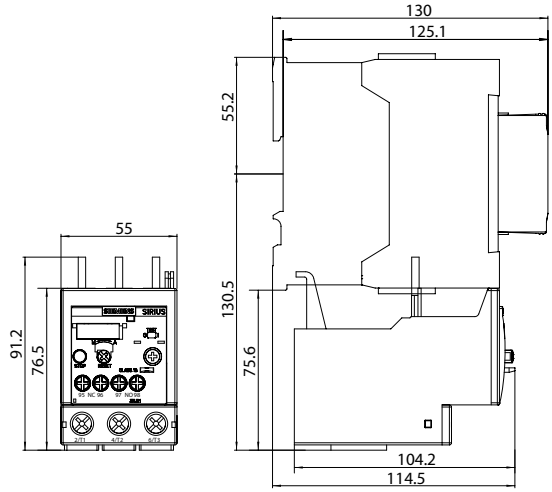
3RU21 26-..B.
Size S0



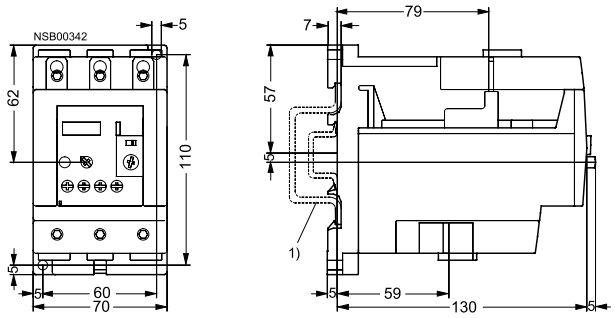
3RU21 26-..B1
Size S0
with adapter for installation as a single unit



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

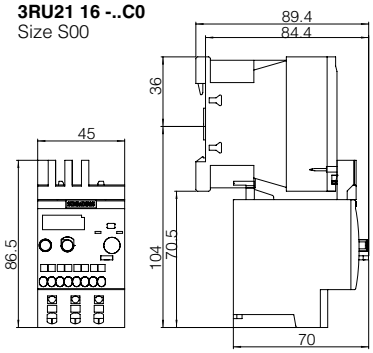
Dimension drawings "Contactor with built-on overload relay" see contactors and contactor combinations.

Dimension drawings

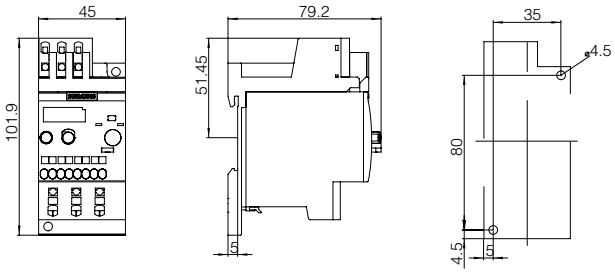
Spring Loaded terminals

Lateral clearance to grounded components: at least 6 mm.

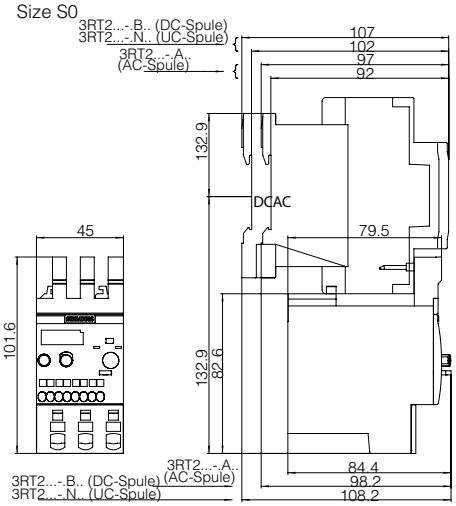
3RU21 16 -..C0
Size S00



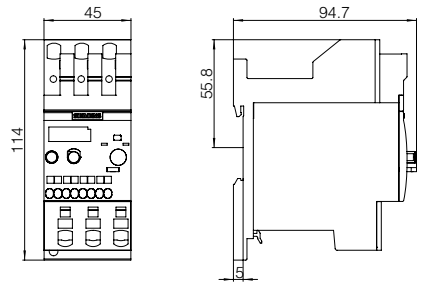
3RU21 16 -..C1
Size S00 with with adapter for installation as a single unit



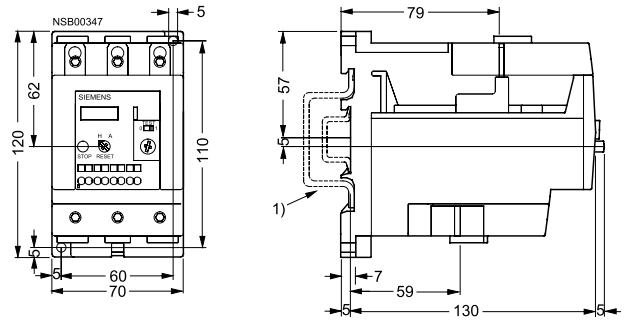
3RU21 26-..C0
Size S0



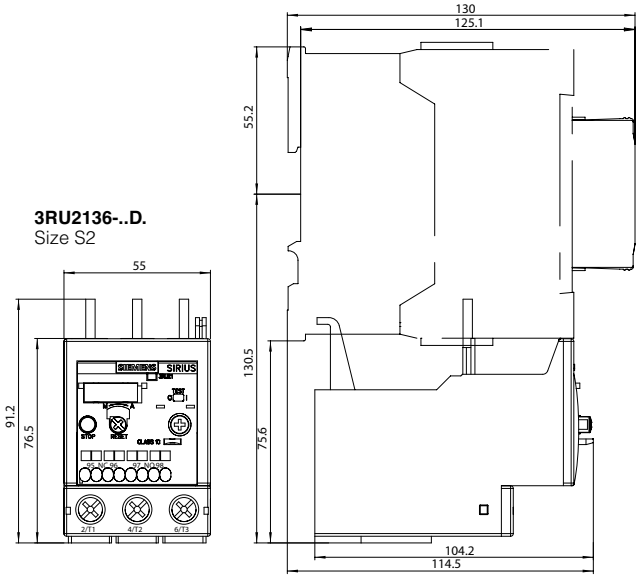
3RU21 26-..C1
Size S0 with adapter for installation as a single unit



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

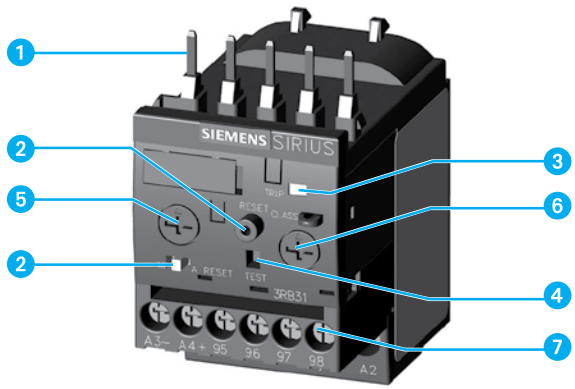
Dimension drawings "Contactor with built-on overload relay" see contactors and contactor combinations.

3RB2 / 3RB3 Solid-State Overload Relays

SIRIUS

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 5E to CLASS 30E) 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 C to +60 °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

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.

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 5E, 10E, 20E or 30E) 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 5E, 10E, 20E or 30E) 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.

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 26-□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	**3RB20 66-□MC2**	160 ... 630
	3RB10 66-□LG0	300 ... 630		
CLASS 10	**1**		**1**	
CLASS 20	**2**		**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	**3RB21 63-4MC2**	160 ... 630
	3RB10 66-□LG0	300 ... 630		
CLASS 10	**1**			
CLASS 20	**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

3RB30/3RB20 electronic overload relays for mounting onto contactors and stand-alone installation, CLASS 10E or 20E

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

	Size Contactor[4]	Set current value of the inverse-time delayed overload trip A		Screw Terminal Order Number	Spring Loaded Terminal Order Number	Weight per PU approx. kg
Size S00[1]						
3RB30 16-1RB0	S00	0.1 … 0.4		**3RB30 16-□RB0**	**3RB30 16-□RE0**	0.172
		0.32 … 1.25		**3RB30 16-□NB0**	**3RB30 16-□NE0**	0.172
		1 … 4		**3RB30 16-□PB0**	**3RB30 16-□PE0**	0.172
		3 … 12		**3RB30 16-□SB0**	**3RB30 16-□SE0**	0.172
		4 … 16		**3RB30 16-□TB0**	**3RB30 16-□TE0**	0.172
Size S0[1]						
3RB30 26-1QB0	S0	0.1 … 0.4		**3RB30 26-□RB0**	**3RB30 26-□RE0**	0.250
		0.32 … 1.25		**3RB30 26-□NB0**	**3RB30 26-□NE0**	0.250
		1 … 4		**3RB30 26-□PB0**	**3RB30 26-□PE0**	0.250
		3 … 12		**3RB30 26-□SB0**	**3RB30 26-□SE0**	0.250
		6 … 25		**3RB30 26-□QB0**	**3RB30 26-□QE0**	0.250
		10 … 40		**3RB30 26-□VB0**	**3RB30 26-□VE0**	0.250
Size S2 [1)3)5)]						
3RB30 36-1UB0	S2	12 … 50	with busbar	**3RB30 36-□UB0**	**3RB30 36-□UD0**	0.360
			with pass through CT's	**3RB30 36-□UW1**	**3RB30 36-□UX1**	0.230
		20 … 80	with busbar	**3RB30 36-□WB0**	**3RB30 36-□WD0**	0.360
			with pass through CT's	**3RB30 36-□WW1**	**3RB30 36-□WX1**	0.230
Size S3 [1)3)5)]						
3RB30 46-1XB0	S3	12.5 … 50	with busbar	**3RB30 46-□UB0**	**3RB30 46-□UD0**	0.560
			with pass through CT's	**3RB30 46-□UW1**	**3RB30 46-□UX1**	0.450
		32 … 115	with busbar	**3RB30 46-□XB0**	**3RB30 46-□XD0**	0.560
			with pass through CT's	**3RB30 46-□XW1**	**3RB30 46-□XX1**	0.450
Size S6 [2)5)]						
3RB20 56-1FW2	S6	50 … 200	with busbar	**3RB20 56-□FC2**	**3RB20 56-□FF2**	1.030
			with pass through CT's	**3RB20 56-□FW2**	**3RB20 56-□FX2**	0.690
Size S10/S12[2)]						
3RB20 66-1MC2	S10/S12 and size 14 (3TF68/ 3TF69)	55 … 250	with busbar	**3RB20 66-□GC2**	**3RB20 66-□GF2**	1.820
		160 … 630	with busbar	**3RB20 66-□MC2**	**3RB20 66-□MF2**	1.820

2 Class 20 — **2** Class 20

1 Class 10 — **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

3RB31/3RB21 electronic overload relays for mounting onto contactors and stand-alone installation, CLASS 5E, 10E, 20E and 30E (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 Contactor[4]	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
Size S00[1]						
3RB31 13-4RB0	S00	0.1 … 0.4		**3RB31 13-4RB0**	**3RB31 13-4RE0**	0.175
		0.32 … 1.25		**3RB31 13-4NB0**	**3RB31 13-4NE0**	0.175
		1 … 4		**3RB31 13-4PB0**	**3RB31 13-4PE0**	0.175
		3 … 12		**3RB31 13-4SB0**	**3RB31 13-4SE0**	0.175
		4 … 16		**3RB31 13-4TB0**	**3RB31 13-4TE0**	0.175
Size S0[1]						
3RB31 23-4QB0	S0	0.1 … 0.4		**3RB31 23-4RB0**	**3RB31 23-4RE0**	0.215
		0.32 … 1.25		**3RB31 23-4NB0**	**3RB31 23-4NE0**	0.215
		1 … 4		**3RB31 23-4PB0**	**3RB31 23-4PE0**	0.215
		3 … 12		**3RB31 23-4SB0**	**3RB31 23-4SE0**	0.215
		6 … 25		**3RB31 23-4QB0**	**3RB31 23-4QE0**	0.215
		10 … 40		**3RB31 23-4VB0**	**3RB31 23-4VE0**	0.215
Size S2[1)3)5)]						
3RB31 33-4WB0	S2	12 … 50	with busbar	**3RB31 33-4UB0**	**3RB31 33-4UD0**	0.360
			with pass through CT's	**3RB31 33-4UW1**	**3RB31 33-4UX1**	0.230
		20 … 80	with busbar	**3RB31 33-4WB0**	**3RB31 33-4WD0**	0.360
			with pass through CT's	**3RB31 33-4WW1**	**3RB31 33-4WX1**	0.230
Size S3[1)3)5)]						
3RB31 43-4XB0	S3	12.5 … 50	with busbar	**3RB31 43-4UB0**	**3RB31 43-4UD0**	0.560
			with pass through CT's	**3RB31 43-4UW1**	**3RB31 43-4UX1**	0.450
		32 … 115	with busbar	**3RB31 43-4XB0**	**3RB31 43-4XD0**	0.560
			with pass through CT's	**3RB31 43-4XW1**	**3RB31 43-4XX1**	0.450
Size S6[2)5)]						
3RB21 53-4FC2	S6	50 … 200	with busbar	**3RB21 53-4FC2**	**3RB21 53-4FF2**	1.030
			with pass through CT's	**3RB21 53-4FW2**	**3RB21 53-4FX2**	0.690
Size S10/S12[2)]						
3RB21 63-4MC2	S10/S12 and size 14 (3TF68/ 3TF69)	55 … 250		**3RB21 63-4GC2**	**3RB21 63-4GF2**	1.820
		160 … 630		**3RB21 63-4MC2**	**3RB21 63-4MF2**	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.

3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

Technical specifications

Type		3RB30 16, 3RB31 13	3RB30 26, 3RB31 23	3RB30 36 3RB31 33	3RB30 46, 3RB31 43	3RB20 56, 3RB21 53	3RB20 66, 3RB21 63
Size		**S00**	**S0**	**S2**	**S3**	**S6**	**S10/S12**
Width		**45 mm**	**45 mm**	**55 mm**	**70 mm**	**120 mm**	**145 mm**
General data							
Trips in the event of		Overload, phase failure, and phase unbalance + ground fault (for 3RB31 only)					
Trip class according to IEC 60947-4-1	CLASS	3RB30: 10E, 20E; 3RB31: 5E, 10E, 20E or 30E adjustable					
Phase failure sensitivity		Yes					
Overload warning					No		
Reset and recovery							
• Reset options after tripping		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		
• Recovery time							
- For automatic RESET	min.	Appox. 3 min			Appox. 3 min		
- For manual RESET	min.	Immediately			Immediately		
- For remote RESET	min.	Immediately			Immediately		
Features							
• Display of operating status on device		Yes, by means of switch position indicator slide					
• TEST function		Yes, test of electronics by pressing the button Test Test of auxiliary contacts and wiring of control current circuit by actuating the switch position indicator slide/self-monitoring					
• RESET button		Yes					
• STOP button		No					
Protection and operation of explosion-proof motors Certificate of suitability/explosion protection type according to ATEX directive 2014/34/EU		PTB 09 ATEX 3001 Ⓔx II (2) G [Ex e] [Ex d] [Ex px] Ⓔx II (2) G [Ex t] [Ex p]			PTB 09 ATEX 3001 Ⓔx II (2) G [Ex e] [Ex d] [Ex px] Ⓔx II (2) G [Ex t] [Ex p]		
Ambient temperatures							
• 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[2]
- Temperature inside control cabinet 60 °C, mounted on contactor	%	100			100	70	70
- Temperature inside control cabinet 70 °C	%	On request			On request		
Repeat terminals							
• Coil repeat terminal		Yes	Not required				
• Auxiliary contact repeat terminal		Yes	Not required				
Degree of protection according to IEC 60529		IP20				IP20[3]	
Touch protection according to IEC 61140		Finger-safe for vertical contact from the front				Finger-safe, for busbar connection with cover	Finger-safe with cover
Shock resistance with sine according to IEC 60068-2-27	g/ms	15/11 (signaling contact 97/98 in position "tripped": 9 g/11ms)		15/11 (signaling contact 97/98 in "Tripped" position: 8 g/11ms)	15/11 (signaling contact 97/98 in position "tripped": 4 g/11ms)		
Electromagnetic compatibility (EMC) – Interference immunity							
• Conductor-related interference							
- 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					
Electromagnetic compatibility (EMC) – Emitted interference		Degree of severity B according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)					
Resistance to extreme climates – air humidity	%	95			100		
Dimensions		See dimensional drawings					
Installation altitude above sea level	m	Up to 2000					
Mounting position		Any					
Type of mounting		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, Ie max = 32 A
- CLASS 30, Ie max = 25 A

2) 90 % for relay with current setting range 160A to 630A

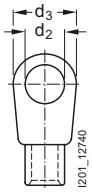
3) Terminal compartment: degree of protection IP00.

3RB2 / 3RB3 Solid-State Overload Relays

SIRIUS

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

Type Size Width		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
Main circuit					
Rated insulation voltage U_i (pollution degree 3)	V	690	690	690 1000 with straight-through transformer	1000
Rated impulse withstand voltage U_{imp}	kV	6	6	6/8	8
Rated operational voltage U_e	V	690	690	690 1000 with straight-through transformer	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	0.1 ... 1.1	0.1 ... 4.5	0.5 ... 4.6	0.9 ... 4.6
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			
Connection for main circuit					
Connection type		**Screw terminals**			**Screw terminals with box terminal**
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2		4 mm Allen screw
Operating devices	mm	∅5 ... 6	∅5 ... 6		4 mm Allen screw
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5		4.5 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1] 2 x (0.75 ... 2.5)[1] 2 x (0.5 ... 4)[1]	2 x (1 ... 2.5)[1] 2 x (2.5 ... 10)[1]	1 x (1 ... 50)[1] 2 x (1 ... 35)[1]	2 x (2.5 ... 16)[1] 2 x (10 ... 50)[1] 1 x (10 ... 70)[1]
• Finely stranded with end sleeve (DIN 46228)	mm^2	2 x (0.5 ... 1.5)[1] 2 x (0.75 ... 2.5)[1]	2 x (1 ... 2.5)[1] 2 x (2.5 ... 6)[1] max. 1 x 10	2 x (1 ... 25)[1] 1 x (1 ... 35)[1]	2 x (2.5 ... 35)[1] 1 x (2.5 ... 50)[1]
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1] 2 x (18 ... 14)[1] 2 x 12	2 x (16 ... 12)[1] 2 x (14 ... 8)[1]	2 x (18 ... 2)[1] 1 x (18 ... 1)[1]	2 x (10 ... 1/0)[1] 1 x (10 ... 2/0)[1]
Removable box terminals[2] • With copper bars[3] • With cable lugs[4] - Terminal screw - Prescribed tightening torque - Usable ring terminal lugs	 mm Nm mm	 -- -- -- --	 -- -- -- --	 -- -- -- --	 2 x 12 x 4 M6 4.5 ... 6 d_2 = min. 6.3 d_3 = max. 19
Connection type		**Spring-loaded terminals**			
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5			
Conductor cross-sections (min./max.), 1 conductor can be connected					
• Solid or stranded	mm^2	1 x (0.5 ... 4)	1 x (1 ... 10)	--	
• Finely stranded without end sleeve	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)	--	
• Finely stranded with end sleeve (DIN 46228)	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)	--	
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)	1 x (18 ... 8)	--	
• Max. external diameter of the conductor insulation	mm	3.6	6.4	--	
Connection type		**Straight-through transformers**			
Diameter of opening	mm	--		15	18



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

2) Cable lug and busbar connection possible after removing the box terminals.

3) If bars larger than 12 mm x 10 mm are connected, a 3RT2946-4EA2 cover is needed to maintain the required phase clearance.

4) If conductors larger than 25 mm^2 are connected, the 3RT2946-4EA2 cover is needed to maintain the required phase clearance.

3RB2 /3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

Type		3RB20 56, 3RB21 53	3RB20 66, 3RB21 63
Size		**S6**	**S10/S12**
Width		**120 mm**	**145 mm**
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	1000	
Rated impulse withstand voltage U_{imp}	kV	8	
Rated operational voltage U_e	V	1000	
Type of current			
• Direct current		No	
• Alternating current		Yes, 50/60 Hz ± 5 (other frequencies on request)	
Set current	A	50 ... 200	55 ... 250 to 160 ... 630
Power loss per unit (max.)	W	0.05	
Short-circuit protection			
- With fuse without contactor		See Selection and Ordering Data	
- With fuse and contactor		See Technical Specifications (short-circuit protection with fuses for motor feeders)	
Safe isolation between main and auxiliary conducting path according to IEC 60947-1	V	690[1)]	
Connection for main circuit			
Electrical connection version		Screw terminal with box terminal/ Bus connection / Straight-through transformer	Screw terminal with box terminal/ Bus connection
Screw terminal			
• 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^2	--	
- Finely stranded without end sleeve	mm^2	With 3RT19 55-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70) With 3RT19 56-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), front clamping point only: 1 × (70 ... 240) rear clamping point only: 1 × (120 ... 185)
- Finely stranded with end sleeve	mm^2	With 3RT19 55-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70) With 3RT19 56-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), front clamping point only: 1 × (70 ... 240) rear clamping point only: 1 × (120 ... 185)
- Stranded	mm^2	With 3RT19 55-4G box terminal: 2 × (max. 70), 1 × (16 ... 70) With 3RT19 56-4G box terminal: 2 × (max. 120), 1 × (16 ... 120)	2 × (70 ... 240), front clamping point only: 1 × (95 ... 300) rear clamping point only: 1 × (120 ... 240)
- AWG conductors, solid or stranded	AWG	With 3RT19 55-4G box terminal: 2 × (max. 1/0), 1 × (6 ... 2/0) With 3RT19 56-4G box terminal: 2 × (max. 3/0), 1 × (6 ... 250 kcmil)	2 × (2/0 ... 500 kcmil), front clamping point only: 1 × (3/0 ... 600 kcmil) rear clamping point only: 1 × (250 kcmil ... 500 kcmil)
- Ribbon cable conductors (number x width x circumference)	mm	With 3RT19 55-4G box terminal: 2 × (6 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 6 × 15.5 × 0.8) With 3RT19 56-4G box terminal: 2 × (10 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 10 × 15.5 × 0.8)	2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5)
Busbar connections			
• Terminal screw		M 8 × 25	M 10 × 30
• Tightening torque	Nm	10 ... 14	14 ... 24
• Conductor cross-section (min./max.)			
- Finely stranded with cable lug	mm^2	16 ... 95[2)]	50 ... 240[3)]
- Stranded with cable lug	mm^2	25 ... 120[2)]	70 ... 240[3)]
- AWG connections, solid or stranded, with cable lug	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
- With connecting bar (max. width)	mm	15	25
Straight-through transformers			
• Diameter of opening	mm	24.5	--
• Conductor cross-section (max.)			
- NYY	mm^2	120	--
- H07RN-F	mm^2	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^2 to ensure phase spacing.

3) When connecting cable lugs according to DIN 46234 for conductor cross-sections from 240 mm^2 as well as DIN 46235 for conductor cross-sections from 185 mm^2, use the 3RT19 56-4EA1 terminal cover to ensure phase spacing.

3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

Type		3RB30 16, 3RB31 13	3RB30 26, 3RB31 23	3RB30 36, 3RB31 33	3RB30 46, 3RB31 43	3RB20 56, 3RB21 53	3RB20 66, 3RB21 63
Size		**S00**	**S0**	**S2**	**S3**	**S6**	**S10/S12**
Width		**45 mm**	**45 mm**	**55 mm**	**70 mm**	**120 mm**	**145 mm**
Auxiliary circuit							
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					
Auxiliary contacts – Contact rating							
• NC, NO contact with alternating current AC-14/AC-15, rated operational current *Ie* at *Ue*							
- 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	2					
- 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					
Short-circuit protection							
• With fuse							
- gL/gG operational class	A	6					
Ground-fault protection (only 3RB31)		The information refers to sinusoidal residual currents at 50/60 Hz.					
• Tripping value I_Δ		> 0.75 × I_{motor}					
• Operating range *I*		Lower current setting value < I_{motor} < 3.5 × upper current setting value					
• Response time t_{trip} (in steady-state condition)	s	< 1					
Integrated electrical remote RESET (only 3RB31)							
Connecting terminals A3, A4		24 V DC, max. 200 mA for approx. 20 ms, then < 10 mA					
Protective separation between main and auxiliary conducting path according to IEC 60947-1	V	300					
CSA, UL, and UR rated data							
Auxiliary circuit – switching capacity		3RB30: B600, R300 3RB31: B300, R300			B300, R300		
Connection of the auxiliary circuit							
Connection type		Screw terminal or spring-loaded terminals					
Screw terminal							
• 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^2	1 × (0.5 ... 4), 2 × (0.5 ... 2.5)					
- Finely stranded with end sleeve	mm^2	1 × (0.5 ... 2.5), 2 × (0.5 ... 1.5)					
- AWG conductors, solid or stranded	AWG	2 × (20 ... 14)					
Spring-loaded terminals							
• Conductor cross-sections (min./max.), 1 or 2 conductors							
- Solid	mm^2	2 × (0.25 ... 1.5)					
- Finely stranded without end sleeve	mm^2	--					
- Finely stranded with end sleeve	mm^2	2 × (0.25 ... 1.5)					
- Stranded	mm^2	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 5 and 10			20			30			690 V Fuse links[1] LV HRC Type 3NA DIAZED Type 5SB NEOZED Type 5SE gL/gG operational class	
		Rated operational current I_e AC-3 in A at									Type of coordination[2]	
Setting range	Type	400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	1	2
Size S00												
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
Size S0												
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
Size S2												
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
Size S3												
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
Size S6												
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
Size S10/S12												
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	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[3]	630	630	630	440	440	440	376	376	376	800	500[4]
	3TF69[3]	630	630	630	572	572	572	500	500	500	800	630[4]

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

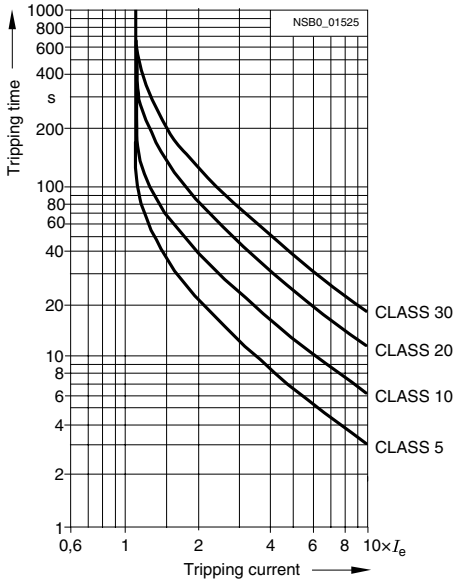


Illustration 1

Tripping characteristics for 2-pole loads

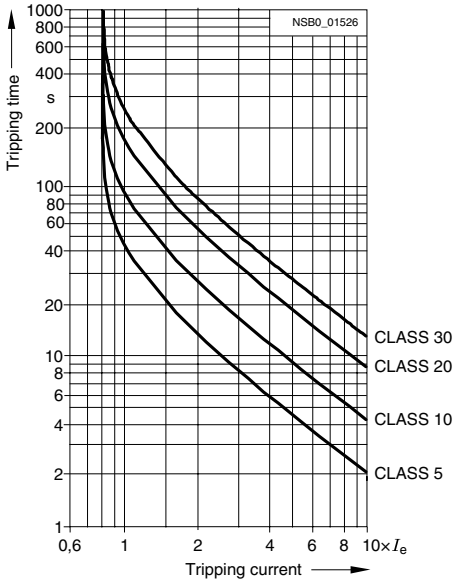
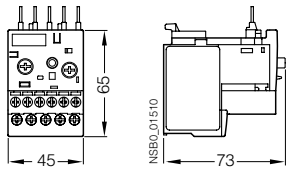


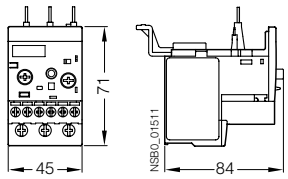
Illustration 2

The above illustrations are schematic representations of characteristic curves.

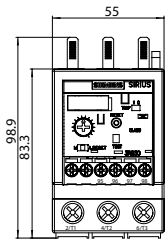
Dimensional drawings

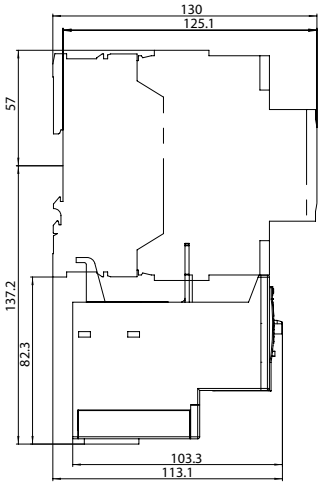


3RB30 16, 3RB31 13, size S00

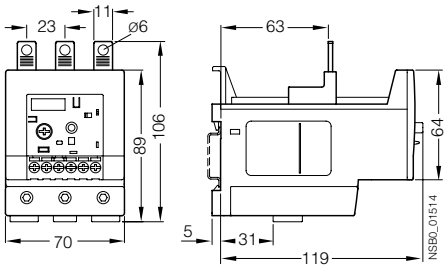


3RB30 26, 3RB31 23, size S0

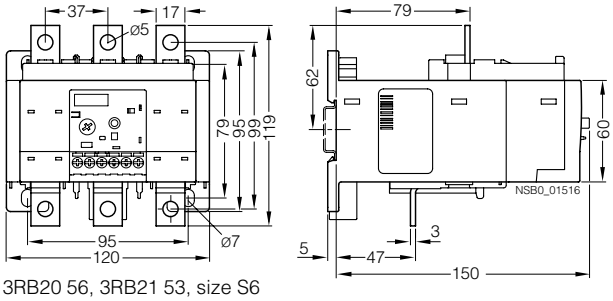




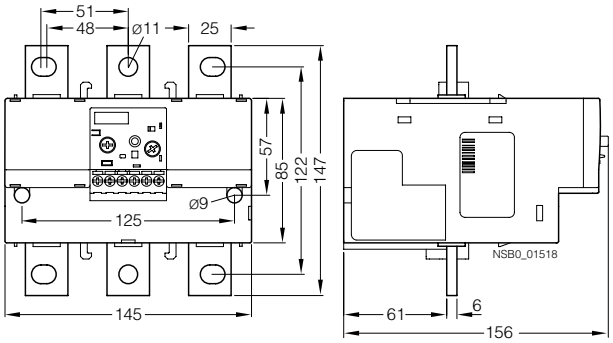
3RB30 36, 3RB31 33, size S2



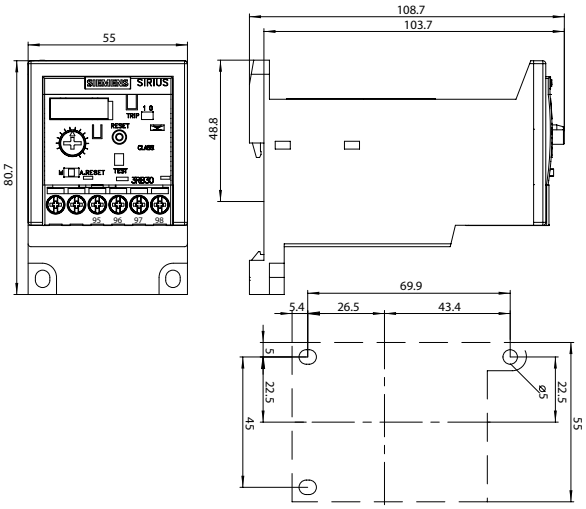
3RB30 46, 3RB31 43, size S3



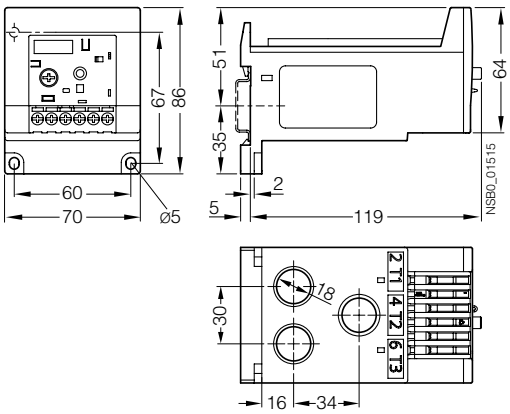
3RB20 56, 3RB21 53, size S6



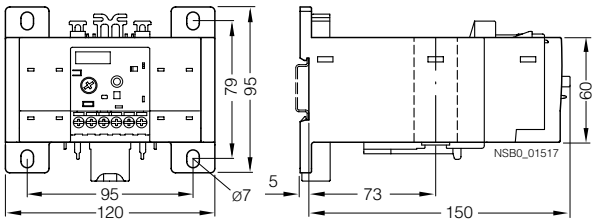
3RB20 66, 3RB21 63, size S10/S12



3RB30 36, 3RB31 33, size S2 with straight-through transformer



3RB30 46, 3RB31 43, size S3 with straight-through transformer

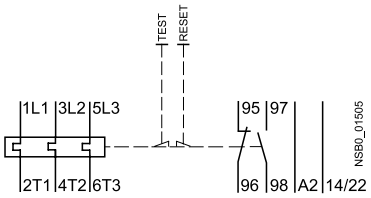


3RB20 56, 3RB21 53, size S6 with straight-through transformer

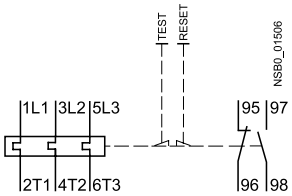
3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A for standard applications

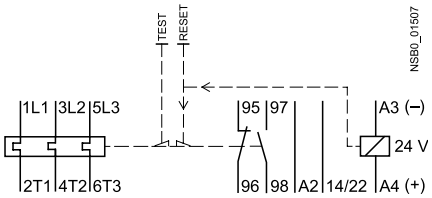
Schematics



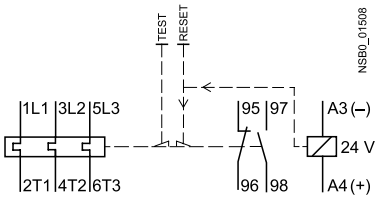
3RB30 16 overload relays



3RB30 26 to 3RB20 66 overload relays



3RB31 13 overload relays

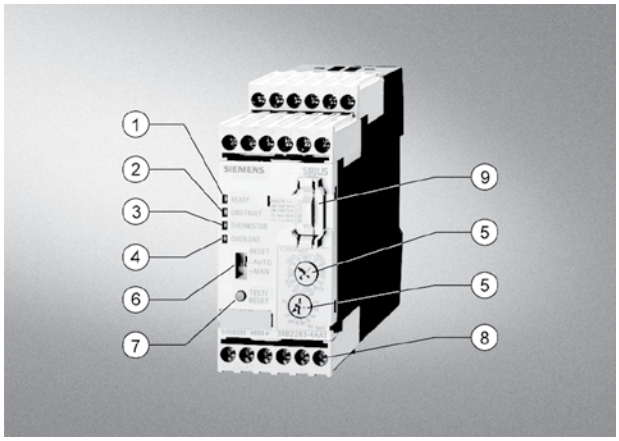


3RB31 23 to 3RB21 63 overload relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for high-feature applications UPDATED

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).

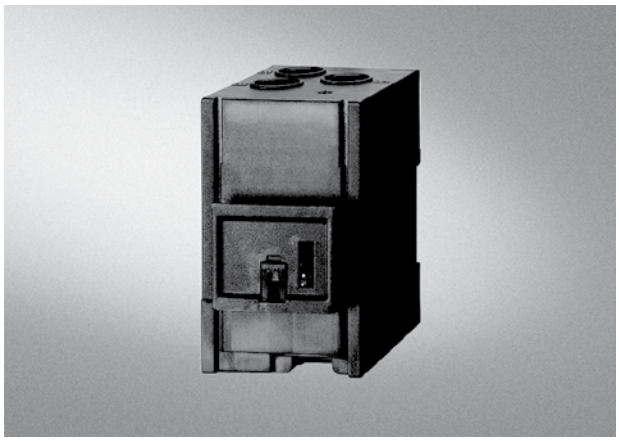
(5) Motor current and trip class adjustment:
Setting the device to the motor current and to the required trip class dependent on the starting conditions is easy with the two rotary knobs.

(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_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 5E to CLASS 30E), 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 C to +60 °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 °C or above +60 °C on request.

Use of SIRIUS protection devices in conjunction with IE3/IE4 motors

Note:
For the use of 3RB22 and 3RB23 electronic overload relays in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see Application Manual.

"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 5E, 10E, 20E and 30E (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					
3RB2. 83-4AA1	S00 ... S12	Monostable	Screw connection	**3RB22 83-4AA1**	0.300
			Spring-loaded terminals	**3RB22 83-4AC1**	0.300
		Bistable	Screw connection	**3RB23 83-4AA1**	0.300
			Spring-loaded terminals	**3RB23 83-4AC1**	0.300
3RB2. 83-4AC1					
Function expansion modules					
	–	**Analog Basic 1 module**[1)] Analog output DC 4 ... 20 mA, with overload warning		**3RB29 85-2AA0**	0.030
		Analog Basic 1 GF module[1)2)] Analog output DC 4 ... 20 mA, with internal ground fault detection and overload warning		**3RB29 85-2AA1**	0.030
		Analog Basic 2 GF module[1)2)] Analog output DC 4 ... 20 mA, with internal ground fault detection and ground fault signaling		**3RB29 85-2AB1**	0.030
		Basic 1 GF module[2)] with internal ground fault detection and overload warning		**3RB29 85-2CA1**	0.030
		Basic 2 GF module[2)] with internal ground fault detection and ground fault signaling		**3RB29 85-2CB1**	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_e 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_e 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[1] and stand-alone installation[1)2)]

	Size Con-tactor[3]	Set current value of the inverse-time delayed overload trip A		Order No.	Weight per PU approx. kg
Size S00/S0[2)4)]					
3RB29 06-2.G1	S00/S0	0.3 … 3		**3RB29 06-2BG1**	0.100
		2.4 … 25		**3RB29 06-2DG1**	0.150
Size S2/S3[2)4)]					
3RB29 06-2JG1	S2/S3	10 … 100		**3RB29 06-2JG1**	0.350
Size S6[1)4)]					
3RB29 56-2TG2	S6	20 … 200	with pass through CT's	**3RB29 56-2TG2**	0.600
			with busbar	**3RB29 56-2TH2**	1.000
Size S10/S12[1)]					
3RB29 66-2WH2	S10/S12 and size 14 (3TF68/ 3TF69)	63 … 630		**3RB29 66-2WH2**	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
Connecting cables (essential accessory)				
3RB29 87-2.		For connection between evaluation module and current measuring module		
	S00 ... S3	• Length 0.1 m (only for mounting of the evaluation module directly onto the current measuring module)	**3RB29 87-2B**	0.010
	S00 ... S12	• Length 0.5 m	**3RB29 87-2D**	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 5E, 10E, 20E or 30E) 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 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_{emax}) 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 × 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

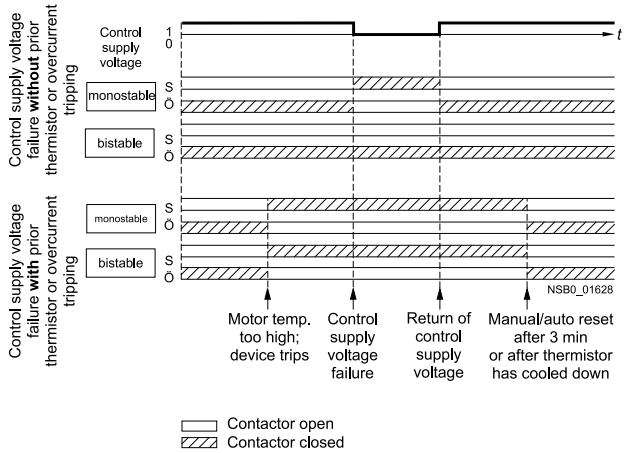
If the control supply voltage fails for more than 0.2 s, the output relays respond differently depending on the version: Monostable or bistable.

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: • For overload tripping, after 3 minutes • For thermistor tripping, after the temperature has fallen 5 K below the response temperature • For ground-fault tripping, immediately	The device remains tripped Reset: • For overload tripping, after 3 minutes • For thermistor tripping, after the temperature has fallen 5 K below the response temperature • For ground-fault tripping, immediately

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/WW/view/en/35681297
- or specific information on a particular article number via the product data sheet, http://support.automation.siemens.com/WW/view/en/20357046/133200

Type Ð Overload relay: evaluation modules		**3RB2283-4A.1**	**3RB2383-4A.1**
Size contactor		S00 ... S10/S12	
Dimensions of evaluation modules (W x H x D)	mm	45 x 111 x 95	
General data			
Trips in the event of		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)	
Trip class acc. to IEC 60947-4-1		CLASS 5E, 10E, 20E and 30E adjustable	
Phase failure sensitivity		Yes	
Overload warning		Yes, from 1.125 x I_e for symmetrical loads and from 0.85 x I_e for unsymmetrical loads	
Reset and recovery			
• Reset options after tripping		Manual, automatic and remote RESET	
• 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 tripping due to a ground fault: no automatic RESET	
- For manual 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 tripping due to a ground fault: Immediately	
- For remote 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 tripping due to a ground fault: Immediately	
Features			
• 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	
Protection and operation of explosion-proof motors			
EC type test certificate number according to directive 94/9/EC (ATEX)		PTB 05 ATEX 3022 Ex II (2) GD, see http://support.automation.siemens.com/WW/view/en/23115758	--
Ambient temperatures			
• 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	
Degree of protection acc. to IEC 60529		IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
Touch protection acc. to IEC 61140		Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
Shock resistance with sine acc. to IEC 60068-2-27	*g*/ms	15/11	
Electromagnetic compatibility (EMC) Ð Interference immunity			
• 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	
Electromagnetic compatibility (EMC) Ð emitted interference		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**
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					
• Direct current		No			
• Alternating current		Yes, 50/60 Hz ± 5 % (other frequencies on request)			
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					
• With fuse without contactor		See Selection and Ordering Data			
• With fuse and contactor		See Technical Specifications (short-circuit protection with fuses for motor feeders)			
Safe isolation between main and auxiliary conducting path according to IEC 60947-1	V	690[1)]			
Connection for main circuit					
Electrical connection version		Screw terminals with box terminal			
Screw terminal					
• 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^2	--		--	--
- Finely stranded without end sleeve	mm^2	--		With 3RT19 55-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70) With 3RT19 56-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), front clamping point only: 1 × (70 ... 240) rear clamping point only: 1 × (120 ... 185)
- Finely stranded with end sleeve	mm^2	--		With 3RT19 55-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70) With 3RT19 56-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), front clamping point only: 1 × (70 ... 240) rear clamping point only: 1 × (120 ... 185)
- Stranded	mm^2	--		With 3RT19 55-4G box terminal: 2 × (max. 70), 1 × (16 ... 70) With 3RT19 56-4G box terminal: 2 × (max. 120), 1 × (16 ... 120)	2 × (70 ... 240), front clamping point only: 1 × (95 ... 300) rear clamping point only: 1 × (120 ... 240)
- AWG conductors, solid or stranded	AWG	--		With 3RT19 55-4G box terminal: 2 × (max. 1/0), 1 × (6 ... 2/0) With 3RT19 56-4G box terminal: 2 × (max. 3/0), 1 × (6 ... 250 kcmil)	2 × (2/0 ... 500 kcmil), front clamping point only: 1 × (3/0 ... 600 kcmil) rear clamping point only: 1 × (250 kcmil ... 500 kcmil)
- Ribbon cable conductors (number x width x circumference)	mm	--		With 3RT19 55-4G box terminal: 2 × (6 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 6 × 15.5 × 0.8) With 3RT19 56-4G box terminal: 2 × (10 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 10 × 15.5 × 0.8)	2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5)
Busbar connections					
• Terminal screw		--		M8 × 25	M10 × 30
• Tightening torque	Nm	--		10 ... 14	14 ... 24
• Conductor cross-section (min./max.)		--			
- Solid with cable lug	mm^2	--		16 ... 95[2)]	50 ... 240[3)]
- Stranded with cable lug	mm^2	--		25 ... 120[2)]	70 ... 240[3)]
- AWG connections, solid or stranded, with cable lug	AWG	--		4 ... 250 kcmil	2/0 ... 500 kcmil
- With connecting bar (max. width)	mm	--		15	25
Straight-through transformers					
• Diameter of opening	mm	7.5	14	25	--
• Conductor cross-section (max.)					
- NYY	mm^2	4)	4)	120	--
- H07RN-F	mm^2	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^2 to ensure phase spacing.

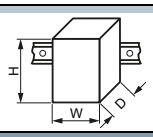
3) When connecting cable lugs according to DIN 46234 for conductor cross-sections from 240 mm^2 as well as DIN 46235 for conductor cross-sections from 185 mm^2, use the 3RT19 56-4EA1 terminal cover to ensure phase spacing.

4) On request.

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

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)	mm	45 x 111 x 95	



General data (continued)		
Resistance to extreme climates – air humidity	%	100
Dimensions		"Dimensional drawings", see • Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", http://support.automation.siemens.com/WW/view/en/35681297 • Product data sheet, http://support.automation.siemens.com/WW/view/en/20357046/133200
Installation altitude above sea level	m	Up to 2 000
Mounting position		Any
Type of mounting		
• Evaluation modules		Stand-alone installation
• Current measuring module	Size	S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors

Type – Overload relay: evaluation modules		**3RB2283-4A.1, 3RB2383-4A.1**
Size contactor		S00 ... S10/S12
Auxiliary circuit		
Number of NO contacts		2
Number of NC contacts		2
Number of CO contacts		--
Auxiliary contacts – assignment		• Alternative 1 - 1 NO for the signal "tripped by overload and/or thermistor" - 1 NC for disconnecting the contactor - 1 NO for the signal "tripped by ground fault" - 1 NC for disconnecting the contactor or[1)] • Alternative 2 - 1 NO for the signal "tripped by overload and/or thermistor and/or ground fault" - 1 NC for disconnecting the contactor - 1 NO for overload warning - 1 NC for disconnecting the contactor
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Auxiliary contacts – contact rating		
• 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
Short-circuit protection		
• With fuse, operational class gG	A	6
• With miniature circuit breaker, C characteristic	A	1.6
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	300
CSA, UL, UR rated data		
Auxiliary circuit – switching capacity		B300, R300

1) The assignment of auxiliary contacts may be influenced by function expansion modules.

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

Type – Overload relay: evaluation modules		3RB2283-4A.1, 3RB2383-4A.1
Size contactor		S00 ... S10/S12
Control circuit		
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Rated control supply voltage U_s		
• 50/60 Hz AC	V	24 ... 240
• DC	V	24 ... 240
Operating range		
• 50/60 Hz AC		$0.85 \times U_{s\,min} \leq U_s \leq 1.1 \times U_{s\,max}$
• DC		$0.85 \times U_{s\,min} \leq U_s \leq 1.1 \times U_{s\,max}$
Rated power		
• 50/60 Hz AC	W	0.5
• DC	W	0.5
Mains buffering time	ms	200
Sensor circuit		
Thermistor motor protection (PTC thermistor sensor)		
• Summation cold resistance	kΩ	≤ 1.5
• Response value	kΩ	3.4 ... 3.8
• Return value	kΩ	1.5 ... 1.65
Ground-fault detection		The information refers to sinusoidal residual currents at 50/60 Hz.
• Tripping value I_Δ [1]		
- 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
Analog output [1)2)]		
Rated values		
• Output signal	mA	4 ... 20
• Measuring range		0 ... $1.25 \times I_e$ 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.	Ω	100
Conductor cross-sections for the auxiliary, control and sensor circuit as well as the analog output		
Connection type		**Screw terminals**
Terminal screw		M3, Pozidriv size 2
Operating devices	mm	3.0 x 0.5
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	1 × (0.5 ... 4)[3], 2 × (0.5 ... 2.5)[3]
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	1 × (0.5 ... 2.5)[3], 2 × (0.5 ... 1.5)[3]
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)
Connection type		**Spring-type terminals**
Operating devices	mm	3.0 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	2 × (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 × (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)

1) For the 3RB22 and 3RB23 overload relays in combination with a corresponding function expansion module.

2) 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.

3) 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 5 and 10			CLASS 20			CLASS 30			690 V Fuse links[1] LV HRC DIAZED NEOZED gL/gG operational class	Type 3NA Type 5SB Type 5SE Type of coordination[2]
		Rated operational current I_e AC-3 in A at										
Setting range	Type	400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	1	2
Size S00/S0												
0.3 ... 3 A	3RT20 15	3	3	3	3	3	3	3	3	3	35	20
	3RT20 16	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
Size S2/S3												
On request	3RT20 35	On request										
	3RT20 36	On request										
	3RT20 45	On request										
	3RT20 46	On request										
	3RT20 47	On request										
Size S6												
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
Size S10/S12												
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[3]	630	630	630	440	440	440	376	376	376	800	500[4]
	3TF69[3]	630	630	630	572	572	572	500	500	500	800	630[4]

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 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

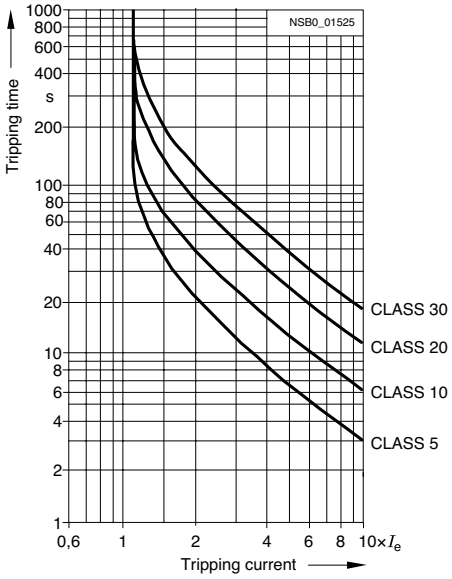


Illustration 1

Tripping characteristics for 2-pole loads

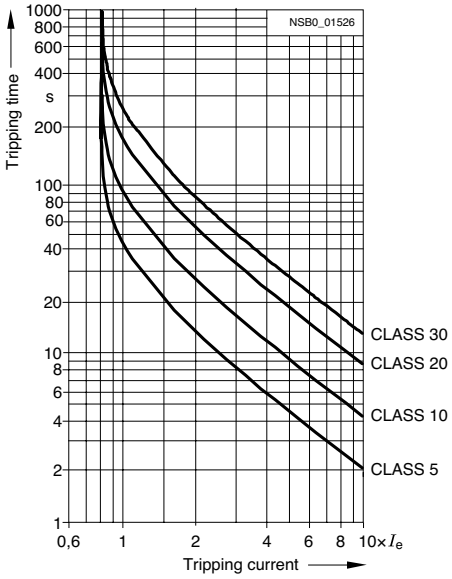
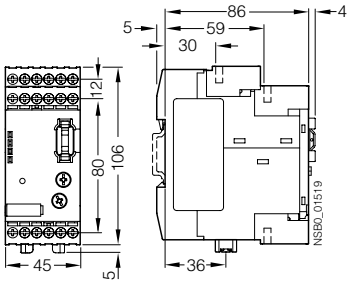


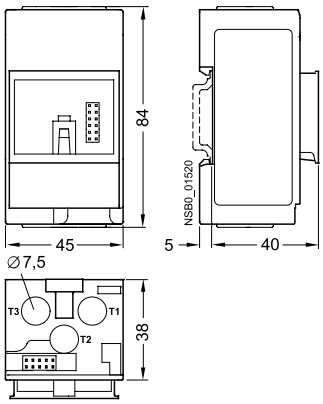
Illustration 2

The above illustrations are schematic representations of characteristic curves.

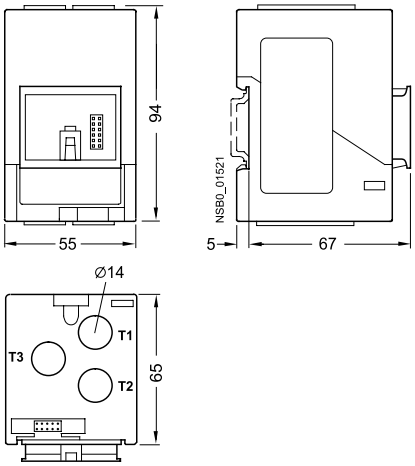
Dimensional drawings



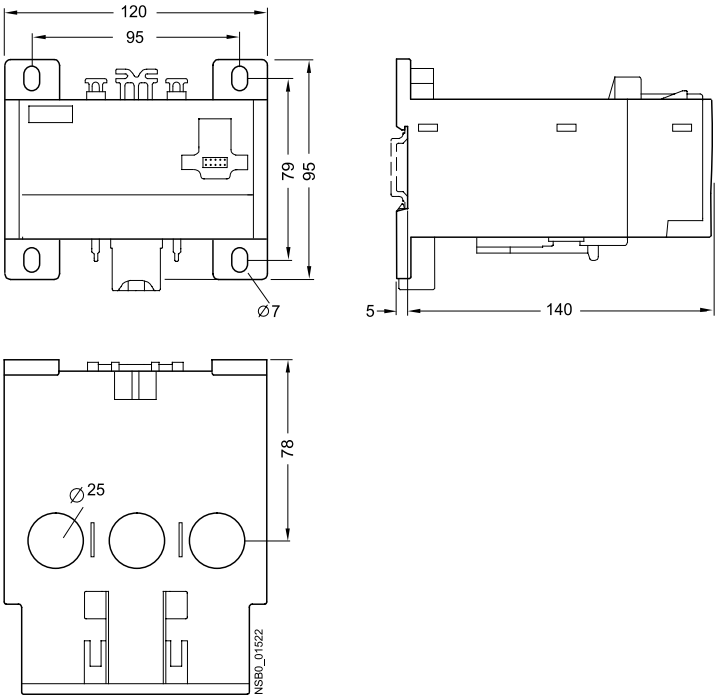
3RB22 83-4, 3RB23 83-4 evaluation module



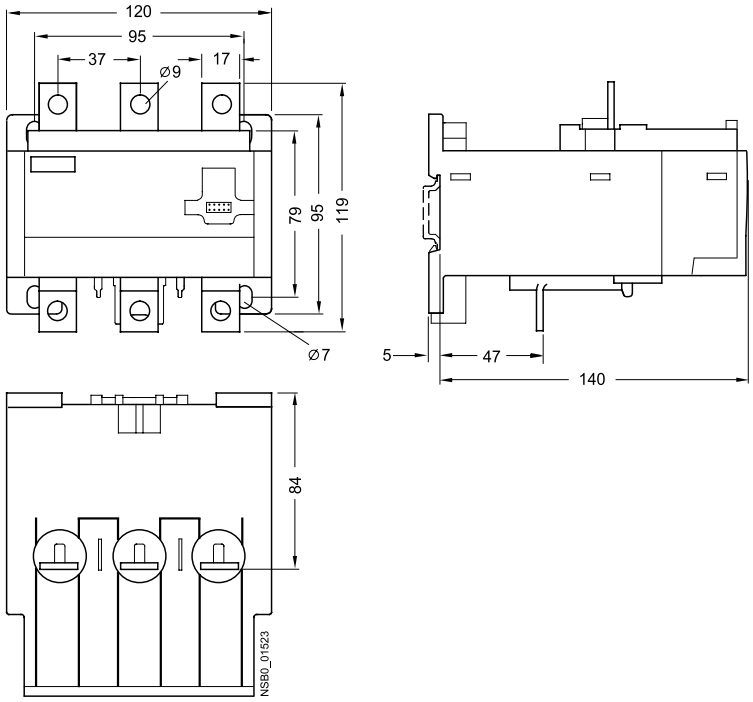
3RB29 06-2BG1, 3RB29 06-2DG1 current measuring module



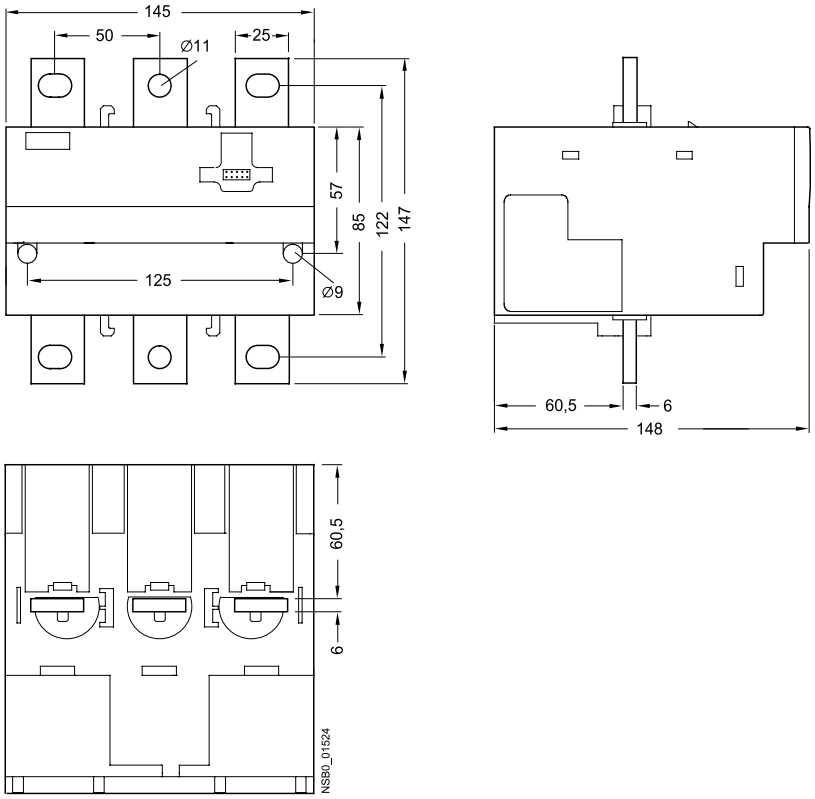
3RB29 06-2JG1 current measuring module



3RB29 56-2TG2 current measuring module



3RB29 56-2TH2 current measuring module

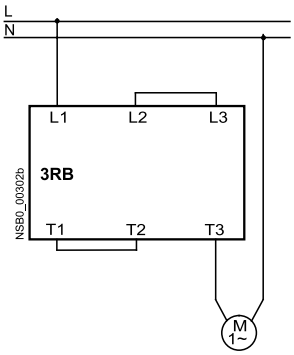


3RB29 66-2WH2 current measuring module

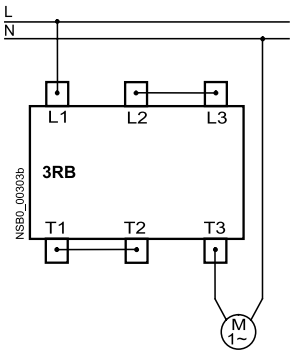
Schematics

Protection of single-phase motors

(not in conjunction with internal ground-fault detection)

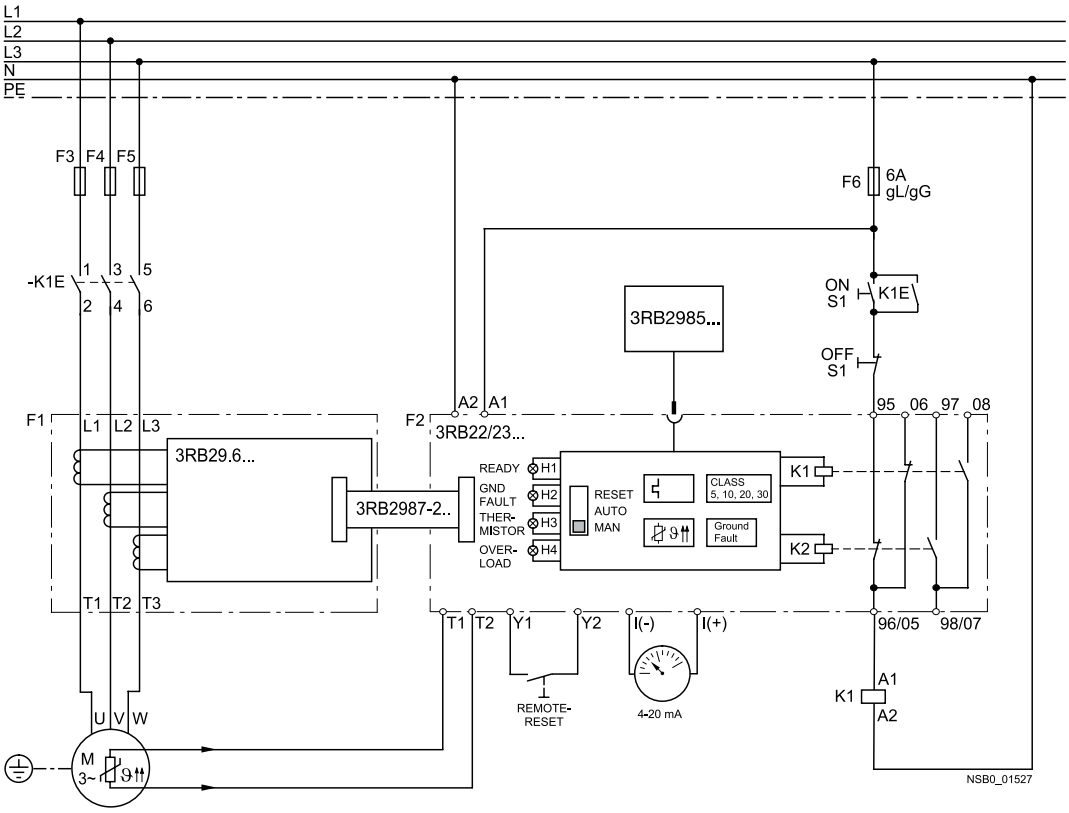


3RB29 06-2.G1, 3RB29 56-2TG2



3RB29 56-2TH2, 3RB29 66-2WH2

Schematic representation of a possible application (3-phase)



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
Terminal brackets for stand-alone installation[1) 2)]					
3RU29.6-3AA01	For separate mounti ng 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
Mechanical RESET [1) 2)]					
3RB39 80-0A with pushbutton and extension plunger	**Resetting plungers, holders and formers**		S00 to S12	**3RB39 80-0A**	0.030
	Pushbuttons with extended stroke (12 mm), IP65, Ø 22 mm		S00 to S12	**3SU1200-0FB10-0AA0**	0.021
	Extension plungers For compensation of the distance between a pushbutton and the unlatching button of the relay		S00 to S12	**3SU1900-0KG10-0AA0**	0.004
Cable releases with holder for RESET [1) 2)]					
3RU3980-0.	For holes with Ø 6.5 mm in the mounting plate; max. control panel thickness 8 mm				
	• Length 400 mm		S00 to S12	**3RB39 80-0B**	0.060
	• Length 600 mm		S00 to S12	**3RB39 80-0C**	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
Sealable covers						
3RB3984-0	For covering the setting knobs					
	• For 3RB30/3RB31	S00 to S3	**3RB39 84-0**		10 units	0.003
	• For 3RB20/3RB21	S6 to S12	**3RB39 84-0**		10 units	0.020
	• For 3RB22 to 3RB24	–	**3RB29 84-2**		10 units	0.050
Terminal covers						
3RT19 46-4EA1	**Covers for cable lugs and rail connection**					
	• Length 100 mm	S6	**3RT19 56-4EA1**			0.067
	• Length 120 mm	S10/S12	**3RT19 66-4EA1**			0.124
3RT19 36-4EA2 The figures show mounting on the contactor	**Covers for box terminals**					
	• Length 20.6 mm[1)]	S2	**3RT29 36-4EA2**			0.016
	• Length 20.8 mm[1)]	S3	**3RT29 46-4EA2**			0.023
	• Length 25 mm	S6	**3RT19 56-4EA2**			0.028
	• Length 30 mm	S10/S12	**3RT19 66-4EA2**			0.038
	Covers for screw connections between contactor and overload relay, without box terminals (1 unit required per combination)	S6	**3RT19 56-4EA3**			0.021
		S10/S12	**3RT19 66-4EA3**			0.062
Box terminal blocks						
3RT19 5.-4G	For round and ribbon cables					
	up to 70 mm² 2/0 AWG	S6[2)]	**3RT19 55-4G**			0.237
	up to 120mm² 4/0 AWG	S6	**3RT19 56-4G**			0.270
	up to 240mm² 500 mcm	S10/S12	**3RT19 66-4G**			0.676
Push-in lugs						
3RP19 03	For screw fixing of 3RB22 to 3RB24 overload relays	--	**3RP19 03**		10 units	0.002
3RB19 00-0B	For screw mounting of 3RB29 06 current measuring modules (2 units are required per module)	S00 ... S3	**3RB1900-0B**		10 units	0.100

For more accessories (tools for spring-loaded terminals and labeling plates), see page 3/56.

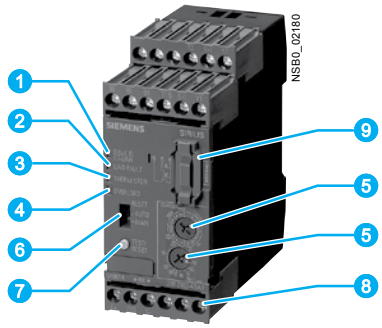
1) Only for 3RB20/3RB21. The accessories are identical to those of the 3RU11 thermal overload relays.

2) In the scope of supply for 3RT10 54-1 contactors (55 kW).

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 3/54) 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 → "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.

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	**3 R B**									
SIRIUS 2nd generation		**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:

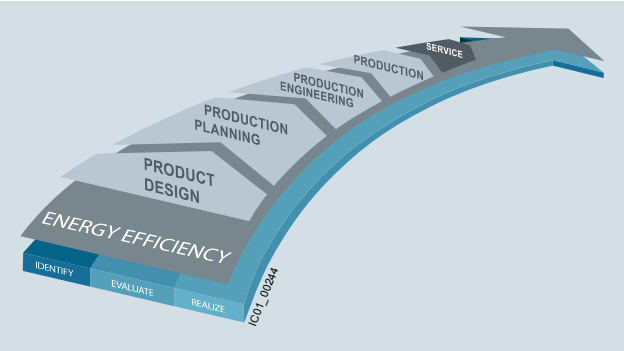
The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

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).

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 5E to 30E), 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.

Use of SIRIUS protection devices in conjunction with IE3/IE4 motors.

Note:
For the use of 3RB24 electronic overload relays in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see Application Manual.

3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A for High-Feature applications *IE3/IE4* ready

Selection and ordering data

3RB24 solid-state overload relays (evaluation module) for full motor protection, stand-alone installation, CLASS 5E, 10E, 20E and 30E (adjustable)

Type	3RB24 83-4A.1
Features and technical specifications	
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	✓
IO-Link-specific functions	
• 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					
S00 ... S12	Monostable	**3RB24 83-4AA1**		**3RB24 83-4AC1**	

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 3/54, accessories see pages 3/55 and 3/56.

3RB24 Solid-State Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24 *IE3/IE4* ready

Selection and ordering data

Current measuring modules for mounting onto contactor[1] and stand-alone installation[1)2)] (essential accessories)

	Size contactor[3]	Rating for induction motor,[4]	Current setting of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[5]	For overload relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
		kW	A	A							
Sizes S00/S0[2)6)]											
3RB29 06-2.G1	S00/S0	0.09 … 1.1	0.3 … 3	20	3RB22 to 3RB24	▶	**3RB29 06-2BG1**		1	1 unit	41G
		1.1 … 11	2.4 … 25	63		▶	**3RB29 06-2DG1**		1	1 unit	41G
Sizes S2/S3[2)6)]											
3RB29 06-2JG1	S2/S3	5.5 … 45	10 … 100	315	3RB22 to 3RB24	▶	**3RB29 06-2JG1**		1	1 unit	41G
Size S6[1)6)]											
3RB29 56-2TG2	S6 with busbar connection	11 … 90	20 … 200	315	3RB22 to 3RB24	▶	**3RB29 56-2TH2**		1	1 unit	41G
	For mounting to S6 contactors with box terminals				3RB22 to 3RB24	▶	**3RB29 56-2TG2**		1	1 unit	41G
Sizes S10/S12[1)]											
3RB29 66-2WH2	S10/S12 and size 14 (3TF68/ 3TF69)	37 … 450	63 … 630	800	3RB22 to 3RB24	▶	**3RB29 66-2WH2**		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 contactor	Version	For overload relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
Connecting cables (necessary accessories)									
3RB29 87-2.		For connection between evaluation module and current measuring module							
	S00 … S3	• Length 0.1 m (only for mounting of the evaluation module directly onto the current measuring module)	3RB24, 3RB29	▶	**3RB29 87-2B**		1	1 unit	41F
	S00 … S12	• Length 0.5 m	3RB24, 3RB29	▶	**3RB29 87-2D**		1	1 unit	41F

Additional general accessories see page 3/56.

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
- 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 overload relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
Operator panels for evaluation modules								
3RA69 35-0A	**Operator panels (set)** 1 set comprises: • 1 x operator panel • 1 x 3RA69 36-0A enabling module • 1 x 3RA69 33-0B interface cover • 1 x fixing terminal Note: The connecting cable between the evaluation module and the operator panel is not included in the scope of supply; please order separately.	3RB24	A	**3RA69 35-0A**		1	1 unit	42F
	Connecting cable Length 2 m (round), for connecting the evaluation module to the operator panel	3RB24	►	**3UF79 33-0BA00-0**		1	1 unit	42J
	Enabling modules (replacement)	3RB24	A	**3RA69 36-0A**		1	1 unit	42F
	Interface covers	3RB24	A	**3RA69 33-0B**		1	5 units	42F

Additional general accessories see next page.

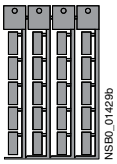
3RB24 Solid-State Overload Relays

Accessories for 3RB22, 3RB23, 3RB24

General accessories

	Version	Size	For overload relays	Order No.	PU (UNIT, SET, M)	Pack Units
Sealable covers for evaluation modules						
3RB29 84-2	For covering the setting knobs	--	3RB22 to 3RB24	**3RB29 84-2**	1	10 units
Terminal covers for current measuring modules						
	Covers for cable lugs and busbar connections					
	• Length 100 mm	S6	3RB29 56	**3RT19 56-4EA1**	1	1 unit
	• Length 120 mm	S10/S12	3RB29 66	**3RT19 66-4EA1**	1	1 unit
	Covers for box terminals					
	• Length 25 mm	S6	3RB29 56	**3RT19 56-4EA2**	1	1 unit
	• Length 30 mm	S10/S12	3RB29 66	**3RT19 66-4EA2**	1	1 unit
	Covers for screw terminals between contactor and overload relay, without box terminals (1 unit required per combination)	S6	3RB29 56	**3RT19 56-4EA3**	1	1 unit
		S10/S12	3RB29 66	**3RT19 66-4EA3**	1	1 unit
Box terminal blocks for current measuring modules						
3RT19 5.-4G	For round and ribbon cables					
	• Up to 70 mm²	S6[1]	3RB29 56	**3RT19 55-4G**	1	1 unit
	• Up to 120 mm²	S6	3RB29 56	**3RT19 56-4G**	1	1 unit
	• Up to 240 mm²	S10/S12	3RB29 66	**3RT19 66-4G**	1	1 unit
	Technical specifications for conductor cross-sections see "Reference Manual for Protection Equipment– 3RU1, 3RB2 Overload Relays".					
Push-in lugs for evaluation modules and current measuring modules						
3RP19 03	For screw fixing the evaluation modules	--	3RB22 to 3RB24	**3RP19 03**	1	10 units
3RB29 00-0B	For screw fixing the current measuring modules (2 units per module)	S00 ... S3	3RB29 06	**3RB19 00-0B**	100	10 units

[1] In the scope of supply for 3RT10 54-1 contactors (55 kW).

	Version	Size	Color	For overload relays	Order No.	PU (UNIT, SET, M)	Pack Units
Tools for opening spring-type terminals							
					Spring-type terminals		
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	Main and auxiliary circuit connection: 3RB2	**3RA29 08-1A**	1	1 unit
Blank labels							
 3RT19 00-1SB20	**Unit labeling plates**[1] for SIRIUS devices	20 mm x 7 mm	Titanium gray	3RB24	**3RT29 00-1SB20**	100	340 units
		20 mm x 7 mm	Pastel turquoise	3RB22, 3RB23	**3RT29 00-1SB20**	100	340 units

[1] 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

Type – Overload relay of evaluation modules		**3RB24 83-4A.1**
Size of contactor		S00 ... S10/S12
General data		
Trips in the event of		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)
Trip class acc. to IEC 60947-4-1		CLASS 5E, 10E, 20E and 30E adjustable
Phase failure sensitivity		Yes
Overload warning		Yes, from 1.125 x I_e for symmetrical loads and from 0.85 x I_e for unsymmetrical loads
Reset and recovery		
• Reset options after tripping		Manual and automatic RESET, electrical remote RESET or through IO-Link
• 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 tripping due to a ground fault: no automatic RESET
- For manual 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 tripping due to a ground fault: Immediately
- For remote 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 tripping due to a ground fault: Immediately
Features		
• Display of operating state on device		Yes, with 4 LEDs - Green LED "DEVICE/IO-Link" - Red "Ground Fault" LED - Red "Thermistor" LED - Red "Overload" LED
• 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
Explosion protection – Safe operation of motors with "increased safety EEX e and explosion-proof enclosure EEx d" type of protection		PTB 11 ATEX 3014 Ex II (2) G [Ex e][Ex d][Ex px] Ex II (2) D [Ex t][Ex p]
EC type test certificate number according to directive 94/9/EC (ATEX)		See https://support.industry.siemens.com/cs/ww/en/view/60524083
Ambient temperatures		
• 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
Repeat terminals		
• Coil repeat terminals		Not required
• Auxiliary contact repeat terminal		Not required
Degree of protection acc. to IEC 60529		IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover
Touch protection acc. to IEC 61140		Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	15/11
Electromagnetic compatibility (EMC) – Interference immunity		
• Conductor-related interference		
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2 (power ports), 1 (signal ports)
- 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
Electromagnetic compatibility (EMC) – emitted interference		Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)
Resistance to extreme climates – air humidity	%	100
Dimensions		"Dimensional drawings" see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link".
Installation altitude above sea level	m	Up to 2000
Mounting position		Any
Type of mounting		
• Evaluation modules		Stand-alone installation
• Current measuring module	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

Type – Overload relay of evaluation modules		**3RB24 83-4A.1**
Size of contactor		S00 ... S10/S12
Dimensions of evaluation modules (W x H x D)	mm	45 x 111 x 95
Auxiliary circuit		
Number of auxiliary switches		1 CO contact, 1 NO contact connected in series internally
Auxiliary contacts – assignment		• 1 CO contact for selecting the contactor (for reversing starter function), actuated by the control system • 1 NO contact for normal switching duty, actuated by the control system (opens automatically when tripping occurs)
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Auxiliary contacts – contact rating		
• 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
Short-circuit protection		
• With fuse, operational class gG	A	6
• With miniature circuit breaker, C characteristic	A	1.6
Protective separation between auxiliary conducting paths acc. to IEC 60947-1	V	300
CSA, UL, UR rated data		
Auxiliary circuit – switching capacity		B300, R300
Conductor cross-sections of the auxiliary circuit		
Connection type		**Screw terminals**
Terminal screw		M3, Pozidriv size 2
Operating devices	mm	3.0 x 0.5
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	1 × (0.5 ... 4)[1], 2 × (0.5 ... 2.5)[1]
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve	mm^2	1 × (0.5 ... 2.5)[1], 2 × (0.5 ... 1.5)[1]
• Stranded	mm^2	--
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)
Connection type		**Spring-type terminals**
Operating devices	mm	3.0 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	2 × (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	–
• Finely stranded with end sleeve	mm^2	2 × (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 × (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

Type – Overload relay of evaluation modules		**3RB24 83-4A.1**
Size of contactor		S00 ... S10/S12
Control and sensor circuit as well as the analog output		
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Rated control supply voltage U_s		
• DC	V	24 through IO-Link
Operating range		
• DC		$0.85 \times U_{s\,min} \leq U_s \leq 1.1 \times U_{s\,max}$
Rated power		
• DC	W	0.5
Mains buffering time	ms	200
Thermistor motor protection (PTC thermistor detector)		
• Summation cold resistance	kΩ	≤ 1.5
• Response value	kΩ	3.4 ... 3.8
• Return value	kΩ	1.5 ... 1.65
Ground-fault detection		The information refers to sinusoidal residual currents at 50/60 Hz.
• Tripping value I_Δ - 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
Analog output[1]		
• Output signal	mA	4 ... 20
• Measuring range		0 ... $1.25 \times I_e$ 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.	Ω	100
Conductor cross-sections for the control and sensor circuit as well as the analog output		
Connection type		**Screw terminals**
Terminal screw		M3, Pozidriv size 2
Operating devices	mm	3.0 x 0.5
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	1 × (0.5 ... 4)[2], 2 × (0.5 ... 2.5)[2]
• Finely stranded without end sleeve	mm^2	—
• Finely stranded with end sleeve	mm^2	1 × (0.5 ... 2.5)[2], 2 × (0.5 ... 1.5)[2]
• Stranded	mm^2	—
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)
Connection type		**Spring-type terminals**
Operating devices	mm	3.0 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	2 × (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	—
• Finely stranded with end sleeve	mm^2	2 × (0.25 ... 1.5)
• Stranded	mm^2	2 × (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)

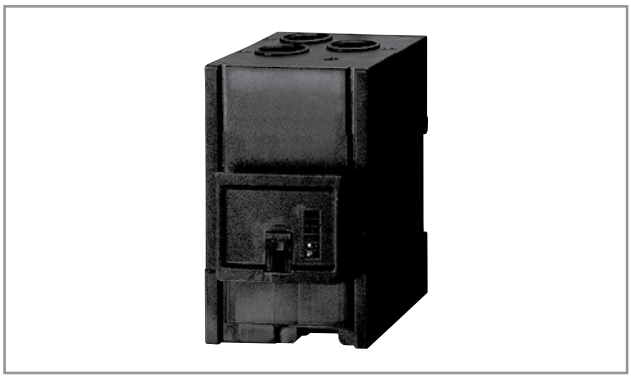
1) Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 overload relay.

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

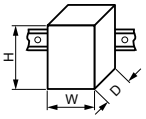
The current measuring modules are designed as system components for connecting to evaluation units 3RB22 to 3RB24. Using these evaluation units the motor current is measured and the measured value sent to the evaluation unit for evaluation. The current measuring modules in sizes S00 to S3 up to 55 mm 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-alond 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
Main circuit					
Rated insulation voltage U_i (pollution degree 3)	V	690		1 000	
Rated impulse withstand voltage U_{imp}	kV	6		8	
Rated operational voltage U_e	V	690		1 000	
Type of current					
• Direct current		No			
• Alternating current		Yes, 50/60 Hz ±5 %			
Current setting	A	0.3 ... 3; 2.4 ... 25	10 ... 100	20 ... 200	63 ... 630
Power loss per unit (max.)	W	0.5			
Short-circuit protection					
• With fuse without contactor		See "Selection and ordering data" on page 3/55.			
• With fuse and contactor		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"			
Protective separation between main and auxiliary conducting paths acc. to IEC 60947-1 (pollution degree 2)	V	690 for grounded networks, otherwise 600			

3RB24 Solid-State Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24



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
Conductor cross-sections of the main circuit					
Connection type		**Screw terminals with box terminal**			
Terminal screw	mm	—		4 mm Allen screw	5 mm Allen screw
Operating devices	mm	—		4 mm Allen screw	5 mm Allen screw
Prescribed tightening torque	Nm	—		10 ... 12	20 ... 22
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid	mm^2	—		—	—
• Finely stranded without end sleeve	mm^2	—		With 3RT19 55-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70) With 3RT19 56-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), rear clamping point only: 1 × (70 ... 240) Rear clamping point only: 1 × (120 ... 185)
• Finely stranded with end sleeve	mm^2	—		With 3RT19 55-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70) With 3RT19 56-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), rear clamping point only: 1 × (70 ... 240) Rear clamping point only: 1 × (120 ... 185)
• Stranded	mm^2	—		With 3RT19 55-4G box terminal: 2 × (max. 70), 1 × (16 ... 70) With 3RT19 56-4G box terminal: 2 × (max. 120), 1 × (16 ... 120)	2 × (70 ... 240), rear clamping point only: 1 × (95 ... 300) Rear clamping point only: 1 × (120 ... 240)
• AWG cables, solid or stranded	AWG	—		With 3RT19 55-4G box terminal: 2 × (max. 1/0), 1 × (6 ... 2/0) With 3RT19 56-4G box terminal: 2 × (max. 3/0), 1 × (6 ... 250 kcmil)	2 × (2/0 ... 500 kcmil), rear clamping point only: 1 × (3/0 ... 600 kcmil) Rear clamping point only: 1 × (250 kcmil ... 500 kcmil)
• Ribbon cables (number x width x thickness)	mm	—		With 3RT19 55-4G box terminal: 2 × (6 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 6 × 15.5 × 0.8) With 3RT19 56-4G box terminal: 2 × (10 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 10 × 15.5 × 0.8)	2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5)
Connection type		**Busbar connections**			
Terminal screw		—		M8 × 25	M10 x 30
Prescribed tightening torque	Nm	—		10 ... 14	14 ... 24
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid with cable lug	mm^2	—		16 ... 95[1)]	50 ... 240[2)]
• Stranded with cable lug	mm^2	—		25 ... 120[1)]	70 ... 240[2)]
• AWG cable, solid or stranded, with cable lug	AWG	—		4 ... 250 kcmil	2/0 ... 500 kcmil
• with connecting bar (max. width)	mm	—		17	25
Connection type		**Straight-through transformers**			
Diameter of opening	mm	7.5	14	25	—

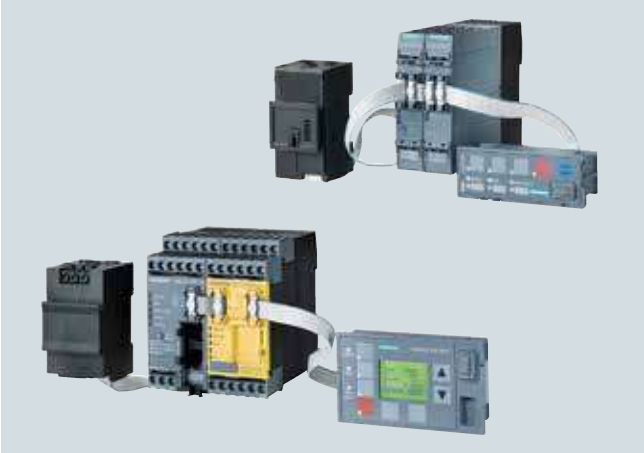
1) When connecting cable lugs according to DIN 46235 with conductor cross-sections of 95 mm^2 and more, the 3RT19 56-4EA1 terminal cover must be used to ensure phase spacing.

2) When connecting cable lugs according to DIN 46234 with conductor cross-sections of 240 mm^2 and more as well as to DIN 46235 with conductor cross-sections of 185 mm^2 and more, the 3RT19 56-4EA1 terminal cover must be used for to keep the phase clearance.

SIMOCODE pro 3UF7

General data

Overview



SIMOCODE pro S and SIMOCODE pro V

More information

Home page, see www.usa.siemens.com/simocode

Industry Mall, see www.siemens.com/product?3UF7

TIA Selection Tool Cloud (TST Cloud)
- For SIMOCODE pro S, see https://mall.industry.siemens.com/spice/TSTWeb/?kmat=SimocodeProS
- For SIMOCODE pro V, see https://mall.industry.siemens.com/spice/TSTWeb/?kmat=SimocodeProV

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, PROFINET/PROFIsafe, Modbus RTU, and Ethernet IP and OPC UA – which also lets you take advantage of the cloud
- 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 (TIA Portal) is the software package for SIMOCODE pro parameterization, start up and diagnostics.

Device series

Basic Performance with SIMOCODE pro C

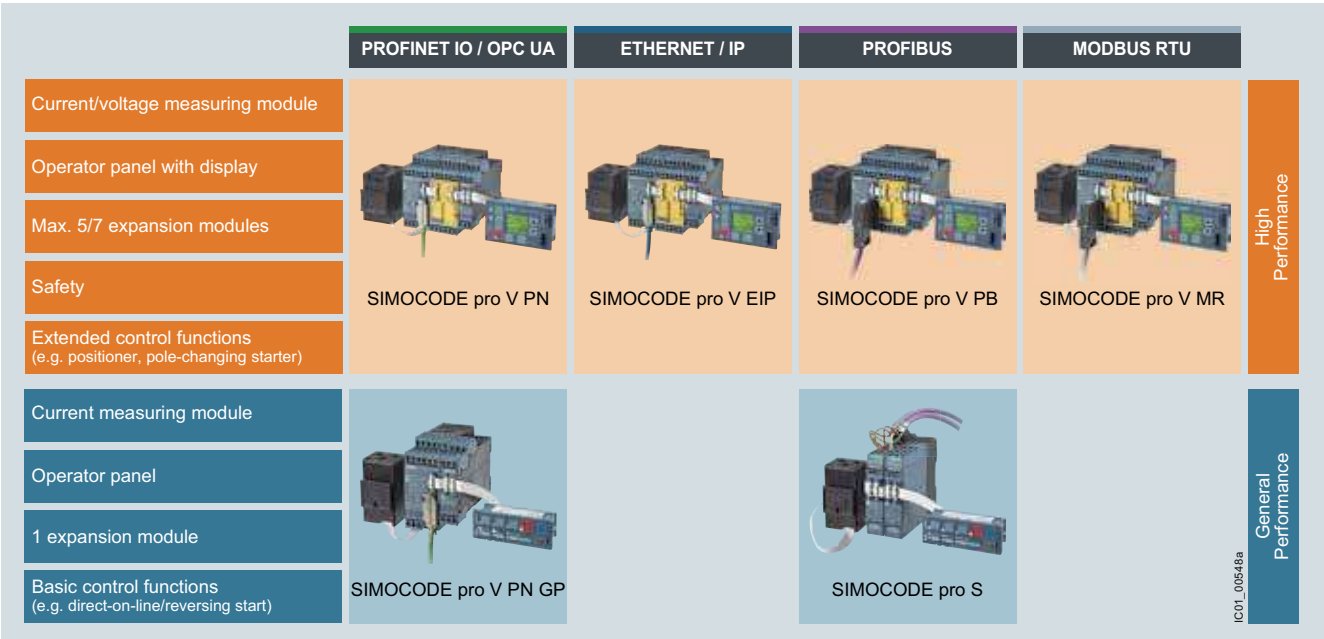
The compact system for direct-on-line starters and reversing starters or for controlling a motor starter protector.

General Performance with SIMOCODE pro S or SIMOCODE pro V PN GP

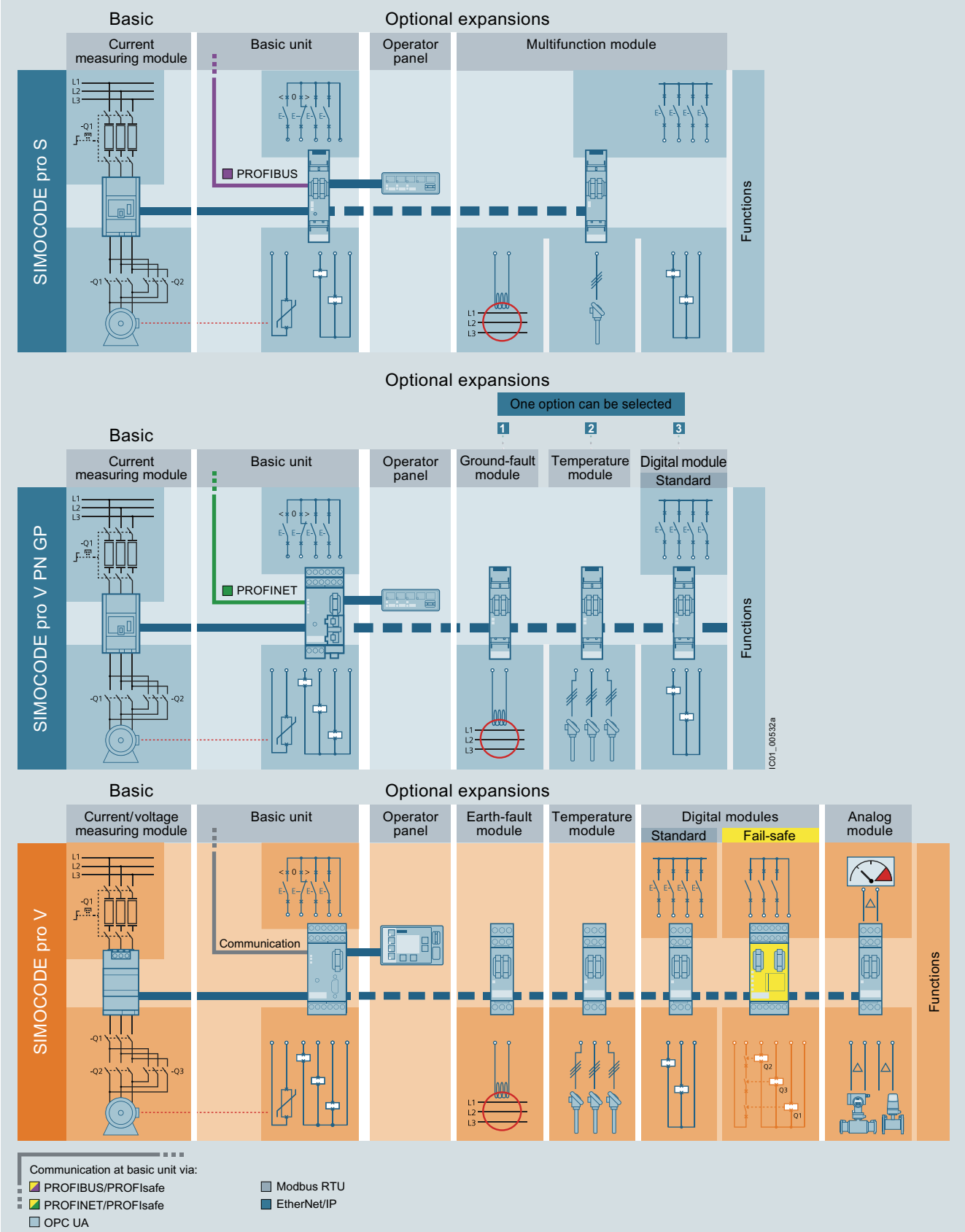
The smart system for direct-on-line, reversing, and wye-delta starters or for controlling a motor starter protector or soft starter. Its expandability with an expansion module/multifunction module provides comprehensive input/output project data volume, precise ground-fault detection via the 3UL23 residual-current transformers and temperature measurement.

High Performance with 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



Device series



System structure

SIMOCODE pro 3UF7

General data

Expansion possibilities	SIMOCODE pro C Basic Performance PROFIBUS	SIMOCODE pro S General Performance PROFIBUS	SIMOCODE pro V General Performance PROFINET GP	SIMOCODE pro V High Performance PROFIBUS/Modbus RTU	PROFINET/ EtherNet/IP
Operator panels	✓	✓	✓	✓	✓
Operator panels with display	--	--	--	✓	✓
Current measuring modules	✓	✓	✓	✓	✓
Current/voltage measuring modules	--	--	--	✓	✓
Expansion modules:					
• Digital modules	--	--	1[2)]	2	2
• Fail-safe digital modules[1)]	--	--	--	1	1
• Analog modules	--	--	--	1	2
• Ground-fault modules	--	--	1	1	1
• Temperature modules	--	--	1	1	2
• Multifunction modules	--	1	--	--	--

✓ Available
-- Not available

1) The fail-safe digital module can be used instead of one of the two digital modules.
2) Only monostable version can be used.

Per feeder each system always comprises one basic unit and one current measuring module. The two modules are connected together electrically through the system interface with a connection cable and can be mounted mechanically connected (one behind the other) or separately (side by side). The motor current to be monitored determines the size 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 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.

Article No. scheme

Product versions		Article number
SIMOCODE pro motor management system		**3UF7 □ □ □ – 1 □ □ 0 □ – 0**
Type of unit/module	e.g. 0 = basic unit	□
Functional version of the module	e.g. 20 = SIMOCODE pro S	□ □
Connection type of the current transformer	e.g. A = through-hole technology	□
Voltage version	e.g. B = 24 V DC	□
Enclosure color	e.g. 1 = titanium gray	□
Example		**3UF7 0 2 0 – 1 A B 0 1 – 0**

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

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, costs can be internally allocated with a high degree of accuracy
- By virtue of its wide frequency range (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. via 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.

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 E03 and with all SIMOCODE pro V PROFINET and EtherNet/IP).

Communication

SIMOCODE pro V 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 (for 2-port devices with an integrated switch)
- Media redundancy via MRP protocol (for 2-port devices with an integrated switch)
- 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 power management via PROFIenergy
- Module exchange without PC/memory module through proximity detection
- Extensive diagnostics and maintenance alarms

System redundancy with SIMOCODE pro PROFINET

All SIMOCODE PROFINET devices support 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 or higher – via local device interface and Ethernet

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.

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 from integrated energy management

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 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.

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 localize 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 directive 2014/34/EU
  - With heavy starting (paper, cement, metal and water industries)
  - In high-availability plants (chemical, oil, raw material processing industries, power plants)
- New: Dry-running protection of centrifugal pumps based on active power monitoring for type of protection Ex b

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.

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 in 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

New: Dry-running protection of centrifugal pumps with SIMOCODE pro in hazardous areas

With special versions of the current/voltage measuring modules, SIMOCODE pro enables dry-running protection of centrifugal pumps through active power monitoring and motor switch-off. This applies to centrifugal pumps with progressive flow characteristics, which are also suitable for pumping flammable media and are also installed in hazardous areas. If the active power, and thus the flow rate, falls below a minimum value, the motor – and thus the centrifugal pump – is switched off. When determining the limit values to be monitored, the user is supported by a menu-guided teach-in process in the engineering software.

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16337/td	Application Manual "SIRIUS Controls with IE3/IE4 motors", see https://support.industry.siemens.com/cs/ww/en/view/94770820
Manual Collection "SIMOCODE pro", see https://support.industry.siemens.com/cs/ww/en/view/109743951	Configuration Manual "Load Feeders – SIRIUS Modular System", see https://support.industry.siemens.com/cs/ww/en/view/39714188
System Manual "SIMOCODE pro Safety Fail-Safe Digital Modules", see https://support.industry.siemens.com/cs/ww/en/view/50564852	

General data

Type		3UF7
Permissible ambient temperature		
• During operation	°C	-25 ... +60; 3UF721: 0 ... +60
• During storage and transport	°C	-40 ... +80; 3UF721: -20 ... +70
Degree of protection (acc. to IEC 60529)		
• Measurement modules with busbar connection		IP00
• Operator panel (front) and door adapter (front) with cover		IP54
• Other components		IP20
Shock resistance (sine pulse)	*g*/ms	15/11
Mounting position		Any
Frequency	Hz	50/60 ± 5%
EMC interference immunity (according to IEC 60947-1)		Corresponds to degree of severity 3
• Conducted interference, burst acc. to IEC 61000-4-4	kV	2 (power ports)
	kV	1 (signal port)
• Conducted interference, high frequency acc. to IEC 61000-4-6	V	10
• 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
EMC emitted interference (according to IEC 60947-1)		
• Conducted and radiated interference emission		EN 55011/EN 55022 (CISPR 11/CISPR 22) (corresponds to degree of severity A)
Protective separation (acc. to IEC 60947-1)		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			
Type		**3UF7000-1AU00-0, 3UF7010-1AU00-0, 3UF7011-1AU00-., 3UF7020-1AU01-0, 3UF7012-1AU00-0, 3UF7013-1AU00-0**	**3UF7000-1AB00-0, 3UF7010-1AB00-0, 3UF7011-1AB00-., 3UF7020-0AB01-0, 3UF7012-1AB00-0, 3UF7013-1AB00-0**
Control circuit			
Rated control supply voltage U_s (acc. to IEC 61131-2)		110 ... 240 V AC/DC; 50/60 Hz	24 V DC
Operating range			
• SIMOCODE pro C (3UF7000) and SIMOCODE pro V PROFIBUS (3UF7010) SIMOCODE pro V Modbus RTU (3UF7012)		0.85 ... 1.1 x U_s	0.80 ... 1.2 × U_s
• SIMOCODE pro V PROFINET (3UF7011), SIMOCODE pro V EtherNet/IP (3UF7013) and SIMOCODE pro S (3UF7020)			
- Operation		0.85 ... 1.1 x U_s	0.80 ... 1.2 × U_s
- Start up		0.85 ... 1.1 x U_s	0.85 ... 1.2 × U_s
Power consumption[1]			
• SIMOCODE pro C (3UF7000) and SIMOCODE pro S (3UF7020)		7 VA/5 W	5 W
• SIMOCODE pro V PROFIBUS (3UF7010) and SIMOCODE pro V Modbus RTU (3UF7012)		10 VA/7 W	7 W
• SIMOCODE pro V PROFIBUS E15/V4.0 (3UF7010-1A.00-0 -Z B01) and SIMOCODE pro V Modbus RTU E03/V2.0 (3UF7012-1A.00-0-Z B01)		7 VA/5 W	4 W
• SIMOCODE pro V PROFINET (3UF7011) and SIMOCODE pro V EtherNet/IP (3UF7013)		11 VA/8 W	8 W
Rated insulation voltage U_i	V	300 (for pollution degree 3)	
Rated impulse withstand voltage U_{imp}	kV	4	
Relay outputs			
• Number			
- SIMOCODE pro C, SIMOCODE pro V (incl. SIMOCODE pro V PN GP)		3 monostable relay outputs	
- SIMOCODE pro S		2 monostable relay outputs	
• Specified short-circuit protection for auxiliary contacts (relay outputs) - Fuse links		6 A operational class gG; 10 A quick-response (IEC 60947-5-1)	
- Miniature circuit breaker		1.6 A, C characteristic (IEC 60947-5-1); 6 A, C characteristic (I_k < 500 A)	
• Rated uninterrupted current	A	6	
• Rated switching capacity - AC-15		6 A/24 V AC; 6 A/120 V AC; 3 A/230 V AC	
- DC-13		2 A/24 V DC; 0.55 A/60 V DC; 0.25 A/125 V DC	
Inputs (binary)		4 inputs supplied internally by the device electronics (with 24 V DC) and connected to a common potential	
Thermistor motor protection (binary PTC)			
• Summation cold resistance	kΩ	≤ 1.5	
• Response value	kΩ	3.4 ... 3.8	
• Return value	kΩ	1.5 ... 1.65	

2nd-generation current/voltage measuring modules						
Type		**3UF7..0-1AA01-0**	**3UF7..1-1AA01-0**	**3UF7..2-1AA01-0**	**3UF7..3-1.A01-0**	**3UF7..4-1BA01-0**
Main circuit						
Current setting I_e	A	0.3 ... 4	3 ... 40	10 ... 115	20 ... 200	63 ... 630
Rated insulation voltage U_i	V	690				
Rated operational voltage U_e	V	690				
Rated impulse withstand voltage U_{imp}	kV	6				
Rated frequency	Hz	50/60				
Type of current		Three-phase current				
Short circuit		Additional short-circuit protection is required in the main circuit				
Typical voltage measuring range						
• Phase-to-phase voltage/line-to-line voltage (e.g. $U_{L1\,L2}$)	V	110 ... 690				
• Phase voltage (e.g. $U_{L1\,N}$)	V	65 ... 400				
Accuracy at 25 °C, 50/60 Hz						
Valid for voltage range		• Phase-to-phase voltage U_L in the range 0.85 x 110 V ... 1.1 x 690 V • Phase voltage U_L in the range 0.85 x 65 V ... 1.1 x 400 V				
Valid for current range	A	0.25 ... 8/ 8 ... 32	2.25 ... 80/ 80 ... 320	7.5 ... 230/ 230 ... 920	15 ... 400/ 400 ... 1 600	47 ... 1 260/ 1 260 ... 5 040
• Voltage measurement	%	± 1.5				
• Current measurement	%	± 1.5/3 (typical)				
• Temperature drift of current measurement						
- 3UF7110-1AA01-0	%	± 0.02 K				
- 3UF7111-1AA01-0, 3UF7112-1AA01-0, 3UF7113-1AA01-0, 3UF7113-1BA01-0, 3UF7114-1BA01-0	%	± 0.01 K				
• Power factor measurement (p.f. ≥ 0.5)	%	± 1.5/5 (typical)				
• Apparent power measurement (p.f. ≥ 0.5)	%	± 3/5 (typical)				
• Active power measurement (p.f. ≥ 0.5)	%	± 5/10				
• Energy measurement (p.f. ≥ 0.5)	%	± 5/10				
• Frequency measurement (p.f. ≥ 0.5)	%	± 1.5				
Notes on voltage measurement • 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!				

1) All values are based on a combination consisting of basic unit, current measuring module and operator panel.

Current measuring modules						
Type		**3UF7100-1AA00-0**	**3UF7101-1AA00-0**	**3UF7102-1AA00-0**	**3UF7103-1.A00-0**	**3UF7104-1BA00-0**
Main circuit						
Current setting 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 (typical)				

Digital modules or multifunction modules		
Type		**3UF7300, 3UF7310, 3UF7600**
Control circuit		
Rated insulation voltage U_i	V	300 (at pollution degree 3)
Rated impulse withstand voltage U_{imp}	kV	4
Relay outputs		
• Number		2 monostable or bistable relay outputs (depending on the version)
• Specified short-circuit protection for auxiliary contacts (relay outputs)		
- Fuse links		6 A operational class gG; 10 A quick-response (IEC 60947-5-1)
- Miniature circuit breakers		1.6 A, C characteristic (IEC 60947-5-1); 6 A, C characteristic (I_k < 500 A)
• Rated uninterrupted current	A	6
• Rated switching capacity		
- AC-15		6 A/24 V AC; 6 A/120 V AC; 3 A/230 V AC
- DC-13		2 A/24 V DC; 0.55 A/60 V DC; 0.25 A/125 V DC
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**
Control circuit		
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**			
Sensor circuit					
Number of temperature sensors					
• 3UF7700		3 temperature sensors			
• 3UF7600		1 temperature sensor			
Typical sensor current					
• Pt100	mA	1			
• Pt1000/KTY83/KTY84/NTC	mA	0.2			
Open-circuit/short-circuit detection					
• 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			
Deviation due to ambient temperature (in % of 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		
Type		**3UF74**
Control circuit		
Inputs		
• 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
Outputs		
• 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
Connection type		Two-wire connection
Electrical separation of inputs/output to the device electronics		No

Fail-safe digital modules					
Type		**3UF7320-1AB00-0**	**3UF7320-1AU00-0**	**3UF7330-1AB00-0**	**3UF7330-1AU00-0**
Control circuit					
Rated control supply voltage U_s	V	24 DC	110 ... 240 AC/DC; 50/60 Hz	24 DC	110 ... 240 AC/DC; 50/60 Hz
Power consumption		3 W	9.5 VA/4.5 W	4 W	11 VA/5.5 W
Rated insulation voltage	V	300			
Rated impulse withstand voltage U_{imp}	kV	4			
Relay outputs					
• Number		2 relay enabling circuits, 2 relay outputs			
Version of the fuse link For short-circuit protection of the relay enabling circuit	A	4, operational class gG			
Rated uninterrupted current	A	5			
Rated switching capacity					
• AC-15		3 A/24 V AC; 3 A/120 V AC; 1.5 A/230 V AC			
• DC-13		4 A/24 V DC; 0.55 A/60 V DC; 0.22 A/125 V DC			
Inputs (binary)		5 (with internal power supply from the device electronics)			
Cable length					
• Between sensor/start signal and evaluation electronics	m	1 500	1 500	--	--
• For further digital signals	m	--	--	300	300
Safety data [1]					
SIL level max. according to IEC 61508		3			
Achievable performance level PL according to EN ISO 13849-1		e			
Achievable category according to EN ISO 13849-1		4			
Stop category according to EN 60204-1		0			
Probability of a dangerous failure for SIL 3 applications					
• Per hour (PFH_d) at a high demand rate according to IEC 62061	1/h	1.0×10^{-8} for 2-channel sensor evaluation		1.0×10^{-8}	
• Per hour (PFD_{avg}) at a low demand rate according to IEC 61508		2.0×10^{-6} for 2-channel sensor evaluation		2.0×10^{-6}	
T1 value for proof test interval or service duration according to IEC 61508	a	20			

[1] For more safety data, see System Manual "SIMOCODE pro Safety Fail-Safe Digital Modules".

More information

Configuration instructions

When using an operator panel with display, please note that the type and number of expansion modules that can be connected are limited for the use of a SIMOCODE pro V PROFIBUS basic unit (with product version lower than E15) or SIMOCODE pro V Modbus RTU (with product version lower than E03), see

- TIA Selection Tool
- SIMOCODE pro Manual Collection

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 test certificate: BVS 06 ATEX F 001
Test report: BVS PP 05.2029 EC.

Type of protection Ex b

The function for dry-running protection of centrifugal pumps in hazardous areas complies with the requirements of the following type of protection:

- Ex b "Control of ignition source", ignition protection system b1, e.g. according to EN 80079-37

SIMOCODE pro is registered for the dry-running protection of centrifugal pumps by means of active power monitoring according to both ATEX and IEC Ex.

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		
SIMOCODE pro PROFIBUS						
3UF7000-1AB00-0	**SIMOCODE pro C** 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	▶	**3UF7000-1AB00-0**		1	1 unit
	• 110 ... 240 V AC/DC	▶	**3UF7000-1AU00-0**		1	1 unit
3UF7020-1AU01-0	**SIMOCODE pro S** 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 Note: The connection cable to the current measuring module must be at least 15 cm. Rated control supply voltage U_S:					
	• 24 V DC	▶	**3UF7020-1AB01-0**		1	1 unit
	• 110 ... 240 V AC/DC	▶	**3UF7020-1AU01-0**		1	1 unit
3UF7010-1AB00-0	**SIMOCODE pro V**[1)] 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	▶	**3UF7010-1AB00-0**		1	1 unit
	• 110 ... 240 V AC/DC	▶	**3UF7010-1AU00-0**		1	1 unit
SIMOCODE pro PROFINET						
3UF7011-1AB00-1	**SIMOCODE pro V PROFINET GP** NEW ETHERNET/PROFINET IO, OPC UA server and web server, 100 Mbps, PROFINET system redundancy, 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion module, web server in German/English/Chinese/Russian 2 x connection to bus through RJ45, Media Redundancy Protocol Rated control supply voltage U_S:					
	• 24 V DC	▶	**3UF7011-1AB00-1**		1	1 unit
	• 110 ... 240 V AC/DC	▶	**3UF7011-1AU00-1**		1	1 unit
	1 x connection to bus through RJ45, Rated control supply voltage U_S:					
	• 24 V DC	▶	**3UF7011-1AB00-2**		1	1 unit
	• 110 ... 240 V AC/DC	▶	**3UF7011-1AU00-2**		1	1 unit
3UF7011-1AB00-0	**SIMOCODE pro V PROFINET** 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	▶	**3UF7011-1AB00-0**		1	1 unit
	• 110 ... 240 V AC/DC	▶	**3UF7011-1AU00-0**		1	1 unit

[1)] For the use of 2nd-generation current/voltage measuring modules, SIMOCODE pro V PROFIBUS with product version E15 (V4.0) must be ordered. This version does not have an NEPSI certificate. It can be ordered at no extra charge. The article number must be supplemented by "–**Z**" and the order code "**B01**", e.g. **3UF7010-1AB00-0 -Z B01**.

SIMOCODE pro 3UF7

Basic units *IE3/IE4* ready

Version	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
SIMOCODE pro Modbus RTU					
3UF7012-1A.00-0					
SIMOCODE pro V Modbus RTU[1)5)]					
Modbus RTU interface, 57.6 Kbps, 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	▶	**3UF7012-1AB00-0**		1	1 unit
• 110 ... 240 V AC/DC	▶	**3UF7012-1AU00-0**		1	1 unit
SIMOCODE pro EtherNet/IP					
3UF7013-1AB00-0					
SIMOCODE pro V EtherNet/IP[1)]					
EtherNet/IP interface, web server, 100 Mbps, 2 x connection to bus through RJ45, DLR media redundancy, 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	▶	**3UF7013-1AB00-0**		1	1 unit
• 110 ... 240 V AC/DC	▶	**3UF7013-1AU00-0**		1	1 unit
SIMOCODE pro current or current/voltage measuring modules					
3UF7103-1AA00-0					
Current measuring modules					
• Straight-through transformers 0.3 ... 3	45	▶ **3UF7100-1AA00-0**		1	1 unit
2.4 ... 25	45	▶ **3UF7101-1AA00-0**		1	1 unit
10 ... 100	55	▶ **3UF7102-1AA00-0**		1	1 unit
20 ... 200	120	▶ **3UF7103-1AA00-0**		1	1 unit
• Busbar connection[6)] 20 ... 200	120	▶ **3UF7103-1BA00-0**		1	1 unit
63 ... 630	145	▶ **3UF7104-1BA00-0**		1	1 unit
3UF7110-1AA01-0					
2nd-generation current/voltage measuring modules for SIMOCODE pro V[1)2)]					
Voltage measuring up to 690 V, measured values with increased accuracy, power, power factor and frequency monitoring					
• Straight-through transformers 0.3 ... 4	45	▶ **3UF7110-1AA01-0**		1	1 unit
3 ... 40	45	▶ **3UF7111-1AA01-0**		1	1 unit
10 ... 115	55	▶ **3UF7112-1AA01-0**		1	1 unit
20 ... 200	120	▶ **3UF7113-1AA01-0**		1	1 unit
• Busbar connection[6)] 20 ... 200	120	▶ **3UF7113-1BA01-0**		1	1 unit
63 ... 630	145	▶ **3UF7114-1BA01-0**		1	1 unit
3UF7123-1AA01-0					
Current/voltage measuring modules for dry-running protection of centrifugal pumps in hazardous areas[2)3)4)] NEW					
• Straight-through transformers 0.3 ... 4	45	▶ **3UF7120-1AA01-0**		1	1 unit
3 ... 40	45	▶ **3UF7121-1AA01-0**		1	1 unit
10 ... 115	55	▶ **3UF7122-1AA01-0**		1	1 unit
20 ... 200	120	▶ **3UF7123-1AA01-0**		1	1 unit
• Busbar connection[6)] 20 ... 200	120	▶ **3UF7123-1BA01-0**		1	1 unit
63 ... 630	145	▶ **3UF7124-1BA01-0**		1	1 unit

1) The SIMOCODE ES (TIA Portal) V14 software or higher is necessary for parameterization, see page 3/82.

2) When installing the basic unit on a current/voltage measuring module, the connection cable must be at least 15 cm long.

3) The current/voltage measuring modules for dry-running protection require SIMOCODE pro V PROFIBUS basic units as of product version E16 (expected to be available from 03/2019), SIMOCODE pro V PROFINET as of product version E13 (expected to be available from 10/2018) or SIMOCODE pro V EtherNet/IP as of product version E04 (expected to be available from 03/2019).

4) When using an operator panel with display with the current/voltage measuring modules for dry-running protection, an operator panel with display as of product version E03 (both versions 3UF7210-1AA01-0 and 3UF7210-1BA01-0 expected to be available from 03/2019) is required.

5) For the use of 2nd-generation current/voltage measuring modules, SIMOCODE pro V Modbus RTU with product version E03 (V2.0) must be ordered. This version does not have an NEPSI certificate. It can be ordered at no extra charge. The article number must be supplemented by "–**Z**" and the order code "**B01**", e.g. **3UF7012-1AB00-0 -Z B01.**

6) One terminal parts kit 3RT1955-4PA00 or 3RT1966-4PA00 (see page 3/81) is included in the scope of delivery for connection to a contactor.

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 operator panels								
3UF7200-1AA01-0	**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**		1	1 unit
3UF7210-1.A01-0	**Operator panels with display for SIMOCODE pro V** Installation in control cabinet door or front plate, for plugging into SIMOCODE pro V, 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							
	• English/German/French/Spanish/Portuguese/ Italian/Polish/Finnish			►	**3UF7210-1AA01-0**		1	1 unit
	• English/Chinese/Russian/Korean			►	**3UF7210-1BA01-0**		1	1 unit

Selection and ordering data

Version	SD	Screw terminals	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. Notes: The SIMOCODE pro V PN GP basic unit can be used with the 3UF7300-1A.00-0 monostable digital module, the 3UF7510-1AA00-0 ground-fault module, or the 3UF7700-1AA0-0 temperature module. Please order connection cable separately, see page 10/22.				
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	▶	**3UF7300-1AB00-0**	1	1 unit
Monostable / 110 ... 240 V AC/DC	▶	**3UF7300-1AU00-0**	1	1 unit
Bistable / 24 V DC	▶	**3UF7310-1AB00-0**	1	1 unit
Bistable / 110 ... 240 V AC/DC	▶	**3UF7310-1AU00-0**	1	1 unit
Analog modules By means of the analog module, the basic unit can be optionally expanded by 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 PB/MB RTU basic unit and max. two analog modules per pro V PN/EIP basic unit	▶	**3UF7400-1AA00-0**	1	1 unit
Ground-fault modules 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.	▶	**3UF7510-1AA00-0**	1	1 unit
Temperature modules Irrespective of the thermistor motor protection of the basic units, up to an additional 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 PB/MB RTU basic unit and up to two temperature modules per pro V PN/EIP basic unit	▶	**3UF7700-1AA00-0**	1	1 unit

3UF7300-1AB00-0

3UF7400-1AA00-0

3UF7510-1AA00-0

3UF7700-1AA00-0

	Version	SD	Screw terminals		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.					
 3UF7600-1AU01-0	**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	▶	**3UF7600-1AB01-0**		1	1 unit
	• 110 ... 240 V AC/DC	▶	**3UF7600-1AU01-0**		1	1 unit

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	▶	**3UF7320-1AB00-0**		1	1 unit
• 110 ... 240 V AC/DC	▶	**3UF7320-1AU00-0**		1	1 unit
DM-F PROFIsafe fail-safe digital modules[1)] For fail-safe disconnection using PROFIBUS/PROFIsafe or PROFINET/PROFIsafe 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	▶	**3UF7330-1AB00-0**		1	1 unit
• 110 ... 240 V AC/DC	▶	**3UF7330-1AU00-0**		1	1 unit

3UF7320-1AB00-0

3UF7330-1AB00-0

1) Cannot be used in conjunction with SIMOCODE pro V for Modbus RTU or EtherNet/IP communication.

Selection and ordering data

	Version		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
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						
	Version	Length					
	Flat	0.025 m	▶	**3UF7930-0AA00-0**		1	1 unit
		0.1 m	▶	**3UF7931-0AA00-0**		1	1 unit
		0.15 m NEW	▶	**3UF7934-0AA00-0**		1	1 unit
		0.3 m	▶	**3UF7935-0AA00-0**		1	1 unit
		0.5 m	▶	**3UF7932-0AA00-0**		1	1 unit
	Round	0.5 m	▶	**3UF7932-0BA00-0**		1	1 unit
		1.0 m	▶	**3UF7937-0BA00-0**		1	1 unit
		2.5 m	▶	**3UF7933-0BA00-0**		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		▶	**3UF7941-0AA00-0**		1	1 unit
	USB/serial adapters For connecting an RS 232 PC cable to the USB interface of a PC		5	**3UF7946-0AA00-0**		1	1 unit
Memory modules							
3UF7901-0AA01-0	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 modules for SIMOCODE pro C For saving the complete parameterization of a SIMOCODE pro C system, titanium gray		▶	**3UF7900-0AA01-0**		1	1 unit
	Memory modules for SIMOCODE pro S and pro V For saving the complete parameterization of a SIMOCODE pro system, titanium gray		▶	**3UF7901-0AA01-0**		1	1 unit
Interface covers							
3RA6936-0B	For system interface, titanium gray		10	**3RA6936-0B**		1	5 units
Addressing plugs							
3UF7910-0AA00-0	For assigning the PROFIBUS or Modbus RTU address without using a PC/PG to SIMOCODE pro through the system interface		▶	**3UF7910-0AA00-0**		1	1 unit

SIMOCODE pro 3UF7

Accessories

	Version		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Accessories for motor control centers							
3UF7902-0AA00-0	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.						
	Initialization modules		▶	**3UF7902-0AA00-0**		1	1 unit
	For automatic parameterization of SIMOCODE pro S and SIMOCODE pro V basic units (pro V PROFIBUS basic units from product version E09)						
	Y connection cables						
	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	▶	**3UF7931-0CA00-0**		1	1 unit
	0.5 m	1.0 m	▶	**3UF7932-0CA00-0**		1	1 unit
	1.0 m	1.0 m	▶	**3UF7937-0CA00-0**		1	1 unit
Bus connection terminals							
3UF7960-0AA00-0	For shield support and strain relief of the PROFIBUS cable on a SIMOCODE pro S		▶	**3UF7960-0AA00-0**		1	1 unit
Door adapters							
3UF7920-0AA00-0	For external connection of the system interface, e.g. outside a control cabinet		▶	**3UF7920-0AA00-0**		1	1 unit
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		▶	**3UF7922-0AA00-0**		1	1 unit
Labeling strips							
3UF7925-0AA02-0	• For pushbuttons of the 3UF720 operator panel		▶	**3UF7925-0AA00-0**		100	400 units
	• For pushbuttons of the 3UF721 operator panel with display		▶	**3UF7925-0AA01-0**		100	600 units
	• For LEDs of the 3UF720 operator panel		▶	**3UF7925-0AA02-0**		100	1 200 units
Push-in lugs							
3RV2928-0B	For screw fixing, e.g. on mounting plate, 2 units required per device						
	• Can be used for 3UF71.0, 3UF71.1 and 3UF71.2		2	**3RV2928-0B**		100	10 units
	• Can be used for 3UF700, 3UF701, 3UF73, 3UF74, 3UF75 and 3UF77		5	**3RP1903**		1	10 units
	• Can be used for 3UF7020, 3UF7600		2	**3ZY1311-0AA00**		1	10 units

SIMOCODE pro 3UF7

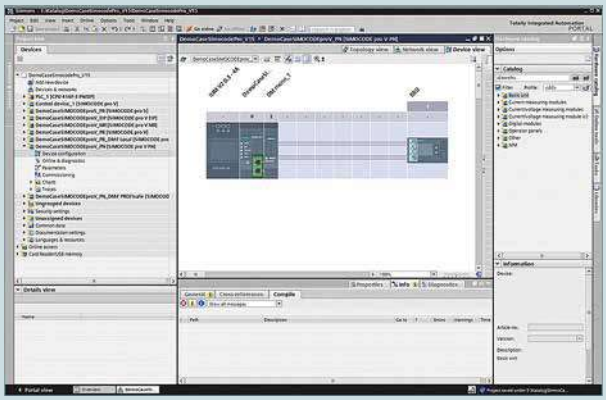
Accessories

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Terminal covers						
3RT1956-4EA1	**Covers for cable lugs and busbar connections**					
	• Length 100 mm, can be used for 3UF71.3-1BA0.-0	▶	**3RT1956-4EA1**		1	1 unit
	• Length 120 mm, can be used for 3UF71.4-1BA0.-0	2	**3RT1966-4EA1**		1	1 unit
	Covers for box terminals					
	• Length 25 mm, can be used for 3UF71.3-1BA0.-0	▶	**3RT1956-4EA2**		1	1 unit
	• Length 30 mm, can be used for 3UF71.4-1BA0.-0	2	**3RT1966-4EA2**		1	1 unit
3RT1956-4EA2	**Covers for screw terminals**					
	Between contactor and current measuring module or current/voltage measuring module for direct mounting					
	• Can be used for 3UF71.3-1BA0.-0	▶	**3RT1956-4EA3**		1	1 unit
	• Can be used for 3UF71.4-1BA0.-0	2	**3RT1966-4EA3**		1	1 unit
Terminal parts kit						
	Can be used for current and/or current/voltage measuring modules with standard mounting rail connection, complete for one contactor					
	• M 8 x 25	5	**3RT1955-4PA00**		1	1 unit
	• M 10 x 30	5	**3RT1966-4PA00**		1	1 unit
Box terminal blocks						
3RT195.-4G	For round and ribbon cables					
	• Up to 70 mm^2, can be used for 3UF71.3-1BA0.-0	▶	**3RT1955-4G**		1	1 unit
	• Up to 120 mm^2, can be used for 3UF71.3-1BA0.-0	▶	**3RT1956-4G**		1	1 unit
	• Up to 240 mm^2, can be used for 3UF71.4-1BA0.-0	▶	**3RT1966-4G**		1	1 unit
Bus termination modules						
3UF1900-1KA00	With separate control supply voltage for bus termination following the last unit on the bus line					
	Supply voltage:					
	• 115/230 V AC	5	**3UF1900-1KA00**		1	1 unit
	• 24 V DC	5	**3UF1900-1KB00**		1	1 unit

SIMOCODE pro 3UF7

SIMOCODE ES (TIA Portal) NEW

Overview



Selection of SIMOCODE pro device configuration in SIMOCODE ES (TIA Portal)

More information

Industry Mall, see www.siemens.com/product?3ZS1

TIA Selection Tool Cloud (TST Cloud)

Software download
- For SIMOCODE pro S, see https://support.industry.siemens.com/cs/ww/en/view/109752321
- For SIMOCODE pro V, see https://support.industry.siemens.com/cs/ww/en/view/109480470
- SIMOCODE ES 2007, see https://support.industry.siemens.com/cs/ww/en/view/109750623

SIMOCODE ES is the central software for configuration, startup, operation and diagnostics of SIMOCODE pro.

SIMOCODE ES Version 15.1 is available as a powerful successor to Version 2007, which is based on the central engineering framework Totally Integrated Automation Portal (TIA Portal).

SIMOCODE ES V15.1 is integrated seamlessly when further TIA Portal-based software such as STEP 7 or WinCC is available, thus enabling users to achieve a consistent, efficient and intuitive solution for all automation tasks.

However, use of SIMOCODE ES V15.1 as stand-alone software also provides these advantages.

Three program versions

The user can choose between three different versions of SIMOCODE ES:

- SIMOCODE ES Basic
- SIMOCODE ES Standard
- SIMOCODE ES Premium

From V15, the powerful SIMOCODE ES Basic tool for startup or maintenance personnel is available for downloading free of charge in the Siemens Industry Online Support (see "More information").

SIMOCODE ES Standard and Premium are the perfect tools for engineers or configuration engineers on account of their larger scope of functions and integrated graphics editor. Unlike the Standard version, SIMOCODE ES Premium also permits parameterization and diagnostics via PROFIBUS/PROFINET/Ethernet. Indication of all operating, service and diagnostics data supplies important information about the current state of the motor and plant at all times – everywhere on PROFIBUS/PROFINET/Ethernet.

SIMOCODE ES V15.1	Basic	Standard	Premium
Access via the local interface on the device	✓	✓	✓
Parameter assignment in list form	✓	✓	✓
Parameter printing in list form	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	✓	✓	✓
Test	✓	✓	✓
Service data	✓	✓	✓
Analog value recording[1)]	✓	✓	✓
Trend display of measured values	--	✓	✓
Parameterizing with convenient graphical display	--	✓	✓
Parameterizing with the integrated graphics editor (CFC-based)	--	✓	✓
Printing of diagrams	--	✓	✓
Parameter comparison	--	✓	✓
Access via PROFIBUS/PROFINET/Ethernet[2)]	--	--	✓
Teleservice via MPI	--	--	✓
Routing[3)]	--	--	✓

✓ Function available

-- Function not available

1) For SIMOCODE pro V.

2) In combination with Modbus devices, SIMOCODE ES Premium does not offer any additional functions compared with SIMOCODE ES Standard.

3) See https://support.industry.siemens.com/cs/ww/en/view/109738745.

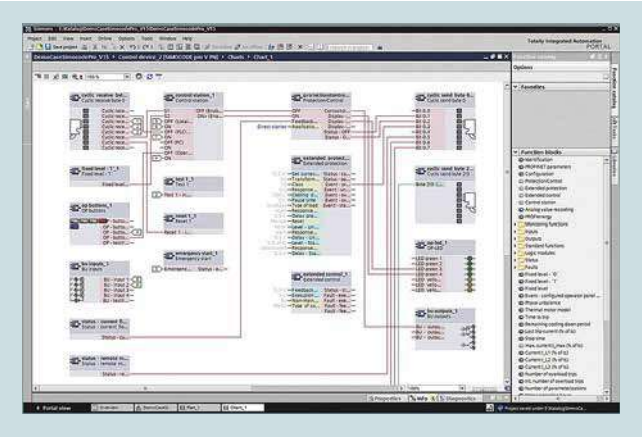
Working with libraries

Users can create copy templates for SIMOCODE pro device configuration and can manage them in global or project libraries.

This way, individual modules, diagrams and complete device configurations can be saved as reusable elements for frequently occurring tasks.

Integrated graphics editor

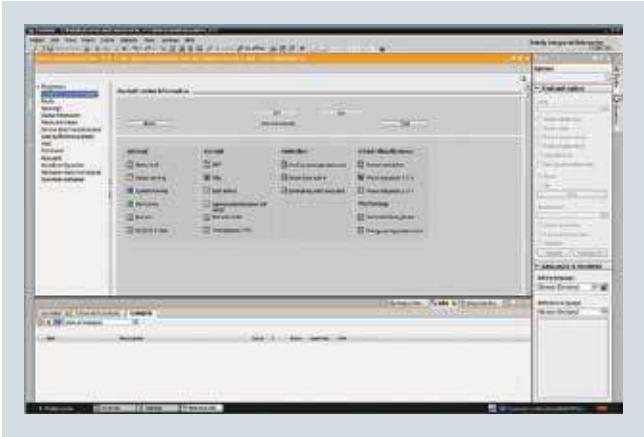
The graphics editor is a part of SIMOCODE ES Standard and SIMOCODE ES Premium. It is based on the Continuous Function Chart (CFC) and adds a powerful tool to the parameterizing interface that enables easy parameterization of devices by drag & drop. What is more, all the parameters can also be edited directly in the graphics editor. Extremely compact documentation of all configured parameters is possible, as is the graphic online presentation of the configured device functions including all signal states during operation.



Parameterize easily and ergonomically with the CFC-based graphics editor of SIMOCODE ES V15.1

Online functions for startup and diagnostics

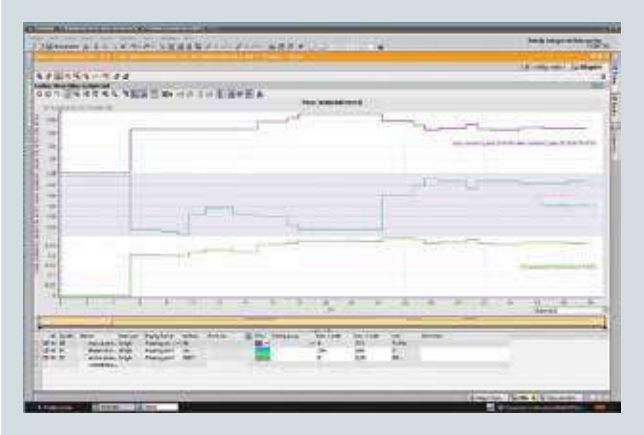
To this end, SIMOCODE ES provides powerful functions for startup and diagnostics of motor feeders. Besides a detailed display of status information and the causes of faults, all available measurement and statistics data can be retrieved online. Access to the fault and event memory and also to analog values recorded on the device, e.g. current or voltage, is also possible.



Commissioning functions of SIMOCODE ES V15

Trend display of measured values

With this online function, SIMOCODE ES Standard or Premium can present the trends of different measured values. It is thus possible for example to record and evaluate the start-up characteristic of a motor or its behavior under different load conditions.



Live trend display of SIMOCODE ES V15.1

Additional functions

SIMOCODE ES V15.1 offers numerous advantages of the TIA Portal that can be used in an integrated working environment.

Seamless integration

When using other TIA Portal-based software such as STEP 7 or WinCC, for example, the configuration for devices and networks for all components used is created in a standardized environment.

Teleservice via MPI

The SIMOCODE ES (TIA Portal) 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.

Benefits

- Easy parameterization with the graphics editor based on the Continuous Function Chart (CFC) reduces engineering work and shortens startup times
- Clear plant documentation by means of graphic presentation
- Detailed information, also when there are faults, is a help for maintenance personnel and shortens downtimes
- Universally applicable through stand-alone version or seamless integration into the central engineering framework when other TIA Portal-based software such as STEP 7 or WinCC are available
- Parameter changes are also possible during normal operation
- Users can create copy templates for device configurations and can manage them in global libraries

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 V15.1 Basic						
	Basic functional scope including Premium Trial License Engineering software, software download 6 languages (German/English/French/Italian/Spanish/Chinese), for all SIMOCODE pro, online functions via system interface Available free of charge as a download, see https://support.industry.siemens.com/cs/ww/en/view/109763898	▶				
SIMOCODE ES V15.1 Standard						
 3ZS1322-5CC13-0YA5	**Floating license for one user** Engineering software, software and documentation on DVD, 6 languages (German/English/French/Italian/Spanish/Chinese), Combo license for parallel use of versions 2007 and V15.1 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	▶	**3ZS1322-5CC13-0YA5**		1	1 unit
	• License key and software download, Class A	▶	**3ZS1322-5CE13-0YB5**		1	1 unit
	Upgrade for SIMOCODE ES 2007 Standard Floating license for one user, engineering software, software and documentation on DVD, license key on USB flash drive, Class A, 6 languages (German/English/French/Italian/Spanish/Chinese), Combo license for parallel use of versions 2007 and V15.1 of SIRIUS ES, for all SIMOCODE pro, online functions via system interface, parameterizing with integrated graphics editor (CFC-based)	2	**3ZS1322-5CC13-0YE5**		1	1 unit
	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, parameterizing with integrated graphics editor (CFC-based)	▶	**3ZS1322-5CC00-0YL5**		1	1 unit

Notes:

SIMOCODE ES V12/V13/V14/V15 licenses can also be used for SIMOCODE ES V15.1.

Please order PC cable separately, see page 3/79.

For a description of the software versions, see page 3/82.

SIMOCODE pro 3UF7

SIMOCODE ES (TIA Portal) NEW

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
SIMOCODE ES V15.1 Premium						
3ZS1322-6CC13-0YA5	**Floating license for one user** Engineering software, software and documentation on DVD, 6 languages (German/English/French/Italian/Spanish/Chinese), Combo license for parallel use of versions 2007 and V15.1 of SIRIUS ES, for all SIMOCODE pro, online functions via system interface and PROFIBUS/PROFINET/Ethernet, parameterizing with the integrated graphics editor (CFC-based)					
	• License key on USB flash drive, Class A	▶	**3ZS1322-6CC13-0YA5**		1	1 unit
	• License key and software download, Class A	▶	**3ZS1322-6CE13-0YB5**		1	1 unit
	Upgrade for SIMOCODE ES 2007 Premium Floating license for one user, engineering software, software and documentation on DVD, license key on USB flash drive, Class A, 6 languages (German/English/French/Italian/Spanish/Chinese), Combo license for parallel use of versions 2007 and V15.1 of SIRIUS ES, for all SIMOCODE pro, online functions via system interface and PROFIBUS/PROFINET/Ethernet, parameterizing with the integrated graphics editor (CFC-based)	2	**3ZS1322-6CC13-0YE5**		1	1 unit
	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, parameterizing with integrated graphics editor (CFC-based)	▶	**3ZS1322-6CC00-0YL5**		1	1 unit

Notes:

Please order PC cable separately, see page 3/79.

For a description of the software versions, see page 3/82.

Notes

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

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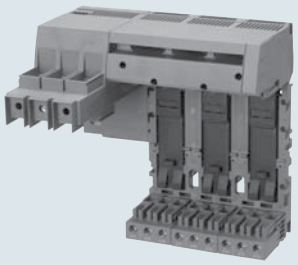
3RA64 / 3RA65 up to 32 A for mounting rail, surface, comb busbar, infeed system Page

Selection and ordering data

- Direct start, Reversing duty 4/8
- Accessories 4/9-4/13



3RA68 up to 100 A for 3RA6 direct and reversing starters Page

Selection and ordering data

- Infeed Components 4/16-4/19
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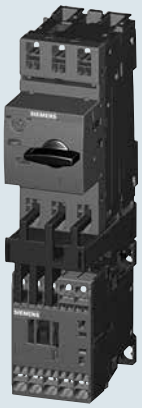
Combination starters & starters for group installation 3RA2



3RA21 up to 100 A for mounting rail and Fast Bus busbar systems Page

Selection and ordering data

- Direct start 4/36-4/39
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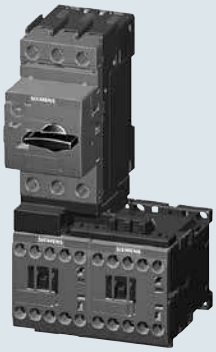

3RA22 up to 100 A for mounting rail and Fast Bus busbar systems Page

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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)"	**3RV29 28-1H**
Three-phase busbars	Three-phase infeed terminal for constructing "Type E Starters", UL 508	**3RV29 25-5EB**
Infeed systems for 3RA6	Infeed on left, 50/70 mm^2, screw terminal with 3 sockets, outgoing terminal with screw/spring-type connections, including PE bar	**3RA68 13-8AB** (screw terminals), **3RA68 13-8AC** (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_q = 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	Rated control supply voltage for 3RA61, 3RA62 compact starters	Rated control supply voltage for 3RA64, 3RA65 compact starters for IO-Link
A	HP	V AC/DC	V DC
0.1 ... 0.4	0.12	24 110 ... 240	24
0.32 ... 1.25	0.43 ... 1.68		
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

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 autoreset 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.

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 < 10 s

CLASS 20: 6s < t_A < 20 s (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 "counter-clockwise 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)

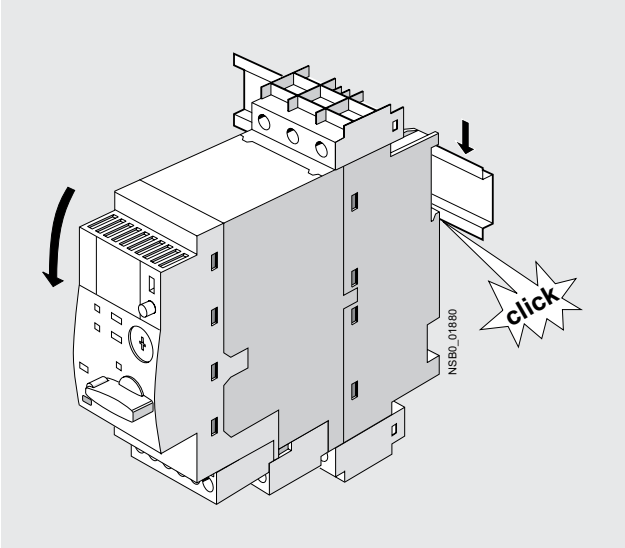
Design

Mounting

The 3RA6 compact starters can be mounted in 4 ways:

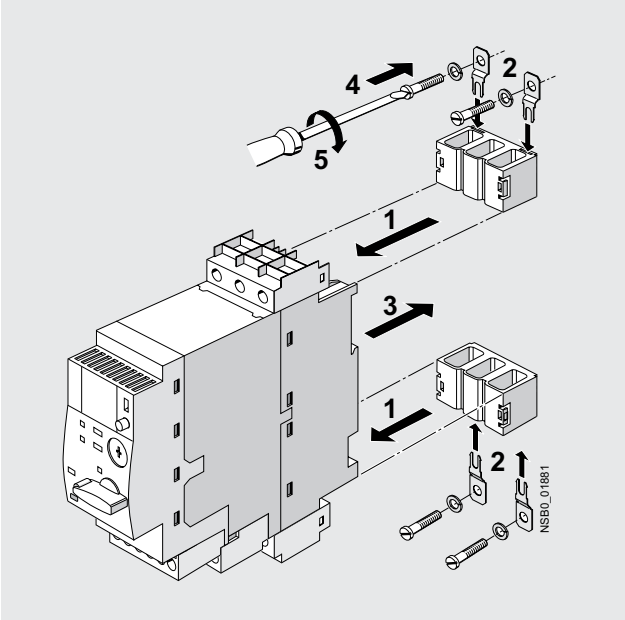
1) By snapping onto a TH 35 standard mounting rail

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

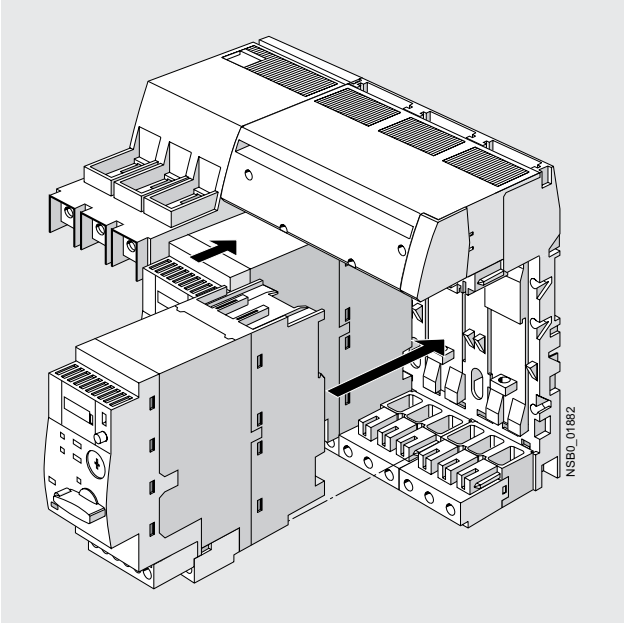
The SIRIUS compact starters are suitable for screw fixing to a flat surface. One set of 3RA69 40-0A adapters for screw connection (including push-in lugs) is required per direct-on-line starter, two sets are required per reversing starter.



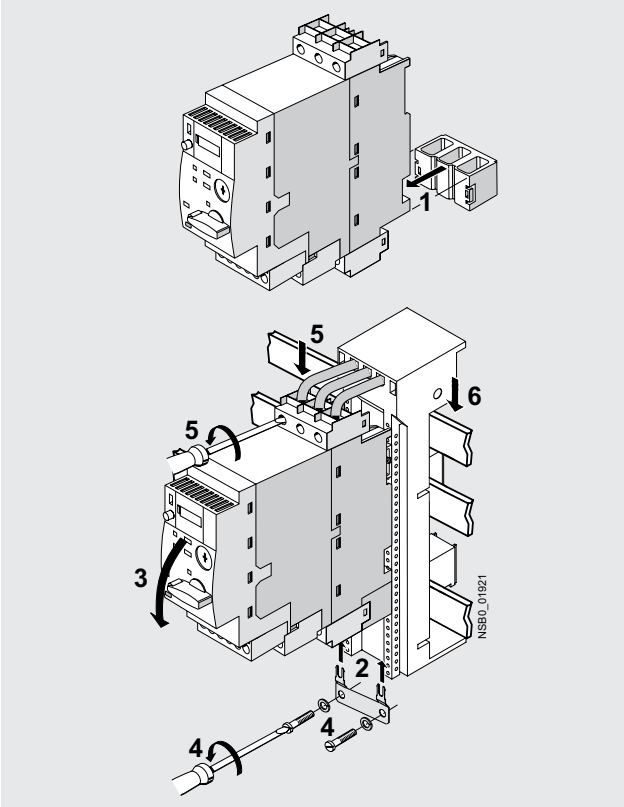
1 ... 5: order of mounting steps

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

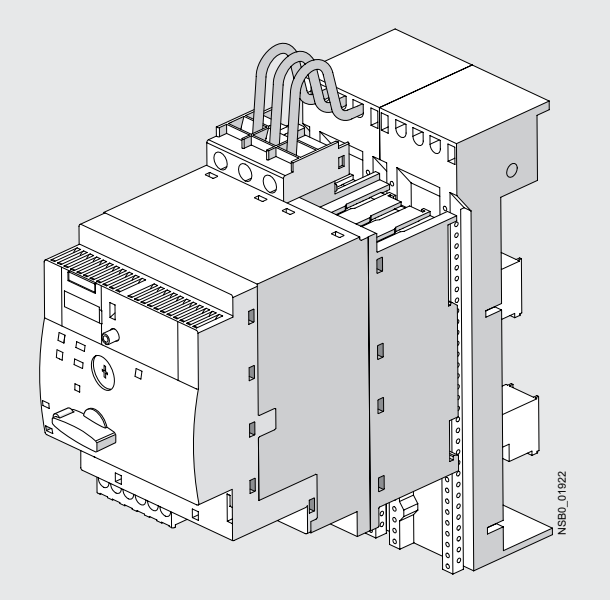


1 ... 6: order of mounting steps

4a) By using an additional device holder in the case of reversing starters

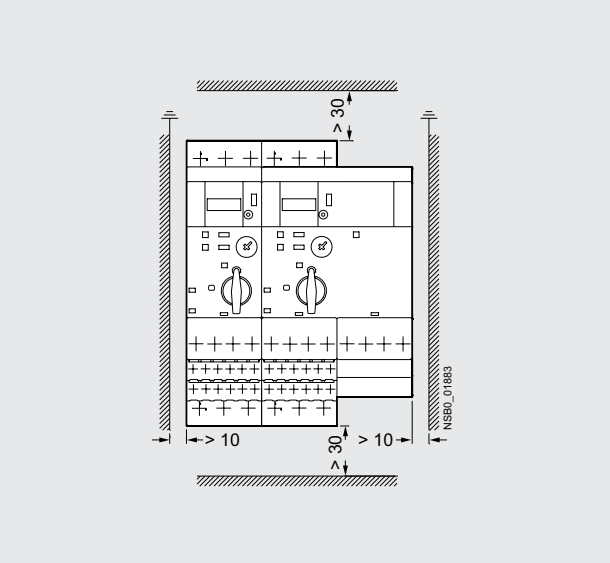
When the 8US busbar adapter is used on Fast Bus systems with 60 mm busbar center-to-center clearance, a device holder is needed in addition for a reversing starter on account of its double width.

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 at 600 V [1] Standard output *P* HP	Setting range for solid-state overload release A	Order No.	Order No.
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			
--	0.1 ... 0.4	**3RA6□□0-0A □32**	–
1/2	0.32 ... 1.25	**3RA6□□0-0B □32**	–
3	1 ... 4	**3RA6□□0-0C □32**	–
10	3 ... 12	**3RA6□□0-0D □32**	–
30	8 ... 32	**3RA6□□0-0E □32**	–
		Screw terminals [2]	**Spring-type terminals**
For standard mounting rail or screw mounting, including 1 pair of main circuit terminals and 1 pair of control circuit terminals			
--	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**
3	1 ... 4	**3RA6□□0-1C □32**	**3RA6□□0-2C □32**
10	3 ... 12	**3RA6□□0-1D □32**	**3RA6□□0-2D □32**
30	8 ... 32	**3RA6□□0-1E □32**	**3RA6□□0-2E □32**
For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals			
--	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**
3	1 ... 4	**3RA6□□0-1C □33**	**3RA6□□0-2C □33**
10	3 ... 12	**3RA6□□0-1D □33**	**3RA6□□0-2D □33**
30	8 ... 32	**3RA6□□0-1E □33**	**3RA6□□0-2E □33**
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			
--	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**
3	1 ... 4	**3RA6□□0-1C □34**	**3RA6□□0-2C □34**
10	3 ... 12	**3RA6□□0-1D □34**	**3RA6□□0-2D □34**
30	8 ... 32	**3RA6□□0-1E □34**	**3RA6□□0-2E □34**

Order No. supplements for rated control supply voltage

• Direct-on-line starter	**12**	**12**
• Reversing duty starter	**25**	**25**
• 24 V AC/DC (for combining with AS-I add-on module)	**B**	**B**
• 110 … 240 V AC/DC	**P**	**P**

[1] Selection depends on the motor full load amps. Horse Power ratings provided for reference only.

[2] 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 600 V AC Standard output P HP 1)	Setting range for solid-state overload release A	Screw terminals Order No.	Spring-type terminals Order No.
For standard mounting rail or screw moutning, including 1 pair of main circuit terminals and 1 pair of control circuit terminals			
--	0.1 … 0.4	**3RA64 00-1AB42**	**3RA64 00-2AB42**
½	0.32 … 1.25	**3RA64 00-1BB42**	**3RA64 00-2BB42**
3	1 … 4	**3RA64 00-1CB42**	**3RA64 00-2CB42**
10	3 … 12	**3RA64 00-1DB42**	**3RA64 00-2DB42**
30	8 … 32	**3RA64 00-1EB42**	**3RA64 00-2EB42**
For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals			
—	0.1 … 0.4	**3RA64 00-1AB43**	**3RA64 00-2AB43**
½	0.32 … 1.25	**3RA64 00-1BB43**	**3RA64 00-2BB43**
3	1 … 4	**3RA64 00-1CB43**	**3RA64 00-2CB43**
10	3 … 12	**3RA64 00-1DB43**	**3RA64 00-2DB43**
30	8 … 32	**3RA64 00-1EB43**	**3RA64 00-2EB43**

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

For standard mounting rail or screw moutning, including 1 pair of main circuit terminals and 1 pair of control circuit terminals			
—	0.1 … 0.4	**3RA65 00-1AB42**	**3RA65 00-2AB42**
½	0.32 … 1.25	**3RA65 00-1BB42**	**3RA65 00-2BB42**
3	1 … 4	**3RA65 00-1CB42**	**3RA65 00-2CB42**
10	3 … 12	**3RA65 00-1DB42**	**3RA65 00-2DB42**
30	8 … 32	**3RA65 00-1EB42**	**3RA65 00-2EB42**
For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals			
—	0.1 … 0.4	**3RA65 00-1AB43**	**3RA65 00-2AB43**
½	0.32 … 1.25	**3RA65 00-1BB43**	**3RA65 00-2BB43**
3	1 … 4	**3RA65 00-1CB43**	**3RA65 00-2CB43**
10	3 … 12	**3RA65 00-1DB43**	**3RA65 00-2DB43**
30	8 … 32	**3RA65 00-1EB43**	**3RA65 00-2EB43**

1) Selection depends on the motor full load amps. Horse power ratings provided for reference only.

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

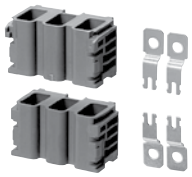
Door-coupling rotary operating mechanisms for standard and emergency-stop applications are available for operating the compact starter with closed control cabinet doors.

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

Selection and ordering data

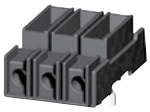
	Version	Order No.	Std. pack qty.	Weight approx. kg
Accessories for 3RA6 compact starters				
3RA69 50-0A	**Control kits** For mechanical actuation of the compact starter	**3RA69 50-0A**	1 unit	0.004
 3RA69 40-0A	**Adapters for screw mounting the compact starter** (set including push-in lugs) Direct-on-line starters require 1 set, reversing starters 2 sets.	**3RA69 40-0A**	1 unit	0.152
		Screw terminals		
3RA69 11-1A	**Auxiliary switch blocks for compact starters**			
	• 2 NO	**3RA69 11-1A**	1 unit	0.018
	• 2 NC	**3RA69 12-1A**	1 unit	0.018
	• 1 NO +1 NC (these auxiliary contacts are positively driven.)	**3RA69 13-1A**	1 unit	0.018
3RA69 20-1A	**Main circuit terminals** (line and load side)	**3RA69 20-1A**	1 unit	0.038
3RA69 20-1B	**Control circuit terminals**			
	• For 3RA61	**3RA69 20-1B**	1 unit	0.042
	• For 3RA62	**3RA69 20-1C**	1 unit	0.042
		Spring-type terminals		
3RA69 11-2A	**Auxiliary switch blocks for compact starters**			
	• 2 NO	**3RA69 11-2A**	1 unit	0.018
	• 2 NC	**3RA69 12-2A**	1 unit	0.018
	• 1 NO +1 NC (these auxiliary contacts are positively driven.)	**3RA69 13-2A**	1 unit	0.018
3RA69 20-2A	**Main circuit terminals** (line and load side)	**3RA69 20-2A**	1 unit	0.049
3RA69 20-2B	**Control circuit terminals**			
	• For 3RA61	**3RA69 20-2B**	1 unit	0.036
	• For 3RA62	**3RA69 20-2C**	1 unit	0.036

	Version	Order No.	Std. pack qty.	Weight approx. kg
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	**3RA69 20-3A**	1 unit	0.044

	Version	Order No.	Std. pack qty.	Weight approx. kg
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[1]	**3RA69 32-0A**	5 units	0.007
	- 200 mm[1]	**3RA69 33-0B**	5 units	0.012
	• 14-pole			
	- 8 mm[2]	**3RA69 31-0A**	5 units	0.007
	- 200 mm	**3RA69 33-0C**	5 units	0.014
3RA69 35-0A	**Operator panels** - 1 operator panel - 1 enabling module - 1 interface cover - 1 fixing terminal	**3RA69 35-0A**	1 unit	0.052
	Enabling block	**3RA69 36-0A**	1 unit	0.002
	Blanking covers	**3RA69 36-0B**	5 units	0.001
	Connection cable (round) for connecting the operator panel 10-pole, 2000 mm	**3RA69 33-0A**	1 unit	0.114
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)	**3RK1 005-0LB00-0AA0**	1 unit	0.057

[1] 10-pole connection cables are required for EMERGENCY-STOP group concepts.

[2] 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
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".				
	Terminal blocks type E For extended clearance and creepage distances (1 and 2 inch)	S00, S0	**3RV29 28-1H**	1 unit	0.065

SIRIUS 3RA6 Compact Starters

Accessories

Three-phase busbars[1)]

For feeding several motor starter protectors with screw terminals, mounted side by side on standard mounting rails, insulated, with touch protection

	Modular spacing	Number of motor starter protectors that can be connected: Without lateral accessories	With lateral auxiliary switch	With auxiliary release	Rated current I_n at 690 V	For motor starter protectors	Order No.	Std. pack qty.	Weight approx.
	mm				A	Size			
3RV1915-1AB	45[3)]	2	--	--	63	S00, S0[2)]	**3RV1915-1AB**	1 unit	0.044
		3	--	--	63	S00, S0[2)]	**3RV1915-1BB**	1 unit	0.071
3RV1915-1BB		4	--	--	63	S00, S0[2)]	**3RV1915-1CB**	1 unit	0.099
		5	--	--	63	S00, S0[2)]	**3RV1915-1DB**	1 unit	0.124
3RV1915-1CB	55[4)]	--	2	--	63	S00, S0[2)]	**3RV1915-2AB**		
		--	3	--	63	S00, S0[2)]	**3RV1915-2BB**		
		--	4	--	63	S00, S0[2)]	**3RV1915-2CB**		
		--	5	--	63	S00, S0[2)]	**3RV1915-2DB**		
		2	--	--	108	S2	**3RV1935-1A**		
		3	--	--	108	S2	**3RV1935-1B**		
		4	--	--	108	S2	**3RV1935-1C**		
3RV1915-1DB	63[5)]	--	--	2	63	S00, S0[2)]	**3RV1915-3AB**		
		--	--	4	63	S00, S0[2)]	**3RV1915-3CB**		
	75[5)]	--	2	2	108	S2	**3RV1935-3A**		
		--	3	3	108	S2	**3RV1935-3B**		
		--	4	4	108	S2	**3RV1935-3C**		

1) 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.

2) Approved for motor starter protectors size S0 with $I_n \leq 32$ A.

3) For 3RV2 motor starter protectors without accessories mounted on the side.

4) 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).

5) 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).

Three-phase infeed terminals

	Conductor cross-section: Solid or stranded	Finely stranded with end sleeve	AWG cables, solid or stranded	Tightening torque	For motor starter protectors/ circuit breakers	Order No.	Weight approx.
	mm²	mm²	AWG	Nm	Size		
Connection from top							
3RV2925-5AB	2.5 ... 25	2.5 ... 16	10 ... 4	3 ... 4	S00, S0	**3RV2925-5AB**	0.043
3RV2935-5A	2 x (2.5 ... 50)[1)], 1 x (2.5 ... 70)[1)]	2 x (2.5 ... 35)[1)], 1 x (2.5 ... 50)[1)]	2 x (10 ... 1/0)[1)], 1 x (10 ... 2/0)[1)]	4 ... 6	S2 NEW	**3RV2935-5A**	
Connection from below 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	**3RV2915-5B**	0.093

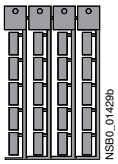
Three-phase infeed terminals for constructing "Type E Starters"

Connection from top							
3RV2925-5EB	2.5 ... 25	2.5 ... 16	10 ... 4	3 ... 4	S00, S0	**3RV2925-5EB**	0.044
3RV2935-5E	2 x (2.5 ... 50)[1)], 1 x (2.5 ... 70)[1)]	2 x (2.5 ... 35)[1)], 1 x (2.5 ... 50)[1)]	2 x (10 ... 1/0)[1)], 1 x (10 ... 2/0)[1)]	4 ... 6	S2 NEW	**3RV2935-5E**	

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

	Version	Order No.	Std. pack qty.	Weight approx. kg
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
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
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**[1)] for SIRIUS devices 20 mm x 7 mm, titanium gray	**3RT29 00-1SB20**	340 units	0.200

[1)] PC labeling system for individual inscription of unit labeling plates available from: Murrplastik Systems, Inc. www.murrplastik.com.

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

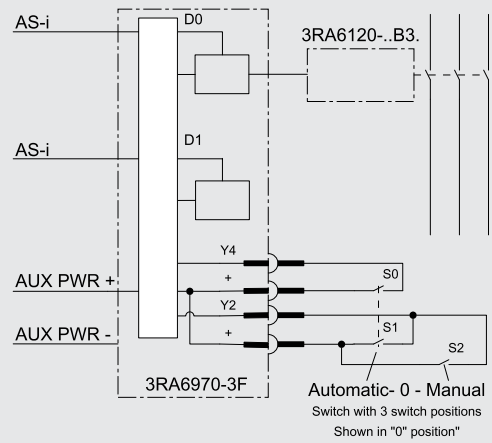
Opening the two inputs Y2 and Y4 will result in the direct disconnection of the compact starter. Operation through AS-i Communication is ended and the compact starter can now be switched on and off directly using NO contacts (one NO contact per direction of rotation on the reversing starter).

"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.

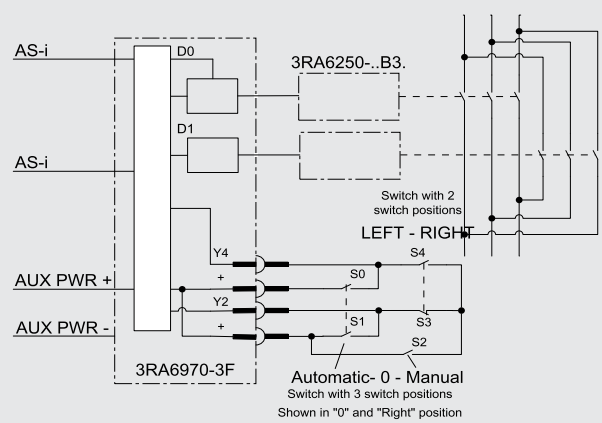
If AS-i Communication is reset, the motor is first switched off and then on again when requested by the control system.



Switch with 3 switch positions			
Switch	Automatic	0	Manual
S0	Closed	Open	Open
S1	Closed	Open	Open
S2	Open	Open	Closed

NSB0_02096

Circuit diagram example for operating a 3RA61 20 direct-on-line starter using an AS-i add-on module for on-site controller



Switch with 3 switch positions			
Switch	Automatic	0	Manual
S0	Closed	Open	Open
S1	Closed	Open	Open
S2	Open	Open	Closed

Switch with 2 switch positions		
Switch	Left	Right
S3	Open	Closed
S4	Closed	Open

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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
AS-i add-on modules				
3RA69 70-3A	**Standard version** For communication of the compact starter with the control system using AS-Interface	**3RA69 70-3A**	1 unit	0.045
	With two local inputs For safe disconnection through local safety relays, e.g. cable-operated switches	**3RA69 70-3B**	1 unit	0.045
3RA69 70-3B to -3F	**With two free external inputs** Replaces the digital standard inputs "Motor On" and "Group warning"	**3RA69 70-3C**	1 unit	0.045
	With one free external input and one free external output Replaces the digital standard input "Group warning"	**3RA69 70-3D**	1 unit	0.045
	With two free external outputs Only for direct-on-line starters, replaces the digital standard output "Motor left"	**3RA69 70-3E**	1 unit	0.045
	For local control Control of the compact starter optionally using AS-Interface or local switches	**3RA69 70-3F**	1 unit	0.045
Spare parts for AS-i add-on modules				
	Connectors for data and auxiliary supply cable with 2 insulation displacement terminations for standard litz wires 2 x 0.5 ... 0.75 mm^2			
	• Flat, yellow, extender	**3RK1901-0NA00**	5 units	
	• Flat, black, extender	**3RK1901-0PA00**	5 units	
Accessories for AS-i add-on modules				
3RK1904-2AB02	**AS-Interface addressing unit V 3.0** • For AS-Interface modules and sensors and actuators with integrated AS-Interface in accordance with AS-i Specification V3.0 • For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with 4 batteries type AA (IEC LR6, NEDA 15) • Scope of supply: - Addressing unit with 4 batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5m	**3RK1904-2AB02**	1 unit	0.540

3RA6 Compact Starters

Infeed systems for 3RA6 – up to 100 A

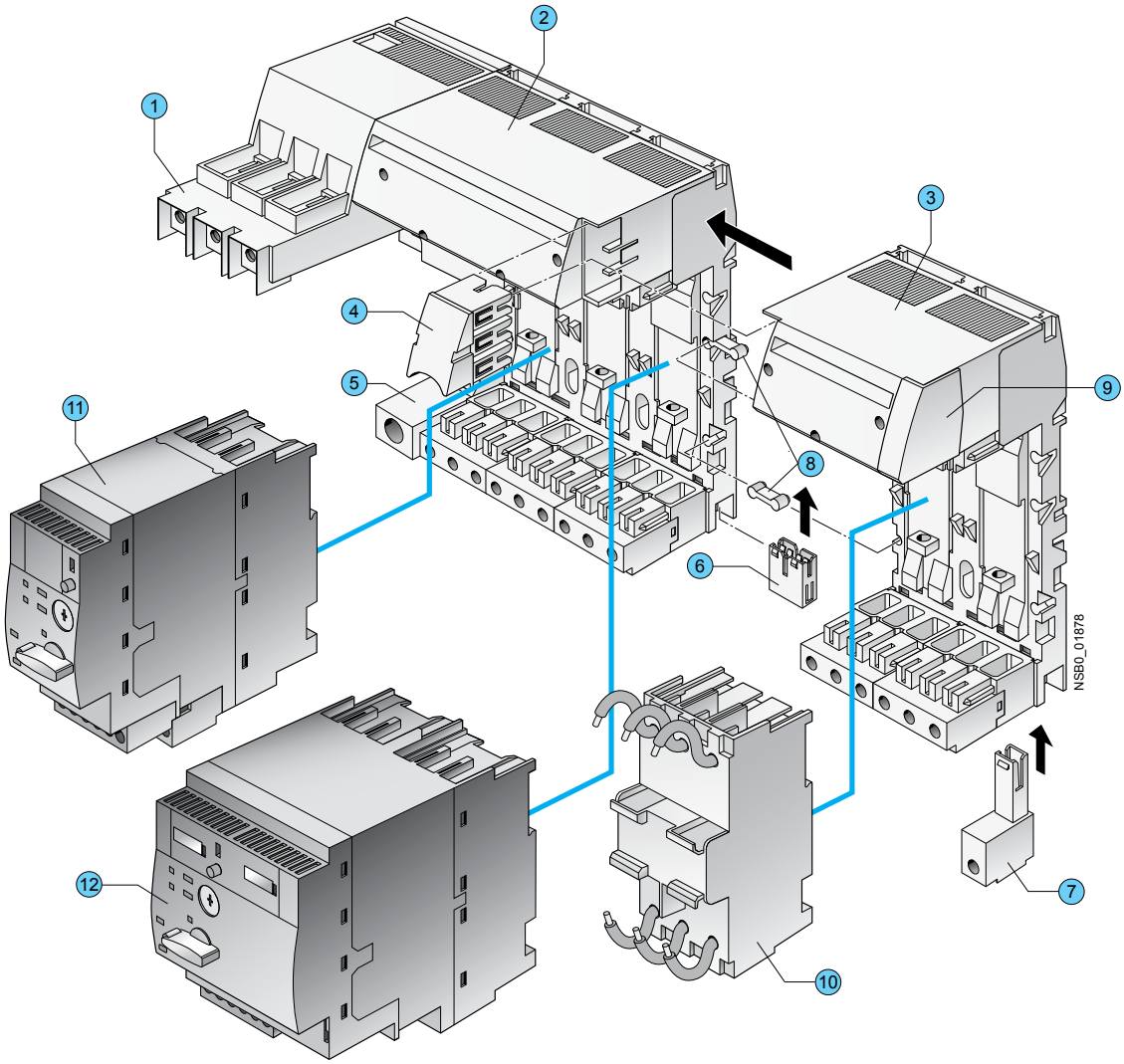
Overview

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.



1. Feeder terminal
2. Three-socket expansion module
3. Two-socket expansion module
4. Expansion plug
5. PE infeed
6. PE expansion plug
7. PE tap-off
8. Connecting plates
9. End cover
10. 45 mm adapter for SIRIUS motor starter protector size S0
11. 3RA61 direct-on-line starter
12. 3RA62 reversing starter

Infeed system for 3RA6 compact starters

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 a 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 3RV2motor 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:

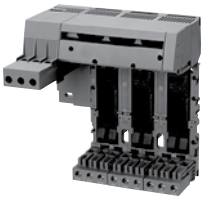
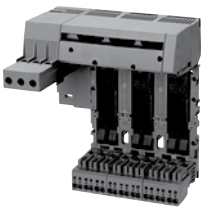
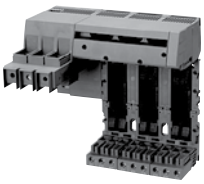
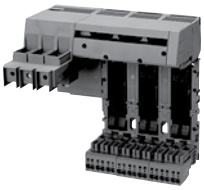
Conductor cross-section AWG	Inscriptions	Proposal for upstream short-circuit protection device
Short-circuit protection for infeed block (4-2 AWG) with screw connection		
14-2	$I_{d,\,max}$ = 19 kA, I^2t = 440 kA²s	**3RV10 41-4JA10**
Short-circuit protection for infeed block (0-2/0 AWG) with screw connection		
14-2/0	$I_{d,\,max}$ = approx. 22 kA	**3RV10 41-4MA10**
Short-circuit protection for infeed block with spring-type connection		
12	$I_{d,\,max}$ = 9.5 kA, I^2t = 85 kA²s	**3RV10 21-4DA10**
10	$I_{d,\,max}$ = 12.5 kA, I^2t = 140 kA²s	**3RV10 31-4EA10**
8	$I_{d,\,max}$ = 15 kA, I^2t = 180 kA²s	**3RV10 31-4HA10**
6-4	$I_{d,\,max}$ = 19 kA, I^2t = 440 kA²s	**3RV10 41-4JA10**
Short-circuit protection for terminal block		
16	$I_{d,\,max}$ = 7.5 kA	**5SY...** [1]
14	$I_{d,\,max}$ = 9.5 kA	
12	$I_{d,\,max}$ = 9.5 kA	
10	$I_{d,\,max}$ = 12.5 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

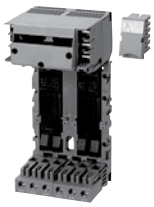
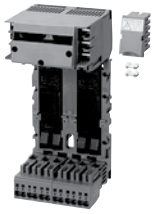
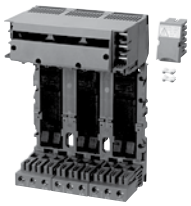
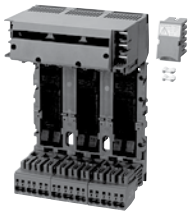
Infeed systems for 3RA6 – up to 100 A

Selection and ordering data

	Version	Order No.	Weight approx. kg
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**	**Screw terminals**	
	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	**3RA68 12-8AB**	0.957
 3RA68 12-8AC	• Spring-type terminals on outgoing side	**3RA68 12-8AC**	0.990
 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	**Screw terminals**	
	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	**3RA68 13-8AB**	1.146
 3RA68 13-8AC	• Spring-type terminals on outgoing side	**3RA68 13-8AC**	1.179
3RA68 30-5AC	***Infeeds with spring-type connection 4-2 AWG left or right***		
		Spring-type terminals	
	Up to 63 A	**3RA68 30-5AC**	0.283

SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6

	Version	Order No.		Weight approx. kg
Expansion modules				
 3RA68 22-0AB	***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
 3RA68 22-0AC		**Spring-type terminals**		
	• Spring-type terminals	**3RA68 22-0AC**		0.527
 3RA68 23-0AB	***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
 3RA68 23-0AC		**Spring-type terminals**		
	• Spring-type terminals	**3RA68 23-0AC**		0.750

Accessories

	Version	Order No.	Weight approx. kg
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

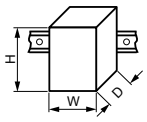
Infeed systems for 3RA6

	Version	Order No.	Weight approx.
Accessories for infeed systems for 3RA6 (continued)			
	45 mm adapters		
3RA6890-0BA	For SIRIUS 3RV1.2 and 3RV2.2 motor starter protectors. Size S0 up to 25 A • Screw terminals (conductor cross-section AWG 10)	**Screw terminals** **3RA6890-0BA**	0.152
	Terminal covers for infeeds with screw connection		
3RA6880-2AB	**IP20 terminal covers for infeeds with screw connection 25/35 mm² (3RA6812-8AB/AC)** (2 units per pack)	**3RA6880-2AB**	
3RA6880-3AB	**IP20 terminal covers for infeeds with screw connection 50/70 mm² (3RA6813-8AB/AC)** (2 units per pack)	**3RA6880-3AB**	
	Terminal blocks		
3RV2917-5D	For integration of single-phase, 2-phase and 3-phase external components • Spring-type terminals	**Spring-type terminals** **3RV2917-5D**	.0.050
Tools for opening spring-type terminals			
	Screwdrivers		
3RA2908-1A	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** **3RA2908-1A**	.0.045
System Manual "SIRIUS Compact Starters and Accessories"			
	The system manual can be downloaded free of charge in PDF format from the Internet, see http://support.automation.siemens.com/WW/view/en/27136554/133300		

SIRIUS 3RA6 Compact Starters

General data

More information

Type Size Number of poles			3RA61 S0 3	3RA62	3RA64	3RA65
General technical specifications						
Device standard			IEC/EN 60947-6-2			
Mounting dimensions (WxHxD) • Screw terminals • Spring-type terminals		mm mm	45 x 170 x 165 45 x 191 x 165	90 x 170 x 165 90 x 191 x 165	45 x 170 x 165 45 x 191 x 165	90 x 170 x 165 90 x 191 x 165
Weight		kg	1.4	2.3 -2.4	1.3	2.3
Permissible mounting positions			No restrictions, preferably vertical or horizontal installation			
Max. rated current I_e in the respective setting range	0.1 ... 0.4 A 0.32 ... 1.25 A 1 ... 4 A 3 ... 12 A 8 ... 32 A	A A A A A	0.4 1.25 4 12 32			
Permissible ambient temperature • During operation • For installation in SIRIUS infeed system for 3RA6 • During storage • During transport	 Acc. to IEC/EN 60721-3-3 IEC/EN 60732-3-1 IEC/EN 60721-3-2	 °C °C °C °C	 -20 ... +60, with derating up to +70 -20 ... +40 -55 ... +80 -55 ... +80			
Permissible rated current of the compact starter, 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 • For a control cabinet inside temperature of • For a control cabinet inside temperature of	 +40 °C +60 °C +70 °C	 % % %	 100 80 60			
Relative air humidity		%	10 ... 90			
Installation altitude		m	Up to 2000 above sea level without restriction			
Rated frequency		Hz	50/60			
Rated insulation voltage U_i (pollution degree 3)		V	690			
Rated impulse withstand voltage U_{imp}		kV	6			
Trip class (CLASS)	Acc. to IEC 60947-4-1, EN 60947-4-1		10/20			
Rated short-circuit current I_q **at AC 50/60 Hz 480 V**	Acc. to IEC 60947-4-1, EN 60947-4-1	kA	30 (up to 12 A units) 15 (8 ... 32 A unit)			
Types of coordination	Acc. to IEC 60947-6-2, EN 60947-6-2		Continuous			
Power loss $P_{v\ max}$ of all main current paths Dependent on the rated current I_e (upper setting range)	0.4 A 1.25 A 4 A 12 A 32 A	mW mW W W W	10 100 1 1.8 5.4			
Max. switching frequency	AC-41 AC-43 AC-44	1/h 1/h 1/h	750 250 15			
Drive losses Active power	 At 24 V • 0.1 ... 12 A • 8 ... 32 A At 110 ... 240 V • 0.1 ... 12 A • 8 ... 32 A	 W W W W	 2.7 2.95 3.4 3.8			
Overload function Ratio of lower to upper current mark			1:4			
Shock resistance (sine-wave pulse)			a = 60 m/s² = 6 g with 10 ms; for every 3 shocks in all axes			
Vibratory load			f = 4 ... 5.8 Hz; d =15 mm; f = 5.8 ... 500 Hz; a = 20 m/s²;10 cycles			
Degree of protection	Acc. to IEC 60947-1		IP20			
Touch protection	Acc. to IEC/EN 61140		Finger-safe			
Isolating features of the compact starter	Acc. to IEC/EN 60947-3		Yes: Isolation is assured only by moving the actuator into the *OFF* position			
Main and EMERGENCY-STOP switch characteristics of the compact starter and accessories	Acc. to IEC 60204		Yes			

SIRIUS 3RA6 Compact Starters

General data

Type Size Number of poles			3RA61 S0 3	3RA62	3RA64	3RA65
General technical specifications (continued)						
Protective separation	Acc. to IEC 60947-2					
Control circuit to auxiliary circuit						
• Horizontal standard mounting rail		V	Up to 400			
• Other mounting position		V	Up to 250			
Auxiliary circuit to auxiliary circuit						
• Horizontal standard mounting rail		V	Up to 400			
• Other mounting position		V	Up to 250			
Main circuit to auxiliary circuit						
• Any mounting position		V	Up to 400			
EMC interference immunity	Acc. to IEC/EN 60947-1		Corresponds to degree of severity 3			
Conductor-related interference	BURST acc. to IEC/EN 61000-4-4					
• In the main circuit		kV	4		4	
• In the auxiliary circuit		kV	3		2	
Conductor-related interference	SURGE acc. to IEC/EN 61000-4-5					
• In the main circuit						
- Conductor - Ground		kV	4		2	
- Conductor - Conductor		kV	2		1	
• In the auxiliary circuit						
- Conductor - Ground		kV	2		0.5[1]	
- Conductor - Conductor		kV	1		0.5[1]	
Auxiliary switches						
• Integrated						
- Position of the main contacts			1 NO + 1 NC	2 NO	1 NO + 1 NC	2 NO
- Overload/short-circuit signal			1 CO/1 NO			
• Expandable						
- Position of the main contacts			2 NO, 2 NC, 1 NO + 1 NC			
Surge suppressors			Integrated (Varistor)			
Pollution degree			3			
Depth from standard mounting rail		mm	160			
Electromagnetic operating mechanism						
Control voltage		V V	24 AC/DC 110 ... 240 AC/DC		24 DC --	
Frequency	At AC	Hz	50/60 (±5%)			
Primary operating range			0.7 ... 1.25 U_s		0.85 ... 1.2 U_s	
No-load switching frequency		1/h	3600			
Make-time		ms	max. 70		Max. 70 + IO-Link communication	
Break-time		ms	max. 120		Max. 120 + IO-Link communication	

[1] 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[1)]			
• On	ms	<140	<140
• Off	ms	<35	<30

SIRIUS 3RA6 Compact Starters

General data

Type Size Number of poles			3RA61 S0 3	3RA62	3RA64	3RA65
Electromagnetic operating mechanism (continued)						
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 • Breaker mechanism ON		 *g* *g*	 25 15			
Normal switching duty						
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 x I_n and 400 V		 3 ... 10 000 000	 2 x 3 ... 10 000 000	3 000 000	2 x 1 500 000
Control circuit						
Rated operational voltage • External auxiliary switch block • Internal auxiliary switch • Short-circuit signaling switch • Overload signaling switch		 V V V V	 400/690 400/690 400 400			
Switching capacity • External auxiliary switch block	**AC-15**					
	• 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			
	DC-13					
	• 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	**AC-15**					
	• 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			
	DC-13					
	• 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	**AC-15**					
	• At U_e = 230 V	A	3			
	• At U_e = 400 V	A	1			
	DC-13					
	• At U_e = 24 V	A	2			
	• At U_e = 250 V	A	0.11			

SIRIUS 3RA6 Compact Starters

General data

Type Size Number of poles			3RA61 S0 3	3RA62	3RA64	3RA65
External auxiliary switch block, internal auxiliary switch						
Endurance in operating cycles						
• Mechanical endurance			10 000 000		3 000 000	
• Electrical endurance	**AC-15, 230 V**					
	• At 6 A		200 000			
	• At 3 A		500 000			
	• At 1 A		2 000 000			
	• At 0.3 A		10 000 000			
	DC-13, 24 V					
	• At 6 A		300 00			
	• At 3 A		100 000			
	• At 0.5 A		2 000 000			
	• At 0.2 A		10 000 000			
	DC-13, 110 V					
	• At 1 A		40 000			
	• At 0.55 A		100 000			
	• At 0.3 A		300 000			
	• At 0.1 A		2 000 000			
	• At 0.04 A		10 000 000			
	DC-13, 220 V					
	• At 0.3 A		110 000			
	• At 0.1 A		650 000			
	• At 0.05 A		2 000 000			
	• At 0.018 A		10 000 000			
Contact stability	At 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000			
Short-circuit protection						
• 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			
Signaling switches						
Endurance in operating cycles						
• Mechanical endurance			20000			
• Electrical endurance AC-15	At 230 V and 3 A		6050			
Contact stability	At 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000			
Short-circuit protection						
• 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			
Overload (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			

Technical data

Connection type		Screw connection		Spring-type connection	
Max. rated current I_{max}		**12 A**	**32 A**	**12 A**	**32 A**
Conductor cross-sections of main circuit terminals					
Tools		Posidrive size 2		(3.5 x 0.5) mm, 8WA2 803	
Prescribed tightening torque	NM	2 ... 2.5		--	
Minimum/maximum conductor cross-sections					
• Solid	mm² mm² mm²	2 x (1.5 ... 2.5) 2 x (2.5 ... 6) Max. 1 x 10	2 x (2.5 ... 6) Max. 1 x 10	2 x (1.5 ... 6) Max. 1 x 10	2 x (2.5 ... 6) Max. 1 x 10
• Finely stranded without ferrule	mm²	--	--	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• Finely stranded with ferrule	mm² mm²	2 x (1.5 ... 2.5) 2 x (2.5 ... 6)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• AWG cables	AWG AWG AWG	2 x (16 ...14) 2 x (14 ...10) 1 x 8	2 x (14 ...10) 1 x 8	2 x (16 ...10) 1 x 8	2 x (14 ...10) 1 x 8

Connection type		Screw connection	Spring-type connection
Conductor cross-sections of control circuit terminals			
Tools		Posidrive size 2	(3.0 x 0.5) mm, DIN ISO 2380-1A
Prescribed tightening torque	NM	0.8 ... 1.2	--
Minimum/maximum conductor cross-sections			
• Solid	mm² mm²	1 x (0.5 ... 4) 2 x (0.5 ... 2.5)	2 x (0.25 ... 1.5)
• Finely stranded without ferrule	mm²	--	2 x (0.25 ... 1.5)
• Finely stranded with ferrule	mm² mm²	1 x (0.5 ... 2.5) 2 x (0.5 ... 1.5)	2 x (0.25 ... 1.5)
• AWG cables	AWG	2 x (20 ... 14)	2 x (24 ... 16)
Conductor cross-sections of the auxiliary switch for compact starters			
Order No.		**3RA69 1.-1A**	**3RA69 1.-2A**
Tools		Posidrive size 2	(2.5 x 0.4) mm, 8WA2 807
Prescribed tightening torque	NM	0.8 ... 1.2	--
Conductor cross-sections			
• Solid	mm² mm² mm²	2 x (0.5 ...1.5) 2 x (0.75 ... 2.5) 2 x (1 ... 4)	2 x (0.25 ... 2.5)
• Finely stranded without ferrule	mm²	--	2 x (0.25 ... 2.5)
• Finely stranded with ferrule	mm² mm²	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5)	2 x (0.25 ... 1.5)
• AWG cables	AWG AWG AWG	2 x (20 ... 16) 2 x (18 ... 14) 1 x 12	2 x (24 ... 14)

Technical data

Order No.			3RA6970-3A, 3RA6970-3B, 3RA6970-3C, 3RA6970-3D, 3RA6970-3E
General data of the AS-i add-on module			
Permissible ambient temperature			
• Storage	Acc. to IEC/EN 60721-3-1	°C	-25 ... +70
• Transport	Acc. to IEC/EN 60721-3-2	°C	-25 ... +70
Degree of protection	Acc. to IEC/EN 60947-1		IP20
EMC interference immunity	Acc. to EN 50295		
Conductor-related interference	BURST acc. to IEC/EN 61000-4-4	kV	1/2
Electrostatic discharge	Acc. to IEC/EN 61000-4-2	kV	6/8
Field-related interference	Acc. to IEC/EN 61000-4-3	V/m	10 (80 MHz ... 2.7 GHz)
Maximum pick-up current		mA	400
Maximum hold current		mA	200
Power consumption, max.		mA	30
IO code			7
ID code			A
ID2 code			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			
Tools			Posidrive size 1
Prescribed tightening torque		NM	0.5 ... 0.6
Conductor cross-sections			
• Solid		mm^2	1 x (0.5 ... 2.5)
		mm^2	2 x (0.5 ... 1.0)
• Finely stranded with ferrule		mm^2	1 x (0.5 ... 2.5)
		mm^2	2 x (0.5 ... 1.0)
• AWG cables		AWG	1 x (20 ... 12)

Technical data

Type			3RA6.	
General data				
Max. rated operational current				
• 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	
Permissible ambient temperature				
• 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	
Relative air humidity		%	10 ... 90	
Installation altitude		m	Up to 2000 above sea level without restriction	
Rated operational voltage U_e		V	690 AC	
Rated frequency		Hz	50/60	
Shock resistance			a = 60 m/s² = 6g with 10 ms; for every 3 shocks in all axes	
Vibratory load			f =1 ... 6 Hz; d =15 mm 10 cycles f =150 Hz; a = 2 g	
Degree of protection	Acc. to IEC 60947-1		IP20 (IP 00 terminal compartment)	
Touch protection	Acc. to EN 50274		Finger-safe	
Degree of pollution			3	
Short-circuit protection for **infeed with screw connection 4-2 AWG and infeed with screw connection 0-2/0 AWG**				Recommendation for upstream short-circuit protection device 3RV1041-4JA10 3RV1041-4MA10
	$I_{d,max}$	kA	< 21	
	I^2t	kA²s	530	LV HRC gL/gG 3NA3, 315 A
Short-circuit protection for infeed with spring-type connection				Recommendation for upstream short-circuit protection device
• Conductor cross-section 12 AWG	$I_{d,max}$	kA	< 9.5	3RV2021-4DA10
	I^2t	kA²s	85	
• Conductor cross-section 10 AWG	$I_{d,max}$	kA	< 12.5	3RV1031-4EA10
	I^2t	kA²s	140	
• Conductor cross-section 8 AWG	$I_{d,max}$	kA	< 15	3RV1031-4HA10
	I^2t	kA²s	180	
• Conductor cross-section 6-4 AWG	$I_{d,max}$	kA	< 19	3RV1041-4JA10
	I^2t	kA²s	440	
Short-circuit protection for terminal block				Recommendation for upstream short-circuit protection device
• Conductor cross-section 16 AWG	$I_{d,max}$	kA	7.5	5SY... [1]
• 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	

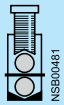
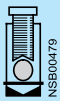
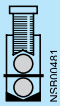
[1] To prevent the possibility of short-circuits, the cables on the terminal block must be installed so that they are short-circuit resistant according to EN 60439-1 Section 7.5.5.1.2.

Type			3RV29.
Connection type			**Spring-type connection**
Conductor cross-sections of terminal block			
Order No.			**3RV29 17-5D**
Conductor cross-sections			
• Solid		mm²	1.5 ... 6
• Finely stranded with ferrule		mm²	1.5 ... 4
• Finely stranded without ferrule		mm²	1.5 ... 6
• AWG cables, solid or stranded		AWG	15 ... 10

SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6 – up to 100 A

Technical data

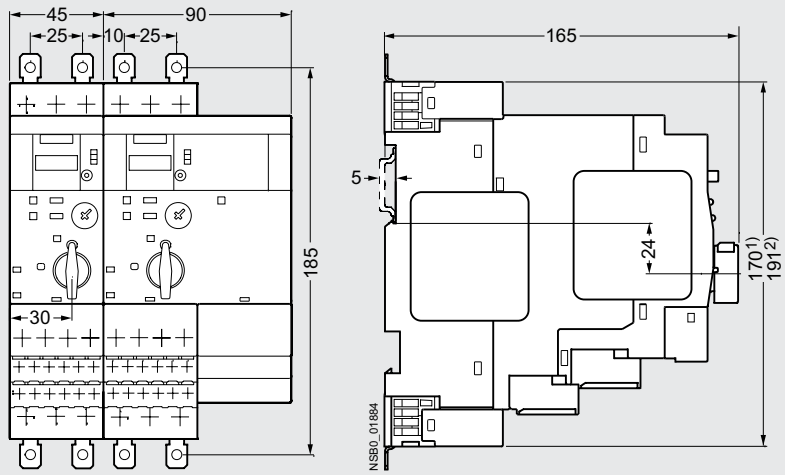
Type		**3RA6.**		
Connection type		**Screw connection**		
Conductor cross-sections of infeed with screw connection 16-2 AWG (L1, L2, L3)[1] and PE infeed 2 AWG[2]				
Order No.		**3RA68 12-8AB, 3RA68 12-8AC, 3RA68 60-6AB**		
Tools		Posidrive size 2		
Specified tightening torque	NM	3 ... 4.5		
		NSB00479	NSB00480	 NSB00481
Conductor cross-sections				
• Solid	mm^2	2.6 ... 16	2.6 ... 16	max. 2 x 16
• Stranded	mm^2	2.5 ... 35	2.5 ... 35	max. 2 x 25
• Finely stranded with ferrule	mm^2	2.5 ... 25	2.5 ... 25	max. 2 x 16
• Finely stranded without ferrule	mm^2	2.5 ... 25	2.5 ... 25	max. 2 x 16
• AWG cables	AWG	12 ... 2	12 ... 2	max. 2 x (16 ... 2)
Connection type		**Screw connection**		
Conductor cross-sections of infeed with screw connection 10-2/0 AWG (L1, L2, L3)[1]				
Order No.		**3RA68 13-8AB, 3RA68 13-8AC**		
Tools	SW	4		
Specified tightening torque	NM	6 ... 8		
		 NSB00479	NSB00480	 NSB00481
Conductor cross-sections				
• Solid	mm^2	2.5 ... 16	2.5 ... 16	max. 2 x 16
• Stranded	mm^2	4 ... 70	10 ... 70	max. 2 x 50
• Finely stranded with ferrule	mm^2	2.5 ... 35	2.5 ... 50	max. 2 x 35
• Finely stranded without ferrule	mm^2	4 ... 50	10 ... 50	max. 2 x 35
• AWG cables	AWG	10 ... 2/0	10 ... 2/0	max. 2 x (10 ... 1/0)
Connection type		**Spring-type connection**		
Conductor cross-sections of infeed with spring-type connection 10-3 AWG (L1, L2, L3)[1] and PE infeed 3 AWG				
Order No.		**3RA68 30-5AC, 3RA68 60-5AC**		
Tools	8WA2 806 mm	5.5 x 0.8		
Conductor cross-sections				
• Solid	mm^2	4 ... 16		
• Stranded	mm^2	4 ... 35		
• Finely stranded with ferrule	mm^2	4 ... 25		
• Finely stranded without ferrule	mm^2	6 ... 25		
• AWG cables	AWG	10 ... 3		
Connection type		**Screw connection**		**Spring-type connection**
Conductor cross-sections of infeed with screw connection 4-2 AWG (T1, T2, T3)[2], infeed with screw connection 0-2/0 AWG (T1, T2, T3)[2] 2-socket and 3-socket expansion modules (T1, T2, T3)[2] and PE tap-off 10-8 AWG				
Order No.		**3RA68 12-8AB, 3RA68 13-8AB, 3RA68 22-0AB, 3RA68 23-0AB, 3RA68 70-4AB**		**3RA68 12-8AC, 3RA68 13-8AC, 3RA68 22-0AC, 3RA68 23-0AC, 3RA68 70-3AC**
Tools		Posidrive size 2		(3.5 x 0.5) mm, 8WA2 803
Specified tightening torque	NM	2 ... 2.5		--
Maximum rated current	A	**12**	**32**	**12**	**32**
Conductor cross-sections					
• Solid	mm^2	2 x (1 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm^2	2 x (2.5 ... 6)			
	mm^2	max. 1 x 10	max. 1 x 10	max. 1 x 10	max. 1 x 10
• Finely stranded with ferrule	mm^2	--	--	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• Finely stranded without ferrule	mm^2	2 x (1 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm^2	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

[1] L1, L2, L3 main conductors on input side.

[2] T1, T2, T3 main conductors on output side.

Dimensional drawings

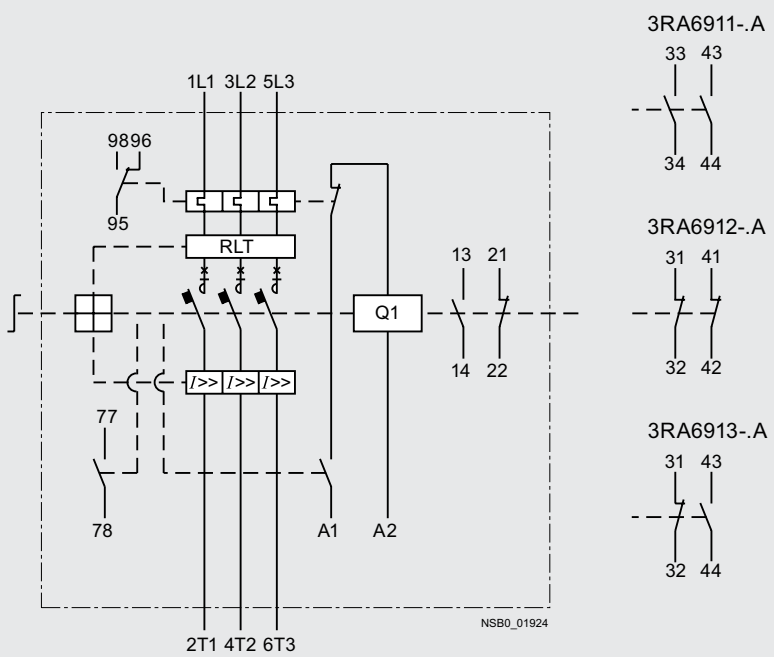
Direct-on-line starters and reversing starters



1) Screw connection
2) Spring-loaded connection

Schematics

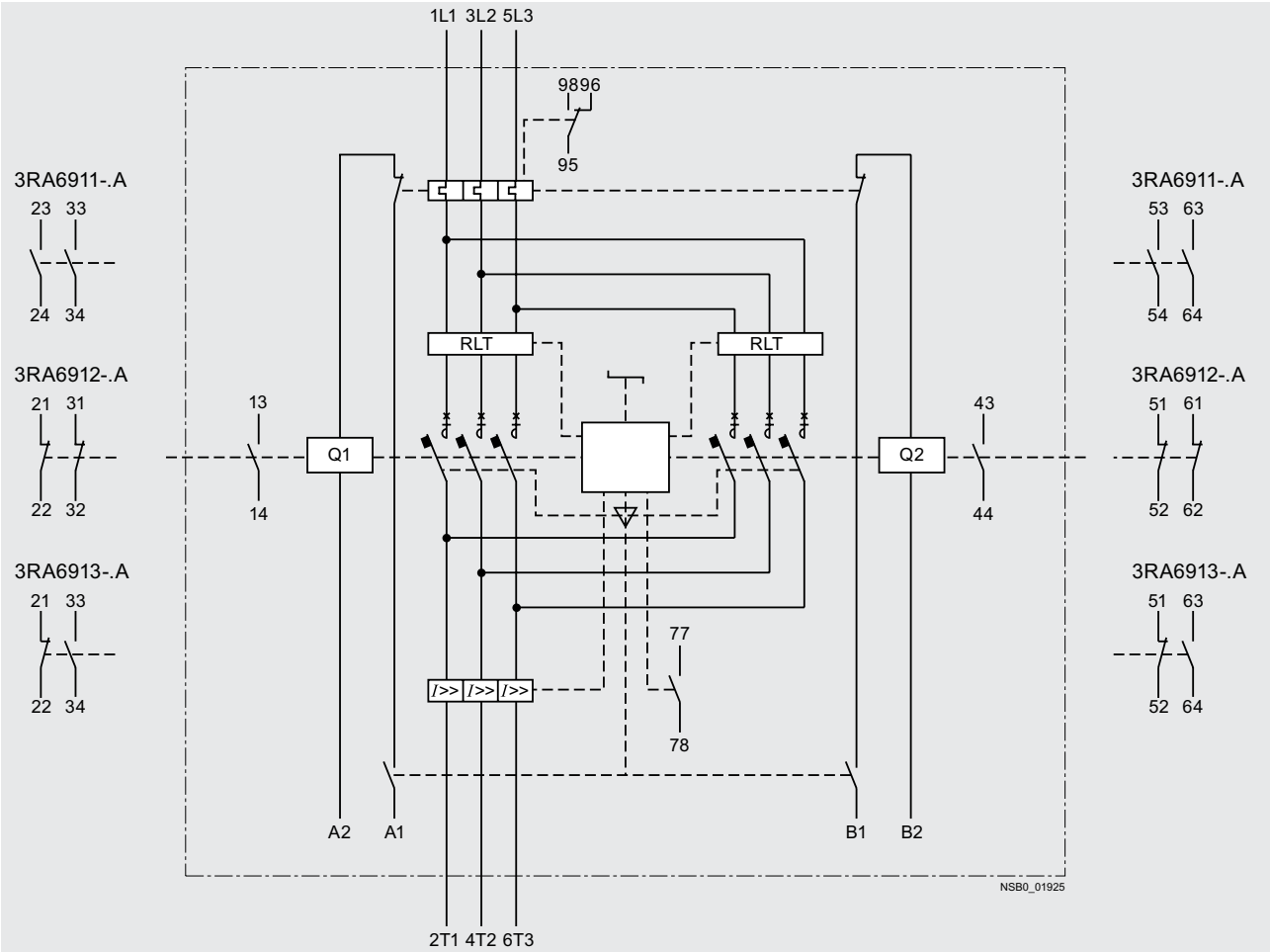
3RA61 direct-on-line starters



Schematic for 3RA61 direct-on-line starters (main circuit)

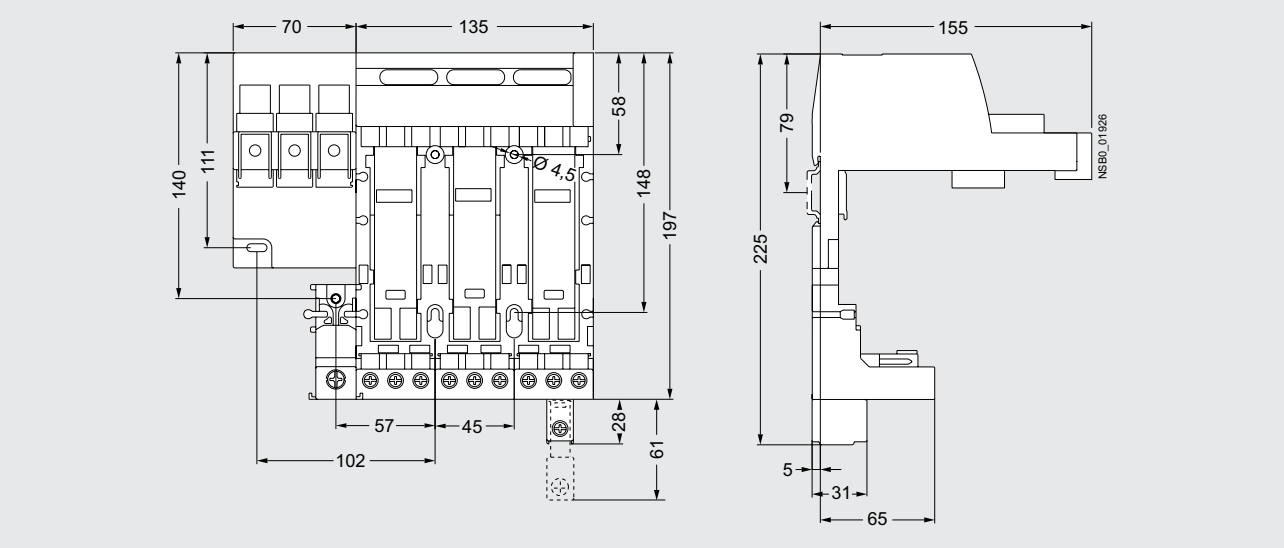
Dimensional drawings

3RA62 reversing starters

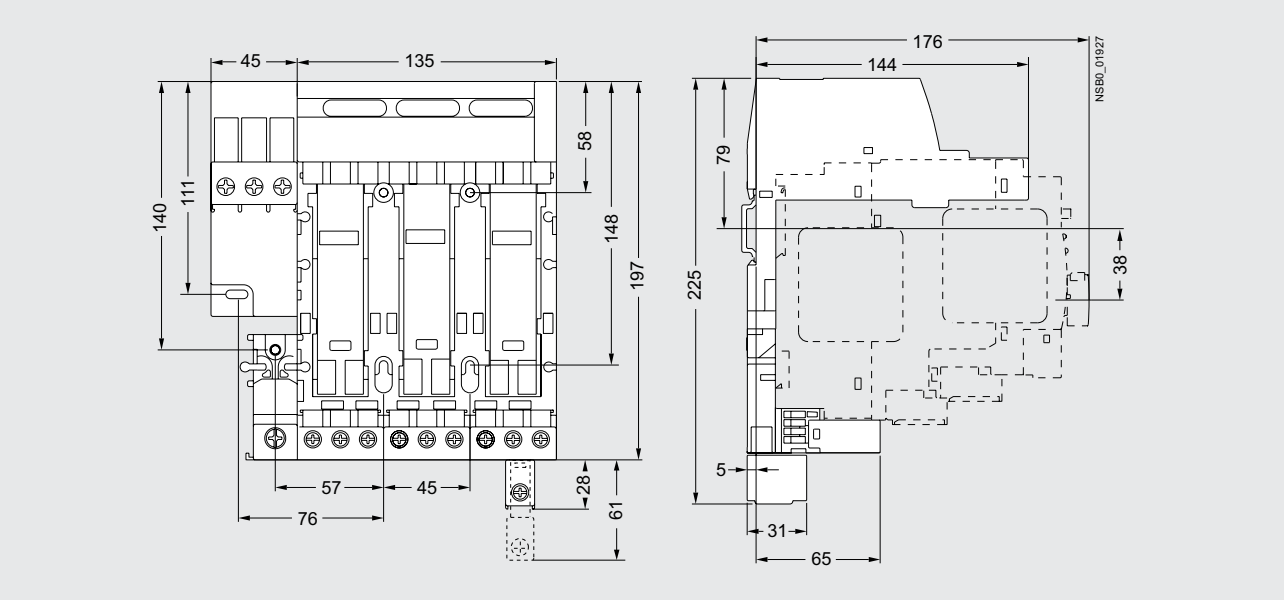


Schematic for 3RA62 reversing starters (main circuit)

Dimensional drawings



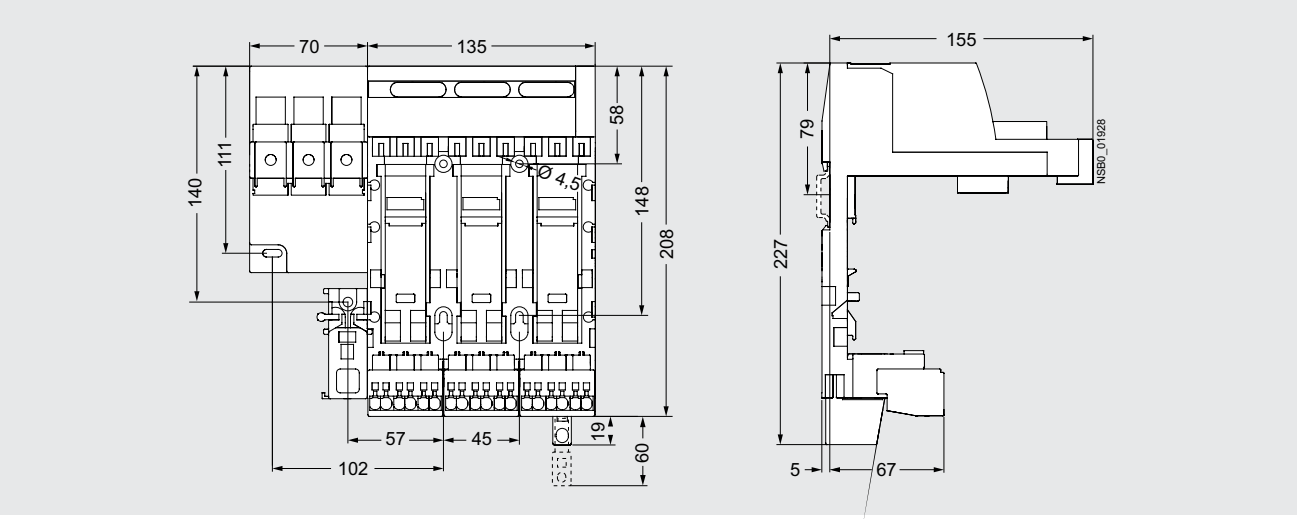
Infeed with screw connection 0-2/0 AWG on left with fixed 3-socket expansion module with outgoing screw terminals



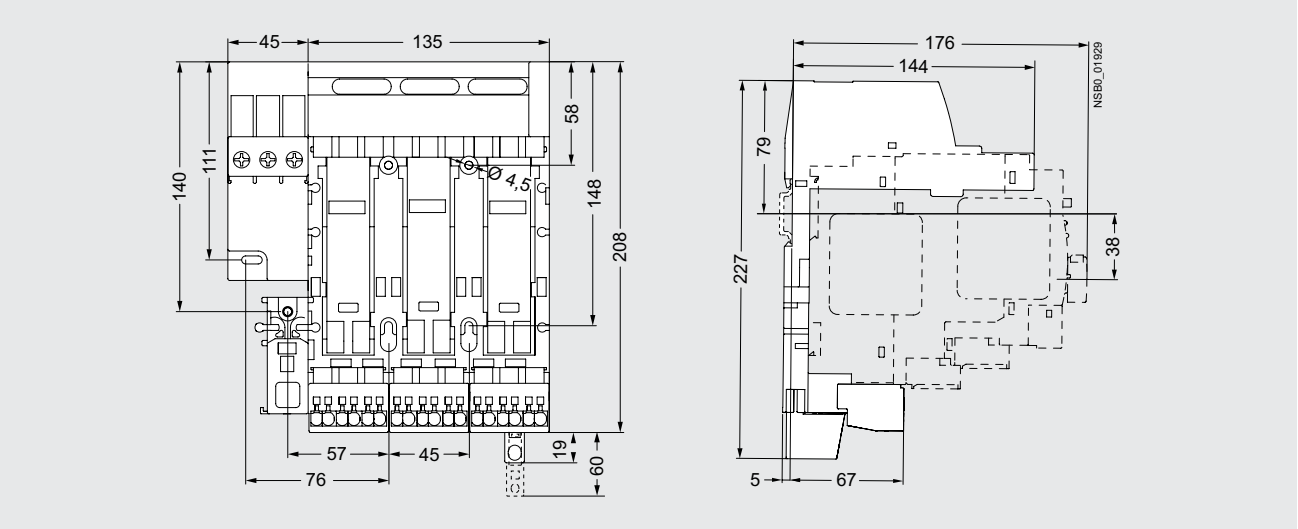
Infeed with screw connection 4-2 AWG on left with fixed 3-socket expansion module with outgoing screw terminals

SIRIUS 3RA6 Compact Starters

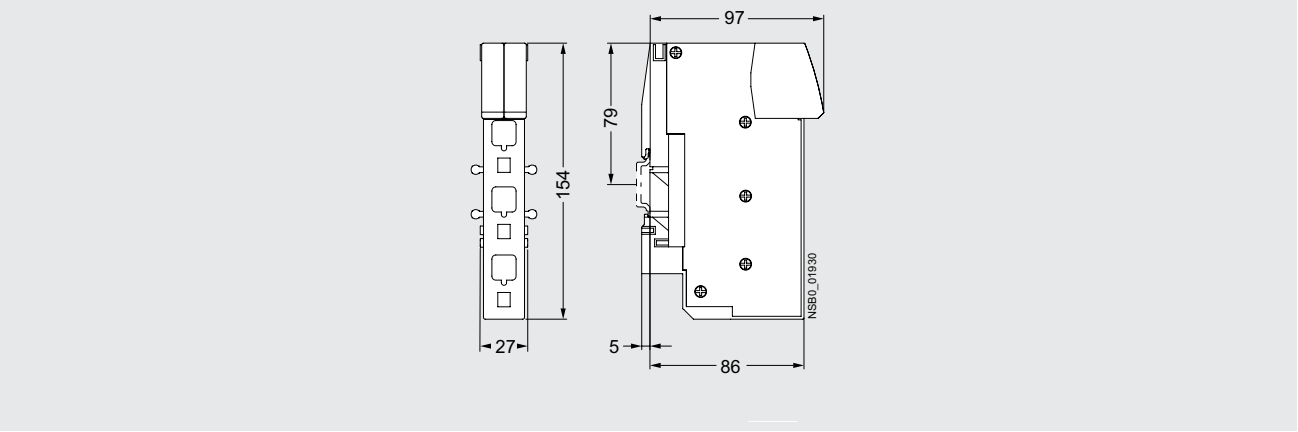
Infeed systems for 3RA6 – up to 100 A



Infeed with screw connection 0-2/0 AWG on left with fixed 3-socket expansion module with outgoing spring-type terminals



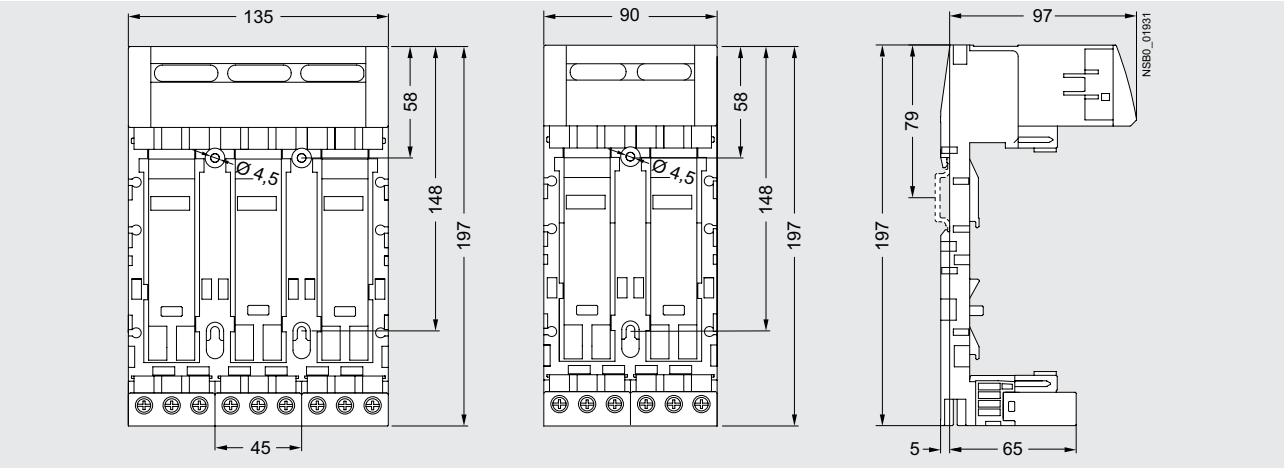
Infeed with screw connection 4-2 AWG on left with fixed 3-socket expansion module with outgoing spring-type terminals



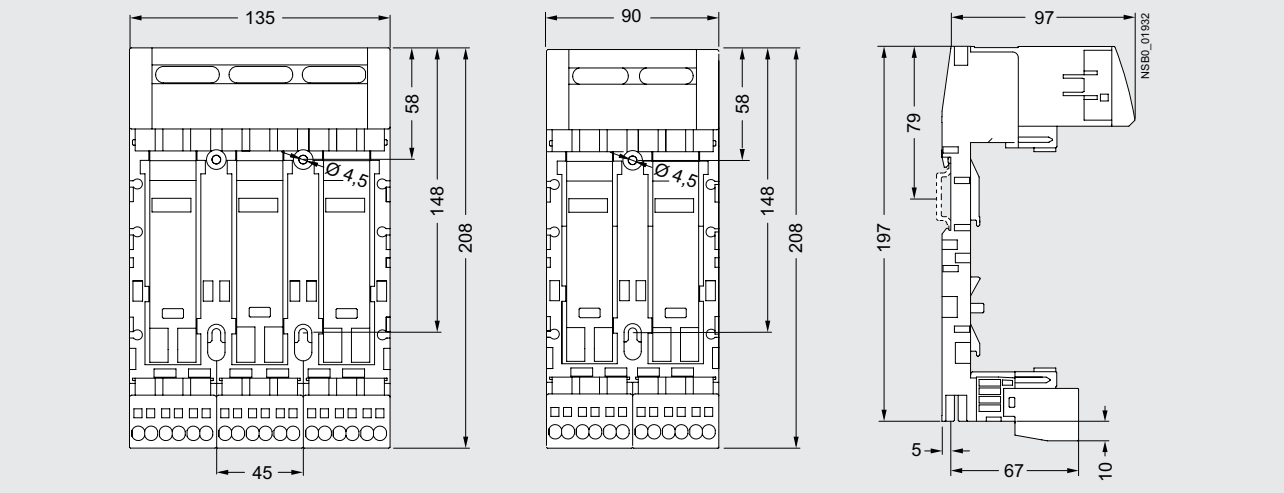
Infeed with spring-type terminals

SIRIUS 3RA6 Compact Starters

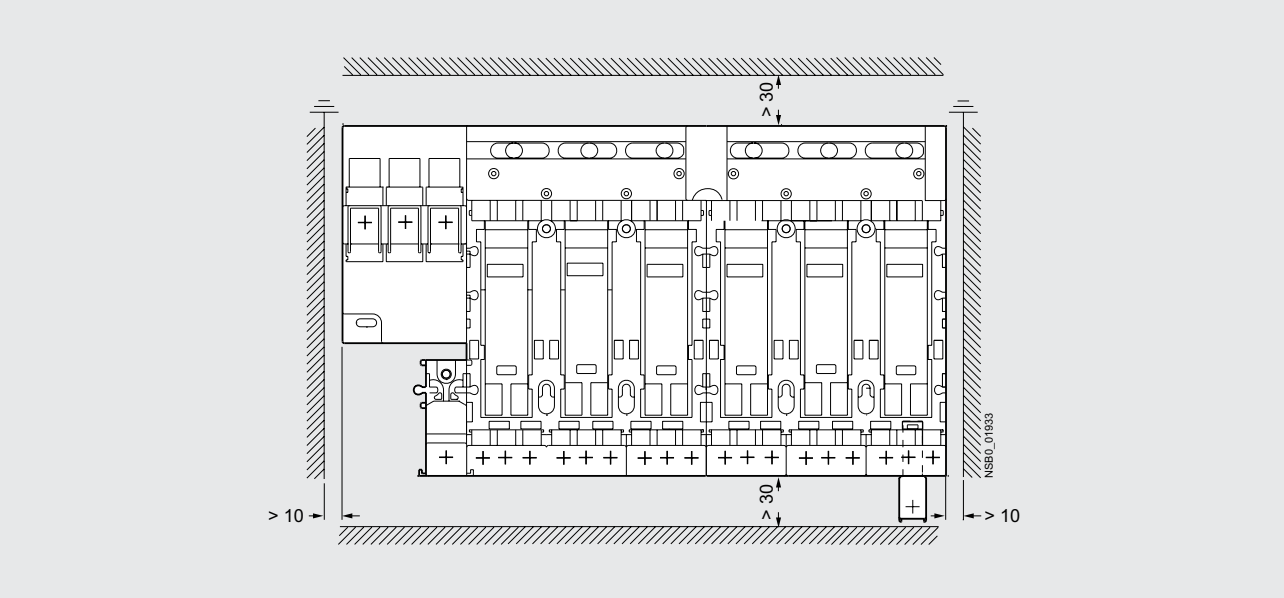
Infeed systems for 3RA6 – up to 100 A



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

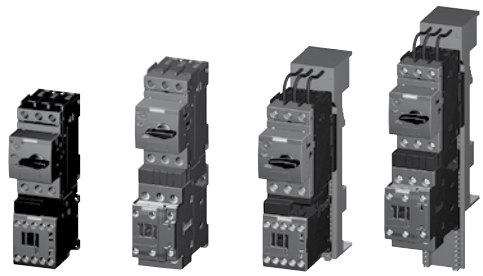


Minimum clearances to adjacent components when using infeed system for 3RA6

3RA2 Starters

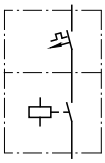
Non-Reversing, AC Coil – up to 22 A

Selection and ordering data



3RA21 10 3RA21 20 3RA21 10 3RA21 20

Direct-on-line starting



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[1] 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: Single-phase HP ratings 115 V	230 V	Three-phase[2] HP ratings 200 V	230 V	460 V	575 V	SCCR at 480 V kA	FLA setting range inverse-time delayed overload release A	Consisting of the following single devices: Motor starter protector	+ Contactor	+ Link module + Busbar adapter[3]	Assembled starter Screw terminals Order No.	Weight approx. kg
Selection depends on motor full load amps													
									3RV20	**3RT20**	**3RA**		
S00	--	--	--	--	--	--	65	0.11…0.16	11-0AA10	15-1AK61	1921-1DA00 + 8US1251-5DS10	**3RA21 1□-0A□15-1AK6**	0.575
	--	--	--	--	--	--	65	0.14…0.2	11-0BA10			**3RA21 1□-0B□15-1AK6**	0.575
	--	--	--	--	--	--	65	0.18…0.25	11-0CA10			**3RA21 1□-0C□15-1AK6**	0.575
	--	--	--	--	--	--	65	0.22…0.32	11-0DA10			**3RA21 1□-0D□15-1AK6**	0.575
	--	--	--	--	--	--	65	0.28…0.4	11-0EA10			**3RA21 1□-0E□15-1AK6**	0.575
	--	--	--	--	--	--	65	0.35…0.5	11-0FA10			**3RA21 1□-0F□15-1AK6**	0.575
	--	--	--	--	--	--	65	0.45…0.63	11-0GA10			**3RA21 1□-0G□15-1AK6**	0.575
	--	--	--	--	--	--	65	0.55…0.8	11-0HA10			**3RA21 1□-0H□15-1AK6**	0.575
	--	--	--	--	--	1/2	65	0.7… 1	11-0JA10			**3RA21 1□-0J□15-1AK6**	0.575
	--	--	--	--	1/2	1/2	65	0.9… 1.25	11-0KA10			**3RA21 1□-0K□15-1AK6**	0.575
	--	1/10	--	--	3/4	3/4	65	1.1… 1.6	11-1AA10			**3RA21 1□-1A□15-1AK6**	0.575
	--	1/8	--	--	3/4	1	65	1.4… 2	11-1BA10			**3RA21 1□-1B□15-1AK6**	0.575
	--	1/6	1/2	1/2	1	1 1/2	65	1.8… 2.5	11-1CA10			**3RA21 1□-1C□15-1AK6**	0.575
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2… 3.2	11-1DA10			**3RA21 1□-1D□15-1AK6**	0.575
	1/8	1/3	3/4	3/4	2	3	65	2.8… 4	11-1EA10			**3RA21 1□-1E□15-1AK6**	0.575
	1/6	1/2	1	1	3	3	65	3.5… 5	11-1FA10			**3RA21 1□-1F□15-1AK6**	0.575
	1/4	1/2	1	1 1/2	3	5	65	4.5… 6.3	11-1GA10			**3RA21 1□-1G□15-1AK6**	0.575
	1/3	1	2	2	5	5	65	5.5… 8	11-1HA10	16-1AK61		**3RA21 1□-1H□16-1AK6**	0.575
	1/2	1 1/2	2	3	5	7 1/2	65	7… 10	11-1JA10			**3RA21 1□-1J□16-1AK6**	0.575
	1/2	2	3	3	7 1/2	10	65	9… 12	11-1KA10	17-1AK61		**3RA21 1□-1K□17-1AK6**	0.575
	1	2	3	5	10	--	65	11… 16	11-4AA10	18-1AK61		**3RA21 1□-4A□18-1AK6**	0.575
S0	1/6	1/2	1	1	3	3	65	3.5… 5	11-1FA10	24-1AK60	2921-1AA00 + 8US1251-5NT10	**3RA21 2□-1F□24-0AK6**	0.761
	1/4	1/2	1	1 1/2	3	5	65	4.5… 6.3	11-1GA10			**3RA21 2□-1G□24-0AK6**	0.761
	1/3	1	2	2	5	5	65	5.5… 8	11-1HA10			**3RA21 2□-1H□24-0AK6**	0.761
	1/2	1 1/2	2	3	5	7 1/2	65	7… 10	11-1JA10			**3RA21 2□-1J□24-0AK6**	0.761
	1/2	2	3	3	7 1/2	10	65	9… 12.5	11-1KA10			**3RA21 2□-1K□24-0AK6**	0.761
	1	2	3	5	10	--	65	11… 16	21-4AA10	26-1AK60		**3RA21 2□-4A□26-0AK6**	0.761
	1 1/2	3	5	5	10	--	65	14… 20	21-4BA10			**3RA21 2□-4B□26-0AK6**	0.761
	1 1/2	3	5	7 1/2	15	--	50	17… 22	21-4CA10	27-1AK60		**3RA21 2□-4C□27-0AK6**	0.761
	2	3	5	7 1/2	15	--	50	20… 25	21-4DA10			**3RA21 2□-4D□27-0AK6**	0.761
	2	5	7 1/2	10	20	--	50	27… 32	21-4EA10			**3RA21 2□-4E□27-0AK6**	0.761

Order No. supplement for:

• Standard DIN rail or screw mounting with no additional auxiliaries	**0**	**A**
• 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)	**5**	**A**
• With Fast Bus adaptor and no additional auxiliaries	**0**	**D**
• 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)	**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.

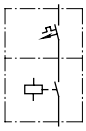
3) Used only for mounting starter on 8US Fast Bus busbar systems.

3RA2 Starters

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[1]) 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 115V	Single-Phase HP Ratings 230V	Three-Phase[2]) HP ratings 200V	Three-Phase[2]) HP ratings 230V	Three-Phase[2]) HP ratings 460V	Three-Phase[2]) HP ratings 575V	SCCR at 480Y/277V kA	FLA setting range Inverse-time delayed overload release A	Starter Order No.	Size	Consisting of the following individual devices: Motor starter protector	+ Contactor	+ Link module + Adapter for standard mounting rail[3])
110VAC 50Hz / 120VAC 60 Hz												
3	7.5	10	15	30	40	65	22... 32	**3RA21 3□-4EA35-□AK6**	**S2**	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 3RA2932-1AA00 (must be ordered separately)
3	10	15	15	40	50	65	28... 36	**3RA21 3□-4PA36-□AK6**		3RV20 31-4PA10	3RT2036-1AK60	
3	10	15	15	40	50	65	32... 40	**3RA21 3□-4UA36-□AK6**		3RV20 31-4UA10		
3	10	15	15	40	50	65	35... 45	**3RA21 3□-4VA36-□AK6**		3RV20 31-4VA10		
5	10	20	20	50	50	65	42... 52	**3RA21 3□-4WA37-□AK6**		3RV20 31-4WA10	3RT2037-1AK60	
5	15	20	25	50	60	20	49... 59	**3RA21 3□-4XA38-□AK6**		3RV20 31-4XA10	3RT2038-1AK60	
5	15	20	25	50	60	20	54... 65	**3RA21 3□-4JA38-□AK6**		3RV20 31-4JA10		
7.5	15	25	30	60	60	65	28... 40	**3RA21 4□-4FB45-□AK6**	**S3**	3RV20 41-4FA10	3RT2045-1AK60	3RA1941-1AA00 + 3RA2942-1AA00
7.5	15	25	30	60	60	65	36... 50	**3RA21 4□-4HB45-□AK6**		3RV20 41-4HA10		
7.5	15	25	30	60	60	65	45... 63	**3RA21 4□-4JB45-□AK6**		3RV20 41-4JA10		
10	20	30	30	75	75	65	57... 75	**3RA21 4□-4KB46-□AK6**		3RV20 41-4KA10	3RT2046-1AK60	
10	20	30	30	75	75	65	65... 84	**3RA21 4□-4RB46-□AK6**		3RV20 41-4RA10		
10	20	30	30	75	–	65	75... 93	**3RA21 4□-4YB46-□AK6**		3RV20 41-4YA10		
10	20	30	40	75	–	65	80...100	**3RA21 4□-4MB47-□AK6**		3RV20 41-4MA10	3RT2047-1AK60	
24V UC												
3	7.5	10	15	30	40	65	22... 32	**3RA21 3□-4EA35-□NB3**	**S2**	3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 3RA2932-1AA00 (must be ordered separately)
3	10	15	15	40	50	65	28... 36	**3RA21 3□-4PA36-□NB3**		3RV20 31-4PA10	3RT2036-1NB30	
3	10	15	15	40	50	65	32... 40	**3RA21 3□-4UA36-□NB3**		3RV20 31-4UA10		
3	10	15	15	40	50	65	35... 45	**3RA21 3□-4VA36-□NB3**		3RV20 31-4VA10		
5	10	20	20	50	50	65	42... 52	**3RA21 3□-4WA37-□NB3**		3RV20 31-4WA10	3RT2037-1NB30	
5	15	20	25	50	60	20	49... 59	**3RA21 3□-4XA38-□NB3**		3RV20 31-4XA10	3RT2038-1NB30	
5	15	20	25	50	60	20	54... 65	**3RA21 3□-4JA38-□NB3**		3RV20 31-4JA10		
7.5	15	25	30	60	60	65	28... 40	**3RA21 4□-4FB45-□NB3**	**S3**	3RV20 41-4FA10	3RT2045-1NB30	3RA1941-1BA00 + 3RA2942-1AA00
7.5	15	25	30	60	60	65	36... 50	**3RA21 4□-4HB45-□NB3**		3RV20 41-4HA10		
7.5	15	25	30	60	60	65	45... 63	**3RA21 4□-4JB45-□NB3**		3RV20 41-4JA10		
10	20	30	30	75	75	65	57... 75	**3RA21 4□-4KB46-□NB3**		3RV20 41-4KA10	3RT2046-1NB30	
10	20	30	30	75	75	65	65... 84	**3RA21 4□-4RB46-□NB3**		3RV20 41-4RA10		
10	20	30	30	75	–	65	70... 90	**3RA21 4□-4YB46-□NB3**		3RV20 41-4YA10		
10	20	30	40	75	–	65	80...100	**3RA21 4□-4MB47-□NB3**		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)**
(S3 frame contactor has 1NO top mounted auxiliary)	**5**	**1 (S3)**

1) For auxilary switches, see accessories page 4/44.

2) Selection depends on motor full load amps. Horsepower ratings for reference only.

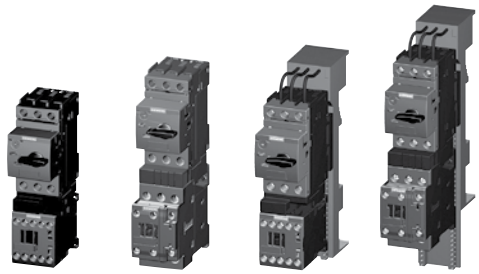
3) Adapters for standard mounting rail are included for all S3 starters and optional to be ordered as accessories for S2 non-reversing starters.

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.

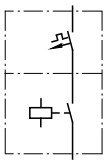
3RA2 Starters

Non-Reversing, DC Coil – up to 22 A



3RA21 10 3RA21 20 3RA21 10 3RA21 20

Direct-on-line starting



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[1] 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: Single-phase HP ratings 115 V	230 V	Three-phase[2] HP ratings 200 V	230 V	460 V	575 V	SCCR at 480 V kA	FLA setting range inverse-time delayed overload release A	Consisting of the following single devices: Motor starter protector	+ Contactor	+ Link module + Busbar adapter[3]	Assembled starter, Screw terminals: Order No.	Weight approx. kg
Selection depends on motor full load amps													
									3RV20	**3RT20**	**3RA**		
S00	--	--	--	--	--	--	65	0.11…0.16	11-0AA10	15-1BB41	1921-1DA00	**3RA21 1□-0A□15-1BB4**	0.630
	--	--	--	--	--	--	65	0.14…0.2	11-0BA10		+ 8US1251-	**3RA21 1□-0B□15-1BB4**	0.630
	--	--	--	--	--	--	65	0.18…0.25	11-0CA10		5DS10	**3RA21 1□-0C□15-1BB4**	0.630
	--	--	--	--	--	--	65	0.22…0.32	11-0DA10			**3RA21 1□-0D□15-1BB4**	0.630
	--	--	--	--	--	--	65	0.28…0.4	11-0EA10			**3RA21 1□-0E□15-1BB4**	0.630
	--	--	--	--	--	--	65	0.35…0.5	11-0FA10			**3RA21 1□-0F□15-1BB4**	0.630
	--	--	--	--	--	--	65	0.45…0.63	11-0GA10			**3RA21 1□-0G□15-1BB4**	0.630
	--	--	--	--	--	--	65	0.55…0.8	11-0HA10			**3RA21 1□-0H□15-1BB4**	0.630
	--	--	--	--	--	1/2	65	0.7… 1	11-0JA10			**3RA21 1□-0J□15-1BB4**	0.630
	--	--	--	--	1/2	1/2	65	0.9… 1.25	11-0KA10			**3RA21 1□-0K□15-1BB4**	0.630
	--	1/10	--	--	3/4	3/4	65	1.1… 1.6	11-1AA10			**3RA21 1□-1A□15-1BB4**	0.630
	--	1/8	--	--	3/4	1	65	1.4… 2	11-1BA10			**3RA21 1□-1B□15-1BB4**	0.630
	--	1/6	1/2	1/2	1	1 1/2	65	1.8… 2.5	11-1CA10			**3RA21 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			**3RA21 1□-1D□15-1BB4**	0.630
	1/8	1/3	3/4	3/4	2	3	65	2.8… 4	11-1EA10			**3RA21 1□-1E□15-1BB4**	0.630
	1/6	1/2	1	1	3	3	65	3.5… 5	11-1FA10			**3RA21 1□-1F□15-1BB4**	0.630
	1/4	1/2	1	1 1/2	3	5	65	4.5… 6.3	11-1GA10			**3RA21 1□-1G□15-1BB4**	0.630
	1/3	1	2	2	5	5	65	5.5… 8	11-1HA10	16-1BB41		**3RA21 1□-1H□16-1BB4**	0.630
	1/2	1 1/2	2	3	5	7 1/2	65	7… 10	11-1JA10			**3RA21 1□-1J□16-1BB4**	0.630
	1/2	2	3	3	7 1/2	10	65	9… 12	11-1KA10	17-1BB41		**3RA21 1□-1K□17-1BB4**	0.630
	1	2	3	5	10	--	65	11…16	11-4AA10	18-1BB41		**3RA21 1□-4A□18-1BB4**	0.630
S0	1/6	1/2	1	1	3	3	65	3.5… 5	11-1FA10	24-1BB40	2921-1BA00	**3RA21 2□-1F□24-0BB4**	0.948
	1/4	1/2	1	1 1/2	3	5	65	4.5… 6.3	11-1GA10		+ 8US1251-	**3RA21 2□-1G□24-0BB4**	0.948
	1/3	1	2	2	5	5	65	5.5… 8	11-1HA10		5NT10	**3RA21 2□-1H□24-0BB4**	0.948
	1/2	1 1/2	2	3	5	7 1/2	65	7… 10	11-1JA10			**3RA21 2□-1J□24-0BB4**	0.948
	1/2	2	3	3	7 1/2	10	65	9… 12.5	11-1KA10			**3RA21 2□-1K□24-0BB4**	0.948
	1	2	3	5	10	--	65	11… 16	21-4AA10	26-1BB40		**3RA21 2□-4A□26-0BB4**	0.948
	1 1/2	3	5	5	10	--	65	14… 20	21-4BA10			**3RA21 2□-4B□26-0BB4**	0.948
	1 1/2	3	5	7 1/2	15	--	50	17… 22	21-4CA10	27-1BB40		**3RA21 2□-4C□27-0BB4**	0.948
	2	3	5	7 1/2	15	--	50	20… 25	21-4DA10			**3RA21 2□-4D□27-0BB4**	0.948
	2	5	7 1/2	10	20	--	50	27… 32	21-4EA10			**3RA21 2□-4E□27-0BB4**	0.948

Order No. supplement for:

• Standard DIN rail or screw mounting with no additional auxiliaries	**0**	**A**
• 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)	**5**	**A**
• With Fast Bus adaptor and no additional auxiliaries	**0**	**D**
• 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)	**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.

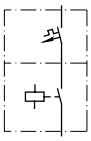
3) Use only for mounting starter on 8US Fast Bus busbar systems.

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[1]) 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[2]) 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: Motor starter protector	+ Contactor	+ Link module + Adapter for standard mounting rail[3])
115V	230V	200V	230V	460V	575V							
110VAC 50Hz / 120 VAC 60Hz												
3	7.5	10	15	30	40	65	22... 32	**3RA21 3□-4ED35-□AK6**	**S2**	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 8US1261-6MT10
3	10	15	15	40	50	65	28... 36	**3RA21 3□-4PD36-□AK6**		3RV20 31-4PA10	3RT2036-1AK60	
3	10	15	15	40	50	65	32... 40	**3RA21 3□-4UD36-□AK6**		3RV20 31-4UA10		
3	10	15	15	40	50	65	35... 45	**3RA21 3□-4VD36-□AK6**		3RV20 31-4VA10		
5	10	20	20	50	50	65	42... 52	**3RA21 3□-4WD37-□AK6**		3RV20 31-4WA10	3RT2037-1AK60	
5	15	20	25	50	60	20	49... 59	**3RA21 3□-4XD38-□AK6**		3RV20 31-4XA10	3RT2038-1AK60	
5	15	20	25	50	60	20	54... 65	**3RA21 3□-4JD38-□AK6**		3RV20 31-4JA10		
7.5	15	25	30	60	60	65	28... 40	**3RA21 4□-4FD45-□AK6**	**S3**	3RV20 41-4FA10	3RT2045-1AK60	3RA1941-1AA00 + 8US1211-4TR00
7.5	15	25	30	60	60	65	36... 50	**3RA21 4□-4HD45-□AK6**		3RV20 41-4HA10		
7.5	15	25	30	60	60	65	45... 63	**3RA21 4□-4JD45-□AK6**		3RV20 41-4JA10		
10	20	30	30	75	75	65	57... 75	**3RA21 4□-4KD46-□AK6**		3RV20 41-4KA10	3RT2046-1AK60	
10	20	30	30	75	75	65	65... 84	**3RA21 4□-4RD46-□AK6**		3RV20 41-4RA10		
10	20	30	30	75	–	65	75... 93	**3RA21 4□-4YD46-□AK6**		3RV20 41-4YA10		
10	20	30	40	75	–	65	80...100	**3RA21 4□-4MD47-□AK6**		3RV20 41-4MA10	3RT2047-1AK60	
24V UC												
3	7.5	10	15	30	40	65	22... 32	**3RA21 3□-4ED35-□NB3**	**S2**	3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 8US1261-6MT10
3	10	15	15	40	50	65	28... 36	**3RA21 3□-4PD36-□NB3**		3RV20 31-4PA10	3RT2036-1NB30	
3	10	15	15	40	50	65	32... 40	**3RA21 3□-4UD36-□NB3**		3RV20 31-4UA10		
3	10	15	15	40	50	65	35... 45	**3RA21 3□-4VD36-□NB3**		3RV20 31-4VA10		
5	10	20	20	50	50	65	42... 52	**3RA21 3□-4WD37-□NB3**		3RV20 31-4WA10	3RT2037-1NB30	
5	15	20	25	50	60	20	49... 59	**3RA21 3□-4XD38-□NB3**		3RV20 31-4XA10	3RT2038-1NB30	
5	15	20	25	50	60	20	54... 65	**3RA21 3□-4JD38-□NB3**		3RV20 31-4JA10		
7.5	15	25	30	60	60	65	28... 40	**3RA21 4□-4FD45-□NB3**	**S3**	3RV20 41-4FA10	3RT2045-1NB30	3RA1941-1BA00 + 8US1211-4TR00
7.5	15	25	30	60	60	65	36... 50	**3RA21 4□-4HD45-□NB3**		3RV20 41-4HA10		
7.5	15	25	30	60	60	65	45... 63	**3RA21 4□-4JD45-□NB3**		3RV20 41-4JA10		
10	20	30	30	75	75	65	57... 75	**3RA21 4□-4KD46-□NB3**		3RV20 41-4KA10	3RT2046-1NB30	
10	20	30	30	75	75	65	65... 84	**3RA21 4□-4RD46-□NB3**		3RV20 41-4RA10		
10	20	30	30	75	–	65	75... 93	**3RA21 4□-4YD46-□NB3**		3RV20 41-4YA10		
10	20	30	40	75	–	65	80...100	**3RA21 4□-4MD47-□NB3**		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)**
(S3 frame contactor has 1NO top mounted auxiliary)	**5**	**1 (S3)**

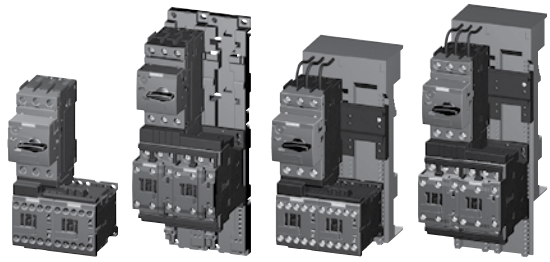
1) For auxiliary switches, see Accessories page 4/44.

2) Selection depends on motor full load amps. Horsepower ratings for reference only.

Note:

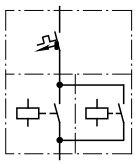
In the S2 frame, for 100kA SCCR versions, replace the prefix 3RA213x with 3RA215x. Rating exceptions would be the 59A and 65A versions having a 30kA SCCR at 480Y/277V. For UL 508 type E/F, order 3RV2938-1K Phase Barrier for field installation on all versions.

Selection and ordering data



3RA22 10 3RA22 20 3RA22 10 3RA22 20

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[1] 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: Single-phase HP ratings 115 V	230 V	Three-phase[2] HP ratings 200 V	230 V	460 V	575 V	SCCR at 480 V kA	FLA setting range inverse-time delayed overload release A	Consisting of the following single devices: Motor starter protector	+ 2 contactors	+ Link module + Assembly kit RH/RS[3]	Assembled starter, Screw terminals: Order No.	Weight approx. kg
Selection depends on motor full load amps													
									3RV20	**3RT20**	**3RA**		
S00	--	--	--	--	--	--	65	0.11…0.16	11-0AA10	15-1AK62	1921-1DA00	**3RA22 10-0A ☐15-2AK6**	0.824
	--	--	--	--	--	--	65	0.14…0.2	11-0BA10		+ 2913-2AA1[4]	**3RA22 10-0B ☐15-2AK6**	0.824
	--	--	--	--	--	--	65	0.18…0.25	11-0CA10		+ 2913-1DB1 (RS)	**3RA22 10-0C ☐15-2AK6**	0.824
	--	--	--	--	--	--	65	0.22…0.32	11-0DA10			**3RA22 10-0D ☐15-2AK6**	0.824
	--	--	--	--	--	--	65	0.28…0.4	11-0EA10			**3RA22 10-0E ☐15-2AK6**	0.824
	--	--	--	--	--	--	65	0.35…0.5	11-0FA10			**3RA22 10-0F ☐15-2AK6**	0.824
	--	--	--	--	--	--	65	0.45…0.63	11-0GA10			**3RA22 10-0G ☐15-2AK6**	0.824
	--	--	--	--	--	--	65	0.55…0.8	11-0HA10			**3RA22 10-0H ☐15-2AK6**	0.824
	--	--	--	--	--	1/2	65	0.7… 1	11-0JA10			**3RA22 10-0J ☐15-2AK6**	0.824
	--	--	--	--	1/2	1/2	65	0.9… 1.25	11-0KA10			**3RA22 10-0K ☐15-2AK6**	0.824
	--	1/10	--	--	3/4	3/4	65	1.1… 1.6	11-1AA10			**3RA22 10-1A ☐15-2AK6**	0.824
	--	1/8	--	--	3/4	1	65	1.4… 2	11-1BA10			**3RA22 10-1B ☐15-2AK6**	0.824
	--	1/6	1/2	1/2	1	1 1/2	65	1.8… 2.5	11-1CA10			**3RA22 10-1C ☐15-2AK6**	0.824
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2… 3.2	11-1DA10			**3RA22 10-1D ☐15-2AK6**	0.824
	1/8	1/3	3/4	3/4	2	3	65	2.8… 4	11-1EA10			**3RA22 10-1E ☐15-2AK6**	0.824
	1/6	1/2	1	1	3	3	65	3.5… 5	11-1FA10			**3RA22 10-1F ☐15-2AK6**	0.824
	1/4	1/2	1	1 1/2	3	5	65	4.5… 6.3	11-1GA10			**3RA22 10-1G ☐15-2AK6**	0.824
	1/3	1	2	2	5	5	65	5.5… 8	11-1HA10	16-1AK62		**3RA22 10-1H ☐16-2AK6**	0.824
	1/2	1 1/2	2	3	5	7 1/2	65	7… 10	11-1JA10			**3RA22 10-1J ☐16-2AK6**	0.824
	1/2	2	3	3	7 1/2	10	65	9… 12	11-1KA10	17-1AK62		**3RA22 10-1K ☐17-2AK6**	0.824
	1	2	3	5	10	--	65	11…16	11-4AA10	18-1AK62		**3RA22 10-4A ☐18-2AK6**	0.824
S0	1/6	1/2	1	1	3	3	65	3.5… 5	11-1FA10	24-1AK60	2921-1AA00	**3RA22 20-1F ☐24-0AK6**	1.434
	1/4	1/2	1	1 1/2	3	5	65	4.5… 6.3	11-1GA10		+ 2923-1BB1 (RH)	**3RA22 20-1G ☐24-0AK6**	1.434
	1/3	1	2	2	5	5	65	5.5… 8	11-1HA10		+ 2923-1DB1 (RS)	**3RA22 20-1H ☐24-0AK6**	1.434
	1/2	1 1/2	2	3	5	7 1/2	65	7… 10	11-1JA10			**3RA22 20-1J ☐24-0AK6**	1.434
	1/2	2	3	3	7 1/2	10	65	9… 12.5	11-1KA10			**3RA22 20-1K ☐24-0AK6**	1.434
	1	2	3	5	10	--	65	11… 16	21-4AA10	26-1AK60		**3RA22 20-4A ☐26-0AK6**	1.434
	1 1/2	3	5	5	10	--	65	14… 20	21-4BA10			**3RA22 20-4B ☐26-0AK6**	1.434
	1 1/2	3	5	7 1/2	15	--	50	17… 22	21-4CA10	27-1AK60		**3RA22 20-4C ☐27-0AK6**	1.434
	2	3	5	7 1/2	15	--	50	20… 25	21-4DA10			**3RA22 20-4D ☐27-0AK6**	1.434
	2	5	7 1/2	10	20	--	50	27… 32	21-4EA10			**3RA22 20-4E ☐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[4]		**1**	**A**	
• With 2 standard mounting rail adapters for size S0		**2**	**B**	
Screw fixing with 2 push-in lugs each per motor starter is possible				
Order No. supplement for mounting onto Fastbus 60mm busbar system	for size S00	**1**	**D**	0.486
With 8US Fast Bus busbar adapter	for size S0	**2**	**D**	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.

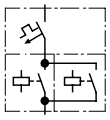
3RA2 Starter

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 [1]) 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[2]) HP ratings				FLA setting range Inverse-time delayed overload	Starter Order No.	Size	Consisting of the following individual devices: Motor starter protector	+ 2 Contactors +	Link module + assembly kit RH[3])
115V	230V	200V	230V	460V	575V	A					
110VAC 50Hz / 120VAC 60Hz											
3	7.5	10	15	30	40	22 ... 32	For customer assembly	S2	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 3RA2933-1BB1
3	10	15	15	40	50	28 ... 36			3RV20 31-4PA10	3RT2036-1AK60	
3	10	15	15	40	50	32 ... 40			3RV20 31-4UA10		
3	10	15	15	40	50	35 ... 45			3RV20 31-4VA10		
5	10	20	20	50	50	42 ... 52			3RV20 31-4WA10	3RT2037-1AK60	
5	15	20	25	50	60	49 ... 59			3RV20 31-4XA10	3RT2038-1AK60	
5	15	20	25	50	60	54 ... 65			3RV20 31-4JA10		
7.5	15	25	30	60	60	28 ... 40	For customer assembly	S3	3RV20 41-4FA10	3RT2045-1AK60	3RA1941-1AA00 + 3RA1943-1B[4])
7.5	15	25	30	60	60	36 ... 50			3RV20 41-4HA10		
7.5	15	25	30	60	60	45 ... 63			3RV20 41-4JA10		
10	20	30	30	75	75	57 ... 75			3RV20 41-4KA10	3RT2046-1AK60	
10	20	30	30	75	75	65 ... 84			3RV20 41-4RA10		
10	20	30	30	75	–	75 ... 93			3RV20 41-4YA10		
10	20	30	40	75	–	80 ...100			3RV20 41-4MA10	3RT2047-1AK60	

24VDC											
3	7.5	10	15	30	40	22... 32	For customer assembly	S2	3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 3RA2933-1BB1
3	10	15	15	40	50	28... 36			3RV20 31-4PA10	3RT2036-1NB30	
3	10	15	15	40	50	32... 40			3RV20 31-4UA10		
3	10	15	15	40	50	35... 45			3RV20 31-4VA10		
5	10	20	20	50	50	42... 52			3RV20 31-4WA10	3RT2037-1NB30	
5	15	20	25	50	60	49... 59			3RV20 31-4XA10	3RT2038-1NB30	
5	15	20	25	50	60	54... 65			3RV20 31-4JA10		
7.5	15	25	30	60	60	28 ... 40	For customer assembly	S3	3RV20 41-4FA10	3RT2045-1NB30	3RA1941-1BA00 + 3RA1943-1B[4])
7.5	15	25	30	60	60	36 ... 50			3RV20 41-4HA10		
7.5	15	25	30	60	60	45 ... 63			3RV20 41-4JA10		
10	20	30	30	75	75	57 ... 75			3RV20 41-4KA10	3RT2046-1NB30	
10	20	30	30	75	75	65 ... 84			3RV20 41-4RA10		
10	20	30	30	75	–	75 ... 93			3RV20 41-4YA10		
10	20	30	40	75	–	80 ...100			3RV20 41-4MA10	3RT2047-1NB30	

RH = Reversing duty for rail mounting.

1) For auxiliary switches, see Accessories page 4/44.

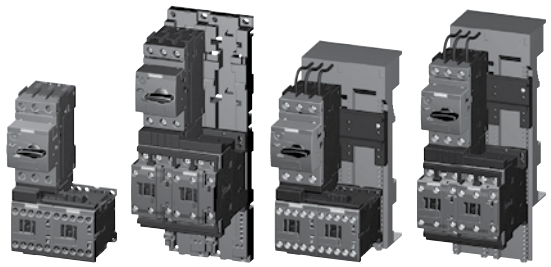
2) Selection depends on motor full load amps. Horse power ratings for reference only.

3) Adapters for standard mounting rail are also suitable for screw mounting.

4) Mechanical interlock must be ordered separately; see Accessories page 4/50

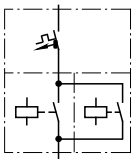
3RA2 Starter

Reversing, DC Coil – up to 22 A



3RA22 10 3RA22 20 3RA22 10 3RA22 20

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[1] 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: Single-phase HP ratings 115 V	230 V	Three-phase[2] HP ratings 200 V	230 V	460 V	575 V	SCCR at 480 V kA	FLA setting range inverse-time delayed overload release A	Consisting of the following single devices: Motor starter protector 3RV20	+ 2 contactors 3RT20	+ Link module + Assembly kit RH/RS[3] 3RA	Assembled starter Screw terminals Order No.	Weight approx. kg
Selection depends on motor full load amps													
S00	--	--	--	--	--	--	65	0.11…0.16	11-0AA10	15-1BB42	1921-1DA00 '+	**3RA22 10-0A□15-2BB4**	0.934
	--	--	--	--	--	--	65	0.14…0.2	11-0BA10		2913-2AA1[4] '+	**3RA22 10-0B□15-2BB4**	0.934
	--	--	--	--	--	--	65	0.18…0.25	11-0CA10		2913-1DB1 (RS)	**3RA22 10-0C□15-2BB4**	0.934
	--	--	--	--	--	--	65	0.22…0.32	11-0DA10			**3RA22 10-0D□15-1BB4**	0.934
	--	--	--	--	--	--	65	0.28…0.4	11-0EA10			**3RA22 10-0E□15-2BB4**	0.934
	--	--	--	--	--	--	65	0.35…0.5	11-0FA10			**3RA22 10-0F□15-1BB4**	0.934
	--	--	--	--	--	--	65	0.45…0.63	11-0GA10			**3RA22 10-0G□15-2BB4**	0.934
	--	--	--	--	--	--	65	0.55…0.8	11-0HA10			**3RA22 10-0H□15-2BB4**	0.934
	--	--	--	--	--	1/2	65	0.7… 1	11-0JA10			**3RA22 10-0J□15-2BB4**	0.934
	--	--	--	--	1/2	1/2	65	0.9… 1.25	11-0KA10			**3RA22 10-0K□15-2BB4**	0.934
	--	1/10	--	--	3/4	3/4	65	1.1… 1.6	11-1AA10			**3RA22 10-1A□15-2BB4**	0.934
	--	1/8	--	--	3/4	1	65	1.4… 2	11-1BA10			**3RA22 10-1B□15-2BB4**	0.934
	--	1/6	1/2	1/2	1	1 1/2	65	1.8… 2.5	11-1CA10			**3RA22 10-1C□15-2BB4**	0.934
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2… 3.2	11-1DA10			**3RA22 10-1D□15-2BB4**	0.934
	1/8	1/3	3/4	3/4	2	3	65	2.8… 4	11-1EA10			**3RA22 10-1E□15-2BB4**	0.934
	1/6	1/2	1	1	3	3	65	3.5… 5	11-1FA10			**3RA22 10-1F□15-2BB4**	0.934
	1/4	1/2	1	1 1/2	3	5	65	4.5… 6.3	11-1GA10			**3RA22 10-1G□15-2BB4**	0.934
	1/3	1	2	2	5	5	65	5.5… 8	11-1HA10	16-1BB42		**3RA22 10-1H□16-2BB4**	0.934
	1/2	1 1/2	2	3	5	7 1/2	65	7… 10	11-1JA10			**3RA22 10-1J□16-2BB4**	0.934
	1/2	2	3	3	7 1/2	10	65	9… 12	11-1KA10	17-1BB42		**3RA22 10-1K□17-2BB4**	0.934
	1	2	3	5	10	--	65	11…16	11-4AA10	18-1BB42		**3RA22 10-4A□18-2BB4**	0.934
S0	1/6	1/2	1	1	3	3	65	3.5… 5	11-1FA10	24-1BB40	2921-1BA00 '+	**3RA22 20-1F□24-0BB4**	1.811
	1/4	1/2	1	1 1/2	3	5	65	4.5… 6.3	11-1GA10		2923-1BB1 (RH) '+	**3RA22 20-1G□24-0BB4**	1.811
	1/3	1	2	2	5	5	65	5.5… 8	11-1HA10		2923-1DB1 (RS)	**3RA22 20-1H□24-0BB4**	1.811
	1/2	1 1/2	2	3	5	7 1/2	65	7… 10	11-1JA10			**3RA22 20-1J□24-0BB4**	1.811
	1/2	2	3	3	7 1/2	10	65	9… 12.5	11-1KA10			**3RA22 20-1K□24-0BB4**	1.811
	1	2	3	5	10	--	65	11… 16	21-4AA10	26-1BB40		**3RA22 20-4A□26-0BB4**	1.811
	1 1/2	3	5	5	10	--	65	14… 20	21-4BA10			**3RA22 20-4B□26-0BB4**	1.811
	1 1/2	3	5	7 1/2	15	--	50	17… 22	21-4CA10	27-1BB40		**3RA22 20-4C□27-0BB4**	1.811
	2	3	5	7 1/2	15	--	50	20… 25	21-4DA10			**3RA22 20-4D□27-0BB4**	1.811
	2	5	7 1/2	10	20	--	50	27… 32	21-4EA10			**3RA22 20-4E□27-0BB4**	1.811

			Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing			
• Without standard mounting rail adapter for size S00[4]	**1**	**A**	
• With 2 standard mounting rail adapters for size S0	**2**	**B**	
Screw fixing with 2 push-in lugs each per motor starter is possible			
Order No. supplement for mounting onto Fastbus 60mm busbar system — for size S00	**1**	**D**	0.486
With 8US Fast Bus busbar adapter — for size S0	**2**	**D**	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.

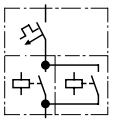
3RA2 Starter

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[1] 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 115V	Single-Phase HP Ratings 230V	Three-Phase[2] HP ratings 200V	Three-Phase[2] HP ratings 230V	Three-Phase[2] HP ratings 460V	Three-Phase[2] HP ratings 575V	FLA setting range Inverse-time delayed overload release A	Starter Order No.	Size	Consisting of the following individual devices: Motor starter protector	+ Contactor	+ Link module + Adapter shoe for Fastbus
110VAC 50Hz / 120VAC 60Hz											
3	7.5	10	15	30	40	22... 32	For customer assembly	S2	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 3RA2933-1DB1
3	10	15	15	40	50	28... 36			3RV20 31-4PA10	3RT2036-1AK60	
3	10	15	15	40	50	32... 40			3RV20 31-4UA10		
3	10	15	15	40	50	35... 45			3RV20 31-4VA10		
5	10	20	20	50	50	42... 52			3RV20 31-4WA10	3RT2037-1AK60	
5	15	20	25	50	60	49... 59			3RV20 31-4XA10	3RT2038-1AK60	
5	15	20	25	50	60	54... 65			3RV20 31-4JA10		
7.5	15	25	30	60	60	28... 40	For customer assembly	S3	3RV20 41-4FA10	3RT2045-1AK60	3RA1941-1AA00 + 3RA1943-2A[3]
7.5	15	25	30	60	60	36... 50			3RV20 41-4HA10		
7.5	15	25	30	60	60	32... 40			3RV20 41-4JA10		
10	20	30	30	75	75	57... 75			3RV20 41-4KA10	3RT2046-1AK60	
10	20	30	30	75	75	42... 52			3RV20 41-4RA10		
10	20	30	30	75	–	75... 93			3RV20 41-4YA10		
10	20	30	40	75	–	80...100			3RV20 41-4MA10	3RT2047-1AK60	
24VDC											
3	7.5	10	15	30	40	22... 32	For customer assembly	S2	3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 3RA2933-1DB1
3	10	15	15	40	50	28... 36			3RV20 31-4PA10	3RT2036-1NB30	
3	10	15	15	40	50	32... 40			3RV20 31-4UA10		
3	10	15	15	40	50	35... 45			3RV20 31-4VA10		
5	10	20	20	50	50	42... 52			3RV20 31-4WA10	3RT2037-1NB30	
5	15	20	25	50	60	49... 59			3RV20 31-4XA10	3RT2038-1NB30	
5	15	20	25	50	60	54... 65			3RV20 31-4JA10		
7.5	15	25	30	60	60	28... 40	For customer assembly	S3	3RV20 41-4FA10	3RT2045-1NB30	3RA1941-1BA00 + 3RA 1943-2A[3]
7.5	15	25	30	60	60	36... 50			3RV20 41-4HA10		
7.5	15	25	30	60	60	45... 63			3RV20 41-4JA10		
10	20	30	30	75	75	57... 75			3RV20 41-4KA10	3RT2046-1NB30	
10	20	30	30	75	75	65... 84			3RV20 41-4RA10		
10	20	30	30	75	–	75... 93			3RV20 41-4YA10		
10	20	30	40	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

3RV29 01-1E

3RV29 01-2E

3RV29 01-1A

3RV29 01-2A

3RV29 02-1A

3RV29 02-2D

	For MSPs Size	Screw Terminals Order No.	Weight approx. kg	Spring-type Terminals Order No.	Weight approx. kg
Auxillary switches for motor starter protectors [1]					
Transverse auxillary switches For front mounting					
1 CO	S00 ... S3	**3RV29 01-1D**	0.014	—	
1 NO + 1 NC	S00 ... S3	**3RV29 01-1E**	0.016	**3RV29 01-2E**	0.016
Lateral auxillary switches Mountable on the left					
1 NO + 1 NC	S00 ... S3	**3RV29 01-1A**	0.036	**3RV29 01-2A**	0.035

1 One transverse auxillary switch and one lateral auxillary switch can be attached per motor starter protector.
When the lateral auxillary switch with 2 NO + 2 NC is used, a transverse auxillary switch is not allowed.

Rated control supply voltage Us				For MSPs	Screw Terminals	Weight approx.	Spring-type Terminals	Weight approx.
AC 50 Hz V	AC 60 Hz V	AC 50/60 Hz 100% ON period [1] V	AC/DC 50/60 Hz, DC 5s ON period [2] V	Size	Order No.	kg	Order No.	kg
Auxillary releases for motor starter protectors [3]								
Undervoltage releases								
415	480	—	—	S00 ... S3	**3RV29 02-1AV1**	0.117	—	
Shunt releases								
—	—	20…24	20...70	S00 ... S3	**3RV29 02-1DB0**	0.119	**3RV29 02-2DB0**	0.115
—	—	90…110	70...190		**3RV29 02-1DF0**	0.119	**3RV29 02-2DF0**	0.115

1 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.

2 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.

3 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
Auxillary switch blocks for snapping on the front for contactors							
Cable entry from below	S00 ... S3	1-pole	1 NC	**3RH29 11-1BA10**	0.020	—	
3RH29 11-1BA10	S00 ... S3	1-pole	1 NO	**3RH29 11-1BA01**	0.020	—	
	S00 ... S3	2-pole	1 NO + 1 NC	**3RH29 11-1MA11**	0.050	—	
3RH29 11-1MA20	S00 ... S3	2-pole	2 NO	**3RH29 11-1MA20**	0.050	—	
Cable entry from two sides	S00 ... S3	4-pole	2 NO + 2 NC	**3RH29 11-1FA22**	0.060	**3RH29 11-2FA22**	0.049
3RH29 11-1FA22	S00	2-pole	1 NO + 1 NC	**3RH29 11-1DA11**	0.039	**3RH29 11-2DA11**	0.050
	S00	2-pole	2 NC	**3RH29 11-1DA02**	0.039	**3RH29 11-2DA02**	0.050
	S0 ... S3	2-pole	1 NO + 1 NC	**3RH29 21-1DA11**	0.039	**3RH29 21-2DA11**	0.050
	S0 ... S3	2-pole	2 NC	**3RH29 21-1DA02**	0.041	**3RH29 21-2DA02**	0.050
	S0 ... S3	2-pole	2 NO	**3RH29 21-1DA20**	0.041	**3RH29 21-2DA20**	0.050
Laterally mountable auxiliary switch blocks for contactors							
	S00	2 NC		**3RH29 11-1DA02**	0.020	**3RH29 11-2DA02**	0.050
3RH29 11-1DA11	S00	1 NO + 1 NC		**3RH29 11-1DA11**	0.040	**3RH29 11-2DA11**	0.050
	S00	1 NO		**3RH29 11-1DA20**	0.040	**3RH29 11-2DA20**	0.050
	S0 ... S3	2 NC		**3RH29 21-1DA02**	0.050	**3RH29 21-2DA02**	0.050
	S0 ... S3	1 NO + 1 NC		**3RH29 21-1DA11**	0.050	**3RH29 21-2DA11**	0.050
	S0 ... S3	2 NO		**3RH29 21-1DA20**	0.050	**3RH29 21-2DA20**	0.050
Connection modules for contactors with screw terminals							
Adaptors for contactors	Ambient temperature $T_{u\,max}$ = 60 °C						
3RT19 26-4RD01	S00	Rated operational current I_e at AC-3/400 V: 20A		**3RT19 16-4RD01**	0.020	—	
	S0	Rated operational current I_e at AC-3/400 V: 25A		**3RT19 26-4RD01**	0.020	—	
Plugs for contactors	S00, S0			**3RT19 00-4RE01**	0.025	—	
3RT19 00-4RE01							

3RA2 Accessories

Terminals

Selection and ordering data

For Conductors Size	Version	Screw Terminals Order No.	Weight approx. kg
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

3RT19 46-4GA07

Terminal block type E for extended air/creepage distance (1” and 2”)	S00, S0	**3RV29 28-1H**	0.120
	S00, S0	**3RV29 28-1K**	0.120
	S2	**3RV29 38-1K**	0.120
	S3	**3RT29 46-4GA07**	0.120

3RA2 Accessories

Surge suppressors

Selection and ordering data

	For Conductors Size	Version	Rated control supply voltage U_S AC V	DC V	Surge Suppressors Order No.	Weight approx. kg
Auxillary 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	**3RT29 16-1BB00**	0.010
			48 … 127 AC	70 … 150 DC	**3RT29 16-1BC00**	0.010
	3RT2.1	RC elements	24 … 48 AC	24 … 70 DC	**3RT29 16-1CB00**	0.010
			48 … 127 AC	70 … 150 DC	**3RT29 16-1CC00**	0.010
	3RT2.1	Noise suppression		12 … 250 DC	**3RT29 16-1DG00**	0.010
	3RT2.1	Diode assemblies (diode and Zener diode) for DC operation and short break times		12 … 250 DC	**3RT29 16-1EH00**	0.010
Size S0 — For plugging onto the front side of the contacctors (prior to mounting of the auxiliary switch block)						
3RT29 26-1BB00	3RT2.2	Varistors	24 … 48 AC	24 … 70 DC	**3RT29 26-1BB00**	0.010
			48 … 127 AC	70 … 150 DC	**3RT29 26-1BC00**	0.010
	3RT2.2	RC elements	24 … 48 AC	24 … 70 DC	**3RT29 26-1CB00**	0.010
			48 … 127 AC	70 … 150 DC	**3RT29 26-1CC00**	0.010
	3RT2.2	Diode assemblies for DC operation and short break times		24 DC	**3RT29 26-1ER00**	0.010
				30 … 250 DC	**3RT29 26-1ES00**	0.010
Sizes S2						
3RT2936-1B.00	3RT2.3	Varistors	24 ... 48 AC	24 ... 70 DC	**3RT29 36-1BB00**	0.010
			127 ... 240 AC	150 ... 250 DC	**3RT29 36-1BD00**	0.010
			48 ... 127 AC	70 ... 150 DC	**3RT29 36-1BC00**	0.010
	3RT2.3	RC elements	24 ... 48 AC	24 ... 70 DC	**3RT29 36-1CB00**	0.010
			127 ... 240 AC	150 ... 250 DC	**3RT29 36-1CD00**	0.010
			48 ... 127 AC	70 ... 150 DC	**3RT29 36-1CC00**	0.010
3RT2936-1E.00	3RT2.3	Diode assemblies	--	24 DC	**3RT29 36-1ER00**	0.010
			--	30 ... 250 DC	**3RT29 36-1ES00**	0.010
Sizes S3						
3RT2936-1CC00	3RT20 4.	Varistors	24 … 48 AC	24 … 70 DC	**3RT29 36-1BB00**	0.025
			48 … 127 AC	70 … 150 DC	**3RT29 36-1BC00**	0.025
	3RT20 4.	RC elements	24 … 48 AC	24 … 70 DC	**3RT29 36-1CB00**	0.040
			48 … 127 AC	70 … 150 DC	**3RT29 36-1CC00**	0.040
	3RT20 4.	Diode assemblies for DC operation and short break times, can be plugged in at bottom		24 DC	**3RT29 36-1ER00**	0.025
				30 … 250 DC	**3RT29 36-1ES00**	0.025

For additional surge suppression, see page 2/75

3RA2 Accessories

Surge suppressors, link modules

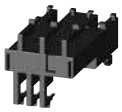
Selection and ordering data

Auxillary switch blocks for snapping on the front for contactors

3RA29 11-2AA00

Electrical and mechanical link between motor starter protector and contactor

	For MSP Size	For contactors	Actuating voltage of contactor	Screw Terminals Order No.	Pack Qty.	Weight approx. kg
Single-unit packaging	S00, S0	S00	AC and DC	**3RA19 21-1DA00**		
	S00, S0	S0	AC	**3RA29 21-1AA00**	1 unit	0.055
	S00, S0	S0	DC	**3RA29 21-1BA00**	1 unit	0.068
	S2	S2	AC and DC	**3RA29 31-1AA00**	1 unit	0.104
	S3	S3	AC and DC	**3RA19 41-1AA00**	1 unit	0.090
Multi-unit packaging	S00, S0	S00	AC and DC	**3RA19 21-1D**	10 unit	0.021
	S00, S0	S0	AC	**3RA29 21-1A**	10 unit	0.001
	S00, S0	S0	DC	**3RA29 21-1B**	10 unit	0.001
	S2	S2	AC and DC	**3RA29 31-1A**	5 unit	0.104
	S3	S3	AC and DC	**3RA19 41-1A**	5 unit	0.073

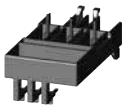


3RA29 11-2AA00

Electrical and mechanical link between motor starter protector and contactor

				Spring-type Terminals Order No.		
Single-unit packaging	S00	S00	AC and DC	**3RA29 11-2AA00**		
	S0	S0	AC[1] and DC	**3RA29 21-2AA00**	1 unit	0.040
Multi-unit packaging	S00	S00	AC and DC	**3RA29 11-2A**	10 unit	0.400
	S0	S0	AC[1] and DC	**3RA29 21-2A**	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	**3RA29 11-2FA00**	1 unit	0.029
	S0	S0	AC[1] and DC	**3RA29 21-2FA00**	1 unit	0.056
Multi-unit packaging	S00	S00	AC and DC	**3RA29 11-2F**	10 unit	0.290
	S0	S0	AC[1] and DC	**3RA29 21-2F**	10 unit	0.560

Link modules from motor starter protector to soft starters

Electrical and mechanical link between motor starter protector and soft starter

	For MSPs Size	For soft starters Size	Screw Terminals Order No.	Pack Qty.	Weight approx. kg
Single-unit packaging	S00/S0	S00/S0	**3RA29 21-1BA00**	1 unit	0.001
Multi-unit packaging	S00/S0	S00/S0	**3RA29 21-1B**	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	**3RA29 11-2GA00**	1 unit	0.038
	S0	S0	**3RA29 21-2GA00**	1 unit	0.072
Multi-unit packaging	S00	S00	**3RA29 11-2G**	10 unit	0.380
	S0	S0	**3RA29 21-2G**	10 unit	0.720

[1] A spacer for height compensation on AC contactors with spring-type terminals, size S0 is optionally available, see page 4/52.

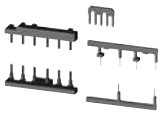
3RA2 Accessories

Mounting kits for Fast Bus

Accessories

For Conductors Size	Version	Screw Terminals Order No.	Pack Qty.	Weight approx. kg
Wiring kits for contactors				
Reversing				
S00	Electrical and mechanical connection for reversing contactors, optionally with integrated electrical and mechanical interlock	**3RA29 13-2AA1**	1 unit	0.001
S0		**3RA29 23-2AA1**	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	**3RA29 33-2AA1**	1 unit	0.120
Wye-delta starting				
S00	Electrical and mechanical link for three contactors of same size	**3RA29 13-2BB1**	1 unit	0.001
S0		**3RA29 23-2BB1**	1 unit	0.001
S2-S2-S0		**3RA29 33-2C**	1 unit	0.070
S2-S2-S2		**29RA2933-2BB1**	1 unit	0.160
		Spring-type Terminals		
Reversing Duty				
S00	Electrical and mechanical connection for reversing contactors, optionally with integrated electrical and mechanical interlock	**3RA29 13-2AA2**	1 unit	0.001
S0		**3RA29 23-2AA2**	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	**3RA29 33-2AA2**	1 unit	0.001
Wye-delta starting				
S00	Electrical and mechanical link for three contactors of same size	**3RA29 13-2BB2**	1 unit	0.001
S0		**3RA29 23-2BB2**	1 unit	0.001
S2-S2-S0		**3RA29 33-2C**	1 unit	0.001
S2-S2-S2		**3RA29 33-2BB2**	1 unit	0.001
		Screw Terminals		
Wiring kits for contactors				
Reversing				
S00	Switches 2 contactors in series	**3RA29 16-1A**	1 unit	0.001
S0		**3RA29 26-1A**	1 unit	0.001
S2		**3RA29 36-1A**	1 unit	0.001

3RA29 23-2AA1


3RA29 23-2BB1

3RA29 23-2AA2

3RA29 16-1A

3RA2 Accessories

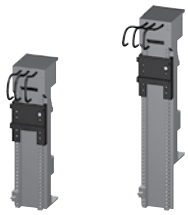
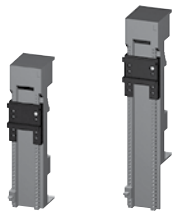
Mounting kits for Fast Bus

Accessories

	For Conductors Size	For MSPs Size	Version	Screw Terminals Order No.	Pack Qty.	Weight approx. kg
Mechanical interlocks						
3RA29 34-2B	S2/S3	--	For reversing contactors, laterally mounted, no electrical connections (each contactor has 1NO/1NC auxiliaries)	**3RA29 34-2B**		0.010
Terminals for contactor coil						
3RA19 23-3B	S3	--	For A1 and A2 of reversing contactors (includes 2 x A1 and 1 x A2)	**3RA19 23-3B**		0.020
Standard mounting rail adapters						
3RA29 22-1AA00	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	**3RA29 22-1AA00**	1 unit	0.001
	S2	S2		**3RA19 31-1AA00**	1 unit	0.020
	S3	S3		**3RA19 41-1AA00**	1 unit	0.250
	S00, S0	S00, S0	Multi-unit packaging	**3RA29 22-1A**	5 units	0.001
Side modules for standard mounting rail adaptors						
3RA19 02-1B	S00 ...S3	S00 ...S3	For standard mountin 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	**3RA19 02-1B**	10 units	0.009
RH assembly kits for reversing duty and standard rail mounting						
3RA29 23-1BB1	RH assembly kits for screw terminals					
	S0	S0	Comprising: • Wiring kits • 2 standard mounting rail adaptors • 2 connecting wedges Link modules may be ordered seperately.	**3RA29 23-1BB1**	1 unit	0.001
	S2	S2		**3RA29 33-1BB1**	1 unit	0.560
	S3	S3		**3RA29 43-1BB1**	1 unit	0.810
	RH assembly kits for spring-type terminals			Spring-type Terminals		
	S0	S0	Comprising: • Wiring kits • 2 standard mounting rail adaptors • 2 connecting wedges • Spacers Link modules may be ordered seperately.	**3RA29 23-1BB2**	1 unit	0.001

3RA2 Accessories

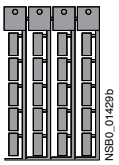
Busbar adapters

	For motor starter protector	For contactors	Version	Order No.	Std. pack qty.	Weight approx.
	Size	Size				kg
Busbar adapters for 60 mm systems						
 8US12 51-5DS10 8US12 51-5DT11	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					
	For motor starter protectors and contactors with screw terminals			**Screw terminals**		
	S00	S00	Rated current 16 A, 45 mm wide, 200 mm long	**8US12 51-5DS10**	1 unit	0.183
	S0	S0	Rated current 32 A, 45 mm wide, 260 mm long	**8US12 51-5NT10**	1 unit	0.183
	S2	S2	Up to 65A, 55mm wide, 260mm long	**8US12 61-6MT10**	1 unit	0.572
	For motor starter protectors and contactors with spring-type terminals			**Spring-type terminals**		
	S00	S00	Rated current 16 A, 45 mm wide, 260 mm long	**8US12 51-5DT11**	1 unit	0.183
	S0	S0	Rated current 32 A, 45 mm wide, 260 mm long	**8US12 51-5NT11**	1 unit	0.183
Device holders for lateral mounting onto busbar adapters for 60 mm system						
 8US12 50-5AS10 8US12 50-5AT10	S00, S0	S00, S0	Up to 25 A, 45 mm wide, 200 mm long	**8US12 50-5AS10**	1 unit	0.183
	S0	S0	Up to 40 A, 45 mm wide, 260 mm long	**8US12 50-5AT10**	1 unit	0.183
	S2	S2	Up to 65A, 118mm wide, 260mm long (includes 8US1261-6MT10 adapter)	**8US12 11-6MT10**	1 unit	0.873
Side modules for widening busbar adapters						
	--	--	Including connecting wedges, for widening busbar adapters or device holders, 9 mm wide, 200 mm long	**8US19 98-2BJ10**	1 unit	0.023
Spacers for fixing the motor starter onto the busbar adapter						
	--	S00, S0	(1 pack = 100 units)	**8US19 98-1BA10**	1 pack	0.183
Vibration and shock kits for high vibration and shock loads						
	--	S00, S0		**8US19 98-1CA10**	1 unit	0.183
RS assembly kits for reversing duty for 60 mm busbar systems						
3RA29 23-1DB1 only Busbar adapter pictured	**RS assembly kits for screw terminals**			**Screw terminals**		
	S00, S0 S0 S00 S2	S00 S0 S0 S2	Comprising: • Wiring kits • Busbar adapters • Device holders • 2 connecting wedges • Side modules Link modules must be ordered separately.	**3RA29 13-1DB1** **3RA29 23-1DB1** **3RA29 23-1EB1** **3RA29 33-1DB1**	1 unit 1 unit 1 unit 1 unit	0.001 0.001 0.001 1.235
3RA29 23-1DB2 only Busbar adapter pictured	**RS assembly kits for spring-type terminals**			**Spring-type terminals**		
	S00 S0	S00 S0	Comprising: • Wiring kits • Busbar adapters • Device holders • 2 connecting wedges • Spacers • Side modules Link modules must be ordered separately.	**3RA29 13-1DB2** **3RA29 23-1DB2**	1 unit 1 unit	0.001 0.001

3RA2 Accessories

Connecting wedges, spaces, and tools

	For motor starter protector Size	For contactors Size	Version	Order No.	Std. pack qty.	Weight approx. kg
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
Spacers						
3RA29 11-1CA00	For height compensation on AC contactors size S0 with spring-type terminals			**Spring-type terminals**		
	S0	S0	**Single-unit packaging**	**3RA29 11-1CA00**	1 unit	0.001
	S0	S0	**Multi-unit packaging**	**3RA29 11-1C**	5 units	0.001

	Version	Order No.	Std. pack qty.	Weight approx. kg
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**[1] for SIRIUS devices 20 mm x 7 mm, pastel turquoise	**3RT29 00-1SB20**	340 units	0.200

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systems, Inc. www.murrplastik.com .

Selection and ordering data

	For MSPs Size	For Conductors Size	Version	Order No.	Std. Pack Qty.	Weight approx. kg
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

Components for IEC types of coordination 1 and 2 at AC 500 V

Technical data

Three-phase standard motor[1]) 4-pole at AC 500 V		Setting range Inverse-time delayed overload release	Motor starter protector	Contactor[2])	Size
Standard output	Motor current (guide value)		Type	Type	
P	*I*				
kW	A	A			
IEC Type of coordination 1 at I_q = 50 kA/AC 400 V Normal starting Class 10					
1.5	3.6	3.5 ... 5	3RV20 11-1FA10	3RT20 15-1AP00	**S00**
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	
IEC Type of coordination 2 at I_q = 50 kA/AC 400 V Normal starting Class 10					
0.06	0.2	0.14 ... 0.2	3RV20 11-0BA10	3RT20 15-1AP01	**S00**
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	**S0**
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[1]) 4-pole at AC 500 V		Setting range Inverse-time delayed overload release	Motor starter protector	Contactor[2])	Size
Standard output	Motor current (guide value)		Type	Type	
P	*I*				
kW	A	A			
IEC Type of coordination 1 at I_q = 50 kA/AC 500 V Normal starting Class 10					
On request			3RV2031-4DA10	3RT20 35-1AK60	**S2**
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	**S3**
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	**S2**
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	**S3**
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

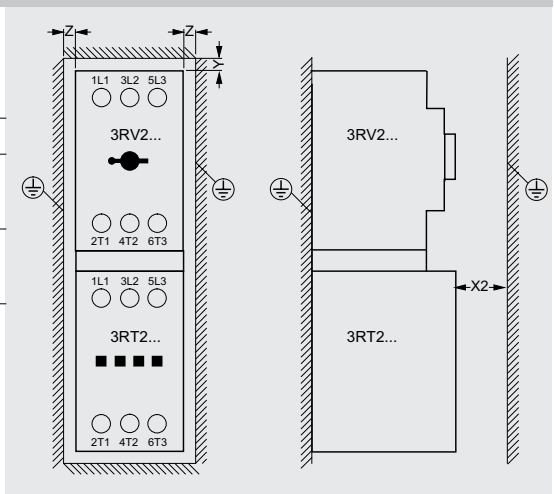
Technical data

Three-phase standard motor 4-pole at AC 690 V[3]) Standard output	Motor current (guide value)	Setting range MSP	Standard IEC circuit-breaker with limiting function Type	Subsequent MSP Type	Contactor[1]) Type	Size	Short-circuit switching capacity I_q at 690 V
P	I						
kW	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 Size S2 I_n= 50 A	3RV20 31-4AA10	3RT20 35-1AK60	**S2**	50
On request		14 ... 20		3RV20 31-4BA10	3RT20 35-1AK60		
On request		18 ... 25		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[2])	**S2/S3**	50
On request		36 ... 45		3RV20 31-4GA10	3RT20 45-1AK60[2])		
On request		40 ... 50		3RV20 31-4HA10	3RT20 46-1AK60[2])		

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 MSP	Contactor	Rated operational voltage	Distances from earthed or live parts Y mm	X2[4]) 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.

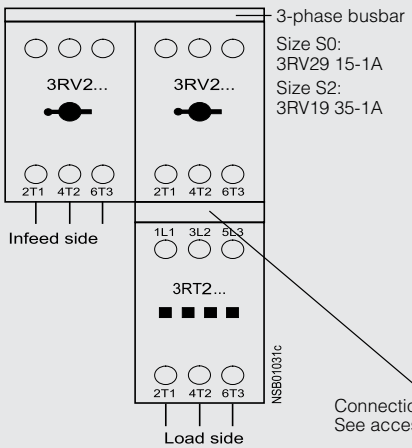
1) Rated control supply voltage 120 V AC. Other voltages are possible.
2) With these combinations, the distance between the subsequent MSP and the contactor must be at least 10 cm.
3) Selection depends on the specific startup and rated data of the protected motor.
4) Minimum distance to contactor at front. For the MSP, no minimum distance at the front must be maintained.

Technical data

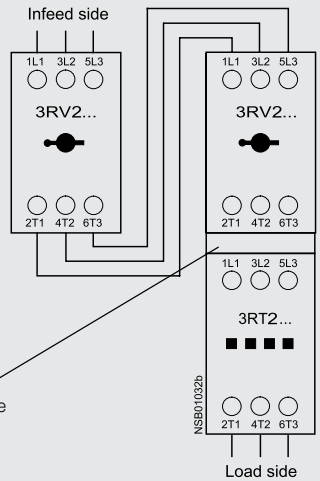
Installation guidelines for AC 690 V

Size	Mounting method
S0	Mounting on an insulated base plate. If screws are used for fixing, the screws must not be earthed. Alternatively, the standard rail adapter can be used for all units.
S2/S3	Mounting on an insulated base plate. Alternatively, the standard rail adapter can also be used without restriction.

Standard surface mounting for sizes S0 up to 5.5 kW, S2 and S3



Surface mounting for sizes S0 from 7.5 to 11 kW

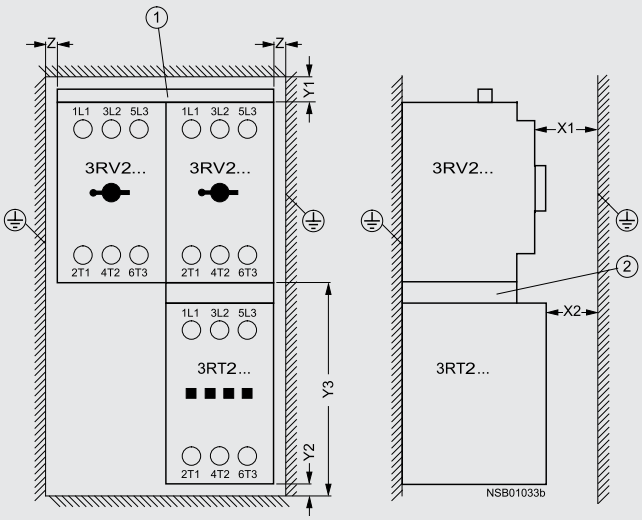


The following distances from earthed components must be observed when installing combinations:

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 3RT20 4	690 V 690 V	50 50	10 10	120 120	10 10	32 40	10 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.



Technical data

General data

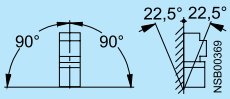
Specifications			IEC 60 947-1, EN 60 947-1 (VDE 0660 Part 100) IEC 60 947-2, EN 60 947-2 (VDE 0660 Part 101) IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)			
Type Size Number of poles			**3RA2. 1** **S00** 3	**3RA2. 2** **S0** 3	**3RA2. 3** **S2** 3	**3RA2.4** **S3** 3
Max. rated current I_{nmax} (= max. rated operational current I_e)		A	16	32	65	100
Permissible ambient temperature	°C for storage/transport °C for operation		–55 ... +80 –20 ... +60 (restrictions apply at more than +60 °C)		–50 ... +80 –20 ... +60	
Rated operational voltage U_e **Rated frequency** **Rated insulation voltage U_i** **Rated impulse withstand voltage U_{imp}**		V Hz V kV	690 50/60 690 6			
Release class (CLASS)	acc. to IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)		10			
Rated fused short-circuit current I_q at 50/60 Hz AC 400 V acc. to IEC 60 947-4-1, DIN EN 60 947-4-1 (VDE 0660 Part 102) **Types of coordination to IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)**		kA	150 [1])		100	50
Power losses $P_{v\,max}$ of all main conducting paths depending on the rated current I_n (upper current setting range)	• Up to 1.25 A • 1.6 - 6.3 A • 8 - 12 A • 16 A • 5 - 6.3 A • 8 - 12 A • 16 - 32 A • 25 - 32 A • 40 A • 45 - 50 A • 63 A • 75 - 90 A • 100 A	W W W W W W W W W W W W W	2 2.3 3.5 4.3	2.3 3.5 4.3	16.2 17.2 21	29 45 60
Power consumption of solenoid coils (with cold coil and U_s, 50 Hz)						
• AC operation	closing p.f. closed p.f.	VA 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
Coil voltage tolerance for contactors			0.8 - 1.1 x U_s			
low limit	at 55 °C at 60 °C		0.8 x U_s 0.85 x U_s	– –		
Endurance of MSP						
• Mechanical endurance		operating cycles	100 000		Up to 52A: 50 000	50 000
• Electrical endurance		operating cycles	100 000		from 65A: On request	50 000
• Max. switching frequency per hour (motor starts)		1/h	15		15	15
Endurance of contactor						
• Mechanical endurance		operating cycles	30 million	10 million		
• Electrical endurance		operating cycles	See endurance curves of contactors in Part 3.			
Shock resistance (sine-wave pulse)	acc. to IEC 60 068 Part 2-27	*g*	up to 6	up to 6	up to 6	up to 6
Degree of protection	acc. to IEC 60 947-1		IP 20		IP 20	
Shock-hazard protection	acc. to DIN VDE 0106 Part 100		Finger-safe			
Phase failure sensitivity of MSP	acc. to IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)		Yes			
Isolating characteristics of MSP **Main and EMERGENCY-STOP switch characteristics of MSP and accessories**	acc. to IEC 60 947-2, EN 60 947-2 (VDE 0660 Part 101) acc. to IEC 60 204-1, EN 60 204-1 (VDE 0113 Part 1)		Yes Yes (with overvoltage releases of category 1 under conditions of proper use)			
Safe isolation between main and auxiliary circuits	acc. to DIN VDE 0160 Part 101		up to 400 V			
Positively driven operation at contactors			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)			
Type Size Number of poles		**3RA2. 1** **S00** 3	**3RA2. 2** **S0** 3	**3RA2.3** **S2** 3	**3RA21 4** **S3** 3
Connection type **Terminal screw**		Screw terminal M3 Posidrive size 2	Screw terminal M3 Posidrive size 2	Screw Terminals M6 Pozidriv size 2	Box terminals Allen screw
Conductor cross-sections (min./max) 1 or 2 conductors can be connected					
• Solid and stranded	mm² mm² mm²	2 x (0.5 … 1.5)[2] only for contactors 2 x (0.75 … 2.5)[2] max. 2 x 4		2 x (1 ... 25)[2] 1 x (1 ... 35)[2] 2 x (1 ... 35)[2] 1 x (1 ... 50)[2]	
• Finely stranded without end sleeve	mm²	–			
• Finely stranded with end sleeves (DIN 46 228 T1)	mm²	2 x (0.5 ... 1.5)[2] 2 x (0.75 ... 2.5)[2]		2 x (1 ... 16)[2] 1 x (1 ... 25)[2] 2 x (1 ... 25)[2] 1 x (1 ... 35)[2]	
• AWG cables, solid or stranded	AWG AWG AWG	2 x (20 ... 16)[2] 2 x (18 ... 14) 2 x 12		2 x (18 ... 3)[2] 1 x (18 ... 2)[2] 2 x (18 ... 2)[2] 1 x (18 ... 1)[2]	
Minimum/maximum conductor cross-sections					
• flexible with ferrule					
- 1 conductor	mm²			0.75/25	2.5/50[1]
- 2 conductors	mm²			0.75/16	2.5/35[1]
• solid or stranded					
- 1 conductor	mm²			0.75/35	2.5/70[1]
- 2 conductors	mm²			0.75/25	2.5/50[1]
Ribbon cable				yes	yes
Bus connection				–	yes
• solid or stranded	AWG			2 x (30 ... 2)	–
• stranded	AWG			–	2 x (10 ... 1/0)
Connection type		Spring Loaded connection			
• Solid and stranded	mm²	2 x (0.5 ... 2.5)	–	2 x (0.5 … 2.5)	
• Finely stranded without end sleeve	mm²			2 x (0.5 … 2.5)	
• Finely stranded with end sleeves	mm²			2 x (0.5 … 2.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)		2 x (20 … 14)	
Permissible mounting position		 Attention: acc. to DIN 43 602 Start command **"I"** right-hand or above			

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 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

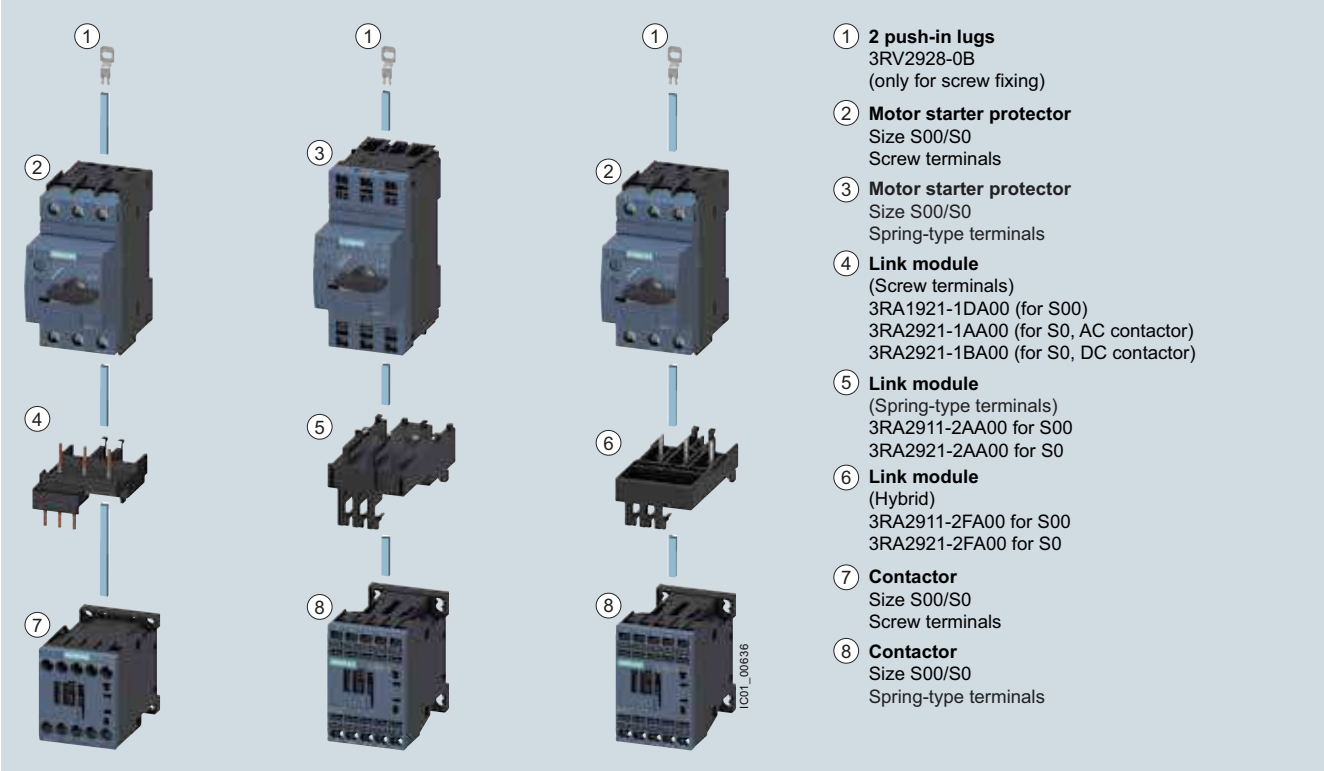
3RA combination starters are available for assembly on standard mounting rails in accordance with EN 50 022-35 x 15 or on busbar adapters with a busbar centre-line spacing of 40 or 60 mm and a busbar thickness of 5 or 10 mm.

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

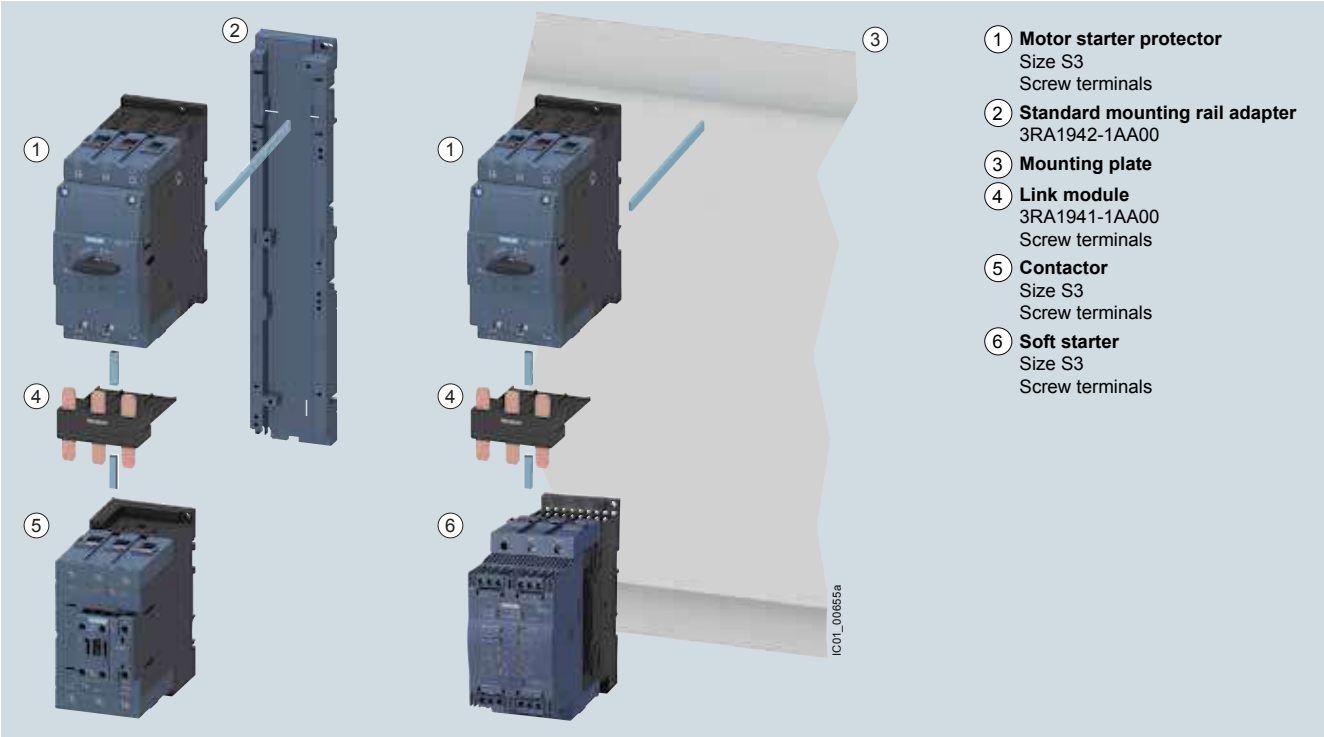
Direct-on-line starting • For standard rail mounting or screw fixing • Sizes S00 and S0



1. **2 push-in lugs**
   3RV2928-0B
   (only for screw fixing)
2. **Motor starter protector**
   Size S00/S0
   Screw terminals
3. **Motor starter protector**
   Size S00/S0
   Spring-type terminals
4. **Link module**
   (Screw terminals)
   3RA1921-1DA00 (for S00)
   3RA2921-1AA00 (for S0, AC contactor)
   3RA2921-1BA00 (for S0, DC contactor)
5. **Link module**
   (Spring-type terminals)
   3RA2911-2AA00 for S00
   3RA2921-2AA00 for S0
6. **Link module**
   (Hybrid)
   3RA2911-2FA00 for S00
   3RA2921-2FA00 for S0
7. **Contactor**
   Size S00/S0
   Screw terminals
8. **Contactor**
   Size S00/S0
   Spring-type terminals

Left: 3RA21 load feeder with screw terminals
Center: 3RA21 load feeder with spring-type terminals
Right: Motor starter protector combination with screw terminals, with contactor with spring-type terminals

Direct-on-line starting · For standard rail mounting · Up to Size S3

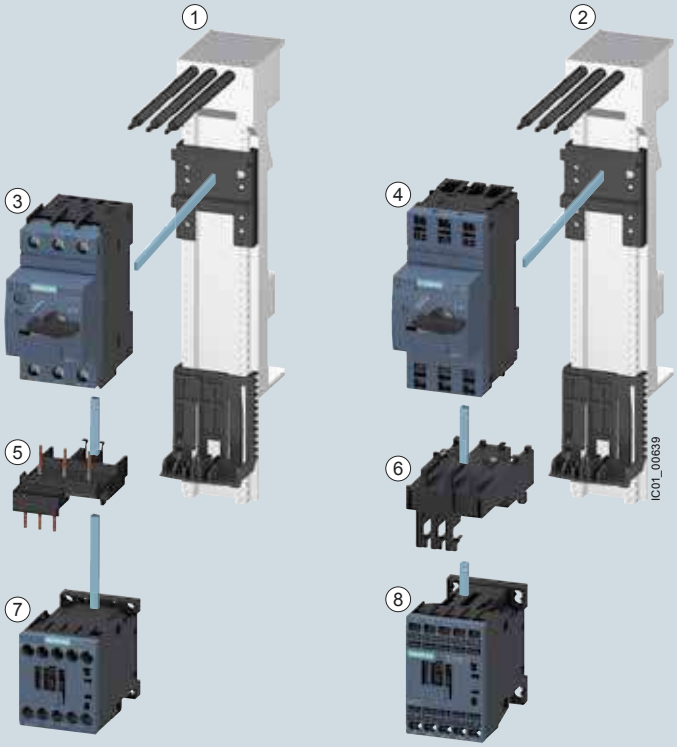


1. **Motor starter protector**
   Size S3
   Screw terminals
2. **Standard mounting rail adapter**
   3RA1942-1AA00
3. **Mounting plate**
4. **Link module**
   3RA1941-1AA00
   Screw terminals
5. **Contactor**
   Size S3
   Screw terminals
6. **Soft starter**
   Size S3
   Screw terminals

Load feeder for direct-on-line starting and standard rail mounting in size S3 (the version with screw terminals is shown in the picture)

3RA2 – up to 100 A

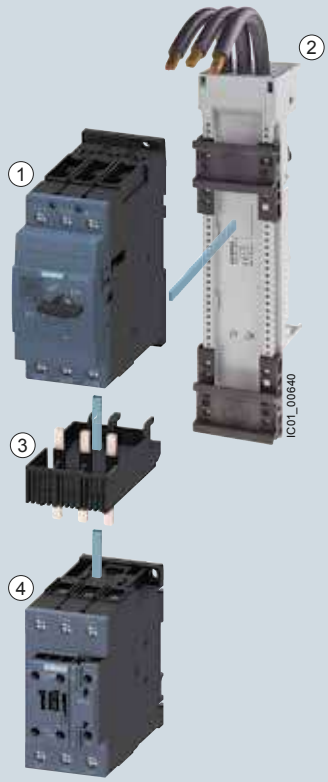
Direct-on-line starting · For 60 mm busbar systems · Sizes S00 and S0



1. **60 mm busbar adapter for screw terminals**
   8US1251-5DS10 for S00
   8US1251-5NT10 for S0
2. **60 mm busbar adapter for spring-type terminals**
   8US1251-5DT11 for S00
   8US1251-5NT11 for S0
3. **Motor starter protector**
   Size S00/S0
   Screw terminals
4. **Motor starter protector**
   Size S00/S0
   Spring-type terminals
5. **Link module**
   Screw terminals
   3RA1921-1DA00 for S00
   3RA2921-1AA00 for S0, AC contactor
   3RA2921-1BA00 for S0, DC contactor
6. **Link module**
   3RA2911-2AA00 for S00
   3RA2921-2AA00 for S0
   (additional 3RA2911-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals)
7. **Contactor**
   Size S00/S0
   Screw terminals
8. **Contactor**
   Size S00/S0
   Spring-type terminals

Left: 3RA21 load feeder for direct-on-line starting with busbar adapter with screw terminals
Right: 3RA21 load feeder for direct-on-line starting with busbar adapter with spring-type terminals

Direct-on-line starting · For 60 mm busbar systems · Size S2

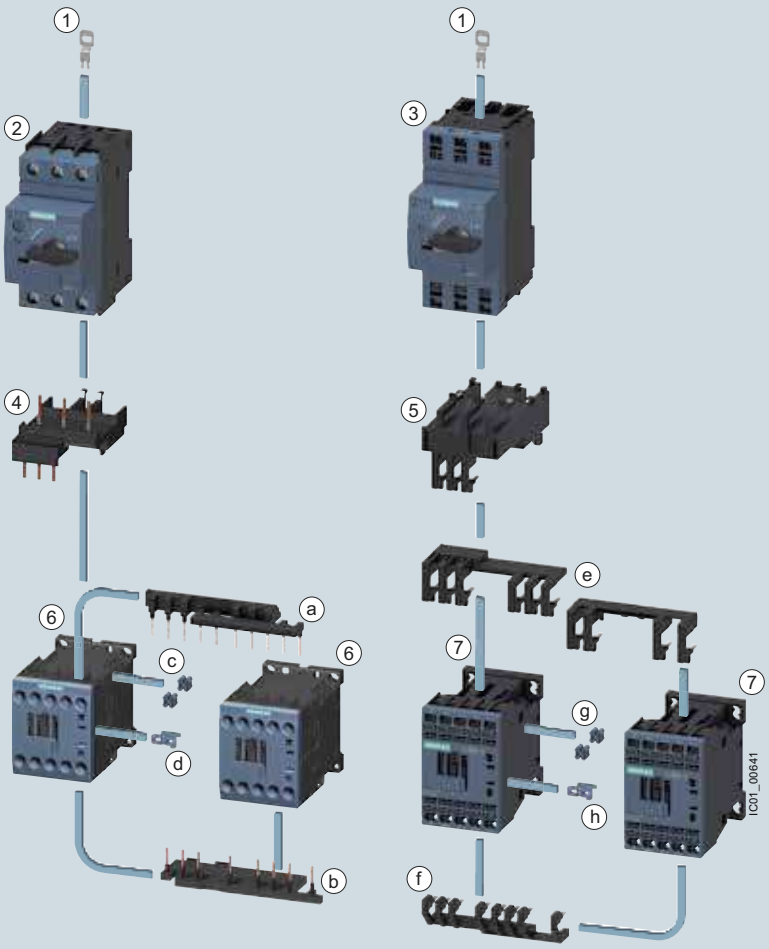


1. **Motor starter protector**
   Size S2
   Screw terminals
2. **Busbar adapter 60 mm**
   8US1261-6MT10
3. **Link module**
   3RA2931-1AA00
   Screw terminals
4. **Contactor**
   Size S2
   Screw terminals

3RA21 load feeder for direct-on-line starting with busbar adapter with screw terminals

3RA2 – up to 100 A

Reversing duty • For standard rail mounting or screw fixing • Size S00



1 **Push-in lug**
3RV2928-0B
(only for screw fixing)

2 **Motor starter protector**
Size S00/S0
Screw terminal

3 **Motor starter protector**
Size S00/S0
Spring-type terminal

4 **Link module**
Screw terminal
3RA1921-1DA00 for S00
3RA2921-1AA00 for S0, AC contactor
3RA2921-1BA00 for S0, DC contactor

5 **Link module**
Spring-type terminal
3RA2911-2AA00 for S00
3RA2921-2AA00 for S0

6 **Contactor**
Size S00/S0
Screw terminal

7 **Contactor**
Size S00/S0
Spring-type terminal

Wiring kit
3RA2913-2AA1

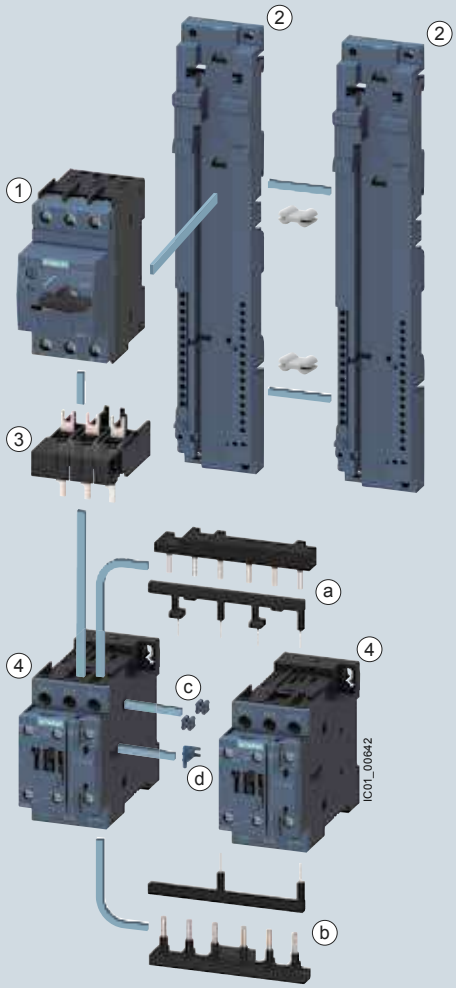
a Upper wiring module
b Lower wiring module
c Two connecting clips for two contactors
d Mechanical interlock
(can be removed if necessary)

Wiring kit
3RA2913-2AA2

e Upper wiring module
f Lower wiring module
g Two connecting clips for two contactors
h Mechanical interlock
(can be removed if necessary)

Left: 3RA22 load feeder with screw terminals with push-in lugs with two contactors for reversing duty and 3RA2913-2AA1 wiring kit for connection of the contactors (incl. mechanical interlocking and connecting clips)
Right: 3RA22 load feeder with spring-type terminals with push-in lugs with two contactors for reversing duty and 3RA2913-2AA2 wiring kit (incl. mechanical interlocking and connecting clips)

Reversing duty · For standard rail mounting · Size S0



RH assembly kit for reversing duty and standard rail mounting in size S0

Screw terminals
3RA2923-1BB1

Spring-type terminals
3RA2923-1BB2[1)]

Comprising:
- Wiring kit for the main and auxiliary circuits
- Two standard mounting rail adapters
- Two connecting wedges
- Mechanical interlock
- Two connecting clips
- Fixing accessories

(1) **Motor starter protector**
Size S0
Screw terminals/spring-type terminals

(2) **Standard mounting rail adapters**
3RA2922-1AA00

with two connecting wedges
8US1998-1AA00

(3) **Link module**
Screw terminals:
3RA2921-1AA00 for S0, AC contactor
3RA2921-1BA00 for S0, DC contactor

Spring-type terminals:
3RA2921-2AA00[2)]

(4) **Contactor**
Size S0
Screw terminals/spring-type terminals

Wiring kit
Screw terminals:
3RA2923-2AA1

Spring-type terminals:
3RA2923-2AA2

(a) Upper wiring module

(b) Lower wiring module

(c) Two connecting clips for two contactors

(d) Mechanical interlock
(can be removed if necessary)

[1)] Contains two 3RA2911-1CA00 spacers for height compensation on AC contactors size S0 with spring-type terminals.

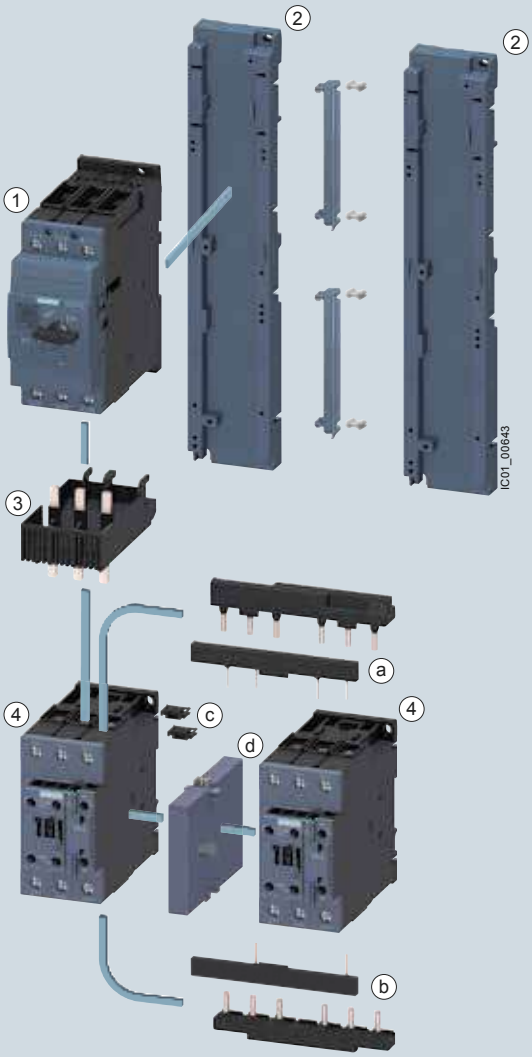
[2)] Additionally two 3RA2911-1CA00 spacers for height compensation on AC contactors size S0 with spring-type terminals.

3RA22 load feeder for reversing duty and standard rail mounting in size S0 (the version with screw terminals is shown in the picture)

RH assembly kits for reversing duty and standard rail mounting in size S0, see page 4/50.

3RA2 – up to 100 A

Reversing duty · For standard rail mounting · Size S2



RH assembly kit for reversing duty and standard rail mounting in size S2

3RA2933-1BB1

Comprising:
- Wiring kit for the main and auxiliary circuits
- Two standard mounting rail adapters
- Two side modules
- Four connecting wedges
- Mechanical interlock
- Two connectors for two contactors
- Fixing accessories

(1) **Motor starter protector**
Size S2
Screw terminals

(2) **Standard mounting rail adapter**
3RA2932-1AA00
with two side modules
3RA1902-1B
and four connecting wedges
8US1998-1AA00

(3) **Link module**
3RA2931-1AA00
Screw terminals

(4) **Contactor**
size S2
Screw terminals

Wiring kit
Screw terminals
3RA2933-2AA1

(a) Upper wiring module

(b) Lower wiring module

(c) Two connectors for two contactors

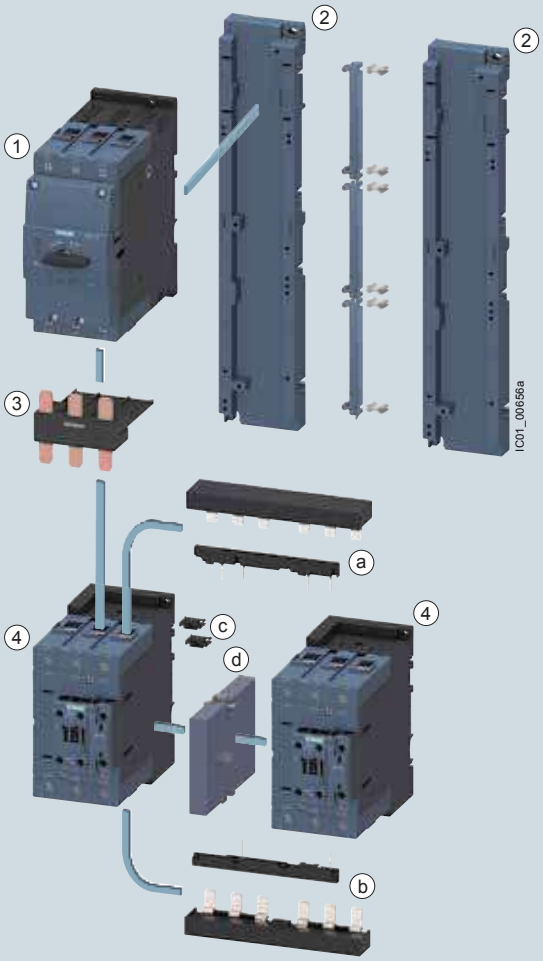
(d) Mechanical interlock
3RA2934-2B (not part of the wiring kit, must be ordered separately)

Load feeder for reversing duty and standard rail mounting in size S2 (the version with screw terminals is shown in the picture)

RH assembly kits for reversing duty and standard rail mounting in size S2, see page 4/50.

3RA2 – up to 100 A

Reversing duty · For standard rail mounting · size S3



Assembly kit (RH) for reversing duty and mounting onto standard rails in size S3

3RA2943-1BB1

Comprising:
- Wiring kit for the main and auxiliary circuits
- Two standard mounting rail adapters
- Three side modules
- Six connecting wedges
- Mechanical interlock
- Two connectors for two contactors
- Fixing accessories

(1) **Motor starter protector**
size S3

(2) **Standard mounting rail adapter**
3RA2932-1AA00

with two side modules
3RA1902-1B

and four connecting wedges
8US1998-1AA00

(3) **Link module**
3RA1941-1AA00

(4) **Contactor**
size S3

Wiring kit
Screw terminals
3RA2943-2AA1

(a) Upper wiring module

(b) Lower wiring module

(c) Two connectors for two contactors

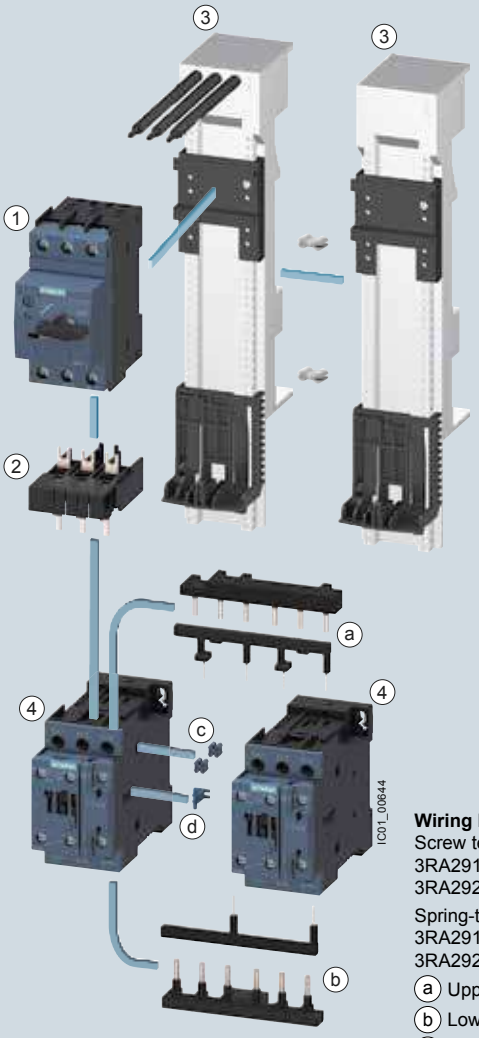
(d) Mechanical interlock
3RA2934-2B (not part of the wiring kit, must be ordered separately)

Load feeder for reversing duty and standard rail mounting in size S3 (the version with screw terminals is shown in the picture)

RH assembly kits for reversing duty and standard rail mounting in size S3, see page 4/50.

3RA2 – up to 100 A

Reversing duty · For 60 mm busbar systems · Sizes S00 and S0



Wiring kit
Screw terminals
3RA2913-2AA1 for S00
3RA2923-2AA1 for S0

Spring-type terminals
3RA2913-2AA2 for S00
3RA2923-2AA2 for S0

(a) Upper wiring module
(b) Lower wiring module
(c) Two connecting clips for two contactors
(d) Mechanical interlock (can be removed if necessary)

RS assembly kit for reversing duty and busbar mounting in size S00/S0

Screw terminals
3RA2913-1DB1 for S00
3RA2923-1DB1 for S0

Spring-type terminals
3RA2913-1DB2 for S00
3RA2923-1DB2 for S0[1)]

Comprising:
- Wiring kit for the main and auxiliary circuits
- Busbar adapter
- Device holder
- Two connecting wedges
- Mechanical interlock
- Two connecting clips for two contactors
- Fixing accessories

(1) **Motor starter protector**
Size S00/S0
Screw terminals/spring-type terminals

(2) **Link module**
Screw terminals
3RA1921-1DA00 for S00
3RA2921-1AA00 for S0, AC contactor
3RA2921-1BA00 for S0, DC contactor

Spring-type terminals
3RA2911-2AA00 for S00
3RA2921-2AA00 for S0[2)]

(3) **60 mm busbar adapter**
Screw terminals
8US1251-5DS10 for S00/S0
8US1251-5NT10 for S0

Spring-type terminals
8US1251-5DT11 for S00/S0
8US1251-5NT11 for S0

2 connecting wedges
8US1998-1AA00

60 mm device holder
8US1250-5AS10 or
8US1250-5AT10
(according to left adapter)

(4) **Contactor**
Size S00/S0
Screw terminals/spring-type terminals

[1)] Contains two 3RA2911-1CA00 spacers for height compensation on AC contactors size S0 with spring-type terminals.

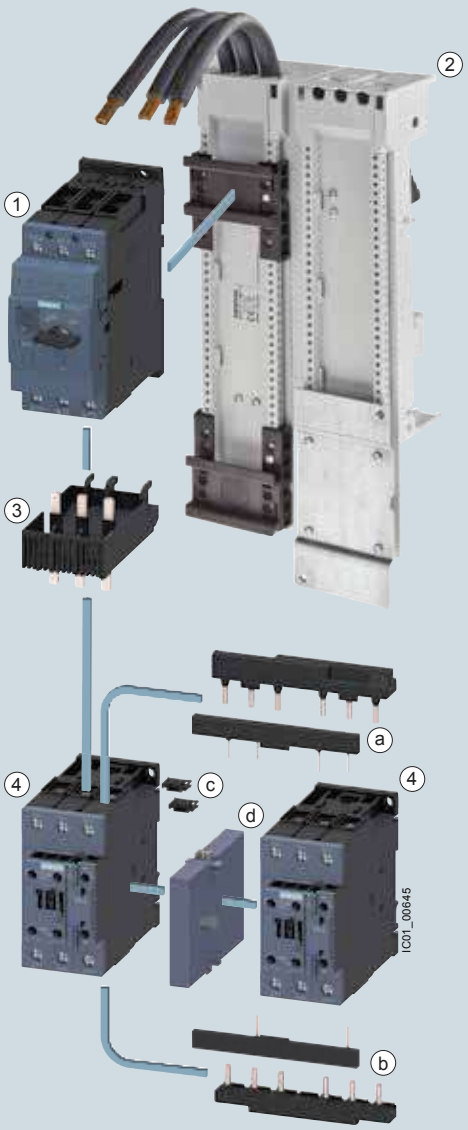
[2)] Additionally two 3RA2911-1CA00 spacers for height compensation on AC contactors size S0 with spring-type terminals.

3RA22 load feeder for reversing duty and 60 mm busbar
(the version with screw terminals is shown in the picture)

RS assembly kits for reversing duty and busbar mounting in size S00/S0, see page 4/51.

3RA2 – up to 100 A

Reversing duty · For 60 mm busbar systems · size S2



RS assembly kit for reversing duty and busbar mounting in size S2

3RA2933-1DB1

Comprising:
- Wiring kit for the main and auxiliary circuits
- Busbar adapter
- Mechanical interlock
- Two connectors for two contactors
- Fixing accessories

(1) **Motor starter protector**
Size S2
Screw terminals

(2) **Busbar adapter 60 mm**
8US1211-6MT10

(3) **Link module**
3RA2931-1AA00
Screw terminals

(4) **Contactor**
Size S2
Screw terminals

Wiring kit
For screw terminals
3RA2933-2AA1

(a) Upper wiring module

(b) Lower wiring module

(c) Two connecting pins for two contactors

(d) Mechanical interlock
3RA2934-2B (not part of the wiring kit, must be ordered separately)

Load feeder for reversing duty and 60 mm busbar in size S2
(the version with screw terminals is shown in the picture)

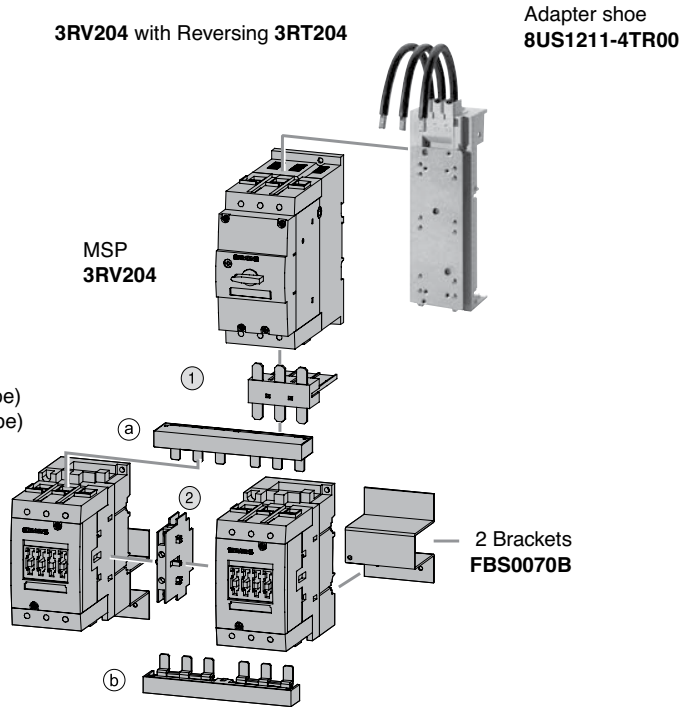
RS assembly kits for reversing duty and busbar mounting in size S2,
see page 4/51.

3RA2 – up to 100 A

Components for Fast Bus mounting

① Link module
for AC: 3RA19 41-1A
for DC: 3RA19 41-1B

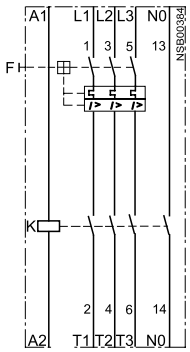
② Mechanical interlock
3RA19 24-2B



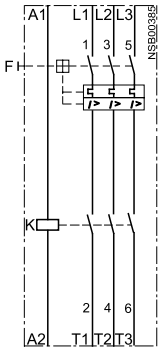
Circuit diagrams

Direct-on-line starting

Size S00: 3RA21.1

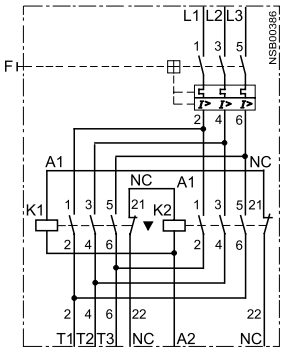


Sizes S0, S2 and S3: 3RA21 2, 3RA21 3

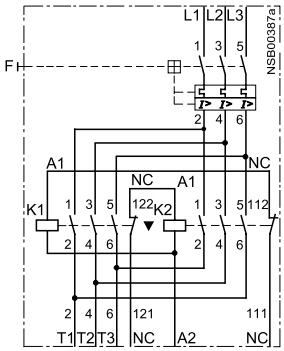


Reversing duty

Size S00: 3RA22



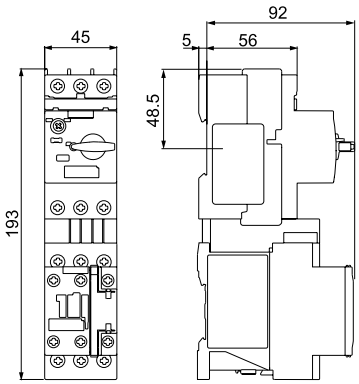
Size S0: 3RA22



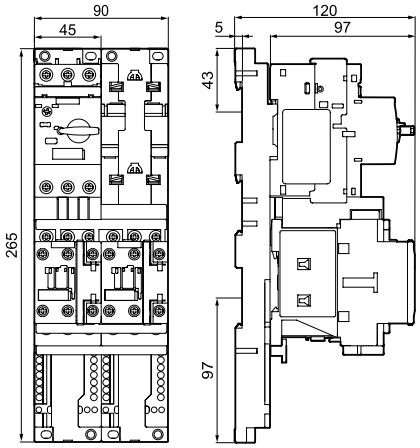
3RA2 – up to 100 A

Dimension drawings

Size S00 · for standard rail mounting

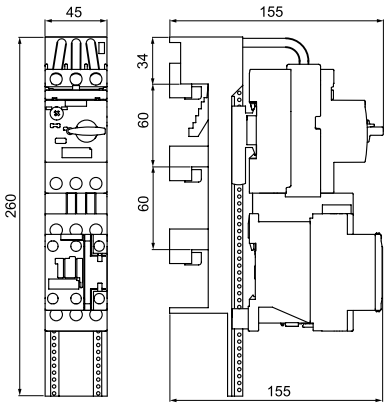


S0 direct-on-line starter,
AC, screw-type connection system
3RA2120-..A

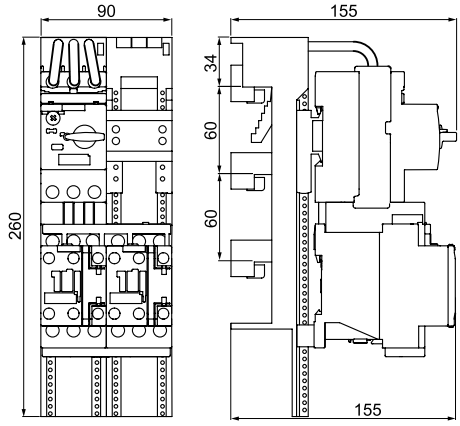


S0/S0 and S00/S0 reversing starters,
AC, screw-type connection system
3RA2220-..B..-0AP0

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

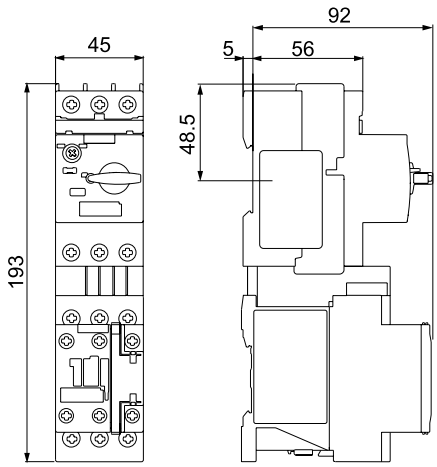


S0/S0 and S00/S0 reversing starters,
AC, screw-type connection system
3RA2220-..D..-0AP0

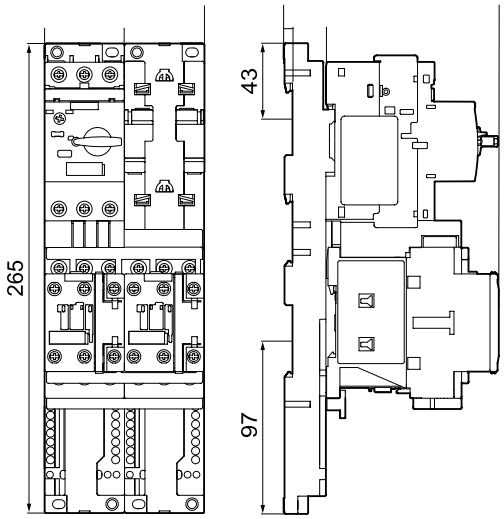
When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

Dimension drawings

Size S0 · for standard rail mounting

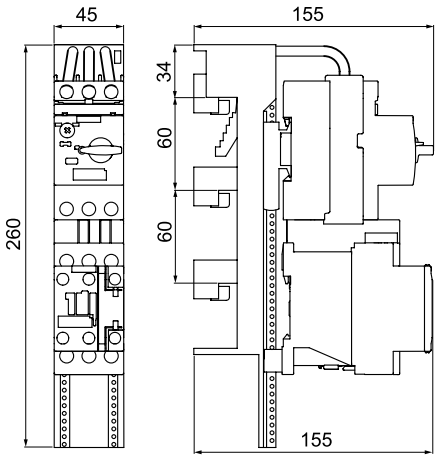


S0 direct-on-line starter, AC, screw-type connection system
3RA2120-..A

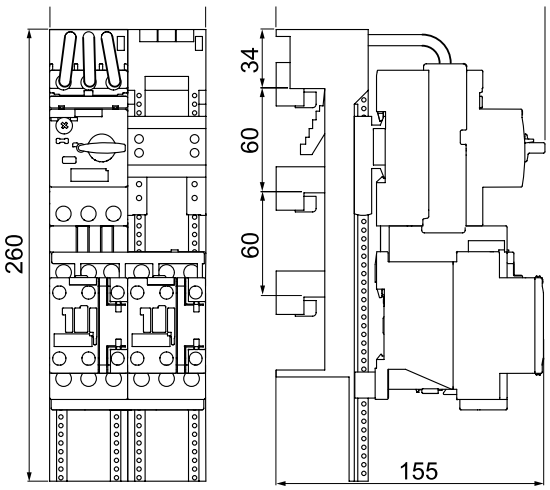


S0/S0 and S00/S0 reversing starters, AC, screw-type connection system
3RA2220-..B..-0AP0

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



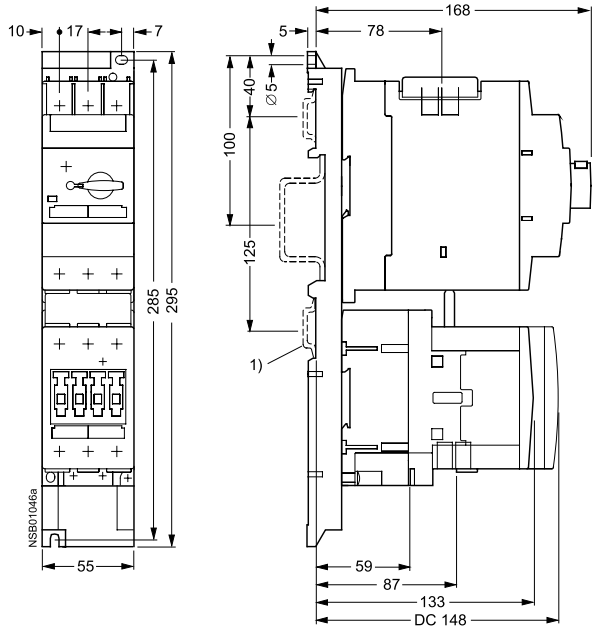
S0/S0 and S00/S0 reversing starters, AC, screw-type connection system
3RA2220-..D..-0AP0

When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

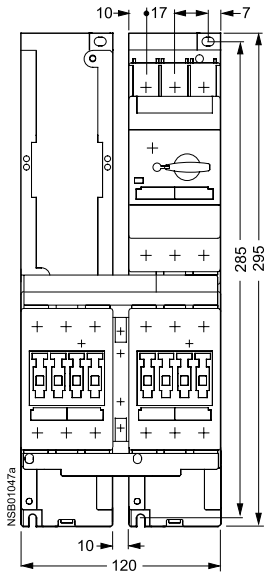
Dimension drawings

Size S2 · for standard rail mounting

Direct-on-line starting



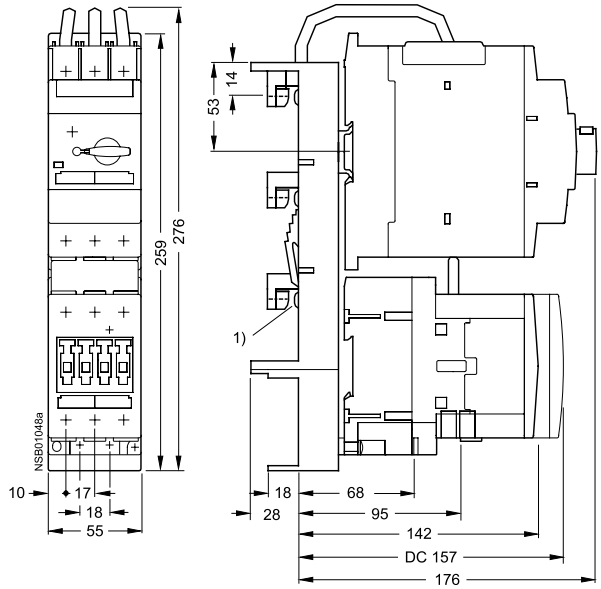
Reversing duty



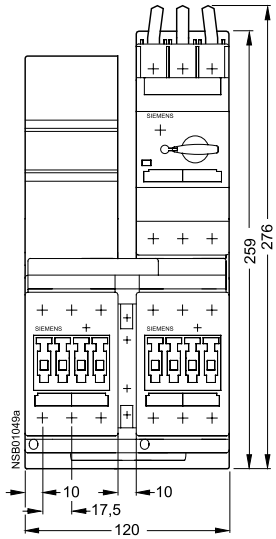
1) Alternative fixing methods
   a) 2 35 mm mounting rails acc. to DIN EN 50022 Spacing: 125 mm Depth: 7.5 or 15 mm.
   b) 1 75 mm mounting rail acc. to DIN EN 50 023.

Size S2 · for 40 mm and 60 mm busbar systems

Direct-on-line starting



Reversing duty



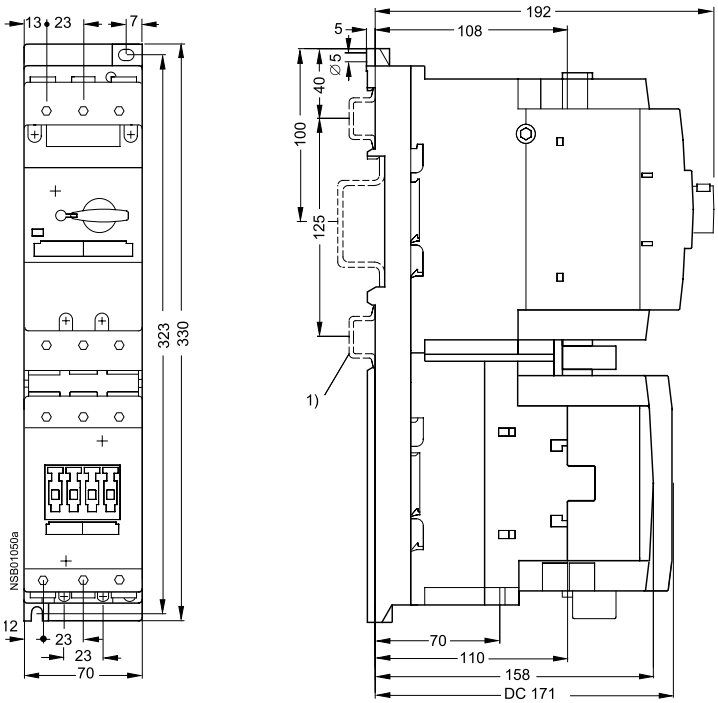
1) Busbar adapter suitable for rail thicknesses of 5 and 10 mm with chamfered edges.

When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

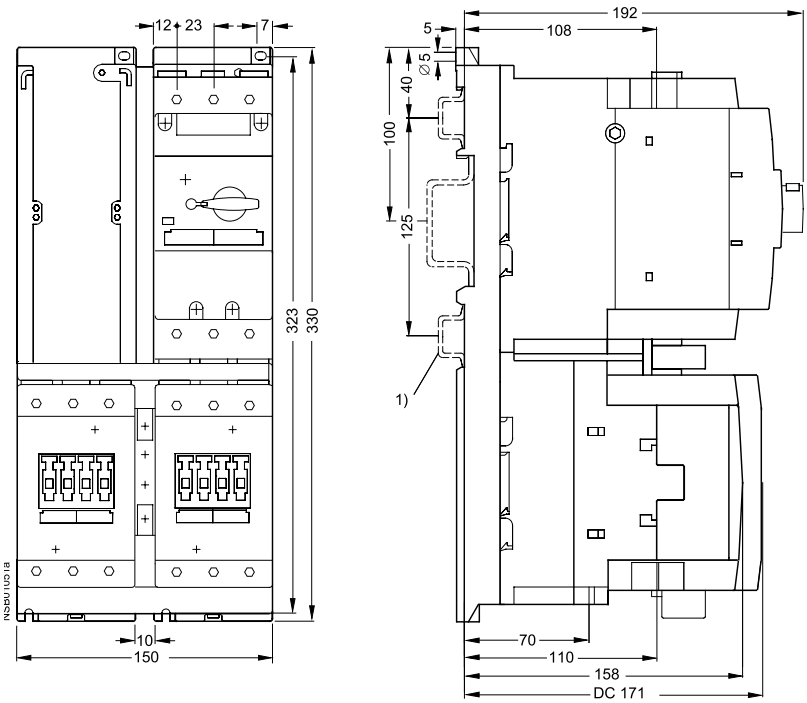
Dimension drawings

Size S3 · for standard rail mounting

Direct-on-line starting



Reversing duty



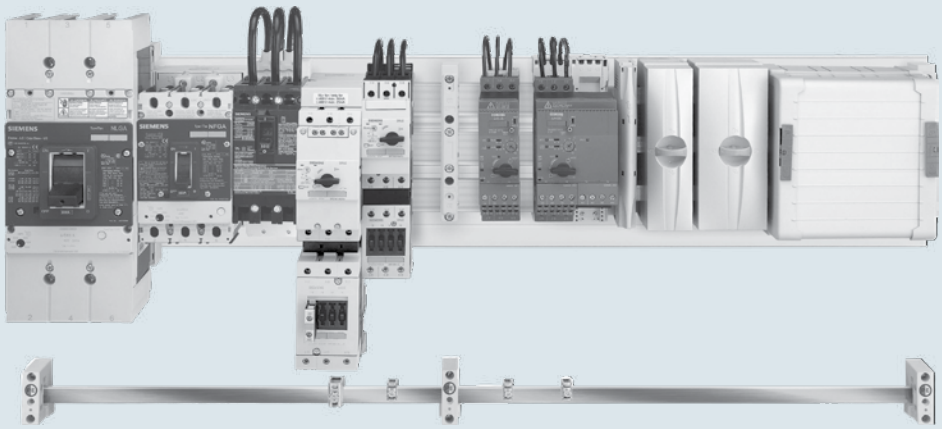
1) Alternative fixing methods
   a) 2 35 mm mounting rails acc. to DIN EN 50 022 Spacing: 125 mm Depth: 7.5 or 15 mm.
   b) 1 75 mm mounting rail acc. to DIN EN 50 023.

When mounting the combinations, observe the installation guidelines (page guidelines 4/60-4/64).

Fast Bus Busbar System

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

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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 UPDATED

- 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

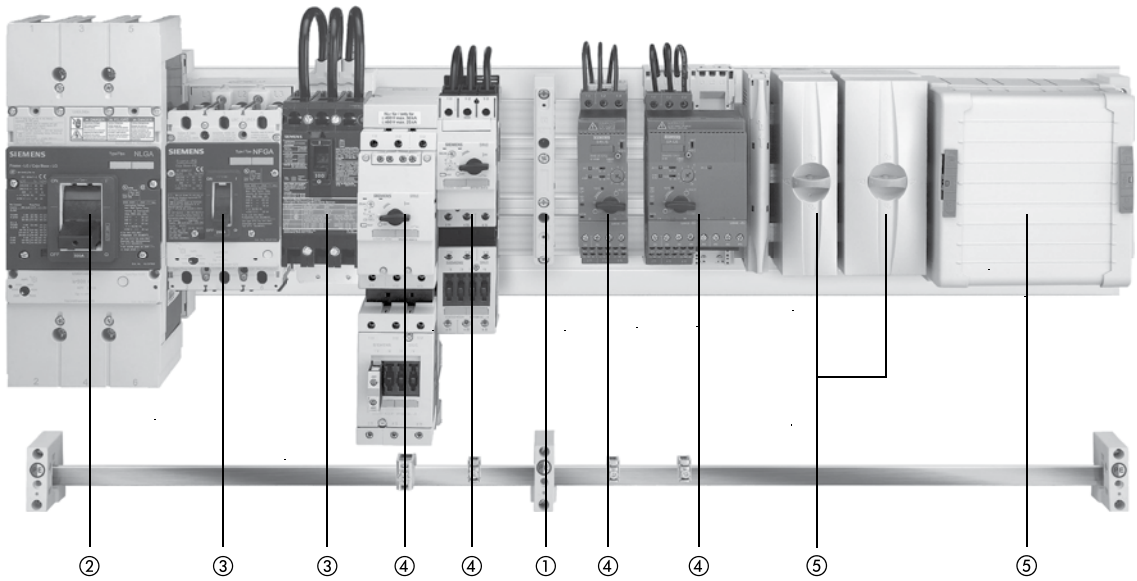
- See Section 4

Fast Bus Busbar Adapter System

Overview

Busbar adapter systems

Busbar adapter systems
with busbar centerline spacing of 60 mm



60 mm busbar system		Page		Page
for sharp-edged copper busbars to DIN 46 433, width 20 mm to 30 mm, thickness 5 mm and 10 mm	① **Busbar holder** End and intermediate holders for flat copper profiles	5/6	④ **3RA2 Combination Starters**	see section 4
	② **Fast Bus main circuit breakers** from 15 to 500A	5/6	⑤ **Incoming supply terminals**	5/6
	③ **Fast Bus circuit breakers** from 15 to 500A	5/7		

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.

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

How to Select Fast Bus

1) Determine the required load.

2) Select method to power Fastbus.

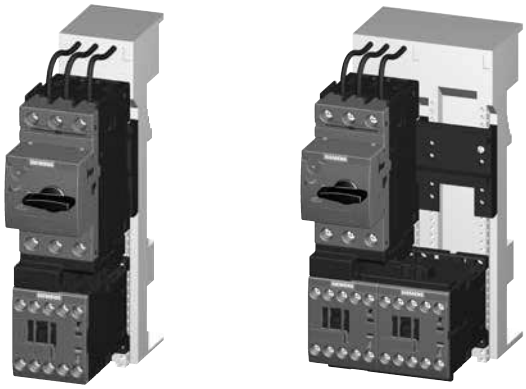
—Main lug up to 800A using a single set of lugs or up to 1400A using a double set of lugs.

—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.



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^2	---	1400A

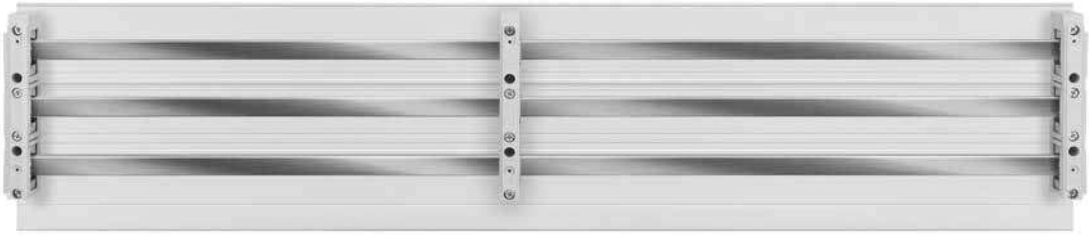
For technical information on E and F frame circuit breakers used as main and feeder breakers, see section 17

Thermal busbar currents, E-Cu, bare, at 35 °C ambient temperature in accordance with DIN 43 6711

Busbar dimensions	System	Thermal current at 65 °C	85 °C	105 °C
		Busbar temperature		
mm	mm	A	A	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 Busbar Adapter System

Introduction



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

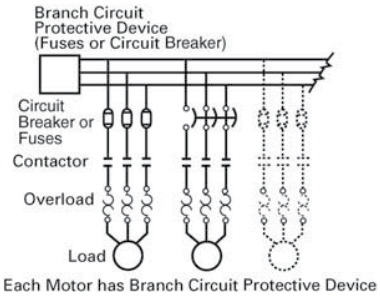
Introduction

Fast Bus combination starters and group installation assemblies

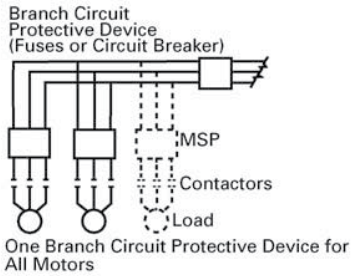
Ratings for Group Installations per NEC 430-53

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: Fuse	Maximum rating of Group Branch Circuit Protective Device: Circuit Breaker	Short Circuit Current Ratings[1) 2)] 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) x115%.

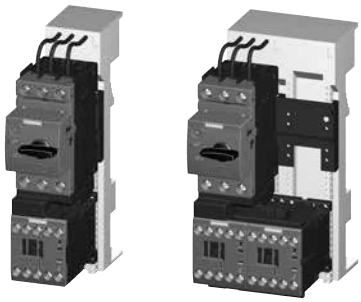
Maximum CB size (per NEC430-53c): 250% x FLC of the largest motor + FLC of all other motors.

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) [1)] 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	—



1) 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.

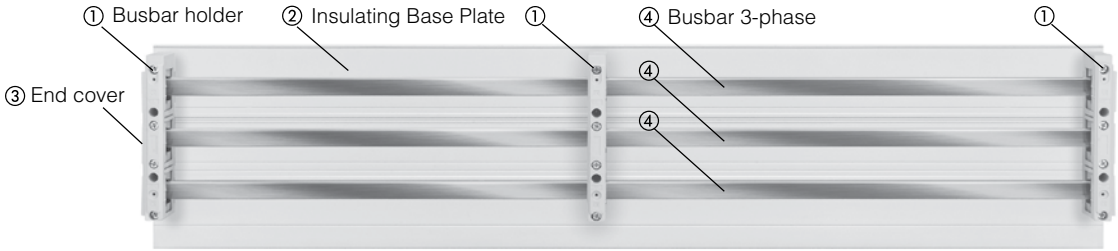
2) 3RA2 used as Manual Motor Controller; Branch Circuit Protective Device for 600V-Ratings: Max. Class J 50A

3) 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

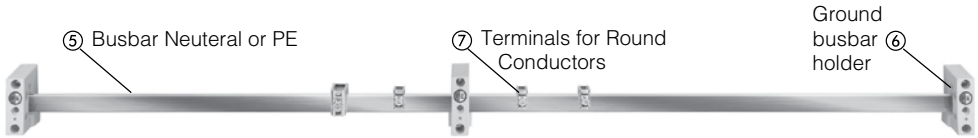
Fast Bus Busbar Adapter System

60 mm system

Selection and ordering data



① Busbar holder
② Insulating Base Plate
③ End cover
④ Busbar 3-phase
⑤ Busbar Neuteral or PE
⑥ Ground busbar holder
⑦ Terminals for Round Conductors



8US1922-2UA01

8WC5

8US1948-2AA00

8US1922-1AC00
8US1923-3UA01

8US1923-1AA01

8US1922-2AA00

8US1922-2EB00

5SH3538
8US1921-1BA00

FBT600F w/cover

Description		UL Current rating	UL508A Compliance[1)]	Order No.	Pack Units
Base plate ②					
3-pole system flat	230 mm x 1100 mm	—	required	**8US19 22-2UA01**	
Copper Busbar with tin plating					
20 mm x 5 mm x 914 mm (36")	for 60 mm systems	362A	yes	**FBB36**	3 pcs
20 mm x 5 mm x 1524 mm (60")	for 60 mm systems	362A	yes	**FBB60**	3 pcs
20 mm x 5 mm x 2000 mm (78.74")	for 60 mm systems	362A	yes	**8WC5053**	
25 mm x 5 mm x 2000 mm (78.74")	for 60 mm systems [4)]	432A	yes	**8WC5054**	
30 mm x 5 mm x 2000 mm (78.74")	for 60 mm systems	500A	yes	**8WC5055**	
20 mm x 10 mm x 2000 mm (78.74")	for 60 mm systems	564A	yes	**8WC5063**	
30 mm x 10 mm x 2000 mm (78.74")	for 60 mm systems	756A	yes	**8WC5065**	
720 mm^2 x 2400 mm (94.49")	Twin T (TT) Busbar	1400A	yes	**8US19 48-2AA00**	
Busbar holder (end and intermediate) ①					
3-pole with inside mounting	for 20 mm and 30 mm x 5 mm or 10 mm	—	yes	**8US19 23-3UA01**	
3-pole with inside mounting	for 25mm x 5mm or x 10mm	—	—	**8US19 23-3AA00**	
3-pole with inside mounting	for Twin T (TT) w/ end cover	—	yes	**8US19 43-3AA01**	
Busbar holder end cover ③					
3-pole end cover	fits 8US19 23-3UA01 and 8US1923-3AA01		required	**8US19 22-1AC00**	
Ground Busbar holder ⑥					
1-pole with inside mounting	for 20 mm - 30 mm x 5 mm or 10 mm[2)]		n/a	**8US19 23-1AA01**	
Cover profiles for Busbars					
for 5 mm busbars up to 30 mm wide	1000 mm length	—	required	**8US19 22-2AA00**	
for 10 mm busbas up to 30 mm	1000 mm length	—	required	**8US19 22-2BA00**	
for Twin T (TT) busbar	1000 mm length	—	required	**8US19 22-2DA00**	
Reserve Space Cover (for covering round terminals placed on 3-phase busbar)					
Holder for reserve space cover	32mm height	—	required	**8US1922-2EA00**	4 pcs
Holder for reserve space cover	107 mm length	—	required	**8US1922-2EA01**	8 pcs
Reserve space cover	195mm height / 700mm length	—	required	**8US1922-2EB00**	
Feeder Lugs (mounts to all busbar sizes on this page)					
3-pole terminal plate with cover	20 mm x 200 mm 16-4 AWG	80A	yes	**5SH3538**	
3-pole terminal plate with cover	54 mm x 200 mm 10-2/0 AWG	175A	yes	**8US19 21-1BA00**	
3-pole terminal plate with cover	81 mm x 200 mm 2 AWG-250 MCM	440A	yes	**8US19 21-1AA00**	
3-pole terminal plate with cover	180 mm x 200 mm 250-600 MCM	560A	yes	**FBT600F**	
3-pole terminal plate	154 mm x 184 mm 300-600 MCM	560A	yes	**8US19 41-2AA03**	
3-pole terminal plate	160 mm x 184 mm for flat bars up to 32 mm x 20 mm	800A	yes	**8US19 41-2AA04**	
Cover for 8US19 41-2AA03 and 04	180 mm x 200 mm x 90 mm	—	yes	**8US19 22-1GC00**	

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 UPDATED

Selection and ordering data

Description

FBCB Fast Bus circuit breakers
Offer a full range of feeder circuit breakers from 15A to 500A. All Sentron kits 125A and under are pre-assembled on 60 mm Fast Bus adaptor shoes and ready to place on the busbar. All other circuit breaker kits are pre-packaged 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.

3VA and GG Feeder Circuit Breakers

Bus bar system for 3VA circuit breakers are available from 15A up to 500A.

Type	Part Number	For molded case circuit breakers / SCCR Rating				
		3VA5 & GG 125A 65KA @ 480VAC	3VA5 250A 100KA @ 480VAC	3VA6 150A-250A 150KA @ 480VAC	3VA5 400A-500A 100KA @ 480VAC	3VA6 400A-500A 150KA @ 480VAC
Busbar adapter system with 60 mm busbar center-to-center spacing, 3-pole	**8US1211-4SS00**	√	–	–	–	–
	8US1213-4AP03	–	√	√	–	–
	8US1213-4AH04	–	–	–	√	√

3VA and GG Main Circuit Breakers

Busbar adapter system with 60 mm busbar center-to-center spacing, top-fed, 15A to 125A 3-pole	**8US1215-4SS00**	√	–	–	–	–
	8US1213-4AP03	–	√	√	–	–
	8US1213-4AH04	–	–	–	√	√

Sentron and GG Feeder Circuit Breakers

Design	UL Current Rating	Breaker Frame (SCCR Rating)[1]		
		ED (25kA)	HHED (65kA)	FXD (35kA)
3 pole/600V fully assembled breakers and adaptors that quickly snap onto the Busbar.	15A	**FBCB015**	–	–
	20A	**FBCB020**	**FBCB020H**	–
	25A	**FBCB025**	**FBCB025H**	–
	30A	**FBCB030**	**FBCB030H**	–
	35A	**FBCB035**	**FBCB035H**	–
	40A	**FBCB040**	**FBCB040H**	–
	45A	**FBCB045**	**FBCB045H**	–
	50A	**FBCB050**	**FBCB050H**	–
	60A	**FBCB060**	–	–
	70A	**FBCB070**	–	–
	80A	**FBCB080**	–	–
	90A	**FBCB090**	–	–
	100A	**FBCB100**	–	–
	110A	**FBCB110**	–	–
	125A	**FBCB125**	–	–
3 pole/600V kitted components for customer assembly that require the adaptor to be torqued down to the Busbars prior to assembly.	150A	–	–	**FBCB150**
	175A	–	–	**FBCB175**
	200A	–	–	**FBCB200**
	225A	–	–	**FBCB225**
	250A	–	–	**FBCB250**

FBCB100

Sentron Main Circuit Breakers

Design	UL Current Rating	Breaker Frame (SCCR Rating)[1]		
		FXD (25kA)[2]	HFXD (65kA)[2]	
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**	–

FBCB250M

1) UL Short Circuit Current ratings are based on 480V.
FBCB015 -125 SCCR = 18kA @ 600V
FBCB015H -125H SCCR = 18kA @ 600V
FBCB150 -250 SCCR = 22kA @ 600V

2) FBCB100M -125M SCCR = 18kA @ 600V
FBCB150M -250M SCCR = 25kA @ 600V
FBCB150M-HB -250M-HB SCCR = 25kA @ 600V

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	Connecting cables	Adapter length	Adapter width	Rated voltage UL	UL508A[1] compliance	Order No.	Pack units	Weight per PU approx.
		A	AWG	mm	mm	V				kg
For SIRIUS										
Size S00/S0										
MSPs	1	25	12	182	45	600	yes	**8US12 51-5DM07**		0.183
Contactors + Overload relays	1	25	12	182	45	600	yes	**8US12 51-5DM07**		0.183
Direct start load feeders	1	25	12	182	45	600	yes	**8US12 51-5DM07**		0.183
Reversing feeders										
Busbar adapters	1	25	12	182	45	600	yes	**8US12 51-5DM07**		0.183
+ Device holders	1	--	--	182	45	600	yes	**8US12 50-5AM00**		0.158
+ Connecting plates	--	--	--	--	--	--	yes	**8US19 98-1AA00**	100 units	0.100
Size S00/S0 Cage Clamp										
Direct start load feeders	1	12	14	182	45	600	yes	**8US12 51-5CM47**		0.190
Size S2										
MSPs	1	50	8	182	55	600	yes	**8US12 61-5FM08**		0.263
Contactors + Overload relays	1	50	8	182	55	600	yes	**8US12 61-5FM08**		0.263
Direct start load feeders	1	50	8	245	55	600	yes	**8US12 61-5FP08**		0.292
Reversing feeders										
Busbar adapters	1	50	8	242	55	600	yes	**8US12 61-5FP08**		0.292
Busbar adapters	1	--	--	242	55	600	yes	**8US12 60-5AM00**		0.202
+ Device holders	--	--	--	242	55	600	yes	**8US12 60-5AP00**		0.243
+ Connecting plates	--	--	--	--	--	--	yes	**8US19 98-1AA00**	100 units	0.100
Size S3		80	4	215	72	600	yes	**8US12 11-4TR00** [4]		0.659
	1	100	--	200	72	600	yes	**FBS100723R**		0.590
	--	100	--	200	72	600	yes	**FBS100722**		0.610
For VL UL circuit breakers [2]										
VL150 UL, DG frame	--	150	Tubular contacts	190	105	600	yes	**8US12 13-4AQ03**		1.020
VL250 UL, FG frame	--	250	Tubular contacts	190	105	600	yes	**8US12 13-4AQ03**		1.020
VL400 UL, JG frame	--	400	Tubular contacts	296	140	600	yes	**8US12 13-4AH00**		1.900
VL400X UL, LG frame	--	540 [3]	Tubular contacts	296	140	600	yes	**8US12 13-4AH00**		1.900

8US21 51-5DM07

8US21 60-5AM00

8US12 11-4TR00

8US12 13-4AQ03

8US12 13-4AH00

[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] For use with 10mm x 30mm and twin T (TT) busbars only. Adaptors can be configured for main or feeder breakers applications.

[3] 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.

[4] Rated 100A @ 480V. Rated 100A @ 600V with Class J Fuses.

Fast Bus Busbar Adapter System

60 mm system – Terminals and accessories

Selection and ordering data

Terminals

Terminals

8US19 22-1GA00

Mounting Rail

8US1998-1BA00

FBC20

Load Side Terminal

8US1998-2BM00

Description	Max Amps	Width	UL508A Compliance[1]	Order No.	List Price $	Pack Units
Terminals for round conductors						
5 mm busbar thickness [3]						
12 mm x 5 mm	180		16 - 6 AWG	**8US19 21-2AA00**		100
15 mm x 5 mm	270		12 - 2 AWG	**8US19 21-2AB00**		50
20 mm x 5 mm	400		6 - 2/0 AWG	**8US19 21-2AD00**		50
25 mm x 5 mm	440		6 - 250 MCM	**8US19 21-2AC00**		50
30 mm x 5 mm	180		16 - 6 AWG	**8US19 21-2AA01**		15
	270		12 - 2 AWG	**8US19 21-2AB01**		15
	400		6 - 2/0 AWG	**8US19 21-2AD01**		15
	440		6 - 250 MCM	**8US19 21-2AC01**		15
20 mm x 5 mm, 25 mm x 5 mm	500		3/0 - 350 MCM	**8US19 41-2AA01**		6
30 mm x 5 mm	600		300 - 600 MCM	**8US19 41-2AA02**		3
10 mm bar thickness						
12 mm x 10 mm[3]	180		16 - 6 AWG	**8US19 21-2BA00**		100
15 mm x 10 mm[3], 20 mm x 10 mm	270		12 - 2 AWG	**8US19 21-2BB00**		50
25 mm x 10 mm, 30 mm x 10 mm	400		6 - 2/0 AWG	**8US19 21-2BD00**		50
	440		6 - 250 MCM	**8US19 21-2BC00**		50
	180		16 - 6 AWG	**8US19 21-2BA01**		15
	270		12 - 2 AWG	**8US19 21-2BB01**		15
	400		6 - 2/0 AWG	**8US19 21-2BD01**		15
	440		6 - 250 MCM	**8US19 21-2BC01**		15
20 mm x 10 mm, 25 mm x 10 mm	500		3/0 - 600 MCM	**8US19 41-2AA01**		6
30 mm x 10 mm	600		300 - 600 MCM	**8US19 41-2AA02**		3
Terminal covers for circular conductors (mounts to busbars)						
For terminals up to 250 MCM 200 mm long, 84 mm wide				**8US19 22-1GA00**		10
For terminals up to 600 MCM 200 mm long, 270 mm wide				**8US19 22-1GA02**		1
For terminals up to 600 MCM 200 mm long, 135 mm wide				**FBC135**		
Accessories for busbar adapters and device holders						
Mounting rail (35 mm) - plastic	45 mm		n/a	**8US1998-7CA15**		10
complete with mounting screws	55 mm		n/a	**8US1998-7CA16**		10
	70 mm		n/a	**8US1998-4AA00**		10
	90 mm		n/a	**8US1998-7CA08**		10
	110 mm		n/a	**8US1998-7CA10**		10
Connection holder **(for vertical bubar assembly)** fixes the MSP to the mounting rail[3] (for SIRIUS sizes S00/S0)	-		n/a	**8US1998-1DA00**		20
Screw holder for supplementary screw fixing of the feeder (for SIRIUS sizes S00/S0)	-		n/a	**8US1998-1CA00**		20
Spacer	-		n/a	**8US1998-1BA00**		100
fixes the busbar adapter to the device holder (for SIRIUS sizes S00/S0)	-		n/a	**8US1998-1BA01**		1
Connection wedges for mechanical linking of adapters and switching device holders (2 units required per combination)	-		n/a	**FBC20**		20
Outgoing terminal rail for busbar adapters						
Plug-type terminal (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	**8US1998-8AM07**		
7 x 14 AWG (400 V)	91 mm	54 mm	n/a	**8US1998-8AA10**		
Accessories for busbar adapters and device holders						
Side module for busbar adapter expansion For adapters w/182 mm	182 mm	10 mm	n/a	**8US1998-2BM00**		
Side module for busbar adapter expansion For adapters w/200 mm	200 mm	9 mm	n/a	**8US1998-2BJ10**		

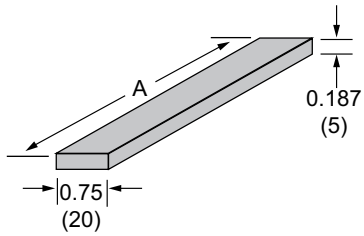
[1] UL508A labeled panels require the use of components that meet the creepage and air distances of 1" air clearance and 2" creepage distance. N/A = not applicable for given item.
[2] Terminals must be manually spaced on the busbar to comply with UL508A distances of 1" air clearance and 2" creepage distance.
[3] Cannot be used on Twin T (TT) profile up to 1400 A.

Fast Bus Busbar Adapter System

60 mm system

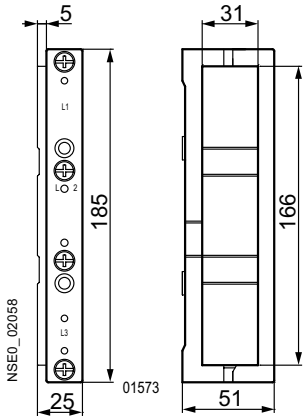
Dimension drawings

FBB36/FBB60 Copper Busbar

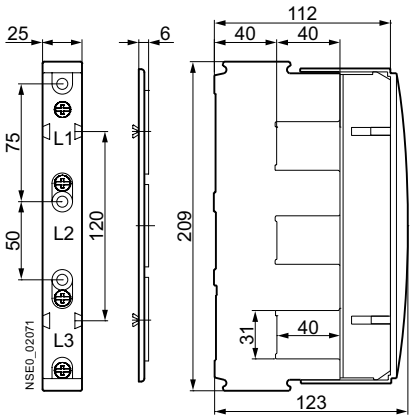


Dimension	A
FBB36	36 (914)
FBB60	60 (1524)

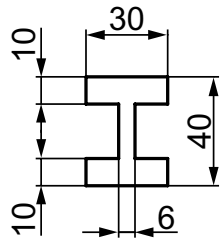
8US19 23-3UA01



8US19 43-3AA00

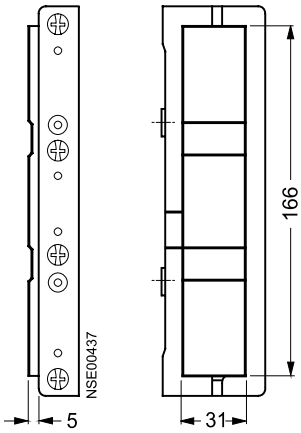


Copper Busbar/TT profile, 8US19 48-2AA00

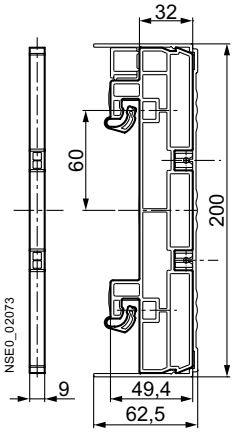


NSE0_02070

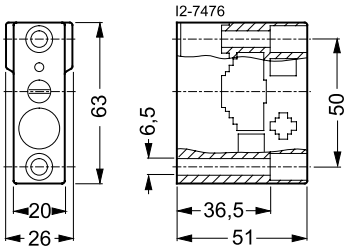
8US19 22-1AC00 with 8US19 23-3UA01
8US19 22-1AC00 with 8US19 23-3AA01



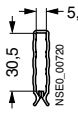
Support for blanking covers, 8US1922-2EA00



8US19 23-1AA01

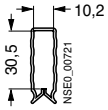


8US19 22-2AA00



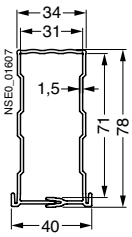
Length 1000 mm

8US19 22-2BA00

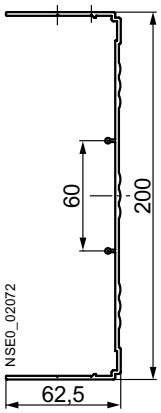


Length 1000 mm

8US19 22-2DA00



Blanking cover, 8US1922-2EB00

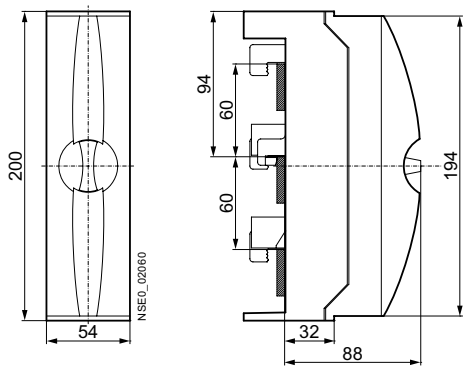


Fast Bus Busbar Adapter System

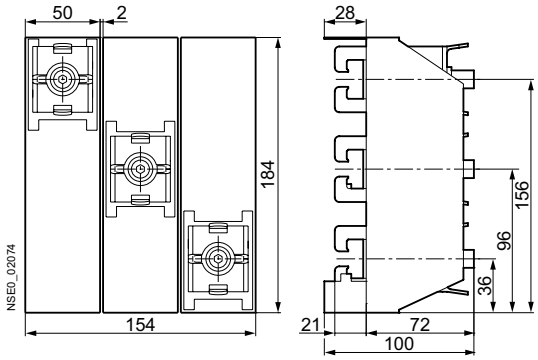
60 mm system

Dimension drawings

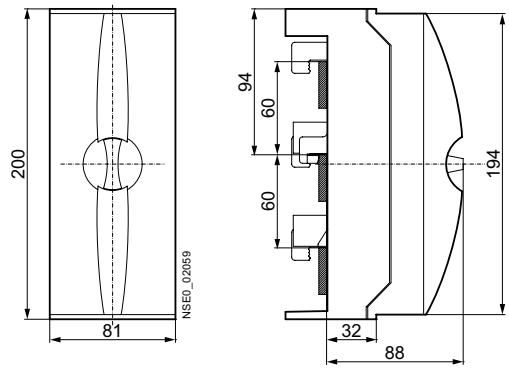
Infeed, 8US19 21-1BA00



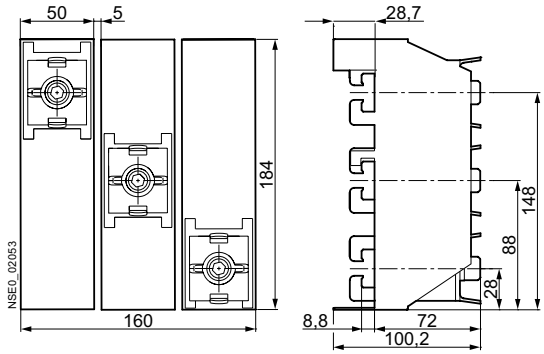
Infeed, 8US19 41-2AA03



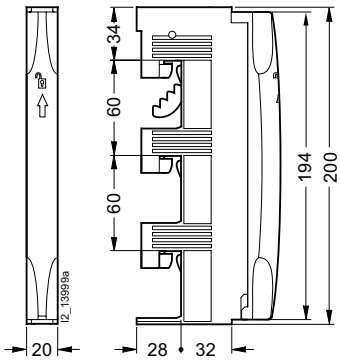
Infeed, 8US19 21-1AA00



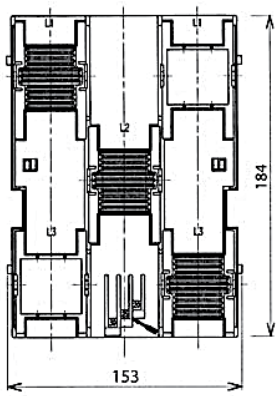
Infeed, 8US19 41-2AA04



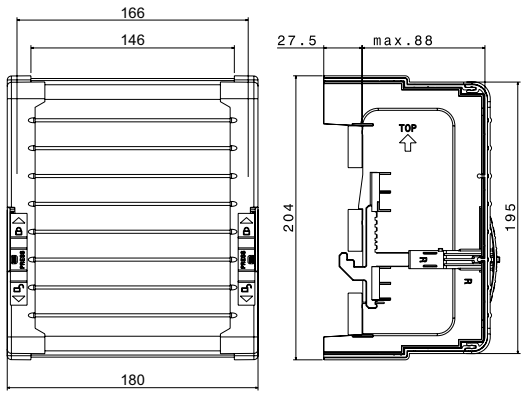
Infeed 5SH3538



FBT600F (supplied with cover)



FBT600F Cover

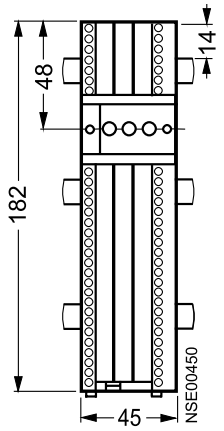


Fast Bus Busbar Adapter System

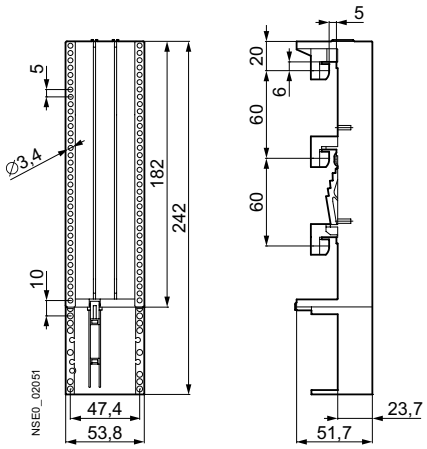
60 mm system

Dimension drawings

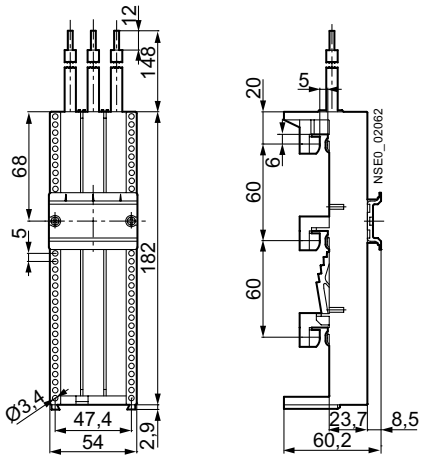
Busbar device adapter, 8US12 50-5AM00



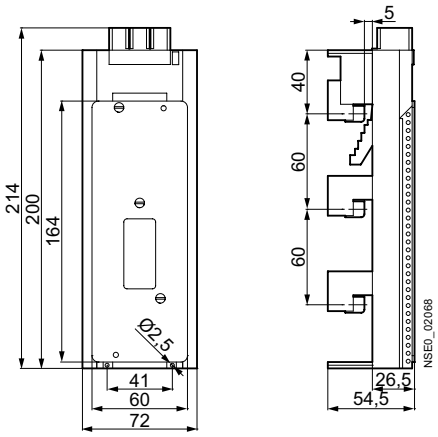
Busbar device adapter, 8US12 60-5AP00



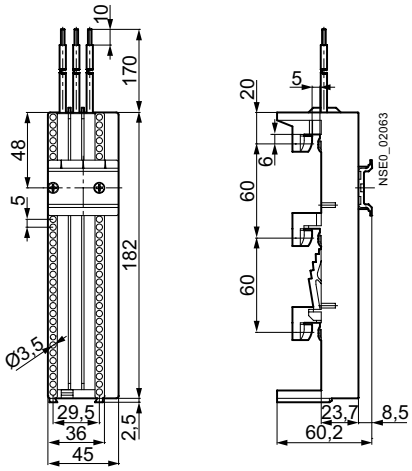
Busbar device adapter, 8US12 61-5FM08



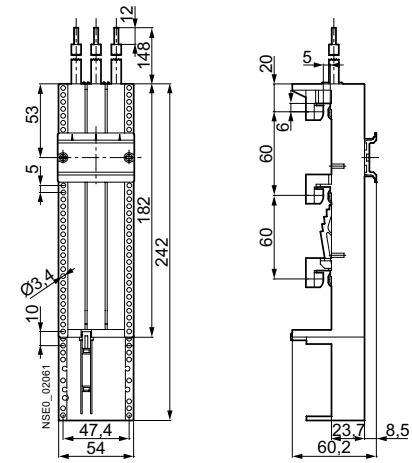
Busbar device adapter, 8US12 11-4TR00



Busbar device adapter, 8US12 51-5DM07



Busbar device adapter, 8US12 61-5FP08

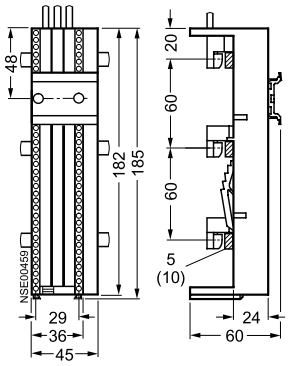


Fast Bus Busbar Adapter System

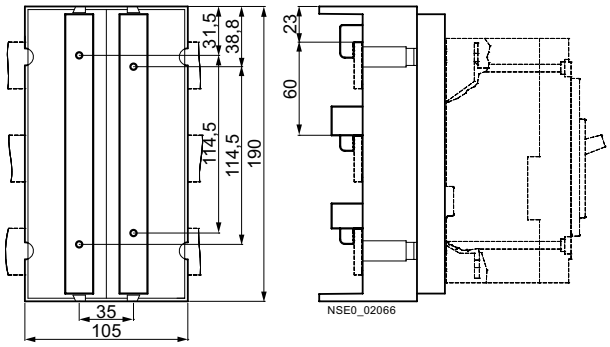
60 mm system

Dimension drawings

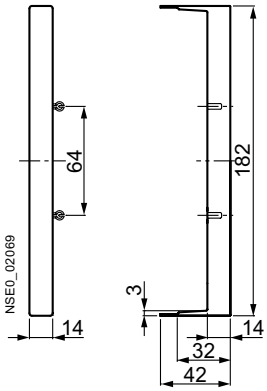
Busbar device adapter, 8US12 51-5CM47



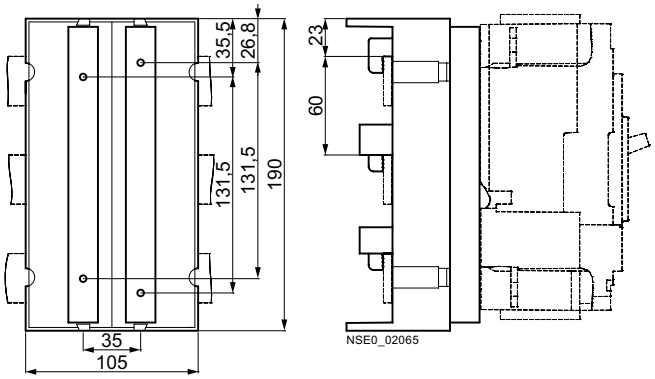
Busbar device adapter, 8US12 13-4AQ01



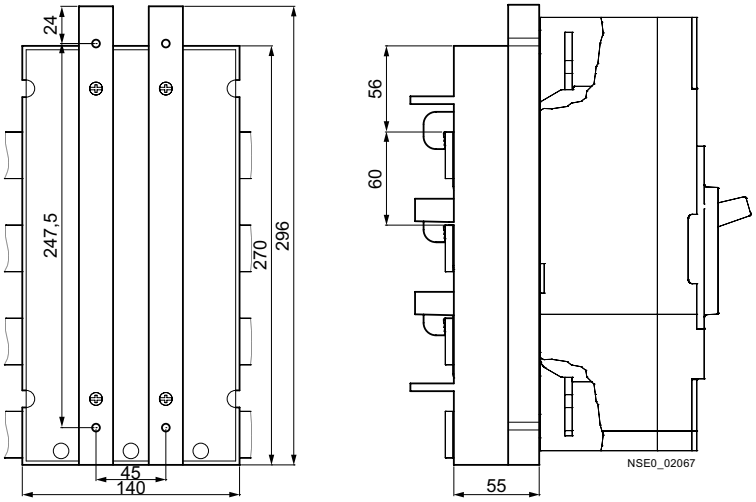
8US19 98-2BM00



Busbar device adapter, 8US12 13-4AQ03



Busbar device adapter, 8US12 13-4AH00



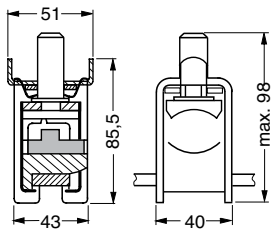
Fast Bus Busbar Adapter System

60 mm system

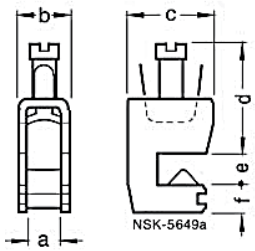
Dimension drawings

	Type	a	b	c	d	e	f	Max tighening 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

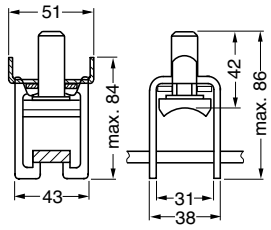
8US1941-2AA01



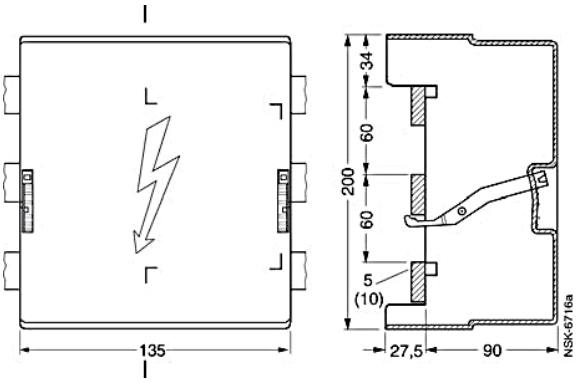
8US1921-2A / -2B



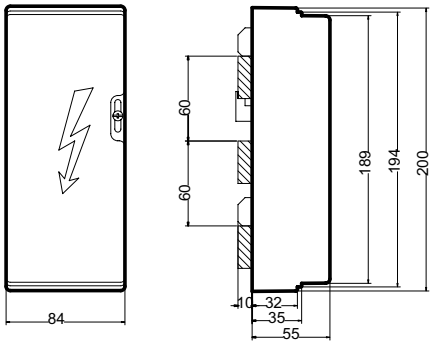
8US1941-2AA02



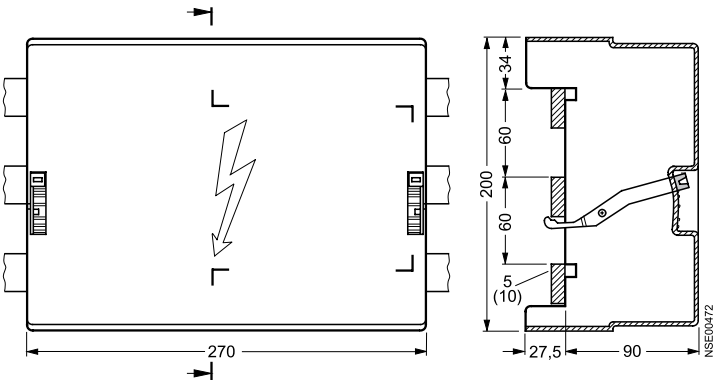
FBC135



8US1922-1GA00



8US19 22-1GA02

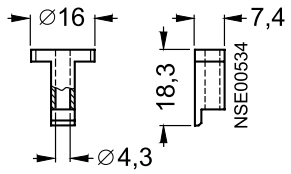


Fast Bus Busbar Adapter System

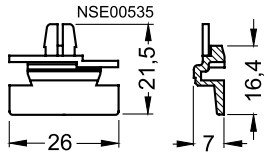
60 mm system

Dimension drawings

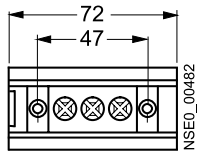
8US19 98-1CA00



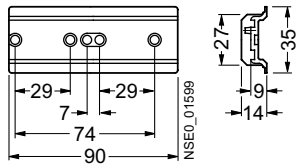
8US19 98-1DA00



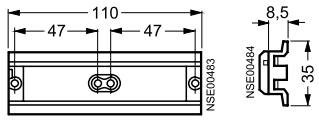
8US19 98-4AA00



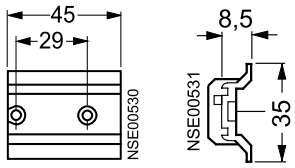
8US19 98-7CA08



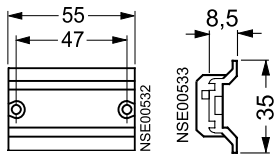
8US19 98-7CA10



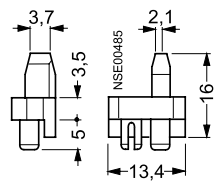
8US19 98-7CA15



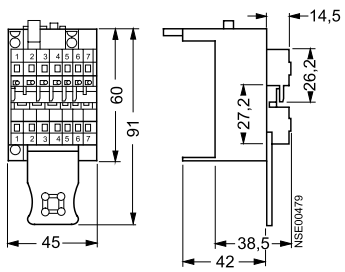
8US19 98-7CA16



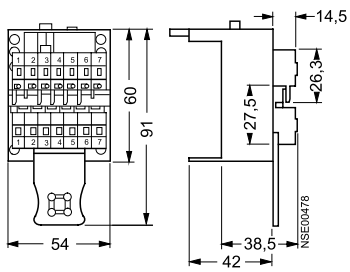
8US19 98-1BA00



8US19 98-8AM07



8US19 98-8AA10



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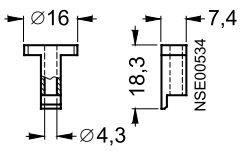
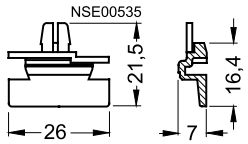


8US19 98-1DA00



SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

General data

Order No. scheme

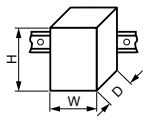
Digit of the Order No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□	□	□	□	0	–	□	□	□	□	□	–	□	□	□	□
SIRIUS starters	3 R A															
SIRIUS 2nd generation		2														
Type of starter (direct-on-line starter = 1, reversing starter = 2)			□													
Size (S00 = 1, S0 = 2)				□												
Setting range for overload release							□	□								
Design type and connection method									□							
Rated power at 460 V AC										□	□					
Integrated auxiliary switches of the contactor													□			
Operating range / solenoid coil circuit (contactor)														□		
Rated control supply voltage (contactor)															□	□
Example	3 R A	2	1	1	0	–	0	B	A	1	5	–	1	A	K	6

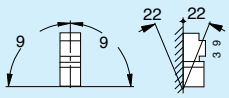
Note:

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.

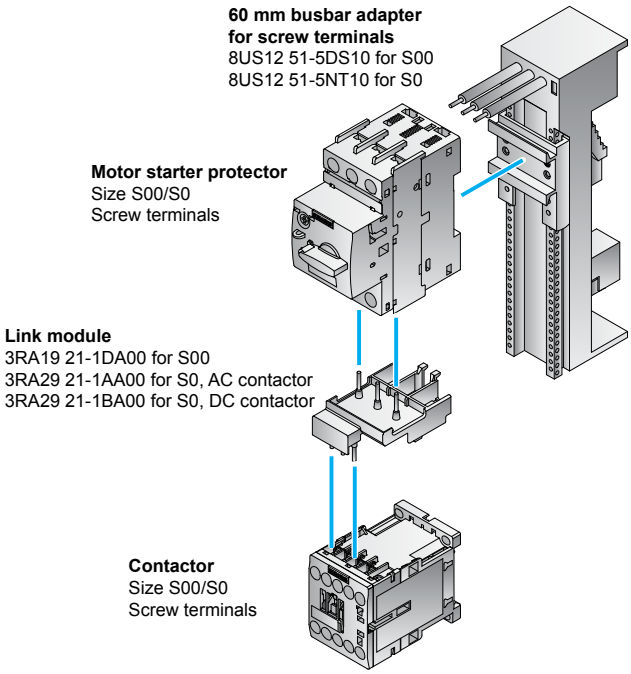
Technical specifications

Direct-on-line starters/ reversing starters	Size	Connection methods	Mounting	Control voltage	Width W	Height H	Depth D
					mm	mm	mm
Mounting dimensions							
Direct-on-line starters 3RA21.	S00 3RA21 1.	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 3RA21 2.	Screw terminals	Standard mounting rails	AC	45	193	97
				DC	45	193	107
			Busbar adapters	AC	45	260	155
				DC	45	260	165
		Spring-type terminals	Standard mounting rails	AC/DC	45	243	107
			Busbar adapters	AC/DC	45	260	165
Reversing starters 3RA22.	S00 3RA22 1.	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 3RA22 2.	Screw terminals	Standard mounting rail adapters	AC	90	265	120.3
				DC	90	265	130
			Busbar adapters	AC	90	260	155
				DC	90	260	165
		Spring-type terminals	Standard mounting rail adapters	AC/DC	90	270	131
			Busbar adapters	AC/DC	90	260	165

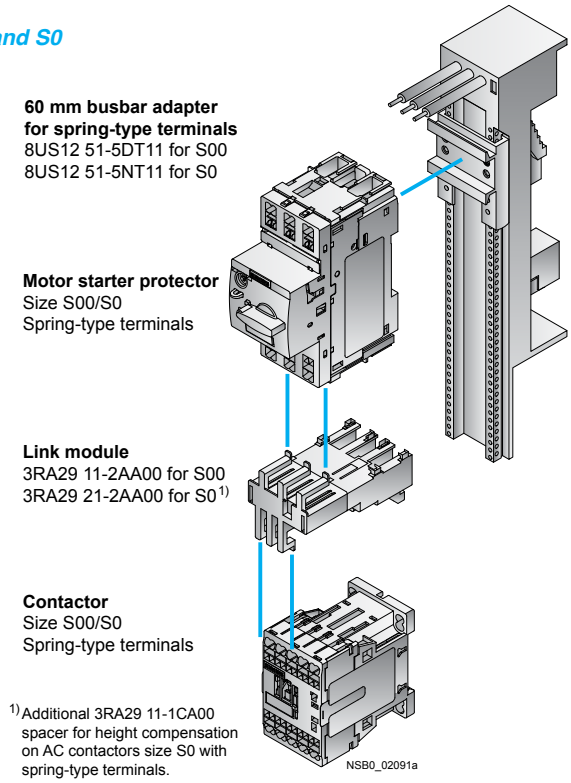


Type Size Number of poles			**3RA2. 1** **S00** **3**	**3RA2. 2** **S0** **3**
Mechanics and environment				
Permissible ambient temperature • During operation • Storage and transport		°C °C	-20 ... +60 -55 ... +80	
Weight		kg	0.6 ... 1.5	0.8 ... 2.3
Permissible mounting positions			 Important: Acc. to DIN 43602 start command "I" at the right or top	
Shock resistance (sine-wave pulse)	Acc. to IEC 60086 Part 2-27	*g*	Up to 6	Up to 6
Degree of protection	Acc. to IEC 60947-1		IP20	

Direct-on-line starting · For 60 mm busbar systems · Sizes S00 and S0

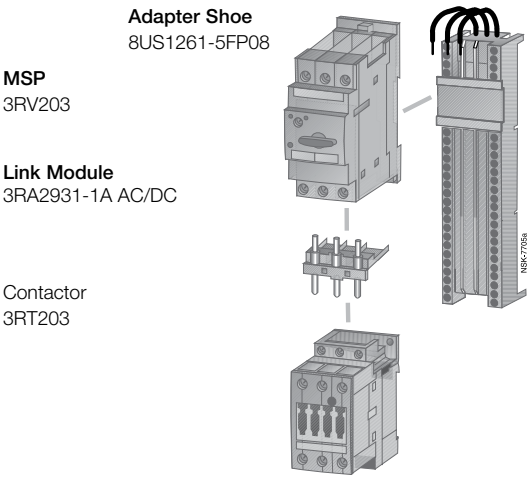


Left: 3RA21 motor starter for direct-on-line starting with busbar adapters with screw connection

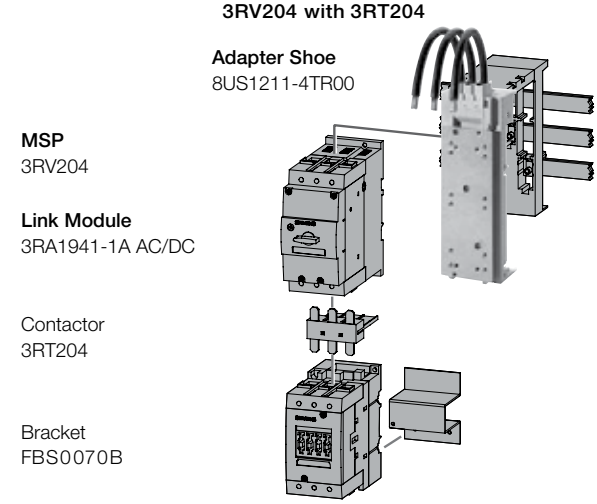


Right: 3RA21 motor starter for direct-on-line starting with busbar adapters with spring-type connection

3RV203 with 3RT203



3RV204 with 3RT204



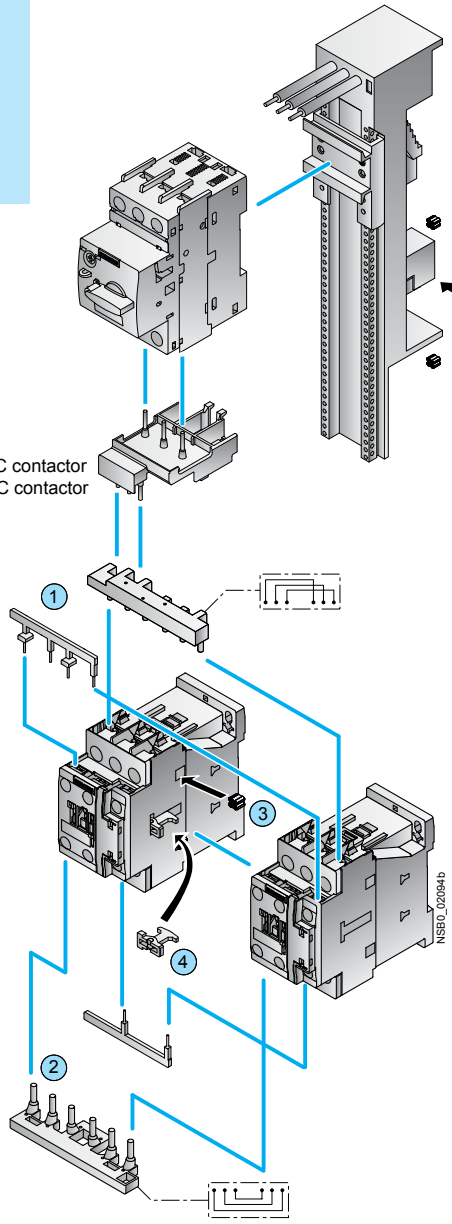
Reversing duty • For 60 mm busbar systems • Sizes S00 and S0

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[1)]
Comprising:
1 wiring kit
1 busbar adapter
1 device holder
2 connecting wedges

[1)] 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[2)]



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)

[2)] Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

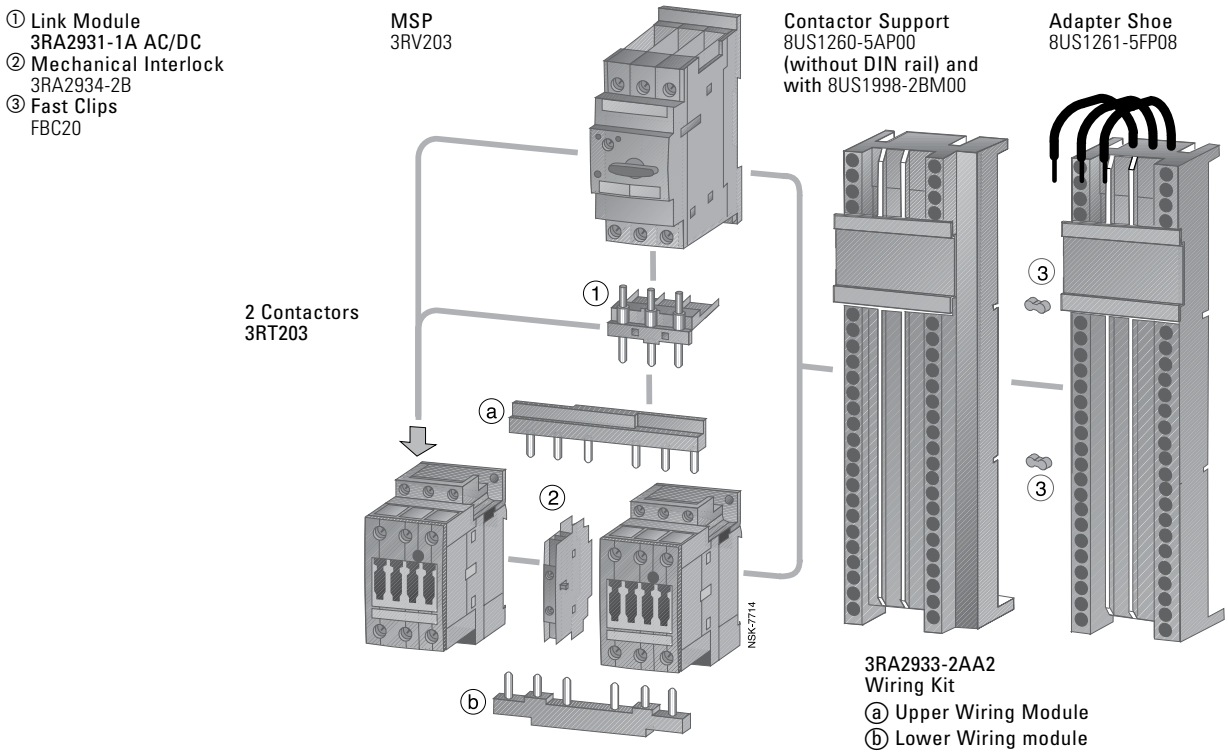
3RA22 motor starter for reversing duty and 60 mm standard mounting rail in size S00/S0
(the version with screw connection is shown in the picture)

SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

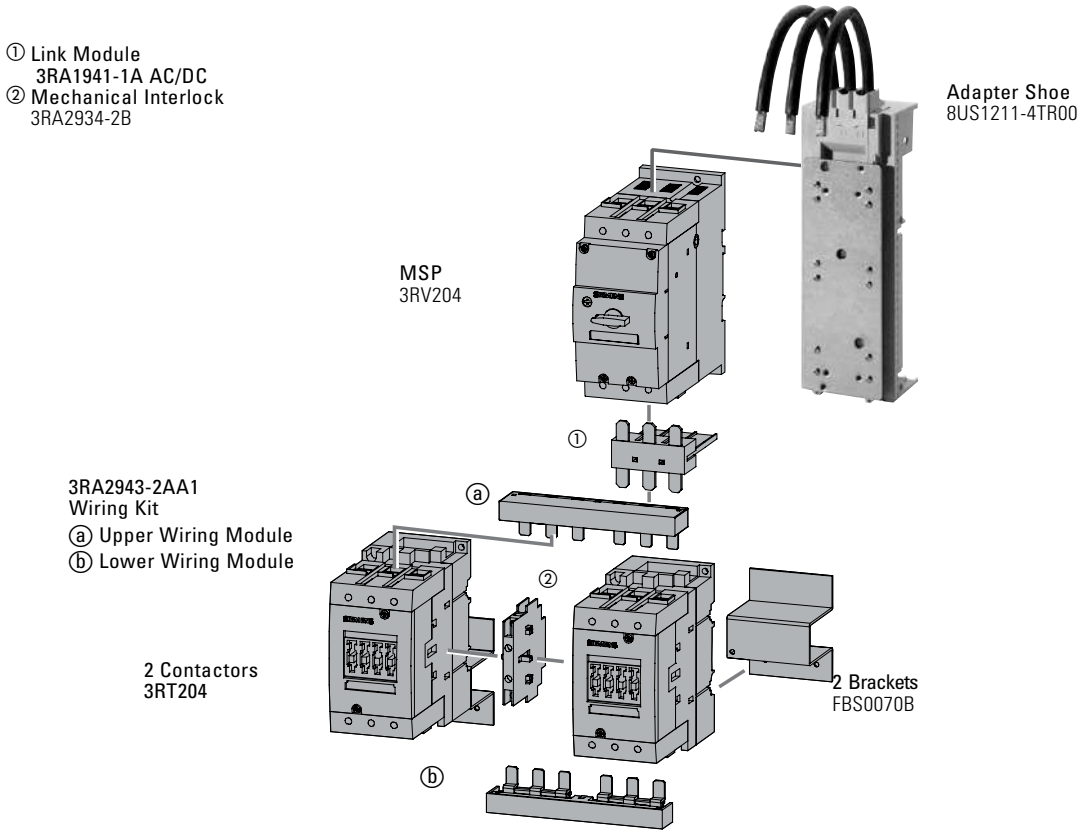
Selection

Required Components for Fast Bus Mounting

3RV203 with Reversing 3RT203



3RV204 with Reversing 3RT204

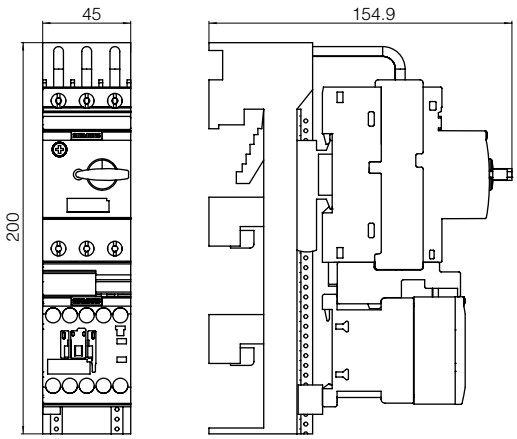


SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

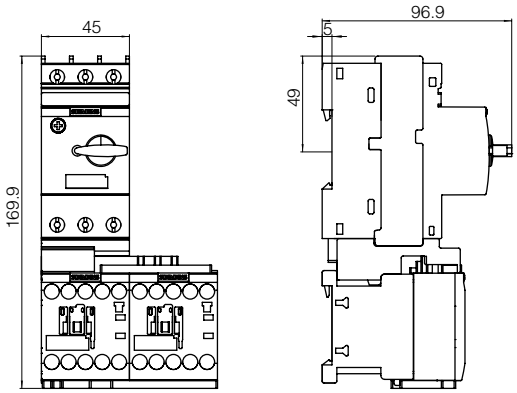
Dimensions

Dimensions, 3RV201 with 3RT201

3RA2110
Fast Bus Non-reversing



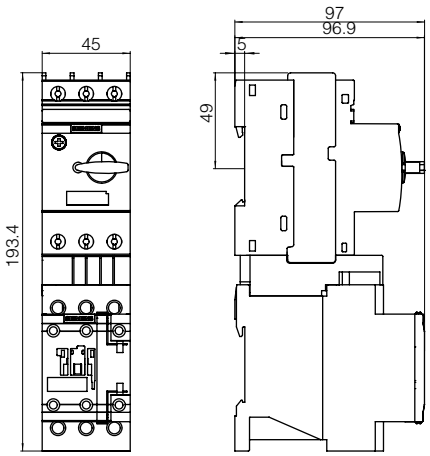
3RA2210
Fast Bus Reversing



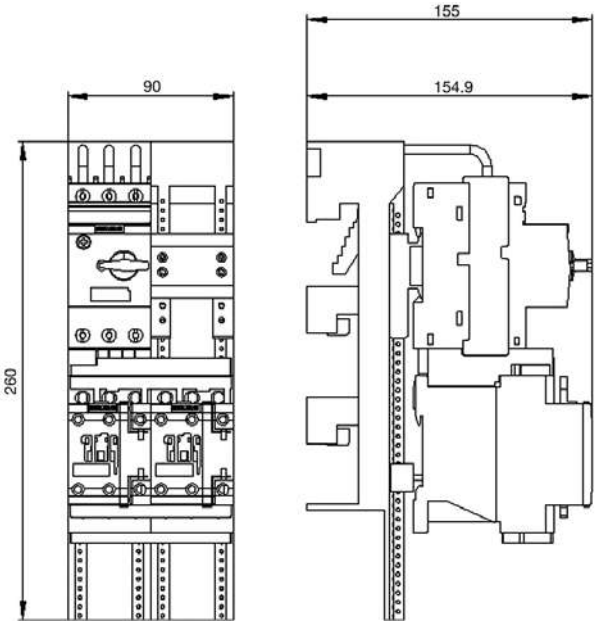
1) Lockable in OFF position. Padlock diameter 5 mm.
2) When a front auxiliary is installed on the contactor, add 44 mm to the depth of the contactor.

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.

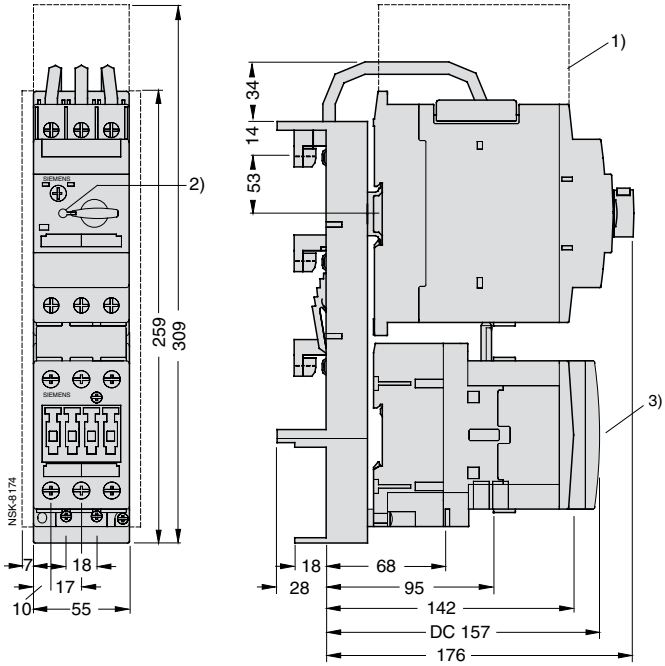
All dimensions shown in millimeters. For reference purposes only. Not to be used for design or construction purposes.

SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

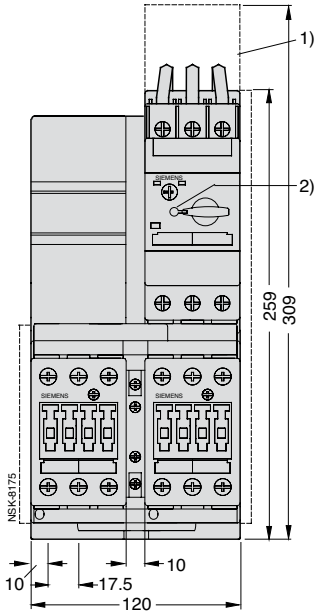
Dimensions

3RV203 with 3RT203

3RA2130
Fast Bus Non-reversing



3RA2230
Fast Bus Reversing



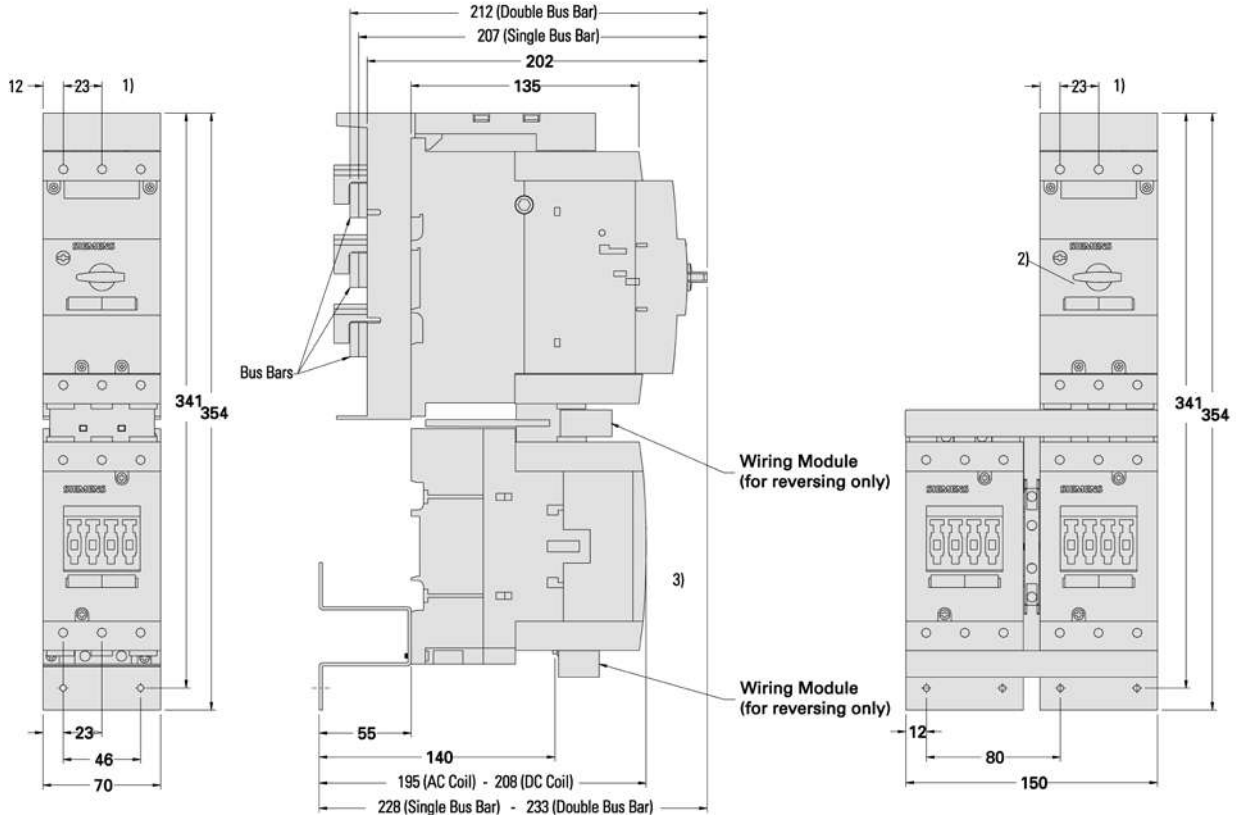
Lateral clearance to grounded components minimum 6 mm.
1) Arcing space
2) Lockable in OFF position with padlock diameter 5 mm.
3) When a front mount auxiliary is installed on the contactor, add 49 mm to the depth of the contactor.

All dimensions shown in millimeters. For reference purposes only. Not to be used for design or construction purposes.

SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

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.

SIRIUS 3RM1

ET 200SP

ET 200pro

SIRIUS M200D

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SIRIUS 3RM1 motor starters

Introduction

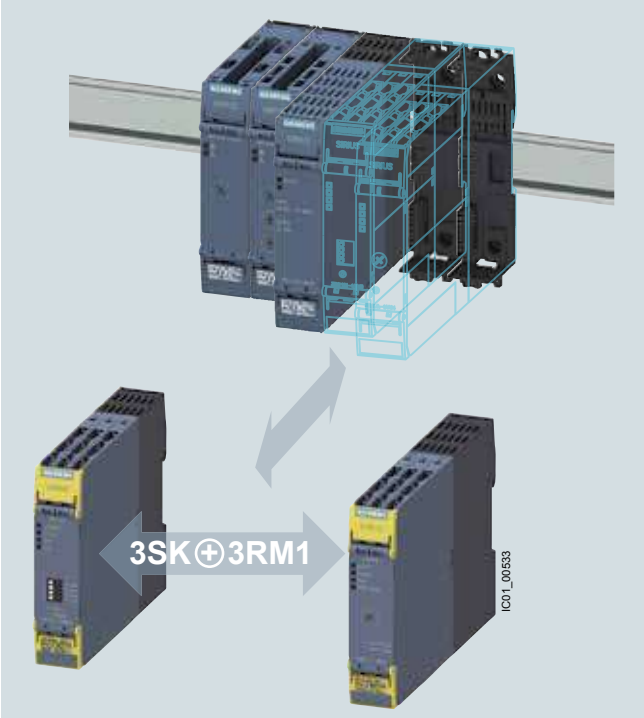
Overview

3RM13 motor starter with reversing functionality, electronic overload protection and safety-related shutdown

SIRIUS 3RM1 motor starters are compact devices, 22.5 mm wide, combining a large number of functions in a single enclosure. They consist of combinations of relay contacts, power semiconductors (hybrid technology), and an electronic overload relay for operational switching of three-phase motors up to 3 HP (at 380 - 400 V AC).

The 3RM1 motor starters with overload protection with wide setting range are available as direct-on-line starters and reversing starters and as versions with safety-related shutdown up to SIL 3/PL e.

Seamlessly integrated safety right through to the main circuit



Problem-free integration of functional safety into the main circuit through the simple combination of 3RM1 and 3SK devices

Functional safety in the main circuit needs to be both simple and flexible.

The unique compatibility of hybrid 3RM1 fail-safe motor starters and 3SK safety relays means that integrated functional safety right through to the main circuit is no longer a problem.

Their compact design allows the motor starters to be installed to the right of the safety relay in a simple manner, just like an output expansion. The wiring of the safety-related signals to the relay can be performed simply, quickly and in an error-free manner using the device connector.

The ergonomically designed enclosure with removable terminals and terminal labeling in the hinged cover allows for the cables to be conveniently diagonally mounted from the front. Either screw or spring-loaded terminals with push-in technology are available.

Highlights

- Fail-safe disconnection of motors up to 3 HP
- Problem-free combination of fail-safe motor starters and safety relays
- End-to-end system, simple setup using device connectors
- Ergonomic enclosure

Note:

For SIRIUS 3SK safety relays, see page 13/133.
Limit Switches and Safety.

SIRIUS 3RM1 motor starters

General data

Article No. scheme

Product versions		Article number								
Product function	Direct-on-line starters	**3RM10**	**0**	**□**	**–**	**□**	**AA**	**□**	**4**	
	Failsafe direct-on-line starters	**3RM11**	**0**	**□**	**–**	**□**	**AA**	**□**	**4**	with ATEX certification and safety-related shutdown
	Reversing starters	**3RM12**	**0**	**□**	**–**	**□**	**AA**	**□**	**4**	
	Failsafe reversing starters	**3RM13**	**0**	**□**	**–**	**□**	**AA**	**□**	**4**	with ATEX certification and safety-related shutdown
Wide setting range for electronic overload release	0.1 ... 0.5 A			**1**						
	0.4 ... 2.0 A			**2**						For motor standard output up to 3/4 HP[1)]
	1.6 ... 7.0 A (UL/CSA 6.1A max rated)			**7**						For motor standard output up to 3 HP[1)]
Connection method	Screw terminals					**1**				
	Spring-loaded terminals (push-in)					**2**				
	Mixed connection method					**3**				Spring-loaded terminals (push-in)
Rated control supply voltage U_s	24 V DC							**0**		
	110 ... 230 V AC; 110 V DC							**1**		
Example		**3RM13**	**0**	**1**	**–**	**2**	**AA**	**0**	**4**	

1) Standard three-phase motor; the actual startup characteristics of the motor as well as its rated data are important factors here.

Note:

The article number 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

Product advantages

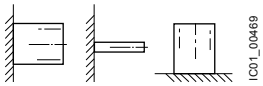
- Less space required in the control cabinet (20 to 80%) thanks to high functional density, which also means reduced wiring and testing
- Greater endurance and reduced heat losses thanks to hybrid technology
- Lower costs for stock keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:5)
- Fast wiring without tools for rigid conductors or conductors equipped with end sleeves thanks to spring-loaded terminals (push-in)
- Safety-related shutdown in accordance with SIL 3/PL e by shutting down the control supply voltage without additional devices in the main circuit
- The motor starters can be ideally combined with 3SK safety relays for safety-related shutdown (see Section 13 Limit Switches and Safety.
- 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 infeed system
- ATEX certification of the overload protection of the 3RM1 Failsafe motor starters: "Increased safety" type of protection EEx e according to ATEX directive 2014/34/EU
- The 3RM1 motor starters can be used with highly energy-efficient IE3/IE4 motors. In this regard, please observe the information on dimensioning and configuring, see Application Manual.

Standards and approvals

- IEC/EN 60947-4-2
- UL 60947-4-2
- CSA
- ATEX
- IEC 61508-1: SIL 3
- ISO 13849: PL e
- CCC approval for China

Technical specifications

More information	
Industry Mall, see www.siemens.com/product?3RM1 Equipment Manual, see https://support.industry.siemens.com/cs/ww/en/view/66295730	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16311/faq

Article number		3RM10, 3RM12	3RM11, 3RM13
General technical specifications:			
Dimensions (W x H x D)	mm	22.5 x 100 x 141.6	
Ambient temperature			
• During operation	°C	-25 … +60	
• During storage	°C	-40 … +70	
• During transport	°C	-40 … +70	
Installation altitude at height above sea level, maximum	m	4 000	2 000
Shock resistance		6 *g* / 11 ms	
Vibration resistance		1 ... 6 Hz, 15 mm; 20 m/s², 500 Hz	
Degree of protection		IP20	
Mounting position 		Vertical, horizontal, standing (consider derating)	

Article number		3RM1.01	3RM1.02	3RM1.07
Main circuit:				
Operational voltage, rated value, maximum	V	400		
Operating frequency	Hz	50/60		
Operational current at AC-53a at 400 V at an ambient temperature of 40 °C	A	0.5	2	6.1
Minimum load [% of IM]	%	20		
Adjustable current response value of the inverse-time delayed overload release	A	0.1 ... 0.5	0.4 ... 2	1.6 ... 7

Article number		3RM1.0.-.AA04	3RM1.0.-.AA14
Control circuit:			
Type of voltage of the control supply voltage		DC	AC/DC
Control supply voltage			
• At DC	V	24	110
• At AC at 50 Hz	V	--	110 … 230
Frequency of the control supply voltage	Hz	--	50/60

SIRIUS 3RM1 motor starters

General data

Type		3RM1.0.-1AA.4	3RM1.0.-3AA.4	3RM1.0.-2AA.4
Connections/terminals:				
Type of electrical connection for main circuit (1 or 2 conductors can be connected)		**Screw terminals**		**Spring-loaded terminals (push-in)**
Connectable conductor cross-section for main contacts				
• Solid	mm²	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)		1 x (0.5 ... 4)
• Finely stranded				
- With end sleeve	mm²	1 x (0.5 ... 4), 2 x (0.5 ... 1.5)		1 x (0.5 ... 2.5)
- Without end sleeve	mm²	--		1 x (0.5 ... 4)
Type of electrical connection for auxiliary and control circuit (1 or 2 conductors can be connected)		**Screw terminals**	**Spring-loaded terminals (push-in)**	
Type of connectable conductor cross-sections for auxiliary contacts				
• Solid	mm²	1 x (0.5 ... 2.5), 2 x (1.0 ... 1.5)	1 x (0.5 ... 1.5), 2 x (0.5 ... 1.5)	
• Finely stranded				
- With end sleeve	mm²	1 x (0.5 ... 2.5), 2 x (0.5 ... 1)	1 x (0.5 ... 1.0), 2 x (0.5 ... 1.0)	
- Without end sleeve	mm²	--	1 x (0.5 ... 1.5), 2 x (0.5 ... 1.5)	
Type of connectable conductor cross-sections for AWG cables				
• For main contacts		1 x (20 ... 12), 2 x (20 ... 14)		1 x (20 ... 12)
• For auxiliary contacts		1 x (20 ... 14), 2 x (18 ... 16)	1x (20 ... 16), 2 x (20 ... 16)	

Accessories

More information
Equipment Manual, see https://support.industry.siemens.com/cs/ww/en/view/66295730

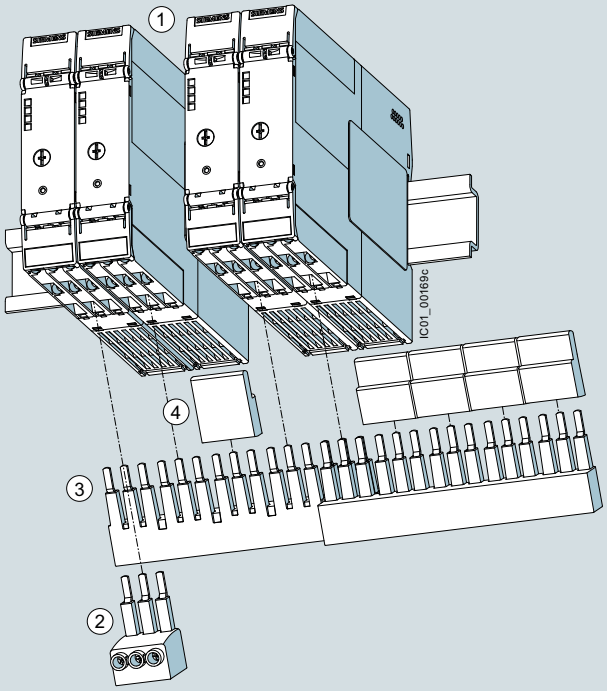
Three-phase infeed system (3RM19 three-phase busbar system)

The system permits an easy, time-saving and safe means of feeding two or more 3RM1 motor starters. It can be used only with motor starters with screw terminals and in combination with 8US1716-0RK00 adapters for mounting rails in the main circuit.

The maximum summation current must not exceed 25 A. The primary infeed is connected via a three-phase infeed terminal.

The busbars are available in three lengths, for two, three or five motor starters. More than five devices can be connected by clamping the connection tags of a second busbar rotated by 180°.

The three-phase busbars are finger-safe but empty connection tags must be fitted with covers.



1. Four 3RM1 motor starters on standard mounting rail with one free slot
2. 3RM1920-1AA three-phase infeed terminal
3. Two 3RM1910-1DA three-phase busbars rotated through 180° for the connection of up to nine motor starters
4. Covers for three 3RM1910-6AA connection tags respectively for unused slots

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 nine 3RM1 motor starters to be connected. Contact with the unused connection tags in unoccupied positions is prevented safely by the covers.

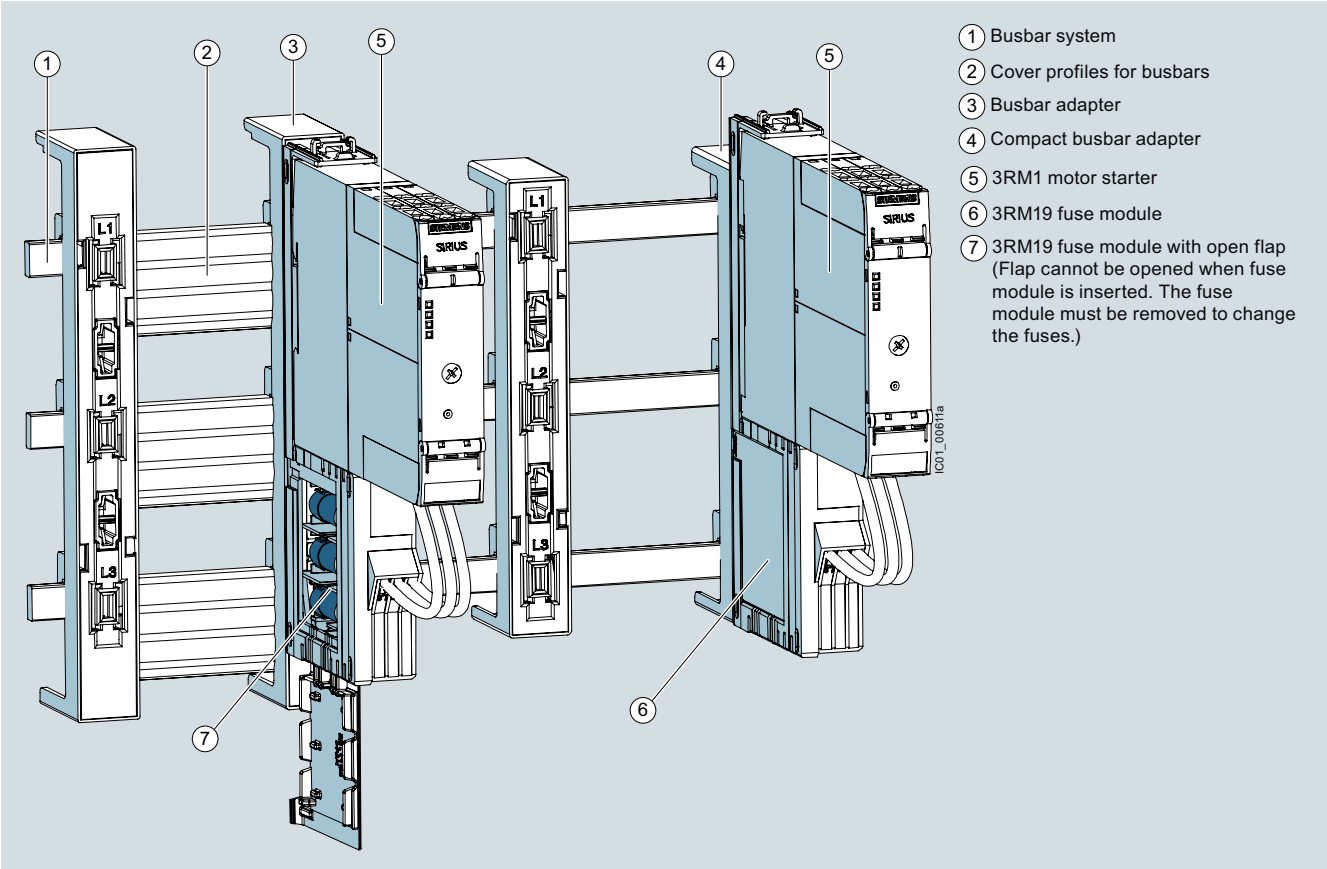
SIRIUS 3RM1 motor starters

General data

Fuse module for the use of 3RM1 motor starters on 8US busbar systems and mounting rails

The fuse module permits the very compact construction of a load feeder with a maximum width of 22.5 mm. The 3RM1 motor starter in combination with the integrated fuses for short-circuit protection can therefore be used on 8US busbar systems. Thanks to the range of different adapters, the fuse module can be used in all 60 mm busbar systems and also in compact busbar systems and on mounting rails. The interface to the adapter also permits a simple and secure replacement of the load feeder.

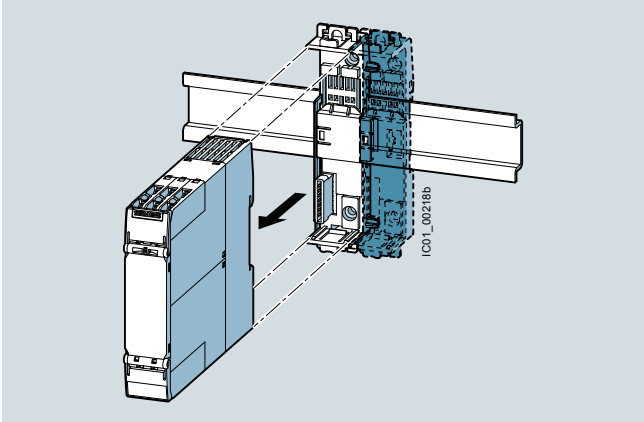
The fuse module can be combined with all 3RM1 motor starters. The easily replaceable fuses protect the connected motor and the cables.



By means of the fuse module, 3RM1 motor starters can be used in busbar systems and 8US compact busbar systems, as well as on mounting rails

Device connectors for the control circuit

The device connectors for 3RM1 motor starters (24 V DC control supply voltage only) reduce the outlay for cabling by looping through the control supply voltage. The device connectors can be snapped onto a standard mounting rail or fixed to a level mounting panel using screws.



Device connector with 3RM1 motor starter

Using the device connectors exclusively for feeding in the control supply voltage

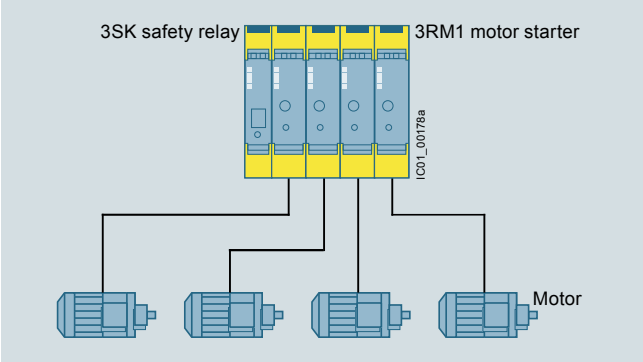
By using device connectors, a maximum of five motor starters can be supplied with 24 V DC control supply voltage. This requires the control supply voltage to be applied to the A1 and A2 terminals of only one motor starter.

Device daisy chain connectors can be used for gaps between two motor starters. Device termination connectors terminate a group.

Using the device connectors for safe group shutdown

In combination with the 3RM11 and 3RM13 fail-safe motor starters, the device connector can also be used for safety-related shutdown. For this application, groups of no more than five fail-safe motor starters can be connected using a device connector, and the group must be terminated with a termination connector. Removing the control voltage supply from the first motor starter will safely shut down the whole group.

Safe group shutdown can be implemented particularly easily in conjunction with 3SK safety relays. In this case, up to five motor starters can be directly connected to 3SK safety relays via the device connector and then safely shut down (see page 13/133).



Ideal connection: Combination of four SIRIUS 3RM1 Failsafe motor starters with SIRIUS 3SK safety relays

Electromechanical switching devices in series with hybrid motor starters

Switching an inductive load - in particular of motors < 1 HP with high inductance - with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

The resulting faults/damage can be prevented by first disconnecting with the hybrid motor starter or by using EMC suppression modules:

- For 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor, see Section 2 Contactors.
- For motor suppression modules that are fitted in the main circuit, (see page 6/11).

Note:

For more information, see https://support.industry.siemens.com/cs/ww/en/view/109758696.

SIRIUS 3RM1 motor starters

Selection and ordering data *IE3/IE4* ready

Selection and ordering data

More information

Industry Mall, see www.siemens.com/product?3RM1

	Operational power for three-phase motor at 380 V[1]	Adjustable current response value of the inverse-time delayed overload release	Control supply voltage At DC	Control supply voltage At AC at 50 Hz	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	HP	A	V	V	d				
Direct-on-line starters									
3RM1001-1AA04	--	0.1 … 0.5	24	--	2	**3RM1001-□AA04**		1	1 unit
	3/4	0.4 … 2	24	--	2	**3RM1002-□AA04**		1	1 unit
	3	1.6 … 6.1	24	--	2	**3RM1007-□AA04**		1	1 unit
	--	0.1 … 0.5	110	110 ... 230	2	**3RM1001-□AA14**		1	1 unit
	3/4	0.4 … 2	110	110 ... 230	2	**3RM1002-□AA14**		1	1 unit
	3	1.6 … 6.1	110	110 ... 230	2	**3RM1007-□AA14**		1	1 unit
Reversing starters									
3RM1201-1AA04	--	0.1 … 0.5	24	--	2	**3RM1201-□AA04**		1	1 unit
	3/4	0.4 … 2	24	--	2	**3RM1202-□AA04**		1	1 unit
	3	1.6 … 6.1	24	--	2	**3RM1207-□AA04**		1	1 unit
	--	0.1 … 0.5	110	110 ... 230	2	**3RM1201-□AA14**		1	1 unit
	3/4	0.4 … 2	110	110 ... 230	2	**3RM1202-□AA14**		1	1 unit
	3	1.6 … 6.1	110	110 ... 230	2	**3RM1207-□AA14**		1	1 unit
Failsafe direct-on-line starters									
3RM1101-1AA04	--	0.1 … 0.5	24	--	2	**3RM1101-□AA04**		1	1 unit
	3/4	0.4 … 2	24	--	2	**3RM1102-□AA04**		1	1 unit
	3	1.6 … 6.1	24	--	2	**3RM1107-□AA04**		1	1 unit
	--	0.1 … 0.5	110	110 ... 230	2	**3RM1101-□AA14**		1	1 unit
	3/4	0.4 … 2	110	110 ... 230	2	**3RM1102-□AA14**		1	1 unit
	3	1.6 … 6.1	110	110 ... 230	2	**3RM1107-□AA14**		1	1 unit
Failsafe reversing starters									
3RM1301-1AA04	--	0.1 … 0.5	24	--	2	**3RM1301-□AA04**		1	1 unit
	3/4	0.4 … 2	24	--	2	**3RM1302-□AA04**		1	1 unit
	3	1.6 … 6.1	24	--	2	**3RM1307-□AA04**		1	1 unit
	--	0.1 … 0.5	110	110 ... 230	2	**3RM1301-□AA14**		1	1 unit
	3/4	0.4 … 2	110	110 ... 230	2	**3RM1302-□AA14**		1	1 unit
	3	1.6 … 6.1	110	110 ... 230	2	**3RM1307-□AA14**		1	1 unit

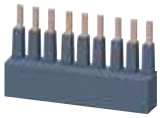
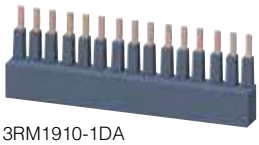
Type of electrical connection

- Screw terminals for main circuit, screw terminals for control circuit **1**
- Spring-loaded terminals (push-in) for main circuit, spring-loaded terminals (push-in) for control circuit **2**
- Screw terminals for main circuit, spring-loaded terminals (push-in) for control circuit **3**

[1] The actual startup characteristics of the motor as well as its rated data are important factors here.

SIRIUS 3RM1 motor starters

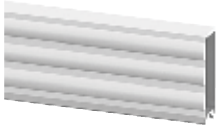
Accessories

	Product designation	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Three-phase infeed system for 3RM1 with screw terminals						
3RM1920-1AA	**Three-phase infeed terminals** • For three-phase busbars	▶	**3RM1920-1AA**		1	1 unit
3RM1910-1AA	**Three-phase busbars** • For 2 motor starters	▶	**3RM1910-1AA**		1	1 unit
 3RM1910-1BA	• For 3 motor starters	▶	**3RM1910-1BA**		1	1 unit
 3RM1910-1DA	• For 5 motor starters	▶	**3RM1910-1DA**		1	1 unit
3RM1910-6AA	**Covers** For 3 connection tags of the three-phase busbars	▶	**3RM1910-6AA**		1	10 units
Fuse modules for 3RM1 for use on busbars or mounting rails						
3RM1932-1AB	**Fuse module with 3NW6007-1 fuse**	2	**3RM1932-1AB**		1	1 unit
	Fuse module without fuse[1]	10	**3RM1930-1AA**		1	1 unit
Adapters						
8US1216-0AS00	**Adapters for 60 mm busbar systems** 22.5 mm x 200 mm x 41.5 mm Note: The adapter can be used on busbars with a width of 12 mm and a thickness of 5 mm or 10 mm.	5	**8US1216-0AS00**		1	1 unit
8US1616-0AK02	**Adapters for 60 mm compact busbar systems** 22.5 mm x 160 mm x 41.5 mm Note: The adapter can be used on busbars with a width of 12 mm, 15 mm, 20 mm, 25 mm or 30 mm and a thickness of 5 mm or 10 mm.	5	**8US1616-0AK02**		1	1 unit

[1] For details of alternative fuses, see Equipment Manual.

SIRIUS 3RM1 motor starters

Accessories

	Product designation	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Adapters						
8US1716-0RK00	**Adapter for 35 mm DIN mounting rails** 22.5 mm x 185 mm x 23.5 mm	5	**8US1716-0RK00**		1	1 unit
Cover profiles[1)2)]						
Cover profiles for busbars						
8US1922-2CA00	12 mm x 5 mm x 1 000 mm 40 mm or 60 mm center-to-center busbar clearance depending on busbar system	2	**8US1922-2CA00**		1	10 units
8US1922-2AA00	15 mm x 5 mm x 1 000 mm 20 mm x 5 mm x 1 000 mm 25 mm x 5 mm x 1 000 mm 30 mm x 5 mm x 1 000 mm 40 mm or 60 mm center-to-center busbar clearance depending on busbar system	2	**8US1922-2AA00**		1	10 units
 8US1922-2BA00	12 mm x 10 mm x 1 000 mm 15 mm x 10 mm x 1 000 mm 20 mm x 10 mm x 1 000 mm 25 mm x 10 mm x 1 000 mm 30 mm x 10 mm x 1 000 mm 60 mm center-to-center busbar clearance	2	**8US1922-2BA00**		1	10 units
Device connectors						
3ZY1212-2EA00	**Device connectors** For 3RM1 motor starters, 24 V DC, 22.5 mm	2	**3ZY1212-2EA00**		1	1 unit
3ZY1212-2AB00	**Device daisy chain connectors** For 3RM1 motor starters 24 V DC, 22.5 mm For gaps without motor starters in assemblies	2	**3ZY1212-2AB00**		1	1 unit
3ZY1212-2FA00	**Device termination connectors** For 3RM1 motor starters, 24 V DC, 22.5 mm	2	**3ZY1212-2FA00**		1	1 unit

1) The cover profiles for busbars can be used for maintaining minimum spacing between the load feeders.

2) For further accessories for the configuration of a busbar system, see Catalog LV 10.

SIRIUS 3RM1 motor starters

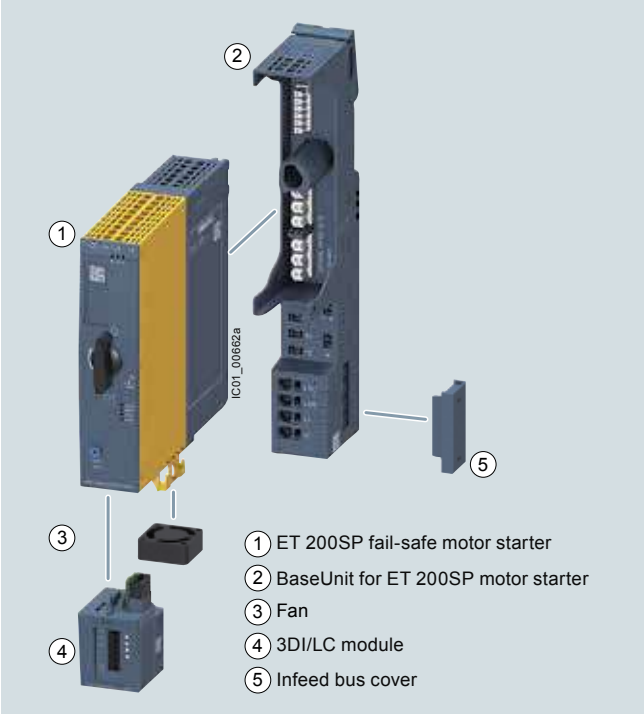
Accessories

	Product designation	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Removable terminals						
3ZY1122-1BA00	**Terminal for main circuit, 2-pole**					
			Screw terminals			
	• Screw terminals, 1 x 4 mm²	2	**3ZY1122-1BA00**		1	6 units
			Spring-loaded terminals (push-in)			
	• Spring-loaded terminals (push-in), 1 x 4 mm²	2	**3ZY1122-2BA00**		1	6 units
3ZY1131-1BA00	**Terminal for control circuit, 3-pole**					
			Screw terminals			
	• Screw terminals, 1 x 2.5 mm²	2	**3ZY1131-1BA00**		1	6 units
			Spring-loaded terminals (push-in)			
	• Spring-loaded terminals (push-in), 1 x 2.5 mm²	2	**3ZY1131-2BA00**		1	6 units
Further accessories						
3ZY1311-0AA00	**Push-in lugs for wall mounting** 2 lugs per device are required	2	**3ZY1311-0AA00**		1	10 units
3ZY1321-2AA00	**Sealable covers, 22.5 mm** For simple protection against unauthorized access	2	**3ZY1321-2AA00**		1	5 units
3ZY1440-1AA00	**Coding pins for removable terminals** For mechanical coding of the terminals	2	**3ZY1440-1AA00**		1	12 units
	Hinged cover Replacement cover, without terminal labeling, 22.5 mm wide					
	• Titanium gray	2	**3ZY1450-1AB00**		1	5 units
	• Yellow	2	**3ZY1450-1BB00**		1	5 units
3ZY1450-1AB00						
3RK1911-6EA00	**Motor suppression module**					
	• Square	15	**3RK1911-6EA00**		1	1 unit
	• Round	15	**3RK1911-6EB00**		1	1 unit
3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-loaded terminals		**Spring-loaded terminals**			
	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit

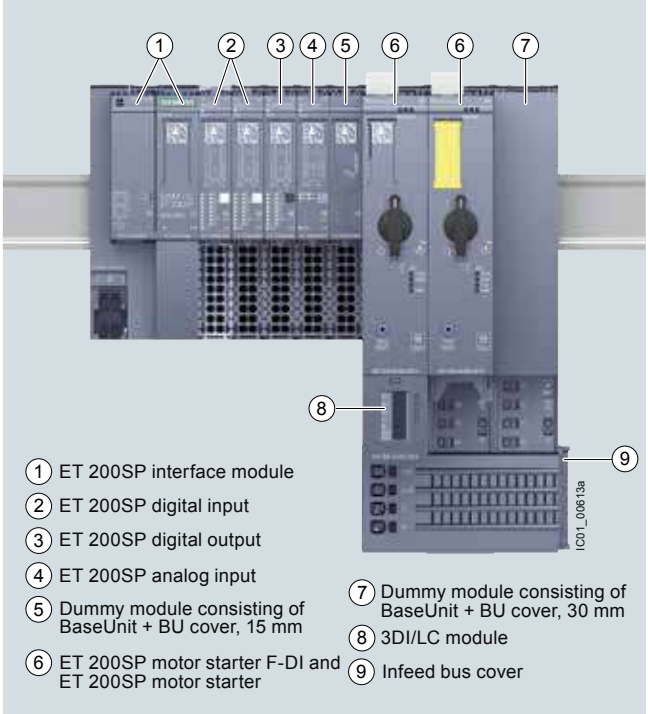
ET 200SP motor starter

Introduction

Overview



Motor starter, BaseUnit, fan and 3DI/LC control module



3RK1308 motor starter in the ET 200SP I/O system

More information	
Homepage, see www.siemens.com/ET200SP-motorstarter Industry Mall, see www.siemens.com/product?3RK1308 TIA Selection Tool, see www.siemens.com/TST	Further components in the ET 200SP I/O system: • Catalog ST 70 • Industry Mall, see www.siemens.de/product?ET200SP

ET 200SP motor starters

ET 200SP is a scalable and extremely flexible modular I/O system with IP20 degree of protection.

As I/O modules, the ET 200SP motor starters are an integral part of this I/O system. They are switching and protection devices for single- and three-phase loads and are available as direct-on-line or reversing starters.

Basic functionality

All versions of the ET 200SP motor starter feature the following functionality:

- Fully pre-wired motor starters for switching and protecting any AC loads up to 7.5 HP from 48 V AC to 480 V AC
- Disconnection possible via fail-safe motor starters up to SIL 3 and PL e Cat. 4
- With self-assembling 32 A power bus, i.e. the load voltage is only fed in once for a group of motor starters
- All control supply voltages connected only once, i.e. when modules are added they are automatically connected to the next module
- Hot swapping is permissible
- Digital inputs can optionally be used via a 3DI/LC module
- Control of the motor starter from the control system and extensive diagnostics status via the cyclic process image
- Diagnostics capability for active monitoring of the switching and protection functions
- The signal states in the process image of the motor starter provide information about protective devices (short circuit or overload), the switching states of the motor starter, and system faults.

Starter Kit

The 3RK1908-1SK00 Starter Kit is a favorably priced complete package for switching and monitoring motors in the ET 200SP system, see page 6/21.

It contains:

- a 3RK1308-0BC00-0CP0 reversing starter (0.9 to 3 A)
- a 3RK1908-0AP00-0AP0 BaseUnit with 500 V and 24 V AC/DC infeed
- an EMC distance module (consisting of 6ES7193-6BP00-0BA0 BaseUnit plus 6ES7133-6CV15-1AM0 BU cover 15 mm)

Use of fan

For motor starters with a 12 A rated current, the 3RW4928-8VB00 fan is included in the scope of supply.

This fan can also be ordered as an option for motor starters with lower rated currents, if the boundary conditions demand this. For information on the ambient conditions for the use of motor starters, see chapter "Product overview" in the Equipment Manual.

Designing interference-free motor starters

For interference-free operation of the ET 200SP station in accordance with IEC 60947-4-2 standard, use a dummy module before the first motor starter. The dummy module consists of the 6ES7193-6BP00-0BA0 or 6ES7193-6BP00-0DA0 BaseUnit and the 6ES7133-6CV15-1AM0 BU cover 15 mm.

The 15 mm BU cover protects the plug contacts of the BaseUnit against dirt.

Electromechanical switching devices in series with hybrid motor starters

Switching an inductive load - in particular of motors <1 kW with high inductance - with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

The resulting faults/damage can be prevented by first disconnecting with the hybrid motor starter or by using EMC suppression modules:

- For 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor, see page 13/133.
- For motor suppression modules that are fitted in the main circuit, see page 16/21.

Note:

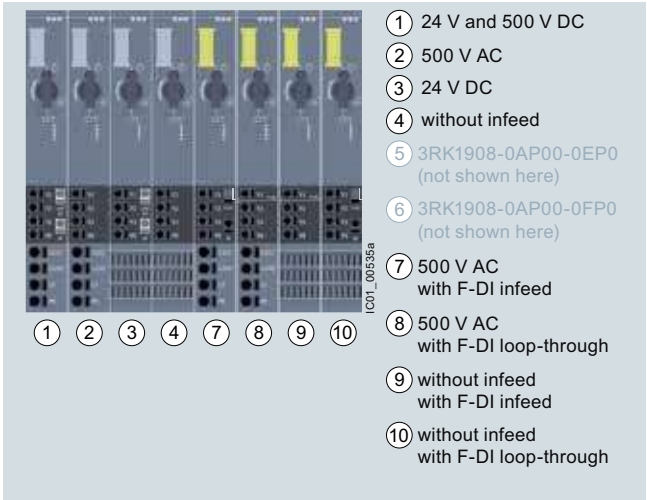
For more information, see https://support.industry.siemens.com/cs/ww/en/view/109758696.

3DI/LC control module

This is a digital input module with three inputs for local motor starter functions such as “manual local control”, “implementation of fast inputs” or “end position disconnection”. For a list of all the functions permitted by the 3DI/LC module, see chapter “Overview of functions” in the Equipment Manual.

The module is plugged into the front of the motor starter from which it is supplied with a 24 V DC operating voltage.

BaseUnits for motor starters



View of the BaseUnit infeeds for the motor starters

BaseUnits are components for accommodating the ET 200SP I/O modules.

The self-assembling voltage buses integrated into the BaseUnits reduce wiring outlay to the single infeed (both of auxiliary and load voltage).

All modules following on the right are automatically supplied upon plugging the BaseUnits together, if BaseUnits are inserted with routing.

The rugged design and keyed connection technology enables use in harsh industrial conditions.

The BaseUnits are available with various infeeds for the motor starters.

ET 200SP motor starter

General data

Article No. scheme

Product versions		Article number	
Motor starters		**3RK1308 – 0 □ □ 0 0 – 0 C P 0**	
Product function	Direct-on-line starters	**A**	For motor standard output 1/10 .... 7-1/2 HP[1)]
	Reversing starters	**B**	For motor standard output 1/10 .... 7-1/2 HP[1)]
	Fail-safe direct-on-line starters	**C**	For motor standard output 1/10 .... 7-1/2 HP[1)]
	Fail-safe reversing starters	**D**	For motor standard output 1/10 .... 7-1/2 HP[1)]
Current range	0.1 ... 0.4 A	**A**	Maximum current-carrying capacity when starting 4 A
	0.3 ... 1 A	**B**	Maximum current-carrying capacity when starting 10 A
	0.9 ... 3 A	**C**	Maximum current-carrying capacity when starting 30 A
	2.8 ... 9 A	**D**	Maximum current-carrying capacity when starting 90 A
	4 ... 12 A	**E**	Including fan (3RW4928-8VB00), maximum current-carrying capacity when starting 100 A
Example		**3RK1308 – 0 A D 0 0 – 0 C P 0**	

1) For standard motors: Single- or three-phase asynchronous motors, single-phase AC motors, single-phase asynchronous motors, at 400 V AC and 500 V AC; the actual startup characteristics of the motor as well as its rated data are important factors here.

Product versions		Article number	
BaseUnit		**3RK1908 – 0 A P 0 0 – 0 □ P 0**	
BU infeed	24 V and 500 V AC	**A**	
	24 V DC	**B**	
	500 V AC	**C**	
	without infeed	**D**	
	500 V AC	**G**	with F-DI infeed
	500 V AC	**H**	with F-DI loop-through
	without infeed	**J**	with F-DI loop-through
	without infeed	**K**	with F-DI infeed
Example		**3RK1908 – 0 A P 0 0 – 0 A P 0**	

Note:

The article number schemes show 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

Product advantages

The ET 200SP motor starters offer a number of advantages:

- Fully integrated into the ET 200SP I/O system (including TIA Selection Tool and TIA Portal)
- High degree of flexibility when it comes to safety applications via SIMATIC F-CPU or SIRIUS 3SK safety relays up to SIL 3 and PL e Cat. 4.
- Simple, integrated current value transmission
- Extensive parameterization by means of TIA Portal
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Greater endurance and reduced heat losses thanks to hybrid technology
- Less space required in the control cabinet (20 to 80%) as a result of greater functional density (direct-on-line and reversing starters in same width)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs via 3DI/LC control module
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower overheads for stock keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:3)
- The ET 200SP motor starters can be used with highly energy efficient IE3/IE4 motors, see Application Manual.
  Take the current characteristics of the connected motor and motor starter into account when dimensioning. In addition to the rated current, the maximum permissible current range of the motor starter and the ratio of the rated current to the starting current of the motor are relevant.
  For more information on IE3/IE4, see page 1/7.

Standards and approvals

- IEC/EN 60947-4-2
- UL 60947-4-2
- CSA
- ATEX
- IEC 61508-1: SIL 3
- ISO 13849: PL e
- CCC approval for China

ET 200SP motor starter

General data

Application

The ET 200SP motor starters are suitable for the following applications:

- Switching and monitoring of
  - three-phase motors with overload and short-circuit protection (e.g. 400 V asynchronous motors for secondary drives in conveyor systems)
  - single-phase motors with overload and short-circuit protection (e.g. 230 V motors for pump applications)
  - Resistive loads by means of current value and diagnostics via the maintenance function (e.g. for heaters)
- Plant monitoring and energy management in conveyor systems:
  By means of the phase asymmetry and zero current detection during current measurement, for example, drive belt monitoring and blocking monitoring are possible.
- Track switching and lifting table control in conveyor systems:
  Track switches can be implemented using the quick stop function and lifting table controls by means of the "immediate end position disconnection" function without any laborious programming.
- Safe isolation of the drive from main power supply:
  The isolating functions according to IEC 60947-1 offer protection against inadvertent activation during plant maintenance.

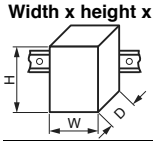
Motor starters in the process industry

For the ET 200SP motor starters, special BaseUnits are available that enable the device to be used in the ET 200SP HA I/O system, too. This is typically used in process engineering applications.

Technical specifications

More information	
Industry Mall, see www.siemens.com/product?3RK1308 Equipment Manual, see https://support.industry.siemens.com/cs/ww/en/view/109479973	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/21800/faq

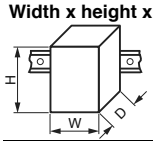
ET 200SP motor starters

Article number		3RK1308-0AA00-0CP0 3RK1308-0BA00-0CP0	3RK1308-0AB00-0CP0 3RK1308-0BB00-0CP0	3RK1308-0AC00-0CP0 3RK1308-0BC00-0CP0	3RK1308-0AD00-0CP0 3RK1308-0BD00-0CP0	3RK1308-0AE00-0CP0 3RK1308-0BE00-0CP0
Product category		**Motor starters**				
General technical specifications:						
Width x height x depth 	mm	30 × 142 × 150				
Design of the switching contact		Hybrid				
Design of the motor protection		Electronic				
Installation altitude at height above sea level, maximum	m	4 000				
Mounting position		Vertical, horizontal, flat (observe derating)				
Type of mounting		Can be plugged into BaseUnit				
Ambient temperature • During operation • During transport • During storage	 °C °C °C	 -25 ... +60 -40 ... +70 -40 ... +70				
Relative humidity during operation	%	10 ... 95				
Vibration resistance		15 mm up to 6 Hz; 2 *g* up to 500 Hz				
Shock resistance		6 *g* / 11 ms				
Degree of protection		IP20				
Type of coordination		1				
Electrical data:						
Supply voltage at DC rated value	V	24				
Operational power for AC-53a at 440-480V rated value	HP	-	-	1-1/2	5	7-1/2
Operating frequency, rated value	Hz	50 ... 60				
Adjustable current response value of the inverse-time delayed overload release	A	0.1 ... 0.4	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
Max. current carrying capacity at startup at 480V	A	3.2	8	24	72	72
Max. permissible voltage for protective separation between main and auxiliary circuit	V	500				
Insulation voltage, rated value	V	500				
Trip class		CLASS 5 and 10 adjustable				

ET 200SP motor starter

General data

ET 200SP fail-safe motor starters

Article number		3RK1308-0CA00-0CP0 3RK1308-0DA00-0CP0	3RK1308-0CB00-0CP0 3RK1308-0DB00-0CP0	3RK1308-0CC00-0CP0 3RK1308-0DC00-0CP0	3RK1308-0CD00-0CP0 3RK1308-0DD00-0CP0	3RK1308-0CE00-0CP0 3RK1308-0DE00-0CP0
Product category		**Motor starters**				
General technical specifications:						
Width x height x depth 	mm	30 × 142 × 150				
Design of the switch contact		Hybrid				
Design of the motor protection		Electronic				
Installation altitude at height above sea level, maximum	m	2 000				
Mounting position		Vertical, horizontal, flat (observe derating)				
Type of mounting		Can be plugged into BaseUnit				
Ambient temperature • During operation • During transport • During storage	 °C °C °C	 -25 ... +60 -40 ... +70 -40 ... +70				
Relative humidity during operation	%	10 ... 95				
Vibration resistance		15 mm up to 6 Hz; 2 *g* up to 500 Hz				
Shock resistance		6 *g* / 11 ms				
Degree of protection		IP20				
Type of coordination		1				
Electrical data:						
Supply voltage at DC rated value	V	24				
Operational power for AC-53a at 440-480V, rated value	HP	-	-	1-1/2	5	7/12
Operating frequency, rated value	Hz	50 ... 60				
Adjustable current response value of the inverse-time delayed overload release	A	0.1 ... 0.4	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
Max. current carrying capacity at startup at 480V	A	3.2	8	24	72	72
Max. permissible voltage for protective separation between main and auxiliary circuit	V	500				
Insulation voltage, rated value	V	500				
Trip class		CLASS 5 and 10 adjustable				

ET 200SP motor starter

General data

BaseUnits for motor starters

Article number		3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0	3RK1908-0AP00-0DP0	3RK1908-0AP00-0GP0	3RK1908-0AP00-0HP0	3RK1908-0AP00-0JP0	3RK1908-0AP00-0KP0
Product designation		**BaseUnit**							
General technical specifications:									
Width x height x depth	mm	30 × 215 × 75							
Ambient temperature									
• During operation	°C	-25 ... +60							
• During transport	°C	-40 ... +70							
• During storage	°C	-40 ... +70							
Degree of protection		IP20							
Touch protection against electric shock		Finger-safe							
Connections/terminals:									
Type of connectable conductor cross-sections									
• At the inputs for supply voltage									
- Solid		1 x 0.5 ... 2.5 mm^2		--					
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm^2		--					
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm^2		--					
- Solid for AWG cables		1 x 20 ... 12		--					
• For infeed									
- Solid		1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2		--	
- Finely stranded with end sleeve		1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2		--	
- Finely stranded without end sleeve		1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2		--	
- Solid for AWG cables		1 x 18 ... 10	--	1 x 18 ... 10	--	1 x 18 ... 10		--	
• For load-side outgoing feeder									
- Solid		1 x 0.5 ... 2.5 mm^2							
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm^2							
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm^2							
- Solid for AWG cables		1 x 20 ... 12							
Type of electrical connection for auxiliary and control circuits		Spring-loaded terminals (push-in)							
Miscellaneous:									
Type of screwdriver tip		Slotted							
Size of screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm							

ET 200SP motor starter

General data

3DI/LC control module

Article number		**3RK1908-1AA00-0BP0**
Product designation		**3DI/LC control module**
General technical specifications:		
Width x height x depth	mm	30 × 54.5 × 42.3
Type of product		Accessories
Number of digital inputs		4
Installation altitude at height above sea level, maximum	m	2 000
Mounting position		Vertical, horizontal, flat
Type of mounting		Can be plugged onto motor starter
Ambient temperature		
• During operation	°C	-25 ... +60
• During transport	°C	-40 ... +70
• During storage	°C	-40 ... +70
Connections/terminals:		
Connectable conductor cross-section for auxiliary contacts		
• Solid or stranded	mm^2	0.2 ... 1.5
• Finely stranded with end sleeve	mm^2	0.25 ... 1.5
• Finely stranded without end sleeve	mm^2	0.2 ... 1.5
AWG number as coded connectable conductor cross-section		24 ... 16
Type of electrical connection for auxiliary and control circuits		Spring-loaded terminals (push-in)
Electrical data:		
Type of voltage of the control supply voltage		DC
Control supply voltage at DC rated value	V	20.4 ... 28.8
Miscellaneous:		
Type of screwdriver tip		Slotted
Size of screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm

Selection and ordering data

	Adjustable current response value of the inverse-time delayed overload release	Max. current carrying capacity at startup at 480V	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	A	A	d				
Motor starters							
	Direct-on-line starters						
3RK1308-0AB00-0CP0	0.1 ... 0.4	3.2	NEW 2	**3RK1308-0AA00-0CP0**		1	1 unit
	0.3 ... 1	8	2	**3RK1308-0AB00-0CP0**		1	1 unit
	0.9 ... 3	24	2	**3RK1308-0AC00-0CP0**		1	1 unit
	2.8 ... 9	72	2	**3RK1308-0AD00-0CP0**		1	1 unit
	4 ... 12	72	2	**3RK1308-0AE00-0CP0**		1	1 unit
	Reversing starters						
3RK1308-0BB00-0CP0	0.1 ... 0.4	3.2	NEW 2	**3RK1308-0BA00-0CP0**		1	1 unit
	0.3 ... 1	8	2	**3RK1308-0BB00-0CP0**		1	1 unit
	0.9 ... 3	24	2	**3RK1308-0BC00-0CP0**		1	1 unit
	2.8 ... 9	72	2	**3RK1308-0BD00-0CP0**		1	1 unit
	4 ... 12	72	2	**3RK1308-0BE00-0CP0**		1	1 unit
	Fail-safe direct-on-line starters						
3RK1308-0CE00-0CP0	0.1 ... 0.4	3.2	NEW 2	**3RK1308-0CA00-0CP0**		1	1 unit
	0.3 ... 1	8	2	**3RK1308-0CB00-0CP0**		1	1 unit
	0.9 ... 3	24	2	**3RK1308-0CC00-0CP0**		1	1 unit
	2.8 ... 9	72	2	**3RK1308-0CD00-0CP0**		1	1 unit
	4 ... 12	72	2	**3RK1308-0CE00-0CP0**		1	1 unit
	Fail-safe reversing starters						
3RK1308-0DE00-0CP0	0.1 ... 0.4	3.2	NEW 2	**3RK1308-0DA00-0CP0**		1	1 unit
	0.3 ... 1	8	2	**3RK1308-0DB00-0CP0**		1	1 unit
	0.9 ... 3	24	2	**3RK1308-0DC00-0CP0**		1	1 unit
	2.8 ... 9	72	2	**3RK1308-0DD00-0CP0**		1	1 unit
	4 ... 12	72	2	**3RK1308-0DE00-0CP0**		1	1 unit

ET 200SP motor starter

Base units and control module

	Type of product	Operational voltage of the AC infeed	Supply voltage of the DC infeed	SD	Push-in terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V	V	d				
BaseUnits[1]								
3RK1908-0AP00-0AP0	***For motor starters***							
	• with AC/DC infeed	500	24	2	**3RK1908-0AP00-0AP0**		1	1 unit
	• with DC infeed	--	24	2	**3RK1908-0AP00-0BP0**		1	1 unit
	• with AC infeed	500	--	2	**3RK1908-0AP00-0CP0**		1	1 unit
	• without infeed	--	--	2	**3RK1908-0AP00-0DP0**		1	1 unit
	For fail-safe motor starters NEW							
	• with AC infeed, with F-DI infeed for fail-safe motor starters	500	--	2	**3RK1908-0AP00-0GP0**		1	1 unit
	• with AC infeed, with F-DI loop-through for fail-safe motor starters	500	--	2	**3RK1908-0AP00-0HP0**		1	1 unit
	• without AC/DC infeed, with F-DI loop-through for fail-safe motor starters	--	--	2	**3RK1908-0AP00-0JP0**		1	1 unit
	• without AC/DC infeed, with F-DI infeed for fail-safe motor starters	--	--	2	**3RK1908-0AP00-0KP0**		1	1 unit

[1] The voltage is looped-through from BaseUnits with infeed to subsequent BaseUnits without infeed.

	Type of product	Supply voltage at DC rated value	Loop through the potential group from the left	SD	Push-in terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V		d				
BaseUnits								
6ES7193-6BP00-0BA0	***For dummy modules***							
	• dark, looping through the potential group	24	Yes	1	**6ES7193-6BP00-0BA0**		1	1 unit
	• light, opening a new potential group	24	No	1	**6ES7193-6BP00-0DA0**		1	1 unit

	Control supply voltage at DC rated value	Product function Local control	Digital inputs parameterizable	SD	Push-in terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V			d				
3DI/LC control module								
3RK1908-1AA00-0BP0	20.4 ... 28.8	Yes	Yes	2	**3RK1908-1AA00-0BP0**		1	1 unit

ET 200SP motor starter

Accessories

	Product designation	Type of product	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Accessories							
6ES7133-6CV15-1AM0	**BU cover 15 mm**	for BaseUnits Type A0 or A1	1	**6ES7133-6CV15-1AM0**		1	5 units
3RK1908-1CA00-0BP0	**BU cover 30 mm**	For protection of empty slots, 30 mm	2	**3RK1908-1CA00-0BP0**		1	1 unit
3RK1908-1DA00-2BP0	**Infeed bus cover** (1 bag containing 10 covers)	For ET 200SP	2	**3RK1908-1DA00-2BP0**		1	1 unit
3RK1908-1EA00-1BP0	**Mechanical bracket** (1 bag containing 5 mechanical brackets)	Mechanical, for ET 200SP	2	**3RK1908-1EA00-1BP0**		1	1 unit
3RW4928-8VB00	**Fan**	Can be used for 3RK1308	►	**3RW4928-8VB00**		1	1 unit
3RK1911-6EA00	**Motor suppression module** • Square		15	**3RK1911-6EA00**		1	1 unit
3RK1911-6EB00	• Round		15	**3RK1911-6EB00**		1	1 unit
3RK1908-1SK00	**Starter Kit** NEW	consists of 3RK1308-0BC00-0CP0 reversing starter (0.9 ... 3 A), 3RK1908-0AP00-0AP0 BaseUnit with 500 V and 24 V AC/DC infeed, and EMC distance module (consisting of 6ES7193-6BP00-0BA0 BaseUnit plus 6ES7133-6CV15-1AM0 BU cover 15 mm)	5	**3RK1908-1SK00**		1	1 unit

For Use in the Field, High Degree of Protection

Introduction

Overview

Flexible and cost-efficient distributed starter solutions

Be it their high degree of protection, compact design or integrated multifunctionality – our motor starters and soft starters for use in the field are ideal for realizing distributed drive solutions. The modular concepts, distributed power supply and integrated safety technology of our portfolio for a high degree of protection consistently supports current trends in drive technology.

3RK1304

3RK1315

		Type	Page
ET 200pro motor starters			
Motor starters in the SIMATIC ET 200pro I/O system up to 10 HP			
Standard motor starters		**3RK1304**	6/28
High Feature motor starters		**3RK1304**	6/29
ET 200pro isolator modules	• With switch disconnector function for safe disconnection	**3RK1304**	6/30
Safety modules local	• Isolator module, 400 V disconnecting module	**3RK1304**	6/31
Safety modules PROFIsafe	• F-Switch PROFIsafe	**6ES7148**	6/34
Accessories for ET 200pro motor starters	• Incoming power supply, power loop-through connection on the field device, motor cable, power bus with power terminal connectors	**3RK19**	6/35
ET 200pro – interface modules	• For communication with PROFIBUS, PROFINET and IWLAN	**6ES71**	ST 70
ET 200pro – CPUs	• Standard CPUs, fail-safe CPUs	**6ES71**	ST 70
ET 200pro – I/O modules	• Digital/analog expansion modules, fail-safe expansion modules, power modules, ET 200pro pneumatic interfaces	**6ES71**	ST 70
ET 200pro PS	• Stabilized power supplies	**6ES7148**	ST 70
ET 200pro FC-2 frequency converters		**6SL35**	D 31.2
ET 200pro add-on products	• Modules for EtherNet/IP	**ZNX:EIP**	ST 70
SIRIUS M200D motor starters			
Distributed motor starters up to 10 HP			
M200D AS-i Basic motor starters		**3RK1315**	6/47
M200D AS-i Standard motor starters		**3RK1325**	6/48
M200D communication modules for PROFIBUS		**3RK1305**	6/55
M200D communication modules for PROFINET		**3RK1335**	6/55
M200D motor starter modules		**3RK1395**	6/55
Accessories	• Incoming power supply, motor cable, power bus with power terminal connectors	**3RK1911**	6/59
	• Motor control with I/O communication	**3RK1902**	6/61
	• Motor control with AS-i communication	**3RK1902**	6/62
	• Motor control with PROFIBUS	**3RK1902**	6/64
	• Motor control with PROFINET	**3RK1902**	6/65
Hybrid fieldbus connections			
	• Passive and active	**3RK1911**	6/67

ET 200pro motor starter

General data

Overview

ET 200pro motor starters in I/O system ET 200pro

SIMATIC ET 200pro is the modular I/O system with high degree of protection IP65/66/67 for local, cabinet-free use. The ET 200pro motor starters with the high degree of protection IP65 are an integral part of ET 200pro.

ET 200pro motor starter: Isolator module, Standard starter and High Feature starter mounted on a wide module rack

ET 200pro motor starters (see pages 6/28 and 6/29)

- Only two variants up to 10 HP
- All settings can be parameterized by bus
- Comprehensive diagnostic signals
- Support for PROFIenergy
- Overload can be acknowledged by remote RESET
- Current asymmetry monitoring
- Stall protection
- EMERGENCY START function on overload
- Current value transmission by bus
- Current limit monitoring
- Full support of acyclic services
- Direct-on-line or reversing starters
- Power bus connection can be plugged in using Han Q4/2 connectors
- Motor feeder with Han Q8/0 plug
- Conductor cross-section up to 6 x 4 mm^2
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High Feature versions (with 4 DI on-board)
- Electromechanical switching and electronic switching
- Electronic starter for direct activation or with integrated soft starter function
- Supplied with 400 V AC brake contact as an option
- Temperature sensor can be connected (Thermoclick or PTC type A)
- Provision of the motor current in PROFIenergy format to higher-level systems, motor current shutdown in dead times using PROFIenergy

More information

Homepage, see www.siemens.com/ET200pro

Industry Mall, see www.siemens.com/product?ET200pro

Further components in the ET 200pro distributed I/O system:

- Interface modules, central units, I/O modules, ET 200pro PS, see Catalog ST 70
- ET 200pro FC-2 frequency converters, see Catalog D 31.2

ET 200pro isolator modules (see page 6/30)

The isolator module with switch disconnector function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

Safety applications

Safety Solution local (see page 6/31)

With the Safety local modules
- Safety local isolator module and
- 400 V disconnecting module

with an appropriate connection, safety level PL e (according to ISO 13849-1) can be reached.

Safety Solution PROFIsafe (see page 6/34)

With the Safety PROFIsafe modules
- F-Switch and
- 400 V disconnecting module

with an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can also be reached.

Functionality

With the ET 200pro motor starters, any three-phase loads can be protected and switched.

The ET 200pro motor starters are available with mechanical and also electronic contacts.

The ET 200pro electromechanical starters are offered as direct-on-line starters (DSe) and reversing starters (RSe) as **Standard** and **High Feature** versions. There are device versions with or without control for externally fed brakes with 400 V AC.

Compared with the Standard motor starters, the **High Feature, mechanical** motor starter also has:

- Four digital inputs
- Advanced parameterization options

The ET 200pro electronic starters are offered as direct-on-line starters (sDSSte/sDSte) and reversing starters (sRSSte/sRSte) in the High Feature version.

Compared with the High Feature mechanical motor starters, the **High Feature electronic** motor starter also has:

- Soft starting and smooth ramp-down function
- Deactivated soft start function as an electronic starter for applications with a high switching frequency
- Advanced parameterization options

ET 200pro motor starter

General data

As a result of the protection concept with solid-state overload evaluation and the use of SIRIUS switching devices, size S00, additional advantages are realized on the Standard and High Feature motor starters – advantages that soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Configuration is made easier and flexibility is increased by the fine modular structure with ET 200pro. When using ET 200pro motor starters, the parts list per load feeder is reduced to two main items: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveying systems and in machine-tool building.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are also optimized by the low level of variance (two units up to 7.5 HP).
- With four locally acting inputs available on the High Feature motor starter it is possible to realize autonomous special functions that work independently of the bus and the higher level control system, e.g. as a quick stop on gate valve controls or limit position disconnectors. In parallel with this, the states of these inputs are signaled to the control system.

Article No. scheme

Product versions		Article number													
Motor starters		**3RK1304**	**–**	**5**	**□**	**S**	**□**	**0**	**–**	**□**	**A**	**A**	**□**		
Setting range	0.15 ... 2.0 A				**K**										
	1.5 ... 12 A				**L**										
Product function	Direct-on-line starters DSe						**4**			**4**				Standard	
	Reversing starters RSe						**4**			**5**				Standard	
	Direct-on-line starters DSe						**4**			**2**				High Feature	
	Reversing starters RSe						**4**			**3**				High Feature	
	Direct-on-line starters sDSSte/sDSte						**7**			**2**				High Feature	
	Reversing starters sDSSte/sDSte						**7**			**3**				High Feature	
Inputs/outputs	Without brake output												**0**		
	With brake output												**3**	400 V AC, with High Feature + 4 inputs	
Example		**3RK1304**	**–**	**5**	**K**	**S**	**4**	**0**	**–**	**4**	**A**	**A**	**0**		

Product versions		Article number												
Modules		**3RK1304**	**–**	**0**	**H**	**S**	**0**	**0**	**–**	**□**	**A**	**A**	**0**	
Product function	Isolator modules									**6**				
	Isolator modules									**7**				Safety modules local
	400 V disconnecting modules									**8**				Safety modules local/PROFIsafe
Example		**3RK1304**	**–**	**0**	**H**	**S**	**0**	**0**	**–**	**6**	**A**	**A**	**0**	

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.

ET 200pro motor starter

General data

Type Technology designation[1]		Standard motor starters DSe, RSe	High Feature motor starters DSe, RSe	 sDSSte, sDSte, sRSSte, sRSte
Device functions (firmware features)				
Parameterizable rated operational current		✓		
Integrated short-circuit protection		✓		
Parameterizable current limit values		--	✓ 2 limit values	
Parameterizable response in case of current limit violation		--	✓	
Zero current monitoring		✓		
Parameterizable response in case of zero current violation		✓		
Parameterizable current asymmetry limit	%	-- Fixed limit value (30 x I_e)	✓ 30 ... 60 x I_e	
Parameterizable response in case of asymmetry limit violation		✓		
Motor blocking monitoring		--	✓	
Parameterizable blocking current limit	%	--	✓ 150 ... 1 000 x I_e	
Parameterizable blocking time limit	s	--	✓ 1 ... 5	
Current value transmission		✓		
Group warning diagnostics		--	✓ Parameterizable	
Group diagnostics		✓ Parameterizable		
EMERGENCY START		✓		
Digital inputs		--	✓ 4 inputs	
• Parameterizable input signal		--	✓ Latching/non-latching	
• Parameterizable input level		--	✓ NC/NO contacts	
• Parameterizable input signal delay	ms	--	✓ 10 ... 80	
• Parameterizable input signal extension	ms	--	✓ 0 ... 200	
• Parameterizable input control actions		--	✓ 12 different actions	
Brake output (400 V AC)		✓ Order option		
Parameterizable brake enabling delay	s	✓ -2.5 ... +2.5		
Parameterizable holding time of the brake during stopping	s	✓ 0 ... 25		
Parameterizable startup type		--		✓
Parameterizable ramp-down time		--		✓
Parameterizable starting voltage		--		✓
Parameterizable stopping voltage		--		✓
Local device interface		✓		
Firmware update		✓ By specialists		
Thermal motor model		✓		
Parameterizable trip class		-- CLASS 10 fixed	✓ CLASS 5, 10, 15, 20	
Parameterizable response in case of overload of thermal motor model		--	✓ 3 possible states	
Advance warning limit for motor heating	%	--	✓ Parameterizable 0 ... 95	
Advance warning limit time-related trip reserve	s	--	✓ Parameterizable 0 ... 500	
Parameterizable recovery time	min	--	✓ 1 ... 30	
Parameterizable protection against voltage failure		-- Permanently integrated	✓	
Reversing start function		✓ Order option		
Parameterizable interlock time for reversing starters		-- 150 ms fixed	✓ 0 ... 60 s	
Integrated logbook functions		✓ 3 device logbooks		
Integrated statistics data memory		✓		
Parameterizable response in case of CPU/master stop		✓		
PROFIenergy profile support				
• Disconnection of the motor current during idle times		✓		
• Measured motor current values		✓		
Device indications				
• Group fault		SF LED (red)		
• Switching state		STATE LED (red, yellow, green)		
• Device status		DEVICE LED (red, yellow, green)		
• Digital inputs		--	IN 1 ... IN 4, LED	

✓ Function available

-- Function not available

[1] DS .... Direct-on-line starters
RS .... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
e ..... Electronic motor protection
te ..... Full motor protection (thermal + electronic)
s ..... Electronic switching with semiconductor.

ET 200pro motor starter

General data

Benefits

ET 200pro motor starters provide the following advantages:

- High flexibility thanks to a modular and compact design
- Little variance among all motor starter versions (two units up to 10 HP)
- Extensive parameterization using STEP 7 HW Config
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs for on-site control functions (High Feature)
- Cabinet-free design thanks to high degree of protection IP65

Application

The SIMATIC ET 200pro motor starters are ideal for the use of several spatially concentrated distributed drive solutions in which several motors, or digital or analog sensors and actuators are addressed from a distributed station. They are perfectly suited for protecting and switching any AC loads.

Application areas

The SIMATIC ET 200pro motor starters are suitable for numerous sectors of industry, e.g. machinery and plant engineering or conveying applications.

Use of ET 200pro motor starters in conjunction with IE3/IE4 motors

Note:

For the use of ET 200pro motor starters in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring; see Application Manual.

ET 200pro motor starter

General data

Technical specifications

More information	
Equipment Manual, see https://support.industry.siemens.com/cs/ww/en/view/22332388	Notes on security: System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation. For more information on the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Type		Standard motor starters	High Feature motor starters	
		Mechanical switching without inputs	Mechanical switching with inputs	Electronic switching with inputs and soft starter function
Technology designation[1]		DSe, RSe	DSe, RSe	sDSSte, sDSte, sRSSte, sRSte
Mechanics and environment				
Motor starters or modules that can be connected to ET 200pro With width of 110 mm		max. 8		
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters	mm	110 x 230 x 150		110 x 230 x 160
Permissible ambient temperature • During operation • During storage	°C °C	-25 ... +55, from +40 with derating -40 ... +70		
Permissible mounting position		Vertical, horizontal		
Vibration resistance acc. to IEC 60068, Part 2-6	*g*	2		
Shock resistance acc. to IEC 60068, Part 2-27	*g*/ms	Half-sine 15/11		
Degree of protection		IP65		
Pollution degree		3, IEC 60664 (IEC 61131)		
Electrical specifications				
Power consumption at 24 V DC • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	mA mA	Approx. 40 Approx. 200		
Rated operational current I_e for power bus	A	25		
Rated operational voltage U_e • Approval according to EN 60947-1, Appendix N • Approval according to CSA and UL	V AC V AC V AC	400 (50/60 Hz) Up to 400 (50/60 Hz) Up to 600 (50/60 Hz)		Up to 400 (50/60 Hz) Up to 480 (50/60 Hz)
Approval • DIN VDE 0106, Part 101 • CSA and UL approval	V V	Up to 400 Up to 600		Up to 480 Up to 480
Conductor cross-sections • Incoming power supply	mm^2	Max. 6 x 4		
Touch protection		Finger-safe		
Rated impulse withstand voltage U_{imp}	kV	6		
Rated insulation voltage U_i	V	400		
Rated operational current I_e for starters • AC-1 / 2 / 3 at 40 °C - At 400 V • - At 500 V • AC-4 at 40 °C - At 400 V	A A A	0.15 ... 2.0/1.5 ... 12.0 0.15 ... 2.0/1.5 ... 9.0 0.15 ... 2.0/1.5 ... 4.0		0.15 ... 2.0/1.5 ... 12.0[2]
Rated short-circuit breaking capacity	kA	100 at 400 V		
Type of coordination acc. to IEC 60947-4-1		1		
Power of three-phase motors	HP	At 600V max 10		At 480V max 7.5/5[3]
Utilization categories		AC-1, AC-2, AC-3, AC-4		AC-53a[4] (max. 9 A with deactivated soft start function up to CLASS 10)
Protective separation between main and auxiliary circuits	V	400, acc. to EN 60947-1, Appendix N		
Endurance of contactor • Mechanical • Electrical	Operating cycles Operating cycles	30 million Up to 10 million; depending on the current loading (see manual)		-- --
Permissible switching frequency		Depending on the current loading, motor starting time, and relative ON period (see manual)		
Operating times for 0.85 ... 1.1 x U_e • Closing delay • Opening delay	ms ms	11 ... 50 5 ... 45		-- --

1) DS .... Direct-on-line starters
RS .... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
e ..... Electronic motor protection
te ..... Full motor protection (thermal + electronic)
s ..... Electronic switching with semiconductor.

2) If the soft starter control function is deactivated, the permissible rated operational current is reduced to 9 A up to CLASS 10.

3) With parameterization as electronic starter max. 5 HP.

4) 8-hour operation.

ET 200pro motor starter

Standard motor starter *IE3/IE4* ready

Overview

The functionality, device functions, and technical specifications of the Standard motor starter are described in "ET 200pro Motor Starters, General data" see page 6/23 onwards.

Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
Standard motor starters, mechanical Motor protection: thermal model					
DSe direct-on-line starters[1)]					
• Without brake output	2	**3RK1304-5□S40-4AA0**		1	1 unit
• With brake output 400 V AC	2	**3RK1304-5□S40-4AA3**		1	1 unit
RSe reversing starters[1)]					
• Without brake output	2	**3RK1304-5□S40-5AA0**		1	1 unit
• With brake output 400 V AC	2	**3RK1304-5□S40-5AA3**		1	1 unit
Setting range Rated operational current			Additional price		
• 0.15 ... 2.0 A		**K**	None		
• 1.5 ... 12.0 A		**L**	✓		

DSe Standard

✓ = Additional price

1) Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 6/39).

ET 200pro motor starter

High Feature motor starter *IE3/IE4* ready

Overview

The functionality, device functions, and technical specifications of the High Feature motor starter are described in "ET 200pro Motor Starters, General data" see page 6/23 onwards.

The High Feature motor starter differs from the Standard motor starter in having more parameters and four integrated, freely-parameterizable digital inputs.

Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
High Feature motor starters, mechanical Motor protection: thermal model					
DSe direct-on-line starters[1)]					
• Without brake output and with 4 inputs	2	**3RK1304-5□S40-2AA0**		1	1 unit
• With brake output 400 V AC and 4 inputs	5	**3RK1304-5□S40-2AA3**		1	1 unit
RSe reversing starters[1)]					
• Without brake output and with 4 inputs	2	**3RK1304-5□S40-3AA0**		1	1 unit
• With brake output 400 V AC and 4 inputs	2	**3RK1304-5□S40-3AA3**		1	1 unit
Setting range Rated operational current			Additional price		
• 0.15 ... 2.0 A		**K**	None		
• 1.5 ... 12.0 A		**L**	✓		
High Feature motor starters[2)], electronic Full motor protection, comprising thermal motor protection and thermistor motor protection					
sDSSte/sDSte direct-on-line starters[1)2)]					
• Without brake output and with 4 inputs	2	**3RK1304-5□S70-2AA0**		1	1 unit
• With brake output 400 V AC and 4 inputs	5	**3RK1304-5□S70-2AA3**		1	1 unit
Reversing starters sRSSte/sRSte[1)2)]					
• Without brake output and with 4 inputs	2	**3RK1304-5□S70-3AA0**		1	1 unit
• With brake output 400 V AC and 4 inputs	2	**3RK1304-5□S70-3AA3**		1	1 unit
Setting range Rated operational current			Additional price		
• 0.15 ... 2.0 A		**K**	None		
• 1.5 ... 12.0 A		**L**	✓		

RSe High Feature

sRSSte High Feature

✓ = Additional price

1) Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 6/39).

2) The electronic motor starters can be used not only as electronic motor starters with a high level of switching frequency but also as fully fledged soft starters for soft starting and stopping. The changeover from motor starter to soft starter takes place through reparameterization in HW Config. Depending on the setting, this results in the following current ranges:
- Parameterization as electronic motor starter: 0.15 to 2 A and 1.5 to 9 A (5 HP)
- Parameterization as soft starter: 0.15 to 2 A and 1.5 to 12 A (7.5 HP).

ET 200pro motor starter

Isolator modules *IE3/IE4* ready

Overview

The isolator module with integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters) and switch disconnector function is used for safe disconnection of the 400 V operational voltage in the plant.

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

The following properties apply to the isolator module:

- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free design thanks to high degree of protection IP65

The isolator module is available in addition in a safety version (see "Safety local isolator module" on page 6/31).

Technical specifications

Type		Isolator modules
General data		
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters	mm	110 x 230 x 170
Permissible ambient temperature • During operation • During storage	 °C °C	 -25 ... +55 -40 ... +70
Permissible mounting position		Any
Vibration resistance acc. to IEC 60068 Part 2-6	*g*	2
Shock resistance acc. to IEC 60068 Part 2-27	*g*/ms	Half-sine 15/11
Power consumption • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	 mA	 Approx. 20 --
Rated operational current I_e for power bus	A	25
Rated operational voltage U_e	V	400
Approvals according to • DIN VDE 0106, Part 101 • CSA and UL	 V V	 Up to 500 Up to 600
Conductor cross-sections • Incoming power supply	 mm^2	 Max. 6 x 4

Type		Isolator modules
Degree of protection		IP65
Touch protection		Finger-safe
Pollution degree		3, IEC 60664 (IEC 61131)
Rated impulse withstand voltage U_{imp}	kV	6
Rated insulation voltage U_i	V	400
Rated operational current I_e for starters • AC-1/2/3 at 40 °C - At 400 V - At 500 V	 A A	 25 25
Rated short-circuit breaking capacity	kA	50 at 400 V
Type of coordination acc. to IEC 60947-4-1		2
Protective separation between main and auxiliary circuits	V	400, according to DIN VDE 0106, Part 101
Device functions • Group diagnostics		 Yes, parameterizable
Device indications • Group fault		 SF LED (red)

Selection and ordering data

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
ET 200pro isolator modules, mechanical						
 3RK1304-0HS00-6AA0	**Isolator modules**[1)] Rated operational current 25 A	2	**3RK1304-0HS00-6AA0**		1	1 unit

[1)] Only functions when used together with the related 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see page 6/39).

Overview

Safety Solution local

With the Safety local modules
- Safety local isolator module and
- 400 V disconnecting module

with an appropriate connection, safety level PL e (according to ISO 13849-1) can be reached.

ET 200pro motor starter (Safety Solution local): Safety local isolator module, disconnecting module, Standard starter and High Feature starter mounted on a wide module rack

Safety local isolator module

The Safety local isolator module is a repair switch with integrated safety evaluation functions that can be parameterized using DIP switches.

It is used for
- Connection of a one- or two-channel EMERGENCY STOP circuit up to PL e (protective door or EMERGENCY STOP pushbuttons) and parameterizable start behavior
- For controlling the 400 V disconnecting module by means of a safety rail signal

400 V disconnecting module

The 400 V disconnecting module enables the safe disconnection of an operational voltage of 400 V up to PL e. For operation in a Safety Solution local application, it functions only in combination with the Safety local isolator module.

For operation in a Safety PROFIsafe application it functions only in combination with the F-Switch.

Functionality

Safety local isolator module

The Safety local isolator module features the same functions as a standard isolator module with an additional local safety function.

The Safety local isolator module contains a 3TK2841 module and is equipped with M12 terminals for the connection of external safety components.

Terminals 1 and 2 can be used to connect either one- or two-channel EMERGENCY STOP circuits or protective door circuits (IN 1, IN 2).

For monitored starts, an external START switch can be connected to terminal 3.

The required safety functions can be set using two slide switches located under the left M12 opening.

In the event of an EMERGENCY STOP, the Safety local isolator module trips the downstream 400 V disconnecting module. This safely separates the 400 V circuit up to PL e.

In combination with the 400 V disconnecting module, the Safety local isolator module can be used for safety applications up to PL e.

400 V disconnecting module

The 400 V disconnecting module can be used together with the Safety local isolator module for local safety applications and together with the F-Switch for PROFIsafe safety applications.

It contains two contactors connected in series for safety-related disconnection of the main circuit.

The auxiliary circuit supply of the device is over a safety power rail in the backplane bus module.

The 400 V disconnecting module can be used in conjunction with the Safety local isolator module or with the F-Switch for safety applications up to PL e.

Technical specifications

Type		Safety local isolator module	400 V disconnecting module
General data			
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters	mm	110 x 230 x 170	110 x 230 x 150
Permissible ambient temperature • During operation • During storage	 °C °C	 -25 ... +55 -40 ... +70	
Permissible mounting position		Any	
Vibration resistance acc. to IEC 60068, Part 2-6		2 *g*	
Shock resistance acc. to IEC 60068, Part 2-27		Half-sine 15 *g*/11 ms	
Power consumption • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	 mA	 Approx. 20 --	
Rated operational current I_e for power bus	A	25	
Rated operational voltage U_e	V	400 (50/60 Hz)	
Approval DIN VDE 0106, Part 101	V	Up to 500	
CSA and UL approval	V	Up to 600	
Conductor cross-sections Incoming power supply	 mm^2	 Max. 6 x 4	
Degree of protection		IP65	
Touch protection		Finger-safe	
Pollution degree		3, IEC 60664 (IEC 61131)	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated insulation voltage U_i	V	400	
Rated operational current I_e for starters • AC-1/2/3 at 40 °C - At 400 V - At 500 V	 A A	 16 16	 25 25
Rated short-circuit breaking capacity	kA	50 at 400 V	
Type of coordination acc. to IEC 60947-4-1		2	
Protective separation between main and auxiliary circuits	V	400, according to DIN VDE 0106, Part 101	
Operating times for 0.85 ... 1.1 x U_e • Closing delay • Opening delay	 ms ms	 -- --	 25 ... 100 7 ... 10
Device functions • Group diagnostics		Yes, parameterizable	
Device indications • Group fault		SF LED (red)	

Selection and ordering data

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Safety modules local						
3RK1304-0HS00-7AA0	**Safety local isolator module**[1)2)] Rated operational current 16 A	5	**3RK1304-0HS00-7AA0**		1	1 unit
3RK1304-0HS00-8AA0	**400 V disconnecting modules**[3)4)] Rated operational current 25 A	2	**3RK1304-0HS00-8AA0**		1	1 unit

1) The Safety local isolator module only functions when used together with the 400 V disconnecting module.

2) Only in combination with the special backplane bus module for the Safety local isolator module (see "Accessories for ET 200pro motor starters", page 6/39).

3) The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.

4) The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 6/39).

Overview

Safety Solution PROFIsafe

With the Safety PROFIsafe modules
- F-Switch and
- 400 V disconnecting module

with an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can be reached.

F-Switch PROFIsafe

Fail-safe digital inputs/outputs in degrees of protection IP65 to IP67 for near-machine, cabinet-free use.

Fail-safe digital inputs

- For the fail-safe reading in of sensor information (one-/two-channel)
- Including integrated discrepancy evaluation for 2v2 signals
- Internal sensor supplies (incl. testing) available

Fail-safe digital outputs

- Three fail-safe PP-switching outputs for safe switching of the backplane busbars

The F-Switch is certified up to SIL 3/PL e and has detailed diagnostics.

It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

Functionality

The PROFIsafe F-Switch is a fail-safe solid-state module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane busbars. In combination with the 400 V disconnecting module, fail-safe disconnection of ET 200pro motor starters is possible in PROFIsafe applications up to SIL 3/PL e.

400 V disconnecting module

See "Safety modules local", Overview, page 6/31 and Technical specifications, page 6/32.

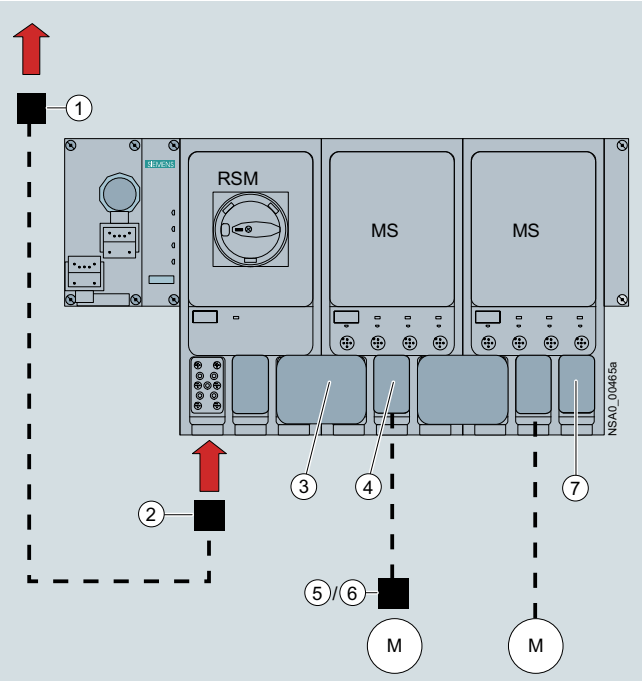
Selection and ordering data

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Safety modules PROFIsafe						
3RK1304-0HS00-8AA0	**400 V disconnecting modules**[1)2)]					
	Rated operational current 25 A	2	**3RK1304-0HS00-8AA0**		1	1 unit
6ES7148-1FS00-0AB0	**F-Switch PROFIsafe**					
	24 V DC, including bus module Note: Connection module must be ordered separately	1	**6ES7148-4FS00-0AB0**		1	1 unit
	Connection modules for F-Switch					
	24 V DC	1	**6ES7194-4DA00-0AA0**		1	1 unit

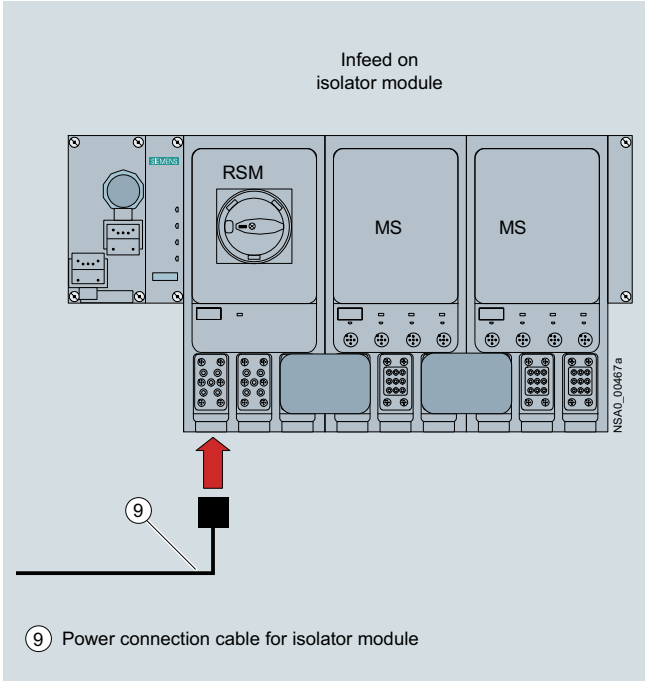
1) The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.

2) The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 6/39).

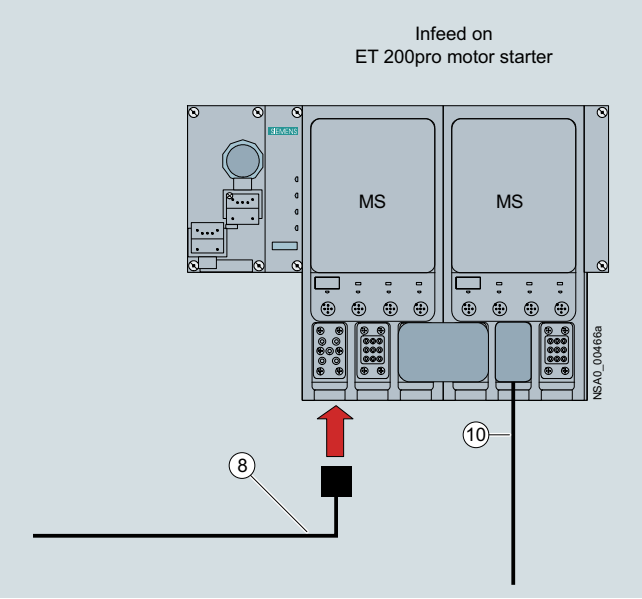
Overview



Basic design of an ET 200pro version with (from the left) connection module for IM, interface module for communication (IM), RSM isolator module, two ET 200pro motor starters (MS), and connections for energy



Infeed on the RSM isolator module



Infeed on the ET 200pro motor starter

Legend:

① Power feeder plug (see page 6/37)
② Power connection plug (see page 6/37)
③ Power jumper plug (see page 6/37)
④ Motor connection plug (see page 6/37)
⑤ Motor plug (see page 6/37)
⑥ Motor plug with EMC suppressor circuit (see page 6/37)
⑦ Power loop-through plug (see page 6/37)
⑧ Power connection cable (see page 6/37)
⑨ Power connection cable for isolator module (see page 6/37)
⑩ Motor cable (see page 6/38)

Power bus

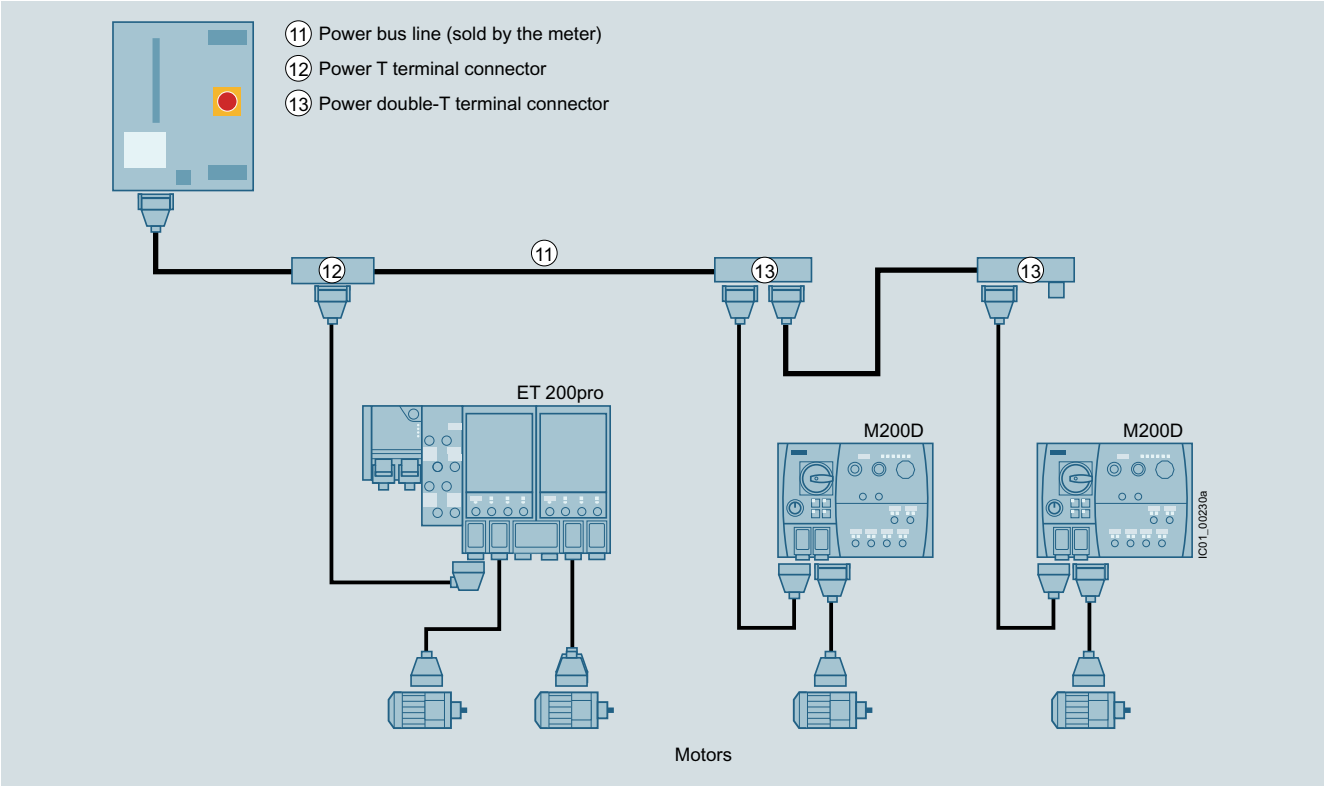
The power supply to the field devices (ET 200pro motor starters, M200D motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

Feeders

From the terminal connectors, spur lines with Han Q4/2 plugs lead to the field devices, from which the motors are supplied with power via motor connection cables.

Interruption-free thanks to power terminal connectors

In finger-safe connection technology the power T terminal connectors and power double-T terminal connectors connect the components of a feeder to the power bus. They ensure interruption-free operation, i.e. the power bus is not interrupted when the components are unplugged.



Power supply to the motors via the power bus with power T and double-T terminal connectors linked by power bus cables, spur lines to the field devices (motor starters), and power loop-through connections to the motors via motor connection cables

Motor control via PROFIBUS

The interface modules (IM) for PROFIBUS can be combined with three different connection modules for connecting PROFIBUS DP and the power supply:

- Direct connection with cable gland
- ECOFAST connection with hybrid fieldbus cables (with two copper cores for data transmission with PROFIBUS DP, and four copper cores for the power supply), and ECOFAST plugs (HanBrid)[1)]
- M12, 7/8" connection
  - with M12 connecting cable and M12 plugs for data transmission with PROFIBUS DP
  - with 7/8" connecting cable and 7/8" plugs for the power supply[2)]

For connection modules with the relevant accessories, see "Accessories for ET 200pro interface modules" in Catalog ST 70 or the Industry Mall.

Motor control via PROFINET

For connection modules with the relevant accessories, see "Accessories for ET 200pro interface modules" in Catalog ST 70 or the Industry Mall.

1) Hybrid fieldbus connections with HanBrid sockets designed as cabinet bushings transmit data and energy from the control cabinet (IP20) to the field (IP65). They are the interface for jointly routing PROFIBUS DP and the auxiliary voltages into the hybrid fieldbus cable (see page 6/66).

2) On the control cabinet bushings with two M12 sockets for the PROFIBUS M12 connecting cables (see page 6/66), the 24 V supply of the motor starters is implemented via separate 7/8" connecting cables.

Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
Incoming power supply					
① Power feeder plugs Connector set for incoming power supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for HAN Q4/2, incl. gland					
• 5 male contacts, 2.5 mm^2	5	**3RK1911-2BS60**		1	1 unit
• 5 male contacts, 4 mm^2	5	**3RK1911-2BS20**		1	1 unit
• 5 male contacts, 6 mm^2	5	**3RK1911-2BS40**		1	1 unit
② Power connection plugs Connector set for incoming power supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, female insert for HAN Q4/2, incl. gland					
• 5 female contacts, 2.5 mm^2	5	**3RK1911-2BE50**		1	1 unit
• 5 female contacts, 4 mm^2	5	**3RK1911-2BE10**		1	1 unit
• 5 female contacts, 6 mm^2	5	**3RK1911-2BE30**		1	1 unit
⑧ Power connection cables, assembled at one end Power connection cable for ET 200pro motor starters, open at one end, for HAN Q4/2, angular, 4 x 4 mm^2					
• Length 1.5 m	5	**3RK1911-0DB13**		1	1 unit
• Length 5.0 m	5	**3RK1911-0DB33**		1	1 unit
⑨ Power connection cables for isolator module, assembled at one end Power connection cable for ET 200pro isolator modules, open at one end, for HAN Q4/2, angular, insert turned at isolator module end, 4 x 4 mm^2					
• Length 1.5 m	30	**3RK1911-0DF13**		1	1 unit
• Length 5.0 m	30	**3RK1911-0DF33**		1	1 unit
Power loop-through on the field device					
③ Power jumper plugs	2	**3RK1922-2BQ00**		1	1 unit
⑦ Power loop-through plugs Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q4/2, incl. gland					
• 4 male contacts, 2.5 mm^2	5	**3RK1911-2BF50**		1	1 unit
• 4 male contacts, 4 mm^2	5	**3RK1911-2BF10**		1	1 unit
Motor cables					
④ Motor connection plugs Connector set for motor cable for connection to ET 200pro motor starters, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q8/0, incl. gland					
• 8 male contacts, 1.5 mm^2	5	**3RK1902-0CE00**		1	1 unit
• 6 male contacts, 2.5 mm^2	5	**3RK1902-0CC00**		1	1 unit
⑤ Motor plugs Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e, incl. star jumper, incl. gland					
• 7 female contacts, 1.5 mm^2	30	**3RK1911-2BM21**		1	1 set
• 7 female contacts, 2.5 mm^2	30	**3RK1911-2BM22**		1	1 set
⑥ Motor plugs with EMC suppressor circuit Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e with EMC suppressor circuit, incl. star jumper, incl. gland					
• 7 female contacts, 1.5 mm^2	30	**3RK1911-2BL21**		1	1 set
• 7 female contacts, 2.5 mm^2	30	**3RK1911-2BL22**		1	1 set

ET 200pro motor starter

Accessories

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Motor cables (continued)						
	⑩ **Motor cables, assembled at one end** Open at one end, HAN Q8, angular, length 5 m					
	• For motor without brake, for ET 200pro, 4 x 1.5 mm²	15	**3RK1911-0EB31**		1	1 unit
	• For motor with brake for ET 200pro, 6 x 1.5 mm²	30	**3RK1911-0ED31**		1	1 unit
	• For motor without brake, with thermistor, for ET 200pro, 6 x 1.5 mm²	30	**3RK1911-0EF31**		1	1 unit
	• For motor with brake and thermistor for ET 200pro, 8 x 1.5 mm²	30	**3RK1911-0EG31**		1	1 unit
Power bus						
	⑫ **Power T terminal connectors** For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments					
	• 2.5 mm²/4 mm²	5	**3RK1911-2BF01**		1	1 unit
	• 4 mm²/6 mm²	5	**3RK1911-2BF02**		1	1 unit
	⑬ **Power double-T terminal connectors** For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments, connection of two motor starters possible					
	• 4 mm²/6 mm²	5	**3RK1911-2BG02**		1	1 unit
	Sealing set (comprising 2 seals) For power T/power double-T terminal connectors					
	• For power cables with Ø 10 ... 13 mm	5	**3RK1911-5BA00**		1	1 unit
	• For power cables with Ø 13 ... 16 mm	5	**3RK1911-5BA10**		1	1 unit
	• For power cables with Ø 16 ... 19 mm	5	**3RK1911-5BA20**		1	1 unit
	• For power cables with Ø 19 ... 22 mm	X	**3RK1911-5BA30**		1	1 unit
	• Blanking plugs	5	**3RK1911-5BA50**		1	1 unit
Further accessories for power connections						
 3RK1902-0CW00	**Crimping tool** for pins/sockets, 4 mm² and 6 mm²	15	**3RK1902-0CW00**		1	1 unit
	Dismantling tools					
	• For male and female contacts for 9-pole HAN Q4/2 inserts	15	**3RK1902-0AB00**		1	1 unit
	• For male and female contacts for 9-pole HAN Q8 inserts	5	**3RK1902-0AJ00**		1	1 unit
 3RK1902-0CK00	**Sealing caps** For 9-pole power sockets					
	• 1 unit per pack	5	**3RK1902-0CK00**		1	1 unit
	• 10 units per pack	5	**3RK1902-0CJ00**		1	10 units

ET 200pro motor starter

Accessories

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Further accessories						
	Module racks, wide[1]					
	• Length 500 mm	1	**6ES7194-4GB00-0AA0**		1	1 unit
	• Length 1 000 mm	1	**6ES7194-4GB60-0AA0**		1	1 unit
	• Length 2 000 mm	1	**6ES7194-4GB20-0AA0**		1	1 unit
	Module racks, wide, compact[1]					
	• Length 500 mm	1	**6ES7194-4GD00-0AA0**		1	1 unit
	• Length 1 000 mm	1	**6ES7194-4GD10-0AA0**		1	1 unit
	• Length 2 000 mm	1	**6ES7194-4GD20-0AA0**		1	1 unit
	Backplane bus modules 110 mm[2]	2	**3RK1922-2BA00**		1	1 unit
	Backplane bus module for Safety local isolator modules	2	**3RK1922-2BA01**		1	1 unit
3RK1922-3BA00	**Handheld devices** For ET 200pro motor starters (or for ET 200S High Feature and M200D motor starters) for local operation. Notes: • The motor-starter-specific serial interface cables must be ordered separately. • The RS 232 interface cable 3RK1922-2BP00 is used for the MS ET 200pro.	5	**3RK1922-3BA00**		1	1 unit
	RS 232 interface cable Serial data connection between ET 200pro (or M200D) motor starters and the RS 232 interface of a PC/PG/laptop (with the Motor Starter ES software) or the handheld device 3RK1922-3BA00.	5	**3RK1922-2BP00**		1	1 unit
	USB interface cable, 2.5 m Serial data connection between ET 200pro (or M200D) motor starters and the USB interface of a PC/PG/laptop (with the Motor Starter ES software).	3	**6SL3555-0PA00-2AA0**		1	1 unit
3RK1901-1KA00	**M12 sealing caps** For sealing unused M12 input or output sockets (one set contains ten sealing caps)	►	**3RK1901-1KA00**		100	10 units
	Motor suppression module RC element for installation in motor terminal box					
3RK1911-6EA00	• Angular design	15	**3RK1911-6EA00**		1	1 unit
3RK1911-6EB00	• Round design	15	**3RK1911-6EB00**		1	1 unit

[1] The wide module rack can accommodate all ET 200pro motor starters and any optional modules (isolator module, Safety local isolator module and 400 V disconnecting module).

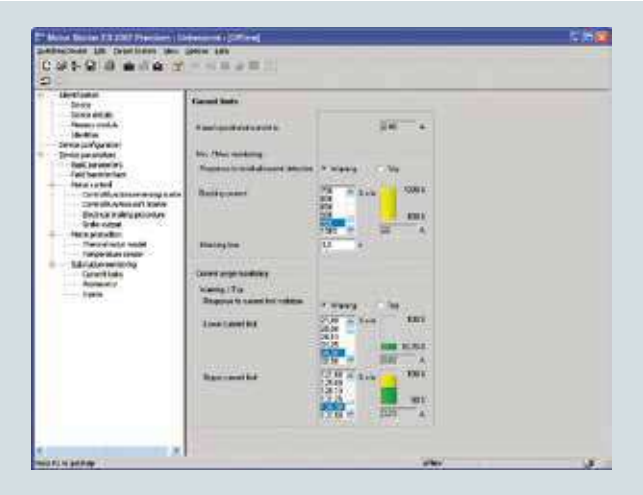
[2] The backplane bus module is a prerequisite for operation of the ET 200pro motor starter and the optional module.

For more connection technology products, see https://support.industry.siemens.com/cs/ww/en/view/65355810..

Motor starter ES

Software

Overview



Motor Starter ES for parameterization, monitoring, diagnostics and testing of motor starters

More information

Industry Mall, see www.siemens.com/product?3ZS1

Technical specifications and system requirements, see https://support.industry.siemens.com/cs/ww/en/ps/16713/td

Motor Starter ES is used for the startup, parameterization, diagnostics, documentation and preventive maintenance of SIMATIC ET 200S, ET 200pro, ECOFAST and M200D motor starters.

The software program is available in three versions which differ in their user-friendliness, scope of functions and price.

SIRIUS M200D motor starters

General data

Overview

SIRIUS M200D AS-i Basic motor starter with manual local operation

The intelligent and highly flexible SIRIUS M200D motor starters for distributed installation start, monitor and protect motors and loads up to 7.5 HP.

The M200D motor starters are available in four versions:

M200D AS-i Basic	M200D AS-i Standard	M200D PROFIBUS	M200D PROFINET
Motor control with AS-i communication		PROFIBUS	PROFINET
Mechanical or electronic switching			
✓	✓	✓	✓
Electronic switching with soft starter functionality			
--	✓	✓	✓

✓ Function available

-- Function not available

More information

Homepage, see www.siemens.com/motorstarter

Industry Mall, see www.siemens.com/product?M200D

TIA Selection Tool Cloud (TST Cloud), see https://www.siemens.com/tstcloud/?node=MS_M200D

Basic functionality

The versions of the M200D motor starter are equipped with the following properties and functions:

- Available as direct-on-line and reversing starters in a rugged design
- Electromechanical or electronic switching version
- Low variance – only two device versions up to 7.5 HP thanks to wide range setting
- All versions have the same enclosure size.
- Degree of protection IP65
- Quick and fail-safe wiring of system and motor cables using ISO 23570 plug-in connector technology (Q4/2 and Q8/0)
- Robust and widely used M12 connection method for digital inputs and outputs
- Integrated feeder connector monitoring
- Full motor protection through overload protection and a temperature sensor (PTC, TC)
- Short-circuit and overload protection integrated
- Integrated repair switch lockable with three locks (multi-level service)
- Uniform wiring to the SINAMICS G110D, SINAMICS G110M and SINAMICS G120D frequency inverters and to the ET 200pro distributed I/O system
- Extensive diagnostics concept using LEDs
- Optional integrated manual local control with key-operated switch (ordering option)
- Optionally available brake actuation with voltages from 180 V DC (no rectifier needed in motor) or 230/400 V AC (ordering options)

Article No. scheme

Product versions		Article number															
Motor starters		**3RK13**	**□**	**5**	**–**	**6**	**□**	**S**	**□**	**1**	**–**	**□**	**A**	**□**	**□**		
Type	AS-i Basic		**1**											**A**			
	AS-i Standard		**2**											**A**			
	PROFIBUS/PROFINET		**9**											**D**			
Setting range for rated operational current I_A	0.15 ... 2 A						**K**										
	1.5 ... 9 A						**N**										
	1.5 ... 12 A						**L**										
Starter version	Electromechanical starters								**4**							with integrated contactor	
	Electronic starters								**7**							with thyristors	
Product function	Direct-on-line starters											**0**					
	Reversing starters											**1**					
	Direct-on-line starters											**2**				with manual local operation	
	Reversing starters											**3**				with manual local operation	
Brake actuation	None														**0**		
	230/400 V AC														**3**		
	180 V DC														**5**		
Example		**3RK13**	**1**	**5**	**–**	**6**	**K**	**S**	**4**	**1**	**–**	**3**	**A**	**A**	**0**		

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 M200D motor starters

General data

Benefits

M200D motor starters provide the following advantages for customers:

- High plant availability through plug-in capability of the main circuit, communication and I/Os – relevant for installing and replacing devices
- Cabinet-free construction and near-motor installation thanks to the high degree of protection IP65
- The motor starters record the actual current flow for the parameterizable electronic motor overload protection. Reliable messages concerning the overshooting or undershooting of setpoint values ensure comprehensive motor protection. All motor protection functions can be defined by simple parameterization
- Low stock levels and low order costs thanks to a wide setting range for the electronic motor protection of 1:10 (only two device versions up to 7.5 HP)
- The integrated wide range for the current enables a single device to cover numerous standard motors of different sizes.
- Comprehensive offering of accessories, including ready-assembled cables
- The M200D motor starters can be installed with a few manual steps. The integrated plug-in technology enables far lower wiring outlay:
  Preassembled cables can be plugged directly onto the motor starter module.
- Easy and user-friendly installation because all versions have the same enclosure dimensions.
- Fast and user-friendly commissioning using optional manual local operation
- Increase of process speed through integrated functions such as "Quick Stop" and "Disable Quick Stop", e.g. at points and crossings
- Optional manual local control with momentary-contact and latching operation for easier startup and easier servicing

Application

The high degree of protection IP65 makes the M200D motor starters suitable in particular for use on extensive conveying systems such as are found in mail sorting centers, airports, automotive factories and the packing industry.

For simple drive tasks, particularly in conveyor applications, the new SINAMICS G110D frequency inverter series with a performance range from 0.75kW to 7.5kW (1.0 to 10 HP) and degree of protection IP65 is the ideal partner for the M200D motor starters.

SINAMICS G110D converters allow for stepless speed control of three-phase asynchronous motors and comply with the requirements for materials handling applications with frequency control.

For simple drive tasks in conveyor applications in which a frequency inverter integrated into the motor is required, the SINAMICS G110M frequency inverter with a performance range from 0.37 kW to 4 kW and degree of protection IP65/66 is the ideal partner. The SINAMICS G110M is available individually as a frequency converter for self-assembly and pre-mounted on SIMOGEAR geared motors, and with its conveyor-specific functions it satisfies the requirements of conveyor technology applications.

Use of SIRIUS M200D motor starters in conjunction with IE3/IE4 motors

Note:

For the use of SIRIUS M200D motor starters in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see Application Manual.

Overview

For motor control using AS-Interface there are the following M200D motor starter versions: SIRIUS M200D AS-i Basic and SIRIUS M200D AS-i Standard (basic functionality, see page 16/41 "SIRIUS M200D Motor Starters" → "General data" → "Overview").

SIRIUS M200D AS-i Basic

Functionality

- Easy and fast on-site startup through parameterization of local setting knobs (DIP switches) and rotary coding switches for adjusting the rated operational current. The rotary coding switch has an OFF position for deactivating the overload protection with the help of the thermal motor model when using a temperature sensor.

Communications

- AS-i communication with A/B addressing according to Spec V2.1
- The AS-i bus is connected cost-effectively using an M12 connection on the device. Of the four digital inputs, two are contained in the process image and can therefore be used in the PLC program. The other two inputs are locally effective and permanently assigned with functions.
- The LEDs can provide comprehensive diagnostics of the device on the spot. In addition to diagnostics using the PAE process image, the device can create up to 15 different diagnostic signals per slave. The message with the highest priority can be read out through the AS-i communication. This is yet another new development which distinguishes the M200D AS-i Basic motor starter from the rest of the market and adds innovative technology, maximum availability and transparency to the system.

SIRIUS M200D AS-i Standard

The intelligent and highly flexible M200D AS-i Standard motor starter in A/B technology starts and protects motors and loads up to 5.5 kW. They are available in direct-on-line or reversing starter versions, in a mechanical version and also an electronic version (the latter with soft start function).

The M200D AS-i Standard motor starter is the most functional member of the SIRIUS motor starter family in the high degree of protection IP65 for AS-i communication. Consistency with other products of the SIRIUS M200D motor starter range and with the frequency converter and ET 200pro I/O system is assured.

Functionality

- AS-i communication with A/B addressing according to Spec 3.0
- Electronic version also with soft start function
- AS-i slave profile 7AE/7A5 with process image 6E/4A
- Full TIA integration: All digital inputs and outputs exist in the cyclic process image and are visible through AS-i, providing maximum flexibility and best adaptability to the application.
- Additionally expanded diagnostics using data record through AS-i bus
- Complete plant monitoring using statistics data record and current value monitoring by means of data records
- Parameterization through AS-i bus with the help of data records or an expanded process image from the user program
- Control of the motor starter using a command data record from the user program
- Flexible assignment of the digital inputs and outputs with all available assignable input actions
- Parameterization using Motor Starter ES at the local interface (ordering option for startup software)
- Diagnostics with the help of Motor Starter ES (ordering option for startup software)

Mounting and installation

The M200D motor starters can be installed with a few manual steps. The integrated plug-in technology enables far lower wiring outlay. Connecting cables can be plugged directly onto the motor starter module. Swapping of the connecting wires and malfunctions within the plant are prevented by preassembled cables. The AS-i bus is connected cost-effectively using an M12 connection on the device. All versions have identical enclosure dimensions for easier system design and conversion.

Parameterization and configuration

The particularly robust M200D AS-i Standard motor starter is characterized by numerous functions which can be flexibly parameterized. It enables highly flexible parameterization through the AS-i bus using data records from the user program as well as user-friendly local parameterization using the Motor Starter ES startup software through the local point-to-point interface.

Functions can be flexibly assigned to the digital inputs and outputs, adapting them to all possible conveyor applications. All motor protection functions, limit values and reactions can be defined by parameterization. The AS-i Standard is unique. In its 6E/4A process image the motor starter sends all four digital inputs and the digital output via the process image to the PLC in cyclic mode. System configuration and system documentation are facilitated not least by a number of CAX data.

Operation

The new generation of motor starters is characterized by its advanced functionality, maximum flexibility and extremely high degree of automation.

All digital inputs and outputs exist in the cyclic process image. All limit values for monitoring functions and their reactions are parameterizable and therefore adaptable to the application. The motor starters record the actual current flow. Evaluating the current of the parameterizable solid-state overload protection increases the availability of the drives, as do reliable messages concerning the overshooting or undershooting of setpoint values.

Diagnostics and maintenance

The M200D sets new standards for diagnostics. In addition to diagnostics using the PAE process image and diagnostics by "parameter echo" (up to 15 different diagnostic signals per slave can be read out via AS-i communication), the possibility of reading out diagnostic data records is unique on the market.

The AS-i Standard is recommended in particular for expansive and highly automated system components because the possibility of monitoring devices and systems with data records (statistical data, measured values and device diagnostics) provides an in-depth view of the plant from the control room, guaranteeing the monitoring process and increasing plant availability.

Preventive maintenance can be carried out with the integrated maintenance timer and plant downtimes prevented as a result in advance.

Local control of a drive is possible using the ordering option with integrated manual operation. This is yet another new development which distinguishes the M200D AS-i Standard motor starter from the rest of the market and adds innovative technology, maximum availability and transparency to the plant.

SIRIUS M200D motor starters for AS-Interface

General data

	SIRIUS M200D AS-i Basic	**SIRIUS M200D AS-i Standard**
Device functions (firmware features)		
Slave on the bus		
Fieldbus	✓ AS-i	
Slave type	✓ A/B acc. to Spec 2.1	✓ A/B acc. to Spec 3.0
Profile	✓ 7.A.E	✓ 7.A.E & 7.A.5
Number of assigned AS-i addresses on the bus	✓ 1	✓ 2
Number of stations per AS-i master	✓ Max. 62 devices	✓ Max. 31 devices
AS-i master profile	✓ M3 and higher	✓ M4 and higher
Parameter assignment		
DIP switches	✓	--
Potentiometer for rated operational current	✓	--
Motor Starter ES	--	✓
Data records through AS-i	--	✓
Diagnostics		
Diagnostics through parameter channel	✓	
Acyclic through data records	--	✓
Expanded process image PAE 4 bytes	--	✓
Process image		
Process image	✓ 4E/3A	✓ 6E/4A
Data channels		
Local optical interface (manual local)	✓	
AS-i bus	✓	
Motor Starter ES through local interface	--	✓
Motor Starter ES through bus	--	
Data records[1] (acyclic)		
Parameter assignment	--	✓
Diagnostics	--	✓
Measured values	--	✓
Statistics	--	✓
Commands	--	✓
Inputs		
Number	✓ 4	
• Of these in the process image	✓ 2 through AS-i	✓ 4 through AS-i
Input action	✓ For permanently assigned functions, see manual	✓ Parameterizable: flexible
Quick stop	✓ Permanent function: latching, edge-triggered	✓ Parameterizable function: latching (edge-triggered), non-latching (level-triggered)
Outputs		
Number	✓ 1	
Output action	✓ Permanent function: assigned with group fault	✓ Parameterizable: For function, see manual
Brake output		
180 V DC / 230/400 V AC / none	✓	
Motor protection		
Overload protection	✓ Electronic, wide range 1:10	
Short-circuit protection	✓	
Full motor protection	✓	
Temperature sensor	✓ Parameterizable using DIP switches: PTC or Thermoclick or deactivated	✓ Parameterizable via Motor Starter ES, data record: PTC or Thermoclick or deactivated

✓ Function available

-- Function not available

[1] The data records are a reduced selection compared with PROFIBUS/PROFINET.

SIRIUS M200D motor starters for AS-Interface

General data

	SIRIUS M200D AS-i Basic	**SIRIUS M200D AS-i Standard**
Device functions (firmware features) (continued)		
Device function		
Repair switch	✓	
Current limit monitoring bottom	--	✓ Parameterizable
Current limit monitoring top	--	✓ Parameterizable
Zero current detection	✓ Permanent function: disconnection, less than 18.75% of the rated operational current I_e	✓ Parameterizable
Blocking current	✓ Permanent function: starting up of the motor: Tripping limit up to 800% of the rated operational current I_e for 10 s Active operation: Threshold for tripping "blocking current" up to 400% of the rated operational current I_e	✓ Parameterizable
Asymmetry	✓ Permanent function: up to 30% of the rated operational current I_e (only mechanical MS)	✓ Parameterizable
Load type	✓ Permanent function: Three-phase	✓ Parameterizable: single-phase and three-phase
Shutdown class	✓ Parameterizable using DIP switches: CLASS 10/deactivated	Parameterizable via Motor Starter ES, data record: CLASS 5, 10, 15, 20
Protection against voltage failure	✓	✓ Parameterizable: activated/deactivated
Soft starter control function		
Soft start function	--	✓ Only solid-state version
Bypass function	--	✓ Only solid-state version

✓ Function available
-- Function not available

Application

The M200D AS-i standard is particularly suitable for highly automated applications in conveyor systems requiring devices and systems to be monitored to prevent or limit plant downtime. The option of planning the functions of the motor starter or its interfaces also creates the prerequisite for fine-adjustment to the function of the motor starter in the application and hence provides for extreme flexibility.

Use of M200D motor starters in conjunction with IE3/IE4 motors

Note:

For the use of SIRIUS M200D motor starters in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring,; see Application Manual.

Technical specifications

More information	
Manuals for SIRIUS M200D: • AS-i Basic, see https://support.industry.siemens.com/cs/ww/en/view/35016496 • AS-i Standard, see https://support.industry.siemens.com/cs/ww/en/view/38722160 FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16324/faq	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 the subject of Industrial Security, see www.siemens.com/industrialsecurity.

SIRIUS M200D motor starters for AS-Interface

General data

Type		M200D motor starters			
		AS-i Basic electromechanical switching	AS-i Basic electronic switching	AS-i Standard electromechanical switching	AS-i Standard electronic switching
Technology designation[1]		DSte/RSte	sDSte/sRSte	DSte/RSte	sDSSte/sRSSte
Mechanics and environment					
Mounting dimensions (W x H x D)	mm	294 x 215 x 159			
Permissible ambient temperature					
• During operation	°C	-25 ... +55			
• During storage	°C	-40 ... +70			
Weight	g	2 880/3 130	3 220/3 420	2 880/3 130	3 220/3 420
Permissible mounting position		Vertical, horizontal, lying			
Vibration resistance acc. to IEC 60068 Part 2-6	*g*	2			
Shock resistance					
• Acc. to IEC 60068 Part 2-27	*g*/ms	12/11 half-sine			
• Without influencing the contact position	*g*/ms	9.8/5 or 5.9/10			
Degree of protection acc. to IEC 529		IP65			
Installation altitude					
• Up to 1 000 m		No derating			
• Up to 2 000 m		1% per 100 m			
Cooling		Convection			
Protection class IEC 536 (VDE 0106-1)		1			
Electrical specifications					
Control circuit					
Operating voltage $U_{As\text{-}i}$	V DC	26.5 ... 31.6			
Supply voltage U_{aux}	V DC	20.4 ... 28.8			
Power consumption from AS-i (incl. 200 mA sensor supply)	mA	< 300			
Current consumption from U_{aux} (without digital output)					
• Max.	mA	155	15 (direct-on-line)/ 175 (reversing)	155	15 (direct-on-line)/ 175 (reversing)
• Typ.	mA	75	10 (direct-on-line)/ 75 (reversing)	75	10 (direct-on-line)/ 75 (reversing)
Main circuit					
Maximum power of three-phase motors at 600 V AC	HP	Up to 10 max			
Rated operational voltage U_e					
• Approval acc. to EN 60947-1	V AC	400 (50/60 Hz)			
• Approval acc. to UL and CSA	V AC	600 (50/60 Hz)	480 (50/60 Hz)	600 (50/60 Hz)	480 (50/60 Hz)
• Rated operational current range	A	0.15 ... 2/1.5 ... 12	--	0.15 ... 2/1.5 ... 12	--
• Rated operational current range for soft starting	A	--			0.15 ... 2/1.5 ... 12
• Rated operational current range for direct-on-line starting	A	--	0.15 ... 2/1.5 ... 9	--	0.15 ... 2/1.5 ... 9
Rated operational current for starters I_e at 400 V AC					
• 400 V at AC-1/2/3	A	12	--	12	--
• 500 V at AC-1/2/3	A	9	--	9	--
• 400 V at AC-4	A	4	--	4	--
• 400 V at AC-53a	A	--	9	--	12 for soft starting 9 for direct-on-line starting
Mechanical endurance of contactor	Operating cycles	30 million	--	30 million	--
Trip class		CLASS 10		CLASS 5, 10, 15, 20	
Type of coordination acc. to IEC 60947-4-1		1 (2 for device version 2A)	1	1 (2 for device version 2A)	1
Permissible switching frequency		see manual		see manual	
Rated ultimate short-circuit breaking capacity I_q					
• At 400 V AC	kA	50			
• At 500 V AC	kA	50[2]	20[2]	50	20[2]
Short-circuit protection					
• At I_{emax} = 2 A		Integrated, 2 x13 I_e = 26 A			
• At I_{emax} = 9/12 A		Integrated, 2 x13 I_e = 208 A			
Brake actuation (option)					
Operational voltage	V	230/400 AC or 180 DC			
Uninterrupted current	A	< 0.5 at 230/400 V AC < 0.8 at 180 V DC			
Short-circuit protection		Yes, 1 A melting fuse			

[1] DS .... Direct-on-line starters
RS .... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
te ..... Full motor protection (thermal + electronic)
s ..... Electronic switching with semiconductor.

[2] Only systems with grounded neutral point permitted.

SIRIUS M200D motor starters for AS-Interface

Basic motor starter *IE3/IE4* ready

Selection and ordering data

M200D AS-i Basic without manual local operation

M200D AS-i Basic with manual local operation

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
Electromechanical starters (with integrated contactor)					
	15	**3RK1315-6□S41-□AA□**		1	1 unit
Rated operational current setting range/A			Additional price		
• 0.15 ... 2		**K**	None		
• 1.5 ... 12		**L**	✓		
Direct-on-line starters/reversing starters					
• Direct-on-line starters		**0**	None		
• Reversing starters		**1**	✓		
• Direct-on-line starters with manual local operation		**2**	✓		
• Reversing starters with manual local operation		**3**	✓		
Brake actuation					
• Without brake actuation		**0**	None		
• Brake actuation (230/400 V AC)		**3**	✓		
• Brake actuation (180 V DC)		**5**	✓		
Electronic starters (with thyristors)					
	15	**3RK1315-6□S71-□AA□**		1	1 unit
Rated operational current setting range/A			Additional price		
• 0.15 ... 2		**K**	None		
• 1.5 ... 9		**N**	✓		
Direct-on-line starters/reversing starters					
• Direct-on-line starters		**0**	None		
• Reversing starters		**1**	✓		
• Direct-on-line starters with manual local operation		**2**	✓		
• Reversing starters with manual local operation		**3**	✓		
Brake actuation					
• Without brake actuation		**0**	None		
• Brake actuation (230/400 V AC)		**3**	✓		
• Brake actuation (180 V DC)		**5**	✓		

✓ = Additional price

SIRIUS M200D motor starters for AS-Interface

Standard motor starter *IE3/IE4* ready

Selection and ordering data

M200D AS-i Standard without manual local operation

M200D AS-i Standard with manual local operation

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
Electromechanical starters (with integrated contactor)					
	15	**3RK1325-6□S41-□AA□**		1	1 unit
Rated operational current setting range/A			Additional price		
• 0.15 ... 2		**K**	None		
• 1.5 ... 12		**L**	✓		
Direct-on-line starters/reversing starters					
• Direct-on-line starters		**0**	None		
• Reversing starters		**1**	✓		
• Direct-on-line starters with manual local operation		**2**	✓		
• Reversing starters with manual local operation		**3**	✓		
Brake actuation					
• Without brake actuation		**0**	None		
• Brake actuation (230/400 V AC)		**3**	✓		
• Brake actuation (180 V DC)		**5**	✓		
Electronic starters (with thyristors)					
	15	**3RK1325-6□S71-□AA□**		1	1 unit
Rated operational current setting range/A			Additional price		
• 0.15 ... 2		**K**	None		
• 1.5 ... 12		**L**	✓		
Direct-on-line starters/reversing starters					
• Direct-on-line starters		**0**	None		
• Reversing starters		**1**	✓		
• Direct-on-line starters with manual local operation		**2**	✓		
• Reversing starters with manual local operation		**3**	✓		
Brake actuation					
• Without brake actuation		**0**	None		
• Brake actuation (230/400 V AC)		**3**	✓		
• Brake actuation (180 V DC)		**5**	✓		

✓ = Additional price

SIRIUS M200D motor starters for PROFIBUS/PROFINET

General data

Overview

The intelligent, highly flexible M200D PROFIBUS/PROFINET motor starters are the most functional motor starters of the SIRIUS motor starter family in the high degree of protection IP65 for PROFIBUS/PROFINET communication.

They start and protect motors and loads up to 7.5 HP. Direct-on-line and reversing starter versions are available, in a mechanical version and also an electronic version (the latter with soft start function).

The particularly robust M200D PROFIBUS/PROFINET motor starters are characterized by numerous functions which can be flexibly parameterized. Their modular design comprises a motor starter module and a communication module.

The M200D PROFINET motor starters enable TIA-integrated parameterization through PROFINET from STEP 7 – in familiar, user-friendly manner with the look and feel of PROFIBUS.

Functionality

- For basic functionality, see page 16/41 "SIRIUS M200D Motor Starters" → "General data" → "Overview"
- Electronic version also with soft start function
- Robust and widely used M12 connection method for the digital inputs and outputs and the PROFIBUS/PROFINET bus connection
- All four digital inputs and two digital outputs exist in the cyclic process image. This provides complete transparency of the process on the control level
- Full TIA integration: All digital inputs and outputs exist in the cyclic process image and are visible through the bus, providing maximum flexibility and excellent adaptability to the application
- Flexible assignment of the digital inputs and outputs with all available assignable input actions
- Extensive diagnostics concept using LEDs and through the bus with the TIA-compatible mechanisms
- Expanded diagnostics using data records
- Complete plant monitoring using statistics data record and current value monitoring by means of data records
- Parameterization through PROFIBUS/PROFINET bus with the help of data records from the user program
- Control of the motor starter using a command data record from the user program
- Removable modular control unit – quicker device replacement and therefore lower costs when device outages occur – since existing wiring is on the control unit and only one device needs to be replaced
- Parameterization in STEP 7 HW Config using Motor Starter ES (ordering option for startup software)
- Startup and diagnostics with the help of Motor Starter ES (ordering option for startup software)
- Trace function through Motor Starter ES for optimized startup and tracking of process and device values

Only with PROFINET:

- Just one bus system from the MES level to the devices – no routers
- More stations on the bus and possible configuration of flexible bus structures
- Automatic re-parameterization in case of device replacement thanks to proximity detection
- Wireless integration of plant segments in difficult environments using WLAN
- Easier expansion of the system thanks to a higher number of stations on the bus and elimination of terminating resistors

M200D motor starter module for PROFIBUS/PROFINET (without communication module)

M200D communication module for PROFIBUS

M200D communication module for PROFINET

Mounting and installation

The M200D PROFIBUS/PROFINET motor starter is comprised of the communication module and the motor starter module. Only the motor starter module has to be replaced therefore when replacing devices. This saves time and money. The communication module remains as an active station on the bus and all other system components continue running. This prevents downtimes.

The integrated plug-in technology enables far lower wiring outlay: Connecting cables can be plugged directly onto the motor starter module. The PROFINET bus is connected cost-effectively using an M12 connection on the device. All versions have identical enclosure dimensions for easier system design and conversion.

Parameterization and configuration

All motor protection functions, limit values and reactions can be defined by parameterization.

The user has several user-friendly options for the parameterization. In addition to parameterization directly from STEP 7, which also permits automatic re-parameterization in case of device replacement, it is possible to use the user-friendly Motor Starter ES startup software. By connecting a programming device directly to PROFIBUS/PROFINET and the Motor Starter ES startup software, the devices can also be conveniently programmed from a central point through the bus. Also, parameters can be changed during operation from the user program using the data record mechanism so that the function of the motor starter is adapted to the process when required. With the help of a PC and the Motor Starter ES software it is also possible to perform the parameterization through the local point-to-point interface on-site.

Functions can be flexibly assigned to the digital inputs and outputs, adapting them to all possible conveyor applications. All digital inputs and outputs exist in the cyclic process image. All limit values for monitoring functions and their reactions are parameterizable and therefore adaptable to the application. Consistency with other products of the SIRIUS M200D motor starter range and with the frequency converter and ET 200pro I/O system is assured.

Only with M200D PROFINET motor starters

Thanks to the integrated proximity detection, the device name does not need to be issued manually when a device is replaced. The name is issued automatically by the neighboring devices which note the "names" of the devices in their proximity.
No additional startup measures are required therefore when replacing a device.

The new motor starter generation is characterized by high functionality, maximum flexibility and the highest level of automation. PROFINET is especially recommended for large-scale and highly automated system components, since the possibility of monitoring the devices or plants with data records (statistical data, measured values and device diagnostics) ensures a broader insight into the plant by the control room, and hence increases the availability of the plant sustainably.

Operation

The motor starters record the actual current flow. Evaluating the current of the parameterizable solid-state overload protection increases the availability of the drives, as do reliable signals concerning the overshooting or undershooting of setpoint values.

Diagnostics and maintenance

Diagnostics is provided through numerous mechanisms – and can be used as the customer prefers.

The motor starter is TIA-diagnostics compatible, which means that when a fault is identified, a diagnostics alarm is distributed, which invokes the diagnostics OB in the case of a SIMATIC control. The fault can be evaluated as usual in the user program.

The M200D motor starter offers a large variety of diagnostics data through data records. Its functionality is without equal on the market. There are extensive options for reading out data from the motor starter for monitoring devices, systems or processes.

The motor starter is equipped internally with three logbooks for device faults, motor starter trips and events that are issued with a time stamp. These logbooks can be read out of the motor starter at any time in the form of data records and provide the plant operator with plenty of information about the state of his plant and process which he can use to carry out improvements.

With the slave pointer and statistical data functions it is possible to read out, for example, the maximum internal current values or the number of motor starter connection operations for plant monitoring purposes. This allows deviations in the process to be monitored, but also optimum initial commissioning to take place. The user can draw conclusions about the actual load conditions of the devices in his process and on this basis can optimize his plant maintenance intervals.

The device diagnostics data record contains details of all the states of the motor starter, the device configuration and the communication status as a basis for central device and plant monitoring.

With installation and maintenance functions (I&M), information on modules employed and data specified by the user during configuration, such as location designations, are stored in the motor starter. I&M functions are used for troubleshooting faults and localizing changes in hardware in a plant or checking the system configuration. Reordering a device is particularly easy as the result.

The integrated maintenance timer can be used to implement preventative maintenance and avoid plant downtimes through look-ahead servicing.

Another new addition is the TRACE integrated into the Motor Starter ES software. It can be used to record measured values as a function of time following a trigger event. This enables process flows to be recorded and their timing optimized.

Local control of a drive is possible using the ordering option with integrated manual operation. This is yet another new development which distinguishes the M200D PROFIBUS/PROFINET motor starter from the rest of the market and adds innovative technology, maximum availability and transparency to the system.

M200D PROFINET motor starters with PROFIenergy

Increasing energy prices, far-reaching ecological problems worldwide and the threat of climate change make it necessary for you to be more conscious about your use of energy.

Active and effective energy management is possible with PROFIenergy.

PROFIenergy is a manufacturer-independent profile on PROFINET, which can be used by all manufacturers, has been standardized by PNO[1)] and supports switching off electrical devices during dead times and measuring the energy flow.

[1)] In the PNO (PROFIBUS Nutzerorganisation e. V. – PROFIBUS User Organization), manufacturers and users have come together to agree on the PROFIBUS and PROFINET standardized communication technologies.

SIRIUS M200D motor starters for PROFIBUS/PROFINET

General data

Switching off during dead times

PROFIenergy supports the targeted switching-off of loads during dead time.

These can be planned short breaks of a few minutes (such as lunch breaks), longer dead times (such as nights) or unplanned dead times. Energy is always saved when no power is required.

Measuring and visualizing the energy flow as a basis of energy management

The objective of energy management is to optimize the use of energy in a company – from the purchasing of energy through to the consumption of energy – economically and ecologically.

Analyses of energy consumption over time can be used to control energy flows, avoid energy peaks, improve ratings and thus save costs.

PROFIenergy enables consumption data to be read off from the devices in a unified form. This is recorded during operation and can be displayed on a control panel, for example, or sent to overlying energy management software packages. This ensures that the measured variables are in a uniform manufacturer-independent form and structure that is available to the user for further processing. These PROFIenergy functions thus provide the basis for active load and energy management during operation.

PROFIenergy in the M200D PROFINET motor starter

The M200D PROFINET motor starter supports the "switching during dead times" and "current measurement values" functions of the motor current using PROFIenergy. These are called commands, because they trigger a reaction in the M200D motor starter.

	SIRIUS M200D PROFIBUS	SIRIUS M200D PROFINET
Device functions (firmware features)		
Slave on the bus		
Fieldbus	✓ PROFIBUS to M12	✓ PROFINET to M12
Adjustable number of stations	✓ 1 ... 125	✓ 1 ... 128 with CPU 315, CPU 317 1 ... 1 256 with CPU 319
Parameter assignment		
DIP switches	✓ For address setting and terminating resistor	--
Motor Starter ES	✓ Through bus, optical interface	
PROFIBUS/PROFINET data records	✓	
From STEP 7/HW Config	✓	
Diagnostics		
Acyclic through data records	✓	
Diagnostic interrupt support	✓	
Process image		
Process image	✓ 2 bytes PAE/2 bytes PAA	
Data channels		
Local optical interface (manual local)	✓	
Motor Starter ES through local interface	✓	
Using Motor Starter ES through bus	✓	
Data records (acyclic)		
Parameter assignment	✓ Using DS 131 (DS = data record)	
Diagnostics	✓ Device-specific DS 92	
Measured values	✓ Measured values DS 94	
Statistics	✓ Statistical data DS 95	
Commands	✓ Using DS 93	
Slave pointer	✓ Slave pointer DS 96	
Logbook	✓ Using Motor Starter ES and data records: device faults DS 72, tripping operation DS 73, events DS 75	
Device identification	✓ Using DS 100	
I&M data	✓ Using DS 231 ... 234	✓ Using data records 0xAFF0 ... 0xAFF3
Inputs		
Number	✓ 4	
• Of these in the process image	✓ 4	
Input action	✓ Parameterizable: For flexibly assignable action, see manual	
Quick stop	✓ Parameterizable: latching, non-latching	

✓ Function available
-- Function not available

SIRIUS M200D motor starters for PROFIBUS/PROFINET

General data

	SIRIUS M200D PROFIBUS	SIRIUS M200D PROFINET
Device functions (firmware features) (continued)		
Outputs		
Number	✓ 2	
• Of these in the process image	✓ 2	
Output action	✓ Parameterizable: For flexibly assignable action, see manual	
Brake output		
180 V DC / 230/400 V AC / none	✓	
Motor protection		
Overload protection	✓ Electronic, wide range 1:10	
Short-circuit protection	✓	
Full motor protection	✓	
Temperature sensor	✓ Parameterizable via Motor Starter ES, data record: PTC or Thermoclick or deactivated	
Device function		
Repair switch	✓	
Current limit monitoring bottom	✓ Parameterizable	
Current limit monitoring top	✓ Parameterizable	
Zero current detection	✓ Parameterizable: tripping, warning	
Blocking current	✓ Parameterizable	
Asymmetry	✓ Parameterizable	
Load type	✓ Parameterizable: single-phase and three-phase	
Shutdown class	✓ Parameterizable via Motor Starter ES, data record: CLASS 5, 10, 15, 20	
Protection against voltage failure	✓ Parameterizable: activated/deactivated	
Support for PROFIenergy profile		
Switching during dead times	--	3
Measured motor current values	--	3
Soft starter control function		
Soft start function	✓	
Bypass function	✓ Only solid-state version	

✓ Function available
-- Function not available

Benefits

M200D PROFINET motor starters with PROFIenergy

Both standards and laws are making environmental protection and energy management increasingly important, as is the desire to cut energy costs in production facilities and thus ensure a sustainable competitive advantage.

It is thus an objective within the industry to save energy and actively reduce CO_2 emissions. By the careful use of valuable resources, the manufacturer-independent PROFIenergy profile on PROFINET can make an active contribution to environmental protection.

Application

M200D PROFIBUS/PROFINET motor starters are particularly suitable for fully TIA-integrated, highly automated conveyor applications that meet all needs with regard to the monitoring of devices and systems and preventive maintenance.

Adaptability of the motor starter functions and maximum flexibility of the device enable a broad range of application without any limits. The PROFINET-specific expansions are the best assurance of a future-proof investment.

SIRIUS M200D motor starters for PROFIBUS/PROFINET

General data

Technical specifications

More information	
Equipment Manual for M200D PROFIBUS/PROFINET, see https://support.industry.siemens.com/cs/ww/en/view/38823402 FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16325/faq	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 the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Type		M200D PROFIBUS/PROFINET motor starter modules	
		Electromechanical switching	Electronic switching
Technology designation[1]		DSte/RSte	sDSSte/sRSSte
Mechanics and environment			
Mounting dimensions (W x H x D)			
• Without communication module	mm	294 x 215 x 159	
• With communication module	mm	295 x 215 x 163	
Permissible ambient temperature			
• During operation	°C	-25 ... +55	
• During storage	°C	-40 ... +70	
Weight	g	2 820/3 080	3 160/3 360
Permissible mounting position		Vertical, horizontal, lying	
Vibration resistance acc. to IEC 60068 Part 2-6	*g*	2	
Shock resistance			
• Acc. to IEC 60068 Part 2-27	*g*/ms	12/11 half-sine	
• Without influencing the contact position	*g*/ms	9.8/5 or 5.9/10	
Degree of protection acc. to IEC 529		IP65	
Installation altitude			
• Up to 1 000 m		No derating	
• Up to 2 000 m		1% per 100 m	
Cooling		Convection	
Protection class IEC 536 (VDE 0106-1)		1	
Electrical specifications			
Main circuit			
Maximum power of three-phase motors at 600 V AC	HP	10	
Rated operational voltage U_e			
• Approval acc. to EN 60947-1	V AC	400 (50/60 Hz)	
• Approval acc. to UL and CSA	V AC	600 (50/60 Hz)	480 (50/60 Hz)
• Rated operational current range	A	0.15 ... 2/1.5 ... 12	--
• Rated operational current range for soft starting	A	--	0.15 ... 2/1.5 ... 12
• Rated operational current range for direct-on-line starting	A	--	0.15 ... 2/1.5 ... 9
Rated operational current for starters I_e at 400 V AC			
• 400 V at AC-1/2/3	A	12	--
• 500 V at AC-1/2/3	A	9	--
• 400 V at AC-4	A	4	--
• 400 V at AC-53a	A	--	12 for soft starting, 9 for direct-on-line starting
Mechanical endurance of contactor	Operating cycles	30 million	--
Trip class		CLASS 5, 10, 15, 20	
Permissible switching frequency		see manual	
Rated ultimate short-circuit breaking capacity I_q			
• At 400 V AC	kA	50	
• At 500 V AC	kA	50	20[2]
Short-circuit protection			
• At I_{emax} = 2 A		Integrated, 2 x13 I_e = 26 A	
• At I_{emax} = 9 /12 A		Integrated, 2 x13 I_e = 208 A	

1) DS .... Direct-on-line starters
RS .... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
te ..... Full motor protection (thermal + electronic)
s ..... Electronic switching with semiconductor.

2) Only systems with grounded neutral point permitted.

SIRIUS M200D motor starters for PROFIBUS/PROFINET

General data

		Line voltage				
		380 V AC	400 V AC	440 V AC	480 V AC	500 V AC
Brake voltage with brake actuation 180 V DC[1)]						
Operational voltage	V	230/400 AC or 180 DC				
Uninterrupted current	A	< 0.5 at 230/400 V AC, < 0.8 at 180 V DC				
Short-circuit protection		Yes, 1 A melting fuse				
Rectified brake voltage	V DC	171	180	198	216	225
Recommended brake coil voltage for Siemens motors	V DC	170 ... 200	170 ... 200	184 ... 218	184 ... 218	--

1) Integrated brake actuation supplies DC power supply for the brake.

Type		M200D communication modules	
		For PROFIBUS	For PROFINET
Mechanics and environment			
Mounting dimensions (W x H x D)	mm	174 x 139 x 40	
Permissible ambient temperature			
• During operation	°C	-25 ... +55	
• During storage	°C	-40 ... +70	
Weight	g	300	
Permissible mounting position		Vertical, horizontal, lying	
Vibration resistance acc. to IEC 60068 Part 2-6	*g*	2	
Shock resistance			
• Acc. to IEC 60068 Part 2-27	*g*/ms	12/11 half-sine	
• Without influencing the contact position	*g*/ms	9.8/5 or 5.9/10	
Degree of protection acc. to IEC 529		IP65	
Installation altitude			
• Up to 1 000 m		No derating	
• Up to 2 000 m		1% per 100 m	
Cooling		Convection	
Protection class IEC 536 (VDE 0106-1)		1	
Electrical specifications			
Control circuit			
Operational voltage			
• $U_{DC24V-NS}$	V DC	20.4 ... 28.8	
• $U_{DC24V-S}$	V DC	20.4 ... 28.8	
Power consumption from			
• $U_{DC24V-NS}$	mA	< 300	
• $U_{DC24V-S}$	mA	< 100	

SIRIUS M200D motor starters for PROFIBUS/PROFINET

Communication modules, motor starter modules

Selection and ordering data

M200D motor starter module PROFIBUS/PROFINET (without communication module)

M200D motor starter PROFIBUS

M200D motor starter PROFINET

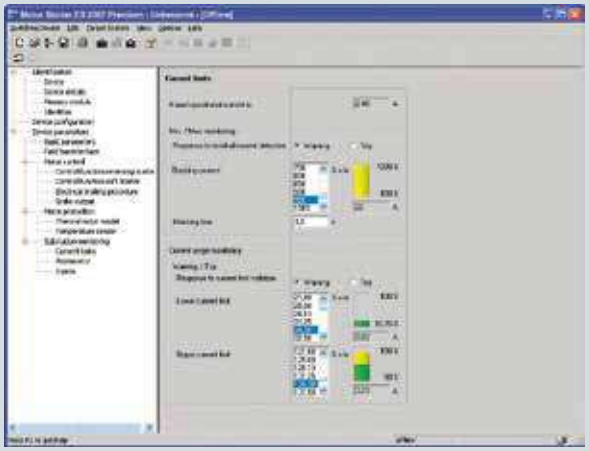
Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
M200D communication modules for PROFIBUS					
Communication module for PROFIBUS M12 connection for communication, 7/8" for 24 V power supply	15	**3RK1305-0AS01-0AA0**		1	1 unit
M200D communication modules for PROFINET					
Communication module for PROFINET M12 connection for communication, 7/8" for 24 V power supply	15	**3RK1335-0AS01-0AA0**		1	1 unit
M200D PROFIBUS/PROFINET motor starter modules					
Electromechanical starters (with integrated contactor)					
	15	**3RK1395-6□S41-□AD□**		1	1 unit
Rated operational current setting range/A			Additional price		
• 0.15 ... 2		**K**	None		
• 1.5 ... 12		**L**	✓		
Direct-on-line starters/reversing starters					
• Direct-on-line starters		**0**	None		
• Reversing starters		**1**	✓		
• Direct-on-line starters with manual local operation		**2**	✓		
• Reversing starters with manual local operation		**3**	✓		
Brake actuation					
• Without brake actuation		**0**	None		
• Brake actuation (230/400 V AC)		**3**	✓		
• Brake actuation (180 V DC)		**5**	✓		
Electronic starters (with thyristors)					
	15	**3RK1395-6□S71-□AD□**		1	1 unit
Rated operational current setting range/A			Additional price		
• 0.15 ... 2		**K**	None		
• 1.5 ... 12		**L**	✓		
Direct-on-line starters/reversing starters					
• Direct-on-line starters		**0**	None		
• Reversing starters		**1**	✓		
• Direct-on-line starters with manual local operation		**2**	✓		
• Reversing starters with manual local operation		**3**	✓		
Brake actuation					
• Without brake actuation		**0**	None		
• Brake actuation (230/400 V AC)		**3**	✓		
• Brake actuation (180 V DC)		**5**	✓		

✓ = Additional price

Motor Starter ES

Software

Overview



Motor Starter ES for parameterization, monitoring, diagnostics and testing of motor starters

More information

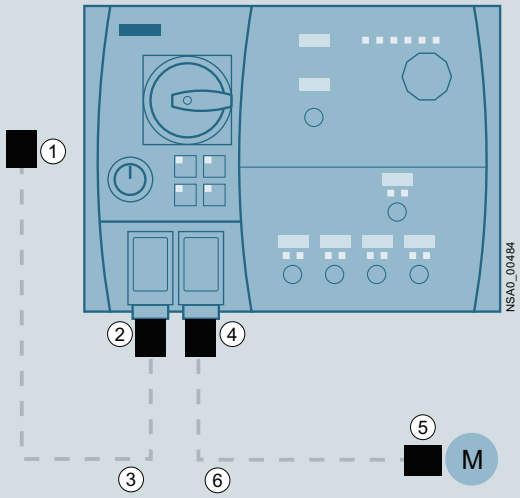
Industry Mall, see www.siemens.com/product?3ZS1

Technical specifications and system requirements, see https://support.industry.siemens.com/cs/ww/en/ps/16713/td

Motor Starter ES is used for the startup, parameterization, diagnostics, documentation and preventive maintenance of SIMATIC ET 200S, ET 200pro, ECOFAST and M200D motor starters.

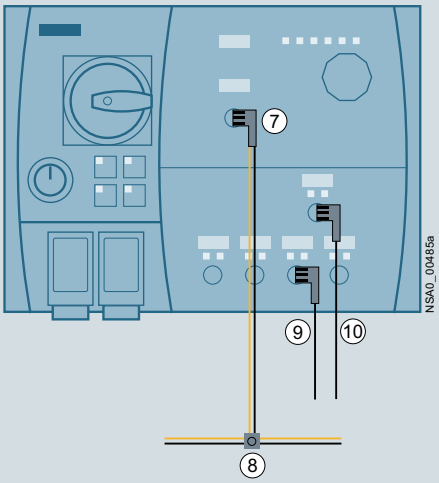
The software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Overview



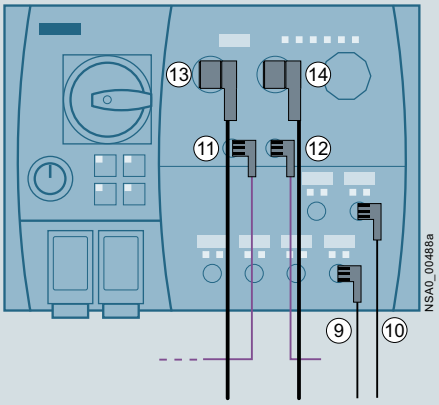
1. Power feeder plug
2. Power connection plug
3. Power connection cable
4. Motor connection plug
5. Motor plug
6. Motor cable

Power and motor connection on the M200D motor starter (in this example: M200D for AS-i)



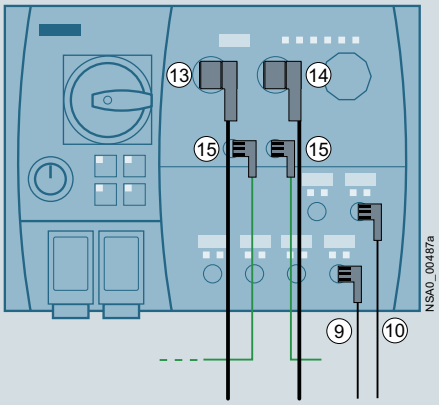
7. Connection for motor control with AS-i communication
8. AS-Interface M12 feeder
9. Connection for digital input (IO communication, 5-pole)
10. Connection for digital output (IO communication, 4- or 5-pole)

Communication connection using AS-Interface and digital inputs and outputs



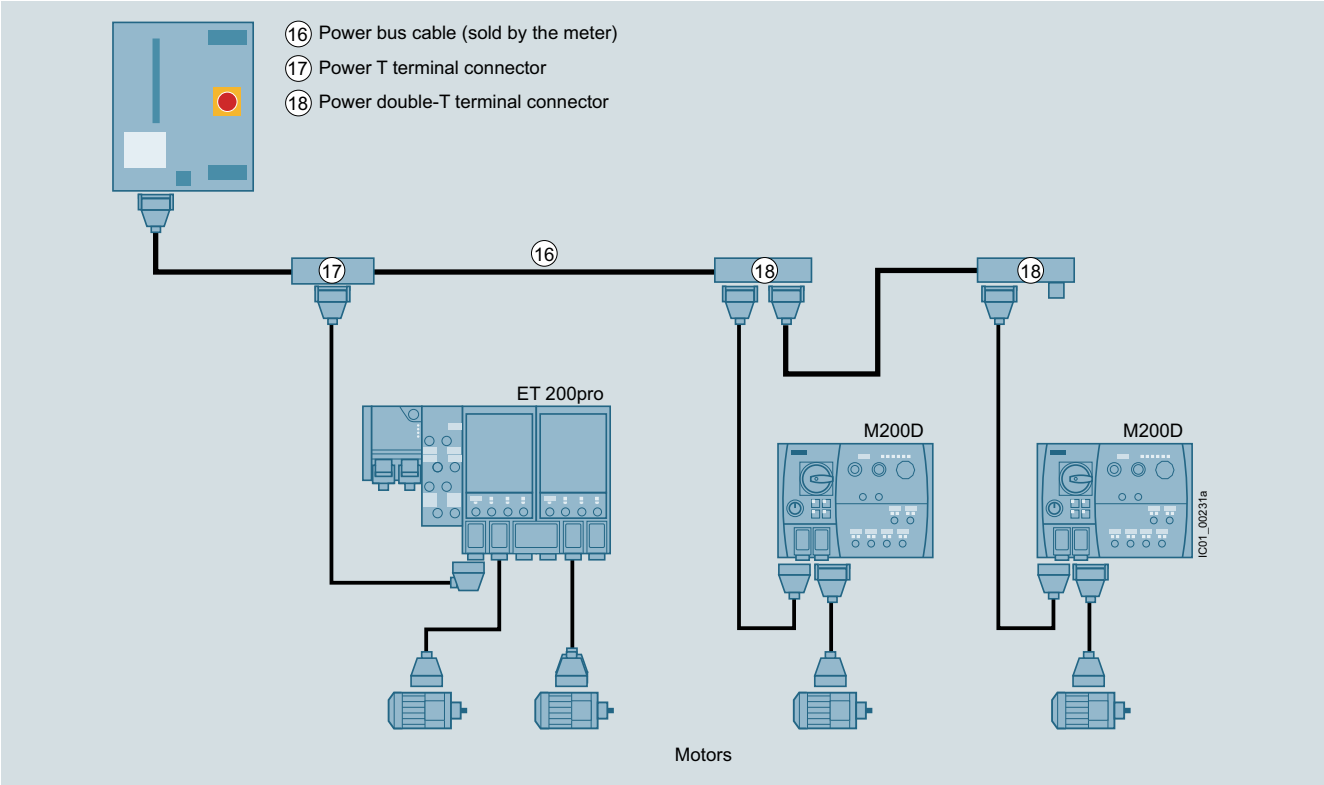
9. Connection for digital input (IO communication, 5-pole)
10. Connection for digital output (IO communication, 4- or 5-pole)
11. PROFIBUS connection (input)
12. PROFIBUS connection (loop)
13. Connection for 24 V supply (infeed)
14. Connection for 24 V supply (loop)

Communication connection using PROFIBUS and digital inputs and outputs



9. Connection for digital input (IO communication, 5-pole)
10. Connection for digital output (IO communication, 4- or 5-pole)
13. Connection for 24 V supply (infeed)
14. Connection for 24 V supply (loop)
15. Connection with PROFINET (input on the left, loop on the right)

Communication connection using PROFINET and digital inputs and outputs



Power supply to the motors via the power bus with power T and double-T terminal connectors linked by power bus cables, spur lines to the field devices (motor starters), and power loop-through connections to the motors via motor connection cables

Power bus

The power supply to the field devices (ET 200pro motor starters, M200D motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

Feeders

From the terminal connectors, spur lines with Han Q4/2 plugs lead to the field devices, from which the motors are supplied with power via motor connection cables.

Interruption-free thanks to power terminal connectors

In finger-safe connection technology the power T terminal connectors and power double-T terminal connectors connect the components of a feeder to the power bus. They ensure interruption-free operation, i.e. the power bus is not interrupted when the components are unplugged.

Selection and ordering data

The accessories listed below represent a basic selection sorted by:

- Accessories for all M200D motor starters
- Accessories for M200D motor starters for AS-Interface
- Accessories for M200D motor starters for PROFIBUS
- Accessories for M200D motor starters for PROFINET

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
Mountable accessories					
M200D protective brackets	5	**3RK1911-3BA00**		1	1 unit
Incoming power supply					
① **Power feeder plugs** Connector set for incoming power supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for HAN Q4/2, incl. gland					
• 5 male contacts, 2.5 mm²	5	**3RK1911-2BS60**		1	1 unit
• 5 male contacts, 4 mm²	5	**3RK1911-2BS20**		1	1 unit
• 5 male contacts, 6 mm²	5	**3RK1911-2BS40**		1	1 unit
② **Power connection plugs** Connector set for incoming power supply for connection to M200D motor starters, comprising a cable-end connector hood, angular outgoing feeder, female insert for HAN Q4/2, incl. gland					
• 5 female contacts, 2.5 mm², 2 female contacts, 0.5 mm²	5	**3RK1911-2BE50**		1	1 unit
• 5 female contacts, 4 mm², 2 female contacts, 0.5 mm²	5	**3RK1911-2BE10**		1	1 unit
• 5 female contacts, 6 mm², 2 female contacts, 0.5 mm²	5	**3RK1911-2BE30**		1	1 unit
② + ③ **Power connection cables** Assembled at one end with "N" and jumper pin 11 and 12 for plug monitoring, with HAN Q4/2, angular; open at one end; 5 x 4 mm²					
• Length 1.5 m	10	**3RK1911-0DC13**		1	1 unit
• Length 5.0 m	10	**3RK1911-0DC33**		1	1 unit
Motor cables					
④ **Motor connection plugs** Connector set for motor cable for connection to M200D motor starters, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q8/0, incl. gland					
• 8 male contacts, 1.5 mm²	5	**3RK1902-0CE00**		1	1 unit
• 6 male contacts, 2.5 mm²	5	**3RK1902-0CC00**		1	1 unit
⑤ **Motor plugs** Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e, incl. star jumper, incl. gland					
• 7 female contacts, 1.5 mm²	30	**3RK1911-2BM21**		1	1 set
• 7 female contacts, 2.5 mm²	30	**3RK1911-2BM22**		1	1 set
④ + ⑥ **Motor cables, assembled at one end** For connection to M200D motor starters, HAN Q8/0, angular, length 5 m					
• Motor cables for motor without brake, 4 x 1.5 mm²	15	**3RK1911-0EB31**		1	1 unit
• Motor cables for motor without brake with thermistor, 6 x 1.5 mm²	30	**3RK1911-0EF31**		1	1 unit
• Motor cables for motor with brake actuation, braking voltage 400 V AC or 180 V DC, 6 x 1.5 mm²	30	**3RK1911-0ED31**		1	1 unit
• Motor cables for motor with brake actuation, braking voltage 400 V AC or 180 V DC and thermistor, 8 x 1.5 mm²	30	**3RK1911-0EG31**		1	1 unit
• Motor cables for motor with brake actuation, braking voltage 230 V AC, 6 x 1.5 mm²	30	**3RK1911-0EH31**		1	1 unit
• Motor cables for motor with brake actuation, braking voltage 230 V AC and thermistor, 8 x 1.5 mm²	30	**3RK1911-0EE31**		1	1 unit

SIRIUS M200D Motor Starters

Accessories for all M200D motor starters

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Power bus						
	⑰ **Power T terminal connectors** For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments					
	• 2.5 mm²/4 mm²	5	**3RK1911-2BF01**		1	1 unit
	• 4 mm²/6 mm²	5	**3RK1911-2BF02**		1	1 unit
	⑱ **Power double-T terminal connectors** For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments, connection of two motor starters possible					
	• 4 mm²/6 mm²	5	**3RK1911-2BG02**		1	1 unit
	Sealing set (comprising 2 seals) For power T/power double-T terminal connectors					
	• For power cables with					
	- Ø 10 ... 13 mm	5	**3RK1911-5BA00**		1	1 unit
	- Ø 13 ... 16 mm	5	**3RK1911-5BA10**		1	1 unit
	- Ø 16 ... 19 mm	5	**3RK1911-5BA20**		1	1 unit
	- Ø 19 ... 22 mm	X	**3RK1911-5BA30**		1	1 unit
	• Blanking plugs	5	**3RK1911-5BA50**		1	1 unit
Further accessories for power connections						
 3RK1902-0CW00	**Crimping tools for pins/sockets 4 mm² and 6 mm²**	15	**3RK1902-0CW00**		1	1 unit
	Dismantling tools					
	• For male and female contacts for 9-pole HAN Q4/2 inserts	15	**3RK1902-0AB00**		1	1 unit
	• For male and female contacts for 9-pole HAN Q8 inserts	5	**3RK1902-0AJ00**		1	1 unit
 3RK1902-0CK00	**Sealing caps** For 9-pole power sockets					
	• 1 unit per pack	5	**3RK1902-0CK00**		1	1 unit
	• 10 units per pack	5	**3RK1902-0CJ00**		1	10 units

SIRIUS M200D Motor Starters

Accessories for all M200D motor starters

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Motor control with I/O communication						
3RK1902-4BA00-5AA0	**M12 plugs, straight** Screw fixing, 5-pole screw terminals, max. 0.75 mm², A-coded, max. 4 A	5	**3RK1902-4BA00-5AA0**		1	1 unit
3RK1902-4DA00-5AA0	⑩ **M12 plugs, angular** Screw fixing, 5-pole screw terminals, max. 0.75 mm², A-coded, max. 4 A	5	**3RK1902-4DA00-5AA0**		1	1 unit
3RK1902-4H...-5AA0	⑨,⑩ **Control cables, assembled at one end** M12 plugs, angular, screw fixing, 5-pole, 5 x 0.34 mm², A-coded, black PUR sheath, max. 4 A					
	• Cable length 1.5 m	5	**3RK1902-4HB15-5AA0**		1	1 unit
	• Cable length 5 m	5	**3RK1902-4HB50-5AA0**		1	1 unit
	• Cable length 10 m	5	**3RK1902-4HC01-5AA0**		1	1 unit
3RK1902-4PB15-3AA0	**Control cables, assembled at both ends** Straight M12 plug, straight M12 socket, screw fixing, 3-pole, 3 x 0.34 mm², A-coded, black PUR sheath, max. 4 A					
	• Cable length 1.5 m	5	**3RK1902-4PB15-3AA0**		1	1 unit
Further accessories						
3RK1922-3BA00	**Handheld devices** For M200D motor starters (or for ET 200pro and ET 200S High Feature motor starters) for local operation. The motor starter-specific serial interface cables must be ordered separately. The RS 232 interface cable 3RK1922-2BP00 is used for the MS M200D.	5	**3RK1922-3BA00**		1	1 unit
	RS 232 interface cable Serial data connection between M200D (or ET 200pro) motor starters and the RS 232 interface of a PC/PG/laptop (with the Motor Starter ES software) or the handheld device 3RK1922-3BA00	5	**3RK1922-2BP00**		1	1 unit
	USB interface cable, 2.5 m Serial data connection between M200D (or ET 200pro) motor starters and the USB interface of a PC/PG/laptop (with the Motor Starter ES software).	3	**6SL3555-0PA00-2AA0**		1	1 unit
3RK1901-1KA00	**M12 sealing caps** For sealing unused M12 input or output sockets and M12 sockets for PROFIBUS and PROFINET communication modules (one set contains ten sealing caps)	▶	**3RK1901-1KA00**		100	10 units
3SU1950-0FB80-0AA0	**RONIS SB30 keys** Replacement key for M200D for "manual local control" ordering option	▶	**3SU1950-0FB80-0AA0**		1	1 unit

For more connection technology products, see https://support.industry.siemens.com/cs/ww/en/view/65355810..

SIRIUS M200D Motor Starters

Accessories for M200D motor starters for AS-Interface

Selection and ordering data

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Motor control with AS-i communication						
3RK1902-4GB50-4AA0	⑦ **Control cables, assembled at one end** M12 plug, angular, screw fixing, 4-pole, 4 x 0.34 mm², A-coded, black PUR sheath, max. 4 A					
	• Cable length 5 m	5	**3RK1902-4GB50-4AA0**		1	1 unit
3RK1902-4CA00-4AA0	⑦ **M12 sockets, angled** For screw fixing, 4-pole screw terminals, max. 0.75 mm², A-coded, max. 4 A	5	**3RK1902-4CA00-4AA0**		1	1 unit
3RK1901-2NR21	⑧ **AS-Interface M12 feeders**					
	For flat cable: AS-i/U_{aux}; For: M12 socket; Cable length: --; Cable end in feeder: not available	2	**3RK1901-2NR20**		1	1 unit
	For: M12 cable box; Cable length: 1 m; Cable end in feeder: not available	2	**3RK1901-2NR21**		1	1 unit
	Cable length: 2 m; Cable end in feeder: not available	2	**3RK1901-2NR22**		1	1 unit
3RK1901-1MN00	**Cable terminating pieces** For sealing of open cable ends (shaped AS-Interface cable) in IP67	▶	**3RK1901-1MN00**		1	10 units
3RX90..-0AA00	**AS-Interface shaped cable,** see also page 2/82					
	Material: Rubber; Color: Yellow (AS-Interface); Quantity: 100 m roll	2	**3RX9010-0AA00**		1	1 unit
	Quantity: 1 km drum	5	**3RX9012-0AA00**		1	1 unit
	Color: Black (24 V DC); Quantity: 100 m roll	2	**3RX9020-0AA00**		1	1 unit
	Quantity: 1 km drum	5	**3RX9022-0AA00**		1	1 unit
	Material: TPE; Color: Yellow (AS-Interface); Quantity: 100 m roll	2	**3RX9013-0AA00**		1	1 unit
	Quantity: 1 km drum	5	**3RX9014-0AA00**		1	1 unit
	Color: Black (24 V DC); Quantity: 100 m roll	2	**3RX9023-0AA00**		1	1 unit
	Quantity: 1 km drum	5	**3RX9024-0AA00**		1	1 unit
	Material: TPE special version according to UL Class 2; Color: Yellow (AS-Interface); Quantity: 100 m roll	5	**3RX9017-0AA00**		1	1 unit
	Color: Black (24 V DC); Quantity: 100 m roll	5	**3RX9027-0AA00**		1	1 unit
	Material: PUR; Color: Yellow (AS-Interface); Quantity: 100 m roll	2	**3RX9015-0AA00**		1	1 unit
	Quantity: 1 km drum	5	**3RX9016-0AA00**		1	1 unit
	Color: Black (24 V DC); Quantity: 100 m roll	2	**3RX9025-0AA00**		1	1 unit
	Quantity: 1 km drum	5	**3RX9026-0AA00**		1	1 unit

SIRIUS M200D Motor Starters

Accessories for M200D motor starters for AS-Interface

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Further accessories						
3RK1904-2AB02	**AS-Interface addressing unit V3.0** • For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0 • For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with four type AA batteries (IEC LR6, NEDA 15) • Scope of supply: - Addressing unit with four batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m	2	**3RK1904-2AB02**		1	1 unit
3RK1902-4PB15-3AA0	**M12 addressing cables to M12** • Standard M12 cable for addressing slaves with M12 connection, e.g. K60R modules • When using the current version of the 3RK1904-2AB01 addressing unit • 1.5 m	5	**3RK1902-4PB15-3AA0**		1	1 unit
"SIRIUS M200D Motor Starter" manuals						
	Equipment Manual - SIRIUS M200D AS-Interface Basic Motor Starter, see https://support.industry.siemens.com/cs/ww/en/view/35016496					
	Equipment Manual - SIRIUS M200D AS-Interface Basic Motor Starter, see https://support.industry.siemens.com/cs/ww/en/view/38722160					

SIRIUS M200D Motor Starters

Accessories for M200D motor starters for PROFIBUS

Selection and ordering data

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Motor control with PROFIBUS						
3RK1902-1DA00	**M12 plugs, angular** For screw fixing, 5-pole screw terminal, max. 0.75 mm², B-coded, no terminating resistor					
	• ⑪ 5 female contacts	5	**3RK1902-1DA00**		1	1 unit
3RK1902-1BA00	• ⑫ 5 male contacts	5	**3RK1902-1BA00**		1	1 unit
3RK1902-1G.	**Control cables, assembled at one end** M12, screw fixing, angular, B-coded, no terminating resistor					
	• ⑪ 5 female contacts, 3 m	15	**3RK1902-1GB30**		1	1 unit
	• ⑪ 5 female contacts, 5 m	15	**3RK1902-1GB50**		1	1 unit
	• ⑪ 5 female contacts, 10 m	15	**3RK1902-1GC10**		1	1 unit
3RK1902-1N.	⑪ ⑫ **Control cables, assembled at both ends** M12, screw fixing, angular, pin/socket 5-pole, B-coded, no terminating resistor					
	• 3.0 m	15	**3RK1902-1NB30**		1	1 unit
	• 5.0 m	15	**3RK1902-1NB50**		1	1 unit
	• 10.0 m	15	**3RK1902-1NC10**		1	1 unit
Further accessories						
	PROFIBUS trailing cables Max. acceleration 4 m/s², at least 3 000 000 bending cycles, bending radius at least 60 mm, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	1	**6XV1830-3EH10**		1	1 M
	PROFIBUS FC Food bus cables with PE outer sheath for operation in the food and beverage industry, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	1	**6XV1830-0GH10**		1	1 M
	PROFIBUS FC Robust bus cables with PUR outer sheath for operation in environments exposed to chemicals and mechanical loads, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	1	**6XV1830-0JH10**		1	1 M
	Power cables 5-core, 5 x 1.5 mm², trailing, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	1	**6XV1830-8AH10**		1	1 M
Connection for 24 V power supply of the M200D PROFIBUS/PROFINET						
	See page 6/65					
Equipment Manual "SIRIUS M200D PROFIBUS/PROFINET Motor Starters"						
	See https://support.industry.siemens.com/cs/ww/en/view/38823402					

Selection and ordering data

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Motor control with PROFINET						
	⑮ **M12 plugs, angular** For screw fixing, 4-pole screw terminal, max. 0.75 mm², angular, D-coded					
	• 4 male contacts	5	**3RK1902-2DA00**		1	1 unit
 3RK1902-2H.	⑮ **Control cables, assembled at one end** M12 for screw fixing, angular, 4-pole, D-coded,					
	• 4 male contacts, 3 m	15	**3RK1902-2HB30**		1	1 unit
	• 4 male contacts, 5 m	15	**3RK1902-2HB50**		1	1 unit
	• 4 male contacts, 10 m	15	**3RK1902-2HC10**		1	1 unit
 3RK1902-2N.	⑮ **Control cables, assembled at both ends** M12 for screw fixing, angular at both ends, 4-pole, D-coded, male contacts at both ends					
	• 3 m	15	**3RK1902-2NB30**		1	1 unit
	• 5 m	15	**3RK1902-2NB50**		1	1 unit
	• 10 m	15	**3RK1902-2NC10**		1	1 unit
Further accessories						
	PROFINET IE FC TP standard cable GP 2 x 2 Sold by the meter	1	**6XV1840-2AH10**		1	1 M
	PROFINET IE FC TP trailing cable 2 x 2 Sold by the meter	1	**6XV1840-3AH10**		1	1 M
	PROFINET IE FC TP trailing cable GP 2 x 2 Sold by the meter	1	**6XV1870-2D**		1	1 M
	PROFINET IE FC TP torsion cable 2 x 2 Sold by the meter	1	**6XV1870-2F**		1	1 M
	PROFINET IE FC TP marine cable, 4-core Sold by the meter	1	**6XV1840-4AH10**		1	1 M
	Power cables 5-core, 5 x 1.5 mm², trailing, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	1	**6XV1830-8AH10**		1	1 M
Connection for 24 V power supply of the M200D PROFIBUS/PROFINET						
 3RK1902-3DA00	**Plugs** On M200D, 7/8" for screw fixing, angular, screw terminal, 1.5 mm²					
	• ⑬ 5 female contacts	5	**3RK1902-3DA00**		1	1 unit
 3RK1902-3BA00	• ⑭ 5 male contacts	5	**3RK1902-3BA00**		1	1 unit
 3RK1902-3G.	⑬ **Supply lines, assembled at one end** 7/8" for screw fixing, angular, 1.5 mm²					
	• 5 female contacts, 3 m	15	**3RK1902-3GB30**		1	1 unit
	• 5 female contacts, 5 m	15	**3RK1902-3GB50**		1	1 unit
	• 5 female contacts, 10 m	15	**3RK1902-3GC10**		1	1 unit
 3RK1902-3N.	⑬ ⑭ **Supply lines, assembled at both ends** 7/8", for screw fixing, angular at both ends, 5-pole pin/socket, 1.5 mm²					
	• 3 m	15	**3RK1902-3NB30**		1	1 unit
	• 5 m	15	**3RK1902-3NB50**		1	1 unit
	• 10 m	15	**3RK1902-3NC10**		1	1 unit
 6ES7194-3JA00-0AA0	**7/8" sealing caps** 1 pack = 10 units	1	**6ES7194-3JA00-0AA0**		1	10 units
Equipment Manual "SIRIUS M200D PROFIBUS/PROFINET Motor Starters"						
	See https://support.industry.siemens.com/cs/ww/en/view/38823402					

Hybrid fieldbus connections

General data

Overview

Hybrid fieldbus connection with two HanBrid sockets

Control cabinet bushing with two M12 sockets

Hybrid fieldbus connections with HanBrid sockets designed as cabinet bushings transmit data and energy from the control cabinet (IP20) to the field (IP65). They are the interface for jointly routing PROFIBUS DP and the auxiliary voltages into the hybrid fieldbus cable.

On the cabinet bushings with two M12 sockets for the PROFIBUS M12 connecting cables, the 24 V supply of the motor starters is implemented via separate 7/8" connecting cables.

Passive and active hybrid fieldbus connections

The hybrid fieldbus connections are available in two versions which differ in their functionality:

- Passive version
- Active version with signal refresher function to considerably increase the maximum PROFIBUS cable length

Connection methods

The field side is connected using HanBrid or M12 plug-in connections.

In the case of HanBrid, the following versions are available:

- Socket/socket for feeding into the field
- Pin/socket for looping through in the field

The M12 version is generally configured with socket/socket.

Following connections are available at the rear (cabinet side) in the case of the passive bushings:

- Direct connection
- FastConnect connection

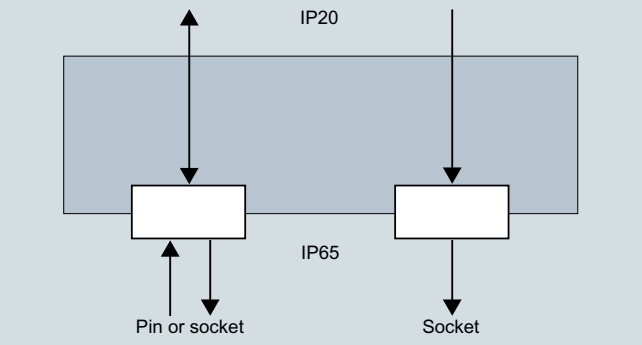
The active bushing with refresher function has 9-pole Sub D sockets for the rear connection.

Auxiliary power infeed

HanBrid plug-in connection technology offers the option of feeding in or looping through two separate auxiliary voltages of 24 V DC (switched/unswitched) into the field in addition to the PROFIBUS signal. The terminal block with spring-loaded terminals on the rear (cabinet side) of the hybrid fieldbus connection provides a variety of interconnecting options for these auxiliary voltages.

Passive hybrid fieldbus connections

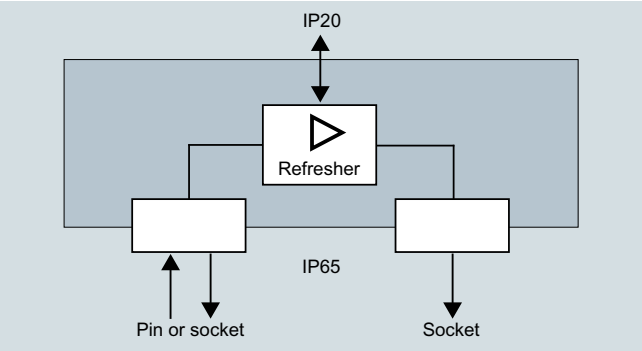
- Bushing from the control cabinet (IP20) into the field (IP65)
- HanBrid plug-in design socket/socket or pin/socket
- Direct connection or FastConnect connection for PROFIBUS at the rear
- Terminal block with spring-loaded terminals (0.25 to 2.5 mm^2) for infeeding or forwarding the auxiliary voltages



Hybrid fieldbus connection as passive cabinet bushing

Active hybrid fieldbus connections with refresher function

- Bushing from the control cabinet (IP20) into the field (IP65)
- Three independent, electrically separated PROFIBUS segments
- Signal refresher function from and to all segments
- Automatic continuous baud rate detection
- Status/diagnostics displays with LEDs
- Cascading depth of a maximum nine hybrid fieldbus connections
- HanBrid plug-in design socket/socket and pin/socket
- M12 plug-in design socket/socket
- 9-pole Sub D socket connection for PROFIBUS at the rear
- Terminal block with spring-loaded terminals (0.25 to 2.5 mm^2) for infeeding or forwarding the auxiliary voltages



Hybrid fieldbus connection as active control cabinet bushing with refresher function

Hybrid fieldbus connections

Selection and ordering

Technical specifications

Type		Passive hybrid fieldbus connections	Active hybrid fieldbus connections
Mechanics and environment			
Dimensions (W x H x D)	mm	93 x 103 x 65	
Cutout (W x H)	mm	80 x 90	
Temperature range	°C	-25 ... +60	
Degree of protection		IP20 internal/IP65 on field side	
Material/enclosure	mm	Plastic (black PC), flame retardant	
Electrical specifications			
Rated operational voltage			
• 24 V DC not switched (NS)	V DC	24, ± 25%	
• 24 V DC switched (S)	V DC	24, ± 25%	
Max. rated current	A	10	
Power supply		--	From 24 V DC not switched (NS)
Max. power consumption	mA	--	130
Mains buffering	ms	--	> 20
Baud rate detection		--	Automatic
Maximum cascading depth		--	9 hybrid fieldbus connections
Baud rates	kbps	9.6/19.2/45.45/93.75/187.5/500/1 500/3 000/6 000 /12 000	
Electrical separation	V DC	500	

Selection and ordering data

Hybrid fieldbus connection on the field side:
With socket/socket (HanBrid)

With pin/socket (HanBrid)

Control cabinet bushing on the field side
With socket/socket (M12)

Link type / function	Connection IP65	Connection IP20 (PROFIBUS)	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Hybrid fieldbus connections							
Passive							
• Cu/Cu, for feeding into the field	Socket/socket (2 x HanBrid)	Direct connection	5	**3RK1911-1AA22**		1	1 unit
• Cu/Cu, for looping through in the field	Pin/socket (2 x HanBrid)	Direct connection	5	**3RK1911-1AA32**		1	1 unit
• Cu/Cu, for feeding into the field	Socket/socket (2 x HanBrid)	PROFIBUS FastConnect bus connector	5	**3RK1911-1AF22**		1	1 unit
• Cu/Cu, for looping through in the field	Pin/socket (2 x HanBrid)	PROFIBUS FastConnect bus connector	5	**3RK1911-1AF32**		1	1 unit
Active (refresher)							
• Cu/Cu, for feeding into the field	Socket/socket (2 x HanBrid)	9-pole Sub D socket	5	**3RK1911-1AJ22**		1	1 unit
• Cu/Cu, for looping through in the field	Pin/socket (2 x HanBrid)	9-pole Sub D socket	5	**3RK1911-1AJ32**		1	1 unit
• Cu/Cu, for feeding into the field	Socket/socket (2 x M12)	9-pole Sub D socket	5	**3RK1911-1AK22**		1	1 unit

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Accessories						
6ES7194-1JB10-0XA0	**Sealing caps for HanBrid** Protective cover for bus and power supply connection (pack of 10)	1	**6ES7194-1JB10-0XA0**		1	10 units

PROFIBUS ECOFAST hybrid cables, see siemens.com/industrymall

Notes

3RW55/55F

3RW52

3RW50

3RW30 3RW40

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3RW55 Failsafe soft starters NEW
- General Data 7/36 – 7/48
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General Performance soft starters

3RW52 soft starters NEW
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Basic Performance soft starters

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Introduction

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Homepage, see www.siemens.com/softstarter Industry Mall, see www.siemens.com/product?3RW TIA Selection Tool Cloud (TST Cloud), see https://www.siemens.com/tstcloud/?node=Sirius3rwFolder	Industry Online Support (SIOS) topic page, see https://support.industry.siemens.com/cs/ww/en/view/109747404 Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

3RW55

3RW55 Failsafe

3RW52

3RW50

3RW40

3RW30

3RW soft starters		Page
High Performance soft starters		
3RW55 soft starters	• TIA integration optional • Plug-in communication modules for PROFINET, PROFIBUS, EtherNet/IP and Modbus • Removable HMI module with color display, local interface and slot for a micro SD memory card • Extended protection functions • Up to 1000HP @ 480V (600V and 690V ratings also available) • Automatic parameterization for simple commissioning and reliability even under changing load conditions • Hybrid switching devices for minimum power loss and three-phase motor control for optimum/symmetrical motor control • Pump stop for reduced mechanical loading and optimum pump stop control • ATEX/IECEx certification	7/12
3RW55 Failsafe soft starters	• TIA integration optional • Plug-in communication modules for PROFINET, PROFIBUS, EtherNet/IP and Modbus • Removable HMI module with color display, local interface and slot for a micro SD memory card • Extended protection functions • Up to 400HP @ 480V • SIL 1 - PL c / STO without additional components • SIL 3 - PL e / STO with additional contactor and safety relay • Hybrid switching devices for minimum power loss and three-phase motor control for optimum/symmetrical motor control • Pump stop for reduced mechanical loading and optimum pump stop control • ATEX/IECEx certification	7/36
General Performance soft starters		
3RW52 soft starters	• TIA integration optional • Plug-in communication modules for PROFINET, PROFIBUS, EtherNet/IP and Modbus • HMI modules optional • Soft starting and stopping • Current limiting • Motor overload protection (optionally with thermistor motor protection) • Analog output (optional) • Up to 400HP @ 480V (600V ratings also available) • Hybrid switching devices for minimum power loss and three-phase motor control for optimum/symmetrical motor control • Soft Torque for reduced mechanical loading and optimum pump stop • Parameterization using potentiometers	7/53

Introduction

3RW55

3RW55 Failsafe

3RW52

3RW50

3RW40

3RW30

		Page
3RW soft starters		
Basic Performance soft starters		
3RW50 soft starters	• TIA integration optional • Communication modules for PROFINET, PROFIBUS, EtherNet/IP and Modbus • HMI modules optional • Soft starting and stopping • Current limiting • Motor overload protection (optionally with thermistor motor protection) • Analog output (optional) • Up to 400HP @ 480V (600V ratings also available) • Hybrid switching devices for minimum power loss and two-phase motor control • Soft Torque for reduced mechanical loading and optimum pump stop • Parameterization using potentiometers • ATEX/IECEx certification	7/71
3RW40 soft starters	• Soft starting and stopping • Current limiting • Motor overload protection (optionally with thermistor motor protection) • Up to 75HP @ 480V 600V ratings also available) • Hybrid switching devices for minimum power loss and two-phase motor control • ATEX certification	7/83
3RW30 soft starters	• Soft starting with voltage ramp • Up to 75HP @ 480V	7/94
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 • Application areas: - Compressors - Pumps - Stamping presses - Cooling towers - Molding and extruding - Chippers and debarkers - Lumber processing - Pulp & paper processing - Conveyors - Textiles - HVAC	7/111

Use of soft starters in conjunction with IE3/IE4 motors

Note:

For the use of SIRIUS 3RW soft starters in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see Application Manual.

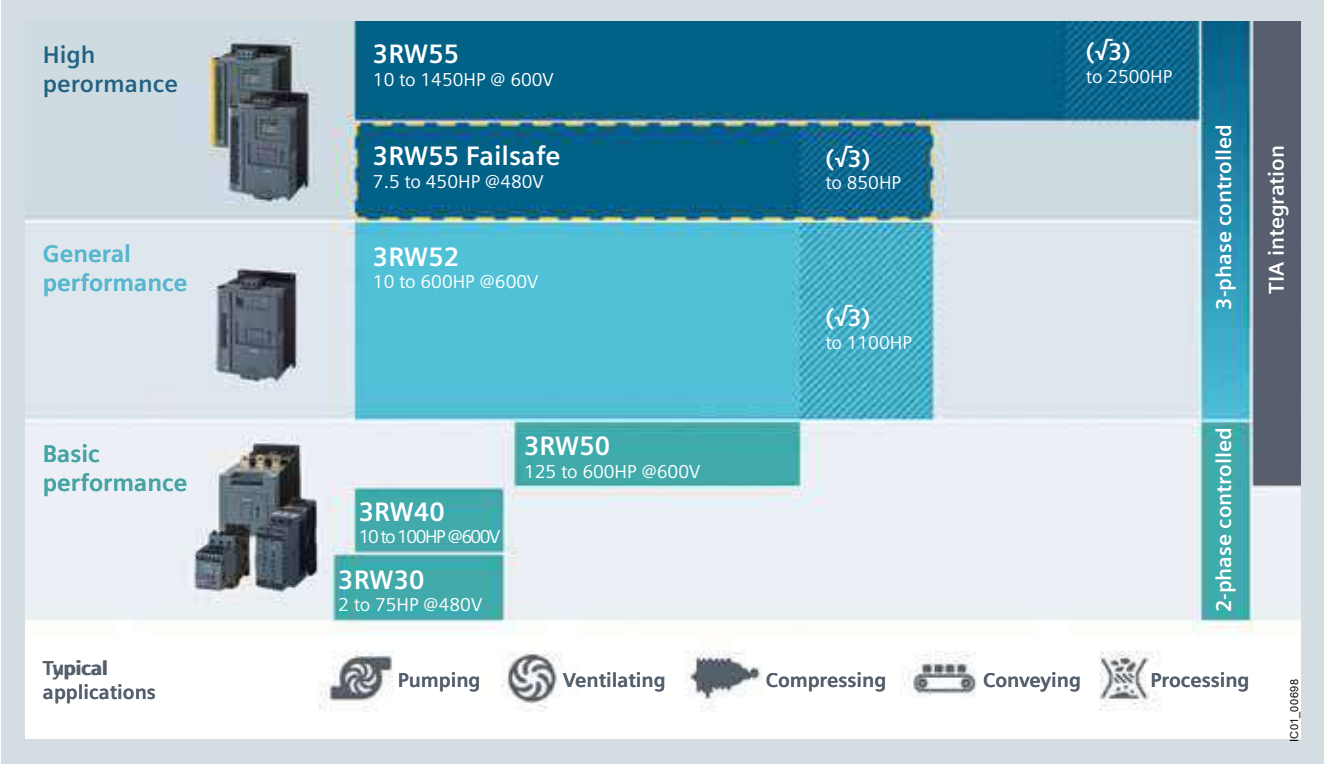
SIRIUS 3RW Soft Starters

General data

Overview

More information	
Homepage, see www.siemens.com/softstarter Industry Mall, see www.siemens.com/product?3RW TIA Selection Tool Cloud (TST Cloud), see https://www.siemens.com/tstcloud/?node=Sirius3rwFolder	Industry Online Support (SIOS) topic page, see https://support.industry.siemens.com/cs/ww/en/view/109747404 Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

SIRIUS 3RW soft starters – as versatile as your application



SIRIUS 3RW Soft Starters

General data

Applications	High Performance	General Performance	Basic Performance		
SIRIUS soft starters	**3RW55/3RW55-F**	**3RW52**	**3RW50**	**3RW40**	**3RW30**
Selection aid for soft starters					
Normal starting (CLASS 10)					
Pumps	●	●	●	●	●
Pumps with special pump stop (to prevent water hammer)	●	❍	❍		
Heat pumps	●	●	●	●	●
Hydraulic pumps	●	●	●	●	❍
Presses	●	●	●	●	❍
Conveyor belts	●	●	●	●	❍
Roller conveyors	●	●	●	●	❍
Screw conveyors	●	●	●	●	❍
Escalators	●	●	●	●	
Piston compressors	●	●	●	●	
Screw compressors	●	●	●	●	
Small fans[1)]	●	●	●	●	
Centrifugal blowers	●	●	●	●	
Bow thrusters	●	●	●	●	
Heavy starting (CLASS 20)					
Stirrers	●	❍	❍	❍	
Extruders	●	❍	❍	❍	
Lathes	●	❍	❍	❍	
Milling machines	●	❍	❍	❍	
Heavy starting (CLASS 30)					
Large fans[2)]	●				
Circular saws/bandsaws	●				
Centrifuges	●				
Mills	●				
Crushers	●				

● Recommended soft starter
❍ Possible soft starter

1) The mass inertia of the fan is <10 times the mass inertia of the motor.
2) The mass inertia of the fan is ≥10 times the mass inertia of the motor.

SIRIUS 3RW Soft Starters

General data

Applications		High Performance		General Performance	Basic Performance		
SIRIUS soft starters		**3RW55**	**3RW55-F**	**3RW52**	**3RW50**	**3RW40**	**3RW30**
General technical specifications							
Operational current at 40 °C	A	13 ... 2 217	13 ... 987	13 ... 987	143 ... 570	12.5 ... 106	3 ... 106
Operational voltage	V	200 ... 690[1]	200 ... 480	200 ... 600	200 ... 600	200 ... 600	200 ... 480
Operating power for three-phase motors							
• At 400 V, at 40 °C - Inline circuit	kW	5.5 ... 710	5.5 ... 315	5.5 ... 315	75 ... 315	5.5 ... 55	1.5 ... 55
- Inside-delta circuit	kW	11 ... 1 200	11 ... 560	11 ... 560	--	--	--
• At 460/480 V at 50 °C - Inline circuit	hp	7.5 ... 1 000	7.5 ... 400	7.5 ... 400	100 ... 400	7.5 ... 75	1.5 ... 75
- Inside-delta circuit	hp	10 ... 1 700	10 ... 750	10 ... 750	--	--	--
Ambient temperature[2]	°C	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60
Soft starting/ramp-down		✓	✓	✓	✓	✓	✓[3]
Voltage ramp		✓	✓	✓	✓	✓	✓
Starting voltage	%	20 ... 100	20 ... 100	30 ... 100	30 ... 100	40 ... 100	40 ... 100
Ramp-up and ramp-down time	s	0 ... 360	0 ... 360	0 ... 20	0 ... 20	0 ... 20	0 ... 20[3]
Pump stop (torque control)[4]		✓	✓	--	--	--	--
• Starting torque	%	10 ... 100	10 ... 100	--	--	--	--
• Torque limit	%	20 ... 200	20 ... 200	--	--	--	--
Soft Torque (torque limit)		--	--	✓	✓	--	--
Integral bypass contact system		✓	✓	✓	✓	✓	✓
Intrinsic device protection		✓	✓	✓	✓	✓	--
Motor overload protection		✓[5]	✓[5]	✓	✓[5]	✓[5]	--
Thermistor motor protection evaluation		✓	✓	✓[6]	✓[6]	✓[6]	--
Analog output		✓	✓	✓[6]	✓[6]	--	--
Remote RESET		✓	✓	✓	✓	✓	--
Adjustable current limiting		✓	✓	✓	✓	✓	--
Inside-delta circuit[1]		✓	✓	✓	--	--	--
Breakaway pulse		✓	✓	--	--	--	--
Automatic parameterization		✓	✓	--	--	--	--
Pump cleaning		✓	✓	--	--	--	--
Condition monitoring		✓	✓	--	--	--	--
User account administration[8]		✓	✓	--	--	--	--
Creep speed in both directions of rotation		✓	--	--	--	--	--
Reversing duty		✓	✓	--	--	--	--
Reversing DC braking[4][7]		✓	--	--	--	--	--
DC braking[4][7]		✓	--	--	--	--	--
Dynamic DC braking[4][7]		✓	--	--	--	--	--
Motor heating		✓	--	--	--	--	--
Communication function[9]		✓	✓	✓	✓	--	--
HMI module installable in the cabinet door		✓	✓	✓[9]	✓[9]	--	--
Operating measured value display		✓	✓	✓[9]	✓[9]	--	--
Logbooks		✓	✓	✓[9]	✓[9]	--	--
Statistical data and slave pointer function		✓	✓	✓[9]	✓[9]	--	--
Trace function[8]		✓	✓	--	--	--	--
Programmable control inputs and outputs		✓	✓	--	--	--	--
Number of parameter sets		3	3	1	1	1	1
Parameterizable via software[8]		✓	✓	--	--	--	--
Number of controlled phases		3	3	3	2	2	2
Heavy starting CLASS 30[4]		✓	✓	--	--	--	--

✓ Function available
-- Function not available

1) Inside-delta circuit only up to operational voltage 600 V.
2) Note derating above 40 °C.
3) Only soft starting available for 3RW30.
4) Calculate soft starter and motor with size allowance where required.
5) When using the motor overload protection according to ATEX/IECEx, an upstream contactor may be required, see page 7/10.
6) Special device versions only.
7) Not possible in inside-delta circuit.
8) With software Soft Starter ES (TIA Portal).
9) Only in conjunction with special accessories.

SIRIUS 3RW Soft Starters

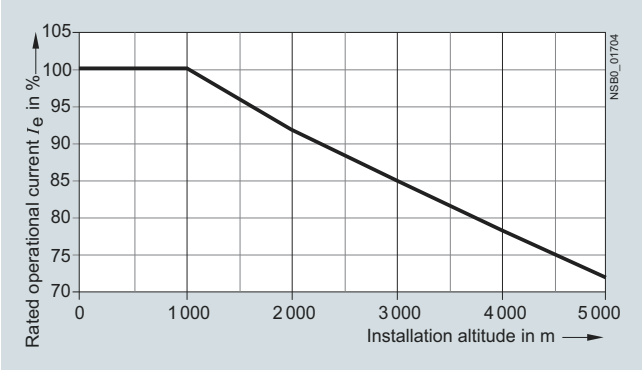
General data

Constraints

The 3RW soft starters should always be designed on the basis of the required rated operational current of the motor.
The motor ratings listed in the selection and ordering data are rough guide values and designed for basic starting conditions (CLASS 10). For other starting conditions we recommend the Simulation Tool for Soft Starters (STS).

Motor rating data in kW and hp is based on IEC 60947-4-1.

At an installation altitude above 2 000 m, max. permissible operational voltage is reduced to 480 V.



Installation altitude for SIRIUS 3RW soft starters

The selection and ordering data were determined for the following constraints (stand-alone installation without auxiliary fan)

Applications		High Performance	General Performance	Basic Performance		
SIRIUS soft starters		**3RW55/3RW55-F**	**3RW52**	**3RW50**	**3RW40**	**3RW30**
Constraints						
Maximum starting time	s	20	10			3
Maximum starting current in % of motor current	I_e	300				
Maximum number of starts per hour	1/h	5				20

Simulation Tool for Soft Starters (STS)

The Simulation Tool for Soft Starters (STS) provides a convenient means of designing soft starters using a simple, quick and easy-to-use interface.
Entering the motor and load data will simulate the application and prompt suggestions for suitable soft starters.

Link to the free download of the Simulation Tool for Soft Starters (STS).

- Simple, quick and user-friendly interface
- Detailed and up-to-date Siemens motor database, including IE3/IE4 motors.
- Simulation of heavy starting up to CLASS 30
- Update-capable (e.g. motors, load types, functions)
- Fast simulations with minimum input data
- Immediate, graphical curve charts of start operations with limit values
- Table view of suitable soft starters for the application

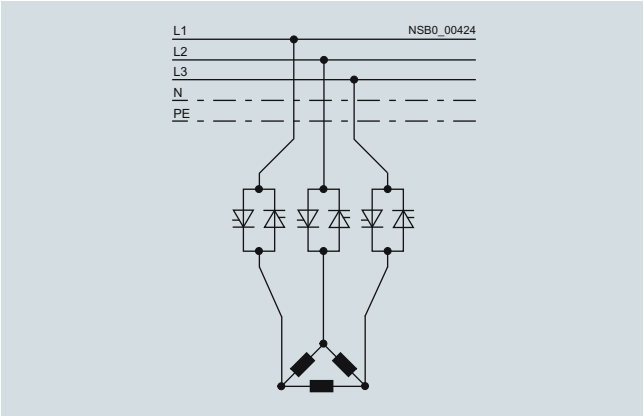
Everything at a glance: Simulation and results list

Circuit concept

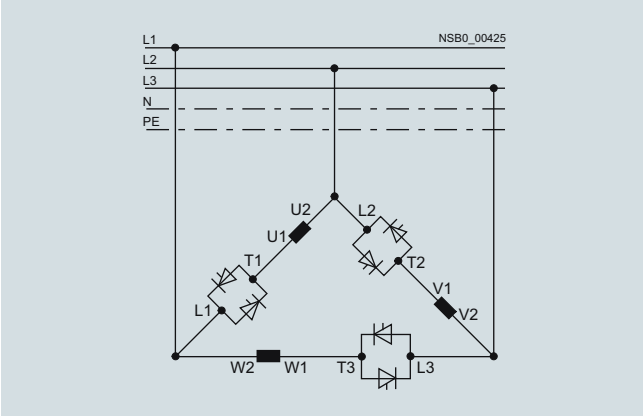
Three-phase controlled SIRIUS 3RW soft starters can be operated in two different types of circuit:

- 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 leads.
- 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, three cables to the motor



Inside-delta circuit: Rated current I_e corresponds to approx. 58% of the rated motor current I_n, six cables to the motor (as for 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.

The wiring complexity is twice as high when using the inside-delta circuit, but a smaller device can be used with 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.
The inside-delta circuit cannot be used in 690 V line supplies.

Configuration

The solid-state 3RW soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger unit must be selected. The 3RW52 soft starters may be used in isolated supply networks (IT systems) up to 600 V AC and the 3RW55 soft starters even up to 690 V.

For long starting times it is recommended to have a PTC sensor or temperature switch in the motor. This also applies for the ramp-down modes torque control, pump stop and DC braking, because during the ramp-down time in these modes, an additional current loading applies in contrast to free ramp-down.

No capacitive elements are permitted in the motor feeder between the SIRIUS 3RW soft starter and the motor (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-on-line starting, following the local short-circuit conditions. Fuses and switching devices must 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). Please observe the maximum switching frequencies specified in the technical specifications.

Notes:

When three-phase motors are switched on, voltage drops occur as a rule on starters of all types (direct-on-line 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.

For dimensioning soft starters, we recommend our Simulation Tool for Soft Starters (STS), see page 7/7 or
our Technical Support:
https://support.industry.siemens.com/My/ww/en/requests.

Recommended parameters for the initial commissioning of our SIRIUS 3RW soft starters are listed in every report of our Simulation Tool for Soft Starters (STS). In addition, our High Performance soft starters provide support by means of their commissioning wizards.

Motor feeders with soft starters

The type of coordination according to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting (combination of motor starter protector and soft starter) is sufficient.

If type of coordination "2" is to be fulfilled, then semiconductor fuses must be fitted in the motor feeder.

ToC 1 Type of coordination "1" according to IEC 60947-4-1: After a short-circuit incident, the unit is defective and therefore unsuitable for further use (protection of persons and system guaranteed).

ToC 2 Type of coordination "2" according to IEC 60947-4-1: After a short-circuit incident the unit is suitable for further use (protection of persons and system guaranteed).

The type of coordination refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

The types of coordination are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Feeder tests and events

To keep the scope of feeder tests with SIRIUS 3RW soft starters within economically reasonable limits, tests were conducted with feeder components (motor starter protectors/circuit breakers, fuses) that cover the greatest number of use cases (different soft starter versions depending on, for example, line voltage, type of circuit, or necessary overdimensioning). For the combined tests that were conducted, the values for the short-circuit breaking capacity I_q in kA were determined and documented.

If the short-circuit breaking capacity is the same, of course, smaller circuit breakers or fuses can also be used for the selected soft starter provided the dimensioning of the short-circuit components is suitable for the connected three-phase motor and the line protection for the cables used. For type of coordination "2" (with semiconductor protection), it is also necessary to compare the characteristics because the protection function would no longer be completely ensured if too small a fuse were selected. If the soft starter does not have a motor protection function, the motor protection must also be dimensioned appropriately.

Setting the motor current

If circuit breakers with an overload release are used (e.g. SIRIUS 3RV20 motor starter protector), we recommend activating the motor protection function of the SIRIUS 3RW soft starter to protect the motor and setting the soft starter to the rated operational current I_e of the motor. We recommend setting the circuit breaker in such a way that it provides line protection but does not usually trip before the soft starter when a motor overload occurs.

Line protection and motor protection

Line protection and motor protection are not ensured in all operating cases, depending on:

- How the motor feeder is constructed (e.g. with fuses or motor starter protectors)
- Whether the SIRIUS 3RW soft starters are operated within the specification relevant for the tests (IEC 60947-4-2)
- Or whether the documented constraints (see page 7/7) have been observed.

There are operating states of the thyristors (caused, for example, by high starting frequencies or heavy starting) that do not permit an overload to be disconnected by the SIRIUS 3RW soft starter. These cases are very rare but can not be ruled out in all cases.

In accordance with IEC 60947-4-2, the SIRIUS 3RW soft starters are dimensioned and checked for operation with up to 8 times the rated operational current I_e. For currents larger than this, reliable disconnection of an overcurrent by the SIRIUS 3RW soft starter is not ensured. Such large overcurrents have to be disconnected by a switching device at a higher level (e.g. by a circuit breaker or a fuse in conjunction with an optional line contactor).

Motor protection by the SIRIUS 3RW soft starter is ensured for currents up to 8 times the rated operational current I_e in any case. Line protection is covered by the line-side motor starter protector/circuit breaker or fuse. These motor feeder components must be dimensioned accordingly and the cable cross-sections must be chosen to match.

Line protection

Line protection in motor feeders with soft starters is always covered by a fuse or a circuit breaker both in case of an overload and in case of a short circuit. The circuit breaker must have an overload release. That is the case for motor starter protectors (e.g. SIRIUS 3RV20).

Circuit breakers without an overload release (e.g. SIRIUS 3RV23 motor starter protectors) must not be used because they do not provide overload protection. The feeder tests for these were therefore not performed. If the motor feeder with SIRIUS 3RW soft starters is configured without a fuse, motor starter protectors must be used that ensure tripping on an overload.

Motor protection

If fuses are used to provide protection against overload and short circuit of the cables, the motor is protected by the SIRIUS 3RW soft starter. If the constraints (simple starting conditions CLASS 10, listed maximum values for starting current, starting time and number of starts per hour) of page 7/7) are observed, the motor feeders can be configured according to IEC as described in the section about soft starters (an optional line contactor is not required). If these preconditions are met, the SIRIUS 3RW soft starters are able to trip on overloads to protect the motor in any case.

In other starting conditions and on heavy starting, the following must be considered:

Trip classes

Tested fuseless switchgear assemblies comprising SIRIUS 3RW soft starters and motor starter protectors only comply with CLASS 10.
To configure tested motor feeders, for example, for CLASS 20 or CLASS 30, fuses must be used together with SIRIUS 3RW soft starters.

Line contactor

In applications with high starting frequencies or heavy starting as of CLASS 20, we recommend combining fuses with the use of a line contactor on the line side so that a motor overload is disconnected by the fault signaling contact of the soft starter in any case (that is, even in rare cases in which disconnection by the SIRIUS 3RW soft starter is no longer possible due to the operating state of the thyristors).

ATEX/IECEx-certified motor overload protection

Ambient temperature during operation

The SIRIUS 3RW soft starters are approved for operation in a temperature range of -25 to +60 °C.

Please take into account derating of the rated operational current for ambient temperatures above 40 °C.

For more information, see Equipment Manual and the technical data sheet of the selected soft starter.

Trip class (electronic overload protection)

The motor and cables must be dimensioned for the selected trip class.

The rated data of the soft starters refers to normal starting (CLASS 10). For heavy starting (> CLASS 10), the soft starter may need to be overdimensioned as only a rated motor current that is lower than the soft starter rated current can be set.

Short-circuit protection

The SIRIUS 3RW soft starter does not have short-circuit protection. Short-circuit protection must be ensured.

Line protection

Avoid impermissibly high cable surface temperatures by correctly dimensioning the cross-sections.

The cable cross-section must be adequately dimensioned.

Line contactor or additional undervoltage release on the motor starter protector

In many ATEX/IECEx applications no additional measures (e.g. the use of a line contactor) are necessary with regard to the motor feeder configuration.

The operation of the selected soft starter may, depending on the amplitude of the line voltage and the type of motor connection (inline circuit or inside-delta circuit), result in the loss of the certified motor overload protection according to ATEX/IECEx if one of the two remedial measures listed below is not implemented.

Remedial measures

- An additional line contactor in the main circuit
- An additional undervoltage release for a motor feeder configuration with a motor starter protector

The line contactor or the undervoltage release are connected to error outputs 95, 96 and 98 of the selected soft starter

Note:

For ATEX/IECEx applications, the accompanying information on parameterization and commissioning must be observed in the ATEX/IECEx chapters of the Equipment Manual for the selected soft starter.

Article No. scheme

Product versions		Article number								
Device type	**High Performance soft starters**	**3RW55**	□	□	–	□	□	□	□	□
	General Performance soft starters	**3RW52**	□	□	–	□	□	□	□	□
	Basic Performance soft starters	**3RW50**	□	□	–	□	□	□	□	□
		3RW40	□	□	–	□	□	□	□	□
		3RW30	□	□	–	□	□	□	□	□
Size/rated operational current I_e	e.g. 15 = 25 A in size S1		□	□						
Connection type	e.g. 1 = screw terminal					□				
Soft starter functionality	e.g. AC = with bypass and analog output, three-phase controlled						□	□		
Rated control supply voltage U_s	e.g. 0 = 24 V AC/DC								□	
Rated operational voltage U_e	e.g. 4 = 200 ... 480 V AC									□
Example		**3RW52**	**1**	**5**	**–**	**1**	**A**	**C**	**0**	**4**

Note:

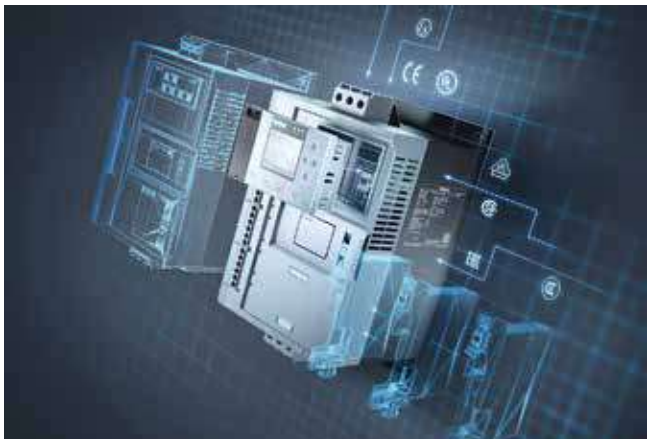
The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

Benefits

Can be flexibly deployed in many applications

Strong portfolio: comprehensive, coordinated soft starter portfolio



- The right hardware for all requirements, soft starters for tasks ranging from simple to demanding starting in Basic, General and High Performance versions
- Extensive portfolio for individual expansion: Optional HMIs for installation in the device or mounting on the control cabinet door
- Communication via PROFINET, PROFIBUS, EtherNet/IP and Modbus
- Design enclosure with removable terminals, space-saving thanks to compact design and rugged thanks to coated printed circuit boards
- Can be used worldwide thanks to numerous certificates and approvals: IEC, UL, CSA, CCC, ATEX/IECEx, shipbuilding

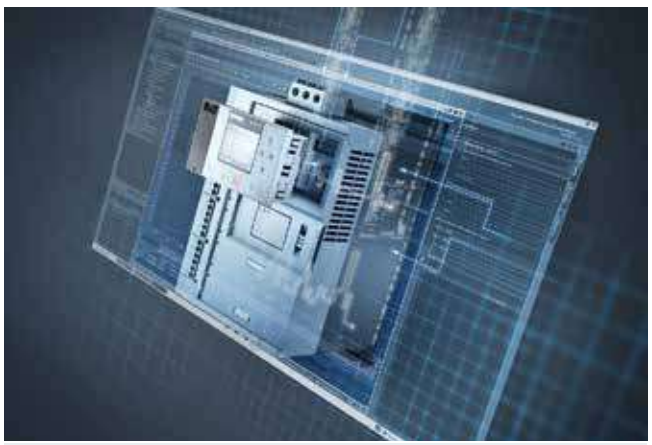
Intelligent operation: concentrated, application-specific functionality

- Can be used in a wide variety of applications: Pumping, ventilating, compressing, moving and processing
- Integrated, self-learning automatic parameterization depending on motor starting conditions
- Application-specific functionality such as pump cleaning and pump stop
- Condition monitoring: Current and power monitoring with warning and alarm limits, starting time monitoring

Efficient switching: hybrid switching technology on board

- Energy-efficient switching and mechanical protection of the drive train thanks to soft starters with hybrid switching technology
- Low-wear switching extends the service life of the devices
- Soft starting prevents current peaks, thereby increasing the network stability
- Protection against disturbances in the application. Mechanical protection for the drive train

Ready for a digital future: data available whenever and wherever needed



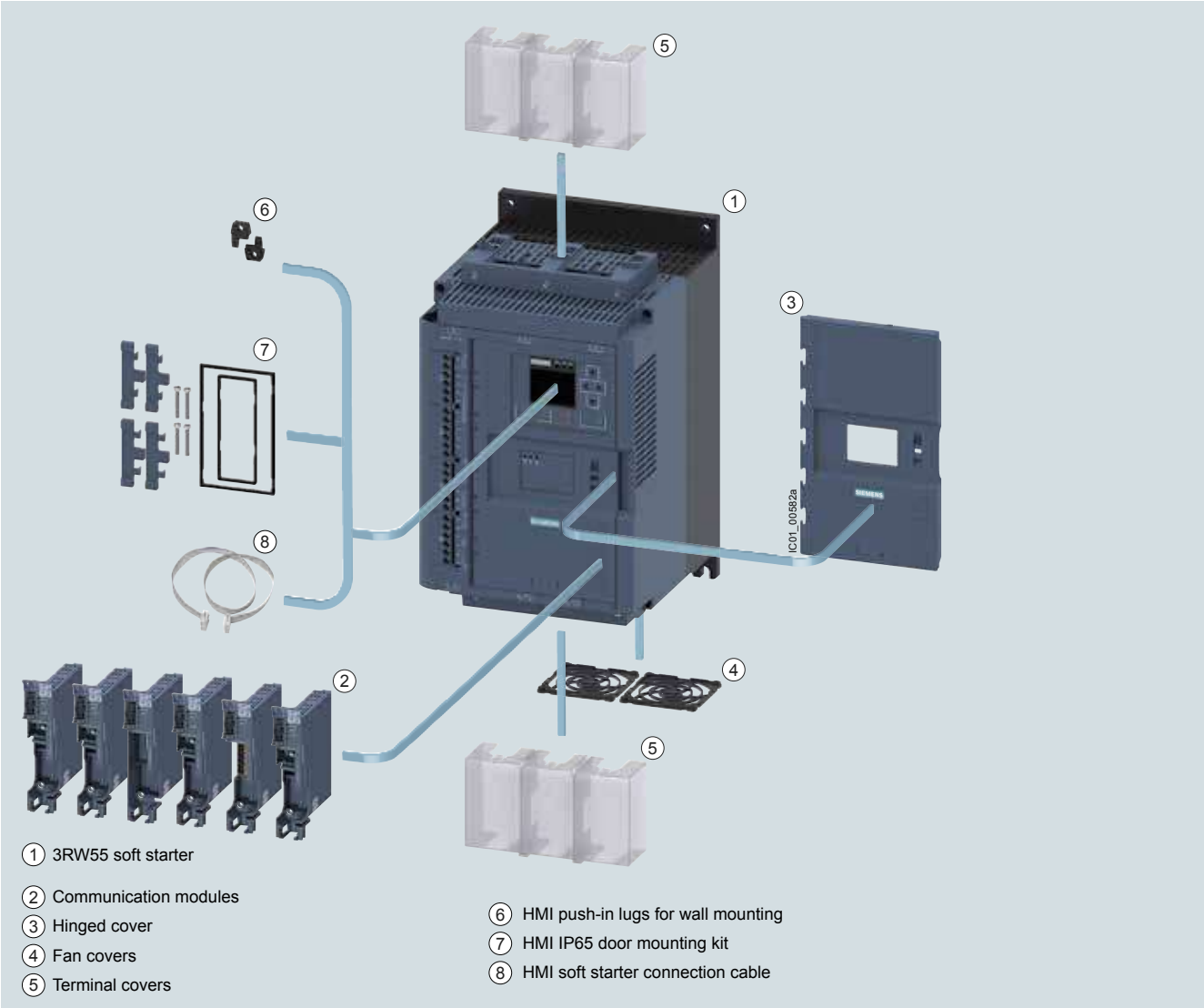
- Support from tools and data during engineering
- Simulation Tool for Soft Starters for support during product selection
- Very simple, standardized commissioning and configuration via Soft Starter ES in TIA Portal
- Integration in the automation system via communication interfaces
- Data availability and analysis: large volumes of data at any time and anywhere, even into MindSphere

Overview

More information	
Homepage, see www.siemens.com/softstarter Industry Mall, see www.siemens.com/product?3RW TIA Selection Tool Cloud (TST Cloud), see https://www.siemens.com/tstcloud/?node=Sirius3rwFolder	Industry Online Support (SIOS) topic page, see https://support.industry.siemens.com/cs/ww/en/view/109747404 Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

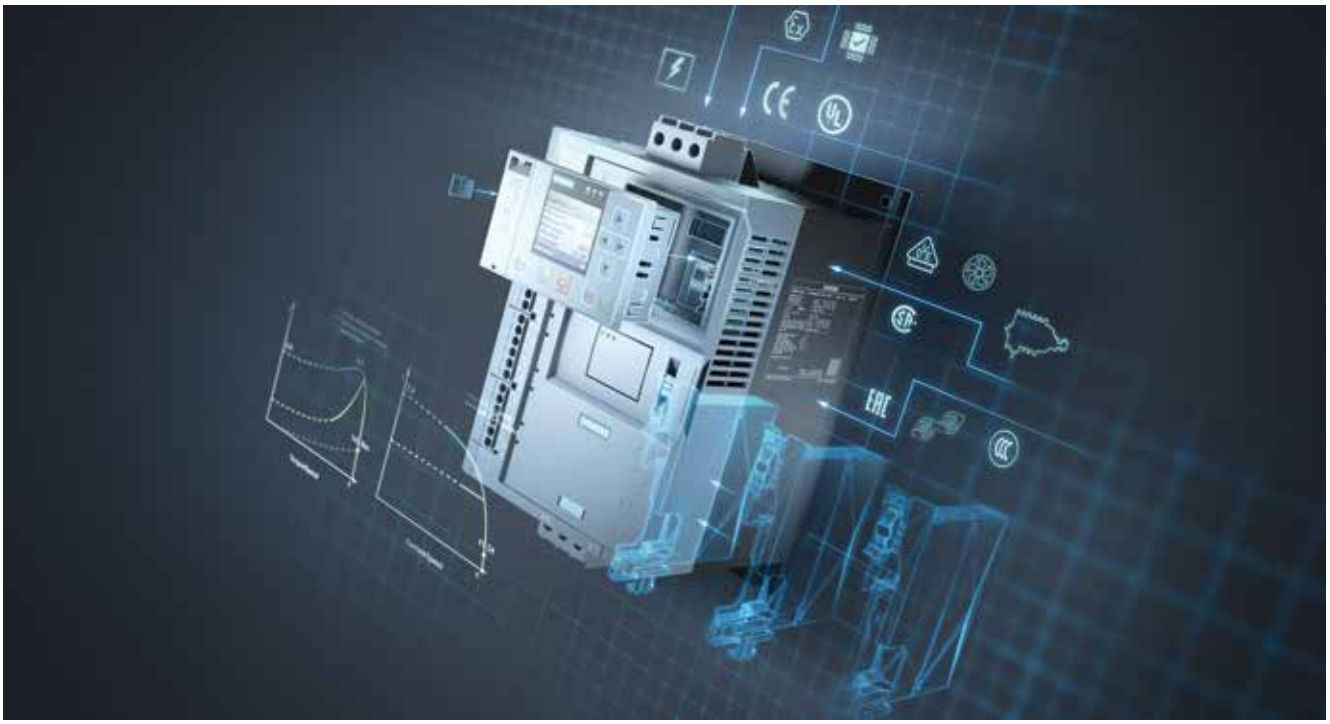
Equipped with the utmost functionality, the SIRIUS 3RW55 High Performance soft starters confidently handle even difficult starting and stopping operations. Thanks to innovative torque control, the device can be used for drives with an output of between 10 to 1,450 HP @ 600V.

The functions have been specially designed to offer maximum user friendliness. The HMI (with color display, local interface and a slot for micro SD memory card) and plug-in communication modules (PROFINET, PROFIBUS, EtherNet/IP and Modbus) ensure maximum flexibility. With their modern hybrid switching technology, the SIRIUS 3RW55 soft starters offer efficient switching for long-term, energy-saving use.



3RW55 High Performance soft starters with accessories, see page 7/34.

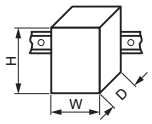
Benefits



Product characteristics / function	Performance features / benefits
Automatic parameterization	Extremely easy commissioning and reliability even under changing load conditions
Hybrid switching devices and three-phase motor control	Minimum power loss and optimum/symmetrical motor control
Integration into TIA Portal – communication modules optional	Efficient configuration and maximum flexibility in automation engineering
Removable HMI with color display, local interface, slot for micro SD memory card	Maximum flexibility with regard to user interface and intuitive menu guidance
Pump stop and torque control	Reduced mechanical loading and optimum pump stop control
Certified according to ATEX/IECEx directive	Suitable for the starting of explosion-proof motors

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/25099/td Equipment Manual "SIRIUS 3RW55 Soft Starter", see https://support.industry.siemens.com/cs/ww/en/view/109753752	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/25099/faq Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

Type		3RW551.-.HA.4 3RW551.-.HA.5	3RW552.-.HA.6 3RW553.-.HA.6	3RW552.-.HA.4 3RW553.-.HA.4	3RW554.-.HA.4	3RW554.-.HA.6	3RW555.-.HA.4	3RW555.-.HA.6
Installation/fixing/ dimensions								
Width x height x depth 	mm	170 × 275 × 152	185 × 306 × 203		210 × 393 × 203		478 x 764 x 241	
Type of mounting		Screw fixing						
Mounting position		Vertical (can be rotated +/- 90° and tilted +/- 22.5° forward or backward)						
Distance to be maintained with side-by-side mounting								
• Above	mm	100						
• At the side	mm	5						
• Below	mm	75						
Maximum installation altitude above sea level[1]	m	5 000	2 000	5 000		2 000	5 000	2 000
Degree of protection		IP00						
Ambient conditions								
Ambient temperature								
• During operation[2]	°C	-25 ... +60						
• During storage and transport	°C	-40 ... +80						
Environmental category according to IEC 60721								
• During operation		3K6 (no ice formation, no condensation), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6						
• During storage		1K6 (only occasional condensation), 1C2 (no salt mist), 1S2 (sand must not enter the devices), 1M4						
• During transport		2K2, 2C1, 2S1, 2M2 (max. height of fall 0.3 m)						

1) Derating from 1 000 m, see characteristic curve on page 7/7.

2) Note derating above 40 °C.

Type		3RW55..-.HA0.	3RW55..-.HA1.
Control circuit/control			
Control supply voltage			
• At AC/DC, rated value	V	24/24	--/--
• At AC	V	--	110 ... 250
• Relative negative tolerance/relative positive tolerance with AC	%	-20/20	-15/10
• Relative negative tolerance/relative positive tolerance with DC	%	-20/20	--/--
Frequency of the control supply voltage	Hz	50 ... 60	
• Relative negative tolerance/relative positive tolerance	%	-10/10	
Type of overvoltage protection		Varistors	
Type of short-circuit protection for control circuit[1]		Fuse 4 A gG (I_{cu} = 1 kA), fuse 6 A quick-response (I_{cu} = 1 kA), MCB C1 (I_{cu} = 600 A), MCB C6 (I_{cu} = 300 A)	

[1] Not included in scope of supply

Type		3RW55..-.HA.4	3RW55..-.HA.5	3RW55..-.HA.6
Power electronics				
Operational voltage, rated value	V	200 ... 480	200 ... 600	200 ... 690
• Relative negative tolerance/relative positive tolerance	%	-15/10		
Operational voltage for inside-delta circuit, rated value	V	200 ... 480	200 ... 600	
• Relative negative tolerance/relative positive tolerance	%	-15/10		
Operating frequency, rated value	Hz	50 ... 60		
• Relative negative tolerance/relative positive tolerance	%	-10/10		
Minimum load [% of I_M][1]	%	10		
Maximum cable length between soft starter and motor	m	800		

[1] Relative to set I_e.

Type		3RW5513	3RW5514	3RW5515	3RW5516	3RW5517
Rated operational current I_e	A	13	18	25	32	38
Power electronics						
Load rating with rated operational current I_e						
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	32/28.4/26	38/33.5/30.5
Permissible rated motor current and starts/h						
Normal starting (CLASS 10A)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	32/28.4/26	38/33.5/30.5
• 300% I_M						
- Start-up time 5 s	1/h	43	43	43	43	43
- Start-up time 10 s	1/h	18	18	18	18	18
• 350% I_M						
- Start-up time 5 s	1/h	28	28	28	28	28
- Start-up time 10 s	1/h	10	10	10	10	10
Normal starting (CLASS 10E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	32/28.4/26	38/33.5/30.5
• 300% I_M						
- Start-up time 5 s	1/h	21	21	21	21	21
- Start-up time 10 s	1/h	8	8	8	8	8
• 350% I_M						
- Start-up time 5 s	1/h	13	13	13	13	13
- Start-up time 10 s	1/h	4	4	4	4	4
Heavy starting (CLASS 20E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	29.6/27.2/23.6	33.5/30.5/27.5
• 300% I_M						
- Start-up time 20 s	1/h	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4
• 350% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5	2.5	2.5
Heavy starting (CLASS 30E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	26/23.6/21.2	29/26/23
• 300% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	3	3	3	3	3
• 350% I_M						
- Start-up time 20 s	1/h	4	4	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8	1.8	1.8
Adjustable rated motor current I_M						
• Minimum/maximum	A	2.5/13	3.5/18	5/25	6.5/32	7.5/38
• Minimum/maximum in inside-delta circuits	A	4.3/22.5	6.1/31.1	8.7/43.3	11.3/55.4	13/65.8

Type		3RW5521	3RW5524	3RW5525	3RW5526	3RW5527
Rated operational current I_e	A	25	47	63	77	93
Power electronics						
Load rating with rated operational current I_e						
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	25/22.3/19.6	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
Permissible rated motor current and starts/h						
Normal starting (CLASS 10A)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	25/22.3/19.6	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
• 300% I_M						
- Start-up time 5 s	1/h	43	43	43	43	43
- Start-up time 10 s	1/h	18	18	18	18	18
• 350% I_M						
- Start-up time 5 s	1/h	28	28	28	28	28
- Start-up time 10 s	1/h	10	10	10	10	10
Normal starting (CLASS 10E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	25/22.3/19.6	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
• 300% I_M						
- Start-up time 5 s	1/h	21	21	21	21	21
- Start-up time 10 s	1/h	8	8	8	8	8
• 350% I_M						
- Start-up time 5 s	1/h	13	13	13	13	13
- Start-up time 10 s	1/h	4	4	4	4	4
Heavy starting (CLASS 20E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	25/22.3/19.6	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
• 300% I_M						
- Start-up time 20 s	1/h	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4
• 350% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5	2.5	2.5
Heavy starting (CLASS 30E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	25/22.3/19.6	43.4/38/34.4	53/48/43	68/62/56	82.5/75.5/65
• 300% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	3	3	3	3	3
• 350% I_M						
- Start-up time 20 s	1/h	4	4	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8	1.8	1.8
Adjustable rated motor current I_M						
• Minimum/maximum	A	5/25	10/47	13/63	16/77	19/93
• Minimum/maximum in inside-delta circuits	A	8.7/43.3	17.3/81.4	22.5/109	27.7/133	32.9/161

Type		3RW5534	3RW5535	3RW5536
Rated operational current I_e	A	113	143	171
Power electronics				
Load rating with rated operational current I_e				
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	113/101/89	143/128/118	171/153/141
Permissible rated motor current and starts/h				
Normal starting (CLASS 10A)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	113/101/89	143/128/118	171/153/141
• 300% I_M				
- Start-up time 5 s	1/h	43	43	43
- Start-up time 10 s	1/h	18	18	18
• 350% I_M				
- Start-up time 5 s	1/h	28	28	28
- Start-up time 10 s	1/h	10	10	10
Normal starting (CLASS 10E)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	113/101/89	143/128/118	171/153/141
• 300% I_M				
- Start-up time 5 s	1/h	21	21	21
- Start-up time 10 s	1/h	8	8	8
• 350% I_M				
- Start-up time 5 s	1/h	13	13	13
- Start-up time 10 s	1/h	4	4	4
Heavy starting (CLASS 20E)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	109/97/85	128/113/103	141/129/117
• 300% I_M				
- Start-up time 20 s	1/h	10	10	10
- Start-up time 40 s	1/h	4	4	4
• 350% I_M				
- Start-up time 20 s	1/h	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5
Heavy starting (CLASS 30E)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	89/81/74	108/98/88	117/105/93
• 300% I_M				
- Start-up time 20 s	1/h	7	7	7
- Start-up time 40 s	1/h	3	3	3
• 350% I_M				
- Start-up time 20 s	1/h	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8
Adjustable rated motor current I_M				
• Minimum/maximum	A	23/113	29/143	34/171
• Minimum/maximum in inside-delta circuits	A	39.8/195	50.2/247	58.9/296

Type		3RW5543	3RW5544	3RW5545	3RW5546	3RW5547	3RW5548
Rated operational current I_e	A	210	250	315	370	470	570
Power electronics							
Load rating with rated operational current I_e							
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
Permissible rated motor current and starts/h							
Normal starting (CLASS 10A)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
• 300% I_M							
- Start-up time 5 s	1/h	43	43	43	43	40	20
- Start-up time 10 s	1/h	18	18	18	18	17	6
• 350% I_M							
- Start-up time 5 s	1/h	28	28	28	28	26	9
- Start-up time 10 s	1/h	10	10	10	10	10	1
Normal starting (CLASS 10E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	551/490/445
• 300% I_M							
- Start-up time 5 s	1/h	21	21	21	21	17	8
- Start-up time 10 s	1/h	8	8	8	8	6	1
• 350% I_M							
- Start-up time 5 s	1/h	13	13	13	13	10	2
- Start-up time 10 s	1/h	4	4	4	4	2	--
Heavy starting (CLASS 20E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	162/146/130	200/180/160	231/207/183	258/230/202	272/254/236	284/262/240
• 300% I_M							
- Start-up time 20 s	1/h	10	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4	4
• 350% I_M							
- Start-up time 20 s	1/h	7	7	7	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5	2.5	2.5	2.5
Heavy starting (CLASS 30E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	138/122/106	160/140/120	183/159/135	202/174/160	210/190/170	220/200/180
• 300% I_M							
- Start-up time 20 s	1/h	7	7	7	7	7	7
- Start-up time 40 s	1/h	3	3	3	3	3	3
• 350% I_M							
- Start-up time 20 s	1/h	4	4	4	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8	1.8	1.8	1.8
Adjustable rated motor current I_M							
• Minimum/maximum	A	42/210	50/250	63/315	74/370	94/470	114/570
• Minimum/maximum in inside-delta circuits	A	72.7/363	86.6/433	109.1/545	128.2/640	162.8/814	197.5/987

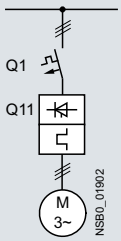
Type		3RW5552	3RW5553	3RW5554	3RW5556	3RW5558
Rated operational current I_e	A	630	720	840	1 100	1 280
Power electronics						
Load rating with rated operational current I_e						
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	630/561/510	720/641/580	840/748/670	1 100/979/890	1 280/1 139/1 030
Permissible rated motor current and starts/h						
Normal starting (CLASS 10A)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	630/561/510	720/641/580	840/748/670	1 100/979/890	1 280/1 139/1 030
• 300% I_M						
- Start-up time 5 s	1/h	43	43	42	43	32
- Start-up time 10 s	1/h	18	18	18	18	12
• 350% I_M						
- Start-up time 5 s	1/h	28	28	25	27	17
- Start-up time 10 s	1/h	10	10	10	9	4
Normal starting (CLASS 10E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	630/561/510	720/641/580	840/748/670	1 100/979/890	1 225/1 130/1 030
• 300% I_M						
- Start-up time 5 s	1/h	21	21	19	18	15
- Start-up time 10 s	1/h	8	8	7	7	5
• 350% I_M						
- Start-up time 5 s	1/h	13	13	10	9	1
- Start-up time 10 s	1/h	4	4	2	2	1
Heavy starting (CLASS 20E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	500/450/400	520/470/420	570/520/470	920/840/760	980/900/810
• 300% I_M						
- Start-up time 20 s	1/h	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4
• 350% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5	2.5	2.5
Heavy starting (CLASS 30E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	380/340/300	400/360/320	420/380/340	740/670/600	790/720/650
• 300% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	3	3	3	3	3
• 350% I_M						
- Start-up time 20 s	1/h	4	4	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8	1.8	1.8
Adjustable rated motor current I_M						
• Minimum/maximum	A	114/630	144/720	168/840	220/1 100	258/1 280
• Minimum/maximum in inside-delta circuits	A	197.5/987	249.4/1 247	291/1 454	381.1/1 905	446.9/2 217

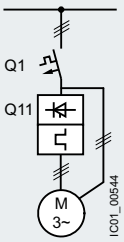
Motor feeders according to IEC with 3RV2/3VA motor starter protectors/circuit breakers (without semiconductor protection)

Type of coordination "1", CLASS 10,
short-circuit breaking capacity I_q in kA, see table

Note:

For general recommendations for constructing motor feeders
with soft starters, see page 7/9.





Soft starters	Motor starter protectors				Motor starter protectors			
	for 400 V systems		for 500 V systems		for 400 V systems		for 500 V systems	
Q11	Q1	I_q	Q1	I_q	Q1	I_q	Q1	I_q
Type	Type	kA	Type	kA	Type	kA	Type	kA
Type of coordination "1" ToC 1	**Inline circuit**				**Inside-delta circuit**			
3RW5513	3RV2032-4TA10	65	3RV2032-4TA10	18	3RV2032-4DA10	65	3RV2032-4DA10	18
3RW5514	3RV2032-4DA10	65	3RV2032-4DA10	15	3RV2032-4EA10	65	3RV2032-4EA10	15
3RW5515	3RV2032-4EA10	65	3RV2032-4EA10	15	3RV2032-4VA10	65	3RV2032-4VA10	15
3RW5516	3RV2032-4VA10	65	3RV2032-4VA10	10	3RV2032-4JA10	65	3RV2032-4JA10	10
3RW5517	3RV2032-4WA10	65	3RV2032-4WA10	10	3RV2032-4RA10	65	3RV2032-4RA10	10
3RW5521	--	--	--	--	--	--	--	--
3RW5524	3RV2032-4JA10	65	3RV2032-4JA10	10	3RV2032-4RA10	65	3RV2032-4RA10	10
3RW5525	3VA2163-7MN32-0AA0	65	3VA2163-7MN32-0AA0	20	3VA2110-7MN32-0AA0	65	3VA2110-7MN32-0AA0	20
3RW5526	3VA2110-7MN32-0AA0	65	3VA2110-7MN32-0AA0	20	3VA2216-7MN32-0AA0	65	3VA2216-7MN32-0AA0	20
3RW5527	3VA2216-7MN32-0AA0	15	3VA2216-7MN32-0AA0	10	3VA2220-7MN32-0AA0	15	3VA2220-7MN32-0AA0	10
3RW5534	3VA2216-7MN32-0AA0	65	--	--	3VA2220-7MN32-0AA0	65	--	--
3RW5535	3VA2220-7MN32-0AA0	65	--	--	3VA2325-7MN32-0AA0	65	--	--
3RW5536	3VA2325-7MN32-0AA0	30	3VA2325-7MN32-0AA0	10	3VA2440-7MN32-0AA0	30	3VA2440-7MN32-0AA0	10
3RW5543	3VA2325-7MN32-0AA0	65	3VA2325-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65
3RW5544	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65
3RW5545	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65
3RW5546	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65
3RW5547	3VA2450-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65	3VA2510-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65
3RW5548	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65
3RW5552	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2716-7AB05-0AA0	65	3VA2716-7AB05-0AA0	65
3RW5553	3VA2510-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65	3VA2716-7AB05-0AA0	65	3VA2716-7AB05-0AA0	65
3RW5554	3VA2510-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65	3VA2716-7AB05-0AA0	65	3VA2716-7AB05-0AA0	65
3RW5556	3VA2716-7AB05-0AA0	65	3VA2716-7AB05-0AA0	65	--	--	--	--
3RW5558	3VA2716-7AB05-0AA0	65	3VA2716-7AB05-0AA0	65	--	--	--	--

Note:

The service factor or measurement inaccuracies have been taken into account, for example, for the selection of the specified motor starter protectors/circuit breakers; the specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller motor starter protectors/circuit breakers than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

In 690 V systems, in motor feeder tests with soft starters demonstrable short-circuit breaking capacities can only be achieved with the use of fuses (I_q > 5 to 10 kA).

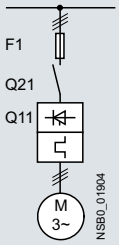
Motor feeders according to IEC with 3NA3 fuses

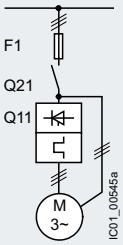
gG class full-range fuses for cable and line protection according to IEC 60269-2, without semiconductor protection

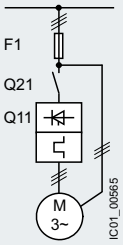
Type of coordination "1",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.







Soft starters	gG class fuse	Line contactor (optional)		gG class fuse	Line contactor (optional)			
	for systems up to 690 V	for systems up to 480 V	for systems up to 690 V	for systems up to 600 V	for systems up to 480 V in the supply cable	for systems up to 600 V in the supply cable	for systems up to 480 V in the delta	for systems up to 600 V in the delta
Q11	F1	Q21	Q21	F1	Q21	Q21	Q21	Q21
Type	Type	Type	Type	Type	Type	Type	Type	Type
Type of coordination "1" ToC 1	**Inline circuit**			**Inside-delta circuit**				
3RW5513	3NA3820-6	3RT2025	3RT2025	3NA3820-6	3RT2027	3RT2035	3RT2025	3RT2025
3RW5514	3NA3820-6	3RT2026	3RT2027	3NA3820-6	3RT2027	3RT2037	3RT2026	3RT2027
3RW5515	3NA3822-6	3RT2027	3RT2037	3NA3822-6	3RT2036	3RT2037	3RT2027	3RT2037
3RW5516	3NA3824-6	3RT2035	3RT2037	3NA3824-6	3RT2037	3RT2038	3RT2035	3RT2037
3RW5517	3NA3824-6	3RT2035	3RT2037	3NA3824-6	3RT2038	3RT2046	3RT2035	3RT2037
3RW5521	3NA3824-6	3RT2027	3RT2037	3NA3824-6	3RT2036	3RT2037	3RT2027	3RT2037
3RW5524	3NA3824-6	3RT2036	3RT2037	3NA3824-6	3RT2046	3RT2047	3RT2036	3RT2037
3RW5525	3NA3830-6	3RT2037	3RT2046	3NA3830-6	3RT2047	3RT1054	3RT2037	3RT2046
3RW5526	3NA3132-6	3RT2038	3RT2046	3NA3132-6	3RT1055	3RT1055	3RT2038	3RT2046
3RW5527	3NA3136-6	3RT2046	3RT2047	3NA3136-6	3RT1056	3RT1056	3RT2046	3RT2047
3RW5534	3NA3244-6	3RT1054	3RT1054	3NA3244-6	3RT1064	3RT1064	3RT1054	3RT1054
3RW5535	3NA3244-6	3RT1055	3RT1055	3NA3244-6	3RT1065	3RT1065	3RT1055	3RT1055
3RW5536	3NA3365-6	3RT1056	3RT1064	3NA3365-6	3RT1066	3RT1075	3RT1056	3RT1064
3RW5543	2 x 3NA3354-6	3RT1064	3RT1064	2 x 3NA3354-6	3RT1075	3RT1075	3RT1064	3RT1064
3RW5544	2 x 3NA3354-6	3RT1065	3RT1065	2 x 3NA3354-6	3RT1076	3RT1076	3RT1065	3RT1065
3RW5545	2 x 3NA3365-6	3RT1075	3RT1075	2 x 3NA3365-6	3TF68	3TF68	3RT1075	3RT1075
3RW5546	2 x 3NA3365-6	3RT1075	3RT1075	2 x 3NA3365-6	3TF69	3TF69	3RT1075	3RT1075
3RW5547	2 x 3NA3365-6	3RT1076	3RT1276	2 x 3NA3365-6	3TF69	3TF69	3RT1076	3RT1276
3RW5548	2 x 3NA3365-6	3TF68	3TF68	2 x 3NA3365-6	--	--	3TF68	3TF68
3RW5552	2 x 3NA3365-6	3TF68	3TF69	--	--	--	3TF68	3TF69
3RW5553	2 x 3NA3365-6	3TF69	3TF69	--	--	--	3TF69	3TF69
3RW5554	2 x 3NA3365-6	--	--	--	--	--	--	--
3RW5556	3 x 3NA3365-6	--	--	--	--	--	--	--
3RW5558	3 x 3NA3365-6	--	--	--	--	--	--	--

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

In inside-delta circuits, motor feeders with soft starters can only be operated in systems with up to 600 V.

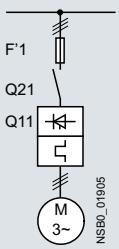
Motor feeders according to IEC with 3NE1/3NB3 SITOR fuses

gR class full-range fuses for semiconductor protection, cable and line protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	Line contactor (optional)	
	for systems up to 690 V	for systems up to 480 V	for systems up to 690 V
Q11	F'1	Q21	Q21
Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**		
3RW5513	3NE1815-0	3RT2025	3RT2025
3RW5514	3NE1802-0	3RT2026	3RT2027
3RW5515	3NE1817-0	3RT2027	3RT2037
3RW5516	3NE1818-0	3RT2035	3RT2037
3RW5517	3NE1820-0	3RT2035	3RT2037
3RW5521	3NE1817-0	3RT2027	3RT2037
3RW5524	3NE1021-2	3RT2036	3RT2037
3RW5525	3NE1022-0	3RT2037	3RT2046
3RW5526	3NE1224-0	3RT2038	3RT2046
3RW5527	3NE1224-0	3RT2046	3RT2047
3RW5534	3NE1225-0	3RT1054	3RT1054
3RW5535	3NE1227-0	3RT1055	3RT1055
3RW5536	3NE1230-0	3RT1056	3RT1064
3RW5543	3NE1230-2[1)]	3RT1064	3RT1064
3RW5544	3NE1331-0	3RT1065	3RT1065
3RW5545	3NE1334-2	3RT1075	3RT1075
3RW5546	3NE1334-2	3RT1075	3RT1075
3RW5547	3NE1436-2	3RT1076	3RT1276
3RW5548	3NE1437-2	3TF68	3TF68
3RW5552	3NB3350-1KK26	3TF68	3TF69
3RW5553	3NB3351-1KK26	3TF69	3TF69
3RW5554	3NB3351-1KK26	--	--
3RW5556	3NB3354-1KK26	--	--
3RW5558	3NB3357-1KK26	--	--

[1)] For systems up to 500 V.

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

In inside-delta circuits, a gR class full-range fuse could not provide the semiconductor protection of the delta-connected soft starter with a short-circuit breaking capacity that is adequate for practical use. In this case, we recommend using aR class partial-range fuses for semiconductor protection for type of coordination “2” (see page 7/24).

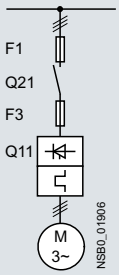
Motor feeders according to IEC with 3NE8 / 3NE3 / 3NC3 fuses

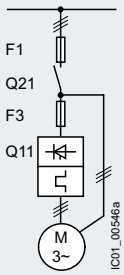
aR class partial-range fuses for semiconductor protection

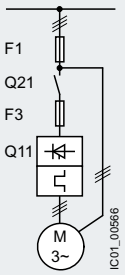
Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.







Soft starters	gG class fuse	aR class fuse	Line contactor (optional)		gG class fuse	aR class fuse	Line contactor (optional)			
	for systems up to 690 V	for systems up to 690 V	for systems up to 480 V	for systems up to 690 V	for systems up to 600 V	for systems up to 600 V	for systems up to 480 V in the supply cable	for systems up to 600 V in the supply cable	for systems up to 480 V in the delta	for systems up to 600 V in the delta
Q11	F1	F3	Q21	Q21	F1	F3	Q21	Q21	Q21	Q21
Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**				**Inside-delta circuit**					
3RW5513	3NA3820-6	3NE8017-1	3RT2025	3RT2025	3NA3820-6	3NE8017-1	3RT2027	3RT2035	3RT2025	3RT2025
3RW5514	3NA3820-6	3NE8020-1	3RT2026	3RT2027	3NA3820-6	3NE8020-1	3RT2027	3RT2037	3RT2026	3RT2027
3RW5515	3NA3822-6	3NE8021-1	3RT2027	3RT2037	3NA3822-6	3NE8021-1	3RT2036	3RT2037	3RT2027	3RT2037
3RW5516	3NA3824-6	3NE8022-1	3RT2035	3RT2037	3NA3824-6	3NE8022-1	3RT2037	3RT2038	3RT2035	3RT2037
3RW5517	3NA3824-6	3NE8024-1	3RT2035	3RT2037	3NA3824-6	3NE8024-1	3RT2038	3RT2046	3RT2035	3RT2037
3RW5521	3NA3824-6	3NE8021-1	3RT2027	3RT2037	3NA3824-6	3NE8021-1	3RT2036	3RT2037	3RT2027	3RT2037
3RW5524	3NA3824-6	3NE8024-1	3RT2036	3RT2037	3NA3824-6	3NE8024-1	3RT2046	3RT2047	3RT2036	3RT2037
3RW5525	3NA3830-6	3NE3227	3RT2037	3RT2046	3NA3830-6	3NE3227	3RT2047	3RT1054	3RT2037	3RT2046
3RW5526	3NA3132-6	3NE3227	3RT2038	3RT2046	3NA3132-6	3NE3227	3RT1055	3RT1055	3RT2038	3RT2046
3RW5527	3NA3136-6	3NE3227	3RT2046	3RT2047	3NA3136-6	3NE3227	3RT1056	3RT1056	3RT2046	3RT2047
3RW5534	3NA3244-6	3NE3231	3RT1054	3RT1054	3NA3244-6	3NE3231	3RT1064	3RT1064	3RT1054	3RT1054
3RW5535	3NA3244-6	3NE3233	3RT1055	3RT1055	3NA3244-6	3NE3233	3RT1065	3RT1065	3RT1055	3RT1055
3RW5536	3NA3365-6	3NE3334-0B	3RT1056	3RT1064	3NA3365-6	3NE3334-0B	3RT1066	3RT1075	3RT1056	3RT1064
3RW5543	2 x 3NA3354-6	3NE3333	3RT1064	3RT1064	2 x 3NA3354-6	3NE3333	3RT1075	3RT1075	3RT1064	3RT1064
3RW5544	2 x 3NA3354-6	3NE3335	3RT1065	3RT1065	2 x 3NA3354-6	3NE3335	3RT1076	3RT1076	3RT1065	3RT1065
3RW5545	2 x 3NA3365-6	--	3RT1075	3RT1075	2 x 3NA3365-6	--	3TF68	3TF68	3RT1075	3RT1075
3RW5546	2 x 3NA3365-6	--	3RT1075	3RT1075	2 x 3NA3365-6	--	3TF69	3TF69	3RT1075	3RT1075
3RW5547	2 x 3NA3365-6	3NE3340-8	3RT1076	3RT1276	2 x 3NA3365-6	3NE3340-8	3TF69	3TF69	3RT1076	3RT1276
3RW5548	2 x 3NA3365-6	3NC3342-1U	3TF68	3TF68	2 x 3NA3365-6	3NC3342-1U	--	--	3TF68	3TF68
3RW5552	2 x 3NA3365-6	3NC3343-1U	3TF68	3TF69	--	3NC3343-1U	--	--	3TF68	3TF69
3RW5553	2 x 3NA3365-6	3NC3343-1U	3TF69	3TF69	--	3NC3343-1U	--	--	3TF69	3TF69
3RW5554	2 x 3NA3365-6	3NC3343-1U	--	--	--	3NC3343-1U	--	--	--	--
3RW5556	3 x 3NA3365-6	3 x 3NE3340-8	--	--	--	3 x 3NE3340-8	--	--	--	--
3RW5558	3 x 3NA3365-6	3 x 3NE3340-8	--	--	--	3 x 3NE3340-8	--	--	--	--

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

For CLASS 10 applications, as an alternative to the gG class full-range fuses for cable and line protection 3NA3 (F1), 3RV2/3VA motor starter protectors/circuit breakers can also be used, possibly with reduced short-circuit breaking capacity (see page 7/21). In these cases, optional line contactors can be dispensed with.

In inside-delta circuits, motor feeders with soft starters can only be operated in systems with up to 600 V.

Reversing operation with reversing contactors

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.

(For an example circuit, see 3RW55 Equipment Manual, Appendix A.3)

Soft starters	Reversing contactor assembly		For reversing contactor	
	for systems up to 480 V	for systems up to 690 V	for systems up to 480 V	for systems up to 690 V
Q11	Q21 / Q22	Q21 / Q22	Q21 / Q22	Q21 / Q22
Type	Type	Type	Type	Type
3RW5513	3RA2325	3RA2325	3RT2025	3RT2025
3RW5514	3RA2326	3RA2327	3RT2026	3RT2027
3RW5515	3RA2327	3RA2337	3RT2027	3RT2037
3RW5516	3RA2335	3RA2337	3RT2035	3RT2037
3RW5517	3RA2335	3RA2337	3RT2035	3RT2037
3RW5521	3RA2327	3RA2337	3RT2027	3RT2037
3RW5524	3RA2336	3RA2337	3RT2036	3RT2037
3RW5525	3RA2337	3RA2346	3RT2037	3RT2046
3RW5526	3RA2338	3RA2346	3RT2038	3RT2046
3RW5527	3RA2346	3RA2347	3RT2046	3RT2047
3RW5534	--	--	3RT1054	3RT1054
3RW5535	--	--	3RT1055	3RT1055
3RW5536	--	--	3RT1056	3RT1064
3RW5543	--	--	3RT1064	3RT1064
3RW5544	--	--	3RT1065	3RT1065
3RW5545	--	--	3RT1075	3RT1075
3RW5546	--	--	3RT1075	3RT1075
3RW5547	--	--	3RT1076	3RT1276
3RW5548	--	--	3TF68	3TF68
3RW5552	--	--	3TF68	3TF69
3RW5553	--	--	3TF69	3TF69
3RW5554	--	--	--	--
3RW5556	--	--	--	--
3RW5558	--	--	--	--

DC braking with braking contactors

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.

(For an example circuit, see 3RW55 Equipment Manual, Appendix A.3)

Soft starters	DC braking contactor	DC braking contactor assembly			
	for systems up to 400 V	for systems up to 480 V		for systems up to 690 V	
	with 2 NC contacts + 2 NO contacts parallel	with 3 NO contacts parallel	with 3 NO contacts parallel	with 3 NO contacts parallel	with 3 NO contacts parallel
Q11	Q93	Q91	Q92	Q91	Q92
Type	Type	Type	Type	Type	Type
3RW5513	3RT2517	3RT2015	3RT2016	3RT2015	3RT2016
3RW5514	3RT2518	3RT2015	3RT2017	3RT2015	3RT2023
3RW5515	3RT2526	3RT2015	3RT2025	3RT2015	3RT2025
3RW5516	3RT2526	3RT2015	3RT2025	3RT2015	3RT2027
3RW5517	3RT2535	3RT2015	3RT2027	3RT2015	3RT2027
3RW5521	3RT2526	3RT2015	3RT2025	3RT2015	3RT2025
3RW5524	3RT2535	3RT2016	3RT2027	3RT2016	3RT2035
3RW5525	--	3RT2024	3RT2027	3RT2024	3RT2037
3RW5526	--	3RT2025	3RT2035	3RT2025	3RT2037
3RW5527	--	3RT2027	3RT2036	3RT2027	3RT2037
3RW5534	--	3RT2035	3RT2037	3RT2035	3RT2038
3RW5535	--	3RT2036	3RT2038	3RT2036	3RT2046
3RW5536	--	3RT2037	3RT2046	3RT2037	3RT2047
3RW5543	--	3RT2045	3RT2047	3RT2045	3RT1054
3RW5544	--	3RT2045	3RT1055	3RT2045	3RT1055
3RW5545	--	3RT2446	3RT1056	3RT2446	3RT1056
3RW5546	--	3RT1055	3RT1056	3RT1055	3RT1064
3RW5547	--	3RT1456	3RT1065	3RT1456	3RT1065
3RW5548	--	3RT1456	3RT1066	3RT1456	3RT1075
3RW5552	--	3RT1065	3RT1075	3RT1065	3RT1075
3RW5553	--	3RT1065	3RT1075	3RT1065	3RT1075
3RW5554	--	3RT1466	3RT1076	3RT1466	3RT1076
3RW5556	--	3RT1476	3TF68	3RT1476	3TF68
3RW5558	--	3RT1476	3TF69	3RT1476	3TF69

Selection and ordering data

For normal starting (CLASS 10E)

3RW551.

3RW552.

At 40 °C													
Operational current	Operating power for three-phase motors				Rating [hp] for three-phase motors				SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	At 230 V	At 400 V	At 500 V	At 690 V	At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 480 V													
13	3	**5.5**	--	--	3	3	**7.5**	--	5	**3RW5513-□HA□4**		1	1 unit
18	4	**7.5**	--	--	5	5	**10**	--	5	**3RW5514-□HA□4**		1	1 unit
25	5.5	**11**	--	--	5	7.5	**15**	--	5	**3RW5515-□HA□4**		1	1 unit
32	7.5	**15**	--	--	7.5	10	**20**	--	5	**3RW5516-□HA□4**		1	1 unit
38	11	**18.5**	--	--	10	10	**25**	--	5	**3RW5517-□HA□4**		1	1 unit
47	11	**22**	--	--	10	15	**30**	--	5	**3RW5524-□HA□4**		1	1 unit
63	18.5	**30**	--	--	20	20	**40**	--	5	**3RW5525-□HA□4**		1	1 unit
77	22	**37**	--	--	20	25	**60**	--	5	**3RW5526-□HA□4**		1	1 unit
93	22	**45**	--	--	30	30	**60**	--	5	**3RW5527-□HA□4**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals — **1**
Spring-loaded terminals — **3**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

High Performance Soft Starters

3RW55 soft starters > Inline circuit *IE3/IE4* ready

For normal starting (CLASS 10E)

3RW553.

3RW554.

3RW555.

At 40 °C												
Operational current	Operating power for three-phase motors				Rating [hp] for three-phase motors				SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	At 230 V	At 400 V	At 500 V	At 690 V	At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 480 V													
113	30	**55**	--	--	30	40	**75**	--	5	**3RW5534-□HA□4**		1	1 unit
143	37	**75**	--	--	40	50	**100**	--	5	**3RW5535-□HA□4**		1	1 unit
171	45	**90**	--	--	50	60	**125**	--	5	**3RW5536-□HA□4**		1	1 unit
210	55	**110**	--	--	60	75	**150**	--	5	**3RW5543-□HA□4**		1	1 unit
250	75	**132**	--	--	75	100	**200**	--	5	**3RW5544-□HA□4**		1	1 unit
315	90	**160**	--	--	100	125	**250**	--	5	**3RW5545-□HA□4**		1	1 unit
370	110	**200**	--	--	125	150	**300**	--	5	**3RW5546-□HA□4**		1	1 unit
470	132	**250**	--	--	150	150	**350**	--	5	**3RW5547-□HA□4**		1	1 unit
570	160	**315**	--	--	200	200	**450**	--	5	**3RW5548-□HA□4**		1	1 unit
630	200	**355**	--	--	200	250	**500**	--	15	**3RW5552-□HA□4**		1	1 unit
720	200	**400**	--	--	250	250	**600**	--	15	**3RW5553-□HA□4**		1	1 unit
840	250	**450**	--	--	300	350	**700**	--	15	**3RW5554-□HA□4**		1	1 unit
1 100	315	**560**	--	--	350	450	**950**	--	15	**3RW5556-□HA□4**		1	1 unit
1 280	400	**710**	--	--	400	550	**1 100**	--	15	**3RW5558-□HA□4**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals
Screw terminals

Control supply voltage
24 V AC/DC
110 ... 250 V AC

[1] 3RW55 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

High Performance Soft Starters

3RW55 soft starters > Inline circuit *IE3/IE4* ready

For normal starting (CLASS 10E)

3RW551.

3RW552.

At 40 °C													
Operational current	Operating power for three-phase motors				Rating [hp] for three-phase motors				SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	At 230 V	At 400 V	At 500 V	At 690 V	At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 600 V													
13	3	5.5	7.5	--	3	3	7.5	**10**	5	**3RW5513-□HA□5**		1	1 unit
18	4	7.5	11	--	5	5	10	**15**	5	**3RW5514-□HA□5**		1	1 unit
25	5.5	11	15	--	5	7.5	15	**20**	5	**3RW5515-□HA□5**		1	1 unit
32	7.5	15	18.5	--	7.5	10	20	**30**	5	**3RW5516-□HA□5**		1	1 unit
38	11	18.5	22	--	10	10	25	**30**	5	**3RW5517-□HA□5**		1	1 unit
Operational voltage 200 ... 690 V													
25	5.5	11	15	22	5	7.5	15	**20**	5	**3RW5521-□HA□6**		1	1 unit
47	11	22	30	45	10	15	30	**40**	5	**3RW5524-□HA□6**		1	1 unit
63	18.5	30	37	55	20	20	40	**60**	5	**3RW5525-□HA□6**		1	1 unit
77	22	37	45	75	20	25	60	**75**	5	**3RW5526-□HA□6**		1	1 unit
93	22	45	55	90	30	30	60	**75**	5	**3RW5527-□HA□6**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals — **1**
Spring-loaded terminals — **3**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 690 V: Standard delivery time SD = 2 days (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

High Performance Soft Starters

3RW55 soft starters > Inline circuit *IE3/IE4* ready

For normal starting (CLASS 10E)

3RW553.

3RW554.

3RW555.

At 40 °C												
Operational current	Operating power for three-phase motors				Rating [hp] for three-phase motors				SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	At 230 V	At 400 V	At 500 V	At 690 V	At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 690 V													
113	30	55	75	110	30	40	75	**100**	5	**3RW5534-□HA□6**		1	1 unit
143	37	75	90	132	40	50	100	**125**	5	**3RW5535-□HA□6**		1	1 unit
171	45	90	110	160	50	60	125	**150**	5	**3RW5536-□HA□6**		1	1 unit
210	55	110	132	200	60	75	150	**200**	5	**3RW5543-□HA□6**		1	1 unit
250	75	132	160	250	75	100	200	**250**	5	**3RW5544-□HA□6**		1	1 unit
315	90	160	200	315	100	125	250	**300**	5	**3RW5545-□HA□6**		1	1 unit
370	110	200	250	355	125	150	300	**350**	5	**3RW5546-□HA□6**		1	1 unit
470	132	250	315	400	150	150	350	**450**	5	**3RW5547-□HA□6**		1	1 unit
570	160	315	355	560	200	200	450	**600**	5	**3RW5548-□HA□6**		1	1 unit
630	200	355	400	630	200	250	500	**700**	15	**3RW5552-□HA□6**		1	1 unit
720	200	400	500	710	250	250	600	**800**	15	**3RW5553-□HA□6**		1	1 unit
840	250	450	560	800	300	350	700	**900**	15	**3RW5554-□HA□6**		1	1 unit
1 100	215	560	710	1 000	350	450	950	**1 250**	15	**3RW5556-□HA□6**		1	1 unit
1 280	400	710	900	1 200	400	550	1 100	**1 450**	15	**3RW5558-□HA□6**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals
Screw terminals

Control supply voltage
24 V AC/DC
110 ... 250 V AC

[1] 3RW55 soft starter with screw terminals for operational voltage up to 690 V:
- Sizes 3 and 4: Standard delivery time SD = 2 days (d).
- Size 5: Standard delivery time SD = 5 days (d).

Note:

For the constraints for the motor outputs specified here,
see page 7/7.

Selection and ordering data

For normal starting (CLASS 10E)

3RW551.

3RW552.

At 40 °C for inside-delta circuit								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors			Rating [hp] for three-phase motors								
	At 230 V	At 400 V	At 500 V	At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 480 V												
22.5	5.5	**11**	--	5	7.5	**15**	--	5	**3RW5513-□HA□4**		1	1 unit
31.5	7.5	**15**	--	7.5	10	**20**	--	5	**3RW5514-□HA□4**		1	1 unit
43.3	11	**18.5**	--	10	15	**30**	--	5	**3RW5515-□HA□4**		1	1 unit
55.4	15	**22**	--	15	20	**40**	--	5	**3RW5516-□HA□4**		1	1 unit
65.8	18.5	**30**	--	20	20	**50**	--	5	**3RW5517-□HA□4**		1	1 unit
81.4	22	**45**	--	25	30	**60**	--	5	**3RW5524-□HA□4**		1	1 unit
109	30	**55**	--	30	40	**75**	--	5	**3RW5525-□HA□4**		1	1 unit
133	37	**75**	--	40	50	**100**	--	5	**3RW5526-□HA□4**		1	1 unit
161	45	**90**	--	50	60	**125**	--	5	**3RW5527-□HA□4**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals **1**
Spring-loaded terminals **3**

Control supply voltage
24 V AC/DC **0**
110 ... 250 V AC **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

High Performance Soft Starters

3RW55 soft starters > Inside-delta circuit *IE3/IE4* ready

For normal starting (CLASS 10E)

3RW553.

3RW554.

3RW555.

At 40 °C for inside-delta circuit								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors			Rating [hp] for three-phase motors								
	At 230 V	At 400 V	At 500 V	At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 480 V												
196	55	**110**	--	60	75	**150**	--	5	**3RW5534-□HA□4**		1	1 unit
248	75	**132**	--	75	75	**200**	--	5	**3RW5535-□HA□4**		1	1 unit
296	90	**160**	--	100	100	**200**	--	5	**3RW5536-□HA□4**		1	1 unit
364	110	**200**	--	125	150	**300**	--	5	**3RW5543-□HA□4**		1	1 unit
433	132	**250**	--	150	150	**350**	--	5	**3RW5544-□HA□4**		1	1 unit
546	160	**315**	--	150	200	**450**	--	5	**3RW5545-□HA□4**		1	1 unit
641	200	**355**	--	200	250	**500**	--	5	**3RW5546-□HA□4**		1	1 unit
814	250	**400**	--	250	300	**700**	--	5	**3RW5547-□HA□4**		1	1 unit
987	315	**560**	--	350	400	**850**	--	5	**3RW5548-□HA□4**		1	1 unit
1 091	355	**630**	--	350	450	**950**	--	15	**3RW5552-□HA□4**		1	1 unit
1 247	400	**710**	--	400	500	**1 100**	--	15	**3RW5553-□HA□4**		1	1 unit
1 454	450	**800**	--	500	600	**1 300**	--	15	**3RW5554-□HA□4**		1	1 unit
1 905	560	**1 000**	--	650	800	**1 700**	--	15	**3RW5556-□HA□4**		1	1 unit
2 217	710	**1 200**	--	800	950	**1 900**	--	15	**3RW5558-□HA□4**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — **2**
Screw terminals — **6**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

High Performance Soft Starters

3RW55 soft starters > Inside-delta circuit *IE3/IE4* ready

For normal starting (CLASS 10E)

3RW551.

3RW552.

At 40 °C for inside-delta circuit								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors			Rating [hp] for three-phase motors								
	At 230 V	At 400 V	At 500 V	At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 600 V												
22.5	5.5	11	15	5	7.5	15	**20**	5	**3RW5513-□HA□5**		1	1 unit
31.5	7.5	15	18.5	7.5	10	20	**25**	5	**3RW5514-□HA□5**		1	1 unit
43.3	11	18.5	22	10	15	30	**40**	5	**3RW5515-□HA□5**		1	1 unit
55.4	15	22	30	15	20	40	**50**	5	**3RW5516-□HA□5**		1	1 unit
65.8	18.5	30	37	20	20	50	**60**	5	**3RW5517-□HA□5**		1	1 unit
43.3	11	18.5	22	10	15	30	**40**	5	**3RW5521-□HA□6**		1	1 unit
81.4	22	45	45	25	30	60	**75**	5	**3RW5524-□HA□6**		1	1 unit
109	30	55	55	30	40	75	**100**	5	**3RW5525-□HA□6**		1	1 unit
133	37	75	90	40	50	100	**125**	5	**3RW5526-□HA□6**		1	1 unit
161	45	90	110	50	60	125	**150**	5	**3RW5527-□HA□6**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals **1**
Spring-loaded terminals **3**

Control supply voltage
24 V AC/DC **0**
110 ... 250 V AC **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 600 V: Standard delivery time SD = 2 days (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

High Performance Soft Starters

3RW55 soft starters > Inside-delta circuit *IE3/IE4* ready

For normal starting (CLASS 10E)

3RW553.

3RW554.

3RW555.

At 40 °C for inside-delta circuit								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors			Rating [hp] for three-phase motors								
	At 230 V	At 400 V	At 500 V	At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 600 V												
196	55	110	132	60	75	150	**200**	5	**3RW5534-□HA□6**		1	1 unit
248	75	132	160	75	75	200	**250**	5	**3RW5535-□HA□6**		1	1 unit
296	90	160	200	100	100	200	**300**	5	**3RW5536-□HA□6**		1	1 unit
364	110	200	250	125	150	300	**350**	5	**3RW5543-□HA□6**		1	1 unit
433	132	250	315	150	150	350	**450**	5	**3RW5544-□HA□6**		1	1 unit
546	160	315	355	150	200	450	**550**	5	**3RW5545-□HA□6**		1	1 unit
641	200	355	450	200	250	500	**700**	5	**3RW5546-□HA□6**		1	1 unit
814	250	400	500	250	300	700	**900**	5	**3RW5547-□HA□6**		1	1 unit
987	315	560	630	350	400	850	**1 100**	5	**3RW5548-□HA□6**		1	1 unit
1 091	355	630	710	350	450	950	**1 200**	15	**3RW5552-□HA□6**		1	1 unit
1 247	400	710	800	400	500	1 100	**1 400**	15	**3RW5553-□HA□6**		1	1 unit
1 454	450	800	900	500	600	1 300	**1 600**	15	**3RW5554-□HA□6**		1	1 unit
1 905	560	1 000	1 200	650	800	1 700	**2 100**	15	**3RW5556-□HA□6**		1	1 unit
2 217	710	1 200	1 500	800	950	1 900	**2 500**	15	**3RW5558-□HA□6**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — **2**
Screw terminals — **6**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 600 V:
- Sizes 3 and 4: Standard delivery time SD = 2 days (d).
- Size 5: Standard delivery time SD = 5 days (d).

Note:

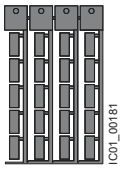
For the constraints for the motor outputs specified here,
see page 7/7.

Selection and ordering data

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	Application	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
					d				
Fan covers									
3RW5983-0FC00	**Fan cover**	3RW551 (1x), 3RW552 (2x), 3RW553 (2x)	--	--	▶	**3RW5983-0FC00**		1	1 unit
		3RW554 (1x)	--	--	▶	**3RW5984-0FC00**		1	1 unit
		3RW555 (3x)	--	--	▶	**3RW5985-0FC00**		1	1 unit
Terminal covers									
3RW5983-0TC20	**Terminal cover**	3RW552 (2x), 3RW553 (2x)	--	--	▶	**3RW5983-0TC20**		1	1 unit
3RW5984-0TC20		3RW554 (2x)	--	--	▶	**3RW5984-0TC20**		1	1 unit
Enclosure components									
3RW5950-0GL20	**Hinged cover**	3RW55	Without cutout	--	▶	**3RW5950-0GL20**		1	1 unit
Communication modules									
3RW5980-0CS00	**Communication module**	3RW55	PROFINET High Feature with integral switch	--	▶	**3RW5950-0CH00**		1	1 unit
			PROFINET Standard	--	▶	**3RW5980-0CS00**		1	1 unit
			PROFIBUS	--	▶	**3RW5980-0CP00**		1	1 unit
3RW5980-0CE00			EtherNet/IP	--	▶	**3RW5980-0CE00**		1	1 unit
3RW5980-0CR00			Modbus RTU	--	▶	**3RW5980-0CR00**		1	1 unit
			Modbus TCP	--	▶	**3RW5980-0CT00**		1	1 unit

High Performance Soft Starters

3RW55 soft starters > Accessories

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	Application	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
					d				
HMI modules									
3RW5980-0HD00	**IP65 door mounting kit for HMI modules**	3RW55	IP65	For HMI modules	►	**3RW5980-0HD00**		1	1 unit
Connecting cables									
3UF793.-0BA00-0	**HMI connection cable**	3RW55	5 m, round	For door mounting	►	**3RW5980-0HC60**		1	1 unit
			2.5 m, round		►	**3UF7933-0BA00-0**		1	1 unit
			1.0 m, round		►	**3UF7937-0BA00-0**		1	1 unit
			0.5 m, round		►	**3UF7932-0BA00-0**		1	1 unit
Further accessories									
3ZY1311-0AA00	**Push-in lugs for wall mounting**	--	Two lugs are required per device	For HMI modules and communication modules	2	**3ZY1311-0AA00**		1	10 units
Blank labels									
 3RT2900-1SB20	**Unit labeling plates[1)]**		20 mm x 7 mm, titanium gray	For SIRIUS devices	20	**3RT2900-1SB20**		100	340 units
3RW55 starter kit									
3RW5951-1ES04	**SIRIUS 3RW55 starter kit**	--	Including 3RW55 soft starter 13 A, 200 ... 480 V, 24 V AC/DC Soft Starter ES V15.1, 24 V power supply unit, connecting cable and RJ45 network cable		5	**3RW5951-1ES04**		1	1 unit

1) PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH.

High Performance Soft Starters

3RW55 Failsafe soft starters > General data NEW

Overview

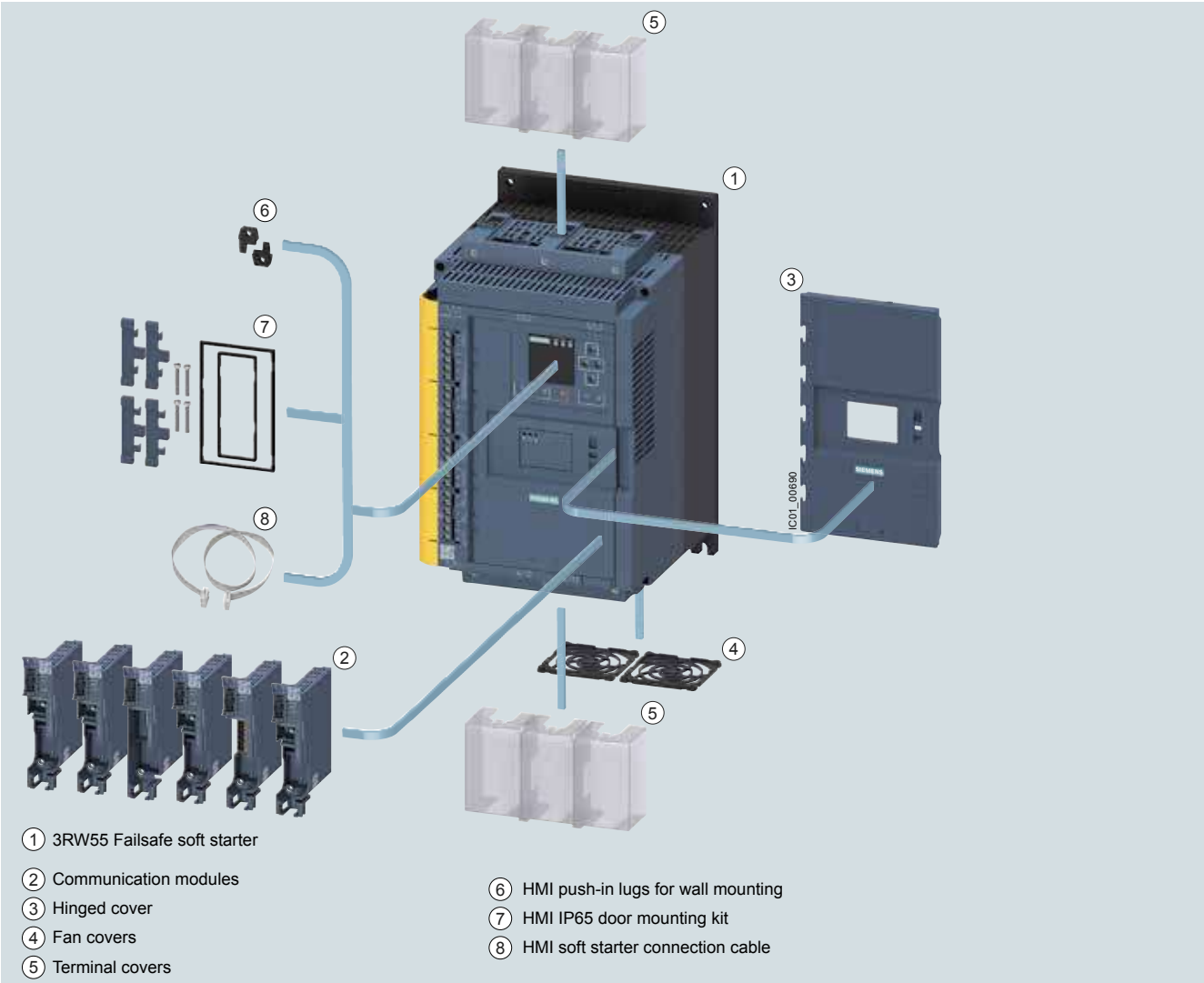
More information

Homepage, see www.siemens.com/softstarter
Industry Mall, see www.siemens.com/product?3RW
Industry Online Support (SIOS) topic page, see https://support.industry.siemens.com/cs/ww/en/view/109747404

Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917
SIRIUS Soft Starter ES (TIA Portal), see page 7/7

Equipped with the utmost functionality, the SIRIUS 3RW55 Failsafe High Performance soft starters confidently handle even difficult starting and stopping operations. Thanks to innovative torque control, the device can be used for drives with an output of between 7.5 to 450HP @ 480V.

The innovative 3RW55 Failsafe soft starter features an integrated fail-safe digital input for directly connecting the EMERGENCY STOP, and thus covers SIL 1 STO applications. The HMI (with color display, local interface and a slot for micro SD memory card) and plug-in communication modules (PROFINET, PROFIBUS, EtherNet/IP and Modbus) ensure maximum flexibility. With their modern hybrid switching technology, the 3RW55 Failsafe soft starters offer efficient switching for long-term, energy-saving use.



3RW55 Failsafe High Performance soft starters with accessories, see page 7/51.

High Performance Soft Starters

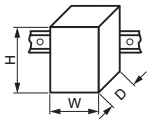
3RW55 Failsafe soft starters > General data NEW

Benefits

Product characteristics / function	Performance features / benefits
Automatic parameterization	Extremely easy commissioning and reliability even under changing load conditions
Hybrid switching devices and three-phase motor control	Minimum power loss and optimum/symmetrical motor control
Integration into TIA Portal – communication modules optional	Efficient configuration and maximum flexibility in automation engineering
Removable HMI with color display, local interface, slot for micro SD memory card	Maximum flexibility with regard to user interface and intuitive menu guidance
Pump stop and torque control	Reduced mechanical loading and optimum pump stop control
Certified according to ATEX/IECEx directive	Suitable for the starting of explosion-proof motors
Fail-safe disconnection up to SIL 3 - PL e / STO	Reduced costs and space requirements thanks to direct wiring of the EMERGENCY STOP mushroom pushbutton to the soft starter for SIL 1

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/25776/td Equipment Manual "SIRIUS 3RW55 Soft Starter", see https://support.industry.siemens.com/cs/ww/en/view/109753752	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/25776/faq Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

Type		3RW551.-.HF.4	3RW552.-.HF.4 3RW553.-.HF.4	3RW554.-.HF.4
Installation/fixing/dimensions				
Width x height x depth 	mm	170 × 275 × 152	185 × 306 × 203	210 × 393 × 203
Type of mounting		Screw fixing		
Mounting position		Vertical (can be rotated +/- 90° and tilted +/- 22.5° forward or backward)		
Distance to be maintained with side-by-side mounting				
• Above	mm	100		
• At the side	mm	5		
• Below	mm	75		
Maximum installation altitude above sea level[1]	m	2 000		
Degree of protection		IP00		
Ambient conditions				
Ambient temperature				
• During operation[2]	°C	-25 ... +60		
• During storage and transport	°C	-40 ... +80		
Environmental category according to IEC 60721				
• During operation		3K6 (no ice formation, no condensation), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6		
• During storage		1K6 (only occasional condensation), 1C2 (no salt mist), 1S2 (sand must not enter the devices), 1M4		
• During transport		2K2, 2C1, 2S1, 2M2 (max. height of fall 0.3 m)		

1) Derating from 1 000 m, see characteristic curve on page 7/7.

2) Note derating above 40 °C.

Type		3RW55..-.HF0.	3RW55..-.HF1.
Control circuit/control			
Control supply voltage			
• At AC/DC, rated value	V	24/24	--/--
• At AC	V	--	110 ... 250
• Relative negative tolerance/relative positive tolerance with AC	%	-20/20	-15/10
• Relative negative tolerance/relative positive tolerance with DC	%	-20/20	--/--
Frequency of the control supply voltage	Hz	50 ... 60	
• Relative negative tolerance/relative positive tolerance	%	-10/10	
Type of overvoltage protection		Varistors	
Type of short-circuit protection for control circuit[1)]		Fuse 4 A gG (I_{cu} = 1 kA), fuse 6 A quick-response (I_{cu} = 1 kA), MCB C1 (I_{cu} = 600 A), MCB C6 (I_{cu} = 300 A)	

1) Not included in scope of supply

Type		3RW55..-.HF.4
Power electronics		
Operational voltage, rated value	V	200 ... 480
• Relative negative tolerance/relative positive tolerance	%	-15/10
Operational voltage for inside-delta circuit, rated value	V	200 ... 480
• Relative negative tolerance/relative positive tolerance	%	-15/10
Operating frequency, rated value	Hz	50 ... 60
• Relative negative tolerance/relative positive tolerance	%	-10/10
Minimum load [% of I_M][1)]	%	10
Maximum cable length between soft starter and motor	m	800

1) Relative to set I_e.

High Performance Soft Starters

3RW55 Failsafe soft starters > General data NEW

Type		3RW5513	3RW5514	3RW5515	3RW5516	3RW5517
Rated operational current I_e	A	13	18	25	32	38
Power electronics						
Load rating with rated operational current I_e						
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	25/22.3/19.6	38/33.5/30.5
Permissible rated motor current and starts/h						
Normal starting (CLASS 10A)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	32/28.4/26	38/33.5/30.5
• 300% I_M						
- Start-up time 5 s	1/h	43	43	43	43	43
- Start-up time 10 s	1/h	18	18	18	18	18
• 350% I_M						
- Start-up time 5 s	1/h	28	28	28	28	28
- Start-up time 10 s	1/h	10	10	10	10	10
Normal starting (CLASS 10E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	32/28.4/26	38/33.5/30.5
• 300% I_M						
- Start-up time 5 s	1/h	21	21	21	21	21
- Start-up time 10 s	1/h	8	8	8	8	8
• 350% I_M						
- Start-up time 5 s	1/h	13	13	13	13	13
- Start-up time 10 s	1/h	4	4	4	4	4
Heavy starting (CLASS 20E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	29.6/27.2/23.6	33.5/30.5/27.5
• 300% I_M						
- Start-up time 20 s	1/h	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4
• 350% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5	2.5	2.5
Heavy starting (CLASS 30E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	26/23.6/21.2	29/26/23
• 300% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	3	3	3	3	3
• 350% I_M						
- Start-up time 20 s	1/h	4	4	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8	1.8	1.8
Adjustable rated motor current I_M						
• Minimum/maximum	A	2.5/13	3.5/18	5/25	6.5/32	7.5/38
• Minimum/maximum in inside-delta circuits	A	4.3/22.5	6.1/31.1	8.7/43.3	11.3/55.4	13/65.8

Type		3RW5524	3RW5525	3RW5526	3RW5527
Rated operational current I_e	A	47	63	77	93
Power electronics					
Load rating with rated operational current I_e					
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
Permissible rated motor current and starts/h					
Normal starting (CLASS 10A)					
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
• 300% I_M					
- Start-up time 5 s	1/h	43	43	43	43
- Start-up time 10 s	1/h	18	18	18	18
• 350% I_M					
- Start-up time 5 s	1/h	28	28	28	28
- Start-up time 10 s	1/h	10	10	10	10
Normal starting (CLASS 10E)					
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
• 300% I_M					
- Start-up time 5 s	1/h	21	21	21	21
- Start-up time 10 s	1/h	8	8	8	8
• 350% I_M					
- Start-up time 5 s	1/h	13	13	13	13
- Start-up time 10 s	1/h	4	4	4	4
Heavy starting (CLASS 20E)					
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
• 300% I_M					
- Start-up time 20 s	1/h	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4
• 350% I_M					
- Start-up time 20 s	1/h	7	7	7	7
- Start-up time 40 s	1/h	2.5	0	0	0
Heavy starting (CLASS 30E)					
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	43.4/38/34.4	53/48/43	68/62/56	82.5/75.5/65
• 300% I_M					
- Start-up time 20 s	1/h	7	7	7	7
- Start-up time 40 s	1/h	3	3	3	3
• 350% I_M					
- Start-up time 20 s	1/h	4	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8	1.8
Adjustable rated motor current I_M					
• Minimum/maximum	A	10/47	13/63	16/77	19/93
• Minimum/maximum in inside-delta circuits	A	17.3/81.4	22.5/109	27.7/133	32.9/161

High Performance Soft Starters

3RW55 Failsafe soft starters > General data NEW

Type		3RW5534	3RW5535	3RW5536
Rated operational current I_e	A	113	143	171
Power electronics				
Load rating with rated operational current I_e				
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	113/101/89	143/128/118	171/153/141
Permissible rated motor current and starts/h				
Normal starting (CLASS 10A)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	113/101/89	143/128/118	171/153/141
• 300% I_M				
- Start-up time 5 s	1/h	43	43	35
- Start-up time 10 s	1/h	18	18	13
• 350% I_M				
- Start-up time 5 s	1/h	28	17	10
- Start-up time 10 s	1/h	10	4	0
Normal starting (CLASS 10E)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	113/101/89	143/128/118	171/153/141
• 300% I_M				
- Start-up time 5 s	1/h	21	21	14
- Start-up time 10 s	1/h	8	7	4
• 350% I_M				
- Start-up time 5 s	1/h	13	4	0
- Start-up time 10 s	1/h	4	0	0
Heavy starting (CLASS 20E)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	109/97/85	128/113/103	141/129/117
• 300% I_M				
- Start-up time 20 s	1/h	10	10	10
- Start-up time 40 s	1/h	4	4	4
• 350% I_M				
- Start-up time 20 s	1/h	7	6	6
- Start-up time 40 s	1/h	0	0	0
Heavy starting (CLASS 30E)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	89/81/74	108/98/88	117/105/93
• 300% I_M				
- Start-up time 20 s	1/h	7	7	7
- Start-up time 40 s	1/h	3	3	3
• 350% I_M				
- Start-up time 20 s	1/h	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8
Adjustable rated motor current I_M				
• Minimum/maximum	A	23/113	29/143	34/171
• Minimum/maximum in inside-delta circuits	A	39.8/195	50.2/247	58.9/296

High Performance Soft Starters

3RW55 Failsafe soft starters > General data NEW

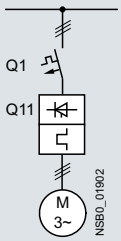
Type		3RW5543	3RW5544	3RW5545	3RW5546	3RW5547	3RW5548
Rated operational current I_e	A	210	250	315	370	470	570
Power electronics							
Load rating with rated operational current I_e							
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
Permissible rated motor current and starts/h							
Normal starting (CLASS 10A)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
• 300% I_M							
- Start-up time 5 s	1/h	43	43	38	43	32	13
- Start-up time 10 s	1/h	13	18	14	18	13	3
• 350% I_M							
- Start-up time 5 s	1/h	14	28	19	28	19	4
- Start-up time 10 s	1/h	0	10	5	10	6	0.4
Normal starting (CLASS 10E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	551/490/445
• 300% I_M							
- Start-up time 5 s	1/h	13	21	14	20	13	5
- Start-up time 10 s	1/h	2	8	4	8	3	--
• 350% I_M							
- Start-up time 5 s	1/h	0	13	5	12	6	1
- Start-up time 10 s	1/h	0	4	0	3	0.4	--
Heavy starting (CLASS 20E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	162/146/130	200/180/160	231/207/183	258/230/202	272/254/236	284/262/240
• 300% I_M							
- Start-up time 20 s	1/h	10	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4	4
• 350% I_M							
- Start-up time 20 s	1/h	7	7	7	7	7	7
- Start-up time 40 s	1/h	2	2.5	2.5	2.5	2.5	2.5
Heavy starting (CLASS 30E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	138/122/106	160/140/120	183/159/135	202/174/160	210/190/170	220/200/180
• 300% I_M							
- Start-up time 20 s	1/h	7	7	7	7	7	7
- Start-up time 40 s	1/h	3	3	3	3	3	3
• 350% I_M							
- Start-up time 20 s	1/h	4	4	4	4	4	4
- Start-up time 40 s	1/h	1.8	1.8	1.8	1.8	1.8	1.8
Adjustable rated motor current I_M							
• Minimum/maximum	A	42/210	50/250	63/315	74/370	94/470	114/570
• Minimum/maximum in inside-delta circuits	A	72.7/363	86.6/433	109.1/545	128.2/640	162.8/814	197.5/987

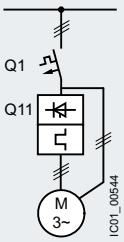
Motor feeders according to IEC with 3RV2/3VA motor starter protectors/circuit breakers (without semiconductor protection)

Type of coordination "1", CLASS 10,
short-circuit breaking capacity I_q in kA, see table

Note:

For general recommendations for constructing motor feeders
with soft starters, see page 7/9.





Soft starters	Motor starter protectors				Motor starter protectors			
	for 400 V systems		for 480 V systems		for 400 V systems		for 480 V systems	
Q11	Q1	I_q	Q1	I_q	Q1	I_q	Q1	I_q
Type	Type	kA	Type	kA	Type	kA	Type	kA
Type of coordination "1" ToC 1	**Inline circuit**				**Inside-delta circuit**			
3RW5513	3RV2032-4TA10	65	3RV2032-4TA10	18	3RV2032-4DA10	65	3RV2032-4DA10	18
3RW5514	3RV2032-4DA10	65	3RV2032-4DA10	15	3RV2032-4EA10	65	3RV2032-4EA10	15
3RW5515	3RV2032-4EA10	65	3RV2032-4EA10	15	3RV2032-4VA10	65	3RV2032-4VA10	15
3RW5516	3RV2032-4VA10	65	3RV2032-4VA10	10	3RV2032-4JA10	65	3RV2032-4JA10	10
3RW5517	3RV2032-4WA10	65	3RV2032-4WA10	10	3RV2032-4RA10	65	3RV2032-4RA10	10
3RW5524	3RV2032-4JA10	65	3RV2032-4JA10	10	3RV2032-4RA10	65	3RV2032-4RA10	10
3RW5525	3VA2163-7MN32-0AA0	65	3VA2163-7MN32-0AA0	20	3VA2110-7MN32-0AA0	65	3VA2110-7MN32-0AA0	20
3RW5526	3VA2110-7MN32-0AA0	65	3VA2110-7MN32-0AA0	20	3VA2216-7MN32-0AA0	65	3VA2216-7MN32-0AA0	20
3RW5527	3VA2216-7MN32-0AA0	15	3VA2216-7MN32-0AA0	10	3VA2220-7MN32-0AA0	15	3VA2220-7MN32-0AA0	10
3RW5534	3VA2216-7MN32-0AA0	65	--	--	3VA2220-7MN32-0AA0	65	--	--
3RW5535	3VA2220-7MN32-0AA0	65	--	--	3VA2325-7MN32-0AA0	65	--	--
3RW5536	3VA2325-7MN32-0AA0	30	3VA2325-7MN32-0AA0	10	3VA2440-7MN32-0AA0	30	3VA2440-7MN32-0AA0	10
3RW5543	3VA2325-7MN32-0AA0	65	3VA2325-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65
3RW5544	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65
3RW5545	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65
3RW5546	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65
3RW5547	3VA2450-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65	3VA2510-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65
3RW5548	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65

Note:

The service factor or measurement inaccuracies have been taken into account, for example, for the selection of the specified motor starter protectors/circuit breakers; the specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller motor starter protectors/circuit breakers than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

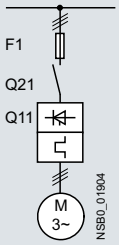
Motor feeders according to IEC with 3NA3 fuses

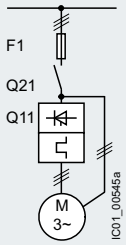
gG class full-range fuses for cable and line protection according to IEC 60269-2, without semiconductor protection

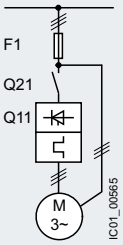
Type of coordination "1",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.







Soft starters	gG class fuse	Line contactor (optional)	gG class fuse	Line contactor (optional)	
	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V in the supply cable	for systems up to 480 V in the delta
Q11	F1	Q21	F1	Q21	Q21
Type	Type	Type	Type	Type	Type
Type of coordination "1" ToC 1	**Inline circuit**		**Inside-delta circuit**		
3RW5513	3NA3820-6	3RT2025	3NA3820-6	3RT2027	3RT2025
3RW5514	3NA3820-6	3RT2026	3NA3820-6	3RT2027	3RT2026
3RW5515	3NA3822-6	3RT2027	3NA3822-6	3RT2036	3RT2027
3RW5516	3NA3824-6	3RT2035	3NA3824-6	3RT2037	3RT2035
3RW5517	3NA3824-6	3RT2035	3NA3824-6	3RT2038	3RT2035
3RW5524	3NA3824-6	3RT2036	3NA3824-6	3RT2046	3RT2036
3RW5525	3NA3830-6	3RT2037	3NA3830-6	3RT2047	3RT2037
3RW5526	3NA3132-6	3RT2038	3NA3132-6	3RT1055	3RT2038
3RW5527	3NA3136-6	3RT2046	3NA3136-6	3RT1056	3RT2046
3RW5534	3NA3244-6	3RT1054	3NA3244-6	3RT1064	3RT1054
3RW5535	3NA3244-6	3RT1055	3NA3244-6	3RT1065	3RT1055
3RW5536	3NA3365-6	3RT1056	3NA3365-6	3RT1066	3RT1056
3RW5543	2 x 3NA3354-6	3RT1064	2 x 3NA3354-6	3RT1075	3RT1064
3RW5544	2 x 3NA3354-6	3RT1065	2 x 3NA3354-6	3RT1076	3RT1065
3RW5545	2 x 3NA3365-6	3RT1075	2 x 3NA3365-6	3TF68	3RT1075
3RW5546	2 x 3NA3365-6	3RT1075	2 x 3NA3365-6	3TF69	3RT1075
3RW5547	2 x 3NA3365-6	3RT1076	2 x 3NA3365-6	3TF69	3RT1076
3RW5548	2 x 3NA3365-6	3TF68	2 x 3NA3365-6	--	3TF68

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

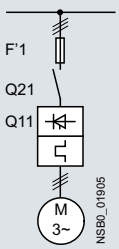
Motor feeders according to IEC with 3NE1 SITOR fuses

gR class full-range fuses for semiconductor protection, cable and line protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	Line contactor (optional)
	for systems up to 480 V	for systems up to 480 V
Q11	F'1	Q21
Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**	
3RW5513	3NE1815-0	3RT2025
3RW5514	3NE1802-0	3RT2026
3RW5515	3NE1817-0	3RT2027
3RW5516	3NE1818-0	3RT2035
3RW5517	3NE1820-0	3RT2035
3RW5524	3NE1021-2	3RT2036
3RW5525	3NE1022-0	3RT2037
3RW5526	3NE1224-0	3RT2038
3RW5527	3NE1224-0	3RT2046
3RW5534	3NE1225-0	3RT1054
3RW5535	3NE1227-0	3RT1055
3RW5536	3NE1230-0	3RT1056
3RW5543	3NE1230-2	3RT1064
3RW5544	3NE1331-0	3RT1065
3RW5545	3NE1334-2	3RT1075
3RW5546	3NE1334-2	3RT1075
3RW5547	3NE1436-2	3RT1076
3RW5548	3NE1437-2	3TF68

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

In inside-delta circuits, a gR class full-range fuse could not provide the semiconductor protection of the delta-connected soft starter with a short-circuit breaking capacity that is adequate for practical use. In this case, we recommend using aR class partial-range fuses for semiconductor protection for type of coordination “2” (see page 7/47).

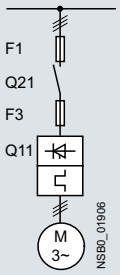
Motor feeders according to IEC with 3NE8 / 3NE3 / 3NC3 fuses

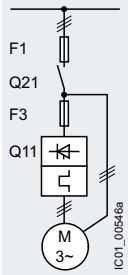
aR class partial-range fuses for semiconductor protection

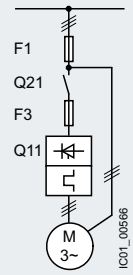
Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.







Soft starters	gG class fuse	aR class fuse	Line contactor (optional)	gG class fuse	aR class fuse	Line contactor (optional)	
	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V in the supply cable	for systems up to 480 V in the delta
Q11	F1	F3	Q21	F1	F3	Q21	Q21
Type	Type	Type	Type	Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**			**Inside-delta circuit**			
3RW5513	3NA3820-6	3NE8017-1	3RT2025	3NA3820-6	3NE8017-1	3RT2027	3RT2025
3RW5514	3NA3820-6	3NE8020-1	3RT2026	3NA3820-6	3NE8020-1	3RT2027	3RT2026
3RW5515	3NA3822-6	3NE8021-1	3RT2027	3NA3822-6	3NE8021-1	3RT2036	3RT2027
3RW5516	3NA3824-6	3NE8022-1	3RT2035	3NA3824-6	3NE8022-1	3RT2037	3RT2035
3RW5517	3NA3824-6	3NE8024-1	3RT2035	3NA3824-6	3NE8024-1	3RT2038	3RT2035
3RW5524	3NA3824-6	3NE8024-1	3RT2036	3NA3824-6	3NE8024-1	3RT2046	3RT2036
3RW5525	3NA3830-6	3NE3227	3RT2037	3NA3830-6	3NE3227	3RT2047	3RT2037
3RW5526	3NA3132-6	3NE3227	3RT2038	3NA3132-6	3NE3227	3RT1055	3RT2038
3RW5527	3NA3136-6	3NE3227	3RT2046	3NA3136-6	3NE3227	3RT1056	3RT2046
3RW5534	3NA3244-6	3NE3231	3RT1054	3NA3244-6	3NE3231	3RT1064	3RT1054
3RW5535	3NA3244-6	3NE3233	3RT1055	3NA3244-6	3NE3233	3RT1065	3RT1055
3RW5536	3NA3365-6	3NE3334-0B	3RT1056	3NA3365-6	3NE3334-0B	3RT1066	3RT1056
3RW5543	2 x 3NA3354-6	3NE3333	3RT1064	2 x 3NA3354-6	3NE3333	3RT1075	3RT1064
3RW5544	2 x 3NA3354-6	3NE3335	3RT1065	2 x 3NA3354-6	3NE3335	3RT1076	3RT1065
3RW5545	2 x 3NA3365-6	--	3RT1075	2 x 3NA3365-6	--	3TF68	3RT1075
3RW5546	2 x 3NA3365-6	--	3RT1075	2 x 3NA3365-6	--	3TF69	3RT1075
3RW5547	2 x 3NA3365-6	3NE3340-8	3RT1076	2 x 3NA3365-6	3NE3340-8	3TF69	3RT1076
3RW5548	2 x 3NA3365-6	3NC3342-1U	3TF68	2 x 3NA3365-6	3NC3342-1U	--	3TF68

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

For CLASS 10 applications, as an alternative to the gG class full-range fuses for cable and line protection 3NA3 (F1), 3RV2/3VA motor starter protectors/circuit breakers can also be used, possibly with reduced short-circuit breaking capacity (see page 7/44). In these cases, optional line contactors can be dispensed with.

Reversing operation with reversing contactors

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.

(For an example circuit, see 3RW55 Equipment Manual, Appendix A.3)

Soft starters Q11 Type	**Reversing contactor assembly** for systems up to 480 V Q21 / Q22 Type	**For reversing contactor** for systems up to 480 V Q21 / Q22 Type
3RW5513	3RA2325	3RT2025
3RW5514	3RA2326	3RT2026
3RW5515	3RA2327	3RT2027
3RW5516	3RA2335	3RT2035
3RW5517	3RA2335	3RT2035
3RW5524	3RA2336	3RT2036
3RW5525	3RA2337	3RT2037
3RW5526	3RA2338	3RT2038
3RW5527	3RA2346	3RT2046
3RW5534	--	3RT1054
3RW5535	--	3RT1055
3RW5536	--	3RT1056
3RW5543	--	3RT1064
3RW5544	--	3RT1065
3RW5545	--	3RT1075
3RW5546	--	3RT1075
3RW5547	--	3RT1076
3RW5548	--	3TF68

Selection and ordering data

For normal starting (CLASS 10E)

3RW551.

3RW552.

3RW553.

3RW554.

At 40 °C						SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V					
A	kW	kW	hp	hp	hp	d				
Operational voltage 200 ... 480 V										
13	3	**5.5**	3	3	**7.5**	5	**3RW5513-□HF□4**		1	1 unit
18	4	**7.5**	5	5	**10**	5	**3RW5514-□HF□4**		1	1 unit
25	5.5	**11**	5	7.5	**15**	5	**3RW5515-□HF□4**		1	1 unit
32	7.5	**15**	7.5	10	**20**	5	**3RW5516-□HF□4**		1	1 unit
38	11	**18.5**	10	10	**25**	5	**3RW5517-□HF□4**		1	1 unit
47	11	**22**	10	15	**30**	5	**3RW5524-□HF□4**		1	1 unit
63	18.5	**30**	20	20	**40**	5	**3RW5525-□HF□4**		1	1 unit
77	22	**37**	20	25	**60**	5	**3RW5526-□HF□4**		1	1 unit
93	22	**45**	30	30	**60**	5	**3RW5527-□HF□4**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals — **1**
Spring-loaded terminals — **3**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

At 40 °C						SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V					
A	kW	kW	hp	hp	hp	d				
Operational voltage 200 ... 480 V										
113	30	**55**	30	40	**75**	5	**3RW5534-□HF□4**		1	1 unit
143	37	**75**	40	50	**100**	5	**3RW5535-□HF□4**		1	1 unit
171	45	**90**	50	60	**125**	5	**3RW5536-□HF□4**		1	1 unit
210	55	**110**	60	75	**150**	5	**3RW5543-□HF□4**		1	1 unit
250	75	**132**	75	100	**200**	5	**3RW5544-□HF□4**		1	1 unit
315	90	**160**	100	125	**250**	5	**3RW5545-□HF□4**		1	1 unit
370	110	**200**	125	150	**300**	5	**3RW5546-□HF□4**		1	1 unit
470	132	**250**	150	150	**350**	5	**3RW5547-□HF□4**		1	1 unit
570	160	**315**	200	200	**450**	5	**3RW5548-□HF□4**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — **2**
Screw terminals — **6**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

High Performance Soft Starters

3RW55 Failsafe soft starters > Inside-delta circuit IE3/IE4 ready NEW

Selection and ordering data

For normal starting (CLASS 10E)

3RW551.

3RW552.

3RW553.

3RW554.

At 40 °C for inside-delta circuit						SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V					
A	kW	kW	hp	hp	hp	d				
Operational voltage 200 ... 480 V										
22.5	5.5	**11**	5	7.5	**15**	5	**3RW5513-□HF□4**		1	1 unit
31.5	7.5	**15**	7.5	10	**20**	5	**3RW5514-□HF□4**		1	1 unit
43.3	11	**18.5**	10	15	**30**	5	**3RW5515-□HF□4**		1	1 unit
55.4	15	**22**	15	20	**40**	5	**3RW5516-□HF□4**		1	1 unit
65.8	18.5	**30**	20	20	**50**	5	**3RW5517-□HF□4**		1	1 unit
81.4	22	**45**	25	30	**60**	5	**3RW5524-□HF□4**		1	1 unit
109	30	**55**	30	40	**75**	5	**3RW5525-□HF□4**		1	1 unit
133	37	**75**	40	50	**100**	5	**3RW5526-□HF□4**		1	1 unit
161	45	**90**	50	60	**125**	5	**3RW5527-□HF□4**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals — **1**
Spring-loaded terminals — **3**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

At 40 °C for inside-delta circuit						SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V					
A	kW	kW	hp	hp	hp	d				
Operational voltage 200 ... 480 V										
196	55	**110**	60	75	**150**	5	**3RW5534-□HF□4**		1	1 unit
248	75	**132**	75	75	**200**	5	**3RW5535-□HF□4**		1	1 unit
296	90	**160**	100	100	**200**	5	**3RW5536-□HF□4**		1	1 unit
364	110	**200**	125	150	**300**	5	**3RW5543-□HF□4**		1	1 unit
433	132	**250**	150	150	**350**	5	**3RW5544-□HF□4**		1	1 unit
546	160	**315**	150	200	**450**	5	**3RW5545-□HF□4**		1	1 unit
641	200	**355**	200	250	**500**	5	**3RW5546-□HF□4**		1	1 unit
814	250	**400**	250	300	**700**	5	**3RW5547-□HF□4**		1	1 unit
987	315	**560**	350	400	**850**	5	**3RW5548-□HF□4**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — **2**
Screw terminals — **6**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW55 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

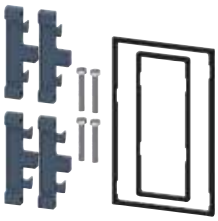
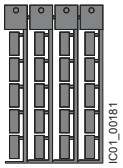
For the constraints for the motor outputs specified here, see page 7/7.

Selection and ordering data

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	Application	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
					d				
Fan covers									
3RW5983-0FC00	**Fan cover**	3RW551 (1x), 3RW552 (2x), 3RW553 (2x)	--	--	▶	**3RW5983-0FC00**		1	1 unit
		3RW554 (1x)	--	--	▶	**3RW5984-0FC00**		1	1 unit
Terminal covers									
3RW5983-0TC20	**Terminal cover**	3RW552 (2x), 3RW553 (2x)	--	--	▶	**3RW5983-0TC20**		1	1 unit
3RW5984-0TC20		3RW554 (2x)	--	--	▶	**3RW5984-0TC20**		1	1 unit
Enclosure components									
3RW5950-0GL20	**Hinged cover**	3RW55	Without cutout	--	▶	**3RW5950-0GL20**		1	1 unit
Communication modules									
3RW5980-0CS00	**Communication module**	3RW55	PROFINET High Feature with integral switch	--	▶	**3RW5950-0CH00**		1	1 unit
			PROFINET Standard	--	▶	**3RW5980-0CS00**		1	1 unit
			PROFIBUS	--	▶	**3RW5980-0CP00**		1	1 unit
3RW5980-0CE00			EtherNet/IP	--	▶	**3RW5980-0CE00**		1	1 unit
			Modbus RTU	--	▶	**3RW5980-0CR00**		1	1 unit
3RW5980-0CR00			Modbus TCP	--	▶	**3RW5980-0CT00**		1	1 unit

High Performance Soft Starters

3RW55 Failsafe soft starters > Accessories

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	Application	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
					d				
HMI modules									
 3RW5980-0HD00	**IP65 door mounting kit for HMI modules**	3RW55	IP65	For HMI modules	▶	**3RW5980-0HD00**		1	1 unit
Connecting cables									
3UF793.-0BA00-0	**HMI connection cable**	3RW55	5 m, round	For door mounting	▶	**3RW5980-0HC60**		1	1 unit
			2.5 m, round		▶	**3UF7933-0BA00-0**		1	1 unit
			1.0 m, round		▶	**3UF7937-0BA00-0**		1	1 unit
			0.5 m, round		▶	**3UF7932-0BA00-0**		1	1 unit
Further accessories									
3ZY1311-0AA00	**Push-in lugs for wall mounting**	--	Two lugs are required per device	For HMI modules and communication modules	2	**3ZY1311-0AA00**		1	10 units
Blank labels									
 3RT2900-1SB20	**Unit labeling plates[1)]**	--	20 mm x 7 mm, titanium gray	For SIRIUS devices	20	**3RT2900-1SB20**		100	340 units

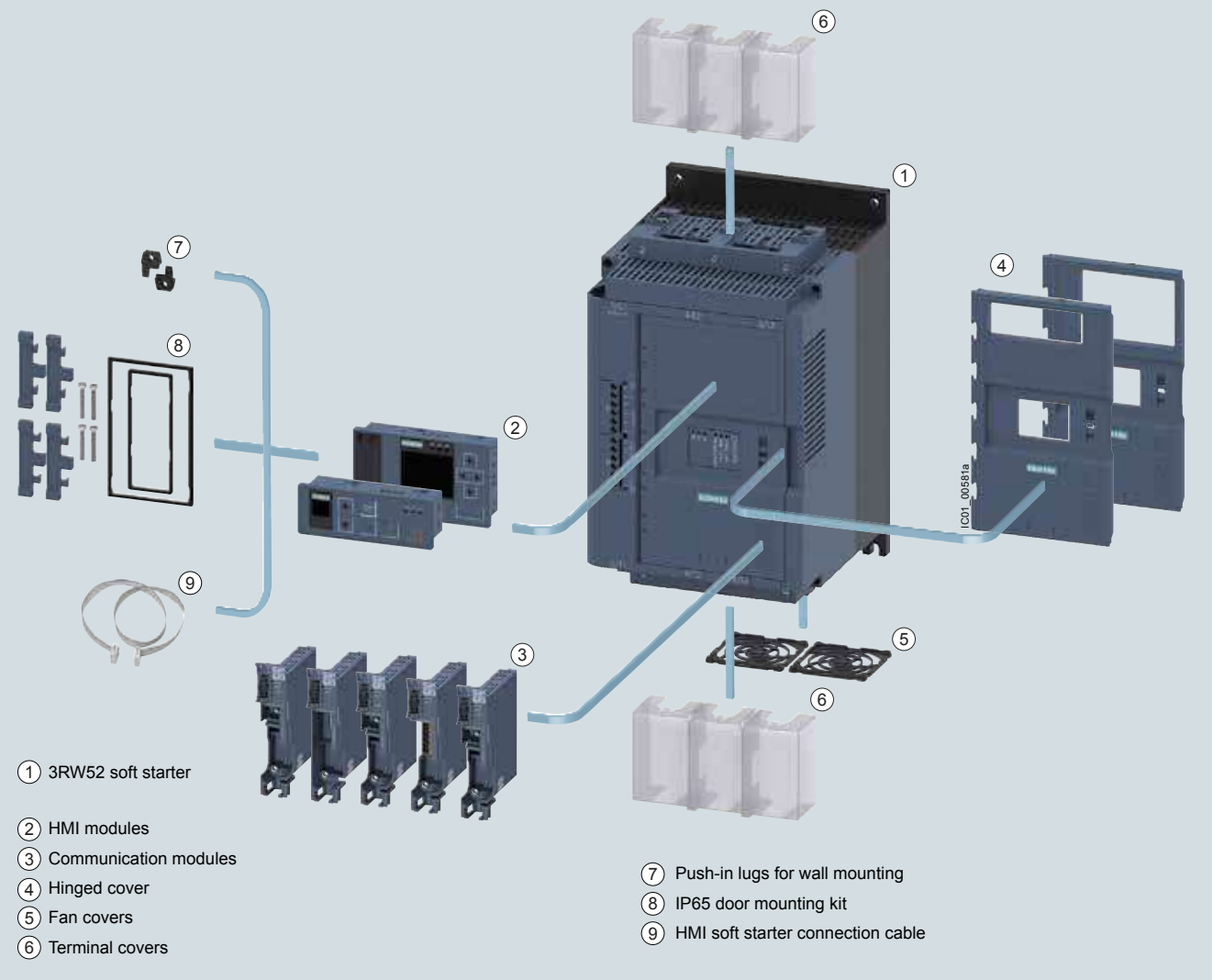
1) PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH.

Overview

More information	
Homepage, see www.siemens.com/softstarter Industry Mall, see www.siemens.com/product?3RW52 TIA Selection Tool Cloud (TST Cloud), see https://www.siemens.com/tstcloud/?node=3rw52	Industry Online Support (SIOS) topic page, see https://support.industry.siemens.com/cs/ww/en/view/109747404 Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917 SIRIUS Soft Starter ES (TIA Portal), see page 7/7

SIRIUS 3RW52 General Performance soft starters are the ideal solution for standard applications. With ideal three-phase motor control, they cover the performance range from 10 to 600 HP @ 600V.

Optional HMI modules, plug-in communication modules (PROFINET, PROFIBUS, EtherNet/IP and Modbus) and either an analog output or thermistor motor protection ensure maximum flexibility. With their modern hybrid switching technology, the SIRIUS 3RW52 soft starters offer efficient switching for long-term, energy-saving use.



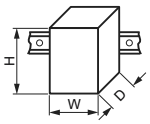
3RW52 General Performance soft starters with accessories (see page 7/69), for expansion with HMI module or communication module

Benefits

Product characteristics / function	Performance features / benefits
Hybrid switching devices and three-phase motor control	Minimum power loss and optimum/symmetrical motor control
TIA-Integration – communication modules and HMI modules optional	Efficient configuration and maximum flexibility in automation engineering
Soft Torque	Reduced mechanical loading and optimum pump stop
Parameterization using potentiometers	Simple and fast commissioning
Wide range for control supply and main voltage	Low variance, high system availability even with weak supply networks

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/25100/td Equipment Manual "SIRIUS 3RW52 Soft Starter", see https://support.industry.siemens.com/cs/ww/en/view/109753751	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/25100/faq Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

Type		3RW5213 3RW5214 3RW5215	3RW5216 3RW5217	3RW5224 3RW5225	3RW5226 3RW5227 3RW5234 3RW5235 3RW5236	3RW5243 3RW5244 3RW5245 3RW5246 3RW5247 3RW5248
Installation/fixing/dimensions						
Width x height x depth 	mm	170 × 275 × 152		185 × 306 × 203		210 × 393 × 203
Type of mounting		Screw fixing				
Mounting position		For vertical mounting surface can be rotated +/- 10° and tilted forward or backward	For vertical mounting surface can be rotated +/- 90°, for vertical mounting surface can be tilted +/- 22.5° forward or backward	For vertical mounting surface can be rotated +/- 10° and tilted forward or backward	For vertical mounting surface can be rotated +/- 90°, for vertical mounting surface can be tilted +/- 22.5° forward or backward	
Distance to be maintained with side-by-side mounting						
• Above	mm	100				
• At the side	mm	5				
• Below	mm	75				
Maximum installation altitude above sea level[1]	m	5 000				
Degree of protection		IP20	IP00			
Ambient conditions						
Ambient temperature						
• During operation[2]	°C	-25 ... +60				
• During storage and transport	°C	-40 ... +80				
Environmental category according to IEC 60721						
• During operation		3K6 (no ice formation, no condensation), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6				
• During storage		1K6 (only occasional condensation), 1C2 (no salt mist), 1S2 (sand must not enter the devices), 1M4				
• During transport		2K2, 2C1, 2S1, 2M2 (max. height of fall 0.3 m)				

1) Derating from 1 000 m, see characteristic curve on page 7/7.

2) Note derating above 40 °C.

Type		3RW52..-..C0.	3RW52..-..C1.
Control circuit/control			
Control supply voltage			
• At AC/DC, rated value	V	24/24	--/--
• At AC	V	--	110 ... 250
• Relative negative tolerance/relative positive tolerance with AC	%	-20/20	-15/10
• Relative negative tolerance/relative positive tolerance with DC	%	-20/20	--/--
Frequency of the control supply voltage	Hz	50 ... 60	
• Relative negative tolerance/relative positive tolerance	%	-10/10	
Type of overvoltage protection		Varistors	
Type of short-circuit protection for control circuit[1]		Fuse 4 A gG (I_{cu} = 1 kA), fuse 6 A quick-response (I_{cu} = 1 kA), MCB C1 (I_{cu} = 600 A), MCB C6 (I_{cu} = 300 A)	

[1] Not included in scope of supply

Type		3RW52..-..C.4	3RW52..-..C.5
Power electronics			
Operational voltage, rated value	V	200 ... 480	200 ... 600
• Relative negative tolerance/relative positive tolerance	%	-15/10	
Operational voltage for inside-delta circuit, rated value	V	200 ... 480	200 ... 600
• Relative negative tolerance/relative positive tolerance	%	-15/10	
Operating frequency, rated value	Hz	50 ... 60	
• Relative negative tolerance/relative positive tolerance	%	-10/10	
Minimum load [% of I_M][1]	%	15	
Maximum cable length between soft starter and motor	m	800	

[1] Relative to the smallest adjustable I_e.

Type		3RW5213	3RW5214	3RW5215	3RW5216	3RW5217
Rated operational current I_e	A	13	18	25	32	38
Power electronics						
Load rating with rated operational current I_e						
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	32/28.4/26	38/33.5/30.5
Permissible rated motor current and starts/h						
Normal starting (CLASS 10A)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	32/28.4/26	38/33.5/30.5
• 300% I_M						
- Start-up time 5 s	1/h	43	43	43	43	43
- Start-up time 10 s	1/h	18	18	18	18	18
• 350% I_M						
- Start-up time 5 s	1/h	28	28	28	28	28
- Start-up time 10 s	1/h	10	10	10	10	10
Normal starting (CLASS 10E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	32/28.4/26	38/33.5/30.5
• 300% I_M						
- Start-up time 20 s	1/h	21	21	21	21	21
- Start-up time 40 s	1/h	8	8	8	8	8
• 350% I_M						
- Start-up time 20 s	1/h	13	13	13	13	13
- Start-up time 40 s	1/h	4	4	4	4	4
Heavy starting (CLASS 20E)						
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	13/11.5/10.5	18/15.9/13.8	25/22.3/19.6	29.6/27.2/23.6	33.5/30.5/27.5
• 300% I_M						
- Start-up time 20 s	1/h	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4
• 350% I_M						
- Start-up time 20 s	1/h	7	7	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5	2.5	2.5
Adjustable rated motor current I_M						
• Minimum/maximum	A	5.5/13	7.5/18	11.5/25	14/32	15.5/38
• Minimum/maximum in inside-delta circuits	A	9.5/22.5	13/31.2	19.9/43.3	24.2/55.4	26.8/65.8

Type		3RW5224	3RW5225	3RW5226	3RW5227
Rated operational current I_e	A	47	63	77	93
Power electronics					
Load rating with rated operational current I_e					
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
Permissible rated motor current and starts/h					
Normal starting (CLASS 10A)					
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
• 300% I_M					
- Start-up time 5 s	1/h	43	43	43	43
- Start-up time 10 s	1/h	18	18	18	18
• 350% I_M					
- Start-up time 5 s	1/h	28	28	28	28
- Start-up time 10 s	1/h	10	10	10	10
Normal starting (CLASS 10E)					
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	47/41.6/36.2	63/55.5/50.5	77/68/62	93/82.5/75.5
• 300% I_M					
- Start-up time 20 s	1/h	21	21	21	21
- Start-up time 40 s	1/h	8	8	8	8
• 350% I_M					
- Start-up time 20 s	1/h	13	13	13	13
- Start-up time 40 s	1/h	4	4	4	4
Heavy starting (CLASS 20E)					
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	47/41.6/36.2	63/55.5/50.5	65/59/53	93/82.5/75.5
• 300% I_M					
- Start-up time 20 s	1/h	10	10	10	10
- Start-up time 40 s	1/h	4	3	4	4
• 350% I_M					
- Start-up time 20 s	1/h	7	4	7	7
- Start-up time 40 s	1/h	2	0	2.5	2.5
Adjustable rated motor current I_M					
• Minimum/maximum	A	20/47	25.5/63	32/77	40.5/93
• Minimum/maximum in inside-delta circuits	A	34.6/81.4	44.2/109	55.4/133	70.1/161

Type		3RW5234	3RW5235	3RW5236
Rated operational current I_e	A	113	143	171
Power electronics				
Load rating with rated operational current I_e				
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	113/101/89	143/128/118	171/153/141
Permissible rated motor current and starts/h				
Normal starting (CLASS 10A)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	113/101/89	143/128/118	171/153/141
• 300% I_M				
- Start-up time 5 s	1/h	43	43	43
- Start-up time 10 s	1/h	18	18	18
• 350% I_M				
- Start-up time 5 s	1/h	28	27	20
- Start-up time 10 s	1/h	10	8	4
Normal starting (CLASS 10E)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	113/101/89	139/127/116	158/146/129
• 300% I_M				
- Start-up time 20 s	1/h	21	21	21
- Start-up time 40 s	1/h	8	8	8
• 350% I_M				
- Start-up time 20 s	1/h	13	12	12
- Start-up time 40 s	1/h	4	1	1
Heavy starting (CLASS 20E)				
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	109/97/85	113/103/93	129/117/105
• 300% I_M				
- Start-up time 20 s	1/h	10	10	10
- Start-up time 40 s	1/h	4	4	4
• 350% I_M				
- Start-up time 20 s	1/h	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5
Adjustable rated motor current I_M				
• Minimum/maximum	A	53/113	68/143	81/171
• Minimum/maximum in inside-delta circuits	A	91.8/196	118/248	140/296

General Performance Soft Starters

3RW52 soft starters > General data

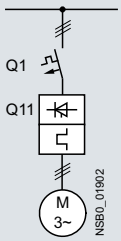
Type		3RW5243	3RW5244	3RW5245	3RW5246	3RW5247	3RW5248
Rated operational current I_e	A	210	250	315	370	470	570
Power electronics							
Load rating with rated operational current I_e							
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
Permissible rated motor current and starts/h							
Normal starting (CLASS 10A)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
• 300% I_M							
- Start-up time 5 s	1/h	43	43	43	43	30	20
- Start-up time 10 s	1/h	18	18	14	18	11	6
• 350% I_M							
- Start-up time 5 s	1/h	28	28	16	28	17	9
- Start-up time 10 s	1/h	5	10	4	10	5	1
Normal starting (CLASS 10E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	197/184/170	250/220/200	279/255/231	370/328/300	398/362/326	460/416/372
• 300% I_M							
- Start-up time 20 s	1/h	21	21	21	21	21	18
- Start-up time 40 s	1/h	8	8	8	8	8	7
• 350% I_M							
- Start-up time 20 s	1/h	12	13	12	13	13	11
- Start-up time 40 s	1/h	1	4	3	4	4	2
Heavy starting (CLASS 20E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	162/146/130	200/180/160	195/171/147	258/230/202	272/236/218	284/262/240
• 300% I_M							
- Start-up time 20 s	1/h	10	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4	4
• 350% I_M							
- Start-up time 20 s	1/h	7	7	7	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5	2.5	2.5	2.5
Adjustable rated motor current I_M							
• Minimum/maximum	A	90/210	100/250	135/315	160/370	200/470	240/570
• Minimum/maximum in inside-delta circuits	A	156/364	173/433	234/546	277/641	346/814	416/987

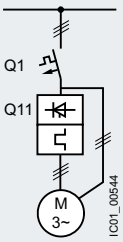
Motor feeders according to IEC with 3RV2/3VA motor starter protectors/circuit breakers (without semiconductor protection)

Type of coordination "1", CLASS 10,
short-circuit breaking capacity I_q in kA, see table

Note:

For general recommendations for constructing motor feeders
with soft starters, see page 7/9.





Soft starters	Motor starter protectors				Motor starter protectors			
	for 400 V systems		for 500 V systems		for 400 V systems		for 500 V systems	
Q11	Q1	I_q	Q1	I_q	Q1	I_q	Q1	I_q
Type	Type	kA	Type	kA	Type	kA	Type	kA
Type of coordination "1" ToC 1	**Inline circuit**				**Inside-delta circuit**			
3RW5213	3RV2032-4TA10	65	3RV2032-4TA10	18	3RV2032-4DA10	65	3RV2032-4DA10	18
3RW5214	3RV2032-4DA10	65	3RV2032-4DA10	15	3RV2032-4EA10	65	3RV2032-4EA10	15
3RW5215	3RV2032-4EA10	65	3RV2032-4EA10	15	3RV2032-4VA10	65	3RV2032-4VA10	15
3RW5216	3RV2032-4VA10	65	3RV2032-4VA10	10	3RV2032-4JA10	65	3RV2032-4JA10	10
3RW5217	3RV2032-4WA10	65	3RV2032-4WA10	10	3RV2032-4RA10	65	3RV2032-4RA10	10
3RW5224	3RV2032-4JA10	65	3RV2032-4JA10	10	3RV2032-4RA10	65	3RV2032-4RA10	10
3RW5225	3VA2163-7MN32-0AA0	65	3VA2163-7MN32-0AA0	20	3VA2110-7MN32-0AA0	65	3VA2110-7MN32-0AA0	20
3RW5226	3VA2110-7MN32-0AA0	65	3VA2110-7MN32-0AA0	20	3VA2216-7MN32-0AA0	65	3VA2216-7MN32-0AA0	20
3RW5227	3VA2216-7MN32-0AA0	15	3VA2216-7MN32-0AA0	10	3VA2220-7MN32-0AA0	15	3VA2220-7MN32-0AA0	10
3RW5234	3VA2216-7MN32-0AA0	65	--	--	3VA2220-7MN32-0AA0	65	--	--
3RW5235	3VA2220-7MN32-0AA0	65	--	--	3VA2325-7MN32-0AA0	65	--	--
3RW5236	3VA2325-7MN32-0AA0	30	3VA2325-7MN32-0AA0	10	3VA2440-7MN32-0AA0	30	3VA2440-7MN32-0AA0	10
3RW5243	3VA2325-7MN32-0AA0	65	3VA2325-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65
3RW5244	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65
3RW5245	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65
3RW5246	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65
3RW5247	3VA2450-7MN32-0AA0	65	3VA2450-7MN32-0AA0	65	3VA2510-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65
3RW5248	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65	3VA2510-6HN32-0AA0	65

Note:

The service factor or measurement inaccuracies have been taken into account, for example, for the selection of the specified motor starter protectors/circuit breakers; the specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller motor starter protectors/circuit breakers than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

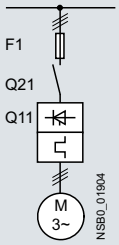
Motor feeders according to IEC with 3NA3 fuses

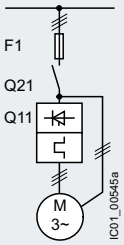
gG class full-range fuses for cable and line protection according to IEC 60269-2, without semiconductor protection

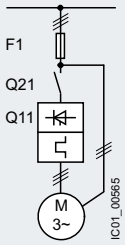
Type of coordination "1",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.







Soft starters	gG class fuse	Line contactor (optional)		gG class fuse	Line contactor (optional)			
	for systems up to 600 V	for systems up to 480 V	for systems up to 600 V	for systems up to 600 V	for systems up to 480 V in the supply cable	for systems up to 600 V in the supply cable	for systems up to 480 V in the delta	for systems up to 600 V in the delta
Q11	F1	Q21	Q21	F1	Q21	Q21	Q21	Q21
Type	Type	Type	Type	Type	Type	Type	Type	Type
Type of coordination "1" ToC 1	**Inline circuit**			**Inside-delta circuit**				
3RW5213	3NA3820-6	3RT2025	3RT2025	3NA3820-6	3RT2027	3RT2035	3RT2025	3RT2025
3RW5214	3NA3820-6	3RT2026	3RT2027	3NA3820-6	3RT2027	3RT2037	3RT2026	3RT2027
3RW5215	3NA3822-6	3RT2027	3RT2037	3NA3822-6	3RT2036	3RT2037	3RT2027	3RT2037
3RW5216	3NA3824-6	3RT2035	3RT2037	3NA3824-6	3RT2037	3RT2038	3RT2035	3RT2037
3RW5217	3NA3824-6	3RT2035	3RT2037	3NA3824-6	3RT2038	3RT2046	3RT2035	3RT2037
3RW5224	3NA3824-6	3RT2036	3RT2037	3NA3824-6	3RT2046	3RT2047	3RT2036	3RT2037
3RW5225	3NA3830-6	3RT2037	3RT2046	3NA3830-6	3RT2047	3RT1054	3RT2037	3RT2046
3RW5226	3NA3132-6	3RT2038	3RT2046	3NA3132-6	3RT1055	3RT1055	3RT2038	3RT2046
3RW5227	3NA3136-6	3RT2046	3RT2047	3NA3136-6	3RT1056	3RT1056	3RT2046	3RT2047
3RW5234	3NA3244-6	3RT1054	3RT1054	3NA3244-6	3RT1064	3RT1064	3RT1054	3RT1054
3RW5235	3NA3244-6	3RT1055	3RT1055	3NA3244-6	3RT1065	3RT1065	3RT1055	3RT1055
3RW5236	3NA3365-6	3RT1056	3RT1064	3NA3365-6	3RT1066	3RT1075	3RT1056	3RT1064
3RW5243	2 x 3NA3354-6	3RT1064	3RT1064	2 x 3NA3354-6	3RT1075	3RT1075	3RT1064	3RT1064
3RW5244	2 x 3NA3354-6	3RT1065	3RT1065	2 x 3NA3354-6	3RT1076	3RT1076	3RT1065	3RT1065
3RW5245	2 x 3NA3365-6	3RT1075	3RT1075	2 x 3NA3365-6	3TF68	3TF68	3RT1075	3RT1075
3RW5246	2 x 3NA3365-6	3RT1075	3RT1075	2 x 3NA3365-6	3TF69	3TF69	3RT1075	3RT1075
3RW5247	2 x 3NA3365-6	3RT1076	3RT1276	2 x 3NA3365-6	3TF69	3TF69	3RT1076	3RT1276
3RW5248	2 x 3NA3365-6	3TF68	3TF68	2 x 3NA3365-6	--	--	3TF68	3TF68

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

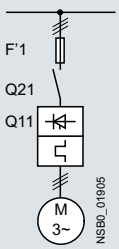
Motor feeders according to IEC with 3NE1 SITOR fuses

gR class full-range fuses for semiconductor protection, cable and line protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	Line contactor (optional)	
	for systems up to 600 V	for systems up to 480 V	for systems up to 600 V
Q11	F'1	Q21	Q21
Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**		
3RW5213	3NE1815-0	3RT2025	3RT2025
3RW5214	3NE1802-0	3RT2026	3RT2027
3RW5215	3NE1817-0	3RT2027	3RT2037
3RW5216	3NE1818-0	3RT2035	3RT2037
3RW5217	3NE1820-0	3RT2035	3RT2037
3RW5224	3NE1021-2	3RT2036	3RT2037
3RW5225	3NE1022-0	3RT2037	3RT2046
3RW5226	3NE1224-0	3RT2038	3RT2046
3RW5227	3NE1224-0	3RT2046	3RT2047
3RW5234	3NE1225-0	3RT1054	3RT1054
3RW5235	3NE1227-0	3RT1055	3RT1055
3RW5236	3NE1230-0	3RT1056	3RT1064
3RW5243	3NE1230-2[1)]	3RT1064	3RT1064
3RW5244	3NE1331-0	3RT1065	3RT1065
3RW5245	3NE1334-2	3RT1075	3RT1075
3RW5246	3NE1334-2	3RT1075	3RT1075
3RW5247	3NE1436-2	3RT1076	3RT1276
3RW5248	3NE1437-2	3TF68	3TF68

[1)] For systems up to 500 V.

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

In inside-delta circuits, a gR class full-range fuse could not provide the semiconductor protection of the delta-connected soft starter with a short-circuit breaking capacity that is adequate for practical use. In this case, we recommend using aR class partial-range fuses for semiconductor protection for type of coordination “2” (see page 7/64).

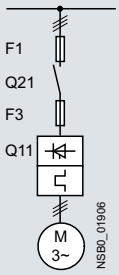
Motor feeders according to IEC with fuses 3NE8 / 3NE4 / 3NE3

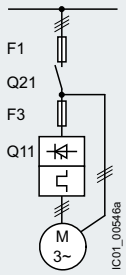
aR class partial-range fuses for semiconductor protection

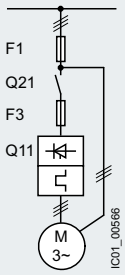
Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.







Soft starters	gG class fuse	aR class fuse	Line contactor (optional)		gG class fuse	aR class fuse	Line contactor (optional)			
	for systems up to 600 V	for systems up to 500 V	for systems up to 480 V	for systems up to 600 V	for systems up to 600 V	for systems up to 600 V	for systems up to 480 V in the supply cable	for systems up to 600 V in the supply cable	for systems up to 480 V in the delta	for systems up to 600 V in the delta
Q11	F1	F3	Q21	Q21	F1	F3	Q21	Q21	Q21	Q21
Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**				**Inside-delta circuit**					
3RW5213	3NA3820-6	3NE8017-1	3RT2025	3RT2025	3NA3820-6	3NE8017-1	3RT2027	3RT2035	3RT2025	3RT2025
3RW5214	3NA3820-6	3NE8020-1	3RT2026	3RT2027	3NA3820-6	3NE8020-1	3RT2027	3RT2037	3RT2026	3RT2027
3RW5215	3NA3822-6	3NE8021-1	3RT2027	3RT2037	3NA3822-6	3NE8021-1	3RT2036	3RT2037	3RT2027	3RT2037
3RW5216	3NA3824-6	3NE8022-1	3RT2035	3RT2037	3NA3824-6	3NE8022-1	3RT2037	3RT2038	3RT2035	3RT2037
3RW5217	3NA3824-6	3NE8024-1	3RT2035	3RT2037	3NA3824-6	3NE8024-1	3RT2038	3RT2046	3RT2035	3RT2037
3RW5224	3NA3824-6	3NE8024-1	3RT2036	3RT2037	3NA3824-6	3NE8024-1	3RT2046	3RT2047	3RT2036	3RT2037
3RW5225	3NA3830-6	3NE8024-1	3RT2037	3RT2046	3NA3830-6	3NE8024-1	3RT2047	3RT1054	3RT2037	3RT2046
3RW5226	3NA3132-6	3NE8024-1	3RT2038	3RT2046	3NA3132-6	3NE8024-1	3RT1055	3RT1055	3RT2038	3RT2046
3RW5227	3NA3136-6	3NE4124	3RT2046	3RT2047	3NA3136-6	3NE4124	3RT1056	3RT1056	3RT2046	3RT2047
3RW5234	3NA3244-6	3NE3332-0B	3RT1054	3RT1054	3NA3244-6	3NE3332-0B	3RT1064	3RT1064	3RT1054	3RT1054
3RW5235	3NA3244-6	3NE3334-0B	3RT1055	3RT1055	3NA3244-6	3NE3334-0B	3RT1065	3RT1065	3RT1055	3RT1055
3RW5236	3NA3365-6	3NE3335	3RT1056	3RT1064	3NA3365-6	3NE3335	3RT1066	3RT1075	3RT1056	3RT1064
3RW5243	2 x 3NA3354-6	3NE3333	3RT1064	3RT1064	2 x 3NA3354-6	3NE3333	3RT1075	3RT1075	3RT1064	3RT1064
3RW5244	2 x 3NA3354-6	3NE3336	3RT1065	3RT1065	2 x 3NA3354-6	3NE3336	3RT1076	3RT1076	3RT1065	3RT1065
3RW5245	2 x 3NA3365-6	3NE3336	3RT1075	3RT1075	2 x 3NA3365-6	3NE3336	3TF68	3TF68	3RT1075	3RT1075
3RW5246	2 x 3NA3365-6	3NE3336	3RT1075	3RT1075	2 x 3NA3365-6	3NE3336	3TF69	3TF69	3RT1075	3RT1075
3RW5247	2 x 3NA3365-6	3NE3340-8	3RT1076	3RT1276	2 x 3NA3365-6	3NE3340-8	3TF69	3TF69	3RT1076	3RT1276
3RW5248	2 x 3NA3365-6	3NE3340-8	3TF68	3TF68	2 x 3NA3365-6	3NE3340-8	--	--	3TF68	3TF68

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

For CLASS 10 applications, as an alternative to the gG class full-range fuses for cable and line protection 3NA3 (F1), 3RV2/3VA motor starter protectors/circuit breakers can also be used, possibly with reduced short-circuit breaking capacity (see page 7/61). In these cases, optional line contactors can be dispensed with.

Selection and ordering data

For normal starting (CLASS 10A)

3RW521.

3RW522.

3RW523.

3RW524.

At 40 °C								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 480 V												
13	3	**5.5**	--	3	3	**7.5**	--	5	**3RW5213-□□C□4**		1	1 unit
18	4	**7.5**	--	5	5	**10**	--	5	**3RW5214-□□C□4**		1	1 unit
25	5.5	**11**	--	5	7.5	**15**	--	5	**3RW5215-□□C□4**		1	1 unit
32	7.5	**15**	--	7.5	10	**20**	--	5	**3RW5216-□□C□4**		1	1 unit
38	11	**18.5**	--	10	10	**25**	--	5	**3RW5217-□□C□4**		1	1 unit
47	11	**22**	--	10	15	**30**	--	5	**3RW5224-□□C□4**		1	1 unit
63	18.5	**30**	--	20	20	**40**	--	5	**3RW5225-□□C□4**		1	1 unit
77	22	**37**	--	20	25	**60**	--	5	**3RW5226-□□C□4**		1	1 unit
93	22	**45**	--	30	30	**60**	--	5	**3RW5227-□□C□4**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals — 1
Spring-loaded terminals — 3

Product function
Analog output — A
Thermistor motor protection — T

Control supply voltage
24 V AC/DC — 0
110 ... 250 V AC — 1

[1] 3RW52 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

At 40 °C								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 480 V												
113	30	**55**	--	30	40	**75**	--	5	**3RW5234-□□C□4**		1	1 unit
143	37	**75**	--	40	50	**100**	--	5	**3RW5235-□□C□4**		1	1 unit
171	45	**90**	--	50	60	**125**	--	5	**3RW5236-□□C□4**		1	1 unit
210	55	**110**	--	60	75	**150**	--	5	**3RW5243-□□C□4**		1	1 unit
250	75	**132**	--	75	100	**200**	--	5	**3RW5244-□□C□4**		1	1 unit
315	90	**160**	--	100	125	**250**	--	5	**3RW5245-□□C□4**		1	1 unit
370	110	**200**	--	125	150	**300**	--	5	**3RW5246-□□C□4**		1	1 unit
470	132	**250**	--	150	150	**350**	--	5	**3RW5247-□□C□4**		1	1 unit
570	160	**315**	--	200	200	**450**	--	5	**3RW5248-□□C□4**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — 2
Screw terminals — 6

Product function
Analog output — A
Thermistor motor protection — T

Control supply voltage
24 V AC/DC — 0
110 ... 250 V AC — 1

[1] 3RW52 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

General Performance Soft Starters

3RW52 soft starters > Inline circuit IE3/IE4 ready

For normal starting (CLASS 10A)

3RW521.

3RW522.

3RW523.

3RW524.

At 40 °C Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V	SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 600 V												
13	3	5.5	7.5	3	3	7.5	**10**	5	**3RW5213-□□C□5**		1	1 unit
18	4	7.5	11	5	5	10	**15**	5	**3RW5214-□□C□5**		1	1 unit
25	5.5	11	15	5	7.5	15	**20**	5	**3RW5215-□□C□5**		1	1 unit
32	7.5	15	18.5	7.5	10	20	**30**	5	**3RW5216-□□C□5**		1	1 unit
38	11	18.5	22	10	10	25	**30**	5	**3RW5217-□□C□5**		1	1 unit
47	11	22	30	10	15	30	**40**	5	**3RW5224-□□C□5**		1	1 unit
63	18.5	30	37	20	20	40	**60**	5	**3RW5225-□□C□5**		1	1 unit
77	22	37	45	20	25	60	**75**	5	**3RW5226-□□C□5**		1	1 unit
93	22	45	55	30	30	60	**75**	5	**3RW5227-□□C□5**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals — **1**
Spring-loaded terminals — **3**

Product function
Analog output — **A**
Thermistor motor protection — **T**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW52 soft starter with screw terminals for operational voltage up to 600 V: Standard delivery time SD = 2 days (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

At 40 °C Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V	SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 600 V												
113	30	55	75	30	40	75	**100**	5	**3RW5234-□□C□5**		1	1 unit
143	37	75	90	40	50	100	**125**	5	**3RW5235-□□C□5**		1	1 unit
171	45	90	110	50	60	125	**150**	5	**3RW5236-□□C□5**		1	1 unit
210	55	110	132	60	75	150	**200**	5	**3RW5243-□□C□5**		1	1 unit
250	75	132	160	75	100	200	**250**	5	**3RW5244-□□C□5**		1	1 unit
315	90	160	200	100	125	250	**300**	5	**3RW5245-□□C□5**		1	1 unit
370	110	200	250	125	150	300	**350**	5	**3RW5246-□□C□5**		1	1 unit
470	132	250	315	150	150	350	**450**	5	**3RW5247-□□C□5**		1	1 unit
570	160	315	355	200	200	450	**600**	5	**3RW5248-□□C□5**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — **2**
Screw terminals — **6**

Product function
Analog output — **A**
Thermistor motor protection — **T**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW52 soft starter with screw terminals for operational voltage up to 600 V: Standard delivery time SD = 2 days (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

Selection and ordering data

For normal starting (CLASS 10A)

3RW521.

3RW522.

3RW523.

3RW524.

At 40 °C for inside-delta circuit								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 480 V												
22.5	5.5	**11**	--	5	7.5	**15**	--	5	**3RW5213-□□C□4**		1	1 unit
31.5	7.5	**15**	--	7.5	10	**20**	--	5	**3RW5214-□□C□4**		1	1 unit
43.3	11	**18.5**	--	10	15	**30**	--	5	**3RW5215-□□C□4**		1	1 unit
55.4	15	**22**	--	15	20	**40**	--	5	**3RW5216-□□C□4**		1	1 unit
65.8	18.5	**30**	--	20	20	**50**	--	5	**3RW5217-□□C□4**		1	1 unit
81.4	22	**45**	--	25	30	**60**	--	5	**3RW5224-□□C□4**		1	1 unit
109	30	**55**	--	30	40	**75**	--	5	**3RW5225-□□C□4**		1	1 unit
133	37	**75**	--	40	50	**100**	--	5	**3RW5226-□□C□4**		1	1 unit
161	45	**90**	--	50	60	**125**	--	5	**3RW5227-□□C□4**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals — 1
Spring-loaded terminals — 3

Product function
Analog output — A
Thermistor motor protection — T

Control supply voltage
24 V AC/DC — 0
110 ... 250 V AC — 1

[1] 3RW52 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

At 40 °C for inside-delta circuit								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 480 V												
196	55	**110**	--	60	60	**150**	--	5	**3RW5234-□□C□4**		1	1 unit
248	75	**132**	--	75	75	**200**	--	5	**3RW5235-□□C□4**		1	1 unit
296	90	**160**	--	100	100	**200**	--	5	**3RW5236-□□C□4**		1	1 unit
364	110	**200**	--	125	125	**300**	--	5	**3RW5243-□□C□4**		1	1 unit
433	132	**250**	--	150	150	**350**	--	5	**3RW5244-□□C□4**		1	1 unit
546	160	**315**	--	150	150	**450**	--	5	**3RW5245-□□C□4**		1	1 unit
641	200	**355**	--	200	200	**500**	--	5	**3RW5246-□□C□4**		1	1 unit
814	250	**400**	--	250	250	**700**	--	5	**3RW5247-□□C□4**		1	1 unit
987	315	**560**	--	350	350	**850**	--	5	**3RW5248-□□C□4**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — 2
Screw terminals — 6

Product function
Analog output — A
Thermistor motor protection — T

Control supply voltage
24 V AC/DC — 0
110 ... 250 V AC — 1

[1] 3RW52 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

General Performance Soft Starters

3RW52 soft starters > Inside-delta circuit *IE3/IE4* ready

For normal starting (CLASS 10A)

3RW521.

3RW522.

3RW523.

3RW524.

At 40 °C for inside-delta circuit								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 600 V												
22.5	5.5	11	15	5	7.5	15	**20**	5	**3RW5213-□□C□5**		1	1 unit
31.5	7.5	15	18.5	7.5	10	20	**25**	5	**3RW5214-□□C□5**		1	1 unit
43.3	11	18.5	22	10	15	30	**40**	5	**3RW5215-□□C□5**		1	1 unit
55.4	15	22	30	15	20	40	**50**	5	**3RW5216-□□C□5**		1	1 unit
65.8	18.5	30	37	20	20	50	**60**	5	**3RW5217-□□C□5**		1	1 unit
81.4	22	45	45	25	30	60	**75**	5	**3RW5224-□□C□5**		1	1 unit
109	30	55	55	30	40	75	**100**	5	**3RW5225-□□C□5**		1	1 unit
133	37	75	90	40	50	100	**125**	5	**3RW5226-□□C□5**		1	1 unit
161	45	90	110	50	60	125	**150**	5	**3RW5227-□□C□5**		1	1 unit

Type of electrical connection for the control circuit
Screw terminals — **1**
Spring-loaded terminals — **3**

Product function
Analog output — **A**
Thermistor motor protection — **T**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW52 soft starter with screw terminals for operational voltage up to 600 V: Standard delivery time SD = 2 days (d).

Note:

For the constraints for the motor outputs specified here, see page 7/7.

At 40 °C for inside-delta circuit								SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V					
A	kW	kW	kW	hp	hp	hp	hp	d				
Operational voltage 200 ... 600 V												
196	55	110	132	60	75	150	**200**	5	**3RW5234-□□C□5**		1	1 unit
248	75	132	160	75	75	200	**250**	5	**3RW5235-□□C□5**		1	1 unit
296	90	160	200	100	100	200	**300**	5	**3RW5236-□□C□5**		1	1 unit
364	110	200	250	125	150	300	**350**	5	**3RW5243-□□C□5**		1	1 unit
433	132	250	315	150	150	350	**450**	5	**3RW5244-□□C□5**		1	1 unit
546	160	315	355	150	200	450	**550**	5	**3RW5245-□□C□5**		1	1 unit
641	200	355	450	200	250	500	**700**	5	**3RW5246-□□C□5**		1	1 unit
814	250	400	500	250	300	700	**900**	5	**3RW5247-□□C□5**		1	1 unit
987	315	560	630	350	400	850	**1 100**	5	**3RW5248-□□C□5**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — **2**
Screw terminals — **6**

Product function
Analog output — **A**
Thermistor motor protection — **T**

Control supply voltage
24 V AC/DC — **0**
110 ... 250 V AC — **1**

[1] 3RW52 soft starter with screw terminals for operational voltage up to 600 V: Standard delivery time SD = 2 days (d).

Note:

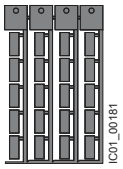
For the constraints for the motor outputs specified here, see page 7/7.

Selection and ordering data

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	Application	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Fan covers									
3RW5983-0FC00	**Fan cover**	3RW5216/17 (1x), 3RW5226/27 (2x), 3RW523 (2x)	--	--	▶	**3RW5983-0FC00**		1	1 unit
		3RW524 (1x)	--	--	▶	**3RW5984-0FC00**		1	1 unit
Terminal covers									
3RW5983-0TC20	**Terminal cover**	3RW522 (2x), 3RW523 (2x)	--	--	▶	**3RW5983-0TC20**		1	1 unit
3RW5984-0TC20		3RW524 (2x)	--	--	▶	**3RW5984-0TC20**		1	1 unit
Enclosure components									
3RW5950-0GL30	**Hinged cover**	3RW52	With cutout for High Feature HMI module	--	▶	**3RW5950-0GL30**		1	1 unit
3RW5950-0GL40			With cutout for Standard HMI module	--	▶	**3RW5950-0GL40**		1	1 unit
Communication modules									
3RW5980-0CS00	**Communication module**	3RW52	PROFINET Standard	--	▶	**3RW5980-0CS00**		1	1 unit
			PROFIBUS	--	▶	**3RW5980-0CP00**		1	1 unit
			EtherNet/IP	--	▶	**3RW5980-0CE00**		1	1 unit
3RW5980-0CR00			Modbus RTU	--	▶	**3RW5980-0CR00**		1	1 unit
			Modbus TCP	--	▶	**3RW5980-0CT00**		1	1 unit

General Performance Soft Starters

3RW52 soft starters > Accessories

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	Application	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
HMI modules									
3RW5980-0HF00	**HMI module**	3RW52	High Feature	--	▶	**3RW5980-0HF00**		1	1 unit
3RW5980-0HS00			Standard	--	▶	**3RW5980-0HS00**		1	1 unit
3RW5980-0HD00	**IP65 door mounting kit for HMI modules**	3RW52	IP65	For HMI modules	▶	**3RW5980-0HD00**		1	1 unit
Connecting cables									
3UF793.-0BA00-0	**HMI connection cable**	3RW52	5 m, round	For door mounting	▶	**3RW5980-0HC60**		1	1 unit
			2.5 m, round		▶	**3UF7933-0BA00-0**		1	1 unit
			1.0 m, round		▶	**3UF7937-0BA00-0**		1	1 unit
			0.5 m, round		▶	**3UF7932-0BA00-0**		1	1 unit
3UF7931-0AA00-0			0.1 m, flat	for mounting in the device	▶	**3UF7931-0AA00-0**		1	1 unit
Further accessories									
3ZY1311-0AA00	**Push-in lugs for wall mounting**	--	Two lugs are required per device	For HMI modules and communication modules	2	**3ZY1311-0AA00**		1	10 units
Blank labels									
 3RT2900-1SB20	**Unit labeling plates[1)]**	--	20 mm x 7 mm, titanium gray	For SIRIUS devices	20	**3RT2900-1SB20**		100	340 units

1) PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH.

Basic Performance Soft Starters

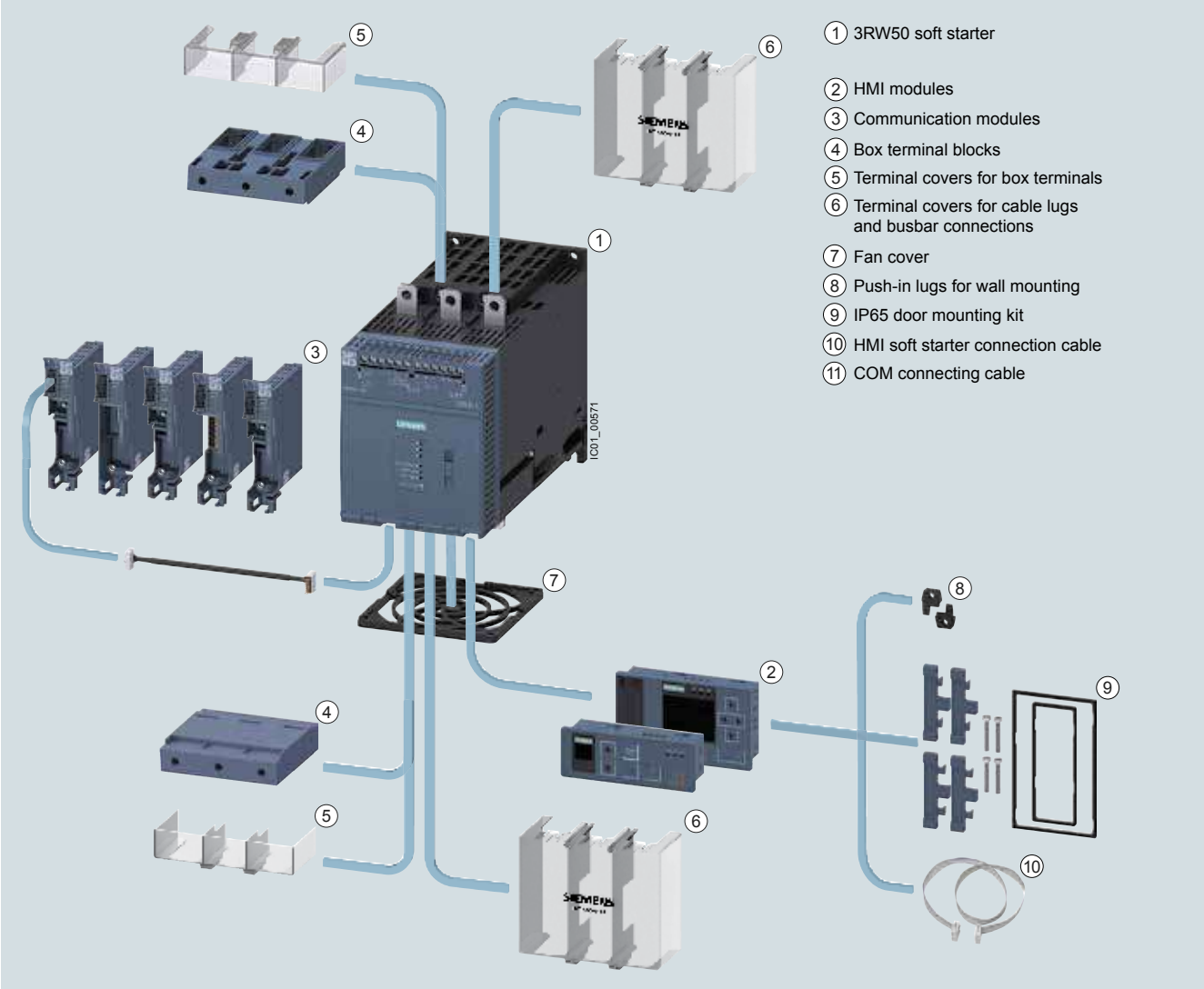
3RW50 soft starters > General data NEW

Overview

More information	
Homepage, see www.siemens.com/softstarter Industry Mall, see www.siemens.com/product?3RW50 TIA Selection Tool Cloud (TST Cloud), see https://support.industry.siemens.com/cs/ww/en/view/109747404	Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917 SIRIUS Soft Starter ES (TIA Portal), see page 7/7

SIRIUS 3RW50 Basic Performance soft starters are the compact solution for standard applications. With two-phase motor control, they cover the performance range from 125 to 600 HP @ 600V.

Optional HMI modules for installation in the control cabinet door, laterally mountable communication modules (PROFINET, PROFIBUS, EtherNet/IP and Modbus) and either an analog output or thermistor motor protection ensure maximum flexibility. With their modern hybrid switching technology, the SIRIUS 3RW50 soft starters offer efficient switching for long-term, energy-saving use.

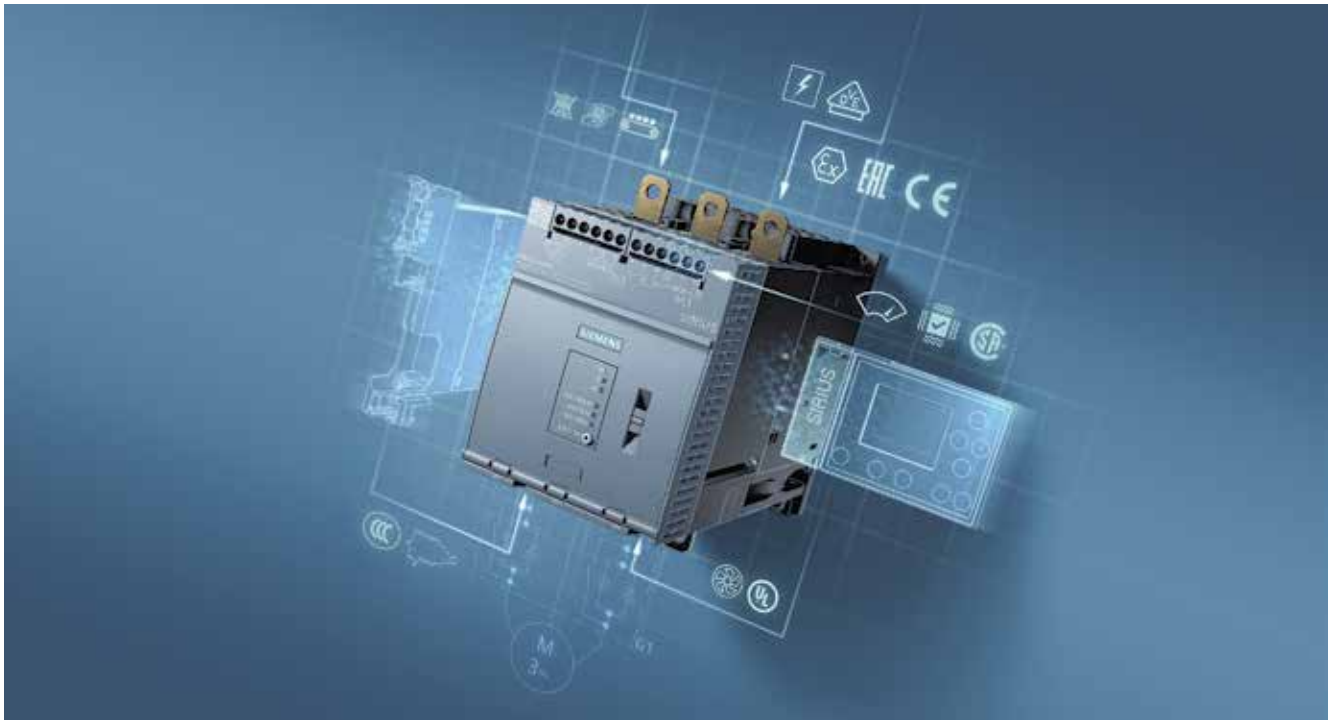


3RW50 Basic Performance soft starters with accessories (see page 7/81), for expansion with HMI module or communication module

Basic Performance Soft Starters

3RW50 soft starters > General data NEW

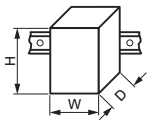
Benefits



Product characteristics / function	Performance features / benefits
Hybrid switching devices and two-phase motor control	Minimum power loss and optimized motor control by avoiding DC components
Small and compact design	Space-saving, clearly arranged control panel layout
TIA-Integration – communication modules and HMI modules optional	Efficient configuration and maximum flexibility in automation engineering
Motor overload and intrinsic device protection without additional wiring	Adjustable trip classes, integrated diagnostics functions
Soft Torque	Reduced mechanical loading and optimum pump stop
Parameterization using potentiometers	Simple and fast commissioning
Wide range for control supply and main voltage	Low variance, high system availability even with weak supply networks
Certified according to ATEX/IECEx directive	Suitable for the starting of explosion-proof motors with "increased safety" type of protection

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/25252/td Equipment Manual "SIRIUS 3RW50 Soft Starter", see https://support.industry.siemens.com/cs/ww/en/view/109753750	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/25252/faq Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

Type		3RW5055 3RW5056	3RW5072 3RW5073 3RW5074 3RW5075 3RW5076 3RW5077
Installation/fixing/dimensions			
Width x height x depth 	mm	120 × 198 × 249	160 × 230 × 282
Type of mounting		Screw fixing	
Mounting position		For vertical mounting surface can be rotated +/- 90°, for vertical mounting surface can be tilted +/- 22.5° forward or backward	
Distance to be maintained with side-by-side mounting			
• Above	mm	100	
• At the side	mm	5	
• Below	mm	75	
Maximum installation altitude above sea level[1]	m	5 000	
Degree of protection		IP00	
Ambient conditions			
Ambient temperature			
• During operation[2]	°C	-25 ... +60	
• During storage and transport	°C	-40 ... +80	
Environmental category according to IEC 60721			
• During operation		3K6 (no ice formation, only occasional condensation), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6	
• During storage		1K6 (only occasional condensation), 1C2 (no salt mist), 1S2 (sand must not enter the devices), 1M4	
• During transport		2K2, 2C1, 2S1, 2M2 (max. height of fall 0.3 m)	

1) Derating from 1 000 m, see characteristic curve on page 7/7.
2) Note derating above 40 °C.

Basic Performance Soft Starters

3RW50 soft starters > General data NEW

Type		3RW50..-..B0.	3RW50..-..B1.
Control circuit/control			
Control supply voltage			
• At AC/DC, rated value	V	24/24	--/--
• At AC	V	--	110 ... 250
• Relative negative tolerance/relative positive tolerance with AC	%	-20/20	-15/10
• Relative negative tolerance/relative positive tolerance with DC	%	-20/20	--/--
Frequency of the control supply voltage	Hz	50 ... 60	
• Relative negative tolerance/relative positive tolerance	%	-10/10	
Type of overvoltage protection		Varistors	
Type of short-circuit protection for control circuit[1)]		Fuse 4 A gG (I_{cu} = 1 kA), fuse 6 A quick-response (I_{cu} = 1 kA), MCB C1 (I_{cu} = 600 A), MCB C6 (I_{cu} = 300 A)	

1) Not included in scope of supply

Type		3RW50..-..B.4	3RW50..-..B.5
Power electronics			
Operational voltage, rated value	V	200 ... 480	200 ... 600
• Relative negative tolerance/relative positive tolerance	%	-15/10	
Operating frequency, rated value	Hz	50 ... 60	
• Relative negative tolerance/relative positive tolerance	%	-10/10	
Minimum load [% of I_M][1)]	%	15	
Maximum cable length between soft starter and motor	m	800	

1) Relative to the smallest adjustable I_e.

Basic Performance Soft Starters

3RW50 soft starters > General data NEW

Type		3RW5055	3RW5056
Rated operational current I_e	A	143	171
Power electronics			
Load rating with rated operational current I_e			
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	143/128/118	171/153/141
Permissible rated motor current and starts/h			
Normal starting (CLASS 10A)			
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	143/128/118	171/153/141
• 300% I_M - Start-up time 5 s	1/h	43	43
- Start-up time 10 s	1/h	18	18
• 350% I_M - Start-up time 5 s	1/h	28	28
- Start-up time 10 s	1/h	10	9
Normal starting (CLASS 10E)			
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	143/128/118	171/153/141
• 300% I_M - Start-up time 20 s	1/h	21	21
- Start-up time 40 s	1/h	8	8
• 350% I_M - Start-up time 20 s	1/h	12	9
- Start-up time 40 s	1/h	4	--
Heavy starting (CLASS 20E)			
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	108/98/88	135/123/111
• 300% I_M - Start-up time 20 s	1/h	10	10
- Start-up time 40 s	1/h	4	4
• 350% I_M - Start-up time 20 s	1/h	7	7
- Start-up time 40 s	1/h	2.5	2.5
Adjustable rated motor current I_M • Minimum/maximum	A	68/143	81/117

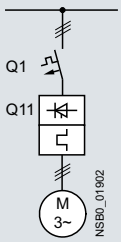
Type		3RW5072	3RW5073	3RW5074	3RW5075	3RW5076	3RW5077
Rated operational current I_e	A	210	250	315	370	470	570
Power electronics							
Load rating with rated operational current I_e							
IEC + UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
Permissible rated motor current and starts/h							
Normal starting (CLASS 10A)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
• 300% I_M							
- Start-up time 5 s	1/h	43	43	43	43	43	28
- Start-up time 10 s	1/h	18	18	18	18	18	11
• 350% I_M							
- Start-up time 5 s	1/h	28	28	28	28	28	16
- Start-up time 10 s	1/h	8	10	10	10	10	4
Normal starting (CLASS 10E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	210/186/170	250/220/200	315/279/255	370/328/300	470/416/380	570/504/460
• 300% I_M							
- Start-up time 20 s	1/h	21	21	21	21	20	21
- Start-up time 40 s	1/h	8	8	8	8	7	8
• 350% I_M							
- Start-up time 20 s	1/h	8	13	12	13	12	13
- Start-up time 40 s	1/h	--	4	4	4	2	4
Heavy starting (CLASS 20E)							
Rated motor current I_M, T_u = 40/50/60 °C ON period = 70%; motor protection activated	A	162/146/130	200/180/160	219/195/171	258/230/202	272/254/218	284/262/240
• 300% I_M							
- Start-up time 20 s	1/h	10	10	10	10	10	10
- Start-up time 40 s	1/h	4	4	4	4	4	4
• 350% I_M							
- Start-up time 20 s	1/h	7	7	7	7	7	7
- Start-up time 40 s	1/h	2.5	2.5	2.5	2.5	2.5	2.5
Adjustable rated motor current I_M • Minimum/maximum	A	90/210	100/250	135/315	160/370	200/470	240/570

Motor feeders according to IEC with 3VA motor starter protectors/circuit breakers (without semiconductor protection)

Type of coordination "1", CLASS 10,
short-circuit breaking capacity I_q in kA, see table

Note:

For general recommendations for constructing motor feeders
with soft starters, see page 7/9.



Soft starters	Motor starter protectors			
	for 400 V systems		for 500 V systems	
Q11	Q1	I_q	Q1	I_q
Type	Type	kA	Type	kA
Type of coordination "1" ToC 1	**Inline circuit**			
3RW5055	3VA2220-7MN32-0AA0	20	3VA2220-7MN32-0AA0	20
3RW5056	3VA2220-7MN32-0AA0	20	3VA2220-7MN32-0AA0	20
3RW5072	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65
3RW5073	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65
3RW5074	3VA2440-7MN32-0AA0	65	3VA2440-7MN32-0AA0	65
3RW5075	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65
3RW5076	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65
3RW5077	3VA2580-6HN32-0AA0	65	3VA2580-6HN32-0AA0	65

Note:

The service factor or measurement inaccuracies have been taken into account, for example, for the selection of the specified motor starter protectors/circuit breakers; the specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller motor starter protectors/circuit breakers than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

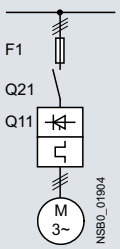
Motor feeders according to IEC with 3NA3 fuses

gG class full-range fuses for cable and line protection according to IEC 60269-2, without semiconductor protection

Type of coordination "1",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	Line contactor (optional)	
	for systems up to 600 V	for systems up to 480 V	for systems up to 600 V
Q11	F1	Q21	Q21
Type	Type	Type	Type
Type of coordination "1" ToC 1	**Inline circuit**		
3RW5055	3NA3244-6	3RT1055	3RT1055
3RW5056	3NA3244-6	3RT1056	3RT1064
3RW5072	2 x 3NA3354-6	3RT1064	3RT1064
3RW5073	2 x 3NA3354-6	3RT1065	3RT1065
3RW5074	2 x 3NA3365-6	3RT1075	3RT1075
3RW5075	2 x 3NA3365-6	3RT1075	3RT1075
3RW5076	2 x 3NA3365-6	3RT1076	3RT1076
3RW5077	2 x 3NA3365-6	3TF68	3TF68

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

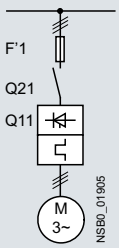
Motor feeders according to IEC with 3NE1 SITOR fuses

gR class full-range fuses for semiconductor protection, cable and line protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	Line contactor (optional)	
	for systems up to 600 V	for systems up to 480 V	for systems up to 600 V
Q11	F'1	Q21	Q21
Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**		
3RW5055	3NE1227-0	3RT1055	3RT1055
3RW5056	3NE1230-0	3RT1056	3RT1064
3RW5072	3NE1230-2	3RT1064	3RT1064
3RW5073	3NE1331-0	3RT1065	3RT1065
3RW5074	3NE1333-2	3RT1075	3RT1075
3RW5075	3NE1334-2	3RT1075	3RT1075
3RW5076	3NE1436-2	3RT1076	3RT1076
3RW5077	3NE1437-2	3TF68	3TF68

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

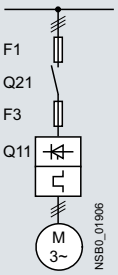
Motor feeders according to IEC with 3NE3 fuses

aR class partial-range fuses for semiconductor protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	aR class fuse	Line contactor (optional)	
	for systems up to 600 V	for systems up to 600 V	for systems up to 480 V	for systems up to 600 V
Q11	F1	F3	Q21	Q21
Type	Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**			
3RW5055	3NA3244-6	3NE3334-0B	3RT1055	3RT1055
3RW5056	3NA3244-6	3NE3335	3RT1056	3RT1064
3RW5072	2 x 3NA3354-6	3NE3333	3RT1064	3RT1064
3RW5073	2 x 3NA3354-6	3NE3335	3RT1065	3RT1065
3RW5074	2 x 3NA3365-6	3NE3335	3RT1075	3RT1075
3RW5075	2 x 3NA3365-6	3NE3336	3RT1075	3RT1075
3RW5076	2 x 3NA3365-6	3NE3340-8	3RT1076	3RT1076
3RW5077	2 x 3NA3365-6	3NE3340-8	3TF68	3TF68

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

For CLASS 10 applications, as an alternative to the gG class full-range fuses for cable and line protection 3NA3 (F1), 3VA circuit breakers can also be used, possibly with reduced short-circuit breaking capacity (see page 7/76). In these cases optional line contactors can be dispensed with.

Basic Performance Soft Starters

3RW50 soft starters > Inline circuit IE3/IE4 ready NEW

Selection and ordering data

For normal starting (CLASS 10E)

3RW5055

3RW5075

At 40 °C Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V	Size	SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
A	kW	kW	kW	hp	hp	hp	hp		d				
Operational voltage 200 ... 480 V													
143	37	75	90	40	50	**100**	--	S6	5	**3RW5055-□□B□4**		1	1 unit
171	45	90	110	50	60	**125**	--	S6	5	**3RW5056-□□B□4**		1	1 unit
210	55	110	132	60	75	**150**	--	S12	5	**3RW5072-□□B□4**		1	1 unit
250	75	132	160	75	100	**200**	--	S12	5	**3RW5073-□□B□4**		1	1 unit
315	90	160	200	100	125	**250**	--	S12	5	**3RW5074-□□B□4**		1	1 unit
370	110	200	250	125	150	**300**	--	S12	5	**3RW5075-□□B□4**		1	1 unit
470	132	250	315	150	150	**350**	--	S12	5	**3RW5076-□□B□4**		1	1 unit
570	160	315	355	200	200	**450**	--	S12	5	**3RW5077-□□B□4**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — 2
Screw terminals — 6

Product function
Analog output — A
Thermistor motor protection — T

Control supply voltage
24 V AC/DC — 0
110 ... 250 V AC — 1

[1] 3RW50 soft starter with screw terminals for operational voltage up to 480 V: Standard delivery time SD = 1 day (d).

Note: For the constraints for the motor outputs specified here, see page 7/7.

At 40 °C Operational current	Operating power for three-phase motors At 230 V	At 400 V	At 500 V	Rating [hp] for three-phase motors At 200/208 V	At 220/230 V	At 460/480 V	At 575/600 V	Size	SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
A	kW	kW	kW	hp	hp	hp	hp		d				
Operational voltage 200 ... 600 V													
143	37	75	90	40	50	100	**125**	S6	5	**3RW5055-□□B□5**		1	1 unit
171	45	90	110	50	60	125	**150**	S6	5	**3RW5056-□□B□5**		1	1 unit
210	55	110	132	60	75	150	**200**	S12	5	**3RW5072-□□B□5**		1	1 unit
250	75	132	160	75	100	200	**250**	S12	5	**3RW5073-□□B□5**		1	1 unit
315	90	160	200	100	125	250	**300**	S12	5	**3RW5074-□□B□5**		1	1 unit
370	110	200	250	125	150	300	**350**	S12	5	**3RW5075-□□B□5**		1	1 unit
470	132	250	315	150	150	350	**450**	S12	5	**3RW5076-□□B□5**		1	1 unit
570	160	315	355	200	200	450	**600**	S12	5	**3RW5077-□□B□5**		1	1 unit

Type of electrical connection for the control circuit
Spring-loaded terminals — 2
Screw terminals — 6

Product function
Analog output — A
Thermistor motor protection — T

Control supply voltage
24 V AC/DC — 0
110 ... 250 V AC — 1

[1] 3RW50 soft starter with screw terminals for operational voltage up to 600 V: Standard delivery time SD = 2 days (d).

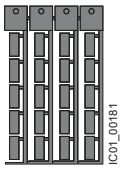
Note: For the constraints for the motor outputs specified here, see page 7/7.

Selection and ordering data

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	Application	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
					d					
Fan covers										
3RW5985-0FC00	**Fan cover**	3RW50 (1x)	--	--	▶	**3RW5985-0FC00**		1	1 unit	42S
Box terminal block										
3RT1956-4G	**Box terminal block for round and ribbon cables**	3RW505 (2x)	Up to 70 mm²	--	▶	**3RT1955-4G**		1	1 unit	41B
			Up to 120 mm²		▶	**3RT1956-4G**		1	1 unit	41B
		3RW507 (2x)	Up to 240 mm² (with auxiliary conductor connection)		▶	**3RT1966-4G**		1	1 unit	41B
Terminal covers										
3RT1956-4EA2	**Covers for box terminals**	3RW505 (2x)	--	--	▶	**3RT1956-4EA2**		1	1 unit	41B
		3RW507 (2x)	--	--	2	**3RT1966-4EA2**		1	1 unit	41B
3RT1956-4EA1	**Covers for cable lugs and busbar connections**	3RW505 (2x)	--	--	▶	**3RT1956-4EA1**		1	1 unit	41B
		3RW507 (2x)	--	--	2	**3RT1966-4EA1**		1	1 unit	41B
Communication modules										
3RW5980-0CS00	**Communication module**	3RW50	PROFINET Standard	--	▶	**3RW5980-0CS00**		1	1 unit	42S
			PROFIBUS		▶	**3RW5980-0CP00**		1	1 unit	42S
			EtherNet/IP		▶	**3RW5980-0CE00**		1	1 unit	42S
			Modbus RTU		▶	**3RW5980-0CR00**		1	1 unit	42S
			Modbus TCP		▶	**3RW5980-0CT00**		1	1 unit	42S
3RW5900-0CC00	**COM connection cable** For mounting laterally on the device	3RW50	0.3 m	--	▶	**3RW5900-0CC00**		1	1 unit	42S

Basic Performance Soft Starters

3RW50 soft starters > Accessories

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	Application	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
HMI modules										
3RW5980-0HF00	**HMI module**	3RW50	High Feature	--	▶	**3RW5980-0HF00**		1	1 unit	42S
3RW5980-0HS00			Standard	--	▶	**3RW5980-0HS00**		1	1 unit	42S
3RW5980-0HD00	**IP65 door mounting kit for HMI modules**	3RW50	IP65	For HMI modules	▶	**3RW5980-0HD00**		1	1 unit	42S
Connecting cables										
3UF793.-0BA00-0	**HMI connection cable**	3RW50	5 m, round	For door mounting	▶	**3RW5980-0HC60**		1	1 unit	42S
			2.5 m, round		▶	**3UF7933-0BA00-0**		1	1 unit	42J
			1.0 m, round		▶	**3UF7937-0BA00-0**		1	1 unit	42J
			0.5 m, round		▶	**3UF7932-0BA00-0**		1	1 unit	42J
Further accessories										
3ZY1311-0AA00	**Push-in lugs for wall mounting**	--	Two lugs are required per device	For HMI modules and communication modules	2	**3ZY1311-0AA00**		1	10 units	41L
Blank labels										
 3RT2900-1SB20	**Unit labeling plates[1)]**	--	20 mm x 7 mm, titanium gray	For SIRIUS devices	20	**3RT2900-1SB20**		100	340 units	41B

[1)] PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH.

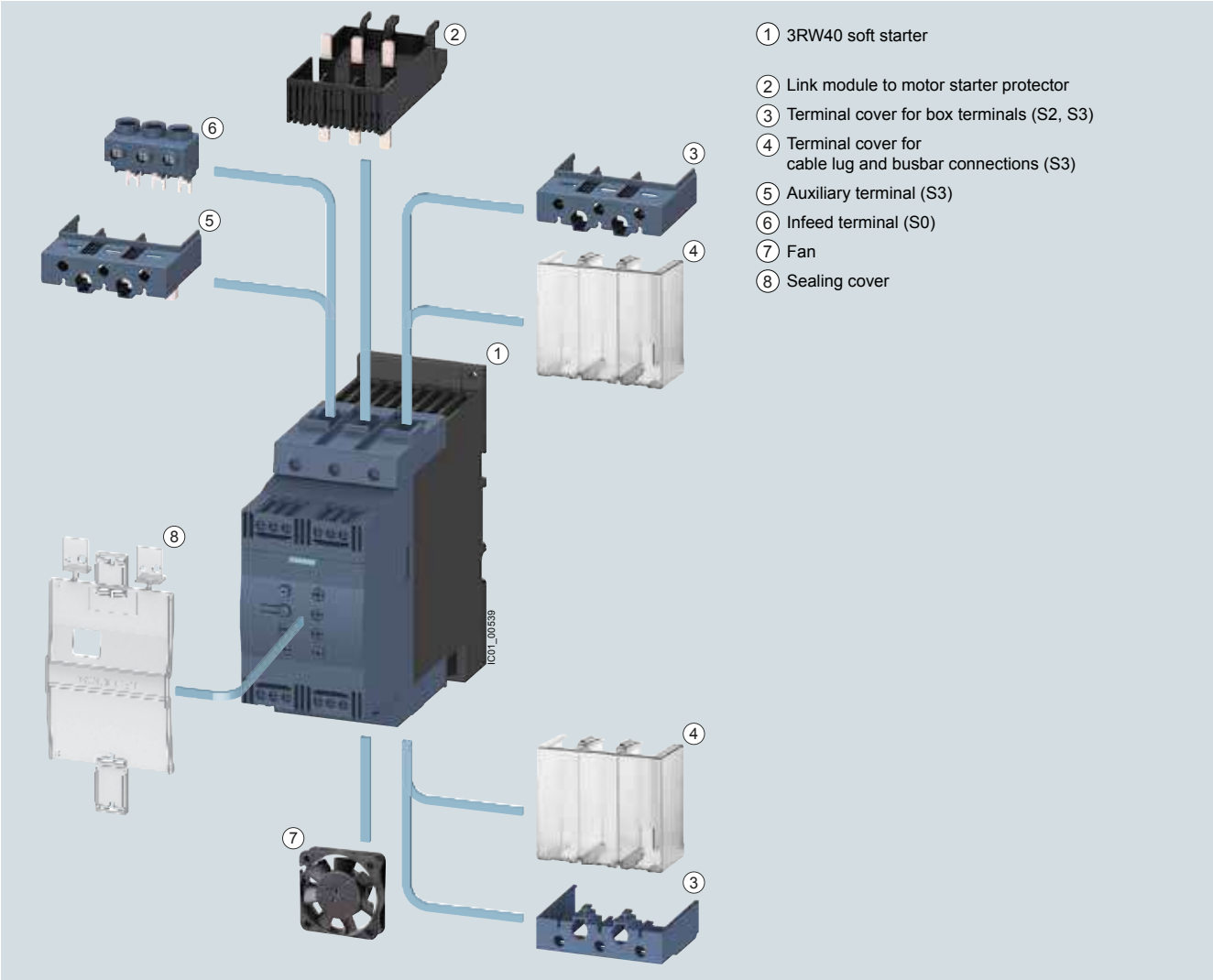
Overview

More information	
Homepage, see www.siemens.com/softstarter Industry Mall, see www.siemens.com/product?3RW40	TIA Selection Tool Cloud (TST Cloud), see https://www.siemens.com/tstcloud/?node=3rw40 Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

The SIRIUS 3RW40 Basic Performance soft starters are suitable for soft starting and stopping of three-phase asynchronous motors.

Thanks to two-phase control, not only is the current kept at minimum values in all three phases throughout the entire starting time, but disturbing direct current components are also eliminated. This not only enables the two-phase starting of motors from 10 to 100 HP @ 600V but also avoids the current and torque peaks which occur e.g. with wye-delta starters.

The SIRIUS 3RW40 soft starters are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e according to ATEX Directive 94/9/EC.



3RW40 Basic Performance soft starters with accessories (see page 7/92)

Basic Performance Soft Starters

3RW40 soft starters > General data

Benefits

3RW402.

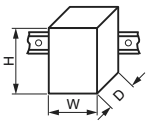
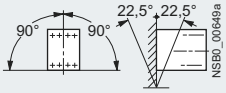
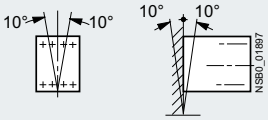
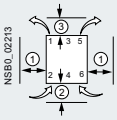
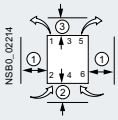
3RW403.

3RW404.

Product characteristics / function	Performance features / benefits
Small and compact design	Space-saving, clearly arranged control panel layout
Motor overload and intrinsic device protection without additional wiring	Adjustable trip classes, integrated diagnostics functions
Integrated in the SIRIUS modular system	Link modules to motor starter protectors
Hybrid switching devices and two-phase motor control	Minimum power loss and optimized motor control by avoiding DC components
Certified according to ATEX Directive 94/9/EC	Suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.
Optional thermistor motor protection	Full motor protection

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/25252/td Equipment Manual "SIRIUS 3RW30/3RW40 Soft Starter", see https://support.industry.siemens.com/cs/ww/en/view/38752095	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/25251/faq Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917

Type			3RW402.	3RW403.	3RW404.
Mechanics and environment					
Mounting dimensions (W x H x D) • Screw terminals • Spring-loaded terminals		mm mm	45 x 125 x 154 45 x 150 x 154	55 x 144 x 170 55 x 144 x 170	70 x 160 x 188 70 x 160 x 188
Permissible ambient temperature During operation During storage		°C °C	-25 ... +60; (derating from +40) -40 ... +80		
Weight		kg	0.77	1.35	1.9
Permissible mounting position[1)] • With auxiliary fan (for 3RW402. ... 3RW404.) • Without auxiliary fan (for 3RW402. ... 3RW404.)			 		
Installation type[1)]	Stand-alone installation		 ① ≥ 15 mm (≥ 0.59 in) ② ≥ 40 mm (≥ 1.56 in) ③ ≥ 60 mm (≥ 2.36 in)	 ① ≥ 30 mm (≥ 1.18 in) ② ≥ 40 mm (≥ 1.56 in) ③ ≥ 60 mm (≥ 2.36 in)	
Permissible installation altitude		m	5 000 (Derating from 1 000, see characteristic curve on page 7/7)		
Degree of protection			IP20 for 3RW402.; all others IP00		

1) In the case of deviations, please observe derating, see Equipment Manual in the chapter "Configuring".

Type	Terminal		3RW402., 3RW403., 3RW404.	
Control electronics				
Rated values Rated control supply voltage • Tolerance	A1/A2	V %	24 AC/DC ± 20	110 ... 230 AC/DC -15/+10
Rated frequency • Tolerance		Hz %	50/60 ± 10	

Type		3RW402.-..B.4, 3RW403.-..B.4, 3RW404.-..B.4	3RW402.-..B.5, 3RW403.-..B.5, 3RW404.-..B.5
Power electronics			
Rated operational voltage Tolerance	V AC %	200 ... 480 -15/+10	400 ... 600
Maximum blocking voltage (thyristor)	V AC	1 600	
Rated frequency Tolerance	Hz %	50/60 ± 10	
Uninterrupted duty at 40 °C (% of I_e)	%	115	
Minimum load (% of smallest adjustable rated motor current I_M)	%	20 (at least 2 A)	
Maximum cable length between soft starter and motor	m	300	

Type		3RW4024	3RW4026	3RW4027	3RW4028
Power electronics					
Load rating with rated operational current I_e • According to IEC and UL/CSA[1], 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
Smallest adjustable rated motor current I_M For the motor overload protection	A	5	10	17	23
Power loss • In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	2	8	13	19
• During starting with current limiting set to 300% I_M (40 °C)	W	68	188	220	256
Permissible rated motor current and starts per hour • For normal starting (CLASS 10) at 40/50 °C					
- Rated motor current I_M[2], start-up time 3 s	A	12.5/11	25/23	32/29	38/34
- Starts per hour[3]	1/h	50/50	23/23	23/23	19/19
- Rated motor current I_M[2], start-up time 4 s	A	12.5/11	25/23	32/29	38/34
- Starts per hour[3]	1/h	36/36	15/15	16/16	12/12
• For heavy starting (CLASS 20) at 40/50 °C					
- Rated motor current I_M[2], start-up time 6 s	A	10/9	21/19	27/24	31/28
- Starts per hour[3]	1/h	47/47	21/21	20/20	18/18
- Rated motor current I_M[2], start-up time 8 s	A	10/9	21/19	27/24	31/28
- Starts per hour[3]	1/h	34/34	15/15	14/14	13/13

1) Measurement at 60 °C according to UL/CSA not required.

2) Current limiting on soft starter set to 300% I_M, T_u = 40/50 °C. Maximum adjustable rated motor current I_M dependent on CLASS setting.

3) For intermittent duty S4 with ON period = 30%, T_u = 40/50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode. Factors for permissible switching frequency in other mounting position, direct mounting, side-by-side mounting, and implementation of optional auxiliary fan, see Equipment Manual in the chapter "Configuring".

Type		3RW4036	3RW4037	3RW4038	3RW4046	3RW4047
Power electronics						
Load rating with rated operational current I_e • According to IEC and UL/CSA[1], individual mounting at 40/50/60 °C, AC-53a	A	45/42/39	63/58/53	72/62.1/60	80/73/66	106/98/90
Smallest adjustable rated motor current I_M For the motor overload protection	A	23	26	35	43	46
Power loss • In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6	12	15	12	21
• During starting with current limiting set to 300% I_M (40 °C)	W	316	444	500	576	768
Permissible rated motor current and starts per hour • For normal starting (CLASS 10) at 40/50 °C						
- Rated motor current I_M[2], start-up time 3 s	A	45/42	63/58	72/62	80/73	106/98
- Starts per hour[3]	1/h	38/38	23/23	22/22	22/22	15/15
- Rated motor current I_M[2], start-up time 4 s	A	45/42	63/58	72/62	80/73	106/98
- Starts per hour[3]	1/h	26/26	15/15	15/15	15/15	10/10
• For heavy starting (CLASS 20) at 40/50 °C						
- Rated motor current I_M[2], start-up time 6 s	A	38/34	46/42	50/46	64/58	77/70
- Starts per hour[3]	1/h	30/30	31/31	34/34	23/23	23/23
- Rated motor current I_M[2], start-up time 8 s	A	38/34	46/42	50/46	64/58	77/70
- Starts per hour[3]	1/h	21/21	22/22	24/24	16/16	16/16

1) Measurement at 60 °C according to UL/CSA not required.

2) Current limiting on soft starter set to 300% I_M, T_u = 40/50 °C. Maximum adjustable rated motor current I_M dependent on CLASS setting.

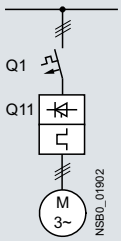
3) For intermittent duty S4 with ON period = 30%, T_u = 40/50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode. Factors for permissible switching frequency in other mounting position, direct mounting, side-by-side mounting, and implementation of optional auxiliary fan, see Equipment Manual in the chapter "Configuring".

Motor feeders according to IEC with 3RV2 motor starter protectors (without semiconductor protection)

Type of coordination "1", CLASS 10,
short-circuit breaking capacity I_q in kA, see table

Note:

For general recommendations for constructing motor feeders
with soft starters, see page 7/9.



Soft starters	Motor starter protectors			
	for 400 V systems		for 500 V systems	
Q11	Q1	I_q	Q1	I_q
Type	Type	kA	Type	kA
Type of coordination "1" ToC 1	**Inline circuit**			
3RW4024	3RV2021-4AA10	55	3RV2021-4AA10	10
3RW4026	3RV2021-4DA10	55	3RV2021-4DA10	10
3RW4027	3RV2021-4EA10	55	3RV2021-4EA10	10
3RW4028	3RV2021-4FA10	55	3RV2021-4FA10	10
3RW4036	3RV2031-4WA10	10	3RV2031-4WA10	10
3RW4037	3RV2031-4JA10	10	3RV2031-4JA10	5
3RW4038	3RV2031-4KA10	10	3RV2031-4KA10	5
3RW4046	3RV2041-4RA10	11	3RV2041-4YA10	5
3RW4047	3RV2041-4MA10	11	3RV2041-4MA10	5

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller motor starter protectors/circuit breakers than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

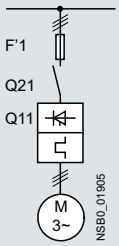
Motor feeders according to IEC with 3NE1 SITOR fuses

gR class full-range fuses for semiconductor protection, cable and line protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	Line contactor (optional)		
	for systems up to 600 V	for systems up to 400 V	for systems up to 480 V	for systems up to 600 V
Q11	F'1	Q21	Q21	Q21
Type	Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**			
3RW4024	3NE1814-0	3RT2025	3RT2025/ 3RT2018 (in size S00)	3RT2025
3RW4026	3NE1803-0	3RT2026	3RT2027	3RT2037
3RW4027	3NE1020-2	3RT2027	3RT2028	3RT2037
3RW4028	3NE1020-2	3RT2028	3RT2035	3RT2037
3RW4036	3NE1020-2	3RT2036	3RT2036	3RT2038
3RW4037	3NE1820-0	3RT2037	3RT2037	3RT2046
3RW4038	3NE1820-0	3RT2038	3RT2038	3RT2046
3RW4046	3NE1021-0	3RT2045	3RT2045	3RT2047
3RW4047	3NE1022-0	3RT2047	3RT2047	3RT1054

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

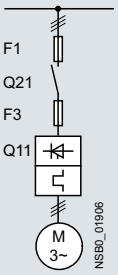
Motor feeders according to IEC with 3NE8 / 3NE4 / 3NE3 / 3NC fuses

aR class partial-range fuses for semiconductor protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	aR class fuse			Cylindrical fuses	Line contactor (optional)		
	for systems up to 600 V	for systems up to 600 V	for systems up to 600 V	for systems up to 600 V	for systems up to 480 V	for systems up to 400 V	for systems up to 480 V	for systems up to 600 V
Q11	F1	F3	F3	F3	F3	Q21	Q21	Q21
Type	Type	Type	Type	Type	Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**							
3RW4024	3NA3820-6	--	3NE4101	3NE8015-1	3NC2240	3RT2025	3RT2025/ 3RT2018 (in size S00)	3RT2025
3RW4026	3NA3822-6	--	3NE4102	3NE8017-1	3NC2263	3RT2026	3RT2027	3RT2037
3RW4027	3NA3824-6	--	3NE4118	3NE8018-1	3NC2280	3RT2027	3RT2028	3RT2037
3RW4028	3NA3824-6	--	3NE4118	3NE8020-1	3NC2280	3RT2028	3RT2035	3RT2037
3RW4036	3NA3130-6	--	3NE4120	3NE8020-1	3NC2280	3RT2036	3RT2036	3RT2038
3RW4037	3NA3132-6	--	3NE4121	3NE8021-1	--	3RT2037	3RT2037	3RT2046
3RW4038	3NA3132-6	3NE3221	--	3NE8022-1	--	3RT2038	3RT2038	3RT2046
3RW4046	3NA3136-6	3NE3222	--	3NE8022-1	--	3RT2045	3RT2045	3RT2047
3RW4047	3NA3136-6	3NE3224	--	3NE8024-1	--	3RT2047	3RT2047	3RT1054

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

For CLASS 10 applications, as an alternative to the gG class full-range fuses for cable and line protection 3NA3 (F1), 3RV2 motor starter protectors can also be used, possibly with reduced short-circuit breaking capacity (see page 7/87). In these cases, optional line contactors can be dispensed with.

Selection and ordering data

For normal starting (CLASS 10)

3RW402.

3RW403.

3RW404.

3RW ambient temperature 40 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	Rating at operational voltage U_e 200 V	230 V	460 V	575 V	Size	SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
A	kW	kW	kW	hp	hp	hp	hp		d				
Rated operational voltage U_e 200 ... 480 V													
12.5	3	**5.5**	--	3	3	**7.5**	--	**S0**	2	**3RW4024-□BB□4**		1	1 unit
25	5.5	**11**	--	7.5	7.5	**15**	--	**S0**	2	**3RW4026-□BB□4**		1	1 unit
32	7.5	**15**	--	10	10	**20**	--	**S0**	2	**3RW4027-□BB□4**		1	1 unit
38	11	**18.5**	--	10	10	**25**	--	**S0**	2	**3RW4028-□BB□4**		1	1 unit
45	11	**22**	--	10	15	**30**	--	**S2**	2	**3RW4036-□BB□4**		1	1 unit
63	18.5	**30**	--	20	20	**40**	--	**S2**	2	**3RW4037-□BB□4**		1	1 unit
72	22	**37**	--	20	25	**50**	--	**S2**	2	**3RW4038-□BB□4**		1	1 unit
80	22	**45**	--	25	30	**60**	--	**S3**	2	**3RW4046-□BB□4**		1	1 unit
106	30	**55**	--	30	40	**75**	--	**S3**	2	**3RW4047-□BB□4**		1	1 unit
Rated operational voltage U_e 400 ... 600 V													
12.5	--	5.5	**7.5**	--	--	7.5	**10**	**S0**	5	**3RW4024-□BB□5**		1	1 unit
25	--	11	**15**	--	--	15	**20**	**S0**	5	**3RW4026-□BB□5**		1	1 unit
32	--	15	**18.5**	--	--	20	**30**	**S0**	5	**3RW4027-□BB□5**		1	1 unit
38	--	18.5	**22**	--	--	25	**30**	**S0**	5	**3RW4028-□BB□5**		1	1 unit
45	--	22	**30**	--	--	30	**40**	**S2**	5	**3RW4036-□BB□5**		1	1 unit
63	--	30	**37**	--	--	40	**60**	**S2**	5	**3RW4037-□BB□5**		1	1 unit
72	--	37	**45**	--	--	50	**60**	**S2**	5	**3RW4038-□BB□5**		1	1 unit
80	--	45	**55**	--	--	60	**75**	**S3**	5	**3RW4046-□BB□5**		1	1 unit
106	--	55	**75**	--	--	75	**100**	**S3**	5	**3RW4047-□BB□5**		1	1 unit

Article No. supplement for connection types

- Screw terminals **1**
- Spring-loaded terminals[2] **2**

Control supply voltage

- 24 V AC/DC **0**
- 110 ... 230 V AC/DC **1**

[1] Soft starter U_e 200 to 480 V with screw terminals: Standard delivery time SD = 1 day (d).

[2] Main connection from size S2: screw terminals.

Note:

For the constraints for the motor outputs specified here, see page 7/7.

Basic Performance Soft Starters

3RW40 soft starters > Inline circuit *IE3/IE4* ready

For normal starting (CLASS 10)

3RW402.

3RW403.

3RW404.

3RW ambient temperature 40 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	Rating at operational voltage U_e 200 V	230 V	460 V	575 V	Size	SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
A	kW	kW	kW	hp	hp	hp	hp		d				
Rated operational voltage U_e 200 ... 480 V, with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC													
12.5	3	**5.5**	--	3	3	**7.5**	--	**S0**	5	**3RW4024-□TB04**		1	1 unit
25	5.5	**11**	--	7.5	7.5	**15**	--	**S0**	5	**3RW4026-□TB04**		1	1 unit
32	7.5	**15**	--	10	10	**20**	--	**S0**	5	**3RW4027-□TB04**		1	1 unit
38	11	**18.5**	--	10	10	**25**	--	**S0**	5	**3RW4028-□TB04**		1	1 unit
45	11	**22**	--	10	15	**30**	--	**S2**	5	**3RW4036-□TB04**		1	1 unit
63	18.5	**30**	--	20	20	**40**	--	**S2**	5	**3RW4037-□TB04**		1	1 unit
72	22	**37**	--	20	25	**50**	--	**S2**	5	**3RW4038-□TB04**		1	1 unit
80	22	**45**	--	25	30	**60**	--	**S3**	5	**3RW4046-□TB04**		1	1 unit
106	30	**55**	--	30	40	**75**	--	**S3**	5	**3RW4047-□TB04**		1	1 unit
Rated operational voltage U_e 400 ... 600 V, with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC													
12.5	--	5.5	**7.5**	--	--	7.5	**10**	**S0**	5	**3RW4024-□TB05**		1	1 unit
25	--	11	**15**	--	--	15	**20**	**S0**	5	**3RW4026-□TB05**		1	1 unit
32	--	15	**18.5**	--	--	20	**30**	**S0**	5	**3RW4027-□TB05**		1	1 unit
38	--	18.5	**22**	--	--	25	**30**	**S0**	5	**3RW4028-□TB05**		1	1 unit
45	--	22	**30**	--	--	30	**40**	**S2**	5	**3RW4036-□TB05**		1	1 unit
63	--	30	**37**	--	--	40	**60**	**S2**	5	**3RW4037-□TB05**		1	1 unit
72	--	37	**45**	--	--	50	**60**	**S2**	5	**3RW4038-□TB05**		1	1 unit
80	--	45	**55**	--	--	60	**75**	**S3**	5	**3RW4046-□TB05**		1	1 unit
106	--	55	**75**	--	--	75	**100**	**S3**	5	**3RW4047-□TB05**		1	1 unit

Article No. supplement for connection types

- Screw terminals **1**
- Spring-loaded terminals[2] **2**

[1] Soft starter U_e 200 to 480 V with screw terminals: Standard delivery time SD = 1 day (d).

[2] Main connection from size S2: screw terminals.

Note:

For the constraints for the motor outputs specified here, see page 7/7.

Selection and ordering data

	Conductor cross-section: Solid or stranded	Conductor cross-section: Finely stranded with end sleeve	Conductor cross-section: AWG cables, solid or stranded	Tightening torque	For soft starters size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	mm²	mm²	AWG	Nm		d				
Three-phase infeed terminals										
3RV2925-5AB	2.5 … 25	2.5 … 16	10 ... 4	3 ... 4	**S0** (3RW402.)	▶	**3RV2925-5AB**		1	1 unit

	For soft starters: Type	For soft starters: Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
Auxiliary terminals								
3RT2946-4F	**Auxiliary terminals, 3-pole**							
	3RW404.	**S3**	For connection of auxiliary and control cables (0.5 ... 2.5 mm²) to the main conductor terminals	5	**3RT2946-4F**		1	1 unit
Covers for soft starters								
3RT2936-4EA2	**Terminal covers for box terminals**							
	3RW403.	**S2**	Additional touch protection to be fitted at the box terminals (two units required per device)	▶	**3RT2936-4EA2**		1	1 unit
	3RW404.	**S3**		▶	**3RT2946-4EA2**		1	1 unit
3RT1946-4EA1	**Terminal covers for cable lugs and busbar connections**							
	3RW404.	**S3**	For complying with the voltage clearances and as touch protection if box terminal is removed (two units required per device)	5	**3RT1946-4EA1**		1	1 unit
3RW4900-0PB10	**Sealing covers**							
	3RW402. to 3RW404.	**S0, S2, S3**	--	5	**3RW4900-0PB10**		1	1 unit

Basic Performance Soft Starters

3RW40 soft starters > Accessories

Standard mounting rail adapters

3RA2932-1CA00

For motor starter protectors Size	For soft starters Size	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		For mechanical fixing of motor starter protector and soft starter; for snapping onto standard mounting rail or for screw fixing					
S2	**S2**	**Single-unit packaging**	2	**3RA2932-1CA00**		1	1 unit

Fans (to increase switching frequency and for device mounting in positions different to the standard position)

3RW49..-8VB00

For soft starters Type	Size	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
3RW402.	**S0**	▶	**3RW4928-8VB00**		1	1 unit
3RW403., 3RW404.	**S2, S3**	▶	**3RW4947-8VB00**		1	1 unit

Link modules to motor starter protectors[1)]

3RA2921-1BA00

3RA2921-2GA00

For soft starters Type	Size	Motor starter protectors Size	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				Screw terminals			
3RW402.	**S0**	**S00/S0**	2	**3RA2921-1BA00**		1	1 unit
3RW4036	**S2**	**S2**	▶	**3RA2931-1AA00**		1	1 unit
3RW404.	**S3**	**S3**	▶	**3RA1941-1AA00**		1	1 unit
				Spring-loaded terminals			
3RW402.	**S0**	**S0**	2	**3RA2921-2GA00**		1	1 unit

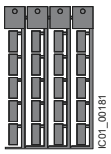
1) Can be used in size S0 up to 32 A.
Can be used in size S2 up to 65 A in combination with 3RA2932-1CA00 standard mounting rail adapter (specially for soft starters).
Can be used in size S3 only with mounting plate.

Tools for opening spring-loaded terminals in sizes S00 and S0

3RA2908-1A

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Screwdrivers For all SIRIUS devices with spring-loaded terminals		**Spring-loaded terminals**			
Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit

Blank labels



3RT2900-1SB20

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Unit labeling plates[1)] For SIRIUS devices					
20 mm x 7 mm, titanium gray	20	**3RT2900-1SB20**		100	340 units

1) PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH.

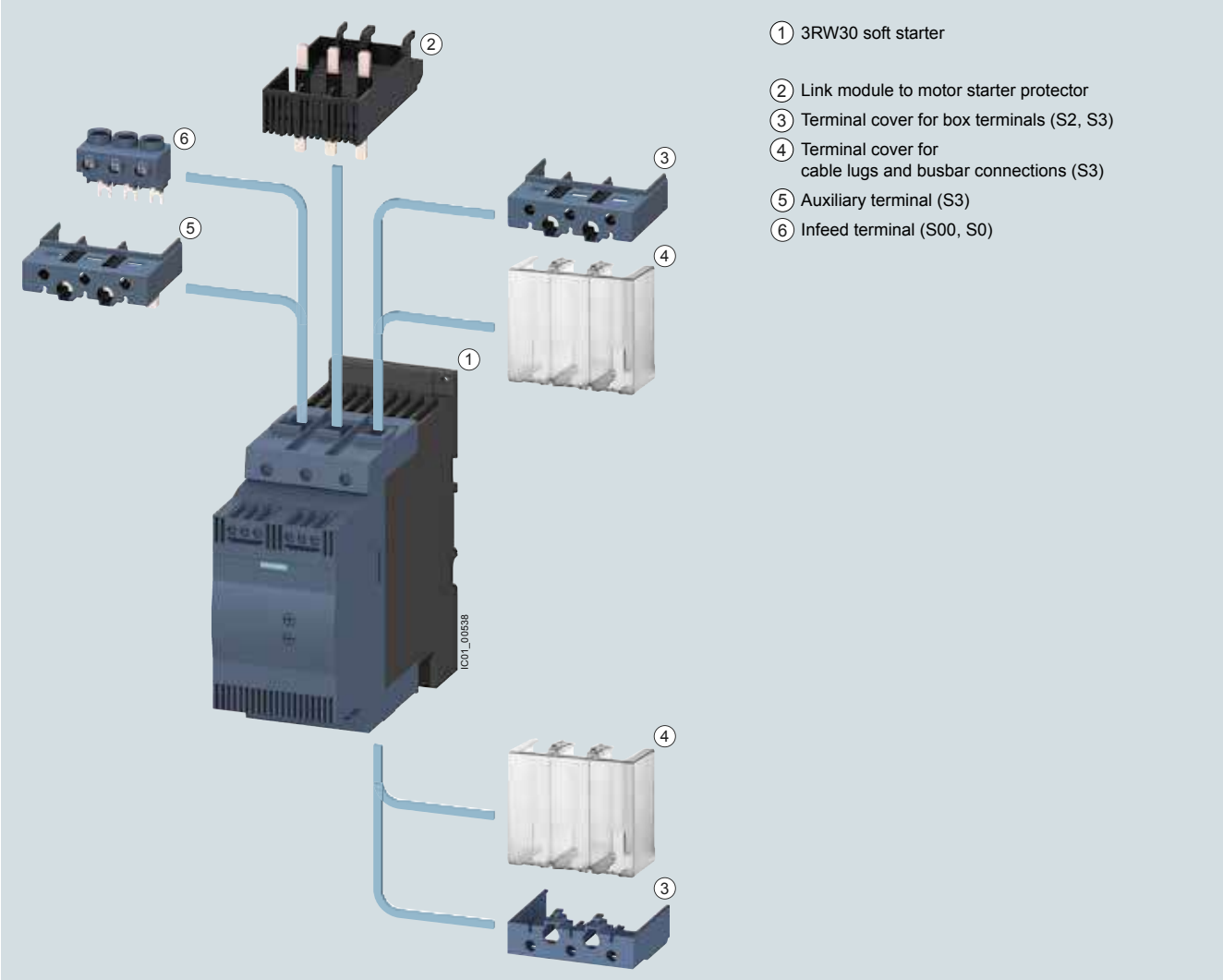
Basic Performance Soft Starters

Overview

More information	
Homepage, see www.siemens.com/softstarter Industry Mall, see www.siemens.com/product?3RW TIA Selection Tool Cloud (TST Cloud), see https://www.siemens.com/tstcloud/?node=3rw30	Simulation Tool for Soft Starters (STS), see page 7/7 or https://support.industry.siemens.com/cs/ww/en/view/101494917 SIRIUS Soft Starter ES (TIA Portal), see page 7/7

The SIRIUS 3RW30 Basic Performance soft starters are suitable for soft starting of three-phase asynchronous motors.

Thanks to two-phase control, not only is the current kept at minimum values in all three phases throughout the entire starting time, but disturbing direct current components are also eliminated. This not only enables the two-phase starting of motors from 2 to 75HP @ 480V but also avoids the current and torque peaks which occur e.g. with wye-delta starters.



1. 3RW30 soft starter
2. Link module to motor starter protector
3. Terminal cover for box terminals (S2, S3)
4. Terminal cover for cable lugs and busbar connections (S3)
5. Auxiliary terminal (S3)
6. Infeed terminal (S00, S0)

3RW30 Basic Performance soft starters with accessories (see page 7/103)

Basic Performance Soft Starters

3RW30 soft starters > General data

Benefits

3RW301.

3RW302.

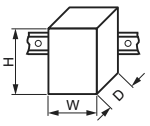
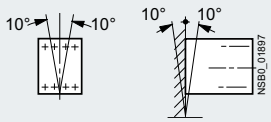
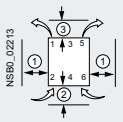
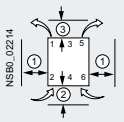
3RW303.

3RW304.

Product characteristics / function	Performance features / benefits
Small and compact design	Space-saving, clearly arranged control panel layout
Parameterization using potentiometers	Simple and fast commissioning
Integrated in the SIRIUS modular system	Link modules to motor starter protectors
Hybrid switching devices and two-phase motor control	Minimum power loss and optimized motor control by avoiding DC components

Technical specifications

More information	
Equipment Manual "SIRIUS 3RW30/3RW40 Soft Starters", see https://support.industry.siemens.com/cs/ww/en/view/38752095 FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16213/faq	Catalog LV 10, see www.siemens.com/lowvoltage/lv10

Type			3RW301.	3RW302.	3RW303.	3RW304.
Mechanics and environment						
Mounting dimensions (W x H x D) • Screw terminals • Spring-loaded terminals		mm mm	45 x 95 x 151 45 x 117 x 151	45 x 125 x 151 45 x 150 x 151	55 x 144 x 168 55 x 144 x 168	70 x 160 x 186 70 x 160 x 186
Permissible ambient temperature During operation During storage		 °C °C	 -25 ... +60; (derating from +40) -40 ... +80			
Weight		kg	0.58	0.69	1.20	1.71
Permissible mounting position[1] (auxiliary fan not possible)						
Installation type[1]	Stand-alone installation		 ① ≥ 15 mm (≥ 0.59 in) ② ≥ 40 mm (≥ 1.56 in) ③ ≥ 60 mm (≥ 2.36 in)		 ① ≥ 30 mm (≥ 1.18 in) ② ≥ 40 mm (≥ 1.56 in) ③ ≥ 60 mm (≥ 2.36 in)	
Permissible installation altitude		m	5 000 (Derating from 1 000, see characteristic curve on page 7/7)			
Degree of protection			IP20 for 3RW301. and 3RW302.; IP00 for 3RW303. and 3RW304.			

[1] In the case of deviations, please observe derating, see Equipment Manual in the chapter "Configuring".

Type	Terminal		3RW301., 3RW302.		3RW303., 3RW304.	
Control electronics						
Rated values						
Rated control supply voltage	A1/A2	V	24	110 ... 230	24	110 ... 230
• Tolerance		%	20	-15/+10	20	-15/+10
Rated frequency		Hz	50/60			
• Tolerance		%	± 10			

Type		3RW301.	3RW302.	3RW303.	3RW304.
Power electronics					
Rated operational voltage	V AC	200 ... 480			
Tolerance	%	-15/+10			
Rated frequency	Hz	50/60			
Tolerance	%	10			
Uninterrupted duty at 40 °C (% of I_e)	%	115			
Minimum load (% of I_e)	%	10 (at least 1 A)			
Maximum cable length between soft starter and motor	m	300			

Type		3RW3013	3RW3014	3RW3016	3RW3017	3RW3018
Power electronics						
Load rating with rated operational current I_e						
• According to IEC and UL/CSA[1], individual mounting at 40/50/60 °C, AC-53a	A	3.6/3.3/3	6.5/6/5.5	9/8/7	12.5/12/11	17.6/17/14
Power loss						
• 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	24	52	80	80	116
Permissible rated motor current and starts per hour						
• For normal starting (CLASS 10) at 40/50 °C						
- Rated motor current I_M[2], start-up time 3 s	A	3.6/3.3	6.5/6.0	9/8	12.5/12.0	17.6/17.0
- Starts per hour[3]	1/h	200/150	87/60	50/50	85/70	62/46
- Rated motor current I_M[2], start-up time 4 s	A	3.6/3.3	6.5/6.0	9/8	12.5/12.0	17.6/17.0
- Starts per hour[3]	1/h	150/100	64/46	35/35	62/47	45/32

1) Measurement at 60 °C according to UL/CSA not required.

2) At 300% I_M, T_u = 40/50 °C.

3) For intermittent duty S4 with ON period = 30%, T_u = 40/50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type		3RW3026	3RW3027	3RW3028
Power electronics				
Load rating with rated operational current I_e				
• According to IEC and UL/CSA[1], individual mounting at 40/50/60 °C, AC-53a	A	25.3/23/21	32.2/29/26	38/34/31
Power loss				
• 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	188	220	256
Permissible rated motor current and starts per hour				
• For normal starting (CLASS 10) at 40/50 °C				
- Rated motor current I_M[2], start-up time 3 s	A	25/23	32/29	38/34
- Starts per hour[3]	1/h	23/23	23/23	19/19
- Rated motor current I_M[2], start-up time 4 s	A	25/23	32/29	38/34
- Starts per hour[3]	1/h	15/15	16/16	12/12

1) Measurement at 60 °C according to UL/CSA not required.

2) At 300% I_M, T_u = 40/50 °C.

3) For intermittent duty S4 with ON period = 30%, T_u = 40/50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode. Factors for permissible switching frequency with deviating mounting position, direct mounting, side-by-side mounting, see Equipment Manual in the chapter "Configuring".

Type		3RW3036	3RW3037	3RW3038	3RW3046	3RW3047
Power electronics						
Load rating with rated operational current I_e						
• According to IEC and UL/CSA[1], individual mounting at 40/50/60 °C, AC-53a	A	45/42/39	65/58/53	72/62.1/60	80/73/66	106/98/90
Power loss						
• 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	316	444	500	576	768
Permissible rated motor current and starts per hour						
• For normal starting (CLASS 10) at 40/50 °C						
- Rated motor current I_M[2], start-up time 3 s	A	45/42	63/58	72/62	80/73	106/108
- Starts per hour[3]	1/h	38/38	23/23	22/22	22/22	15/15
- Rated motor current I_M[2], start-up time 4 s	A	45/42	63/58	72/62	80/73	106/98
- Starts per hour[3]	1/h	26/26	15/15	15/15	15/15	10/10

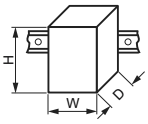
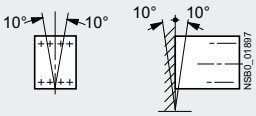
1) Measurement at 60 °C according to UL/CSA not required.

2) At 300% I_M, T_u = 40/50 °C.

3) For intermittent duty S4 with ON period = 30%, T_u = 40/50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Basic Performance Soft Starters

3RW30 soft starters > General data

Type		3RW3003-1CB54	3RW3003-2CB54
Mechanics and environment			
Mounting dimensions (W x H x D) 			
• Screw terminals	mm	22.5 x 100 x 120	--
• Spring-loaded terminals	mm	--	22.5 x 101.6 x 120
Permissible ambient temperature			
During operation	°C	-25 ... +60; (derating from +40)	
During storage	°C	-40 ... +80	
Weight	kg	0.207	0.188
Permissible mounting position			
Permissible installation altitude	m	5 000 (Derating from 1 000, see characteristic curve on page 7/7)	
Degree of protection acc. to IEC 60529		IP20 (IP00 terminal compartment)	
Control electronics			
Rated values			
Rated control supply voltage	V	24 ... 230 AC/DC	
• Tolerance	%	± 10	
Rated frequency at AC	Hz	50/60	
• Tolerance	%	± 10	
Power electronics			
Rated operational voltage	V AC	200 ... 400	
Tolerance	%	± 10	
Rated frequency	Hz	50/60	
Tolerance	%	± 10	
Uninterrupted duty (% of I_e)	%	100	
Minimum load[1] (% of I_e); at 40 °C	%	9	
Maximum conductor length between soft starter and motor	m	100[2]	
Load rating with rated operational current I_e			
• According to IEC and UL/CSA, individual mounting at 40/50/60 °C, AC-53a	A	3/2.6/2.2	
• According to IEC and UL/CSA, side-by-side mounting at 40/50/60 °C, AC-53a	A	2.6/2.2/1.8	
Power loss			
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6.5	
• With utilization of maximum switching frequency	W	3	
Permissible starts per hour (cannot be increased by using a fan)			
• For intermittent duty S4 T_u = 40 °C, stand-alone installation vertical	1/h	1 500	
• ON period = 70% for 300% I_e	1/s	0.2	
Dead time after uninterrupted duty with I_e before restart	s	0	

1) 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.

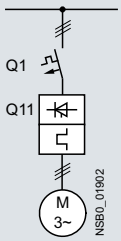
2) If this value is exceeded, problems with line capacities may arise, which can result in false firing.

Motor feeders according to IEC with 3RV2 motor starter protectors (without semiconductor protection)

Type of coordination "1", CLASS 10,
short-circuit breaking capacity I_q in kA, see table

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	Motor starter protectors for 400 V systems	
Q11 Type	Q1 Type	I_q kA
Type of coordination "1" ToC 1	**Inline circuit**	
3RW3003	3RV2011-1EA10	50
3RW3013	3RV2011-1FA10	5
3RW3014	3RV2011-1HA10	5
3RW3016	3RV2011-1JA10	5
3RW3017	3RV2011-1KA10	5
3RW3018	3RV2021-4BA10	5
3RW3026	3RV2021-4DA10	55
3RW3027	3RV2021-4EA10	55
3RW3028	3RV2021-4FA10	55
3RW3036	3RV2031-4WA10	10
3RW3037	3RV2031-4JA10	10
3RW3038	3RV2031-4KA10	10
3RW3046	3RV2041-4RA10	11
3RW3047	3RV2041-4MA10	11

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller motor starter protectors/circuit breakers than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

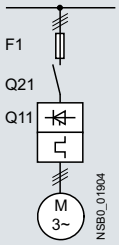
Motor feeders according to IEC with 3NA3 fuses

gG class full-range fuses for cable and line protection according to IEC 60269-2, without semiconductor protection

Type of coordination "1",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters Q11 Type	gG class fuse for systems up to 480 V F1 Type	Line contactor (optional) for systems up to 400 V Q21 Type	 for systems up to 480 V Q21 Type
Type of coordination "1" ToC 1	**Inline circuit**		
3RW3003[1]	3NA3805[2]	3RT2015	3RT2015
3RW3013 **3RW3014** **3RW3016**	3NA3803-6 3NA3805-6 3NA3807-6	3RT2015 3RT2015 3RT2016	3RT2015 3RT2016 3RT2017
3RW3017 **3RW3018**	3NA3810-6 3NA3814-6	3RT2018 3RT2026	3RT2025 3RT2026
3RW3026 **3RW3027** **3RW3028**	3NA3822-6 3NA3824-6 3NA3824-6	3RT2026 3RT2027 3RT2028	3RT2027 3RT2028 3RT2035
3RW3036 **3RW3037** **3RW3038**	3NA3130-6 3NA3132-6 3NA3132-6	3RT2036 3RT2037 3RT2038	3RT2036 3RT2037 3RT2038
3RW3046 **3RW3047**	3NA3136-6 3NA3136-6	3RT2045 3RT2047	3RT2045 3RT2047

1) I_q = 50 kA at 400 V.
2) 3NA3805-1 (NH00), 5SB261 (DIAZED), 5SE2201-6 (NEOZED).

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

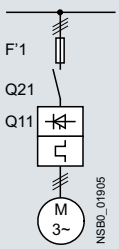
Motor feeders according to IEC with 3NE1 SITOR fuses

gR class full-range fuses for semiconductor protection, cable and line protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	Line contactor (optional)	
	for systems up to 480 V	for systems up to 400 V	for systems up to 480 V
Q11	F'1	Q21	Q21
Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**		
3RW3003[1]	3NE1813-0[2]	3RT2015	3RT2015
3RW3013	3NE1813-0	3RT2015	3RT2015
3RW3014	3NE1813-0	3RT2015	3RT2016
3RW3016	3NE1813-0	3RT2016	3RT2017
3RW3017	3NE1813-0	3RT2018	3RT2025
3RW3018	3NE1814-0	3RT2026	3RT2026
3RW3026	3NE1803-0	3RT2026	3RT2027
3RW3027	3NE1020-2	3RT2027	3RT2028
3RW3028	3NE1020-2	3RT2028	3RT2035
3RW3036	3NE1020-2	3RT2036	3RT2036
3RW3037	3NE1820-0	3RT2037	3RT2037
3RW3038	3NE1820-0	3RT2038	3RT2038
3RW3046	3NE1021-0	3RT2045	3RT2045
3RW3047	3NE1022-0	3RT2047	3RT2047

1) I_q = 50 kA at 400 V.
2) No SITOR fuse required!
Alternatively: 3NA3803 (NH00), 5SB221 (DIAZED), 5SE2206 (NEOZED).

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

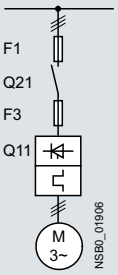
Motor feeders according to IEC with 3NE8 / 3NE4 / 3NE3 / 3NC fuses

aR class partial-range fuses for semiconductor protection

Type of coordination "2",
short-circuit breaking capacity I_q = 65 kA

Note:

For general recommendations for constructing motor feeders with soft starters, see page 7/9.



Soft starters	gG class fuse	aR class fuse			Cylindrical fuses	Line contactor (optional)	
	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V	for systems up to 480 V	for systems up to 400 V	for systems up to 480 V
Q11	F1	F3	F3	F3	F3	Q21	Q21
Type	Type	Type	Type	Type	Type	Type	Type
Type of coordination "2" ToC 2	**Inline circuit**						
3RW3003[1]	3NA3805[2]	--	--	3NE8015-1	3NC1010	3RT2015	3RT2015
3RW3013	3NA3803-6	--	3NE4101	3NE8015-1	3NC2220	3RT2015	3RT2015
3RW3014	3NA3805-6	--	3NE4101	3NE8015-1	3NC2220	3RT2015	3RT2016
3RW3016	3NA3807-6	--	3NE4101	3NE8015-1	3NC2220	3RT2016	3RT2017
3RW3017	3NA3810-6	--	3NE4101	3NE8015-1	3NC2250	3RT2018	3RT2025
3RW3018	3NA3814-6	--	3NE4101	3NE8003-1	3NC2263	3RT2026	3RT2026
3RW3026	3NA3822-6	--	3NE4102	3NE8017-1	3NC2263	3RT2026	3RT2027
3RW3027	3NA3824-6	--	3NE4118	3NE8018-1	3NC2280	3RT2027	3RT2028
3RW3028	3NA3824-6	--	3NE4118	3NE8020-1	3NC2280	3RT2028	3RT2035
3RW3036	3NA3130-6	--	3NE4120	3NE8020-1	3NC2280	3RT2036	3RT2036
3RW3037	3NA3132-6	--	3NE4121	3NE8021-1	--	3RT2037	3RT2037
3RW3038	3NA3132-6	3NE3221	--	3NE8022-1	--	3RT2038	3RT2038
3RW3046	3NA3136-6	3NE3222	--	3NE8022-1	--	3RT2045	3RT2045
3RW3047	3NA3136-6	3NE3224	--	3NE8024-1	--	3RT2047	3RT2047

1) I_q = 50 kA at 400 V.
2) 3NA3805-1 (NH00), 5SB261 (DIAZED).

Note:

The specified short-circuit breaking capacities I_q in kA are covered by combination tests. Smaller fuses than those specified can be used at any time as smaller ones trip more quickly in the event of a short circuit (unchanged short-circuit breaking capacity) and thus protect the soft starter in any case. The dimensioning of the short-circuit components must, however, be suitable for the connected three-phase motor and the line protection for the cables used.

For CLASS 10 applications, as an alternative to the gG class full-range fuses for cable and line protection 3NA3 (F1), 3RV2 motor starter protectors/circuit breakers can also be used, possibly with reduced short-circuit breaking capacity (see page 7/98). In these cases, optional line contactors can be dispensed with.

Selection and ordering data

For simple starting conditions

3RW301.

3RW302.

3RW303.

3RW304.

3RW ambient temperature 40 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	Rating at operational voltage U_e 200 V	230 V	460 V	575 V	Size	SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
A	kW	kW	kW	hp	hp	hp	hp		d				
Rated operational voltage U_e 200 ... 480 V													
3.6	0.75	**1.5**	--	0.5	0.75	**2**	--	**S00**	2	**3RW3013-□BB□4**		1	1 unit
6.5	1.5	**3**	--	1	1.5	**3**	--	**S00**	2	**3RW3014-□BB□4**		1	1 unit
9	2.2	**4**	--	2	2	**5**	--	**S00**	2	**3RW3016-□BB□4**		1	1 unit
12.5	3	**5.5**	--	3	3	**7.5**	--	**S00**	2	**3RW3017-□BB□4**		1	1 unit
17.6	4	**7.5**	--	5	5	**10**	--	**S00**	2	**3RW3018-□BB□4**		1	1 unit
25	5.5	**11**	--	7.5	7.5	**15**	--	**S0**	2	**3RW3026-□BB□4**		1	1 unit
32	7.5	**15**	--	10	10	**20**	--	**S0**	2	**3RW3027-□BB□4**		1	1 unit
38	11	**18.5**	--	10	10	**25**	--	**S0**	2	**3RW3028-□BB□4**		1	1 unit
45	11	**22**	--	10	15	**30**	--	**S2**	2	**3RW3036-□BB□4**		1	1 unit
63	18.5	**30**	--	20	20	**40**	--	**S2**	2	**3RW3037-□BB□4**		1	1 unit
72	22	**37**	--	20	25	**50**	--	**S2**	2	**3RW3038-□BB□4**		1	1 unit
80	22	**45**	--	25	30	**60**	--	**S3**	2	**3RW3046-□BB□4**		1	1 unit
106	30	**55**	--	30	40	**75**	--	**S3**	2	**3RW3047-□BB□4**		1	1 unit

Article No. supplement for connection types

- Screw terminals **1**
- Spring-loaded terminals[2] **2**

Control supply voltage U_s

- 24 V AC/DC **0**
- 110 ... 230 V AC/DC **1**

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	**1.1**	--	A	0.5	**0.5**	--	--	22.5 mm				
• With screw terminals										►	**3RW3003-1CB54**	1	1 unit
• With spring-loaded terminals										►	**3RW3003-2CB54**	1	1 unit

[1] Soft starter U_e 200 to 480 V with screw terminals: Standard delivery time SD = 1 day (d).

[2] Main connection from size S2: screw terminals.

Note:

For the constraints for the motor outputs specified here, see page 7/7.

Selection and ordering data

More information

Equipment Manual "SIRIUS 3RW30/3RW40 Soft Starters", see https://support.industry.siemens.com/cs/ww/en/view/38752095

Three-phase infeed terminals

3RV2925-5AB

Conductor cross-section: Solid or stranded	Conductor cross-section: Finely stranded with end sleeve	Conductor cross-section: AWG cables, solid or stranded	Tightening torque	For soft starters size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
mm²	mm²	AWG	Nm		d				
2.5 … 25	2.5 … 16	10 ... 4	3 ... 4	S00 (3RW301.), S0 (3RW302.)	▶	**3RV2925-5AB**		1	1 unit

Auxiliary terminals

3RT2946-4F

For soft starters: Type	For soft starters: Size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Auxiliary terminals, 3-pole						
3RW304.	**S3**	5	**3RT2946-4F**		1	1 unit

Covers for soft starters

3RT2946-4EA2

3RT1946-4EA1

For soft starters: Type	For soft starters: Size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Terminal covers for box terminals Additional touch protection to be fitted at the box terminals (two units required per device)						
3RW303.	**S2**	▶	**3RT2936-4EA2**		1	1 unit
3RW304.	**S3**	▶	**3RT2946-4EA2**		1	1 unit
Terminal covers for cable lugs and busbar connections For complying with the voltage clearances and as touch protection if box terminal is removed (two units required per device)						
3RW304.	**S3**	5	**3RT1946-4EA1**		1	1 unit

Mounting rails for mounting contactors for the customer assembly of 3RA21 load feeders with busbar adapters for 60 mm systems

8US1998-7CB45

For motor starter protectors: Size	For soft starters: Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
--	**S0**	For the discrete configuration of direct-on-line starters, an additional mounting rail is needed for the contactor in addition to the existing mounting rail on the bus-bar adapter for the motor starter protec-tor. For pushing onto the device adapter, in-cluding fixing screws	2	**8US1998-7CB45**		1	10 units

Standard mounting rail adapters

3RA2932-1CA00

S2	**S2**	For mechanical fixing of motor starter protector and soft starter; for snapping onto standard mounting rail or for screw fixing **Single-unit packaging**	2	**3RA2932-1CA00**		1	1 unit

Basic Performance Soft Starters

3RW30 soft starters > Accessories

Link modules to motor starter protectors[1)]

3RA2921-1BA00

3RA2921-2GA00

For soft starters Type	Size	Motor starter protectors Size	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				Screw terminals			
3RW301.	**S00**	**S00**	2	**3RA2921-1BA00**		1	1 unit
3RW302.	**S0**	**S00/S0**	2	**3RA2921-1BA00**		1	1 unit
3RW3036	**S2**	**S2**	▶	**3RA2931-1AA00**		1	1 unit
3RW304.	**S3**	**S3**	▶	**3RA1941-1AA00**		1	1 unit
				Spring-loaded terminals			
3RW301.	**S00**	**S00**	2	**3RA2911-2GA00**		1	1 unit
3RW302.	**S0**	**S0**	2	**3RA2921-2GA00**		1	1 unit

1) Can be used in size S0 up to 32 A.
Can be used in size S2 up to 65 A in combination with 3RA2932-1CA00 standard mounting rail adapter (specially for soft starters).
Can be used in size S3 only on mounting plate.

Covers and push-in lugs (only for 3RW3003)

3RP1902

3RP1903

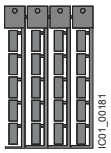
Version	Functionality Functions	Use	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Sealable covers	For securing against unauthorized adjustment of setting knobs	For devices with 1 or 2 CO contacts	5	**3RP1902**		1	5 units
Push-in lugs for screw fixing	--	For devices with 1 or 2 CO contacts	5	**3RP1903**		1	10 units

Tools for opening spring-loaded terminals in sizes S00 and S0

3RA2908-1A

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Screwdrivers For all SIRIUS devices with spring-loaded terminals		**Spring-loaded terminals**			
Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit

Blank labels



3RT2900-1SB20

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Unit labeling plates[1)] For SIRIUS devices					
20 mm x 7 mm, titanium gray	20	**3RT2900-1SB20**		100	340 units

1) PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH.

Basic Performance Soft Starters

For 3RW55/3RW55 Failsafe

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
Fans								
3RW5983-0FF00	**Fan**	3RW551 (1x), 3RW552 (2x), 3RW553 (2x)	--	▶	**3RW5983-0FF00**		1	1 unit
		3RW554 (1x)	--	▶	**3RW5984-0FF00**		1	1 unit
		3RW555 (3x)	--	▶	**3RW5985-0FF00**		1	1 unit
Terminals and terminal covers								
3RW5982-0TB00	**Box terminal block**	3RW552 (2x)	--	▶	**3RW5982-0TB00**		1	1 unit
					Screw terminals			
3RW5980-1TR00	**Removable control terminals**	3RW551.-1H... (2x), 3RW552.-1H... (2x), 3RW553.-6H... (2x), 3RW554.-6H... (2x), 3RW555.-6H... (2x)	contains 2 blocks each with 6 terminals	▶	**3RW5980-1TR00**		1	1 unit
					Spring-loaded terminals			
		3RW551.-3H... (2x), 3RW552.-3H... (2x), 3RW553.-2H... (2x), 3RW554.-2H... (2x), 3RW555.-2H... (2x)	contains 2 blocks each with 6 terminals	▶	**3RW5980-2TR00**		1	1 unit
3RW5955-0TC20	**Terminal cover**	3RW555	--	▶	**3RW5955-0TC20**		1	1 unit

Basic Performance Soft Starters

For 3RW55/3RW55 Failsafe

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosure components								
3RW5950-0GD20	**Cover for control cable duct**	3RW55..-.HA..	Titanium gray	▶	**3RW5950-0GD20**		1	1 unit
3RW5950-0GD30		3RW55..-.HF..	Yellow NEW	▶	**3RW5950-0GD30**		1	1 unit
3RW5950-0GL30	**Hinged cover**	3RW55	With cutout for High Feature HMI module	▶	**3RW5950-0GL30**		1	1 unit

Basic Performance Soft Starters

For 3RW55/3RW55 Failsafe

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
HMI modules								
3RW5980-0HF00	**HMI module**	3RW55	High Feature	▶	**3RW5980-0HF00**		1	1 unit
3RW5980-0HL00	**Interface cover**	3RW55	--	▶	**3RW5980-0HL00**		1	1 unit
Connection cable for installing the HMI module in the soft starter								
3UF7931-0AA00-0	**Connection cable**	--	0.1 m, flat	▶	**3UF7931-0AA00-0**		1	1 unit
Transport packaging								
3RW5953-0VY00	**Transport packaging**	3RW551	--	▶	**3RW5951-0VY00**		1	1 unit
		3RW552, 3RW553	--	▶	**3RW5953-0VY00**		1	1 unit
		3RW554	--	▶	**3RW5954-0VY00**		1	1 unit
		3RW555	--	▶	**3RW5955-0VY00**		1	1 unit

Basic Performance Soft Starters

For 3RW52

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Fans								
3RW5983-0FF00	**Fans**	3RW5216/17 (1x), 3RW5226/27 (2x), 3RW523 (2x)	--	▶	**3RW5983-0FF00**		1	1 unit
		3RW524 (1x)	--	▶	**3RW5984-0FF00**		1	1 unit
Terminals								
3RW5982-0TB00	**Box terminal block**	3RW522 (2x)	--	▶	**3RW5982-0TB00**		1	1 unit
					Screw terminals			
3RW5980-1TR00	**Removable control terminals**	3RW521.-1.C.., 3RW522.-1.C.., 3RW523.-6.C.., 3RW524.-6.C..	contains 2 blocks each with 6 terminals	▶	**3RW5980-1TR00**		1	1 unit
					Spring-loaded terminals			
		3RW521.-3.C.., 3RW522.-3.C.., 3RW523.-2.C.., 3RW524.-2.C..	contains 2 blocks each with 6 terminals	▶	**3RW5980-2TR00**		1	1 unit
Enclosure components								
3RW5953-0GB00	**Enclosure base**	3RW522, 3RW523	--	▶	**3RW5953-0GB00**		1	1 unit
		3RW524	--	▶	**3RW5954-0GB00**		1	1 unit
3RW5950-0GD20	**Cover for control cable duct**	3RW52	Titanium gray	▶	**3RW5950-0GD20**		1	1 unit

Basic Performance Soft Starters

For 3RW52

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
Enclosure components								
3RW5950-0GL20	**Hinged cover**	3RW52	Without cutout	▶	**3RW5950-0GL20**		1	1 unit
Transport packaging								
3RW5953-0VY00	**Transport packaging**	3RW521	--	▶	**3RW5951-0VY00**		1	1 unit
		3RW522, 3RW523	--	▶	**3RW5953-0VY00**		1	1 unit
		3RW524	--	▶	**3RW5954-0VY00**		1	1 unit

Basic Performance Soft Starters

For 3RW50 NEW

	Product designation	Manufacturer's Article No. of the soft starter	Type of product	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Fan								
3RW5905-0FF00	**Fan**	3RW505 (1x)	--	▶	**3RW5905-0FF00**		1	1 unit
		3RW507 (1x)	--	▶	**3RW5907-0FF00**		1	1 unit
Terminals								
					Screw terminals			
3RW5980-1TR00	**Removable control terminals**	3RW50..-6.B..	contains 2 blocks each with 6 terminals	▶	**3RW5980-1TR00**		1	1 unit
					Spring-loaded terminals			
		3RW50..-2.B..	contains 2 blocks each with 6 terminals	▶	**3RW5980-2TR00**		1	1 unit
Enclosure components								
3RW5900-0GL00	**Hinged cover**	3RW50	--	▶	**3RW5900-0GL00**		1	1 unit
Transport packaging								
3RW5905-0VY00	**Transport packaging**	3RW505	--	▶	**3RW5905-0VY00**		1	1 unit
		3RW507	--	▶	**3RW5907-0VY00**		1	1 unit

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:

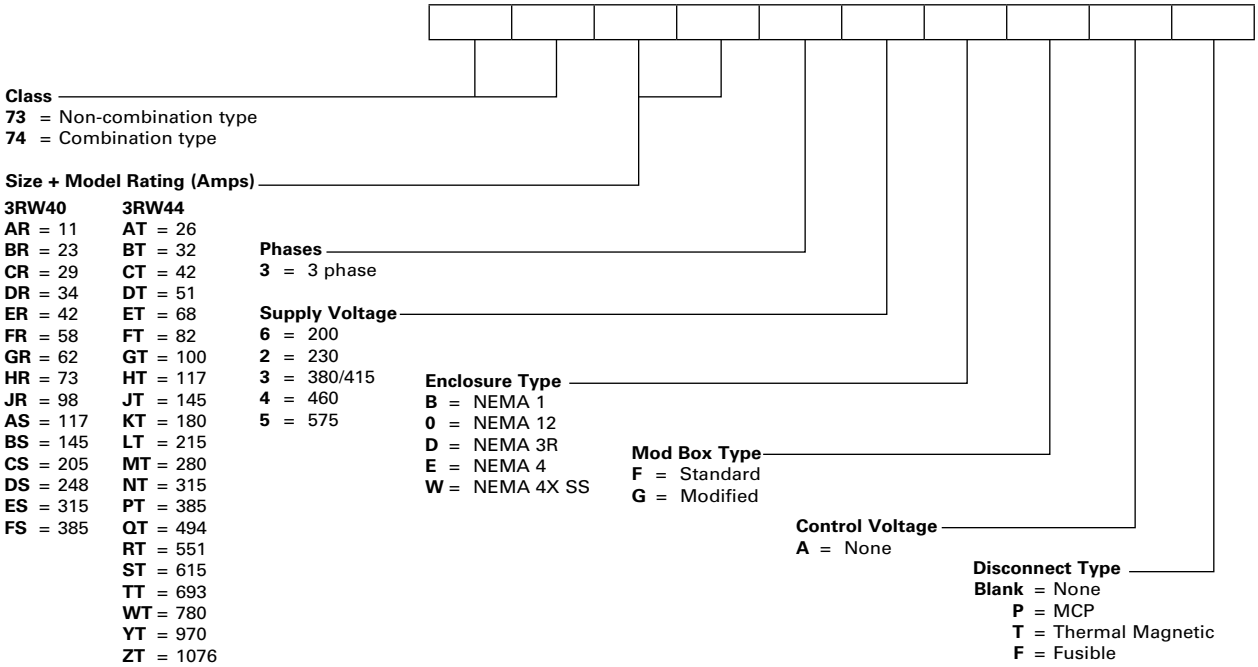
- Select proper RVSS by application
  - Select the 3RW40 versus the 3RW44 using the application info provided in the open section of the catalog
- Select the rating chart for normal starting or sever duty starting
  - Normal starting is rated at 350% of rated motor current IM for 10 seconds and based 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[1)]

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



1) Some modifications will require a larger 'Modified' box than the standard box e.g. Isolation contactor, space heater, etc. See page 7/124 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 7/124.
- ► For dimensional drawings see page 7/125.

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 HP①				KW	Class 10 Light Duty (350% * Ie for 10s)②										
	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 $
11	3	3	7.5	—	6	3RW4024-1BB14	73AR3_BFA		73AR3_DFA		73AR3_0FA		73AR3_EFA		73AR3_WFA	
23	5	7.5	15	—	13	3RW4026-1BB14	73BR3_BFA		73BR3_DFA		73BR3_0FA		73BR3_EFA		73BR3_WFA	
29	7.5	10	20	—	16	3RW4027-1BB14	73CR3_BFA		73CR3_DFA		73CR3_0FA		73CR3_EFA		73CR3_WFA	
34	10	10	25	—	18	3RW4028-1BB14	73DR3_BFA		73DR3_DFA		73DR3_0FA		73DR3_EFA		73DR3_WFA	
42	10	15	30	—	23	3RW4036-1BB14	73ER3_BFA		73ER3_DFA		73ER3_0FA		73ER3_EFA		73ER3_WFA	
58	15	20	40	—	31	3RW4037-1BB14	73FR3_BFA		73FR3_DFA		73FR3_0FA		73FR3_EFA		73FR3_WFA	
62	20	20	40	—	33	3RW4038-1BB14	73GR3_BFA		73GR3_DFA		73GR3_0FA		73GR3_EFA		73GR3_WFA	
73	20	25	50	—	39	3RW4046-1BB14	73HR3_BFA		73HR3_DFA		73HR3_0FA		73HR3_EFA		73HR3_WFA	
98	30	30	75	—	52	3RW4047-1BB14	73JR3_BFA		73JR3_DFA		73JR3_0FA		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. Ie = 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 7/124.
- ► For dimensional drawings see page 7/125.

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 HP①				KW	Class 10 Light Duty (350% * Im for 10s)②										
	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**	**73AS3_BFA**		**73AS3_DFA**		**73AS3_0FA**		**73AS3_EFA**		**73AS3_WFA**	
145	40	50	100	—	75	**3RW4056-6BB34**	**73BS3_BFA**		**73BS3_DFA**		**73BS3_0FA**		**73BS3_EFA**		**73BS3_WFA**	
205	60	75	150	—	112	**3RW4073-6BB34**	**73CS3_BFA**		**73CS3_DFA**		**73CS3_0FA**		**73CS3_EFA**		**73CS3_WFA**	
248	75	100	200	—	149	**3RW4074-6BB34**	**73DS3_BFA**		**73DS3_DFA**		**73DS3_0FA**		**73DS3_EFA**		**73DS3_WFA**	
315	100	125	250	—	186	**3RW4075-6BB34**	**73ES3_BFA**		**73ES3_DFA**		**73ES3_0FA**		**73ES3_EFA**		**73ES3_WFA**	
385	125	150	300	—	224	**3RW4076-6BB34**	**73FS3_BFA**		**73FS3_DFA**		**73FS3_0FA**		**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 HP①				KW	Class 20 Severe Duty (350% * Ie for 20s)②										
	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**	**73AS3_BFA**		**73AS3_DFA**		**73AS3_0FA**		**73AS3_EFA**		**73AS3_WFA**	
132	40	50	100	—	75	**3RW4056-6BB34**	**73BS3_BFA**		**73BS3_DFA**		**73BS3_0FA**		**73BS3_EFA**		**73BS3_WFA**	
185	60	60	125	—	93	**3RW4073-6BB34**	**73CS3_BFA**		**73CS3_DFA**		**73CS3_0FA**		**73CS3_EFA**		**73CS3_WFA**	
205	60	75	150	—	112	**3RW4074-6BB34**	**73DS3_BFA**		**73DS3_DFA**		**73DS3_0FA**		**73DS3_EFA**		**73DS3_WFA**	
280	75	100	200	—	149	**3RW4075-6BB34**	**73ES3_BFA**		**73ES3_DFA**		**73ES3_0FA**		**73ES3_EFA**		**73ES3_WFA**	
340	100	125	250	—	186	**3RW4076-6BB34**	**73FS3_BFA**		**73FS3_DFA**		**73FS3_0FA**		**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 7/124.
- ► For dimensional drawings see page 7/125.

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 HP①				KW	Class 10 Light Duty (350% * Ie for 10s)②										
	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 $
11	3	3	7.5	—	6	3RW4024-1BB14	74AR3_BFAP		74AR3_DFAP		74AR3_0FAP		74AR3_EFAP		74AR3_WFAP	
23	5	7.5	15	—	13	3RW4026-1BB14	74BR3_BFAP		74BR3_DFAP		74BR3_0FAP		74BR3_EFAP		74BR3_WFAP	
29	7.5	10	20	—	16	3RW4027-1BB14	74CR3_BFAP		74CR3_DFAP		74CR3_0FAP		74CR3_EFAP		74CR3_WFAP	
34	10	10	25	—	18	3RW4028-1BB14	74DR3_BFAP		74DR3_DFAP		74DR3_0FAP		74DR3_EFAP		74DR3_WFAP	
42	10	15	30	—	23	3RW4036-1BB14	74ER3_BFAP		74ER3_DFAP		74ER3_0FAP		74ER3_EFAP		74ER3_WFAP	
58	15	20	40	—	31	3RW4037-1BB14	74FR3_BFAP		74FR3_DFAP		74FR3_0FAP		74FR3_EFAP		74FR3_WFAP	
62	20	20	40	—	33	3RW4038-1BB14	74GR3_BFAP		74GR3_DFAP		74GR3_0FAP		74GR3_EFAP		74GR3_WFAP	
73	20	25	50	—	39	3RW4046-1BB14	74HR3_BFAP		74HR3_DFAP		74HR3_0FAP		74HR3_EFAP		74HR3_WFAP	
98	30	30	75	—	52	3RW4047-1BB14	74JR3_BFAP		74JR3_DFAP		74JR3_0FAP		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 7/124.
- ▶ For dimensional drawings see page 7/125.

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 HP①				KW	Class 10 Light Duty (350% * Im for 10s)②										
	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_0FAP		74AS3_EFAP		74AS3_WFAP	
145	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP		74BS3_DFAP		74BS3_0FAP		74BS3_EFAP		74BS3_WFAP	
205	60	75	150	—	112	3RW4073-6BB34	74CS3_BFAP		74CS3_DFAP		74CS3_0FAP		74CS3_EFAP			
248	75	100	200	—	149	3RW4074-6BB34	74DS3_BFAP		74DS3_DFAP		74DS3_0FAP		74DS3_EFAP			
315	100	125	250	—	186	3RW4075-6BB34	74ES3_BFAP		74ES3_DFAP		74ES3_0FAP		74ES3_EFAP			
385	125	150	300	—	224	3RW4076-6BB34	74FS3_BFAP		74FS3_DFAP		74FS3_0FAP		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 HP①				KW	Class 20 Severe Duty (350% * Ie for 20s)②										
	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_0FAP		74AS3_EFAP		74AS3_WFAP	
132	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP		74BS3_DFAP		74BS3_0FAP		74BS3_EFAP		74BS3_WFAP	
185	60	60	125	—	93	3RW4073-6BB34	74CS3_BFAP		74CS3_DFAP		74CS3_0FAP		74CS3_EFAP			
205	60	75	150	—	112	3RW4074-6BB34	74DS3_BFAP		74DS3_DFAP		74DS3_0FAP		74DS3_EFAP			
280	75	100	200	—	149	3RW4075-6BB34	74ES3_BFAP		74ES3_DFAP		74ES3_0FAP		74ES3_EFAP			
340	100	125	250	—	186	3RW4076-6BB34	74FS3_BFAP		74FS3_DFAP		74FS3_0FAP		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 7/124.
- ► For dimensional drawings see page 7/125.

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

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 Fusible Combination (Starter With Fusible Disconnect)

Rated Operating Current	MAX HP①				KW	Class 10 Light Duty (350% * Ie for 10s)②										
	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 $
11	3	3	7.5	—	6	3RW4024-1BB14	**74AR3_BFAF**		**74AR3_DFAF**		**74AR3_0FAF**		**74AR3_EFAF**		**74AR3_WFAF**	
23	5	7.5	15	—	13	3RW4026-1BB14	**74BR3_BFAF**		**74BR3_DFAF**		**74BR3_0FAF**		**74BR3_EFAF**		**74BR3_WFAF**	
29	7.5	10	20	—	16	3RW4027-1BB14	**74CR3_BFAF**		**74CR3_DFAF**		**74CR3_0FAF**		**74CR3_EFAF**		**74CR3_WFAF**	
34	10	10	25	—	18	3RW4028-1BB14	**74DR3_BFAF**		**74DR3_DFAF**		**74DR3_0FAF**		**74DR3_EFAF**		**74DR3_WFAF**	
42	10	15	30	—	23	3RW4036-1BB14	**74ER3_BFAF**		**74ER3_DFAF**		**74ER3_0FAF**		**74ER3_EFAF**		**74ER3_WFAF**	
58	15	20	40	—	31	3RW4037-1BB14	**74FR3_BFAF**		**74FR3_DFAF**		**74FR3_0FAF**		**74FR3_EFAF**		**74FR3_WFAF**	
62	20	20	40	—	33	3RW4038-1BB14	**74GR3_BFAF**		**74GR3_DFAF**		**74GR3_0FAF**		**74GR3_EFAF**		**74GR3_WFAF**	
73	20	25	50	—	39	3RW4046-1BB14	**74HR3_BFAF**		**74HR3_DFAF**		**74HR3_0FAF**		**74HR3_EFAF**		**74HR3_WFAF**	
98	30	30	75	—	52	3RW4047-1BB14	**74JR3_BFAF**		**74JR3_DFAF**		**74JR3_0FAF**		**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. 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 7/124.
- ► For dimensional drawings see page 7/125.

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 HP①				KW	Class 10 Light Duty (350% * Im for 10s)②										
	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 HP①				KW	Class 20 Severe Duty (350% * Ie for 20s)②										
	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. 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 7/124.
- ► For dimensional drawings see page 7/125.

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 HP①				KW	Class 10 Light Duty (350% * Im for 10s)②										
	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	73AT3_BFA		73AT3_DFA		73AT3_0FA		73AT3_EFA		73AT3_WFA	
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_0FA		73BT3_EFA		73BT3_WFA	
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_0FA		73CT3_EFA		73CT3_WFA	
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_0FA		73DT3_EFA		73DT3_WFA	
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_0FA		73ET3_EFA		73ET3_WFA	
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_0FA		73FT3_EFA		73FT3_WFA	
100	30	30	75	—	56	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_0FA		73GT3_EFA		73GT3_WFA	
117	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_0FA		73HT3_EFA		73HT3_WFA	
145	40	50	100	—	75	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_0FA		73JT3_EFA		73JT3_WFA	
180	60	60	125	—	93	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_0FA		73KT3_EFA		73KT3_WFA	
215	60	75	150	—	112	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_0FA		73LT3_EFA		73LT3_WFA	
280	75	100	200	—	149	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_0FA		73MT3_EFA		73MT3_WFA	
315	100	125	250	—	186	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_0FA		73NT3_EFA		73NT3_WFA	
385	125	150	300	—	224	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_0FA		73PT3_EFA		73PT3_WFA	
494	150	200	400	—	298	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_0FA		73QT3_EFA			
551	150	200	450	—	336	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_0FA		73RT3_EFA			
615	200	250	500	—	373	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_0FA		73ST3_EFA			
693	200	250	550	—	410	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_0FA		73TT3_EFA			
780	200	250	600	—	447	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_0FA					
970	350	350	800	—	597	3RW4465-6BC34	73YT3_BFA				73YT3_0FA					
1076	350	400	900	—	972	3RW4466-6BC34	73ZT3_BFA				73ZT3_0FA					
						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		73AT350FA		73AT35EFA		73AT35WFA	
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT350FA		73BT35EFA		73BT35WFA	
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT350FA		73CT35EFA		73CT35WFA	
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT350FA		73DT35EFA		73DT35WFA	
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET350FA		73ET35EFA		73ET35WFA	
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT350FA		73FT35EFA		73FT35WFA	
100	—	—	75	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT350FA		73GT35EFA		73GT35WFA	
117	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT350FA		73HT35EFA		73HT35WFA	
145	—	—	100	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT350FA		73JT35EFA		73JT35WFA	
180	—	—	125	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT350FA		73KT35EFA		73KT35WFA	
215	—	—	150	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT350FA		73LT35EFA		73LT35WFA	
280	—	—	200	250	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT350FA		73MT35EFA		73MT35WFA	
315	—	—	250	300	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT350FA		73NT35EFA		73NT35WFA	
385	—	—	300	400	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT350FA		73PT35EFA		73PT35WFA	
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT350FA		73QT35EFA			
551	—	—	450	600	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT350FA		73RT35EFA			
615	—	—	500	700	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST350FA		73ST35EFA			
693	—	—	550	750	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT350FA		73TT35EFA			
780	—	—	600	850	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT350FA		73WT35EFA			
970	—	—	800	1000	—	3RW4465-6BC35	73YT35BFA				73YT350FA					
1076	—	—	900	1100	—	3RW4466-6BC35	73ZT35BFA				73ZT350FA					

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 7/124.
- ► For dimensional drawings see page 7/125.

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 HP①				KW	Class 20 Severe Duty (350% * Im for 20s)②											
	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	73AT3_BFA		73AT3_DFA		73AT3_0FA		73AT3_EFA		73AT3_WFA	
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_0FA		73BT3_EFA		73BT3_WFA	
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_0FA		73CT3_EFA		73CT3_WFA	
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_0FA		73DT3_EFA		73DT3_WFA	
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_0FA		73ET3_EFA		73ET3_WFA	
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_0FA		73FT3_EFA		73FT3_WFA	
97	30	30	60	—	45	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_0FA		73GT3_EFA		73GT3_WFA	
113	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_0FA		73HT3_EFA		73HT3_WFA	
134	40	50	75	—	56	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_0FA		73JT3_EFA		73JT3_WFA	
175	50	60	100	—	75	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_0FA		73KT3_EFA		73KT3_WFA	
195	60	75	125	—	93	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_0FA		73LT3_EFA		73LT3_WFA	
243	75	75	150	—	112	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_0FA		73MT3_EFA		73MT3_WFA	
263	75	100	200	—	149	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_0FA		73NT3_EFA		73NT3_WFA	
326	100	125	250	—	186	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_0FA		73PT3_EFA		73PT3_WFA	
494	150	150	400	—	224	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_0FA		73QT3_EFA			
551	150	200	450	—	298	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_0FA		73RT3_EFA			
615	200	200	500	—	336	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_0FA		73ST3_EFA			
634	200	250	500	—	373	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_0FA		73TT3_EFA			
650	200	250	550	—	410	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_0FA		73WT3_EFA			
880	300	350	700	—	522	3RW4465-6BC34	73YT3_BFA				73YT3_0FA					
940	300	350	750	—	559	3RW4466-6BC34	73ZT3_BFA				73ZT3_0FA					
						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		73AT350FA		73AT35EFA		73AT35WFA	
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT350FA		73BT35EFA		73BT35WFA	
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT350FA		73CT35EFA		73CT35WFA	
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT350FA		73DT35EFA		73DT35WFA	
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET350FA		73ET35EFA		73ET35WFA	
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT350FA		73FT35EFA		73FT35WFA	
97	—	—	60	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT350FA		73GT35EFA		73GT35WFA	
113	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT350FA		73HT35EFA		73HT35WFA	
134	—	—	75	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT350FA		73JT35EFA		73JT35WFA	
175	—	—	100	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT350FA		73KT35EFA		73KT35WFA	
195	—	—	125	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT350FA		73LT35EFA		73LT35WFA	
243	—	—	150	200	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT350FA		73MT35EFA		73MT35WFA	
263	—	—	200	250	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT350FA		73NT35EFA		73NT35WFA	
326	—	—	250	300	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT350FA		73PT35EFA		73PT35WFA	
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT350FA		73QT35EFA			
551	—	—	450	550	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT350FA		73RT35EFA			
615	—	—	500	600	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST350FA		73ST35EFA			
693	—	—	500	650	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT350FA		73TT35EFA			
780	—	—	550	700	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT350FA		73WT35EFA			
880	—	—	700	850	—	3RW4465-6BC35	73YT35BFA				73YT350FA					
940	—	—	750	900	—	3RW4466-6BC35	73ZT35BFA				73ZT350FA					

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

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- ► For factory modifications see page 7/124.
- ► For dimensional drawings see page 7/125.
- ► 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 HP①				KW	Class 10 Light Duty (350% * Im for 10s)②											
	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_0FAP		74AT3_EFAP		74AT3_WFAP	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_0FAP		74BT3_EFAP		74BT3_WFAP	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_0FAP		74CT3_EFAP		74CT3_WFAP	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_0FAP		74DT3_EFAP		74DT3_WFAP	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_0FAP		74ET3_EFAP		74ET3_WFAP	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_0FAP		74FT3_EFAP		74FT3_WFAP	
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_0FAP		74GT3_EFAP		74GT3_WFAP	
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_0FAP		74HT3_EFAP		74HT3_WFAP	
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_0FAP		74JT3_EFAP		74JT3_WFAP	
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_0FAP		74KT3_EFAP			
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_0FAP		74LT3_EFAP			
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_0FAP		74MT3_EFAP			
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_0FAP		74NT3_EFAP			
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_0FAP		74PT3_EFAP			
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_0FAT		74QT3_EFAT			
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_0FAT		74RT3_EFAT			
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_0FAT		74ST3_EFAT			
693	200	250	550	—	410	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_0FAT		74TT3_EFAT			
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_0FAT		74WT3_EFAT			
970	350	350	800	—	597	3RW4465-6BC34	74YT3_BFAT				74YT3_0FAT					
1076	350	400	900	—	672	3RW4466-6BC34	74ZT3_BFAT				74ZT3_0FAT					
						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		74AT350FAP		74AT35EFAP		74AT35WFAP	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT350FAP		74BT35EFAP		74BT35WFAP	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT350FAP		74CT35EFAP		74CT35WFAP	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT350FAP		74DT35EFAP		74DT35WFAP	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET350FAP		74ET35EFAP		74ET35WFAP	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT350FAP		74FT35EFAP		74FT35WFAP	
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT350FAP		74GT35EFAP		74GT35WFAP	
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT350FAP		74HT35EFAP		74HT35WFAP	
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT350FAP		74JT35EFAP		74JT35WFAP	
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT350FAP		74KT35EFAP			
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT350FAP		74LT35EFAP			
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT350FAP		74MT35EFAP			
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT350FAP		74NT35EFAP			
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT350FAP		74PT35EFAP			
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT350FAT		74QT35EFAT			
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT350FAT		74RT35EFAT			
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST350FAT		74ST35EFAT			
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT350FAT		74TT35EFAT			
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT350FAT		74WT35EFAT			
970	—	—	800	1000	—	3RW4465-6BC35	74YT35BFAT				74YT350FAT					
1076	—	—	900	1100	—	3RW4466-6BC35	74ZT35BFAT				74ZT350FAT					

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Enclosed 3RW44

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- 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
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Enclosed Combination with Circuit Breaker Disconnect

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32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_0FAP		74BT3_EFAP		74BT3_WFAP	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_0FAP		74CT3_EFAP		74CT3_WFAP	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_0FAP		74DT3_EFAP		74DT3_WFAP	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_0FAP		74ET3_EFAP		74ET3_WFAP	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_0FAP		74FT3_EFAP		74FT3_WFAP	
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_0FAP		74GT3_EFAP		74GT3_WFAP	
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_0FAP		74HT3_EFAP		74HT3_WFAP	
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_0FAP		74JT3_EFAP		74JT3_WFAP	
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_0FAP		74KT3_EFAP			
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_0FAP		74LT3_EFAP			
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_0FAP		74MT3_EFAP			
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_0FAP		74NT3_EFAP			
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_0FAP		74PT3_EFAP			
494	150	150	400	—	224	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_0FAT		74QT3_EFAT			
551	150	200	450	—	298	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_0FAT		74RT3_EFAT			
615	200	200	500	—	336	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_0FAT		74ST3_EFAT			
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650	200	250	550	—	410	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_0FAT		74WT3_EFAT			
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						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		74AT350FAP		74AT35EFAP		74AT35WFAP	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT350FAP		74BT35EFAP		74BT35WFAP	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT350FAP		74CT35EFAP		74CT35WFAP	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT350FAP		74DT35EFAP		74DT35WFAP	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET350FAP		74ET35EFAP		74ET35WFAP	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT350FAP		74FT35EFAP		74FT35WFAP	
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT350FAP		74GT35EFAP		74GT35WFAP	
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT350FAP		74HT35EFAP		74HT35WFAP	
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT350FAP		74JT35EFAP		74JT35WFAP	
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT350FAP		74KT35EFAP			
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT350FAP		74LT35EFAP			
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT350FAP		74MT35EFAP			
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT350FAP		74NT35EFAP			
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT350FAP		74PT35EFAP			
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT350FAT		74QT35EFAT			
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT350FAT		74RT35EFAT			
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST350FAT		74ST35EFAT			
693	—	—	500	650	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT350FAT		74TT35EFAT			
780	—	—	550	700	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT350FAT		74WT35EFAT			
880	—	—	700	850	—	3RW4465-6BC35	74YT35BFAT				74YT350FAT					
940	—	—	750	900	—	3RW4466-6BC35	74ZT35BFAT				74ZT350FAT					

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 7/124.
- ► For dimensional drawings see page 7/125.

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 HP①				KW	Class 10 Light Duty② (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	List Price $
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAF		74AT3_DFAF		74AT3_0FAF		74AT3_EFAF		74AT3_WFAF	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_0FAF		74BT3_EFAF		74BT3_WFAF	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_0FAF		74CT3_EFAF		74CT3_WFAF	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_0FAF		74DT3_EFAF		74DT3_WFAF	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_0FAF		74ET3_EFAF		74ET3_WFAF	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_0FAF		74FT3_EFAF		74FT3_WFAF	
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_0FAF		74GT3_EFAF		74GT3_WFAF	
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_0FAF		74HT3_EFAF		74HT3_WFAF	
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_0FAF		74JT3_EFAF		74JT3_WFAF	
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_0FAF		74KT3_EFAF			
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_0FAF		74LT3_EFAF			
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_0FAF		74MT3_EFAF			
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_0FAF		74NT3_EFAF			
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_0FAF		74PT3_EFAF			
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAF				74QT3_0FAF					
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF				74RT3_0FAF					
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAF				74ST3_0FAF					
693	200	250	550	—		3RW4456-6BC34	74TT3_BFAF				74TT3_0FAF					
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAF				74WT3_0FAF					
						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		74AT350FAF		74AT35EFAF		74AT35WFAF	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT350FAF		74BT35EFAF		74BT35WFAF	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT350FAF		74CT35EFAF		74CT35WFAF	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT350FAF		74DT35EFAF		74DT35WFAF	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET350FAF		74ET35EFAF		74ET35WFAF	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT350FAF		74FT35EFAF		74FT35WFAF	
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT350FAF		74GT35EFAF		74GT35WFAF	
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT350FAF		74HT35EFAF		74HT35WFAF	
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT350FAF		74JT35EFAF		74JT35WFAF	
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT350FAF		74KT35EFAF			
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT350FAF		74LT35EFAF			
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT350FAF		74MT35EFAF			
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT350FAF		74NT35EFAF			
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT350FAF		74PT35EFAF			
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF				74QT350FAF					
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAF				74RT350FAF					
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAF				74ST350FAF					
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAF				74TT350FAF					
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAF				74WT350FAF					

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 7/124.
- ► For dimensional drawings see page 7/125.

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 HP①				KW	Class 20 Severe Duty (350% * Im for 20s)②											
	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_BFAF		74AT3_DFAF		74AT3_0FAF		74AT3_EFAF		74AT3_WFAF	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_0FAF		74BT3_EFAF		74BT3_WFAF	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_0FAF		74CT3_EFAF		74CT3_WFAF	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_0FAF		74DT3_EFAF		74DT3_WFAF	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_0FAF		74ET3_EFAF		74ET3_WFAF	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_0FAF		74FT3_EFAF		74FT3_WFAF	
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_0FAF		74GT3_EFAF		74GT3_WFAF	
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_0FAF		74HT3_EFAF		74HT3_WFAF	
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_0FAF		74JT3_EFAF		74JT3_WFAF	
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_0FAF		74KT3_EFAF			
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_0FAF		74LT3_EFAF			
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_0FAF		74MT3_EFAF			
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_0FAF		74NT3_EFAF			
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_0FAF		74PT3_EFAF			
494	150	150	400	—	298	3RW4453-6BC34	74QT3_BFAF				74QT3_0FAF					
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF				74RT3_0FAF					
615	200	200	500	—	373	3RW4455-6BC34	74ST3_BFAF				74ST3_0FAF					
634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAF				74TT3_0FAF					
650	200	250	550	—	373	3RW4457-6BC34	74WT3_BFAF				74WT3_0FAF					
						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		74AT350FAF		74AT35EFAF		74AT35WFAF	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT350FAF		74BT35EFAF		74BT35WFAF	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT350FAF		74CT35EFAF		74CT35WFAF	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT350FAF		74DT35EFAF		74DT35WFAF	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET350FAF		74ET35EFAF		74ET35WFAF	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT350FAF		74FT35EFAF		74FT35WFAF	
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT350FAF		74GT35EFAF		74GT35WFAF	
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT350FAF		74HT35EFAF		74HT35WFAF	
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT350FAF		74JT35EFAF		74JT35WFAF	
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT350FAF		74KT35EFAF			
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT350FAF		74LT35EFAF			
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT350FAF		74MT35EFAF			
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT350FAF		74NT35EFAF			
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT350FAF		74PT35EFAF			
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF				74QT350FAF					
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAF				74RT350FAF					
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAF				74ST350FAF					
693	—	—	550	650	—	3RW4456-6BC35	74TT35BFAF				74TT350FAF					
780	—	—	600	700	—	3RW4457-6BC35	74WT35BFAF				74WT350FAF					

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.

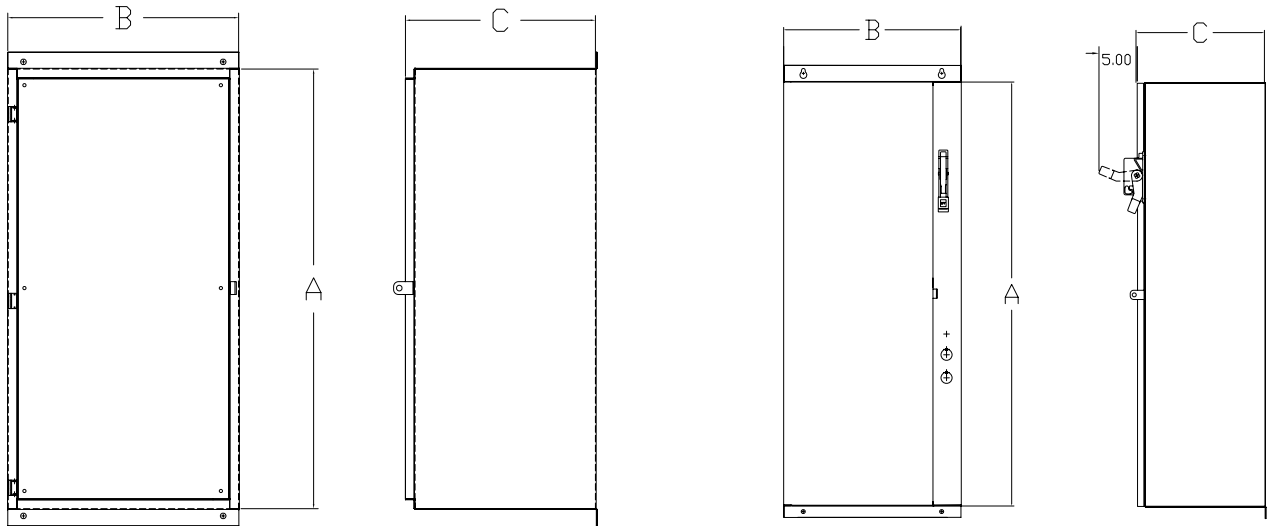
Factory Modifications

Modification Available modifications in STANDARD enclosure	3RW Version	Enclosed Style	Enclosure NEMA Type	Mod Suffix
Push Buttons				
Start/Stop	3RW40/44	73/74	ALL	A1
Emergency Stop	3RW40/44	73/74	ALL	ES
Selector Switches				
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
Pilot Light				
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 Upgrade④	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
Through the Door Metering				
External keypad for 3RW44	3RW44	73/74	1,12	K1
Elapse time meter	3RW40/44	73/74	1,12 (120V)	M5
Control Options				
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
	3RW40①②	73/74	1/12/3R/4	A12

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
Isolation Contactor ③	3RW40/44	73/74	1/12/3R/4	IC
100 VA Extra CPT Capacity	3RW40/44	73/74	ALL	CA
Space Heater (120V separate control)	3RW40/44	73/74	ALL	SH
Space Heater w/ T-stat (120V separate control)	3RW40/44	73/74	ALL	ST
Lightning Arrestor	3RW40/44	73/74	ALL	L

① (A) For sizes 73YT & 73ZT, mods IC & A12 are available individually or together; (B) For sizes 74YT & 74ZT (combination w\CB), mods IC & A12 are only available individually (NOT together); (C) For sizes 74YT & 74ZT (combination w\ fusible disc), mods IC & A12 are NOT available individually or together.
② An isolation contactor is included with the emergency HP rated bypass starter for version 3RW40 soft starters.
③ Isolation contactor IC is included as standard with version 3RW40 model R (4th character of the cat. no.) soft starters.
④ 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.



Dimensions are in inches and are for reference only (not for construction). Certain styles may deviate from values indicated.

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

① Add 4" for N4.

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	40①	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

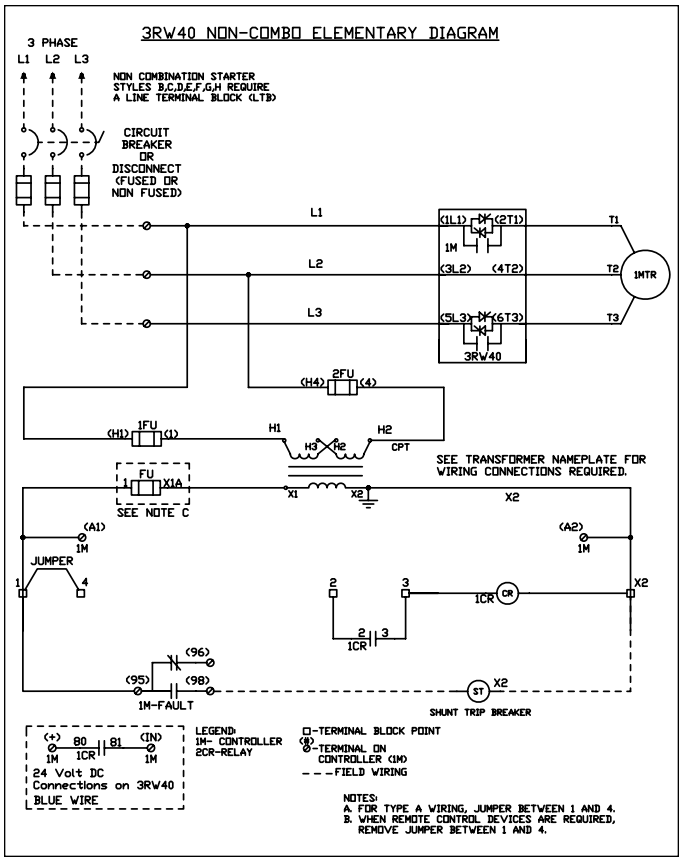
N1, N3R, N12, N4 Modified Enclosure

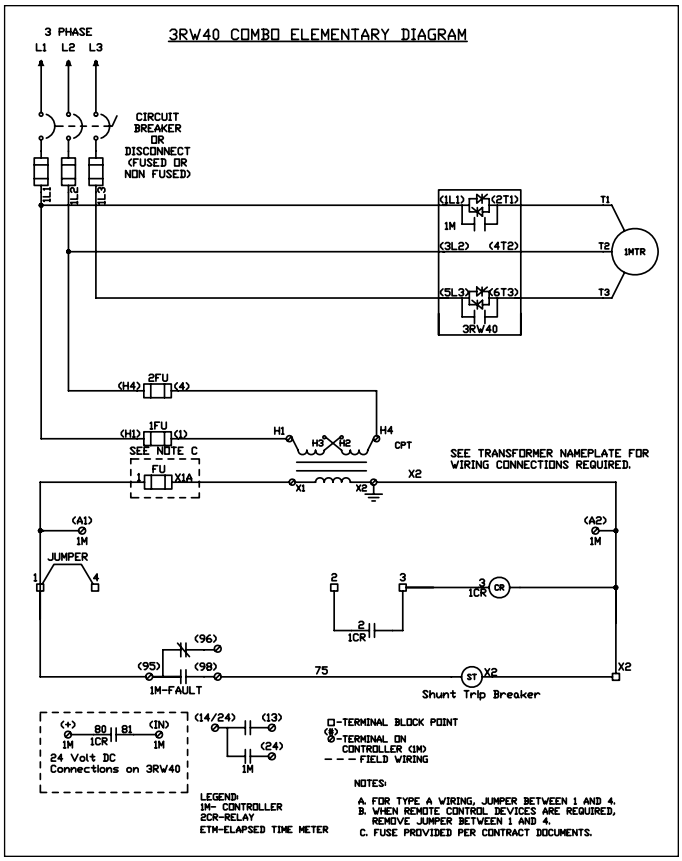
	Amps	A	B	C
3RW40	117 - 248	76	30	20
	315	90	30	20
	385	90	40	20
3RW44	26 - 215	76	30	20
	280	90	30	20
	315 - 385	90	40	20

N4X Stainless Steel Modified Enclosure

	Amps	A	B	C
3RW40	117-145	76	30	20
3RW44	26-145	76	30	20

Class 73, 74


3RW40 NON-COMBO ELEMENTARY DIAGRAM
3 PHASE
L1 L2 L3
NON COMBINATION STARTER STYLES B,C,D,E,F,G,H REQUIRE A LINE TERMINAL BLOCK (LTB)
CIRCUIT BREAKER OR DISCONNECT (FUSED OR NON FUSED)
L1
L2
L3
(1L1) (2T1)
1M
(3L2) (4T2)
(5L3) (6T3)
3RW40
T1
T2
T3
1MTR
2FU
(H4) (4)
1FU
(H1) (1)
H1
H2
H3
H2
CPT
SEE TRANSFORMER NAMEPLATE FOR WIRING CONNECTIONS REQUIRED.
FU
X1A
SEE NOTE C
X1
X2
(A1)
1M
(A2)
JUMPER
1
4
2
3
1CR
CR
(96)
(95)
(98)
1M-FAULT
ST
SHUNT TRIP BREAKER
(+) 80 81 (IN)
1M 1CR 1M
24 Volt DC Connections on 3RW40 BLUE WIRE
LEGEND:
1M- CONTROLLER
2CR-RELAY
□-TERMINAL BLOCK POINT
(8) -TERMINAL ON CONTROLLER (1M)
- - - FIELD WIRING
NOTES:
A. FOR TYPE A WIRING, JUMPER BETWEEN 1 AND 4.
B. WHEN REMOTE CONTROL DEVICES ARE REQUIRED, REMOVE JUMPER BETWEEN 1 AND 4.


3RW40 COMBO ELEMENTARY DIAGRAM
3 PHASE
L1 L2 L3
CIRCUIT BREAKER OR DISCONNECT (FUSED OR NON FUSED)
(1L1) (2T1)
1M
(3L2) (4T2)
(5L3) (6T3)
3RW40
T1
T2
T3
1MTR
2FU
(H4) (4)
1FU
(H1) (1)
SEE NOTE C
H1
H3
H2
H4
CPT
SEE TRANSFORMER NAMEPLATE FOR WIRING CONNECTIONS REQUIRED.
FU
X1A
X1
X2
(A1)
1M
(A2)
JUMPER
1
4
2
3
1CR
CR
(96)
(95)
(98)
1M-FAULT
75
ST
Shunt Trip Breaker
(+) 80 81 (IN)
1M 1CR 1M
24 Volt DC Connections on 3RW40
(14/24)
(13)
(24)
LEGEND:
1M- CONTROLLER
2CR-RELAY
ETM-ELAPSED TIME METER
□-TERMINAL BLOCK POINT
(8) -TERMINAL ON CONTROLLER (1M)
- - - FIELD WIRING
NOTES:
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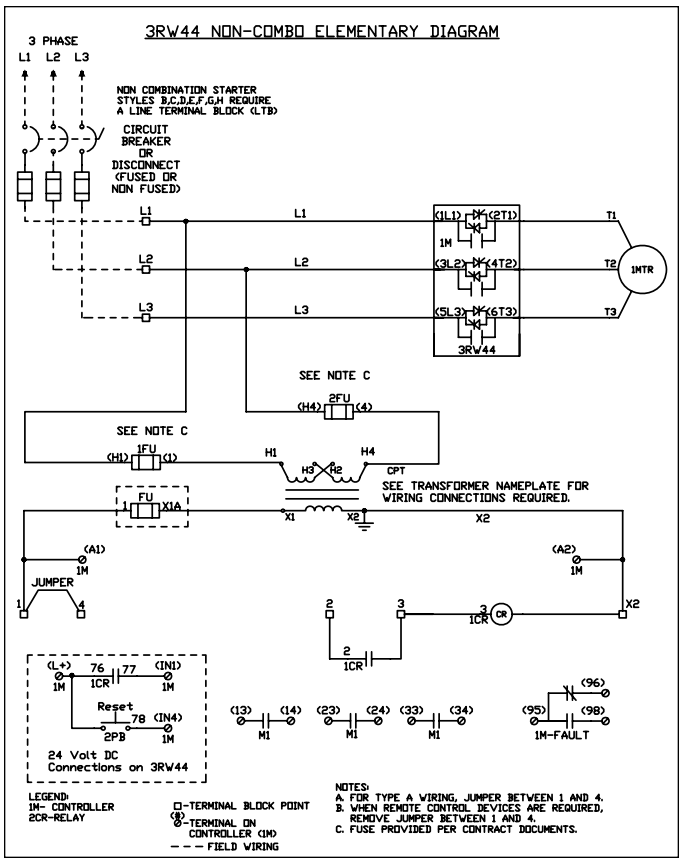
B. WHEN REMOTE CONTROL DEVICES ARE REQUIRED, REMOVE JUMPER BETWEEN 1 AND 4.
C. FUSE PROVIDED PER CONTRACT DOCUMENTS.


3RW44 NON-COMBO ELEMENTARY DIAGRAM
3 PHASE
L1 L2 L3
NON COMBINATION STARTER STYLES B,C,D,E,F,G,H REQUIRE A LINE TERMINAL BLOCK (LTB)
CIRCUIT BREAKER OR DISCONNECT (FUSED OR NON FUSED)
L1
L2
L3
(1L1) (2T1)
1M
(3L2) (4T2)
(5L3) (6T3)
3RW44
T1
T2
T3
1MTR
SEE NOTE C
2FU
(H4) (4)
1FU
(H1) (1)
H1
H4
H3
H2
CPT
SEE TRANSFORMER NAMEPLATE FOR WIRING CONNECTIONS REQUIRED.
FU
X1A
X1
X2
(A1)
1M
(A2)
JUMPER
1
4
2
3
1CR
CR
(L+) 76 77 (IN1)
1M 1CR 1M
Reset
78 (IN4)
2PB 1M
24 Volt DC Connections on 3RW44
(13) (14)
M1
(23) (24)
M1
(33) (34)
M1
(96)
(95) (98)
1M-FAULT
LEGEND:
1M- CONTROLLER
2CR-RELAY
□-TERMINAL BLOCK POINT
(8) -TERMINAL ON CONTROLLER (1M)
- - - FIELD WIRING
NOTES:
A. FOR TYPE A WIRING, JUMPER BETWEEN 1 AND 4.
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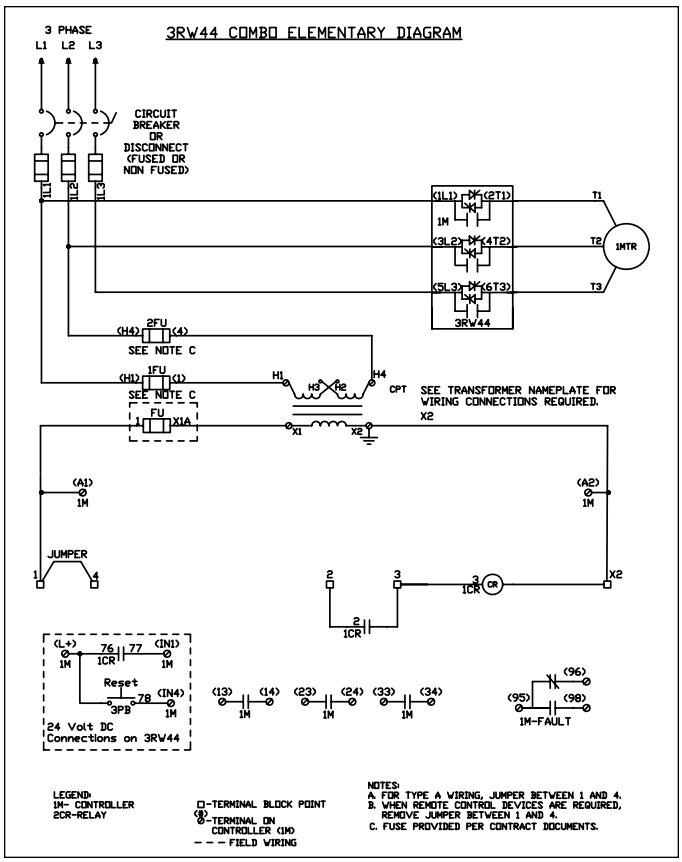
3RW44 COMBO ELEMENTARY DIAGRAM
3 PHASE
L1 L2 L3
CIRCUIT BREAKER OR DISCONNECT (FUSED OR NON FUSED)
(1L1) (2T1)
1M
(3L2) (4T2)
(5L3) (6T3)
3RW44
T1
T2
T3
1MTR
2FU
(H4) (4)
SEE NOTE C
1FU
(H1) (1)
SEE NOTE C
H1
H3
H2
H4
CPT
SEE TRANSFORMER NAMEPLATE FOR WIRING CONNECTIONS REQUIRED.
FU
X1A
X1
X2
(A1)
1M
(A2)
JUMPER
1
4
2
3
1CR
CR
(L+) 76 77 (IN1)
1M 1CR 1M
Reset
78 (IN4)
3PB 1M
24 Volt DC Connections on 3RW44
(13) (14)
1M
(23) (24)
1M
(33) (34)
1M
(96)
(95) (98)
1M-FAULT
LEGEND:
1M- CONTROLLER
2CR-RELAY
□-TERMINAL BLOCK POINT
(8) -TERMINAL ON CONTROLLER (1M)
- - - FIELD WIRING
NOTES:
A. FOR TYPE A WIRING, JUMPER BETWEEN 1 AND 4.
B. WHEN REMOTE CONTROL DEVICES ARE REQUIRED, REMOVE JUMPER BETWEEN 1 AND 4.
C. FUSE PROVIDED PER CONTRACT DOCUMENTS.

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Introduction

Overview

3RF21

3RF20

3RF22

3RF23

3RF24

3RF34 (Motor)

3RF29

		Order No.	Page
SIRIUS solid-state switching devices for switching resistive loads			
Solid-state relays			
22.5 mm solid-state relays, 45 mm solid-state relays	• Widths of 22.5 mm and 45 mm • Compact and space-saving design • "Zero-point switching" version • Mounting onto existing heat sinks	3RF21, 3RF20 3RF22	8/9 8/10 8/43
Solid-state contactors			
Solid-state contactors	• Complete units comprising a solid-state relay and an optimized heat sink, "ready to use" • Compact and space-saving design • Versions for resistive loads "zero-point switching" and inductive loads "instantaneous switching" • Special versions "Low Noise" and "Short-Circuit Resistant"	3RF23 3RF24	8/24 8/46 8/8, 8/12
Function modules	For extending the functionality of the 3RF21 solid-state relays and the 3RF23 solid-state contactors for many different applications:		
Converters	• For converting an analog input signal into an on/off ratio; can also be used on 3RF22 and 3RF24 3-phase switching devices	3RF29 00-0EA18	8/13
Load monitoring	• For load monitoring of one or more loads (partial loads)	3RF29 20-0FA08, 3RF29 .0-0GA..	8/14
Heating current monitoring	• For load monitoring of one or more loads (partial loads); remote teach	3RF29 ..-0JA..	8/14
Power control regulators	• For supplying the current by means of a solid-state switching device depending on a setpoint value. There is a choice of full-wave control and generalized phase control.	3RF29 ..-0KA.	8/14
Power controllers	• For supplying the current by means of a solid-state switching device depending on a setpoint value. Closed-loop control: Full-wave control or generalized phase control	3RF29 .0-0HA..	8/15
SIRIUS Innovations solid-state switching devices for switching motors			
Solid-state contactors			
Solid-state contactors **Solid-state reversing contactors**	• Complete "ready to use" units with an integrated insulated heatsink • Compact and space-saving design • Version for motors, "instantaneous switching"	3RF34	8/16 8/17

Nomenclature Guide

3RF2	**0**	**20**	**-**	**1**	**A**	**A**	**0**	**2**
SIRIUS SC	Type 0 = 45 mm Relay 1 = 22.5 mm Relay 2 = 3-phase 45 mm Relay 3 = Contactor 4 = 3-phase Contactor 9 = Function Module	Rating		Terminal Type 1 = Screw 2 = Spring 3 = Ring Tounge	Switching A = Zero Point B = Instantaneous C = Low Noise D = Short Circuit	Control Phases A = 1-phase B = 2-phase C = 3-phase	Coil Type 0 = 24 VDC 2 = 110 - 230 VAC 4 = 4 - 30 VDC 5 = 230 VAC	Power Voltage 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

General data

Overview

3RF21

3RF20

3RF22

3RF23

3RF24

3RF34 (Motor)

3RF29

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 3RV2 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[1)]
- CE marking for Europe
- C-Tick approval for Australia

[1)] 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		3-phase	1-phase	3-phase	Converter	Load monitoring		Heating current monitoring	Power control-lers	Power regula-tors
	22.5 mm	45 mm	45 mm				Basic	Extended			
Usage											
Simple use of existing solid-state relays	❑	✓	❑	❑	❑	--	--	--	--	--	--
Complete device "Ready to use"	❑	❑	❑	✓	✓	--	--	--	--	--	--
Space-saving	✓	--	✓	✓	✓	✓	✓	--	--	--	--
Can be extended with modular function modules	✓	--	✓	✓	✓	--	--	--	--	--	--
Frequent switching and monitor-ing of loads and solid-state relays/solid-state contactors	--	--	--	--	--	--	✓	✓	✓	✓	✓
Monitoring of up to 6 partial loads	--	--	--	--	--	--	✓	--	✓	✓	--
Monitoring of more than 6 partial loads	--	--	--	--	--	--	--	✓	--	--	--
Control of the heating power through an analog input	--	--	--	--	--	✓	--	--	--	✓	✓
Power control	--	--	--	--	--	--	--	--	--	--	✓
Startup											
Easy setting of setpoints with "Teach" button	--	--	--	--	--	--	✓	✓	--	✓	✓
"Remote Teach" input for setting setpoints	--	--	--	--	--	--	--	--	✓	--	--
Mounting											
Mounting onto mounting rails or mounting plates	--	--	--	✓	✓	--	--	--	--	--	--
Can be snapped directly onto a solid-state relay or contactor	--	--	--	--	--	✓	✓	✓	✓	✓	✓
For use with "Coolplate" heat sink	✓	✓	✓	--	--	--	--	--	--	--	--
Cable routing											
Connection of load circuit as for controls	✓	--	✓	✓	✓	--	✓	✓	✓	✓	✓
Connection of load circuit from above	--	✓	--	--	--	--	--	--	--	--	--

✓ 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 x U_i
- Reduction of load current to 0,93 x I_e

Site altitude 3000 m above sea level:

- Reduction of rated insulation voltage to 0,88 x U_i
- Reduction of load current to 0,9 x I_e

Site altitude 4000 m above sea level:

- Reduction of rated insulation voltage to 0,79 x U_i
- Reduction of load current to 0,8 x I_e

Site altitude 5000 m above sea level:

- Reduction of rated insulation voltage to 0,75 x U_i
- Reduction of load current to 0,7 x 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.

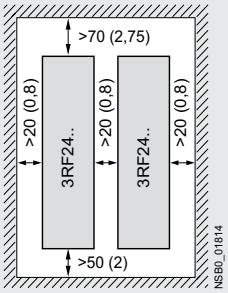
Short-circuit protection and line protection with 5 SY supplemental protectors is easy to achieve with SIRIUS SC semiconductor relays and semiconductor contactors in comparison with designing load feeders with fuses. A special version of the semiconductor contactors can be protected against damage in 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

General data

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 mm^2 [1] 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 mm^2 [1] 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 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.

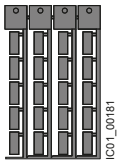
Maximum load integral

One of the purposes of specifying the maximum load integral (I^2t) is to determine the rating of the short-circuit protection. Only a large power semiconductor with a correspondingly high I^2t 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 (I^2t 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 mm^2 to AWG conversion see page 19/21 of Industrial Controls catalog.

Selection and ordering data

Inscription labels for 3RF2 series

	Designation	Labeling area (W x H)	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		mm x mm		d					
Blank labels									
 3RT2900-1SB20 (1 frame = 20 units)	**Unit labeling plates for "SIRIUS"[1)]**	10 x 7	Titanium gray	20	**3RT2900-1SB10**		100	816 units	41B
		20 x 7	Titanium gray	20	**3RT2900-1SB20**		100	340 units	41B
	Adhesive labels for SIRIUS	19 x 6	Titanium gray	5	**3RT2900-1SB60**		100	3 060 units	41B

1) PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH

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

Selection and ordering data

3RF21 20-1AA02

3RF21 20-2AA02

3RF21 20-3AA02

Type current 1)	Maximum achievable power for type current and U_e = 115 V	230 V	400 V	Screw connection 2)	Spring-loaded connection 3)	Ring cable connection	Std. Pack Qty	Weight per pack approx.
A	kW	kW	kW	Order No.	Order No.	Order No.		kg
Zero-point switching, rated operational voltage U_e = 24 V to 230 V								
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
Zero-point switching, rated operational voltage U_e = 24 V to 230 V, control DC 4 ... 30 V								
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
Zero-point switching, rated operational voltage U_e = 48 V to 460 V								
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** 4)	**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
Zero-point switching, rated operational voltage U_e = 48 V to 600 V, control DC 4 ... 30 V								
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
Zero-point switching, rated operational voltage U_e = 48 V to 600 V, blocking voltage 1600 V								
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
Zero-point switching, rated operational voltage U_e = 48 V to 600 V, control 24 V DC low power								
70	-	-	28	**3RF21 70-1AA05-0KN0**	**-**	**-**	1 unit	0.075
Zero-point switching, rated operational voltage U_e = 24 V to 230 V, control 110 V to 230 V								
50	-	-	-	**3RF21 50-1BA22**	**-**	**-**	1 unit	0.075
Instantaneous switching, rated operational voltage U_e = 48 V to 460 V, control 24 V DC acc. to EN 61131-2								
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
Instantaneous switching, rated operational voltage U_e = 48 V to 600 V, control 24 V DC acc. to EN 61131-2, blocking voltage 1600 V								
50	-	-	-	**3RF21 50-1BA06**	**-**	**-**	1 unit	0.075
Low noise 3) - zero-point switching, rated operational voltage U_e = 48 V to 460 V, control 24 V DC acc. to EN 61131-2								
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	**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 relay. The actual permitted operational current I_e 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 10 mm².

3) 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 mm². See page 19/21 of Industrial controls catalog for mm² to AWG conversion chart.

4) 50 A version with 24 AC/DC control - 3RF21 50-2AA14.

Note: See page 19/21 of Industrial Controls catalog for mm² to AWG conversion chart.

Fused design with semiconductor protection (similar to type of coordination "2")[1)]

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 [1)]	Maximum achievable power for type current and U_e = 115 V	230 V	400 V	Screw connection [2)]	Spring-loaded connection [3)]	Ring cable connection	Std. Pack Qty	Weight per pack approx.
A	kW	kW	kW	Order No.	Order No.	Order No.		kg
Zero-point switching, rated operational voltage U_e = 24 V to 230 V								
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
Zero-point switching, rated operational voltage U_e = 48 V to 460 V								
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
Zero-point switching, rated operational voltage U_e = 24 V to 230 V, control DC 4 ... 30 V								
20	-	-	-	**3RF20 20-1AA42**	-	-	1 unit	0.085
30	-	-	-	**3RF20 30-1AA42**	-	-	1 unit	0.085
Zero-point switching, rated operational voltage U_e = 48 V to 600 V, control DC 4 ... 30 V								
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
Zero-point switching, rated operational voltage U_e = 48 V to 600 V, blocking voltage 1600 V								
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
Zero-point switching, rated operational voltage U_e = 48 V to 460 V, control DC 4 ... 30 V switching								
50	-	-	-	**3RF20 50-1AA44**	-	-	1 unit	0.085
Instantaneous switching, rated operational voltage U_e = 48 V to 460 V, control 24 V DC acc. to EN 61131-2								
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**	**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 relay. The actual permitted operational current I_e 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^2.

3) Screw terminals and spring terminals (control current side).

Note: For mm^2 to AWG conversion chart see Industrial Controls catalog page 15/9.

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.

3RF22 30-1AB45

Type current[1]	Rated control supply voltage	Screw terminal[2] Order No.	Weight per pack approx.
A	V		kg
Zero-point switching Rated operational voltage U_e 48 V ... 600 V			
Two-phase controlled			
30	4 ... 30 V DC	**3RF22 30-1AB□5**	0.150
55		**3RF22 55-1AB□5**	0.150
Three-phase controlled			
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**	

3RF22 30-2AB45

Type current[1]	Rated control supply voltage	Spring-loaded terminals[3] Order No.	Weight per pack approx.
A	V		kg
Zero-point switching Rated operational voltage U_e 48 V ... 600 V			
Two-phase controlled			
30	4 ... 30 V DC	**3RF22 30-2AB45**	0.150
55		**3RF22 55-2AB45**	0.150
Three-phase controlled			
30	4 ... 30 V DC	**3RF22 30-2AC45**	0.150
55		**3RF22 55-2AC45**	0.150

3RF22 30-3AB45

Type current[1]	Rated control supply voltage	Ring terminal end connection Order No.	Weight per pack approx.
A	V		kg
Zero-point switching Rated operational voltage U_e 48 V ... 600 V			
Two-phase controlled			
30	4 ... 30 V DC	**3RF22 30-3AB45**	0.150
55		**3RF22 55-3AB45**	0.150
Three-phase controlled			
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_e 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^2.

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^2.

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

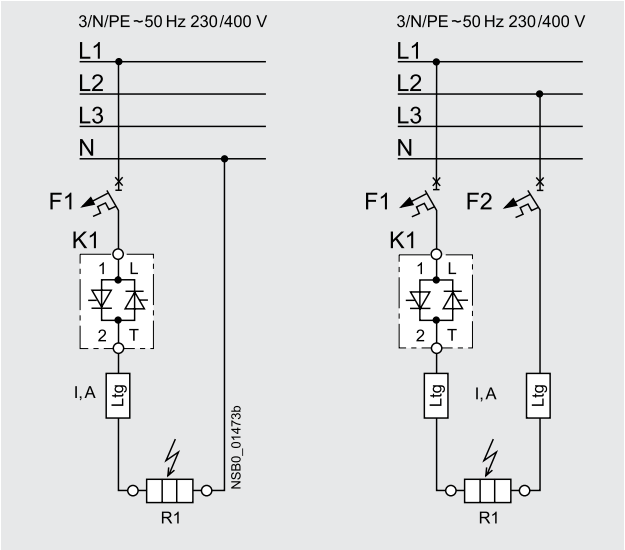
Skillful matching of the power semiconductor with the performance capacity of the solid-state contactor means that "short-circuit strength" can be achieved with a standard miniature circuit breaker. In combination with a B-type MCB or a conventional line protection fuse, the result is a short-circuit 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[1)]	Max. conductor cross-section	Minimum cable length from contactor to load
6 A	5SY4106-6	1 mm^2	5 m
10 A	5SY4110-6	1.5 mm^2	8 m
16 A	5SY4116-6	1.5 mm^2	12 m
		2.5 mm^2	20 m
20 A	5SY4120-6	2.5 mm^2	20 m
25 A	5SY4125-6	2.5 mm^2	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^2s.

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.

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

3RF23 10-1AA02 3RF23 30-1AA02

3RF23 40-1AA02

3RF23 50-3AA02

3RF23 70-3AA02

3RF23 90-3AA02

Type current 1) $I_{max.}$	Maximum achievable power for I_{max} and U_e = 115 V	230 V	400 V	Screw connection	Spring-loaded connection	Ring cable connection	Std. Pack Qty	Weight per pack approx.
A	kW	kW	kW	Order No.	Order No.	Order No.		kg
Zero-point switching, rated operational voltage U_e = 24 V to 230 V								
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
Zero-point switching, rated operational voltage U_e = 24 V to 230 V, control 24 V DC low power								
20	-	-	-	**3RF23 20-1AA02-0KN0**	**-**	**-**	1 unit	0.240
Zero-point switching, rated operational voltage U_e = 48 V to 460 V								
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
Zero-point switching, rated operational voltage U_e = 24 V to 230 V, control 24 V AC/DC								
10.5	-	-	-	**3RF23 10-1AA12**	**-**	**-**	1 unit	0.165
Zero-point switching, rated operational voltage U_e = 48 V to 460 V, control 24 V DC low power								
10.5	-	-	-	**3RF23 10-1AA04-0KN0**	**-**	**-**	1 unit	0.165
Zero-point switching, rated operational voltage U_e = 48 V to 460 V, control 24 V AC/DC								
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
Zero-point switching, rated operational voltage U_e = 48 V to 600 V, control DC 4 ... 30 V								
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
30	-	-	-	**3RF23 30-1AA25** 2)	**-**	**-**	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
Zero-point switching, rated operational voltage U_e = 48 V to 460 V, control 4 V ... 30 V DC								
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 50-3AA44**	1 unit	0.400
Zero-point switching, rated operational voltage U_e = 48 V to 600 V, blocking voltage 1600 V								
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
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.

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 8/50, 8/51, 8/52.

2) 110 ... 230 AC control voltage.

Solid-State Contactors

SIRIUS SC semiconductor contactors – single phase selection

Type current 1) $I_{max.}$	Maximum achievable power for I_{max} and U_e = 115 V	230 V	400 V	Screw connection	Spring-loaded connection	Ring cable connection	Std. Pack Qty	Weight per pack approx.
A	kW	kW	kW	Order No.	Order No.	Order No.		kg
Instantaneous switching, rated operational voltage U_e = 24 V to 230 V								
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**	-	-	1 unit	2.600
Instantaneous switching, rated operational voltage U_e = 48 V to 460 V								
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**	-	-	1 unit	2.600
Zero-point switching, rated operational voltage U_e = 48 V to 600 V, control 110 V to 230 V								
30	-	-	-	**3RF23 30-1AA25**	-	-	1 unit	0.400
Instantaneous switching, rated operational voltage U_e = 48 V to 600 V, blocking voltage 1600 V								
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**	-	-	1 unit	2.600
Low noise, zero-point switching, rated operational voltage U_e = 24 V to 230 V								
20	2.3	4.6	-	**3RF23 20-1CA□2**	**3RF23 20-2CA□2**	-	1 unit	0.204
30	-	-	-	**3RF23 30-1CA02**	-	-	1 unit	0.204
Low noise, zero-point switching, rated operational voltage U_e = 48 V to 460 V								
20	-	4.6	8	**3RF23 20-1CA□4**	**3RF23 20-2CA□4**	-	1 unit	0.204
Instantaneous switching, rated operational voltage U_e = 48 V to 460 V, control DC 4 ... 30 V switching								
20	-	-	-	**3RF23 20-1BA44**	-	-	1 unit	0.240
30	-	-	-	**3RF23 30-1BA44**	-	-	1 unit	0.400
50	-	-	-	**3RF23 50-1BA44**	-	-	1 unit	0.550
Short-circuit resistant with B-automatic device, zero-point switching, rated operational voltage U_e = 24 V to 230 V								
20	2.3	4.6	-	**3RF23 20-1DA□2**	**3RF23 20-2DA22**	**3RF23 20-3DA□2**	1 unit	0.204
Short-circuit resistant with B-automatic device, zero-point switching, rated operational voltage U_e = 48 V to 460 V								
20	-	4.6	8	**3RF23 20-1DA□4**	**3RF23 20-2DA□4**	**3RF23 20-3DA□4**	1 unit	0.204
20	-	-	-	**3RF23 20-1DA44** 2)	-	-	1 unit	0.204
30	-	-	-	**3RF23 30-1DA44** 2)	-	-	1 unit	0.204
Order No. extension for rated control supply voltage U_s								
DC 24 V acc. to EN 61131-2				**0**	**0**	**0**		
AC 110 V ... 230 V				**2**	**2**	**2**		

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 8/50, 8/51, 8/52.

Other rated control supply voltages on request.

2) 4...30 DC control voltage

	Version	Order No.	Std. Pack Qty	Weight per pack approx.
				kg
	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[1] 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
Zero-point switching Rated operational voltage U_e 48 V ... 600 V						
Two-phase controlled						
10.5	4 ... 30 DC	A	**3RF24 10-1AB45**		1 unit	0.320
20		B	**3RF24 20-1AB45**		1 unit	0.400
30		B	**3RF24 30-1AB45**		1 unit	0.540
40		B	**3RF24 40-1AB45**		1 unit	0.800
50		B	**3RF24 50-1AB45**		1 unit	1.100
10.5	110 AC	A	**3RF24 10-1AB35**		1 unit	0.320
20		B	**3RF24 20-1AB35**		1 unit	0.400
30		B	**3RF24 30-1AB35**		1 unit	0.540
40		B	**3RF24 40-1AB35**		1 unit	0.800
50		B	**3RF24 50-1AB35**		1 unit	1.100
10.5	230 AC	B	**3RF24 10-1AB55**		1 unit	0.320
20		B	**3RF24 20-1AB55**		1 unit	0.400
30		B	**3RF24 30-1AB55**		1 unit	0.540
40		B	**3RF24 40-1AB55**		1 unit	0.800
50		B	**3RF24 50-1AB55**		1 unit	1.100
Three-phase controlled						
10.5	4 ... 30 DC	B	**3RF24 10-1AC45**		1 unit	0.320
20		B	**3RF24 20-1AC45**		1 unit	0.540
30		A	**3RF24 30-1AC45**		1 unit	0.800
40		B	**3RF24 40-1AC45**		1 unit	1.100
50		B	**3RF24 50-1AC45**		1 unit	1.850
10.5	110 AC	B	**3RF24 10-1AC35**		1 unit	0.320
20		B	**3RF24 20-1AC35**		1 unit	0.540
30		A	**3RF24 30-1AC35**		1 unit	0.800
40		B	**3RF24 40-1AC35**		1 unit	1.100
50		B	**3RF24 50-1AC35**		1 unit	1.850
10.5	230 AC	B	**3RF24 10-1AC55**		1 unit	0.320
20		B	**3RF24 20-1AC55**		1 unit	0.540
30		B	**3RF24 30-1AC55**		1 unit	0.800
40		B	**3RF24 40-1AC55**		1 unit	1.100
50		B	**3RF24 50-1AC55**		1 unit	1.850
			Spring-loaded terminals			
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 600 V AC						
Two-phase controlled						
10	4 ... 30 DC	5	**3RF2410-2AB45**		1 unit	
20		5	**3RF2420-2AB45**		1 unit	
10	230 AC	5	**3RF2410-2AB55**		1 unit	
20		5	**3RF2420-2AB55**		1 unit	
Three-phase controlled						
10	4 ... 30 DC	5	**3RF2410-2AC45**		1 unit	
20		5	**3RF2420-2AC45**		1 unit	
10	230 AC	5	**3RF2410-2AC55**		1 unit	
20		5	**3RF2420-2AC55**		1 unit	
			Ring terminal lug connection			
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 600 V AC						
Two-phase controlled						
50	4 ... 30 DC	5	**3RF2450-3AB45**		1 unit	
50	230 AC	5	**3RF2450-3AB55**		1 unit	
Three-phase controlled						
50	4 ... 30 DC	5	**3RF2450-3AC45**		1 unit	
50	230 AC	5	**3RF2450-3AC55**		1 unit	

3RF24 20-1AB45

3RF24 10-1AC45

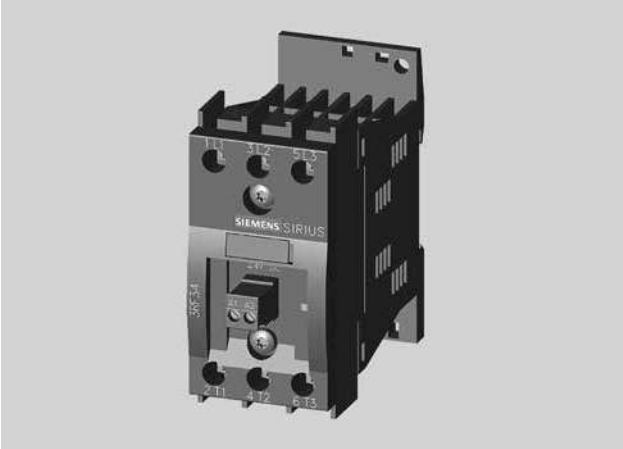
3RF2410-2AB45

[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 installation conditions. For derating characteristic curves, see page 8/55, "More information".

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 America1)
- CE marking for Europe
- C-Tick approval for Australia
- CCC approval for China

1) Please note: Use overvoltage protection device; max. cut-off-voltage 6000 V; min. energy handling capability 100 J.

Solid-State Contactors for Switching Motors

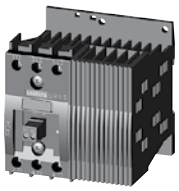
3RF34 solid-state contactors, 3-phase

Selection and ordering data

Motor contactors · Instantaneous switching · Two-phase controlled

Rated operational current I_e	Rated HP at supply voltage: Single Phase 115V	Single Phase 200/208V	Single Phase 230/240V	Three Phase 200/208V	Three Phase 230/240V	Three Phase 460/480V	Three Phase 575/600V	Rated control supply voltage U_s	DT	Screw terminals / Configurator — Order No.	Std. Pack Qty
A								V			
Rated operational voltage U_e 48 ... 480 V AC											
5.2	1/10	1/4	1/4	1/2	3/4	2	2	24 DC acc. to IEC 61131-2	A	**3RF34 05-1BB04**	1 unit
9.2	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-1BB04**	1 unit
12.5	1/3	1/2	3/4	2	2	3	5		B	**3RF34 12-1BB04**	1 unit
16	1/3	3/4	1	2	2	5	7		B	**3RF34 16-1BB04**	1 unit
5.2	1/10	1/4	1/4	1/2	3/4	2	2	110 ... 230 AC	B	**3RF34 05-1BB24**	1 unit
9.2	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-1BB24**	1 unit
12.5	1/3	1/2	3/4	2	2	3	5		B	**3RF34 12-1BB24**	1 unit
16	1/3	3/4	1	2	2	5	7		B	**3RF34 16-1BB24**	1 unit
Rated operational voltage U_e 48 ... 600 V AC, blocking voltage 1600 V											
5.2	1/10	1/4	1/4	1/2	3/4	2	2	24 DC acc. to IEC 61131-2	B	**3RF34 05-1BB06**	1 unit
9.2	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-1BB06**	1 unit
12.5	1/3	1/2	3/4	2	2	3	5		B	**3RF34 12-1BB06**	1 unit
16	1/3	3/4	1	2	2	5	7		B	**3RF34 16-1BB06**	1 unit
5.2	1/10	1/4	1/4	1/2	3/4	2	2	110 ... 230 AC	B	**3RF34 05-1BB26**	1 unit
9.2	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-1BB26**	1 unit
12.5	1/3	1/2	3/4	2	2	3	5		B	**3RF34 12-1BB26**	1 unit
16	1/3	3/4	1	2	2	5	7		B	**3RF34 16-1BB26**	1 unit

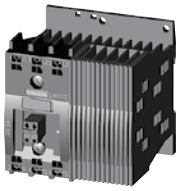
3RF34 05-1BB



3RF34 10-1BB

Rated operational current I_e	Rated HP at supply voltage: Single Phase 115V	Single Phase 200/208V	Single Phase 230/240V	Three Phase 200/208V	Three Phase 230/240V	Three Phase 460/480V	Three Phase 575/600V	Rated control supply voltage U_s	DT	Spring-type terminals / Configurator — Order No.	Std. Pack Qty
A								V			
Rated operational voltage U_e 48 ... 480 V AC											
5.2	1/10	1/4	1/4	1/2	3/4	2	2	24 DC acc. to IEC 61131-2	B	**3RF34 05-2BB04**	1 unit
9.2	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-2BB04**	1 unit
12.5	1/3	1/2	3/4	2	2	3	5		B	**3RF34 12-2BB04**	1 unit
16	1/3	3/4	1	2	2	5	7		B	**3RF34 16-2BB04**	1 unit
5.2	1/10	1/4	1/4	1/2	3/4	2	2	110 ... 230 AC	B	**3RF34 05-2BB24**	1 unit
9.2	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-2BB24**	1 unit
12.5	1/3	1/2	3/4	2	2	3	5		B	**3RF34 12-2BB24**	1 unit
16	1/3	3/4	1	2	2	5	7		B	**3RF34 16-2BB24**	1 unit
Rated operational voltage U_e 48 ... 600 V AC, blocking voltage 1600 V											
5.2	1/10	1/4	1/4	1/2	3/4	2	2	24 DC acc. to IEC 61131-2	B	**3RF34 05-2BB06**	1 unit
9.2	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-2BB06**	1 unit
12.5	1/3	1/2	3/4	2	2	3	5		B	**3RF34 12-2BB06**	1 unit
16	1/3	3/4	1	2	2	5	7		B	**3RF34 16-2BB06**	1 unit
5.2	1/10	1/4	1/4	1/2	3/4	2	2	110 ... 230 AC	B	**3RF34 05-2BB26**	1 unit
9.2	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-2BB26**	1 unit
12.5	1/3	1/2	3/4	2	2	3	5		B	**3RF34 12-2BB26**	1 unit
16	1/3	3/4	1	2	2	5	7		B	**3RF34 16-2BB26**	1 unit

3RF34 05-2BB



3RF34 10-2BB

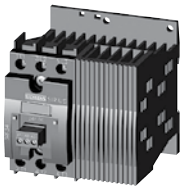
For online configurator see www.siemens.com/sirius/configurators.

Solid-State Contactors for Switching Motors

3RF34 solid-state – reversing contactors, 3-phase

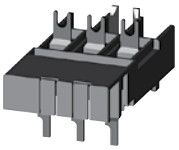
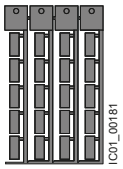
Selection and ordering data

Reversing contactors · Instantaneous switching · Two-phase controlled

	Rated operational current I_e	Rated HP at supply voltage							Rated control supply voltage U_s	DT	Screw terminals Configurator	Std. Pack Qty
		Single Phase			Three Phase							
	A	115V	200/ 208V	230/ 240V	200/ 208V	230/ 240V	460/ 480V	575/ 600V	V		Order No.	
Rated operational voltage U_e 48 ... 480 V AC												
3RF34 03-1BD	3.8	1/10	1/4	1/4	1/2	3/4	2	2	24 DC acc. to IEC 61131-2	B	**3RF34 03-1BD04**	1 unit
	5.4	1/6	1/3	1/3	1	1	3	5		B	**3RF34 05-1BD04**	1 unit
	7.4	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-1BD04**	1 unit
 3RF34 10-1BD	3.8	1/10	1/4	1/4	1/2	3/4	2	2	110 ... 230 AC	B	**3RF34 03-1BD24**	1 unit
	5.4	1/6	1/3	1/3	1	1	3	5		B	**3RF34 05-1BD24**	1 unit
	7.4	1/4	1/2	3/4	1 1/2	2	3	5		B	**3RF34 10-1BD24**	1 unit

For online configurator see www.siemens.com/sirius/configurators.

Accessories

	Version	DT	Order No.	Price per PU	Std. Pack Qty
Link modules for solid-state contactor to motor starter protector					
 3RA29 21-1BA00	**Link module** between solid-state reversing contactor and motor starter protector with screw terminals For 3RV2 motor starter protectors size S00/S0	A	**Screw terminals** **3RA29 21-1BA00**		1 unit
Link adapters for solid-state contactor to overload relay					
3RF39 00-0QA88	**Link adapters** for direct mounting of 3RB3 overload relays or 3RR2 current monitoring relays to the solid-state contactor with screw terminals The adapter is snapped onto the enclosure of the 3RF34 contactor and receives the fixing hooks of the 3RB3 overload relays or the 3RR2 current monitoring relays for direct mounting.	A	**3RF39 00-0QA88**		1 unit
Blank labels					
 3SB2900-1SB20	**Unit labeling plates** For SIRIUS devices[1)]				
	• 10 mm × 7 mm, titanium gray	20	**3RT2900-1SB10**		816 units
	• 20 mm × 7 mm, titanium gray	20	**3RT2900-1SB20**		340 units
	Adhesive labels For SIRIUS devices				
	• 19 mm × 6 mm, titanium gray	5	**3RT2900-1SB60**		3 060 units

1) 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

Type	Accessories					
	Converters	Load monitoring		Heating current[1] monitoring	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current = 20 A						
3RF21 20-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF21 20-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF21 20-1A.22	--	--	3RF29 20-0GA33	--	--	--
3RF21 20-1A.24	--	--	3RF29 20-0GA36	--	--	--
3RF21 20-1A.42	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF21 20-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF21 20-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF21 20-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF21 20-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF21 20-2A.22	--	--	--	--	--	--
3RF21 20-2A.24	--	--	--	--	--	--
3RF21 20-2A.42	3RF29 00-0EA18	--	--	--	--	--
3RF21 20-2A.45	3RF29 00-0EA18	--	--	--	--	--
3RF21 20-3A.02	3RF29 00-0EA18	--	3RF29 20-0GA13	--	--	3RF29 20-0HA13
3RF21 20-3A.04	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF21 20-3A.22	--	--	3RF29 20-0GA33	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF21 20-3A.24	--	--	3RF29 20-0GA36	--	3RF29 20-0KA16	3RF29 20-0HA16
Type current = 30 A						
3RF21 30-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	3RF29 50-0KA13	3RF29 50-0HA13
3RF21 30-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 30-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 30-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 30-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 30-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 30-1A.42	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	3RF29 50-0KA13	3RF29 50-0HA13
3RF21 30-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 30-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
Type current = 50 A						
3RF21 50-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	3RF29 50-0KA13	3RF29 50-0HA13
3RF21 50-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 50-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 50-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 50-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1B.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 50-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF21 50-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF21 50-2A.06	3RF29 00-0EA18	--	--	--	--	--
3RF21 50-2A.14	3RF29 00-0EA18	--	--	--	--	--
3RF21 50-2A.22	--	--	--	--	--	--
3RF21 50-2A.24	--	--	--	--	--	--
3RF21 50-2A.26	--	--	--	--	--	--
3RF21 50-3A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA13	3RF29 50-0HA13
3RF21 50-3A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-3A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-3A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 50-3A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 50-3A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36

1) For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state relays (3RF21..-....4, -....5 or -....6).

3RF29 Function Modules

Selection Tables

Type	Accessories					
	Converters	Load monitoring		Heating current[1] monitoring	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current = 70 A						
3RF21 70-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	3RF29 50-0KA13	3RF29 50-0HA13
3RF21 70-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1A.05	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 70-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 70-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 70-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1C.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
Type current = 90 A						
3RF21 90-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	3RF29 50-0KA13	3RF29 50-0HA13
3RF21 90-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 90-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 90-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 90-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 90-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 90-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 90-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 90-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF21 90-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF21 90-2A.06	3RF29 00-0EA18	--	--	--	--	--
3RF21 90-2A.22	--	--	--	--	--	--
3RF21 90-2A.24	--	--	--	--	--	--
3RF21 90-2A.26	--	--	--	--	--	--
3RF21 90-3A.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	3RF29 50-0KA13	3RF29 90-0HA13
3RF21 90-3A.04	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16
3RF21 90-3A.06	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16
3RF21 90-3A.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF21 90-3A.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF21 90-3A.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF21 90-3A.44	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16

1) For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state relays (3RF21..-....4, -....5 or -....6).

Recommended assignment of the function modules to the 3RF22 three-phase solid-state relays

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
		Basic	Extended			
Type current up to 55 A						
3RF22 ..-1A...	3RF29 00-0EA18	--	--	--	--	--
3RF22 ..-2A...	3RF29 00-0EA18	--	--	--	--	--
3RF22 ..-3A...	3RF29 00-0EA18	--	--	--	--	--

Recommended assignment of the function modules to the 3RF23 single-phase solid-state contactors

Type	Accessories					
	Converters	Load monitoring		Heating current[1] monitoring	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current I_e = 10.5 A						
3RF23 10-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 10-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1A.12	3RF29 00-0EA18	--	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 10-1A.14	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1A.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 10-1A.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-1A.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-1A.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16

1) For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state contactors (3RF23..-....4, -....5 or -....6).

3RF29 Function Modules

Selection Tables

Type	Accessories					
	Converters	Load monitoring		Heating current[1] monitoring	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current I_e = 10.5 A						
3RF23 10-1B.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 10-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1B.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1B.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 10-1B.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-1B.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF23 10-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF23 10-2A.06	3RF29 00-0EA18	--	--	--	--	--
3RF23 10-2A.22	--	--	--	--	--	--
3RF23 10-2A.24	--	--	--	--	--	--
3RF23 10-2A.26	--	--	--	--	--	--
3RF23 10-3A.02	3RF29 00-0EA18	--	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 10-3A.04	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-3A.06	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-3A.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 10-3A.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-3A.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
Type current I_e = 20 A						
3RF23 20-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1A.14	3RF29 00-0EA18	--	3RF29 20-0GA16	--	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1A.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-1A.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1A.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1A.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1B.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1B.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1B.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-1B.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1B.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1B.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1C.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-1C.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1C.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-1C.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1C.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1D.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-1D.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1D.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-1D.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1D.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2A.06	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2A.22	--	--	--	--	--	--
3RF23 20-2A.24	--	--	--	--	--	--
3RF23 20-2A.26	--	--	--	--	--	--
3RF23 20-2C.02	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2C.04	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2C.22	--	--	--	--	--	--
3RF23 20-2C.24	--	--	--	--	--	--
3RF23 20-2D.22	--	--	--	--	--	--
3RF23 20-2D.24	--	--	--	--	--	--
3RF23 20-3A.02	3RF29 00-0EA18	--	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-3A.04	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-3A.06	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-3A.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-3A.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-3A.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-3A.44	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16

1) For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state contactors (3RF23..-....4, -....5 or -....6).

3RF29 Function Modules

Selection Tables

Type	Accessories					
	Converters	Load monitoring[1]		Heating current[2] monitoring	Power controllers[2]	Power regulators[2]
		Basic	Extended[2]			
Type current I_e = 20 A						
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
Type current I_e = 30 A						
3RF23 30-1A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA13	3RF29 50-0HA13
3RF23 30-1A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.06	3RF29 00-0EA18	--	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 50-0GA13	--	3RF29 50-0KA13	3RF29 50-0HA13
3RF23 30-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1B.06	3RF29 00-0EA18	--	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 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 50-0KA13	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
Type current I_e = 40 A						
3RF23 40-1A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA13	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 50-0KA13	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 50-0KA13	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
Type current I_e = 50 A						
3RF23 50-1A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA13	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 technical specifications must be taken into account when selecting the function modules. More combinations may be possible if the solid-state relays and contactors are not fully loaded, e.g. a load monitor for 20 A can also be operated with a solid-state contactor for 30 A if the load current during operation does not exceed 20 A.

2) For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state contactors (3RF23..-....4, -....5 or -....6).

3RF29 Function Modules

Selection Tables

Type	Accessories					
	Converters	Load monitoring		Heating current[1] monitoring	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current I_e = 50 A						
3RF23 50-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA13	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 50-0KA13	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
Type current I_e = 70 A						
3RF23 70-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA13	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 90-0KA13	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 90-0KA13	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
Type current I_e = 90 A						
3RF23 90-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA13	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 50-0KA13	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 50-0KA13	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) For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state contactors (3RF23..-....4, -....5 or -....6).

Recommended assignment of the function modules to the 3RF24 three-phase solid-state contactors

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
		Basic	Extended			
Type current up to 50 A						
3RF24 ..-1..4.	3RF29 00-0EA18	--	--	--	--	--
3RF24 ..-2..4.	--	--	--	--	--	--
3RF24 ..-3..4.	3RF29 00-0EA18	--	--	--	--	--
3RF24 ..-...5.	--	--	--	--	--	--

Function Modules

Converters

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 module can only be used in conjunction with 3RF21 and 3RF23 single-phase solid-state switching devices or 3RF22 and 3RF24 three-phase devices. It can be used on versions with 24 V DC and 24 V AC/DC control supply voltage.

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.

Note: The use of 1-pole solid-state switching devices with converters, power controllers or power regulators on AC loads in full-wave control mode is not recommended. Since the function modules do not synchronize with each other, this may lead to fluctuations in the heating power; optimum compensation can no longer be ensured, especially for setpoints < 50%.

Technical specifications

Control input for converter and load monitoring

Type		3RF29 00-0EA18	3RF29 ..-0HA.
Analog input Permissible range	V V	0 ... 10 -1 ... 11	0 ... 10 -1 ... 11
Input resistance	kΩ	100	8
Period duration	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
3RF29 00-0EA18	—	—	**3RF29 00-0EA18**	1 unit	0.025

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[1]) LEDs flash alternately; simultaneous maintained light from the 3 (red[1]) 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.

	OK	Fault		
LEDs		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"[1]) 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"[1]) 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** Order No.	**Rated control supply voltage U_s AC/DC 24 V** Order No.	Std. Pack Qty	Weight per pack approx. kg	**Rated control supply voltage U_s DC 24 V** Order No.	Std. Pack Qty	Weight per pack approx. kg
Basic load monitoring								
6	-	**-**	**-**			**3RF29 06-0FA08**[1]	1 unit	0.050
20	-	**-**	**-**			**3RF29 20-0FA08**		
Extended load monitoring								
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 00-0RA88 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.
	A	V			kg
Heating current monitoring[1]					
	Rated control supply voltage 24 V AC/DC				
	16	110 … 230	**3RF29 16-0JA13**	1 unit	0.175
	16	110 … 230	**3RF29 16-0JA13-1KK0**	1 unit	0.175
	16	400 … 600	**3RF29 16-0JA16-1KK0**	1 unit	0.175
	32	110 … 230	**3RF29 32-0JA13-1KK0**	1 unit	0.175
	32	400 … 600	**3RF29 32-0JA16**	1 unit	0.175
	32	400 … 600	**3RF29 32-0JA16-1KK0**	1 unit	0.175

1) Supplied without control connector. The control connector can be purchased from from Wieland by quoting Article No. 8213 B/6VR (PCB connector).

	Version	Order No.	Std. Pack Qty	Weight per pack approx.
				kg
Optional accessories				
3RF29 00-0RA88	**Sealable covers for function modules** (not for converters)	**3RF29 00-0RA88**	10 units	0.001

*** 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_R), the control is carried out according to the principle of full-wave control or generalized phase control.

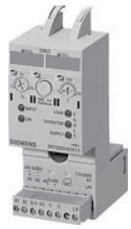
Full-wave control

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 µH.

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	**3RF29 04-0KA13-0KC0**	1 unit	0.175
	4		**3RF29 04-0KA13-0KT0**	1 unit	0.175
	20		**3RF29 20-0KA13**	1 unit	0.175
	50		**3RF29 50-0KA13**	1 unit	0.175
	90		**3RF29 90-0KA13**	1 unit	0.175
	20	400 … 600	**3RF29 20-0KA16**	1 unit	0.175
	50		**3RF29 50-0KA16**	1 unit	0.175
	50		**3RF29 50-0KA16-0KT0**	1 unit	0.175
	90		**3RF29 90-0KA16**	1 unit	0.175

	Version	Order No.	Std. Pack Qty	Weight per pack approx.
				kg
Optional accessories				
3RF29 00-0RA88	**Sealable covers for function modules** (not for converters)	**3RF29 00-0RA88**	10 units	0.001

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 µH 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.

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.

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
Power controllers[1)]					
20	110 ... 230	**3RF29 20-0HA33**	**3RF29 20-0HA13**	1 unit	0.120
20	400 ... 600	**3RF29 20-0HA36**	**3RF29 20-0HA16**	1 unit	0.120
50	110 ... 230	**3RF29 50-0HA33**	**3RF29 50-0HA13**	1 unit	0.120
50	400 ... 600	**3RF29 50-0HA36**	**3RF29 50-0HA16**	1 unit	0.120
90	110 ... 230	**3RF29 90-0HA33**	**3RF29 90-0HA13**	1 unit	0.120
90	400 ... 600	**3RF29 90-0HA36**	**3RF29 90-0HA16**	1 unit	0.120

1) Optional sealable cover - 3RF29 00-0RA88 can be used.

3RF29 Function Modules

Power control regulators

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 µH 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.

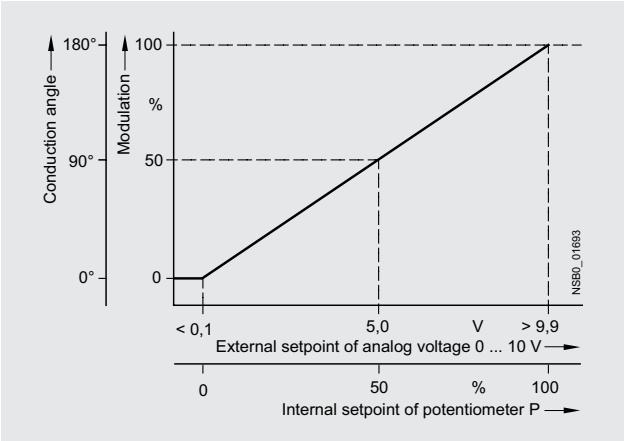
Function

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.

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....
General data				
Ambient temperature				
during operation, derating from 40 °C	°C	-25 ... +60		
when stored	°C	-55 ... +80		
Site altitude	m	0 ... 1000; derating from 1000		
Shock resistance acc. to IEC 60068-2-27	g/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6	g	2		
Degree of protection		IP20		
Electromagnetic compatibility (EMC)				
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		
Connection technique		**Screw-type connection**	**Spring-loaded connection**	**Ring cable connection**
Main contact connection				
Conductor cross-section				
Solid	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2 x (0,5 ... 2.5)	-
Finely stranded with end sleeve	mm^2	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^2		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
	lb.in	7 ... 10.3	-	7 ... 10.3
Cable lug				
• DIN		-	-	DIN 46234 -5-2.5, -5-6, -5-10, -5-16, -5-25
• JIS		-	-	JIS C 2805 R 2-5, 5.5-5, 8-5, 14-5
Auxiliary/control contact connections				
Conductor cross-section	mm^2	1x (0.5 ... 2.5); 2x (0.5 ... 1)	0.5 ... 2.5	1x (0.5 ... 2.5); 2x (0.5 ... 1)
	AWG	20 ... 12	20 ... 12	20 ... 12
Insulation stripping length	mm	7	10	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		3RF21 ..-....2	3RF21 ..-....4	3RF21 ..-....5	3RF21 ..-....6
Main circuit					
Rated operational voltage U_e	V	24 ... 230	48 ... 460	48 ... 600	400 ... 600
• Tolerance	%	-15 / +10			
• Rated frequency	Hz	50/60			
Rated insulation voltage U_i	V	600			
Blocking voltage	V	800	1200	1200	1600
Rate of voltage rise	V/µs	1000			

3RF21 Solid-state – technical data

The heat transfer of the solid-state relays has been considerably improved.
Please note the **highlighted values** when dimensioning the heat sink.

Type	I_{max} [1] at R_{thha}/T_u = 40 °C		I_e acc. to IEC 60947-4-3 at R_{thha}/T_u = 40 °C		I_e acc. to UL/CSA at R_{thha}/T_u = 50 °C		Power loss at I_{max}	Minimum load current	Off-state current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF2120-.....	20	2.00	20	1.70	20	1.30	28.6	0.1	10
3RF2130-1....	30	**1.45**	30	**1.45**	30	**1.25**	44.2	0.5	10
3RF2150-1....	50	**0.85**	50	**0.85**	50	**0.70**	66	0.5	10
3RF2150-2....	50	**0.85**	20	**2.90**	20	**2.60**	66	0.5	10
3RF2150-3....	50	**0.85**	50	**0.85**	50	**0.70**	66	0.5	10
3RF2170-1....	70	**0.50**	50	**1.15**	50	**1.00**	94	0.5	10
3RF2190-1....	88	**0.55**	50	**1.40**	50	**0.85**	118	0.5	10
3RF2190-2....	88	**0.55**	20	**3.50**	20	**2.80**	118	0.5	10
3RF2190-3....	88	**0.55**	80	**0.55**	80	**0.45**	118	0.5	10

[1] The current 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 (see page 8/49). The minimum thickness values for the mounting surface must be observed.

Type	Rated impulse withstand capacity I_{tsm}	I^2t value
	A	A^2s
Main circuit		
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
Main circuit					
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
Rage of voltage rise	V/µs	1000			

Type		3RF21 ..-...0.	3RF21 ..-...1.		3RF21 ..-...2.	3RF21 ..-...4.
Control circuit						
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	4 ... 30
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	30
Typical actuating current	mA	20 / Low Power: 6.5[1]	20	20	15	20
Response voltage	V	15	14 AC	15 DC	90	4
Drop-out voltage	V	5	5 AC	5 DC	40	1
Operating times						
• ON-delay	ms	1 + max. one half-wave[2]	10 + max. one half-wave[2]		40 + max. one half-wave[2]	1 + max. one half-wave[2]
• OFF-delay	ms	1 + max. one half-wave	15 + max. one half-wave		40 + max. one half-wave	1 + max. one half-wave

[1] Applies to the version "Low Power" 3RF21 ..-.AA..-**0KN0**.
[2] Only for zero-point-switching devices.

Fused version with semiconductor protection (similar to type of coordination "2")[1)]

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.

Type	**All-range fuses**		**Semiconductor fuses/partial-range fuses**			
	LV HRC design	Cylindrical design	LV HRC design	Cylindrical design		
	gR/SITOR	gR/NEOZED[2)]	aR/SITOR	aR/SITOR	aR/SITOR	aR/SITOR
		SILIZED		10 mm x 38 mm	14 mm x 51 mm	22 mm x 58 mm
	3NE1	5SE1	3NE8	3NC1 0	3NC1 4	3NC2 2
3RF21 20-...2	3NE1 814-0	5SE1 325	3NE8 015-1	3NC1 020	3NC1 420	3NC2 220
3RF21 20-...4	3NE1 813-0[4)]	5SE1 320	3NE8 015-1	3NC1 016[4)]	3NC1 420	3NC2 220
3RF21 20-....5[3)]	3NE1 813-0[4)]	5SE1 320	3NE8 015-1	3NC1 016[4)]	3NC1 420	3NC2 220
3RF21 30-...2	3NE1 815-0[4)]	5SE1 335	3NE8 003-1	3NC1 032	3NC1 432	3NC2 232
3RF21 30-...4	3NE1 815-0[4)]	5SE1 325[4)]	3NE8 003-1	3NC1 025[4)]	3NC1 430	3NC2 232
3RF21 30-....5[3)]	3NE1 815-0[4)]	5SE1 325[4)]	3NE8 003-1	3NC1 025[4)]	3NC1 430	3NC2 232
3RF21 30-...6	3NE1 815-0[4)]	--	3NE8 003-1	3NC1 032	3NC1 432	3NC2 232
3RF21 50-...2	3NE1 817-0	5SE1 350	3NE8 017-1	--	3NC1 450	3NC2 250
3RF21 50-...4	3NE1 802-0[4)]	5SE1 335[4)]	3NE8 017-1	--	3NC1 450	3NC2 250
3RF21 50-....5[3)]	3NE1 802-0[4)]	5SE1 335[4)]	3NE8 017-1	--	3NC1 450	3NC2 250
3RF21 50-...6	3NE1 803-0[4)]	--	3NE8 017-1	--	3NC1 450	3NC2 250
3RF21 70-...2[5)]	3NE1 820-0	5SE1 363[4)]	3NE8 020-1	--	--	3NC2 280
3RF21 70-...4[5)]	3NE1 020-2	5SE1 363[4)]	3NE8 020-1	--	--	3NC2 280
3RF21 70-....5[3)5)]	3NE1 020-2	--	3NE8 020-1	--	--	3NC2 280
3RF21 70-...6[5)]	3NE1 020-2	--	3NE8 020-1	--	--	3NC2 280
3RF21 90-...2[5)]	3NE1 021-2	--	3NE8 021-1	--	--	3NC2 200
3RF21 90-...4[5)]	3NE1 021-2	--	3NE8 021-1	--	--	3NC2 280[4)]
3RF21 90-....5[3)5)]	3NE1 021-2	--	3NE8 021-1	--	--	3NC2 280[4)]
3RF21 90-...6[5)]	3NE1 817-0[4)]	--	3NE8 021-1	--	--	3NC2 280[4)]

Type	**Cable and line protection fuses**				
	LV HRC design[4)]	Cylindrical design[4)]			DIAZED[4)]
	gG	gG	gG	gG	quick
		10 mm x 38 mm	14 mm x 51 mm	22 mm x 58 mm	
	3NA2	3NW6 0	3NW6 1	3NW6 2	5SB
3RF21 20-...2	3NA2 803	3NW6 000-1	3NW6 101-1	--	5SB1 41
3RF21 20-...4	3NA2 801	--	3NW6 101-1	--	5SB1 41
3RF21 20-....5[3)]	3NA2 801	--	3NW6 101-1	--	5SB1 41
3RF21 30-...2	3NA2 803	--	3NW6 103-1	--	5SB1 71
3RF21 30-...4	3NA2 803	--	3NW6 101-1	--	5SB1 71
3RF21 30-....5[3)]	3NA2 803	--	3NW6 101-1	--	5SB1 71
3RF21 30-...6	3NA2 803-6	--	--	--	--
3RF21 50-...2	3NA2 810	--	3NW6 107-1	3NW6 207-1	5SB3 11
3RF21 50-...4	3NA2 807	--	--	3NW6 205-1	5SB3 11
3RF21 50-....5[3)]	3NA2 807	--	--	3NW6 205-1	5SB3 11
3RF21 50-...6	3NA2 807-6	--	--	--	--
3RF21 70-...2[5)]	3NA2 817	--	--	3NW6 217-1	5SB3 31
3RF21 70-...4[5)]	3NA2 812	--	--	3NW6 212-1	5SB3 31
3RF21 70-....5[3)5)]	3NA2 812	--	--	3NW6 212-1	--
3RF21 70-...6[5)]	3NA2 812-6	--	--	--	--
3RF21 90-...2[5)]	3NA2 817	--	--	3NW6 217-1	--
3RF21 90-...4[5)]	3NA2 812	--	--	3NW6 212-1	--
3RF21 90-....5[3)5)]	3NA2 812	--	--	3NW6 212-1	--
3RF21 90-...6[5)]	3NA2 812-6	--	--	--	--

Suitable fuse holders, fuse bases and controls can be found in Catalog LV 1, Chapter 19.

1) 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.

2) For use only with operational voltage U_e up to 400 V.

3) For use only with operational voltage U_e up to 506 V.

4) These fuses have a smaller rated current than the solid-state relays.

5) 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".

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
General data		
Ambient temperature during operation, derating at 40 °C when stored	 °C °C	 -25 ... +60 -55 ... +80
Site altitude	m	0 ... 1000; derating from 1000
Shock resistance acc. to IEC 60068-2-27	g/ms	15/11
Vibration resistance acc. to IEC 60068-2-6	g	2
Degree of protection		IP20
Electromagnetic compatibility (EMC) Emitted interference • Conducted interference voltage IEC acc. to 60947-4-3 • Emitted, high-frequency interference voltage acc. to IEC 60947-4-3 Noise immunity • Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3) • Induced RF fields acc. to IEC 61000-4-6 • Burst acc. to IEC 61000-4-4 • Surge acc. to IEC 61000-4-5	 kV MHz kV kV	 Class A for industrial applications Class A for industrial applications Contact discharge 4; air discharge 8; behavior criterion 2 0.15 ... 80; 140 dBµV; behavior criterion 1 2/5.0 kHz; behavior criterion 1 Conductor - ground 2; conductor - conductor 1; behavior criterion 2
Connection, main contacts, screw connection • Conductor cross-sections - Solid - Finely stranded with end sleeve - Solid or stranded, AWG cables • Terminal screw • Tightening torque	 mm^2 mm^2 AWG Nm lb.in	 2 x (1.5 ... 2.5)[1], 2 x (2.5 ... 6)[1] 2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1], 1 x 10 2 x (14 ... 10) M4 2 ... 2.5 7 ... 10.3
Connection, auxiliary/control contacts, screw connection Conductor cross-section Insulation stripping length Terminal screw • Tightening torque	 mm^2 mm Nm lb.in	 1x (0.5 ... 2.5); 2x (0.5 ... 1.0); AWG 20 ... 12 7 M 3 0.5 ... 0.6 4.5 ... 5.3

Type		3RF20 .0-1AA.2	3RF20 .0-1AA.4	3RF20..-....5	3RF20 .0-1AA.6
Main circuit					
Rated operational voltage U_e • Tolerance • Rated frequency	V % Hz	24 ... 230 -15/+10 50/60	48 ... 460	48 ... 600	400 ... 600
Rated insulation voltage U_i	V	600			
Blocking voltage	V	800	1200	1200	1600
Rage of voltage rise	V/µs	1000			

Solid-State Relays

3RF20 Solid-state relays – technical data

The heat transfer of the solid-state relays has been considerably improved.
Please note the **highlighted values** when dimensioning the heat sink.

Type	I_{max} [1] at R_{thha}/T_u = 40 °C		I_e acc. to IEC 60947-4-3 at R_{thha}/T_u = 40 °C		I_e acc. to UL/CSA at R_{thha}/T_u = 50 °C		Power loss at I_{max}	Minimum load current	Off-state current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF2020-1.A..	20	2.00	20	1.70	20	1.30	28.6	0.1	10
3RF2030-1.A..	30	**1.45**	30	**1.45**	30	**1.25**	44.2	0.5	10
3RF2050-1.A..	50	**0.85**	50	**0.85**	50	**0.70**	66	0.5	10
3RF2070-1.A..	70	**0.50**	50	**1.15**	50	**1.00**	94	0.5	10
3RF2090-1.A..	88	**0.55**	50	**1.40**	50	**1.00**	118	0.5	10

1) The current 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 (see page 8/49). The minimum thickness values for the mounting surface must be observed.

Type	Rated impulse withstand capacity I_{tsm}	I^2t value
	A	A^2s
Main circuit		
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.**
Control circuit				
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	20	20	15
Rated frequency of the control supply voltage	Hz	-	-	50/60
Response voltage	V	15	4	90
current	mA	>2	>2	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

Order No.	All-range fuse LV design gR/SITOR 3NE1	Semiconductor protection fuse Cylindrical design 10 × 38 mm aR/SITOR 3NC1 0	14 × 51 mm aR/SITOR 3NC1 4	22 × 58 mm aR/SITOR 3NC2 2	Cable and line protection fuse LV design gL/gG/3NA	Cylindrical design 10 × 38 mm gL/gG 3NW	14 × 51 mm gL/gG 3NW	22 × 58 mm gL/gG 3NW	DIAZED quick 5SB
Fused design with semiconductor protection									
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	3NW6 207-1	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[2]	3NE1 820-0	-	-	3NC2 280	3NA2 817	-	-	3NW6 217-1	5SB3 31
3RF20 70-1AA.4[2]	3NE1 020-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 212-1	5SB3 21
3RF20 70-1AA.6[2]	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-	-
3RF20 90-1AA.2[2]	3NE1 021-2	-	-	3NC2 200	3NA2 817	-	-	3NW6 217-1	5SB3 31
3RF20 90-1AA.4[2]	3NE1 021-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 212-1	5SB3 21
3RF20 90-1AA.6[2]	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.

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....
General data				
Ambient temperature				
• During operation, derating from 40 °C	°C	-25 ... +60		
• During storage	°C	-55 ... +80		
Site altitude	m	0 ... 1000; > 1000 ask Technical Assistance		
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6	*g*	2		
Degree of protection		IP20		IP00
Insulation strength at 50/60 Hz (main/control circuit to ground)	V rms	4000		
Electromagnetic compatibility (EMC)				
• Emitted interference				
- Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications[1)]		
- 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		
Connection technique		**Screw terminal**	**Spring-loaded connection**	**Ring terminal end connection**
Main contact connection				
• Conductor cross-section				
- Solid	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2 x (0.5 ... 2.5)	--
- Finely stranded with end sleeve	mm^2	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^2	--	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	--	M5
- Tightening torque, ∅ 5 ... 6 mm, PZ 2	Nm lb.in	2 ... 2.5 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
Connection, auxiliary/control contacts				
• 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	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12
• Stripped length	mm	7	10	7
• Terminal screw		M3	--	M3
- Tightening torque, ∅ 3.5 , PZ 1	Nm lb.in	0.5 ... 0.6 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 the may be required to introduce additional damping measures.

3RF22 Solid-state relays – technical data

Type		3RF22 ..-.AB.5	3RF22 ..-.AC.5
Main circuit			
Controlled phases		Two-phase	Three-phase
Rated operational voltage U_e	V	48 ... 600	48 ... 600
• Operating range	V	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
Rated insulation voltage U_i	V	600	600
Rated impulse withstand voltage U_{imp}	kV	6	6
Blocking voltage	V	1200	1200
Rage of voltage rise	V/µs	1.000	1.000

The heat transfer of the solid-state relays has been considerably improved.
Please note the **highlighted values** when dimensioning the heat sink.

Type	**I_{max} 1)** at R_{thha}/T_u = 40 °C		**I_e acc. to IEC 60947-4-3** at R_{thha}/T_u = 40 °C		**I_e acc. to UL/CSA** at R_{thha}/T_u = 50 °C		**Power loss** at I_{max}	**Minimum load current**	**Max. off-state current**
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF2230-1AB.. **3RF2230-2AB..** **3RF2230-3AB..**	30	**0.80**	30 20 30	**0.80** **1.36** **0.80**	30 20 30	**0.65** **1.15** **0.65**	81	0.5	10
3RF2255-1AB.. **3RF2255-2AB..** **3RF2255-3AB..**	55	**0.25**	50 20 55	**0.35** **1.83** **0.25**	50 20 55	**0.25** **1.58** **0.15**	151	0.5	10
3RF2230-1AC.. **3RF2230-2AC..** **3RF2230-3AC..**	30	**0.45**	30 20 30	**0.45** **0.86** **0.45**	30 20 30	**0.35** **0.72** **0.35**	122	0.5	10
3RF2255-1AC.. **3RF2255-2AC..** **3RF2255-3AC..**	55	**0.14**	50 20 55	**0.20** **1.19** **0.14**	50 20 55	**0.15** **1.02** **0.10**	226	0.5	10

1) The current 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 (see page 8/49, "More information"). The minimum thickness values for the mounting surface must be observed.

Type	Rated impulse withstand capacity I_{tsm}	I^2t value
	A	A^2s
Main circuit		
3RF22 30-....5	300	450
3RF22 55-....5	600	1800

Type		3RF22..-.A.3.	3RF22..-.A.4.
Control circuit			
Method of operation		AC operation	DC operation
Rated control supply voltage U_s	V	110	4 ... 30
Rated frequency of the control supply voltage	Hz	50/60 Ø10%	--
Control supply voltage, max.	V	121	30
Typical actuating current	mA	15	30
Response voltage	V	90	4
Drop-out voltage	V	< 40	1
Operating times			
• ON-delay	ms	40 + max. one half-wave	1 + max. one half-wave
• OFF-delay	ms	40 + max. one half-wave	1 + max. one half-wave

Technical specifications

Order No.		3RF23 ..-.A...	3RF23 ..-.B...	3RF23 ..-.C...	3RF23 ..-.D...
General data					
Ambient temperature					
during operation, derating at 40 °C	°C	-25 ... +60			
when stored	°C	-55 ... +80			
Site altitude	m	0 ... 1000; derating from 1000			
Shock resistance acc. to IEC 60068-2-27	g/ms	15/11			
Vibration resistance acc. to IEC 60068-2-6	g	2			
Degree of protection		IP20			
Electromagnetic compatibility (EMC)					
Emitted interference acc. to IEC 60947-4-3		Class A for industrial applications		Class A for industrial applications; Class B for residential/business/commercial areas up to 16 A, AC51 Low Noise	Class A for industrial applications
• Conducted interference voltage					
• Emitted high-frequency interference voltage					
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			

Type		3RF23 ..-1....	3RF23 ..-2....	3RF23 ..-3....
General data				
Connection technique		**Screw connection**	**Spring-loaded connection**	**Ring cable connection**
Main contact connection				
Conductor cross-section				
Solid	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2 x (0.5 ... 2.5)	-
Finely stranded with end sleeve	mm^2	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^2		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	7 ... 10.3	-	7 ... 10.3
Cable lug				
• DIN		-	-	DIN 46234 -5-2.5, -5-6, -5-10, -5-16, -5-25
• JIS		-	-	JIS C 2805 R 2-5, 5.5-5, 8-5, 14-5
Auxiliary/control contact connections				
Conductor cross-section	mm^2	1x (0.5 ... 2.5); 2x (0.5 ... 1.0)	0.5 ... 2.5	1x (0.5 ... 2.5); 2x (0.5 ... 1.0)
	AWG	20 ... 12	20 ... 12	20 ... 12
Insulation stripping length	mm	7	10	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	3RF23 ..-....6
Main circuit				
Rated operational voltage U_e	V	24 ... 230	48 ... 460	400 ... 600
• Tolerance	%	-15/+10		
• Rated frequency	Hz	50/60 Hz		
Rated insulation voltage U_i	V	600		
Blocking voltage	V	800	1200	1600
Rate of voltage rise	V/µs	1000		

Type		3RF23 ..-...0.	3RF23 ..-...2.
Control circuit			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	24 to EN 61131-2	110 ... 230
Max. rated control voltage	V	30	253
Rated control current at U_s	mA	20	15
Rated frequency of the control supply voltage	Hz		50/60
Response voltage	V	15	90
for tripping current	mA	2	2
Drop-out voltage	V	5	40
Operating times			
closing time	ms	1 + max. one half-wave	40 + max. one half-wave
opening time	ms	1 + max. one half-wave	40 + max. one half-wave

Technical specifications

Type	Type current AC-51/performance capacity[1] at I_{max} at 40 °C	Acc. to IEC 60947-4-3 at 40 °C	Acc. to UL/CSA at 50 °C	Power loss at I_{max}	Minimum load current	Off-state current	Rated peak withstand current I_{tsm}	I^2t value
	A	A	A	W	A	mA	A	A^2s
Main circuit								
3RF2310-.AA.2 **3RF2310-.AA.4** **3RF2310-.AA.5**	10.5	7.5	9.6	11	0.1	10	200	200
3RF2310-.AA.6							400	800
3RF2320-.AA.2 **3RF2320-.AA.4** **3RF2320-.AA.5** **3RF2320-.AA.6**	20	13.2	17.6	20	0.5	10	600	1 800
3RF2320-.CA.2 **3RF2320-.CA.4**						25	600	1 800
3RF2320-.DA.2 **3RF2320-.DA.4**						10	1 150	6 600
3RF2330-.AA.2 **3RF2330-.AA.4** **3RF2330-.AA.5** **3RF2330-.AA.6**	30	22	27	33	0.5	10	600	1 800
3RF2330-.CA.2						25	600	1 800
3RF2330-.DA.4		18.5	26	33	0.5	10	1 150	6 600
3RF2340-.AA.2 **3RF2340-.AA.4** **3RF2340-.AA.5**	40	33	36	44	0.5	10	1 200	7 200
3RF2340-.AA.6							1 150	6 600
3RF2350-.AA.2 **3RF2350-.AA.4** **3RF2350-.AA.5** **3RF2350-.AA.6**	50	36	45	54	0.5	10	1 150	6 600
3RF2370-.AA.2 **3RF2370-.AA.4** **3RF2370-.AA.5** **3RF2370-.AA.6**	70	70	62	83	0.5	10	1 150	6 600

[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 installation conditions.

Type	Type current AC-51/performance capacity[1] at I_{max} at 40 °C	Acc. to IEC 60947-4-3 at 40 °C	Acc. to UL/CSA at 50 °C	Type current AC-15/performance capacity[1] 10 x I_e for 60 ms	Parameters	Power loss at I_{max}	Minimum load current	Off-state current	Rated peak withstand current I_{tsm}	I^2t value
	A	A	A	A		W	A	mA	A	A^2s
Main circuit										
3RF2310-.BA.2 **3RF2310-.BA.4**	10.5	7.5	9.6	6	1 200 1/h 50% ON period	11	0.1	10	200	200
3RF2310-.BA.6									400	800
3RF2320-.BA.2 **3RF2320-.BA.4** **3RF2320-.BA.6**	20	13.2	17.6	12	1 200 1/h 50% ON period	20	0.5	10	600	1 800
3RF2330-.BA.2 **3RF2330-.BA.4** **3RF2330-.BA.6**	30	22	27	15	1 200 1/h 50% ON period	33	0.5	10	600	1 800
3RF2340-.BA.2 **3RF2340-.BA.4**	40	33	36	20	1 200 1/h 50% ON period	44	0.5	10	1 200	7 200
3RF2340-.BA.6									1 150	6 600
3RF2350-.BA.2 **3RF2350-.BA.4** **3RF2350-.BA.6**	50	36	45	25	1 200 1/h 50% ON period	54	0.5	10	1 150	6 600
3RF2370-.BA.2 **3RF2370-.BA.4** **3RF2370-.BA.6**	70	70	62	27.5	1 200 1/h 50% ON period	83	0.5	10	1 150	6 600

[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 installation conditions.

Solid-State Contactors

3RF23 Solid-state contactors – technical data

Fused design with semiconductor protection (similar to type of coordination "2")[1)]

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				
		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	Cylindrical design 14 x 51 mm gL/gG 3NW	Cylindrical design 22 x 58 mm gL/gG 3NW	DIAZED quick 5SB
3RF23 1.-....2	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 803	3NW6 001-1	3NW6 101-1	-	5SB1 41
3RF23 1.-....4	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 801	3NW6 001-1	3NW6 101-1	-	5SB1 41
3RF23 1.-....6	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 803-6	-	-	-	-
3RF23 2.-....2	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807	3NW6 007-1	3NW6 107-1	3NW6 207-1	5SB1 71
3RF23 2.-....4	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807	3NW6 005-1	3NW6 105-1	3NW6 205-1	5SB1 71
3RF23 2.-....6	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807-6	-	-	-	-
3RF23 3.-....2	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 810	-	3NW6 107-1	3NW6 207-1	5SB3 11
3RF23 3.-....4	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 807	-	3NW6 105-1	3NW6 205-1	5SB3 11
3RF23 3.-....6	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 807-6	-	-	-	-
3RF23 4.-....2	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 817	-	3NW6 117-1	3NW6 217-1	5SB3 21
3RF23 4.-....4	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 812	-	3NW6 112-1	3NW6 212-1	5SB3 21
3RF23 4.-....6	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 812-6	-	-	-	-
3RF23 5.-....2	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 817	-	3NW6 117-1	3NW6 217-1	5SB3 21
3RF23 5.-....4	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 812	-	-	3NW6 210-1	5SB3 21
3RF23 5.-....6	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 812-6	-	-	-	-
3RF23 7.-....2	3NE1 820-0	-	-	3NC2 280	3NA2 817	-	-	3NW6 217-1	5SB3 31
3RF23 7.-....4	3NE1 020-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 210-1	5SB3 21
3RF23 7.-....6	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-	-
3RF23 9.-....2	3NE1 021-2	-	-	3NC2 200	3NA2 817	-	-	3NW6 217-1	5SB3 31
3RF23 9.-....4	3NE1 021-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 210-1	5SB3 21
3RF23 9.-....6	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....
General data				
Ambient temperature				
• During operation, derating from 40 °C	°C	-25 ... +60		
• During storage	°C	-55 ... +80		
Site altitude	m	0 ... 1000; derating from 1000		
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6	*g*	2		
Degree of protection		IP20		IP00
Insulation strength at 50/60 Hz (main/control circuit to ground)	V rms	4000		
Electromagnetic compatibility (EMC)				
• Emitted interference acc. to IEC 60947-4-3				
- Conducted interference voltage		Class A for industrial applications[1)]		
- Emitted, high-frequency interference voltage		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		
Connection technique		**Screw terminal**	**Spring-loaded connection**	**Ring terminal end connection**
Main contact connection				
• Conductor cross-section				
- Solid	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2x (0.5 ... 2.5)	--
- Finely stranded with end sleeve	mm^2	2 x (1 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2x (0.5 ... 1.5)	--
- Finely stranded without end sleeve	mm^2	--	2x (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	--	M5
- Tightening torque	NM lb.in	2 ... 2.5 18 ... 22		2 ... 2.5 18 ... 22
• Cable lug		--	--	
- acc. to DIN 46234				5-2.5 ... 5-25
- acc. to JIS C 2805				R 2-5 ,,, 14-5
Connection, auxiliary/control contacts				
• Conductor cross-section	mm AWG	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) AWG 20 ... 12	0.5 ... 2.5 AWG 20 ... 12	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) AWG 20 ... 12
• Stripped length	mm	7	10	7
• Terminal screw		M3	--	M3
- Tightening torque, ∅ 3.5 , PZ 1	NM lb.in	0.5 ... 0.6 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 the may be required to introduce additional damping measures.

Solid-State Contactors

3RF24 Solid-state contactors – technical data

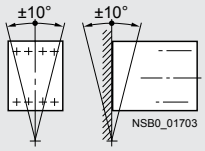
Type		3RF24 ..-.AB.5	3RF24 ..-.AC.5
Main circuit			
Controlled phases		Two-phase	Three-phase
Rated operational voltage U_e	V	48 ... 600	48 ... 600
• Operating range	V	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
Rated insulation voltage U_i	V	600	600
Rated impulse withstand voltage U_{imp}	kV	6	6
Blocking voltage	V	1200	1200
Rage of voltage rise	V/µs	1000	1000

Type	**Type current/ performance capacity**[1] I_{AC-51} at 40 °C	**Rated operational current I_e** Acc. to IEC 60947-4-3 at 40 °C	Acc. to UL/CSA at 50 °C	**Power loss** at I_{AC-51}	**Minimum load current**	**Max. off-state current**	**Rated peak withstand current I_{tsm}**	**I^2t value**
	A	A	A	W	A	mA	A	A^2s
Main circuit								
3RF2410-.AB.5	10.5	7	7	23	0.1	10	200	200
3RF2420-.AB.5	22	15	15	44	0.5	10	600	1 800
3RF2430-.AB.5	30	22	22	61	0.5	10	1 200	7 200
3RF2440-.AB.5	40	30	30	80	0.5	10	1 150	6 600
3RF2450-.AB.5	50	38	38	107	0.5	10	1 150	6 600
3RF2410-.AC.5	10.5	7	7	31	0.5	10	300	450
3RF2420-.AC.5	22	15	15	66	0.5	10	600	1 800
3RF2430-.AC.5	30	22	22	91	0.5	10	1 200	7 200
3RF2440-.AC.5	40	30	30	121	0.5	10	1 150	6 600
3RF2450-.AC.5	50	38	38	160	0.5	10	1 150	6 600

[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 installation conditions.

Type		3RF24 ..-...4.	3RF24 ..-...5.
Control circuit			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	4 ... 30	190 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10%
Actuating voltage, max.	V	30	253
• For actuating current	mA	15	6
Response voltage	V	4	180
• For tripping current	mA	> 3	> 2
Drop-out voltage	V	< 1	< 40
Operating times			
• 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

Technical specifications

Type		3RF3405-1BB.. 3RF3403-1BD.., 3RF3405-1BD..	3RF3410-1BB.., 3RF3412-1BB.., 3RF3416-1BB.. 3RF3410-1BD..	3RF3405-2BB..	3RF3410-2BB.., 3RF3412-2BB.., 3RF3416-2BB..
Dimensions (W x H x D)					
• 3RF34..-1BB..	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
• 3RF34..-1BD..	mm	45 x 95 x 108.5	90 x 95 x 108.5	--	--
General technical specifications					
Ambient temperature					
• During operation, derating from 40 °C	°C	-25 ... +60			
• During storage	°C	-55 ... +80			
Installation altitude	m	0 ... 1000; derating from 1000 on request			
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11			
Vibration resistance acc. to IEC 60068-2-6	*g*	2			
Degree of protection		IP20			
Insulation strength at 50/60 Hz (main/control circuit to floor)	V rms	4000			
Electromagnetic compatibility (EMC)					
• Emitted interference according to IEC 60947-4-2					
- Conducted interference voltage		Class A for industrial applications[1]			
- Emitted, high-frequency interference voltage		Class A for industrial applications			
• 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[2]	kV	Conductor - Ground: 2; Conductor - Conductor: 1; Behavior criterion 2			
Connection type		**Screw terminals**		**Spring-type terminals**	
Operating devices		Standard screwdriver size 2 and Pozidriv 2		3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections, main contacts					
• Solid	mm^2	2 x (1.5 ... 2.5)[3], 2 x (2.5 ... 6)[3]		2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[3]; 2 x (2.5 ... 6)[3]; 1 x 10		2 x (0.5 ... 1.5)	
• Finely stranded without end sleeve	mm^2	--		2 x (0.5 ... 2.5)	
• AWG cables, solid or stranded		2 x (AWG 14 ... 10)		2 x (AWG 18 ... 14)	
Conductor cross-sections, auxiliary/control contacts					
• With/without end sleeve	mm^2	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	
Permissible mounting positions					

[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 these may be required to introduce additional interference suppression measures.

[2] The following applies for reversing contactors: To maintain the values, a 3TX7 462-3L surge suppressor should be used between the phases L1 and L3 as close as possible to the reversing contactor.

[3] 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 insulting 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..
Fuseless design with 3RV2 motor starter protector, CLASS 10					
Rated operational current I_{AC-53}[1] 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
Power loss at I_{AC-53}					
• At 40 °C	W	10 (8)	16	22	28
Short-circuit protection with type of coordination "1" 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

[1] 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..
Fused design with directly connected 3RB3 overload relay							
Rated operational current I_{AC-53} 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
Power loss at I_{AC-53}							
• At 40 °C	W	7		13	16		18
Minimum load current	A	0.1		0.5			
Max. off-state current	mA	10					
Rated peak withstand current I_{tsm}	A	200	600	600	1200	1150	1150
I^2t value	A^2s	200	1800	1800	7200	6600	6600

Type		3RF34 ..-.BB.4	3RF34 ..-.BB.6
Main circuit			
Controlled phases		2-phase	2-phase
Rated operational voltage U_e	V AC	48 ... 480	48 ... 600
• Operating range	V AC	40 ... 506	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
Rated insulation voltage U_i	V	600	600
Rated impulse withstand voltage U_{imp}	kV	6	6
Blocking voltage	V	1200	1600
Rage of voltage rise	V/µs	1000	1000

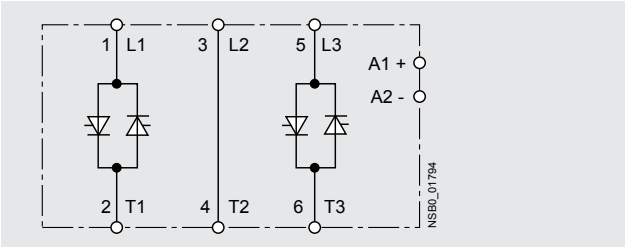
Solid-State Contactors

3RF34 Solid-state contactors – technical data

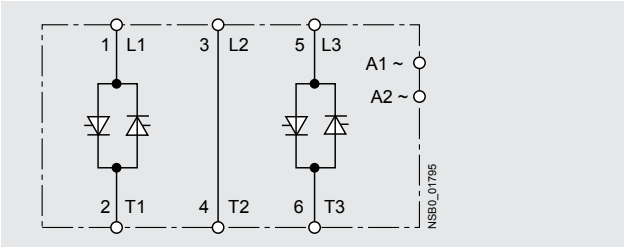
Type		3RF34 ..-.BB0.	3RF34 ..-.BB2.
Control circuits			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	24 acc. to IEC 61131-2	110 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10 %
Control supply voltage, max.	V	30	253
Typical actuating current	mA	20	15
Response voltage	V	15	90
Drop-out voltage	V	5	< 40
Operating times			
• ON-delay	ms	1	5
• OFF-delay	ms	1 + max. one half-wave	30 + max. one half-wave

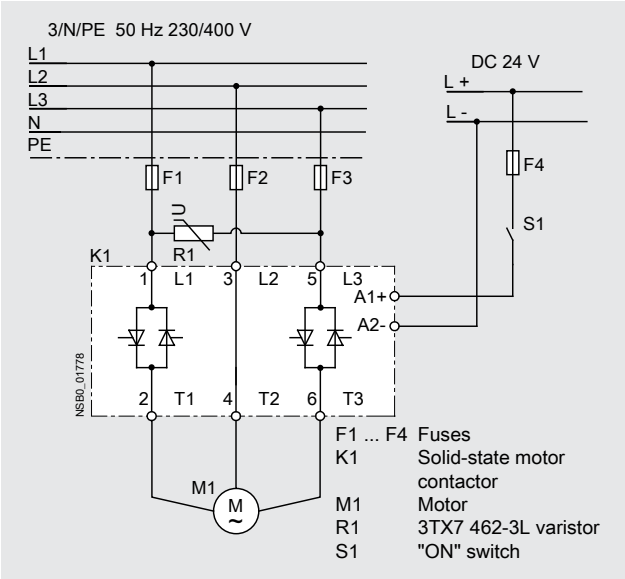
Circuit diagrams

DC control supply voltage



AC control supply voltage





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
Fuseless design with 3RV2 motor starter protector, CLASS 10				
Rated operational current I_{AC-53}[1] 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
Power loss at I_{AC-53}				
• At 40 °C	W	7 (6)	9 (8)	13
Short-circuit protection with type of coordination "1" at an operational voltage of U_e to 440 V				
• Motor starter protector, type		3RV20 11-1FA10	3RV20 11-1GA10	3RV20 11-1JA10
• Current I_q	kA	50	50	10

[1] 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
Fused design with directly connected 3RB3 overload relay				
Rated operational current I_{AC-53} 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
Power loss at I_{AC-53}				
• At 40 °C	W	6	8	16
Minimum load current	A	0.5		
Max. off-state current	mA	10		
Rated peak withstand current I_{tsm}	A	200	600	
I^2t value	A^2s	200	1800	

Type		3RF34 ..-.BD.4
Main circuit		
Controlled phases		2-phase
Rated operational voltage U_e[1]	V AC	48 ... 480
• Operating range	V AC	40 ... 506
• Rated frequency	Hz	50/60 ± 10 %
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Blocking voltage	V	1 200
Rage of voltage rise	V/µs	1 000

[1] 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

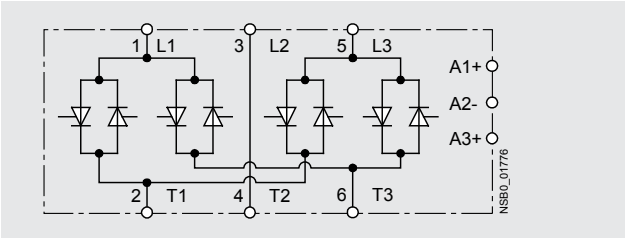
3RF34 Solid-state reversing contactors – technical data

Type		3RF34 ..-.BD0.	3RF34 ..-.BD2.
Control circuits			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	24 acc. to IEC 61131-2	110 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10 %
Control supply voltage, maximum	V	30	253
Typical actuating current	mA	15	10
Response voltage	V	15	90
Drop-out voltage	V	5	< 40
Operating times [1]			
• 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

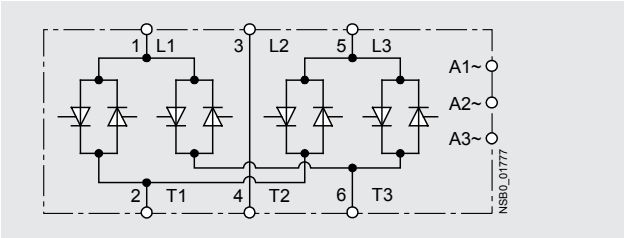
[1] Caution! Risk of phase short circuit in automatic mode.
The control inputs must not be actuated until after a delay time of 40 ms after the main voltage is applied

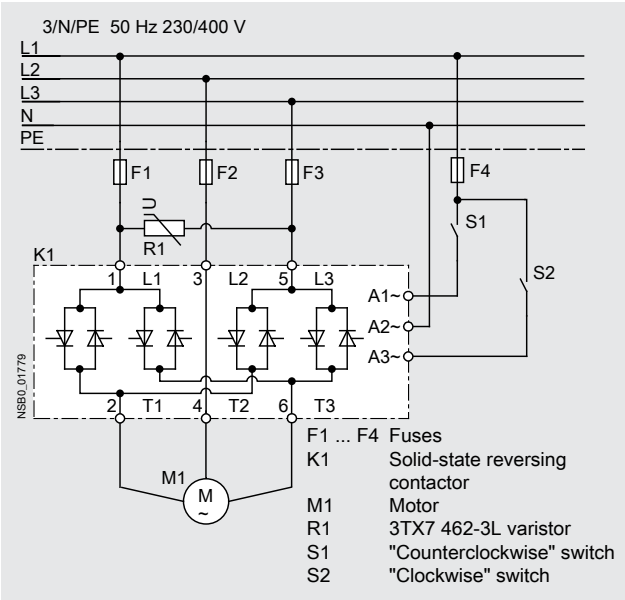
Circuit diagrams

DC control supply voltage



AC control supply voltage





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..-0EA..	3RF29..-0FA..	3RF29..-0GA..	3RF29..-0HA..	3RF29..-0JA..	3RF29..-0KA..
Dimensions (W x H x D)	mm	22.5 x 84 x 38	22.5 x 102 x 39	45 x 112 x 44	45 x 112 x 44	45 x 112 x 44	45 x 112 x 44
General data							
Ambient temperature							
• During operation, derating from 40 °C	°C	-25 ... +60					
• During storage	°C	-55 ... +80					
Installation altitude	m	0 ... 1 000; derating from 1 000					
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11					
Vibration resistance acc. to IEC 60068-2-6	*g*	2					
Degree of protection		IP20					
Electromagnetic compatibility (EMC)							
• Emitted interference							
- Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications[1]					
- Emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class B for residential, business and commercial 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 according to IEC 61000-4-6	MHz	0.15 ... 80; 140 dB V; behavior criterion 1					
- Burst acc. to IEC 61000-4-4		2 kV/5.0 kHz; behavior criterion 2					
- Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2					
Connection type Auxiliary/control contacts		**Screw terminals**					
• Conductor cross-section	mm^2	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	0.5 ... 0.6					
	lb.in	4.5 ... 5.3					
Connection type Converters		**Straight-through transformers**					
• Diameter	mm	--	7	17			

[1] Note limitations for power controller and power regulator function modules. These modules were built as Class A devices. The use of these devices in residential areas could result in lead in radio interference. In this case it may be required to introduce additional interference suppression measures.

Type		3RF29..-0EA18	3RF29..-0FA08	3RF29..-0GA.3	3RF29..-0GA.6
Main circuit					
Rated operational voltage U_e	V AC	--[1]		110 ... 230	400 ... 600
• Operating range	V AC	--		93.5 ... 253	340 ... 660
• Rated frequency	Hz	--		50/60	
Rated insulation voltage U_i	V	--		600	
Voltage measuring					
• Measuring range	V	--		93.5 ... 253	340 ... 660
Mains voltage, fluctuation compensation	%	--		20	

[1] Versions are independent of the main circuit.

Type		3RF29..-0HA.3 3RF29..-0KA.3	3RF29..-0HA.6 3RF29..-0KA.6	3RF29..-0JA.3	3RF29..-0JA.6
Main circuit					
Rated operational voltage U_e	V AC	110 ... 230	400 ... 600	110 ... 230	400 ... 600
• Operating range	V AC	93.5 ... 253	340 ... 660	93.5 ... 253	340 ... 660
• Rated frequency	Hz	50/60			
Rated insulation voltage U_i	V	600			
Voltage measuring					
• Measuring range	V	93.5 ... 253	340 ... 660	93.5 ... 253	340 ... 660
Mains voltage, fluctuation compensation	%	20			

Technical specifications

Type		3RF29..-...0.	3RF29..-...1.	3RF29..-...3.
Control circuit				
Method of operation		DC operation	AC/DC operation	AC operation
Rated control supply voltage U_s	V	24		110
Rated actuating current	mA	15		
Rated frequency of the control supply voltage	Hz	--	50/60	
Actuating voltage, max.	V	30		121
Rated actuating current At maximum voltage	mA	15		
Response voltage	V	15		90
• For operating current	mA	2		
Drop-out voltage	V	5		15

Type		3RF2906-0FA08	3RF2920-0FA08	3RF2920-0GA..	3RF2950-0GA..	3RF2990-0GA..
Current measurement						
Rated operational current I_e	A	6	20		50	90
Current measurement						
• Teach range	A	0.25 ... 6	0.65 ... 20	0.56 ... 20	1.62 ... 50	2.93 ... 90
• Measuring range	A	0 ... 6.6	0 ... 22		0 … 55	0 … 99
• Minimum partial load current	A	0.25	0.65		1.6	2.9
Number of partial loads		1 ... 6		1 ... 12		

Type		3RF2920-0HA..	3RF2950-0HA..	3RF2990-0HA..	3RF2916-0JA..	3RF2932-0JA..
Current measurement						
Rated operational current I_e	A	20	50	90	16	32
Current measurement						
• Teach range	A	4 ... 20	10 ... 50	18 ... 90	0.42 ... 16	0.8 ... 32
• Measuring range	A	0 ... 22	0 ... 55	4 ... 99	0 ... 16	0 ... 32
• Minimum partial load current	A	--			0.42	0.8
Number of partial loads		--			1 ... 6	

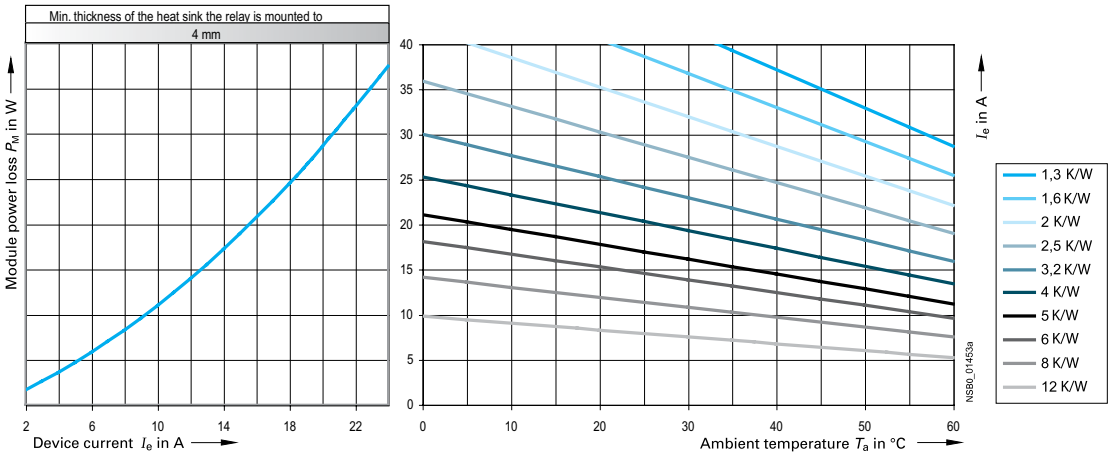
Type		3RF2904-0KA..	3RF2920-0KA..	3RF2950-0KA..	3RF2990-0KA..
Current measurement					
Rated operational current I_e	A	4	20	50	90
Current measurement					
• Teach range	A	0.15 ... 4	0.65 ... 20	1.6 ... 50	2.9 ... 90
• Measuring range	A	0 ... 4	0 ... 22	0 ... 55	0 ... 99
• Minimum partial load current	A	--	0.65	1.6	2.9
Number of partial loads		--	1 ... 6		

Characteristics

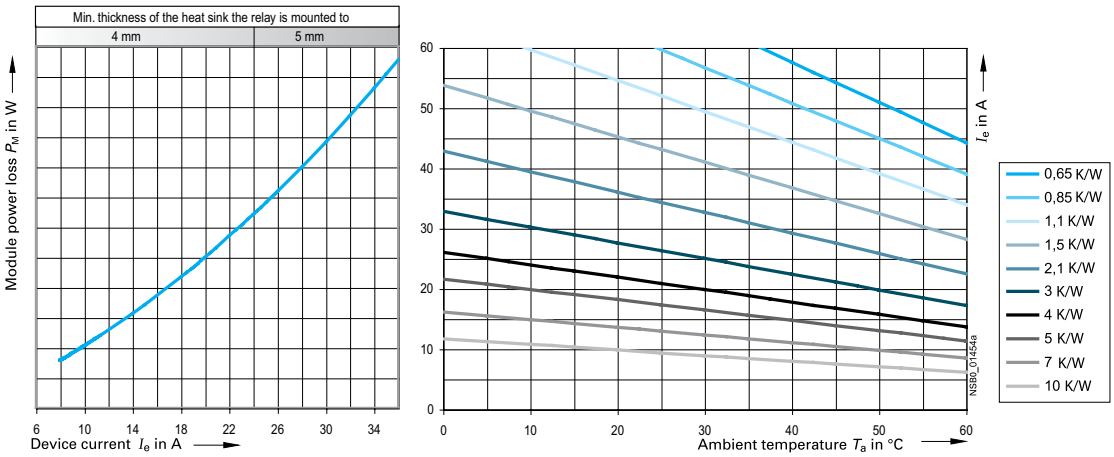
SIRIUS SC semiconductor relays

Dependence of the device current I_e on the ambient temperature T_a (Chart data for SIRIUS SC relays based on I max)

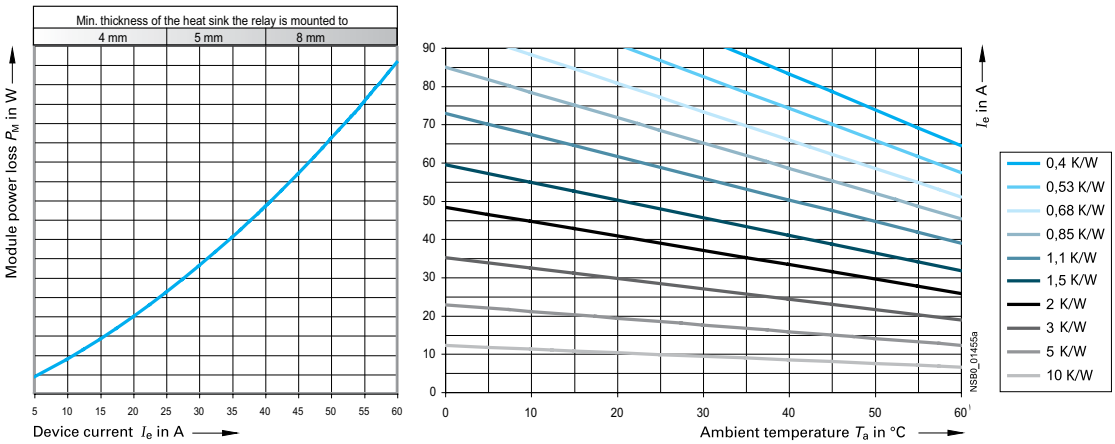
SIRIUS SC semiconductor relay with 20 A type current (3RF21 20/3RF20 20)[1)]



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)

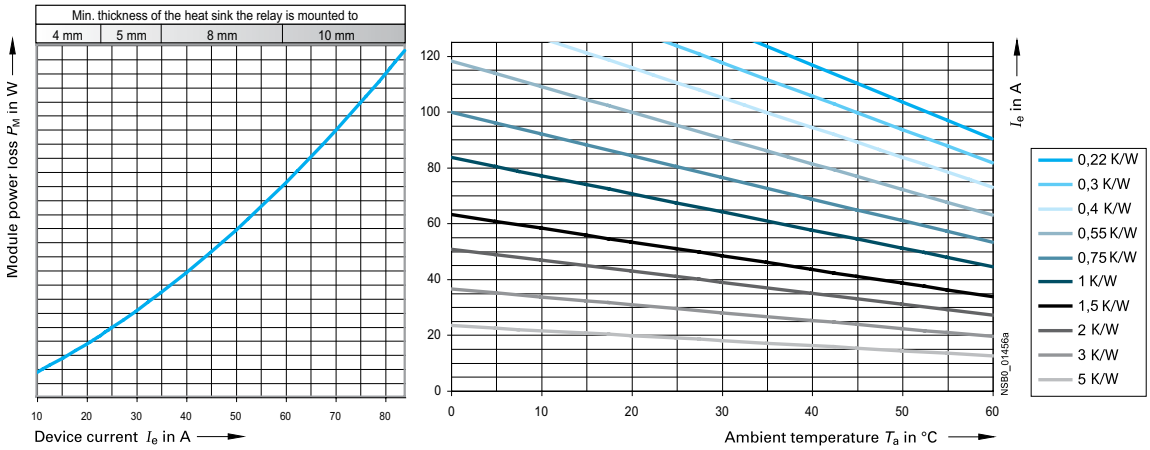


1) Arrangement example for I_e = 20 A and T_a = 40 C:
The task is to find the thermal resistance R_{thha} and the heat-sink overtemperature dT_{ha}. From the diagram on the left -> P_M = 28 W, from the diagram on the right -> **R_{thha} = 1.7 K/W**.

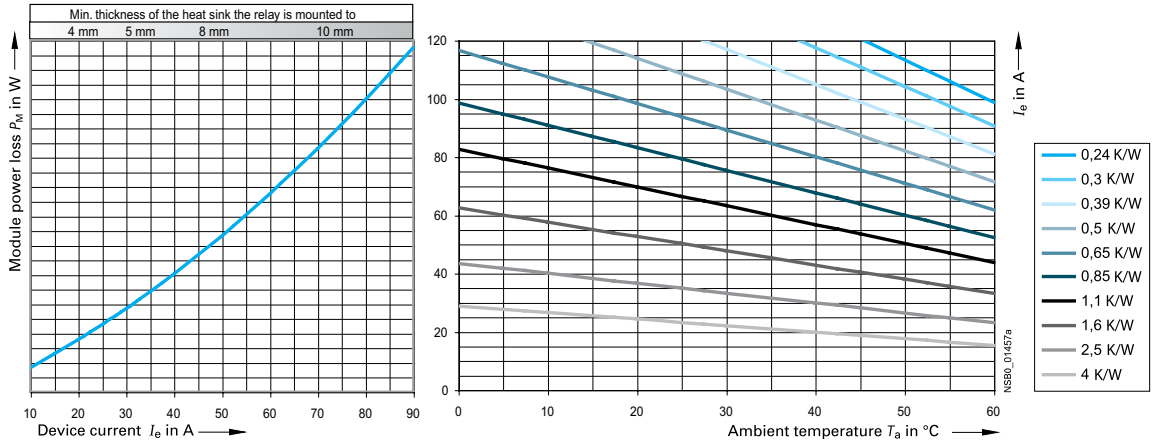
This results in: $dT_{ha} = R_{thha} \times P_M$ = 1.7 K/W x 28 W = 47.6 K. At **dT_{ha} = 47.6 K** the heat sink must therefore have an **R_{thha} = 1.7 K/W**.
(Chart data for SIRIUS SC relays based on I max)

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)



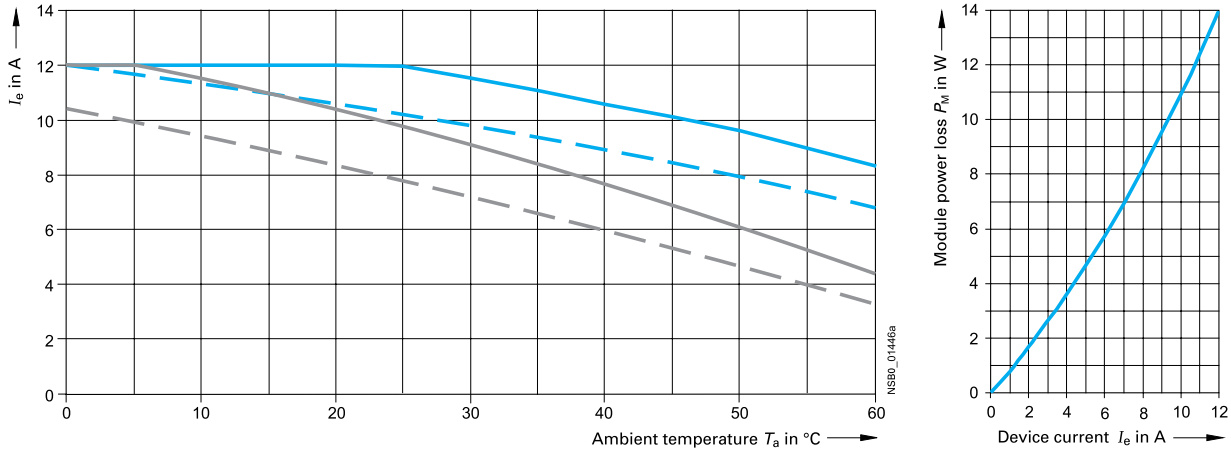
SIRIUS SC semiconductor relay with 88 A type current (3RF21 90/3RF20 90)



SIRIUS SC semiconductor contactors

Derating curves

SIRIUS SC semiconductor contactor with 10 A type current (3RF23 10)



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

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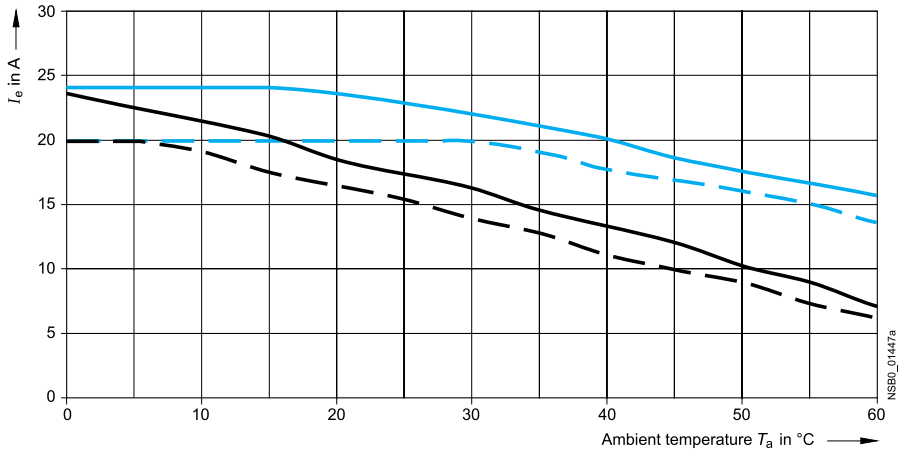
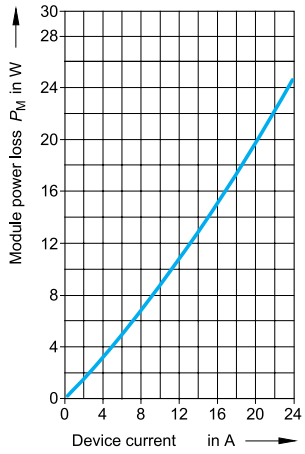
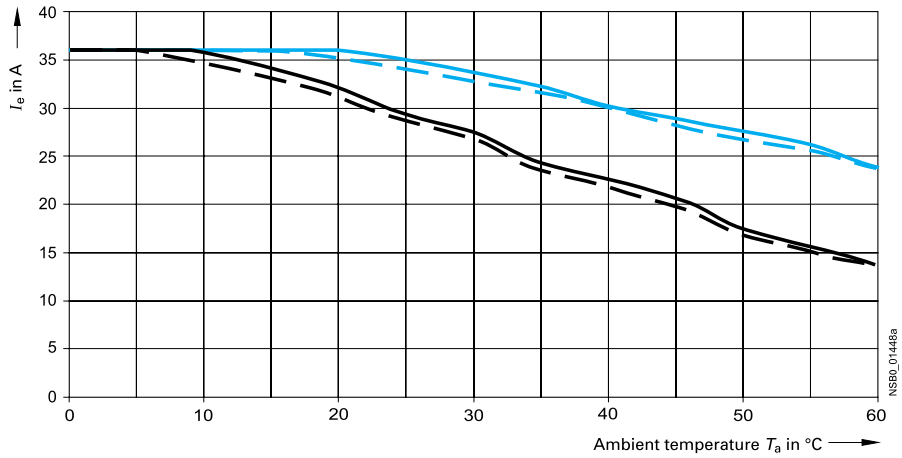
Derating curves

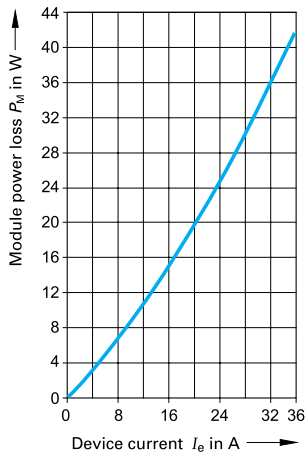
SIRIUS SC semiconductor contactor with 20 A type current (3RF23 20)



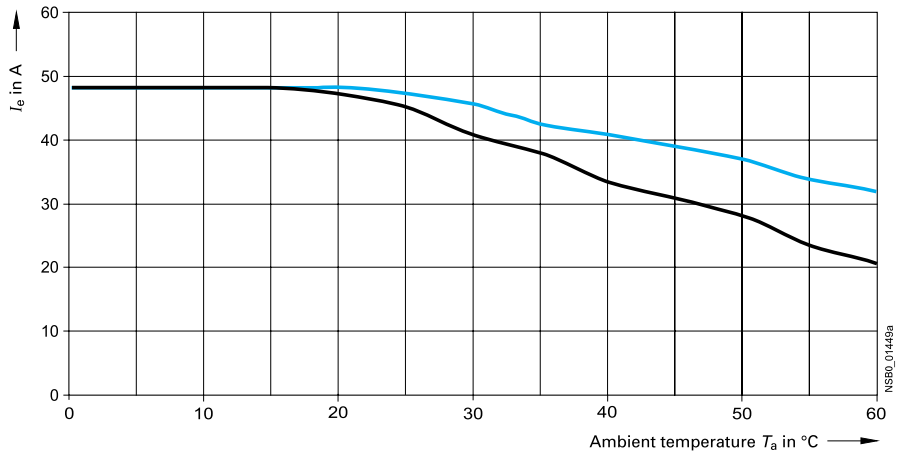


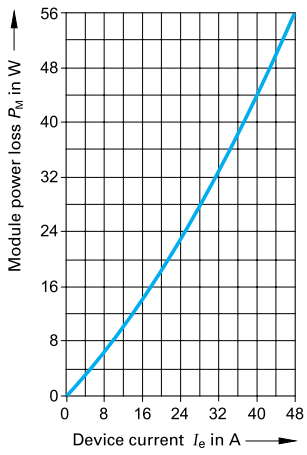
SIRIUS SC semiconductor contactor with 30 A type current (3RF23 30)





SIRIUS SC semiconductor contactor with 40 A type current (3RF23 40)[1)]





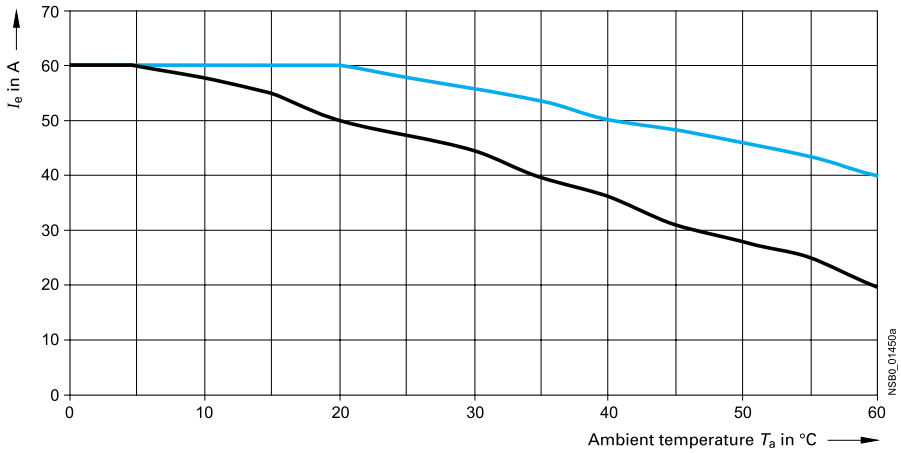
I_{max} Thermal limit current for individual mounting
I_{max} Thermal limit current for side-by-side mounting
I_{IEC} Current acc. to IEC 947-4-3 for individual mounting
I_{IEC} Current acc. to IEC 947-4-3 for side-by-side mounting

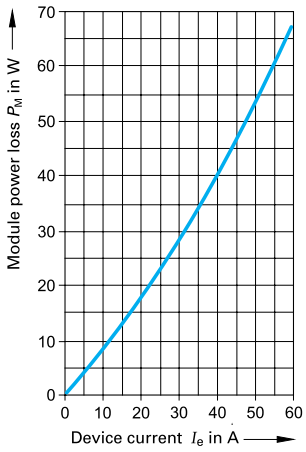
NSB0_01474

1) Identical current/temperature curves for individual and side-by-side mounting.

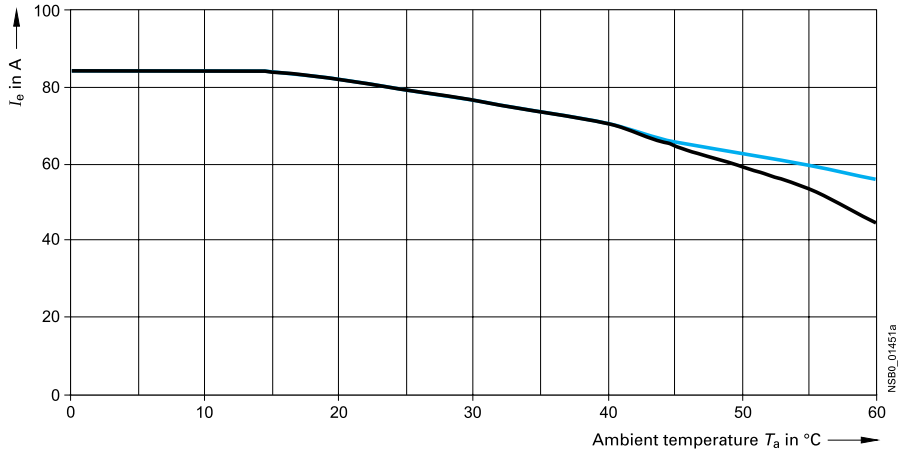
Derating curves

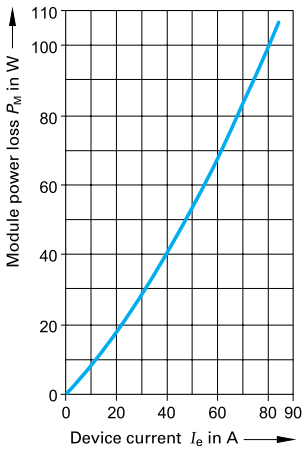
SIRIUS SC semiconductor contactor with 50 A type current (3RF23 50)[1)]



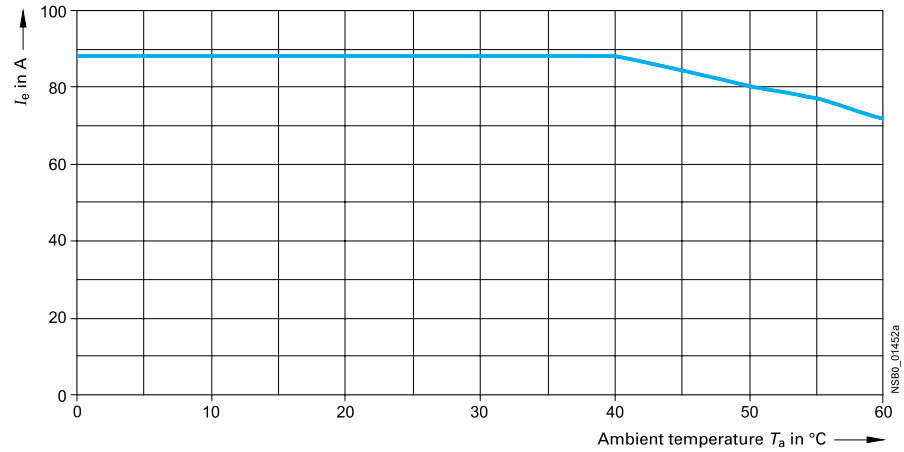


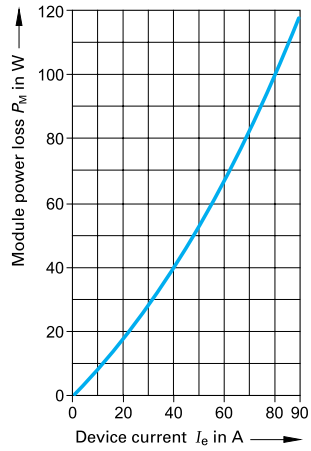
SIRIUS SC semiconductor contactor with 70 A type current (3RF23 70)[1)]





SIRIUS SC semiconductor contactor with 88 A type current (3RF23 90)[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

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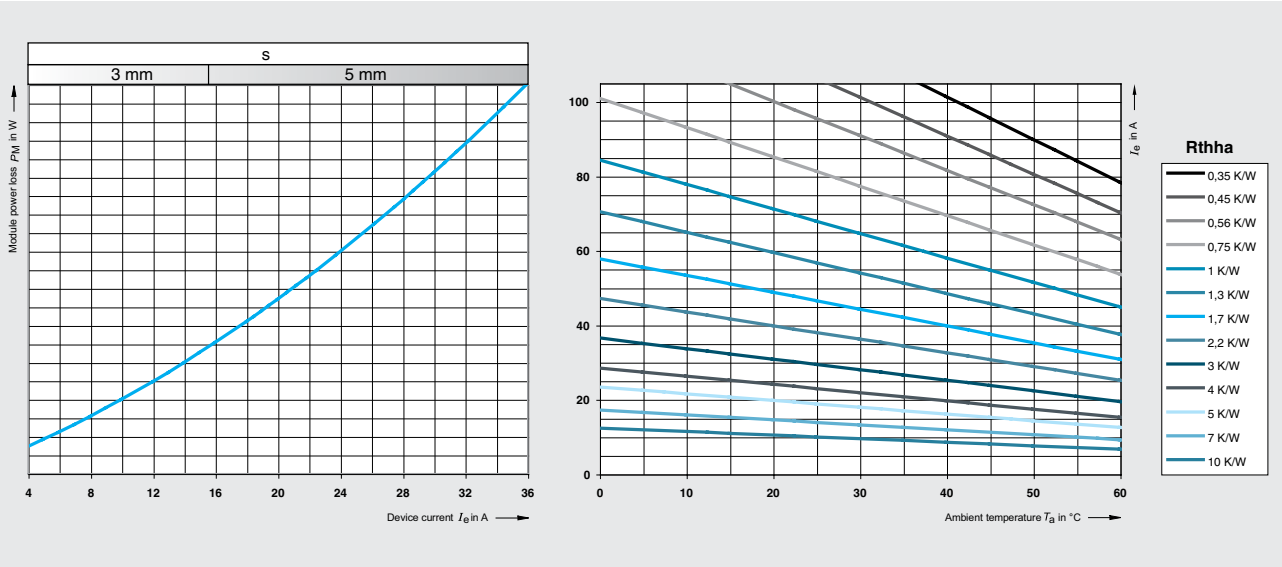
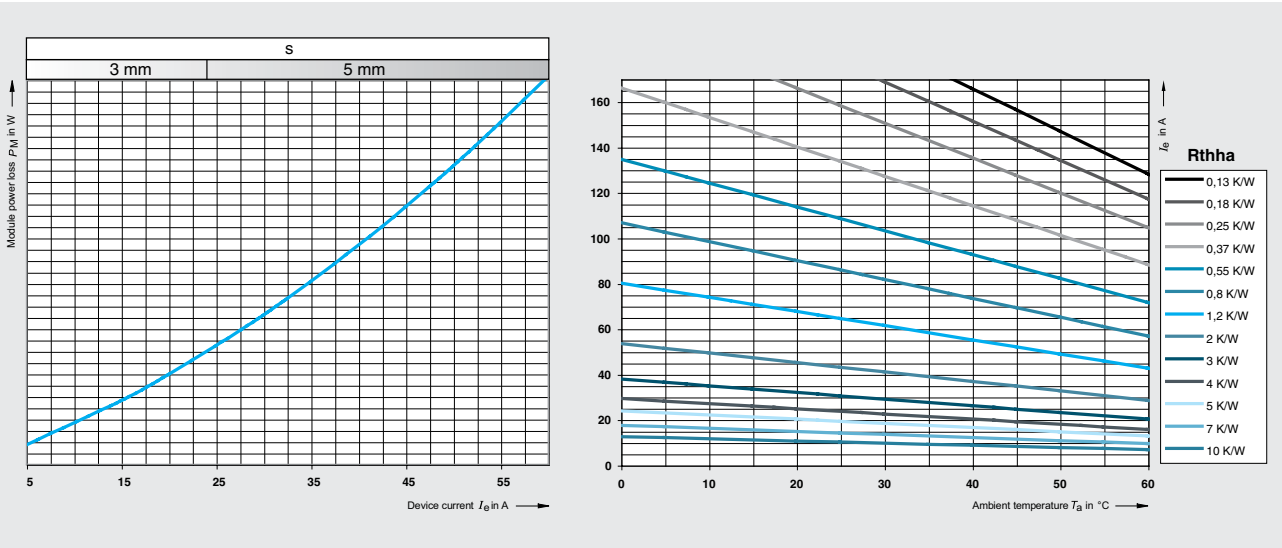
1) Identical current/temperature curves for individual and side-by-side mounting.

Characteristic curves

Dependence of the device current I_e on the ambient temperature T_a (two-phase controlled)

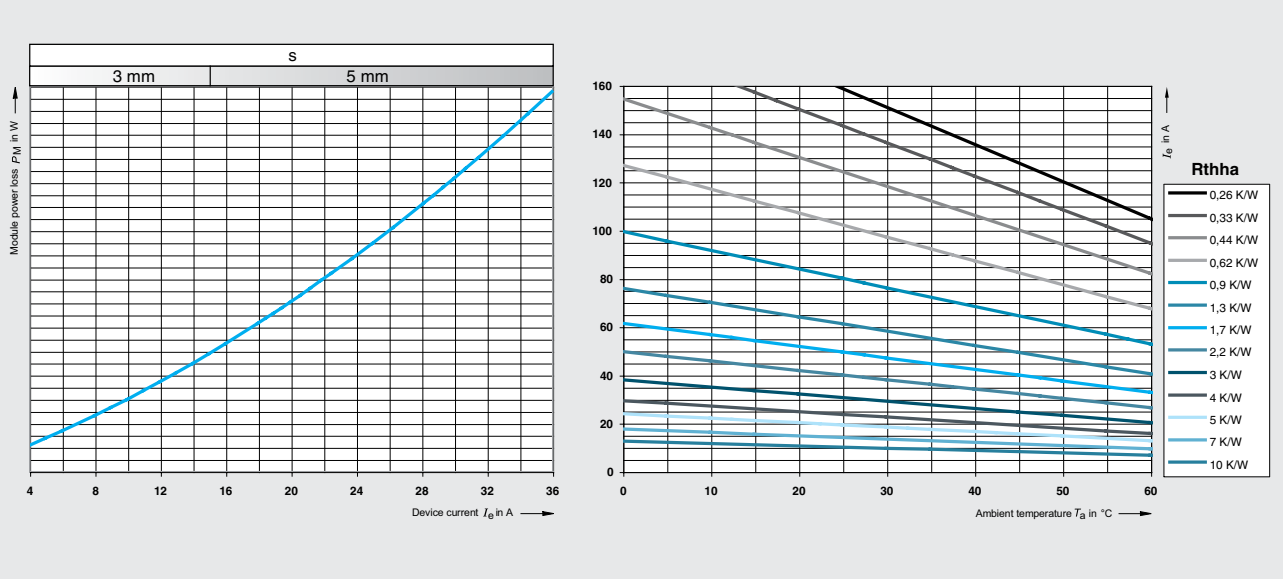


Type current 30 A (3RF22 30-.AB..)

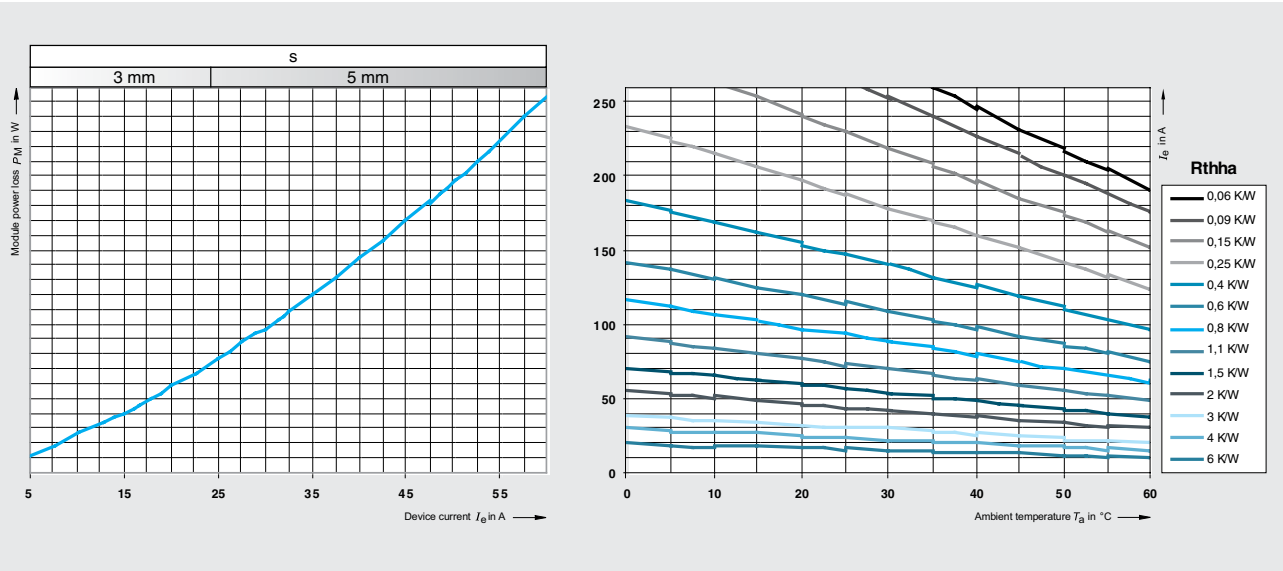


Type current 55 A (3RF22 55-.AB..)

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 on the left → P_M = 227 W,
from the diagram on the right → R_{thha} = 0.09 K/W.

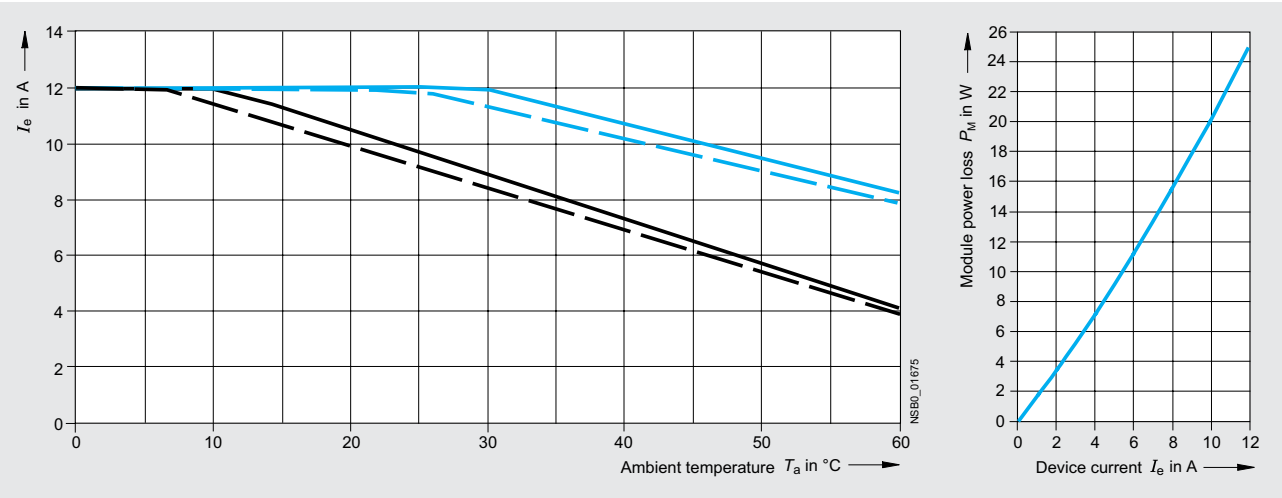
This results in:

$dT_{ha} = R_{thha} \times PM = 0.09\ K/W \times 227\ W = 20.4\ K$.

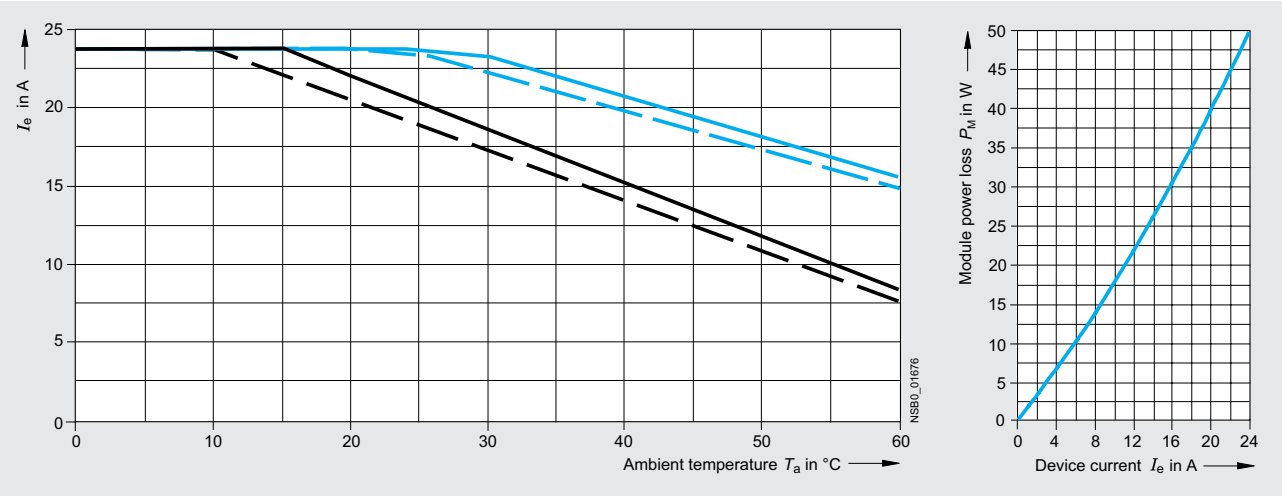
At dT_{ha} = 20.4 K the heat sink must therefore have an R_{thha} = 0.09 K/W.

Characteristic curves

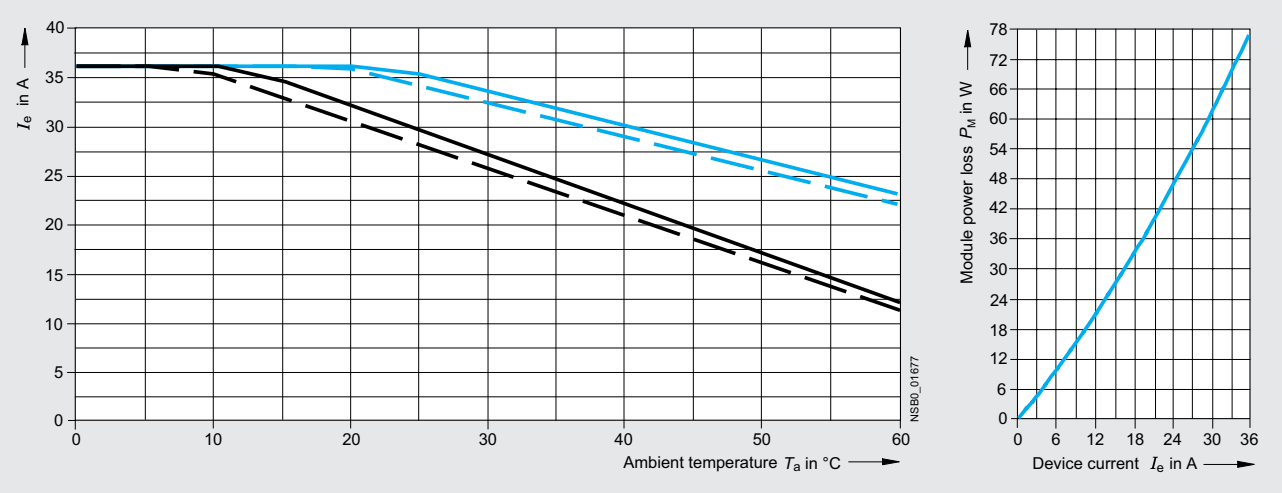
Derating curves, two-phase controlled



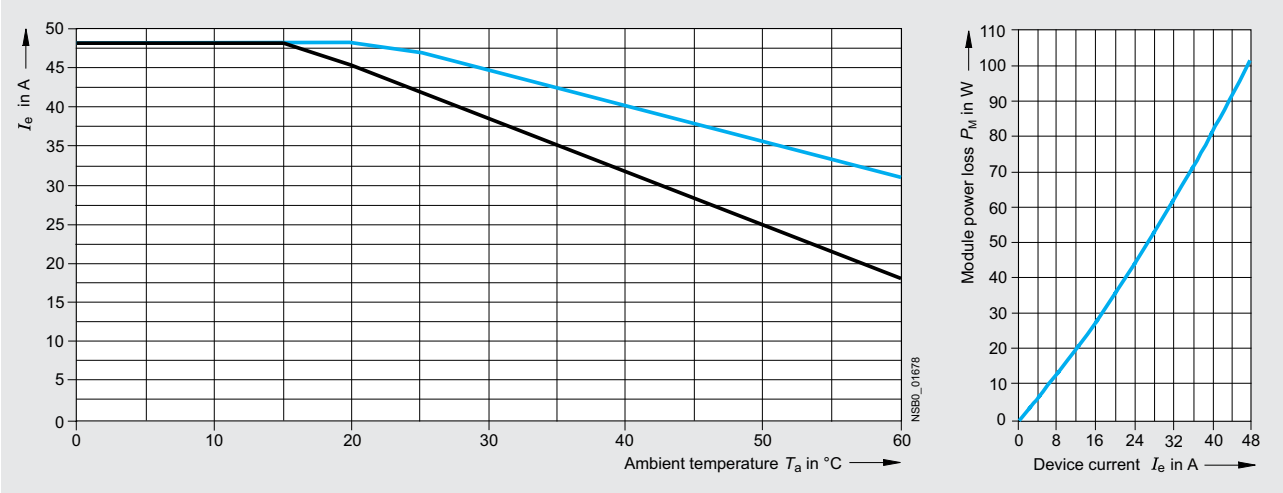
Type current 10.5 A (3RF24 10-.AB..)



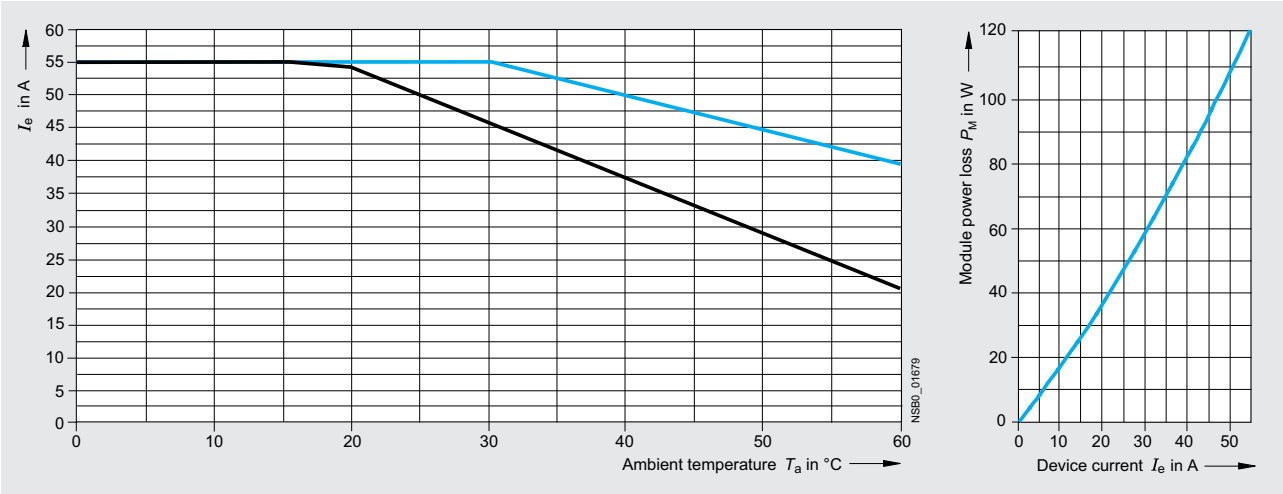
Type current 20 A (3RF24 20-.AB..)



Type current 30 A (3RF24 30-.AB..)



Type current 40 A (3RF24 40-.AB..)[1)]

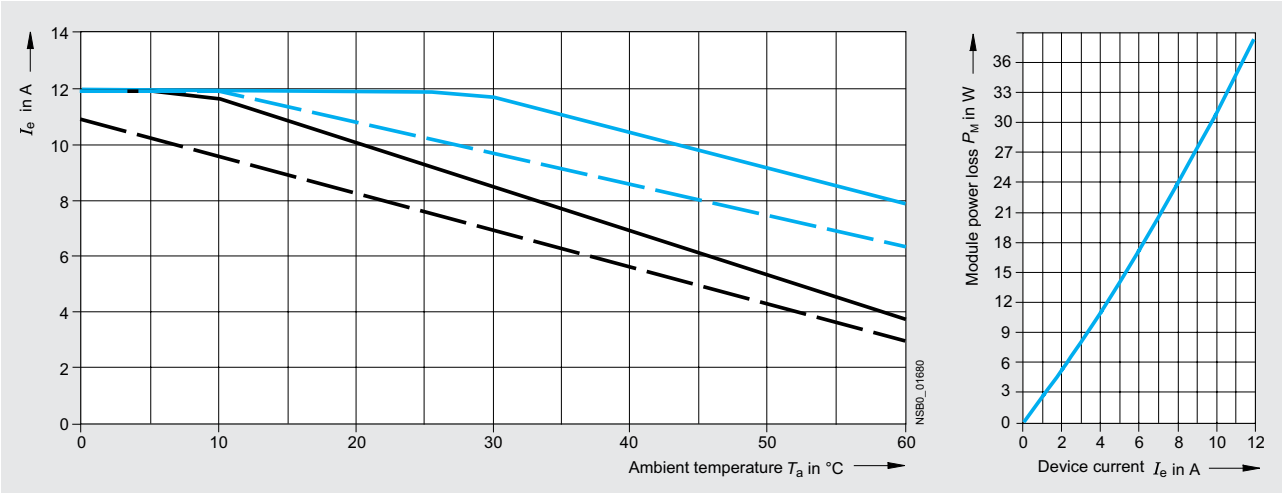


Type current 50 A (3RF24 50-.AB..)[1)]

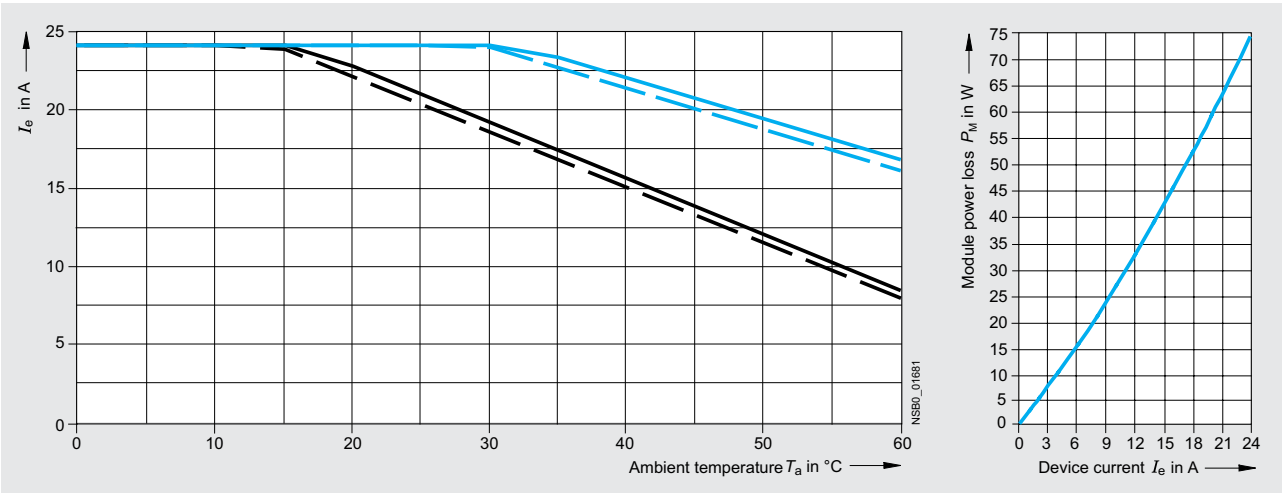
- I_{max} Thermal limit current for individual mounting
- I_{max} Thermal limit current for side-by-side mounting
- I_{IEC} Current acc. to IEC 947-4-3 for individual mounting
- I_{IEC} Current acc. to IEC 947-4-3 for side-by-side mounting

1) Identical current/temperature curves for stand-alone and side-by-side installation.

Derating curves, three-phase controlled

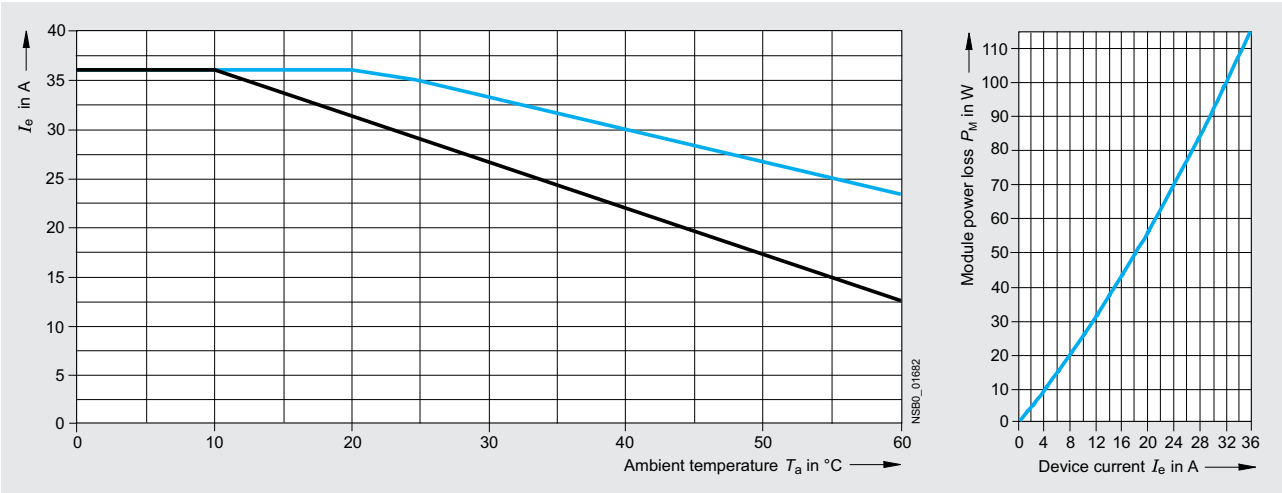


Type current 10.5 A (3RF24 10-.AC..)



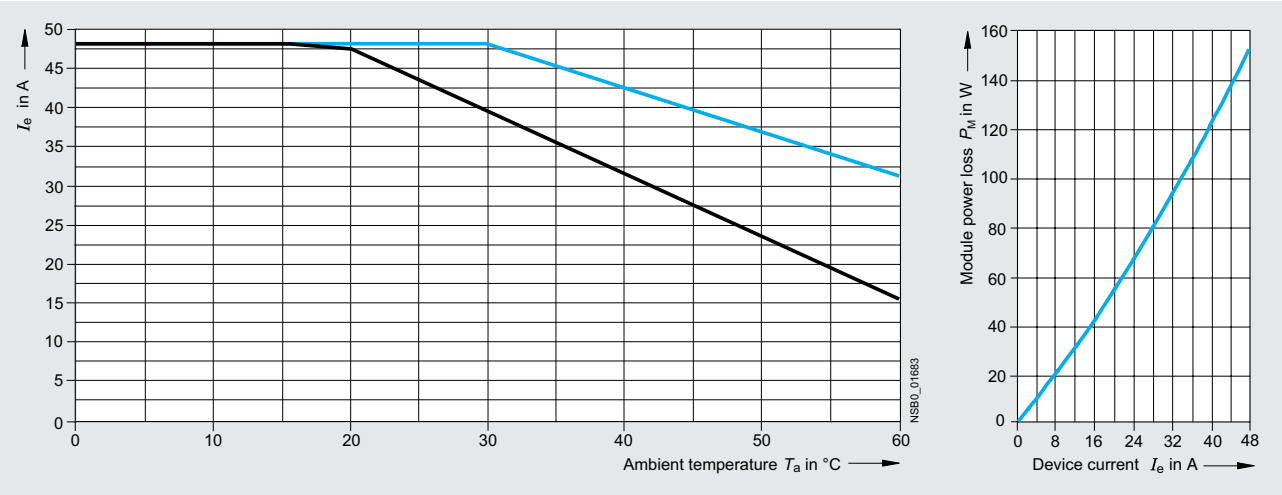
Type current 20 A (3RF24 20-.AC..)

1) Identical current/temperature curves for stand-alone and side-by-side installation.

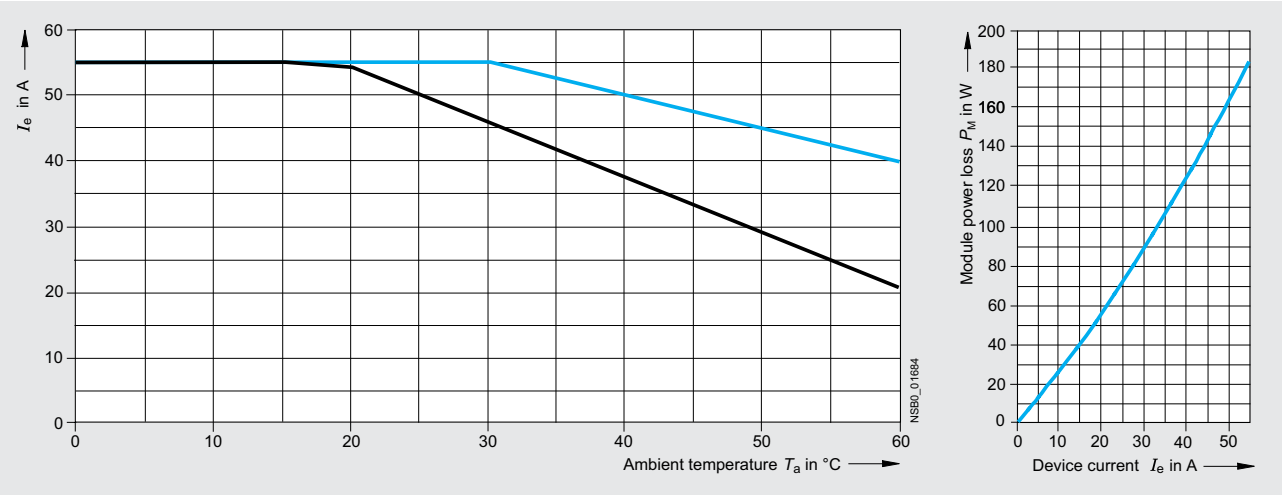


Type current 30 A (3RF24 30-.AC..)[1)]

1) Identical current/temperature curves for stand-alone and side-by-side installation.



Type current 40 A (3RF24 40-.AC..)[1)]

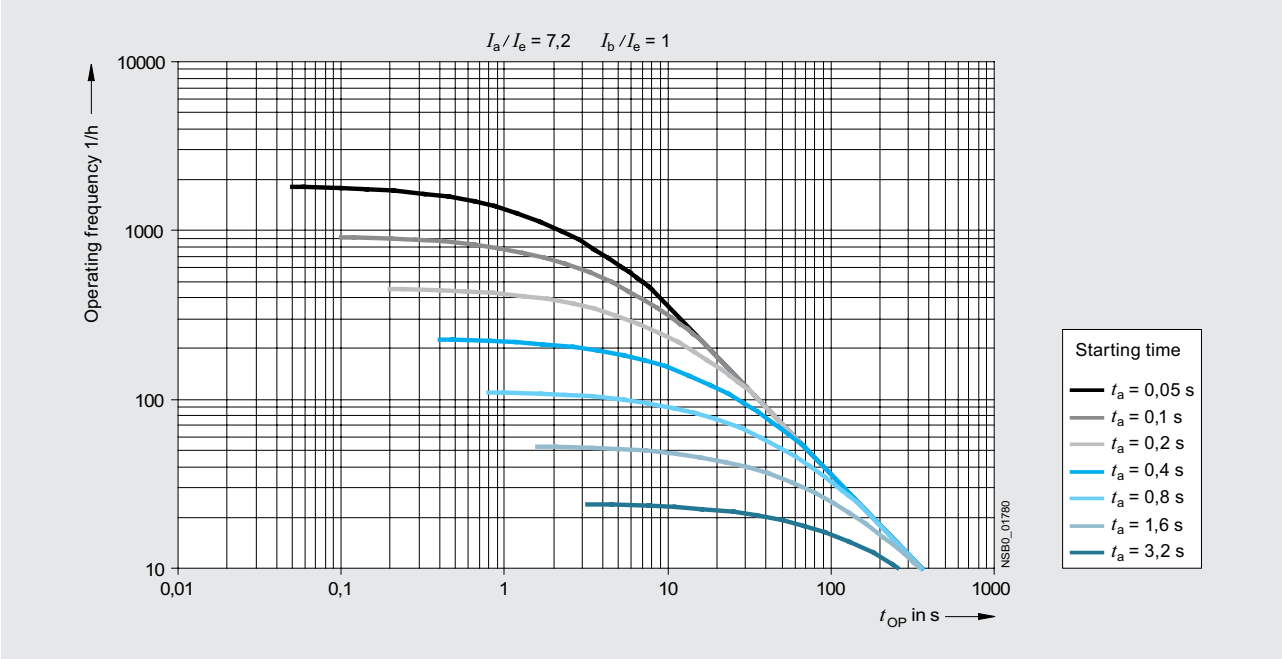


Type current 50 A (3RF24 50-.AC..)[1)]

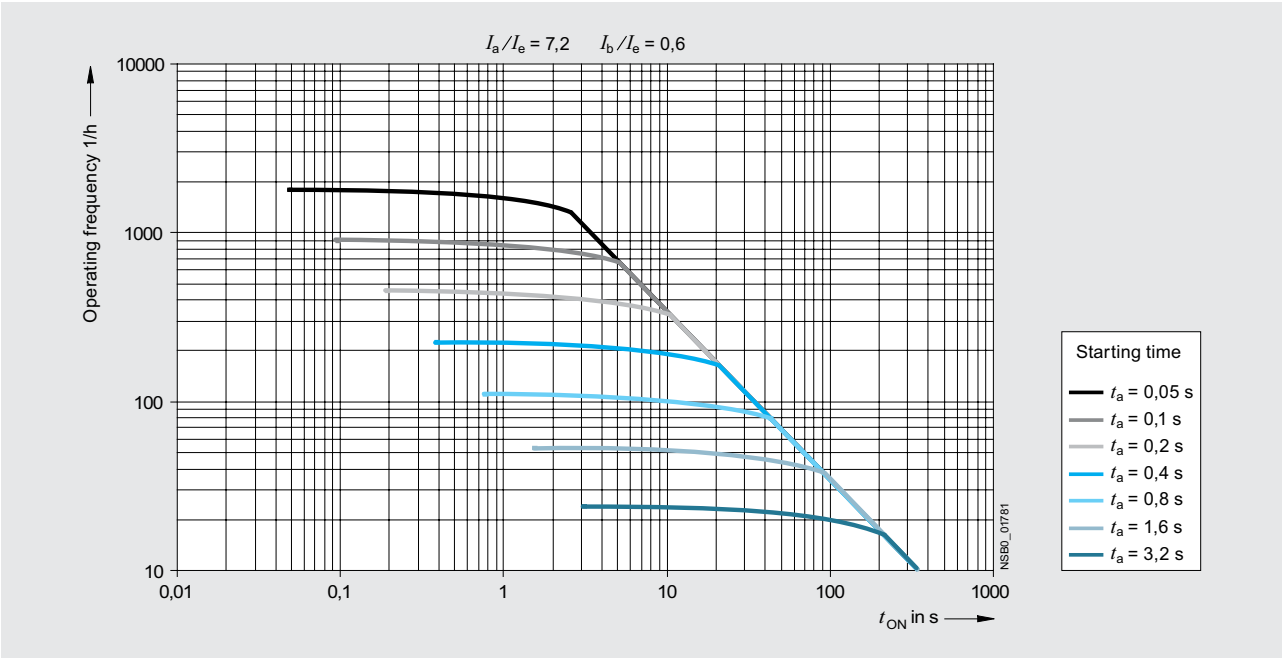
- I_{max} Thermal limit current for individual mounting
- I_{max} Thermal limit current for side-by-side mounting
- I_{IEC} Current acc. to IEC 947-4-3 for individual mounting
- I_{IEC} Current acc. to IEC 947-4-3 for side-by-side mounting

1) Identical current/temperature curves for stand-alone and side-by-side installation.

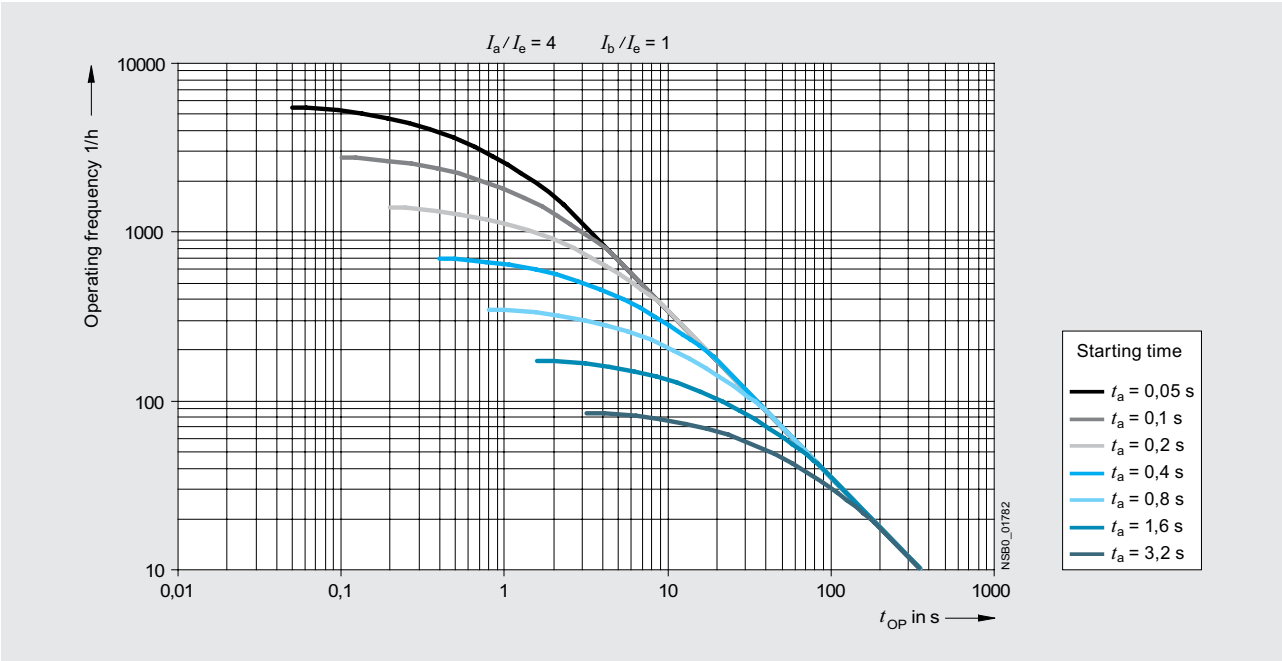
Maximum permissible switching frequency depending on the starting time t_a and the ON period t_{ED}



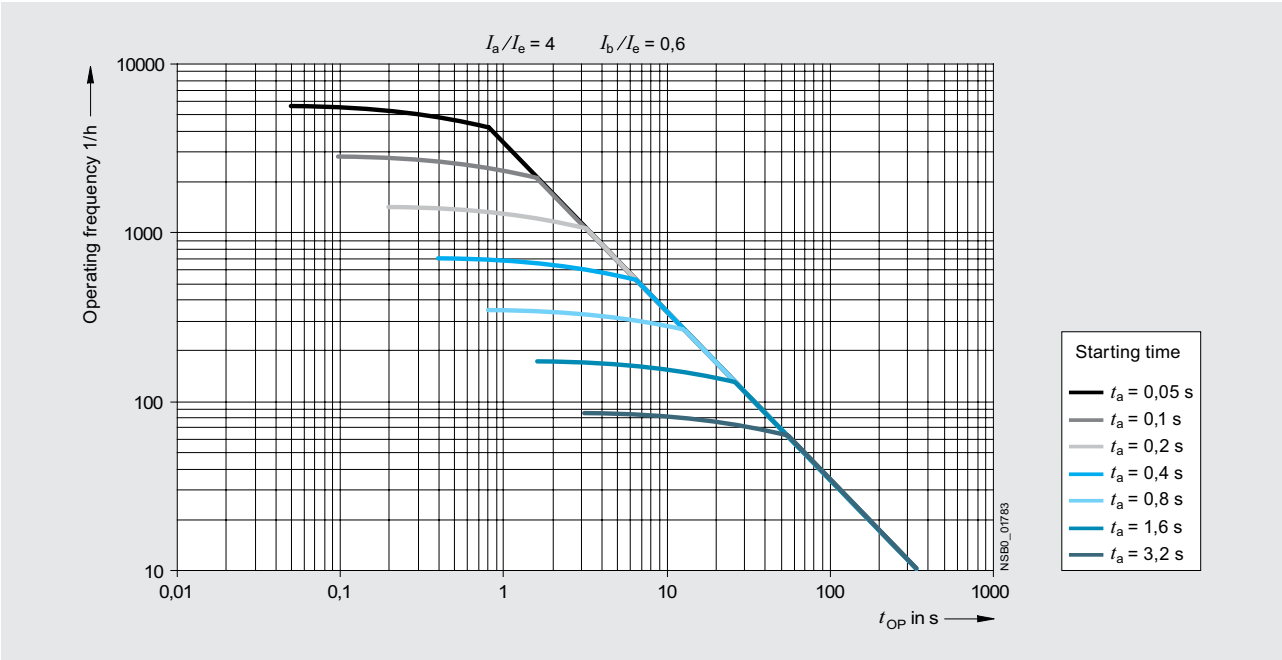
For motors with a starting current of 4- to 7.2 times the rated current and with a full load



For motors with a starting current of 4- to 7.2 times the rated current and with a 60 % load

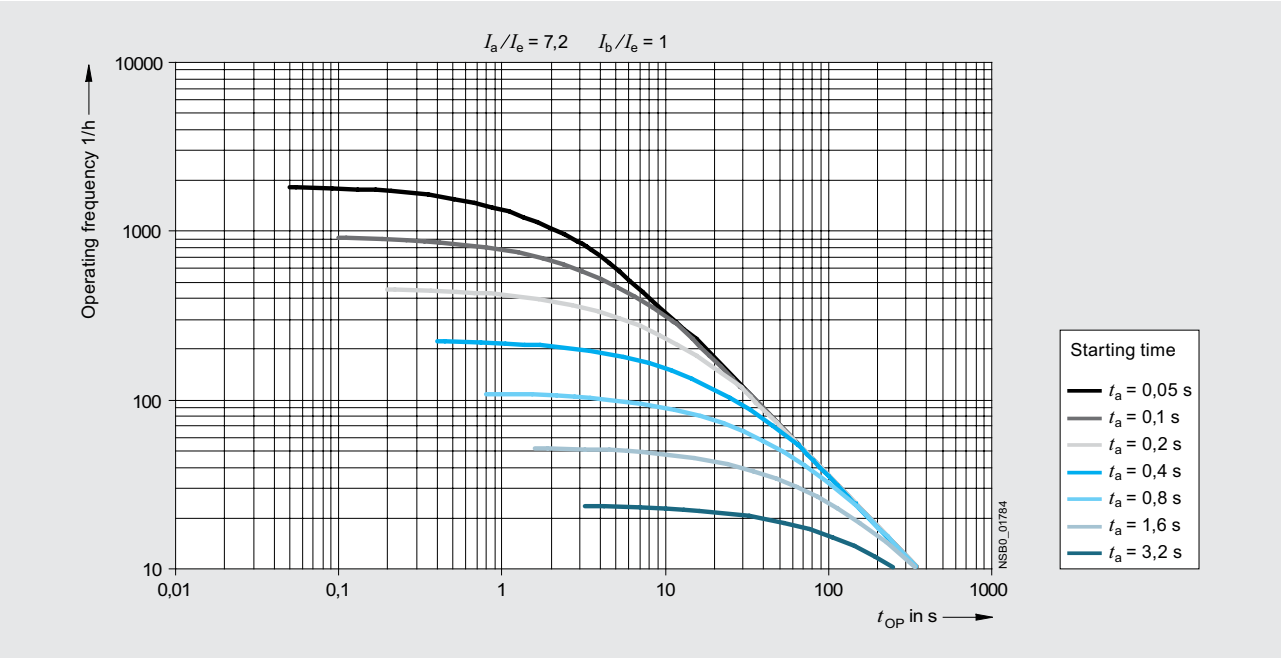


For motors with a starting current of up to 4 times the rated current and with a full load

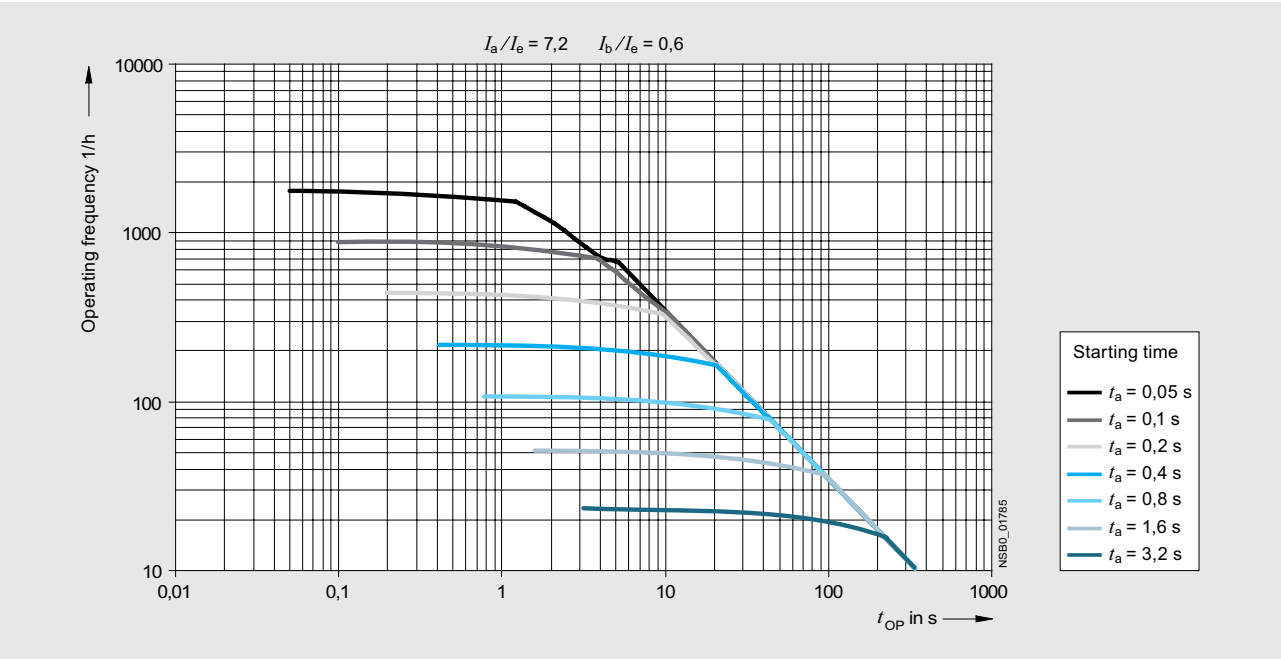


For motors with a starting current of up to 4 times the rated current and with a 60 % load

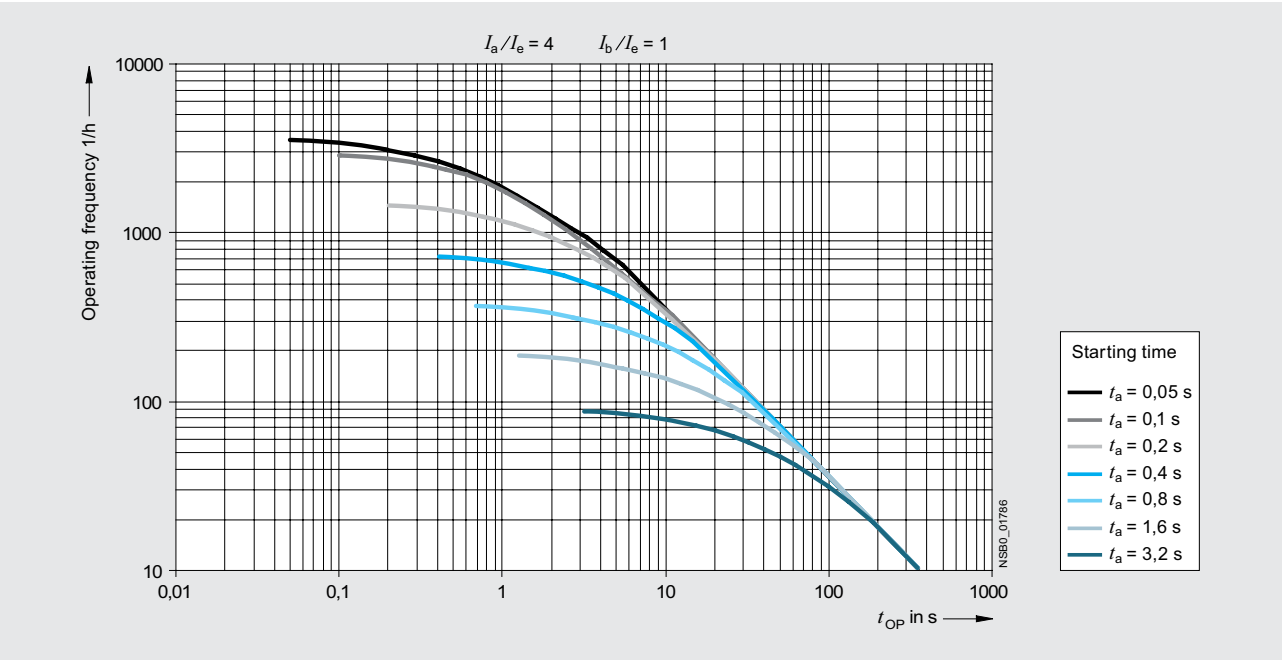
Maximum permissible switching frequency depending on the starting time t_a and the ON period t_{ED}



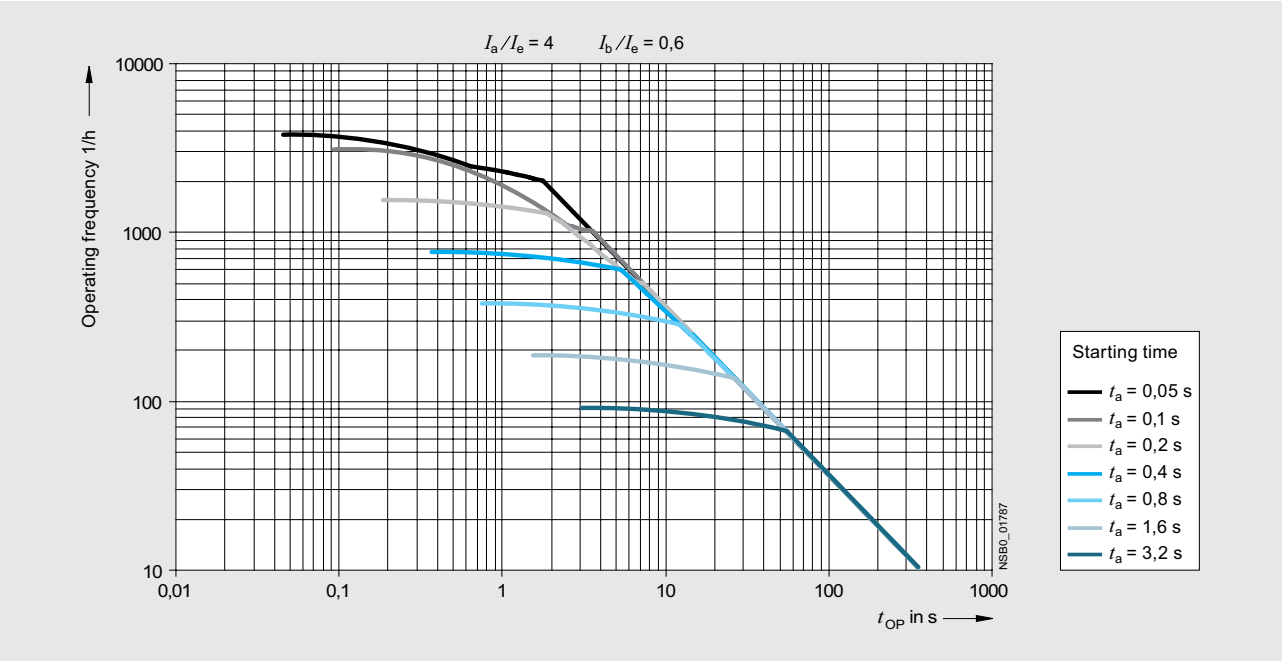
For motors with a starting current of 4- to 7.2 times the rated current and with a full load



For motors with a starting current of 4- to 7.2 times the rated current and with a 60 % load



For motors with a starting current of up to 4 times the rated current and with a full load

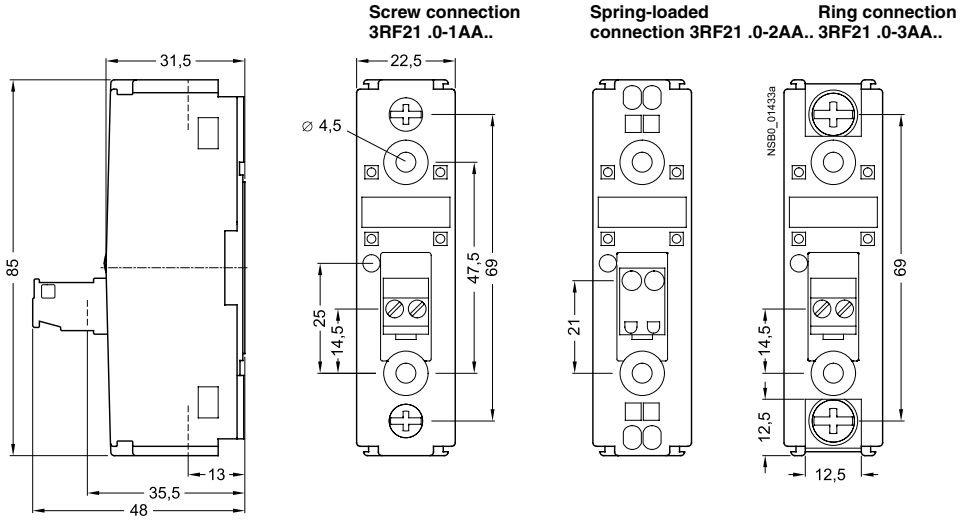


For motors with a starting current of up to 4 times the rated current and with a 60 % load

Dimension drawings

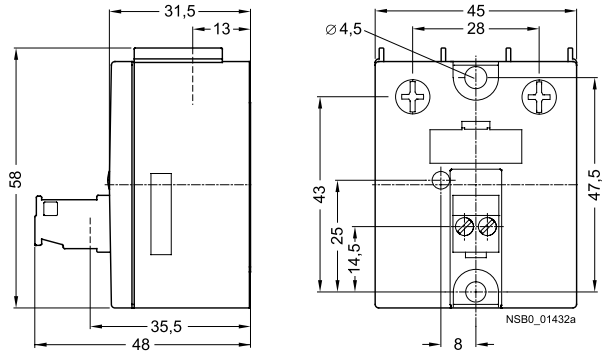
SIRIUS SC semiconductor relays

22.5 mm semiconductor relays



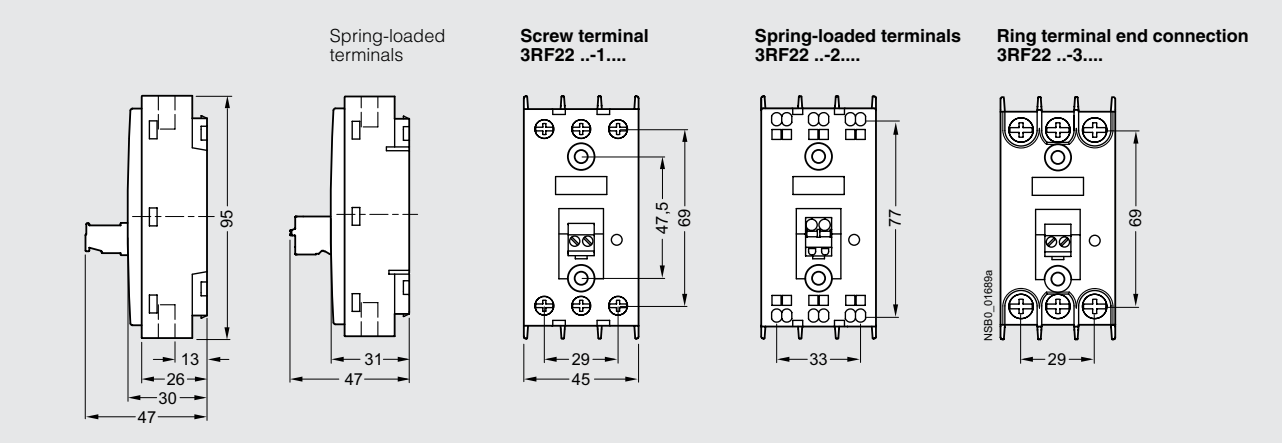
45 mm semiconductor relays

3RF20 .0-1AA.



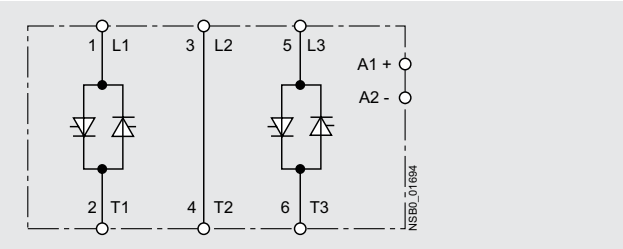
Dimensional drawings

Solid-state relays

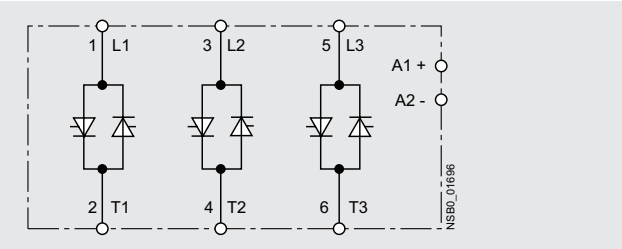


Schematics

Two-phase controlled
DC control supply voltage



Three-phase controlled
DC control supply voltage

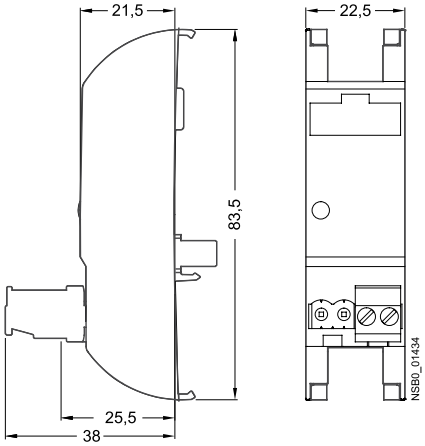


Dimensions

Function modules for SIRIUS SC semiconductor switching devices

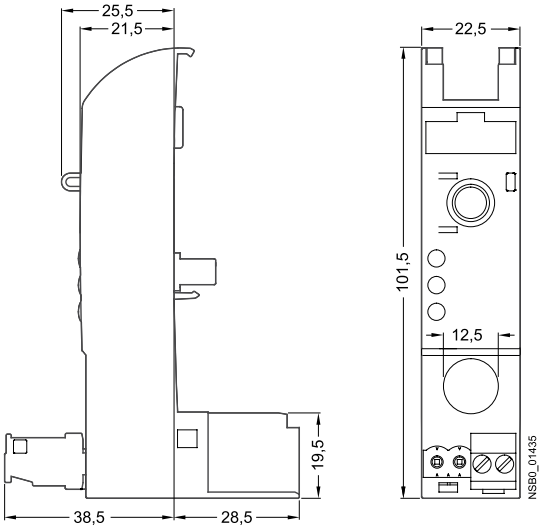
Converters

3RF29 00-0EA18



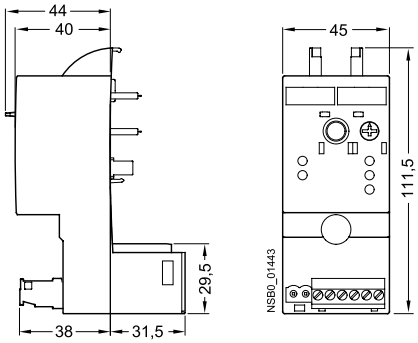
Basic load monitoring

3RF29 00-0FA08



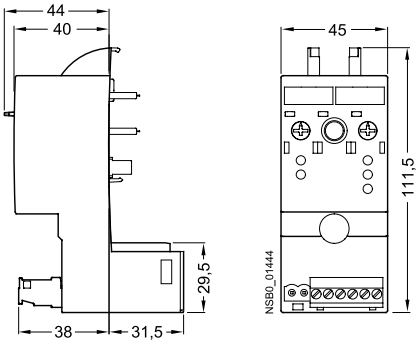
Extended load monitoring

3RF29 .0-0GA..



Power controllers

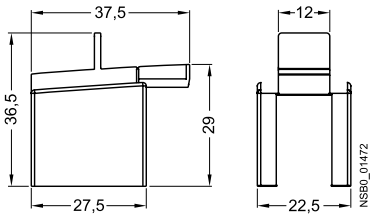
3RF29 .0-0HA..



Accessories for SIRIUS SC semiconductor switching devices

Terminal cover for SIRIUS semiconductor switching devices

3RF29 00-3PA88

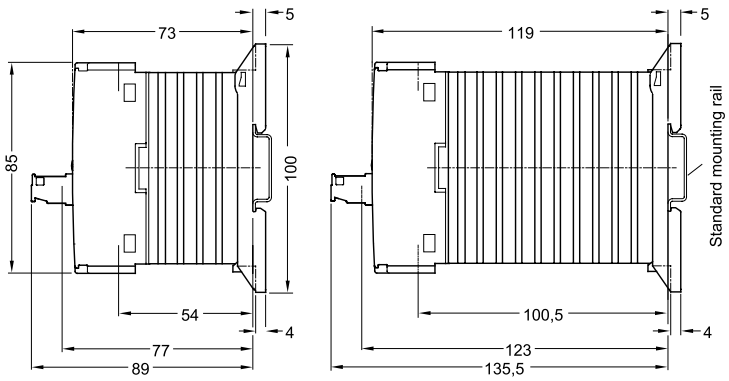


Dimensions

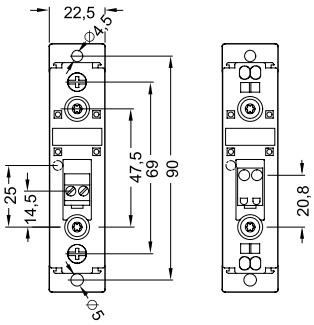
SIRIUS SC semiconductor contactors

Semiconductor contactors with 10 A and 20 A type current

3RF23 10-..... **3RF23 20-.....**

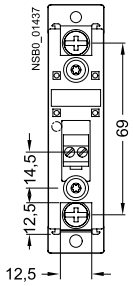


Screw connection
3RF23 10-1....
3RF23 20-1....

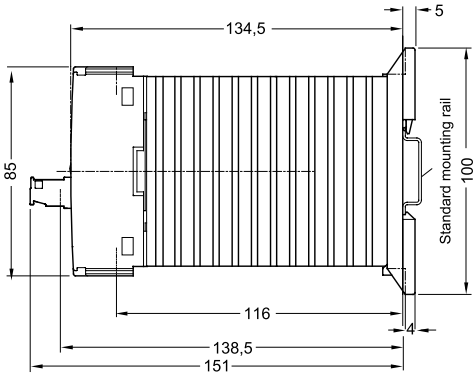


Spring-loaded connection
3RF23 10-2....
3RF2320-2....

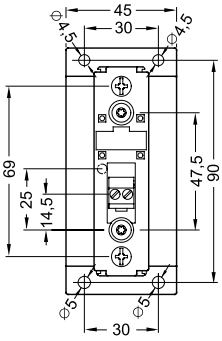
Ring connection
3RF23 10-3....
3RF23 20-3....



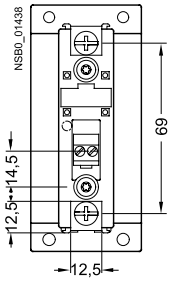
Semiconductor contactors with 30 A type current



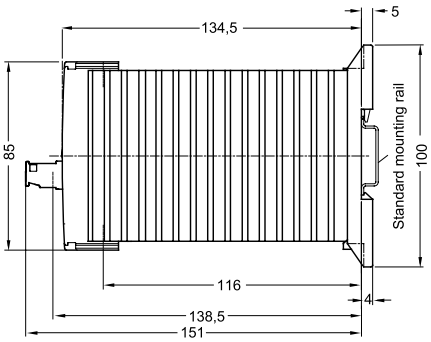
Screw connection
3RF23 30-1....



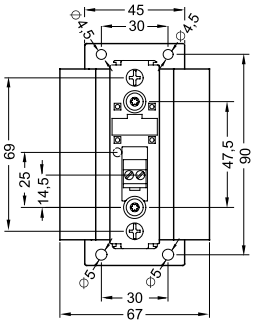
Ring connection
3RF23 30-3....



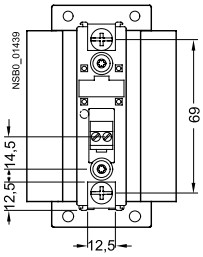
Semiconductor contactors with 40 A and 50 A type current



Screw connection
3RF23 40-1....
3RF23 50-1....

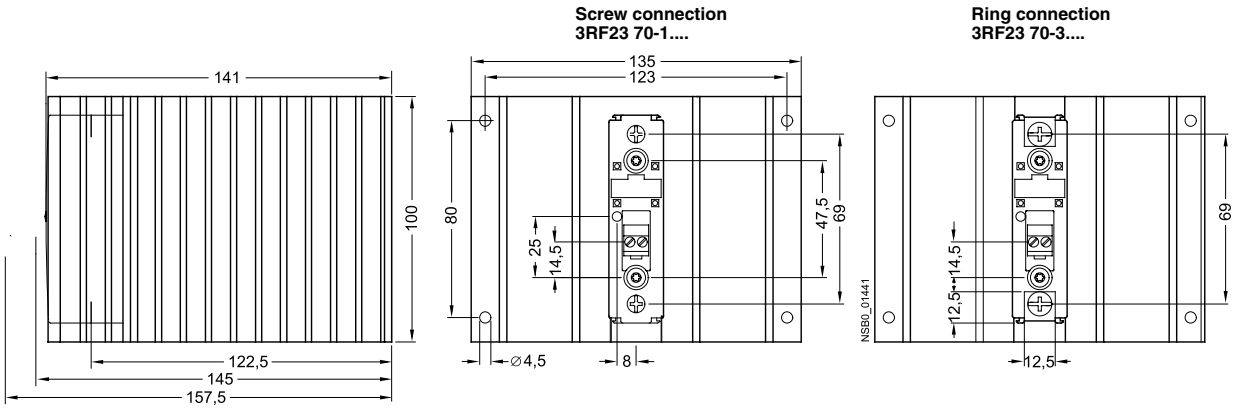


Ring connection
3RF23 40-3....
3RF23 50-3....

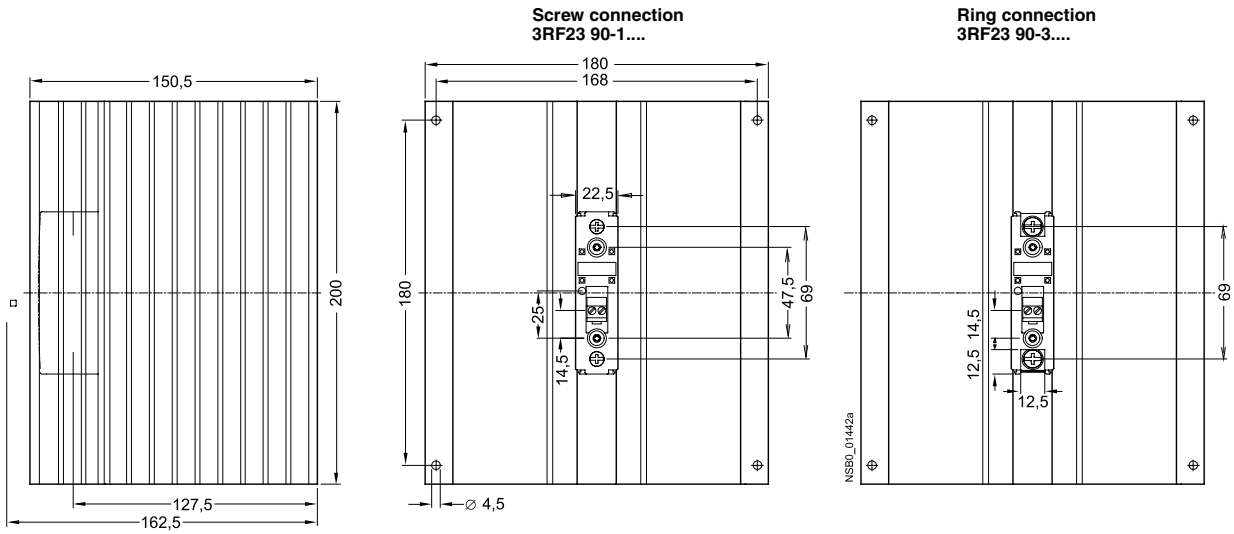


Dimensions

Semiconductor contactors with 70 A type current

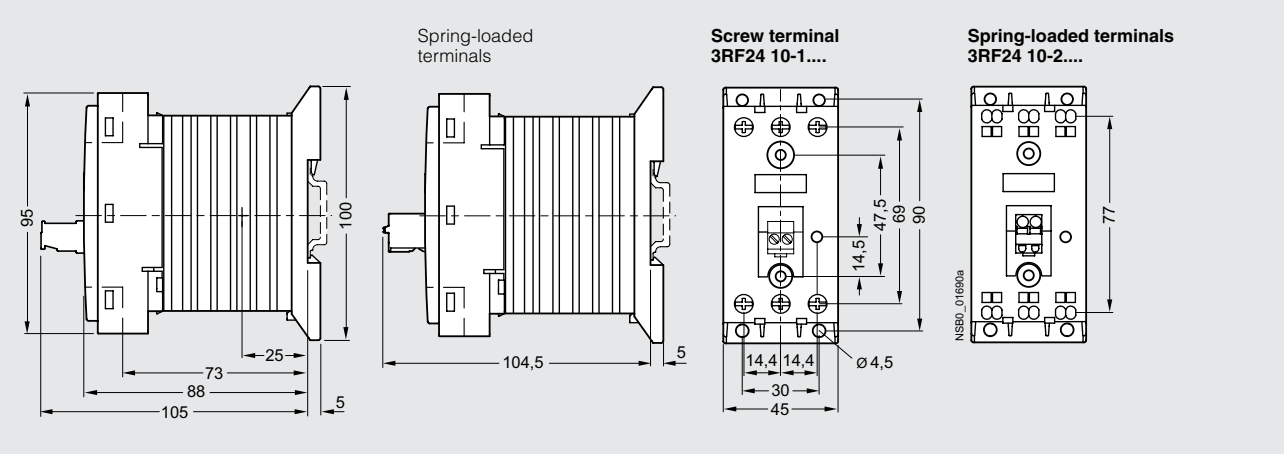


Semiconductor contactors with 88 A type current

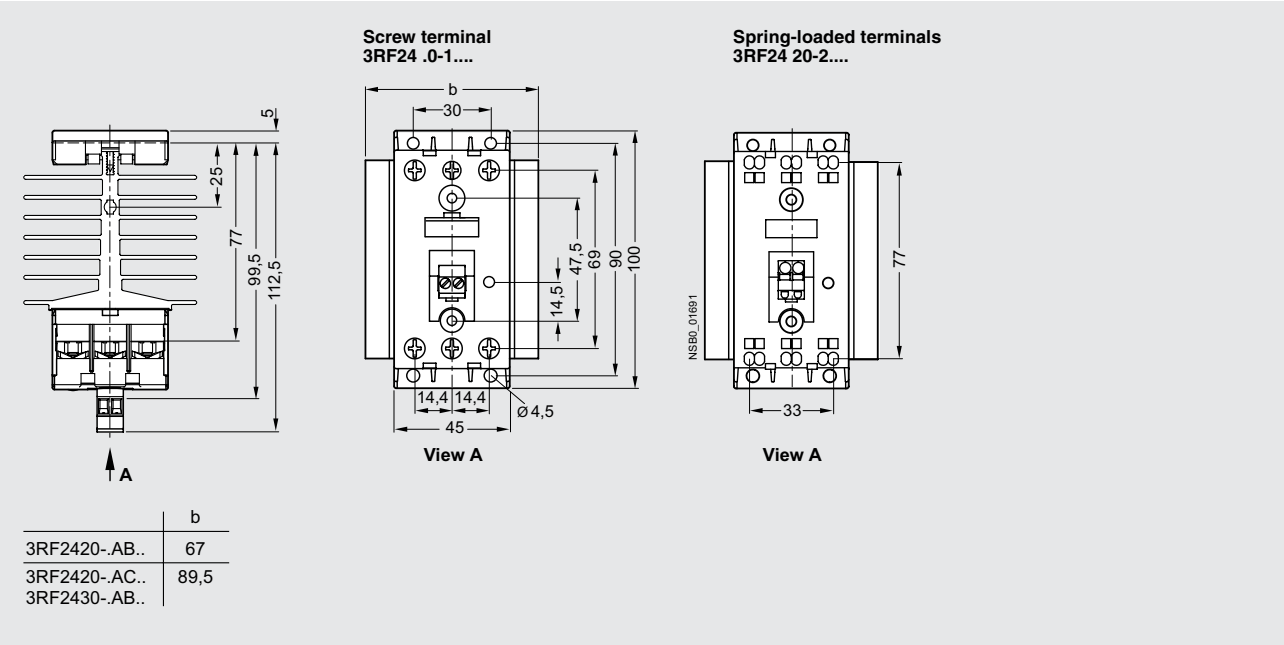


Dimensional drawings

Type current 10.5 A



Type current 20 A; 30 A (2-phase controlled)

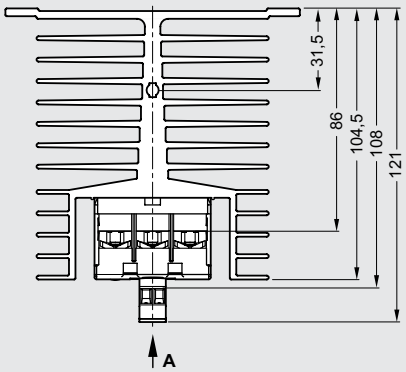


	b
3RF2420-.AB..	67
3RF2420-.AC.. 3RF2430-.AB..	89,5

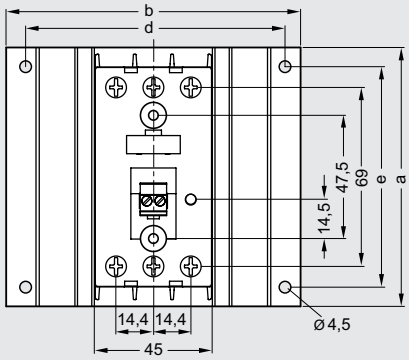
Solid-State Contactors

Dimensions

Type current 30 A (3-phase controlled); 40 A, 50 A

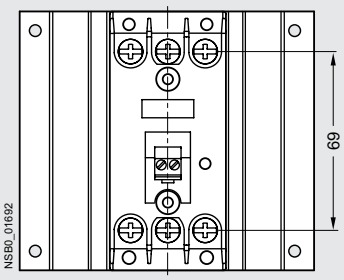


Screw terminal
3RF24 .0-1....



View A

Ring terminal end connection
3RF24 50-3....

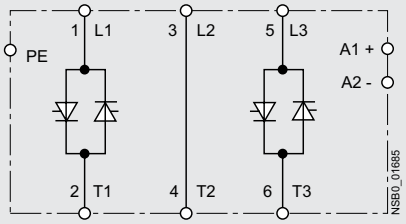


View A

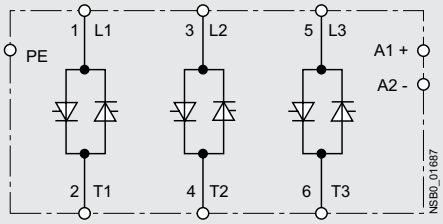
	a	b	d	e
3RF2430-.AC.. 3RF2440-.AB..	100	113,5	100	85
3RF2440-.AC.. 3RF2450-.AB..	100	157,5	146	80
3RF2450-.AC..	180	157,5	146	160

Schematics

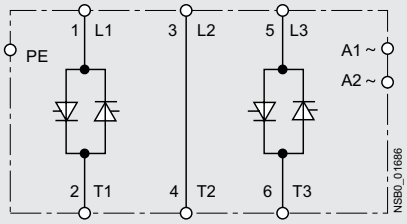
Two-phase controlled
DC control supply voltage



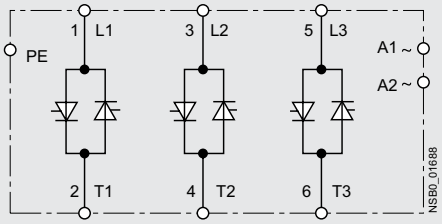
Three-phase controlled
DC control supply voltage



Two-phase controlled
AC control supply voltage

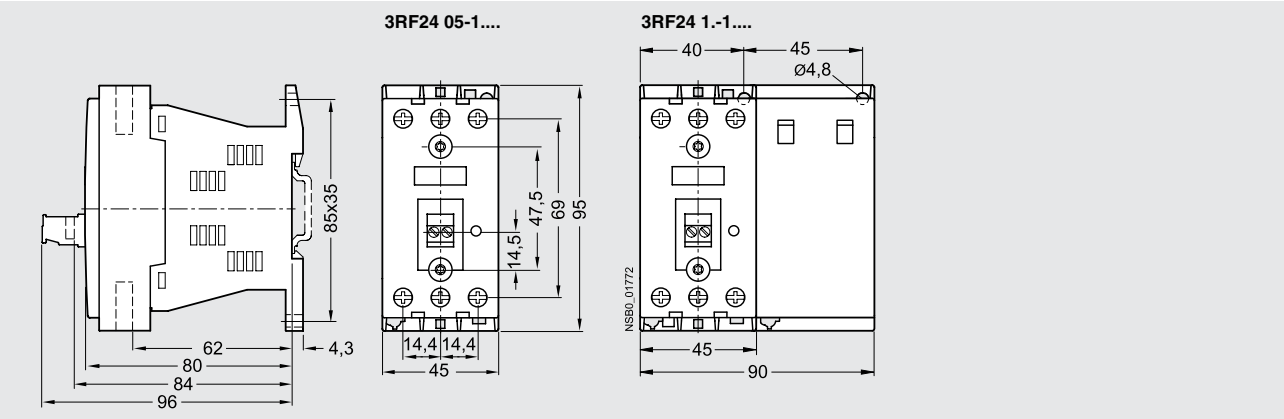


Three-phase controlled
AC control supply voltage

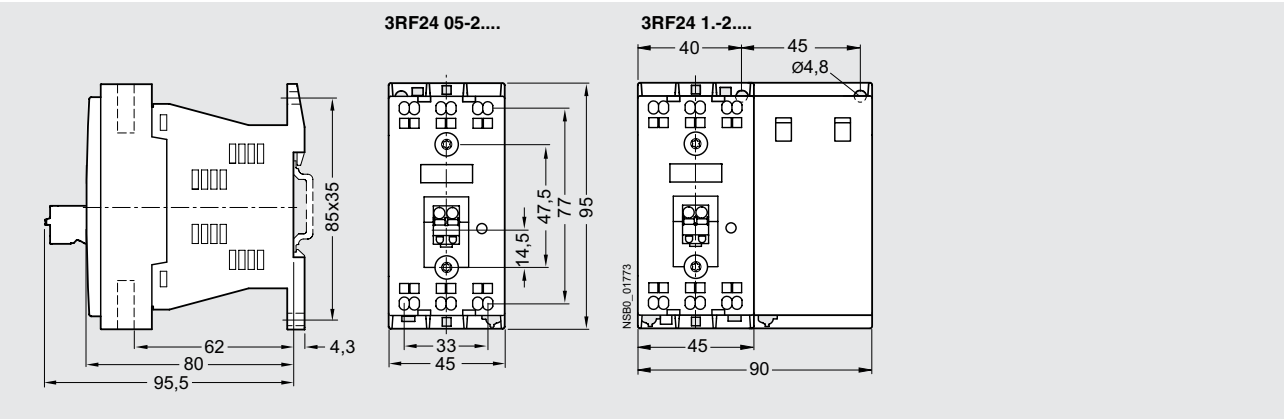


Dimensional drawings

Screw terminals

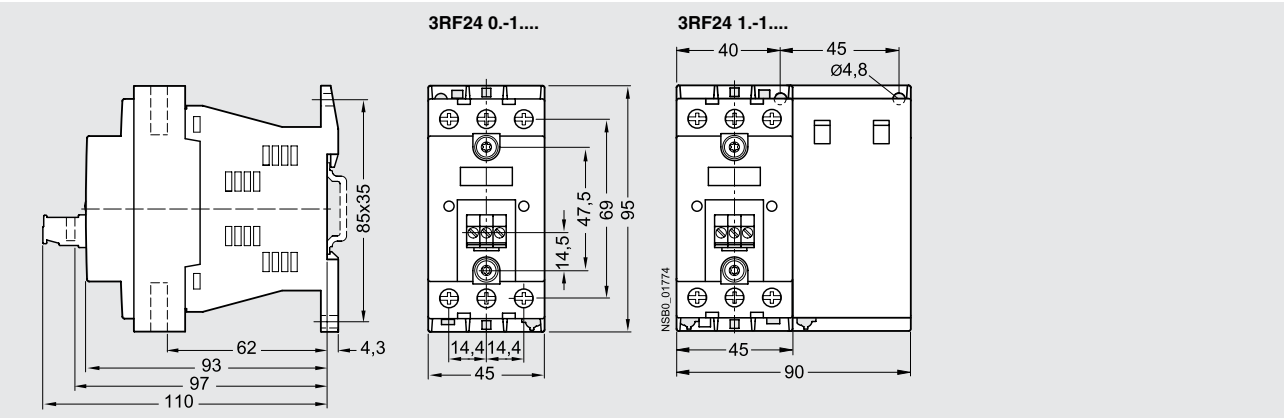


Spring-loaded terminals



Dimensional drawings

Screw terminals



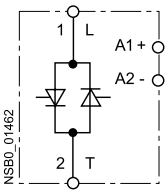
Semiconductor Relays and Contactors, Function Modules

Wiring diagrams

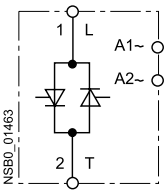
Circuit diagrams

SIRIUS SC semiconductor relays

DC control version

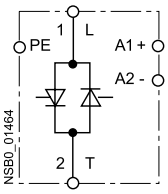


AC control version

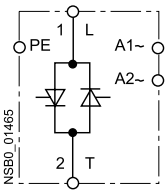


SIRIUS SC semiconductor contactors

DC control version

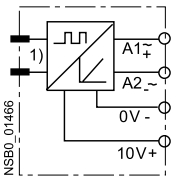


AC control version

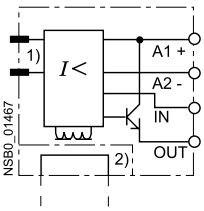


Function modules for SIRIUS SC semiconductor switching devices

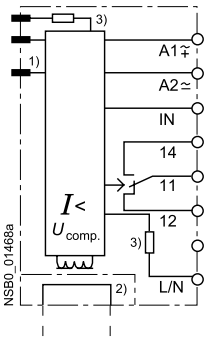
Converters



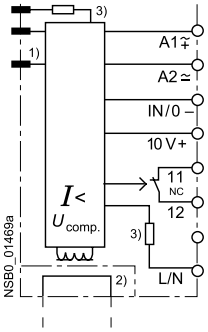
Basic load monitoring



Extended load monitoring



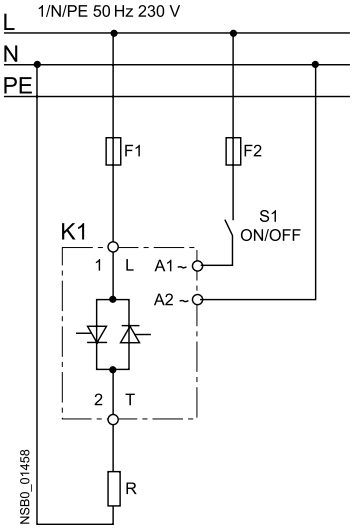
Power controllers



1) Internal connection.
2) Straight-through transformer.

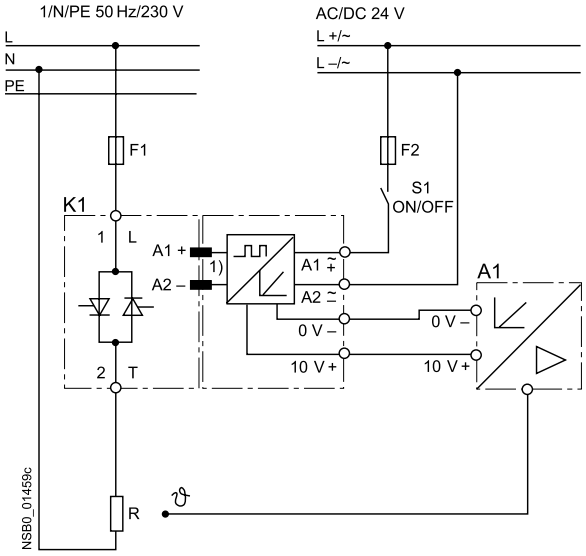
SIRIUS SC semiconductor relays

Typical circuit diagram

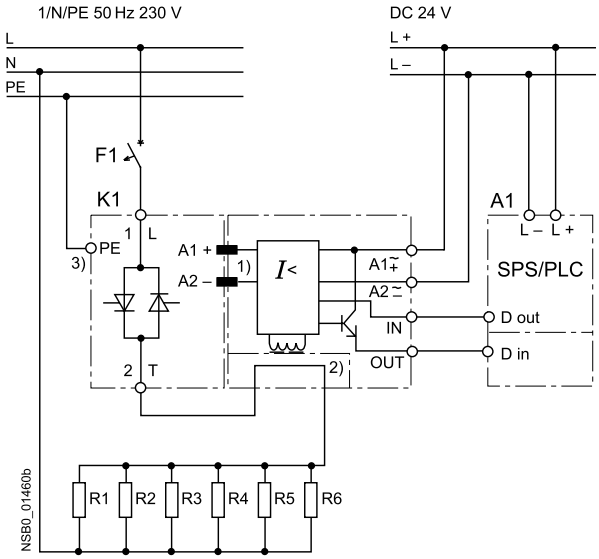


Function modules for SIRIUS SC semiconductor switching devices

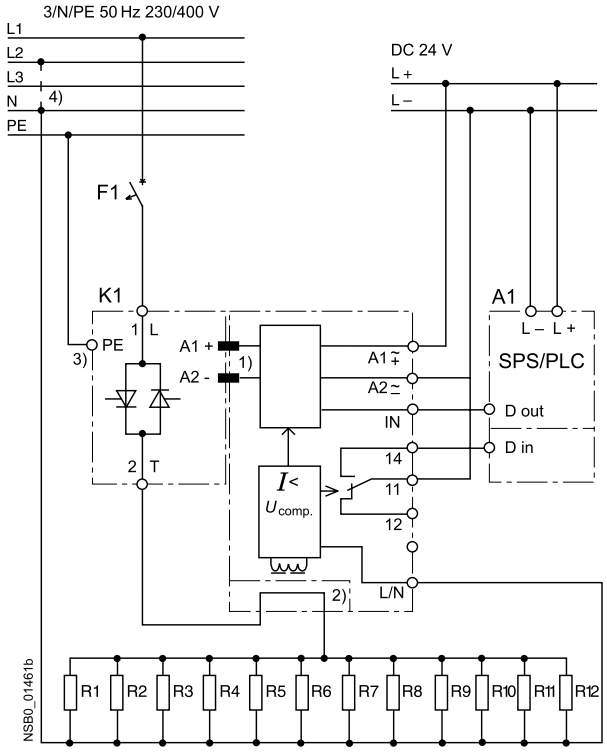
Converters Typical circuit diagram



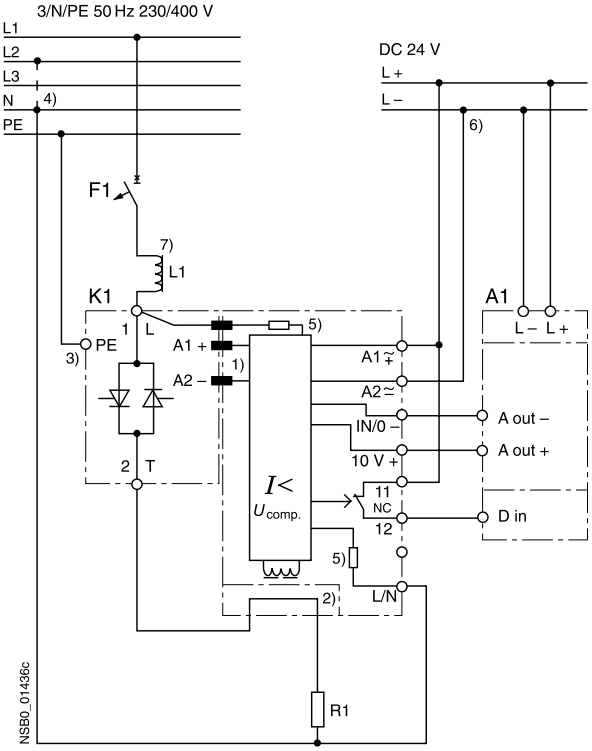
Basic load monitoring Typical circuit diagram



Extended load monitoring Typical circuit diagram



Power controllers Typical circuit diagram

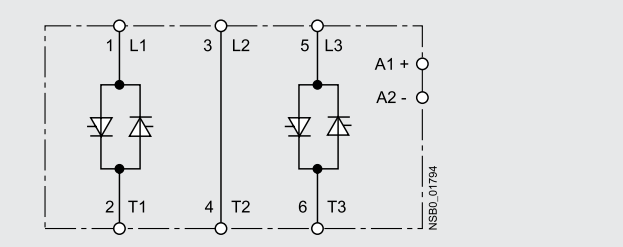


1) Internal connection.
2) Straight-through transformer.
3) PE/ground connection for semiconductor contactors according to installation regulations.
4) Connection of contact L/N to N conductor or a second phase according to the rated operational voltage of the function module.
5) In order to observe the limit values of the conducted interference voltage for generalized phase control, a choke rated at at least 200 µH must be included in the load circuit.

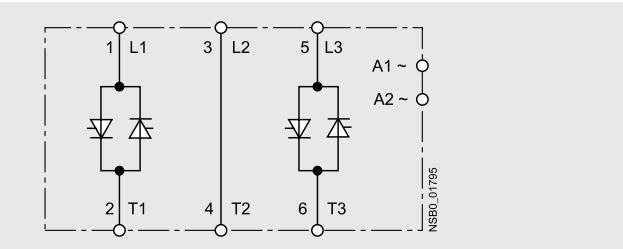
1) Internal connection to the solid state relay/contactor.
2) Straight-through.
3) Make PE/ground connection according to installation regulations.
4) Connection of L/N contact with
   - 3RF29 ..-0GA.3 load monitoring on neutral conductor N (e.g. 230 V),
   - 3RF29 ..-0GA.6 load monitoring on a second phase (e.g. 400V).
5) Voltage detection not electically isolated (3MΩ per path).
6) Grounding of connection L- is recommended.
7) A200 µH 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.

Schematics

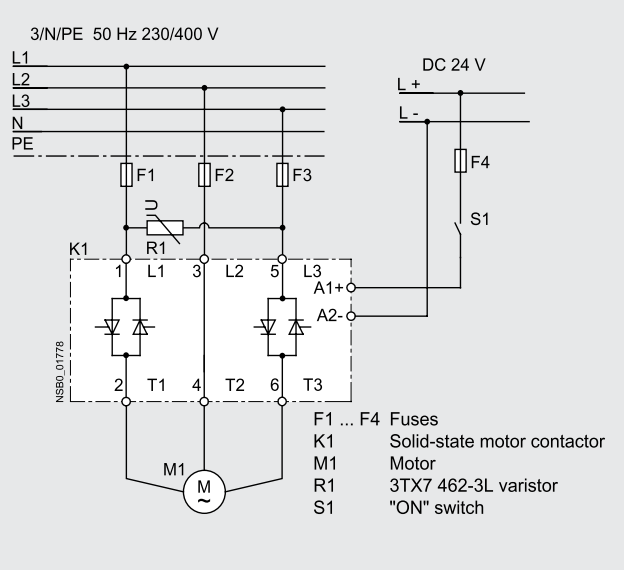
Two-phase controlled,
DC control supply voltage



Two-phase controlled,
AC control supply voltage



Sample schematic



Notes

NEMA & General Purpose Controls

Class 14

Class 17, 18

Class 82, 83, 84, 87, 88

Class LE, LC, CLM

contents

Product Overview 9/3

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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 & 9/14

Class 17 NEMA Combination Starters see pages 9/16 & 9/18. For quick ship versions with factory modifications see on-line at www.usa.siemens.com/controls-express

Class 18 NEMA Combination Starters see page 9/20.

Class 40 NEMA Contactors see page 9/49

Class 87 Pump Panels see pages 9/74

LE Lighting Contactors see page 9/81

LC Lighting Contactors see page 9/87 & 9/88

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

NEMA & General Purpose Controls

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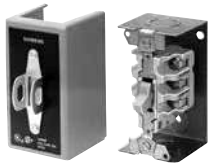

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Fractional HP Starters, Class SMF

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

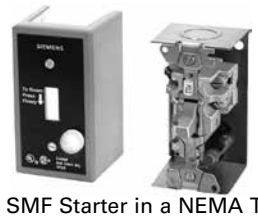
A toggle operator extender is available for Class SMF, NEMA Type 1 surface mounted units. The extender has a red vinyl button that provides a fast and easy method for locating and switching the device's toggle operator into the OFF position. The Emergency Off Actuator is available in kit form only for 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



Class SMF Starter in a NEMA Type 1 Enclosure with Pilot Light

Ordering Information

Heater Elements see page 9/119.
Field Modification Kits see page 9/98.
Dimensions see page 9/126.
Wiring Diagrams see page 9/155.

Horsepower Ratings

Volts	Maximum Horsepower: AC Single Phase 1-Pole	AC Single Phase 2-Pole	DC 2-Pole
115	1	1	¾
230	1	2	¾
277	1	1	—

Starter—Class SMF, Single Phase①

Type of Operator	No. of Poles	Starter Features⑤	Open Type Catalog Number	Open Type List Price$	General Purpose Flush Mounting Open Starter with Flush Plate (No Enclosure Provided): Gray Flush Plate Catalog Number	Gray Flush Plate List Price$	Standard Stainless Steel Flush Plate Catalog Number	Standard Stainless Steel Flush Plate List Price$	Jumbo Stainless Steel Flush Plate Catalog Number	Jumbo Stainless Steel Flush Plate List Price$	NEMA Type 1 General Purpose Enclosure, Surface Mounting: Standard Catalog Number	Standard List Price$	Oversized Catalog Number	Oversized List Price$	NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosure with Clear Cover Catalog Number	NEMA Type 3R, 4 & 12 List Price$	NEMA Type 4 Watertight, Dust-tight Metallic Enclosure Catalog Number	NEMA Type 4 List Price$	NEMA Type 3R, 7 & 9 Div 1 and Div 2 Class I Groups B, C, D & Class II Groups E, F, G Enclosures Catalog Number	NEMA Type 3R, 7 & 9 List Price$
Toggle	1	Standard	SMFF01		SMFFF1		SMFFS1		—	—	SMFFG1		SMFFGJ1		SMFFWN1		—	—	—	—
		Red Pilot Light	SMFF01P		SMFFF1P		SMFFS1P		SMFFSJ1P		SMFFG1P		SMFFGJ1P				—	—	—	—
	2	Standard	SMFF02		SMFFF2		SMFFS2		—	—	SMFFG2		SMFFGJ2		SMFFWN2		—	—	—	—
		Red Pilot Light	SMFF02P		SMFFF2P		SMFFS2P		SMFFSJ2P		SMFFG2P		SMFFGJ2P				—	—	—	—
Key	1	Standard	SMFF03		SMFFF3		SMFFS3		—	—	SMFFG3		SMFFGJ3		SMFFWN3		—	—	—	—
		Red Pilot Light	SMFF03P		SMFFF3P		SMFFS3P		SMFFSJ3P		SMFFG3P		SMFFGJ3P				—	—	—	—
	2	Standard	SMFF04		—	—	SMFFS4		—	—	SMFFG4		SMFFGJ4		SMFFWN4		—	—	—	—
		Red Pilot Light	SMFF04P		SMFFF4P		SMFFS4P		SMFFSJ4P		SMFFG4P		SMFFGJ4P				—	—	—	—

Starter With Handle Guard/Lock-Off—Class SMF, Single Phase①

Toggle	1	Standard	—	—	④	—	④	—	④	—	SMFFG5		SMFFGJ5		—	—	SMFFW1②		SMFFR1②	
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG5P		SMFFGJ5P		—	—	SMFFW1P②		—	—
		(2) ¾" NPT Outlets	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW1H		SMFFR1H	
		(2) ¾" NPT Outlets and Red Pilot Light	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW1PH		—	—
	2	Standard	—	—	④	—	④	—	④	—	—		SMFFGJ6		—	—	SMFFW2②		SMFFR2②	
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG6P		SMFFGJ6P		—	—	SMFFW2P②		—	—
		(2) ¾" NPT Outlets	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW2H		SMFFR2H	
		(2) ¾" NPT Outlets and Red Pilot Light	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW2PH		—	—

One Starter in Duplex Enclosure—Class SMF, Single Phase①

Type of Operator	Number of Poles	Starter Features⑤	General Purpose Flush Mounting Open Starter with Flush Plate - (No Enclosure Provided): Gray Flush Plate For Wall or Cavity Mounting Catalog Number	Gray Flush Plate List Price $	Stainless Steel Flush Plate for Wall or Cavity Mounting Catalog Number	Stainless Steel Flush List Price $	NEMA Type 1 General Purpose Enclosure Surface Mounting Catalog Number	NEMA Type 1 List Price $	Replacement Starters Catalog Number	Replacement Starters List Price $
Toggle	2	Standard	—	—	—	—	SMFFG02		—	—
		Red Pilot Light	—	—	—	—	SMFFG02P		—	—
Key	2	Red Pilot Light	—	—	—	—	SMFFG04P		—	—

Two Starters In Duplex Enclosure—Class SMF, Single Phase③

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 Phase①

Toggle	1	Standard	SMFFF71		—	—	SMFFG71		—	—
		Red Pilot Light	SMFFF71P		SMFFS71P		SMFFG71P		—	—
	2	Standard	—	—	—	—	SMFFG72		—	—
		Red Pilot Light	SMFFF72P		SMFFS72P		SMFFG72P		—	—
Key	2	Red Pilot Light	SMFFF74P		SMFFS74P		SMFFG74P		—	—

Two Speed Starters (AC Only)—Class SMF, Single Phase③

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

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

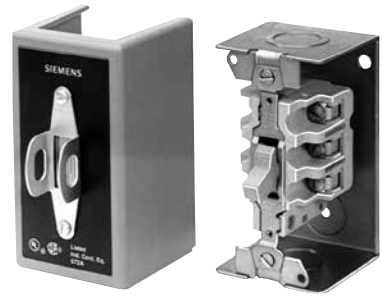
Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

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.

Switches①, Class MMS, MRS

Selection

Class MMS Switch in a NEMA Type 1 Enclosure

Ordering Information

Heater Elements not Required.

Field Modification Kits see page 9/98.

Dimensions see page 9/126.

Wiring Diagrams see page 9/155.

Horsepower Ratings

Device	No of Poles	Motor Type AC	Maximum HP 115V	Maximum HP 230V	Maximum HP 450–575V	DC Ratings 90V	DC Ratings 115V	DC Ratings 230V
Class MMS	2	Single Phase	2	2	3	1	2	1½
	3	3-Phase	2	7½	10	1	2	1½
Class MRS Reversing	2	Single Phase	2	2	3	1	2	1½
	3	3-Phase	2	7½	10	1	2	1½
Class MMS Two Speed	2	Single Phase	2	2	3	1	2	1½
	3	3-Phase, Constant or Variable Torque	2	7½	10	1	2	1½
	3	3-Phase, Constant Horsepower	2	7½	10	1	2	1½

Switch—Class MMS, Single Phase and 3-Phase

Type of Operator	No of Poles	Switch Features④	Open Type Catalog Number	Open Type List Price$	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided) — Gray Flush Plate Catalog Number	Gray Flush Plate List Price$	Standard Stainless Steel Flush Plate Catalog Number	Standard Stainless Steel Flush Plate List Price$	Jumbo Stainless Steel Flush Plate Catalog Number	Jumbo Stainless Steel Flush Plate List Price$	NEMA Type 1 General Purpose Enclosure Surface Mounting — Standard Catalog Number	Standard List Price$	Oversized Catalog Number	Oversized List Price$	NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosurer with Clear Cover Catalog Number	NEMA Type 3R, 4 & 12 List Price$	NEMA Type 4② Watertight, Dust-tight Metallic Enclosure Catalog Number	NEMA Type 4② List Price$	NEMA Type 7 & 9② Class I Groups B, C & D & Class II Groups E, F, G Enclosures Catalog Number	NEMA Type 7 & 9② List Price$
Toggle	2	Standard	MMSK01		MMSKF1		MMSKS1		—		MMSKG1		—		MMSKWN1		MMSKW1		MMSKR1	
		Red Pilot Light 115V AC	MMSK01A③		MMSKF1A		MMSKS1A		—		MMSKG1A		MMSKGJ1A				MMSKW1A		—	
		Red Pilot Light 230V AC	MMSK01B③		MMSKF1B		MMSKS1B		MMSKSJ1B		MMSKG1B		—				MMSKW1B		—	
	3	Standard	MMSK02		MMSKF2		MMSKS2		—		MMSKG2		MMSKGJ2		MMSKWN2		MMSKW2		MMSKR2	
		Red Pilot Light 208-240V AC	MMSK02B③		MMSKF2B		MMSKS2B		—		MMSKG2B		MMSKGJ2B				MMSKW2B		—	
		Red Pilot Light 440-600V AC	MMSK02C③		—		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 Features④ (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided) Catalog Number	General Purpose List Price $	NEMA Type 1 General Purpose Enclosure Surface Mounting Catalog Number	NEMA Type 1 List Price $	Replacement Switch Class MRS Catalog Number	Replacement Switch 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 Features④ (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided) Catalog Number	General Purpose List Price $	NEMA Type 1 General Purpose Enclosure Surface Mounting Catalog Number	NEMA Type 1 List Price $	Replacement Switch Class MRS Catalog Number	Replacement Switch 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 ¾" 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.

Starters and Switches, Class 11 - 3RV

General UPDATED

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.

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

Starters and Switches, Class 11 - 3RV

Selection

Class 11 Manual Motor Starter

Ordering Information

No heaters required.

Field Modification Kits see page 17-100.

Dimensions see page 17-130.

Wiring Diagrams see page 17-157.

For applications requiring a low voltage protection coil see table at right.

Low Voltage Protection Coil Table

60 Hz Voltage	Letter
120V	*F
208V	*D
240V	*G
460V	*H

*Add corresponding letter to end of base Class 11 catalog number for low voltage protection coil with List Price adder.

Note: The LVP option for Open type 3RV is available from the factory, please order separately from the field modification kits on page 9/99.

The coil voltage should correspond with the line voltage.

Manual Starter—Class 11 - 3RV

FLA Adjustment Range①	Max HP						Enclosure			
	Single Phase HP Ratings		3-Phase HP Ratings				Open Type		NEMA 1 General Purpose	
	115V	230V	200V	230V	460V	575V	Catalog No.	List Price $	Catalog No.	List Price $
0.11-0.16	—	—	—	—	—	—	3RV2011-0AA10②		11AD3B	
0.14-0.2	—	—	—	—	—	—	3RV2011-0BA10②		11BD3B	
0.18-0.25	—	—	—	—	—	—	3RV2011-0CA10②		11CD3B	
0.22-0.32	—	—	—	—	—	—	3RV2011-0DA10②		11DD3B	
0.28-0.4	—	—	—	—	—	—	3RV2011-0EA10②		11ED3B	
0.35-0.5	—	—	—	—	—	—	3RV2011-0FA10②		11FD3B	
0.45-0.63	—	—	—	—	—	—	3RV2021-0GA10②		11GD3B	
0.55-0.8	—	—	—	—	—	½	3RV2021-0HA10②		11HD3B	
0.7-1	—	—	—	—	½	½	3RV2021-0JA10②		11JD3B	
0.9-1.25	—	—	—	—	¾	¾	3RV2021-0KA10②		11KD3B	
1.1-1.6	—	1/10	—	—	¾	1	3RV2021-1AA10②		11LD3B	
1.4-2	—	⅛	—	—	1	1 ½	3RV2021-1BA10②		11MD3B	
1.8-2.5	—	⅙	½	½	1 ½	1 ½	3RV2021-1CA10②		11ND3B	
2.2-3.2	1/10	¼	¾	¾	1 ½	2	3RV2021-1DA10②		11PD3B	
2.8-4	⅛	⅓	¾	1	2	3	3RV2021-1EA10②		11QD3B	
3.5-5	⅙	½	1	1	3	3	3RV2021-1FA10②		11RD3B	
4.5-6.3	¼	¾	1 ½	1 ½	5	5	3RV2021-1GA10②		11SD3B	
5.5-8	⅓	1	2	2	5	5	3RV2021-1HA10②		11TD3B	
7-10	½	1 ½	3	3	7 ½	10	3RV2021-1JA10②		11UD3B	
9-12.5	½	2	3	3	7 ½	10	3RV2021-1KA10②		11VD3B	
11-16	1	3	5	5	10	15③	3RV2021-4AA10②		11WD3B	
14-20	1 ½	3	5	7 ½	15	20③	3RV2021-4BA10②		11XD3B	
17-22	2	3	7 ½	7 ½	15	20③	3RV2021-4CA10②		11YD3B	
20-25	2③	5③	7 ½③	7 ½③	15③	20③	3RV2021-4DA10②		11ZD3B	

Manual Switch—Class 11 - 3RV

Rated Current①	Max HP						Enclosure			
	Single Phase HP Ratings		3-Phase HP Ratings				Open Type		NEMA 1 General Purpose	
	115V	230V	200V	230V	460V	575V	Catalog No.	List Price $	Catalog No.	List Price $
1	—	—	—	—	½③	½③	3RV2321-0JC10②		111D3B	
5	⅙③	½③	1③	1③	3③	3③	3RV2321-1FC10②		112D3B	
10	½③	1 ½③	3③	3③	7 ½③	10③	3RV2321-1JC10②		113D3B	
20	1 ½③	3③	5③	7 ½③	15③	20③	3RV2321-4BC10②		114D3B	
25	2③	5③	7 ½③	7 ½ ③	15③	20③	3RV2321-4DC10②		115D3B	

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.

Catalog Numbering System

General

Class

- **17** — Combination Starter (Non Fusible, Fusible)
- **18** — Combination Starter (Circuit Breaker)
- **25** — Reversing Combination Starter (Non Fusible, Fusible)
- **26** — Reversing Combination Starter (Circuit Breaker)

Size

- **B** — 00
- **C** — 0
- **D** — 1
- **E** — 1¾
- **F** — 2
- **G** — 2½
- **H** — 3
- **I** — 3½
- **J** — 4
- **L** — 5
- **M** — 6
- **N** — 7
- **P** — 8

Model

- **U** — Solid-state OLR size 0–4 & size 7 & 8
- **P** — Solid-state size 5 & 6

Solid-state OLR Current Range

Three Phase

- **A** — 0.25–1
- **B** — 0.75–3.4
- **C** — 3–12
- **D** — 5.5–22
- **E** — 10–40
- **F** — 13–52
- **G** — 25–100
- **H** — 50–200
- **J** — 100–300 w/ CT's
- **K** — 133–400 w/ CT's
- **L** — 200–600 w/ CT's
- **M** — 250–750 w/ CT's
- **N** — 400–1200 w/ CT's

Enclosure Size

- **92** — Standard Width
- **82** — Extra Wide

Enclosure Type

- **B** — NEMA 1
- **F** — NEMA 4X Fiberglass
- **N** — NEMA 3/3R/4/12
- **W** — NEMA 4/4X 304 Stainless Steel
- **X** — NEMA 4/4X 316 Stainless Steel

Class

- **14** — Across the Line NEMA Motor Starter
- **22** — Reversing NEMA Motor Starter
- **40** — Across the Line NEMA Magnetic Contactor
- **43** — Reversing NEMA Magnetic Contactor

Size

- **B** — 00
- **C** — 0
- **D** — 1
- **E** — 1¾
- **F** — 2
- **G** — 2½
- **H** — 3
- **I** — 3½
- **J** — 4
- **L** — 5
- **M** — 6
- **N** — 7
- **P** — 8

Model

- **U** — Solid-state OLR size 00–4, Size 7 & 8
- **P** — Solid-state sizes 5 & 6

Solid-state OLR Current Range

Three Phase

- **A** — 0.25–1
- **B** — 0.75–3.4
- **C** — 3–12
- **D** — 5.5–22
- **E** — 10–40
- **F** — 13–52
- **G** — 25–100
- **H** — 50–200
- **J** — 100–300 w/ CT's
- **K** — 133–400 w/ CT's
- **L** — 200–600 w/ CT's
- **M** — 250–750 w/ CT's
- **N** — 400–1200 w/ CT's

Single Phase①

- **A** — 0.25–1
- **B** — 0.75–3.4
- **C** — 3–12
- **D** — 5.5–22

Pilot Control Circuit

- **2** — suitable for 3-wire control (NO aux. contact incl.)

Enclosure Size

- **1** — 2 power poles,1-phase
- **3** — 3 power poles, 3-phase
- **8** — 3 power poles, 3-phase, extra wide enclosure

Enclosure Type

- **A** — Open
- **B** — NEMA 1
- **F** — NEMA 4X Fiberglass
- **0** — NEMA 3/3R/4/12
- **W** — NEMA 4/4X 304 Stainless Steel
- **X** — NEMA 4/4X 316 Stainless Steel

Coil

- **A**② — 110–120V/220–240V@60Hz, 110V/190–220V@50Hz
- **C**② — 220–240V/440–480V@60Hz, 190–220V/380–440V@50Hz
- **D** — 200–208V@60Hz
- **E** — 550–600V@60Hz, 550V@50Hz
- **F** — 120V@60Hz, 110V@50Hz
- **G** — 220–240V@60Hz, 190–220V@50Hz
- **H** — 440–480V@60Hz, 380–440V@50Hz
- **J**④ — 24V@60Hz, 24V@50Hz
- **L** — 277V@60Hz, 240V@50Hz

Class

- **36** — Non Combination Reduced Voltage Starter
- **37** — Combination Reduced Voltage Starter

Size

- **C** — 0
- **D** — 1
- **E** — 1¾
- **F** — 2
- **G** — 2½
- **H** — 3
- **I** — 3½
- **J** — 4
- **L** — 5
- **M** — 6
- **N** — 7
- **P** — 8

Model

- **U** — Solid-state OLR size 0–4 & size 7 & 8
- **P** — Solid-state size 5 & 6

Solid-state OLR Current Range

Type

- **T** — Auto XFMR
- **P** — Part Wind.
- **0** — Wye Delta Open Trans.
- **C** — Wye Delta Closed Trans.

Line Volts

- **2** — 230
- **3** — 380
- **4** — 460
- **5** — 575
- **6** — 200/208

Enclosure Type

- **A** — Open
- **B** — NEMA 1
- **W** — NEMA 4/4X Stainless Steel
- **0** — NEMA 3/3R/4/12

Coil

- **D**
- **E**
- **F**
- **G**
- **H**
- **L**

Disconnect Type③

- **D** — Non Fused Disc.
- **F** — Fusible Disc.
- **P** — MCP

① Single phase solid-state OLR available on Class 14 Starters only.
② Not available on sizes 5–8.
③ For Class 37 only.
④ Not available on sizes 7 and 8.

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 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), and 4X (fiberglass) 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.

Figure 1

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 9/100.

Factory Modifications see page 9/114.

Dimensions see pages 9/129 open and 9/141 enclosed.

Wiring Diagrams see page 9/156.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp						Overload		Enclosure									
								Open Type Standard Auxiliary Contacts⑦		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅓	½	00	—	0.25–1	A	**14BUA32A***		**14BUA32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
½	¾	1½	2	00	—	0.75–3.4	A	**14BUB32A***		**14BUB32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
1½	1½	2	—	00	—	3–12	A1	**14BUC32A***		**14BUC32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
⅛	⅛	⅓	½	0	—	0.25–1	A	**14CUA32A***		**14CUA32B***		**14CUA32@***		**14CUA32F***		**14CUA320***	
½	¾	1½	2	0	—	0.75–3.4	A	**14CUB32A***		**14CUB32B***		**14CUB32@***		**14CUB32F***		**14CUB320***	
2	2	5	5	0	—	3–12	A1	**14CUC32A***		**14CUC32B***		**14CUC32@***		**14CUC32F***		**14CUC320***	
3	3	—	—	0	—	5.5–22	A1	**14CUD32A***		**14CUD32B***		**14CUD32@***		**14CUD32F***		**14CUD320***	
⅛	⅛	⅓	½	1	—	0.25–1	A	**14DUA32A***		**14DUA32B***		**14DUA32@***		**14DUA32F***		**14DUA320***	
½	¾	1½	2	1	—	0.75–3.4	A	**14DUB32A***		**14DUB32B***		**14DUB32@***		**14DUB32F***		**14DUB320***	
2	2	5	5	1	—	3–12	A1	**14DUC32A***		**14DUC32B***		**14DUC32@***		**14DUC32F***		**14DUC320***	
3	3	10	10	1	—	5.5–22	A1	**14DUD32A***		**14DUD32B***		**14DUD32@***		**14DUD32F***		**14DUD320***	
7½	7½	—	—	1	—	10–40	A1	**14DUE32A***		**14DUE32B***		**14DUE32@***		**14DUE32F***		**14DUE320***	
10	10	15	15	—	1¾	10–40	A1	**14EUE32A***		**14EUE32B***		**14EUE32@***		**14EUE32F***		**14EUE320***	
10	15	25	25	2	—	13–52	B	**14FUF32A***		**14FUF32B***		**14FUF32@***		**14FUF32F***		**14FUF320***	
15	20	30	30	—	2½	25–100	B	**14GUG32A***		**14GUG32B***		**14GUG32@***		**14GUG32F***		**14GUG320***	
25	30	50	50	3	—	25–100	B	**14HUG32A***		**14HUG32B***		**14HUG32@***		**14HUG32F***		**14HUG320***	
30	40	75	75	—	3½	50–200	B	**14IUH32A***		**14IUH32B***		**14IUH32@***		**14IUH32F***		**14IUH320***	
40	50	100	100	4	—	50–200	B	**14JUH32A***		**14JUH32B***		**14JUH32@***		**14JUH32F***		**14JUH320***	
75	100	200	200	5	—	55–250	—	**14LPU32A***		**14LPU32B***		—	—	—	—	**14LPU320***	
150	200	400	400	6	—	160–630	—	**14MPX32A***		**14MPX32B***		—	—	—	—	**14MPX320***	
—	300	600	600	7*③	—	400–1220	A1+CT	**14NUN32A***		**14NUN32B***		—	—	—	—	**14NUN320***	
—	450	900	900	8④	—	400–1220	A1+CT	**14PUN32A***		**14PUN32B***		—	—	—	—	**14PUN320***	

Open Type & Standard Width Enclosure, Single Phase, 2-Pole②⑤

Max Hp			Overload		Enclosure									
					Open Type Standard Auxiliary Contacts		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
115 Volts	208/230 Volts	NEMA Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	¼	0	0.75–3.4	A	**14CUB12A***		**14CUB12B***		**14CUB12@***		**14CUB12F***		**14CUB120***	
¼	½	0	3–12	A1	**14CUC12A***		**14CUC12B***		**14CUC12@***		**14CUC12F***		**14CUC120***	
1	2	0	5.5–22	A1	**14CUD12A***		**14CUD12B***		**14CUD12@***		**14CUD12F***		**14CUD120***	
⅛	¼	1	0.75–3.4	A	**14DUB12A***		**14DUB12B***		**14DUB12@***		**14DUB12F***		**14DUB120***	
¼	½	1	3–12	A1	**14DUC12A***		**14DUC12B***		**14DUC12@***		**14DUC12F***		**14DUC120***	
1	2	1	5.5–22	A1	**14DUD12A***		**14DUD12B***		**14DUD12@***		**14DUD12F***		**14DUD120***	
3	7½	2	25-100	B	**14FUG12A***		**14FUG12B***		**14FUG12@***		**14FUG12F***		**14FUG120***	
7½	15	3	25-100	B	**14HUG12A***		**14HUG12B***		**14HUG12@***		**14HUG12F***		**14HUG120***	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in size 5–8 starters.

② 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.

③ F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC

④ Only available F coil100-250V AC 50/60Hz, or DC

⑤ To receive a single phase starter in an extra wide enclosure order an enclosure kit from pg 9/109 and the open style starter from pg 9/13 as separate items.

Solid State Overload with Auto/Manual Reset, Class 14

Selection

NEMA 1

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 9/114.

Factory Modifications see page 9/114.

Dimensions see page 9/141.

Wiring Diagrams see page 9/156.

Replacement Parts see page 9/120.

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 9/114.

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp						Overload		Enclosure					
								NEMA 1 General Purpose		**NEMA 4/4X Stainless** Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		**NEMA 3/3R/4/12** Watertight, Dust-tight, Weatherproof	
200 Volts	**230 Volts**	**460 Volts**	**575 Volts**	**NEMA Size**	**Half Size**	**Amp Range**	**Frame Size**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**
⅙	⅙	⅓	½	00	—	0.25–1	A	**14BUA82B***		**Use Size 0**	—	**Use Size 0**	—
½	¾	1½	2	00	—	0.75–3.4	A	**14BUB82B***		**Use Size 0**	—	**Use Size 0**	—
1½	1½	2	—	00	—	3–12	A1	**14BUC82B***		**Use Size 0**	—	**Use Size 0**	—
⅙	⅙	⅓	½	0	—	0.25–1	A	**14CUA82B***		**14CUA82@***		**14CUA820***	
½	¾	1½	2	0	—	0.75–3.4	A	**14CUB82B***		**14CUB82@***		**14CUB820***	
2	2	5	5	0	—	3–12	A1	**14CUC82B***		**14CUC82@***		**14CUC820***	
3	3	—	—	0	—	5.5–22	A1	**14CUD82B***		**14CUD82@***		**14CUD820***	
⅙	⅙	⅓	½	1	—	0.25–1	A	**14DUA82B***		**14DUA82@***		**14DUA820***	
½	¾	1½	2	1	—	0.75–3.4	A	**14DUB82B***		**14DUB82@***		**14DUB820***	
2	2	5	5	1	—	3–12	A1	**14DUC82B***		**14DUC82@***		**14DUC820***	
3	3	10	10	1	—	5.5–22	A1	**14DUD82B***		**14DUD82@***		**14DUD820***	
7½	7½	—	—	1	—	10–40	A1	**14DUE82B***		**14DUE82@***		**14DUE820***	
10	10	15	15	—	1¾	10–40	A1	**14EUE82B***		**14EUE82@***		**14EUE820***	
10	15	25	25	2	—	13–52	B	**14FUF82B***		**14FUF82@***		**14FUF820***	
15	20	30	30	—	2½	25–100	B	**14GUG82B***		**14GUG82@***		**14GUG820***	
25	30	50	50	3	—	25–100	B	**14HUG82B***		**14HUG82@***		**14HUG820***	
30	40	75	75	—	3½	50–200	B	**14IUH82B***		**14IUH82@***		**14IUH820***	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

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), and 4X fiberglass 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 17-113 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

Ordering Information

Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.

For Fusible Styles see page 9/18.
Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/143.
Wiring Diagrams see page 9/157.
Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Standard Width Enclosure, 3 Phase, 3-Pole

Max Hp						Overload			Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, 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 $
⅛	⅛	⅓	½	0	—	0.25–1	A	30	**17CUA92B***		**17CUA92@***		**17CUA92F***		**17CUA92N***	
½	¾	1½	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***	
⅛	⅛	⅓	½	1	—	0.25–1	A	30	**17DUA92B***		**17DUA92@***		**17DUA92F***		**17DUA92N***	
½	¾	1½	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***	
7½	7½	—	—	1	—	10–40	A1	60	**17DUE92B***		**17DUE92@***		**17DUE92F***		**17DUE92N***	
10	10	15	15	—	1¾	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	—	2½	25–100	B	100②	**17GUG92B***		**17GUG92@***		**17GUG92F***		**17GUG92N***	
20③	25④	50	50	3	—	25–100	B	100	**17HUG92B***		**17HUG92@***		**17HUG92F***		**17HUG92N***	
30	40	75	75	—	3½	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	—	400⑤	**17LPU92B***		—	—	—	—	**17LPU92N***	
150	200	400	400	6	—	160–630	—	600	**17MPX92B***		—	—	—	—	**17MPX92N***	
—	300	600	600	7⑥	—	400–1220	A1+CT	1200	**17NUN92B***		—	—	—	—	**17NUN92N***	
—	450	900	900	8⑦	—	400–1220	A1+CT	1600	**17PUN92B***		—	—	—	—	**17PUN92N***	

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 60A disconnect, order fusible cat. no. page 9/18.
③ For 20 HP and 200A disconnect, order fusible cat. no. page 9/18.
④ For 25 HP and 200A disconnect, order fusible cat. no. page 9/18.
⑤ For 600A disconnect, order fusible cat. no. page 9/18.
⑥ F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC
⑦ Only available F coil 100-250V AC 50/60Hz, or DC

Non-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.

For Fusible Styles see page 9/19.

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/143.

Wiring Diagrams see page 9/157.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Extra Wide Enclosure, 3-Phase, 3-Pole

Hp						Overload			Enclosure					
									NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 3/3R/4/12 Watertight, Dust-tight, 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 $
⅛	⅛	⅓	½	0	—	0.25–1	A	30	**17CUA82B***		**17CUA82@***		**17CUA82N***	
½	¾	1½	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***	
⅛	⅛	⅓	½	1	—	0.25–1	A	30	**17DUA82B***		**17DUA82@***		**17DUA82N***	
½	¾	1½	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***	
7½	7½	—	—	1	—	10–40	A1	60	**17DUE82B***		**17DUE82@***		**17DUE82N***	
10	10	15	15	—	1¾	10–40	A1	60	**17EUE82B***		**17EUE82@***		**17EUE82N***	
10	15	25	25	2	—	13–52	B	60	**17FUF82B***		**17FUF82@***		**17FUF82N***	
15	20	30	30	—	2½	25–100	B	100①	**17GUG82B***		**17GUG82@***		**17GUG82N***	
20②	25③	50	50	3	—	25–100	B	100	**17HUG82B***		**17HUG82@***		**17HUG82N***	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① For 60A disconnect, order fusible cat. no. page 9/19.

② For 20 HP and 200A disconnect, order fusible cat. no. page 9/19.

③ For 25 HP and 200A disconnect, order fusible cat. no. page 9/19.

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 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/143.
Wiring Diagrams see page 9/157.
Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Standard Width Enclosure, 3-Phase, 3-Pole③

Max Hp						Overload				Enclosure							
										NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Fuse Clip Amp/Volts	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	—	—	0	—	0.25–1	A	30	30A/250V	**17CUA92B*10**		**17CUA92@*10**		**17CUA92F*10**		**17CUA92N*10**	
—	—	⅓	½	0	—	0.25–1	A	30	30A/600V	**17CUA92B*11**		**17CUA92@*11**		**17CUA92F*11**		**17CUA92N*11**	
½	¾	—	—	0	—	0.75–3.4	A	30	30A/250V	**17CUB92B*10**		**17CUB92@*10**		**17CUB92F*10**		**17CUB92N*10**	
—	—	1½	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**	
⅛	⅛	—	—	1	—	0.25–1	A	30	30A/250V	**17DUA92B*10**		**17DUA92@*10**		**17DUA92F*10**		**17DUA92N*10**	
—	—	⅓	½	1	—	0.25–1	A	30	30A/600V	**17DUA92B*11**		**17DUA92@*11**		**17DUA92F*11**		**17DUA92N*11**	
½	¾	—	—	1	—	0.75–3.4	A	30	30A/250V	**17DUB92B*10**		**17DUB92@*10**		**17DUB92F*10**		**17DUB92N*10**	
—	—	1½	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**	
7½	7½	—	—	1	—	10–40	A1	30	30A/250V	**17DUE92B*10**		**17DUE92@*10**		**17DUE92F*10**		**17DUE92N*10**	
7½	7½	—	—	1	—	10–40	A1	60	60A/250V	**17DUE92B*12**		**17DUE92@*12**		**17DUE92F*12**		**17DUE92N*12**	
—	—	15	15	—	1¾	10–40	A1	60	60A/600V	**17EUE92B*13**		**17EUE92@*13**		**17EUE92F*13**		**17EUE92N*13**	
10	10	—	—	—	1¾	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	—	2½	25–100	B	60	60A/600V	**17GUG92B*13**		**17GUG92@*13**		**17GUG92F*13**		**17GUG92N*13**	
—	—	30	—	—	2½	25–100	B	100	100A/600V	**17GUG92B*15**		**17GUG92@*15**		**17GUG92F*15**		**17GUG92N*15**	
15	20	—	—	—	2½	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	—	—	—	3½	50–200	B	200	200A/250V	**17IUH92B*16**		**17IUH92@*16**		**17IUH92F*16**		**17IUH92N*16**	
—	—	75	75	—	3½	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**		—	—	—	—	**17LPU92N*18**	
—	100	—	—	5	—	55–250	—	600	600A/250V②	**17LPU92B*20**		—	—	—	—	**17LPU92N*20**	
—	—	—	125	5	—	55–250	—	200	200A/600V	**17LPU92B*17**		—	—	—	—	**17LPU92N*17**	
—	—	200	200	5	—	55–250	—	400	400A/600V	**17LPU92B*19**		—	—	—	—	**17LPU92N*19**	
—	—	200	—	5	—	55–250	—	600	600A/600V②	**17LPU92B*21**		—	—	—	—	**17LPU92N*21**	
150	200	—	—	6	—	160–630	—	600	600A/250V	**17MPX92B*20**		—	—	—	—	**17MPX92N*20**	
—	—	400	400	6	—	160–630	—	600	600A/600V	**17MPX92B*21**		—	—	—	—	**17MPX92N*21**	
—	—	400	400	6	—	160–630	—	800	800A/600V	**17MPX92B*23**		—	—	—	—	**17MPX92N*23**	
—	—	600	600	7④	—	400–1220	A1+CT	1200	1200A/600V	**17NUN92B*24**		—	—	—	—	**17NUN92N*24**	
—	—	900	900	8⑤	—	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).

① Dual voltage coils not available in starter sizes 5–8.
② Use Class J fuses only.
③ Single phase wiring page 9/156.
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

Fusible with Solid State Overload, Class 17

Selection

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 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/143.

Wiring Diagrams see page 9/157.

Replacement Parts see page 9/120.

Coil Table Information

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 9/114.

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp						Overload				Enclosure					
										NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Fuse Clip Amp/Volts	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	—	—	0	—	0.25–1	A	30	30A/250V	**17CUA82B*10**		**17CUA82@*10**		**17CUA82N*10**	
—	—	⅓	½	0	—	0.25–1	A	30	30A/600V	**17CUA82B*11**		**17CUA82@*11**		**17CUA82N*11**	
½	¾	—	—	0	—	0.75–3.4	A	30	30A/250V	**17CUB82B*10**		**17CUB82@*10**		**17CUB82N*10**	
—	—	1½	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**	
⅛	⅛	—	—	1	—	0.25–1	A	30	30A/250V	**17DUA82B*10**		**17DUA82@*10**		**17DUA82N*10**	
—	—	⅓	½	1	—	0.25–1	A	30	30A/600V	**17DUA82B*11**		**17DUA82@*11**		**17DUA82N*11**	
½	¾	—	—	1	—	0.75–3.4	A	30	30A/250V	**17DUB82B*10**		**17DUB82@*10**		**17DUB82N*10**	
—	—	1½	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**	
7½	7½	—	—	1	—	10–40	A1	60	60A/250V	**17DUE82B*12**		**17DUE82@*12**		**17DUE82N*12**	
—	—	15	15	—	1¾	10–40	A1	60	60A/600V	**17EUE82B*13**		**17EUE82@*13**		**17EUE82N*13**	
10	10	—	—	—	1¾	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	—	2½	25–100	B	60	60A/600V	**17GUG82B*13**		**17GUG82@*13**		**17GUG82N*13**	
—	—	30	—	—	2½	25–100	B	100	100A/600V	**17GUG82B*15**		**17GUG82@*15**		**17GUG82N*15**	
15	20	—	—	—	2½	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).

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 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/143.
Wiring Diagrams see page 9/157.
Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp							Overload		Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	½	1	1	0	—	3	0.75–3.4	A	**18CUB92B***		**18CUB92@***		**18CUB92F***		**18CUB92N***	
2	2	5	5	0	—	10	3–12	A1	**18CUC92B***		**18CUC92@***		**18CUC92F***		**18CUC92N***	
3	3	—	—	0	—	25	5.5–22	A1	**18CUD92B***		**18CUD92@***		**18CUD92F***		**18CUD92N***	
½	½	1	1	1	—	3	0.75–3.4	A	**18DUB92B***		**18DUB92@***		**18DUB92F***		**18DUB92N***	
2	2	5	5	1	—	10	3–12	A1	**18DUC92B***		**18DUC92@***		**18DUC92F***		**18DUC92N***	
3	3	7½	10	1	—	25	5.5–22	A1	**18DUD92B***		**18DUD92@***		**18DUD92F***		**18DUD92N***	
7½	7½	10	—	1	—	30	10–40	A1	**18DUE92B***		**18DUE92@***		**18DUE92F***		**18DUE92N***	
—	—	15	15	—	1¾	40	10–40	A1	**18EUE92B***		**18EUE92@***		**18EUE92F***		**18EUE92N***	
10	15	25	25	2	—	50	13–52	B	**18FUF92B***		**18FUF92@***		**18FUF92F***		**18FUF92N***	
15	20	30	30	—	2½	100	25–100	B	**18GUG92B***		**18GUG92@***		**18GUG92F***		**18GUG92N***	
25	30	50	50	3	—	125	25–100	B	**18HUG92B***		**18HUG92@***		**18HUG92F***		**18HUG92N***	
30	40	75	75	—	3½	125	50–200	B	**18IUH92B***		**18IUH92@***		**18IUH92F***		**18IUH92N***	
40	50	100	100	4	—	150	50–200	B	**18JUH92B***		**18JUH92@***		**18JUH92F***		**18JUH92N***	
50	75	150	200	5	—	250	55–250	—	**18LPT92B***		—	—	—	—	**18LPT92N***	
75	100	200	—	5	—	400	55–250	—	**18LPU92B***		—	—	—	—	**18LPU92N***	
100	125	250	300	6	—	400	160–630	—	**18MPW92B***		—	—	—	—	**18MPW92N***	
150	200	400	400	6	—	600	160–630	—	**18MPX92B***		—	—	—	—	**18MPX92N***	
—	250	500	500	7②	—	800	400–1220	A1+CT	**18NUV92B***		—	—	—	—	**18NUV92N***	
—	300	600	600	7②	—	1000	400–1220	A1+CT	**18NUY92B***		—	—	—	—	**18NUY92N***	
—	400	800	800	8③	—	1200	400–1220	A1+CT	**18PUW92B***		—	—	—	—	**18PUW92N***	
—	450	900	900	8③	—	1600	400–1220	A1+CT	**18PUZ92B***		—	—	—	—	**18PUZ92N***	

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 F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC

③ 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 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/143.

Wiring Diagrams see page 9/157.

Replacement Parts see page 9/120.

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 9/114.

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp							Overload		Enclosure					
									NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	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	—	1¾	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).

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 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/130 open and 9/145 enclosed.

Wiring Diagrams see page 9/158.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp						Overload		Enclosure									
								Open Type Standard Auxiliary Contacts④		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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅓	½	00	—	0.25–1	A	**22BUA32A***		**22BUA32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
½	¾	1½	2	00	—	0.75–3.4	A	**22BUB32A***		**22BUB32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
1½	1½	2	—	00	—	3–12	A1	**22BUC32A***		**22BUC32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
⅛	⅛	⅓	1/2	0	—	0.25–1	A	**22CUA32A***		**22CUA32B***		**22CUA32W***		**22CUA32F***		**22CUA320***	
½	¾	1½	2	0	—	0.75–3.4	A	**22CUB32A***		**22CUB32B***		**22CUB32W***		**22CUB32F***		**22CUB320***	
2	2	5	5	0	—	3–12	A1	**22CUC32A***		**22CUC32B***		**22CUC32W***		**22CUC32F***		**22CUC320***	
3	3	—	—	0	—	5.5–22	A1	**22CUD32A***		**22CUD32B***		**22CUD32W***		**22CUD32F***		**22CUD320***	
⅛	⅛	⅓	½	1	—	0.25–1	A	**22DUA32A***		**22DUA32B***		**22DUA32W***		**22DUA32F***		**22DUA320***	
½	¾	1½	2	1	—	0.75–3.4	A	**22DUB32A***		**22DUB32B***		**22DUB32W***		**22DUB32F***		**22DUB320***	
2	2	5	5	1	—	3–12	A1	**22DUC32A***		**22DUC32B***		**22DUC32W***		**22DUC32F***		**22DUC320***	
3	3	10	10	1	—	5.5–22	A1	**22DUD32A***		**22DUD32B***		**22DUD32W***		**22DUD32F***		**22DUD320***	
7½	7½	—	—	1	—	10–40	A1	**22DUE32A***		**22DUE32B***		**22DUE32W***		**22DUE32F***		**22DUE320***	
10	10	15	15	—	1¾	10–40	A1	**22EUE32A***		**22EUE32B***		**22EUE32W***		**22EUE32F***		**22EUE320***	
10	15	25	25	2	—	13–52	B	**22FUF32A***		**22FUF32B***		**22FUF32W***		**22FUF32F***		**22FUF320***	
15	20	30	30	—	2½	25–100	B	**22GUG32A***		**22GUG32B***		**22GUG32W***		**22GUG32F***		**22GUG320***	
25	30	50	50	3	—	25–100	B	**22HUG32A***		**22HUG32B***		**22HUG32W***		**22HUG32F***		**22HUG320***	
30	40	75	75	—	3½	50–200	B	**22IUH32A***		**22IUH32B***		**22IUH32W***		**22IUH32F***		**22IUH320***	
40	50	100	100	4	—	50–200	B	**22JUH32A***		**22JUH32B***		**22JUH32W***		**22JUH32F***		**22JUH320***	
75	100	200	200	5	—	55–250	—	**22LPU32A***		**22LPU32B***		—	—	—	—	**22LPU320***	
150	200	400	400	6	—	160–630	—	**22MPX32A***		**22MPX32B***		—	—	—	—	**22MPX320***	
—	300	600	600	7②	—	400–1220	A1+CT	**22NUN32A***		**22NUN32B***		—	—	—	—	**22NUN320***	
—	450	900	900	8③	—	400–1220	A1+CT	**22PUN32A***		**22PUN32B***		—	—	—	—	**22PUN320***	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in size 5–8 starters.

② Only available
F coil 100-250V AC 50/60Hz, or DC
H coil 150-500V AC 50/60Hz, or DC

③ Only available
F coil 100-250V AC 50/60Hz, or DC

④ 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.

Fuse clips see page 9/115.
Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/147.
Wiring Diagrams see page 9/159.
Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp						Overload			Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Rating	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅓	½	0	—	0.25–1	A	30	**25CUA92B***		**25CUA92W***		**25CUA92F***		**25CUA92N***	
½	¾	1½	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***	
⅛	⅛	⅓	½	1	—	0.25–1	A	30	**25DUA92B***		**25DUA92W***		**25DUA92F***		**25DUA92N***	
½	¾	1½	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***	
7½	7½	—	—	1	—	10–40	A1	60	**25DUE92B***		**25DUE92W***		**25DUE92F***		**25DUE92N***	
10	10	15	15	—	1¾	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	—	2½	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	—	3½	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***		—	—	—	—	**25LPU92N***	
150	200	400	400	6	—	160–630	—	600	**25MPX92B***		—	—	—	—	**25MPX92N***	
—	300	600	600	7②	—	400–1220	A1+CT	1200	**25NUN92B***		—	—	—	—	**25NUN92N***	
—	450	900	900	8③	—	400–1220	A1+CT	1600	**25PUN92B***		—	—	—	—	**25PUN92N***	

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 F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC

③ 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 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/147.

Wiring Diagrams see page 9/159.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp							Overload		Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	½	1	1	0	—	3	0.75–3.4	A	**26CUB92B***		**26CUB92W***		**26CUB92F***		**26CUB92N***	
2	2	5	5	0	—	10	3–12	A1	**26CUC92B***		**26CUC92W***		**26CUC92F***		**26CUC92N***	
3	3	—	—	0	—	25	5.5–22	A1	**26CUD92B***		**26CUD92W***		**26CUD92F***		**26CUD92N***	
½	½	1	1	1	—	3	0.75–3.4	A	**26DUB92B***		**26DUB92W***		**26DUB92F***		**26DUB92N***	
2	2	5	5	1	—	10	3–12	A1	**26DUC92B***		**26DUC92W***		**26DUC92F***		**26DUC92N***	
3	3	7½	10	1	—	25	5.5–22	A1	**26DUD92B***		**26DUD92W***		**26DUD92F***		**26DUD92N***	
7½	7½	10	—	1	—	30	10–40	A1	**26DUE92B***		**26DUE92W***		**26DUE92F***		**26DUE92N***	
—	—	15	15	—	1¾	40	10–40	A1	**26EUE92B***		**26EUE92W***		**26EUE92F***		**26EUE92N***	
10	15	25	25	2	—	50	13–52	B	**26FUF92B***		**26FUF92W***		**26FUF92F***		**26FUF92N***	
15	20	30	30	—	2½	100	25–100	B	**26GUG92B***		**26GUG92W***		**26GUG92F***		**26GUG92N***	
25	30	50	50	3	—	125	25–100	B	**26HUG92B***		**26HUG92W***		**26HUG92F***		**26HUG92N***	
30	40	75	75	—	3½	125	50–200	B	**26IUH92B***		**26IUH92W***		**26IUH92F***		**26IUH92N***	
40	50	100	100	4	—	150	50–200	B	**26JUH92B***		**26JUH92W***		**26JUH92F***		**26JUH92N***	
50	75	150	200	5	—	250	55–250	—	**26LPT92B***		—	—	—	—	**26LPT92N***	
75	100	200	—	5	—	400	55–250	—	**26LPU92B***		—	—	—	—	**26LPU92N***	
100	125	250	300	6	—	400	160–630	—	**26MPW92B***		—	—	—	—	**26MPW92N***	
150	200	400	400	6	—	600	160–630	—	**26MPX92B***		—	—	—	—	**26MPX92N***	
—	250	500	500	7*②	—	800	400–1220	A1+CT	**26NUV92B***		—	—	—	—	**26NUV92N***	
—	300	600	600	7*②	—	1000	400–1220	A1+CT	**26NUY92B***		—	—	—	—	**26NUY92N***	
—	400	800	800	8③	—	1200	400–1220	A1+CT	**26PUW92B***		—	—	—	—	**26PUW92N***	
—	450	900	900	8③	—	1600	400–1220	A1+CT	**26PUZ92B***		—	—	—	—	**26PUZ92N***	

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 F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC

③ 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 9/117.

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 9/117.

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 9/117.

Open Style Two Speed Starter (ESP100 Overload)

Constant or Variable Torque with Solid State Overload, Class 30

Selection

2S2W Starter
(ESP200 Overload)

Ordering Information

Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.

Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.①

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/136.

Wiring Diagrams see page 9/160.

Replacement Parts see page 9/120.

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 9/114.

Low Speed FLA 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 3/4	10–40	A1	E
2-3	13–52	B	F
2-3	25–100	B	G
3 1/2-4	50–200	B	H

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp						Overload		Enclosure									
								Open Type Standard Auxiliary Contacts②		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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	¾	1½	2	0	—	0.75–3.4	A	30CUB†32A2V*		30CUB†32B2V*		30CUB†32W2V*		30CUB†32F2V*		30CUB†3202V*	
2	2	5	5	0	—	3–12	A1	30CUC†32A2V*		30CUC†32B2V*		30CUC†32W2V*		30CUC†32F2V*		30CUC†3202V*	
3	3	—	—	0	—	5.5–22	A1	30CUD†32A2V*		30CUD†32B2V*		30CUD†32W2V*		30CUD†32F2V*		30CUD†3202V*	
½	¾	1½	1½	1	—	0.75–3.4	A	30DUB†32A2V*		30DUB†32B2V*		30DUB†32W2V*		30DUB†32F2V*		30DUB†3202V*	
2	2	5	5	1	—	3–12	A1	30DUC†32A2V*		30DUC†32B2V*		30DUC†32W2V*		30DUC†32F2V*		30DUC†3202V*	
3	3	10	10	1	—	5.5–22	A1	30DUD†32A2V*		30DUD†32B2V*		30DUD†32W2V*		30DUD†32F2V*		30DUD†3202V*	
7½	7½	—	—	1	—	10–40	A1	30DUE†32A2V*		30DUE†32B2V*		30DUE†32W2V*		30DUE†32F2V*		30DUE†3202V*	
10	10	15	15	—	1¾	10–40	A1	30EUE†32A2V*		30EUE†32B2V*		30EUE†32W2V*		30EUE†32F2V*		30EUE†3202V*	
10	15	25	25	2	—	13–52	B	30FUF†32A2V*		30FUF†32B2V*		30FUF†32W2V*		30FUF†32F2V*		30FUF†3202V*	
15	20	30	30	—	2½	25–100	B	30GUG†32A2V*		30GUG†32B2V*		30GUG†32W2V*		30GUG†32F2V*		30GUG†3202V*	
25	30	50	50	3	—	25–100	B	30HUG†32A2V*		30HUG†32B2V*		30HUG†32W2V*		30HUG†32F2V*		30HUG†3202V*	
30	40	75	75	—	3½	50–200	B	30IUH†32A2V*		30IUH†32B2V*		30IUH†32W2V*		30IUH†32F2V*		30IUH†3202V*	
40	50	100	100	4	—	50–200	B	30JUH†32A2V*		30JUH†32B2V*		30JUH†32W2V*		30JUH†32F2V*		30JUH†3202V*	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp						Overload		Enclosure									
								Open Type② Standard Auxiliary Contacts		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel 316 Stainless Steel (Optional)		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	¾	1½	2	0	—	0.75–3.4	A	30CUB†32A1V*		30CUB†32B1V*		30CUB†32W1V*		30CUB†32F1V*		30CUB†3201V*	
2	2	5	5	0	—	3–12	A1	30CUC†32A1V*		30CUC†32B1V*		30CUC†32W1V*		30CUC†32F1V*		30CUC†3201V*	
3	3	—	—	0	—	5.5–22	A1	30CUD†32A1V*		30CUD†32B1V*		30CUD†32W1V*		30CUD†32F1V*		30CUD†3201V*	
½	¾	1½	1½	1	—	0.75–3.4	A	30DUB†32A1V*		30DUB†32B1V*		30DUB†32W1V*		30DUB†32F1V*		30DUB†3201V*	
2	2	5	5	1	—	3–12	A1	30DUC†32A1V*		30DUC†32B1V*		30DUC†32W1V*		30DUC†32F1V*		30DUC†3201V*	
3	3	10	10	1	—	5.5–22	A1	30DUD†32A1V*		30DUD†32B1V*		30DUD†32W1V*		30DUD†32F1V*		30DUD†3201V*	
7½	7½	—	—	1	—	10–40	A1	30DUE†32A1V*		30DUE†32B1V*		30DUE†32W1V*		30DUE†32F1V*		30DUE†3201V*	
10	10	15	15	—	1¾	10–40	A1	30EUE†32A1V*		30EUE†32B1V*		30EUE†32W1V*		30EUE†32F1V*		30EUE†3201V*	
10	15	25	25	2	—	13–52	B	30FUF†32A1V*		30FUF†32B1V*		30FUF†32W1V*		30FUF†32F1V*		30FUF†3201V*	
15	20	30	30	—	2½	25–100	B	30GUG†32A1V*		30GUG†32B1V*		30GUG†32W1V*		30GUG†32F1V*		30GUG†3201V*	
25	30	50	50	3	—	25–100	B	30HUG†32A1V*		30HUG†32B1V*		30HUG†32W1V*		30HUG†32F1V*		30HUG†3201V*	
30	40	75	75	—	3½	50–200	B	30IUH†32A1V*		30IUH†32B1V*		30IUH†32W1V*		30IUH†32F1V*		30IUH†3201V*	
40	50	100	100	4	—	50–200	B	30JUH†32A1V*		30JUH†32B1V*		30JUH†32W1V*		30JUH†32F1V*		30JUH†3201V*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

② Auxiliary contacts 30C-30E 4th pole built-in 30F-30J 2 NO & 2 NC

Constant HP with Solid State Overload, Class 30

Selection

2S2W Starter
(ESP200 Overload)

Ordering Information

Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.

Replace the (†) with the letter that corresponds to the correct FLA in High/Low Speed FLA Table.①

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/136.

Wiring Diagrams see page 9/160.

Replacement Parts see page 9/120.

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 9/114.

High/Low Speed FLA Table①

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 3/4	10–40	A1	E
2-3	13–52	B	F
2-3	25–100	B	G
3 1/2-4	50–200	B	H

* 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.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp						Enclosure									
						Open Type Standard Auxiliary Contacts②		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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	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††3202H*	
5	5	7½	7½	1	—	30DU††32A2H*		30DU††32B2H*		30DU††32W2H*		30DU††32F2H*		30DU††3202H*	
7½	7½	10	10	—	1¾	30EU††32A2H*		30EU††32B2H*		30EU††32W2H*		30EU††32F2H*		30EU††3202H*	
7½	10	20	20	2	—	30FU††32A2H*		30FU††32B2H*		30FU††32W2H*		30FU††32F2H*		30FU††3202H*	
10	15	25	25	—	2½	30GU††32A2H*		30GU††32B2H*		30GU††32W2H*		30GU††32F2H*		30GU††3202H*	
20	25	40	40	3	—	30HU††32A2H*		30HU††32B2H*		30HU††32W2H*		30HU††32F2H*		30HU††3202H*	
25	30	50	50	—	3½	30IU††32A2H*		30IU††32B2H*		30IU††32W2H*		30IU††32F2H*		30IU††3202H*	
30	40	75	75	4	—	30JU††32A2H*		30JU††32B2H*		30JU††32W2H*		30JU††32F2H*		30JU††3202H*	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp						Enclosure									
						Open Type Standard Auxiliary Contacts②		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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	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††3201H*	
5	5	7½	7½	1	—	30DU††32A1H*		30DU††32B1H*		30DU††32W1H*		30DU††32F1H*		30DU††3201H*	
7½	7½	10	10	—	13⁄4	30EU††32A1H*		30EU††32B1H*		30EU††32W1H*		30EU††32F1H*		30EU††3201H*	
7½	10	20	20	2	—	30FU††32A1H*		30FU††32B1H*		30FU††32W1H*		30FU††32F1H*		30FU††3201H*	
10	15	25	25	—	2½	30GU††32A1H*		30GU††32B1H*		30GU††32W1H*		30GU††32F1H*		30GU††3201H*	
20	25	40	40	3	—	30HU††32A1H*		30HU††32B1H*		30HU††32W1H*		30HU††32F1H*		30HU††3201H*	
25	30	50	50	—	3½	30IU††32A1H*		30IU††32B1H*		30IU††32W1H*		30IU††32F1H*		30IU††3201H*	
30	40	75	75	4	—	30JU††32A1H*		30JU††32B1H*		30JU††32W1H*		30JU††32F1H*		30JU††3201H*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① 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.

② 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

Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.

Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.②

Fuse clips see page 9/115.

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/149.

Wiring Diagrams see page 9/160.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Low Speed FLA 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 3/4	10–40	A1	E
2-3	13–52	B	F
2-3	25–100	B	G
3 1/2-4	50–200	B	H

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp						Overload			Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, 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 $
½	¾	1½	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*	
½	¾	1½	1½	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*	
7½	7½	—	—	1	—	10–40	A1	60	32DUE†92B2V2*		32DUE†92W2V2*		32DUE†92F2V2*		32DUE†92N2V2*	
10	10	15	15	—	1¾	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	—	2½	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	—	3½	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						Overload			Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, 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 $
½	¾	1½	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*	
½	¾	1½	1½	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*	
7½	7½	—	—	1	—	10–40	A1	60	32DUE†92B1V2*		32DUE†92W1V2*		32DUE†92F1V2*		32DUE†92N1V2*	
10	10	15	15	—	1¾	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	—	2½	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	—	3½	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 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

Ordering Information

Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.

Replace the (†) with the letter that corresponds to the correct FLA in the High/Low Speed FLA Table.②

Fuse clips see page 9/115.

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/149.

Wiring Diagrams see page 9/160.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies see Factory Modifications page 9/114.

High/Low Speed FLA Table②

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 3/4	10–40	A1	E
2-3	13–52	B	F
2-3	25–100	B	G
3 1/2-4	50–200	B	H

* 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.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp						Overload			Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, 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 $
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	—	1¾	—	—	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						Overload			Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, 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 $
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	—	1¾	—	—	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 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.

MCP Type, Constant or Variable Torque with Solid State Overload, Class 32

Selection

Ordering Information

Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.

Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.②

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/149.

Wiring Diagrams see page 9/160.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Low Speed FLA 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 3/4	10–40	A1	E
2-3	13–52	B	F
2-3	25–100	B	G
3 1/2-4	50–200	B	H

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp							Overload		Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	¾	1½	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***	
½	¾	1½	1½	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***	
7½	7½	—	—	1	—	30	10–40	A1	**32DUE†92B2V***		**32DUE†92W2V***		**32DUE†92F2V***		**32DUE†92N2V***	
—	—	15	15	—	1¾	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	—	2½	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	—	3½	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							Overload		Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	¾	1½	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***	
½	¾	1½	1½	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***	
7½	7½	—	—	1	—	30	10–40	A1	**32DUE†92B1V***		**32DUE†92W1V***		**32DUE†92F1V***		**32DUE†92N1V***	
—	—	15	15	—	1¾	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	—	2½	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	—	3½	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 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

Ordering Information

Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.

Replace the (†) with the letter that corresponds to the correct FLA in the High/Low Speed FLA table.②

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/149.

Wiring Diagrams see page 9/160.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies see Factory Modifications page 9/114.

High/Low Speed FLA Table②

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 3/4	10–40	A1	E
2-3	13–52	B	F
2-3	25–100	B	G
3 1/2-4	50–200	B	H

* 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.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp							Overload		Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	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	—	1¾	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							Overload		Enclosure							
									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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	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	—	1¾	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).

① Dual voltage coils not available in modified starters.

② 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.

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 50% Tap	Autotransformer 65% Tap	Autotransformer 80% Tap	Part-Winding 2 step	Wye-Delta
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% Increases slightly with speed	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/163.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 1 General Purpose Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	10–40	A1	**36EUET6BD**		60	**37EUET6BDD**		60A/250V	**37EUET6BDF**		50	**37EUET6BDP**	
	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	(1¾)	10–40	A1	**36EUET2BG**		60	**37EUET2BGD**		60A/250V	**37EUET2BGF**		50	**37EUET2BGP**	
	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	(1¾)	10–40	A1	**36EUET4BH**		60	**37EUET4BHD**		60A/600V	**37EUET4BHF**		50	**37EUET4BHP**	
	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	(1¾)	10–40	A1	**36EUET5BE**		60	**37EUET5BED**		60A/600V	**37EUET5BEF**		50	**37EUET5BEP**	
	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/163.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 4 Painted Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	10–40	A1	**36EUET6ED**		60	**37EUET6EDD**		60A/250V	**37EUET6EDF**		50	**37EUET6EDP**	
	10	2	13–52	B	**36FUFT6ED**		60	**37FUFT6EDD**		60A/250V	**37FUFT6EDF**		50	**37FUFT6EDP**	
	15	(2½)	25–100	B	**36GUGT6ED**		100	**37GUGT6EDD**		100A/250V	**37GUGT6EDF**		100	**37GUGT6EDP**	
	25	3	25–100	B	**36HUGT6ED**		100	**37HUGT6EDD**		100A/250V	**37HUGT6EDF**		100	**37HUGT6EDP**	
	30	(3½)	50–200	B	**36IUHT6ED**		200	**37IUHT6EDD**		200A/250V	**37IUHT6EDF**		125	**37IUHT6EDP**	
	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	(1¾)	10–40	A1	**36EUET2EG**		60	**37EUET2EGD**		60A/250V	**37EUET2EGF**		50	**37EUET2EGP**	
	15	2	13–52	B	**36FUFT2EG**		60	**37FUFT2EGD**		60A/250V	**37FUFT2EGF**		50	**37FUFT2EGP**	
	20	(2½)	25–100	B	**36GUGT2EG**		100	**37GUGT2EGD**		100A/250V	**37GUGT2EGF**		100	**37GUGT2EGP**	
	30	3	25–100	B	**36HUGT2EG**		100	**37HUGT2EGD**		100A/250V	**37HUGT2EGF**		100	**37HUGT2EGP**	
	40	(3½)	50–200	B	**36IUHT2EG**		200	**37IUHT2EGD**		200A/250V	**37IUHT2EGF**		125	**37IUHT2EGP**	
	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	(1¾)	10–40	A1	**36EUET4EH**		60	**37EUET4EHD**		60A/600V	**37EUET4EHF**		50	**37EUET4EHP**	
	25	2	13–52	B	**36FUFT4EH**		60	**37FUFT4EHD**		60A/600V	**37FUFT4EHF**		50	**37FUFT4EHP**	
	30	(2½)	13–52	B	**36GUGT4EH**		100	**37GUGT4EHD**		100A/600V	**37GUGT4EHF**		100	**37GUGT4EHP**	
	50	3	25–100	B	**36HUGT4EH**		100	**37HUGT4EHD**		100A/600V	**37HUGT4EHF**		100	**37HUGT4EHP**	
	75	(3½)	50–200	B	**36IUHT4EH**		200	**37IUHT4EHD**		200A/600V	**37IUHT4EHF**		125	**37IUHT4EHP**	
	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	(1¾)	10–40	A1	**36EUET5EE**		60	**37EUET5EED**		60A/600V	**37EUET5EEF**		50	**37EUET5EEP**	
	25	2	13–52	B	**36FUFT5EE**		60	**37FUFT5EED**		60A/600V	**37FUFT5EEF**		50	**37FUFT5EEP**	
	30	(2½)	13–52	B	**36GUGT5EE**		100	**37GUGT5EED**		100A/600V	**37GUGT5EEF**		100	**37GUGT5EEP**	
	50	3	25–100	B	**36HUGT5EE**		100	**37HUGT5EED**		100A/600V	**37HUGT5EEF**		100	**37HUGT5EEP**	
	75	(3½)	50–200	B	**36IUHT5EE**		200	**37IUHT5EED**		200A/600V	**37IUHT5EEF**		125	**37IUHT5EEP**	
	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/163.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 4/4X Stainless Steel Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	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	(1¾)	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	(1¾)	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	(1¾)	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/163.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 12, NEMA 3/3R

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	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	(1¾)	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	(1¾)	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	(1¾)	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).

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page page 9/150.
Wiring Diagrams see page 9/162.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 1 General Purpose Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	**36CUDP6BD**		60	**37CUDP6BDD**		60A/250V	**37CUDP6BDF**		30	**37CUDP6BDP**	
	10	1	5.5–22	A1	**36DUDP6BD**		60	**37DUDP6BDD**		60A/250V	**37DUDP6BDF**		50	**37DUDP6BDP**	
	15	(1¾)	10–40	A1	**36EUEP6BD**		100	**37EUEP6BDD**		100A/250V	**37EUEP6BDF**		100	**37EUEP6BDP**	
	20	2	13–52	B	**36FUFP6BD**		100	**37FUFP6BDD**		100A/250V	**37FUFP6BDF**		100	**37FUFP6BDP**	
	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	**37LPSP6BDP**	
	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	**36FUFP2BG**		100	**37FUFP2BGD**		100A/250V	**37FUFP2BGF**		100	**37FUFP2BGP**	
	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	**37LPSP2BGP**	
	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	(1¾)	10–40	A1	**36EUEP4BH**		60	**37EUEP4BHD**		60A/600V	**37EUEP4BHF**		50	**37EUEP4BHP**	
	40	2	13–52	B	**36FUFP4BH**		100	**37FUFP4BHD**		100A/600V	**37FUFP4BHF**		100	**37FUFP4BHP**	
	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	**37LPSP4BHP**	
	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	(1¾)	10–40	A1	**36EUEP5BE**		60	**37EUEP5BED**		60A/600V	**37EUEP5BEF**		50	**37EUEP5BEP**	
	40	2	13–52	B	**36FUFP5BE**		60	**37FUFP5BED**		60A/600V	**37FUFP5BEF**		50	**37FUFP5BEP**	
	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	**37LPSP5BEF**		—	—	
	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page page 9/150.
Wiring Diagrams see page 9/162.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 4 Painted Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	10–40	A1	**36EUEP6ED**		100	**37EUEP6EDD**		100A/250V	**37EUEP6EDF**		100	**37EUEP6EDP**	
	20	2	13–52	B	**36FUFP6ED**		100	**37FUFP6EDD**		100A/250V	**37FUFP6EDF**		100	**37FUFP6EDP**	
	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**	
	100	5	55–250	—	—		—	—		—	—		600	**37LPSP6EDP**	
	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	**36FUFP2EG**		100	**37FUFP2EGD**		100A/250V	**37FUFP2EGF**		100	**37FUFP2EGP**	
	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	**37LPSP2EGP**	
	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	(1¾)	10–40	A1	**36EUEP4EH**		60	**37EUEP4EHD**		60A/600V	**37EUEP4EHF**		50	**37EUEP4EHP**	
	40	2	13–52	B	**36FUFP4EH**		100	**37FUFP4EHD**		100A/600V	**37FUFP4EHF**		100	**37FUFP4EHP**	
	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	**37LPSP4EHP**	
	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	(1¾)	10–40	A1	**36EUEP5EE**		60	**37EUEP5EED**		60A/600V	**37EUEP5EEF**		50	**37EUEP5EEP**	
	40	2	13–52	B	**36FUFP5EE**		60	**37FUFP5EED**		60A/600V	**37FUFP5EEF**		50	**37FUFP5EEP**	
	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	**37LPSP5EEF**		—	—	
	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).

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page page 9/150.
Wiring Diagrams see page 9/162.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 4/4X Stainless Steel Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect		Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	10–40	A1	**36EUEP6WD**		100	**37EUEP6WDD**		100A/250V	**37EUEP6WDF**	100	**37EUEP6WDP**	
	20	2	13–52	B	**36FUFP6WD**		100	**37FUFP6WDD**		100A/250V	**37FUFP6WDF**	100	**37FUFP6WDP**	
	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**	
	75	4	50–200	B	**36JUHP6WD**		400	**37JUHP6WDD**		400A/250V	**37JUHP6WDF**	400	**37JUHP6WDP**	
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	**36FUFP2WG**		100	**37FUFP2WGD**		100A/250V	**37FUFP2WGF**	100	**37FUFP2WGP**	
	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**	
	75	4	50–200	B	**36JUHP2WG**		400	**37JUHP2WGD**		400A/250V	**37JUHP2WGF**	250	**37JUHP2WGP**	
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	(1¾)	10–40	A1	**36EUEP4WH**		60	**37EUEP4WHD**		60A/600V	**37EUEP4WHF**	50	**37EUEP4WHP**	
	40	2	13–52	B	**36FUFP4WH**		100	**37FUFP4WHD**		100A/600V	**37FUFP4WHF**	100	**37FUFP4WHP**	
	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**	
	150	4	50–200	B	**36JUHP4WH**		400	**37JUHP4WHD**		400A/600V	**37JUHP4WHF**	250	**37JUHP4WHP**	
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	(1¾)	10–40	A1	**36EUEP5WE**		60	**37EUEP5WED**		60A/600V	**37EUEP5WEF**	50	**37EUEP5WEP**	
	40	2	13–52	B	**36FUFP5WE**		60	**37FUFP5WED**		60A/600V	**37FUFP5WEF**	50	**37FUFP5WEP**	
	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page page 9/150.
Wiring Diagrams see page 9/162.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 12, NEMA 3/3R

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Call Combination Fusible Disconnect Call			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	10–40	A1	**36EUEP6ND**		100	**37EUEP6NDD**		100A/250V	**37EUEP6NDF**		100	**37EUEP6NDP**	
	20	2	13–52	B	**36FUFP6ND**		100	**37FUFP6NDD**		100A/250V	**37FUFP6NDF**		100	**37FUFP6NDP**	
	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	**37LPSP6NDP**	
	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	**36FUFP2NG**		100	**37FUFP2NGD**		100A/250V	**37FUFP2NGF**		100	**37FUFP2NGP**	
	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	**37LPSP2NGP**	
	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	(1¾)	10–40	A1	**36EUEP4NH**		60	**37EUEP4NHD**		60A/600V	**37EUEP4NHF**		50	**37EUEP4NHP**	
	40	2	13–52	B	**36FUFP4NH**		100	**37FUFP4NHD**		100A/600V	**37FUFP4NHF**		100	**37FUFP4NHP**	
	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	**37LPSP4NHP**	
	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	(1¾)	10–40	A1	**36EUEP5NE**		60	**37EUEP5NED**		60A/600V	**37EUEP5NEF**		50	**37EUEP5NEP**	
	40	2	13–52	B	**36FUFP5NE**		60	**37FUFP5NED**		60A/600V	**37FUFP5NEF**		50	**37FUFP5NEP**	
	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	—	—		—	—		400A/600V	**37LPSP5NEF**		—	—	
	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).

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/164 .
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 1 General Purpose Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/164 .
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 4 Painted Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	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	(1¾)	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	(1¾)	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	(1¾)	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/164 .
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 4/4X Stainless Steel Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/164 .
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 12, NEMA 3/3R

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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**	
	150	5	55–250	—	**36LPU06ND**		600	**37LPU06NDD**		600A/250V	**37LPU06NDF**		600	**37LPU06NDP**	
	300	6	160–630	—	**36MPX06ND**		1200	**37MPX06NDD**		1200A/250V	**37MPX06NDF**		1200	**37MPX06NDP**	
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**	
	150	5	55–250	—	**36LPU02NG**		600	**37LPU02NGD**		600A/250V	**37LPU02NGF**		600	**37LPU02NGP**	
	350	6	160–630	—	**36MPX02NG**		1200	**37MPX02NGD**		1200A/250V	**37MPX02NGF**		1200	**37MPX02NGP**	
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**	
	300	5	55–250	—	**36LPU04NH**		600	**37LPU04NHD**		600A/600V	**37LPU04NHF**		600	**37LPU04NHP**	
	700	6	160–630	—	**36MPX04NH**		1600	**37MPX04NHD**		1600A/600V	**37MPX04NHF**		1200	**37MPX04NHP**	
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**	
	300	5	55–250	—	**36LPU05NE**		600	**37LPU05NED**		600A/600V	**37LPU05NEF**		400	**37LPU05NEP**	
	700	6	160–630	—	**37MPX05NF**		1600	**37MPX05NED**		1600A/600V	**37MPX05NEF**		1600	**37MPX05NEP**	

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

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/165.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 1 General Purpose Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	**36FUFC6BD**		100	**37FUFC6BDD**		100A/250V	**37FUFC6BDF**		100	**37FUFC6BDP**	
	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**	
	150	5	55–250	—	**36LPUC6BD**		600	**37LPUC6BDD**		600A/250V	**37LPUC6BDF**		600	**37LPUC6BDP**	
	300	6	160–630	—	**36MPXC6BD**		1200	**37MPXC6BDD**		1200A/250V	**37MPXC6BDF**		1200	**37MPXC6BDP**	
230	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	**36FUFC2BG**		100	**37FUFC2BGD**		100A/250V	**37FUFC2BGF**		100	**37FUFC2BGP**	
	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**	
	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**	
460	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	**36FUFC4BH**		100	**37FUFC4BHD**		100A/600V	**37FUFC4BHF**		100	**37FUFC4BHP**	
	60	(2½)	25–100	B	**36GUGC4BH**		200	**37GUGC4BHD**		200A/600V	**37GUGC4BHF**		100	**37GUGC4BHP**	
	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**	
575	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	**36FUFC5BE**		100	**37FUFC5BED**		100A/600V	**37FUFC5BEF**		50	**37FUFC5BEP**	
	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

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/165.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 4 Painted Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	**36FUFC6ED**		100	**37FUFC6EDD**		100A/250V	**37FUFC6EDF**		100	**37FUFC6EDP**	
	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**	
	150	5	55–250	—	**36LPUC6ED**		600	**37LPUC6EDD**		600A/250V	**37LPUC6EDF**		600	**37LPUC6EDP**	
	300	6	160–630	—	**36MPXC6ED**		1200	**37MPXC6EDD**		1200A/250V	**37MPXC6EDF**		1200	**37MPXC6EDP**	
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	**36FUFC2EG**		100	**37FUFC2EGD**		100A/250V	**37FUFC2EGF**		100	**37FUFC2EGP**	
	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**	
	150	5	55–250	—	**36LPUC2EG**		600	**37LPUC2EGD**		600A/250V	**37LPUC2EGF**		600	**37LPUC2EGP**	
	350	6	160–630	—	**36MPXC2EG**		1200	**37MPXC2EGD**		1200A/250V	**37MPXC2EGF**		1200	**37MPXC2EGP**	
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	**36FUFC4EH**		100	**37FUFC4EHD**		100A/600V	**37FUFC4EHF**		100	**37FUFC4EHP**	
	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**	
	300	5	55–250	—	**36LPUC4EH**		600	**37LPUC4EHD**		600A/600V	**37LPUC4EHF**		600	**37LPUC4EHP**	
	700	6	160–630	—	**36MPXC4EH**		1600	**37MPXC4EHD**		1600A/600V	**37MPXC4EHF**		1200	**37MPXC4EHP**	
575	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	**36FUFC5EE**		100	**37FUFC5EED**		100A/600V	**37FUFC5EEF**		50	**37FUFC5EEP**	
	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**	
	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

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/165.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 4/4X Stainless Steel Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	**36FUFC6WD**		100	**37FUFC6WDD**		100A/250V	**37FUFC6WDF**		100	**37FUFC6WDP**	
	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	**36FUFC2WG**		100	**37FUFC2WGD**		100A/250V	**37FUFC2WGF**		100	**37FUFC2WGP**	
	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	**36FUFC4WH**		100	**37FUFC4WHD**		100A/600V	**37FUFC4WHF**		100	**37FUFC4WHP**	
	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	**36FUFC5WE**		100	**37FUFC5WED**		100A/600V	**37FUFC5WEF**		50	**37FUFC5WEP**	
	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

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/150.
Wiring Diagrams see page 9/165.
Replacement Parts see page 9/120.

Coil and Control Voltage

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".

NEMA 12, NEMA 3/3R

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	**36FUFC6ND**		100	**37FUFC6NDD**		100A/250V	**37FUFC6NDF**		100	**37FUFC6NDP**	
	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**	
	150	5	55–250	—	**36LPUC6ND**		600	**37LPUC6NDD**		600A/250V	**37LPUC6NDF**		600	**37LPUC6NDP**	
	300	6	160–630	—	**36MPXC6ND**		1200	**37MPXC6NDD**		1200A/250V	**37MPXC6NDF**		1200	**37MPXC6NDP**	
230	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	**36FUFC2NG**		100	**37FUFC2NGD**		100A/250V	**37FUFC2NGF**		100	**37FUFC2NGP**	
	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**	
	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**	
460	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	**36FUFC4NH**		100	**37FUFC4NHD**		100A/600V	**37FUFC4NHF**		100	**37FUFC4NHP**	
	60	(2½)	25–100	B	**36GUGC4NH**		200	**37GUGC4NHD**		200A/600V	**37GUGC4NHF**		100	**37GUGC4NHP**	
	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**	
575	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	**36FUFC5NE**		100	**37FUFC5NED**		100A/600V	**37FUFC5NEF**		50	**37FUFC5NEP**	
	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).

3-Phase, Class 40

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 9/100.

Factory Modifications see page 9/114.

Dimensions see pages 9/131 open and 9/141 enclosed.

Wiring Diagrams see page 9/166.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp							Enclosure									
							Open Type④		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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor 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 $
1½	1½	2	2	9	00	—	**40BP32A***		**40BP32B***		Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	**40CP32A***		**40CP32B***		**40CP32W***		**40CP32F***		**40CP320***	
7½	7½	10	10	27	1	—	**40DP32A***		**40DP32B***		**40DP32W***		**40DP32F***		**40DP320***	
10	10	15	15	40	—	1¾	**40EP32A***		**40EP32B***		**40EP32W***		**40EP32F***		**40EP320***	
10	15	25	25	45	2	—	**40FP32A***		**40FP32B***		**40FP32W***		**40FP32F***		**40FP320***	
15	20	30	30	60	—	2½	**40GP32A***		**40GP32B***		**40GP32W***		**40GP32F***		**40GP320***	
25	30	50	50	90	3	—	**40HP32A***		**40HP32B***		**40HP32W***		**40HP32F***		**40HP320***	
30	40	75	75	115	—	3½	**40IP32A***		**40IP32B***		**40IP32W***		**40IP32F***		**40IP320***	
40	50	100	100	135	4	—	**40JG32A***		**40JG32B***		**40JG32W***		**40JG32F***		**40JG320***	
75	100	200	200	270	5	—	**40LP32A***		**40LP32B***		—	—	—	—	**40LP320***	
150	200	400	400	540	6	—	**40MP32A***		**40MP32B***		—	—	—	—	**40MP320***	
—	300	600	600	810	7②⑤	—	**40NH32A***		**40NH32B***		—	—	—	—	**40NH320***	
—	450	900	900	1215	8③⑤	—	**40PH32A***		**40PH32B***		—	—	—	—	**40PH320***	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp							Enclosure					
							NEMA 1④ General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	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	—
3	3	5	5	18	0	—	**40CP82B***		**40CP82W***		**40CP820***	
7½	7½	10	10	27	1	—	**40DP82B***		**40DP82W***		**40DP820***	
10	10	15	15	40	—	1¾	**40EP82B***		**40EP82W***		**40EP820***	
10	15	25	25	45	2	—	**40FP82B***		**40FP82W***		**40FP820***	
15	20	30	30	60	—	2½	**40GP82B***		**40GP82W***		**40GP820***	
25	30	50	50	90	3	—	**40HP82B***		**40HP82W***		**40HP820***	
30	40	75	75	115	—	3½	**40IP82B***		**40IP82W***		**40IP820***	
40	50	100	100	135	4	—	**40JG82B***		**40JG82W***		**40JG820***	

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 Only available
F coil 100-250V AC 50/60Hz, or DC
H coil 150-500V AC 50/60Hz, or DC

③ Only available
F coil100-250V AC 50/60Hz, or DC

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

⑤ Lugs are not included, refer to page 9/105.

Single Phase, 4-Pole & Vacuum, Class 40

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 9/100.

Factory Modifications see page 9/114.

Dimensions see pages 9/131 open and 9/141 enclosed.

Wiring Diagrams see page 9/166.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Open Type & Standard Width Enclosure, Single Phase, 2-Pole②③

Max Hp					Enclosure									
					Open Type④		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
115 Volts	208/230 Volts	Contactor 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 $
⅓	1	9	00	—	**40BP12A***		**40BP12B***		Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	—	**40CP12A***		**40CP12B***		**40CP12W***		**40CP12F***		**40CP120***	
2	3	27	1	—	**40DP12A***		**40DP12B***		**40DP12W***		**40DP12F***		**40DP120***	
3	5	35	1P	—	**40EP12A***		**40EP12B***		**40EP12W***		**40EP12F***		**40EP120***	
3	7½	45	2	—	**40FP12A***		**40FP12B***		**40FP12W***		**40FP12F***		**40FP120***	
5	10	60	—	2½	**40GP12A***		**40GP12B***		**40GP12W***		**40GP12F***		**40GP120***	
7½	15	90	3	—	**40HP12A***		**40HP12B***		**40HP12W***		**40HP12F***		**40HP120***	

Open Type & Standard Width Enclosure, 4-Pole

Max Hp							Enclosure									
							Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor 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 $
⅓	1½	2	2	9	00	—	**40BP22A***		**40BP22B***		Use Size 0	—	Use Size 0	—	Use Size 0	—
2	3	5	5	18	0	—	**40CP22A***		**40CP22B***		**40CP22W***		**40CP22F***		**40CP220***	
3	7½	10	10	27	1	—	**40DP22A***		**40DP22B***		**40DP22W***		**40DP22F***		**40DP220***	
5	10	15	15	40	—	1¾	**40EP22A***		**40EP22B***		**40EP22W***		**40EP22F***		**40EP220***	

Vacuum Contactors, 3-Phase, 3-Pole①

Max Hp				Contactor Amp Rating	NEMA Size	Open Type	
200V	230V	460V	575V			Catalog Number	List Price $
40	50	100	100	135	4	—	
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 9/114 for a complete list of available coil voltages.

② To order single phase contactor in an extra wide enclosure, order the enclosure kit from Page 9/109 and the open style contactor as separate items.

③ 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.

④ 1 NO Auxiliary.

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 9/100.

Factory Modifications see page 9/114.

Dimensions see pages 9/132 open and 9/145 enclosed.

Wiring Diagrams see page 9/166.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/114.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp							Enclosure									
							Open Type⑤		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 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor 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 $
½	½	2	2	9	00	—	**43BP32A***		**43BP32B***		Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	**43CP32A***		**43CP32B***		**43CP32W***		**43CP32F***		**43CP320***	
7½	7½	10	10	27	1	—	**43DP32A***		**43DP32B***		**43DP32W***		**43DP32F***		**43DP320***	
10	10	15	15	40	—	1¾	**43EP32A***		**43EP32B***		**43EP32W***		**43EP32F***		**43EP320***	
10	15	25	25	45	2	—	**43FP32A***		**43FP32B***		**43FP32W***		**43FP32F***		**43FP320***	
15	20	30	30	60	—	2½	**43GP32A***		**43GP32B***		**43GP32W***		**43GP32F***		**43GP320***	
25	30	50	50	90	3	—	**43HP32A***		**43HP32B***		**43HP32W***		**43HP32F***		**43HP320***	
30	40	75	75	115	—	3½	**43IP32A***		**43IP32B***		**43IP32W***		**43IP32F***		**43IP320***	
40	50	100	100	135	4	—	**43JG32A***		**43JG32B***		**43JG32W***		**43JG32F***		**43JG320***	
75	100	200	200	270	5	—	**43LP32A***		**43LP32B***		—	—	—	—	**43LP320***	
100	200	400	400	540	6	—	**43MP32A***		**43MP32B***		—	—	—	—	**43MP320***	
—	300	600	600	810	7③	—	**43NH32A***		**43NH32B***		—	—	—	—	**43NH320***	
—	450	900	900	1215	8④	—	**43PH32A***		—	—		—	—	—	—	—

Open Type & Standard Width Enclosure, Single Phase, 3-Wire, 2-Pole②

Max Hp				Enclosure									
				Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof	
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅓	1	9	00	**43BP12A***		**43BP12B***		Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	**43CP12A***		**43CP12B***		**43CP12W***		**43CP12F***		**43CP120***	
2	3	27	1	**43DP12A***		**43DP12B***		**43DP12W***		**43DP12F***		**43DP120***	
3	5	35	1P	**43EP12A***		**43EP12B***		**43EP12W***		**43EP12F***		**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 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.

③ Only available
F coil 100-250V AC 50/60Hz, or DC
H coil 150-500V AC 50/60Hz, or DC

④ Only available
F coil 100-250V AC 50/60Hz, or DC

⑤ Auxiliary contacts
43B-43E 4th pole built-in
43F-43J 2 NO & 2 NC

Conversion Table

The tables below list the obsolete order numbers with the corresponding new equivalent order numbers.

Please note this cross is intended as a recommendation only (not all products are exact matches). Check the specifications of the suggested equivalents to ensure they meet your needs.

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14BP32BA81	14BUA32BA
14BP32BC81	14BUA32BC
14BP32BD81	14BUA32BD
14BP32BE81	14BUA32BE
14BP32BF81	14BUA32BF
14BP32BG81	14BUA32BG
14BP32BH81	14BUA32BH
14BP32BJ81	14BUA32BJ
14BP32BS81	14BUA32BS
14BP82BA81	14BUA82BA
14BP82BC81	14BUA82BC
14BP82BD81	14BUA82BD
14BP82BF81	14BUA82BF
14BP82BG81	14BUA82BG
14BP82BH81	14BUA82BH
14BP82BJ81	14BUA82BJ
14BP82BS81	14BUA82BS
14BP32BA81	14BUB32BA
14BP32BC81	14BUB32BC
14BP32BD81	14BUB32BD
14BP32BE81	14BUB32BE
14BP32BF81	14BUB32BF
14BP32BG81	14BUB32BG
14BP32BH81	14BUB32BH
14BP32BJ81	14BUB32BJ
14BP32BS81	14BUB32BS
14BP82BA81	14BUB82BA
14BP82BC81	14BUB82BC
14BP82BD81	14BUB82BD
14BP82BF81	14BUB82BF
14BP82BG81	14BUB82BG
14BP82BH81	14BUB82BH
14BP82BJ81	14BUB82BJ
14BP82BS81	14BUB82BS
14BP32BA81	14BUC32BA
14BP32BC81	14BUC32BC
14BP32BD81	14BUC32BD
14BP32BE81	14BUC32BE
14BP32BF81	14BUC32BF
14BP32BG81	14BUC32BG
14BP32BH81	14BUC32BH
14BP32BJ81	14BUC32BJ
14BP32BS81	14BUC32BS
14BP82BA81	14BUC82BA
14BP82BC81	14BUC82BC
14BP82BD81	14BUC82BD
14BP82BF81	14BUC82BF
14BP82BG81	14BUC82BG
14BP82BH81	14BUC82BH
14BP82BJ81	14BUC82BJ
14BP82BS81	14BUC82BS
14CP320A81	14CUA320A
14CP320C81	14CUA320C
14CP320D81	14CUA320D

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14CP320E81	14CUA320E
14CP320F81	14CUA320F
14CP320G81	14CUA320G
14CP320H81	14CUA320H
14CP320J81	14CUA320J
14CP320S81	14CUA320S
14CP32BA81	14CUA32BA
14CP32BC81	14CUA32BC
14CP32BD81	14CUA32BD
14CP32BE81	14CUA32BE
14CP32BF81	14CUA32BF
14CP32BG81	14CUA32BG
14CP32BH81	14CUA32BH
14CP32BJ81	14CUA32BJ
14CP32BS81	14CUA32BS
14CP32FA81	14CUA32FA
14CP32FC81	14CUA32FC
14CP32FD81	14CUA32FD
14CP32FF81	14CUA32FF
14CP32FG81	14CUA32FG
14CP32FH81	14CUA32FH
14CP32FJ81	14CUA32FJ
14CP32FS81	14CUA32FS
14CP32WA81	14CUA32WA
14CP32WC81	14CUA32WC
14CP32WD81	14CUA32WD
14CP32WF81	14CUA32WF
14CP32WG81	14CUA32WG
14CP32WH81	14CUA32WH
14CP32WJ81	14CUA32WJ
14CP32WS81	14CUA32WS
14CP32XA81	14CUA32XA
14CP32XC81	14CUA32XC
14CP32XD81	14CUA32XD
14CP32XF81	14CUA32XF
14CP32XG81	14CUA32XG
14CP32XH81	14CUA32XH
14CP32XJ81	14CUA32XJ
14CP32XS81	14CUA32XS
14CP820A81	14CUA820A
14CP820C81	14CUA820C
14CP820D81	14CUA820D
14CP820F81	14CUA820F
14CP820G81	14CUA820G
14CP820H81	14CUA820H
14CP820J81	14CUA820J
14CP820S81	14CUA820S
14CP82BA81	14CUA82BA
14CP82BC81	14CUA82BC
14CP82BD81	14CUA82BD
14CP82BF81	14CUA82BF
14CP82BG81	14CUA82BG
14CP82BH81	14CUA82BH
14CP82BJ81	14CUA82BJ

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14CP82BS81	14CUA82BS
14CP82WA81	14CUA82WA
14CP82WC81	14CUA82WC
14CP82WD81	14CUA82WD
14CP82WF81	14CUA82WF
14CP82WG81	14CUA82WG
14CP82WH81	14CUA82WH
14CP82WJ81	14CUA82WJ
14CP82WS81	14CUA82WS
14CP120A81	14CUB120A
14CP120C81	14CUB120C
14CP120D81	14CUB120D
14CP120F81	14CUB120F
14CP120G81	14CUB120G
14CP120J81	14CUB120J
14CP120S81	14CUB120S
14CP12BA81	14CUB12BA
14CP12BC81	14CUB12BC
14CP12BD81	14CUB12BD
14CP12BF81	14CUB12BF
14CP12BG81	14CUB12BG
14CP12BJ81	14CUB12BJ
14CP12BS81	14CUB12BS
14CP12FA81	14CUB12FA
14CP12FC81	14CUB12FC
14CP12FD81	14CUB12FD
14CP12FF81	14CUB12FF
14CP12FG81	14CUB12FG
14CP12FJ81	14CUB12FJ
14CP12FS81	14CUB12FS
14CP12WA81	14CUB12WA
14CP12WC81	14CUB12WC
14CP12WD81	14CUB12WD
14CP12WF81	14CUB12WF
14CP12WG81	14CUB12WG
14CP12WJ81	14CUB12WJ
14CP12WS81	14CUB12WS
14CP12XA81	14CUB12XA
14CP12XC81	14CUB12XC
14CP12XD81	14CUB12XD
14CP12XF81	14CUB12XF
14CP12XG81	14CUB12XG
14CP12XJ81	14CUB12XJ
14CP12XS81	14CUB12XS
14CP320A81	14CUB320A
14CP320C81	14CUB320C
14CP320D81	14CUB320D
14CP320E81	14CUB320E
14CP320F81	14CUB320F
14CP320G81	14CUB320G
14CP320H81	14CUB320H
14CP320J81	14CUB320J
14CP320S81	14CUB320S
14CP32BA81	14CUB32BA

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14CP32BC81	14CUB32BC
14CP32BD81	14CUB32BD
14CP32BE81	14CUB32BE
14CP32BF81	14CUB32BF
14CP32BG81	14CUB32BG
14CP32BH81	14CUB32BH
14CP32BJ81	14CUB32BJ
14CP32BS81	14CUB32BS
14CP32FA81	14CUB32FA
14CP32FC81	14CUB32FC
14CP32FD81	14CUB32FD
14CP32FF81	14CUB32FF
14CP32FG81	14CUB32FG
14CP32FH81	14CUB32FH
14CP32FJ81	14CUB32FJ
14CP32FS81	14CUB32FS
14CP32WA81	14CUB32WA
14CP32WC81	14CUB32WC
14CP32WD81	14CUB32WD
14CP32WF81	14CUB32WF
14CP32WG81	14CUB32WG
14CP32WH81	14CUB32WH
14CP32WJ81	14CUB32WJ
14CP32WS81	14CUB32WS
14CP32XA81	14CUB32XA
14CP32XC81	14CUB32XC
14CP32XD81	14CUB32XD
14CP32XF81	14CUB32XF
14CP32XG81	14CUB32XG
14CP32XH81	14CUB32XH
14CP32XJ81	14CUB32XJ
14CP32XS81	14CUB32XS
14CP820A81	14CUB820A
14CP820C81	14CUB820C
14CP820D81	14CUB820D
14CP820F81	14CUB820F
14CP820G81	14CUB820G
14CP820H81	14CUB820H
14CP820J81	14CUB820J
14CP820S81	14CUB820S
14CP82BA81	14CUB82BA
14CP82BC81	14CUB82BC
14CP82BD81	14CUB82BD
14CP82BF81	14CUB82BF
14CP82BG81	14CUB82BG
14CP82BH81	14CUB82BH
14CP82BJ81	14CUB82BJ
14CP82BS81	14CUB82BS
14CP82WA81	14CUB82WA
14CP82WC81	14CUB82WC
14CP82WD81	14CUB82WD
14CP82WF81	14CUB82WF
14CP82WG81	14CUB82WG
14CP82WH81	14CUB82WH

Conversion Table

The tables below list the obsolete order numbers with the corresponding new equivalent order numbers.

Please note this cross is intended as a recommendation only (not all products are exact matches). Check the specifications of the suggested equivalents to ensure they meet your needs.

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14CP82WJ81	14CUB82WJ
14CP82WS81	14CUB82WS
14CP120A81	14CUC120A
14CP120C81	14CUC120C
14CP120D81	14CUC120D
14CP120F81	14CUC120F
14CP120G81	14CUC120G
14CP120J81	14CUC120J
14CP120S81	14CUC120S
14CP12BA81	14CUC12BA
14CP12BC81	14CUC12BC
14CP12BD81	14CUC12BD
14CP12BF81	14CUC12BF
14CP12BG81	14CUC12BG
14CP12BJ81	14CUC12BJ
14CP12BS81	14CUC12BS
14CP12FA81	14CUC12FA
14CP12FC81	14CUC12FC
14CP12FD81	14CUC12FD
14CP12FF81	14CUC12FF
14CP12FG81	14CUC12FG
14CP12FJ81	14CUC12FJ
14CP12FS81	14CUC12FS
14CP12WA81	14CUC12WA
14CP12WC81	14CUC12WC
14CP12WD81	14CUC12WD
14CP12WF81	14CUC12WF
14CP12WG81	14CUC12WG
14CP12WJ81	14CUC12WJ
14CP12WS81	14CUC12WS
14CP12XA81	14CUC12XA
14CP12XC81	14CUC12XC
14CP12XD81	14CUC12XD
14CP12XF81	14CUC12XF
14CP12XG81	14CUC12XG
14CP12XJ81	14CUC12XJ
14CP12XS81	14CUC12XS
14CP320A81	14CUC320A
14CP320C81	14CUC320C
14CP320D81	14CUC320D
14CP320E81	14CUC320E
14CP320F81	14CUC320F
14CP320G81	14CUC320G
14CP320H81	14CUC320H
14CP320J81	14CUC320J
14CP320S81	14CUC320S
14CP32BA81	14CUC32BA
14CP32BC81	14CUC32BC
14CP32BD81	14CUC32BD
14CP32BE81	14CUC32BE
14CP32BF81	14CUC32BF
14CP32BG81	14CUC32BG
14CP32BH81	14CUC32BH
14CP32BJ81	14CUC32BJ

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14CP32BS81	14CUC32BS
14CP32FA81	14CUC32FA
14CP32FC81	14CUC32FC
14CP32FD81	14CUC32FD
14CP32FF81	14CUC32FF
14CP32FG81	14CUC32FG
14CP32FH81	14CUC32FH
14CP32FJ81	14CUC32FJ
14CP32FS81	14CUC32FS
14CP32WA81	14CUC32WA
14CP32WC81	14CUC32WC
14CP32WD81	14CUC32WD
14CP32WF81	14CUC32WF
14CP32WG81	14CUC32WG
14CP32WH81	14CUC32WH
14CP32WJ81	14CUC32WJ
14CP32WS81	14CUC32WS
14CP32XA81	14CUC32XA
14CP32XC81	14CUC32XC
14CP32XD81	14CUC32XD
14CP32XF81	14CUC32XF
14CP32XG81	14CUC32XG
14CP32XH81	14CUC32XH
14CP32XJ81	14CUC32XJ
14CP32XS81	14CUC32XS
14CP820A81	14CUC820A
14CP820C81	14CUC820C
14CP820D81	14CUC820D
14CP820F81	14CUC820F
14CP820G81	14CUC820G
14CP820H81	14CUC820H
14CP820J81	14CUC820J
14CP820S81	14CUC820S
14CP82BA81	14CUC82BA
14CP82BC81	14CUC82BC
14CP82BD81	14CUC82BD
14CP82BF81	14CUC82BF
14CP82BG81	14CUC82BG
14CP82BH81	14CUC82BH
14CP82BJ81	14CUC82BJ
14CP82BS81	14CUC82BS
14CP82WA81	14CUC82WA
14CP82WC81	14CUC82WC
14CP82WD81	14CUC82WD
14CP82WF81	14CUC82WF
14CP82WG81	14CUC82WG
14CP82WH81	14CUC82WH
14CP82WJ81	14CUC82WJ
14CP82WS81	14CUC82WS
14CP120A81	14CUD120A
14CP120C81	14CUD120C
14CP120D81	14CUD120D
14CP120F81	14CUD120F
14CP120G81	14CUD120G

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14CP120J81	14CUD120J
14CP120S81	14CUD120S
14CP12BA81	14CUD12BA
14CP12BC81	14CUD12BC
14CP12BD81	14CUD12BD
14CP12BF81	14CUD12BF
14CP12BG81	14CUD12BG
14CP12BJ81	14CUD12BJ
14CP12BS81	14CUD12BS
14CP12FA81	14CUD12FA
14CP12FC81	14CUD12FC
14CP12FD81	14CUD12FD
14CP12FF81	14CUD12FF
14CP12FG81	14CUD12FG
14CP12FJ81	14CUD12FJ
14CP12FS81	14CUD12FS
14CP12WA81	14CUD12WA
14CP12WC81	14CUD12WC
14CP12WD81	14CUD12WD
14CP12WF81	14CUD12WF
14CP12WG81	14CUD12WG
14CP12WJ81	14CUD12WJ
14CP12WS81	14CUD12WS
14CP12XA81	14CUD12XA
14CP12XC81	14CUD12XC
14CP12XD81	14CUD12XD
14CP12XF81	14CUD12XF
14CP12XG81	14CUD12XG
14CP12XJ81	14CUD12XJ
14CP12XS81	14CUD12XS
14CP320A81	14CUD320A
14CP320C81	14CUD320C
14CP320D81	14CUD320D
14CP320E81	14CUD320E
14CP320F81	14CUD320F
14CP320G81	14CUD320G
14CP320H81	14CUD320H
14CP320J81	14CUD320J
14CP320S81	14CUD320S
14CP32BA81	14CUD32BA
14CP32BC81	14CUD32BC
14CP32BD81	14CUD32BD
14CP32BE81	14CUD32BE
14CP32BF81	14CUD32BF
14CP32BG81	14CUD32BG
14CP32BH81	14CUD32BH
14CP32BJ81	14CUD32BJ
14CP32BS81	14CUD32BS
14CP32FA81	14CUD32FA
14CP32FC81	14CUD32FC
14CP32FD81	14CUD32FD
14CP32FF81	14CUD32FF
14CP32FG81	14CUD32FG
14CP32FH81	14CUD32FH

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14CP32FJ81	14CUD32FJ
14CP32FS81	14CUD32FS
14CP32WA81	14CUD32WA
14CP32WC81	14CUD32WC
14CP32WD81	14CUD32WD
14CP32WF81	14CUD32WF
14CP32WG81	14CUD32WG
14CP32WH81	14CUD32WH
14CP32WJ81	14CUD32WJ
14CP32WS81	14CUD32WS
14CP32XA81	14CUD32XA
14CP32XC81	14CUD32XC
14CP32XD81	14CUD32XD
14CP32XF81	14CUD32XF
14CP32XG81	14CUD32XG
14CP32XH81	14CUD32XH
14CP32XJ81	14CUD32XJ
14CP32XS81	14CUD32XS
14CP820A81	14CUD820A
14CP820C81	14CUD820C
14CP820D81	14CUD820D
14CP820F81	14CUD820F
14CP820G81	14CUD820G
14CP820H81	14CUD820H
14CP820J81	14CUD820J
14CP820S81	14CUD820S
14CP82BA81	14CUD82BA
14CP82BC81	14CUD82BC
14CP82BD81	14CUD82BD
14CP82BF81	14CUD82BF
14CP82BG81	14CUD82BG
14CP82BH81	14CUD82BH
14CP82BJ81	14CUD82BJ
14CP82BS81	14CUD82BS
14CP82WA81	14CUD82WA
14CP82WC81	14CUD82WC
14CP82WD81	14CUD82WD
14CP82WF81	14CUD82WF
14CP82WG81	14CUD82WG
14CP82WH81	14CUD82WH
14CP82WJ81	14CUD82WJ
14CP82WS81	14CUD82WS
14DP320A81	14DUA320A
14DP320C81	14DUA320C
14DP320D81	14DUA320D
14DP320F81	14DUA320F
14DP320G81	14DUA320G
14DP320H81	14DUA320H
14DP320J81	14DUA320J
14DP320S81	14DUA320S
14DP32BA81	14DUA32BA
14DP32BC81	14DUA32BC
14DP32BD81	14DUA32BD
14DP32BE81	14DUA32BE

Conversion Table

The tables below list the obsolete order numbers with the corresponding new equivalent order numbers.

Please note this cross is intended as a recommendation only (not all products are exact matches). Check the specifications of the suggested equivalents to ensure they meet your needs.

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14DP32BF81	14DUA32BF
14DP32BG81	14DUA32BG
14DP32BH81	14DUA32BH
14DP32BJ81	14DUA32BJ
14DP32BS81	14DUA32BS
14DP32FA81	14DUA32FA
14DP32FC81	14DUA32FC
14DP32FD81	14DUA32FD
14DP32FE81	14DUA32FE
14DP32FF81	14DUA32FF
14DP32FG81	14DUA32FG
14DP32FH81	14DUA32FH
14DP32FJ81	14DUA32FJ
14DP32FS81	14DUA32FS
14DP32WA81	14DUA32WA
14DP32WC81	14DUA32WC
14DP32WD81	14DUA32WD
14DP32WF81	14DUA32WF
14DP32WG81	14DUA32WG
14DP32WH81	14DUA32WH
14DP32WJ81	14DUA32WJ
14DP32WS81	14DUA32WS
14DP32XA81	14DUA32XA
14DP32XC81	14DUA32XC
14DP32XD81	14DUA32XD
14DP32XF81	14DUA32XF
14DP32XG81	14DUA32XG
14DP32XH81	14DUA32XH
14DP32XJ81	14DUA32XJ
14DP32XS81	14DUA32XS
14DP820A81	14DUA820A
14DP820C81	14DUA820C
14DP820D81	14DUA820D
14DP820F81	14DUA820F
14DP820G81	14DUA820G
14DP820H81	14DUA820H
14DP820J81	14DUA820J
14DP820S81	14DUA820S
14DP82BA81	14DUA82BA
14DP82BC81	14DUA82BC
14DP82BD81	14DUA82BD
14DP82BF81	14DUA82BF
14DP82BG81	14DUA82BG
14DP82BH81	14DUA82BH
14DP82BJ81	14DUA82BJ
14DP82BS81	14DUA82BS
14DP82WA81	14DUA82WA
14DP82WC81	14DUA82WC
14DP82WD81	14DUA82WD
14DP82WF81	14DUA82WF
14DP82WG81	14DUA82WG
14DP82WH81	14DUA82WH
14DP82WJ81	14DUA82WJ
14DP82WS81	14DUA82WS

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14DP120A81	14DUB120A
14DP120C81	14DUB120C
14DP120D81	14DUB120D
14DP120F81	14DUB120F
14DP120G81	14DUB120G
14DP120J81	14DUB120J
14DP120S81	14DUB120S
14DP12BA81	14DUB12BA
14DP12BC81	14DUB12BC
14DP12BD81	14DUB12BD
14DP12BF81	14DUB12BF
14DP12BG81	14DUB12BG
14DP12BJ81	14DUB12BJ
14DP12BS81	14DUB12BS
14DP12FA81	14DUB12FA
14DP12FC81	14DUB12FC
14DP12FD81	14DUB12FD
14DP12FF81	14DUB12FF
14DP12FG81	14DUB12FG
14DP12FJ81	14DUB12FJ
14DP12FS81	14DUB12FS
14DP12WA81	14DUB12WA
14DP12WC81	14DUB12WC
14DP12WD81	14DUB12WD
14DP12WF81	14DUB12WF
14DP12WG81	14DUB12WG
14DP12WJ81	14DUB12WJ
14DP12WS81	14DUB12WS
14DP12XA81	14DUB12XA
14DP12XC81	14DUB12XC
14DP12XD81	14DUB12XD
14DP12XF81	14DUB12XF
14DP12XG81	14DUB12XG
14DP12XJ81	14DUB12XJ
14DP12XS81	14DUB12XS
14DP320A81	14DUB320A
14DP320C81	14DUB320C
14DP320D81	14DUB320D
14DP320F81	14DUB320F
14DP320G81	14DUB320G
14DP320H81	14DUB320H
14DP320J81	14DUB320J
14DP320S81	14DUB320S
14DP32BA81	14DUB32BA
14DP32BC81	14DUB32BC
14DP32BD81	14DUB32BD
14DP32BE81	14DUB32BE
14DP32BF81	14DUB32BF
14DP32BG81	14DUB32BG
14DP32BH81	14DUB32BH
14DP32BJ81	14DUB32BJ
14DP32BS81	14DUB32BS
14DP32FA81	14DUB32FA
14DP32FC81	14DUB32FC

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14DP32FD81	14DUB32FD
14DP32FE81	14DUB32FE
14DP32FF81	14DUB32FF
14DP32FG81	14DUB32FG
14DP32FH81	14DUB32FH
14DP32FJ81	14DUB32FJ
14DP32FS81	14DUB32FS
14DP32WA81	14DUB32WA
14DP32WC81	14DUB32WC
14DP32WD81	14DUB32WD
14DP32WF81	14DUB32WF
14DP32WG81	14DUB32WG
14DP32WH81	14DUB32WH
14DP32WJ81	14DUB32WJ
14DP32WS81	14DUB32WS
14DP32XA81	14DUB32XA
14DP32XC81	14DUB32XC
14DP32XD81	14DUB32XD
14DP32XF81	14DUB32XF
14DP32XG81	14DUB32XG
14DP32XH81	14DUB32XH
14DP32XJ81	14DUB32XJ
14DP32XS81	14DUB32XS
14DP820A81	14DUB820A
14DP820C81	14DUB820C
14DP820D81	14DUB820D
14DP820F81	14DUB820F
14DP820G81	14DUB820G
14DP820H81	14DUB820H
14DP820J81	14DUB820J
14DP820S81	14DUB820S
14DP82BA81	14DUB82BA
14DP82BC81	14DUB82BC
14DP82BD81	14DUB82BD
14DP82BF81	14DUB82BF
14DP82BG81	14DUB82BG
14DP82BH81	14DUB82BH
14DP82BJ81	14DUB82BJ
14DP82BS81	14DUB82BS
14DP82WA81	14DUB82WA
14DP82WC81	14DUB82WC
14DP82WD81	14DUB82WD
14DP82WF81	14DUB82WF
14DP82WG81	14DUB82WG
14DP82WH81	14DUB82WH
14DP82WJ81	14DUB82WJ
14DP82WS81	14DUB82WS
14DP120A81	14DUC120A
14DP120C81	14DUC120C
14DP120D81	14DUC120D
14DP120F81	14DUC120F
14DP120G81	14DUC120G
14DP120J81	14DUC120J
14DP120S81	14DUC120S

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14DP12BA81	14DUC12BA
14DP12BC81	14DUC12BC
14DP12BD81	14DUC12BD
14DP12BF81	14DUC12BF
14DP12BG81	14DUC12BG
14DP12BJ81	14DUC12BJ
14DP12BS81	14DUC12BS
14DP12FA81	14DUC12FA
14DP12FC81	14DUC12FC
14DP12FD81	14DUC12FD
14DP12FF81	14DUC12FF
14DP12FG81	14DUC12FG
14DP12FJ81	14DUC12FJ
14DP12FS81	14DUC12FS
14DP12WA81	14DUC12WA
14DP12WC81	14DUC12WC
14DP12WD81	14DUC12WD
14DP12WF81	14DUC12WF
14DP12WG81	14DUC12WG
14DP12WJ81	14DUC12WJ
14DP12WS81	14DUC12WS
14DP12XA81	14DUC12XA
14DP12XC81	14DUC12XC
14DP12XD81	14DUC12XD
14DP12XF81	14DUC12XF
14DP12XG81	14DUC12XG
14DP12XJ81	14DUC12XJ
14DP12XS81	14DUC12XS
14DP320A81	14DUC320A
14DP320C81	14DUC320C
14DP320D81	14DUC320D
14DP320F81	14DUC320F
14DP320G81	14DUC320G
14DP320H81	14DUC320H
14DP320J81	14DUC320J
14DP320S81	14DUC320S
14DP32BA81	14DUC32BA
14DP32BC81	14DUC32BC
14DP32BD81	14DUC32BD
14DP32BE81	14DUC32BE
14DP32BF81	14DUC32BF
14DP32BG81	14DUC32BG
14DP32BH81	14DUC32BH
14DP32BJ81	14DUC32BJ
14DP32BS81	14DUC32BS
14DP32FA81	14DUC32FA
14DP32FC81	14DUC32FC
14DP32FD81	14DUC32FD
14DP32FE81	14DUC32FE
14DP32FF81	14DUC32FF
14DP32FG81	14DUC32FG
14DP32FH81	14DUC32FH
14DP32FJ81	14DUC32FJ
14DP32FS81	14DUC32FS

Conversion Table

The tables below list the obsolete order numbers with the corresponding new equivalent order numbers.

Please note this cross is intended as a recommendation only (not all products are exact matches). Check the specifications of the suggested equivalents to ensure they meet your needs.

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14DP32WA81	14DUC32WA
14DP32WC81	14DUC32WC
14DP32WD81	14DUC32WD
14DP32WF81	14DUC32WF
14DP32WG81	14DUC32WG
14DP32WH81	14DUC32WH
14DP32WJ81	14DUC32WJ
14DP32WS81	14DUC32WS
14DP32XA81	14DUC32XA
14DP32XC81	14DUC32XC
14DP32XD81	14DUC32XD
14DP32XF81	14DUC32XF
14DP32XG81	14DUC32XG
14DP32XH81	14DUC32XH
14DP32XJ81	14DUC32XJ
14DP32XS81	14DUC32XS
14DP820A81	14DUC820A
14DP820C81	14DUC820C
14DP820D81	14DUC820D
14DP820F81	14DUC820F
14DP820G81	14DUC820G
14DP820H81	14DUC820H
14DP820J81	14DUC820J
14DP820S81	14DUC820S
14DP82BA81	14DUC82BA
14DP82BC81	14DUC82BC
14DP82BD81	14DUC82BD
14DP82BF81	14DUC82BF
14DP82BG81	14DUC82BG
14DP82BH81	14DUC82BH
14DP82BJ81	14DUC82BJ
14DP82BS81	14DUC82BS
14DP82WA81	14DUC82WA
14DP82WC81	14DUC82WC
14DP82WD81	14DUC82WD
14DP82WF81	14DUC82WF
14DP82WG81	14DUC82WG
14DP82WH81	14DUC82WH
14DP82WJ81	14DUC82WJ
14DP82WS81	14DUC82WS
14DP120A81	14DUD120A
14DP120C81	14DUD120C
14DP120D81	14DUD120D
14DP120F81	14DUD120F
14DP120G81	14DUD120G
14DP120J81	14DUD120J
14DP120S81	14DUD120S
14DP12BA81	14DUD12BA
14DP12BC81	14DUD12BC
14DP12BD81	14DUD12BD
14DP12BF81	14DUD12BF
14DP12BG81	14DUD12BG
14DP12BJ81	14DUD12BJ
14DP12BS81	14DUD12BS

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14DP12FA81	14DUD12FA
14DP12FC81	14DUD12FC
14DP12FD81	14DUD12FD
14DP12FF81	14DUD12FF
14DP12FG81	14DUD12FG
14DP12FJ81	14DUD12FJ
14DP12FS81	14DUD12FS
14DP12WA81	14DUD12WA
14DP12WC81	14DUD12WC
14DP12WD81	14DUD12WD
14DP12WF81	14DUD12WF
14DP12WG81	14DUD12WG
14DP12WJ81	14DUD12WJ
14DP12WS81	14DUD12WS
14DP12XA81	14DUD12XA
14DP12XC81	14DUD12XC
14DP12XD81	14DUD12XD
14DP12XF81	14DUD12XF
14DP12XG81	14DUD12XG
14DP12XJ81	14DUD12XJ
14DP12XS81	14DUD12XS
14DP320A81	14DUD320A
14DP320C81	14DUD320C
14DP320D81	14DUD320D
14DP320F81	14DUD320F
14DP320G81	14DUD320G
14DP320H81	14DUD320H
14DP320J81	14DUD320J
14DP320S81	14DUD320S
14DP32BA81	14DUD32BA
14DP32BC81	14DUD32BC
14DP32BD81	14DUD32BD
14DP32BE81	14DUD32BE
14DP32BF81	14DUD32BF
14DP32BG81	14DUD32BG
14DP32BH81	14DUD32BH
14DP32BJ81	14DUD32BJ
14DP32BS81	14DUD32BS
14DP32FA81	14DUD32FA
14DP32FC81	14DUD32FC
14DP32FD81	14DUD32FD
14DP32FE81	14DUD32FE
14DP32FF81	14DUD32FF
14DP32FG81	14DUD32FG
14DP32FH81	14DUD32FH
14DP32FJ81	14DUD32FJ
14DP32FS81	14DUD32FS
14DP32WA81	14DUD32WA
14DP32WC81	14DUD32WC
14DP32WD81	14DUD32WD
14DP32WF81	14DUD32WF
14DP32WG81	14DUD32WG
14DP32WH81	14DUD32WH
14DP32WJ81	14DUD32WJ

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14DP32WS81	14DUD32WS
14DP32XA81	14DUD32XA
14DP32XC81	14DUD32XC
14DP32XD81	14DUD32XD
14DP32XF81	14DUD32XF
14DP32XG81	14DUD32XG
14DP32XH81	14DUD32XH
14DP32XJ81	14DUD32XJ
14DP32XS81	14DUD32XS
14DP820A81	14DUD820A
14DP820C81	14DUD820C
14DP820D81	14DUD820D
14DP820F81	14DUD820F
14DP820G81	14DUD820G
14DP820H81	14DUD820H
14DP820J81	14DUD820J
14DP820S81	14DUD820S
14DP82BA81	14DUD82BA
14DP82BC81	14DUD82BC
14DP82BD81	14DUD82BD
14DP82BF81	14DUD82BF
14DP82BG81	14DUD82BG
14DP82BH81	14DUD82BH
14DP82BJ81	14DUD82BJ
14DP82BS81	14DUD82BS
14DP82WA81	14DUD82WA
14DP82WC81	14DUD82WC
14DP82WD81	14DUD82WD
14DP82WF81	14DUD82WF
14DP82WG81	14DUD82WG
14DP82WH81	14DUD82WH
14DP82WJ81	14DUD82WJ
14DP82WS81	14DUD82WS
14DP320A81	14DUE320A
14DP320C81	14DUE320C
14DP320D81	14DUE320D
14DP320F81	14DUE320F
14DP320G81	14DUE320G
14DP320H81	14DUE320H
14DP320J81	14DUE320J
14DP320S81	14DUE320S
14DP32BA81	14DUE32BA
14DP32BC81	14DUE32BC
14DP32BD81	14DUE32BD
14DP32BE81	14DUE32BE
14DP32BF81	14DUE32BF
14DP32BG81	14DUE32BG
14DP32BH81	14DUE32BH
14DP32BJ81	14DUE32BJ
14DP32BS81	14DUE32BS
14DP32FA81	14DUE32FA
14DP32FC81	14DUE32FC
14DP32FD81	14DUE32FD
14DP32FE81	14DUE32FE

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14DP32FF81	14DUE32FF
14DP32FG81	14DUE32FG
14DP32FH81	14DUE32FH
14DP32FJ81	14DUE32FJ
14DP32FS81	14DUE32FS
14DP32WA81	14DUE32WA
14DP32WC81	14DUE32WC
14DP32WD81	14DUE32WD
14DP32WF81	14DUE32WF
14DP32WG81	14DUE32WG
14DP32WH81	14DUE32WH
14DP32WJ81	14DUE32WJ
14DP32WS81	14DUE32WS
14DP32XA81	14DUE32XA
14DP32XC81	14DUE32XC
14DP32XD81	14DUE32XD
14DP32XF81	14DUE32XF
14DP32XG81	14DUE32XG
14DP32XH81	14DUE32XH
14DP32XJ81	14DUE32XJ
14DP32XS81	14DUE32XS
14DP820A81	14DUE820A
14DP820C81	14DUE820C
14DP820D81	14DUE820D
14DP820F81	14DUE820F
14DP820G81	14DUE820G
14DP820H81	14DUE820H
14DP820J81	14DUE820J
14DP820S81	14DUE820S
14DP82BA81	14DUE82BA
14DP82BC81	14DUE82BC
14DP82BD81	14DUE82BD
14DP82BF81	14DUE82BF
14DP82BG81	14DUE82BG
14DP82BH81	14DUE82BH
14DP82BJ81	14DUE82BJ
14DP82BS81	14DUE82BS
14DP82WA81	14DUE82WA
14DP82WC81	14DUE82WC
14DP82WD81	14DUE82WD
14DP82WF81	14DUE82WF
14DP82WG81	14DUE82WG
14DP82WH81	14DUE82WH
14DP82WJ81	14DUE82WJ
14DP82WS81	14DUE82WS
14EP320A81	14EUE320A
14EP320C81	14EUE320C
14EP320D81	14EUE320D
14EP320E81	14EUE320E
14EP320F81	14EUE320F
14EP320G81	14EUE320G
14EP320H81	14EUE320H
14EP320J81	14EUE320J
14EP320S81	14EUE320S

Conversion Table

The tables below list the obsolete order numbers with the corresponding new equivalent order numbers.

Please note this cross is intended as a recommendation only (not all products are exact matches). Check the specifications of the suggested equivalents to ensure they meet your needs.

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14EP32BA81	14EUE32BA
14EP32BC81	14EUE32BC
14EP32BD81	14EUE32BD
14EP32BE81	14EUE32BE
14EP32BF81	14EUE32BF
14EP32BG81	14EUE32BG
14EP32BH81	14EUE32BH
14EP32BJ81	14EUE32BJ
14EP32BS81	14EUE32BS
14EP32FA81	14EUE32FA
14EP32FC81	14EUE32FC
14EP32FD81	14EUE32FD
14EP32FF81	14EUE32FF
14EP32FG81	14EUE32FG
14EP32FH81	14EUE32FH
14EP32FJ81	14EUE32FJ
14EP32FS81	14EUE32FS
14EP32WA81	14EUE32WA
14EP32WC81	14EUE32WC
14EP32WD81	14EUE32WD
14EP32WE81	14EUE32WE
14EP32WF81	14EUE32WF
14EP32WG81	14EUE32WG
14EP32WH81	14EUE32WH
14EP32WJ81	14EUE32WJ
14EP32WS81	14EUE32WS
14EP32XA81	14EUE32XA
14EP32XC81	14EUE32XC
14EP32XD81	14EUE32XD
14EP32XF81	14EUE32XF
14EP32XG81	14EUE32XG
14EP32XH81	14EUE32XH
14EP32XJ81	14EUE32XJ
14EP32XS81	14EUE32XS
14EP820A81	14EUE820A
14EP820C81	14EUE820C
14EP820D81	14EUE820D
14EP820F81	14EUE820F
14EP820G81	14EUE820G
14EP820H81	14EUE820H
14EP820J81	14EUE820J
14EP820S81	14EUE820S
14EP82BA81	14EUE82BA
14EP82BC81	14EUE82BC
14EP82BD81	14EUE82BD
14EP82BF81	14EUE82BF
14EP82BG81	14EUE82BG
14EP82BH81	14EUE82BH
14EP82BJ81	14EUE82BJ
14EP82BS81	14EUE82BS
14EP82WA81	14EUE82WA
14EP82WC81	14EUE82WC
14EP82WD81	14EUE82WD
14EP82WF81	14EUE82WF

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14EP82WG81	14EUE82WG
14EP82WH81	14EUE82WH
14EP82WJ81	14EUE82WJ
14EP82WS81	14EUE82WS
14FP320A81	14FUF320A
14FP320C81	14FUF320C
14FP320D81	14FUF320D
14FP320F81	14FUF320F
14FP320G81	14FUF320G
14FP320H81	14FUF320H
14FP320J81	14FUF320J
14FP320S81	14FUF320S
14FP32BA81	14FUF32BA
14FP32BC81	14FUF32BC
14FP32BD81	14FUF32BD
14FP32BE81	14FUF32BE
14FP32BF81	14FUF32BF
14FP32BG81	14FUF32BG
14FP32BH81	14FUF32BH
14FP32BJ81	14FUF32BJ
14FP32BS81	14FUF32BS
14FP32FA81	14FUF32FA
14FP32FC81	14FUF32FC
14FP32FD81	14FUF32FD
14FP32FF81	14FUF32FF
14FP32FG81	14FUF32FG
14FP32FH81	14FUF32FH
14FP32FJ81	14FUF32FJ
14FP32FS81	14FUF32FS
14FP32WA81	14FUF32WA
14FP32WC81	14FUF32WC
14FP32WD81	14FUF32WD
14FP32WE81	14FUF32WE
14FP32WF81	14FUF32WF
14FP32WG81	14FUF32WG
14FP32WH81	14FUF32WH
14FP32WJ81	14FUF32WJ
14FP32WS81	14FUF32WS
14FP32XA81	14FUF32XA
14FP32XC81	14FUF32XC
14FP32XD81	14FUF32XD
14FP32XF81	14FUF32XF
14FP32XG81	14FUF32XG
14FP32XH81	14FUF32XH
14FP32XJ81	14FUF32XJ
14FP32XS81	14FUF32XS
14FP820A81	14FUF820A
14FP820C81	14FUF820C
14FP820D81	14FUF820D
14FP820F81	14FUF820F
14FP820G81	14FUF820G
14FP820H81	14FUF820H
14FP820J81	14FUF820J
14FP820S81	14FUF820S

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14FP82BA81	14FUF82BA
14FP82BC81	14FUF82BC
14FP82BD81	14FUF82BD
14FP82BF81	14FUF82BF
14FP82BG81	14FUF82BG
14FP82BH81	14FUF82BH
14FP82BJ81	14FUF82BJ
14FP82BS81	14FUF82BS
14FP82WA81	14FUF82WA
14FP82WC81	14FUF82WC
14FP82WD81	14FUF82WD
14FP82WF81	14FUF82WF
14FP82WG81	14FUF82WG
14FP82WH81	14FUF82WH
14FP82WJ81	14FUF82WJ
14FP82WS81	14FUF82WS
14FP120A81	14FUG120A
14FP120C81	14FUG120C
14FP120D81	14FUG120D
14FP120F81	14FUG120F
14FP120G81	14FUG120G
14FP120J81	14FUG120J
14FP120S81	14FUG120S
14FP12BA81	14FUG12BA
14FP12BC81	14FUG12BC
14FP12BD81	14FUG12BD
14FP12BF81	14FUG12BF
14FP12BG81	14FUG12BG
14FP12BJ81	14FUG12BJ
14FP12BS81	14FUG12BS
14FP12FA81	14FUG12FA
14FP12FC81	14FUG12FC
14FP12FD81	14FUG12FD
14FP12FF81	14FUG12FF
14FP12FG81	14FUG12FG
14FP12FJ81	14FUG12FJ
14FP12FS81	14FUG12FS
14FP12WA81	14FUG12WA
14FP12WC81	14FUG12WC
14FP12WD81	14FUG12WD
14FP12WF81	14FUG12WF
14FP12WG81	14FUG12WG
14FP12WJ81	14FUG12WJ
14FP12WS81	14FUG12WS
14FP12XA81	14FUG12XA
14FP12XC81	14FUG12XC
14FP12XD81	14FUG12XD
14FP12XF81	14FUG12XF
14FP12XG81	14FUG12XG
14FP12XJ81	14FUG12XJ
14FP12XS81	14FUG12XS
14HP320A81	14HUG320A
14HP320C81	14HUG320C
14HP320D81	14HUG320D

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14HP320F81	14HUG320F
14HP320G81	14HUG320G
14HP320H81	14HUG320H
14HP320J81	14HUG320J
14HP320S81	14HUG320S
14HP32BA81	14HUG32BA
14HP32BC81	14HUG32BC
14HP32BD81	14HUG32BD
14HP32BE81	14HUG32BE
14HP32BF81	14HUG32BF
14HP32BG81	14HUG32BG
14HP32BH81	14HUG32BH
14HP32BJ81	14HUG32BJ
14HP32BS81	14HUG32BS
14HP32FA81	14HUG32FA
14HP32FC81	14HUG32FC
14HP32FD81	14HUG32FD
14HP32FF81	14HUG32FF
14HP32FG81	14HUG32FG
14HP32FH81	14HUG32FH
14HP32FJ81	14HUG32FJ
14HP32FS81	14HUG32FS
14HP32WA81	14HUG32WA
14HP32WC81	14HUG32WC
14HP32WD81	14HUG32WD
14HP32WF81	14HUG32WF
14HP32WG81	14HUG32WG
14HP32WH81	14HUG32WH
14HP32WJ81	14HUG32WJ
14HP32WS81	14HUG32WS
14HP32XA81	14HUG32XA
14HP32XC81	14HUG32XC
14HP32XD81	14HUG32XD
14HP32XF81	14HUG32XF
14HP32XG81	14HUG32XG
14HP32XH81	14HUG32XH
14HP32XJ81	14HUG32XJ
14HP32XS81	14HUG32XS
14HP820A81	14HUG820A
14HP820C81	14HUG820C
14HP820D81	14HUG820D
14HP820F81	14HUG820F
14HP820G81	14HUG820G
14HP820H81	14HUG820H
14HP820J81	14HUG820J
14HP820S81	14HUG820S
14HP82BA81	14HUG82BA
14HP82BC81	14HUG82BC
14HP82BD81	14HUG82BD
14HP82BF81	14HUG82BF
14HP82BG81	14HUG82BG
14HP82BH81	14HUG82BH
14HP82BJ81	14HUG82BJ
14HP82BS81	14HUG82BS

Conversion Table

The tables below list the obsolete order numbers with the corresponding new equivalent order numbers.

Please note this cross is intended as a recommendation only (not all products are exact matches). Check the specifications of the suggested equivalents to ensure they meet your needs.

Obsolete Order Number	New Equivalent Order Number
CLASS 14	
14HP82WA81	14HUG82WA
14HP82WC81	14HUG82WC
14HP82WD81	14HUG82WD
14HP82WF81	14HUG82WF
14HP82WG81	14HUG82WG
14HP82WH81	14HUG82WH
14HP82WJ81	14HUG82WJ
14HP82WS81	14HUG82WS
14JG320A81	14JUH320A
14JG320C81	14JUH320C
14JG320D81	14JUH320D
14JG320F81	14JUH320F
14JG320G81	14JUH320G
14JG320H81	14JUH320H
14JG320J81	14JUH320J
14JG32BA81	14JUH32BA
14JG32BC81	14JUH32BC
14JG32BD81	14JUH32BD
14JG32BE81	14JUH32BE
14JG32BF81	14JUH32BF
14JG32BG81	14JUH32BG
14JG32BH81	14JUH32BH
14JG32BJ81	14JUH32BJ
14JG32FA81	14JUH32FA
14JG32FC81	14JUH32FC
14JG32FD81	14JUH32FD
14JG32FF81	14JUH32FF
14JG32FG81	14JUH32FG
14JG32FH81	14JUH32FH
14JG32FJ81	14JUH32FJ
14JG32WA81	14JUH32WA
14JG32WC81	14JUH32WC
14JG32WD81	14JUH32WD
14JG32WF81	14JUH32WF
14JG32WG81	14JUH32WG
14JG32WH81	14JUH32WH
14JG32WJ81	14JUH32WJ
14JG32XA81	14JUH32XA
14JG32XC81	14JUH32XC
14JG32XD81	14JUH32XD
14JG32XF81	14JUH32XF
14JG32XG81	14JUH32XG
14JG32XH81	14JUH32XH
14JG32XJ81	14JUH32XJ
CLASS 22	
22BP32BA81	22BUA32BA
22BP32BA81	22BUB32BA
22BP32BA81	22BUC32BA
22BP32BC81	22BUA32BC
22BP32BC81	22BUB32BC
22BP32BC81	22BUC32BC
22BP32BD81	22BUA32BD
22BP32BD81	22BUB32BD
22BP32BD81	22BUC32BD

Obsolete Order Number	New Equivalent Order Number
CLASS 22	
22BP32BF81	22BUA32BF
22BP32BF81	22BUB32BF
22BP32BF81	22BUC32BF
22BP32BG81	22BUA32BG
22BP32BG81	22BUB32BG
22BP32BG81	22BUC32BG
22BP32BH81	22BUA32BH
22BP32BH81	22BUB32BH
22BP32BH81	22BUC32BH
22BP32BJ81	22BUA32BJ
22BP32BJ81	22BUB32BJ
22BP32BJ81	22BUC32BJ
22CP320A81	22CUA320A
22CP320A81	22CUB320A
22CP320A81	22CUC320A
22CP320A81	22CUD320A
22CP320C81	22CUA320C
22CP320C81	22CUB320C
22CP320C81	22CUC320C
22CP320C81	22CUD320C
22CP320D81	22CUA320D
22CP320D81	22CUB320D
22CP320D81	22CUC320D
22CP320D81	22CUD320D
22CP320F81	22CUA320F
22CP320F81	22CUB320F
22CP320F81	22CUC320F
22CP320F81	22CUD320F
22CP320G81	22CUA320G
22CP320G81	22CUB320G
22CP320G81	22CUC320G
22CP320G81	22CUD320G
22CP320H81	22CUA320H
22CP320H81	22CUB320H
22CP320H81	22CUC320H
22CP320H81	22CUD320H
22CP320J81	22CUA320J
22CP320J81	22CUB320J
22CP320J81	22CUC320J
22CP320J81	22CUD320J
22CP32BA81	22CUA32BA
22CP32BA81	22CUB32BA
22CP32BA81	22CUC32BA
22CP32BA81	22CUD32BA
22CP32BC81	22CUA32BC
22CP32BC81	22CUB32BC
22CP32BC81	22CUC32BC
22CP32BC81	22CUD32BC
22CP32BD81	22CUA32BD
22CP32BD81	22CUB32BD
22CP32BD81	22CUC32BD
22CP32BD81	22CUD32BD
22CP32BF81	22CUA32BF
22CP32BF81	22CUB32BF

Obsolete Order Number	New Equivalent Order Number
CLASS 22	
22CP32BF81	22CUC32BF
22CP32BF81	22CUD32BF
22CP32BG81	22CUA32BG
22CP32BG81	22CUB32BG
22CP32BG81	22CUC32BG
22CP32BG81	22CUD32BG
22CP32BH81	22CUA32BH
22CP32BH81	22CUB32BH
22CP32BH81	22CUC32BH
22CP32BH81	22CUD32BH
22CP32BJ81	22CUA32BJ
22CP32BJ81	22CUB32BJ
22CP32BJ81	22CUC32BJ
22CP32BJ81	22CUD32BJ
22CP32FA81	22CUA32FA
22CP32FA81	22CUB32FA
22CP32FA81	22CUC32FA
22CP32FA81	22CUD32FA
22CP32FC81	22CUA32FC
22CP32FC81	22CUB32FC
22CP32FC81	22CUC32FC
22CP32FC81	22CUD32FC
22CP32FD81	22CUA32FD
22CP32FD81	22CUB32FD
22CP32FD81	22CUC32FD
22CP32FD81	22CUD32FD
22CP32FF81	22CUA32FF
22CP32FF81	22CUB32FF
22CP32FF81	22CUC32FF
22CP32FF81	22CUD32FF
22CP32FG81	22CUA32FG
22CP32FG81	22CUB32FG
22CP32FG81	22CUC32FG
22CP32FG81	22CUD32FG
22CP32FH81	22CUA32FH
22CP32FH81	22CUB32FH
22CP32FH81	22CUC32FH
22CP32FH81	22CUD32FH
22CP32FJ81	22CUA32FJ
22CP32FJ81	22CUB32FJ
22CP32FJ81	22CUC32FJ
22CP32FJ81	22CUD32FJ
22CP32WA81	22CUA32WA
22CP32WA81	22CUB32WA
22CP32WA81	22CUC32WA
22CP32WA81	22CUD32WA
22CP32WC81	22CUA32WC
22CP32WC81	22CUB32WC
22CP32WC81	22CUC32WC
22CP32WC81	22CUD32WC
22CP32WD81	22CUA32WD
22CP32WD81	22CUB32WD
22CP32WD81	22CUC32WD
22CP32WD81	22CUD32WD

Obsolete Order Number	New Equivalent Order Number
CLASS 22	
22CP32WF81	22CUA32WF
22CP32WF81	22CUB32WF
22CP32WF81	22CUC32WF
22CP32WF81	22CUD32WF
22CP32WG81	22CUA32WG
22CP32WG81	22CUB32WG
22CP32WG81	22CUC32WG
22CP32WG81	22CUD32WG
22CP32WH81	22CUA32WH
22CP32WH81	22CUB32WH
22CP32WH81	22CUC32WH
22CP32WH81	22CUD32WH
22CP32WJ81	22CUA32WJ
22CP32WJ81	22CUB32WJ
22CP32WJ81	22CUC32WJ
22CP32WJ81	22CUD32WJ
22DP320A81	22DUA320A
22DP320A81	22DUB320A
22DP320A81	22DUC320A
22DP320A81	22DUD320A
22DP320A81	22DUE320A
22DP320C81	22DUA320C
22DP320C81	22DUB320C
22DP320C81	22DUC320C
22DP320C81	22DUD320C
22DP320C81	22DUE320C
22DP320D81	22DUA320D
22DP320D81	22DUB320D
22DP320D81	22DUC320D
22DP320D81	22DUD320D
22DP320D81	22DUE320D
22DP320F81	22DUA320F
22DP320F81	22DUB320F
22DP320F81	22DUC320F
22DP320F81	22DUD320F
22DP320F81	22DUE320F
22DP320G81	22DUA320G
22DP320G81	22DUB320G
22DP320G81	22DUC320G
22DP320G81	22DUD320G
22DP320G81	22DUE320G
22DP320H81	22DUA320H
22DP320H81	22DUB320H
22DP320H81	22DUC320H
22DP320H81	22DUD320H
22DP320H81	22DUE320H
22DP320J81	22DUA320J
22DP320J81	22DUB320J
22DP320J81	22DUC320J
22DP320J81	22DUD320J
22DP320J81	22DUE320J
22DP32BA81	22DUA32BA
22DP32BA81	22DUB32BA
22DP32BA81	22DUC32BA

Conversion Table

The tables below list the obsolete order numbers with the corresponding new equivalent order numbers.

Please note this cross is intended as a recommendation only (not all products are exact matches). Check the specifications of the suggested equivalents to ensure they meet your needs.

Obsolete Order Number	New Equivalent Order Number
CLASS 22	
22DP32BA81	22DUD32BA
22DP32BA81	22DUE32BA
22DP32BC81	22DUA32BC
22DP32BC81	22DUB32BC
22DP32BC81	22DUC32BC
22DP32BC81	22DUD32BC
22DP32BC81	22DUE32BC
22DP32BD81	22DUA32BD
22DP32BD81	22DUB32BD
22DP32BD81	22DUC32BD
22DP32BD81	22DUD32BD
22DP32BD81	22DUE32BD
22DP32BF81	22DUA32BF
22DP32BF81	22DUB32BF
22DP32BF81	22DUC32BF
22DP32BF81	22DUD32BF
22DP32BF81	22DUE32BF
22DP32BG81	22DUA32BG
22DP32BG81	22DUB32BG
22DP32BG81	22DUC32BG
22DP32BG81	22DUD32BG
22DP32BG81	22DUE32BG
22DP32BH81	22DUA32BH
22DP32BH81	22DUB32BH
22DP32BH81	22DUC32BH
22DP32BH81	22DUD32BH
22DP32BH81	22DUE32BH
22DP32BJ81	22DUA32BJ
22DP32BJ81	22DUB32BJ
22DP32BJ81	22DUC32BJ
22DP32BJ81	22DUD32BJ
22DP32BJ81	22DUE32BJ
22DP32FA81	22DUA32FA
22DP32FA81	22DUB32FA
22DP32FA81	22DUC32FA
22DP32FA81	22DUD32FA
22DP32FA81	22DUE32FA
22DP32FC81	22DUA32FC
22DP32FC81	22DUB32FC
22DP32FC81	22DUC32FC
22DP32FC81	22DUD32FC
22DP32FC81	22DUE32FC
22DP32FD81	22DUA32FD
22DP32FD81	22DUB32FD
22DP32FD81	22DUC32FD
22DP32FD81	22DUD32FD
22DP32FD81	22DUE32FD
22DP32FF81	22DUA32FF
22DP32FF81	22DUB32FF
22DP32FF81	22DUC32FF
22DP32FF81	22DUD32FF
22DP32FF81	22DUE32FF
22DP32FG81	22DUA32FG
22DP32FG81	22DUB32FG

Obsolete Order Number	New Equivalent Order Number
CLASS 22	
22DP32FG81	22DUC32FG
22DP32FG81	22DUD32FG
22DP32FG81	22DUE32FG
22DP32FH81	22DUA32FH
22DP32FH81	22DUB32FH
22DP32FH81	22DUC32FH
22DP32FH81	22DUD32FH
22DP32FH81	22DUE32FH
22DP32FJ81	22DUA32FJ
22DP32FJ81	22DUB32FJ
22DP32FJ81	22DUC32FJ
22DP32FJ81	22DUD32FJ
22DP32FJ81	22DUE32FJ
22DP32WA81	22DUA32WA
22DP32WA81	22DUB32WA
22DP32WA81	22DUC32WA
22DP32WA81	22DUD32WA
22DP32WA81	22DUE32WA
22DP32WC81	22DUA32WC
22DP32WC81	22DUB32WC
22DP32WC81	22DUC32WC
22DP32WC81	22DUD32WC
22DP32WC81	22DUE32WC
22DP32WD81	22DUA32WD
22DP32WD81	22DUB32WD
22DP32WD81	22DUC32WD
22DP32WD81	22DUD32WD
22DP32WD81	22DUE32WD
22DP32WF81	22DUA32WF
22DP32WF81	22DUB32WF
22DP32WF81	22DUC32WF
22DP32WF81	22DUD32WF
22DP32WF81	22DUE32WF
22DP32WG81	22DUA32WG
22DP32WG81	22DUB32WG
22DP32WG81	22DUC32WG
22DP32WG81	22DUD32WG
22DP32WG81	22DUE32WG
22DP32WH81	22DUA32WH
22DP32WH81	22DUB32WH
22DP32WH81	22DUC32WH
22DP32WH81	22DUD32WH
22DP32WH81	22DUE32WH
22DP32WJ81	22DUA32WJ
22DP32WJ81	22DUB32WJ
22DP32WJ81	22DUC32WJ
22DP32WJ81	22DUD32WJ
22DP32WJ81	22DUE32WJ
22EP320A81	22EUE320A
22EP320F81	22EUE320F
22EP32BA81	22EUE32BA
22EP32BC81	22EUE32BC
22EP32BD81	22EUE32BD
22EP32BF81	22EUE32BF

Obsolete Order Number	New Equivalent Order Number
CLASS 22	
22EP32BG81	22EUE32BG
22EP32BH81	22EUE32BH
22EP32BJ81	22EUE32BJ
22EP32FA81	22EUE32FA
22EP32FC81	22EUE32FC
22EP32FD81	22EUE32FD
22EP32FF81	22EUE32FF
22EP32FG81	22EUE32FG
22EP32FH81	22EUE32FH
22EP32FJ81	22EUE32FJ
22EP32WA81	22EUE32WA
22EP32WC81	22EUE32WC
22EP32WD81	22EUE32WD
22EP32WF81	22EUE32WF
22EP32WG81	22EUE32WG
22EP32WH81	22EUE32WH
22FP320A81	22FUF320A
22FP320C81	22FUF320C
22FP320D81	22FUF320D
22FP320F81	22FUF320F
22FP320G81	22FUF320G
22FP320H81	22FUF320H
22FP320J81	22FUF320J
22FP32BA81	22FUF32BA
22FP32BC81	22FUF32BC
22FP32BD81	22FUF32BD
22FP32BF81	22FUF32BF
22FP32BG81	22FUF32BG
22FP32BH81	22FUF32BH
22FP32BJ81	22FUF32BJ
22FP32FA81	22FUF32FA
22FP32FC81	22FUF32FC
22FP32FD81	22FUF32FD
22FP32FF81	22FUF32FF
22FP32FG81	22FUF32FG
22FP32FH81	22FUF32FH
22FP32FJ81	22FUF32FJ
22FP32WA81	22FUF32WA
22FP32WC81	22FUF32WC
22FP32WD81	22FUF32WD
22FP32WF81	22FUF32WF
22FP32WG81	22FUF32WG
22FP32WH81	22FUF32WH
22FP32WJ81	22FUF32WJ
22HP320A81	22HUG320A
22HP320C81	22HUG320C
22HP320D81	22HUG320D
22HP320F81	22HUG320F
22HP320G81	22HUG320G
22HP320H81	22HUG320H
22HP320J81	22HUG320J
22HP32BA81	22HUG32BA
22HP32BC81	22HUG32BC
22HP32BD81	22HUG32BD

Obsolete Order Number	New Equivalent Order Number
CLASS 22	
22HP32BE81	22HUG32BE
22HP32BF81	22HUG32BF
22HP32BG81	22HUG32BG
22HP32BH81	22HUG32BH
22HP32BJ81	22HUG32BJ
22HP32FA81	22HUG32FA
22HP32FC81	22HUG32FC
22HP32FD81	22HUG32FD
22HP32FF81	22HUG32FF
22HP32FG81	22HUG32FG
22HP32FH81	22HUG32FH
22HP32FJ81	22HUG32FJ
22HP32WA81	22HUG32WA
22HP32WC81	22HUG32WC
22HP32WD81	22HUG32WD
22HP32WF81	22HUG32WF
22HP32WG81	22HUG32WG
22HP32WH81	22HUG32WH
22HP32WJ81	22HUG32WJ
22JG320A81	22JUH320A
22JG320C81	22JUH320C
22JG320D81	22JUH320D
22JG320F81	22JUH320F
22JG320G81	22JUH320G
22JG320H81	22JUH320H
22JG320J81	22JUH320J
22JG32BA81	22JUH32BA
22JG32BC81	22JUH32BC
22JG32BD81	22JUH32BD
22JG32BE81	22JUH32BE
22JG32BF81	22JUH32BF
22JG32BG81	22JUH32BG
22JG32BH81	22JUH32BH
22JG32BJ81	22JUH32BJ
22JG32FA81	22JUH32FA
22JG32FC81	22JUH32FC
22JG32FD81	22JUH32FD
22JG32FF81	22JUH32FF
22JG32FG81	22JUH32FG
22JG32FH81	22JUH32FH
22JG32FJ81	22JUH32FJ
22JG32WA81	22JUH32WA
22JG32WC81	22JUH32WC
22JG32WD81	22JUH32WD
22JG32WF81	22JUH32WF
22JG32WG81	22JUH32WG
22JG32WH81	22JUH32WH
22JG32WJ81	22JUH32WJ

Catalog Numbering System

General

Class
48 — Overload

Size
A — Frame A
B — Frame B

Model
T — ESP200

Current Range
A — 0.25–1①
B — 0.75–3.4①
C — 3–12①
D — 5.5–22①
E — 10–40
F — 13–52
G — 25–100
H — 50–200
J — 100–300 (3.33-10 current range with 300:5 CT and 1 loop with frame A1 (3-12A)-device)
K — 133–400 (3.33-10 current range with 400:5 CT and 1 loop with frame A1 (3-12A)-device)
L — 200–600 (3.33-10 current range with 600:5 CT and 1 loop with frame A1 (3-12A)-device)
M — 250–750 (3.33-10 current range with 750:5 CT and 1 loop with frame A1 (3-12A)-device)
N — 400–1200 (3.33-10.17 currant range with 1200:5 CT and 1 loop with frame A1 (3-12A)-device)

No. of Poles
3 — 3 Phase
1 — Single Phase

Reset
S — Selectable (Man/Auto)

Trip Curve
00 — Class 5, 10, 20 or 30 Selectable

Class
958 — Overload

Amp Range
E — 10–40
G — 25–100
H — 50–200

Model
B — ESP200

No. of Poles
3 — 3 phase

Type
S — Selectable (Man/Auto)

Trip Curve
A — 958

Class
958L — Overload

Amp Range
D — 5.5–22
E — 10–40
F — 13–52
G — 25–100
H — 50–200

Model
B — ESP200

No. of Poles
3 — 3 phase

Type
S — Selectable (Man/Auto)

Trip Curve
A — 958L

① Ranges available in Single or 3-phase.

Solid State ESP200, Class 48, 958 and 958L

General

Features	Benefits
▪ Trip Classes - 5, 10, 20, or 30 Selectable by DIP-switches	▪ Field changeable reduces time and inventory. Suitable for light, normal and heavy starting conditions
▪ Phase Loss Protection - Trips in less than 3 Seconds	▪ Protects motor burn out and minimizes motor heating up
▪ Phase Unbalance - Trips based on Trip Class selected	▪ Minimizes temperature rise of the motor on a asymmetrical three-phase-system
▪ Ground Fault - Trips 60% of Motor Current	▪ 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
▪ Trip Indicator - Visible	▪ Save time, faster to identify overload Trip
▪ Ambient Insensitive	▪ Prevents nuisance tripping
▪ No Heaters Required	▪ Saves cost and eliminates time for installation of heaters
▪ Self-Powered - No outside source required	▪ Reduce cost for external power supply
▪ FLA dial with wide Adjustment - 4:1 ratio	▪ Provides wide range, reduces inventory
▪ Self Protected in short circuit condition (when used with proper fuses or motor starter protector)	▪ Unlike bimetal overloads, this eliminates replacement of the overload heaters after short circuit
▪ Test Button - Tests Electronics	▪ Tests the complete electronic functions including the trip mechanism. Increases up time
▪ Thermal Memory	▪ Prevents re-starting motor when it is still hot
▪ Conformally coated circuit board	▪ Resists against environmental conditions
▪ 1 NO and 1NC Contacts Standard. B600, R300	▪ Makes it easier for user to wire local contacts
▪ Operating Temperature: -25 °C - 65 °C	▪ Wide operating temperature range prevents nuisance tripping with temperature changes
▪ Repeat Accuracy <1%.	▪ For more precise settings and reduced nuisance tripping
▪ Removable Terminal Block	▪ Terminal Block can be removed without removing wires. Saves time for replacements
▪ Automatic reset	▪ 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
▪ Remote reset	▪ 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
▪ DIN Rail Mounted	▪ Reduces installation time
▪ Touch - Safe Terminals	▪ Protects against accidental touching of live circuits
▪ UL listed CSA certified	▪ Third party approval standard

Solid State ESP200, Class 48, 958, 958L and Bimetal

General

ESP200 Solid State Overload

958 or 958L Solid State Overload

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.

Solid State Class 48, ESP200 and 3RB20

Selection

3-Phase, 48ATC3S00

Ordering Information

For CT's see Accessories page 9/63.

Dimensions see page 9/133.

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 9/104.

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" ⑧	**48ATK3S00**	**3UB81234KW2**	
200–600	3	"A1" ④	**48ATL3S00**	**3UB81234LW2**	
250–750	3	"A1" ⑦	**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—3RB206③⑥, 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 Size①	Retrofit Plate Suffix	Plate Kit Separate	Price Adder $
Size 00–1¾ Size 2, 2½	A or A1 B	1P 2P	**49ASMP1** **49ASMP2**	
Size 3, 3½ Size 4	B B	3P 4P	**49ASMP3** **49ASMP3**	

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 9/133.

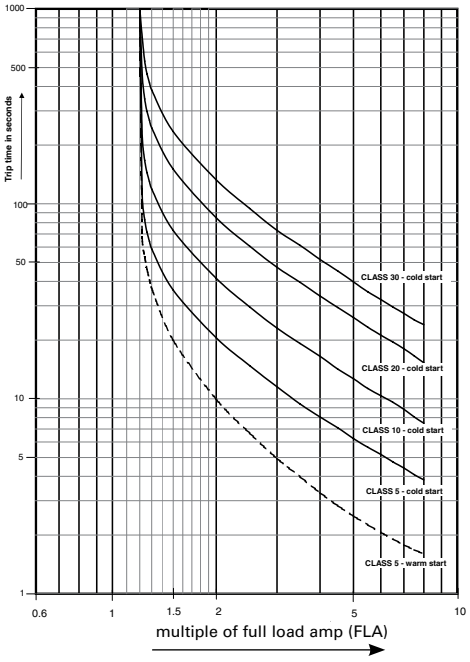
Current Transformers

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**	

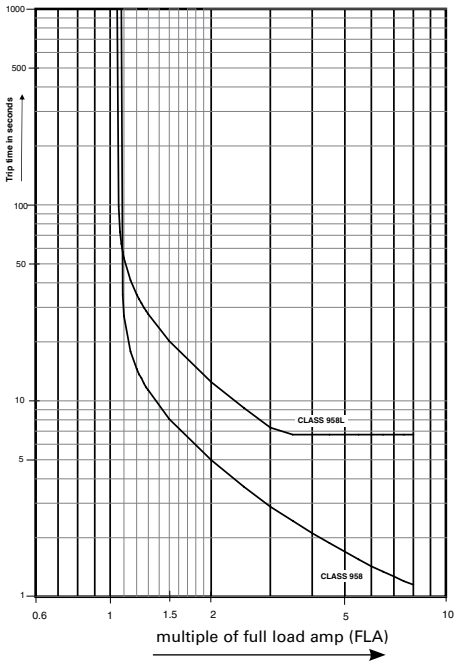
Solid State—Class 958 and 958L

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**	

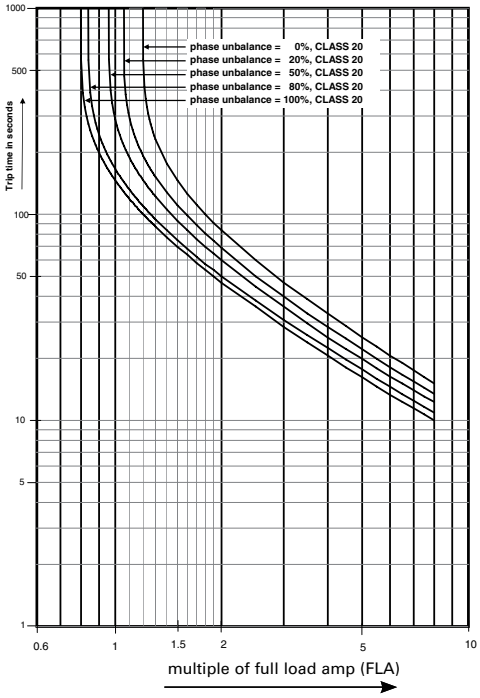
Time - Current - Characteristics CLASS 48



Time - Current - Characteristics CLASS 958, 958L



Trip - curve depending on unbalance CLASS 20



① Temperature rating −25° to +60°C.

General

Features

- Heavy Duty NEMA Starters
- Solid State 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 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

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.

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.

To change the coil voltage for non-alternator controllers, change the 9th character in the catalog number with a letter shown in the coil table.

Field Modification Kits see page

Factory Modifications see page 9/114.

Dimensions see page 9/151.

Wiring Diagrams see page 9/167.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24①	J
120	F
200–208①	D
220–240①	G
277①	L
440–480①	H
550–600①	E

Non-Combination (with Solid-State Overload)

Max Hp						Overload		Enclosure							
								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** Industrial Use Weatherproof	
200 Volts	**230 Volts**	**460 Volts**	**575 Volts**	**NEMA Size**	**Half Size**	**Amp Range**	**Frame Size**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**
⅛	⅛	⅓	½	0	—	0.25–1	A	**83CUA92BF**		**83CUA92WF**		**83CUA92EF**		**83CUA920F**	
½	¾	1½	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**	
⅛	⅛	⅓	½	1	—	0.25–1	A	**83DUA92BF**		**83DUA92WF**		**83DUA92EF**		**83DUA920F**	
½	¾	1½	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**	
7½	7½	—	—	1	—	10–40	A1	**83DUE92BF**		**83DUE92WF**		**83DUE92EF**		**83DUE920F**	
10	10	15	15	—	1¾	10–40	A1	**83EUE92BF**		**83EUE92WF**		**83EUE92EF**		**83EUE920F**	
10	15	25	25	2	—	13–52	B	**83FUF92BF**		**83FUF92WF**		**83FUF92EF**		**83FUF920F**	
15	20	30	30	—	2½	25–100	B	**83GUG92BF**		**83GUG92WF**		**83GUG92EF**		**83GUG920F**	
25	30	50	50	3	—	25–100	B	**83HUG92BF**		**83HUG92WF**		**83HUG92EF**		**83HUG920F**	
30	40	75	75	—	3½	50–200	B	**83IUH92BF**		**83IUH92WF**		**83IUH92EF**		**83IUH920F**	
40	50	100	100	4	—	50–200	B	**83JUH92BF**		**83JUH92WF**		**83JUH92EF**		**83JUH920F**	

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 Not available on standard alternator style ('92' in the catalog number).

Combination Disconnect (Fusible & Non-Fusible), Class 84

Selection

Ordering Information

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.

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.

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.

For factory installed fusible disconnect, see page 9/115.

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/151.

Wiring Diagrams see page 9/167.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24①	J
120	F
200–208①	D
220–240①	G
277①	L
440–480①	H
550–600①	E

Two Disconnect Switches with Solid-State Overload

Max Hp						Overload			Enclosure							
									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 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 $
⅛	⅛	⅓	½	0	—	0.25–1	A	30	**84CUA92BDF**		**84CUA92WDF**		**84CUA92EDF**		**84CUA920DF**	
½	¾	1½	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**	
⅛	⅛	⅓	½	1	—	0.25–1	A	30	**84DUA92BDF**		**84DUA92WDF**		**84DUA92EDF**		**84DUA920DF**	
½	¾	1½	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**	
7½	7½	—	—	1	—	10–40	A1	30	**84DUE92BDF**		**84DUE92WDF**		**84DUE92EDF**		**84DUE920DF**	
10	10	15	15	—	1¾	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	—	2½	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	—	3½	50–200	B	200	**84IUH92BDF**		**84IUH92WDF**		**84IUH92EDF**		**84IUH920DF**	
40	50	100	100	4	—	50–200	B	200	**84JUH92BDF**		**84JUH92WDF**		**84JUH92EDF**		**84JUH920DF**	

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 Not available on standard alternator style ('92' in the catalog number).

Combination Circuit Breaker, Class 84

Selection

Ordering Information

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.

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.

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.

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/151.

Wiring Diagrams see page 9/167.

Replacement Parts see page 9/120.

Coil Table

60Hz Voltage	Letter
24①	J
120	F
200–208①	D
220–240①	G
277①	L
440–480①	H
550–600①	E

2 Motor Circuit Protectors (with Solid-State Overload)

Max Hp						Overload		Motor Circuit Interrupter ETI	Enclosure							
									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 Industrial Use, Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size		Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅓	½	0	—	0.25–1	A	3	**84CUA92BMF**		**84CUA92WMF**		**84CUA92EMF**		**84CUA920MF**	
½	¾	1½	2	0	—	0.75–3.4	A	3	**84CUB92BMF**		**84CUB92WMF**		**84CUB92EMF**		**84CUB920MF**	
2	2	5	5	0	—	3–12	A1	10	**84CUC92BMF**		**84CUC92WMF**		**84CUC92EMF**		**84CUC920MF**	
3	3	—	—	0	—	5.5–22	A1	25	**84CUD92BMF**		**84CUD92WMF**		**84CUD92EMF**		**84CUD920MF**	
⅛	⅛	⅓	½	1	—	0.25–1	A	3	**84DUA92BMF**		**84DUA92WMF**		**84DUA92EMF**		**84DUA920MF**	
½	¾	1½	2	1	—	0.75–3.4	A	3	**84DUB92BMF**		**84DUB92WMF**		**84DUB92EMF**		**84DUB920MF**	
2	2	5	5	1	—	3–12	A1	10	**84DUC92BMF**		**84DUC92WMF**		**84DUC92EMF**		**84DUC920MF**	
3	3	10	10	1	—	5.5–22	A1	25	**84DUD92BMF**		**84DUD92WMF**		**84DUD92EMF**		**84DUD920MF**	
7½	7½	—	—	1	—	10–40	A1	30	**84DUE92BMF**		**84DUE92WMF**		**84DUE92EMF**		**84DUE920MF**	
—	—	15	15	—	1¾	10–40	A1	40	**84EUE92BMF**		**84EUE92WMF**		**84EUE92EMF**		**84EUE920MF**	
10	15	25	25	2	—	13–52	B	50	**84FUF92BMF**		**84FUF92WMF**		**84FUF92EMF**		**84FUF920MF**	
15	20	30	30	—	2½	25–100	B	100	**84GUG92BMF**		**84GUG92WMF**		**84GUG92EMF**		**84GUG920MF**	
20	25	50	50	3	—	25–100	B	100	**84HUG92BMF**		**84HUG92WMF**		**84HUG92EMF**		**84HUG920MF**	
30	40	75	75	—	3½	50–200	B	125	**84IUH92BMF**		**84IUH92WMF**		**84IUH92EMF**		**84IUH920MF**	
40	50	100	100	4	—	50–200	B	150	**84JUH92BMF**		**84JUH92WMF**		**84JUH92EMF**		**84JUH920MF**	

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 Not available on standard alternator style ('92' in the catalog number).

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

82	A	D	C	6	F	B	H

Series

A = Standard size enclosure
B = Extra large enclosure (starter size 1 only)

Starter Size

D = 1
F = 2

OLR Current Range

B = 0.75-3.4A
C = 3-12A
D = 5.5-22A
E = 10-40A
F = 13-52A

Cover Control

6 = HOA selector switch with Start push button

Disconnect Type

F = Fusible disconnect

Disconnect & Fuse Clip Rating

A = 30A/250V
B = 30A/600V
C = 60A/250V
D = 60A/600V

Coil Voltage

F = 110VAC 50HZ / 120VAC 60HZ
G = 220VAC 50HZ / 240VAC 60HZ
H = 480VAC 60HZ

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

General

Ordering Information

Field Modification Kits
(see accessories on this page)

Factory Modifications (NA)

Dimensions see page 9/150

Wiring Diagram see page 9/169

Replacement Parts
(refer to instruction sheet A5E35327591A)

Coil Table

50/60Hz Voltage	Letter
110VAC 50HZ / 120VAC 60HZ	F
220VAC 50HZ / 240VAC 60HZ	G①
480VAC 60HZ	H②

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***③	
—	5	1	3–12	30	30A/600V	**82ADC6FB***		**82BDC6FB***③	
—	10	1	5.5–22	30	30A/600V	**82ADD6FB***		**82BDD6FB***③	
—	10	1	10–40	30	30A/600V	—		**82BDE6FB***③	
2	—	1	3–12	30	30A/250V	**82ADC6FA***		**82BDC6FA***③	
3	—	1	5.5–22	30	30A/250V	**82ADD6FA***		**82BDD6FA***③	
7 1/2	—	1	10–40	30	30A/250V	**82ADE6FA***		**82BDE6FA***③	
—	25	2	13-52	60	60A/600V	**82AFF6FD***③		—	
15	—	2	13-52	60	60A/250V	**82AFF6FC***③		—	

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

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

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

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

Class 82 Technical information

Disconnect Switch:	
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
Enclosure:	
Type	NEMA Type 3/3R enclosure
Rating	Weather proof for outdoor use
Standard Control Devices:	
Hand-Off-Auto selector switch	3SU1 30mm, round, metal with matte finish
Start push button	3SU1 30mm, round, metal with matte finish
Mounting / Wiring:	
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 standed 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 starnded conductors	2x(20 - 14 AWG) CU 60/75°C
Short Circuit Current Rating:	
Fuses	10kA@600V (Class H or K); 85kA@600V (Class R or J)
Certificates / Approvals:	
cULus	UL (file no. E185287)
UL rated Service Entrance Equipment	ISO 9001 certification

Class 87, 88

General

Features

- Fully Gasketed NEMA 3R Rainproof Enclosures
- 100,000 Amp Interrupting Capacity with Class R Fuses
- Heavy Duty NEMA Starters
- Solid State 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.

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.

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.

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.

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 weatherproof 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.

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 contaminates 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 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/152.
Wiring Diagrams see page 9/169.
Replacement Parts see page 9/120.

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	A①
200–208	D
220–240	G
220–240/440–480	C①
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	—	0.75–3.4②	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	—	1¾	10–40	A1	30	30A/600V	**87EUE6FC**	
—	—	15	15	—	1¾	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	—	3½	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	—	—	—	1¾	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	—	—	—	3½	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	—	0.75–3.4②	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	—	1¾	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	—	3½	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).

① Not available on Size 5 and larger.
② For an overload amp range of 0.25-1A, change the 5th character from a 'B' to an 'A'.
③ A version with coil code A is also stocked via Controls Express.

Vacuum Break and Oil Well Pump Control Panels, Class 87

Selection

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/152.
Wiring Diagrams see page 9/169.
Replacement Parts see page 9/120.
Replace the (*) in the catalog number with a letter from the coil table.
Refer to page 9/36 for information on the 958L OLR

Coil Table

60Hz Voltage	Letter
24	J
120	F
200–208	D
220–240	G
277	L
440–480	H
550–600	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	MCI Amps	Catalog Number
100	100	4	50-200A①	200A/600V	**87JCN6F***	250A	**87JCN6M***
100	100	4	55-250A	200A/600V	**87JCM6F***	250A	**87JCM6M***
200	200	5	55-250A	400A/600V	**87LCU6F***	400A	**87LCT6M***
250	300	6	160-630A	—	—	400A	**87MCW6M***
400	400	6	160-630A	—	—	600A	**87MCX6M***

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	MCI Amps	Catalog Number
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.

① ESP200 overload relay.

Auto Transformer & Part winding (2 Step) with Solid State Overload, Class 88

Selection

Auto Transformer

Part Winding

Ordering Information

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/152.
Wiring Diagrams see pages 9/162 and 9/163.
Replacement Parts see page 9/120.

Coil & Control Voltage

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.

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**"

Auto Transformer Type

		Overload				Fusible Disconnect			Circuit Breaker		
Motor Voltage	Max Hp	Amp Range	Frame Size	NEMA Size	Half 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	**88LPUT4MH**	
	250	160–630	—	6	—	—	**—**		400	**88MSVT4MH**	
	400	160–630	—	6	—	600A/600V	**88MSXT4FH**		600	**88MSXT4MH**	

Part Winding 2 Step

		Overload				Fusible Disconnect			Circuit Breaker		
Motor Voltage	Max Hp	Amp Range	Frame Size	NEMA Size	Half Size	Fuse Clip Size Amps/Volts	Catalog Number	List Price $	Circuit Breaker Amps	Catalog Number	List Price $
230	20	10–40	A1	—	1¾	100A/250V	**88EUEP2FG**		100	**88EUEP2MG**	
	25	13–52	B	2	—	100A/250V	**88FUFP2FG**		100	**88FUFP2MG**	
	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	—	1¾	100A/600V	**88EUEP4FH**		100	**88EUEP4MH**	
	40	13–52	B	2	—	100A/600V	**88FUFP4FH**		100	**88FUFP4MH**	
	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

Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/152.
Wiring Diagrams see pages 9/164 and 9/165.
Replacement Parts see page 9/120.

Coil & Control Voltage

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.

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**"

Wye Delta

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fuse Clip Size Amps/Volts	Motor Circuit Interruter ETI Amps	Open Transition				Closed Transition			
								Fusible Disconnect		Circuit Breaker		Fusible Disconnect		Circuit Breaker	
		Amp Range	Frame Size					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**		**88DUE06MD**		**88DUEC6FD**		**88DUEC6MD**	
	15	10–40	A1	—	1¾	100A/250V	100	**88EUE06FD**		**88EUE06MD**		**88EUEC6FD**		**88EUEC6MD**	
	20	13–52	B	2	—	100A/250V	100	**88FUF06FD**		**88FUF06MD**		**88FUFC6FD**		**88FUFC6MD**	
	30	25–100	B	—	2½	200A/250V	125	**88GUG06FD**		**88GUG06MD**		**88GUGC6FD**		**88GUGC6MD**	
	40	25–100	B	3	—	200A/250V	150	**88HUG06FD**		**88HUG06MD**		**88HUGC6FD**		**88HUGC6MD**	
	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	—	1¾	60A/250V	50	**88EUE02FG**		**88EUE02MG**		**88EUEC2FG**		**88EUEC2MG**	
	25	13–52	B	2	—	100A/250V	100	**88FUF02FG**		**88FUF02MG**		**88FUFC2FG**		**88FUFC2MG**	
	30	25–100	B	—	2½	200A/250V	100	**88GUG02FG**		**88GUG02MG**		**88GUGC2FG**		**88GUGC2MG**	
	50	25–100	B	3	—	200A/250V	150	**88HUG02FG**		**88HUG02MG**		**88HUGC2FG**		**88HUGC2MG**	
	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**		**88DUDC4FH**		**88DUDC4MH**	
	30	10–40	A1	—	1¾	60A/600V	50	**88EUE04FH**		**88EUE04MH**		**88EUEC4FH**		**88EUEC4MH**	
	40	13–52	B	2	—	100A/600V	100	**88FUF04FH**		**88FUF04MH**		**88FUFC4FH**		**88FUFC4MH**	
	60	25–100	B	—	2½	200A/600V	100	**88GUG04FH**		**88GUG04MH**		**88GUGC4FH**		**88GUGC4MH**	
	75	25–100	B	3	—	200A/600V	125	**88HUG04FH**		**88HUG04MH**		**88HUGC4FH**		**88HUGC4MH**	
	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**		**88DUDC5FE**		**88DUDC5ME**	
	30	10–40	A1	—	1¾	60A/600V	50	**88EUE05FE**		**88EUE05ME**		**88EUEC5FE**		**88EUEC5ME**	
	40	13–52	B	2	—	100A/600V	50	**88FUF05FE**		**88FUF05ME**		**88FUFC5FE**		**88FUFC5ME**	
	60	25–100	B	—	2½	200A/600V	100	**88GUG05FE**		**88GUG05ME**		**88GUGC5FE**		**88GUGC5ME**	
	75	25–100	B	3	—	200A/600V	125	**88HUG05FE**		**88HUG05ME**		**88HUGC5FE**		**88HUGC5ME**	
	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**		**88LPU05ME**		**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).

Notes

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
- Combination lighting contactors are UL Listed for Service Entrance
- 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

LE					0			

Disconnect Type
B = Combination Circuit Breaker
D = Combination Non-Fused Disconnect
F = Combination Fusible Disconnect
N = Non-Combination

Disconnect Rating
0 = N/A
A = 30A/250V Disconnect
B = 30A/600V Disconnect
C = 60A/250V Disconnect
D = 60A/600V Disconnect
E = 100A/250V Disconnect
F = 100A/600V Disconnect
G = 200A/250V Disconnect
H = 200A/600V Disconnect
J = 400A/250V Disconnect
K = 400A/600V Disconnect
T = 20A Circuit Breaker
V = 30A Circuit Breaker
Y = 60A Circuit Breaker
Z = 100A Circuit Breaker

Enclosure Type
0 = Open
1 = NEMA 1
2 = NEMA 12/3R
4 = NEMA 4/4X SS

Contactor Rating (Amp)
B = 20
C = 30
D = 60
E = 100
F = 200
G = 300
H = 400

N.C. Poles
0 = None

N.O. Poles
03 = Three
04 = Four
06 = Six
09 = Nine
12 = Twelve

Coil Voltage (AC 60Hz)
024 = 24
120 = 120
208 = 208
240 = 240
277 = 277
347 = 347
480 = 480
600 = 600

Series
A = 200 – 400A Contactors
B = 20 & 30A Contactors
C = 60 & 100A Contactors

Electrically Held Lighting Contactors, Class LE

Selection

Ordering Information

Replace *** with a number from the coil table.
Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/135 for open, page 9/153 for enclosed.
Wiring Diagram see page 9/170.
Replacement Parts see page 9/123.

Coil Table

VAC 60Hz	***
24	024
120	120
208	208
240	240
277	277
347 ①	347
480	480
600	600

Replace the (***) with a number from the coil table.

Non-Combination Contactor

Max. Amp Rating	Number of Poles	Normally Closed Contacts	Normally Open Contacts	Enclosure Type			
				Open	1	3/3R/12	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***C	LEN01D003***C	LEN02D003***C	LEN04D003***C
	6	0	6	LEN00D006***C	LEN01D006***C	LEN02D006***C	LEN04D006***C
	9	0	9	LEN00D009***C	LEN01D009***C	LEN02D009***C	LEN04D009***C
	12	0	12	LEN00D012***C	LEN01D012***C	LEN02D012***C	LEN04D012***C
100	3	0	3	LEN00E003***C	LEN01E003***C	LEN02E003***C	LEN04E003***C
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 60 - 400A contactors.

Electrically Held Lighting Contactors, Class LE

Technical

Contactor	LEN00B003	LEN00B004	LEN00C003	LEN00C004
General technical data:				
Finger-safe (main circuit / control circuit)	yes / yes	yes / yes	yes / yes	yes / yes
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
Mechanical operating cycles as operating time:				
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
Main circuit:				
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
Current ratings:				
Tungsten (poles per phase)	**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**
Ballast (poles per phase)	**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**
General and resistive (poles per phase)	**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**
Coil ratings:				
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
Internal/standard auxiliary contact:				
Number of NC / NO auxiliary contacts	0NC / 1NO	NA①	1NC / 1NO	1NC / 1NO
Rating	A600 / Q600	NA	A600 / Q600	A600 / Q600
Installation/mounting/dimensions:				
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
Short circuit current rating of main circuit:				
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
Certificates:	**cULus**	**cULus**	**cULus**	**cULus**

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
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
11.8 / 5, 7.4 / 10	6.7 / 5, 4 / 10	8.5 / 5, 4.2 / 10	8.5 / 5, 4.2 / 10	8.5 / 5, 4.2 / 10
18.5 / 5, 10 / 10	10.6 / 5, 6.3 / 10	13.4 / 5, 6.5 / 10	13.4 / 5, 6.5 / 10	13.4 / 5, 6.5 / 10
Mechanical operating cycles as operating time:				
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
Main circuit:				
0NC / 3NO	0NC / 3NO	0NC / 3NO	0NC / 3NO	0NC / 3NO
3.8	5.3	13	18	35
5,000	5,000	2,000	2,000	2,000
Current ratings:				
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 @347V 1p 1ph 60A @600V 2p 1ph 60A @600V 3p 3ph	**100A @347V 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 @347V 1p 1ph 60A @600V 2p 1ph 60A @600V 3p 3ph	**100A @347V 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**
Coil ratings:				
2)	2)	2)	2)	2)
188 / 16.5	326 / 22	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
Internal/standard auxiliary contact:				
1NC / 1NO	1NC / 1NO	2NC / 2NO	2NC / 2NO	2NC / 2NO
A600 / P600	A600 / P600	A300 / Q300	A300 / Q300	A300 / Q300
Installation/mounting/dimensions:				
vertical	vertical	vertical	vertical	vertical
yes / yes	yes / yes	yes / no	yes / no	yes / no
113 x 55 x 130	140 x 70 x 152	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 / 26-39 lb in	screw / 26-39 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
2 x (18 ... 2), 1 x (18 ... 1)	2 x (18 ... 2), 1 x (18 ... 1)	2x(6-3/0)	2x(2/0-500MCM)	2x(2/0-500MCM)
2x (20 ... 16), 2x (18 ... 14)	2 x (18 ... 2), 1 x (18 ... 1)	2x(18-14)	2x(18-14)	2x(18-14)
75°C CU	75°C CU	75°C CU	75°C CU	75°C CU
Short circuit current rating of main circuit:				
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

Replace *** with a number from the coil table.
Field Modification Kits see page 9/100.
Factory Modifications see page 9/114.
Dimensions see page 9/153.
Wiring Diagram see page 9/170.
Replacement Parts see page 9/123.

Coil Table

VAC 60Hz	***
24	024
120	120
208	208
240	240
277	277
347①	347
480	480
600	600

Replace the (***) with a number from the coil table.

Combination Contactor

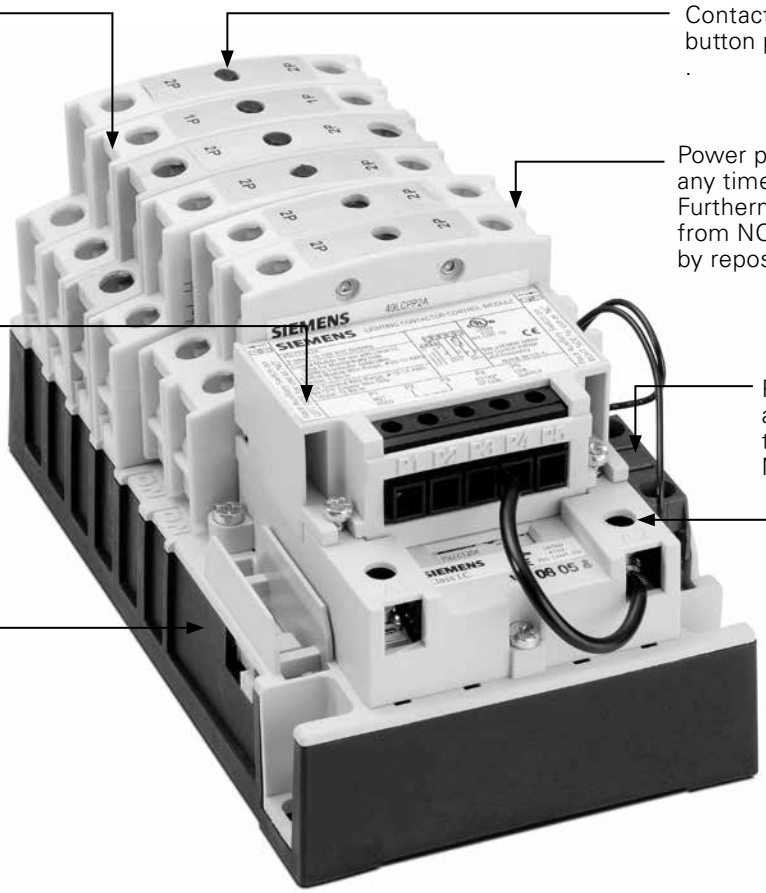
Disconnect Type	Max. Amp Rating	Number of NO Poles	Disc. Amp Rating	Disc Amp/ Fuse Clip Rating	Circuit Breaker Rating	Enclosure Type 1 Catalog Number	3/3R/12, 4② Catalog Number	4/4X 304 S.S. Catalog Number
Non-Fusible	20	3	30A	—	—	**LEDB1B003***B**	**LEDB2B003***B**	**LEDB4B003***B**
	30	3	30A	—	—	**LEDB1C003***B**	**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 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

LC	E0		C				A

Controller Type
E0 = Electrically Held
(Convertible to MH)

Enclosure Type
0 = Open
1 = NEMA 1
2 = NEMA 12/3R
4 = NEMA 4/4X Stainless Steel

Contactor Rating (Amp)
C = 30

N.C. Poles
0 = None
1 = One
2 = Two
3 = Three
4 = Four
5 = Five
6 = Six
7 = Seven
8 = Eight

N.O. Poles
00 = None
01 = One
02 = Two
03 = Three
04 = Four
05 = Five
06 = Six
07 = Seven
08 = Eight
09 = Nine
10 = Ten
11 = Eleven
12 = Twelve

Coil Voltage
024 = 24V 60Hz / 20V 50Hz
120 = 115-120V 60Hz / 110V 50Hz
208 = 200-208V 60Hz
240 = 230-240V 60Hz / 220V 50Hz
277 = 277V 60Hz / 240V 50Hz
347 = 347V 60Hz
480 = 460-480V 60Hz / 440V 50Hz
600 = 575-600V 60Hz / 550V 50Hz

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 9/117.

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 9/102.

Replace *** with a number from the coil table.

Field Modification Kits see page 9/100.

Factory Modifications see page 9/114.

Dimensions see page 9/134 open, page 9/153 enclosed.

Wiring Diagrams see page 9/170.

Replacement Parts see page 9/123.

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	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	LCE04C101***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

Electrically Held Lighting Contactors, Class LC

Selection

Non-Combination Contactor (30 Amp max.)

No. of Poles		Enclosure Type			
		Open	1	3/3R/12	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

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

CLM 20 Amp

CLM 100 Amp

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 cells①
- Energy management systems①
- Microprocessors①
- Occupancy sensors①

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.

① Operation through control modules.

Mechanically and Magnetically Held Lighting Contactors, Class CLM

Selection

Ordering Information

- Replace *** with a number from the coil table.
- Field modification kits see page 9/100.
- Factory modifications see page 9/114.
- Dimensions see page 9/139 open page 9/153 enclosed.
- Wiring Diagrams see page 9/173.
- Replacement parts see page 9/123.

Coil Table

60Hz Voltage	Number
24②	024
120	120
208	208
240	240
277	277
480④	480
600④	600

Open and Non-combination Enclosed Contactors

Max Amp Rating	Number of Poles	Open Type③		Enclosure					
				NEMA 1 General Purpose		NEMA 12 NEMA 3/3R Industrial Use Weatherproof		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 $	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***	
	12			CLM1B12***		CLM2B12***		CLMSB12***	
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***		—	—
	9	CLM0C09***		CLM1C09***		CLM2C09***		—	—
	10	CLM0C10***		CLM1C10***		CLM2C10***		—	—
	12	CLM0C12***		CLM1C12***		CLM2C12***		—	—
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***		—	—
	9	CLM0D09***		CLM1D09***		CLM2D09***		—	—
	10	CLM0D10***		CLM1D10***		CLM2D10***		—	—
	12	CLM0D12***		CLM1D12***		CLM2D12***		—	—
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***	
	3	CLM0F03***		CLM1F03***		CLM2F03***		CLMSF03***	
	4	CLM0F04***		CLM1F04***		CLM2F04***		CLMSF04***	
	5	CLM0F05***		CLM1F05***		CLM2F05***		CLMSF05***	
300	2	CLM0G02***		CLM1G02***		CLM2G02***		—	—
	3	CLM0G03***		CLM1G03***		CLM2G03***		—	—
400	2	CLM0H02***		CLM1H02***		CLM2H02***		—	—
	3	CLM0H03***		CLM1H03***		CLM2H03***		—	—

Open 20 Amp Contactors

Max Amp Rating	Number of Poles①	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 CLM 30 & 60A 6-12-pole can be field assembled. Order mounting kit **49MCMPMA** and the appropriate number of 2-5 pole contactors.

④ 480 or 600 volt coils are not available on 20 amp contactors.

Combination Mechanically and Magnetically Held Lighting Contactors, Class CM

Selection

Ordering Information

- Replace *** with a number from the coil table.
- Field modification kits see page 9/100.
- Factory modifications see page 9/114.
- Dimensions see page 9/153.
- Wiring Diagrams see page 9/173.
- Replacement parts see page 9/123.

Coil Table

60Hz Voltage	Number
24①	024
120	120
208	208
240	240
277	277
480	480
600②	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 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***	
		3	—	30A/600V	—	CMFB11***		CMFB21***		CMFBS1***	
	30	3	—	30A/250V	—	CMFC10***		CMFC20***		CMFCS0***	
		3	—	30A/600V	—	CMFC11***		CMFC21***		CMFCS1***	
	60	3	—	60A/250V	—	CMFD12***		CMFD22***		CMFDS2***	
		3	—	60A/600V	—	CMFD13***		CMFD23***		CMFDS3***	
	100	3	—	100A/250V	—	CMFE14***		CMFE24***		CMFES4***	
		3	—	100A/600V	—	CMFE15***		CMFE25***		CMFES5***	
	200	3	—	200A/250V	—	CMFF16***		CMFF26***		CMFFS6***	
		3	—	200A/600V	—	CMFF17***		CMFF27***		CMFFS7***	
	300	3	—	400A/250V	—	CMFG18***		CMFG28***		CMFGS8***	
		3	—	400A/600V	—	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	Poles to Load: 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

① 24 volt coils are not available on 20 and 300 amp contactors. Use solid state control module on 20 amp size.

② 600 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 because all of our CPTs come standard with touchsafe terminals, both primary and secondary sides. There is no need to buy any terminal cover accessories.
- 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 13⁄32 × 1½ fuses
- 2-Pole primary international type fuse blocks
- 1-Pole secondary international type fuse blocks

Touch safe terminals are standard on all CPTs

The Touch-Safe terminals are designed to comply with IEC 742 and IP 20 requirements. 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.

Transformer Selection Process

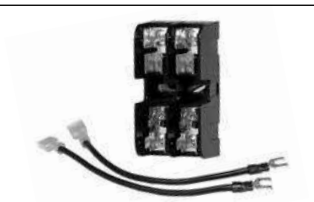
Selecting a transformer for industrial control circuit applications requires knowledge of the following terms:

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: 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
1000①	15000/——	21000/——	27000/——
1000②	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 9/108.
- Dimension and wiring diagrams are available in CAD and PDF format on SIOS.
- All MT and MTG CPTs come standard with touch safe terminals.

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**		—	—	—	—	**MT1500M**	—
2000	**MT2000G**		**MT2000H**		**MT2000I**		—	—	—	—	**MT2000M**	—
3000	**MT3000G**		**MT3000H**		**MT3000I**		—	—	—	—	**MT3000M**	—
5000	**MT5000G**		**MT5000H**		—	—	—	—	—	—	**MT5000M**	—

International, Class MTG

Selection

Ordering Information

- Use the Voltage Table to determine the primary and secondary voltage required.
- Field Modifications see page 9/108.
- Dimension and wiring diagrams are available in CAD and PDF format on SIOS.
- All MT and MTG CPTs come standard with touch safe terminals.

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
550/575/600	110/115/120	E
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
380	24	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	List Price $	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	**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**	—	**MTG1000E**	—	**MTG1000I**	—	**MTG1000J**		—	—
1500	**MTG1500A**		—	—	—	—	**MTG1500E**	—	**MTG1500I**	—	—	—	—	—
2000	**MTG2000A**		—	—	—	—	**MTG2000E**	—	**MTG2000I**	—	—	—	—	—
3000	**MTG3000A**		—	—	—	—	**MTG3000E**	—	**MTG3000I**	—	—	—	—	—
5000	**MTG5000A**		—	—	—	—	**MTG5000E**	—	**MTG5000I**	—	—	—	—	—

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**	

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, MRS①

Device	Voltage Rating	Red Pilot Light		Green Pilot Light	
		Catalog Number	List Price $	Catalog Number	List Price $
Class SMF	115–277V AC	**SMFPL10**		**SMFPL10G**	

Pilot Light Kits—Class MMS, MRS①

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 SMF

Enclosure Type	For Use With SMF	Catalog Number	List Price $
Standard Size NEMA 1 General Purpose	FO1, FO1P, FO2, FO2P, FO3, FO3P, FO4, FO4P	**SMFFE2**	
Oversized NEMA Type 1 General Purpose	FO1, FO1P, FO2, FO2P, FO3, FO3P, FO4, FO4P	**SMFFE1**	
NEMA 3R, 4, 12 Watertight Dust-tight	FO1, FO1P, FO2, FO2P, FO3, FO3P, FO4, FO4P	**SMF40BC2**	

Enclosures—Class MMS

Enclosure Type	For Use With MMS	Catalog Number	List Price $
Standard Size NEMA 1 General Purpose	KO1, KO1P, KO1B, KO2, KO2A, KO2B, KO3, KO3A, KO3B, KO4, KO4A, KO4B	**MMSKE3**	
Oversized NEMA Type 1 General Purpose	KO1, KO2B, KO2C, KO3, KO3A, KO3B, KO4, KO4B, KO4C, KO2	**SMFKE1**	
Jumbo NEMA Type 1 General Purpose	KO1, KO2B, KO2C, KO3, KO3A, KO3B, KO4, KO4B, KO4C, KO2	**SMFKE2**	
NEMA 3R, 4, 12 Watertight Dust-tight	KO1, KO2B, KO2C, KO3, KO3A, KO3B, KO4, KO4B, KO4C	**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**	

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**	

Replacement Parts—Class SMF, MMS

Description	Catalog Number	List Price $
Replacement Toggle Kits:Type FW and KW (NEMA 4 Metallic Enclosure)	**SMFHW1**	

① 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

3RV2901-1D

3RV2901-1A

3RV2922-1CP0

3RV2902-1DP0

3RV2928-1H

3RV2901-0H

Description	Type		Catalog Number	List Price $
Auxiliary Contact Blocks				
Plug in contact block 1 block per 3RV mountable at the front	1 SPDT contact, NO/NC 1 NO + 1 NC 1 SPDT contact NO/NC electronic contact④		**3RV2901-1D** **3RV2901-1E** **3RV2901-1G**	
Side mount auxiliary contact with screw connection 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		**3RV2901-1A** **3RV2901-1B** **3RV2901-1C** **3RV2901-1J**	
Signaling Contact Block				
Signaling contact 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.		**3RV2921-1M**	
Auxiliary Releases				
Undervoltage release 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	**3RV2902-1AF0** **3RV2902-1AM1** **3RV2902-1AP0** **3RV2902-1AV1**	
Undervoltage release with early make contacts (2NO) 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	**3RV2922-1CP0** **3RV2922-1CV1**	
Shunt trip 1 shunt trip per 3RV mountable at the right-hand side. Cannot be fitted together with undervoltage release.	AC 50Hz/60Hz① 20–24V 90–110V 200–240V 350–415V	DC② 20–70V 70–190V 190–330V 330–500V	**3RV2902-1DB0** **3RV2902-1DF0** **3RV2902-1DP0** **3RV2902-1DV0**	
Pilot Lights	AC 50Hz/60Hz			
For NEMA 1 enclosure only. Kit includes Red, Green, and Amber lenses	24V 120V 240V 480V 600V		**49SBLBJ③** **49SBLBF③** **49SBLBG③** **49SBLBH③** **49SBLBE③**	
Lug Kit				
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		**3RV2928-1H**	
Mounting				
Push-in Mounting Hole Kit For screw panel mounting of the 3RV	Four mounting holes required for each 3RV.		**3RV2928-0B**	
Sealing device				
Adjustment Dial covers	For sealing the FLA adjustment dial (Kit includes 10 covers)		**3RV2908-0P**	
Front mount auxiliary cover	For sealing the front mount auxiliary opening. (Kit includes 10 covers)		**3RV2901-0H**	
Door Operators				
Thru-the-door operators 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	**3RV2926-0B**	
		330 mm depth with supporting bracket	**3RV2926-0K**	

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 $
49SDPB5	14, 40, LC, LEN, CLM①	Open	00-4	Start, Stop Push Buttons	**49SAPB5**	
				Hand-Off-Auto Selector Switch	**49SASB1**	
				Off-On Selector Switch	**49SASB4**	
		1	00-4 or (20–100A)	Start, Stop Push Buttons	**49SDPB5**	
				Hand-Off-Auto Selector Switch	**49SDSBJ**	
				Off-On Selector Switch	**49SDSB4**	
			5-8 or (200–400A)	Start, Stop Push Buttons	**49SAP05**	
				Hand-Off-Auto Selector Switch	**49SAS01**	
				Keyed Hand-Off-Auto (key removable in all positions)	**49SAS09**	
				Off-On Selector Switch	**49SAS04**	
49SDSB1		12, 4/4X	00-8 or (20–400A)	Start, Stop Push Buttons	**49SAP05**	
				Hand-Off-Auto Selector Switch	**49SAS01**	
				Keyed Hand-Off-Auto (key removable in all positions)	**49SAS09**	
				Off-On Selector Switch	**49SAS04**	
	22, 43	Open	00-4	Forward-Off-Reverse Selector Switch	**49SASB2**	
		1	00-4	Forward-Off-Reverse Selector Switch	**49SDSBJ**	
			5-8	Forward, Reverse, Stop Push Buttons	**49SAP02**	
				Forward-Off-Reverse Selector Switch	**49SAS02**	
		12, 4/4X	0-8	Forward, Reverse, Stop Push Buttons	**49SAP02**	
				Forward-Off-Reverse Selector Switch	**49SAS02**	
49SAP05	30 (2S1W)	Open	0-4	High-Off-Low Selector Switch	**49SASB3**	
		1	0-1 ¾	High-Off-Low Selector Switch	**49SDSBJ**	
			2-4	High, Low, Stop Push Buttons	**49SAP03**	
				High-Off-Low Selector Switch	**49SAS03**	
		12, 4/4X	0-4	High, Low, Stop Push Buttons	**49SAP03**	
				High-Off-Low Selector Switch	**49SAS03**	
49SAS01	30 (2S2W)	Open	0-4	High-Off-Low Selector Switch	**49SASB3**	
		1	0-4	High-Off-Low Selector Switch	**49SDSBJ**	
		12, 4/4X	0-4	High, Low, Stop Push Buttons	**49SAP03**	
				High-Off-Low Selector Switch	**49SAS03**	
	17, 18, 36, 37, 83, 84, LED,LEF, LEB, CMN①, CMF①, CMB①	1, 12, 4/4X	0-8 (20-400A)	Start, Stop Push Buttons	**49SAP05**	
				Hand-Off-Auto Selector Switch	**49SAS01**	
				Keyed Hand-Off-Auto (key removable in all positions)	**49SAS09**	
				Off-On Selector Switch	**49SAS04**	
	25, 26	1, 12, 4/4X	0-8	Forward, Reverse, Stop Push Buttons	**49SAP02**	
				Forward-Off-Reverse Selector Switch	**49SAS02**	
	32	1, 12, 4/4X	0-4	High, Low, Stop Push Buttons	**49SAP03**	
				High-Off-Low Selector Switch	**49SAS03**	

① 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 (Lamp Type)	Legend(s)	Voltage	Catalog Number
49SDLBU	14, 40, LC, LEN, CLM	1 (with lift-off cover)	00–4 or (20–100A)	Red, Green, Amber (LED lamp)	ON, RUN, OFF①, OLR TRIPPED	24 to 240 V AC/DC	**49SDLBU**
						277 V AC	**49SDLBL**
	14, 17, 18, 36, 37, 40, 83④, 84④, 88, CLM, CM, LE, LEN, LC	1 (with hinged cover), 3/3R, 4, 4X, 12	00–8 or (20–400A)	Red (Transformer Type incandecent lamp)③	ON	(Refer to voltage table)	**49SPL0BR***
					OFF①②	(Refer to voltage table)	**49SPL0AR***
				Green (Transformer Type incandecent lamp)③	ON	(Refer to voltage table)	**49SPL0BG***
					OFF①②	(Refer to voltage table)	**49SPL0AG***
49SPL0BRF	82, 87	3/3R	1-6	Red (LED lamp)	ON	24 to 240 V AC/DC	**49SFL0BRU**
						277 V AC	**49SFL0BRL**
					OFF①	24 to 240 V AC/DC	**49SFL0ARU**
						277 V AC	**49SFL0ARL**
				Green (LED lamp)	ON	24 to 240 V AC/DC	**49SFL0BGU**
						277 V AC	**49SFL0BGL**
					OFF①	24 to 240 V AC/DC	**49SFL0AGU**
						277 V AC	**49SFL0AGL**
49SPL0JRF	22, 43	1 (with lift-off cover)	00–4	Red, Red (LED lamp)	FORWARD, REVERSE	24 to 240 V AC/DC	**49SDLB7RU**
						277 V AC	**49SDLB7RL**
				Green, Green (LED lamp)	FORWARD, REVERSE	24 to 240 V AC/DC	**49SDLB7GU**
						277 V AC	**49SDLB7GL**
	22, 25, 26, 43	1 (with hinged cover), 3/3R, 4, 4X, 12	00-8	Red, Red (Transformer Type incandecent lamp)③	FORWARD, REVERSE	(Refer to voltage table)	**49SPL0JR***
				Green, Green (Transformer Type incandecent lamp)③	FORWARD, REVERSE	(Refer to voltage table)	**49SPL0JG***
49SFL0BGU	30	1 (with lift-off cover)	0-1 3/4 (1-winding) 0-4 (2-winding)	Red, Red (LED lamp)	HIGH, LOW	24 to 240 V AC/DC	**49SDLB7RU**
						277 V AC	**49SDLB7RL**
				Green, Green (LED lamp)	HIGH, LOW	24 to 240 V AC/DC	**49SDLB7GU**
						277 V AC	**49SDLB7GL**
	30, 32	1 (with hinged cover), 3/3R, 4, 4X, 12	0-4 (1- or 2-winding)	Red, Red (Transformer Type incandecent lamp)③	HIGH, LOW	(Refer to voltage table)	**49SPL0KR***
				Green, Green (Transformer Type incandecent lamp)③	HIGH, LOW	(Refer to voltage table)	**49SPL0KG***
49SBLBL	Lens Kit for pilot light light kits 49SDLB*			Red, Green, Amber	—	—	**49SBLBL**
52AED2	LED lamp BA9s type used to replace incandecsent or LED lamps. Applies only to 49SP* pilot light kits.			Red	—	24 V AC/DC	**52AED2**
				Green			**52AED3**
				Amber			**52AED4**
				White			**52AEDB**
				Red	—	120 - 600 V AC/DC	**52AEB2**
				Green			**52AEB3**
				Amber			**52AEB4**
				White			**52AEBB**

Voltage Table

Voltage	Code (*)
24 V AC (Full voltage)	J
120 V AC	F
240 V AC	G
480 V AC	H
600 V AC	E

① To use as an OFF indicator, the contactor must have a normally closed (NC) auxiliary contact available for the circuit. Order separately as needed.
② Includes a nomally closed (NC) auxiliary contact for NEMA controller sizes 0–4.
③ Incandecsent lamps may be replaced with 52AE* LED lamps listed on this page.
④ Class 83 and 84 requires a quantity of two pilot light kits.

NEMA, Lighting and Heating Contactors, 20 Amp CLM, CMB, CMF, CMN

Selection

Solid State Control Module Kits For Lighting and Heating Contactors①

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

Class 40

Disconnect with protective shield

Class 14, 22, 30, 40, 43

Contactor or Starter Size	00–1¾	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**

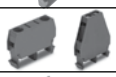
Electrically Held to Mechanically Held Conversion Modules	Class	Enclosure type	Contactor Size (Amp)	Description	Field Kit Catalog No.
	LC	**Open, 1, 12, 4/4X**	**30**	**2-wire, 24VAC** **2-wire, 110-120VAC** **2-wire, 200-277VAC** **3-wire, 24VAC** **3-wire, 110-120VAC** **3-wire, 200-277VAC**	**49LCCM1A** **49LCCM2A** **49LCCM3A** **49LCCM4A** **49LCCM5A** **49LCCM6A**

① 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	2 NO	**3RH1921-1EA20**	
			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**	
		30-100	Side Mounted 1 NO/NC	**3RH2911-1DA11**	
		200-400	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**	
			1 Coil Clearing NO & NC	**CLMFCCK11**	
		300-400 Amps	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 Kits①③

Description	Recommended Transformer Size: Control Size	Recommended Transformer Size: Transformer VA	VA Rating	Catalog Number	List Price $	Transformer Table: Primary Volts	Transformer Table: Secondary Volts	Transformer Table: Code
Transformer 50/60HZ	00–2½	45 or 50③	45 VA	**KT*050②③**		120	24	**1**
	3–3½	75	50 VA	**KT*050P③**		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		500 VA	**KT*500**		277	120	**7**
	20A, 2 - 12P	150				600	24	**6**
	30A, 3P	100				600	120	**9**
	30A, 6 - 12P	200						
	60A, 3P	100						
	60A, 4 - 6P	150						
	60A, 8 - 12P	250						
	100/200A, 3P	200						
	100/200A, 5P	250						
	300/400A, 3P	250						
	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						

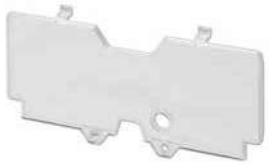
Replace * with code from Transformer table. Kits used with NEMA 1 general purpose lift-off cover type require extra wide enclosure.
Class 14 Sizes 0-2½
Class 30 (2S2W) Sizes 0-2½
Class 30 (2S1W) Sizes 0-1¾

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			**49ASTC1** **3UB89848**	
	ESP100/200 Mounting Plate	**Frame Size**	**Controller Size**		
		A or A1	00 - 1 3/4	**49ASMP1**	
		B	2 -2 1/2	**49ASMP2**	
		B	3-4	**49ASMP3**	
	Mounting Kit			**49ASMS1**	
	Universal Reset Operator 8" for class 36, 37 and 87 in NEMA 1, 12 and 3/3R			**49MARB**	
	Overload Relay Reset Operator for Class 14, 22, 30 and 83 non-combination starters in NEMA type 1, 12 and 4/4X enclosures			**49MBRS**	
	Overload Relay Reset Operator for Class 17, 18, 25, 26, 32 and 84 combination starters in NEMA type 1 enclosures			**49MBRS1**	
	Overload Relay Reset Operator for Class 17, 18, 25, 26, 32 and 84 combination starters in NEMA type 12 and 4/4X enclosures			**49MBRS2**	
	Overload Relay Reset Operator with red button for any Class in NEMA type 1, 3R, 4/4X and 12 enclosures with a 30mm hole			**49MARSR**	
	ESP200 Reset Extender			**49ASRE**	
	Protective Boot Offers protection from ice and foreign substances from interfering with button operation. For use with 49MARSR reset.			**52AABA**	
	Current Transformer 300:5 use with **3UB81234JW2**			**97CT005**	
	Current Transformer 400:5 use with **3UB81234KW2**			**97CT006**	
	Current Transformer 600:5 use with **3UB81234LW2**			**97CT008**	
	Current Transformer 750:5 use with **3UB81234MW2**			**97CT009**	
	Current Transformer 1200:5 use with **3UB81234NW2**			**97CT012**	

Miscellaneous Kits

Description			Class	Encl. Type	Controller Size	Catalog Number	List Price $
	Mechanical Interlock for Horizontally Mounted Contactors	Includes wire	14, 40	Open	00–1 1¾ 2, 2½ 3, 3½ 4	**49CCF22H** **49EEF22H** **49GGF22H** **49HHP22H** **49JJG22H**	
		Interlock Only	14, 40	Open	5, 6	**3RA1954-2A**	
		Wire Kit Only			5 6	**3RA1963-2A** **3RA1973-2A**	
		Base Plate Only			5 6	**3RA1962-2A** **3RA1972-2A**	
		Mechanical Interlock	14, 40	Open	7 8	**49VM750H** **49VM1650H**	
		Includes wire & mounting plate	14, 40	Open	00–1 1¾ 2, 2½ 3, 3½ 4	**49CCF22HP** **49EEF22HP** **49GGF22HP** **49HHP22HP** **49JJG22HP**	
		Includes mounting plate (Different Frame Sizes)	14, 40	Open	Left Right 2, 2½ 3, 3½ 3, 3½ 2, 2½	**49L107944** **49L107945**	
	Surge Suppressor	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	00–4①	**49D26344**	
	Auxiliary Power Pole	NO 36A at 600V AC Max NC 25A at 600V AC Max	All but Class LC, LE, CLM	All	00–1¼	**49SAF0** **49SAFC**	
	Main Contacts Lighting Contactors	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**	
	Load Side Power Take Off Kit	Includes 3 power lugs for making extra connections to the load side of the contactor	All but Class LC, LE, CLM	All	00–1¾	**49SAE**	
	Lug Kit for Contactors Item / Wire Range 49SAAF / 2-14 49SAAH / 2/0-14 75D35994001 / 250MCM-6	For AL/CU Wire	14, 40	All	2-2½ 3-3½ 4 Line 4 Load	**49SAAF③** **49SAAH③** **75D35994002③**	
		For AL/CU Wire	14, 40	All	5, 6	**3RT1966-4G②**	
		Use CU Only	14, 40	All	7 8	**49ZATK750-3②** **49ZATK1650-6②**	
	Three Conductor Ground Lug Kit Meets UL 508 and CSA Standard 22.2 No 14-1973	2-14 AWG AL/CU Wire	All	All	All	**75D28182001**	
	Lightning Arrestor		All	All	All	**49D45584002**	
	Backspin Timer	On delay timer that reduces risk of starting into a backspin	87, 88	All	All	**3RP2025-1AQ30** **3RP2025-1AP30**	
	Hole Plug	Covers the hole that is typically used for the conduit hub	87	All	1-4	**49D41149006**	
	Hole Plug	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	Contactor	Wire Size	Catalog Number	List Price $
 3RT1966-4G	**Lug Kit** 1 Kit = 1 Terminal block. 1 kit necessary for each line and load.	NEMA size 4 (Vacuum) NEMA size 5 NEMA size 6	2/0 to 600 MCM, max. one 500MCM & one 600MCM	3RT1966-4G	

① Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil. For size 4 panel mount.

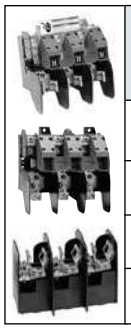
② Only 3 lugs are suplied for line or load. If lugs for line and load are required order 2 kits.

③ Lug Kit for contactors include 3 lugs for line or load. **75D35994001** for line side. **75D35994002** for load side.

NEMA Accessories

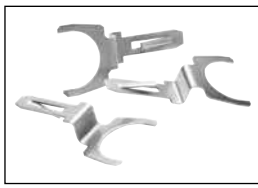
Selection

Fused and Non-Fused Disconnect Switch Kits②



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 H③	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	

Metal Conduit Hubs

Description	Conduit Size	Class	Controller Size	Enclosure Type	Milbank Catalog No.④
	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 mechanisms				
Reset plunger with reset button	**Reset plunger** Mounts directly to overload relay. Requires separate reset operator in enclosure door. Kit includes reset plunger, holder and funnel.		3RB206	**3RU1900-1A**	
	Flexible cable reset mechanism 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**	
Flexible reset	**Covers** 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 $
KCCF1G	SECONDARY FUSE BLOCK,1P,250V MAX	
KCCFBCK	SINGLE POLE FUSE BLOCK COVER KIT	
KCCFP2RG	2 Pole PRIMARY FUSE BLOCK,2P,600V MAX (block only)	
KCCFPX2R	2 Pole PRIMARY FUSE BLOCK KIT with wire Leads	
US2:49FCCPT	Secondary Fuse Clips, 2 per pack	
US2:49JUCPT	Terminal Jumpers	
US2:KCCSECFCVR	Touch safe cover for secondary fuse clips	
US2:KCCFP3POLE	3 pole fuse blk (2 pole primary and 1 pole secondary)	

International Fusing①

Catalog Number	Description	List Price $
8WA1011-1SF12	1-Pole Fuse Block, Touch-Safe. Up to 6.3A for 5 mm × 20 mm or 5 mm × 25 mm (Requires DIN Rail Mounting)	
3NW7013	1-Pole Fuse Block, Touch-Safe 32A, for 10 × 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
3NW7023	2-Pole Fuse Block, Touch-Safe 32A, for 10 × 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
3NW7111	1-Pole Fuse Block, Touch-Safe 4-50A, for 14 × 51 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
8WA1815	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.)	

① Product Category: IEC.

Non-Combination Enclosure Kits, Class 49

Selection

49	E	B	14	E	B	11	07	05	R

Class
49 — Field Kit

Type
E — Enclosure Only

Model
B — Model
C — 2002

Product Class
14 — Class 14, 40
22 — Class 22, 43
30 — Class 30

Starter Size
E — 00, 0, 1, 1¾
G — 2, 2½
I — 3, 3½
J — 4

NEMA Type
B — NEMA 1
0 — NEMA 3/3R/4/12
W — NEMA 4 S.S.

Height (In Inches)

Width (In Inches)

Depth (In Inches)

Reset Installation
R — Reset

Non-Reversing Starters & Contactors Class 14, 40

	NEMA 1 General Purpose (Clamshell)①④					NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant②⑥					NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof②④				
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
	Model C Enclosure		Model C Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
Size	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $
00–1¾	49EC14EB110705R		49EC14IB201208R	200		49EB14EW130806R		49EB22EW131306R			49EB14E0130806R		49EB22E0131306R		
2, 2½	49EC14GB140807R		49EC14IB201208R	200		49EB14GW160907R		49EB22GW161406R			49EB14G0160907R		49EB22G0161406R		
3, 3½	49EC14IB201208R		49EC14IB201208R	100		49EB14JW261408R		49EB14JW261408R			49EB14J0261408R		49EB14J0261408R		
3, 3½	—	—	49EC14JB251409R	250		—	—	—		—	—	—	—		—
4	49EC14JB251409R		49EC14JB251409R	300		49EB14JW261408R		49EB22JW302410R			49EB14J0261408R		49EB22J0302410R		

Reversing Starters & Reversing Contactors Class 22, 43

	NEMA 1 General Purpose (Clamshell)①④					NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant②⑤					NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof②④				
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
	Model C Enclosure		Model C Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
Size	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $
00–1¾	49EC14IB201208R		49EC14IB201208R	200		49EB22EW131306R		49EB22EW131306R			49EB22E0131306R		49EB22E0131306R		
2, 2½	49EC14IB201208R		49EC14IB201208R	200		49EB22GW161406R		49EB22GW161406R			49EB22G0161406R		49EB22G0161406R		
3, 3½	49EC14JB251409R		49EC14JB251409R	250		49EB22IW261808R		49EB22JW302410R			49EB22I0261808R		49EB22J0302410R		
4	49EC14JB251409R		49EC14JB251409R	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		

Two-Speed Two-Winding Starters Class 30

	NEMA 1					NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant②⑤					NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof②④				
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
	Model C Enclosure		Model C Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
Size	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $
0–1¾	49EC14IB201208R①		49EC14JB251409R①	200		49EB30EW131306R		49EB30GW161808R			49EB30E0131306R		49EB30G0161808R		
2, 2½	49EC14IB201208R①		49EC14JB251409R①	200		49EB30GW161406R		49EB30GW161808R			49EB30G0161406R		49EB30G0161808R		
3, 3½	49EC14JB251409R①		49EB22JB302410R②	300		49EB30IW261808R		49EB22JW302410R			49EB30I0261808R		49EB22J0302410R		
4	49EC14JB251409R①		49EB22JB302410R②	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		

Two-Speed One-Winding Starters Class 30

	NEMA 1 General Purpose (Clamshell)①③					NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant②⑤					NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof②④				
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
	Model C Enclosure		Model C Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
Size	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT VA	List Price $
0–1¾	49EC14IB201208R①		49EC14JB251409R①	200		49EB30EW131306R		49EB30GW161808R			49EB30E0131306R		49EB30G0161808R		
2, 2½	49EB30GB161808R②		49EB22JB302410R②	300		49EB30GW161808R		49EB22IW261808R			49EB30G0161808R		49EB22I0261808R		
3, 3½	49EB30IB192208R②		49EB22JB302410R②	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		
4	49EB22JB302410R②		49EB22JB302410R②	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		

Note: Dimensions...See appropriate Product Class Outline Drawing beginning on page 17-143.

① Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 17-102.

② 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 17-94.

③ Install NEMA 1 hole plug cat. no. **3SB1902-0AR** (included) when the cover OL reset is not needed.

④ Install NEMA 12 hole plug cat. no. 52ABH6 (not included) when the cover OL reset is not needed.

⑤ 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			Type 4/4X Stainless Steel①			NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof ②④		
	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 3-6P	**49EC14GB140807R**	**49EC14IB201208R**	200	**49EB22GW161406R**	**49EB22GW161406R**		**49EB22G0161406R**	**49EB22G0161406R**	
LE 60A 9-12P	**49EC14IB201208R**	**49EC14IB201209R**	250	**49ECLXXW161406**	**49EB14JW261408R**		**49ECLXX0161406**	**49EB14J0261408R**	
LE 100A 3P	**49EC14IB201208R**	**49EC14IB201208R**	200	**49EB14JW261408R**	**49EB14JW261408R**		**49EB14J0261408R**	**49EB14J0261408R**	

Lighting & Heating Contactors Class CLM

Size	Pole	NEMA 1 General Purpose (Clamshell)①③					NEMA 4/4X Stainless Watertight, Corrosion Resistant②⑤					NEMA 3/3R/4/12 Watertight, Dust-tight, Weatherproof ②④				
		Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
		Model C/B Enclosure		Model C/B Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
		Catalog Number	List Price $	Catalog Number	Max CPT	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT	List Price $
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 Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 9/104.

② 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.

③ Install NEMA 1 hole plug cat. no. **3SB1902-0AR** (included) when the cover OL reset is not needed.

④ Install NEMA 12 hole plug cat. no. 52ABH6 (not included) when the cover OL reset is not needed.

⑤ Install NEMA 4X stainless steel hole plug cat. no. **52ABHS** (not included) when the cover OL reset is not needed.

Features and Benefits

Features

- 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

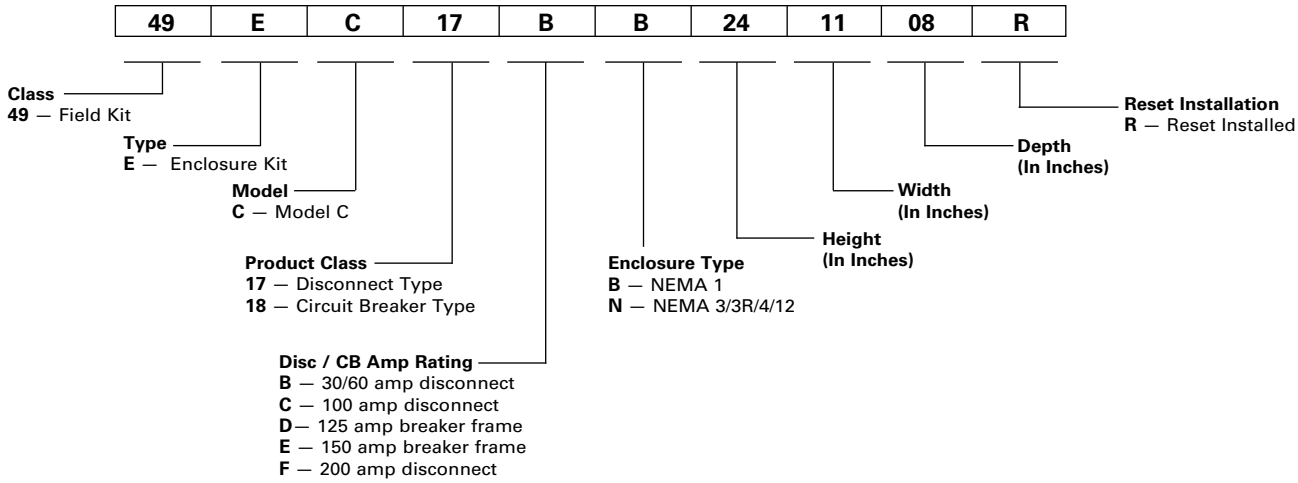
MCP Type Enclosure Kit

- Used to assemble combination starters with circuit breakers
- Accommodates Class 14 full voltage non-reversing (FVNR) 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.
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 3/3R/4/12 Watertight, Dust-tight, Weatherproof		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 3/3R/4/12 Watertight, Dust-tight, Weatherproof		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

	MCP Type Used with Solid State Overload Relay		
Starter Size	Overload Amp Range	Motor Circuit Interrupter Amps	Circuit Breaker Kit
	0.75-3.4	3	**ED63A003**
0	3-12	10	**ED63A010**
	5.5-22	25	**ED63A025**
	0.75-3.4	3	**ED63A003**
1	3-12	10	**ED63A010**
	5.5-22	25	**ED63A025**
	10-40	30	**ED63A030**
1 ¾	10-40	40	**ED63A040**
2	13-52	50	**ED63A050**
2 ½	25-100	100	**ED63A100**
3	25-100	100	**ED63A100**
3 ½	50-200	125	**ED63A125**
4	50-200	150	**FXD63A150L**

Class 87 Pump Panel Enclosure Kits

Selection

Ordering Information

Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.

Refer to Class 87 section of catalog for pump panel ratings and other details.

Handle mechanism, power wire, mounting panel, reset assembly and instruction guide are included with the enclosure kit.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A①
200–208	D
220–240	G
220–240/440–480	C①
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 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.

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, 83③, 84③, 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, 83③, 84③, 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, 83③, 84③, CLM, CM, LC, LE	All	**A4**	
	Auto-Off	14, 17, 18, 40, 83③, 84③, 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, 83③, 84③, 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	Overload Relay Tripped	Control Power On	On For/Rev Low/High	On For/Rev Low/High	Off	
		Mod Code→	FA	FB	FC	FD	FJ	FK	FL	FW	FS	FT	FU	FE①
14, 40, 17, 18, 36, 37, 87, 88, LC, LE, CLM, CM	All													
22, 25, 26, 30, 32, 43, 83③, 84③	All													

Coil Options

Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83④, 84④, 87, 88					
			Controller Size — List Price $		
Volts 60 HZ	Volts 50 HZ	Coil Letter Change	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 Coil②	24V	**S⑤**			
	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 For Class 83 and 84, two devices are included.

④ For Class 83, 84 standard enclosure (92) alternating relay available in 24V or 120V control only.

⑤ S coil is not available for size 4 contactors or starters.

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

Description	Modification Code	Product Class③
Standard Capacity① with 1-Secondary Fuse	**B***	All
Standard Capacity with 2-Primary and 1-Secondary Fuse	**D***	
100VA Extra Capacity with 2-Primary and 1-Secondary Fuse	**C***	
150VA Extra Capacity with 2-Primary and 1-Secondary Fuse	**C*1**	

Factory Assembled Fuse Clips—Class 25, 32, 84④

Fuse Clip Amps	Volts	Modification Code
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.

③ Class 83 and 84 duplex controllers requires two CPTs.
④ Class 84 Duplex Controllers require two fusible disconnects.

Selection

Additional Auxiliary Contacts

Class	NO Contacts	NC Contacts	Modication Code	Controller Size — List Price $			
				00–1¾	2–4	5–6	7–8
14, 17, 18, 40, 83③, 84③	—	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	G02①			—	—
	2	—	G20①			—	—
	2	2	G22①				—
	4	0	G40①				—
	4	4	G44①			—	—
	6	2	G62①			—	—
	8	0	G80①			—	—
30, 32 (1-winding)	0	2	G02①	—		—	—
	2	—	G20①	—		—	—
	2	2	G22①			—	—
	4	—	G40①			—	—
	4	4	G44①	—		—	—
	6	2	G62①	—		—	—
	8	—	G80①	—		—	—
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	G02①		—	—	—
	2	0	G20①		—	—	—
	2	2	G22①		—	—	—

Description	Class	Modification Code	Controller Size - Price Deduction $					
			0, 1	1¾ - 2½	3	3½, 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
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 Coil②	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	All	**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 – 3 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**
Blown Control Fuse Indicator Light	17, 25, 32, 37, 84, 87, 88, CM, LC, LE	All	**L11**
Minimum Run Timer 0.2 sec. - 3 mins.	87, 88	All	**T6**
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
Reversing in one speed only 2 speed 1 winding Reversing in one speed only 2 speed 2 winding Reversing in both speeds 2 speed 1 winding Reversing in both speeds 2 speed 2 winding	30, 32	**R6** **R7** **R8** **R9**
Reversing for Reduced Voltage	36, 37	**R**

Motor Management with PROFIBUS DP Communications③

Description	Class	Enclosure Type	Modification Code
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	Contactor Size (Amp)	Description	Modification Code
LC	**All**	**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**

① Supplied as NEMA 12, field convertible to NEMA 3R.
② Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil.
③ 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
Control Relay 4-Poles Max	4 NO	All	All	**R40**
	2 NO/2 NC			**R22**
	4 NC			**R04**
Under/Over Voltage, Phase Failure, Phase Sequence, Phase Unbalance		All		**R1**
Ground Fault Relay				**R5**
Electronic On Delay Relay (.15s–100h) 24V/120V				**T1**
Electronic On Delay Relay (.15s–100h) 24V/240V①				**T2**
Electronic Off Delay Relay (.15s–100s) 120V				**T3**
Electronic Off Delay Relay (.15s–100s) 240V①				**T4**
24 hour time clock 24 hour time clock with day omission 7 day time clock		LC, LE, CLM, CM		**T7** **T8** **T9**
Compelling Relay		30, 32		**A6**
Acceleration Control				**A7**
Deceleration Control				**A8**

Meters—Mounted on Enclosure

Description	Class	Enclosure Type	Modification Code
Ammeter (includes a C.T. if necessary)	14, 17, 18, 22, 25, 26, 30④, 32④, 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 Meter②		1, 3, 4, 4X, 12	**M5**

Function Identification Plates

Description	Class	Modification Code
Function identification plate, with marking as specified	All	**N1**

Terminal Blocks

Description	Class	Modification Code
3 Point Terminal 6 Point Terminal 9 Point Terminal	All	**TC3③** **TC6③** **TC9③**

Special Ratings

Description	Class	Modification Code
Service Entrance Rating *Please note* Class 87, 88, CM and LE (combination type) are UL Listed for Service Entrance as standard and thus does not need to be modified for such.	17, 18, 25, 26, 32, 37, 84	**N3**

Drawings

Description	Class	Catalog Number
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 ETM available with 120V coil only.
③ For terminal point more than 9 terminals use additional suffixes. Max 3 suffixes can be selected.
④ Class 30 and 32 can be modified with only an elapsed time meter. No other meters apply to class 30 or 32.

Heater Elements, Class SMF

General

Heater Elements Class SMF

Ordering Information

1. Determine number of heater elements required from Table A.
2. Determine motor full load current and service factor.
3. If the motor and controller are in the same ambient temperature:
   a. For 1.15 to 1.25 service factor motors use 100% of motor full load current for heater element selection.
   b. For 1.0 service factor motors use 90% of motor full load current for heater element selection.
   c. Heater elements are class 20.
4. 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.
5. Select proper heater element from table below.
6. 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

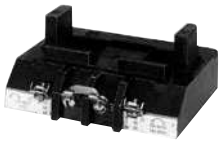
Starters and Contactors – AC Coils

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 60Hz	Volts 50Hz	Catalog Number	List Price $
	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**①	

① Set of 2 coils. Recommend to change printed circuit board when changing coils. **49ZP1650** see page 17-123.

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 24 32 48 125 250	**75D73070R** **75D73070S** **75D73070T** **75D73070U** **75D73070V** **75D73070W**	
	3, 3½	P U (ESP200)	12 24 32 48 125 250	**75D73251R** **75D73251S** **75D73251T** **75D73251U** **75D73251V** **75D73251W**	
	4	G U (ESP200)	48 125 250	**75D70131U** **75D70131V** **75D70131W**	
	4, 5	V (Vacuum)	23-26 42-48 110-127 240-277	**3RT1966-5AB31** **3RT1966-5AD31** **3RT1966-5AF31** **3RT1966-5AU31**	

Note: For sizes 7 & 8 contactors the AC coils are used for DC see page 17-118.

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 ①

Description	Size	Number of Poles in Kit	Model (4th position in part number)	Catalog Number	List Price $
	Internal Aux Contact (00-1-¾) 00 0		P, U P, U P, U	**75AF14** **75BF14** **75CF14**	
	1 1¾–1P	1	P, U P, U	**75DF14** **75EF14**	
	2	1	P, U	**75FP14**	
	2½	1	P, U	**75GP14**	
	3 3½	1	P, U P, U	**75HF14** **75IF14**	
	4 4 (Vacuum)	1 3 (Bottles)	G, T V, C	**75JG14** **3RT1964-6V**	
Class 14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88	5 5 (Vacuum)	3 3 (Bottles)	P V, C	**3RT1966-6A** **3RT1966-6V**	
	6 6 (Vacuum)	3 3 (Bottles)	P V, C	**3RT1976-6A** **3RT1976-6V**	
14, 40	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.

Overload Relays, Lighting Contactors

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	**49LCPP1A** **49LCPP2A**

Replacement Contact Kits

	Class	Contactor Size (Amp)	Description	Catalog No.
	LC	30	NA	**NA**
	LE	20, 30	NA	**NA**
		60 100 200 300 400	1 contact kit includes 3 moving and 6 fixed contacts.	**3RT2937-6A** **3RT1945-6A** **3RT1956-6A** **3RT1965-6A** **3RT1975-6A**

Lighting Contactors, Type LC, LE, CLM, CMF, CMN

Selection

Replacement Coil Kits

	Class	Contactor Size (Amp)	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	NA	**NA**
	LE	60	24VAC 50/60Hz 110VAC 50Hz / 120VAC 60Hz 208VAC 50/60Hz 220VAC 50Hz / 240VAC 60Hz 277VAC 60Hz 480VAC 60Hz 600VAC 60Hz	**3RT29345AC21** **3RT29345AK61** **3RT29345AM21** **3RT29345AP61** **3RT29345AU61** **3RT29345AV61** **3RT29345AT61**
	LE	100	24VAC 50/60Hz 110VAC 50Hz / 120VAC 60Hz 208VAC 50/60Hz 220VAC 50Hz / 240VAC 60Hz 277VAC 60Hz 480VAC 60Hz 600VAC 60Hz	**3RT29445AC21** **3RT29445AK61** **3RT29445AM21** **3RT29445AP61** **3RT29445AU61** **3RT29445AV61** **3RT29445AT61**
	LE	200	23 - 26 V AC 50-60Hz / DC 110 - 127 V AC 50-60Hz / DC 200 - 220 V AC 50-60Hz / DC 220 - 240 V AC 50-60Hz / DC 240 - 277 V AC 50-60Hz / DC 440 - 480 V AC 50-60Hz / DC 575 - 600 V AC 50-60Hz / DC	**3RT19555AB31** **3RT19555AF31** **3RT19555AM31** **3RT19555AP31** **3RT19555AU31** **3RT19555AR31** **3RT19555AT31**
	LE	300	23 - 26 V AC 50-60Hz / DC 110 - 127 V AC 50-60Hz / DC 200 - 220 V AC 50-60Hz / DC 220 - 240 V AC 50-60Hz / DC 240 - 277 V AC 50-60Hz / DC 440 - 480 V AC 50-60Hz / DC 575 - 600 V AC 50-60Hz / DC	**3RT19655AB31** **3RT19655AF31** **3RT19655AM31** **3RT19655AP31** **3RT19655AU31** **3RT19655AR31** **3RT19655AT31**
	LE	400	23 - 26 V AC 50-60Hz / DC 110 - 127 V AC 50-60Hz / DC 200 - 220 V AC 50-60Hz / DC 220 - 240 V AC 50-60Hz / DC 240 - 277 V AC 50-60Hz / DC 440 - 480 V AC 50-60Hz / DC 575 - 600 V AC 50-60Hz / DC	**3RT19755AB31** **3RT19755AF31** **3RT19755AM31** **3RT19755AP31** **3RT19755AU31** **3RT19755AR31** **3RT19755AT31**

AC Coils 20 Amps②

	Type	Contactor Size	Number of Poles	120V, 60Hz 110V, 50Hz	240V, 60Hz 208V, 50Hz	277V 50/60Hz
 CLM4097341	CLM	20 Amp	2–12	**CLM4097341**	**CLM4097342**	**CLM4097343**

AC Coils 30–400 Amps③

	Type	Contactor Size	Number of Poles	Catalog Number						
				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**
	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**
	CLM†G Latching Coil	300/400 Amp	2–3-Pole	—	**CLMGL3C120**	**CLMGL3C208**	**CLMGL3C240**	**CLMGL3C277**	**CLMGL3C480**	**CLMGL3C600**
	Unlatch Coil		2–3-Pole	—	**CLMGU3C120**	**CLMGU3C208**	**CLMGU3C240**	**CLMGU3C277**	**CLMGU3C480**	**CLMGU3C600**

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

CLM4097334

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	**CLM4097331** **CLM4097332** **CLM4097333** **CLM4097334**	

Main Contacts 30–400 Amp Lighting Contactors

Type	Frame Size	Contactor Size	Number of Poles	Catalog Number	List Price $
CLM	C	30 Amp	2 3 4 5	**CLMCCK02** **CLMCCK03** **CLMCCK04** **CLMCCK05**	
	D	60 Amp	2 3 4 5	**CLMDCK02** **CLMDCK03** **CLMDCK04** **CLMDCK05**	
	E	100 Amp	2 3 4 5	**CLMECK02** **CLMECK03** **CLMECK04** **CLMECK05**	
	F	200 Amp	2 3 4 5	**CLMFCK02** **CLMFCK03** **CLMFCK04** **CLMFCK05**	
	G	300 Amp	2 3	**CLMGCK02** **CLMGCK03**	
	H	400 Amp	2 3	**CLMHCK02** **CLMHCK03**	

Auxiliary Contact Blocks 20 Amp Lighting Contactors②

Type	Contactor Size	Contacts	Catalog Number	List Price $
CLM	20 Amp	1 Form C NO, NC Contact 2 Form C NO, NC Contacts	**CLM4097291** **CLM4097292**	

Auxiliary Contact Blocks 30–400 Amp Lighting Contactors

CLMFCAK11

Type	Frame Size	Contactor Size	Contact Configuration	Catalog Number	List Price $
CLM	C to F②	30–200 Amps	1 NO and 1 NC 2 NC 2 NO 1 Coil Clearing NO and NC	**CLMFCAK11** **CLMFCAK02** **CLMFCAK20** **CLMFCCK11**	
	G to H①	300–400 Amps	1 NO and 1 NC 2 NC 2 NO 1 Coil Clearing NO and NC	**CLMHCAK11** **CLMHCAK02** **CLMHCAK20** **CLMHCCK11**	

Control Module Rectifier③

Type	Device	Contactor Size	Number of Poles	Catalog Number	List Price $
CLM	CLM†C to CLM†F	30–200 Amps	All	**CLMKCMR**	

① Maximum 1 block per contactor.
② Maximum 2 blocks per contactor.

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.

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	

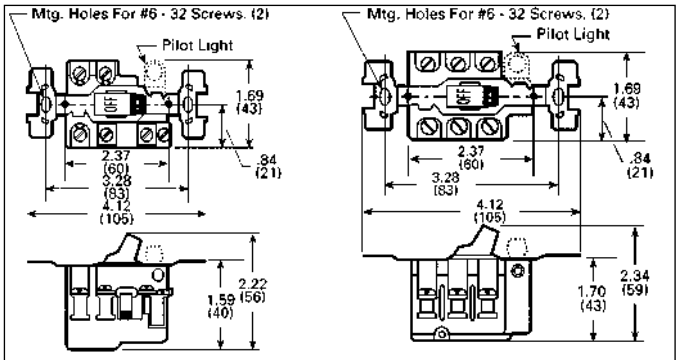
Quarter Turn Assemblies

Description		Class	Enclosure Type	Catalog Number	List Price $
	Quarter-Turn Latch	17, 18, 25, 26, 32, 87 & 88	1, 3/3R & 12	75D46260004	
			4 & 4X	75D46260005	

Class SMF, MMS

Dimensions

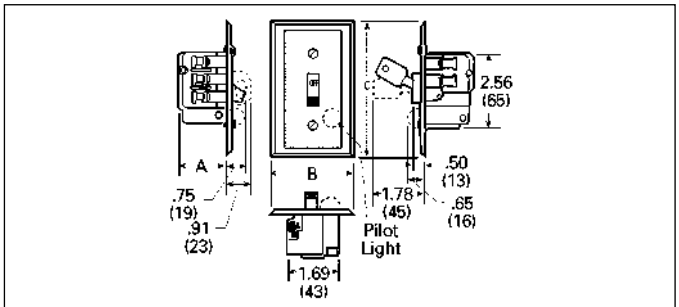
Class SMF and MMS Open Type



Class SMF
①Types FO–1, 1P, 2, 2P
(with toggle operator)

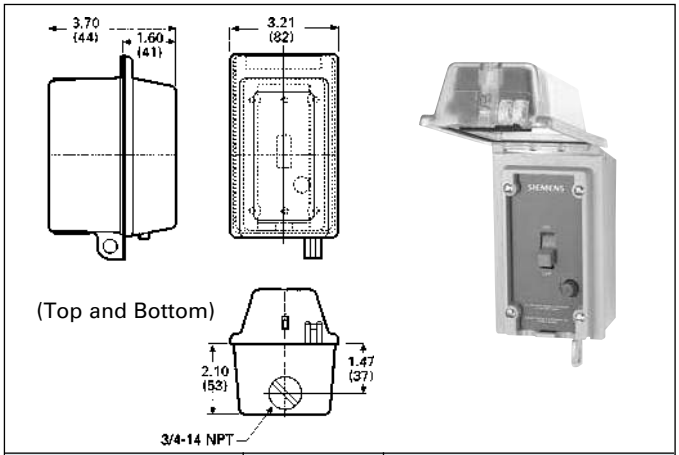
Class MMS
①Types KO–1, 1A, 1B, 2, 2B, 2C
(with toggle operator)

NEMA Type 1B General Purpose Flush Mounting



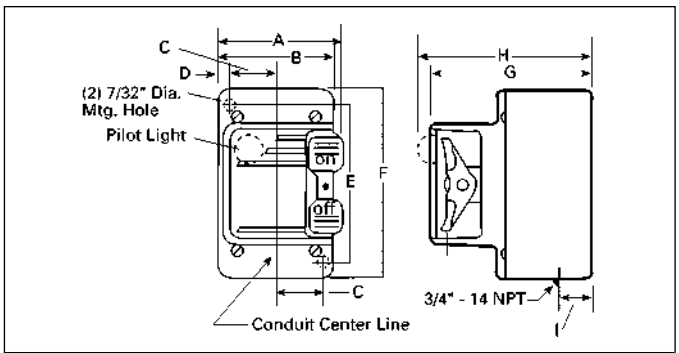
Device	Type of Operator	Type	Dimensions in Inches (mm)		
			A	B	C
Class SMF Fractional HP Starter	Toggle	**FF1, 1P, 2, 2P** **FS1, 1P, 2, 2P**	1.44 (37)	2.75 (70)	4.50 (114)
		FSJ1P, 2P	1.44 (37)	3.50 (89)	5.25 (133)
	Key	**FF3, 3P, 4, 4P** **FS3, 3P, 4, 4P**	1.44 (37)	2.75 (70)	4.50 (114)
		FSJ3P, 4P	1.44 (37)	3.50 (89)	5.25 (133)
Class MMS Motor Starting Switch	Toggle	**KF1, 1A, 1B, 2, 2B, 2C** **KS1, 1A, 1B, 2, 2B, 2C**	1.75 (44)	2.75 (70)	4.50 (114)
		KSJ1A, 1B, 2B, 2C	1.75 (44)	3.50 (89)	5.25 (133)
	Key	**KF3, 3A, 3B, 4, 4B, 4C** **KS3, 3A, 3B, 4, 4B, 4C**	1.75 (44)	2.75 (70)	4.50 (114)
		KSJ3A, 3B, 4B, 4C	1.75 (44)	3.50 (89)	5.25 (133)

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**

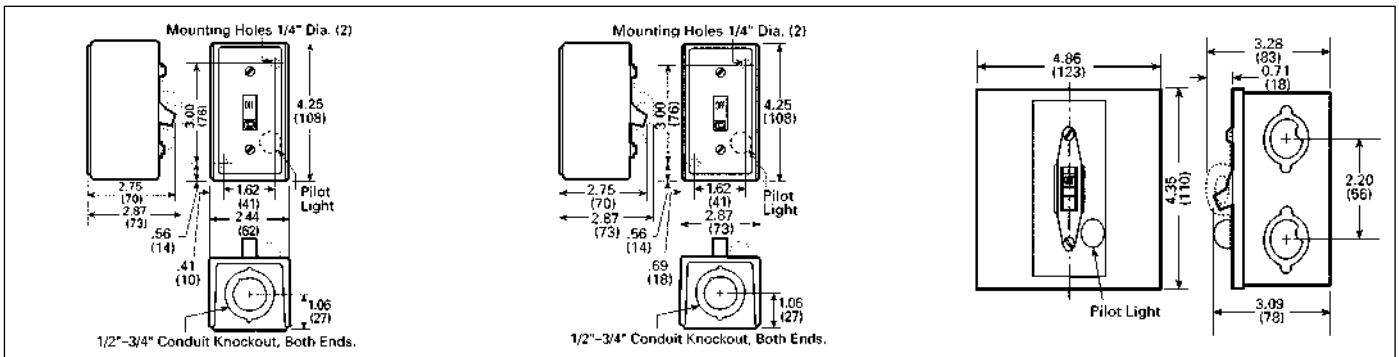
NEMA Type 4 Watertight Die Cast Zinc Enclosure



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 1 General Purpose Surface Mounting Enclosures



Standard Size—Class SMF and MMS
Types FG & KG (Single-Unit)

Oversized—Class SMF and MMS
Types FGJ & KGJ (Single-Unit)

Jumbo MMSKE2
½"–¾" Knock-Out On Back and Sides

Note: Dimensions for reference, not for construction. Dimensions are in inches (mm).

① Dimensions typical for key operator devices.

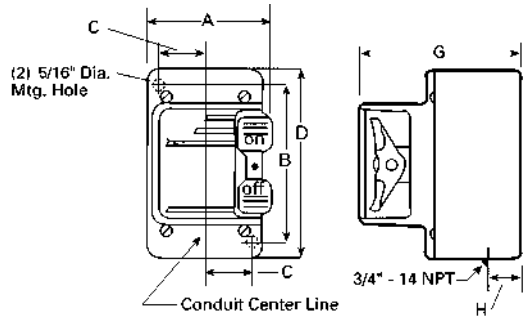
Class SMF, MMS

Dimensions

NEMA Type 7 and 9 Cast Aluminum Enclosure

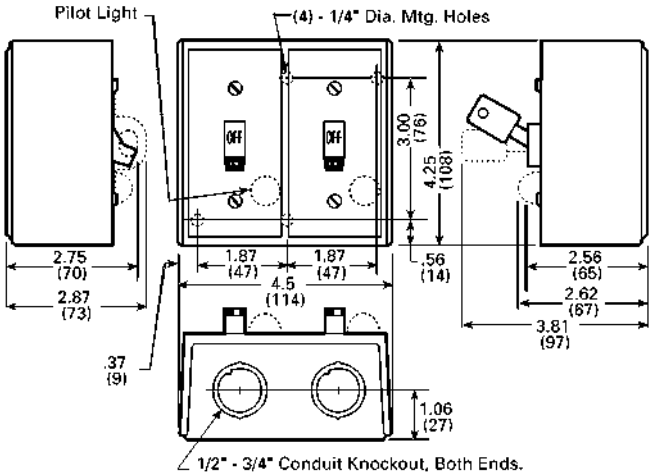
Dimensions in Inches (mm)					
A	**B**	**C**	**D**	**G**	**H**
4.00 (101)	5.75 (146)	1.38 (35)	6.36 (161)	4.38 (111)	1.20 (30)

Device	Class	Type
Fractional HP Starter	SMF	**FR1, FR2**
Motor Starting Switch	MMS	**KR1, KR2**



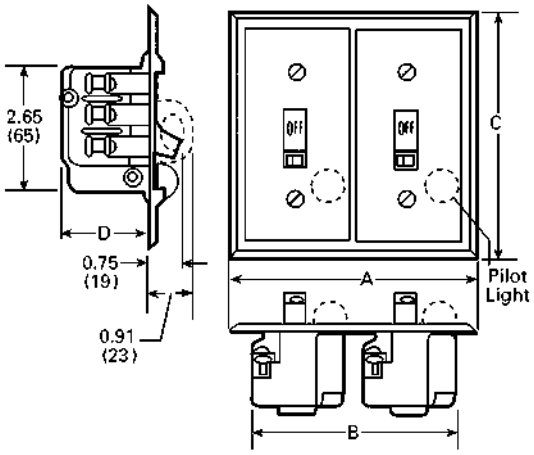
NEMA Type 1 General Purpose Enclosure For Two Unit Devices

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. Switch①	Toggle	SMF	**FG71, 71P, 72, 72P**
	Key	SMF	**FG74P**
Reversing Switch②	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

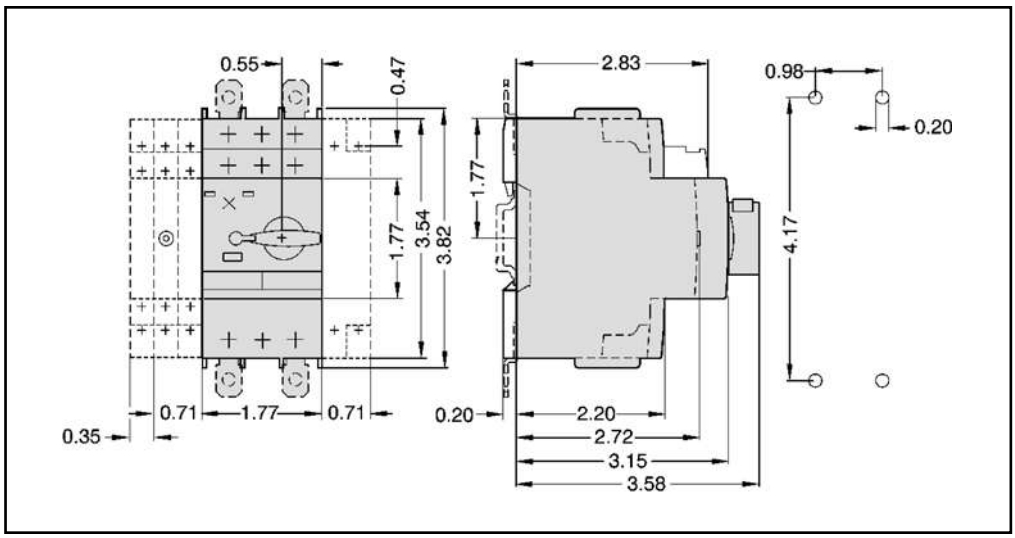
Device③	Type of Operator	Class	Type	A	B	C	D
Two Starters	Toggle	SMF	**FF22, 22P**	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS22P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
	Key	SMF	**FF44P**	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS44P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
One Starter and One Selector Switch④	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)



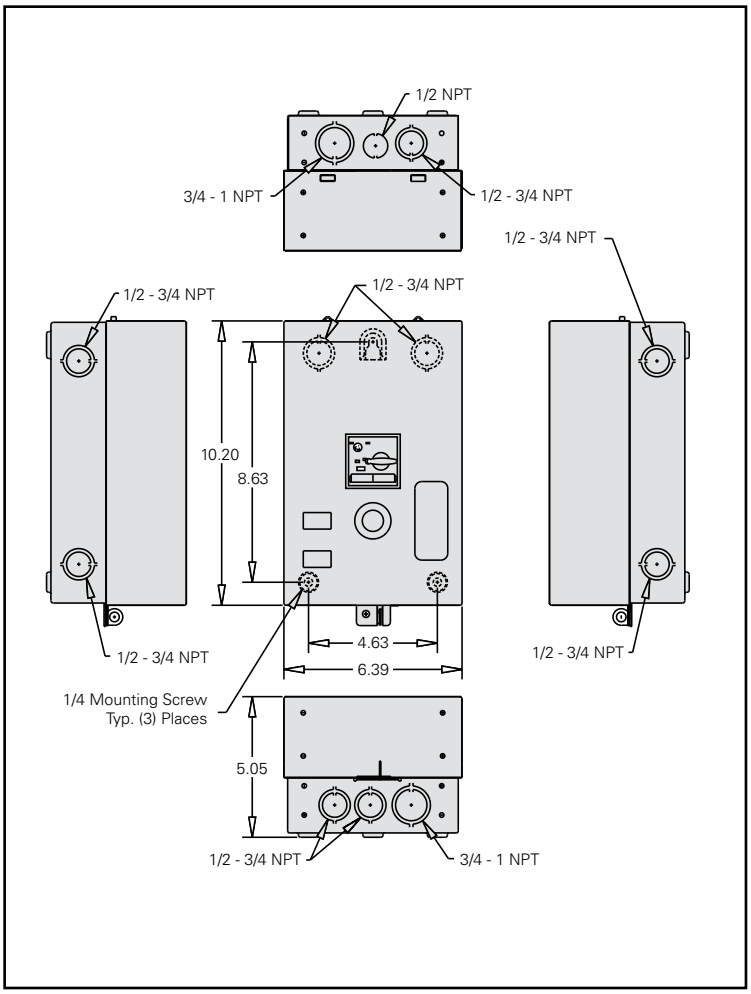
Note: Dimensions for reference, not for construction. Dimensions are in inches (mm).

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.

3RV102



Class 11 - NEMA 1 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

Figure 1

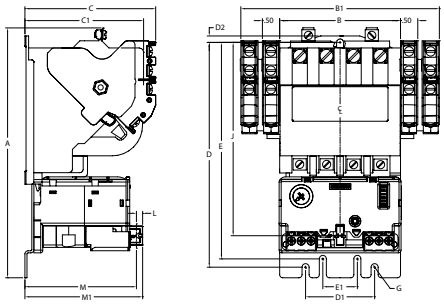


Figure 2

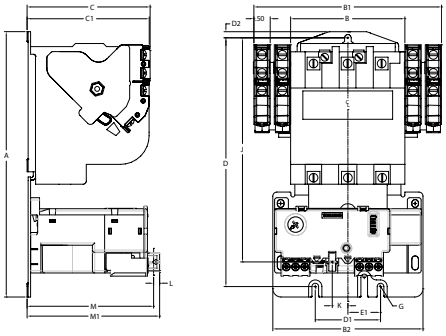


Figure 3

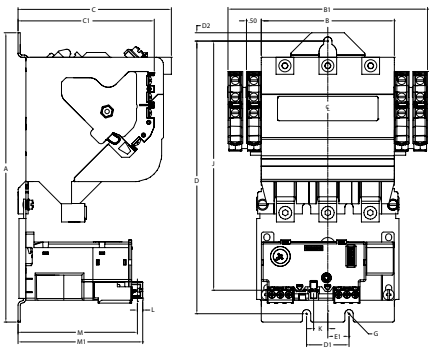


Figure 4

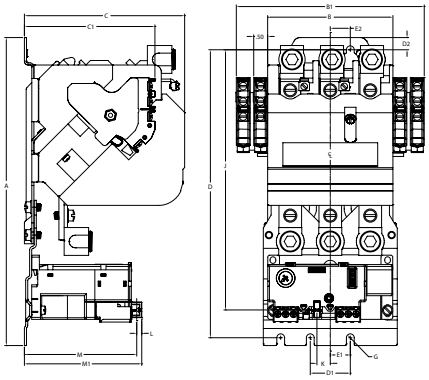
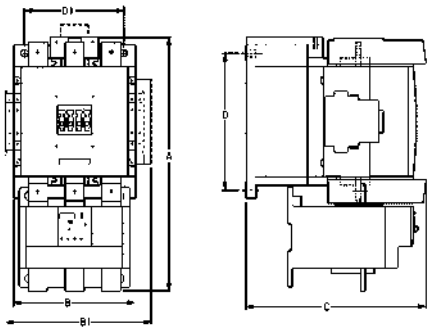


Figure 5



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	M1
00–1¾	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.

Solid State Overload Class 22, 30

Dimensions

Figure 1

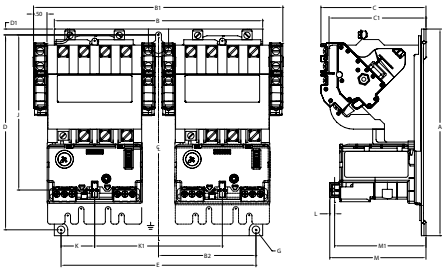


Figure 2

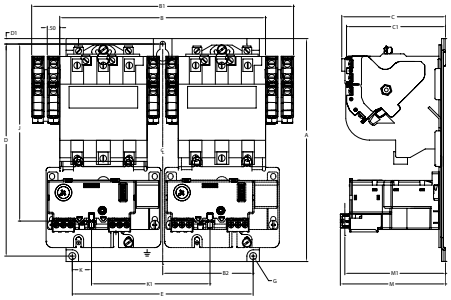


Figure 3

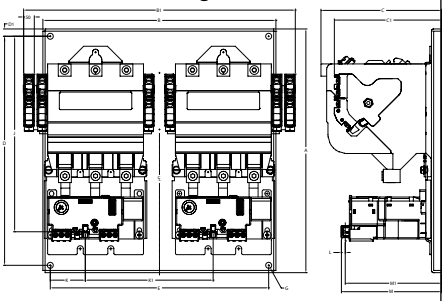


Figure 4

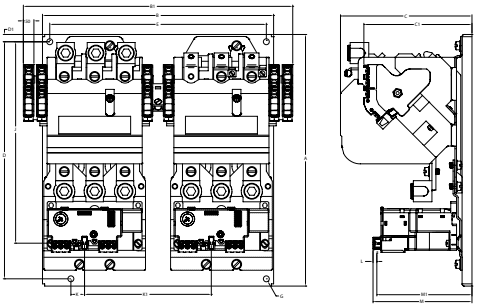


Figure 5

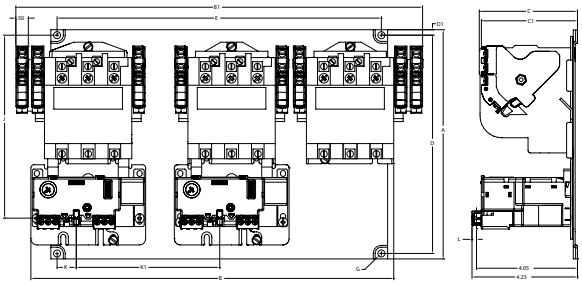


Figure 6

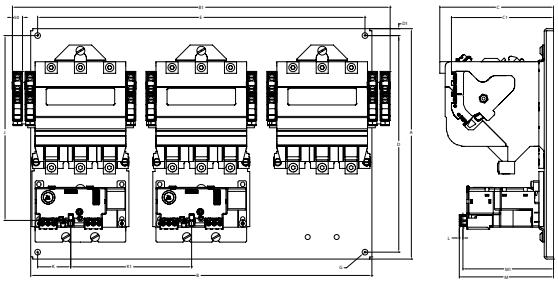
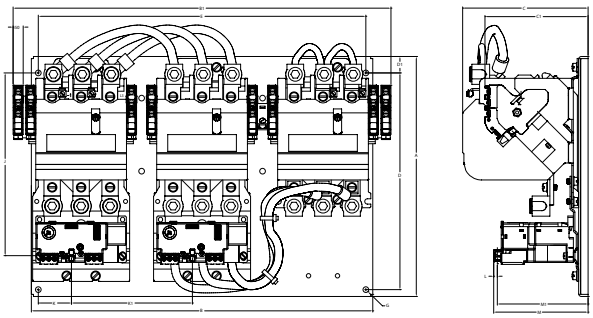


Figure 7



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	G	J	K	K1	L	M	M1
00–1¾	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	G	J	K	K1	L	M	M1
00–1¾	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).

Full Voltage Open Type NEMA Contactor Size 00-8

Figure 1

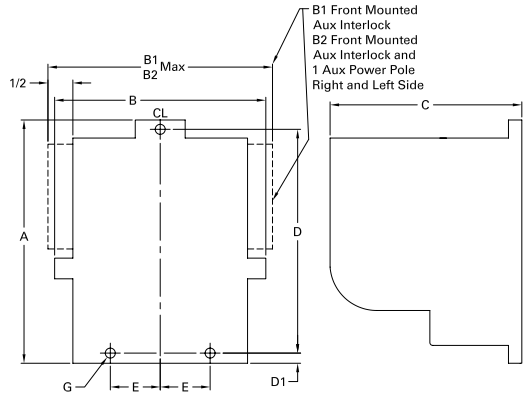


Figure 2

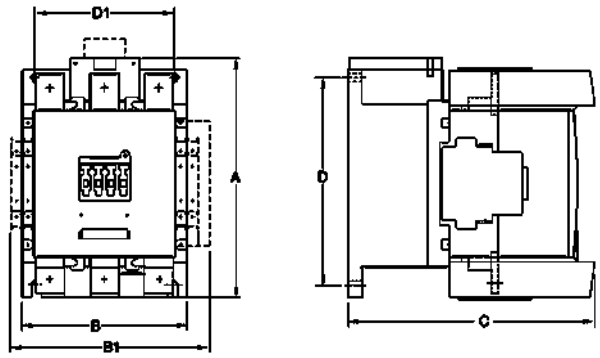


Figure 3

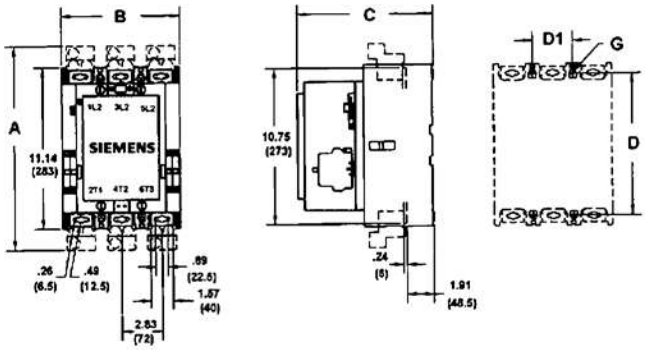
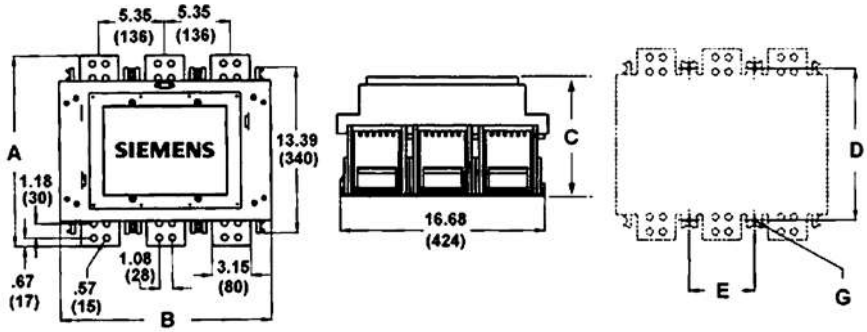


Figure 4



Open Type

Size	3rd Character of Catalog No.①	Outline Dimensions						Mounting Dimensions			Mounting Screw
		Fig	A	B	B1	B2	C	D	D1	E	G
00–1¾	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
2–2½	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
3–3½	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.

Figure 1

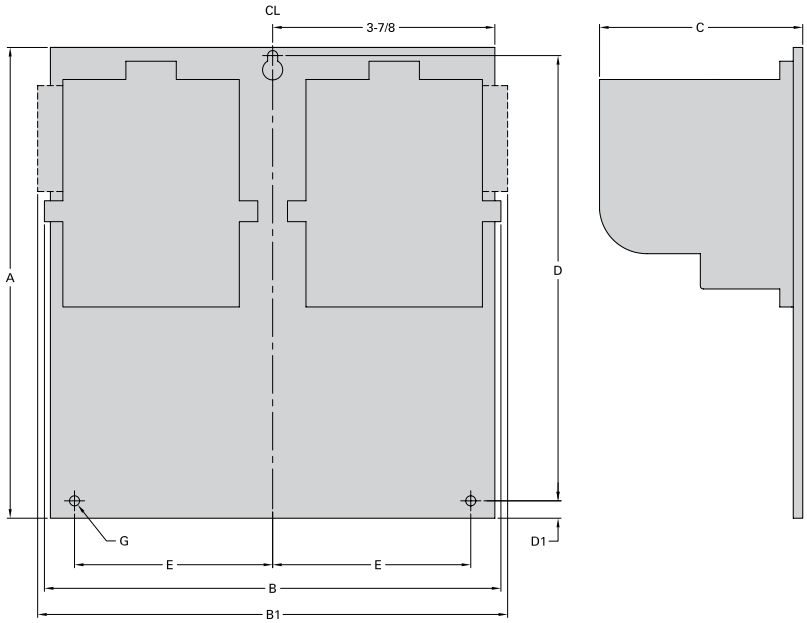
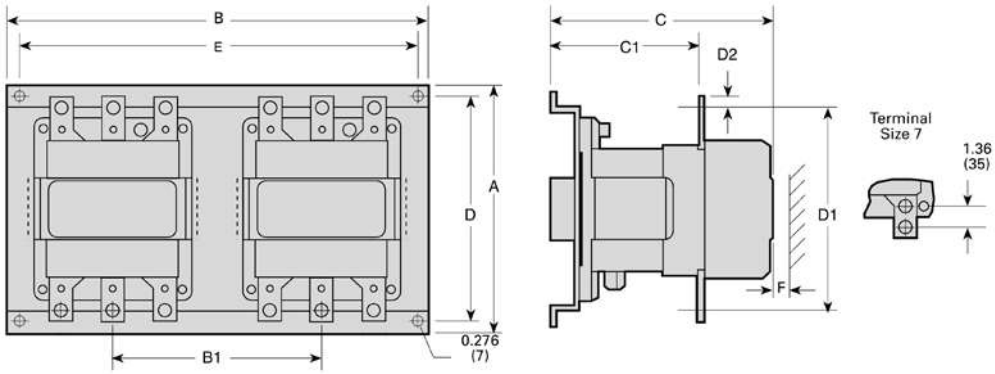


Figure 2



Open Type Horizontal Mounted

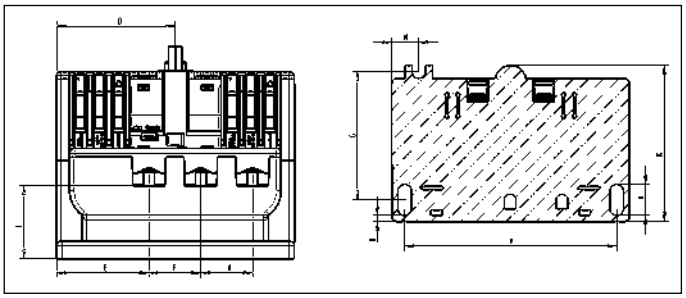
Size	Fig.	Outline Dimensions A	B	B1	C	C1	Mounting Dimensions D	D1	E	F	Mouning Screw G
00–1¾	1	7.69 (195)	7.75 (197)	9.25 (235)	3.88 (98)	—	7.25 (184)	0.25 (6)	3.63 (92)	—	#10
2, 2½	1	8.94 (227)	7.75 (197)	9.25 (235)	4.56 (116)	—	8.5 (216)	0.25 (6)	3.63 (92)	—	#10
3–3½	1	11.44 (291)	10.94 (278)	11.50 (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).

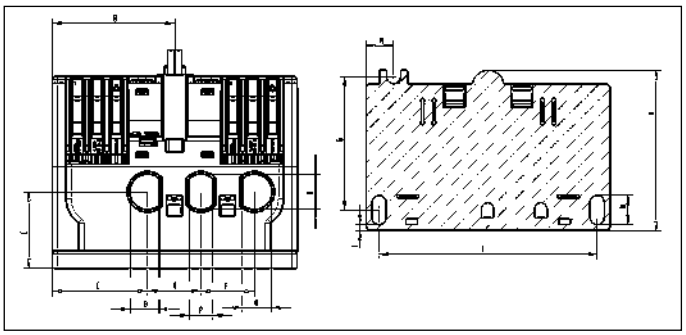
Solid State Overload

Dimensions

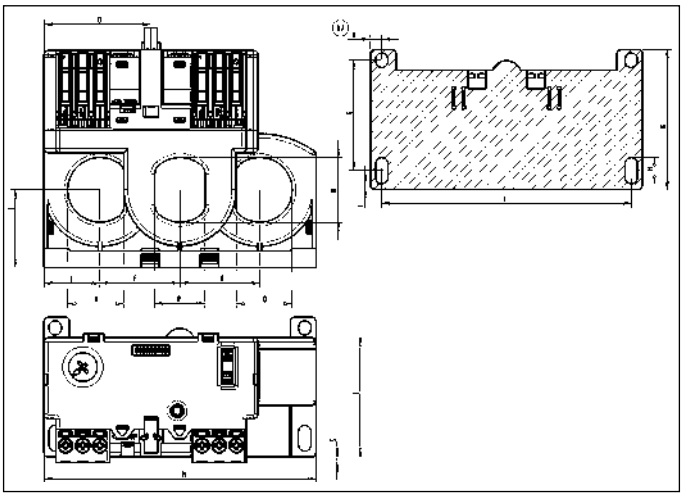
Dimensions "A" Frame—ESP200 Solid State Overload



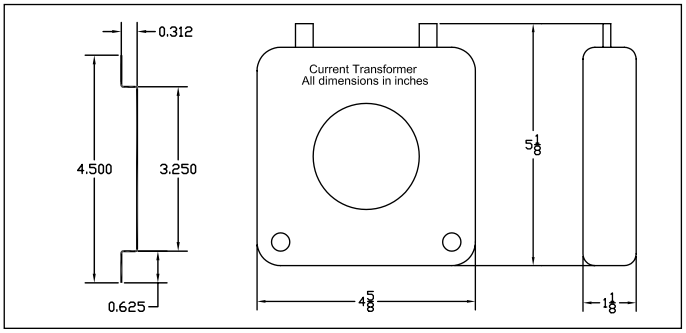
Dimensions "A1" Frame—ESP200 Solid State Overload



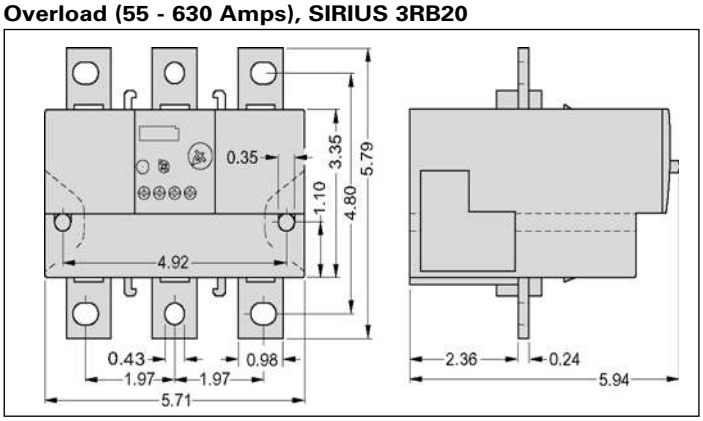
Dimensions "B" Frame—ESP200 Solid State Overload



Current Transformers (all CT's have the same dimensions)



Overload (55 - 630 Amps), SIRIUS 3RB20

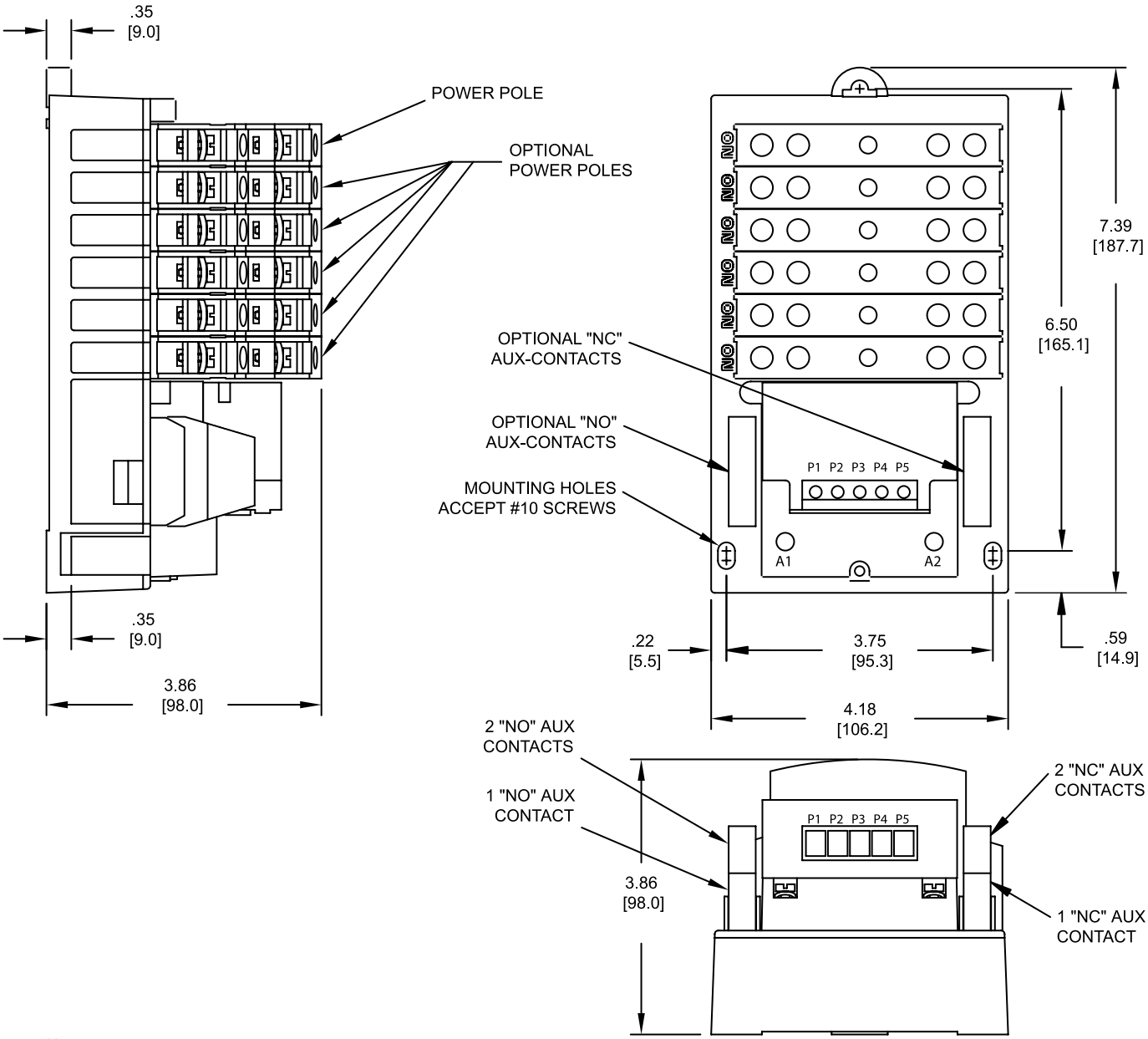


Dimensions	Frame Size A		Frame Size A1		Frame Size B	
	mm	in.	mm	in.	mm	in.
A	80	3.15	80	3.15	100.4	3.95
B	12.6	0.5	12.6	0.5	8.6	0.34
C	27.7	1.1	28	1.10	32.6	1.28
D	44.85	1.77	44.85	1.77	44.85	1.77
E	34.9	1.37	34.9	1.37	23.5	0.93
F	19.6	0.77	19.6	.077	33.5	1.32
G	48.95	1.93	48.95	1.93	46.23	1.82
H	10.7	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).

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

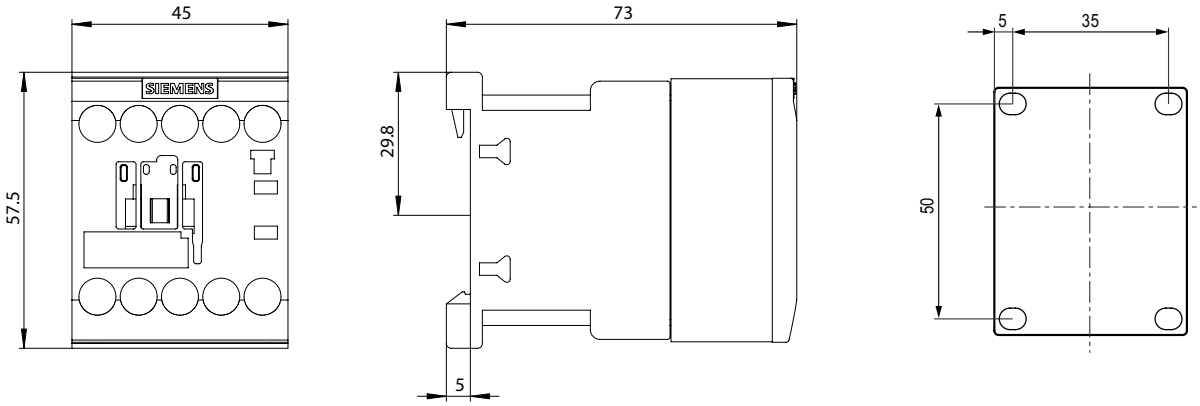
3) Up to 2NO and 2NC auxiliary contacts can be added onto the base product

4) Same Power Pole can be configured as NO type or NC type

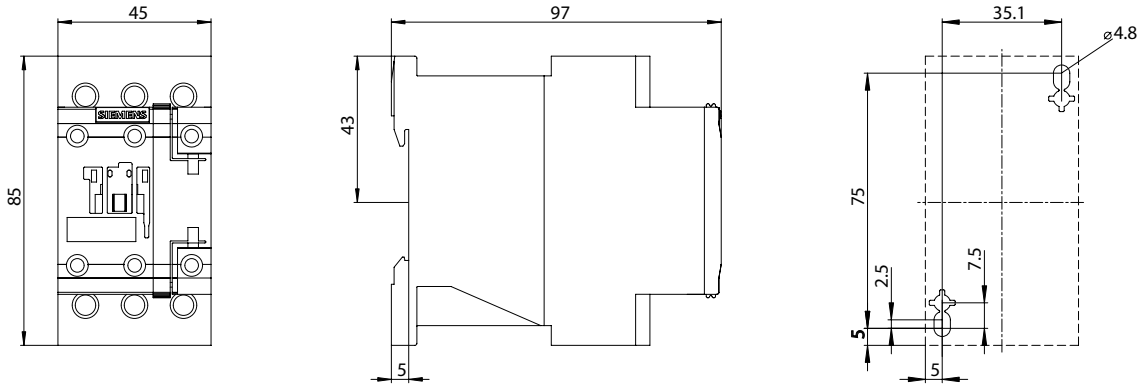
Open Contactors, Class LE

Dimensions

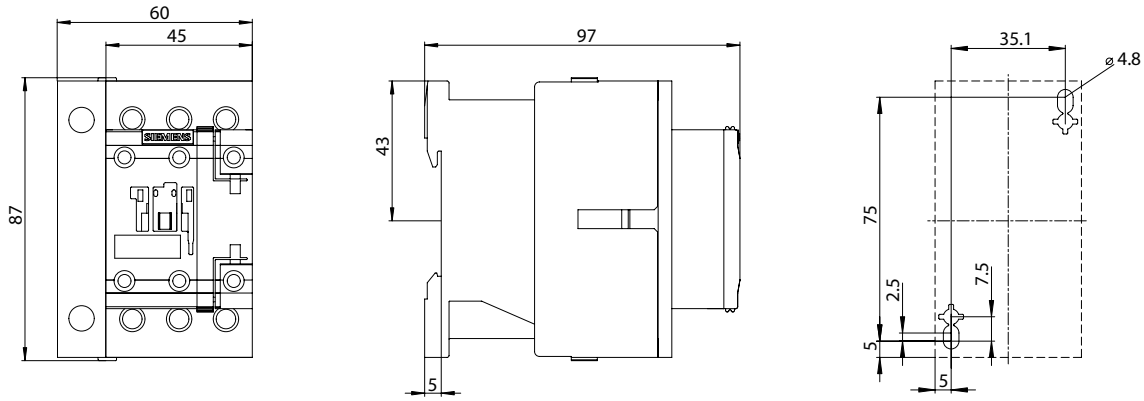
LEN00B (20A 3 Pole and 4 Pole)



LEN00C003 (30A 3 Pole)



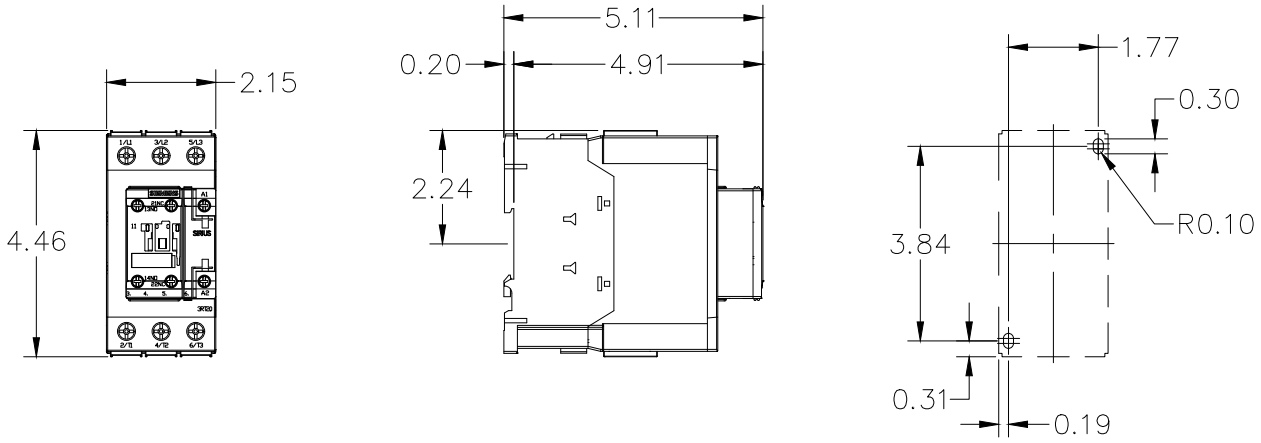
LEN00C004 (30A 4 Pole)



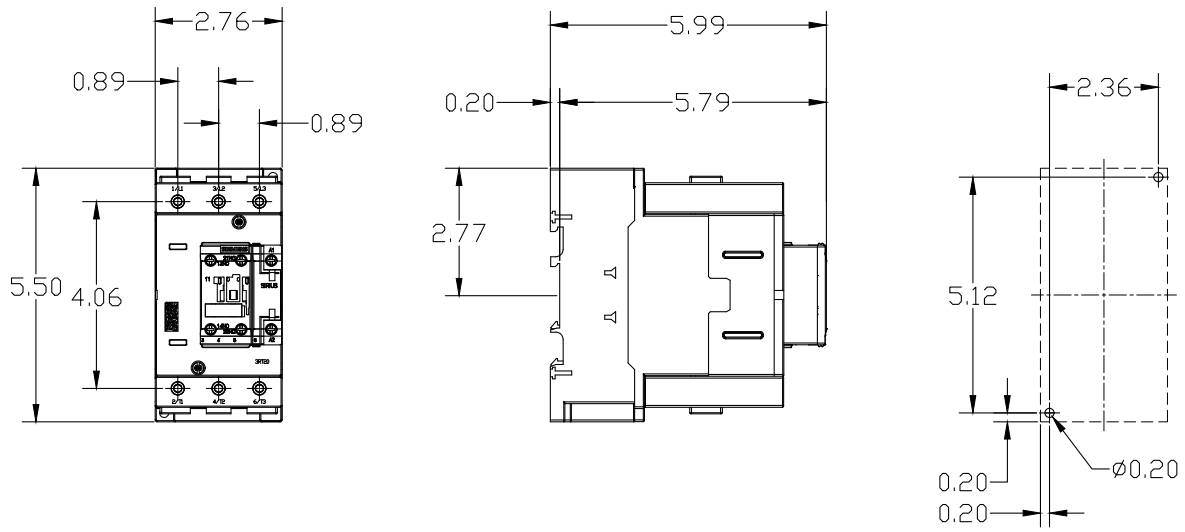
Open Contactors, Class LE

Dimensions

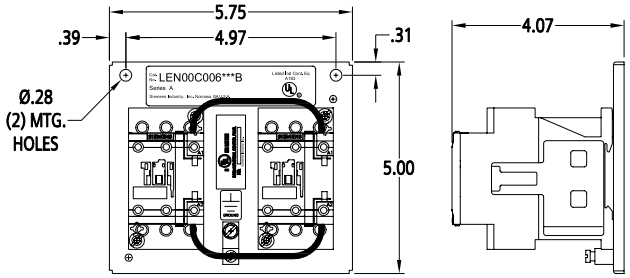
LEN00D003 (60A 3 Pole)



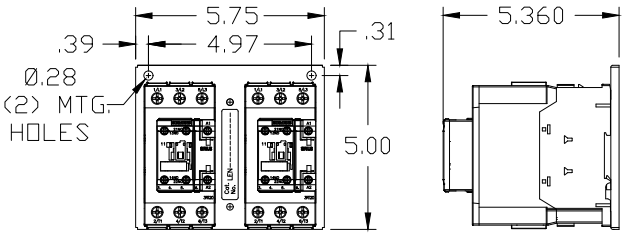
LEN00E003 (100A 3 Pole)



LEN00C006 (30A 6 Pole)



LEN00D006 (60A 6 Pole)

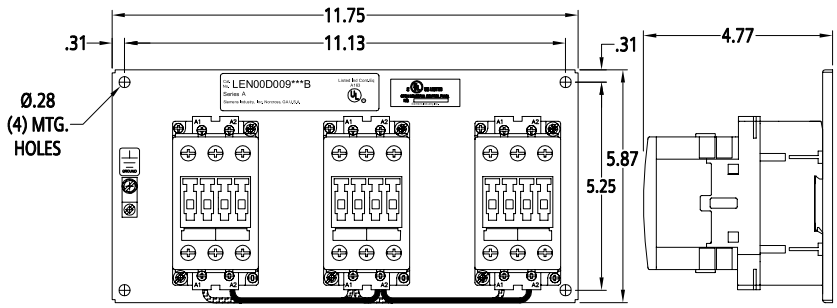


Dimensions in inches.

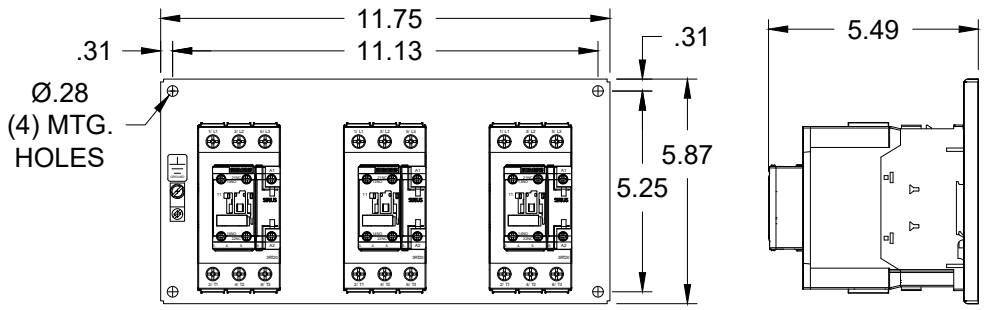
Open Contactors, Class LE

Dimensions

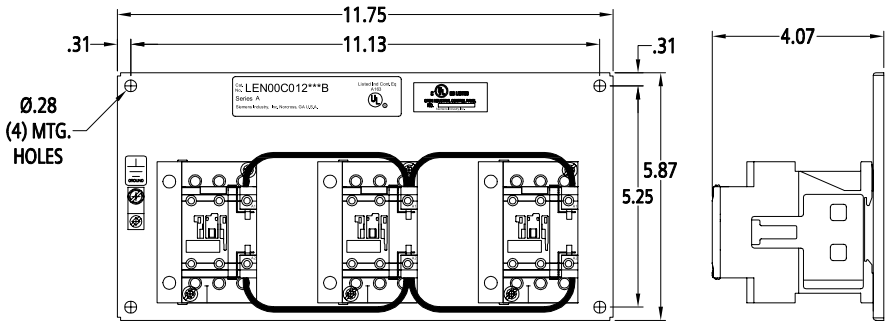
LEN00C009 (30A 9 Pole)



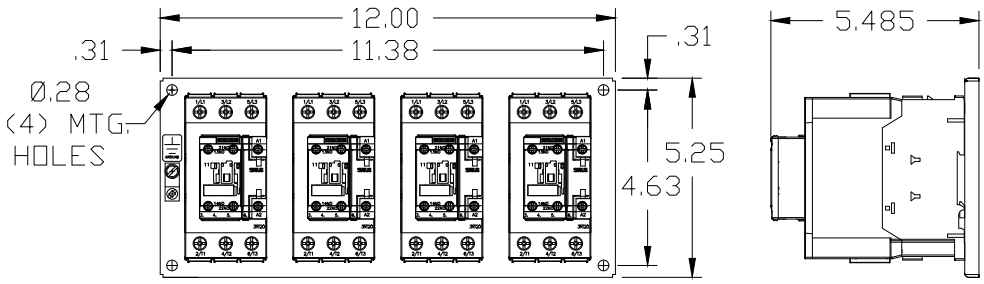
LEN00D009 (60A 9 Pole)



LEN00C012 (30A 12 Pole)



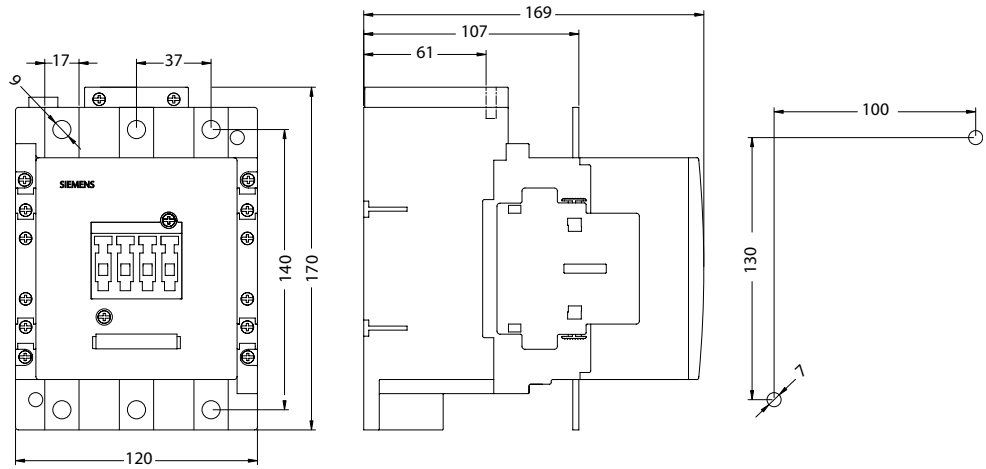
LEN00D012 (60A 12 Pole)



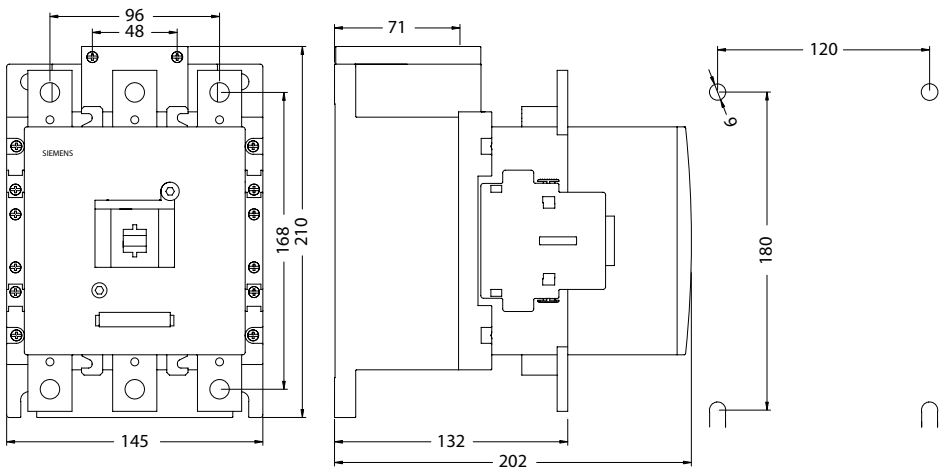
Open Contactors, Class LE

Dimensions

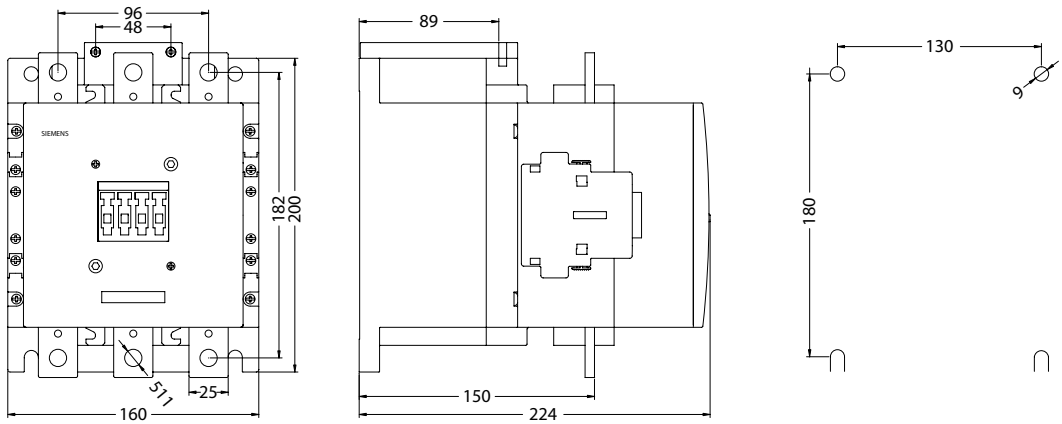
LEN00F003 (200A 3 Pole)



LEN00G003 (300A 3 Pole)



LEN00H003 (400A 3 Pole)



Mechanically / Magnetically Held Lighting Contactors, Class CLM

Dimensions

CLM Contactor, 20 Amp

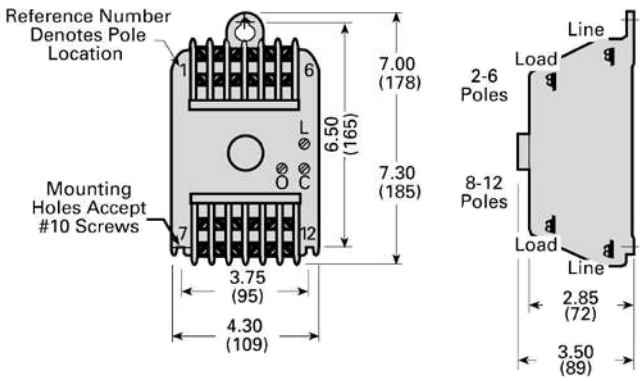


Figure 1

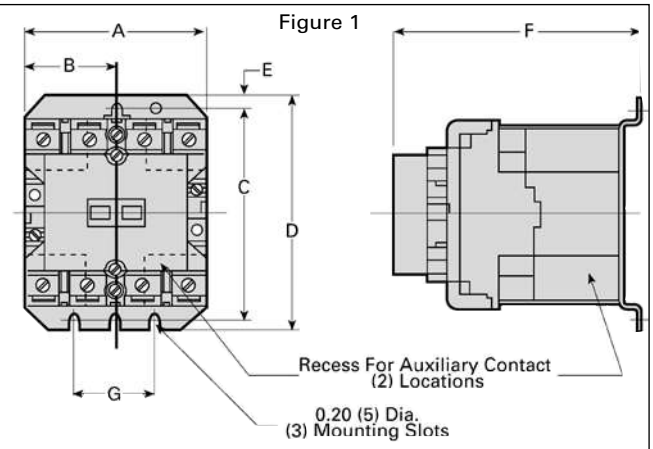


Figure 2

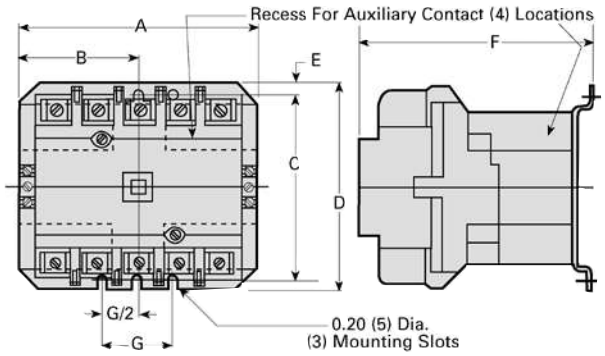


Figure 3

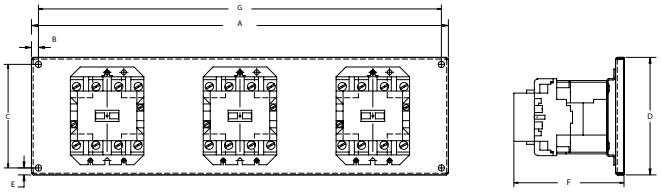


Figure is representative and may not depict the actual number of contactors mounted on the plate. There will be either 2 or 3 contactors. Furthermore, each contactor may have 3, 4 or 5 poles.

Open Type Lighting and Heating Contactors

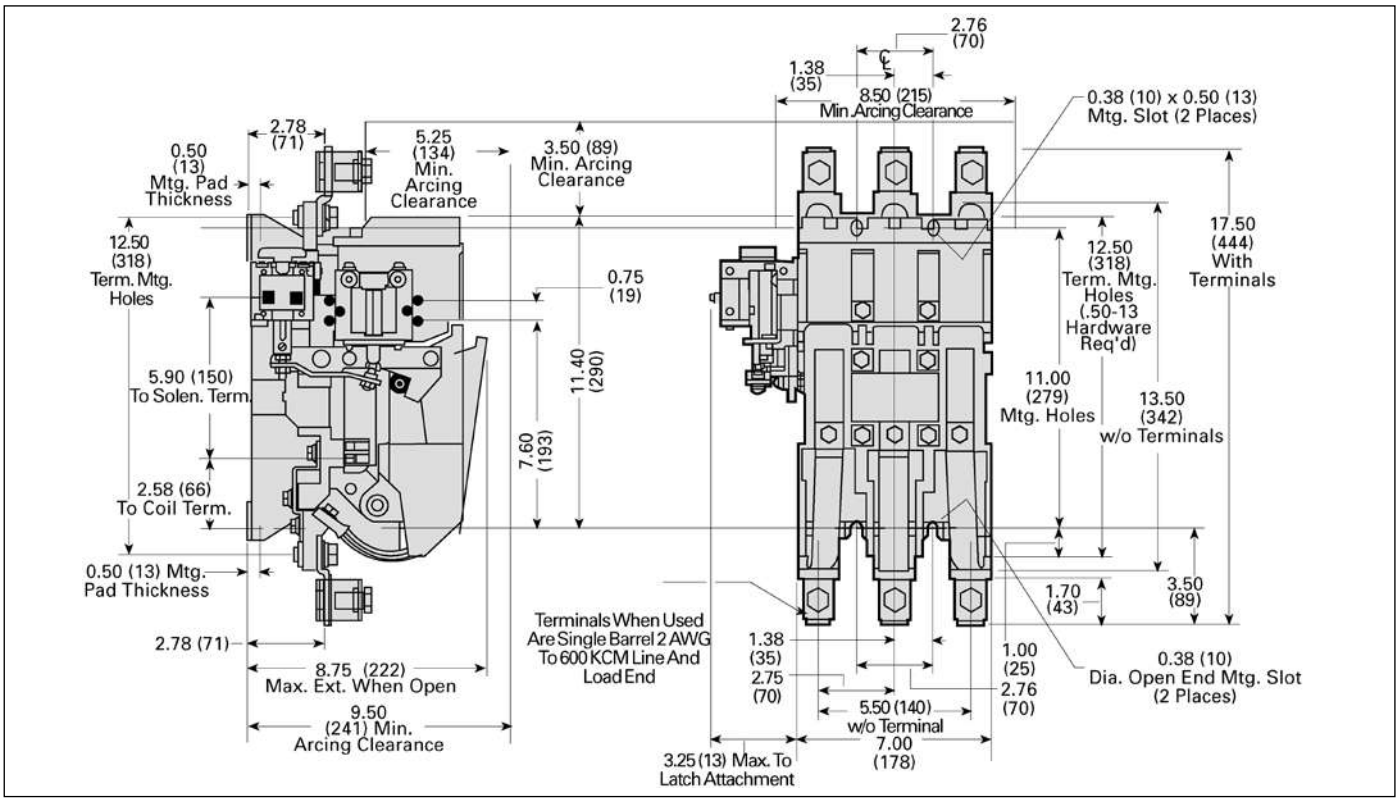
Class	Figure Number	Amp Rating	Number of Poles	A	B	C	D	E	F	G
CLM	1	30	2–4	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
		30	5	4.19 (106)	2.09 (53)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
	2	60	2, 3	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (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)

Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

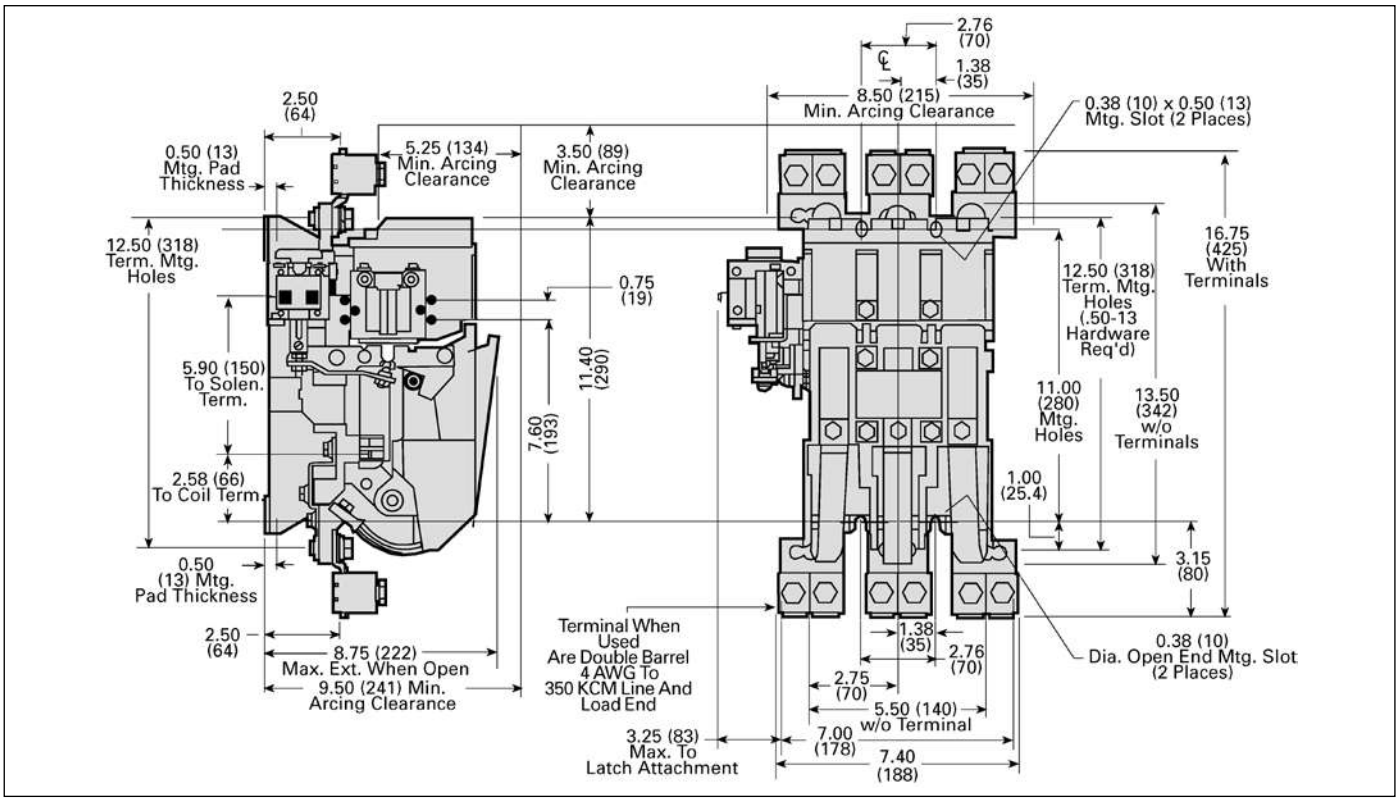
Mechanically Latched 300 and 400 Amps, Class CLM

Dimensions

CLM Contactors 300 Amp



CLM Contactors 400 Amp



Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

Enclosed, Class 14, 40

Dimensions

Figure 1

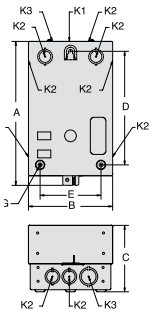


Figure 2

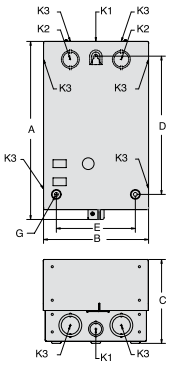


Figure 3

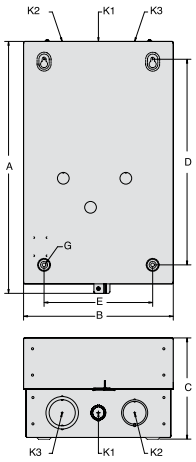


Figure 4

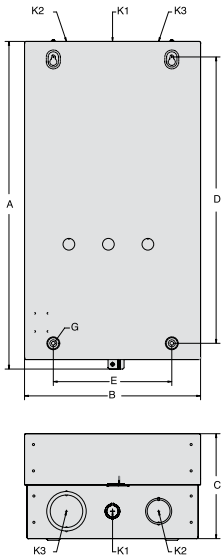
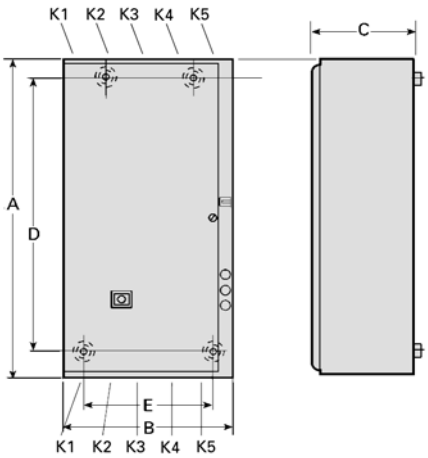


Figure 5



View is typical for bottom and top

Enclosure Type	Size	Fig.②	Outline Dimensions A	B	C	Mounting D	E	G①	Conduit Size K1	K2	K3	K4	K5	Approx. Ship Wt Lbs	Reference Drawing
1 (Standard width for use with or without CPT)	00–1 3/4 (w/o CPT)	1	11.00	6.41	5.00	8.22	4.63	0.25	0.5	0.5-0.75	0.75–1	—	—	10	D68870
	2–2 1/2 (w/o CPT)	2	13.53	8.00	6.38	10.25	6.00	0.25	0.5-0.75	0.75-1	1–1.25	—	—	15	D68870
	3–3 1/2	3	19.13	11.38	7.69	15.63	8.25	0.25	0.5-0.75	1–1.25	1.5–2	—	—	26	D68870
	4	4	24.88	13.38	8.13	21.75	9.00	0.25	0.5-0.75	1.25–1.5	2–2.5	—	—	37	D68870
	5	5	48.00	24.00	12.00	49.56	22.50	0.38	2–3					135	
	6, 7	5	48.00	24.00	12.00	49.56	22.50	0.38	2–2.5					150	
	8	5	60.00	38.00	16.00	61.56	36.50	0.38						275	
1 (Extra wide for use with CPT)	00–2 1/2	3	19.13	11.38	7.69	15.63	8.25	0.25	0.5-0.75	1–1.25	1.5–2	—	—	26	D68870
	3–3 1/2	4	24.88	13.38	8.13	21.75	9.00	0.25	0.5-0.75	1.25–1.5	2–2.5	—	—	37	D68870

Note: Dimensions are in inches.

① G designates mounting screw size.
② Enclosures shown in figures 1 - 4 have lift-off covers.
Enclosures shown in figure 5 have hinged covers.

Enclosed, Class 14, 40

Dimensions

Figure 1

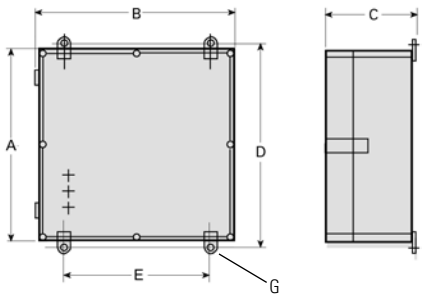


Figure 2

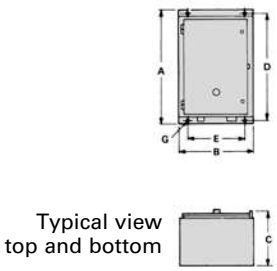
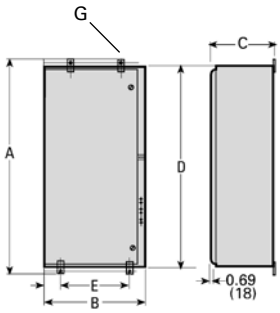


Figure 3



Enclosure Type	Size	Fig.	Outline Dimensions A	B	C	Mounting D	E	G①	Conduit Size K1	K2	K3	Approx. Ship Wt Lbs	Reference Drawing
4/4X Fiberglass (Standard width for use with or without CPT)	0-1 3/4	1	13.00	7.75	5.44	12.25	5.00	0.375	—	—	—	12	D41547
	2-2 1/2	1	16.00	8.13	6.06	15.25	5.00	0.375	—	—	—	18	D41547
	3-4	1	26.00	13.13	7.56	25.25	10.00	0.375	—	—	—	49	D41552
3/3R/4/12 (Standard width for use without CPT)	0-1 3/4	2	13.00	7.75	5.44	12.25	5.00	0.25	—	—	—	12	D41547
	2-2 1/2	2	16.00	8.13	6.06	15.25	5.00	0.25	—	—	—	18	D41547
	3-4	2	26.00	13.13	7.56	25.25	10.00	0.25	—	—	—	49	D41552
3/3R/4/12 (Extra wide for use with CPT)	0–1 3/4	2	13.00	12.63	5.38	12.25	10.00	0.25	—	—	—	30	D17150
	2–2 1/2	2	16.00	13.25	6.13	15.25	11.00	0.25	—	—	—	33	D17150
	3–3 1/2	2	24.00	20.00	8.00	25.56	18.50	0.375	—	—	—	49	D41552
	4	2	30.00	24.00	10.00	31.56	22.50	0.375	—	—	—	64	D17150
	5	3	48.00	24.00	12.00	49.56	22.50	0.375	—	—	—		D65608007
	6, 7	3	48.00	24.00	12.00	49.56	22.50	0.375	—	—	—		D65608009
	8	3	60.00	38.00	16.00	61.56	36.50	0.375	—	—	—	275	D65632006
4/4X Stainless Steel (Standard width for use without CPT)	0-1 3/4	2	13.00	7.75	5.44	12.25	5.00	0.25	—	—	—	18	D41546
	2-2 1/2	2	16.00	8.13	6.06	15.25	5.00	0.25	—	—	—	36	D41546
	3-4	2	26.00	13.13	7.56	25.25	10.00	0.25	—	—	—	67	D41551
4/4X Stainless Steel (Extra wide for use with CPT)	0–1 3/4	2	13.00	12.63	5.38	12.25	10.00	0.25	—	—	—	30	D41917
	2–2 1/2	2	16.00	13.25	6.13	15.25	11.00	0.25	—	—	—	33	D42935
	3–3 1/2	2	24.00	20.00	8.00	25.56	18.50	0.375	—	—	—	64	D41551
	4	2	30.00	24.00	10.00	31.56	22.50	0.375	—	—	—	67	D43292
	5 (Painted)	3	48.00	24.00	12.00	49.56	22.50	0.375	—	—	—		D65608007
	6, 7 (Painted)	3	48.00	24.00	12.00	49.56	22.50	0.375	—	—	—		D65608009
	8	3	60.00	38.00	16.00	61.56	26.50	0.375	—	—	—	275	D65632006

Note: Dimensions are in inches.

① G designates mounting screw size.

Enclosed, Class 17, 18

Dimensions

Figure 1

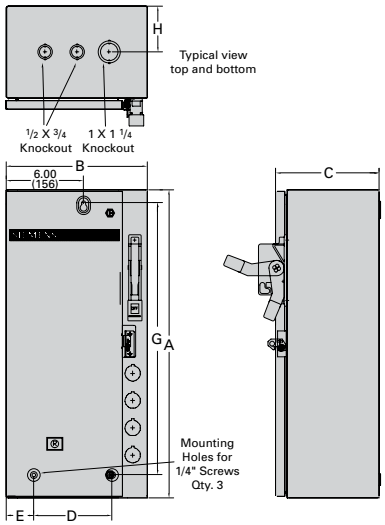


Figure 2

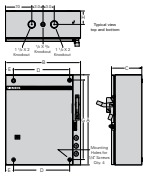


Figure 3

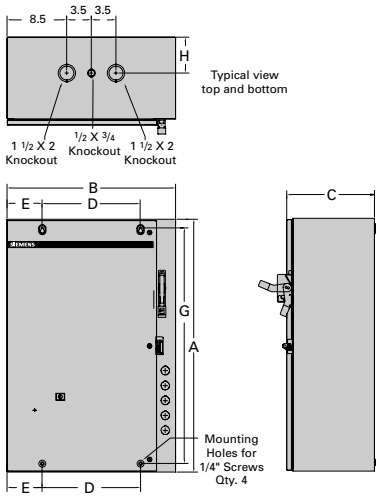
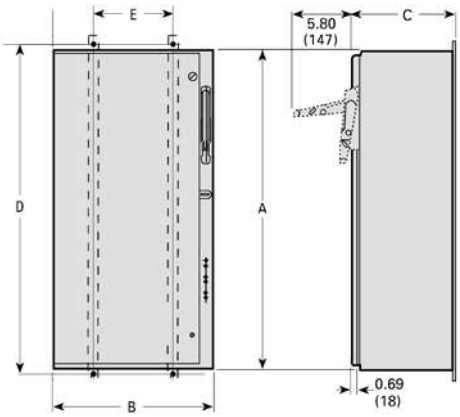


Figure 4



Enclosure Type	Size	Fig.	Outline Dimensions			Mounting Dimensions				Approx. Ship Wt Lbs	Reference Drawing
			A	B	C	D	E	G	H		
1 (Standard width)	0–2	1	24.00	11.00	8.00	6.13	2.13	21.00	3.50	35	D68774001
	2 1/2, 3 (except 200A Disc.)	2	24.00	20.00	8.00	15.00	2.13	21.00	3.50	48	D68774002
	3 (200A Disc.), 3 1/2, 4	3	36.00	24.00	8.00	14.00	5.00	33.50	5.00	101	D68774003
	5	4	72.16	20.00	11.03	71.00	16.00	—	—	250	D56032005
	6	4	60.00	38.00	12.00	36.50	0.75	61.56	—	275	D56032006
1 (Extra wide)	0–2	2	24.00	20.00	8.00	15.00	2.13	21.00	3.50	48	D68774002
	2 1/2, 3	3	36.00	24.00	8.00	14.00	5.00	33.50	5.00	101	D68774003

Note: Dimensions are in inches.

Enclosed, Class 17, 18

Dimensions

Figure 1

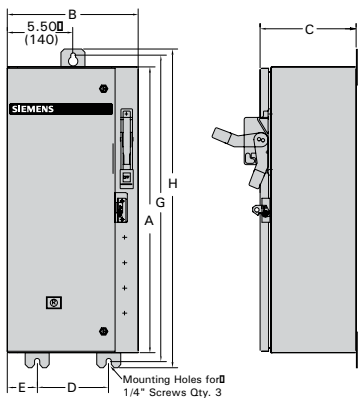


Figure 2

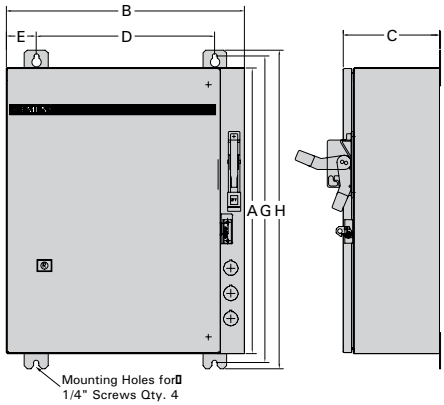


Figure 3

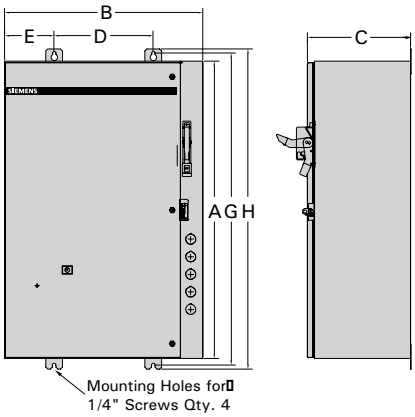


Figure 4

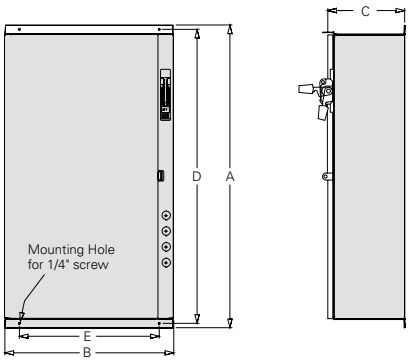
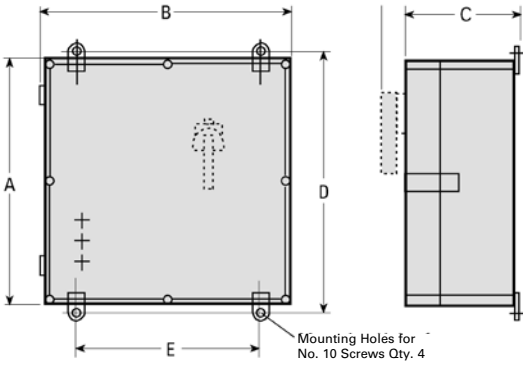


Figure 5



Enclosure Type	Size	Fig.	Outline Dimensions			Mounting Dimensions				Approx. Ship Wt Lbs	Reference Drawing
			A	B	C	D	E	G	H		
3/3R/4/4X/12 (Standard width)	0–2	1	24.00	11.00	8.00	6.00	2.50	25.75	26.75	35	D56033
	2 1/2, 3 (except 200A Disc.)	2	24.00	20.00	8.00	15.00	2.50	25.75	26.75	48	D56033
	3 (200A Disc.), 3 1/2, 4	3	36.00	24.00	8.00	12.00	6.00	37.75	38.75	101	D56033
	5 (Painted)	4	72.16	20.00	11.03	71.00	16.00	—	—	250	D56032005
	6 (Painted)	4	60.00	38.00	12.00	36.50	0.75	61.56	63.10	275	D56032006
3/3R/4/4X/12 (Extra wide)	0–2	2	24.00	20.00	8.00	15.00	2.50	25.75	26.75	48	D56033
	2 1/2, 3	3	36.00	24.00	8.00	12.00	6.00	37.75	38.75	101	D56033
4/4X Fiberglass (Standard width)	0–1 3/4	5	23.75	14.62	7.12	24.09	12.20	—	—	42	
	2–3 1/2	5	23.75	23.75	8.50	24.06	21.30	—	—	44	
	4	5	39.37	29.52	12.20	40.94	27.95	—	—	55	

Note: Dimensions are in inches.

Enclosed, Class 22, 43

Dimensions

Figure 1

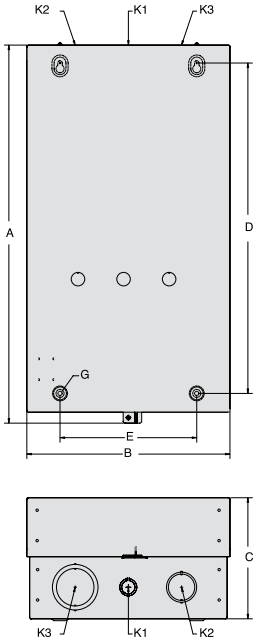


Figure 2

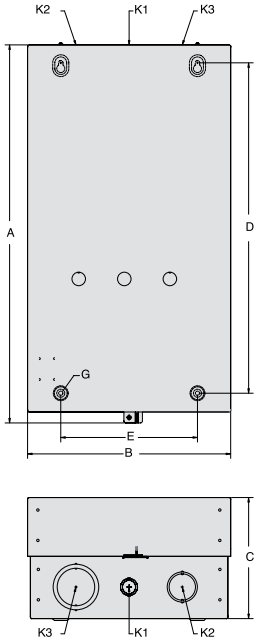
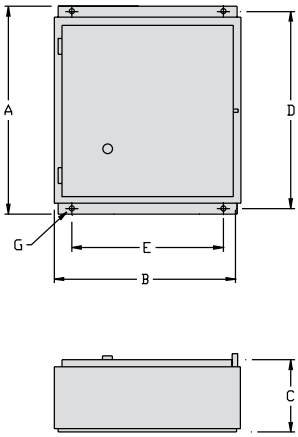


Figure 3



View is typical for bottom and top

Enclosure Type	Size	Fig.③	Outline Dimensions			Mounting		G①	Conduit Size				Approx. Ship Wt Lbs	Reference Drawing
			A	B	C	D	E		K1	K2	K3	K4		
1 (Standard width for use with or without CPT)	00–2 1/2	1	19.12	11.38	7.69	15.62	8.25	0.25	0.5-1.25	1-1.25	1.5-2	—	30	D68870
	3–4	2	24.88	13.38	8.12	21.75	9.00	0.25	1.25-1.5	1.25-1.5	2-2.5	—	52	D68870
	5	3	48.00	24.00	12.00	49.56	22.50	0.38	1.25-1.5	1.25-1.5	0.5-0.75	1.25-1.5	135	D65608
	6, 7	3	48.00	24.00	12.00	49.56	22.50	0.38	1.25-1.5	1.25-1.5	0.5-0.75	1.25-1.5	150	D65608013
4/4X Stainless Steel (Standard width for use without CPT)	0–1 3/4	3	12.00	12.00	6.00	12.75	8.00	0.38	—	—	—	—	30	D41917
	2–2 1/2	3	16.00	14.00	6.00	16.75	12.00	0.38	—	—	—	—	33	D42935
	3–3 1/2 (w/o CPT)	3	24.00	20.00	8.00	25.56	18.50	0.38	—	—	—	—	53	D17423
	3–3 1/2 (w/ CPT),4	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	—	64	D43292
	5②	3	48.00	24.00	12.00	49.56	22.50	0.38	—	—	—	—		D65608007
	6, 7②	3	48.00	24.00	12.00	49.56	22.50	0.38	—	—	—	—		65608009

Note: Dimensions are in inches.

① G designates mounting screw size.
② Type 4 painted enclosure.

③ Enclosures shown in figures 1 and 2 have lift-off covers. Enclosures shown in figure 3 have hinged covers.

Enclosed, Class 22, 43

Dimensions

Figure 5

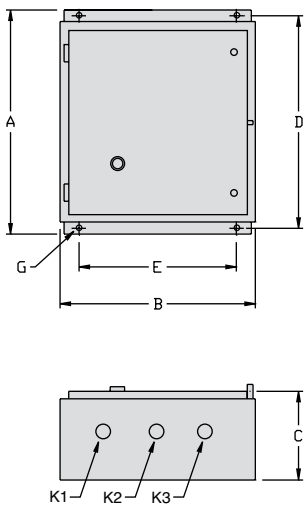


Figure 6

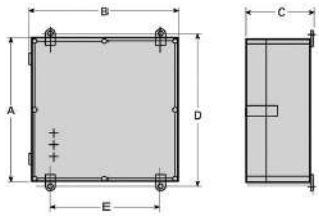
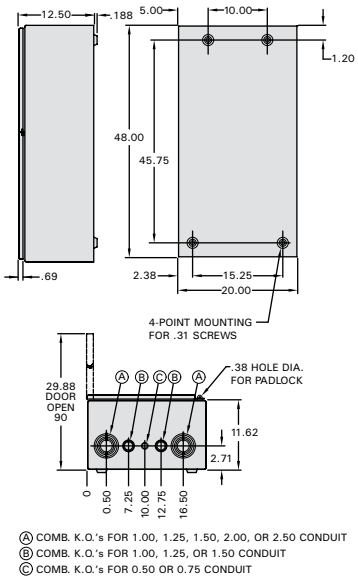


Figure 7



View is typical for bottom and top

Enclosure Type	Size	Fig.	Outline Dimensions A	B	C	Mounting D	E	G①	Conduit Size K1	K2	K3	Approx. Ship Wt Lbs	Reference Drawing
3/3R/4/12 (Standard width for use with or without CPT)	0–1 3/4	5	13.00	12.63	5.63	12.25	10.00	0.25	—	—	—	30	D17150
	2–2 1/2	5	16.00	13.25	6.13	15.25	11.00	0.25	—	—	—	33	D17150
	3–3 1/2 (w/o CPT)	5	24.00	20.00	8.00	25.56	18.50	0.380	—	—	—	53	D17150
	3–4 (w/ CPT)	5	30.00	24.00	10.00	31.56	22.50	0.380	—	—	—	64	D17150
	5	7	48.00	24.00	12.00	49.56	22.50	0.375	—	—	—		D65608007
	6	7	48.00	24.00	12.00	49.56	22.50	0.375	—	—	—		
4/4X Fiberglass (Standard width for use with or without CPT)	0–2 1/2	6	24.00	20.00	8.00	25.56	18.50	0.380	—	—	—	35	
	3–4	6	30.00	24.00	10.00	31.56	22.50	0.380	—	—	—	38	

Note: Dimensions are in inches.

① G designates mounting screw size.

Enclosed, Class 25, 26

Dimensions

Figure 1

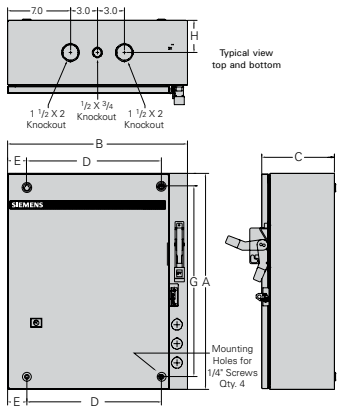


Figure 2

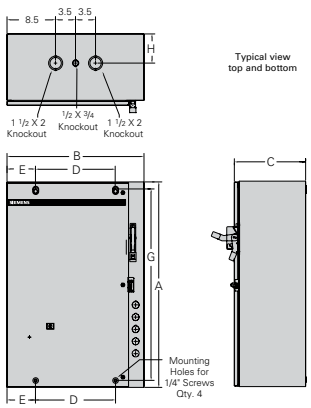


Figure 3

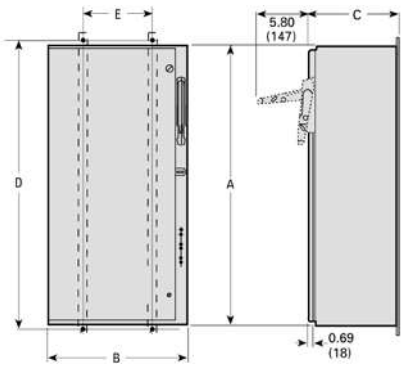


Figure 4

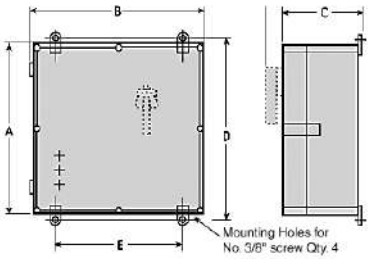
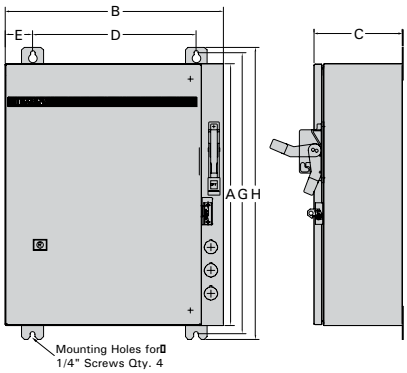


Figure 5



Enclosure Type	Size	Fig.	Outline Dimensions			Mounting Dimensions				Approx. Ship Wt Lbs	Reference Drawing
			A	B	C	D	E	G	H		
1 (Standard width)	0–2 1/2	1	24.00	20.00	8.00	15.00	2.13	21.00	3.50	60	D68774002
	3-4	2	36.00	24.00	8.00	14.00	5.00	33.50	5.00	121	D68774003
	5	3	72.16	20.00	11.03	71.00	16.00	—	—	250	D56032005
	6	3	72.10	40.20	18.10	78.00	18.00	—	—	275	D56032006
3/3R/4/4X/12 (Standard width)	0–2 1/2	5	24.00	20.00	8.00	15.00	3.50	25.75	26.75	63	D68774005
	3-4	5	36.00	24.00	8.00	14.00	6.00	37.75	38.75	124	D68774006
	5(Painted)	3	72.16	20.00	11.03	71.00	16.00	—	—	250	D56032005
	6(Painted)	3	72.10	40.20	18.10	78.00	18.00	—	—	275	D56032006

Enclosure Type	Size	Fig.	Outline Dimensions			Mounting			Conduit Size			Approx. Ship Wt Lbs	Reference Drawing
			A	B	C	D	E	G①	K1	K2	K3		
4/4X Fg (Standard width)	0-2 1/2	4	24.00	20.00	8.00	25.56	18.50	0.38	—	—	—	18	24-139-861-001
	3-4	4	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	28	24-139-861-003

Note: Dimensions are in inches.

① G designates mounting screw size.

Enclosed, Class 30

Dimensions

Figure 1

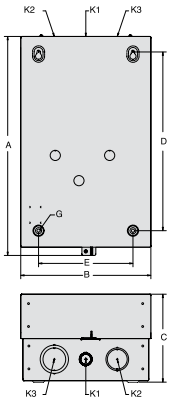


Figure 1a

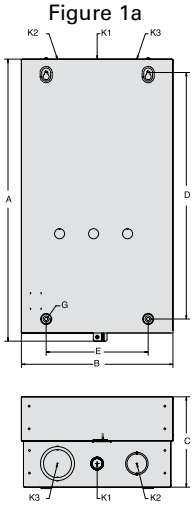


Figure 2

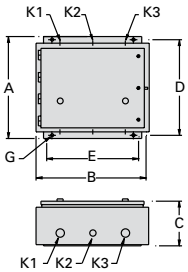


Figure 3

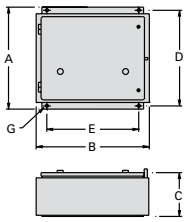
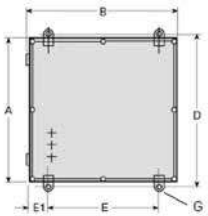


Figure 4



Starter Type (Enclosure Type)	Size	Fig.②	Outline Dimensions A	B	C	Mounting D	E	G①	Conduit Size K1	K2	K3	Approx. Ship Wt Lbs	Reference Drawing
2 Speed 1 Winding (Type 1 for use with or without CPT)	0–1 3/4 w/o CPT	1	19.13	11.38	7.69	15.63	8.25	0.25	0.5-0.75	1.0-1.25	1.5-2	26	D68870
	0–1 3/4 w/ CPT	1a	24.88	13.38	8.13	21.75	9.00	0.25	0.5-0.75	1.25-1.5	2-2.5	52	D68870
	2–2 1/2	2	16.00	17.13	7.63	15.25	14.00	0.25	0.5-0.75	1.25-1.5	1.25-1.5	39	D42932001
	3–3 1/2	2	24.88	13.38	8.13	21.75	9.00	0.25	0.5-0.75	1.25–1.5	2–2.5	60	D72956002
	4	3	24.88	13.38	8.13	21.75	9.00	0.25	0.5-0.75	1.25–1.5	2–2.5	61	D43292001
2 Speed 1 Winding (Type 4/4X Stainless Steel for use with or without CPT)	0–1 3/4 w/o CPT	3	12.00	12.00	6.00	12.75	10.00	0.38	—	—	—	34	D41917000
	0–1 3/4 w/ CPT	3	16.00	16.00	8.00	17.60	14.50	0.38	—	—	—	47	
	2–2 1/2 w/o CPT	3	16.00	16.00	8.00	17.60	14.50	0.38	—	—	—	47	
	2–2 1/2 w/ CPT	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	55	
	3–3 1/2	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	61	D43292001
	4	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	61	D43292001
2 Speed 1 Winding (Type 3/3R/4/12 for use with or without CPT)	0–1 3/4 w/o CPT	3	13.00	12.63	5.38	12.25	10.00	0.25	—	—	—	34	
	0–1 3/4 w/ CPT	3	16.00	17.13	7.63	15.25	14.00	0.25	—	—	—	47	D17150010
	2–2 1/2 w/o CPT	3	16.00	17.13	7.63	15.25	14.00	0.25	—	—	—	47	D17150010
	2–2 1/2 w/ CPT	3	24.00	20.00	8.00	25.56	18.50	0.38	—	—	—	55	
	3–4	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	61	D19673000
2 Speed 1 Winding (Type 4/4X Fg. for use w/ or w/o CPT)	0–2 1/2	4	23.78	23.78	6.89	—	—	0.25	—	—	—	28	24139861003
	3–4	4	39.38	29.53	12.60	—	—	—	—	—	—		24139861004
2 Speed 2 Winding (Type 1 for use with or without CPT)	0–2 1/2 w/o CPT	1	19.13	11.38	7.69	15.63	8.25	0.25	0.5-0.75	1.0-1.25	1.5-2	30	D68870
	0–2 1/2 w/ CPT	1a	24.88	13.38	8.13	21.75	9.00	0.25	0.5-0.75	1.25-1.5	2-2.5	52	D68870
	3–4 w/o CPT	1a	24.88	13.38	8.13	21.75	9.00	0.25	0.5-0.75	1.25-1.5	2-2.5	52	D68870
2 Speed 2 Winding (Type 4/4X Stainless Steel for use with or without CPT)	0–1 3/4 w/o CPT	3	12.00	12.00	6.00	12.75	10.00	0.38	—	—	—	34	
	0–1 3/4 w/ CPT	3	16.00	16.00	8.00	17.60	14.50	0.38	—	—	—	41	
	2–2 1/2 w/o CPT	3	16.00	16.00	8.00	17.60	14.50	0.38	—	—	—	41	
	2–2 1/2 w/ CPT	3	16.00	16.00	8.00	17.60	14.50	0.38	—	—	—	41	
	3–3 1/2 w/o CPT	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	55	
	3–3 1/2 w/ CPT	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	61	D43292001
	4	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	61	D43292001
2 Speed 2 Winding (Type 3/3R/4/12 for use with or without CPT)	0–1 3/4 w/o CPT	3	13.00	12.63	5.38	12.25	10.00	0.25	—	—	—	34	
	0–1 3/4 w/ CPT	3	16.00	17.13	7.63	15.25	14.00	0.25	—	—	—	41	D17150010
	2–2 1/2 w/o CPT	3	16.00	13.25	6.13	15.25	11.00	0.25	—	—	—	41	
	2–2 1/2 w/ CPT	3	16.00	17.13	7.63	15.25	14.00	0.25	—	—	—	41	D17150010
	3–3 1/2 w/o CPT	3	24.00	20.00	8.00	25.56	18.50	0.38	—	—	—	55	
	3–4 w/CPT	3	30.00	24.00	10.00	31.56	22.50	0.38	—	—	—	61	D19673000
2 Speed 2 Winding (Type 4/4X Fg. for use w/ or w/o CPT)	0–2 1/2	4	23.78	23.78	6.89	—	—	0.25	—	—	—	28	24139861003
	3–4	4	39.38	29.53	12.60	—	—	—	—	—	—		24139861004

Note: Dimensions are in inches.

① G designates mounting screw size.

② Enclosures shown in figures 1and 1a have lift-off covers. Enclosures shown in figures 2, 3 and 4 have hinged covers.

Enclosed, Class 32

Dimensions

Figure 1

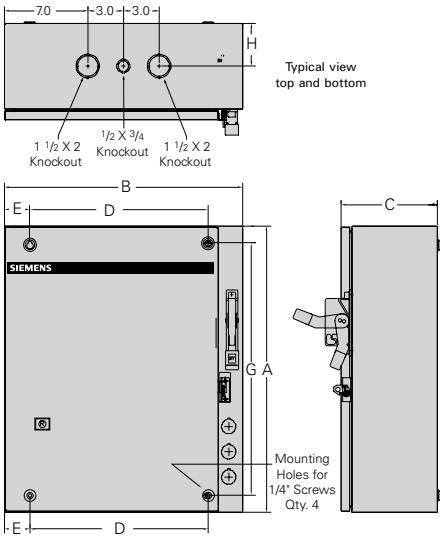


Figure 2

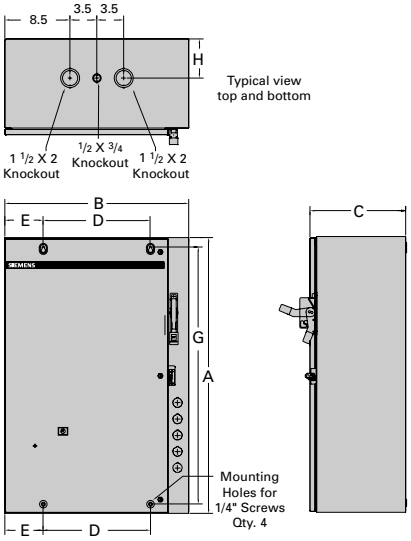


Figure 3

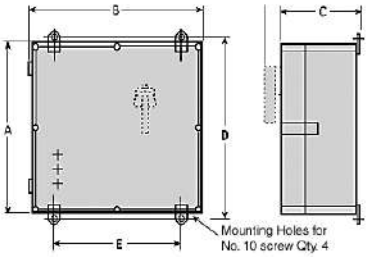
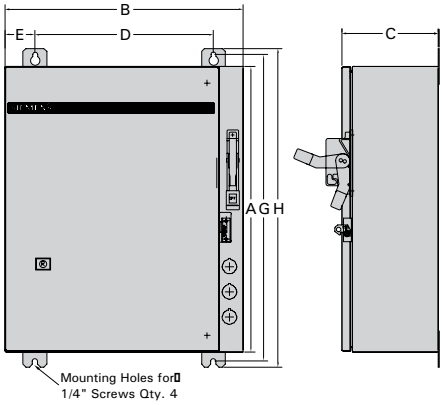


Figure 4



NEMA 1 Standard Width 0–4

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	G	H	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾ (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
0–2½ (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

0–1¾ (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
0–2½ (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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾	3	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (613)	12.250 (311)	¼	—	—	—	18 (8)	—
2–4	3	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (613)	21.250 (540)	¼	—	—	—	28 (13)	—

Note: Dimensions in inches (mm).
Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.

Class 36, 37, 82

Dimensions

Figure 1

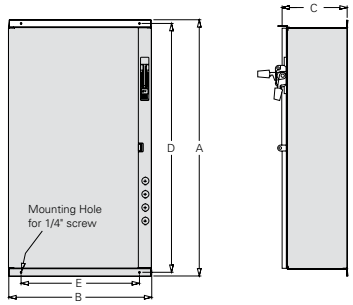
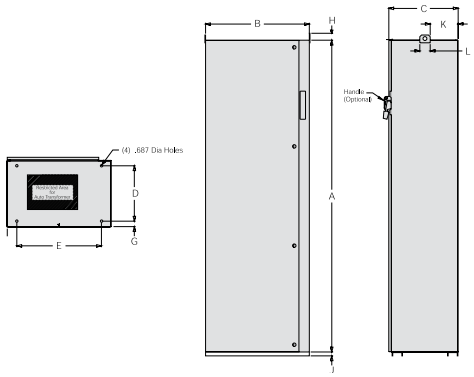


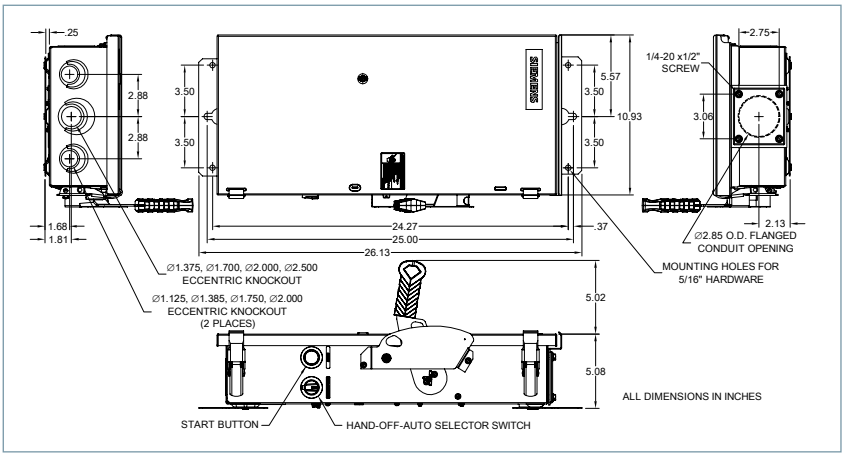
Figure 2



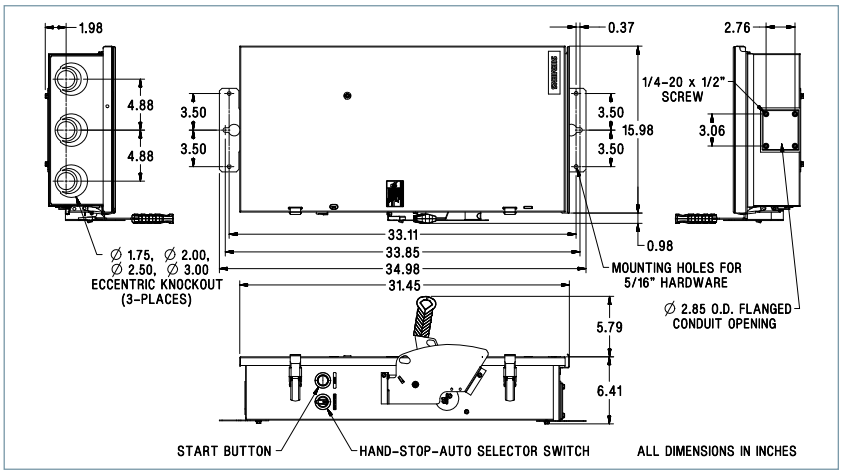
Class 36, 37, NEMA 1, 4, 4X, 12/3R, Combination and Non-combination

Enclosure Type	Size			Fig.	Outline Dimensions					Reference Drawing
	AutoTransformer	Part Winding & Wye Delta								
	Disc. & MCP Type	Disc. Type	MCP Type		A	B	C	D	E	
1, 4/4X & 12/3R	1 3/4–2 1/2	0–2	0–2 1/2	1	42.00	32.00	12.00	43.60	30.50	
	3–3 1/2	2 1/2–3 1/2	3–3 1/2	1	48.00	38.00	12.00	49.60	36.50	
	4	4	4	1	60.00	38.00	12.00	61.60	36.50	
	5, 6	5, 6	5, 6	2	90.00	29.97	20.00	16.00	24.44	

Class 82 size 1



Class 82 Size 1 1/2, 2



Note: Dimensions are in inches.

Class 83, 84

Dimensions

Figure 1

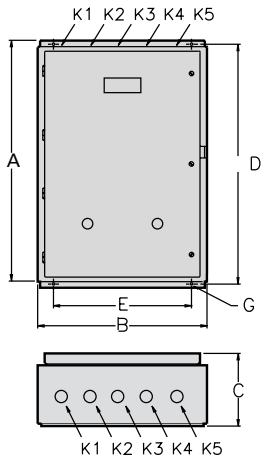


Figure 2

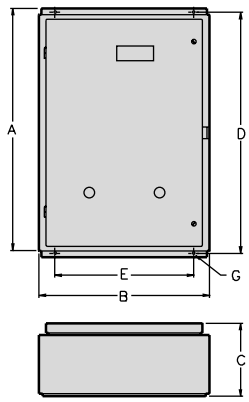
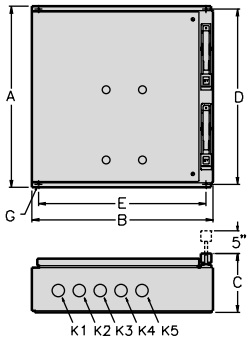


Figure 3



Class 83 Non-Combination Type

Enclosure Type	Size	Fig.	Outline Dimensions			Mounting		G①	Conduit Size					Approx. Ship Wt Lbs	Reference Drawing
			A	B	C	D	E		K1	K2	K3	K4	K5		
1	0–1 3/4	1	20.00	20.00	6.00	21.60	18.50	0.38	—	—	—	—	—	20	
	2, 2 1/2	1	24.00	20.00	8.00	25.60	18.50	0.38	—	—	—	—	—	57	
	3–4	1	30.00	24.00	10.00	31.60	22.50	0.38	—	—	—	—	—	93	
3/3R/4/12	0–1 3/4	2	20.00	20.00	6.00	21.60	18.50	0.38	—	—	—	—	—	20	
	2, 2 1/2	2	24.00	20.00	8.00	25.60	18.50	0.38	—	—	—	—	—	57	
	3–4	2	30.00	24.00	10.00	31.60	22.50	0.38	—	—	—	—	—	93	
4X Stainless Steel	0–1 3/4	2	20.00	16.00	6.00	21.60	14.50	0.38	—	—	—	—	—	20	
	2, 2 1/2	2	24.00	20.00	8.00	25.60	18.50	0.38	—	—	—	—	—	57	
	3–4	2	30.00	24.00	10.00	31.60	22.50	0.38	—	—	—	—	—	93	

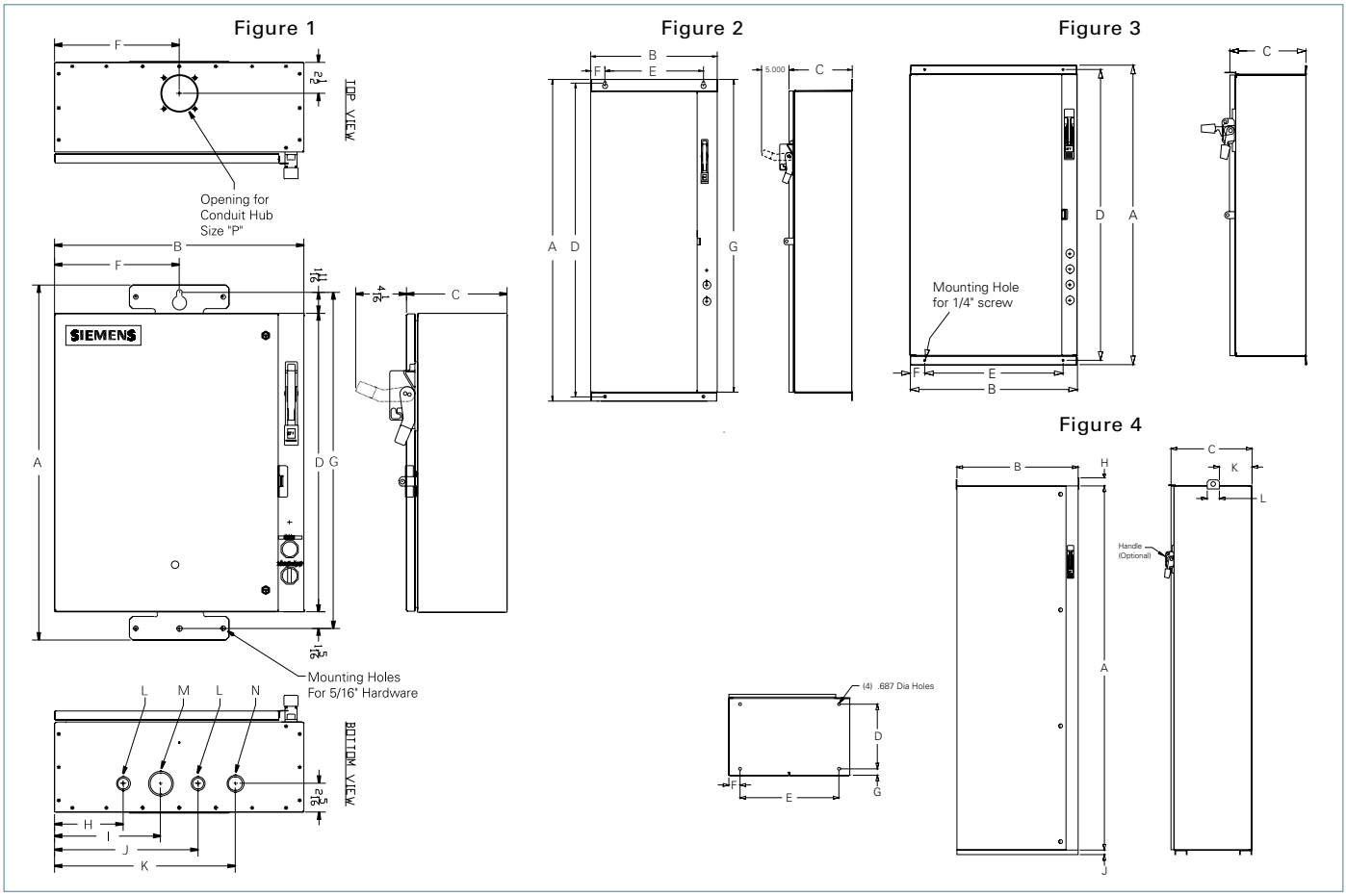
Class 84 Combination Type

Enclosure Type	Size	Fig.	Outline Dimensions			Mounting		G①	Conduit Size					Approx. Ship Wt Lbs	Reference Drawing
			A	B	C	D	E		K1	K2	K3	K4	K5		
1, 12/3/3R/4	0–2	3	34.13	24.63	7.56	33.00	20.00	0.38	0.88–1.13	0.88–1.13	1.13–1.36	1.13–1.36	1.36–1.72	70	
	2 1/2–4	3	48.00	36.00	10.00	49.60	34.50	0.38	—	—	—	—	—	106	
4X Stainless Steel	0–2	3	36.00	24.00	10.00	37.60	22.50	0.38	—	—	—	—	—	70	
	2 1/2–4	3	48.00	36.00	12.00	49.60	34.50	0.38	—	—	—	—	—	106	

Note: Dimensions are in inches.

① G designates mounting screw size.

Outline Drawings



Open air contacts

Size	Fig.	Outline Dimensions			Mounting Dimensions								Conduit Knockout			Hub	Reference Drawing
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	
1–2 1/2	1	28.50	20.00	8.06	24.00	—	10.00	27.00	5.50	8.50	11.50	—	0.5–0.75	1.25–1	0.75–1	1.50	
3 – 4	1	40.50	24.00	8.09	36.00	—	12.00	39.00	8.44	11.94	15.44	—	1.97–2.47	0.88–1.13	—	2.50	
5	2	72.16	20.00	10.00	71.00	16.00	2.13	70.91	—	—	—	—	—	—	—	—	
6	2	60.00	38.00	16.00	61.60	36.50	0.75		—	—	—	—	—	—	—	—	

Vacuum contacts

Size	Fig.	Outline Dimensions			Mounting Dimensions								Conduit Knockout			Hub	Reference Drawing
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	
4	2	55.97	24.38	9.69	54.81	20.25	2.13	54.72	26.19	—	—	27.44	—	—	—	—	
5	2	72.16	20.00	10.00	71.00	16.00	2.13	70.91	—	—	—	—	—	—	—	—	
6	2	60.00	38.00	16.00	61.60	36.50	0.75		—	—	—	—	—	—	—	—	

Reduced voltage

Size			Fig.	Outline Dimensions					Reference Drawing
AutoTransformer	Part Winding & Wye Delta								
Disc. & MCP Type	Disc. Type	MCP Type		A	B	C	D	E	
2-2 1/2	1–2	1–2 1/2	3	42.00	32.00	12.00	43.60	30.50	
3-3 1/2	2 1/2–3 1/2	3–3 1/2	3	48.00	38.00	12.00	49.60	36.50	
4	4	4	3	60.00	38.00	16.00	61.60	36.50	
5, 6	5, 6	5, 6	4	90.00	30.00	20.00	16.00	24.44	

Note: Dimensions are in inches.
All enclosures are Type 3R

Enclosed Contactors, Class LC and LE

Dimensions

Figure 1

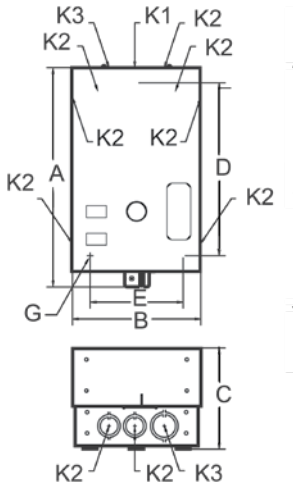


Figure 2

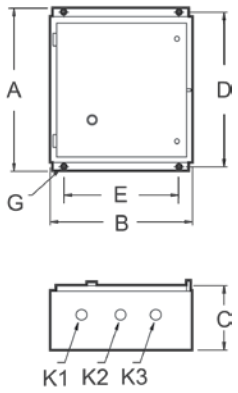
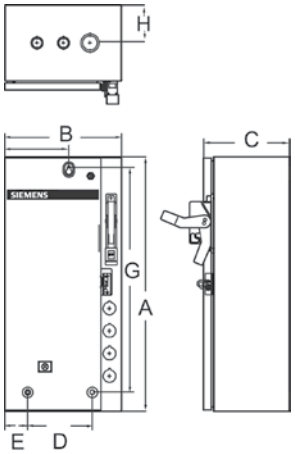


Figure 3



Class LC and LE Non-combo

Enclosure Type	Contactor Rating	Fig.	Outline Dimensions A	B	C	Mounting① D	E	Conduit Size K1	K2	K3	K4	K5	Reference Drawing
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	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	17.62	12.5	25.19	15.5	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	0.50–0.75	1.25–1.5	2–2.5	—	—	
	LE 200-400A 3P	2	26	17.62	12.5	25.19	15.5	—	1.25–1.5	1.25–1.5	—	—	
3/3R/4/12 without CPT	LE 20A 3-4P, LE 30/60A 3-9P, LC 30A 2-12P	2	16	13.25	6.12	15.25	11	—	—	—	—	—	
	LE 30/60A 12P	2	26	13.12	7.56	25.25	10	—	—	—	—	—	
	LE 100A 3P	2	26	13.12	7.56	25.25	10	—	—	—	—	—	
	LE 200-400A 3P	2	26	17.62	12.5	25.19	15.5	—	—	—	—	—	
4/4X without CPT	LE 20A 3-4P, LE 30/60A 3-9P,LC 30A 2-12P	2	16	14	6.02	16.75	12	—	—	—	—	—	
	LE 30/60A, 12P	2	24	16	8.76	22.5	14.5	—	—	—	—	—	
	LE 100A 3P	2	24	16	8.76	22.5	14.5	—	—	—	—	—	
	LE 200-400A,3P	2	24	20	10	22.5	18.5	—	—	—	—	—	
3/3R/4/12 with CPT	LE 20A 3-4P, LE 30/60A 3-9P,LC 30A 2-12P	2	16	13.25	6.12	15.25	11	—	—	—	—	—	
	LE 30/60A, 12P	2	26	13.12	7.56	25.25	10	—	—	—	—	—	
	LE 100A 3P	2	26	13.12	7.56	25.25	10	—	—	—	—	—	
	LE 200-400A,3P	2	26	17.62	12.5	25.19	15.5	—	—	—	—	—	
4/4X with CPT	LE 20A 3-4P, LE 30/60A 3-9P,LC 30A 2-12P	2	16	14	6.02	16.75	12	—	—	—	—	—	
	LE 30/60A, 12P	2	24	16	8.76	22.5	14.5	—	—	—	—	—	
	LE 100A 3P	2	24	16	8.76	22.5	14.5	—	—	—	—	—	
	LE 200-400A,3P	2	24	20	10	22.5	18.5	—	—	—	—	—	

Class LE Combo

Enclosure Type	Type	Contactor Rating	Fig.	Outline Dimensions A	B	C	Reference Drawing
1, 12/3R & 4/4X with & 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	

Note: Dimensions are in inches.

① Mounting screw G size is 0.25".

Enclosed Contactors, Class CLM, CM

Dimensions

Figure 1

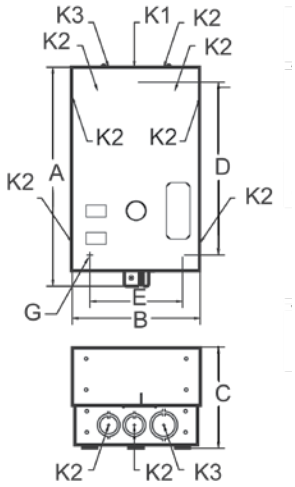


Figure 2

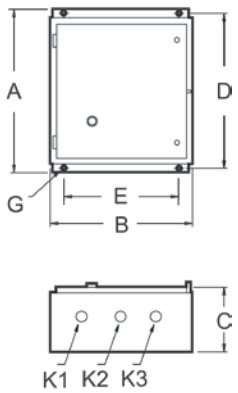
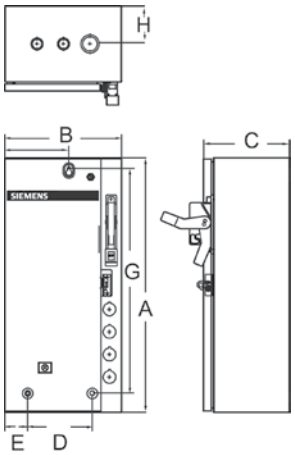


Figure 3



Class CLM Non-combo

Enclosure Type	Contactor Rating (Class CLM)	Fig.	Outline Dimensions A	B	C	Mounting① D	E	Conduit Size K1	K2	K3	K4	K5	Reference Drawing
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	—	—	
	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	
1 with CPT	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	—	—	
	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	
3/3R/4/12 without CPT	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	—	—	—	—	—	
	300A -400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—	
3/3R/4/12 with CPT	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	—	—	—	—	—	
4/4X without CPT	20A (2–12p), 30A (2–12p), 60A (2 - 10p)	2	16.00	14.00	6.02	16.75	12.00	—	—	—	—	—	
	100A (2-5p)	2	16.00	16.00	10.00	14.50	14.50	—	—	—	—	—	
	60A (12p)	2	19.00	22.00	8.00	—	—	—	—	—	—	—	
	200A (2-5p)	2	24.00	20.00	10.00	22.50	18.50	—	—	—	—	—	
	300A -400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—	
4/4X with CPT	20A (2-12p), 30A (2-5p)	2	16.00	14.00	6.02	16.75	12.00	—	—	—	—	—	
	30A (6-12p)	2	16.00	20.00	8.00	14.50	18.50	—	—	—	—	—	
	60-100A (2-5p)	2	16.00	16.00	10.00	14.50	14.50	—	—	—	—	—	
	60A (6-12p)	2	24.00	20.00	8.00	22.50	18.50	—	—	—	—	—	
	200A (3p)	2	24.00	20.00	10.00	22.50	18.50	—	—	—	—	—	
	300–400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—	

Class CM Combo

Enclosure Type	Type	Contactor Rating	Fig.	Outline Dimensions A	B	C	Reference Drawing
1, 12/3R & 4/4X with & 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	

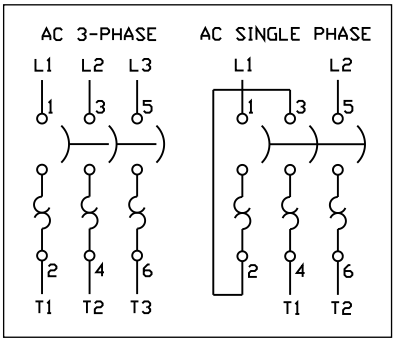
Note: Dimensions are in inches.

① Mounting screw G size is 0.25".

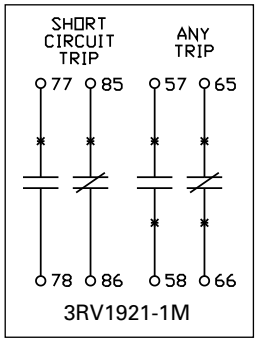
Class 11 - 3RV, SMF, MMS

Wiring Diagrams

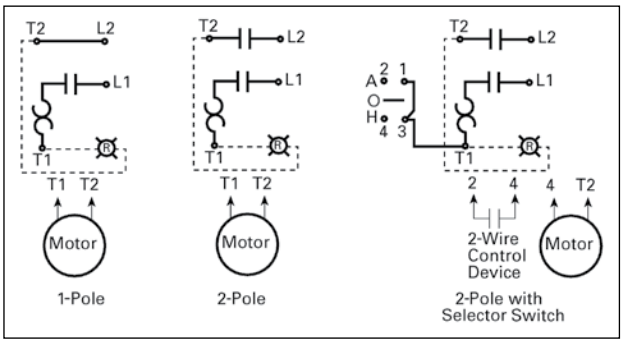
Class 11 - 3RV



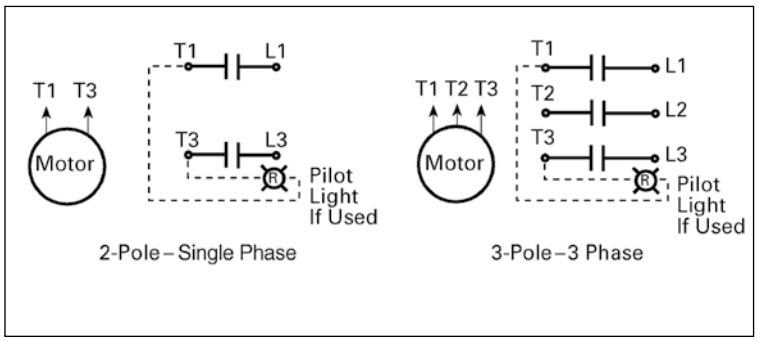
Signaling Contact for Class 11 - 3RV



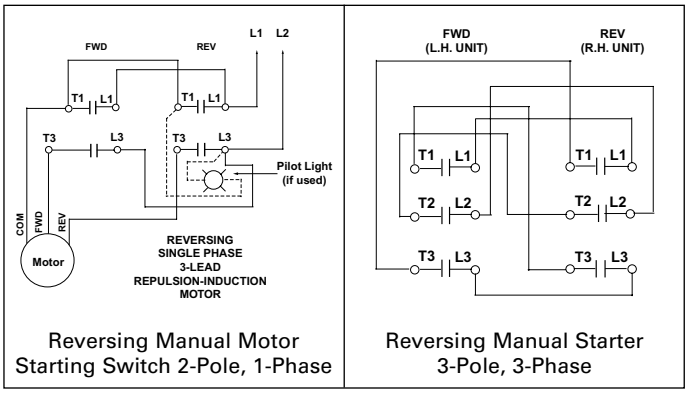
Typical Wiring Diagrams—Class SMF



Typical Wiring Diagrams—MMS



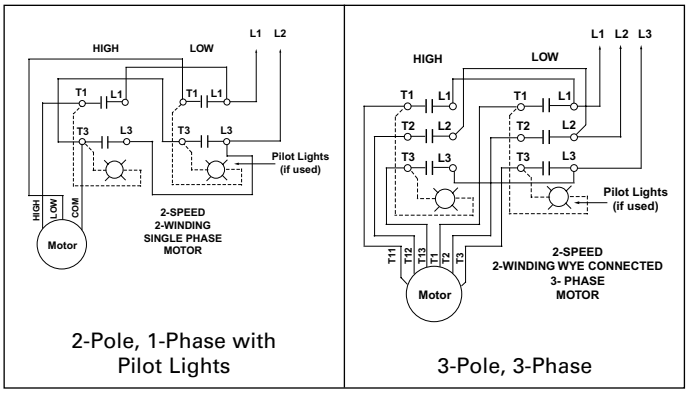
AC Reversing Manual Starter and Manual Motor Starting Switches



Reversing Manual Motor Starting Switch 2-Pole, 1-Phase

Reversing Manual Starter 3-Pole, 3-Phase

AC 2-Speed Manual Motor Starting Switches

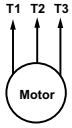


2-Pole, 1-Phase with Pilot Lights

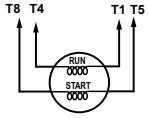
3-Pole, 3-Phase

3-Pole Reversing Switches

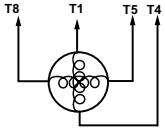
THREE PHASE MOTOR			
LINE AND MOTOR LEADS		L.H. UNIT	R.H. UNIT
Line	L1 to L2 to L3 to	– – –	L1 L2 L3
Meter	T1 to T2 to T3 to	T1 T2 T3	– – –
Pilot Light Leads to		– –	T1 T3



SINGLE PHASE CAPACITOR OR SPLIT PHASE MOTOR			
LINE AND MOTOR LEADS		L.H. UNIT	R.H. UNIT
Line	L1 to L2 to	– –	L1 L2
Meter	T1 to T4 to T5 to T8 to	T1 T3 L1 T2	– – – –
Furnish Jumper		L3 to	T2
Pilot Light Leads to		– –	T1 T3

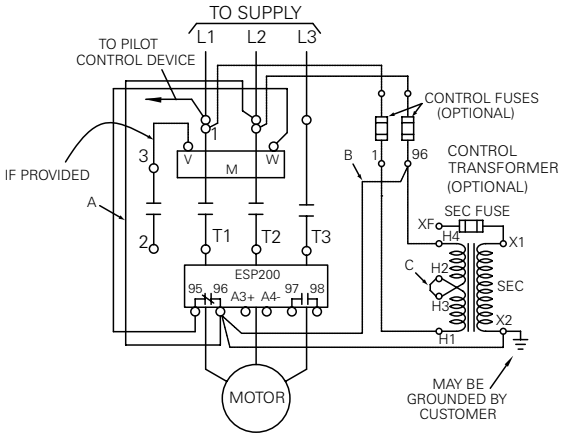


SINGLE PHASE 4-LEAD REPULSION - INDUCTION MOTOR			
LINE AND MOTOR LEADS		L.H. UNIT	R.H. UNIT
Line	L1 to L2 to	– –	L1 L2
Meter	T1 to T4 to T5 to T8 to	T2 L3 T3 T1	– – – –
Furnish Jumper		L3 to	T2
Pilot Light Leads to		– –	L1 T2

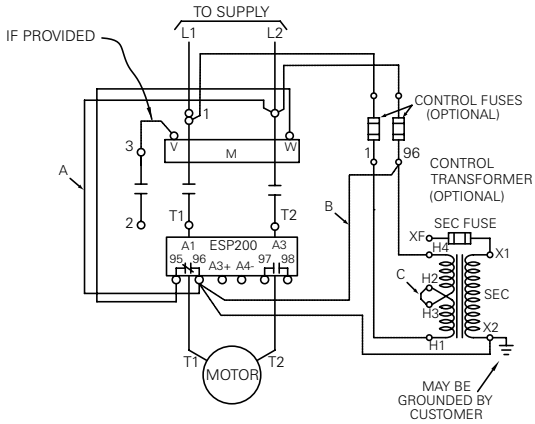


3-Phase and Single Phase Magnetic Starters

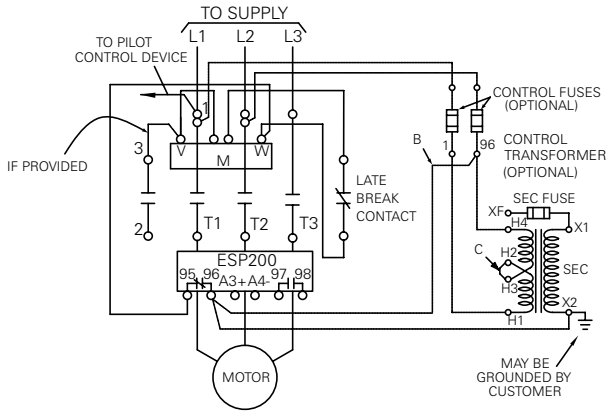
Three Phase Magnetic Starter, Size 00–4



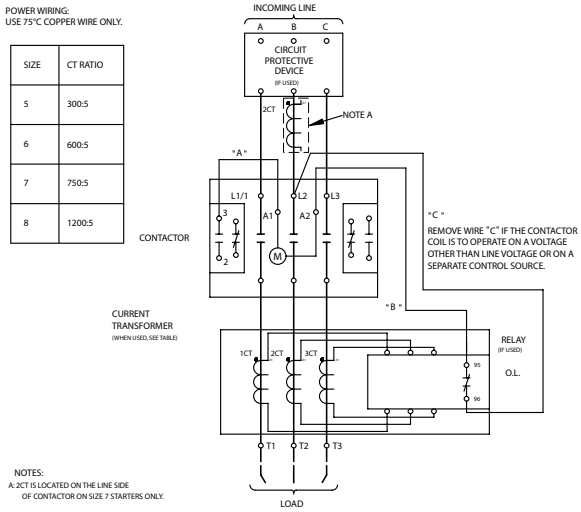
Single Phase Magnetic Starter①②



Three Phase Magnetic Starter with DC Coil, Sizes 00–4



Solid State Overload 3-Phase Sizes 5-8



SIZE	CT RATIO
5	300:5
6	600:5
7	750:5
8	1200:5

① 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.

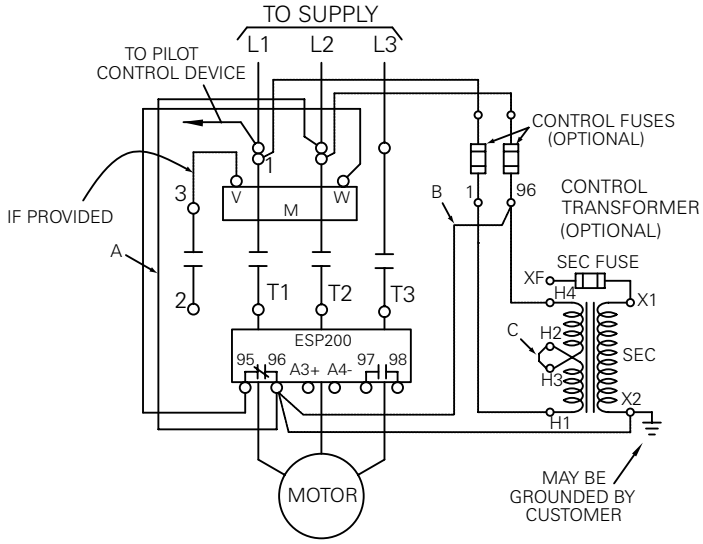
② Full Load Amps (FLA): Adjustment of the ESP200 solid state overload relay accommodates the single phase motor.

Class 17, 18

Wiring Diagrams

3-Phase

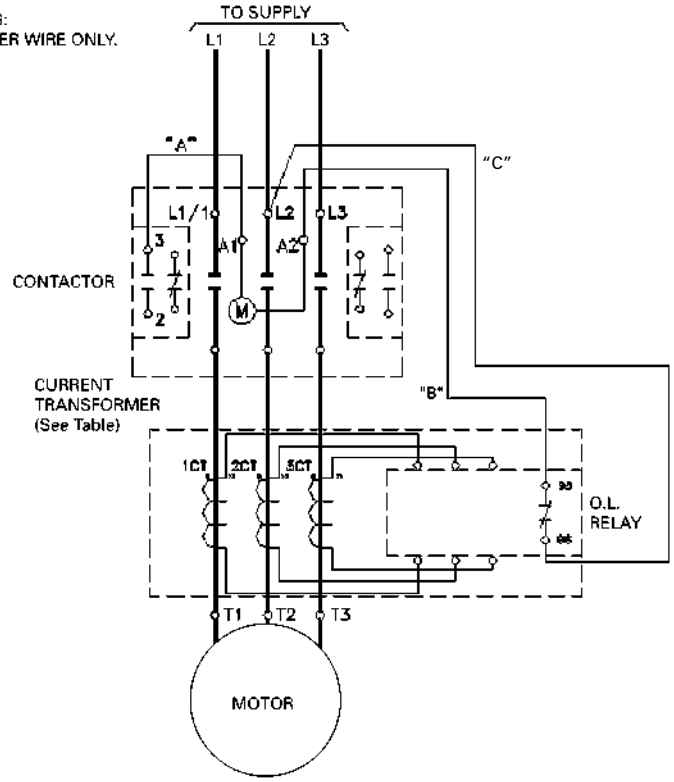
Size 00–4①



Size 5–8②

POWER WIRING:
USE 75°C COPPER WIRE ONLY.

SIZE	CT RATIO
5	300:5
6	600:5
7	750:5
8	1200:5

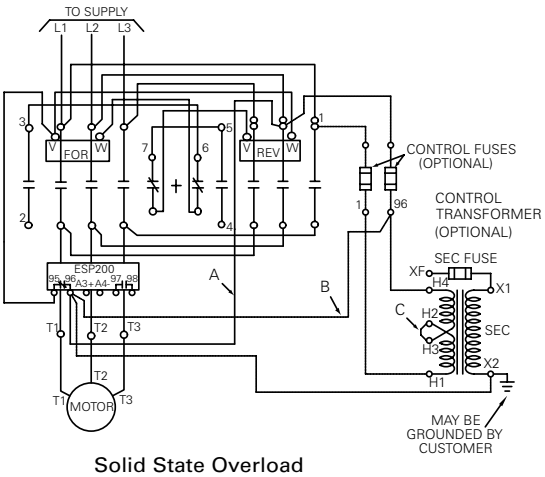


① Remove wire "C" if control transformer is used. For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse line terminals.

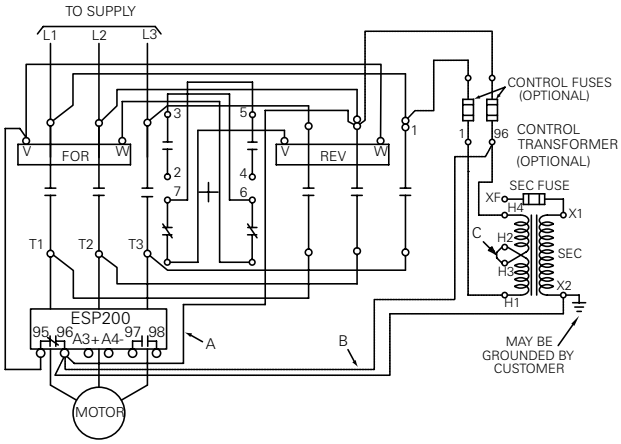
② Remove wire "C" if the contactor coil is to operate on a voltage other than line voltage or in a separate control source.

3-Phase Solid State Overload

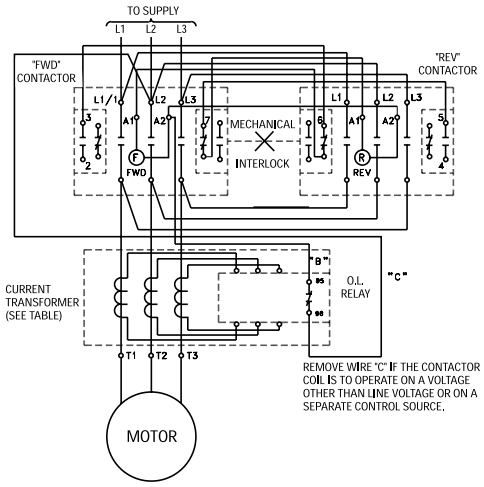
3-Phase Reversing Magnetic Starter
Sizes 00–1¾



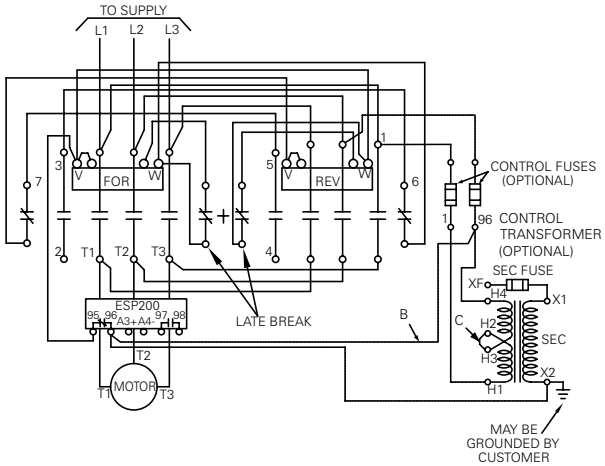
3-Phase Reversing Magnetic Starter
Sizes 2–4



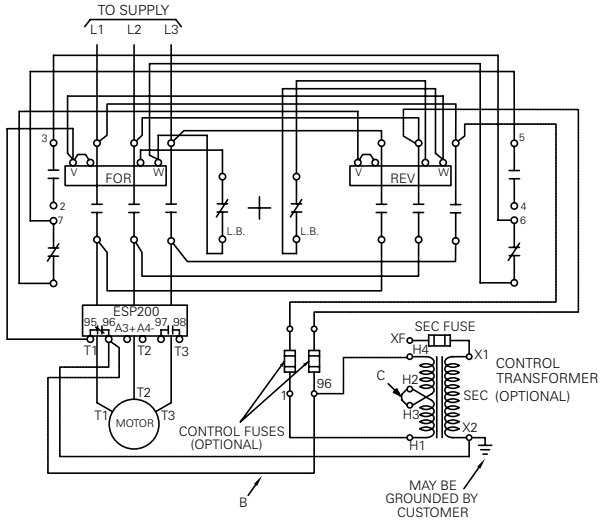
Solid State Overload
Sizes 5–6



3-Phase Reversing Magnetic Starter
with DC Coil, Sizes 00–1¾

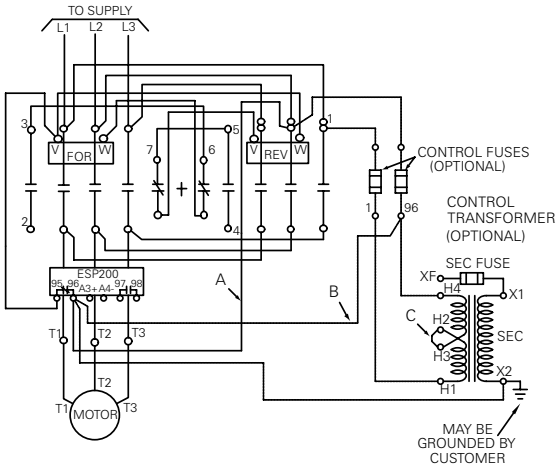


3-Phase Reversing Magnetic Starter
with DC Coil, Sizes 2–4

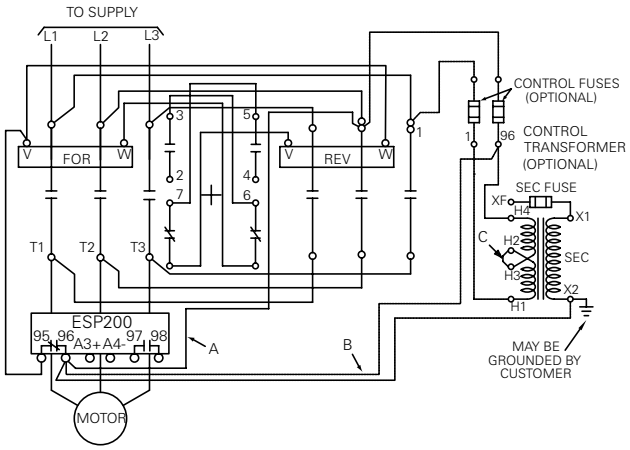


3-Phase

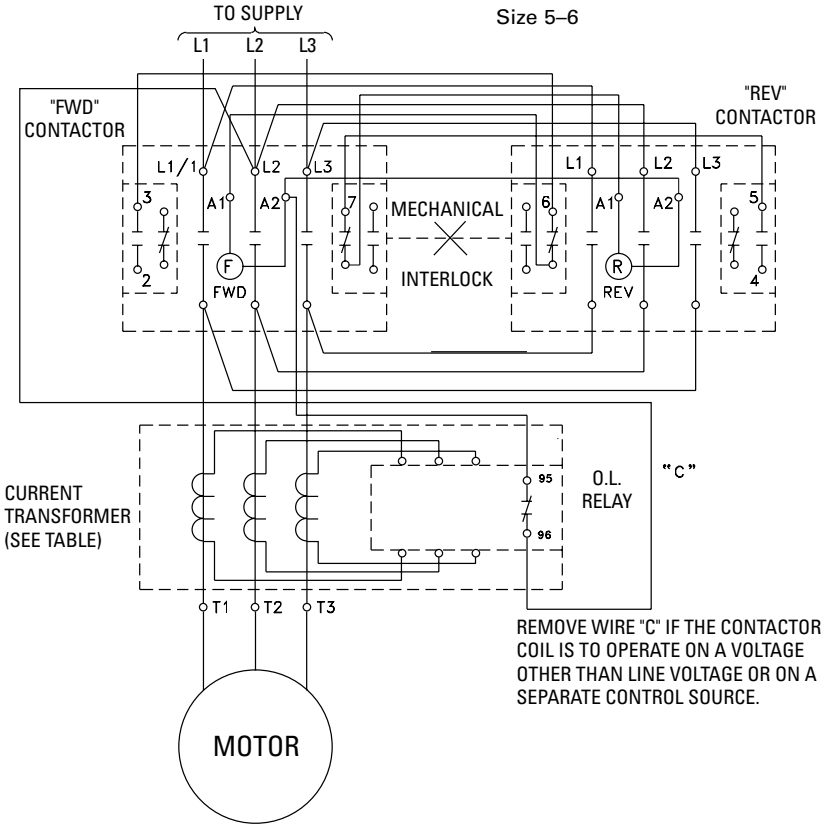
3-Phase Reversing Magnetic Starter
Sizes 00–1¾



3-Phase Reversing Magnetic Starter
Sizes 2–4



Size 5–6

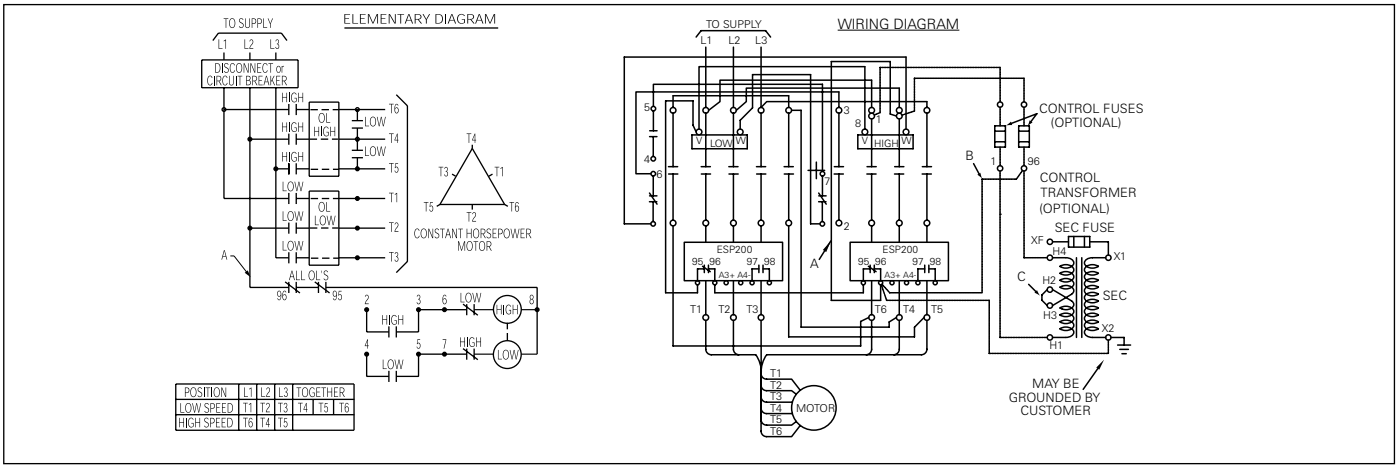


SIZE	CT RATIO
5	300:5
6	600:5

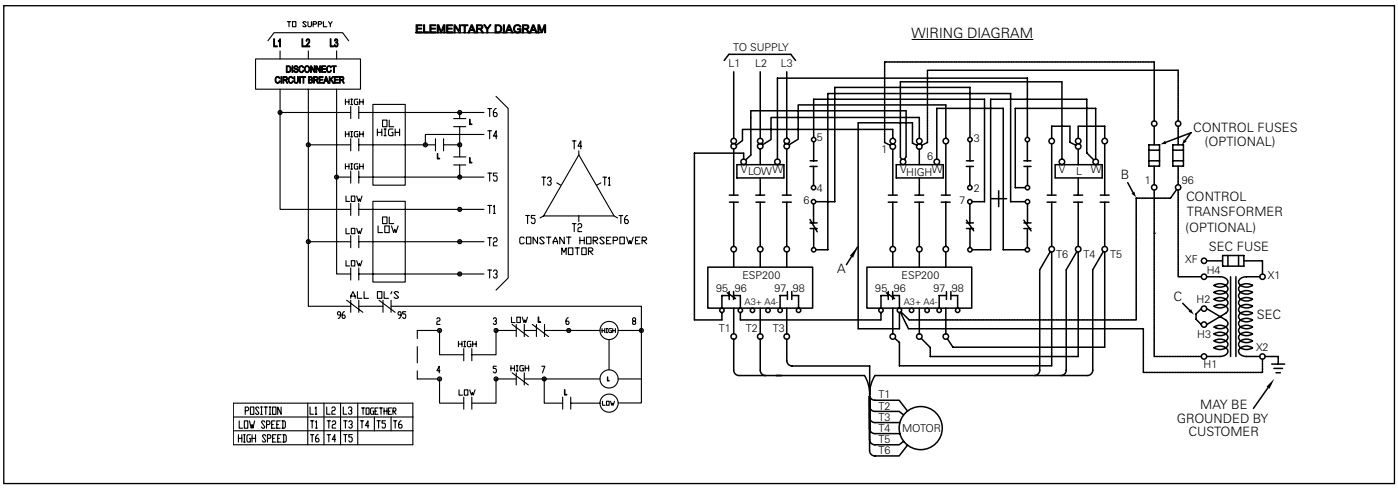
Class 30 & 32 Non-Combination and Combination Starters

Wiring Diagrams

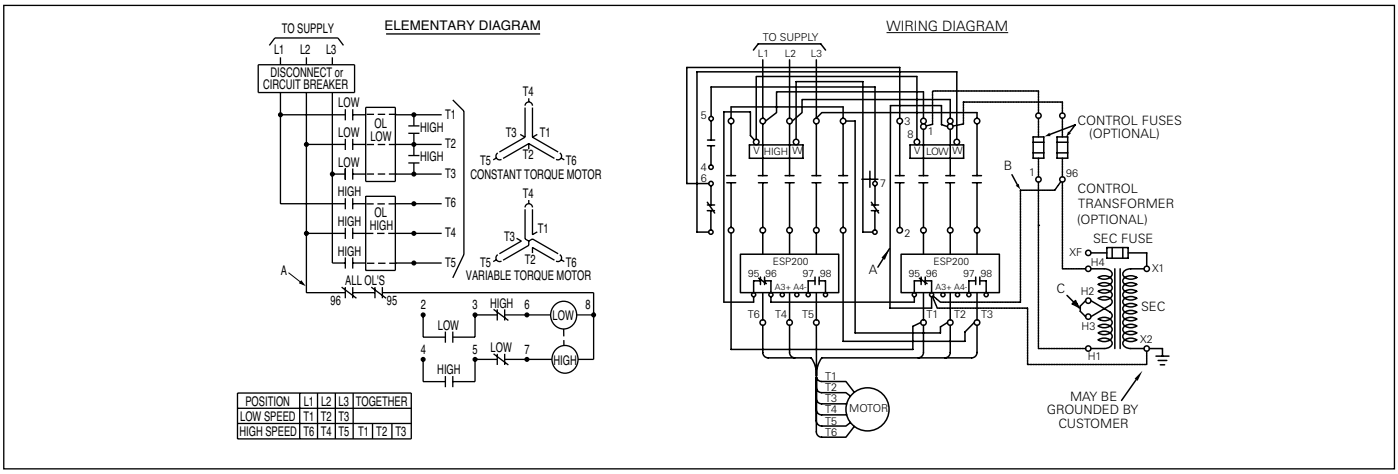
1 Winding Constant Horsepower Size 0–1³/₄



1 Winding Constant Horsepower Size 2–4

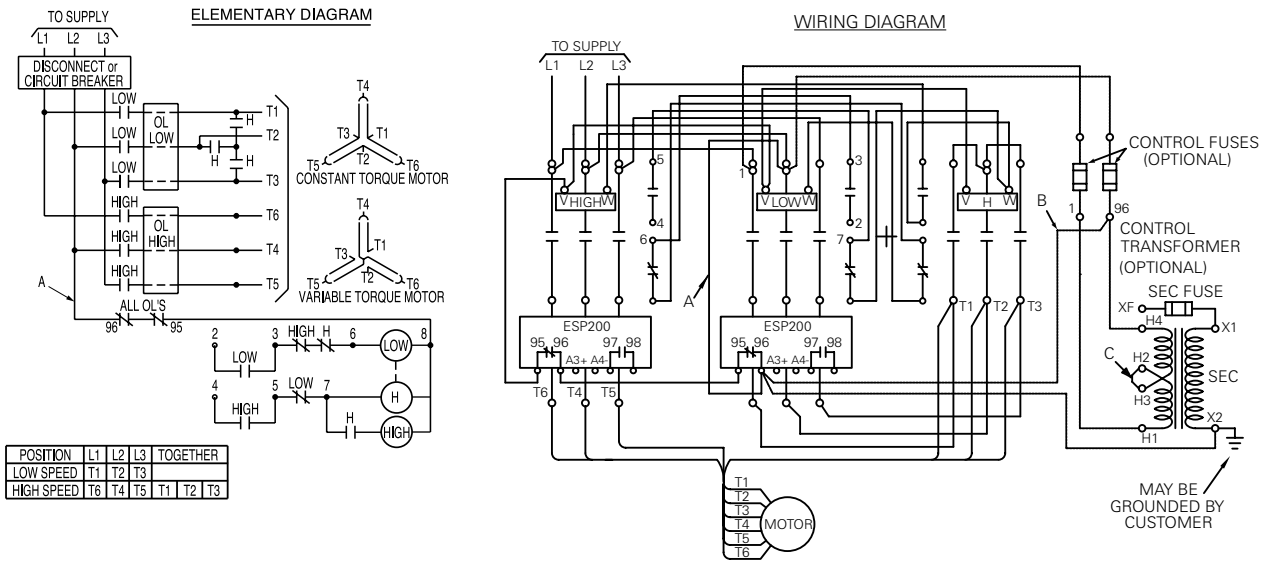


1 Winding Constant or Variable Torque Size 0–1³/₄



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.

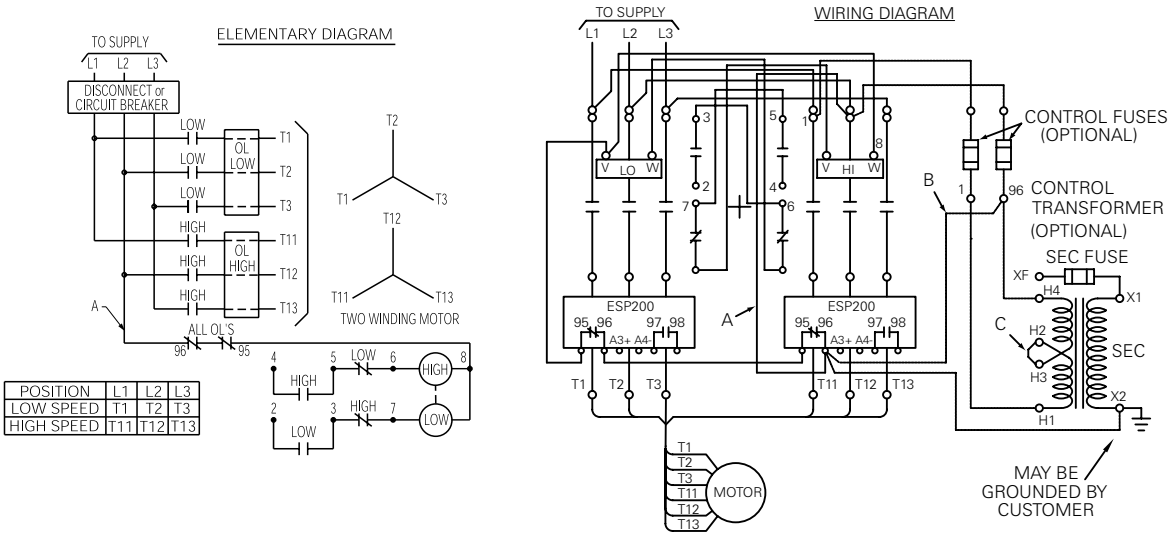
1 Winding Constant or Variable Torque Size 2–4



POSITION	L1	L2	L3	TOGETHER		
LOW SPEED	T1	T2	T3			
HIGH SPEED	T6	T4	T5	T1	T2	T3

D68784002

2 Winding Constant Horsepower & 2 Winding Constant or Variable Torque Size 0–4

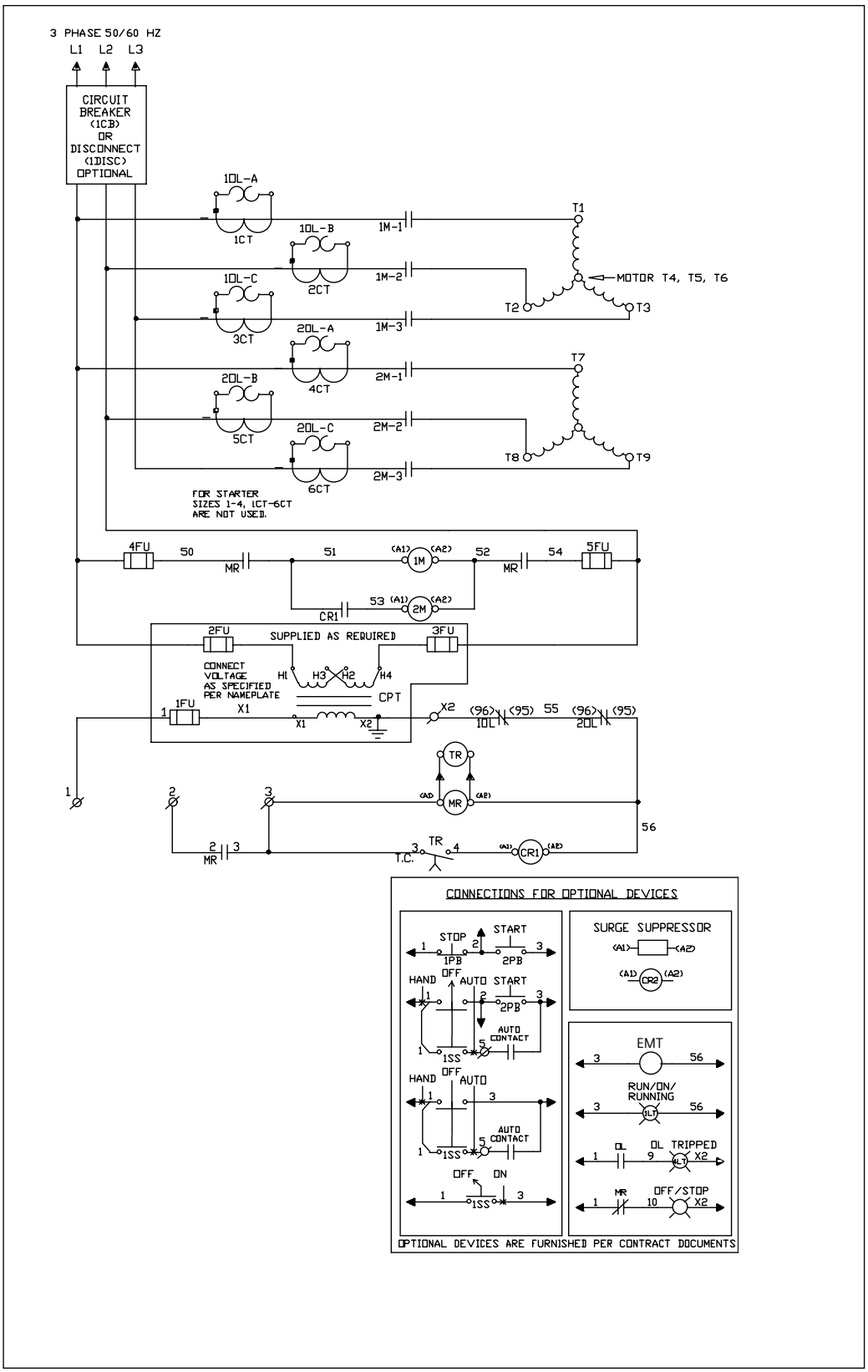


POSITION	L1	L2	L3
LOW SPEED	T1	T2	T3
HIGH SPEED	T11	T12	T13

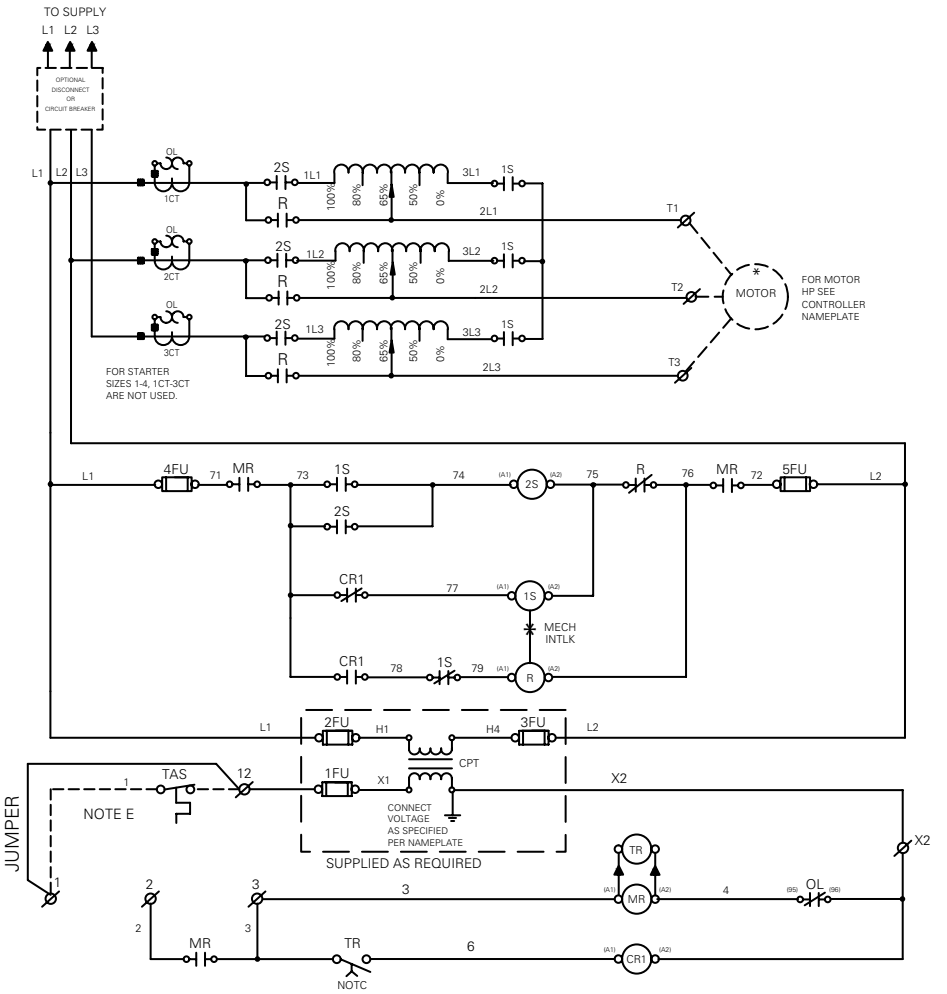
D68786001

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.

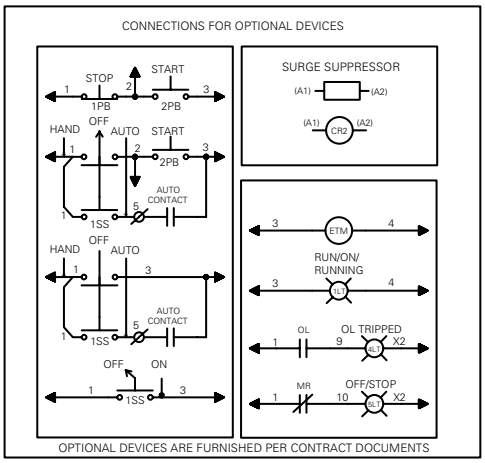
Part Winding

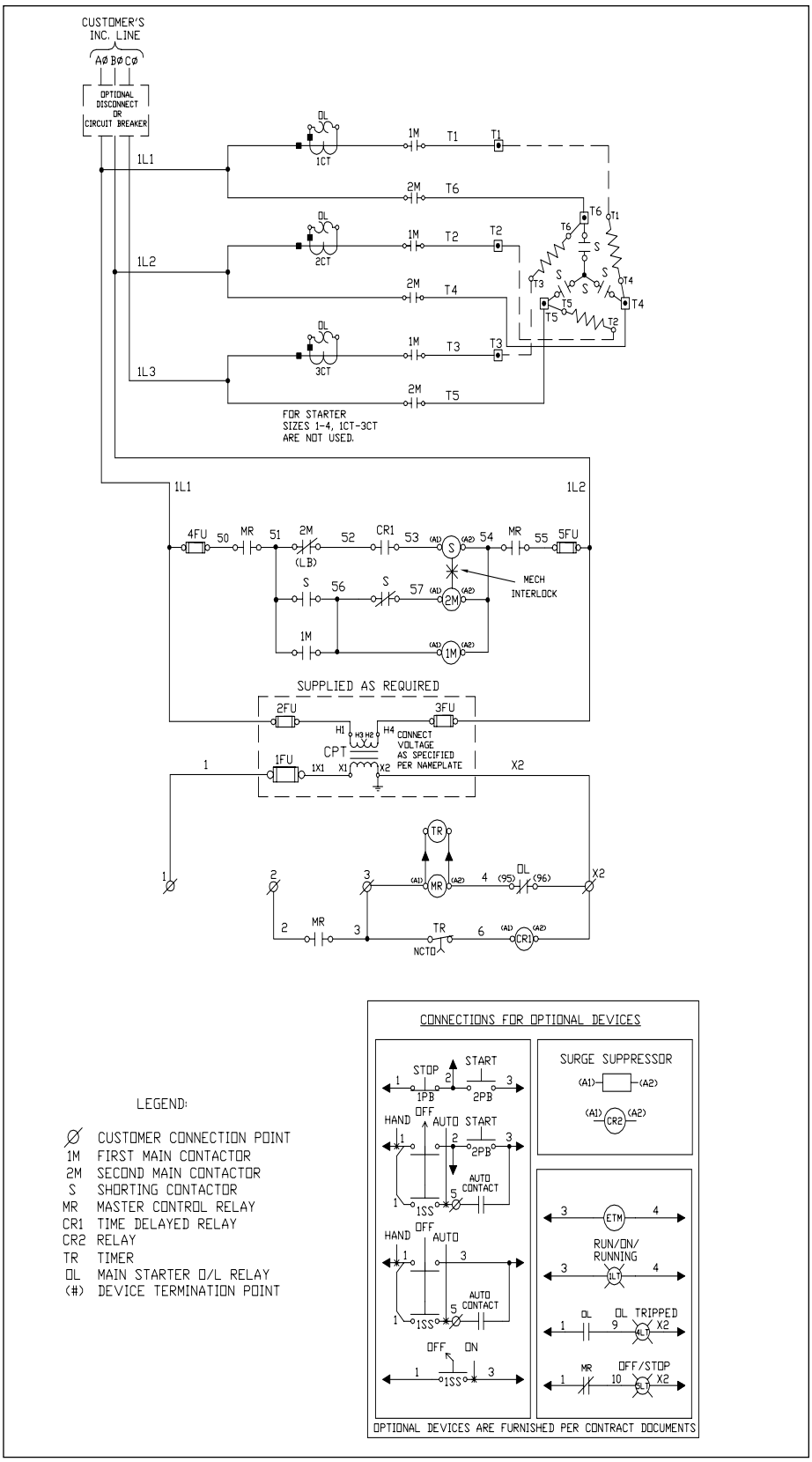


Auto Transformer

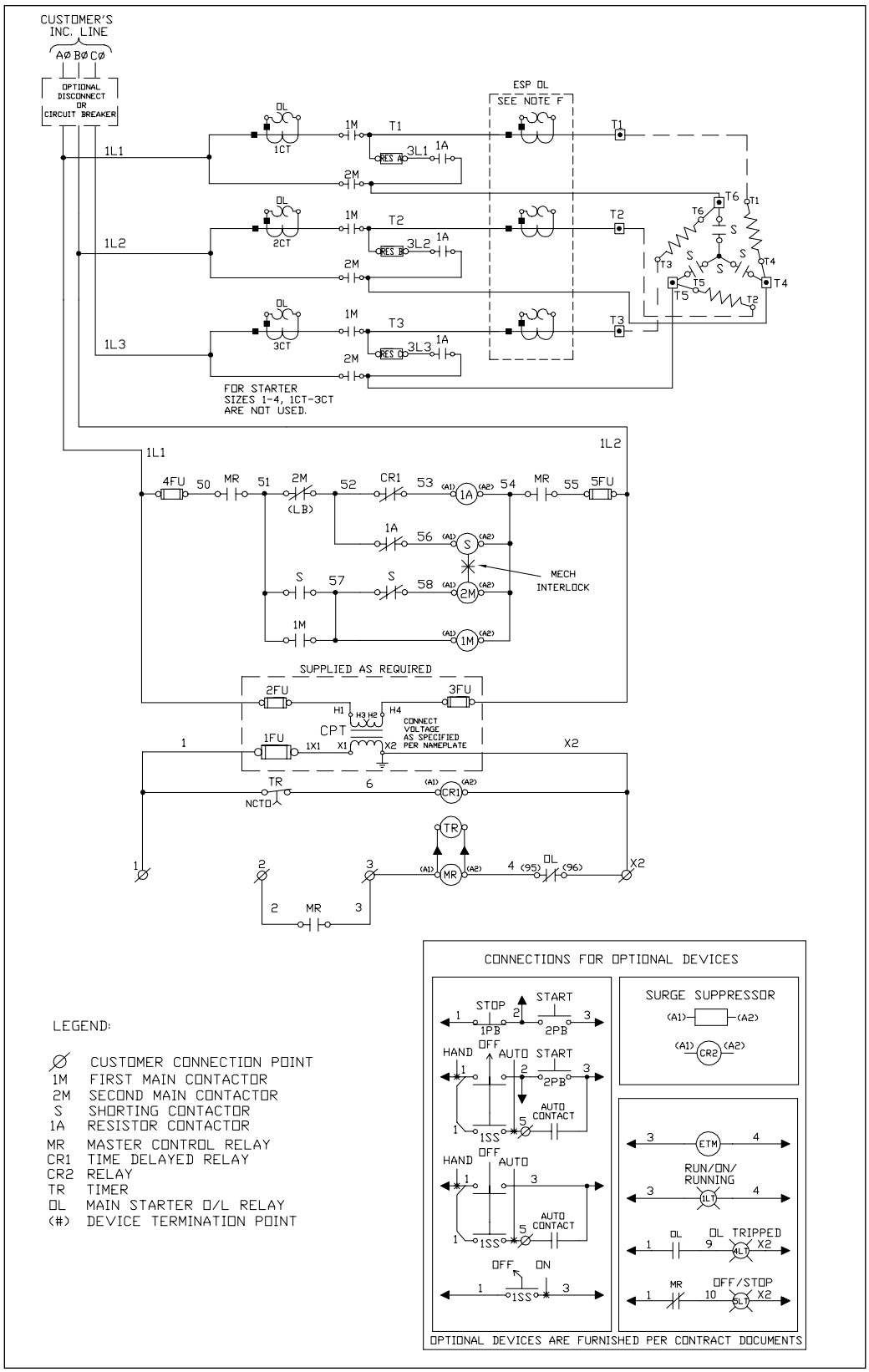


Note E:
Remove jumper if thermal protection switch is provided.



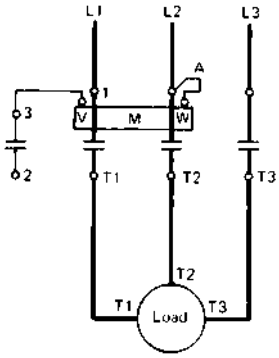

CUSTOMER'S INC. LINE
AØ BØ CØ
OPTIONAL DISCONNECT OR CIRCUIT BREAKER
1L1
1L2
1L3
OL
1CT
2CT
3CT
1M
2M
T1
T2
T3
T4
T5
T6
S
FOR STARTER SIZES 1-4, 1CT-3CT ARE NOT USED.
4FU
50
MR
51
2M
(LB)
52
CR1
53
54
55
5FU
56
57
MECH INTERLOCK
SUPPLIED AS REQUIRED
2FU
3FU
H1
H3 H2
H4
CONNECT VOLTAGE AS SPECIFIED PER NAMEPLATE
CPT
1FU
1X1
X1
X2
TR
NCTO
(95)
(96)
CR1
LEGEND:
Ø CUSTOMER CONNECTION POINT
1M FIRST MAIN CONTACTOR
2M SECOND MAIN CONTACTOR
S SHORTING CONTACTOR
MR MASTER CONTROL RELAY
CR1 TIME DELAYED RELAY
CR2 RELAY
TR TIMER
OL MAIN STARTER O/L RELAY
(#) DEVICE TERMINATION POINT
CONNECTIONS FOR OPTIONAL DEVICES
STOP
START
1PB
2PB
HAND
OFF
AUTO
AUTO CONTACT
1SS
ON
SURGE SUPPRESSOR
CR2
ETM
RUN/ON/ RUNNING
1LT
OL TRIPPED
4LT
OFF/STOP
5LT
OPTIONAL DEVICES ARE FURNISHED PER CONTRACT DOCUMENTS

Wye Delta (Closed Transition)

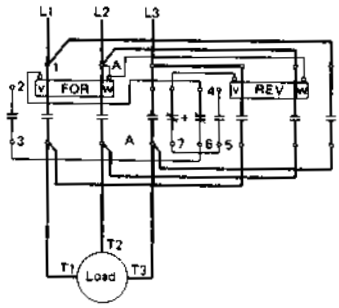


3-Phase Magnetic Contactors and Reversing Contactors

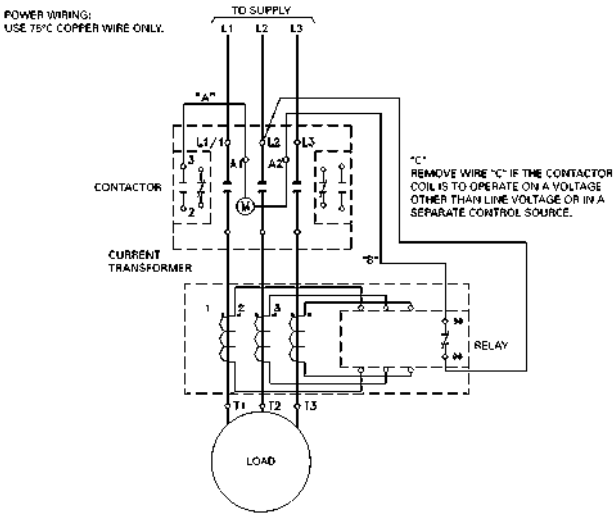
3-Phase Contactors—Size 00–4



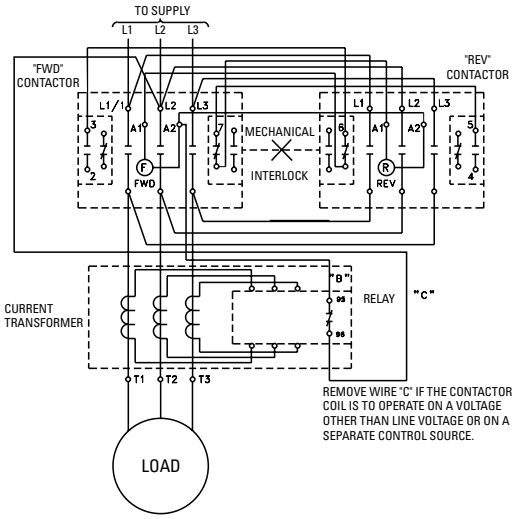
3-Phase Reversing Contactors—Size 00–4



3-Phase Contactors—Size 5, 6

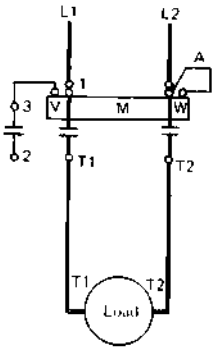


3-Phase Reversing Contactors—Size 5, 6

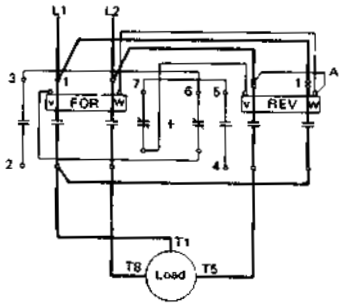


Single Phase Magnetic Contactors and Reversing Contactors

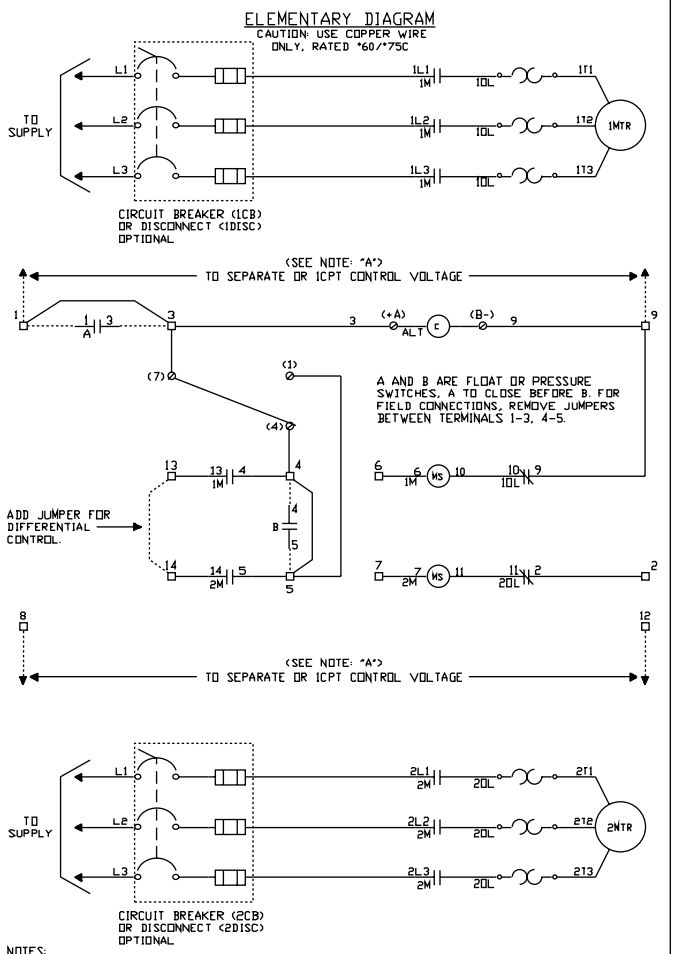
Single Phase Contactors—Size 00–4



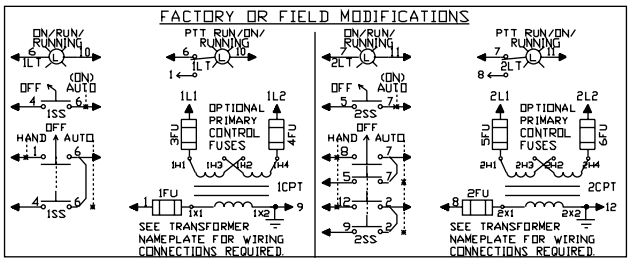
Single Phase Reversing Contactors—Size 00–1P



Standard Duplex Pump Panel (92)

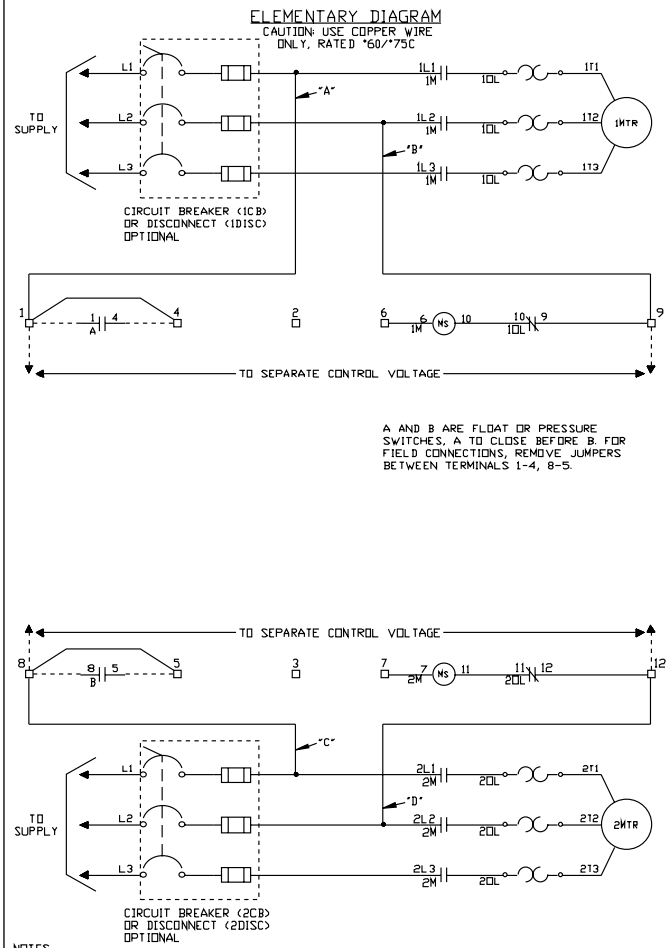


NOTES:
A. FOR SEPARATE OR CPT CONTROL VOLTAGE SOURCE: CONNECT PER DOTTED LINES OR TO 1 AND 2 CPT PRIMARIES PER FACTORY OR FIELD MODIFICATIONS.
B. FOR PROTECTION OF INTERNAL CONTROL CIRCUIT CONDUCTORS IN ACCORDANCE WITH THE N.E.C., USE FUSE KIT 49MAFB4.
C. TO USE THIS CONTROLLER W/O SELECTOR SWITCHES, JUMPER BETWEEN THE FOLLOWING PAIRS OF TERMINALS 4-6, 5-7, AND 9-2.
D. FOR TWO POSITION SELECTOR SWITCHES, WIRE AS SHOWN ALSO ADD JUMPER BETWEEN TERMINALS 9-2.
E. LINE OR SEPARATE SOURCE CONNECTIONS TO TERMINALS 8 AND 12 ARE REQUIRED ONLY WHEN THREE POSITION SELECTOR SWITCH IS BUILT IN.

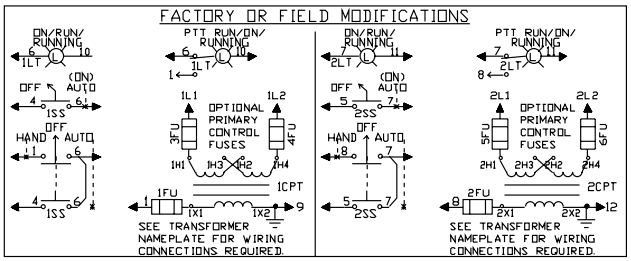


TB LAYOUT (REF) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 12 | 13 | 14 |

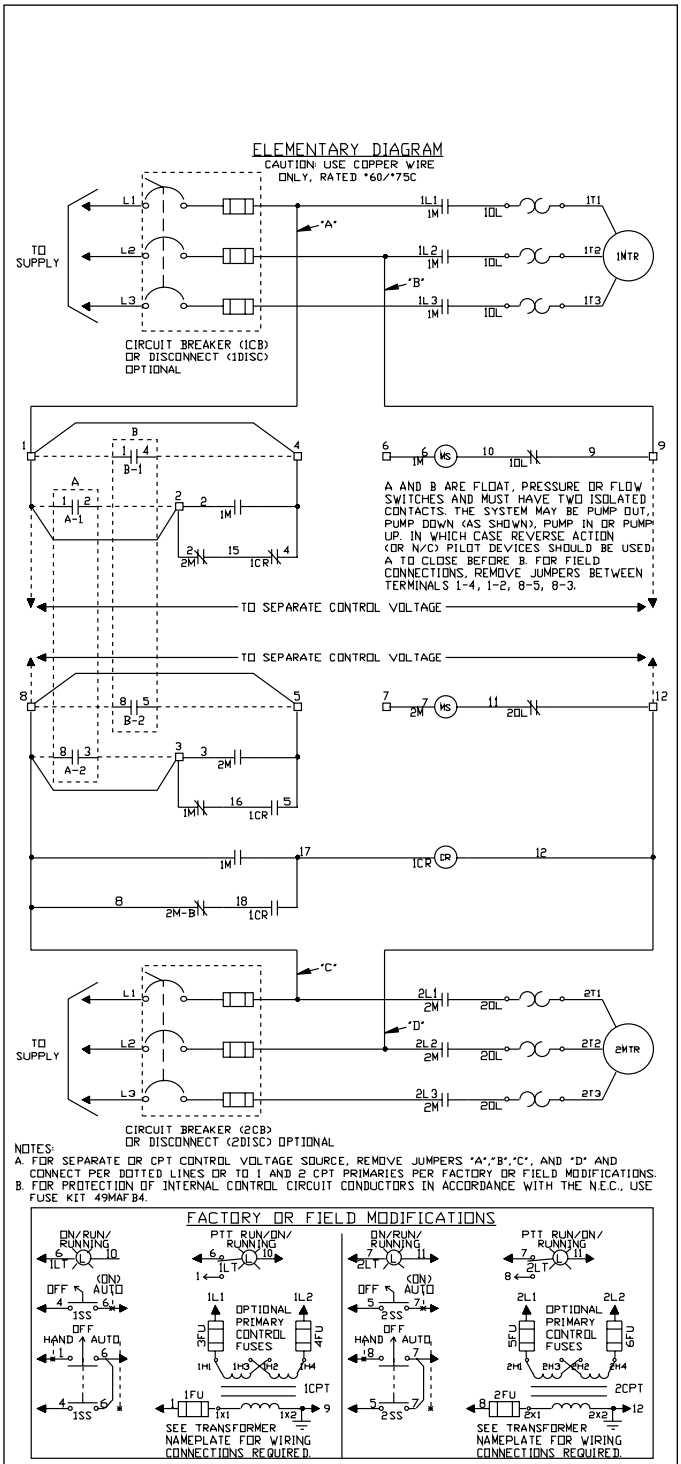
Duplex Panel w/o alternator (95)



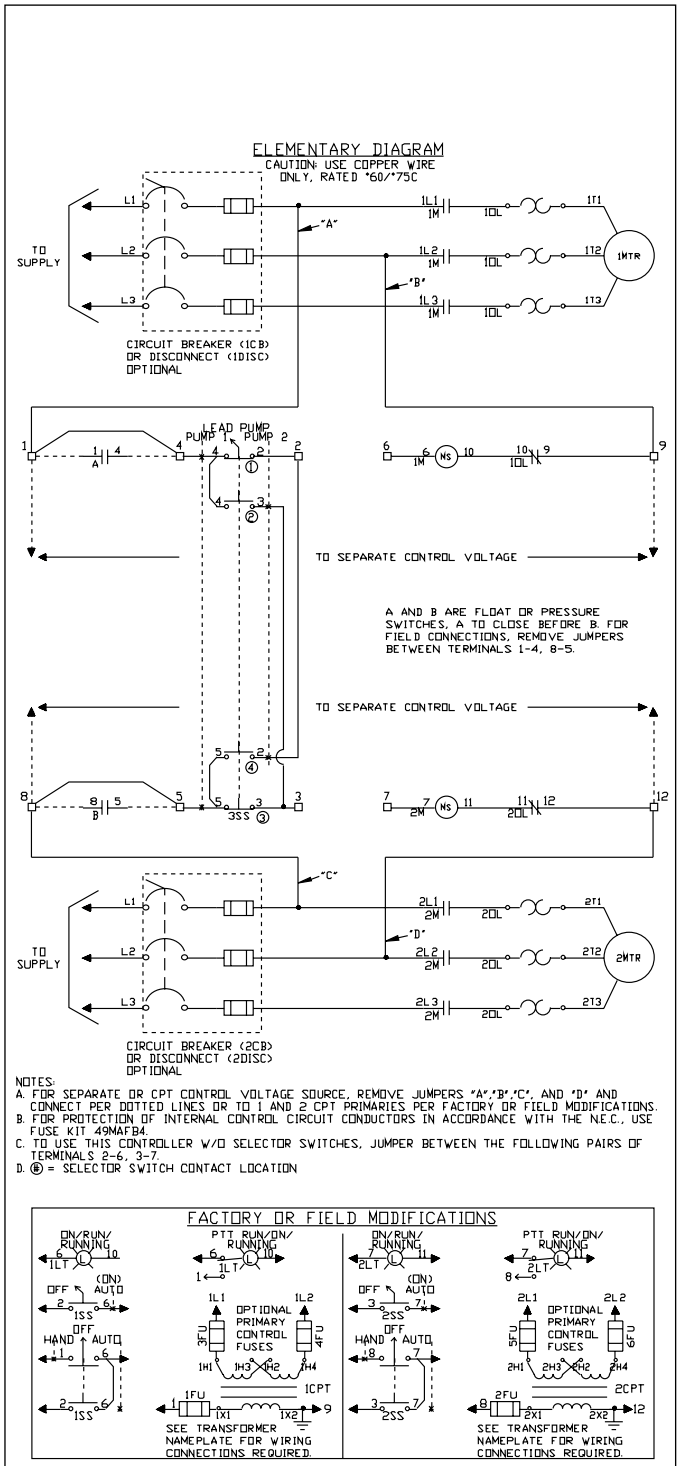
NOTES:
A. FOR SEPARATE OR CPT CONTROL VOLTAGE SOURCE, REMOVE JUMPERS "A","B","C", AND "D" AND CONNECT PER DOTTED LINES OR TO 1 AND 2 CPT PRIMARIES PER FACTORY OR FIELD MODIFICATIONS.
B. FOR PROTECTION OF INTERNAL CONTROL CIRCUIT CONDUCTORS IN ACCORDANCE WITH THE N.E.C., USE FUSE KIT 49MAFB4.
C. TO USE THIS CONTROLLER W/O SELECTOR SWITCHES, JUMPER BETWEEN THE FOLLOWING PAIRS OF TERMINALS 4-6, 5-7.



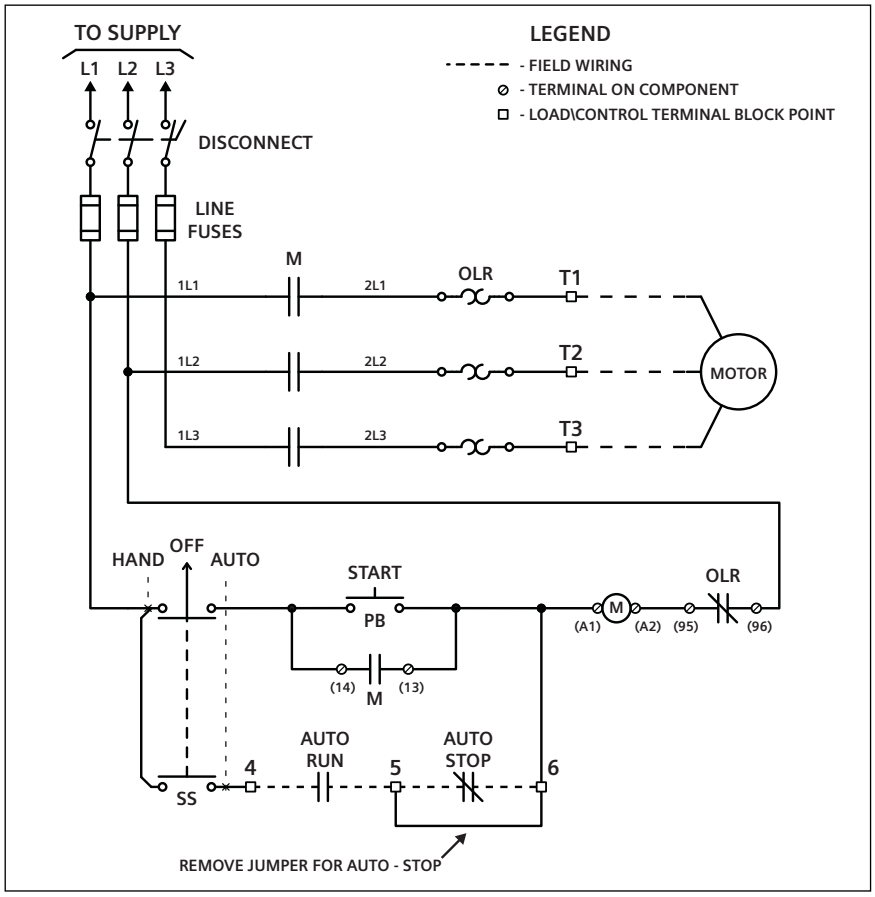
Duplex Panel with Relay Alternation (93)



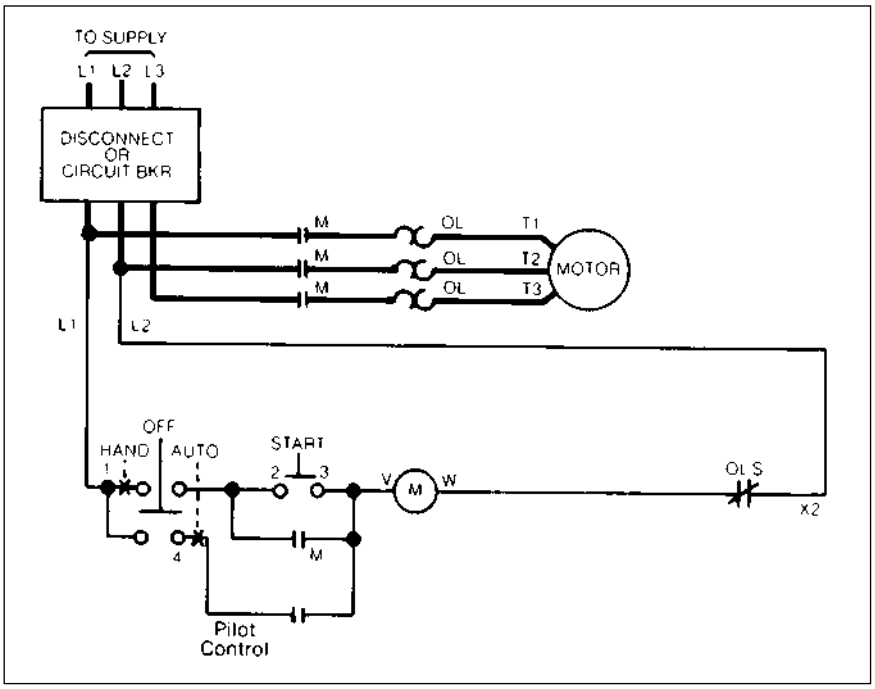
Duplex Panel with Lead Pump Transfer Switch (94)



Class 82 Pump Panel



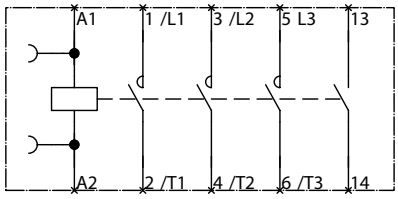
Standard Class 87 Pump Panel



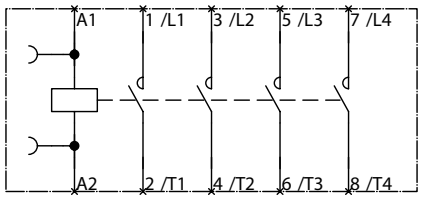
Class LC and LE Electrically Held Contactors

Wiring Diagrams

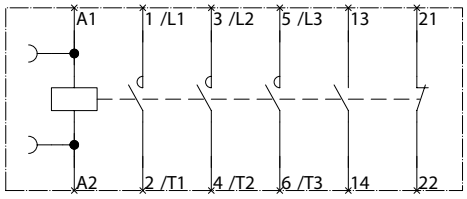
LEN00B003 (20A 3 Pole)



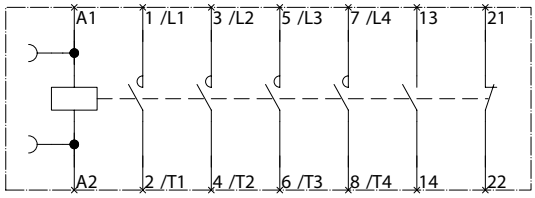
LEN00B004 (20A 4 Pole)



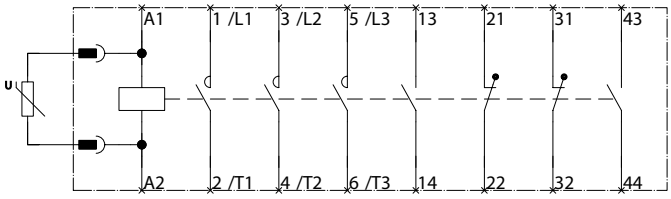
LEN00C003 (30A 3 Pole)
LEN00D003 (60A 3 Pole)
LEN00E003 (100A 3 Pole)



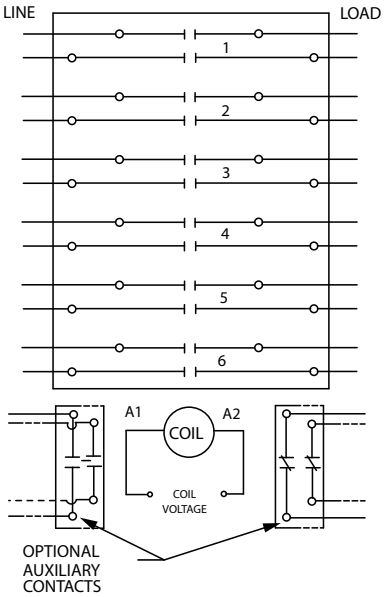
LEN00C004 (30A 4 Pole)



LEN00F003 (200A 3 Pole)
LEN00G003 (300A 3 Pole)
LEN00H003 (400A 3 Pole)



LCE00C (30A 2-12 Pole)

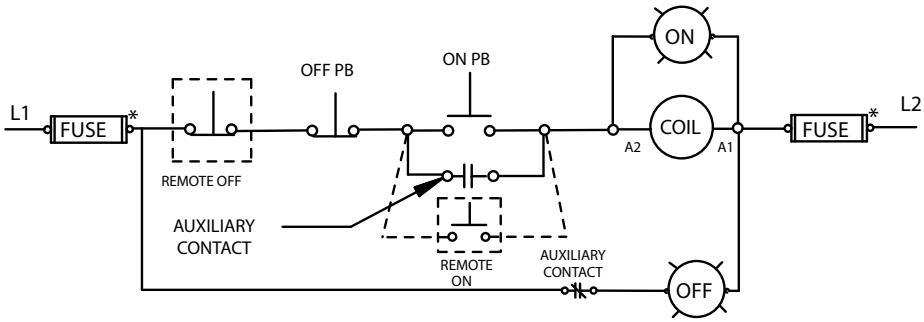


Class LC and LE Electrically Held Contactors

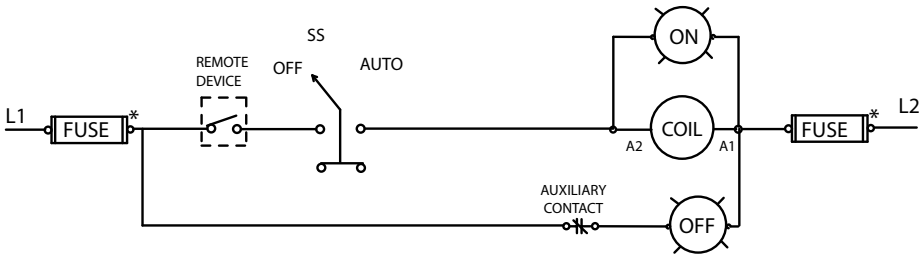
Wiring Diagrams

Optional Pilot Devices for Electrically Held Contactor

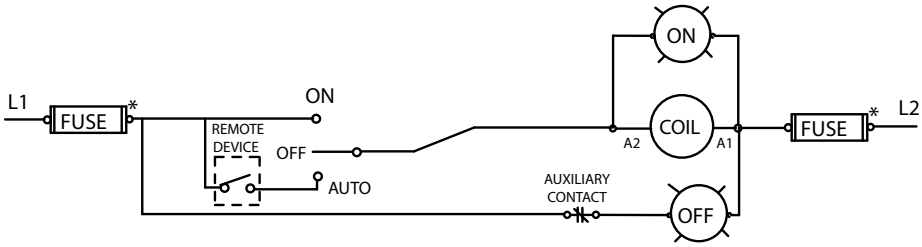
ON and OFF Push buttons



OFF-ON or OFF-AUTO Selector Switch



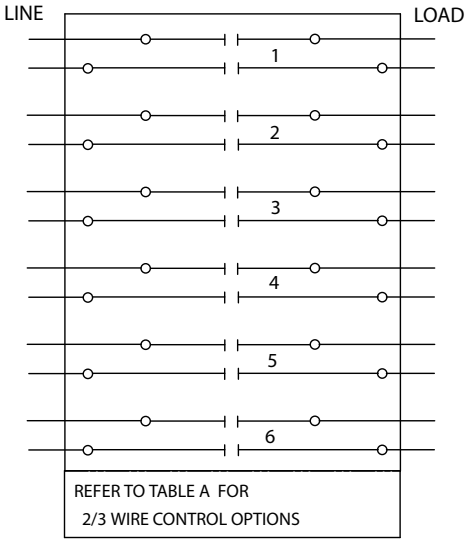
OFF-ON-AUTO HAND-OFF-AUTO Selector Switch

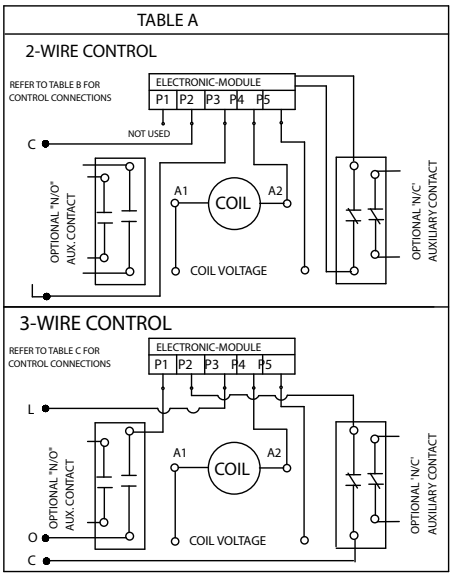


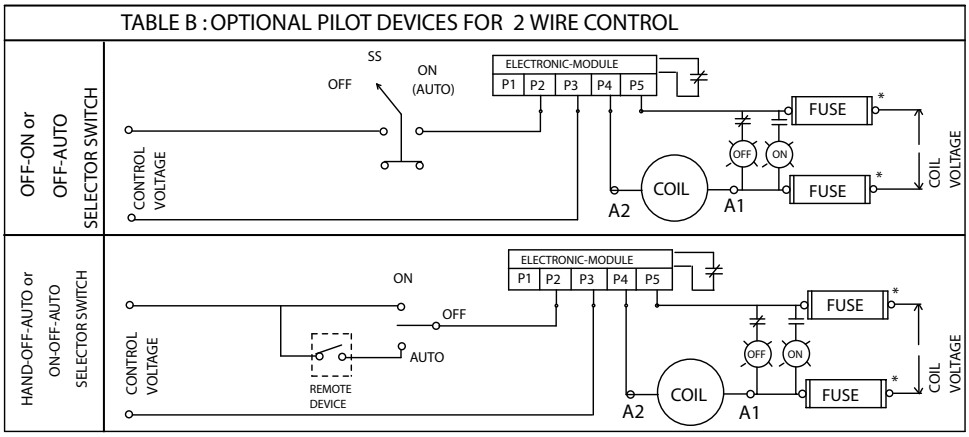
* -- IF USED

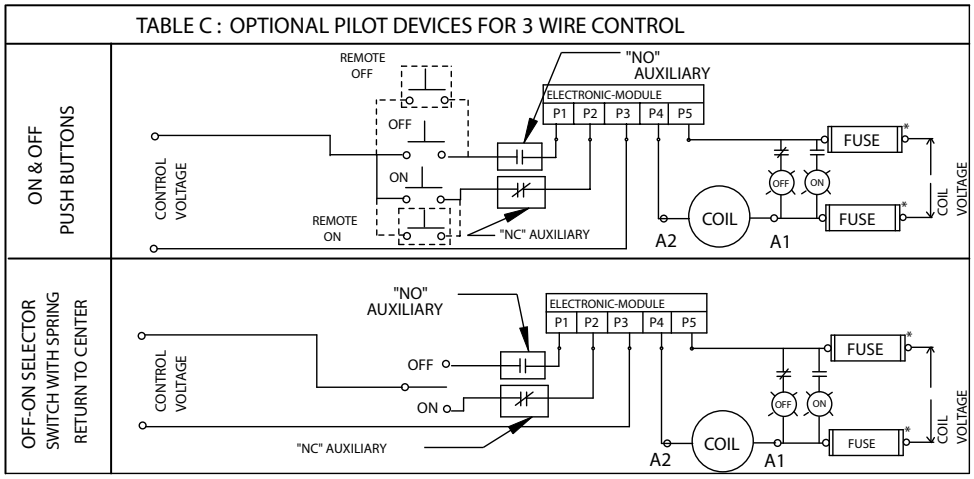
Class LC (converted to mechanically held)

Wiring Diagrams





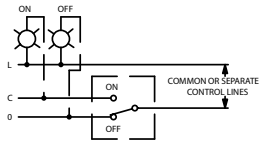




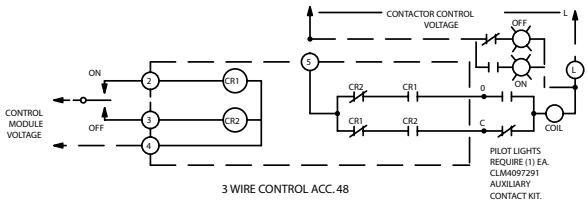
* -- IF USED

Mechanically Latched 20 Amp, Class CLM

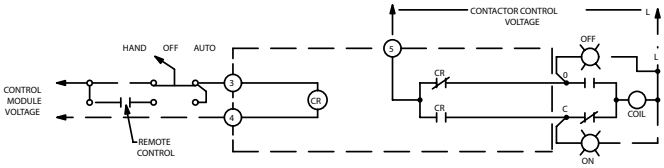
Wiring Diagrams



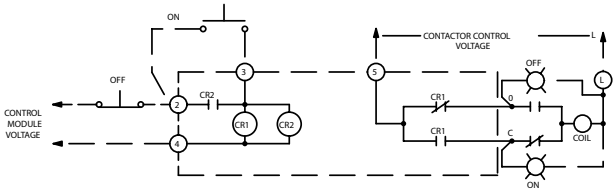
TYPICAL OFF-ON SELECTOR SWITCH



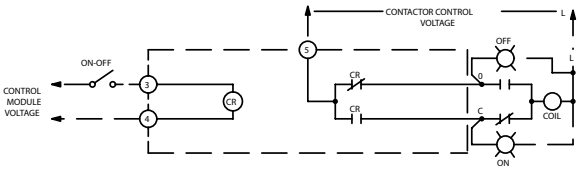
3 WIRE CONTROL ACC. 48



2 WIRE CONTROL ACC. 47



ON-OFF (FORM 3) CONTROL ACC. 49



2 WIRE CONTROL ACC. 47

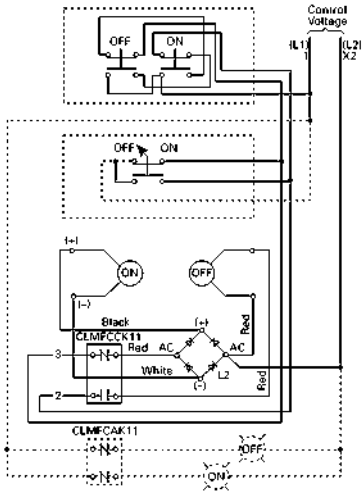
CONNECTIONS TO CONTROL MODULES	
MODULE TERMINAL	CONNECT TO:
1	NOT USED
2	CONT. STATION FOR ACC. 48 & 49
3	CONT. STATION FOR ACC. 47,48 & 49
4	MODULE CONTROL VOLTAGE *
5	CONTACTOR CONTROL VOLTAGE
O	TERMINAL O ON CONTACTOR
C	TERMINAL C ON CONTACTOR

* FOR 24 VDC CONTROL MODULES CONNECT TERMINAL 4 TO NEGATIVE (-)

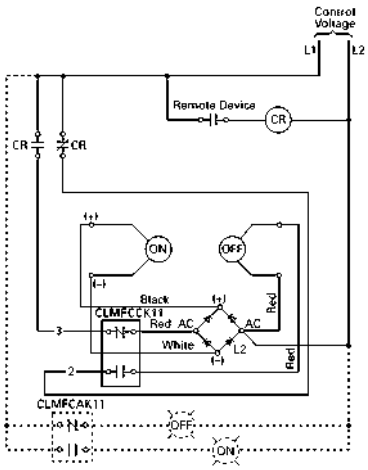
Mechanically Latched 30-400 Amps, Class CLM

Wiring Diagrams

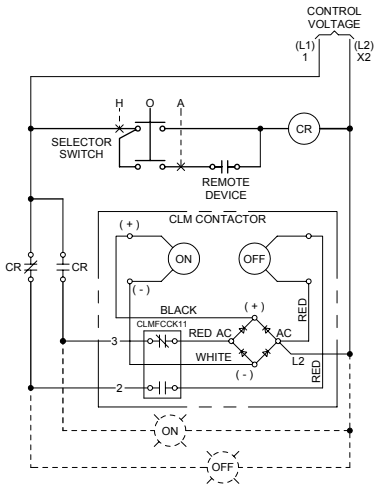
Mechanically Latched, CLM 30–200 Amps①



Connection Diagram for Common/Separate Control with Momentary Pushbutton or ON-OFF Selector Switch **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

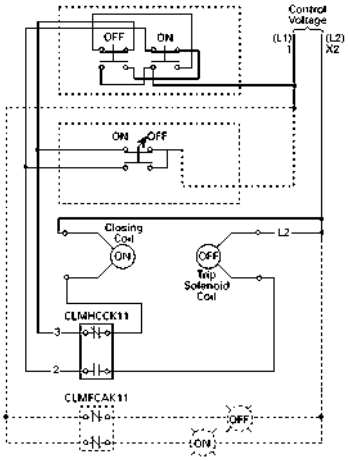


Connection for 2-Wire Control **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

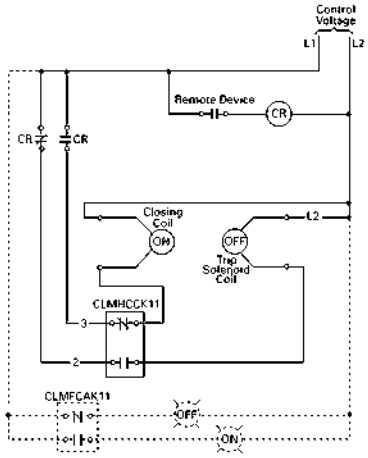


Connection for Hand/Off/Auto Control **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

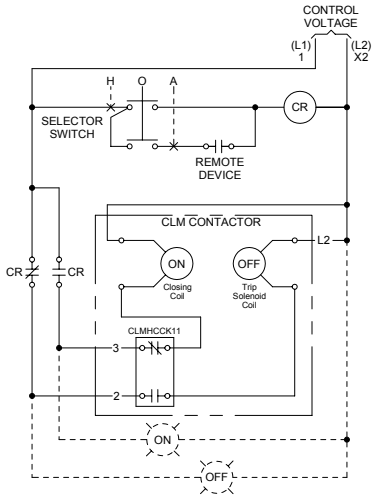
Mechanically Latched Type CLM 300 and 400 Amp①



Connection Diagram for Common/Separate Control with Momentary Pushbutton or ON-OFF Selector Switch **CLMOG** and **CLMOH**



Connection for 2-Wire Control **CLMOG** and **CLMOH**



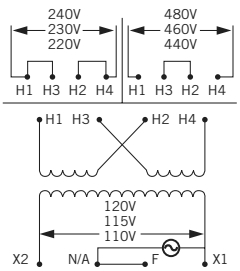
Connection for Hand/Off/Auto Control **CLMOG** and **CLMOH**

① Control relay is required for 2-wire and Hand/Off/Auto Control, as shown in diagram.

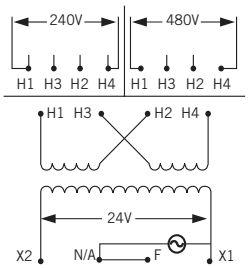
Class MT, MTG

Wiring Diagrams

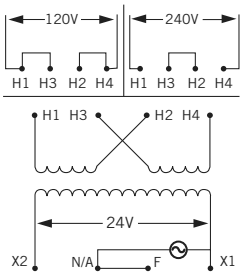
Voltage Letter A①③



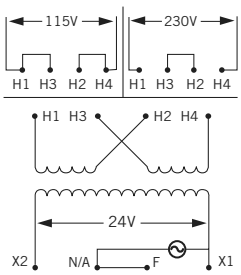
Voltage Letter B②③



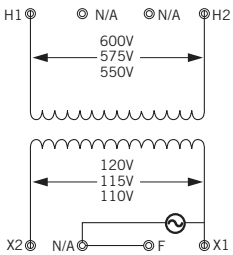
Voltage Letter C②③



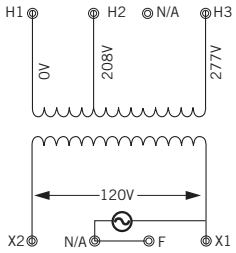
Voltage Letter D②



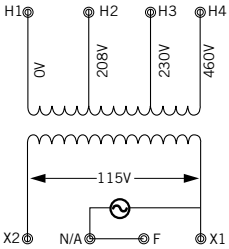
Voltage Letter E①③



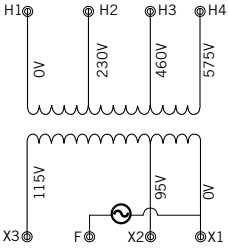
Voltage Letter F①



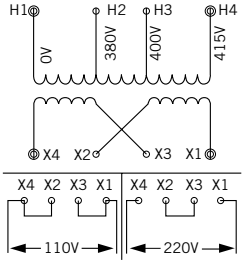
Voltage Letter G①



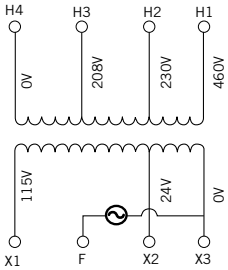
Voltage Letter H



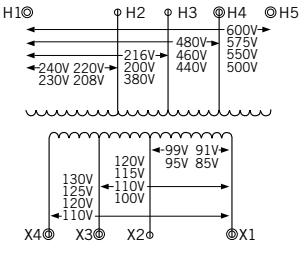
Voltage Letter I



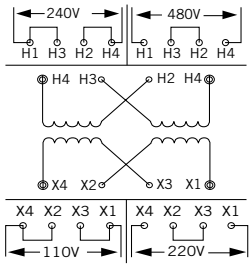
Voltage Letter J②③



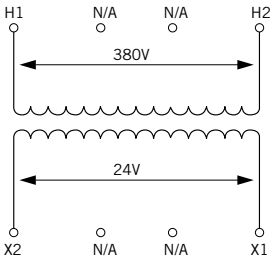
Voltage Letter L



Voltage Letter M①



Voltage Letter P



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.

Notes

SIRIUS HP Rated Magnetic Starters

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Siemens SIRIUS IEC Starters

The SIRIUS IEC Starter is the new generation of IEC HP rated magnetic starters, designed to meet and exceed today's market requirements for HP rated starters.

The new SIRIUS Starters take advantage of the reliability of the SIRIUS line of contactors and overload relays in addition to the new line of SIRIUS ACT 3SU 22mm pilot devices as the standard control device.

As evident in the design and size, all efforts were put in place to offer a new line of starters that exceeds the performance of the previous generation.

The SIRIUS IEC Starters line also offers more price flexibility in the very competitive starters market.

SIRIUS Starters Features:

- CSA approved
- 100HP, 600V max
- Auxiliary contacts available
- Ambient 60°C on contactors
- Fast and simple 3-prong overload contactor connection: no coil extension required
- Standard primary and secondary fusing on control transformers
- Standard 22mm SIRIUS ACT Control Devices

Selection

Catalogue Number Selection Guide

Starter Series	Disconnect Type	Starter Type	Enclosure Type	**Contactor Ref. Number**	Coil Voltage	Overload Relay Setting Range
		page 10/5 - 10/18				page 10/19 - 10/25
V SIRIUS IEC HP rated Starter N SIRIUS IEC NEMA rated Starter	1 Non-combination 2 Circuit breaker combination 3 Non-fusible type 4 Fusible combination	A FVNR B FVR N 2S1W constant or variable torque R 2S1W constant horse-power U 2S2W constant horse-power W 2S2W constant or variable torque	B CSA type 1 EEMAC type 1 general purpose C CSA type 5 EEMAC type 12 dust tight industrial use D CSA type 4 EEMAC type 4 watertight F CSA type 4x EEMAC type 4x watertight corrosion resistant	15 3RT2015 16 3RT2016 17 3RT2017 18 3RT2018 25 3RT2025 26 3RT2026 27 3RT2027 35 3RT2035 36 3RT2036 37 3RT2037 38 3RT2038 45 3RT2045 46 3RT2046 47 3RT2047	C 24V/60Hz 24V/50Hz K 120V/60 Hz 110V/50Hz M 208V/60Hz P 240V/60Hz 220V/50Hz V 460V/60Hz 380V/50Hz T 600V/60Hz Z Others Specify	0A to 4M Standard Class 10 bimetal overload relay 2R to 2U Optional Class 20 electronic overload relay (for 3ph only) 00 Provision for field mounting of overload relay

Selection

Catalogue Number Selection Guide

Power Line Voltage	Control Circuit	Additional Auxiliary Contacts	Pilot Devices				
			Operators		Indicators		
			Operators Type	Legend Plate(s)	Indicator type	Functions	Colour Choice
page 10/20		page 10/21	pages 10/21 - 10/22		page 10/22	page 10/23	
6 600V Max. Distributor Stock 1 120V/1Ph/60Hz 2 208V/3PH/60Hz 3 230V/3PH/60Hz 4 460V/3Ph/60Hz 5 575V/3Ph/60Hz 7 230V/1Ph/60Hz 9 Other Specify	0 Separate control circuit, unfused N Separate control circuit, fused max 250V P Common control with one control fuse (for 120V 1ph only) R Standard control transformer c/w 2 prim. & 1 sec. 120V fuse U Extra 50VA capacity Control Transformer W Extra 100VA capacity Control Transformer 9 Other Specify	0 None E 4 N.O. F 1 N.O. + 1 N.C. J 3 N.O. + 1 N.C. K 2 N.C. L 2 N.O. M 2 N.O. + 2 N.C. 9 Other Specify	0 none 1 or 2 1 push button extended head red 3 or 4 1 twist lock mushroom red 5 or 6 2 push buttons 1-red, 1-green 7 or 8 3 push buttons 1-red, 2-black A or B 2 pos. selector switch C or D 2 pos. selector switch spring return E or F 2 pos. selector switch key operated G or H 3 pos. selector switch J or K 3 pos. selector switch spring return L or M 3 pos. selector switch key operated N or P 3 pos. selector switch spring return key operated T or U 3 pos. selector switch and 2 push buttons START STOP for hand operation 9 Other Specify	0 none A EMERGENCY STOP B STOP C START STOP D ON OFF E to J 3 legend plates for 3 push button K to T 1 legend plate for 2 pos. selector switch 1 to 8 1 legend plate for 3 pos. selector switch X 3 legend plates for 3 pos. selector switch and START STOP push button 9 Other Specify	0 none 5 or 6 Full Voltage 120V LED c/w legend plate(s) 7 or 8 Full Voltage 24V LED c/w legend plate(s)	0 none 1 to 5 1 indicator for 1 function 6 to E 2 indicators for 2 functions F to R 3 indicators for 3 functions	0 none C to F Colour choice for 1 indicator 1 to 6 Colour choice for 2 indicators K to P Colour choice for 3 indicators

Selection

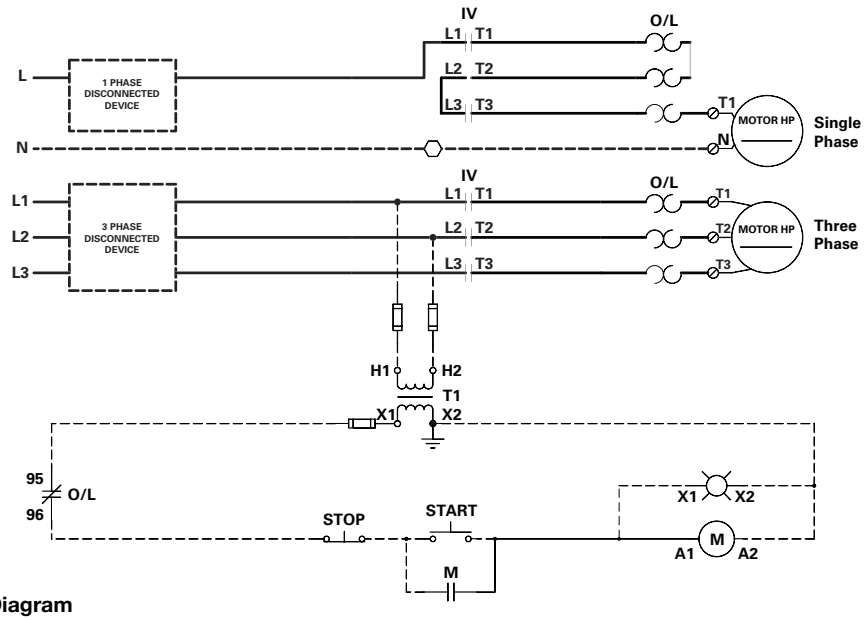
General

Description

Siemens full voltage non-reversing type starters are designed for full voltage across-the-line starting of single or 3-phase squirrel cage motors. They also can be used as the primary control of wound rotor motors.
Combined with short circuit protection, FVNR starters are also offered as combination starters.

- Fusible disconnect type complete with Form I, Class J fuse clips.
- Circuit breaker type or as Non-Fusible Controller.

FVNR starters are available up to 100HP, 600V AC, EEMAC type 1, 12, 4 or 4X sheet metal enclosed. They are an assembly of the proven 3RT contactors and the exclusive 3RU bimetal overload relays.



FVNR Typical Wiring Diagram

Catalogue Number: V 1 A B 1 5 K . . . . . Z . .

- HP Rated Starter
- Disconnect Type
- Starter Type
- Enclosure Type
- Contactor Ref.
- Coil Voltage
- Overload Relay
- Power Line Volt. and Control Circuit
- Additional Aux. Contacts
- Pilot Devices Operators
- Pilot Devices Indicators
- Other options (fuse clips, control & timing relays, metering & protective devices, etc)

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• 1 NO auxiliary contact on all 20A enclosed, with options to add extra contacts • 3 NO + 3 NC auxiliary contacts on all other sizes • Class 10 bimetal overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below. • Add suffix for overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table specify a 120V 60 Hz coil. If a different coil voltage is required, change the "K" (7 digit) as per Coil Suffix Table above.

Non-Combination HP Rated

Enclosed Amps	CSA MAXIMUM HP RATING						Contactor reference number	Aux①, Contacts supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase							CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**		NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
	1/4	3/4	1 1/2	2	3	**5**	15	1	–	V1AB15K..		V1AC15K..	
20	1/3	1	2	3	5	**7 1/2**	16	1	–	V1AB16K..	V0	V1AC16K..	S
	1/2	2	3	3	7 1/2	**10**	17	1	–	V1AB17K..		V1AC17K..	
	1	2	3	5	10	**10**	18	1	–	V1AB18K..		V1AC18K..	
35	1	3	5	5	10	**15**	25	3	3	V1AB25K..	V1	V1AC25K..	S
	2	3	5	7 1/2	15	**20**	26	3	3	V1AB26K..		V1AC26K..	
42	2	5	10	10	20	**25**	27	3	3	V1AB27K..	V1	V1AC27K..	S
	3	5	10	10	25	**25**	28	3	3	V1AB28K..		V1AC28K..	
55	3	7 1/2	10	15	30	**40**	35	3	3	V1AB35K..	V2	V1AC35K..	H2
60	3	10	15	15	40	**50**	36	3	3	V1AB36K..	V2	V1AC36K..	H2
80	5	10	20	20	50	**50**	37	3	3	V1AB37K..	V2	V1AC37K..	H2
90	5	15	20	25	50	**60**	38	3	3	V1AB38K..	V2	V1AC38K..	H2
105	7 1/2	15	25	30	60	**60**	45	3	3	V1AB45K..	V2	V1AC45K..	H2
115	10	–	30	30	75	**75**	46	3	3	V1AB46K..	V2	V1AC46K..	H2
125	10	–	30	40	75	**100**	47	3	3	V1AB47K..	V2	V1AC47K..	H2

NEMA rated available - contact your Siemens representative

① Some Aux contacts may be used for control options, where necessary

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• 1 NO auxiliary contact on all 20A enclosed, with options to add extra contacts • 3 NO + 3NC auxiliary contacts on all other sizes • Class 10 bimetal overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table specify a 120V 60 Hz coil. If a different coil voltage is required, change the "K" (7 digit) as per Coil Suffix Table above.

Circuit Breaker Combination① HP Rated

Enclosed Amps	CSA MAXIMUM HP RATING						Contactor reference number	Aux, Contacts② supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase							CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**		NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
	1/4	3/4	$1^{1/2}$	2	3	**5**	15	1	–	V2AB15K..		V2AC15K..	
20	1/3	1	2	3	5	**$7^{1/2}$**	16	1	–	V2AB16K..	V2	V2AC16K..	H2
	1/2	2	3	3	7 1/2	**10**	17	1	–	V2AB17K..		V2AC17K..	
	1	2	3	5	10	**10**	18	1	–	V2AB18K..		V2AC18K..	
35	1	3	5	5	10	**15**	25	3	3	V2AB25K..	V2	V2AC25K..	H2
	2	3	5	$7^{1/2}$	15	**20**	26	3	3	V2AB26K..		V2AC26K..	
42	2	5	10	10	20	**25**	27	3	3	V2AB27K..	V2	V2AC27K..	H2
	3	5	10	10	25	**25**	28	3	3	V2AB28K..		V2AC28K..	
55	3	$7^{1/2}$	10	15	30	**40**	35	3	3	V2AB35K..	V2	V2AC35K..	H2
60	3	10	15	15	40	**50**	36	3	3	V2AB36K..	V2	V2AC36K..	H2
80	5	10	20	20	50	**50**	37	3	3	V2AB37K..	V2	V2AC37K..	H2
90	5	15	20	25	50	**60**	38	3	3	V2AB38K..	V2	V2AC38K..	H2
105	$7^{1/2}$	15	25	30	60	**60**	45	3	3	V2AB45K..	V4	V2AC45K..	H5
115	10	–	30	30	75	**75**	46	3	3	V2AB46K..	V4	V2AC46K..	H5
125	10	–	30	40	75	**100**	47	3	3	V2AB47K..	V4	V2AC47K..	H5

NEMA rated available - contact your Siemens representative

① Factory will automatically select the circuit breaker based on standard or given motor full-load current and the following:
- Continuous-current rating of a minimum 115% of motor full-load current.
- Trip-setting position is 11 times motor full load current.

② Some aux contacts may be used for control options, where necessary.

Fusible Switch Combination and Non-Fusible Starter

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• 1 NO auxiliary contact on all 20A enclosed, with options to add extra contacts • 3 NO + 3NC auxiliary contacts on all other sizes • Class 10 bimetal overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table specify a 120V 60 Hz coil. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Fusible Switch Combinations and Non-Fusible Starters HP Rated

Enclosed Amps	CSA MAXIMUM HP RATING						FUSE CLIPS Type IJ Amps	Contactor reference number	Aux, Contacts① supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase								CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**			NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
20	1/4	3/4	1 1/2	2	3	**5**	NONE 30	15	1	–	V3AB15K.. V4AB15K..	V2	V3AC15K.. V4AC15K..	H2
	1/3	1	2	3	5	**7 1/2**	NONE 30	16	1	–	V3AB16K.. V4AB16K..		V3AC16K.. V4AC16K..	
	1/2	2	3	3	7 1/2	**10**	NONE 30	17	1	–	V3AB17K.. V4AB17K..		V3AC17K.. V4AC17K..	
35	1	2	3	5	10	**10**	NONE 30	18	1	–	V3AB18K.. V4AB18K..	V2	V3AC18K.. V4AC18K..	H2
	1	3	5	5	10	**15**	NONE 30 60	25	3	3	V3AB25K.. V4AB25K.. V4AB25K..		V3AC25K.. V4AC25K.. V4AC25K..	
	2	3	5	7 1/2	15	**20**	NONE 30 60	26	3	3	V3AB26K.. V4AB26K.. V4AB26K..		V3AC26K.. V4AC26K.. V4AC26K..	
42	2	5	10	10	20	**25**	NONE 30 60	27	3	3	V3AB27K.. V4AB27K.. V4AB27K..	V2	V3AC27K.. V4AC27K.. V4AC27K..	H2
	3	5	10	10	25	**25**	NONE 30 60	28	3	3	V3AB28K.. V4AB28K.. V4AB28K..		V3AC28K.. V4AC28K.. V4AC28K..	
55	3	7 1/2	10	15	30	**40**	NONE 30 60	35	3	3	V3AB35K.. V4AB35K.. V4AB35K..	V2	V3AC35K.. V4AC35K.. V4AC35K..	H2
60	3	10	15	15	40	**50**	NONE 30 60 100	36	3	3	V3AB36K.. V4AB36K.. V4AB36K.. V4AB36K..	V2	V3AC36K.. V4AC36K.. V4AC36K.. V4AC36K..	H2
80	5	10	20	20	50	**50**	NONE 30 60 100	37	3	3	V3AB37K.. V4AB37K.. V4AB37K.. V4AB37K..	V2	V3AC37K.. V4AC37K.. V4AC37K.. V4AC37K..	H2
90	5	15	20	25	50	**60**	NONE 30 60 100	38	3	3	V3AB38K.. V4AB38K.. V4AB38K.. V4AB38K..	V2	V3AC38K.. V4AC38K.. V4AC38K.. V4AC38K..	H2
105	–	–	–	–	–	**60**	NONE 60 100	45	3	3	V3AB45K.. V4AB45K.. V4AB45K..	V4	V3AC45K.. V4AC45K.. V4AC45K..	H5

NEMA rated available - contact your Siemens representative

① Some aux contacts may be used for control options, where necessary.

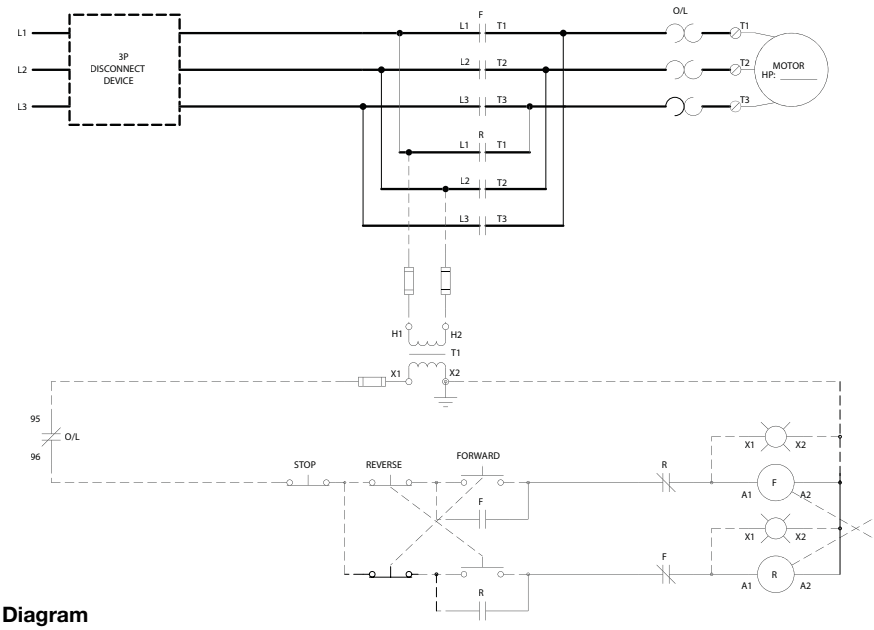
General

Description

Siemens full voltage reversing type starters are designed for full voltage across-the-line starting and reversing of single or 3-phase squirrel cage motors. They also can be used as the primary control of wound rotor motors.
Combined with short circuit protection, FVR starters are also offered as combination starters:

- Fusible disconnect type complete with Form I, Class J fuse clips.
- Circuit breaker type or as Non-Fusible Controller.

FVR - starters are available up to 100HP, 600V AC in EEMAC Type 1, 12, 4 or 4X sheet metal enclosures.
FVR - starters are an assembly of the 3RA Reversing Contactor including electrical and mechanical interlock and a 3RU bimetallic overload relay.



FVNR Typical Wiring Diagram

Catalogue No.: **V1 B B 15K .. ..**

HP Rated Starter

Disconnect Type

Starter Type

Enclosure Type

Contactor Ref.

Coil Voltage

Overload Relay

Power Line Volt. and Control Circuit

Additional Aux. Contacts

Pilot Devices Operators

Pilot Devices Indicators

Other options
(fuse clips, control & timing relays, metering & protective devices, etc)

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• Mechanical and electrical interlock • 2 NO + 2 NC contact block supplied per contactor • Class 10 bimetal overload relays including: - Manual or Automatic reset • - Phase Loss Protection • - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table specify a 120V 60 Hz coil. If a different coil voltage is required, change the "K" (7 digit) as per Coil Suffix Table above.

Non-Combination HP Rated

Enclosed Amps	CSA MAXIMUM HP RATING						Contactor reference number	Aux, Contacts① supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase							CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**		NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
	1/4	3/4	$1^{1/2}$	2	3	**5**	15	2	3	V1BB15K..		V1BC15K..	
20	1/3	1	2	3	5	**$7^{1/2}$**	16	2	3	V1BB16K..	V1	V1BC16K..	S
	1/2	2	3	3	7 1/2	**10**	17	2	3	V1BB17K..		V1BC17K..	
	1	2	3	5	10	**10**	18	2	3	V1BB18K..		V1BC18K..	
35	1	3	5	5	10	**15**	25	3	3	V1BB25K..	V1	V1BC25K..	S
	2	3	5	$7^{1/2}$	15	**20**	26	3	3	V1BB26K..		V1BC26K..	
42	2	5	10	10	20	**25**	27	3	3	V1BB27K..	V1	V1BC27K..	S
	3	5	10	10	25	**25**	28	3	3	V1BB28K..		V1BC28K..	
55	3	$7^{1/2}$	10	15	30	**40**	35	3	3	V1BB35K..	V2	V1BC35K..	H2
60	3	10	15	15	40	**50**	36	3	3	V1BB36K..	V2	V1BC36K..	H2
80	5	10	20	20	50	**50**	37	3	3	V1BB37K..	V2	V1BC37K..	H2
90	5	15	20	25	50	**60**	38	3	3	V1BB38K..	V2	V1BC38K..	H2
105	$7^{1/2}$	15	25	30	60	**60**	45	3	3	V1BB45K..	V3	V1BC45K..	H3
115	10	–	30	30	75	**75**	46	3	3	V1BB46K..	V3	V1BC46K..	H3
125	10	–	30	40	75	**100**	47	3	3	V1BB47K..	V3	V1BC47K..	H3

NEMA rated available - contact your Siemens representative

① Some aux contacts may be used for control options and electrical interlock, where necessary.

Circuit Breaker Combination

SIRIUS

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• Mechanical and electrical interlock • 2 NO + 2 NC contact block supplied per contactor • Class 10 bimetal overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table specify a 120V 60 Hz coil. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Circuit Breaker Combination HP Rated

Enclosed Amps	CSA MAXIMUM HP RATING						Contactor reference number	Aux, Contacts① supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase							CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**		NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
	1/4	3/4	$1^{1/2}$	2	3	**5**	15	2	3	V2BB15K..		V2BC15K..	
20	1/3	1	2	3	5	**$7^{1/2}$**	16	2	3	V2BB16K..	V3	V2BC16K..	H3
	1/2	2	3	3	$7^{1/2}$	**10**	17	2	3	V2BB17K..		V2BC17K..	
	1	2	3	5	10	**10**	18	2	3	V2BB18K..		V2BC18K..	
35	1	3	5	5	10	**15**	25	3	3	V2BB25K..	V3	V2BC25K..	H3
	2	3	5	$7^{1/2}$	15	**20**	26	3	3	V2BB26K..		V2BC26K..	
42	2	5	10	10	20	**25**	27	3	3	V2BB27K..	V3	V2BC27K..	H3
	3	5	10	10	25	**25**	28	3	3	V2BB28K..		V2BC28K..	
55	3	$7^{1/2}$	10	15	30	**40**	35	3	3	V2BB35K..	V3	V2BC35K..	H3
60	3	10	15	15	40	**50**	36	3	3	V2BB36K..	V3	V2BC36K..	H3
80	5	10	20	20	50	**50**	37	3	3	V2BB37K..	V3	V2BC37K..	H3
90	5	15	20	25	50	**60**	38	3	3	V2BB38K..	V3	V2BC38K..	H3
105	$7^{1/2}$	15	25	30	60	**60**	45	3	3	V2BB45K..	V4	V2BC45K..	H5
115	10	–	30	30	75	**75**	46	3	3	V2BB46K..	V4	V2BC46K..	H5
125	10	–	30	40	75	**100**	47	3	3	V2BB47K..	V4	V2BC47K..	H5

NEMA rated available - contact your Siemens representative

① Some aux contacts may be used for control options and electrical interlock, where necessary.

Fusible Switch Combination and Non-Fusible Starter

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• Mechanical and electrical interlock • 2 NO + 2 NC contact block supplied per contactor • Class 10 bimetallic overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table specify a 120V 60 Hz coil. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Fusible Switch Combinations and Non-Fusible Starters HP Rated

Enclosed Amps	CSA MAXIMUM HP RATING						FUSE CLIPS Type IJ Amps	Contactor reference number	Aux, Contacts① supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase								CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**			NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
20	1/4	3/4	1 1/2	2	3	**5**	NONE 30	15	2	3	V3BB15K.. V4BB15K..	V3	V3BC15K.. V4BC15K..	H2
	1/3	1	2	3	5	**7 1/2**	NONE 30	16	2	3	V3BB16K.. V4BB16K..		V3BC16K.. V4BC16K..	
	1/2	2	3	3	7 1/2	**10**	NONE 30	17	2	3	V3BB17K.. V4BB17K..		V3BC17K.. V4BC17K..	
	1	2	3	5	10	**10**	NONE 30	18	2	3	V3BB18K.. V4BB18K..		V3BC18K.. V4BC18K..	
35	1	3	5	5	10	**15**	NONE 30 60	25	3	3	V3BB25K.. V4BB25K.. V4BB25K..		V3BC25K.. V4BC25K.. V4BC25K..	
	2	3	5	7 1/2	15	**20**	NONE 30 60	26	3	3	V3BB26K.. V4BB26K.. V4BB26K..		V3BC26K.. V4BC26K.. V4BC26K..	
42	2	5	10	10	20	**25**	NONE 30 60	27	3	3	V3BB27K.. V4BB27K.. V4BB27K..		V3BC27K.. V4BC27K.. V4BC27K..	
	3	5	10	10	25	**25**	NONE 30 60	28	3	3	V3BB28K.. V4BB28K.. V4BB28K..		V3BC28K.. V4BC28K.. V4BC28K..	
55	3	7 1/2	10	15	30	**40**	NONE 30 60	35	3	3	V3BB35K.. V4BB35K.. V4BB35K..		V3BC35K.. V4BC35K.. V4BC35K..	
60	3	10	15	15	40	**50**	NONE 30 60 100	36	3	3	V3BB36K.. V4BB36K.. V4BB36K.. V4BB36K..		V3BC36K.. V4BC36K.. V4BC36K.. V4BC36K..	
80	5	10	20	20	50	**50**	NONE 30 60 100	37	3	3	V3BB37K.. V4BB37K.. V4BB37K.. V4BB37K..		V3BC37K.. V4BC37K.. V4BC37K.. V4BC37K..	
90	5	15	20	25	50	**60**	NONE 30 60 100	38	3	3	V3BB38K.. V4BB38K.. V4BB38K.. V4BB38K..		V3BC38K.. V4BC38K.. V4BC38K.. V4BC38K..	
105	–	–	–	–	–	**60**	NONE 60 100	45	3	3	V3BB45K.. V4BB45K.. V4BB45K..	V4	V3BC45K.. V4BC45K.. V4BC45K..	H5

NEMA rated available - contact your Siemens representative

① Some aux contacts may be used for control options and electrical interlock, where necessary.

Two Speed Starters

Selection

General

Description

Full-voltage ac magnetic two speed controllers are designed to control reconnectable squirrel-cage induction motors for operation at two different constant speeds depending on the construction of the motor. These controllers are available in combination and non-combination types. The speed of an induction motor is a function of the supply frequency and the number of poles of the motor winding. To obtain different speeds with a fixed supply frequency, the number of magnetic poles of the motor must be changed. Characteristics at any speed are similar to those of a single-speed motor. There are two basic methods of providing multiple-pole combinations:

Separate-Winding Motors have a separate winding for each speed. This motor construction is slightly more expensive, but the controller is relatively simple, and a wide variety of speeds can be selected. Separate winding motors with delta connected motor windings require one corner to be opened on each unused winding.

Consequent-Pole Motors have a single winding for two speeds. Extra winding taps are brought out for reconnection for different number of stator poles. While the motor costs less, the controller is more complicated, and speed range is limited to a 2-to-1 ratio.

Torque Characteristics

Multi-speed motors are divided into three application groups:

Constant Torque - HP output varies directly with speed, while torque remains constant. A constant-torque motor rated 100 HP at 1200 rpm delivers 50 HP at 600 rpm. This type is applicable to conveyors, mills, dough mixers, reciprocating pumps, and other similar loads.

Variable Torque - HP varies as a square of speed, while torque varies directly with speed. A variable-torque motor rated 100 HP at 1200 rpm delivers 25 HP at 600 rpm. This type is applicable to systems having fan or centrifugal pump characteristics.

Constant Horsepower - Motor delivers rated HP at all full-load speeds, while torque varies inversely to speed. This type is applicable to cutting tools, lathes, spindles, etc.

Selection and Ordering

Starter ratings are based on the maximum HP at the highest speed. Electrical interlocking is furnished on all multi-speed starters to preclude connecting more than one speed winding at the same time. Both mechanical and electrical interlocking is provided wherever there is a possibility of short circuiting of the line.

Standard wiring permits starting the motor on any speed. To change a running motor to a higher speed, operator presses the desired speed button. To change to a lower speed, operator must press “stop” button before selecting the lower speed; allowing time for the motor to slow down, this reduces shock on driven machinery and surges on the power system.

When control at various speeds is by means of two-wire control devices, such as limit, pressure or float switches,deceleration relays should be used,unless both the motor manufacturer and the machine manufacturer have been consulted.

Catalogue No.: **V 1 W B 1 5 K . . . . . .**

- HP Rated Starter
- Disconnect Type
- W –2 speed-2 windings constant or variable torque
- U – 2 speed-2 windings constant horsepower
- N – 2 speed-1 winding constant or variable torque
- R – 2 speed-1 winding constant horsepower
- Enclosure Type
- Contactor Ref.
- Coil Voltage
- Overload Relay
- Power Line Volt. and Control Circuit
- Additional Aux. Contacts
- Pilot Devices Operators
- Pilot Devices Indicators
- Other options (fuse clips, control & timing relays, metering & protective devices, etc)

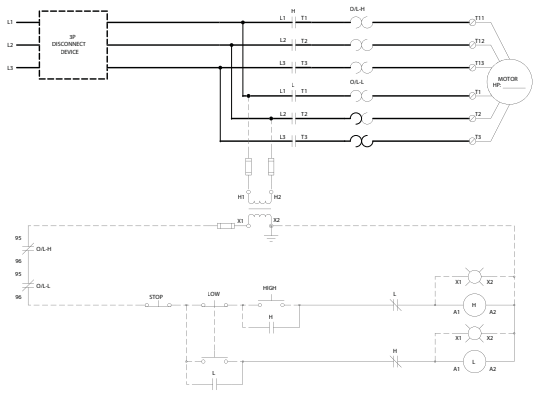
Non-Combination, Constant or Variable Torque

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• 2 NO + 2 NC contact block supplied per contactor • Class 10 bimetallic overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for both overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table below specify 120V 60 Hz coils. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Non-Combination HP Rated										For Constant Horsepower, 'W' is replaced with 'U'			
Enclosed Amps	CSA MAXIMUM HP RATING						Contactor reference number	Aux, Contacts① supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase							CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**		NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
	1/4	3/4	$1^{1/2}$	2	3	**5**	15	3	2	V1WB15K..		V1WC15K..	
20	1/3	1	2	3	5	**$7^{1/2}$**	16	3	2	V1WB16K..	V1	V1WC16K..	S
	1/2	2	3	3	$7^{1/2}$	**10**	17	3	2	V1WB17K..		V1WC17K..	
	1	2	3	5	10	**10**	18	3	3	V1WB18K..	V1	V1WC18K..	S
35	1	3	5	5	10	**15**	25	3	3	V1WB25K..	V2	V1WC25K..	H2
	2	3	5	$7^{1/2}$	15	**20**	26	3	3	V1WB26K..		V1WC26K..	
42	2	5	10	10	20	**25**	27	3	3	V1WB27K..	V2	V1WC27K..	H2
	3	5	10	10	25	**25**	28	3	3	V1WB28K..		V1WC28K..	
55	3	$7^{1/2}$	10	15	30	**40**	35	3	3	V1WB35K..	V2	V1WC35K..	H2
60	3	10	15	15	40	**50**	36	3	3	V1WB36K..	V2	V1WC36K..	H2
80	5	10	20	20	50	**50**	37	3	3	V1WB37K..	V2	V1WC37K..	H2
90	5	15	20	25	50	**60**	38	3	3	V1WB38K..	V2	V1WC38K..	H2
105	$7^{1/2}$	15	25	30	60	**60**	45	3	3	V1WB45K..	V3	V1WC45K..	H3
115	10	–	30	30	75	**75**	46	3	3	V1WB46K..	V3	V1WC46K..	H3
125	10	–	30	40	75	**100**	47	3	3	V1WB47K..	V3	V1WC47K..	H3

NEMA rated available - contact your Siemens representative



2S2W Typical Wiring Diagram

① Some aux contacts may be used for control options and electrical interlock, where necessary.

Circuit Breaker Combination, Constant or Variable Torque

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• 2 NO + 2 NC contact block supplied per contactor • Class 10 bimetallic overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for both overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table below specify 120V 60 Hz coils. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Circuit Breaker Combination① HP Rated										For Constant Horsepower, 'W' is replaced with 'U'			
Enclosed Amps	CSA MAXIMUM HP RATING						Contactor reference number	Aux, Contacts② supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase							CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**		NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
	1/4	3/4	1 1/2	2	3	**5**	15	3	2	V2WB15K..		V2WC15K..	
20	1/3	1	2	3	5	**7 1/2**	16	3	2	V2WB16K..	V3	V2WC16K..	H3
	1/2	2	3	3	7 1/2	**10**	17	3	2	V2WB17K..		V2WC17K..	
	1	2	3	5	10	**10**	18	3	3	V2WB18K..		V2WC18K..	
35	1	3	5	5	10	**15**	25	3	3	V2WB25K..	V3	V2WC25K..	H3
	2	3	5	7 1/2	15	**20**	26	3	3	V2WB26K..		V2WC26K..	
42	2	5	10	10	20	**25**	27	3	3	V2WB27K..	V3	V2WC27K..	H3
	3	5	10	10	25	**25**	28	3	3	V2WB28K..		V2WC28K..	
55	3	7 1/2	10	15	30	**40**	35	3	3	V2WB35K..	V3	V2WC35K..	H3
60	3	10	15	15	40	**50**	36	3	3	V2WB36K..	V3	V2WC36K..	H3
80	5	10	20	20	50	**50**	37	3	3	V2WB37K..	V3	V2WC37K..	H3
90	5	15	20	25	50	**60**	38	3	3	V2WB38K..	V3	V2WC38K..	H3
105	7 1/2	15	25	30	60	**60**	45	3	3	V2WB45K..	V4	V2WC45K..	H5
115	10	–	30	30	75	**75**	46	3	3	V2WB46K..	V4	V2WC46K..	H5
125	10	–	30	40	75	**100**	47	3	3	V2WB47K..	V4	V2WC47K..	H5

NEMA rated available - contact your Siemens representative

① Factory will automatically select the circuit breaker based on standard or given motor full-load current and the following:
- Continuous-current rating of a minimum 115% of motor full-load current.
- Trip-setting position is 11 times motor full load current.

② Some aux contacts may be used for control options and electrical interlock, where necessary.

Fusible Switch Combination & Non-Fusible Starter, Constant or Variable Torque

SIRIUS

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• 2 NO + 2 NC contact block supplied per contactor. • Class 10 bimetallic overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for both overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table below specify 120V 60 Hz coils. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Fusible Switch Combinations and Non-Fusible Starters HP Rated											For Constant Horsepower, 'W' is replaced with 'U'			
Enclosed Amps	CSA MAXIMUM HP RATING						FUSE CLIPS Type IJ Amps	Contactor reference number	Aux, Contacts① supplied as standard per contactor		Enclosure Sheet Metal			
	1 phase		3 phase								CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	115V	230V	208V	230V	460V	**575V**			NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
20	1/4	3/4	1 1/2	2	3	**5**	NONE 30	15	3	2	V3WB15K.. V4WB15K..	V3	V3WC15K.. V4WC15K..	H3
	1/3	1	2	3	5	**7 1/2**	NONE 30	16	3	2	V3WB16K.. V4WB16K..		V3WC16K.. V4WC16K..	
	1/2	2	3	3	7 1/2	**10**	NONE 30	17	3	2	V3WB17K.. V4WB17K..		V3WC17K.. V4WC17K..	
	1	2	3	5	10	**10**	NONE 30	18	2	2	V3WB18K.. V4WB18K..		V3WC18K.. V4WC18K..	
35	1	3	5	5	10	**15**	NONE 30 60	25	2	2	V3WB25K.. V4WB25K.. V4WB25K..		V3WC25K.. V4WC25K.. V4WC25K..	
	2	3	5	7 1/2	15	**20**	NONE 30 60	26	2	2	V3WB26K.. V4WB26K.. V4WB26K..		V3WC26K.. V4WC26K.. V4WC26K..	
42	2	5	10	10	20	**25**	NONE 30 60	27	2	2	V3WB27K.. V4WB27K.. V4WB27K..		V3WC27K.. V4WC27K.. V4WC27K..	
	3	5	10	10	25	**25**	NONE 30 60	28	2	2	V3WB28K.. V4WB28K.. V4WB28K..		V3WC28K.. V4WC28K.. V4WC28K..	
55	3	7 1/2	10	15	30	**40**	NONE 30 60	35	2	2	V3WB35K.. V4BWB35K.. V4WB35K..	V3	V3WC35K.. V4WC35K.. V4WC35K..	H3
60	3	10	15	15	40	**50**	NONE 30 60 100	36	2	2	V3WB36K.. V4WB36K.. V4WB36K.. V4WB36K..	V3	V3WC36K.. V4WC36K.. V4WC36K.. V4WC36K..	H3
80	5	10	20	20	50	**50**	NONE 30 60 100	37	2	2	V3WB37K.. V4WB37K.. V4WB37K.. V4WB37K..	V3	V3WC37K.. V4WC37K.. V4WC37K.. V4WC37K..	H3
90	5	15	20	25	50	**60**	NONE 30 60 100	38	2	2	V3WB38K.. V4WB38K.. V4WB38K.. V4WB38K..	V3	V3WC38K.. V4WC38K.. V4WC38K.. V4WC38K..	H3
105	–	–	–	–	–	**60**	NONE 60 100	45	2	2	V3AB45K.. V4AB45K.. V4AB45K..	V4	V3AC45K.. V4AC45K.. V4AC45K..	H5

NEMA rated available - contact your Siemens representative

① Some aux contacts may be used for control options and electrical interlock, where necessary.

Non-Combination, Constant or Variable Torque

SIRIUS

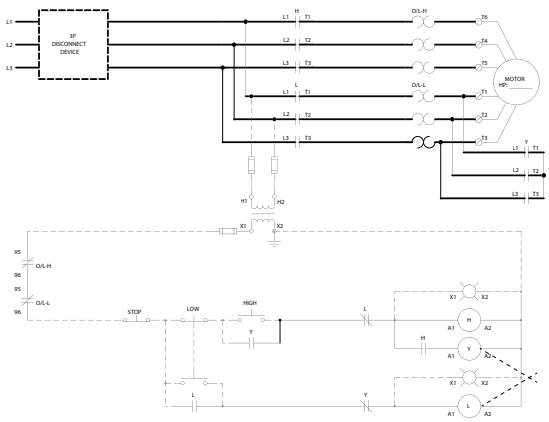
Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• Mechanical and electrical interlock • 2 NO + 2 NC contact block supplied per contactor • Class 10 bimetal overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for both overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table below specify 120V 60 Hz coils. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Non-Combination HP Rated								For Constant Horsepower, 'N' is replaced with 'R'			
Enclosed Amps	3 phase				Contactor reference number	Aux, Contacts① supplied as standard per contactor		Enclosure Sheet Metal			
								CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	208V	230V	460V	**575V**		NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
	$1^{1/2}$	2	3	**5**	15	2	3	V1NB15K..		V1NC15K..	
20	2	3	5	**$7^{1/2}$**	16	2	3	V1NB16K..	V2	V1NC16K..	H2
	3	3	$7^{1/2}$	**10**	17	2	3	V1NB17K..		V1NC17K..	
	3	5	10	**10**	18	2	3	V1NB18K..		V1NC18K..	
35	5	5	10	**15**	25	3	3	V1NB25K..	V2	V1NC25K..	H2
	5	$7^{1/2}$	15	**20**	26	3	3	V1NB26K..		V1NC26K..	
42	10	10	20	**25**	27	3	3	V1NB27K..	V2	V1NC27K..	H2
	10	10	25	**25**	28	3	3	V1NB28K..		V1NC28K..	
55	10	15	30	**40**	35	3	3	V1NB35K..	V3	V1NC35K..	H3
60	15	15	40	**50**	36	3	3	V1NB36K..	V3	V1NC36K..	H3
80	20	20	50	**50**	37	3	3	V1NB37K..	V3	V1NC37K..	H3
90	20	25	50	**60**	38	3	3	V1NB38K..	V3	V1NC38K..	H3
105	25	30	60	**60**	45	3	3	V1NB45K..	V4	V1NC45K..	H5
115	30	30	75	**75**	46	3	3	V1NB46K..	V4	V1NC46K..	H5
125	30	–	75	**100**	47	3	3	V1NB47K..	V4	V1NC47K..	H5

NEMA rated available - contact your Siemens representative



2S1W Constant or Variable Torque Typical Wiring Diagram

① Some aux contacts may be used for control options and electrical interlock, where necessary.

Circuit Breaker Combination, Constant or Variable Torque

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• Mechanical and electrical interlock • 2 NO + 2 NC contact block supplied per contactor • Class 10 bimetallic overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for both overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table below specify 120V 60 Hz coils. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Circuit Breaker Combination① HP Rated

Enclosed Amps	3 phase				Contactor reference number	Aux, Contacts② supplied as standard per contactor		Enclosure Sheet Metal			
								CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	208V	230V	460V	**575V**		NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
	$1^{1/2}$	2	3	**5**	15	2	3	V2NB15K..		V2NC15K..	
20	2	3	5	**$7^{1/2}$**	16	2	3	V2NB16K..	V3	V2NC16K..	H3
	3	3	$7^{1/2}$	**10**	17	2	3	V2NB17K..		V2NC17K..	
	3	5	10	**10**	18	2	3	V2NB18K..		V2NC18K..	
35	5	5	10	**15**	25	3	3	V2NB25K..	V3	V2NC25K..	H3
	5	$7^{1/2}$	15	**20**	26	3	3	V2NB26K..		V2NC26K..	
42	10	10	20	**25**	27	3	3	V2NB27K..	V3	V2NC27K..	H3
	10	10	25	**25**	28	3	3	V2NB28K..		V2NC28K..	
55	10	15	30	**40**	35	3	3	V2NB35K..	V3	V2NC35K..	H3
60	15	15	40	**50**	36	3	3	V2NB36K..	V3	V2NC36K..	H3
80	20	20	50	**50**	37	3	3	V2NB37K..	V3	V2NC37K..	H3
90	20	25	50	**60**	38	3	3	V2NB38K..	V3	V2NC38K..	H3
105	25	30	60	**60**	45	3	3	V2NB45K..	V4	V2NC45K..	H5
115	30	30	75	**75**	46	3	3	V2NB46K..	V4	V2NC46K..	H5
125	30	–	75	**100**	47	3	3	V2NB47K..	V4	V2NC47K..	H5

NEMA rated available - contact your Siemens representative

① Factory will automatically select the circuit breaker based on standard or given motor full-load current and the following:
- Continuous-current rating of a minimum 115% of motor full-load current.
- Trip-setting position is 11 times motor full load current.

② Some aux contacts may be used for control options and electrical interlock, where necessary.

Fusible Switch Combination & Non-Fusible Starters, Constant or Variable Torque

Selection

Standard Features	Ordering Information Required	Coil Voltage Codes		
		ACV 60 Hz	ACV 50 Hz	Coil Suffix
• Mechanical and electrical interlock • 2 NO + 2 NC contact block supplied per contactor • Class 10 bimetallic overload relays including: - Manual or Automatic reset - Phase Loss Protection - Separate Trip and Alarm contact • All enclosures are designed to accept a standard sized control transformer • All enclosures have provisions for up to 4 pilot devices	• Select basic type nr. from table below • Add suffix for both overload relay setting range from page 10/19 • Add suffix for factory modification from page 10/20 - 10/24	24 120 208 240 460 600	20 110 – 220 380 –	C K M P V T
		other voltages and frequencies are available upon request		

The type numbers in the selection table below specify 120V 60 Hz coils. If a different coil voltage is required, change the “K” (7 digit) as per Coil Suffix Table above.

Fusible Switch Combinations and Non-Fusible Starters HP Rated

Enclosed Amps	3 phase				FUSE CLIPS Type IJ Amps	Contactor reference number	Aux, Contacts① supplied as standard per contactor		Enclosure Sheet Metal			
									CSA / EEMAC Type 1 General Purpose Enclosure		CSA Type 5 / EEMAC Type 12 Industrial Use	
	200V	230V	460V	**575V**			NO	NC	**Catalogue Number**	Encl. Fig.	**Catalogue Number**	Encl. Fig.
20	$1^{1/2}$	2	3	**5**	NONE 30	15	2	3	V3NB15K.. V4NB15K..	V3	V3NC15K.. V4NC15K..	H3
	2	3	5	**$7^{1/2}$**	NONE 30	16	2	3	V3NB16K.. V4NB16K..		V3NC16K.. V4NC16K..	
	3	3	$7^{1/2}$	**10**	NONE 30	17	2	3	V3NB17K.. V4NB17K..		V3NC17K.. V4NC17K..	
	3	5	10	**10**	NONE 30	18	2	3	V3NB18K.. V4NB18K..		V3NC18K.. V4NC18K..	
35	5	5	10	**15**	NONE 30 60	25	2	2	V3NB25K.. V4NB25K.. V4NB25K..		V3NC25K.. V4NC25K.. V4NC25K..	
	5	$7^{1/2}$	15	**20**	NONE 30 60	26	2	2	V3NB26K.. V4NB26K.. V4NB26K..		V3NC26K.. V4NC26K.. V4NC26K..	
42	10	10	20	**25**	NONE 30 60	27	2	2	V3NB27K.. V4NB27K.. V4NB27K..		V3NC27K.. V4NC27K.. V4NC27K..	
	10	10	25	**25**	NONE 30 60	28	2	2	V3NB28K.. V4NB28K.. V4NB28K..		V3NC28K.. V4NC28K.. V4NC28K..	
55	10	15	30	**40**	NONE 30 60	35	2	2	V3NB35K.. V4NB35K.. V4NB35K..		V3NC35K.. V4NC35K.. V4NC35K..	
60	15	15	40	**50**	NONE 30 60 100	36	2	2	V3NB36K.. V4NB36K.. V4NB36K.. V4NB36K..		V3NC36K.. V4NC36K.. V4NC36K.. V4NC36K..	
80	20	20	50	**50**	NONE 30 60 100	37	2	2	V3NB37K.. V4NB37K.. V4NB37K.. V4NB37K..		V3NC37K.. V4NC37K.. V4NC37K.. V4NC37K..	
90	20	25	50	**60**	NONE 30 60 100	38	2	2	V3NB38K.. V4NB38K.. V4NB38K.. V4NB38K..		V3NC38K.. V4NC38K.. V4NC38K.. V4NC38K..	

NEMA rated available - contact your Siemens representative

① Some aux contacts may be used for control options and electrical interlock, where neccessary

Selection

Append to Catalogue Number V4AB15K _ _	The overload relay calibration is based on a motor service factor (S.F.) of 1.15. If the service factor is 1.0, multiply motor F.L.C. by 0.92 before making selection.							
Adjustment Range Amps	Contactor Reference in Type No. (5. and 6. digit)							
	15 / 16 / 17/ 18		25 / 26 / 27		35 / 36 / 37 / 38		45 / 46 / 47	
	Overload Type	Overload Suffix	Overload Type	Overload Suffix	Overload Type	Overload Suffix	Overload Type	Overload Suffix
0.11 - 0.16	3RU2116	0A						
0.14 - 0.2	3RU2116	0B						
0.18 - 0.25	3RU2116	0C						
0.22 - 0.32	3RU2116	0D						
0.28 - 0.4	3RU2116	0E						
0.35 - 0.5	3RU2116	0F						
0.45 - 0.63	3RU2116	0G						
0.55 - 0.8	3RU2116	0H						
0.7 - 1.0	3RU2116	0J						
0.9 - 1.25	3RU2116	0K						
1.1 - 1.6	3RU2116	1A						
1.4 - 2	3RU2116	1B						
1.8 - 2.5	3RU2116	1C	3RU2126	1C				
2.2 - 3.2	3RU2116	1D	3RU2126	1D				
2.8 - 4	3RU2116	1E	3RU2126	1E				
3.5 - 5	3RU2116	1F	3RU2126	1F				
4.5 - 6.3	3RU2116	1G	3RU2126	1G				
5.5 - 8	3RU2116	1H	3RU2126	1H	3RU2136	1H		
7 - 10	3RU2116	1J	3RU2126	1J	3RU2136	1J		
9 - 12.5	3RU2116	1K	3RU2126	1K	3RU2136	1K		
11 - 16	3RU2116	4A	3RU2126	4A	3RU2136	4A		
14 - 20			3RU2126	4B	3RU2136	4B		
17 - 22			3RU2126	4C	3RU2136	—		
18 - 25			3RU2126	—	3RU2136	4D		
20 - 25			3RU2126	4D	3RU2136	—		
23 - 28			3RU2126	4N	3RU2136	—		
22 - 32			3RU2126	—	3RU2136	4E		
27 - 32			3RU2126	4E	3RU2136	—	3RU2146	—
28 - 40			3RU2126	—	3RU2136	4F	3RU2146	4F
30 - 36			3RU2126	4P	3RU2136	—	3RU2146	—
34 - 40			3RU2126	4F	3RU2136	—	3RU2146	—
36 - 45					3RU2136	4G	3RU2146	—
36 - 50					3RU2136	—	3RU2146	4H
40 - 50					3RU2136	4H	3RU2146	—
47 - 57					3RU2136	4Q	3RU2146	—
45 - 63					3RU2136	—	3RU2146	4J
54 - 65					3RU2136	4J	3RU2146	—
57 - 75					3RU2136	—	3RU2146	4K
62 - 73					3RU2136	4K	3RU2146	—
70 - 80					3RU2136	4R	3RU2146	—
70 - 90							3RU2146	4L
80 - 100							3RU2146	4M

Other Options	Suffix
Provision only for field amounting of overload relay	00
Substitute bimetal overload relay with solid state type 3RB2, Class 20	□□①

① Contact your Siemens representative for quote. Designators will be added based on requested configuration.

Power Line Voltage and Control Circuit Options

Selection

Power Line Voltage Selection		Append to Catalogue Number i.e.: V4AB15K1E_ _						
		120V	208V	230V	460V	575V	600V Max.	Other
Single Phase, 60HZ (L1, N)	Suffix	1	–	–	–	–	–	–
Single Phase, 60Hz (L1, L2)		–	–	7	–	–	–	–
Three Phases, 60Hz (L1, L2, L3)		–	2	3	4	5	–	–
Three Phases, 600V Max, 60Hz(L1, L2, L3)		–	–	–	–	–	6	–
Specify voltage, frequency, No. of phase & neutral if required		–	–	–	–	–	–	3

Note: Power line voltage is an important data to be known in order to provide a starter properly connected for single phase or three phase load.

Control Circuit Selection

Power Line Voltage Selection	Append to Catalogue Number i.e.: V4AB15K1E_ _	
	Contactor Reference No.	Suffix
Separate Control Circuit, Unfused		0
Separate Control Circuit, Fused, 1 fuse max. 250V		N
Common Control with 1 Control Fuse, max. 250V (for 120V control only)		P
Control Circuit Transformer: Standard Capacity		R
Control Circuit Transformer: Extra Capacity May require larger enclosure Consult Siemens	 additional 50VA 100VA	 U W
Special transformer voltages Specify		9

Circuit Breaker Combination, Constant or Variable Torque

Selection

Additional Auxiliary Contacts

Append to Catalogue Number ie: V4AB15K1E5R_			
		Suffix	
Std. auxiliary contacts as per starter selection table		0	Options available for FVNR type starters with contactor ref numbers: 15 / 16 / 17 / 18 Other configurations will come with additional 2 N.O. + 2 N.C. aux block as standard
Addition of:	2 N.O.	L	
	2 N.C.	F	
	4 N.O.	K	
	3 N.O. + 1 N.C.	E	
	2 N.O. + 2 N.C.	J	
		M	

Pilot Devices – Operators

Legend Plates are supplied as standard with Operators

Append to Catalogue Number i.e.: V4AB30K1E5R0_ _						
Operator Description		First Suffix①	EEMAC Enclosure Type	English Legend	Second Suffix	French Legend
None		0	1/12 4	–	–	–
Pushbutton						
1 pushbutton momentary	extended head red 1 N.C.	1 (2)	1/12 4	STOP	B	ARRET
twist lock maintained	mushroom red 1 N.C.	3 (4)	1/12 4	EMERGENCY STOP	A	ARRET D'URGENCE
2 pushbuttons momentary	1 - red 1 N.C. 1 - green 1 N.O.	5 (6)	1/12 4	START STOP ON OFF	C D	MARCHE ARRET EN HORS
3 pushbuttons momentary	1 - red 1 N.C. E 2 - black each 1 N.O.	7 (8)	1/12 4	FORWARD REVERSE STOP HIGH LOW STOP UP DOWN STOP FAST SLOW STOP OPEN CLOSE STOP	E F G H J	AVANT ARRIERE ARRET HAUTE BASSE ARRET EN HAUT EN BAS ARRET VITE LENTEMENT ARRET OUVRIR FERMER ARRET

① When ordering French legend plates use the "first suffix" in brackets.

Pilot Devices – Operators (continued)

Legend Plates are supplied as standard with Operators

Append to Catalogue Number i.e.: V4AB30K1E5R0_ _

Operator Description		First Suffix①	EEMAC Enclosure Type	English Legend	Second Suffix	French Legend
2-position selector switch						
2 position selector switch maintained	1 N.O.	A (B)	1/12 4	STOP START OFF ON HAND AUTO FOR REV HIGH LOW UP DOWN FAST SLOW OPEN CLOSE LOCAL REMOTE	K L M N P Q R S T	ARRET MARCHE HORS EN MAN AUTO AVANT ARRIERE HAUTE BASSE HAUT BAS VITE LENT OUVRIR FERMER LOCAL A DIST.
2 position selector switch spring return	1 N.O.	C (D)	1/12 4			
2 position selector switch key operated maintained	1 N.O.	E (F)	1/12 4			
3-position selector switch						
3 position selector switch maintained	2 x 1 N.O.	G (H)	1/12 4	HAND OFF AUTO FOR OFF REV HIGH OFF LOW UP OFF DOWN FAST OFF SLOW OPEN OFF CLOSE LOCAL OFF REMOTE TEST OFF AUTO	1 2 3 4 5 6 7 8	MAN ARRET AUTO AVANT ARRET ARRIERE HAUTE ARRET BASSE HAUT ARRET BAS VITE ARRET LENT OUVRIR ARRET FERMER LOCAL HORS A DIST. ESSAI ARRET AUTO
3 position selector switch 1 spring return from both sides	2 x 1 N.O.	J (K)	1/12 4			
3 position selector switch key operated maintained	2 x 1 N.O.	L (M)	1/12 4			
3 position selector switch key operated spring return from both sides	2 x 1 N.O.	N (P)	1/12 4			
2 pushbuttons & 3-position selector switch						
3 position selector switch maintained c/w START STOP pushbuttons momentary green	2 x 1 N.O. 1 N.C. 1 N.O.	T (U)	1/12 4	HAND OFF AUTO for selector switch and START STOP fotpushbutton	X	MAN ARRET AUTO for selector switch and MARCHE ARRET for push-buttons

Pilot Devices – Indicators

Append to Catalogue Number i.e.: V4AB15K1E5R05C _ _ _

Pilot Lights Description	First Suffix①	Enclosure Type
No Pilot Lights	0	1/4/12
LED c/w legend plate(s) 120V extended lfie	5 (6)	1/12 4
LED c/w legend plate(s) 24V extended life	7 (8)	1/12 4
LED without legend plate(s) 120V extended life	C	1/12 4
LED without legend plate(s) 24V extended life	D	1/12 4

① When ordering French legend plates use the "first suffix" in brackets.

Selection

Pilot Lights

Legend Plates and Lens Colours

Table A - One Pilot Light

LEGEND PLATES			LEGEND COLOURS						
English	French		Red	Yellow	Green	Blue			Other Specify
RUN	MARCHE	Suffix	1C	1D	1E	–			19
ON	EN CIRCUIT		2C	2D	2E	–			29
OFF	ARRÊT		3C	3D	3E	–			39
O/L TRIPPED	SURCHARGE		4C	4D	–	–			49
READY	PRÊT		5C	5D	5E	5F			59
Other Legend Plates Specify			9C	9D	9E	9F			99

Table B - Two Pilot Lights

LEGEND PLATES			LEGEND COLOURS						
English	French		Red Red	Green Green	Red Yellow	Red Green	Green Red	Green Yellow	Other Specify
RUN ▪ OFF	MARCHE ▪ ARRÊT	Suffix	–	–	–	64	65	–	69
ON ▪ OFF	EN CIRCUIT ▪ ARRÊT		–	–	–	74	75	–	79
RUN ▪ O/L TRIPPED	MARCHE ▪ SURCHARGE		–	–	83	–	85	86	89
ON ▪ O/L TRIPPED	EN CIRCUIT ▪ SURCHARGE		–	–	A3	–	A5	A6	A9
FORWARD ▪ REVERSE	AVANT ▪ ARRIERE		B1	B2	–	B4	B5	–	B9
FAST ▪ SLOW	VITE ▪ LENTEMENT		C1	C2	–	C4	C5	–	C9
UP ▪ DOWN	EN HAUT ▪ EN BAS		D1	D2	–	D4	D5	–	D9
HIGH ▪ LOW	HAUT ▪ BAS		E1	E2	–	E4	E5	–	E9
Other Legend Plates Specify			91	92	93	94	95	96	99

Table B - Three Pilot Lights

LEGEND PLATES			LEGEND COLOURS						
English	French		Red Red Green	Green Green Red	Red Red Yellow	Green Green Yellow	Red Green Yellow	Green Red Yellow	Other Specify
RUN ▪ OFF ▪ O/L TRIPPED	MARCHE ▪ ARRÊT ▪ SURCHARGE	Suffix	–	–	–	–	FN	FP	F9
ON ▪ OFF ▪ O/L TRIPPED	EN CIRCUIT ▪ ARRÊT ▪ SURCHARGE		–	–	–	–	GN	GP	G9
FORWARD ▪ REVERSE ▪ OFF	AVANT ▪ ARRIERE ▪ ARRÊT		HK	HJ	–	–	–	–	H9
FAST ▪ SLOW ▪ OFF	VITE ▪ LENTEMENT ▪ ARRÊT		JK	JJ	–	–	–	–	J9
UP ▪ DOWN ▪ OFF	EN HAUT ▪ EN BAS ▪ ARRÊT		KK	KJ	–	–	–	–	K9
HIGH ▪ LOW ▪ OFF	HAUT ▪ BAS ▪ ARRÊT		LK	LJ	–	–	–	–	L9
FORWARD ▪ REVERSE ▪ O/L TRIPPED	AVANT ▪ ARRIERE ▪ SURCHARGE		–	MJ	ML	MM	MN	MP	M9
FAST ▪ SLOW ▪ O/L TRIPPED	VITE ▪ LENTEMENT ▪ SURCHARGE		–	NJ	NL	NM	NN	NP	N9
UP ▪ DOWN ▪ O/L TRIPPED	EN HAUT ▪ EN BAS ▪ SURCHARGE		–	PJ	PL	PM	PN	PP	P9
HIGH ▪ LOW ▪ O/L TRIPPED	HAUT ▪ BAS ▪ SURCHARGE		–	RJ	RL	RM	RN	RP	R9
Other Legend Plates Specify			9K	9J	9L	9M	9N	9P	99

Power Line Voltage and Control Circuit Options

SIRIUS

Selection

Miscellaneous Options:

Specify by suffix and description as required.

Append to Catalogue No i.e.: V4AB15K1E5R05C165-Z _ _ _ _ _ _

Description		Suffix
Disconnect Devices		
Auxiliary Contacts, not wired		
Fusible or Non-Fusible	1 N.O. & 1 N.C.	AX
Disconnect Switch	2 N.O. & 2 N.C.	AY
Circuit Breaker	1 SPDT	AW
	2 SPDT	AX
	1 SPDT & 1 Alarm SPDT	AY
Metering①		
Installed & wired, EEMAC Type 1 & 12		
Ammeter, 3-1/2" Panel Type②		
c/w one 5A sec. CT		
One extra CT		MA
Two extra CT's		M0
		MT
Voltmeter, 3-1/2" Panel Type②		
c/w One 0-750V Pt fused		MV
3-Phase Selector Switch		MS
Elapsed Time Meter ME		ME
Phase Failure and Phase Sequence Monitoring Relay		MD
Control Relays and Timers①		
4 Pole Relay, A600		
2 N.O. & 2 N.C.	not wired	K2
	wired	K5
3 N.O. & 1 N.C.	not wired	K3
	wired	K6
4 N.O.	not wired	K4
	wired	K7
Time Delay Relays①		
1-SPDT, B300, max 240V AC coil		
ON-Delay adj. up to 100s	not wired	S1
	wired	S2
OFF - Delay adj. up to 100s	not wired	S3
	wired	S4
Thermistor Tripping Unit①		
max. 240V AC coil,	Auto Reset	HA
installed and wired	Manual Reset	HM
Surge Suppressors for Contactors and Control Relays		SX
Wire Markers		WM

Description		Suffix
Drip Shield available for hinged cover enclosures only (V2, V3, V4)		DS
Identification Name Plate		
Lamacoid	1-25 characters	N1
	25-50 characters	N2

Fuse Clips:

All Fusible Disconnect Combination Starters are supplied with Form I, Class J fuse clips as standard.

Fuse Clip Size	Form IJ
	Suffix
30A	PD (time-delay)
60A	PJ (fast-acting)
100A	

Terminal Blocks

Description	Suffix
Wired 1 point terminal	T1
Wired 2 point terminal	T2
Wired 3 point terminal	T3
Wired 4 point terminal	T4
Wired 5 point terminal	T5
Wired 6 point terminal	T6
Wired 7 point terminal	T7
Wired 8 point terminal	T8
Wired 9 point terminal	T9
Wired 10 point terminal	T0
Unwired 1 point terminal	A
Unwired 2 point terminal	B
Unwired 3 point terminal	C
Unwired 4 point terminal	D
Unwired 5 point terminal	E
Unwired 6 point terminal	F
Unwired 7 point terminal	G
Unwired 8 point terminal	H
Unwired 9 point terminal	J
Unwired 10 point terminal	K

① Option may require larger enclosure. Consult Siemens.
② All requests must be accompanied by complete meter specifications. Availability may be limited.

Contactors and Contactor Assemblies (Gold, Silver and Bronze)

Selection

Siemens SIRIUS

Pre-assembled starter packages are the simple way to order starters:

- 15HP, 600V max, non-combination
- Standard 1 NO contact on models with 15, 16 and 17 contact reference numbers and 1 NO + 1 NC on models with 25 contact reference number
- Ambient 60˚C on contactors
- Fast and simple 3-prong overload/ contactor connection: no coil extension required
- Standard primary and secondary fusing on control transformers
- Standard Plastic 22mm SIRIUS ACT control and pilot devices①

SIRIUS GOLD, SILVER AND BRONZE

Starter Packages offer these standard features:

GOLD

- 50 VA 600/120V control transformer
- 3 pos. selector switch H.O.A.
- Pilot light 120V red

SILVER

- 50 VA 600/120V control transformer
- Start/Stop pushbuttons
- Pilot light 120V red

BRONZE

- No control transformer
- No pilot devices

Siemens modular line of quality Motor Control Products meets and exceeds international standards and are built to serve global markets. Here's why choosing a pakage is the smarter way to select a starter:

Saves Time

No more lengthy navigating through product catalogues! GOLD, SILVER and BRONZE starters offer and easy 2 step approach to selecting your starter.

1. Select the starter based on Horsepower (HP) and Line Voltage.
2. Select the appropriate overload relay.

Then it's ready to install. All this convenience is now available off your distributor's shelves.

Saves Money

This unique solution for the industry's most popular full voltage non-reversing starters is competitively priced compared to other custom-engineered starters.

Saves Hassle

Ease of selection. Off the shelf availability. Competitive pricing. It's easy to see why GOLD, SILVER and BRONZE pakages are the ideal solution. For serious performance and serious convenience, take a SIRIUS approach to starters.

① Field installation kits for BRONZE models will include Metal 22mm SIGNUM control devices

Contactors and Contactor Assemblies (Gold, Silver and Bronze)

Selection

Non-Combination Starter Package Selection EEMAC Type 1 Enclosed

Catalogue Number	Pilot Devices	Control Transformer w/ Primary and Secondary fuses	CSA Maximum HP Rating 3 phase				Contactor Reference Number	Enclosure Reference Number
			208V	240V	480V	600V		
GOLD3R-5-600 GOLD3R-3-480 GOLD3R-2-240 GOLD3R-1.5-208	3 Position Selector Switch & Pilot Light	Included 120V sec.	$1^{1/2}$	2	3	5	15	V0
GOLD3R-7.5-600 GOLD3R-5-480 GOLD3R-3-240 GOLD3R-2-208	3 Position Selector Switch & Pilot Light	Included 120V sec.	2	3	5	$7^{1/2}$	16	V0
GOLD3R-10-600 GOLD3R-7.5-480 GOLD3R-3-240 GOLD3R-3-208	3 Position Selector Switch & Pilot Light	Included 120V sec.	3	3	$7^{1/2}$	10	17	V0
GOLD3R-15-600 GOLD3R-10-480 GOLD3R-5-240 GOLD3R-5-208	3 Position Selector Switch & Pilot Light	Included 120V sec.	5	5	10	15	25	V1
SILVER3R-5-600 SILVER3R-3-480 SILVER3R-2-240 SILVER3R-1.5-208	Start/Stop Pushbuttons & Pilot Light	Included 120V sec.	$1^{1/2}$	2	3	5	15	V0
SILVER3R-7.5-600 SILVER3R-5-480 SILVER3R-3-240 SILVER3R-2-208	Start/Stop Pushbuttons & Pilot Light	Included 120V sec.	2	3	5	$7^{1/2}$	16	V0
SILVER3R-10-600 SILVER3R-7.5-480 SILVER3R-3-240 SILVER3R-3-208	Start/Stop Pushbuttons & Pilot Light	Included 120V sec.	3	3	$7^{1/2}$	10	17	V0
SILVER3R-15-600 SILVER3R-10-480 SILVER3R-5-240 SILVER3R-5-208	Start/Stop Pushbuttons & Pilot Light	Included 120V sec.	5	5	10	15	25	V1
BRONZE3R-5-600 BRONZE3R-7.5-600 BRONZE3R-10-600 BRONZE3R-15-600	None	None	$1^{1/2}$ 2 3 5	2 3 3 5	3 5 $7^{1/2}$ 10	5 $7^{1/2}$ 10 15	15 16 17 25	V0 V0 V0 V1

Overload Relay Selection Chart

FLA Adjustment Range Amps	Catalogue Number	
	15/16/17	25
0.11-0.16	3RU2116-0AB0	–
0.14-0.2	3RU2116-0BB0	–
0.18-0.25	3RU2116-0CB0	–
0.22-0.32	3RU2116-0DB0	–
0.28-0.4	3RU2116-0EB0	–
0.35-0.5	3RU2116-0FB0	–
0.45-0.63	3RU2116-0GB0	–
0.55-0.8	3RU2116-0HB0	–
0.7-1	3RU2116-0JB0	–
0.9-1.25	3RU2116-0KB0	–
1.1-1.6	3RU2116-1AB0	–
1.4-2	3RU2116-1BB0	–
1.8-2.5	3RU2116-1CB0	3RU2126-1CB0
2.2-3.2	3RU2116-1DB0	3RU2126-1DB0
2.8-4	3RU2116-1EB0	3RU2126-1EB0
3.5-5	3RU2116-1FB0	3RU2126-1FB0
4.5-6.3	3RU2116-1GB0	3RU2126-1GB0
5.5-8	3RU2116-1HB0	3RU2126-1HB0
7-10	3RU2116-1JB0	3RU2126-1JB0
9-12.5	3RU2116-1KB0	3RU2126-1KB0
11-16	–	3RU2126-4AB0

Selection

Pilot Devices - Suitable for Installation on BRONZE models

Pushbuttons			LEGEND PLATES English	LEGEND PLATES French	Catalogue Number
2 - pushbuttons momentary	1 - red, ext. 1 - green, flush	1 NC 1 NO	STOP START	ARRÊT MARCHE	**VFMK50**
Selector Switches					
2 - position maintained		black lever 1 NO	ON OFF	EN CIRCUIT ARRÊT	**VFMKCO**
3 - position maintained		black lever 2 x 1 NO	HAND OFF AUTO	MAN ARRÊT AUTO	**VFMKG0**
Pilot Lights					
Full Voltage 120 V incandescent		c/w 2 lenses red & green	None		**VFMK01**

Control Circuit Transformers c/w 2 - Primary and 1 Secondary Fuse

Rating at 60 Hz VA	Catalogue Number			
	Primary/Secondary Voltage			
	208/120	240/120	480/120	600/120
50	VFMKT2050	VFMKT4050	VFMKT4050	VFMKT6050
100①	VFMKT2100	VFMKT4100	VFMKT4100	VFMKT6100

① Minimum V1 size enclosure required.

Dimensions

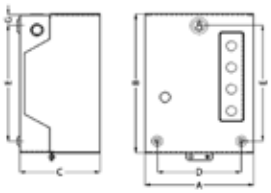


Figure 1

Non-Combination Starter EEMAC Type 1 (Lift-Off Cover)										
Figure 1		Width	Height	Depth	Mfg.-Holes					No. of Holes
		A	B	C	D	E	F	G	H	
V0	MM	161.70	244.7	146	110.3	174	–	25.7	–	3
	INCH	6.37	9.64	5.75	4.34	6.85	–	1.01	–	
V1	MM	241.5	320.9	178.3	187.3	268.1	–	24	–	3
	INCH	9.51	12.64	7.02	7.38	10.55	–	0.95	–	

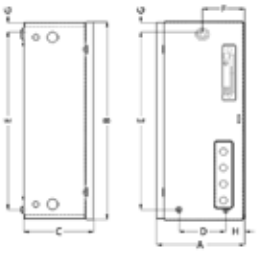


Figure 2

Non-Combination/Combination Starter EEMAC Type 1										
V2	MM	264	610	210	140	548	127	28	57	3
	INCH	10.39	24	8.25	5.5	21.58	5	1.1	2.25	
V3	MM	410	640	209.6	280	578	–	28	60	4
	INCH	16.14	25.2	8.25	11	22.76	–	1.1	2.36	
V4	MM	510	900	279.6	380	838	–	28	60	4
	INCH	20.08	35.43	11.01	14.96	32.99	–	1.1	2.36	

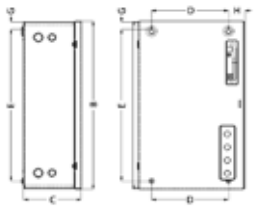


Figure 3

Non-Combination Starter EEMAC Type 12										
S	MM	254	304.8	203.2	203.2	323.85	–	93.53	25.46	4
	INCH	10	12	8	8	12.75	–	0.38	1	

Figure 4

Non-Combination/Combination Starter EEMAC Type 12										
H2	MM	254	610	209.6	165	648	127	12	44.5	3
	INCH	10	24	8.25	6.5	25.51	5	0.47	1.75	
H3	MM	400	640	209.6	311	678	200	12	44.5	3
	INCH	15.75	25.2	8.25	12.24	26.69	7.87	0.47	1.75	
H5	MM	500	900	280	411	955.35	–	25	44.5	4
	INCH	19.69	35.43	11.02	16.18	37.61	–	0.98	1.75	

Note: All dimensions shown for reference purpose only.
Not to be used for construction purposes.

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Actuators and indicators, 22 mm, round, metal, shiny
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Push Button Units and Indicator Lights

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16 mm mounting diameter, molded-plastic

3SB2 Page

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22 mm mounting diameter, plastic black

SIRIUS ACT – 3SU1 Page

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22 mm mounting diameter, plastic with metal matte front ring

SIRIUS 3SU1, plastic round Page

Selection and ordering data

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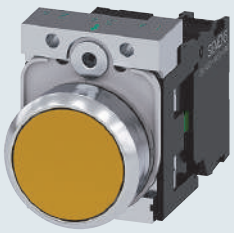
22 mm mounting diameter, metal shiny



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30 mm mounting diameter, metal matte

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22mm enclosures and communication devices

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Push Button Units and Indicator Lights

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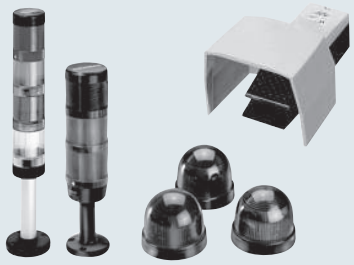

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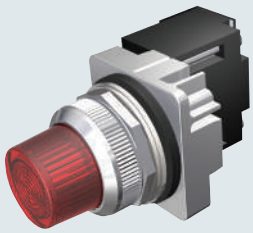
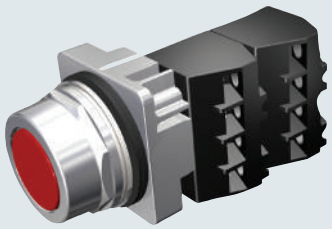
NEMA 30.5 mm mounting diameter, corrosion resistant, watertight & oiltight





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30.5 mm heavy duty control stations, Type 4/4X/12/13 encl.

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3SB2, Mounting Diameter 16 mm

General data

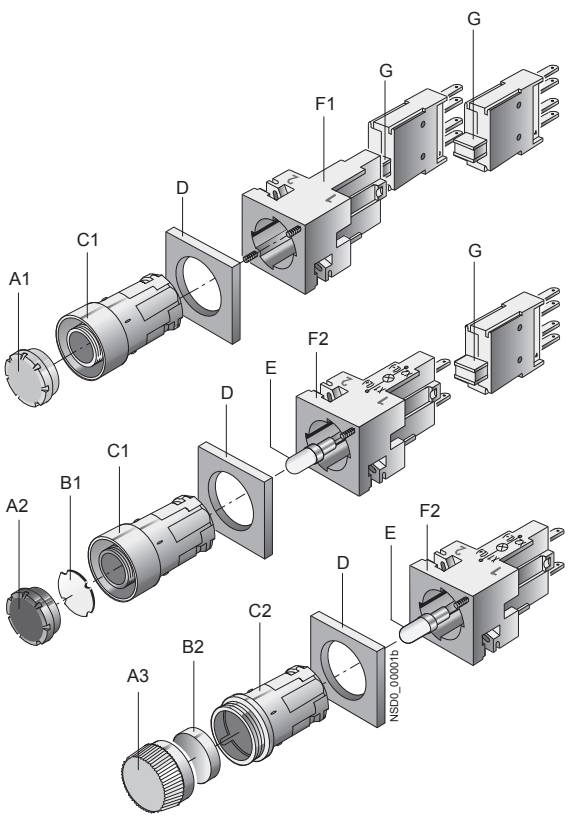
Overview

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.

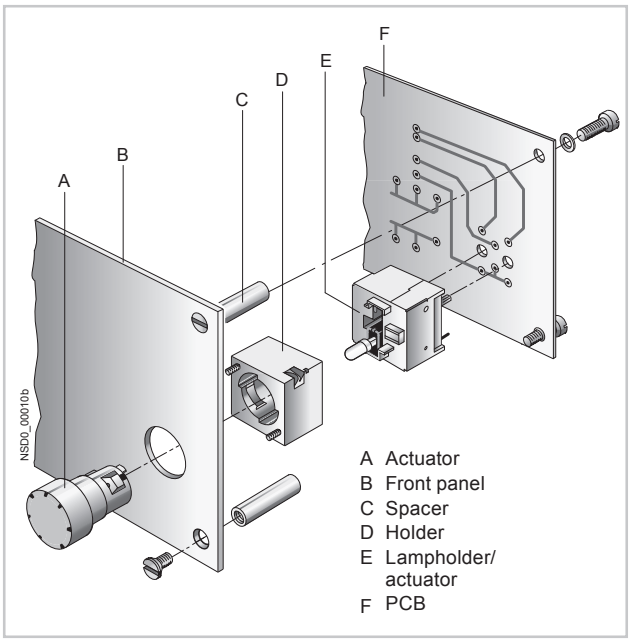
Version with flat connector



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 × 0.8 mm solder pins of length 3.5 mm.



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
Contact blocks and lamp holders		
Standards		IEC 60947-5-1, EN 60947-5-1 IEC 60947-5-5, EN 60947-5-5
Rated insulation voltage U_i	V	250
Conventional thermal current I_{th}	A	10
Rated operational current I_e at rated operational voltage U_e		
• Alternating current AC-12		
- At U_e = 24 ... 230 V	A	10
• Alternating current AC-15		
- At U_e = 24 ... 230 V	A	4
• Direct current DC-12		
- At U_e = 24 V	A	6
- At U_e = 60 V	A	5
- At U_e = 110 V	A	2.5
- At U_e = 230 V	A	1
• Direct current DC-13		
- At U_e = 24 V	A	3
- At U_e = 60 V	A	1.5
- At U_e = 110 V	A	0.7
- At U_e = 230 V	A	0.3
Contact stability		
• Test voltage/test current		5 V/1 mA
Lamps		
• Bases		Wedge base W2× 4.6 d
• Rated voltage	V	6, 12, 24, 30, 48, 60
• Rated power, max.	W	1
Short-circuit protection weld-free according to IEC 60947-5-1		
• DIAZED fuse links, utilization category gG		10 A TDz, 16 A Dz
• Miniature circuit breaker with C characteristic according to IEC 60898		10 A
Electrical endurance		
• For utilization category AC-15 with 3RT10 15 to 3RT10 26 contactors		10×10^6 operating cycles
Mechanical endurance		10×10^6 operating cycles
Degree of protection acc. to IEC 60529		
• Connection of contact blocks and lamp holders behind the front panel		IP00
• Contact chambers of the contact blocks behind the front panel		IP40
Finger-safe 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.
Data according to UL and CSA		
Rated voltage		
• Contact blocks	V	250 AC
• Indicator light (lamp with wedge base W2× 4.6 d)	V	60; 1 W
Uninterrupted current	A	5
Switching capacity		B 300, R 300
Actuators and indicators		
Mechanical endurance		
• Push Buttons		10×10^6 operating cycles
• Actuators, rotary or maintained		3×10^5 operating cycles
• Illuminated push buttons		3×10^6 operating cycles
Climatic withstand capability		Climate-proof; suitable for marine applications
Ambient temperature		
• During operation, non-illuminated devices and complete with LED	°C	–25 ... +70
• During operation, devices with incandescent lamp	°C	–25 ... +60
• During storage, transport	°C	–40 ... +80
Degree of protection acc. to IEC 60529		
• Actuators and indicators		IP65
• Actuators and indicators with protective cap		IP67
Protective measures		
• For mounting in metal front plates and enclosures		The actuators and lens assemblies must not be included in the protective measures.
• For fitting into enclosures with total insulation		The protective measure "Total insulation" is retained.
Shock resistance acc. to IEC 60068-2-27		
• Shock amplitude		≤ 50 *g*
• Shock duration	ms	11
• Shock form		Half-sine

More technical information see Reference manual "Commanding and Signaling Devices".

3SB2, Mounting Diameter 16 mm

General data

Configuration

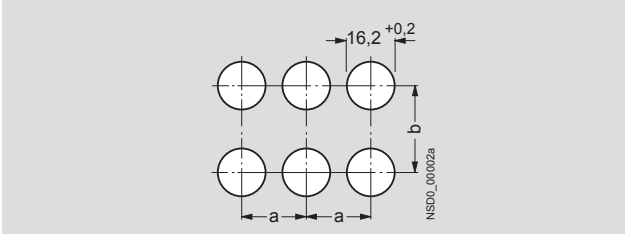
Design

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:

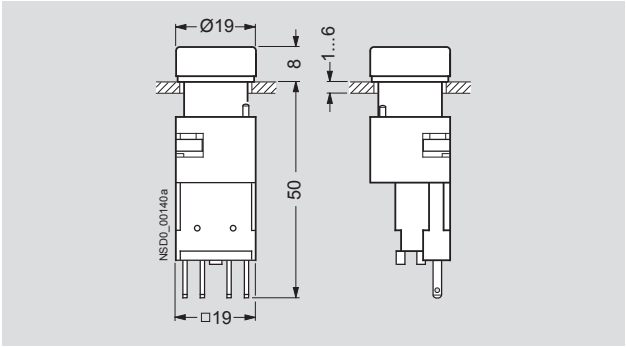
Mounting dimensions according to EN 50007
(not applicable to EMERGENCY-STOP mushroom push buttons)



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

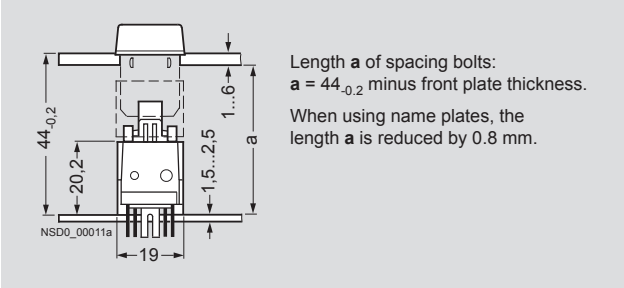
The command point comprises the actuator – e.g. 3SB2 push button, illuminated push button or indicator light –, which is mounted in the front plate, and a contact block and a lamp holder which are soldered to the PCB. For this purpose, the contact blocks and lamp holders are fitted with 0.8 mm × 0.8 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.

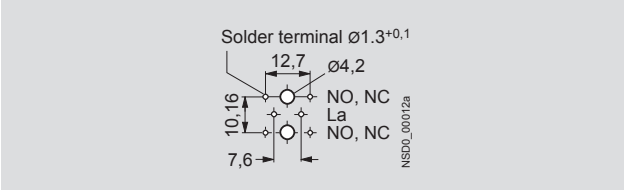


Illuminated push button with solder pin connection

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

Pushbutton with flat button

Illuminated push button with raised button

EMERGENCY-STOP mushroom push button

Version	Contact blocks	DT	Color of handle	Flat connectors Order No.	PS
Push buttons with flat button	1 NO		Black	**3SB22 02-0AB01**	1 unit
	1 NC		Black	**3SB22 03-0AB01**	1 unit
	1 NC		Red	**3SB22 03-0AC01**	1 unit
	1 NO		Yellow	**3SB22 02-0AD01**	1 unit
	1 NO		Green	**3SB22 02-0AE01**	1 unit
	1 NO		Blue	**3SB22 02-0AF01**	1 unit
	1 NO		White	**3SB22 02-0AG01**	1 unit
	1 NO		Clear[1]	**3SB22 02-0AH01**	1 unit
Illuminated push buttons with flat button Lamp holder W2 x 4.6 d[2]	1 NC		Red	**3SB22 07-0AC01**	1 unit
	1 NO		Yellow[1]	**3SB22 06-0AD01**	1 unit
	1 NO		Green	**3SB22 06-0AE01**	1 unit
	1 NO		Blue	**3SB22 06-0AF01**	1 unit
	1 NO		Clear[1]	**3SB22 06-0AH01**	1 unit
Illuminated push buttons with flat button Lamp holder W2 x 4.6 d with incandescent lamp 24 V	1 NC		Red	**3SB22 27-0AC01**	1 unit
	1 NO		Yellow[1]	**3SB22 26-0AD01**	1 unit
	1 NO		Green	**3SB22 26-0AE01**	1 unit
	1 NO		Blue	**3SB22 26-0AF01**	1 unit
	1 NO		Clear[1]	**3SB22 26-0AH01**	1 unit
Push buttons with raised button	1 NO		Black	**3SB22 02-0LB01**	1 unit
	1 NC		Red	**3SB22 03-0LC01**	1 unit
	1 NO		Yellow	**3SB22 02-0LD01**	1 unit
	1 NO		Blue	**3SB22 02-0LF01**	1 unit
	1 NO		Clear[1]	**3SB22 02-0LH01**	1 unit
Illuminated push buttons with raised button Lamp holder W2 x 4.6 d[2]	1 NC		Red	**3SB22 07-0LC01**	1 unit
	1 NO		Yellow[1]	**3SB22 06-0LD01**	1 unit
	1 NO		Green	**3SB22 06-0LE01**	1 unit
	1 NO		Blue	**3SB22 06-0LF01**	1 unit
	1 NO		Clear[1]	**3SB22 06-0LH01**	1 unit
Illuminated push buttons with raised button Lamp holder W2 x 4.6 d with incandescent lamp 24 V	1 NC		Red	**3SB22 27-0LC01**	1 unit
	1 NO		Yellow[1]	**3SB22 26-0LD01**	1 unit
	1 NO		Green	**3SB22 26-0LE01**	1 unit
	1 NO		Blue	**3SB22 26-0LF01**	1 unit
	1 NO		Clear[1]	**3SB22 26-0LH01**	1 unit
EMERGENCY-STOP mushroom push buttons acc. to ISO 13850, maintained[3] **Latches automatically when pressed; unlatches by turning the mushroom head anticlockwise,** **with yellow name plate,** **with inscription "NOT-HALT"**	1 NC ⊕[4]		Red	**3SB22 03-1AC01**	1 unit

1) Inscription is possible by inserting a label.

2) For wedge base lamps see "Accessories", page 11/18.

3) The mushroom push button cannot be combined with 3SB29 02-0AB name plate or 3SB29 02-0AA single frame.

4) 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 Order No.	PS
Selector switches, 2 switch positions Switching sequence O-I, 62° operating angle, maintained	1 NO	Black		**3SB22 02-2AB01**	1 unit
	1 NO	Red		**3SB22 02-2AC01**	1 unit
	1 NO	Green		**3SB22 02-2AE01**	1 unit
	1 NO	White		**3SB22 02-2AG01**	1 unit
Selector switches, 3 switch positions Switching sequence I-O-II, 2 × 62° operating angle, maintained	1 NO, 1 NO	Black		**3SB22 10-2DB01**	1 unit
	1 NO, 1 NO	Red		**3SB22 10-2DC01**	1 unit
	1 NO, 1 NO	Green		**3SB22 10-2DE01**	1 unit
	1 NO, 1 NO	White		**3SB22 10-2DG01**	1 unit
Selector switches, 3 switch positions Switching sequence I-O-II, 2 × 50° operating angle, momentary, Spring return from left and right	1 NO, 1 NO	Black		**3SB22 10-2EB01**	1 unit
	1 NO, 1 NO	Red		**3SB22 10-2EC01**	1 unit
	1 NO, 1 NO	Green		**3SB22 10-2EE01**	1 unit
	1 NO, 1 NO	White		**3SB22 10-2EG01**	1 unit

CES key-operated switch

Version	Contact blocks	Lock No.	Key removal position	DT	Flat connectors Order No.	PS
CES key-operated switches, 2 switch positions Switching sequence O-I, 62° operating angle, maintained	1 NO	SB2	O		**3SB22 02-4LA01**	1 unit
	1 NO	SB2	O + I		**3SB22 02-4LB01**	1 unit
CES key-operated switches, 3 switch positions Switching sequence I-O-II, 2 × 62° operating angle, maintained	1 NO, 1 NO	SB2	O		**3SB22 10-4PA01**	1 unit
	1 NO, 1 NO	SB2	I + O + II		**3SB22 10-4PB01**	1 unit
CES key-operated switches, 3 switch positions Switching sequence I-O-II, 2 × 50° operating angle, momentary, Spring return from left and right	1 NO, 1 NO	SB2	O		**3SB22 10-4QA01**	1 unit

Indicator light

Version	Color of screw lens	DT	Flat connectors Order No.	PS
Indicator lights Lamp holder W2 x 4.6 d without lamp[1]	Red		**3SB22 04-6BC06**	1 unit
	Yellow		**3SB22 04-6BD06**	1 unit
	Green		**3SB22 04-6BE06**	1 unit
	White		**3SB22 04-6BG06**	1 unit
	Clear		**3SB22 04-6BH06**	1 unit
Indicator lights Lamp holder W2 x 4.6 d with incandescent lamp 24 V	Red		**3SB22 24-6BC06**	1 unit
	Yellow		**3SB22 24-6BD06**	1 unit
	Green		**3SB22 24-6BE06**	1 unit
	White		**3SB22 24-6BG06**	1 unit
	Clear		**3SB22 24-6BH06**	1 unit

[1] For wedge base lamps see "Accessories", page 11/18.

Selection and ordering data

Push buttons

Push button and illuminated push button with flat button

Push button and illuminated push button with raised button

EMERGENCY-STOP mushroom push button

Version	Color of handle	DT	Order No.	PS
Push buttons with flat button	Black		**3SB20 00-0AB01**	1 unit
	Red		**3SB20 00-0AC01**	1 unit
	Yellow		**3SB20 00-0AD01**	1 unit
	Green		**3SB20 00-0AE01**	1 unit
	Blue		**3SB20 00-0AF01**	1 unit
	White		**3SB20 00-0AG01**	1 unit
	Clear[1]		**3SB20 00-0AH01**	1 unit
Illuminated push buttons with flat button	Red		**3SB20 01-0AC01**	1 unit
	Yellow[1]		**3SB20 01-0AD01**	1 unit
	Green		**3SB20 01-0AE01**	1 unit
	Blue		**3SB20 01-0AF01**	1 unit
	White		**3SB20 00-0AG01**	1 unit
	Clear[1]		**3SB20 00-0AH01**	1 unit
Push buttons with raised button	Black		**3SB20 00-0LB01**	1 unit
	Red		**3SB20 00-0LC01**	1 unit
	Yellow		**3SB20 00-0LD01**	1 unit
	Blue		**3SB20 00-0LF01**	1 unit
	White		**3SB20 00-0LG01**	1 unit
	Clear[1]		**3SB20 00-0LH01**	1 unit
Illuminated push buttons with raised button	Red		**3SB20 01-0LC01**	1 unit
	Yellow[1]		**3SB20 01-0LD01**	1 unit
	Green		**3SB20 01-0LE01**	1 unit
	Blue		**3SB20 01-0LF01**	1 unit
	Clear[1]		**3SB20 00-0LH01**	1 unit
EMERGENCY-STOP mushroom push buttons acc. to ISO 13850, maintained[2] Latches automatically when pressed; unlatches by turning the mushroom head anticlockwise	Red		**3SB20 00-1AC01**	1 unit

1) Inscription is possible by inserting a label.

2) The mushroom push button cannot be combined with 3SB29 02-0AB name plate or 3SB29 02-0AA single frame.

Selector switches

Selector switch

Version		Color of handle	DT	Order No.	PS
Selector switches with 2 switch positions Switching sequence O-I, 62° operating angle, maintained		Black		**3SB20 00-2AB01**	1 unit
		Red		**3SB20 00-2AC01**	1 unit
		Green		**3SB20 00-2AE01**	1 unit
		White		**3SB20 00-2AG01**	1 unit
Selector switches with 2 switch positions Switching sequence O-I, 50° operating angle, momentary, spring return from right		Black		**3SB20 00-2BB01**	1 unit
		Red		**3SB20 00-2BC01**	1 unit
		Green		**3SB20 00-2BE01**	1 unit
Selector switches with 2 switch positions Switching sequence O-I, 90° operating angle, maintained		Black		**3SB20 00-2HB01**	1 unit
		Red		**3SB20 00-2HC01**	1 unit
		Green		**3SB20 00-2HE01**	1 unit
		White		**3SB20 00-2HG01**	1 unit
Selector switches with 3 switch positions Switching sequence I-O-II, 2 x 62° operating angle, maintained		Black		**3SB20 00-2DB01**	1 unit
		Red		**3SB20 00-2DC01**	1 unit
		Green		**3SB20 00-2DE01**	1 unit
		White		**3SB20 00-2DG01**	1 unit
Selector switches with 3 switch positions Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from left and right		Black		**3SB20 00-2EB01**	1 unit
		Red		**3SB20 00-2EC01**	1 unit
		Green		**3SB20 00-2EE01**	1 unit
		White		**3SB20 00-2EG01**	1 unit
Selector switches with 3 switch positions Switching sequence I-O-II, 2 x 90° operating angle, maintained		Black		**3SB20 00-2JB01**	1 unit

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
CES key-operated switches with 2 keys, 2 switch positions Switching sequence O-I, 62° operating angle, maintained		SB2	O+I O		**3SB20 00-4LB01** **3SB20 00-4LA01**	1 unit 1 unit
CES key-operated switches with 2 keys, 2 switch positions Switching sequence O-I, 50° operating angle,momentary, spring return from right		SB2	O		**3SB20 00-4MA01**	1 unit
CES key-operated switches with 2 keys, 3 switch positions Switching sequence I-O-II, 2 x 62° operating angle, maintained		SB2	I+O+II O		**3SB20 00-4PB01** **3SB20 00-4PA01**	1 unit 1 unit
CES key-operated switches with 2 keys, 3 switch positions Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from left and right		SB2	O		**3SB20 00-4QA01**	1 unit

Indicator lights

Indicator light

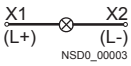
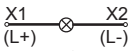
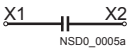
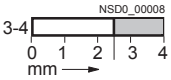
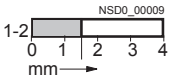
Version	Color of screw lens	DT	Order No.	PS
Indicator lights with concentric rings (inscription by inserting a cap is not possible)	Red Yellow Green Blue White Clear		**3SB20 01-6BC06** **3SB20 01-6BD06** **3SB20 01-6BE06** **3SB20 01-6BF06** **3SB20 01-6BG06** **3SB20 01-6BH06**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
Indicator lights, smooth for inscription by inserting a cap[1)]	Red Yellow Green Blue Clear		**3SB20 01-6CC06** **3SB20 01-6CD06** **3SB20 01-6CE06** **3SB20 01-6CF06** **3SB20 01-6CH06**	1 unit 1 unit 1 unit 1 unit 1 unit

1) Insert caps, see "Accessories", page 11/15

3SB2, Mounting Diameter 16 mm

Contact blocks and lampholders

Selection and ordering data

Version	Diagram	Operating travel Contact closed Contact open	DT	Flat connectors Order No.	PS
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					
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 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				**3SB23 04-2F**	1 unit
• With 24 V incandescent lamp				**3SB23 04-2H**	1 unit
Voltage reducers[1] 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 blocks with one contact[2]					
1 NO				**3SB24 04-0B**	1 unit
1 NC ➔ [3]				**3SB24 04-0C**	1 unit

Holder

Lamp holder

Voltage reducer

Contact block

[1] Use fixpoint terminal according to IEC 60439-1.

[2] For plug-in and insulation sleeves see "Accessories", page 11/19.

[3] Positive opening according to IEC 60947-5-1, Appendix K.

3SB2, Mounting Diameter 16 mm

Contact blocks and lamp holders

Version	Diagram	Operating travel Contact closed Contact open	DT	Solder pin connections Order No.	PS
Contact blocks and lamp holders with solder pins					
Holders for contact block with solder pins For fixing the actuators in the front panel				**3SB29 08-0AB**	5 units
Lamp holders Wedge base W2 x 4.6 d[1]	(L+) X1 (L-) X2			**3SB24 55-2A**	1 unit
Contact blocks					
1 NO	.3 .4	NSD0_00015 3-4 0 1 2 3 4 mm 2,3		**3SB24 55-0B**	1 unit
1 NC	[2] .1 .2	NSD0_00017 1-2 0 1 2 3 4 mm 1,6		**3SB24 55-0C**	1 unit
1 NO + 1 NC	[2] 13 21 14 22	NSD0_00019 21-22 0 1 2 3 4 mm 1,6		**3SB24 55-0J**	1 unit
1 NO + 1 NO	13 23 14 24	NSD0_00021 13-14 23-24 0 1 2 3 4 mm 2,3		**3SB24 55-0E**	1 unit
1 NC + 1 NC	[2] 11 21 12 22	NSD0_00023 21-22 11-12 0 1 2 3 4 mm 1,6		**3SB24 55-0F**	1 unit
Contact blocks and lamp holders, wedge base W2 x 4.6 d[1]					
1 NO	13 X1 14 X2	NSD0_01082 13-14 0 1 2 3 4 mm 2,3		**3SB24 55-1B**	1 unit
1 NC	[2] 21 X1 22 X2	NSD0_01083 21-22 0 1 2 3 4 mm 1,6		**3SB24 55-1C**	1 unit
1 NO + 1 NC	[2] 13 21 X1 14 22 X2	NSD0_00019 21-22 0 1 2 3 4 mm 1,6		**3SB24 55-1J**	1 unit
1 NO + 1 NO	13 23 X1 14 24 X2	NSD0_00021 13-14 23-24 0 1 2 3 4 mm 2,3		**3SB24 55-1E**	1 unit
1 NC + 1 NC	[2] 11 21 X1 12 22 X2	NSD0_00023 21-22 11-12 0 1 2 3 4 mm 1,6		**3SB24 55-1F**	1 unit

Holder

Contact block with solder pins

Contact block and lamp holder with solder pins

[1] 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", page 11/16.

Selection and ordering data

	Inscription/Symbol		Symbol No.	DT	**Insert labels** For push buttons and illuminated push buttons, flat Order No.	PS
For self-inscription						
	Blank				**3SB29 01-4AA**	10 units
With inscription						
	On				**3SB29 01-4EB**	10 units
	Start				**3SB29 01-4EK**	10 units
	Stop				**3SB29 01-4EL**	10 units
	Reset				**3SB29 01-4EM**	10 units
	Test				**3SB29 01-4EN**	10 units
	0				**3SB29 01-4RA**	10 units
	1				**3SB29 01-4RB**	10 units
	2				**3SB29 01-4RC**	10 units
	3				**3SB29 01-4RD**	10 units
	4				**3SB29 01-4RE**	10 units
	5				**3SB29 01-4RF**	10 units
	6				**3SB29 01-4RG**	10 units
	7				**3SB29 01-4RH**	10 units
	8				**3SB29 01-4RJ**	10 units
	9				**3SB29 01-4RK**	10 units
Graphic ON/OFF symbols						
	O (Off)	○	5008 IEC		**3SB29 01-4MB**	10 units
	I (On)	|	5007 IEC		**3SB29 01-4MC**	10 units
	II (On)	||	--		**3SB29 01-4MD**	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
Graphic equipment symbols					
Electric motor		0011 ISO		**3SB29 01-4PA**	10 units
Horn		5014 IEC		**3SB29 01-4PB**	10 units
Pump		0134 ISO		**3SB29 01-4PD**	10 units
Coolant pump		0355 ISO		**3SB29 01-4PE**	10 units
Graphic motion symbols					
Motion in direction of arrow (straight)		5022 IEC		**3SB29 01-4NA**	10 units
Motion in direction of arrow (diagonal)		--		**3SB29 01-4NB**	10 units
Clockwise rotation		0004 ISO		**3SB29 01-4NC**	10 units
Anticlockwise rotation		--		**3SB29 01-4ND**	10 units
Fast motion		0266 ISO		**3SB29 01-4NE**	10 units
Increase (plus)		5005 IEC		**3SB29 01-4NG**	10 units
Decrease (minus)		5006 IEC		**3SB29 01-4MC**	10 units
Graphic control symbols					
Clamp		--		**3SB29 01-4QB**	10 units
Release		--		**3SB29 01-4QC**	10 units
Brake off		0021 ISO		**3SB29 01-4QE**	10 units
Lock		0022 ISO		**3SB29 01-4QF**	10 units
Unlock		0023 ISO		**3SB29 01-4QG**	10 units
On/Off, momentary contact		5011 IEC		**3SB29 01-4QJ**	10 units
Manual operation		0096 ISO		**3SB29 01-4QK**	10 units
Automatic sequence		0017 ISO		**3SB29 01-4QL**	10 units
Customized inscriptions					
Any inscription 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.				**3SB29 01-4AZ** **K0Y** **K1Y** or **K2Y** **K5Y**	 1 unit 1 unit 1 unit
Other graphic symbols Please add the order code **"K3Y"** to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).				**3SB29 01-4AZ** **K3Y**	1 unit
Any inscription or symbol Please add the order code **"K9Y"** to the Order No. and specify the inscription or the symbol required.				**3SB29 01-4AZ** **K9Y**	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
For self-inscription						
	Blank				**3SB29 01-5AA**	10 units
With inscription						
	On				**3SB29 01-5EB**	10 units
	0				**3SB29 01-5RA**	10 units
	1				**3SB29 01-5RB**	10 units
	2				**3SB29 01-5RC**	10 units
	3				**3SB29 01-5RD**	10 units
	4				**3SB29 01-5RE**	10 units
	5				**3SB29 01-5RF**	10 units
	6				**3SB29 01-5RG**	10 units
	7				**3SB29 01-5RH**	10 units
	8				**3SB29 01-5RJ**	10 units
	9				**3SB29 01-5RK**	10 units
Graphic ON/OFF symbols						
	O (Off)	○	5008 IEC		**3SB29 01-5MB**	10 units
	I (On)	|	5007 IEC		**3SB29 01-5MC**	10 units
	II (On)	||	--		**3SB29 01-5MD**	10 units
Graphic motion symbols						
	Motion in direction of arrow	→	5022 IEC		**3SB29 01-5NA**	10 units
	Motion in direction of arrow	↖	--		**3SB29 01-5NB**	10 units
	Increase (plus)	+	5005 IEC		**3SB29 01-5NG**	10 units
	Decrease (minus)	—	5006 IEC		**3SB29 01-5MC**	10 units
Graphic control symbols						
	Clamp	→|←	--		**3SB29 01-5QB**	10 units
	Release	←|→	--		**3SB29 01-5QC**	10 units
Customized inscriptions						
	Any inscription				**3SB29 01-5AZ**	
	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.				**K0Y**	1 unit
					K1Y or **K2Y**	1 unit
					K5Y	1 unit
	Other graphic symbols				**3SB29 01-5AZ**	1 unit
	Please add the order code **"K3Y"** to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).				**K3Y**	
	Any inscription or symbol				**3SB29 01-5AZ**	1 unit
	Please add the order code **"K9Y"** to the Order No. and specify the inscription or the symbol required.				**K9Y**	

3SB2, Mounting Diameter 16 mm

Insert labels and insert caps

	Inscription/Symbol	Symbol No.	DT	**Insert caps** For indicator lights Order No.	PS
For self-inscription					
	Blank			**3SB29 01-7AA**	10 units
Graphic symbols					
	Pump	0134 ISO		**3SB29 01-7PD**	10 units
	Manual operation	0096 ISO		**3SB29 01-7QK**	10 units
Customized inscriptions					
	Any inscription 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.			**3SB29 01-7AZ** **K0Y** **K1Y** or **K2Y** **K5Y**	 1 unit 1 unit 1 unit
	Other graphic symbols Please add the order code **"K3Y"** to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).			**3SB29 01-7AZ** **K3Y**	1 unit
	Any inscription or symbol Please add the order code **"K9Y"** to the Order No. and specify the inscription or the symbol required.			**3SB29 01-7AZ** **K9Y**	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 × 18.5 mm					
	Blank			**3SB29 01-2AA**	10 units
	On			**3SB29 01-2EB**	10 units
	Off			**3SB29 01-2EC**	10 units
	Start			**3SB29 01-2EL**	10 units
	Reset			**3SB29 01-2EM**	10 units
	Fault			**3SB29 01-2EW**	10 units
	Hand Auto			**3SB29 01-2BA**	10 units
	Manual 0 Auto			**3SB29 01-2BE**	10 units
	Man 0 Auto			**3SB29 01-2ET**	10 units
	Graphic symbols				
	O (Off)	5008 IEC		**3SB29 01-2MB**	1 unit
	I (On)	5007 IEC		**3SB29 01-2MC**	1 unit
	O I (horizontal)	--		**3SB29 01-2MF**	1 unit
	Motion in direction of arrow	5002 IEC		**3SB29 01-2NA**	1 unit
	Customized inscriptions or symbols			**3SB29 01-2XZ**	
	(see Options)			**K0Y**	1 unit
				K1Y, K2Y or **K3Y**	1 unit
				K5Y	1 unit
				K9Y	1 unit
Label holders					
	Label holders for inscription labels The label holders must not be used with the 3SB2...-1AC01 EMERGENCY-STOP mushroom push button.			**3SB29 02-0AB**	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				
Buttons and lenses[1)]						
3SB29 10-0AF	**Buttons, flat** 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	**Buttons, flat** 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	**Buttons, raised** For push buttons		Black		**3SB29 10-0BB**	1 unit
			Red		**3SB29 10-0BC**	1 unit
			Yellow		**3SB29 10-0BD**	1 unit
			Clear		**3SB29 10-0BH**	1 unit
3SB29 10-0DD	**Buttons, raised** 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	**Screw lenses** 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	**Screw lenses** 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
Key for actuators						
3SB29 08-2AJ	**Keys** For CES key-operated switch, lock No. SB2				**3SB29 08-2AJ**	1 unit
Lamps, wedge bases[2)]						
3SB29 08-1AE	**Incandescent lamps** 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	**LED lamps, super-bright** 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		**3SB39 01-1SE**	1 unit
			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	**Lamp extractors** For lamps with bases W2 × 4.6 d				**3SB29 08-2AB**	1 unit

1) Included in the scope of supply of actuators or indicator lights.

2) Included in the scope of supply of some complete units.

3SB2, Mounting Diameter 16 mm

Mounting parts and components

	Version	DT	Order No.	PS
Accessories for command points				
3SB29 02-0AA	**Single frames** for square design[1]		**3SB29 02-0AA**	1 unit
3SB29 08-2AG	**Name plates, yellow, Ø 50 mm** As backing plate for EMERGENCY-STOP, self-adhesive • Blank • With German inscription "NOT-HALT" • With German inscription "NOT-AUS"		 **3SB29 08-2AF** **3SB29 08-2AG** **3SB29 08-2AK**	 1 unit 1 unit 1 unit
3SB29 08-3AA	**Blanking plugs** Black plastic (degree of protection IP65)		**3SB29 08-3AA**	1 unit
3SB29 08-1	**Protective caps, clear** Silicone, for push buttons with flat and raised button		**3SB29 08-3AB**	1 unit
Flat connectors				
3SB29 08-8AA	**Plug-in sleeves** For flat connectors 2.8 × 0.8 mm, cross-section 0.5 ... 1.5 mm^2		**3SB29 08-8AA**	1unit
3SB29 08-8AB	**Insulation sleeves** For flat connectors, connection from the front		**3SB29 08-8AB**	1 unit
3SB29 08-8AD	**Complete connectors**[2] For connecting contact blocks and lamp holders (up to 10 connections). Guaranteed finger-safe acc. to IEC 61140 and BGV A3.		**3SB29 08-8AD**	1 unit
3SB29 08-8AE	**Plug-in sleeves** For flat connectors 2.8 × 0.8 mm, with locating spring for maintained in complete connector		**3SB29 08-8AE**	250 units
Tools				
3SB29 08-2AA	**Dismantling tools** For holders and lamp holders with holder		**3SB29 08-2AA**	1 unit
3SB29 08-2AC	**Mounting tools** For buttons and screw lenses		**3SB29 08-2AC**	1 unit

[1] Not suitable for EMERGENCY-STOP mushroom push buttons.

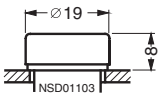
[2] Required 3SB29 08-8AE plug-in sleeves for flat connectors 2.8 × 0.8 mm are not included in the scope of supply.

3SB2, Mounting Diameter 16 mm

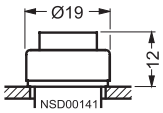
Dimension drawings (mm)

Actuators

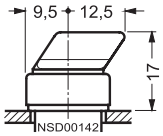
Pushbutton or illuminated pushbutton
with flat button



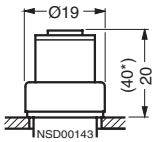
Pushbutton or illuminated pushbutton
with raised button



Selector switch

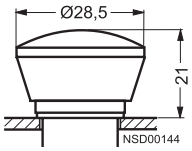


CES key-operated switch

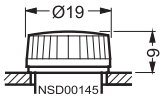


* with key

EMERGENCY-STOP mushroom pushbutton

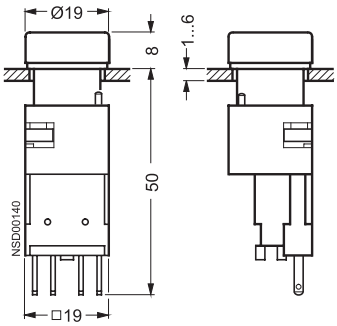


Indicator light



Contact blocks with push-on connection

Pushbutton and contact block
with holder for frontplate mounting

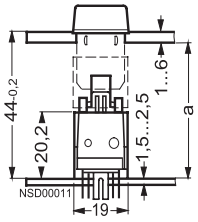


3SB2, Mounting Diameter 16 mm

Dimension drawings (mm)

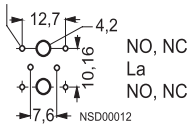
Contact blocks with soldering pins for use on printed circuit boards

Illuminated pushbutton unit
with contact block and lamp-holder with solder pins



Solder pin spacing

Solder terminal ⌀ 1.3 +0.1

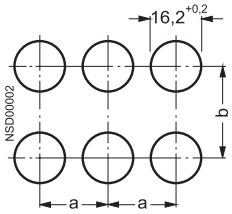


Length **a** of spacers: **a** = $44^{-0.2}$ minus front plate thickness.
When using backing plates, the length **a** is reduced by 0.8 mm.
To avoid bending of the PCB when the actuator is operated, sufficient spacers must be provided spaced as shown in the table below:

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.)

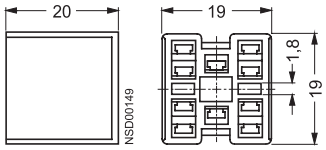
Mounting dimensions



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

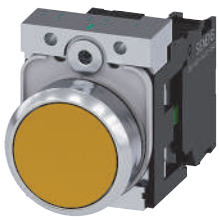
Accessories

Complete connector



SIRUS ACT 3SU Series

Overview



	3SU1.0	3SU1.3	3SU1.5	3SU1.6
Pushbuttons and indicator lights				
Designs				
Nominal diameter	22 mm	22 mm	22 mm	30 mm
Version	Plastic	Plastic with metal front ring, matte	Metal, shiny	Metal, matte, flat
Actuators				
Pushbuttons	✓	✓	✓	✓
Illuminated pushbuttons	✓	✓	✓	✓
Mushroom pushbuttons	✓	✓	✓	--
EMERGENCY STOP mushroom pushbuttons	✓	✓	✓	--
Selector switches	✓	✓	✓	✓
Key-operated switches	✓	✓	✓	✓
Special actuators				
Twin pushbuttons	✓	✓	✓	--
Coordinate switches	✓	✓	✓	--
Toggle switches	✓	✓	✓	--
Sensor switches	✓	✓	--	--
ID key-operated switches	✓	✓	--	--
Pushbuttons with extended stroke	✓	✓	✓	--
Potentiometers	✓	✓	✓	--
Indicators				
Indicator lights	✓	✓	✓	✓
Acoustic signaling devices	✓	✓	✓	--
Contact modules				
Single-pole	✓	✓	✓	✓
Two-pole	✓	✓	✓	✓
LED modules				
With integrated LED	✓	✓	✓	✓
Connections				
Screw terminals	✓	✓	✓	✓
Spring-type terminals	✓	✓	✓	✓
Solder pins	✓	✓	✓	✓
AS-Interface	✓	✓	✓	✓
IO-Link	✓	✓	✓	✓

✓ Standard
-- Not available

Note:
Safety characteristics (see Appendix on page 11/162).

	3SU18	3SU18
	Enclosures	Two-hand operation consoles
Enclosures		
Plastic	✓	✓
Metal	✓	✓
Actuators		
Pushbuttons	✓	✓
Illuminated pushbuttons	✓	✓
Mushroom pushbuttons	✓	✓
EMERGENCY STOP mushroom pushbuttons	✓	✓
Selector switches	✓	✓
Key-operated switches	✓	✓
Indicators		
Indicator lights	✓	❑
Acoustic signaling devices	✓	❑
Contact modules		
Single-pole	✓	✓
Two-pole	--	✓
Connections		
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.

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 11/116).

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 11/126).

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.

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. Thanks to SIRIUS ACT with PROFINET,

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

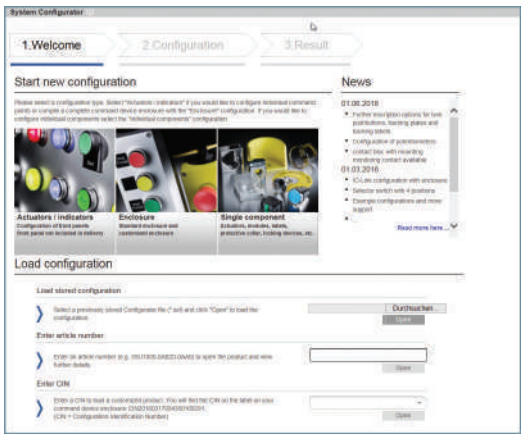
- IEC/EN 60947-1
- IEC/EN 60947-5-1
- IEC/EN 60947-5-5 for EMERGENCY STOP devices

More information

Homepage, see www.siemens.com/sirius-act
Industry Mall, see www.siemens.com/product?3SU1
Configurator, see www.siemens.com/sirius-act/configurator
Conversion tool, see www.siemens.com/sirius/conversion-tool
Manual, see https://support.industry.siemens.com/cs/ww/en/view/107542462
TIA Portal, see www.siemens.com/TIA

pushbuttons and indicator lights can be connected directly via PROFINET to the controller and HMI devices – including with safety functions. Engineering and commissioning are simplified no end by the TIA Portal.

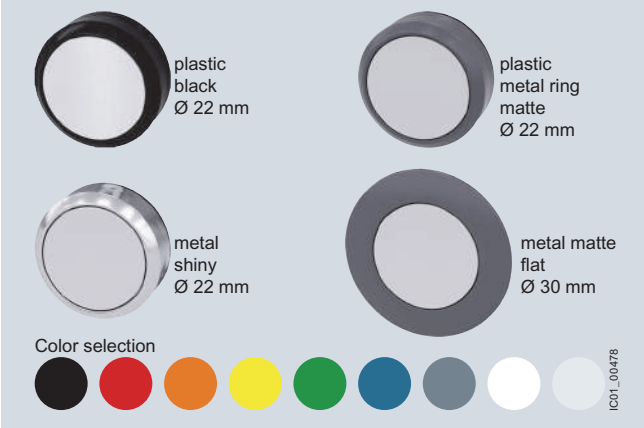
Configurator



- 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



SIRUS ACT is available in four design lines.

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

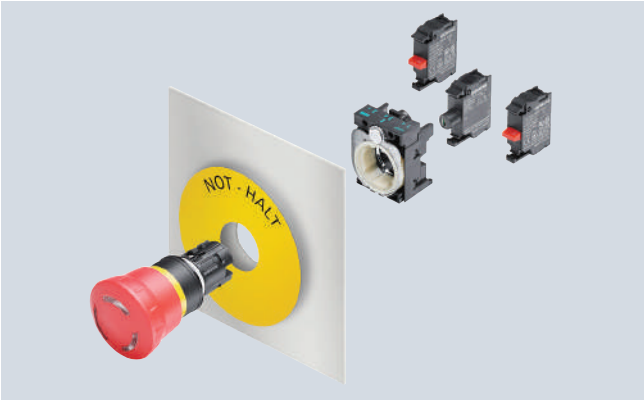
Ruggedness

- 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 x 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

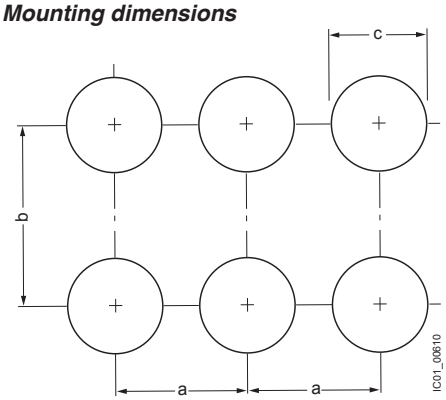
Easy handling



- 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

General data

Mounting dimensions



	Minimum clearance		
	a	b	c
	mm	mm	mm
22 mm, plastic with metal front ring, matte			
3-slot holder	30	40	$22.3^{+0.4}$
4-slot holder	40	40	$22.3^{+0.4}$
30 mm, metal, matte			
3-slot holder	40	45	$30.5^{+0.5}$

Versions

SIRIUS ACT is a modular system of pushbuttons and indicator lights with which customized variants can be configured flexibly.

One command point comprises:

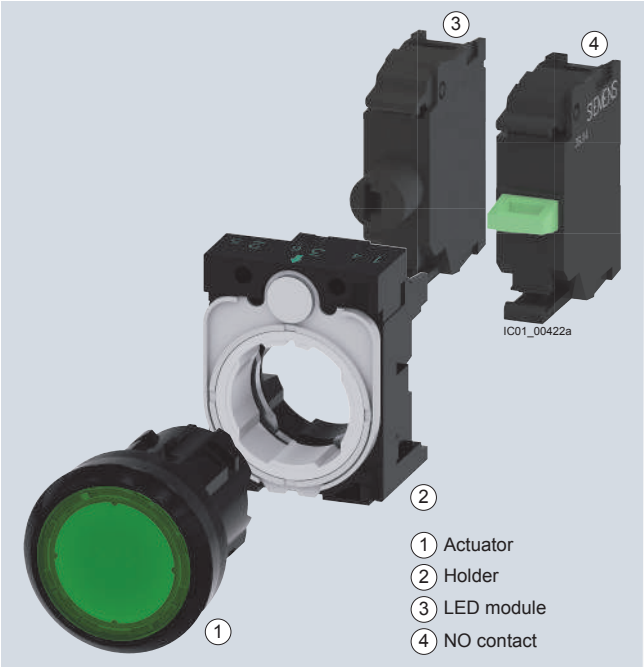
- An actuating or signaling element in front of the control panel
- A holder for securing behind the control panel
- Up to six contact modules and/or one LED module (mounted onto the holder), single-pole contacts can be stacked
- A comprehensive range of accessories for inscription/marking

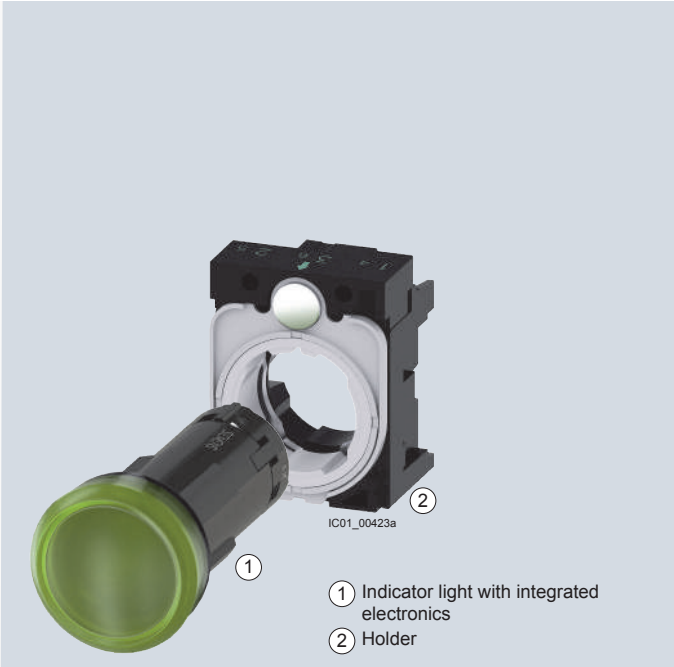
Complete units

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.

Compact units

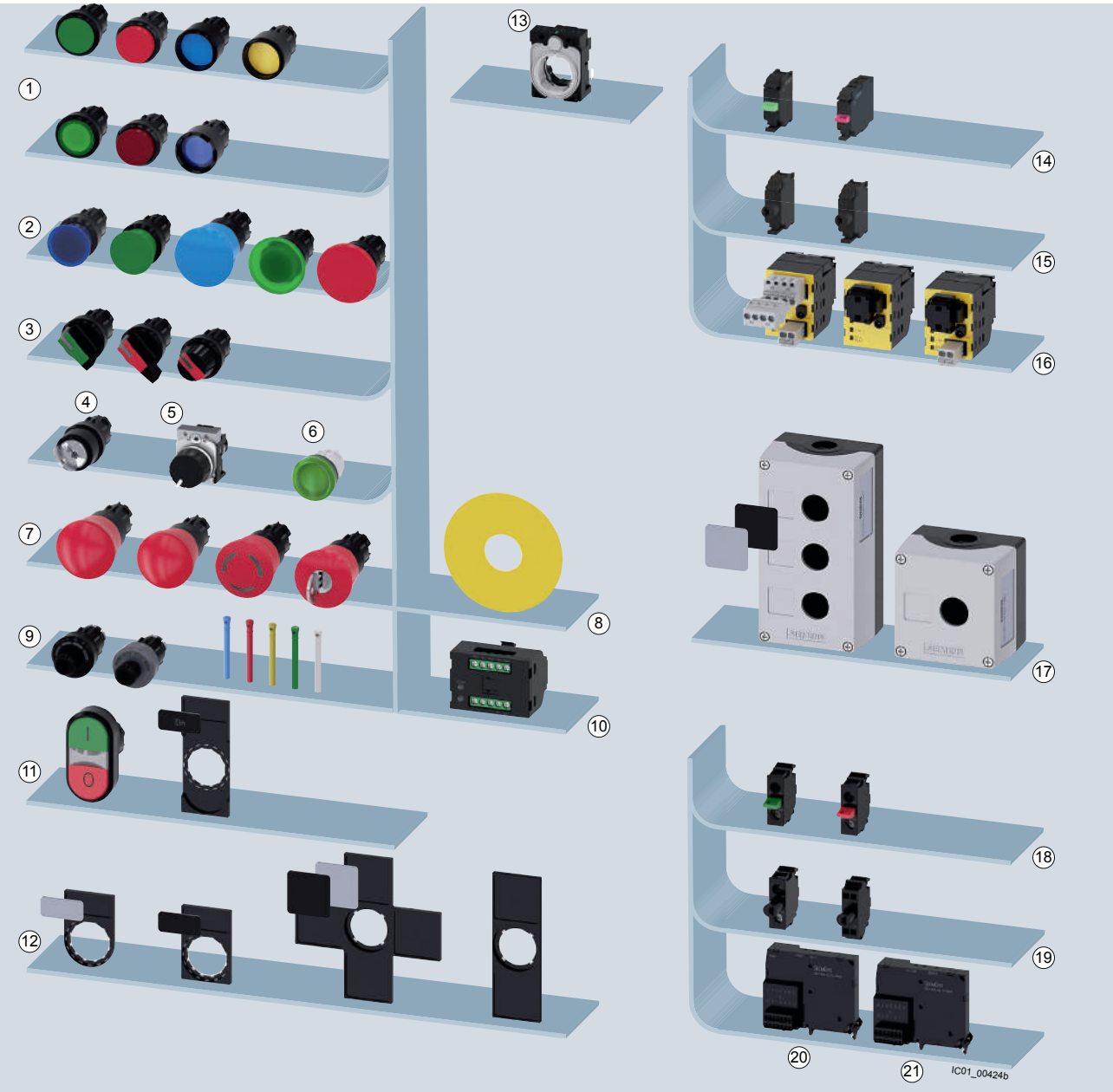
Signaling devices, sensor switches, and pushbuttons with extended stroke are available as compact units. The electronic circuitry is already integrated in these devices, i.e. it is not necessary to snap on a contact or LED module.





Complete units	Pages	Compact units	Pages
Plastic, black	11/39	Plastic, black	11/46
Plastic with metal front ring, matte	11/61	Plastic with metal front ring, matte	11/68
Metal, shiny	11/82	Metal, shiny	11/88

Actuating and signaling elements



Actuating and signaling elements		Pages
①	Pushbuttons, illuminated pushbuttons	11/39
②	Mushroom pushbuttons	11/41
③	Selector switches	11/42
④⑤⑥	Key-operated switches, potentiometers, indicator lights	11/43
⑦⑧	EMERGENCY STOP mushroom pushbuttons, backing plates	11/41
⑨⑩	ID key-operated switches, ID keys, electronic modules	11/59
⑪	Twin pushbuttons, label holders, labeling plates	11/51
⑫	Label holders, labeling plates	11/134
Holders and labels		**Pages**
⑬	Holders	11/134

Modules for front plate mounting		Pages
⑭	Contact modules	11/110
⑮	LED modules	11/114
⑯	AS-Interface modules	11/116
Enclosures		**Pages**
⑰	Enclosures	11/120
Modules for base mounting		**Pages**
⑱	Contact modules	11/129
⑲	LED modules	11/129
⑳	IO-Link modules	11/132
㉑	AS-Interface modules	11/132

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 DIGITALIZATION @ YOUR FINGERTIPS

General data

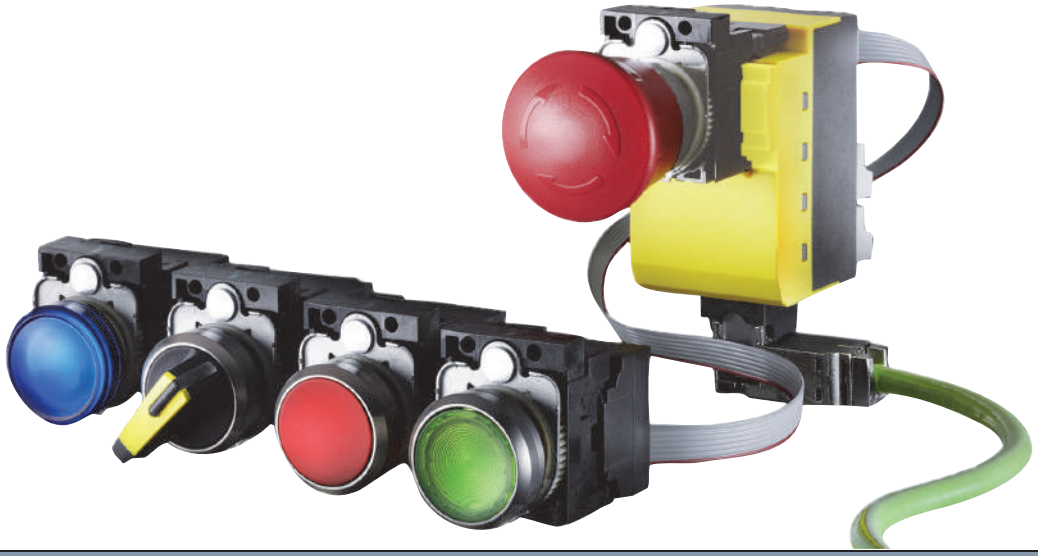
SIRIUS ACT with PROFINET

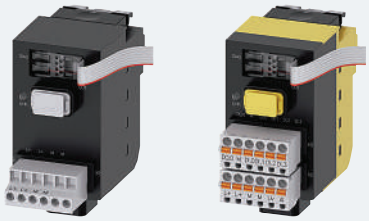
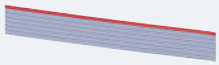
SIRIUS ACT with PROFINET connects pushbuttons and indicator lights directly via PROFINET to the controller and HMI devices – including with safety functions.

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, PL e) 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 to 20 terminal modules can be connected	**3SU1400-1L□10-□AA1**	See page 11/119
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 11/119
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 11/119
	LED modules for mounting on printed-circuit boards	**3SU1401-3BA□0-5AA0**	See page 11/115
	**Flat ribbon cable** 7 cores, length 5 m 7 cores, length 10 m	 **3SU1900-0KQ80-0AA0** **3SU1900-0KP80-0AA0**	See page 11/161

ID key-operated switches

Groups of employees or individuals can be authenticated by means of the ID key-operated switch. The ID key-operated switch is electronic and has four switch positions that are selected by keys with different codes. Using the four ID keys with different codes, it is possible to select 1 to 4 positions. The ID keys are color-coded (yellow, blue, red, green, white) so that they can be clearly differentiated at a glance and used flexibly thanks to four function levels.

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.

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.

Note: ID Key Switches requires the use of a plastic holder only! Purchase 3SU1500-0AA10-0AA0 Holder Separately.

	3SU1000-4WS10-0AA0 **Plastic, black**	**3SU1500-0AA10-0AA0** **Holder, plastic**	**3SU1030-4WS10-0AA0** **Plastic with metal front ring, matte**	**3SU1500-0AA10-0AA0** **Holder, plastic**
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	11/59		11/80	

	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	--	IO-Link protocol
Number of NO contacts	5	5
IO-Link transfer rate	--	COM2 (38.4 kBaud)
Pages	11/118	11/118

	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
Color	White	Green Yellow Red Blue
Pages	11/157	11/157

Article No. scheme

Device types

3SU10	3SU11	3SU12	3SU14	3SU15	3SU18	3SU19
Device types						
Actuating and signaling elements	**Complete units**	**Compact units**	**Modules for actuators and indicators**	**Holders with module**	**Enclosures**	**Accessories**

Actuating and signaling elements

Product versions		**Article number**														
SIRIUS ACT pushbuttons and indicator lights		**3SU1**	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Device type	Actuating and signaling elements		**0**													
Material (front ring)	Plastic, black			**0**												
	Metal, matte (front ring)/plastic, black (rosette, holder)			**3**												
	Metal, matte (front ring)/metal (rosette, holder)			**4**												
	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 pushbutton/sensor switch					**1**										
	Selector switch					**2**										
	Twin pushbutton, toggle switch					**3**										
	Key-operated switch					**4/5**										
	Indicator light/acoustic signaling device					**6**										
	Coordinate switch					**7**										
Design of the actuator/ acoustic signaling device	e.g. A = Flat						□									
Function	e.g. B = Momentary contact							□								
Color/key removal position	e.g. 10 = Black, 20 = Red								□	□						
Connection type	None											**0**				
Module/holder equipment	e.g. A = Without module, without holder Y = Without module, with holder												□			
Marking	e.g. A = None, C = "I", D = "O", R = "R"													□		
Ambient condition	Standard														**0**	
	ATEX Zone 21-22: Protection from dust														**1**	
	ATEX Zone 1-2: Intrinsic safety														**2**	
Example		**3SU1**	**0**	**0**	**0**	**–**	**0**	**A**	**B**	**1**	**0**	**–**	**0**	**A**	**A**	**0**

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.

SIRUS ACT 3SU Series

General data

Complete units

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		**3SU1**	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Device type	Complete units		**1**													
Material (front ring)	Plastic, black			**0**												
	Metal, matte (front ring)/plastic, black (rosette, holder)			**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 STOP mushroom pushbutton/sensor switch						**1**									
	Selector switch						**2**									
	Twin pushbutton, toggle switch						**3**									
	Key-operated switch						**4/5**									
	Indicator light/acoustic signaling device						**6**									
	Coordinate switch						**7**									
Design of the actuator/ acoustic signaling device	e.g. A = Flat							□								
Function	e.g. B = Momentary contact								□							
Color/key removal position	e.g. 10 = Black, 20 = Red									□	□					
Connection type	Screw terminals												**1**			
	Spring-type terminals												**3**			
Module/holder equipment including contact material	e.g. 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"														□	
Ambient condition	Standard															**0**
	ATEX Zone 21-22: Protection from dust															**1**
	ATEX Zone 1-2: Intrinsic safety															**2**
Example		**3SU1**	**1**	**0**	**0**	**–**	**0**	**A**	**B**	**1**	**0**	**–**	**1**	**B**	**A**	**0**

Compact units

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		**3SU1**	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Device type	Compact units		**2**													
Material (front ring)	Plastic, black			**0**												
	Metal, matte (front ring)/plastic, black (rosette, holder)			**3**												
	Metal, shiny			**5**												
	Metal, matte			**6**												
Illumination	Non-illuminated				**0**											
	Illuminated/non-illuminated				**1**											
Type of actuator/indicator	Pushbutton						**0**									
	Sensor switch						**1**									
	Potentiometers						**2**									
	Indicator light/acoustic signaling device						**6**									
Design of the actuator/ acoustic signaling device	e.g. A = Flat							□								
Function (voltage/resistance)	e.g. B = 24 V AC/DC								□							
Color	e.g. 10 = Black, 20 = Red									□	□					
Connection type	None												**0**			
	Screw terminals												**1**			
	M12 connection, 4-pin												**2**			
	Spring-type terminals												**3**			
Module/holder equipment including contact material	e.g. A = Without module, without holder B = 1 NO contact with holder C = 1 NC contact with holder													□		
Marking	e.g. A = None														□	
Ambient condition	Standard															**0**
	ATEX Zone 21-22: Protection from dust															**1**
	ATEX Zone 1-2: Intrinsic safety															**2**
Example		**3SU1**	**2**	**0**	**1**	**–**	**6**	**A**	**B**	**1**	**0**	**–**	**1**	**A**	**A**	**0**

Note:

The Article No. schemes show 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.

General data

Modules for actuators and indicators

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		**3SU1**	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Device type	Modules for actuators and indicators		**4**													
Material (front ring)	Plastic, black			**0**												
Illumination	Non-illuminated Illuminated				**0** **1**											
Fastening method	Front plate mounting Base mounting Printed circuit board						**1** **2** **3**									
Module type	Contact module LED module LED test module Support terminal AS-Interface module Electronic module for ID key-operated switches Interface modules for PROFINET Terminal modules							**A** **B** **C** **D** **E** **G** **L** **M**								
Function/voltage	e.g. B = 24 V AC/DC								□							
Color	e.g. 10 = Black, 20 = Red									□	□					
Connection type	Screw terminals Screw terminals + insulation piercing method Spring-type terminals Spring-type terminals + insulation piercing method Socket terminals												**1** **2** **3** **4** **5**			
Module equipment including contact material	e.g. A = None B = 1 NO contact, silver C = 1 NC contact, silver													□		
Marking	None														**A**	
Ambient condition	Standard ATEX Zone 21-22: Protection from dust ATEX Zone 1-2: Intrinsic safety															**0** **1** **2**
Example		**3SU1**	**4**	**0**	**0**	**–**	**1**	**A**	**A**	**1**	**0**	**–**	**1**	**B**	**A**	**0**

Holders

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		**3SU1**	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Device type	Holder		**5**													
Material (front ring)	Plastic, black Metal, shiny			**0** **5**												
Illumination	Non-illuminated Illuminated				**0** **1**											
Fastening method	Without Front plate mounting						**0** **1**									
Holder type	3x A 4x B							**A** **B**								
Function/voltage	Without 6 ... 24 V AC/DC								**A** **G**							
Color	e.g. 10 = Black, 20 = Red									□	□					
Connection type	None Screw terminals												**1** **2**			
Module equipment including contact material and slot	e.g. A = None B = 1 NO contact, silver C = 1 NC contact, silver													□		
Marking	None														**A**	
Ambient condition	Standard ATEX Zone 21-22: Protection from dust ATEX Zone 1-2: Intrinsic safety															**0** **1** **2**
Example		**3SU1**	**5**	**0**	**0**	**–**	**0**	**A**	**A**	**1**	**0**	**–**	**0**	**A**	**A**	**0**

Note:

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Enclosures

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		**3SU1**	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Device type	Enclosures		**8**													
Material (enclosure/front ring)	Plastic, black plastic Metal, shiny metal			**0** **5**												
Number of command points	Command point ... Command points				**1** **...** **6**											
Type of enclosure	Surface-mounting 4-position selector switch and coordinate switch Palm pushbutton Two-hand operation console						**0** **1** **2** **3**									
Command point	e.g. command point, inscription, module							□	□							
Communication capability	Without AS-i									**0** **1**						
Ambient condition	Standard ATEX Zone 21-22: Protection from dust ATEX Zone 1-2: Intrinsic safety										**0** **1** **2**					
Mounting/connection of modules	None Front plate mounting, screw terminals Base mounting, screw terminals Front mounting, spring-type terminals Base mounting, spring-type terminals												**0** **1** **2** **3** **4**			
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															**1** **2**
Example		**3SU1**	**8**	**0**	**1**	**–**	**0**	**A**	**A**	**0**	**0**	**–**	**0**	**A**	**A**	**2**

Accessories

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		**3SU1**	□	□	□	–	□	□	□	□	□	–	□	□	□	□
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						□	□	□							
Color	e.g. 10 = Black, 20 = Red									□	□					
Marking	e.g. 0AA = None 0AB = ON 0AT = EMERGENCY STOP												□	□	□	
Ambient condition	Standard ATEX Zone 21-22: Protection from dust ATEX Zone 1-2: Intrinsic safety															**0** **1** **2**
Example		**3SU1**	**9**	**0**	**0**	**–**	**0**	**A**	**B**	**2**	**0**	**–**	**0**	**A**	**B**	**0**

Note:

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Application

Environmental conditions

The pushbuttons and indicator lights are climate-proof (KTW 24) and suitable for standard industrial applications and operation in marine applications.

Simple electrical equipment

Non-illuminated actuators, contact modules, enclosures and special accessories can be classified as simple electrical equipment according to IEC 60079-11. This means that they may be used in intrinsically safe circuits in potentially explosive atmospheres. An overview of the devices and atmospheres can be found in Confirmation No. 3287.01.

Safety EMERGENCY STOP pushbuttons according to ISO 13850

For controls according to IEC/EN 60204-1, the SIRIUS ACT mushroom pushbuttons are suitable for use as safety EMERGENCY STOP pushbuttons.

Safety circuits

The IEC/EN 60947-5-1 standard requires 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 see Section 13 Limit Switches and Safety) 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

More information	
Industry Mall, see www.siemens.com/product?3SU1	Configurator, see www.siemens.com/sirius-act/configurator Conversion tool, see www.siemens.com/sirius/conversion-tool Manual, see https://support.industry.siemens.com/cs/ww/en/view/107542462

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		**Pushbuttons**			
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 according to IEC 60068-2-27		Half-sine wave 50 *g* / 11 ms			
Vibration resistance according to IEC 60068-2-6		10 ... 500 Hz: 5 *g*			
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		**Mushroom pushbuttons**					
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	300 000	3 000 000
Switching frequency maximum	1/h	1 800			3 600	1 800	3 600
Shock resistance according to IEC 60068-2-27		Half-sine wave 50 *g* / 11 ms					
Vibration resistance according to IEC 60068-2-6		10 ... 500 Hz: 5 *g*					
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					

SIRUS ACT 3SU Series

General data

Type		**3SU1...-.J** **3SU1...-.H** **3SU1...-.G**
Product version		**EMERGENCY STOP mushroom pushbuttons**
Mechanical endurance (operating cycles)		300 000
Switching frequency maximum	1/h	600
Shock resistance according to IEC 60068-2-27		Half-sine wave 50 *g* / 11 ms
Vibration resistance according to IEC 60068-2-6		10 ... 500 Hz: 5 *g*
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		**3SU1.5.-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**
Mechanical endurance (operating cycles)		300 000	1 000 000			300 000	250 000
Switching frequency maximum	1/h	1 800					3 600
Shock resistance according to IEC 60068-2-27		Half-sine wave 50 *g* / 11 ms					
Vibration resistance according to IEC 60068-2-6		10 ... 500 Hz: 5 *g*					
Degree of protection		IP66, IP67, IP69 (IP69K)		IP66, IP67, IP69K	IP66, IP67, IP69 (IP69K)		IP65, IP67
Ambient temperature							
• During operation	°C	-25 … +70					
• During storage	°C	-40 … +80					

SIRUS ACT 3SU Series

General data

Type		3SU1400-.AA10-1.A0	3SU1400-1AA10-1GA0, 3SU1400-1AA10-1RA0	3SU1400-1AA10-1HA0	3SU1400-.AA10-3.A0	3SU1400-1AA10-3HA0	3SU1400-3AA10-5.A0
Product version		**Contact modules**					
Rated insulation voltage	V	500					
Pollution degree		3					
Impulse withstand voltage, rated value	kV	6					
Operational voltage type		AC/DC					
Operational voltage, rated value							
• At AC at 50 Hz	V	5 … 500					
• At DC	V	5 … 500					
Thermal current	A	10					
Operational current, rated value							
• 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		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					
Contact reliability		One contact failure per 100 million switching operations (17 V, 5 mA), one contact failure per 10 million switching operations (5 V, 1 mA)					
Mechanical endurance (operating cycles) typical		10 000 000					
Switching frequency maximum	1/s	3 600					
Fuse link version required for short-circuit protection of the auxiliary switch with type of coordination 1		gG / Dz 10 A, quick-response / Dz 10 A					
Continuous current of miniature circuit breaker C characteristic	A	10					
Vibration resistance according to IEC 60068-2-6		10 ... 500 Hz: 5 *g*					
Shock resistance according to IEC 60068-2-27		Half-sine wave 50 *g* / 11 ms					
Climate class during operation according to IEC 60721		3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%, no condensation permitted in operation)					
Ambient temperature							
• During operation	°C	-25 … +70					
• During storage	°C	-40 … +80					
Degree of protection							
• Of enclosure		IP40					
• Of the terminal		IP20					
Type of electrical connection		**Screw terminals**			**Spring-type terminals**		**Socket terminals (THT)**
Type of connectable conductor cross-sections							
• Solid with end sleeve	mm²	2 x (0.5 ... 0.75)			--		
• Solid without end sleeve	mm²	2 x (1.0 ... 1.5)			2 x (0.25 ... 1.5)		--
• Finely stranded with end sleeve	mm²	2 x (0.5 ... 1.5)			2 x (0.25 ... 0.75)		--
• Finely stranded without end sleeve	mm²	2 x (1.0 ... 1.5)			2 x (0.25 ... 1.5)		--
• For AWG cables		2 x (18 ... 14)			2 x (24 ... 16)		--
Tightening torque for screw terminals	Nm	0.8 ... 0.9			--		

General data

Type		3SU1401-.....-1	3SU1401-.....-3	3SU1401-.....-5
Product version		LED module		
Light source integrated in product		Yes		
Type of light source		LED		
Rated insulation voltage	V	320		
Pollution degree		3		
Impulse withstand voltage, rated value	kV	4		
Relative positive tolerance of the operational voltage	%	20		
Relative negative tolerance of the operational voltage	%	20		
Operating time typical	h	100 000		
Vibration resistance according to IEC 60068-2-6		10 ... 500 Hz: 5 *g*		
Shock resistance according to IEC 60068-2-27		Half-sine wave 50 *g* / 11 ms		
Environmental category during operation According to IEC 60721		3M6, 3S2, 3B2, 3K6 (with a relative air humidity of 10 ... 95%, no condensation permitted in operation)		
Ambient temperature				
• During operation	°C	-25 … +70		
• During storage	°C	-40 … +80		
Degree of protection of the terminal		IP20		
Type of electrical connection		**Screw terminals**	**Spring-type terminals**	**Socket terminals (THT)**

Type		3SU1400-1LK10-1AA1	3SU1400-1LK10-3AA1	3SU1400-1LL10-1BA1	3SU1400-1LL10-3BA1
Product designation		Interface module		Fail-safe interface module	
Operational voltage type		DC			
Supply voltage at DC rated value	V	24			
Current consumed, maximum	mA	150			
Product function at the interface 1 PROFINET IO-Device		Yes			
Type of interface Fast Ethernet interface		Yes			
Type of interface 1 RJ45 (Ethernet) interface		Yes			
Number of ports at the interface 1		1			
Number of modules per rack, maximum		20			
Number of digital outputs		0		1	
Number of digital inputs		0		4	
Software version required for STEP 7 in the TIA Portal		Integrated in the TIA Portal, version 14 SP1 or higher (HSP for V13 and V14)			
SIL response limit (subsystem) according to IEC 62061		--		SIL CL 3	
Performance level (PL) according to EN ISO 13849-1		--		e	
Ambient temperature					
• During operation	°C	60 … -25			
• During storage	°C	80 … -40			
Degree of protection		IP20			
Connectable conductor cross-section					
• Solid					
- With end sleeves	mm^2	0.2 ... 2.5			
• Finely stranded					
- With end sleeves	mm^2	0.25 … 2.5			
- Without end sleeves	mm^2	0.2 ... 2.5			

3SU1 22 mm, Round, Plastic, Black — Complete Units

Pushbuttons

Selection and ordering data

Supply voltage for light source at AC V	Supply voltage for light source at DC V	Color	Number of Contact modules	Number of NO contacts	Number of NC contacts	SD d	Screw terminals Article No.	Screw terminals Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons										
Pushbuttons with flat button, momentary contact										
13	--	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	▶	**3SU1100-0AB20-1FA0**		1	1 unit
		Yellow	1	1	0	3	**3SU1100-0AB30-1BA0**		1	1 unit
				1	1	3	**3SU1100-0AB30-1FA0**		1	1 unit
		Green	1	1	0	▶	**3SU1100-0AB40-1BA0**		1	1 unit
				1	1	▶	**3SU1100-0AB40-1FA0**		1	1 unit
		Blue	1	1	0	▶	**3SU1100-0AB50-1BA0**		1	1 unit
				1	1	3	**3SU1100-0AB50-1FA0**		1	1 unit
		White	1	1	0	▶	**3SU1100-0AB60-1BA0**		1	1 unit
				1	1	3	**3SU1100-0AB60-1FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1100-0AB70-1BA0**		1	1 unit
				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										
--	--	Black	1	0	1	5	**3SU1100-0BB10-1CA0**		1	1 unit
				1	1	5	**3SU1100-0BB10-1FA0**		1	1 unit
		Red	1	0	1	5	**3SU1100-0BB20-1CA0**		1	1 unit
				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										
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
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

3SU1100-0AB40-1BA0

3SU1100-0BB20-1CA0

3SU1102-0AB40-1BA0

3SU1103-0AB20-1CA0

3SU1 22 mm, Round, Plastic, Black — Complete Units

Pushbuttons

Pushbuttons

Supply voltage for light source at AC	Supply voltage for light source at DC	Color	Number of Contact modules	Number of NO contacts	Number of NC contacts	SD	Screw terminals Article No.	Screw terminals Price per PU	PU (UNIT, SET, M)	PS*
V	V					d				
Illuminated pushbuttons with flat button, momentary contact with integrated LED										
230	--	Red	1	0	1	5	**3SU1106-0AB20-1CA0**		1	1 unit
				1	1	3	**3SU1106-0AB20-1FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1106-0AB30-1BA0**		1	1 unit
				1	1	5	**3SU1106-0AB30-1FA0**		1	1 unit
		Green	1	1	0	3	**3SU1106-0AB40-1BA0**		1	1 unit
				1	1	3	**3SU1106-0AB40-1FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1106-0AB50-1BA0**		1	1 unit
				1	1	5	**3SU1106-0AB50-1FA0**		1	1 unit
		White	1	1	0	5	**3SU1106-0AB60-1BA0**		1	1 unit
				1	1	5	**3SU1106-0AB60-1FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1106-0AB70-1BA0**		1	1 unit
				1	1	5	**3SU1106-0AB70-1FA0**		1	1 unit
							Spring-type terminals			
Pushbuttons with flat button, momentary contact										
--	--	Black	1	1	0	3	**3SU1100-0AB10-3BA0**		1	1 unit
			1	0	1	5	**3SU1100-0AB10-3CA0**		1	1 unit
				1	1	5	**3SU1100-0AB10-3FA0**		1	1 unit
		Red	1	0	1	5	**3SU1100-0AB20-3CA0**		1	1 unit
				1	1	5	**3SU1100-0AB20-3FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1100-0AB30-3BA0**		1	1 unit
				1	1	5	**3SU1100-0AB30-3FA0**		1	1 unit
		Green	1	1	0	5	**3SU1100-0AB40-3BA0**		1	1 unit
				1	1	5	**3SU1100-0AB40-3FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1100-0AB50-3BA0**		1	1 unit
				1	1	5	**3SU1100-0AB50-3FA0**		1	1 unit
		White	1	1	0	5	**3SU1100-0AB60-3BA0**		1	1 unit
				1	1	5	**3SU1100-0AB60-3FA0**		1	1 unit
Illuminated pushbuttons with flat button, momentary contact with integrated LED										
24	24	Red	1	0	1	5	**3SU1102-0AB20-3CA0**		1	1 unit
				1	1	5	**3SU1102-0AB20-3FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1102-0AB30-3BA0**		1	1 unit
				1	1	5	**3SU1102-0AB30-3FA0**		1	1 unit
		Green	1	1	0	3	**3SU1102-0AB40-3BA0**		1	1 unit
				1	1	5	**3SU1102-0AB40-3FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1102-0AB50-3BA0**		1	1 unit
				1	1	5	**3SU1102-0AB50-3FA0**		1	1 unit
		White	1	1	0	3	**3SU1102-0AB60-3BA0**		1	1 unit
				1	1	5	**3SU1102-0AB60-3FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1102-0AB70-3BA0**		1	1 unit
				1	1	5	**3SU1102-0AB70-3FA0**		1	1 unit
110	--	Red	1	0	1	5	**3SU1103-0AB20-3CA0**		1	1 unit
				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 unit
				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 unit
				1	1	5	**3SU1103-0AB60-3FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1103-0AB70-3BA0**		1	1 unit
				1	1	5	**3SU1103-0AB70-3FA0**		1	1 unit
230	--	Red	1	0	1	5	**3SU1106-0AB20-3CA0**		1	1 unit
				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 unit
				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 unit
				1	1	5	**3SU1106-0AB60-3FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1106-0AB70-3BA0**		1	1 unit
				1	1	5	**3SU1106-0AB70-3FA0**		1	1 unit

3SU1106-0AB40-1BA0

3SU1100-0AB30-3BA0

3SU1102-0AB20-3CA0

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 Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
Mushroom pushbuttons								
With red mushroom, diameter 40 mm, latching								
Pull to unlatch	1	0	1	3	**3SU1100-1BA20-1CA0**		1	1 unit
		1	1	3	**3SU1100-1BA20-1FA0**		1	1 unit
					Spring-type terminals			
Pull to unlatch	1	0	1	5	**3SU1100-1BA20-3CA0**		1	1 unit
		1	1	5	**3SU1100-1BA20-3FA0**		1	1 unit

3SU1100-1BA20-3CA0

Selection and ordering data

Unlatching method	Number of Contact modules	NO contacts	NC contacts	Marking	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
					d				
EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5									
With red mushroom, diameter 40 mm, with positive latching									
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
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	▶	**3SU1100-1HB20-1CH0**		1	1 unit
		0	2	EMERGENCY STOP	5	**3SU1100-1HB20-1PG0**		1	1 unit
		1	1	EMERGENCY STOP	5	**3SU1100-1HB20-1FG0**		1	1 unit
		1	1	NOT-HALT	▶	**3SU1100-1HB20-1FH0**		1	1 unit
						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
With red mushroom, diameter 40 mm, with latching NEW									
						Screw terminals			
Rotate to unlatch	2	0	2	NOT-HALT	5	**3SU1100-1LB20-1PH0**		1	1 unit

3SU1100-1HA20-1CH0

3SU1100-1HB20-1CH0

3SU1100-1LB20-1PH0

⊖ 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 Limit Switches and Safety.
Certificate:

3SU1 22 mm, Round, Plastic, Black — Complete Units

Selector switches

Selection and ordering data

Operating principle	Color Supply voltage for light source	Number of Contact modules	NO contacts	NC contacts	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches									
Short black actuator, 2 switch positions, can be illuminated									
Latching, 90°	White	1	1	0	▶	**3SU1100-2BF60-1BA0**		1	1 unit
		2	1	1	▶	**3SU1100-2BF60-1MA0**		1	1 unit
	White 110 V	1	1	0	5	**3SU1103-2BF60-1BA0**		1	1 unit
Short black actuator, 3 switch positions, can be illuminated									
Momentary contact, 2x45°, reset from left + right	White	2	2	2	3	**3SU1100-2BM60-1LA0**		1	1 unit
			2	0	▶	**3SU1100-2BM60-1NA0**		1	1 unit
Latching, 2x45°	White	2	2	2	▶	**3SU1100-2BL60-1LA0**		1	1 unit
			2	0	▶	**3SU1100-2BL60-1NA0**		1	1 unit
						Spring-type terminals			
Short black actuator, 2 switch positions, can be illuminated									
Latching, 90°	White	1	1	0	5	**3SU1100-2BF60-3BA0**		1	1 unit
		2	1	1	5	**3SU1100-2BF60-3MA0**		1	1 unit
Short black actuator, 3 switch positions, can be illuminated									
Momentary contact, 2x45°, reset from left + right	White	2	2	2	5	**3SU1100-2BM60-3LA0**		1	1 unit
			2	0	5	**3SU1100-2BM60-3NA0**		1	1 unit
Latching, 2x45°	White	2	2	2	5	**3SU1100-2BL60-3LA0**		1	1 unit
			2	0	5	**3SU1100-2BL60-3NA0**		1	1 unit

3SU1100-2BF60-1BA0

3SU1100-2BL60-1NA0

3SU1 22 mm, Round, Plastic, Black — Complete Units

Key-operated switches

Selection and ordering data

	Operating principle	Switch position for key removal	Number of Contact modules	NO contacts	NC contacts	Number of keys	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Key-operated switches											
3SU1100-4BF11-1BA0	***With RONIS lock, SB30, 2 switch positions***										
	Latching, 90° (10:30/ 1:30 o'clock)	O+I	1	1	0	2	▶	**3SU1100-4BF11-1BA0**		1	1 unit
				1	1	2	▶	**3SU1100-4BF11-1FA0**		1	1 unit
3SU1100-4BL11-1NA0	***With RONIS lock, SB30, 3 switch positions***										
	Latching, 2x45° (10:30/ 1:30 o'clock)	I+O+II	2	2	0	2	5	**3SU1100-4BL11-1NA0**		1	1 unit
								Spring-type terminals			
	With RONIS lock, SB30, 2 switch positions										
	Latching, 90° (10:30/ 1:30 o'clock)	O+I	1	1	0	2	5	**3SU1100-4BF11-3BA0**		1	1 unit
				1	1	2	5	**3SU1100-4BF11-3FA0**		1	1 unit
	With CES lock, SSG10, 2 switch positions										
	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*
				d	Article No. / Price per PU		
Coordinate switches							
	Without mechanical interlock, 2 switch positions						
3SU1100-7AC10-1NA0	2	Momentary contact	Horizontal	5	**3SU1100-7AC10-1NA0**	1	1 unit
			Vertical	5	**3SU1100-7AD10-1NA0**	1	1 unit
		Latching	Horizontal	5	**3SU1100-7AA10-1NA0**	1	1 unit
			Vertical	5	**3SU1100-7AB10-1NA0**	1	1 unit
	Without mechanical interlock, 4 switch positions						
3SU1100-7AF10-1QA0	4	Momentary contact	Horizontal/Vertical	3	**3SU1100-7AF10-1QA0**	1	1 unit
		Latching	Horizontal/Vertical	5	**3SU1100-7AE10-1QA0**	1	1 unit
	With mechanical interlock, 2 switch positions						
3SU1100-7BA10-1NA0	2	Momentary contact	Horizontal	5	**3SU1100-7BC10-1NA0**	1	1 unit
			Vertical	5	**3SU1100-7BD10-1NA0**	1	1 unit
		Latching	Horizontal	5	**3SU1100-7BA10-1NA0**	1	1 unit
			Vertical	5	**3SU1100-7BB10-1NA0**	1	1 unit
	With mechanical interlock, 4 switch positions						
3SU1100-7BF10-1QA0	4	Momentary contact	Horizontal/Vertical	5	**3SU1100-7BF10-1QA0**	1	1 unit
		Latching	Horizontal/Vertical	5	**3SU1100-7BE10-1QA0**	1	1 unit

3SU1 22 mm, Round, Plastic, Black — Complete Units

Indicator lights

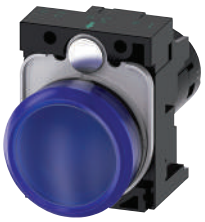
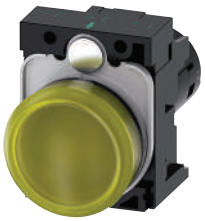
Selection and ordering data

	Operational voltage at AC, rated value	Operational voltage at DC, rated value	Color of actuating element	Color of light source	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V	V			d				
Indicator lights									
	With smooth lens and integrated LED								
3SU1102-6AA30-1AA0	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
3SU1106-6AA50-1AA0	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
						Spring-type terminals			
3SU1102-6AA40-3AA0	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
3SU1106-6AA60-3AA0	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	**3SU1106-6AA20-3AA0**		1	1 unit
			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 at AC, rated value	Operational voltage at DC, rated value	Color of actuating element	Color of light source	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V	V			d				
Indicator lights NEW									
 3SU1201-6AB50-1AA0	24	24	Amber	Amber	3	**3SU1201-6AB00-1AA0**		1	1 unit
			Red	Red	▶	**3SU1201-6AB20-1AA0**		1	1 unit
			Yellow	Yellow	▶	**3SU1201-6AB30-1AA0**		1	1 unit
			Green	Green	▶	**3SU1201-6AB40-1AA0**		1	1 unit
			Blue	Blue	3	**3SU1201-6AB50-1AA0**		1	1 unit
			White	White	▶	**3SU1201-6AB60-1AA0**		1	1 unit
			Clear	Clear	▶	**3SU1201-6AB70-1AA0**		1	1 unit
 3SU1201-6AC30-1AA0	110	110	Amber	Amber	5	**3SU1201-6AC00-1AA0**		1	1 unit
			Red	Red	3	**3SU1201-6AC20-1AA0**		1	1 unit
			Yellow	Yellow	3	**3SU1201-6AC30-1AA0**		1	1 unit
			Green	Green	3	**3SU1201-6AC40-1AA0**		1	1 unit
			Blue	Blue	5	**3SU1201-6AC50-1AA0**		1	1 unit
			White	White	3	**3SU1201-6AC60-1AA0**		1	1 unit
			Clear	Clear	5	**3SU1201-6AC70-1AA0**		1	1 unit
3SU1201-6AF30-1AA0	230	230	Amber	Amber	5	**3SU1201-6AF00-1AA0**		1	1 unit
			Red	Red	3	**3SU1201-6AF20-1AA0**		1	1 unit
			Yellow	Yellow	3	**3SU1201-6AF30-1AA0**		1	1 unit
			Green	Green	3	**3SU1201-6AF40-1AA0**		1	1 unit
			Blue	Blue	5	**3SU1201-6AF50-1AA0**		1	1 unit
			White	White	3	**3SU1201-6AF60-1AA0**		1	1 unit
			Clear	Clear	5	**3SU1201-6AF70-1AA0**		1	1 unit
Indicator lights with "traffic light" LED									
3SU1201-6AG24-1AA0	6 ... 24	6 ... 24	Clear	Red/Yellow/Green	▶	**3SU1201-6AG24-1AA0**		1	1 unit
	110	--	Clear	Red/Yellow/Green	▶	**3SU1201-6AC24-1AA0**		1	1 unit
	230	--	Clear	Red/Yellow/Green	▶	**3SU1201-6AF24-1AA0**		1	1 unit

3SU1 22 mm, Round, Plastic, Black — Compact Units

Pushbuttons with extended stroke

Selection and ordering data

	Operational voltage at AC, rated value	Operational voltage at DC, rated value	Volume level	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	V	V	dB	d	Article No. / Price per PU		
Acoustic signaling devices							
3SU1200-6KB10-1AA0	24	24	90	5	**3SU1200-6KB10-1AA0**	1	1 unit
	110	--	90	5	**3SU1200-6KC10-1AA0**	1	1 unit
	230	--	90	5	**3SU1200-6KF10-1AA0**	1	1 unit

Selection and ordering data

	Operating principle	Number of NO contacts	Number of NC contacts	Color	SD	M12 connector, 4-pin	PU (UNIT, SET, M)	PS*
					d	Article No. / Price per PU		
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	▶	**3SU1200-1SK10-2SA0**	1	1 unit

Optional accessories

- "Protection for sensor switches", see page 11/153.
- "Connectors for sensor switches, angled socket with screw terminal connection", see page 11/161.

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		
Potentiometers							
3SU1200-2PQ10-1AA0	**Rotary knob**	Stepless	1	▶	**3SU1200-2PQ10-1AA0**	1	1 unit
			2.2	5	**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 page 11/149.

3SU1 22 mm, Round, Plastic, Black — Compact Units

Pushbuttons with extended stroke

Selection and ordering data

	Version	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Pushbuttons with extended stroke							
	For actuating relays, can only be combined with extension plunger, no contact module or LED module required						
3SU1200-0EB20-0AA0	**Pushbuttons with flat button**	Red	5	**3SU1200-0EB20-0AA0**		1	1 unit
		Green	5	**3SU1200-0EB40-0AA0**		1	1 unit
3SU1200-0FB10-0AA0	**Pushbuttons with raised button**	Black	▶	**3SU1200-0FB10-0AA0**		1	1 unit
		Red	5	**3SU1200-0FB20-0AA0**		1	1 unit
3SU1201-0EB70-0AA0	**Pushbuttons with flat transparent button for insertion of insert labels**	Red	▶	**3SU1201-0EB20-0AA0**		1	1 unit
		Clear	▶	**3SU1201-0EB70-0AA0**		1	1 unit
	Mechanical reset kit - complete			**3SU1200-0KB10-0AA0**			

	Version	Material	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
Accessories								
3SU1900-0KG10-0AA0	**Extension plungers** For compensation of the distance between the pushbutton and the unlatching button of an overload relay	Plastic	Gray	▶	**3SU1900-0KG10-0AA0**		1	1 unit

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Pushbuttons

Selection and ordering data

	Version of actuating element Front ring version	Operating principle Unlatching method	Color, marking	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons								
3SU1000-0AB20-0AD0	**Pushbuttons with flat button** 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		Latching Push to unlatch	Black	▶	**3SU1000-0AA10-0AA0**		1	1 unit
			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	**Pushbuttons with raised button** 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	**Pushbuttons with flat button** 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	**Pushbuttons with flat button** 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

	Front ring	Operating principle	Colors caps/ markings	Direction of Actuation	SD d	**Screw terminals** Article No.	Price	PU (UNIT, SET, M)	PS*
Quadruple pushbuttons									
3SU1000-3FB11-0AA0	**Plastic, Black**	Momentary Action	Black, None	Up/Down/ Left/Right		**3SU1000-3FB11-0AA0**		1	1 unit
	Plastic, Black	Momentary Action	Black, Arrows	Up/Down/ Left/Right		**3SU1000-3FB11-0AU0**		1	1 unit

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

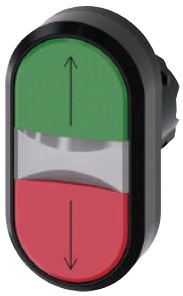
Pushbuttons

	Version of actuating element Front ring version	Operating principle Unlatching method	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons								
 3SU1001-0AB40-0AA0	**Illuminated pushbuttons with flat button** 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
 3SU1001-0AA20-0AA0		Latching Push to unlatch	Red	▶	**3SU1001-0AA20-0AA0**		1	1 unit
			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
 3SU1001-0BB70-0AA0	**Illuminated pushbuttons with raised button** 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
 3SU1001-0DB50-0AA0	**Illuminated pushbuttons with flat button** Raised, castellated	Momentary contact	Blue	5	**3SU1001-0DB50-0AA0**		1	1 unit
 3SU1000-0HC10-0AA0	**Stop pushbuttons** 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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Twin pushbuttons									
3SU1000-3AB66-0AL0	**Twin pushbuttons** flat, flat	Momentary contact	Green/Red	--	3	**3SU1000-3AB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1000-3AB42-0AK0**		1	1 unit
			White/Black	--	▶	**3SU1000-3AB61-0AA0**		1	1 unit
				"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
				⊙ ○ 5264/5265 (IEC 60417)	3	**3SU1000-3AB11-0AQ0**		1	1 unit
3SU1000-3BB42-0AK0	**Twin pushbuttons** flat, raised	Momentary contact	Green/Red	--	3	**3SU1000-3BB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1000-3BB42-0AK0**		1	1 unit
			White/Black	--	▶	**3SU1000-3BB61-0AA0**		1	1 unit
				"I"/"O"	5	**3SU1000-3BB61-0AK0**		1	1 unit
 3SU1001-3AB42-0AN0	**Twin pushbuttons** flat, flat, illuminated	Momentary contact	Green/Red	--	▶	**3SU1001-3AB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1001-3AB42-0AK0**		1	1 unit
				Arrows, vert.	3	**3SU1001-3AB42-0AN0**		1	1 unit
			White/Black	--	▶	**3SU1001-3AB61-0AA0**		1	1 unit
				"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 "Circular saw blade"/ "Tilt tipper"	5	**3SU1001-3AB66-0AP0**		1	1 unit
3SU1001-3BB61-0AK0	**Twin pushbuttons** flat, raised, illuminated	Momentary contact	Green/Red	--	3	**3SU1001-3BB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1001-3BB42-0AK0**		1	1 unit
			White/Black	--	▶	**3SU1001-3BB61-0AA0**		1	1 unit
				"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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons								
3SU1000-1AD20-0AA0	**Mushroom pushbuttons** 30 mm diameter, 2 positions	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
3SU1000-1BD40-0AA0	**Mushroom pushbuttons** 40 mm diameter, 2 positions	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
3SU1000-1CD10-0AA0	**Mushroom pushbuttons** 60 mm diameter, 2 positions	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
3SU1001-1AD30-0AA0	**Mushroom pushbuttons** 30 mm diameter, 2 positions, illuminated	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
3SU1001-1BA50-0AA0	**Mushroom pushbuttons** 40 mm diameter, 2 positions, illuminated	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
3SU1000-1HB10-0AA0	**Mushroom pushbuttons** 40 mm diameter, 2 positions	With positive latching Rotate to unlatch	Black	▶	**3SU1000-1HB10-0AA0**		1	1 unit
			Blue	3	**3SU1000-1HB50-0AA0**		1	1 unit
3SU1000-1HG10-0AA0	**Mushroom pushbuttons** 40 mm diameter, 2 positions RONIS SB30	With positive latching Key-operated release	Black	NEW 5	**3SU1000-1HG10-0AA0**		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	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		mm		d				
EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5								
	With pull-to-unlatch mechanism							
3SU1000-1HA20-0AA0	With positive latching, 2 positions	40	Red	▶	**3SU1000-1HA20-0AA0**		1	1 unit
	With rotate-to-unlatch mechanism							
3SU1000-1GB20-0AA0	With positive latching, 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
3SU1000-1LB20-0AA0	With latching, 2 positions	40	Red	NEW ▶	**3SU1000-1LB20-0AA0**		1	1 unit
	With rotate-to-unlatch mechanism, can be illuminated							
3SU1001-1HB20-0AA0	With positive latching, 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, Round, Plastic, Black — Actuating & 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*
		mm				d				
EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5										
	With key-operated release									
3SU1000-1HF20-0AA0	With positive latching, 2 positions	40	RONIS SB30	Red	2	▶	**3SU1000-1HF20-0AA0**		1	1 unit
			RONIS 455	Red	2	3	**3SU1000-1HG20-0AA0**		1	1 unit
3SU1000-1HK20-0AA0			BKS S1	Red	2	▶	**3SU1000-1HK20-0AA0**		1	1 unit
			BKS E7	Red	0	3	**3SU1000-1HM20-0AA0**		1	1 unit
			BKS E9	Red	0	3	**3SU1000-1HN20-0AA0**		1	1 unit
3SU1000-1HQ20-0AA0			O.M.R. 73037	Red	2	▶	**3SU1000-1HQ20-0AA0**		1	1 unit
3SU1000-1HR20-0AA0			CES SSG10	Red	2	▶	**3SU1000-1HR20-0AA0**		1	1 unit
			CES SSP9	Red	2	▶	**3SU1000-1HS20-0AA0**		1	1 unit
			CES SMS1	Red	2	3	**3SU1000-1HT20-0AA0**		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*
					d				
Toggle switches									
3SU1000-3EA10-0AA0	2	1	Black	Latching	3	**3SU1000-3EA10-0AA0**		1	1 unit
				Momentary contact, reset from above	3	**3SU1000-3EC10-0AA0**		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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches								
	2 switch positions, can be illuminated							
3SU1002-2BC40-0AA0	Selector, short black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	▶	**3SU1002-2BC10-0AA0**		1	1 unit
			Red	▶	**3SU1002-2BC20-0AA0**		1	1 unit
			Yellow	▶	**3SU1002-2BC30-0AA0**		1	1 unit
			Green	▶	**3SU1002-2BC40-0AA0**		1	1 unit
			Blue	▶	**3SU1002-2BC50-0AA0**		1	1 unit
			White	▶	**3SU1002-2BC60-0AA0**		1	1 unit
3SU1002-2BF30-0AA0		Latching, 90° (10:30/1:30 o'clock)	Black	▶	**3SU1002-2BF10-0AA0**		1	1 unit
			Red	▶	**3SU1002-2BF20-0AA0**		1	1 unit
			Yellow	▶	**3SU1002-2BF30-0AA0**		1	1 unit
			Green	▶	**3SU1002-2BF40-0AA0**		1	1 unit
			Blue	▶	**3SU1002-2BF50-0AA0**		1	1 unit
			White	▶	**3SU1002-2BF60-0AA0**		1	1 unit
3SU1002-2CF20-0AA0	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock)	Black	3	**3SU1002-2CF10-0AA0**		1	1 unit
			Red	3	**3SU1002-2CF20-0AA0**		1	1 unit
			White	3	**3SU1002-2CF60-0AA0**		1	1 unit
3SU1002-2AF20-0AA0	Rotary knob	Latching, 90° (10:30/1:30 o'clock)	Red	3	**3SU1002-2AF20-0AA0**		1	1 unit
			White	▶	**3SU1002-2AF60-0AA0**		1	1 unit

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Selector switches

	Version of actuating element	Operating principle	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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**		1	1 unit
			Red	▶	**3SU1002-2BM20-0AA0**		1	1 unit
			Yellow	▶	**3SU1002-2BM30-0AA0**		1	1 unit
			Green	▶	**3SU1002-2BM40-0AA0**		1	1 unit
			Blue	▶	**3SU1002-2BM50-0AA0**		1	1 unit
			White	▶	**3SU1002-2BM60-0AA0**		1	1 unit
3SU1002-2BL60-0AA0		Latching, 2x45° (10:30/12/1:30 o'clock)	Black	▶	**3SU1002-2BL10-0AA0**		1	1 unit
			Red	▶	**3SU1002-2BL20-0AA0**		1	1 unit
			Yellow	▶	**3SU1002-2BL30-0AA0**		1	1 unit
			Green	▶	**3SU1002-2BL40-0AA0**		1	1 unit
			Blue	▶	**3SU1002-2BL50-0AA0**		1	1 unit
			White	▶	**3SU1002-2BL60-0AA0**		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**		1	1 unit
			Red	5	**3SU1002-2BP20-0AA0**		1	1 unit
			Yellow	▶	**3SU1002-2BP30-0AA0**		1	1 unit
			Green	▶	**3SU1002-2BP40-0AA0**		1	1 unit
			Blue	▶	**3SU1002-2BP50-0AA0**		1	1 unit
			White	▶	**3SU1002-2BP60-0AA0**		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**		1	1 unit
			Red	▶	**3SU1002-2BN20-0AA0**		1	1 unit
			Yellow	▶	**3SU1002-2BN30-0AA0**		1	1 unit
			Green	▶	**3SU1002-2BN40-0AA0**		1	1 unit
			Blue	▶	**3SU1002-2BN50-0AA0**		1	1 unit
			White	▶	**3SU1002-2BN60-0AA0**		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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Key-operated switches									
	2 switch positions								
3SU1000-4JC01-0AA0	Momentary contact, 45° (10:30/ 12 o'clock), reset from center to left	RONIS, SB30	O	2	▶	**3SU1000-4BC01-0AA0**		1	1 unit
		RONIS, 455	O	2	5	**3SU1000-4CC01-0AA0**		1	1 unit
		O.M.R. 73037, red	O	2	3	**3SU1000-4FC01-0AA0**		1	1 unit
		O.M.R. 73038, light blue	O	2	3	**3SU1000-4GC01-0AA0**		1	1 unit
		O.M.R. 73034, black	O	2	3	**3SU1000-4HC01-0AA0**		1	1 unit
		O.M.R. 73033, yellow	O	2	3	**3SU1000-4JC01-0AA0**		1	1 unit
		CES, SSG10	O	2	▶	**3SU1000-5BC01-0AA0**		1	1 unit
		CES, LSG1		2	3	**3SU1000-5HC01-0AA0**		1	1 unit
		BKS, S1	O	2	▶	**3SU1000-5PC01-0AA0**		1	1 unit
		IKON, 360012K1	O	2	▶	**3SU1000-5XC01-0AA0**		1	1 unit
3SU1000-4BF11-0AA0	Latching, 90° (10:30/ 1:30 o'clock)	RONIS, SB30	O	2	▶	**3SU1000-4BF01-0AA0**		1	1 unit
			O+I	2	▶	**3SU1000-4BF11-0AA0**		1	1 unit
			I	2	▶	**3SU1000-4BF21-0AA0**		1	1 unit
		RONIS, 455	O	2	3	**3SU1000-4CF01-0AA0**		1	1 unit
			O+I	2	3	**3SU1000-4CF11-0AA0**		1	1 unit
		RONIS, 421	O+I	2	5	**3SU1000-4DF11-0AA0**		1	1 unit
3SU1000-4GF11-0AA0		O.M.R. 73037, red	O	2	3	**3SU1000-4FF01-0AA0**		1	1 unit
			O+I	2	3	**3SU1000-4FF11-0AA0**		1	1 unit
		O.M.R. 73038, light blue	O	2	▶	**3SU1000-4GF01-0AA0**		1	1 unit
			O+I	2	3	**3SU1000-4GF11-0AA0**		1	1 unit
		O.M.R. 73034, black	O	2	3	**3SU1000-4HF01-0AA0**		1	1 unit
			O+I	2	3	**3SU1000-4HF11-0AA0**		1	1 unit
			I	2	5	**3SU1000-4HF21-0AA0**		1	1 unit
		O.M.R. 73033, yellow	O	2	3	**3SU1000-4JF01-0AA0**		1	1 unit
			O+I	2	3	**3SU1000-4JF11-0AA0**		1	1 unit
3SU1000-5BF11-0AA0		CES, SSG10	O	2	▶	**3SU1000-5BF01-0AA0**		1	1 unit
			O+I	2	▶	**3SU1000-5BF11-0AA0**		1	1 unit
			I	2	▶	**3SU1000-5BF21-0AA0**		1	1 unit
		CES, SSG10 with key monitoring	O	2	NEW ▶	**3SU1000-5JF01-0AA0**		1	1 unit
		CES, LSG1	O	2	▶	**3SU1000-5HF01-0AA0**		1	1 unit
			O+I	2	▶	**3SU1000-5HF11-0AA0**		1	1 unit
3SU1000-5PF11-0AA0		BKS, S1	O	2	▶	**3SU1000-5PF01-0AA0**		1	1 unit
			O+I	2	▶	**3SU1000-5PF11-0AA0**		1	1 unit
			I	2	3	**3SU1000-5PF21-0AA0**		1	1 unit
		BKS, E1	O	0	3	**3SU1000-5QF01-0AA0**		1	1 unit
			O+I	0	3	**3SU1000-5QF11-0AA0**		1	1 unit
		BKS, E2	O	0	▶	**3SU1000-5RF01-0AA0**		1	1 unit
			O+I	0	3	**3SU1000-5RF11-0AA0**		1	1 unit
		BKS, E7	O	0	▶	**3SU1000-5SF01-0AA0**		1	1 unit
			O+I	0	▶	**3SU1000-5SF11-0AA0**		1	1 unit
		BKS, E9	O	0	▶	**3SU1000-5TF01-0AA0**		1	1 unit
			O+I	0	3	**3SU1000-5TF11-0AA0**		1	1 unit
		IKON, 360012K1	O	2	▶	**3SU1000-5XF01-0AA0**		1	1 unit
			O+I	2	▶	**3SU1000-5XF11-0AA0**		1	1 unit

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Key-operated switches

Key-operated switches

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
3 switch positions								
Momentary contact, 2x45° (10:30/12/ 1:30 o'clock), reset from left + right	RONIS, SB30	O	2	▶	**3SU1000-4BM01-0AA0**		1	1 unit
	O.M.R. 73037, red	O	2	5	**3SU1000-4FM01-0AA0**		1	1 unit
	O.M.R. 73034, black	O	2	5	**3SU1000-4HM01-0AA0**		1	1 unit
	CES, SSG10	O	2	▶	**3SU1000-5BM01-0AA0**		1	1 unit
	BKS, S1	O	2	3	**3SU1000-5PM01-0AA0**		1	1 unit
	IKON, 360012K1	O	2	3	**3SU1000-5XM01-0AA0**		1	1 unit
Latching, 2x45° (10:30/12/ 1:30 o'clock)	RONIS, SB30	O	2	3	**3SU1000-4BL01-0AA0**		1	1 unit
		I+O+II	2	▶	**3SU1000-4BL11-0AA0**		1	1 unit
		I	2	5	**3SU1000-4BL21-0AA0**		1	1 unit
		II	2	3	**3SU1000-4BL31-0AA0**		1	1 unit
		I+II	2	3	**3SU1000-4BL41-0AA0**		1	1 unit
		O+I	2	3	**3SU1000-4BL51-0AA0**		1	1 unit
	RONIS, 455	O	2	5	**3SU1000-4CL01-0AA0**		1	1 unit
		I+O+II	2	3	**3SU1000-4CL11-0AA0**		1	1 unit
	O.M.R. 73037, red	O	2	5	**3SU1000-4FL01-0AA0**		1	1 unit
		O+I	2	5	**3SU1000-4FL51-0AA0**		1	1 unit
	O.M.R. 73038, light blue	O	2	3	**3SU1000-4GL01-0AA0**		1	1 unit
		I+O+II	2	3	**3SU1000-4GL11-0AA0**		1	1 unit
	O.M.R. 73034, black	O	2	5	**3SU1000-4HL01-0AA0**		1	1 unit
		I+O+II	2	3	**3SU1000-4HL11-0AA0**		1	1 unit
	O.M.R. 73033, yellow	I+O+II	2	5	**3SU1000-4JL11-0AA0**		1	1 unit
	CES, SSG10	O	2	▶	**3SU1000-5BL01-0AA0**		1	1 unit
		I+O+II	2	▶	**3SU1000-5BL11-0AA0**		1	1 unit
		I	2	3	**3SU1000-5BL21-0AA0**		1	1 unit
		II	2	▶	**3SU1000-5BL31-0AA0**		1	1 unit
		I+II	2	3	**3SU1000-5BL41-0AA0**		1	1 unit
		O+I	2	3	**3SU1000-5BL51-0AA0**		1	1 unit
	CES, SSG10 with key monitoring	O	2	NEW 3	**3SU1000-5JL01-0AA0**		1	1 unit
	BKS, S1	O	2	3	**3SU1000-5PL01-0AA0**		1	1 unit
		I+O+II	2	3	**3SU1000-5PL11-0AA0**		1	1 unit
		I	2	3	**3SU1000-5PL21-0AA0**		1	1 unit
		II	2	3	**3SU1000-5PL31-0AA0**		1	1 unit
		I+II	2	3	**3SU1000-5PL41-0AA0**		1	1 unit
	BKS, E2	I+O+II	0	5	**3SU1000-5RL11-0AA0**		1	1 unit
	BKS, E9	I+O+II	0	3	**3SU1000-5TL11-0AA0**		1	1 unit
	IKON, 360012K1	O	2	3	**3SU1000-5XL01-0AA0**		1	1 unit
		I+O+II	2	3	**3SU1000-5XL11-0AA0**		1	1 unit

3SU1000-4BM01-0AA0

3SU1000-4FL01-0AA0

3SU1000-5BL01-0AA0

3SU1000-5JL01-0AA0

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Key-operated switches / ID key-operated switches

Key-operated switches

	Operating principle	Make of lock	Switch position for key removal	Number of keys	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	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	**3SU1000-4BP01-0AA0**		1	1 unit
			II	2	3	**3SU1000-4BP31-0AA0**		1	1 unit
			O+II	2	3	**3SU1000-4BP61-0AA0**		1	1 unit
3SU1000-5BP01-0AA0		CES, SSG10	O	2	3	**3SU1000-5BP01-0AA0**		1	1 unit
			II	2	5	**3SU1000-5BP31-0AA0**		1	1 unit
			O+II	2	3	**3SU1000-5BP61-0AA0**		1	1 unit
		BKS, S1	O	2	3	**3SU1000-5PP01-0AA0**		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	**3SU1000-4BN01-0AA0**		1	1 unit
			I	2	3	**3SU1000-4BN21-0AA0**		1	1 unit
			O+I	2	3	**3SU1000-4BN51-0AA0**		1	1 unit
		O.M.R. 73038, light blue	O	2	5	**3SU1000-4GN01-0AA0**		1	1 unit
		O.M.R. 73034, black	I	2	5	**3SU1000-4HN21-0AA0**		1	1 unit
		CES, SSG10	O	2	3	**3SU1000-5BN01-0AA0**		1	1 unit
			I	2	3	**3SU1000-5BN21-0AA0**		1	1 unit
			O+I	2	3	**3SU1000-5BN51-0AA0**		1	1 unit
		BKS, S1	I	2	5	**3SU1000-5PN21-0AA0**		1	1 unit
			O+I	2	3	**3SU1000-5PN51-0AA0**		1	1 unit
		IKON, 360012K1	O+I	2	5	**3SU1000-5XN51-0AA0**		1	1 unit

Selection and ordering data

ID key-operated switches

	Operating angle	Operating principle	Switch position for key removal	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	4 switch positions								
3SU1000-4WS10-0AA0	45°	Latching	Key removal possible in all 4 positions	Black	►	**3SU1000-4WS10-0AA0**		1	1 unit

For ID keys, see page 11/157.

For electronic modules for ID key-operated switches, see page 11/118.

For plastic holders for ID key-operated switches, see page 11/108.

Note:

ID Key Switches requires the use of a plastic holder only!
Purchase **3SU1500-0AA10-0AA0** Holder Separately.

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Coordinate switches									
3SU1000-7AA10-0AA0	No	2	Momentary contact	Horizontal	▶	**3SU1000-7AC10-0AA0**		1	1 unit
				Vertical	▶	**3SU1000-7AD10-0AA0**		1	1 unit
			Latching	Horizontal	▶	**3SU1000-7AA10-0AA0**		1	1 unit
				Vertical	▶	**3SU1000-7AB10-0AA0**		1	1 unit
		4	Momentary contact	Horizontal/ Vertical	▶	**3SU1000-7AF10-0AA0**		1	1 unit
			Latching	Horizontal/ Vertical	▶	**3SU1000-7AE10-0AA0**		1	1 unit
3SU1000-7BA10-0AA0	Yes	2	Momentary contact	Horizontal	▶	**3SU1000-7BC10-0AA0**		1	1 unit
				Vertical	▶	**3SU1000-7BD10-0AA0**		1	1 unit
			Latching	Horizontal	▶	**3SU1000-7BA10-0AA0**		1	1 unit
				Vertical	▶	**3SU1000-7BB10-0AA0**		1	1 unit
		4	Momentary contact	Horizontal/ Vertical	▶	**3SU1000-7BF10-0AA0**		1	1 unit
			Latching	Horizontal/ Vertical	▶	**3SU1000-7BE10-0AA0**		1	1 unit

Selection and ordering data

	Type of product	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Indicator lights							
3SU1001-6AA40-0AA0	With smooth lens	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
Indicator lights in illuminated pushbutton design							
3SU1001-0AD50-0AA0	--	Red	3	**3SU1001-0AD20-0AA0**		1	1 unit
		Yellow	3	**3SU1001-0AD30-0AA0**		1	1 unit
		Green	3	**3SU1001-0AD40-0AA0**		1	1 unit
		Blue	3	**3SU1001-0AD50-0AA0**		1	1 unit
		Clear	▶	**3SU1001-0AD70-0AA0**		1	1 unit

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

Pushbuttons

Selection and ordering data

	Supply voltage for light source at AC	Supply voltage for light source at DC	Color	Number of Contact modules	Number of NO contacts	Number of NC contacts	SD	Screw terminals Article No.	Screw terminals Price per PU	PU (UNIT, SET, M)	PS*
	V	V					d				
Pushbuttons											
Pushbuttons with flat button, momentary contact											
3SU1130-0AB10-1BA0	--	--	Black	1	1	0	▶	**3SU1130-0AB10-1BA0**		1	1 unit
				0	0	1	3	**3SU1130-0AB10-1CA0**		1	1 unit
				1	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

Pushbuttons

Supply voltage for light source at AC	Supply voltage for light source at DC	Color	Number of Contact modules	Number of NO contacts	Number of NC contacts	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
V	V					d				
Illuminated pushbuttons with flat button, momentary contact with integrated LED										
230	--	Red	1	0	1	5	**3SU1136-0AB20-1CA0**		1	1 unit
				1	1	5	**3SU1136-0AB20-1FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1136-0AB30-1BA0**		1	1 unit
				1	1	5	**3SU1136-0AB30-1FA0**		1	1 unit
		Green	1	1	0	5	**3SU1136-0AB40-1BA0**		1	1 unit
				1	1	5	**3SU1136-0AB40-1FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1136-0AB50-1BA0**		1	1 unit
				1	1	5	**3SU1136-0AB50-1FA0**		1	1 unit
		White	1	1	0	5	**3SU1136-0AB60-1BA0**		1	1 unit
				1	1	5	**3SU1136-0AB60-1FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1136-0AB70-1BA0**		1	1 unit
				1	1	5	**3SU1136-0AB70-1FA0**		1	1 unit
							Spring-type terminals			
Pushbuttons with flat button, momentary contact										
--	--	Black	1	1	0	5	**3SU1130-0AB10-3BA0**		1	1 unit
				1	1	5	**3SU1130-0AB10-3FA0**		1	1 unit
		Red	1	0	1	5	**3SU1130-0AB20-3CA0**		1	1 unit
		Green	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										
24	24	Red	1	0	1	5	**3SU1132-0AB20-3CA0**		1	1 unit
				1	1	5	**3SU1132-0AB20-3FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1132-0AB30-3BA0**		1	1 unit
				1	1	5	**3SU1132-0AB30-3FA0**		1	1 unit
		Green	1	1	0	5	**3SU1132-0AB40-3BA0**		1	1 unit
				1	1	5	**3SU1132-0AB40-3FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1132-0AB50-3BA0**		1	1 unit
				1	1	5	**3SU1132-0AB50-3FA0**		1	1 unit
		White	1	1	0	5	**3SU1132-0AB60-3BA0**		1	1 unit
				1	1	5	**3SU1132-0AB60-3FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1132-0AB70-3BA0**		1	1 unit
				1	1	5	**3SU1132-0AB70-3FA0**		1	1 unit

3SU1136-0AB40-1BA0

3SU1130-0AB10-3BA0

3SU1132-0AB30-3BA0

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 Contact modules	NO contacts	NC contacts	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
Mushroom pushbuttons								
With red mushroom, diameter 40 mm, latching								
Pull to unlatch	1	0	1	5	**3SU1130-1BA20-1CA0**		1	1 unit
		1	1	5	**3SU1130-1BA20-1FA0**		1	1 unit

3SU1130-1BA20-1CA0

Selection and ordering data

Unlatching method	Number of Contact modules	NO con-tacts	NC con-tacts	Marking	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
					d				
EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5									
With red mushroom, diameter 40 mm, with positive latching									
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
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	▶	**3SU1100-1HB20-1CH0**		1	1 unit
		0	2	EMERGENCY STOP	5	**3SU1100-1HB20-1PG0**		1	1 unit
		0	2	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	▶	**3SU1100-1HB20-1FH0**		1	1 unit
						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
With red mushroom, diameter 40 mm, with latching NEW									
						Screw terminals			
Rotate to unlatch	2	0	2	NOT-HALT	5	**3SU1100-1LB20-1PH0**		1	1 unit

3SU1100-1HA20-1CH0

3SU1100-1HB20-1CH0

3SU1100-1LB20-1PH0

⊖ 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 Limit Switches and Safety..
Certificate:

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

Coordinate switches, complete

Selection and ordering data

Operating principle	Color	Number of Contact modules	NO contacts	NC contacts	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches									
Short black actuator, 2 switch positions, can be illuminated									
Latching, 90°	White	1	1	0	▶	**3SU1130-2BF60-1BA0**		1	1 unit
			1	1	▶	**3SU1130-2BF60-1MA0**		1	1 unit
Short black actuator, 3 switch positions, can be illuminated									
Momentary contact, 2x45°	White	2	2	2	5	**3SU1130-2BM60-1LA0**		1	1 unit
			2	0	3	**3SU1130-2BM60-1NA0**		1	1 unit
Latching, 2x45°	White	2	2	2	3	**3SU1130-2BL60-1LA0**		1	1 unit
			2	0	▶	**3SU1130-2BL60-1NA0**		1	1 unit
						Spring-type terminals			
Short black actuator, 2 switch positions, can be illuminated									
Latching, 90°	White	1	1	0	5	**3SU1130-2BF60-3BA0**		1	1 unit
			1	1	5	**3SU1130-2BF60-3MA0**		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**		1	1 unit
			2	0	5	**3SU1130-2BL60-3NA0**		1	1 unit

3SU1130-2BF60-1BA0

3SU1130-2BL60-1NA0

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 Contact modules	NO contacts	NC contacts	Number of keys	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Key-operated switches										
With RONIS lock, SB30, 2 switch positions										
Latching, 90° (10:30/ 1:30 o'clock)	O+I	1	1	0	2	3	**3SU1130-4BF11-1BA0**		1	1 unit
			1	1	2	3	**3SU1130-4BF11-1FA0**		1	1 unit
With RONIS lock, SB30, 3 switch positions										
Latching, 2x45° (10:30/12/ 1:30 o'clock)	I+O+II	2	2	0	2	5	**3SU1130-4BL11-1NA0**		1	1 unit
							Spring-type terminals			
With RONIS lock, SB30, 2 switch positions										
Latching, 90° (10:30/ 1:30 o'clock)	O+I	1	1	0	2	5	**3SU1130-4BF11-3BA0**		1	1 unit

3SU1130-4BF11-1BA0

3SU1130-4BL11-1NA0

Selection and ordering data

Number of NO contacts (1 per direction)	Operating principle	Direction of actuation	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Coordinate switches							
Without mechanical interlock, 2 switch positions							
2	Momentary contact	Horizontal	5	**3SU1130-7AC10-1NA0**		1	1 unit
		Vertical	5	**3SU1130-7AD10-1NA0**		1	1 unit
	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	1 unit
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
	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	1 unit

3SU1130-7AE10-1QA0

3SU1130-7BE10-1QA0

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

Indicator Lights – Complete Units

Selection and ordering data

Operational voltage at AC, rated value	Operational voltage at DC, rated value	Color of actuating element	Color of light source	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
V	V			d				
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
					Spring-type terminals			
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	**3SU1106-6AA20-3AA0**		1	1 unit
		Yellow	Yellow	5	**3SU1106-6AA30-3AA0**		1	1 unit

3SU1102-6AA30-1AA0

3SU1106-6AA50-1AA0

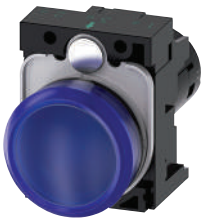
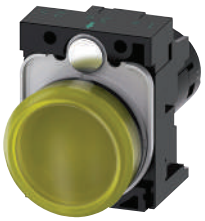
3SU1102-6AA40-3AA0

3SU1106-6AA60-3AA0

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Compact Units

Indicator lights

Selection and ordering data

	Operational voltage at AC, rated value	Operational voltage at DC, rated value	Color of actuating element	Color of light source	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V	V			d				
Indicator lights NEW									
 3SU1201-6AB50-1AA0	24	24	Amber	Amber	3	**3SU1201-6AB00-1AA0**		1	1 unit
			Red	Red	▶	**3SU1201-6AB20-1AA0**		1	1 unit
			Yellow	Yellow	▶	**3SU1201-6AB30-1AA0**		1	1 unit
			Green	Green	▶	**3SU1201-6AB40-1AA0**		1	1 unit
			Blue	Blue	3	**3SU1201-6AB50-1AA0**		1	1 unit
			White	White	▶	**3SU1201-6AB60-1AA0**		1	1 unit
			Clear	Clear	▶	**3SU1201-6AB70-1AA0**		1	1 unit
 3SU1201-6AC30-1AA0	110	110	Amber	Amber	5	**3SU1201-6AC00-1AA0**		1	1 unit
			Red	Red	3	**3SU1201-6AC20-1AA0**		1	1 unit
			Yellow	Yellow	3	**3SU1201-6AC30-1AA0**		1	1 unit
			Green	Green	3	**3SU1201-6AC40-1AA0**		1	1 unit
			Blue	Blue	5	**3SU1201-6AC50-1AA0**		1	1 unit
			White	White	3	**3SU1201-6AC60-1AA0**		1	1 unit
			Clear	Clear	5	**3SU1201-6AC70-1AA0**		1	1 unit
3SU1201-6AF30-1AA0	230	230	Amber	Amber	5	**3SU1201-6AF00-1AA0**		1	1 unit
			Red	Red	3	**3SU1201-6AF20-1AA0**		1	1 unit
			Yellow	Yellow	3	**3SU1201-6AF30-1AA0**		1	1 unit
			Green	Green	3	**3SU1201-6AF40-1AA0**		1	1 unit
			Blue	Blue	5	**3SU1201-6AF50-1AA0**		1	1 unit
			White	White	3	**3SU1201-6AF60-1AA0**		1	1 unit
			Clear	Clear	5	**3SU1201-6AF70-1AA0**		1	1 unit
Indicator lights with "traffic light" LED									
3SU1201-6AG24-1AA0	6 ... 24	6 ... 24	Clear	Red/Yellow/ Green	▶	**3SU1201-6AG24-1AA0**		1	1 unit
	110	--	Clear	Red/Yellow/ Green	▶	**3SU1201-6AC24-1AA0**		1	1 unit
	230	--	Clear	Red/Yellow/ Green	▶	**3SU1201-6AF24-1AA0**		1	1 unit

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Compact Units

Sensor switches / potentiometers

Selection and ordering data

	Operational voltage at AC, rated value	Operational voltage at DC, rated value	Volume level	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V	V	dB	d				
Acoustic signaling devices								
3SU1200-6KB10-1AA0	24	24	90	5	**3SU1200-6KB10-1AA0**		1	1 unit
	110	--	90	5	**3SU1200-6KC10-1AA0**		1	1 unit
	230	--	90	5	**3SU1200-6KF10-1AA0**		1	1 unit

Selection and ordering data

	Operating principle	Number of NO contacts	Number of NC contacts	Color	SD	M12 connector, 4-pin Article No.	Price per PU	PU (UNIT, SET, M)	PS*
					d				
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	►	**3SU1200-1SK10-2SA0**		1	1 unit

Optional accessories

- "Protection for sensor switches", see page 11/153.
- "Connectors for sensor switches, angled socket with screw terminal connection", see page 11/161.

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		
Potentiometers								
3SU1200-2PQ10-1AA0	Rotary knob	Stepless	1	▶	**3SU1200-2PQ10-1AA0**		1	1 unit
			2.2	5	**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 page 11/149.

Selection and ordering data

	Version	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Pushbuttons with extended stroke							
	For actuating relays, can only be combined with extension plunger, no contact module or LED module required						
3SU1230-0EB40-0AA0	**Pushbuttons with flat button**	Red	5	**3SU1230-0EB20-0AA0**		1	1 unit
		Green	5	**3SU1230-0EB40-0AA0**		1	1 unit
3SU1230-0FB10-0AA0	**Pushbuttons with raised button**	Black	3	**3SU1230-0FB10-0AA0**		1	1 unit
3SU1231-0EB20-0AA0	**Pushbuttons with flat transparent button for insertion of insert labels**	Red	3	**3SU1231-0EB20-0AA0**		1	1 unit
		Clear	3	**3SU1231-0EB70-0AA0**		1	1 unit

	Version	Material	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
Accessories								
3SU1900-0KG10-0AA0	**Extension plungers** For compensation of the distance between the pushbutton and the unlatching button of an overload relay	Plastic	Gray	▶	**3SU1900-0KG10-0AA0**		1	1 unit

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons								
 3SU1030-0AB50-0AR0	**Pushbuttons with flat button** 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	**Pushbuttons with raised button** 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	**Pushbuttons with flat button** 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

Selection and ordering data

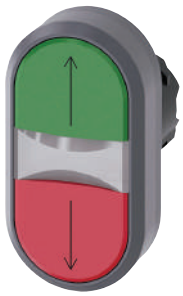
	Front ring	Operating principle	Colors caps/ markings	Direction of Actuation	SD d	**Screw terminals** Article No.	Price	PU (UNIT, SET, M)	PS*
Quadruple pushbuttons									
 3SU1030-3FB11-0AA0	**Metal, Matt**	Momentary Action	Black, None	Up/Down/ Left/Right		**3SU1030-3FB11-0AA0**		1	1 unit
	Metal, Matt	Momentary Action	Black, Arrows	Up/Down/ Left/Right		**3SU1030-3FB11-0AU0**		1	1 unit

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

Pushbuttons

	Version of actuating element Front ring version	Operating principle Unlatching method	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons								
 3SU1031-0AB20-0AA0	**Illuminated pushbuttons with flat button** 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
 3SU1031-0AA50-0AA0		Latching Push to unlatch	Red	▶	**3SU1031-0AA20-0AA0**		1	1 unit
			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	**Illuminated pushbuttons with raised button** 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
 3SU1031-0CB20-0AA0	**Pushbuttons with flat button** NEW Raised	Momentary contact	Red	25	**3SU1031-0CB20-0AA0**		1	100 units
			Green	25	**3SU1031-0CB40-0AA0**		1	100 units

Selection and ordering data

	Version of actuating element	Operating principle	Color	Marking Symbol No.	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Twin pushbuttons									
3SU1030-3AB66-0AN0	**Twin pushbuttons** flat, flat	Momentary contact	Green/Red	--	3	**3SU1030-3AB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1030-3AB42-0AK0**		1	1 unit
			White/Black	--	3	**3SU1030-3AB61-0AA0**		1	1 unit
				"I"/"O"	3	**3SU1030-3AB61-0AK0**		1	1 unit
			White/White	--	3	**3SU1030-3AB66-0AA0**		1	1 unit
				Arrows, vert.	5	**3SU1030-3AB66-0AN0**		1	1 unit
			Black/Black	--	3	**3SU1030-3AB11-0AA0**		1	1 unit
				⊙ ○ 5264/5265 (IEC 60417)	5	**3SU1030-3AB11-0AQ0**		1	1 unit
3SU1030-3BB42-0AK0	**Twin pushbuttons** flat, raised	Momentary contact	Green/Red	--	3	**3SU1030-3BB42-0AA0**		1	1 unit
				"I"/"O"	3	**3SU1030-3BB42-0AK0**		1	1 unit
 3SU1031-3AB42-0AN0	**Twin pushbuttons** flat, flat, illuminated	Momentary contact	Green/Red	--	▶	**3SU1031-3AB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1031-3AB42-0AK0**		1	1 unit
				Arrows, vert.	5	**3SU1031-3AB42-0AN0**		1	1 unit
			White/Black	--	▶	**3SU1031-3AB61-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1031-3AB61-0AK0**		1	1 unit
			White/White	--	3	**3SU1031-3AB66-0AA0**		1	1 unit
				Arrows, vert.	5	**3SU1031-3AB66-0AN0**		1	1 unit
3SU1031-3BB61-0AA0	**Twin pushbuttons** flat, raised, illuminated	Momentary contact	Green/Red	--	3	**3SU1031-3BB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1031-3BB42-0AK0**		1	1 unit
			White/Black	--	3	**3SU1031-3BB61-0AA0**		1	1 unit
				"I"/"O"	3	**3SU1031-3BB61-0AK0**		1	1 unit

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons								
3SU1030-1AD20-0AA0	**Mushroom pushbuttons** 30 mm diameter, 2 positions	Momentary contact	Black	▶	**3SU1030-1AD10-0AA0**		1	1 unit
			Red	▶	**3SU1030-1AD20-0AA0**		1	1 unit
			Yellow	▶	**3SU1030-1AD30-0AA0**		1	1 unit
			Green	▶	**3SU1030-1AD40-0AA0**		1	1 unit
		Latching Pull to unlatch	Black	▶	**3SU1030-1AA10-0AA0**		1	1 unit
			Red	▶	**3SU1030-1AA20-0AA0**		1	1 unit
3SU1030-1BD40-0AA0	**Mushroom pushbuttons** 40 mm diameter, 2 positions	Momentary contact	Black	3	**3SU1030-1BD10-0AA0**		1	1 unit
			Red	3	**3SU1030-1BD20-0AA0**		1	1 unit
			Yellow	3	**3SU1030-1BD30-0AA0**		1	1 unit
			Green	3	**3SU1030-1BD40-0AA0**		1	1 unit
		Latching Pull to unlatch	Black	▶	**3SU1030-1BA10-0AA0**		1	1 unit
			Red	▶	**3SU1030-1BA20-0AA0**		1	1 unit
			Red, "O"	5	**3SU1030-1BA20-0AD0**		1	1 unit
3SU1031-1AD30-0AA0	**Mushroom pushbuttons** 30 mm diameter, 2 positions, illuminated	Momentary contact	Yellow	5	**3SU1031-1AD30-0AA0**		1	1 unit
			Green	3	**3SU1031-1AD40-0AA0**		1	1 unit
			Blue	NEW 5	**3SU1031-1AD50-0AA0**		1	1 unit
			White	3	**3SU1031-1AD60-0AA0**		1	1 unit
			Clear	5	**3SU1031-1AD70-0AA0**		1	1 unit
		Latching Pull to unlatch	Red	3	**3SU1031-1AA20-0AA0**		1	1 unit
			Yellow	5	**3SU1031-1AA30-0AA0**		1	1 unit
3SU1031-1BD60-0AA0	**Mushroom pushbuttons** 40 mm diameter, 2 positions, illuminated	Momentary contact	Yellow	5	**3SU1031-1BD30-0AA0**		1	1 unit
			Green	5	**3SU1031-1BD40-0AA0**		1	1 unit
			White	3	**3SU1031-1BD60-0AA0**		1	1 unit
			Clear	5	**3SU1031-1BD70-0AA0**		1	1 unit
		Latching Pull to unlatch	Red	3	**3SU1031-1BA20-0AA0**		1	1 unit
			Yellow	3	**3SU1031-1BA30-0AA0**		1	1 unit
3SU1000-1HB50-0AA0	**Mushroom pushbuttons** 40 mm diameter, 2 positions	With positive latching Rotate to unlatch	Black	▶	**3SU1000-1HB10-0AA0**		1	1 unit
			Blue	3	**3SU1000-1HB50-0AA0**		1	1 unit
3SU1000-1HG10-0AA0	**Mushroom pushbuttons** 40 mm diameter, 2 positions RONIS SB30	With positive latching Key-operated release	Black	NEW 5	**3SU1000-1HG10-0AA0**		1	1 unit
	Mushroom pushbuttons, 60 mm diameter, 2 positions RONIS SB30	With positive latching Rotate to unlatch	Black	NEW X	**3SU1000-1JB10-0AA0**		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	Make of lock	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		mm			d				
EMERGENCY STOP mushroom pushbuttons									
	With pull-to-unlatch mechanism								
3SU1000-1HA20-0AA0	With positive latching, 2 positions	40	--	Red	▶	**3SU1000-1HA20-0AA0**		1	1 unit
	With rotate-to-unlatch mechanism								
3SU1000-1GB20-0AA0	With positive latching, 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
3SU1000-1LB20-0AA0	With latching, 2 positions	40	--	Red NEW	▶	**3SU1000-1LB20-0AA0**		1	1 unit
	With rotate-to-unlatch mechanism, can be illuminated								
3SU1001-1HB20-0AA0	With positive latching, 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

EMERGENCY STOP mushroom pushbuttons

With key-operated release

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*
	mm				d				
With positive latching, 2 positions	40	RONIS SB30	Red	2	▶	**3SU1000-1HF20-0AA0**		1	1 unit
		RONIS 455	Red	2	3	**3SU1000-1HG20-0AA0**		1	1 unit
		BKS S1	Red	2	▶	**3SU1000-1HK20-0AA0**		1	1 unit
		BKS E7	Red	0	3	**3SU1000-1HM20-0AA0**		1	1 unit
		BKS E9	Red	0	3	**3SU1000-1HN20-0AA0**		1	1 unit
		O.M.R. 73037	Red	2	▶	**3SU1000-1HQ20-0AA0**		1	1 unit
		CES SSG10	Red	2	▶	**3SU1000-1HR20-0AA0**		1	1 unit
		CES SSP9	Red	2	▶	**3SU1000-1HS20-0AA0**		1	1 unit
		CES SMS1	Red	2	3	**3SU1000-1HT20-0AA0**		1	1 unit

3SU1000-1HF20-0AA0

3SU1000-1HK20-0AA0

3SU1000-1HQ20-0AA0

3SU1000-1HR20-0AA0

Selection and ordering data

Toggle switches

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*
				d				
2	1	Black	Latching	3	**3SU1030-3EA10-0AA0**		1	1 unit
			Momentary contact, reset from above	5	**3SU1030-3EC10-0AA0**		1	1 unit

3SU1030-3EA10-0AA0

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches								
	2 switch positions, can be illuminated							
3SU1032--2BC40-0AA0	Selector, short black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	3	**3SU1032-2BC10-0AA0**		1	1 unit
			Red	▶	**3SU1032-2BC20-0AA0**		1	1 unit
			Yellow	▶	**3SU1032-2BC30-0AA0**		1	1 unit
			Green	▶	**3SU1032-2BC40-0AA0**		1	1 unit
			Blue	▶	**3SU1032-2BC50-0AA0**		1	1 unit
			White	▶	**3SU1032-2BC60-0AA0**		1	1 unit
3SU1032-2BF30-0AA0		Latching, 90° (10:30/1:30 o'clock)	Black	▶	**3SU1032-2BF10-0AA0**		1	1 unit
			Red	▶	**3SU1032-2BF20-0AA0**		1	1 unit
			Yellow	▶	**3SU1032-2BF30-0AA0**		1	1 unit
			Green	▶	**3SU1032-2BF40-0AA0**		1	1 unit
			Blue	▶	**3SU1032-2BF50-0AA0**		1	1 unit
			White	▶	**3SU1032-2BF60-0AA0**		1	1 unit
3SU1032-2CF60-0AA0	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock)	Black	3	**3SU1032-2CF10-0AA0**		1	1 unit
			Red	3	**3SU1032-2CF20-0AA0**		1	1 unit
			White	3	**3SU1032-2CF60-0AA0**		1	1 unit
3SU1032-2AF20-0AA0	Rotary knob	Latching, 90° (10:30/1:30 o'clock)	Red	3	**3SU1032-2AF20-0AA0**		1	1 unit
			White	▶	**3SU1032-2AF60-0AA0**		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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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**		1	1 unit
			Red	▶	**3SU1032-2BM20-0AA0**		1	1 unit
			Yellow	▶	**3SU1032-2BM30-0AA0**		1	1 unit
			Green	▶	**3SU1032-2BM40-0AA0**		1	1 unit
			Blue	▶	**3SU1032-2BM50-0AA0**		1	1 unit
			White	▶	**3SU1032-2BM60-0AA0**		1	1 unit
3SU1032-2BL20-0AA0		Latching, 2x45° (10:30/12/1:30 o'clock)	Black	▶	**3SU1032-2BL10-0AA0**		1	1 unit
			Red	▶	**3SU1032-2BL20-0AA0**		1	1 unit
			Yellow	▶	**3SU1032-2BL30-0AA0**		1	1 unit
			Green	▶	**3SU1032-2BL40-0AA0**		1	1 unit
			Blue	▶	**3SU1032-2BL50-0AA0**		1	1 unit
			White	▶	**3SU1032-2BL60-0AA0**		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**		1	1 unit
			Red	5	**3SU1032-2BP20-0AA0**		1	1 unit
			Yellow	▶	**3SU1032-2BP30-0AA0**		1	1 unit
			Green	▶	**3SU1032-2BP40-0AA0**		1	1 unit
			Blue	5	**3SU1032-2BP50-0AA0**		1	1 unit
			White	▶	**3SU1032-2BP60-0AA0**		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**		1	1 unit
			Red	▶	**3SU1032-2BN20-0AA0**		1	1 unit
			Yellow	▶	**3SU1032-2BN30-0AA0**		1	1 unit
			Green	▶	**3SU1032-2BN40-0AA0**		1	1 unit
			Blue	▶	**3SU1032-2BN50-0AA0**		1	1 unit
			White	▶	**3SU1032-2BN60-0AA0**		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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Key-operated switches								
2 switch positions								
Momentary contact, 45° (10:30/12 o'clock), reset from center to left	RONIS, SB30	O	2	▶	**3SU1030-4BC01-0AA0**		1	1 unit
	RONIS, 455	O	2	5	**3SU1030-4CC01-0AA0**		1	1 unit
	O.M.R. 73037, red	O	2	3	**3SU1030-4FC01-0AA0**		1	1 unit
	O.M.R. 73038, light blue	O	2	5	**3SU1030-4GC01-0AA0**		1	1 unit
	O.M.R. 73034, black	O	2	5	**3SU1030-4HC01-0AA0**		1	1 unit
	O.M.R. 73033, yellow	O	2	3	**3SU1030-4JC01-0AA0**		1	1 unit
	CES, SSG10	O	2	▶	**3SU1030-5BC01-0AA0**		1	1 unit
	CES, LSG1	O	2	3	**3SU1030-5HC01-0AA0**		1	1 unit
	BKS, S1	O	2	▶	**3SU1030-5PC01-0AA0**		1	1 unit
	IKON, 360012K1	O	2	3	**3SU1030-5XC01-0AA0**		1	1 unit
Latching, 90° (10:30/1:30 o'clock)	RONIS, SB30	O	2	▶	**3SU1030-4BF01-0AA0**		1	1 unit
		O+I	2	▶	**3SU1030-4BF11-0AA0**		1	1 unit
		I	2	3	**3SU1030-4BF21-0AA0**		1	1 unit
	RONIS, 455	O	2	3	**3SU1030-4CF01-0AA0**		1	1 unit
		O+I	2	5	**3SU1030-4CF11-0AA0**		1	1 unit
	O.M.R. 73037, red	O	2	3	**3SU1030-4FF01-0AA0**		1	1 unit
		O+I	2	3	**3SU1030-4FF11-0AA0**		1	1 unit
	O.M.R. 73038, light blue	O	2	3	**3SU1030-4GF01-0AA0**		1	1 unit
		O+I	2	3	**3SU1030-4GF11-0AA0**		1	1 unit
	O.M.R. 73034, black	O	2	3	**3SU1030-4HF01-0AA0**		1	1 unit
		O+I	2	3	**3SU1030-4HF11-0AA0**		1	1 unit
		I	2	5	**3SU1030-4HF21-0AA0**		1	1 unit
	O.M.R. 73033, yellow	O	2	3	**3SU1030-4JF01-0AA0**		1	1 unit
		O+I	2	5	**3SU1030-4JF11-0AA0**		1	1 unit
	CES, SSG10	O	2	▶	**3SU1030-5BF01-0AA0**		1	1 unit
		O+I	2	▶	**3SU1030-5BF11-0AA0**		1	1 unit
		I	2	3	**3SU1030-5BF21-0AA0**		1	1 unit
	CES, LSG1	O	2	3	**3SU1030-5HF01-0AA0**		1	1 unit
		O+I	2	3	**3SU1030-5HF11-0AA0**		1	1 unit
	BKS, S1	O	2	3	**3SU1030-5PF01-0AA0**		1	1 unit
		O+I	2	3	**3SU1030-5PF11-0AA0**		1	1 unit
		I	2	5	**3SU1030-5PF21-0AA0**		1	1 unit
	BKS, E1	O	0	3	**3SU1030-5QF01-0AA0**		1	1 unit
		O+I	0	5	**3SU1030-5QF11-0AA0**		1	1 unit
	BKS, E2	O	0	▶	**3SU1030-5RF01-0AA0**		1	1 unit
		O+I	0	3	**3SU1030-5RF11-0AA0**		1	1 unit
	BKS, E7	O	0	▶	**3SU1030-5SF01-0AA0**		1	1 unit
		O+I	0	▶	**3SU1030-5SF11-0AA0**		1	1 unit
	BKS, E9	O	0	3	**3SU1030-5TF01-0AA0**		1	1 unit
		O+I	0	3	**3SU1030-5TF11-0AA0**		1	1 unit
	IKON, 360012K1	O	2	▶	**3SU1030-5XF01-0AA0**		1	1 unit
		O+I	2	3	**3SU1030-5XF11-0AA0**		1	1 unit

3SU1030-4BC01-0AA0

3SU1030-4BF01-0AA0

3SU1030-4FF01-0AA0

3SU1030-5BF01-0AA0

3SU1030-5PF01-0AA0

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Key-operated switches									
	3 switch positions								
3SU1030-4BM01-0AA0	Momentary contact, 2x45° (10:30/12/ 1:30 o'clock), reset from left + right	RONIS, SB30	O	2	3	**3SU1030-4BM01-0AA0**		1	1 unit
		O.M.R. 73037, red	O	2	5	**3SU1030-4FM01-0AA0**		1	1 unit
		O.M.R. 73034, black	O	2	5	**3SU1030-4HM01-0AA0**		1	1 unit
		CES, SSG10	O	2	▶	**3SU1030-5BM01-0AA0**		1	1 unit
		BKS, S1	O	2	3	**3SU1030-5PM01-0AA0**		1	1 unit
		IKON, 360012K1	O	2	5	**3SU1030-5XM01-0AA0**		1	1 unit
	Latching, 2x45° (10:30/12/ 1:30 o'clock)	RONIS, SB30	O	2	3	**3SU1030-4BL01-0AA0**		1	1 unit
			I+O+II	2	▶	**3SU1030-4BL11-0AA0**		1	1 unit
			I	2	5	**3SU1030-4BL21-0AA0**		1	1 unit
			II	2	3	**3SU1030-4BL31-0AA0**		1	1 unit
			I+II	2	5	**3SU1030-4BL41-0AA0**		1	1 unit
			O+I	2	3	**3SU1030-4BL51-0AA0**		1	1 unit
		RONIS, 455	O	2	5	**3SU1030-4CL01-0AA0**		1	1 unit
			I+O+II	2	5	**3SU1030-4CL11-0AA0**		1	1 unit
3SU1030-4JL11-0AA0		O.M.R. 73037, red	O	2	5	**3SU1030-4FL01-0AA0**		1	1 unit
			O+I	2	5	**3SU1030-4FL51-0AA0**		1	1 unit
		O.M.R. 73038, light blue	O	2	5	**3SU1030-4GL01-0AA0**		1	1 unit
			I+O+II	2	3	**3SU1030-4GL11-0AA0**		1	1 unit
		O.M.R. 73034, black	O	2	5	**3SU1030-4HL01-0AA0**		1	1 unit
			I+O+II	2	3	**3SU1030-4HL11-0AA0**		1	1 unit
		O.M.R. 73033, yellow	I+O+II	2	5	**3SU1030-4JL11-0AA0**		1	1 unit
3SU1030-5BL41-0AA0		CES, SSG10	O	2	3	**3SU1030-5BL01-0AA0**		1	1 unit
			I+O+II	2	▶	**3SU1030-5BL11-0AA0**		1	1 unit
			I	2	3	**3SU1030-5BL21-0AA0**		1	1 unit
			II	2	3	**3SU1030-5BL31-0AA0**		1	1 unit
			I+II	2	3	**3SU1030-5BL41-0AA0**		1	1 unit
			O+I	2	5	**3SU1030-5BL51-0AA0**		1	1 unit
3SU1030-5PL01-0AA0		BKS, S1	O	2	5	**3SU1030-5PL01-0AA0**		1	1 unit
			I+O+II	2	3	**3SU1030-5PL11-0AA0**		1	1 unit
			I	2	3	**3SU1030-5PL21-0AA0**		1	1 unit
			II	2	5	**3SU1030-5PL31-0AA0**		1	1 unit
			I+II	2	5	**3SU1030-5PL41-0AA0**		1	1 unit
		BKS, E2	I+O+II	0	5	**3SU1030-5RL11-0AA0**		1	1 unit
		BKS, E9	I+O+II	0	5	**3SU1030-5TL11-0AA0**		1	1 unit
		IKON, 360012K1	O	2	5	**3SU1030-5XL01-0AA0**		1	1 unit
			I+O+II	2	5	**3SU1030-5XL11-0AA0**		1	1 unit

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

Key-operated switches /

Key-operated switches

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
3 switch positions								
Momentary contact/ latching, 2x45° (10:30/12/ 1:30 o'clock), reset from left, latching to the right	RONIS, SB30	O	2	5	**3SU1030-4BP01-0AA0**		1	1 unit
		II	2	5	**3SU1030-4BP31-0AA0**		1	1 unit
		O+II	2	5	**3SU1030-4BP61-0AA0**		1	1 unit
	CES, SSG10	O	2	3	**3SU1030-5BP01-0AA0**		1	1 unit
		II	2	5	**3SU1030-5BP31-0AA0**		1	1 unit
		O+II	2	3	**3SU1030-5BP61-0AA0**		1	1 unit
	BKS, S1	O	2	3	**3SU1030-5PP01-0AA0**		1	1 unit
Latching/momentary contact, 2x45° (10:30/12/ 1:30 o'clock), reset from right, latching to the left	RONIS, SB30	O	2	5	**3SU1030-4BN01-0AA0**		1	1 unit
		I	2	5	**3SU1030-4BN21-0AA0**		1	1 unit
		O+I	2	5	**3SU1030-4BN51-0AA0**		1	1 unit
	O.M.R. 73038, light blue	O	2	5	**3SU1030-4GN01-0AA0**		1	1 unit
	O.M.R. 73034, black	I	2	5	**3SU1030-4HN21-0AA0**		1	1 unit
	CES, SSG10	O	2	3	**3SU1030-5BN01-0AA0**		1	1 unit
		I	2	3	**3SU1030-5BN21-0AA0**		1	1 unit
		O+I	2	3	**3SU1030-5BN51-0AA0**		1	1 unit
	BKS, S1	I	2	5	**3SU1030-5PN21-0AA0**		1	1 unit
		O+I	2	5	**3SU1030-5PN51-0AA0**		1	1 unit
	IKON, 360012K1	O+I	2	5	**3SU1030-5XN51-0AA0**		1	1 unit

3SU1030-4BP01-0AA0

3SU1030-5BN01-0AA0

Selection and ordering data

Operating angle	Operating principle	Switch position for key removal	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
4 switch positions								
45°	Latching	Key removal possible in all 4 positions	Black	►	**3SU1030-4WS10-0AA0**		1	1 unit

3SU1030-4WS10-0AA0

For ID keys, see page 11/157.

For electronic modules for ID key-operated switches, see page 11/118.

For plastic holders for ID key-operated switches, see page 11/108.

Note:

ID Key Switches requires the use of a plastic holder only!
Purchase **3SU1500-0AA10-0AA0** Holder Separately.

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Coordinate switches									
3SU1030-7AA10-0AA0	No	2	Momentary contact	Horizontal	▶	**3SU1030-7AC10-0AA0**		1	1 unit
				Vertical	▶	**3SU1030-7AD10-0AA0**		1	1 unit
			Latching	Horizontal	▶	**3SU1030-7AA10-0AA0**		1	1 unit
				Vertical	▶	**3SU1030-7AB10-0AA0**		1	1 unit
		4	Momentary contact	Horizontal/ Vertical	▶	**3SU1030-7AF10-0AA0**		1	1 unit
			Latching	Horizontal/ Vertical	▶	**3SU1030-7AE10-0AA0**		1	1 unit
3SU1030-7BA10-0AA0	Yes	2	Momentary contact	Horizontal	▶	**3SU1030-7BC10-0AA0**		1	1 unit
				Vertical	▶	**3SU1030-7BD10-0AA0**		1	1 unit
			Latching	Horizontal	▶	**3SU1030-7BA10-0AA0**		1	1 unit
				Vertical	▶	**3SU1030-7BB10-0AA0**		1	1 unit
		4	Momentary contact	Horizontal/ Vertical	▶	**3SU1030-7BF10-0AA0**		1	1 unit
			Latching	Horizontal/ Vertical	▶	**3SU1030-7BE10-0AA0**		1	1 unit

Selection and ordering data

	Type of product	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Indicator lights							
3SU1001-6AA20-0AA0	With smooth lens	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
Indicator lights in illuminated pushbutton design							
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 at AC	Supply voltage for light source at DC	Color	Number of Contact modules	Number of NO contacts	Number of NC contacts	SD	Screw terminals Article No.	Screw terminals Price per PU	PU (UNIT, SET, M)	PS*
V	V					d				
Pushbuttons										
Pushbuttons with flat button, momentary contact										
--	--	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
Pushbuttons with raised button, momentary contact										
--	--	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
Illuminated pushbuttons with flat button, momentary contact, with integrated LED										
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

3SU1150-0AB30-1BA0

3SU1150-0BB20-1CA0

3SU1152-0AB50-1BA0

3SU1153-0AB60-1BA0

3SU1 22 mm, Metal, Shiny — Complete Units

Pushbuttons

Supply voltage for light source at AC V	Supply voltage for light source at DC V	Color	Number of Contact modules	Number of NO contacts	Number of NC contacts	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons										
230	--	Blue	1	1	0	5	**3SU1156-0AB50-1BA0**		1	1 unit
				1	1	5	**3SU1156-0AB50-1FA0**		1	1 unit
		White	1	1	0	5	**3SU1156-0AB60-1BA0**		1	1 unit
				1	1	5	**3SU1156-0AB60-1FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1156-0AB70-1BA0**		1	1 unit
				1	1	5	**3SU1156-0AB70-1FA0**		1	1 unit
							Spring-type terminals			
Pushbuttons with flat button, momentary contact										
--	--	Black	1	1	0	▶	**3SU1150-0AB10-3BA0**		1	1 unit
				0	1	5	**3SU1150-0AB10-3CA0**		1	1 unit
				1	1	5	**3SU1150-0AB10-3FA0**		1	1 unit
		Red	1	1	0	5	**3SU1150-0AB20-3CA0**		1	1 unit
				0	1	5	**3SU1150-0AB20-3FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1150-0AB30-3BA0**		1	1 unit
				1	1	5	**3SU1150-0AB30-3FA0**		1	1 unit
		Green	1	1	0	5	**3SU1150-0AB40-3BA0**		1	1 unit
				1	1	5	**3SU1150-0AB40-3FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1150-0AB50-3BA0**		1	1 unit
				1	1	5	**3SU1150-0AB50-3FA0**		1	1 unit
		White	1	1	0	5	**3SU1150-0AB60-3BA0**		1	1 unit
				1	1	5	**3SU1150-0AB60-3FA0**		1	1 unit
Pushbuttons with raised button, momentary contact										
--	--	Red	1	0	1	5	**3SU1150-0BB20-3CA0**		1	1 unit
Illuminated pushbuttons with flat button, momentary contact, with integrated LED										
24	24	Red	1	0	1	5	**3SU1152-0AB20-3CA0**		1	1 unit
				1	1	5	**3SU1152-0AB20-3FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1152-0AB30-3BA0**		1	1 unit
				1	1	5	**3SU1152-0AB30-3FA0**		1	1 unit
		Green	1	1	0	5	**3SU1152-0AB40-3BA0**		1	1 unit
				1	1	3	**3SU1152-0AB40-3FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1152-0AB50-3BA0**		1	1 unit
				1	1	5	**3SU1152-0AB50-3FA0**		1	1 unit
		White	1	1	0	3	**3SU1152-0AB60-3BA0**		1	1 unit
				1	1	5	**3SU1152-0AB60-3FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1152-0AB70-3BA0**		1	1 unit
				1	1	5	**3SU1152-0AB70-3FA0**		1	1 unit
110	--	Red	1	0	1	5	**3SU1153-0AB20-3CA0**		1	1 unit
				1	1	5	**3SU1153-0AB20-3FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1153-0AB30-3BA0**		1	1 unit
				1	1	5	**3SU1153-0AB30-3FA0**		1	1 unit
		Green	1	1	0	5	**3SU1153-0AB40-3BA0**		1	1 unit
				1	1	5	**3SU1153-0AB40-3FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1153-0AB50-3BA0**		1	1 unit
				1	1	5	**3SU1153-0AB50-3FA0**		1	1 unit
		White	1	1	0	5	**3SU1153-0AB60-3BA0**		1	1 unit
				1	1	5	**3SU1153-0AB60-3FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1153-0AB70-3BA0**		1	1 unit
				1	1	5	**3SU1153-0AB70-3FA0**		1	1 unit
230	--	Red	1	0	1	5	**3SU1156-0AB20-3CA0**		1	1 unit
				1	1	5	**3SU1156-0AB20-3FA0**		1	1 unit
		Yellow	1	1	0	5	**3SU1156-0AB30-3BA0**		1	1 unit
				1	1	5	**3SU1156-0AB30-3FA0**		1	1 unit
		Green	1	1	0	5	**3SU1156-0AB40-3BA0**		1	1 unit
				1	1	5	**3SU1156-0AB40-3FA0**		1	1 unit
		Blue	1	1	0	5	**3SU1156-0AB50-3BA0**		1	1 unit
				1	1	5	**3SU1156-0AB50-3FA0**		1	1 unit
		White	1	1	0	5	**3SU1156-0AB60-3BA0**		1	1 unit
				1	1	5	**3SU1156-0AB60-3FA0**		1	1 unit
		Clear	1	1	0	5	**3SU1156-0AB70-3BA0**		1	1 unit
				1	1	5	**3SU1156-0AB70-3FA0**		1	1 unit

3SU1156-0AB50-1BA0

3SU1150-0AB40-3BA0

3SU1150-0BB20-3CA0

3SU1152-0AB20-3CA0

3SU1153-0AB60-3BA0

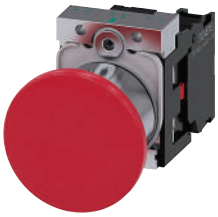
3SU1156-0AB30-3BA0

3SU1 22 mm, Metal, Shiny — Complete Units

Mushroom pushbuttons / EMERGENCY STOP mushroom pushbuttons

Selection and ordering data

Unlatching method	Number of Contact modules	NO contacts	NC contacts	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons								
With red mushroom, diameter 40 mm, latching								
Pull to unlatch	1	0	1	▶	**3SU1150-1BA20-1CA0**		1	1 unit
		1	1	3	**3SU1150-1BA20-1FA0**		1	1 unit
					Spring-type terminals			
Pull to unlatch	1	0	1	5	**3SU1150-1BA20-3CA0**		1	1 unit
		1	1	5	**3SU1150-1BA20-3FA0**		1	1 unit



3SU1150-1BA20-1CA0

Selection and ordering data

Unlatching method	Number of Contact modules	NO con-tacts	NC con-tacts	Marking	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5									
With red mushroom, diameter 40 mm, with positive latching									
Pull to unlatch	1	0	1	EMERGENCY STOP	⊖ 5	**3SU1150-1HA20-1CG0**		1	1 unit
	1	0	1	NOT-HALT	⊖ 5	**3SU1150-1HA20-1CH0**		1	1 unit
		1	1	EMERGENCY STOP	⊖ 5	**3SU1150-1HA20-1FG0**		1	1 unit
		1	1	NOT-HALT	⊖ 5	**3SU1150-1HA20-1FH0**		1	1 unit
Rotate to unlatch	1	0	1	EMERGENCY STOP	⊖ 3	**3SU1150-1HB20-1CG0**		1	1 unit
	1	0	1	NOT-HALT	⊖ ▶	**3SU1150-1HB20-1CH0**		1	1 unit
		1	1	EMERGENCY STOP	⊖ 5	**3SU1150-1HB20-1FG0**		1	1 unit
		1	1	NOT-HALT	⊖ ▶	**3SU1150-1HB20-1FH0**		1	1 unit
						Spring-type terminals			
Pull to unlatch	1	0	1	NOT-HALT	⊖ 5	**3SU1150-1HA20-3CH0**		1	1 unit
	2	0	2	NOT-HALT	⊖ 5	**3SU1150-1HA20-3FH0**		1	1 unit
	2	0	2	NOT-HALT	⊖ 5	**3SU1150-1HA20-3PH0**		1	1 unit
Rotate to unlatch	1	0	1	NOT-HALT	⊖ 5	**3SU1150-1HB20-3CH0**		1	1 unit
	2	0	2	NOT-HALT	⊖ 5	**3SU1150-1HB20-3FH0**		1	1 unit
	2	0	2	NOT-HALT	⊖ 5	**3SU1150-1HB20-3PH0**		1	1 unit
Illuminated EMERGENCY STOP with integrated LED light module, Rated 24-240V AC/DC									
Red button, yellow backing plate, self-adhesive label with text:									
Rotate to unlatch	2	1	1	EMERGENCY STOP	5	**A6X30120577**		1	1 unit
Red button, yellow backing plate, self-adhesive label with text:									
Rotate to unlatch	2	1	2	EMERGENCY STOP	5	**A6X30120587**		1	1 unit
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

3SU1150-1HB20-1CH0

⊖ 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 Limit Switches and Safety.

Certificate:

3SU1 22 mm, Metal, Shiny — Complete Units

Selector switches / key-operated switches

	Un-latching method	Supply voltage for light source at AC	Supply voltage for light source at DC	Number of Contact modules	Number of NO con-tacts	Number of NC con-tacts	Marking	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V	V					d				
ILLUMINATED EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5 NEW												
With red mushroom, diameter 40 mm, with positive latching												
3SU1158-1HB20-1PT0	Rotate to unlatch	24 ... 240	24 ... 240	1	0	2	EMER-GENCY STOP	⊕ 5	**3SU1158-1HB20-1PT0**		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 Limit Switches and Safety.
Certificate:

Selection and ordering data

	Operating principle	Color	Number of Contact modules	Number of NO contacts	Number of NC contacts	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
						d				
Selector switches										
Short black actuator, 2 switch positions										
3SU1150-2BF60-1BA0	Latching, 90°	White	1	1	0	▶	**3SU1150-2BF60-1BA0**		1	1 unit
				1	1	3	**3SU1150-2BF60-1FA0**		1	1 unit
			2	1	1	▶	**3SU1150-2BF60-1MA0**		1	1 unit
Short black actuator, 3 switch positions (I - O - II)										
	Momentary contact, 2x45°, reset from left + right	White	2	2	2	3	**3SU1150-2BM60-1LA0**		1	1 unit
				2	0	▶	**3SU1150-2BM60-1NA0**		1	1 unit
	Latching, 2x45°	White	2	2	2	▶	**3SU1150-2BL60-1LA0**		1	1 unit
				2	0	▶	**3SU1150-2BL60-1NA0**		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**		1	1 unit
			2	1	1	5	**3SU1150-2BF60-3MA0**		1	1 unit
Short black actuator, 3 switch positions										
	Momentary contact, 2x45°, reset from left + right	White	2	2	2	5	**3SU1150-2BM60-3LA0**		1	1 unit
				2	0	5	**3SU1150-2BM60-3NA0**		1	1 unit
	Latching, 2x45°	White	2	2	2	5	**3SU1150-2BL60-3LA0**		1	1 unit
				2	0	5	**3SU1150-2BL60-3NA0**		1	1 unit

3SU1 22 mm, Metal, Shiny — Complete Units

Coordinate switches

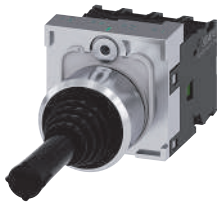
Selection and ordering data

Operating principle	Switch position for key removal	Number of Contact modules	NO contacts	NC contacts	Number of keys	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Key-operated switches										
With RONIS lock, SB30, 2 switch positions										
Latching, 90° (10:30/ 1:30 o'clock)	All	1	1	0	2	3	**3SU1150-4BF11-1BA0**		1	1 unit
	All		1	1	2	3	**3SU1150-4BF11-1FA0**		1	1 unit
							Spring-type terminals			
	All	1	1	0	2	5	**3SU1150-4BF11-3BA0**		1	1 unit
	All		1	1	2	5	**3SU1150-4BF11-3FA0**		1	1 unit
	O	2	0	2	2	5	**3SU1150-4BF01-3PA0**		1	1 unit

3SU1150-4BF11-1BA0

Selection and ordering data

Number of NO contacts (1 per direction)	Operating principle	Direction of actuation	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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
	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
	Latching	Horizontal/Vertical	5	**3SU1150-7AE88-1QA0**		1	1 unit
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
	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
	Latching	Horizontal/Vertical	5	**3SU1150-7BE88-1QA0**		1	1 unit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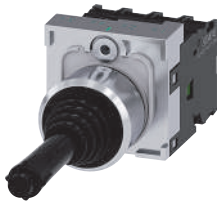

3SU1150-7BF88-1QA0

3SU1 22 mm, Metal, Shiny — Complete Units

Indicator lights

Selection and ordering data

	Operational voltage at AC, rated value	Operational voltage at DC, rated value	Color of actuating element	Color of light source	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V	V			d				
Indicator lights									
	With smooth lens and integrated LED								
3SU1152-6AA50-1AA0	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
3SU1156-6AA60-1AA0	110	--	Amber	Amber	5	**3SU1153-6AA00-1AA0**		1	1 unit
			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	▶	**3SU1156-6AA20-1AA0**		1	1 unit
			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			
3SU1152-6AA40-3AA0	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
3SU1156-6AA20-3AA0	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

Pushbuttons with extended stroke

Selection and ordering data

	Version	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons with extended stroke							
	For actuating relays, can only be combined with extension plunger, no contact module or LED module required						
3SU1250-0EB40-0AA0	**Pushbuttons with flat button**	Red	5	**3SU1250-0EB20-0AA0**		1	1 unit
		Green	5	**3SU1250-0EB40-0AA0**		1	1 unit
		Blue	7	**3SU1250-0EB50-0AA0**		1	1 unit
3SU1250-0FB10-0AA0	**Pushbuttons with raised button**	Black	▶	**3SU1250-0FB10-0AA0**		1	1 unit
3SU1251-0EB20-0AA0	**Pushbuttons with flat transparent button for insertion of insert labels**	Red	3	**3SU1251-0EB20-0AA0**		1	1 unit
		Clear	3	**3SU1251-0EB70-0AA0**		1	1 unit

	Version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Accessories								
3SU1900-0KG10-0AA0	**Extension plungers** For compensation of the distance between the pushbutton and the unlatching button of an overload relay	Plastic	Gray	▶	**3SU1900-0KG10-0AA0**		1	1 unit

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons								
 3SU1050-0AB40-0AC0	**Pushbuttons with flat button** 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
 3SU1050-0AA30-0AA0		Latching Push to unlatch	Black	▶	**3SU1050-0AA10-0AA0**		1	1 unit
			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
 3SU1050-0BB20-0AA0	**Pushbuttons with raised button** 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 Push to unlatch	Red	5	**3SU1050-0BA20-0AA0**		1	1 unit
 3SU1050-0CB50-0AA0	**Pushbuttons with flat button** 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
 3SU1051-0CB40-0AA0	**Illuminated pushbuttons with flat button** Raised	Momentary contact	Green	X	**3SU1051-0CB40-0AA0**		1	20 units

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

Pushbuttons

	Version of actuating element Front ring version	Operating principle Unlatching method	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons								
 3SU1051-0AB30-0AA0	**Illuminated pushbuttons with flat button** 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
 3SU1051-0AA20-0AA0		Latching Push to unlatch	Red	▶	**3SU1051-0AA20-0AA0**		1	1 unit
			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
 3SU1051-0BB20-0AA0	**Illuminated pushbuttons with raised button** Standard	Momentary contact	Amber	5	**3SU1051-0BB00-0AA0**		1	1 unit
			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

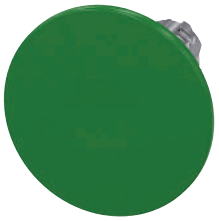
Selection and ordering data

	Version of actuating element	Operating principle	Color	Marking Symbol No.	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Twin pushbuttons									
3SU1050-3AB66-0AL0	**Twin pushbuttons** flat, flat	Momentary contact	Green/Red	--	3	**3SU1050-3AB42-0AA0**		1	1 unit
				"I"/"O"	3	**3SU1050-3AB42-0AK0**		1	1 unit
			White/Black	--	3	**3SU1050-3AB61-0AA0**		1	1 unit
				"I"/"O"	3	**3SU1050-3AB61-0AK0**		1	1 unit
			White/White	--	3	**3SU1050-3AB66-0AA0**		1	1 unit
				"–"/"+"	5	**3SU1050-3AB66-0AL0**		1	1 unit
				Arrows, hor.	5	**3SU1050-3AB66-0AM0**		1	1 unit
			Black/Black	--	3	**3SU1050-3AB11-0AA0**		1	1 unit
				⊙ ○ 5264/5265 (IEC 60417)	5	**3SU1050-3AB11-0AQ0**		1	1 unit
3SU1050-3BB42-0AK0	**Twin pushbuttons** flat, raised	Momentary contact	Green/Red	--	3	**3SU1050-3BB42-0AA0**		1	1 unit
				"I"/"O"	3	**3SU1050-3BB42-0AK0**		1	1 unit
			White/Black	--	3	**3SU1050-3BB61-0AA0**		1	1 unit
				"I"/"O"	5	**3SU1050-3BB61-0AK0**		1	1 unit
3SU1051-3AB42-0AN0	**Twin pushbuttons** flat, flat, illuminated	Momentary contact	Green/Red	--	▶	**3SU1051-3AB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1051-3AB42-0AK0**		1	1 unit
				Arrows, vert.	5	**3SU1051-3AB42-0AN0**		1	1 unit
			White/Black	--	▶	**3SU1051-3AB61-0AA0**		1	1 unit
				"I"/"O"	3	**3SU1051-3AB61-0AK0**		1	1 unit
3SU1051-3BB61-0AA0	**Twin pushbuttons** flat, raised, illuminated	Momentary contact	Green/Red	--	3	**3SU1051-3BB42-0AA0**		1	1 unit
				"I"/"O"	▶	**3SU1051-3BB42-0AK0**		1	1 unit
			White/Black	--	3	**3SU1051-3BB61-0AA0**		1	1 unit
				"I"/"O"	5	**3SU1051-3BB61-0AK0**		1	1 unit

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons								
	2 switch positions							
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 Pull to unlatch	Black	▶	**3SU1050-1AA10-0AA0**		1	1 unit
			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 Pull to unlatch	Black	3	**3SU1050-1BA10-0AA0**		1	1 unit
			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 Pull to unlatch	Black	5	**3SU1050-1CA10-0AA0**		1	1 unit
			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
			Blue NEW	5	**3SU1051-1AD50-0AA0**		1	1 unit
			White	5	**3SU1051-1AD60-0AA0**		1	1 unit
		Latching Pull to unlatch	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 Pull to unlatch	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 None	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 Pull to unlatch	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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons								
3SU1050-1HB10-0AA0	***2 switch positions***							
	Mushroom pushbuttons with raised mushroom, 40 mm diameter, 2 positions	With positive latching Rotate to unlatch	Black	5	**3SU1050-1HB10-0AA0**		1	1 unit
			Yellow	5	**3SU1050-1HB30-0AA0**		1	1 unit
3SU1050-1EA20-0AA0	***3 switch positions***							
	Mushroom pushbuttons 40 mm diameter, 3 positions	Momentary contact	Black	5	**3SU1050-1ED10-0AA0**		1	1 unit
			Red	5	**3SU1050-1ED20-0AA0**		1	1 unit
		Latching Pull to unlatch	Black	5	**3SU1050-1EA10-0AA0**		1	1 unit
			Red	5	**3SU1050-1EA20-0AA0**		1	1 unit
3SU1051-1EA40-0AA0	**Mushroom pushbuttons** 40 mm diameter, 3 positions, illuminated	Momentary contact	Red	5	**3SU1051-1ED20-0AA0**		1	1 unit
			White	5	**3SU1051-1ED60-0AA0**		1	1 unit
		Latching Pull to unlatch	Red	5	**3SU1051-1EA20-0AA0**		1	1 unit
			Green	5	**3SU1051-1EA40-0AA0**		1	1 unit

Selection and ordering data

	Version of actuating element	Outer diameter of mushroom	Make of lock	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5									
3SU1050-1HA20-0AA0	***With pull-to-unlatch mechanism***								
	With positive latching, 2 positions	40	--	Red	3	**3SU1050-1HA20-0AA0**		1	1 unit
3SU1050-1GB20-0AA0	***With rotate-to-unlatch mechanism***								
	With positive latching, 2 positions	33.8	--	Red	3	**3SU1050-1GB20-0AA0**		1	1 unit

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

EMERGENCY STOP mushroom pushbuttons

EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5

Version of actuating element	Outer diameter of mushroom	Make of lock	Color	Number of keys	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
With rotate-to-unlatch mechanism									
With positive latching, 2 positions	40	--	Red	--	▶	**3SU1050-1HB20-0AA0**		1	1 unit
	60	--	Red	--	5	**3SU1050-1JB20-0AA0**		1	1 unit
With latching, 2 positions	40	--	Red	--	NEW 3	**3SU1050-1LB20-0AA0**		1	1 unit
With rotate-to-unlatch mechanism, can be illuminated									
With positive latching, 2 positions	33.8	--	Red	--	▶	**3SU1051-1GB20-0AA0**		1	1 unit
	40				▶	**3SU1051-1HB20-0AA0**		1	1 unit
	60				▶	**3SU1051-1JB20-0AA0**		1	1 unit
With key-operated release									
With positive latching, 2 positions	40	RONIS SB30	Red	2	3	**3SU1050-1HF20-0AA0**		1	1 unit
		RONIS 455		2	5	**3SU1050-1HG20-0AA0**		1	1 unit
		RONIS 421		2	5	**3SU1050-1HH20-0AA0**		1	1 unit
		BKS S1	Red	2	5	**3SU1050-1HK20-0AA0**		1	1 unit
		BKS E7		0	5	**3SU1050-1HM20-0AA0**		1	1 unit
		BKS E9		0	5	**3SU1050-1HN20-0AA0**		1	1 unit
		O.M.R. 73037	Red	2	5	**3SU1050-1HQ20-0AA0**		1	1 unit
		CES SSG10	Red	2	3	**3SU1050-1HR20-0AA0**		1	1 unit
		CES SSP9		2	5	**3SU1050-1HS20-0AA0**		1	1 unit
		CES VL5	Black	2	5	**3SU1050-1HU10-0AA0**		1	1 unit
			Red	2	5	**3SU1050-1HU20-0AA0**		1	1 unit
		CES VL1		2	5	**3SU1050-1HV20-0AA0**		1	1 unit
		IKON 360012K1	Red	2	5	**3SU1050-1HX20-0AA0**		1	1 unit

3SU1050-1HB20-0AA0

3SU1050-1JB20-0AA0

3SU1051-1HB20-0AA0

3SU1050-1HF20-0AA0

3SU1050-1HQ20-0AA0

3SU1050-1HR20-0AA0

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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Toggle switches									
3SU1050-3EA10-0AA0	2	1	Black	Latching	5	**3SU1050-3EA10-0AA0**		1	1 unit
				Momentary contact, reset from above	5	**3SU1050-3EC10-0AA0**		1	1 unit

Selection and ordering data

	Version of actuating element	Operating principle	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches								
	2 switch positions, can be illuminated							
3SU1052-2BC20-0AA0	Selector, short black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	3	**3SU1052-2BC10-0AA0**		1	1 unit
			Red	▶	**3SU1052-2BC20-0AA0**		1	1 unit
			Yellow	5	**3SU1052-2BC30-0AA0**		1	1 unit
			Green	▶	**3SU1052-2BC40-0AA0**		1	1 unit
			Blue	▶	**3SU1052-2BC50-0AA0**		1	1 unit
			White	3	**3SU1052-2BC60-0AA0**		1	1 unit
3SU1052-2BF40-0AA0		Latching, 90° (10:30/1:30 o'clock)	Amber	5	**3SU1052-2BF00-0AA0**		1	1 unit
			Black	▶	**3SU1052-2BF10-0AA0**		1	1 unit
			Red	3	**3SU1052-2BF20-0AA0**		1	1 unit
			Yellow	NEW 7	**3SU1052-2BF30-0AA0**		1	1 unit
			Green	3	**3SU1052-2BF40-0AA0**		1	1 unit
			Blue	NEW 7	**3SU1052-2BF50-0AA0**		1	1 unit
			White	▶	**3SU1052-2BF60-0AA0**		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	**3SU1052-2CC10-0AA0**		1	1 unit
			Yellow	5	**3SU1052-2CC30-0AA0**		1	1 unit
			Green	5	**3SU1052-2CC40-0AA0**		1	1 unit
			Blue	5	**3SU1052-2CC50-0AA0**		1	1 unit
			White	5	**3SU1052-2CC60-0AA0**		1	1 unit
		Latching, 90° (10:30/1:30 o'clock)	Black	5	**3SU1052-2CF10-0AA0**		1	1 unit
			Red	5	**3SU1052-2CF20-0AA0**		1	1 unit
			Yellow	5	**3SU1052-2CF30-0AA0**		1	1 unit
			Green	5	**3SU1052-2CF40-0AA0**		1	1 unit
			Blue	5	**3SU1052-2CF50-0AA0**		1	1 unit
			White	5	**3SU1052-2CF60-0AA0**		1	1 unit

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

Selector switches

Selector switches

3 switch positions, can be illuminated

Version of actuating element	Operating principle	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector, short black actuator	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right	Amber	5	**3SU1052-2BM00-0AA0**		1	1 unit
		Black	▶	**3SU1052-2BM10-0AA0**		1	1 unit
		Red	5	**3SU1052-2BM20-0AA0**		1	1 unit
		Yellow	5	**3SU1052-2BM30-0AA0**		1	1 unit
		Green	▶	**3SU1052-2BM40-0AA0**		1	1 unit
		Blue	▶	**3SU1052-2BM50-0AA0**		1	1 unit
		White	▶	**3SU1052-2BM60-0AA0**		1	1 unit
	Latching, 2x45° (10:30/12/1:30 o'clock)	Amber	5	**3SU1052-2BL00-0AA0**		1	1 unit
		Black	▶	**3SU1052-2BL10-0AA0**		1	1 unit
		Red	▶	**3SU1052-2BL20-0AA0**		1	1 unit
		Yellow	▶	**3SU1052-2BL30-0AA0**		1	1 unit
		Green	3	**3SU1052-2BL40-0AA0**		1	1 unit
		White	▶	**3SU1052-2BL60-0AA0**		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**		1	1 unit
		Red	5	**3SU1052-2BP20-0AA0**		1	1 unit
		Green	5	**3SU1052-2BP40-0AA0**		1	1 unit
		White	5	**3SU1052-2BP60-0AA0**		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**		1	1 unit
		Red	5	**3SU1052-2BN20-0AA0**		1	1 unit
		Green	▶	**3SU1052-2BN40-0AA0**		1	1 unit
		White	3	**3SU1052-2BN60-0AA0**		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**		1	1 unit
		Red	5	**3SU1052-2CM20-0AA0**		1	1 unit
		Green	5	**3SU1052-2CM40-0AA0**		1	1 unit
		White	3	**3SU1052-2CM60-0AA0**		1	1 unit
	Latching, 2x45° (10:30/12/1:30 o'clock)	Black	5	**3SU1052-2CL10-0AA0**		1	1 unit
		Red	5	**3SU1052-2CL20-0AA0**		1	1 unit
		Green	5	**3SU1052-2CL40-0AA0**		1	1 unit
		White	5	**3SU1052-2CL60-0AA0**		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**		1	1 unit
		Red	5	**3SU1052-2CP20-0AA0**		1	1 unit
		White	5	**3SU1052-2CP60-0AA0**		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**		1	1 unit
		Red	5	**3SU1052-2CN20-0AA0**		1	1 unit
		White	5	**3SU1052-2CN60-0AA0**		1	1 unit
Lockable with 2 padlocks or carabiner hooks		Black	NEW 5	**3SU1042-2GL10-0AA0**		1	1 unit

3SU1052-2BM50-0AA0

3SU1052-2BL30-0AA0

3SU1052-2BN20-0AA0

3SU1052-2CL40-0AA0

3SU1042-2GL10-0AA0

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

Selector switches

	Version of actuating element	Operating principle	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches								
3SU1050-2AS60-0AA0	***4 switch positions*** Rotary knob	Latching, 4x90° (3/6/9/12 o'clock)	White	3	**3SU1050-2AS60-0AA0**		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 d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Key-operated switches									
	2 switch positions								
3SU1050-4BC01-0AA0	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	RONIS, SB30	O	2	3	**3SU1050-4BC01-0AA0**		1	1 unit
		RONIS, 455	O	2	5	**3SU1050-4CC01-0AA0**		1	1 unit
		O.M.R. 73037, red	O	2	5	**3SU1050-4FC01-0AA0**		1	1 unit
		O.M.R. 73038, light blue	O	2	5	**3SU1050-4GC01-0AA0**		1	1 unit
		O.M.R. 73034, black	O	2	5	**3SU1050-4HC01-0AA0**		1	1 unit
		O.M.R. 73033, yellow	O	2	5	**3SU1050-4JC01-0AA0**		1	1 unit
		CES, SSG10	O	2	3	**3SU1050-5BC01-0AA0**		1	1 unit
		CES, LSG1	O	2	5	**3SU1050-5HC01-0AA0**		1	1 unit
		CES, VL5	O	2	5	**3SU1050-5KC01-0AA0**		1	1 unit
		CES, STGH10	O	2	5	**3SU1050-5LC01-0AA0**		1	1 unit
		BKS, S1	O	2	5	**3SU1050-5PC01-0AA0**		1	1 unit
		IKON, 360012K1	O	2	5	**3SU1050-5XC01-0AA0**		1	1 unit
3SU1050-4BF01-0AA0	Latching, 90° (10:30/1:30 o'clock)	RONIS, SB30	O	2	3	**3SU1050-4BF01-0AA0**		1	1 unit
			O+I	2	3	**3SU1050-4BF11-0AA0**		1	1 unit
			I	2	5	**3SU1050-4BF21-0AA0**		1	1 unit
		RONIS, 455	O	2	5	**3SU1050-4CF01-0AA0**		1	1 unit
			O+I	2	5	**3SU1050-4CF11-0AA0**		1	1 unit
			I	2	5	**3SU1050-4CF21-0AA0**		1	1 unit
		RONIS, 421	O+I	2	5	**3SU1050-4DF11-0AA0**		1	1 unit
3SU1050-4GF11-0AA0		O.M.R. 73037, red	O	2	5	**3SU1050-4FF01-0AA0**		1	1 unit
			O+I	2	5	**3SU1050-4FF11-0AA0**		1	1 unit
			I	2	5	**3SU1050-4FF21-0AA0**		1	1 unit
		O.M.R. 73038, light blue	O	2	5	**3SU1050-4GF01-0AA0**		1	1 unit
			O+I	2	5	**3SU1050-4GF11-0AA0**		1	1 unit
			I	2	5	**3SU1050-4GF21-0AA0**		1	1 unit
		O.M.R. 73034, black	O	2	5	**3SU1050-4HF01-0AA0**		1	1 unit
			O+I	2	5	**3SU1050-4HF11-0AA0**		1	1 unit
			I	2	5	**3SU1050-4HF21-0AA0**		1	1 unit
		O.M.R. 73033, yellow	O	2	5	**3SU1050-4JF01-0AA0**		1	1 unit
			O+I	2	5	**3SU1050-4JF11-0AA0**		1	1 unit
			I	2	5	**3SU1050-4JF21-0AA0**		1	1 unit
3SU1050-5BF01-0AA0		CES, SSG10	O	2	3	**3SU1050-5BF01-0AA0**		1	1 unit
			O+I	2	3	**3SU1050-5BF11-0AA0**		1	1 unit
			I	2	5	**3SU1050-5BF21-0AA0**		1	1 unit
		CES, SSG10 with key monitoring	O	2	NEW 5	**3SU1050-5JF01-0AA0**		1	1 unit
		CES, LSG1	O	2	5	**3SU1050-5HF01-0AA0**		1	1 unit
			O+I	2	5	**3SU1050-5HF11-0AA0**		1	1 unit
		CES, VL5	O	2	5	**3SU1050-5KF01-0AA0**		1	1 unit
		CES, STGH10	O+I	2	5	**3SU1050-5LF11-0AA0**		1	1 unit
3SU1050-5PF01-0AA0		BKS, S1	O	2	5	**3SU1050-5PF01-0AA0**		1	1 unit
			O+I	2	5	**3SU1050-5PF11-0AA0**		1	1 unit
			I	2	5	**3SU1050-5PF21-0AA0**		1	1 unit
		BKS, E1	O	0	5	**3SU1050-5QF01-0AA0**		1	1 unit
			O+I	0	5	**3SU1050-5QF11-0AA0**		1	1 unit
		BKS, E2	O	0	3	**3SU1050-5RF01-0AA0**		1	1 unit
			O+I	0	5	**3SU1050-5RF11-0AA0**		1	1 unit
		BKS, E7	O	0	5	**3SU1050-5SF01-0AA0**		1	1 unit
			O+I	0	5	**3SU1050-5SF11-0AA0**		1	1 unit
		BKS, E9	O	0	5	**3SU1050-5TF01-0AA0**		1	1 unit
			O+I	0	5	**3SU1050-5TF11-0AA0**		1	1 unit
		IKON, 360012K1	O	2	5	**3SU1050-5XF01-0AA0**		1	1 unit
			O+I	2	5	**3SU1050-5XF11-0AA0**		1	1 unit

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

Key-operated switches

Key-operated switches

3 switch positions

Operating principle	Make of lock	Switch position for key removal	Number of keys	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Momentary contact, 2x45° (10:30/12/ 1:30 o'clock), reset from left + right	RONIS, SB30	O	2	5	**3SU1050-4BM01-0AA0**		1	1 unit
	RONIS, 455	O	2	5	**3SU1050-4CM01-0AA0**		1	1 unit
	O.M.R. 73034, black	O	2	5	**3SU1050-4HM01-0AA0**		1	1 unit
	CES, SSG10	O	2	5	**3SU1050-5BM01-0AA0**		1	1 unit
	CES, STGH10	O	2	5	**3SU1050-5LM01-0AA0**		1	1 unit
	BKS, S1	O	2	5	**3SU1050-5PM01-0AA0**		1	1 unit
	IKON, 360012K1	O	2	5	**3SU1050-5XM01-0AA0**		1	1 unit
Latching, 2x45° (10:30/12/ 1:30 o'clock)	RONIS, SB30	O	2	5	**3SU1050-4BL01-0AA0**		1	1 unit
		I+O+II	2	3	**3SU1050-4BL11-0AA0**		1	1 unit
		I	2	5	**3SU1050-4BL21-0AA0**		1	1 unit
		II	2	5	**3SU1050-4BL31-0AA0**		1	1 unit
		I+II	2	5	**3SU1050-4BL41-0AA0**		1	1 unit
		O+I	2	5	**3SU1050-4BL51-0AA0**		1	1 unit
	RONIS, 455	O	2	5	**3SU1050-4CL01-0AA0**		1	1 unit
		I+O+II	2	5	**3SU1050-4CL11-0AA0**		1	1 unit
	RONIS, 421		2	5	**3SU1050-4DL11-0AA0**		1	1 unit
	O.M.R. 73037, red	I+O+II	2	5	**3SU1050-4FL11-0AA0**		1	1 unit
	O.M.R. 73038, light blue	O	2	5	**3SU1050-4GL01-0AA0**		1	1 unit
		I+O+III	2	5	**3SU1050-4GL11-0AA0**		1	1 unit
	O.M.R. 73034, black	O	2	5	**3SU1050-4HL01-0AA0**		1	1 unit
		I+O+II	2	5	**3SU1050-4HL11-0AA0**		1	1 unit
	CES, SSG10	O	2	5	**3SU1050-5BL01-0AA0**		1	1 unit
		I+O+II	2	3	**3SU1050-5BL11-0AA0**		1	1 unit
		I	2	5	**3SU1050-5BL21-0AA0**		1	1 unit
		II	2	5	**3SU1050-5BL31-0AA0**		1	1 unit
		I+II	2	5	**3SU1050-5BL41-0AA0**		1	1 unit
	CES, SSG10 with key monitoring	O	2	NEW 5	**3SU1050-5JL01-0AA0**		1	1 unit
	BKS, S1	O	2	5	**3SU1050-5PL01-0AA0**		1	1 unit
		I+O+II	2	5	**3SU1050-5PL11-0AA0**		1	1 unit
		I	2	5	**3SU1050-5PL21-0AA0**		1	1 unit
		I+II	2	5	**3SU1050-5PL41-0AA0**		1	1 unit
	IKON, 360012K1	O	2	5	**3SU1050-5XL01-0AA0**		1	1 unit
		I+O+II	2	5	**3SU1050-5XL11-0AA0**		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	**3SU1050-4BP01-0AA0**		1	1 unit
		O+II	2	5	**3SU1050-4BP61-0AA0**		1	1 unit
	O.M.R. 73034, black	II	2	5	**3SU1050-4HP31-0AA0**		1	1 unit
	O.M.R. 73033, yellow	II	2	5	**3SU1050-4JP31-0AA0**		1	1 unit
	CES, SSG10	O	2	5	**3SU1050-5BP01-0AA0**		1	1 unit
		II	2	5	**3SU1050-5BP31-0AA0**		1	1 unit
		O+II	2	5	**3SU1050-5BP61-0AA0**		1	1 unit
	BKS, S1	O	2	5	**3SU1050-5PP01-0AA0**		1	1 unit
Latching/momentary contact, 2x45° (10:30/12/ 1:30 o'clock), reset from right, latching to the left	RONIS, SB30	O	2	5	**3SU1050-4BN01-0AA0**		1	1 unit
		I	2	5	**3SU1050-4BN21-0AA0**		1	1 unit
		O+IO+I	2	5	**3SU1050-4BN51-0AA0**		1	1 unit
	CES, SSG10	O	2	5	**3SU1050-5BN01-0AA0**		1	1 unit
		I	2	5	**3SU1050-5BN21-0AA0**		1	1 unit
		O+I	2	5	**3SU1050-5BN51-0AA0**		1	1 unit
	CES, STGH10	O+I	2	5	**3SU1050-5LN51-0AA0**		1	1 unit
	BKS, S1	O	2	5	**3SU1050-5PN01-0AA0**		1	1 unit
		I	2	5	**3SU1050-5PN21-0AA0**		1	1 unit
		O+I	2	5	**3SU1050-5PN51-0AA0**		1	1 unit

3SU1050-4BM01-0AA0

3SU1050-4FL11-0AA0

3SU1050-5BL01-0AA0

3SU1050-4BP01-0AA0

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 Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
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
	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	▶	**3SU1050-7AF88-0AA0**		1	1 unit
	Latching	Horizontal/Vertical	▶	**3SU1050-7AE88-0AA0**		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
	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

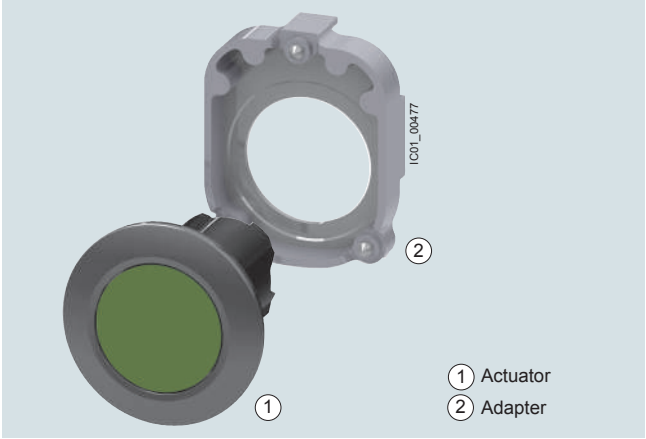
Type of product	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Indicator lights						
With smooth lens	Amber	3	**3SU1051-6AA00-0AA0**		1	1 unit
	Red	▶	**3SU1051-6AA20-0AA0**		1	1 unit
	Yellow	▶	**3SU1051-6AA30-0AA0**		1	1 unit
	Green	▶	**3SU1051-6AA40-0AA0**		1	1 unit
	Blue	3	**3SU1051-6AA50-0AA0**		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, 30 mm, metal, matte, including adapter (adapter included in scope of supply)

Selection and ordering data

	Version	Operating principle	Unlatching method	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Pushbuttons									
3SU1060-0JB50-0AA0	**Pushbuttons** with flat button	Momentary contact	--	Amber	3	**3SU1060-0JB00-0AA0**		1	1 unit
				Black	3	**3SU1060-0JB10-0AA0**		1	1 unit
				Red	3	**3SU1060-0JB20-0AA0**		1	1 unit
				Yellow	3	**3SU1060-0JB30-0AA0**		1	1 unit
				Green	3	**3SU1060-0JB40-0AA0**		1	1 unit
				Blue	3	**3SU1060-0JB50-0AA0**		1	1 unit
				White	3	**3SU1060-0JB60-0AA0**		1	1 unit
				Gray	X	**3SU1060-0JB80-0AA0**		1	10 units
3SU1060-0JA20-0AA0		Latching	Push to unlatch	Black	5	**3SU1060-0JA10-0AA0**		1	1 unit
				Red	5	**3SU1060-0JA20-0AA0**		1	1 unit
				Yellow	5	**3SU1060-0JA30-0AA0**		1	1 unit
				Green	5	**3SU1060-0JA40-0AA0**		1	1 unit
				Blue	5	**3SU1060-0JA50-0AA0**		1	1 unit
				White	5	**3SU1060-0JA60-0AA0**		1	1 unit
3SU1061-0JB40-0AA0	**Illuminated pushbuttons** with flat button	Momentary contact	--	Red	3	**3SU1061-0JB20-0AA0**		1	1 unit
				Yellow	3	**3SU1061-0JB30-0AA0**		1	1 unit
				Green	3	**3SU1061-0JB40-0AA0**		1	1 unit
				Blue	3	**3SU1061-0JB50-0AA0**		1	1 unit
				Clear	3	**3SU1061-0JB70-0AA0**		1	1 unit
3SU1061-0JA30-0AA0		Latching	Push to unlatch	Red	5	**3SU1061-0JA20-0AA0**		1	1 unit
				Yellow	5	**3SU1061-0JA30-0AA0**		1	1 unit
				Green	5	**3SU1061-0JA40-0AA0**		1	1 unit
				Blue	5	**3SU1061-0JA50-0AA0**		1	1 unit
				Clear	5	**3SU1061-0JA70-0AA0**		1	1 unit

3SU1 30 mm, Round, Metal, Matte — Actuating & Signaling Elements

Selector switches

Selection and ordering data

	Version	Operating principle	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches								
	2 switch positions, can be illuminated							
3SU1062-2DC40-0AA0	Selector, short black actuator and front ring for flat mounting	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	5	**3SU1062-2DC10-0AA0**		1	1 unit
			Red	5	**3SU1062-2DC20-0AA0**		1	1 unit
			Green	5	**3SU1062-2DC40-0AA0**		1	1 unit
			White	5	**3SU1062-2DC60-0AA0**		1	1 unit
		Latching, 90° (10:30/1:30 o'clock)	Black	3	**3SU1062-2DF10-0AA0**		1	1 unit
			Red	5	**3SU1062-2DF20-0AA0**		1	1 unit
			Green	5	**3SU1062-2DF40-0AA0**		1	1 unit
			Blue	5	**3SU1062-2DF50-0AA0**		1	1 unit
			White	3	**3SU1062-2DF60-0AA0**		1	1 unit
3SU1062-2EC20-0AA0	Selector, long black actuator and front ring for flat mounting	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	5	**3SU1062-2EC10-0AA0**		1	1 unit
			Red	5	**3SU1062-2EC20-0AA0**		1	1 unit
			Green	5	**3SU1062-2EC40-0AA0**		1	1 unit
			White	5	**3SU1062-2EC60-0AA0**		1	1 unit
		Latching, 90° (10:30/1:30 o'clock)	Black	3	**3SU1062-2EF10-0AA0**		1	1 unit
			Red	5	**3SU1062-2EF20-0AA0**		1	1 unit
			Green	5	**3SU1062-2EF40-0AA0**		1	1 unit
			White	3	**3SU1062-2EF60-0AA0**		1	1 unit
	3 switch positions (I+O+II), can be illuminated							
3SU1062-2DL60-0AA0	Selector, short black actuator and front ring for flat mounting	Momentary contact, 2x45° (10:30/12/ 1:30 o'clock), reset from left + right	Black	3	**3SU1062-2DM10-0AA0**		1	1 unit
			Red	5	**3SU1062-2DM20-0AA0**		1	1 unit
			Green	5	**3SU1062-2DM40-0AA0**		1	1 unit
			White	3	**3SU1062-2DM60-0AA0**		1	1 unit
		Latching, 2x45° (10:30/12/ 1:30 o'clock)	Black	3	**3SU1062-2DL10-0AA0**		1	1 unit
			Red	5	**3SU1062-2DL20-0AA0**		1	1 unit
			Yellow	5	**3SU1062-2DL30-0AA0**		1	1 unit
			Green	5	**3SU1062-2DL40-0AA0**		1	1 unit
			White	3	**3SU1062-2DL60-0AA0**		1	1 unit
		Momentary contact to the right, latching to the left, 2x45° (10:30/12/ 1:30 o'clock)	Black	NEW 5	**3SU1062-2DN60-0AA0**		1	1 unit
3SU1062-2EL20-0AA0	Selector, long black actuator and front ring for flat mounting	Momentary contact, 2x45° (10:30/12/ 1:30 o'clock), reset from left + right	Black	3	**3SU1062-2EM10-0AA0**		1	1 unit
			Red	5	**3SU1062-2EM20-0AA0**		1	1 unit
			Green	5	**3SU1062-2EM40-0AA0**		1	1 unit
			White	3	**3SU1062-2EM60-0AA0**		1	1 unit
		Latching, 2x45° (10:30/12/ 1:30 o'clock)	Black	3	**3SU1062-2EL10-0AA0**		1	1 unit
			Red	5	**3SU1062-2EL20-0AA0**		1	1 unit
			Green	5	**3SU1062-2EL40-0AA0**		1	1 unit
			White	3	**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	Number of keys	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Key-operated switches									
3SU1060-4LF11-0AA0	***2 switch positions***								
	RONIS, SB30 and front ring for flat installation	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	O	2	5	**3SU1060-4LC01-0AA0**		1	1 unit
		Latching, 90° (10:30/1:30 o'clock)	O+I I	2 2	3 3	**3SU1060-4LF11-0AA0** **3SU1060-4LF21-0AA0**		1 1	1 unit 1 unit
3SU1060-4LL11-0AA0	***3 switch positions***								
	RONIS, SB30 and front ring for flat installation	Latching, 2x45° (10:30/12/ 1:30 o'clock)	I+O+II	2	5	**3SU1060-4LL11-0AA0**		1	1 unit
3SU1060-4LL11-0AA0	***3 switch positions***								
	RONIS, SB30 and front ring for flat installation	Latching, 2x45° (10:30/12/ 1:30 o'clock)	I+O+II	2	5	**3SU1060-4LL11-0AA0**		1	1 unit
		Momentary contact, 2x45° (10:30/12/ 1:30 o'clock)	O	2	NEW 5	**3SU1060-4LM01-0AA0**		1	1 unit

Selection and ordering data

	Version	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Indicator lights							
3SU1061-0JD40-0AA0	With flat lens	Red	3	**3SU1061-0JD20-0AA0**		1	1 unit
		Yellow	3	**3SU1061-0JD30-0AA0**		1	1 unit
		Green	3	**3SU1061-0JD40-0AA0**		1	1 unit
		Blue	3	**3SU1061-0JD50-0AA0**		1	1 unit
		Clear	3	**3SU1061-0JD70-0AA0**		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 article number of the relevant key-operated switch for standard locking.

Order code	Y01
Standard 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 table. 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.

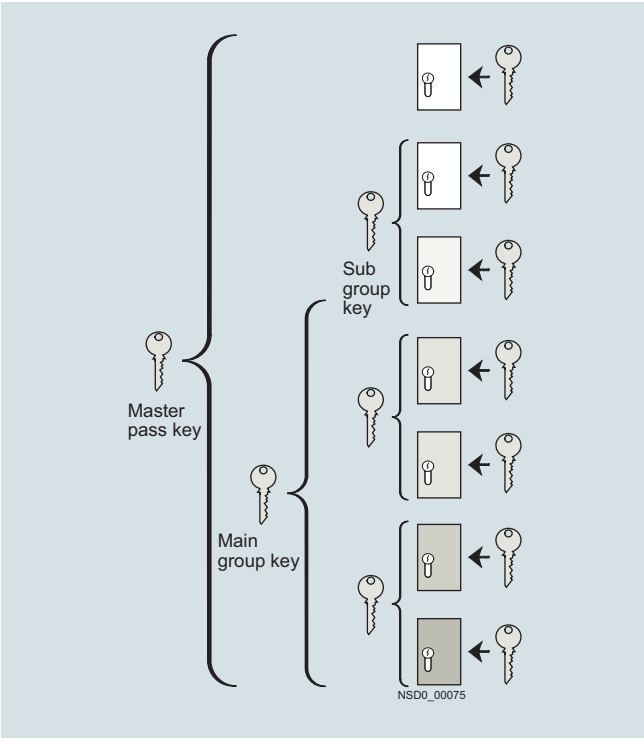
Master and master-pass key systems

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 article number of the matching key-operated switches with **"–Z"** and quote the order code **"Y03"**.

Price and delivery time on request.
Email: sirius-attach.aud@siemens.com



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

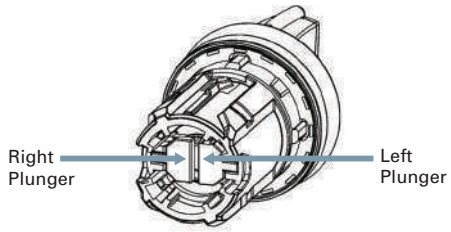
Selection and Ordering Data

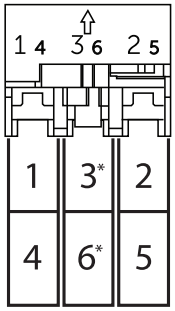
Switch Position (front of switch) Left	Right	Contact Block Circuit	Contact Block Position[1]	Contact Block Order No.
Two-Position Selector Switch Contact Block Selection				
O	X	1 NO	Any Position	**3SU1400-1AA10-1BA0**
X	O	1 NC	Any Position	**3SU1400-1AA10-1CA0**
O X	X O	1 NO/1 NC	Any Position	**3SU1400-1AA10-1FA0**
O O	X X	2 NO	Any Position	**3SU1400-1AA10-1DA0**
X X	O O	2 NC	Any Position	**3SU1400-1AA10-1EA0**

Switch Position (front of switch) Left	Center	Right	Contact Block Circuit	Contact Block Position[1] On Holder	Stacked	Contact Block Order No.
Three-Position Selector Switch Contact Block Selection						
X	O	O	1 NO	2 or 3A	5 or 6A	**3SU1400-1AA10-1BA0**
X	O	X	1 NO	3	6	**3SU1400-1AA10-1BA0**
O	O	X	1 NO	1 or 3B	4 or 6B	**3SU1400-1AA10-1BA0**
O	X	X	1 NC	2 or 3A	5 or 6A	**3SU1400-1AA10-1CA0**
O	X	O	1 NC	3	6	**3SU1400-1AA10-1CA0**
X	X	O	1 NC	1 or 3B	4 or 6B	**3SU1400-1AA10-1CA0**
X O	O X	O X	1 NO/1 NC	2 or 3A	--	**3SU1400-1AA10-1FA0**
X O	O X	X O	1 NO/1 NC	3	--	**3SU1400-1AA10-1FA0**
O X	O X	X O	1 NO/1 NC	1 or 3B	--	**3SU1400-1AA10-1FA0**
X X	O O	O O	2 NO	2 or 3A	--	**3SU1400-1AA10-1DA0**
X X	O O	X X	2 NO	3	--	**3SU1400-1AA10-1DA0**
O O	O O	X X	2 NO	1 or 3B	--	**3SU1400-1AA10-1DA0**
O O	X X	X X	2 NC	2 or 3A	--	**3SU1400-1AA10-1EA0**
O O	X X	O O	2 NC	3	--	**3SU1400-1AA10-1EA0**
X X	X X	O O	2 NC	1 or 3B	--	**3SU1400-1AA10-1EA0**
Three-Position Push-Pull Contact Block Selection						
Out	Center	In				
X	O	O	1 NO	2 or 3A	5 or 6A	**3SU1400-1AA10-1BA0**
O	O	X	1 NO	1 or 3B	4 or 6B	**3SU1400-1AA10-1BA0**
X	X	O	1 NC	1 or 3B	4 or 6B	**3SU1400-1AA10-1CA0**
O	X	X	1 NC	2 or 3A	5 or 6A	**3SU1400-1AA10-1CA0**
O X	X O	X O	1 NO/1 NC	2 or 3A	--	**3SU1400-1AA10-1FA0**
X O	X O	O X	1 NO/1 NC	1 or 3B	--	**3SU1400-1AA10-1FA0**
O X	X O	O X	2 NC	3	--	**3SU1400-1AA10-1FA0**

[1] 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.





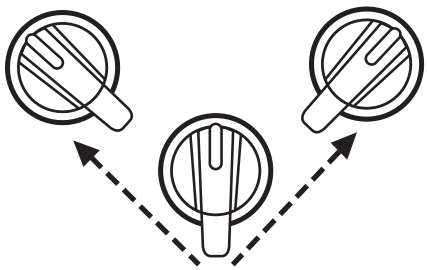
Rear View	Plungers Inserted	Center Module Position Numbers	Replace the asterisks in center position numbers 3* or 6*:
	Both	3 or 6	Contact Blocks Position Number will be (3 or 6) when "Both" plungers are installed.
	Right	3B or 6B	Contact Blocks Position Number will be (3B or 6B) when "Right" plunger 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[1]					
		Left Position			Right Position		
Rear View	Front View	2	3	1	2	3	1
		■	■	□	□	■	■
		■	□	□	□	■	■
		■	■	□	□	□	■
		■	⊗	□	□	⊗	■

■ Activated
□ Not Activated
⊗ LED Available
Plunger

[1] The selector switch position is viewed from the front.

All selector switches are packaged with two plungers, which can be removed manually.

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:

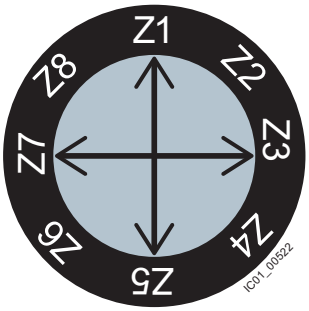
- 10 characters for one line of text
- 8 characters for 2 lines of text
- 6 characters for 3 lines of text, but 10 characters in the middle line

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
- Electronic Catalog CA 01 on DVD or
- Industry Mall: 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=I

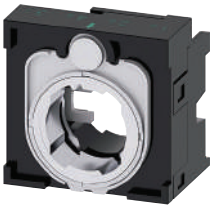
Holders

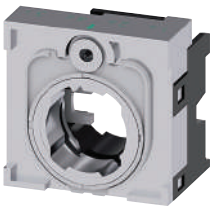
Holders without module

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*
Holders without module						
3SU1500-0AA10-0AA0	**3x without module**	Plastic	A	**3SU1500-0AA10-0AA0**	1	1 unit
 3SU1500-0BA10-0AA0	**4x without module** For selector switch with 4 switch positions and for coordinate switches	Plastic	A	**3SU1500-0BA10-0AA0**	1	1 unit

	Version	Holder material	DT	Order No.	PU (UNIT, SET, M)	PS*
Holders without module						
3SU1550-0AA10-0AA0	**3x without module**	Metal	A	**3SU1550-0AA10-0AA0**	1	1 unit
 3SU1550-0BA10-0AA0	**4x without module** For selector switch with 4 switch positions and for coordinate switches	Metal	A	**3SU1550-0BA10-0AA0**	1	1 unit

Selection and ordering data

Holders with module, plastic

3SU1500-1AA10-1BA0

3SU1501-1AG20-1CA0

3SU1501-1AG20-1LA0

Number of Contact modules	LED modules	NO contacts	NC contacts	Color of light source	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
3x with module									
1	0	1	0	--	▶	**3SU1500-1AA10-1BA0**		1	1 unit
		0	1	→	▶	**3SU1500-1AA10-1CA0**		1	1 unit
		1	1	→	3	**3SU1500-1AA10-1FA0**		1	1 unit
2	0	2	0	-- →	3	**3SU1500-1AA10-1NA0**		1	1 unit
		0	2	→	3	**3SU1500-1AA10-1PA0**		1	1 unit
		2	2	→	3	**3SU1500-1AA10-1LA0**		1	1 unit
3x with contact and LED module[1] (6 ... 24 V AC/DC)									
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	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

[1] Only for use with SIRIUS commanding and signaling devices.

Holders with module, metal

3SU1550-1AA10-1BA0

Number of Contact modules	NO contacts	NC contacts	SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
3x with module							
1	1	0	3	**3SU1550-1AA10-1BA0**		1	1 unit
	0	1 →	3	**3SU1550-1AA10-1CA0**		1	1 unit
	1	1 →	3	**3SU1550-1AA10-1FA0**		1	1 unit
2	2	0 →	3	**3SU1550-1AA10-1NA0**		1	1 unit
	0	2 →	3	**3SU1550-1AA10-1PA0**		1	1 unit
	2	2 →	3	**3SU1550-1AA10-1LA0**		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 Limit Switches and Safety.

Certificate:

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 according to EN 50013.

Mounting the modules

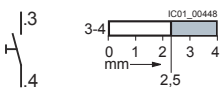
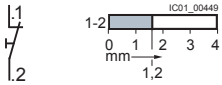
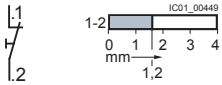
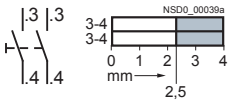
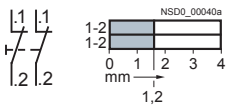
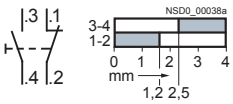
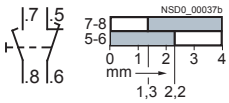
With SIRIUS ACT, the modules are mounted on the holder without any further accessories. Holders in plastic or metal versions are available for mounting three modules.

Connection methods

The modules are available with:

- Screw terminals
- Spring-type terminals or
- Solder pin connections (0.8 mm × 0.8 mm solder pins) for assembly on printed circuit boards

Selection and ordering data

	Contact version	Number of NO contacts	Number of NC contacts			SD	Screw terminals		PU (UNIT, SET, M)	PS*
						d	Article No.	Price per PU		
Contact modules for front plate mounting										
3SU1400-1AA10-1BA0	Silver alloy	1	0			▶	**3SU1400-1AA10-1BA0**		1	1 unit
		0	1	⊖		▶	**3SU1400-1AA10-1CA0**		1	1 unit
3SU1400-1AA10-1HA0		0	1 with installation monitoring[1]	⊖		▶	**3SU1400-1AA10-1HA0**		1	1 unit
		2	0			▶	**3SU1400-1AA10-1DA0**		1	1 unit
		0	2	⊖		▶	**3SU1400-1AA10-1EA0**		1	1 unit
3SU1400-1AA10-1FA0		1	1	⊖		▶	**3SU1400-1AA10-1FA0**		1	1 unit
		1 leading switching	1 lagging switching	⊖		5	**3SU1400-1AA10-1GA0**		1	1 unit

[1] 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.

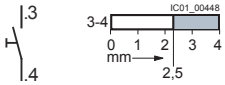
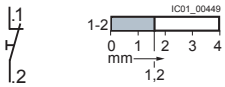
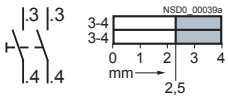
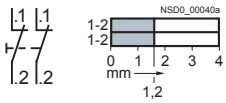
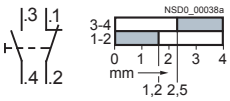
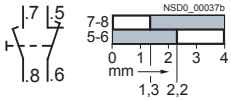
⊖ Positive opening according to IEC 60947-5-1, Annex K.

Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System, see Section 13 Limit Switches and Safety.

Certificate:

Modules for Actuators and Indicators

Contact modules

	Contact version	Number of NO contacts	Number of NC contacts			SD	Screw terminals		PU (UNIT, SET, M)	PS*
						d	Article No.	Price per PU		
Contact modules for front plate mounting										
3SU1400-1AA10-1LA0	Gold-plated	1	0			3	**3SU1400-1AA10-1LA0**		1	1 unit
		0	1	⊖		5	**3SU1400-1AA10-1MA0**		1	1 unit
		2	0			5	**3SU1400-1AA10-1NA0**		1	1 unit
		0	2	⊖		5	**3SU1400-1AA10-1PA0**		1	1 unit
		1	1	⊖		5	**3SU1400-1AA10-1QA0**		1	1 unit
		1 leading	1 lagging	⊖		5	**3SU1400-1AA10-1RA0**		1	1 unit

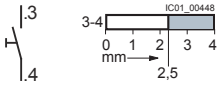
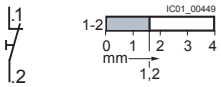
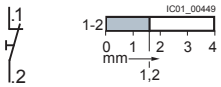
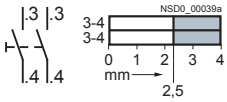
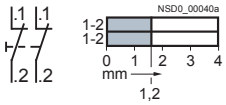
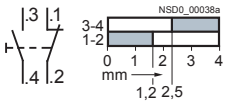
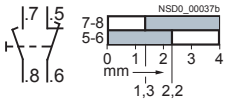
⊖Positive opening according to IEC 60947-5-1, Annex K.

Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System, see Section 13 Limit Switches and Safety.

Certificate:

Modules for Actuators and Indicators

Contact modules

	Contact version	Number of NO contacts	Number of NC contacts			SD d	Spring-type terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Contact modules for front plate mounting										
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[1]	⊖		▶	**3SU1400-1AA10-3HA0**		1	1 unit
3SU1400-1AA10-3DA0		2	0			▶	**3SU1400-1AA10-3DA0**		1	1 unit
		0	2	⊖		▶	**3SU1400-1AA10-3EA0**		1	1 unit
3SU1400-1AA10-3FA0		1	1	⊖		▶	**3SU1400-1AA10-3FA0**		1	1 unit
		1 leading	1 lagging	⊖		5	**3SU1400-1AA10-3GA0**		1	1 unit

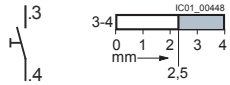
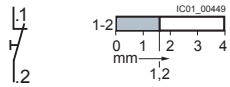
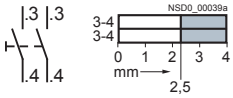
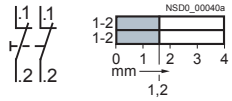
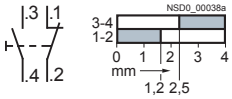
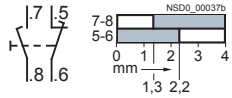
[1] The contact module has 1 NO internal contact + 1 NC internal contact. The NO contact is connected in series with the NC contact and brought out at terminal 1-2. When the module is snapped onto the holder, the NO contact closes. It opens when the module is detached from the holder again (the NC contact 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.

Certificate:

Modules for Actuators and Indicators

Contact modules

	Contact version	Number of NO contacts	Number of NC contacts			SD d	Spring-type terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Contact modules for front plate mounting										
3SU1400-1AA10-3LA0	Gold-plated	1	0			5	**3SU1400-1AA10-3LA0**		1	1 unit
		0	1	⊖		5	**3SU1400-1AA10-3MA0**		1	1 unit
		2	0			5	**3SU1400-1AA10-3NA0**		1	1 unit
		0	2	⊖		5	**3SU1400-1AA10-3PA0**		1	1 unit
		1	1	⊖		5	**3SU1400-1AA10-3QA0**		1	1 unit
		1 leading	1 lagging	⊖		5	**3SU1400-1AA10-3RA0**		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 Limit Switches and Safety.

Certificate:

	Contact version	Number of NO contacts	Number of NC contacts			SD d	Socket terminals (THT) Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Contact modules for mounting on printed-circuit boards *NEW* **No UL/CSA certification**										
3SU1400-3AA10-5BA0	Silver alloy	1	0			▶	**3SU1400-3AA10-5BA0**		1	1 unit
	Gold-plated	0	1	⊖		3	**3SU1400-3AA10-5CA0**		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 Limit Switches and Safety.

Certificate:

Modules for Actuators and Indicators

LED modules

Selection and ordering data

	Operational voltage at AC	Operational voltage at DC	Color	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	V	V		d	Article No. / Price per PU		
LED modules[1] for front plate mounting							
3SU1401-1BB30-1AA0	24	24	Amber	▶	**3SU1401-1BB00-1AA0**	1	1 unit
			Red	▶	**3SU1401-1BB20-1AA0**	1	1 unit
			Yellow	▶	**3SU1401-1BB30-1AA0**	1	1 unit
			Green	▶	**3SU1401-1BB40-1AA0**	1	1 unit
			Blue	▶	**3SU1401-1BB50-1AA0**	1	1 unit
			White	▶	**3SU1401-1BB60-1AA0**	1	1 unit
	110	—	Amber	5	**3SU1401-1BC00-1AA0**	1	1 unit
			Red	▶	**3SU1401-1BC20-1AA0**	1	1 unit
			Yellow	3	**3SU1401-1BC30-1AA0**	1	1 unit
			Green	▶	**3SU1401-1BC40-1AA0**	1	1 unit
			Blue	▶	**3SU1401-1BC50-1AA0**	1	1 unit
			White	▶	**3SU1401-1BC60-1AA0**	1	1 unit
	230	—	Amber	5	**3SU1401-1BF00-1AA0**	1	1 unit
			Red	▶	**3SU1401-1BF20-1AA0**	1	1 unit
			Yellow	3	**3SU1401-1BF30-1AA0**	1	1 unit
			Green	▶	**3SU1401-1BF40-1AA0**	1	1 unit
			Blue	▶	**3SU1401-1BF50-1AA0**	1	1 unit
			White	▶	**3SU1401-1BF60-1AA0**	1	1 unit
					Spring-type terminals		
3SU1401-1BB30-3AA0	24	24	Amber	3	**3SU1401-1BB00-3AA0**	1	1 unit
			Red	▶	**3SU1401-1BB20-3AA0**	1	1 unit
			Yellow	3	**3SU1401-1BB30-3AA0**	1	1 unit
			Green	▶	**3SU1401-1BB40-3AA0**	1	1 unit
			Blue	▶	**3SU1401-1BB50-3AA0**	1	1 unit
			White	▶	**3SU1401-1BB60-3AA0**	1	1 unit
	110	—	Amber	5	**3SU1401-1BC00-3AA0**	1	1 unit
			Red	▶	**3SU1401-1BC20-3AA0**	1	1 unit
			Yellow	5	**3SU1401-1BC30-3AA0**	1	1 unit
			Green	▶	**3SU1401-1BC40-3AA0**	1	1 unit
			Blue	▶	**3SU1401-1BC50-3AA0**	1	1 unit
			White	▶	**3SU1401-1BC60-3AA0**	1	1 unit
	230	—	Amber	5	**3SU1401-1BF00-3AA0**	1	1 unit
			Red	▶	**3SU1401-1BF20-3AA0**	1	1 unit
			Yellow	5	**3SU1401-1BF30-3AA0**	1	1 unit
			Green	▶	**3SU1401-1BF40-3AA0**	1	1 unit
			Blue	▶	**3SU1401-1BF50-3AA0**	1	1 unit
			White	▶	**3SU1401-1BF60-3AA0**	1	1 unit

	Operational voltage at AC	Operational voltage at DC	Color	SD	Screw terminals	PU (UNIT, SET, M)	PS*
	V	V		d	Article No. / Price per PU		
LED modules[1] for front plate mounting with "traffic light" LED							
3SU1401-1BB24-1AA0	24	24	Red / Yellow / Green		**3SU1401-1BB24-1AA0**	1	1 unit
	110	—	Red / Yellow / Green		**3SU1401-1BC24-1AA0**	1	1 unit
	230	—	Red / Yellow / Green		**3SU1401-1BF24-1AA0**	1	1 unit
	6-24	6-24	Red / Yellow / Green		**3SU1401-1BG24-1AA0**	1	1 unit
					Spring-type terminals		
3SU1401-1BB24-3AA0	24	24	Red / Yellow / Green		**3SU1401-1BB24-3AA0**	1	1 unit
	110	—	Red / Yellow / Green		**3SU1401-1BC24-3AA0**	1	1 unit
	230	—	Red / Yellow / Green		**3SU1401-1BF24-3AA0**	1	1 unit
	6-24	6-24	Red / Yellow / Green		**3SU1401-1BG24-3AA0**	1	1 unit

[1] Only for use with SIRIUS commanding and signaling devices.

Modules for Actuators and Indicators

LED modules

LED modules[1] for front plate mounting

3SU1401-1BG30-1AA0

3SU1401-1BG30-3AA0

Operational voltage at AC	Operational voltage at DC	Color	SD	Screw terminals	PU (UNIT, SET, M)	PS*
V	V		d	Article No. / Price per PU		
6 … 24	6 … 24	Amber	▶	**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	5	**3SU1401-1BH00-1AA0**	1	1 unit
		Red	▶	**3SU1401-1BH20-1AA0**	1	1 unit
		Yellow	3	**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
				Spring-type terminals		
6 … 24	6 … 24	Amber	3	**3SU1401-1BG00-3AA0**	1	1 unit
		Red	▶	**3SU1401-1BG20-3AA0**	1	1 unit
		Yellow	5	**3SU1401-1BG30-3AA0**	1	1 unit
		Green	▶	**3SU1401-1BG40-3AA0**	1	1 unit
		Blue	▶	**3SU1401-1BG50-3AA0**	1	1 unit
		White	▶	**3SU1401-1BG60-3AA0**	1	1 unit
24 … 240	24 … 240	Amber	5	**3SU1401-1BH00-3AA0**	1	1 unit
		Red	▶	**3SU1401-1BH20-3AA0**	1	1 unit
		Yellow	5	**3SU1401-1BH30-3AA0**	1	1 unit
		Green	▶	**3SU1401-1BH40-3AA0**	1	1 unit
		Blue	▶	**3SU1401-1BH50-3AA0**	1	1 unit
		White	▶	**3SU1401-1BH60-3AA0**	1	1 unit

[1] Only for use with SIRIUS commanding and signaling devices.

LED test modules[1] for front plate mounting

3SU1400-1CK10-1AA0

Operational voltage at AC	Operational voltage at DC	SD	Screw terminals	PU (UNIT, SET, M)	PS*
V	V	d	Article No. / Price per PU		
6 … 240	6 … 240	3	**3SU1400-1CK10-1AA0**	1	1 unit

[1] Only to be used for SIRIUS ACT LED modules (6 ... 24 V AC/DC, 24 V AC/DC, 24 ... 240 V AC/DC).

LED modules[1] for mounting on printed-circuit boards

3SU1401-3BA20-5AA0

Operational voltage at AC	Operational voltage at DC	Color	SD	Socket terminals (THT)	PU (UNIT, SET, M)	PS*
V	V		d	Article No. / Price per PU		
--	5	Amber	5	**3SU1401-3BA00-5AA0**	1	1 unit
		Red	5	**3SU1401-3BA20-5AA0**	1	1 unit
		Yellow	5	**3SU1401-3BA30-5AA0**	1	1 unit
		Green	3	**3SU1401-3BA40-5AA0**	1	1 unit
		Blue	5	**3SU1401-3BA50-5AA0**	1	1 unit
		White	3	**3SU1401-3BA60-5AA0**	1	1 unit

[1] 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 Standard	Number of digital inputs Safety-related	Number of digital outputs	SD	Screw terminals + Spring-type terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V					d				
AS-Interface modules for front plate mounting										
3SU1400-1EA10-2AA0	30	2 F-DI	--	2	--	5	**3SU1400-1EA10-2AA0**		1	1 unit
		2 F-DI + 1 LED	--	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	--	2	1	▶	**3SU1401-1EE20-4AA0**		1	1 unit
							Spring-type terminals + Insulation piercing method			
3SU1400-1EC10-4AA0		2 F-DI + 1 DQ	--	2	1	5	**3SU1400-1EC10-4AA0**		1	1 unit
							Spring-type terminals (push-in)			
3SU1400-1EJ10-6AA0	30	4 DI/3 DQ AB	4	--	3	5	**3SU1400-1EJ10-6AA0**		1	1 unit
		4 DI/4 DQ	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

	Oper-ational voltage	Slave type	Number of digital inputs	Number of digital outputs	SD	Spring-type terminals (push-in)	PU (UNIT, SET, M)	PS*
	V				d	Article No. / Price per PU		
Electronic modules for IO-Link, front panel mounting								
3SU1400-1HL10-6AA0	24	Freely programmable (default (6 DI/2 DQ)	0 ... 8	0 ... 8	5	**3SU1400-1HL10-6AA0**	1	1 unit

Selection and ordering data

	Color	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		d	Article No. / Price per PU		
Support terminals					
3SU1400-1DA10-1AA0	Black	3	**3SU1400-1DA10-1AA0**	1	1 unit
	Blue	5	**3SU1400-1DA50-1AA0**	1	1 unit
	Green/Yellow	3	**3SU1400-1DA43-1AA0**	1	1 unit
			Spring-type terminals		
3SU1400-1DA50-3AA0	Black	5	**3SU1400-1DA10-3AA0**	1	1 unit
	Blue	5	**3SU1400-1DA50-3AA0**	1	1 unit
	Green/Yellow	5	**3SU1400-1DA43-3AA0**	1	1 unit

Modules for Actuators and Indicators

Electronic modules for ID key-operated switches

Technical specifications

		3SU1400-1GC10-1AA0	3SU1400-1GD10-1AA0
Communication/protocol			
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 power supply via IO-Link master		--	Yes
Data volume			
• 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	
General data			
Impulse withstand voltage, rated value	kV	0.8	
Rated insulation voltage	V	30	
Pollution degree		3	
Type of voltage			
• Of operational voltage		DC	
• Of input voltage		DC	
Operational voltage			
• At DC, rated value	V	24	
• Rated value	V	18 … 30	
Current consumed, maximum	mA	49	
Ambient temperature			
• During operation	°C	-25 … +70	
• During storage	°C	-40 … +80	
Degree of protection		IP20	
Touch protection against electric shock		Finger-safe	
Connections			
Type of electrical connection		**Screw terminals**	
Connectable conductor cross-section for auxiliary contacts			
• Solid - With end sleeves	mm^2	1 x (0.2 … 2.5), 2 x (0.2 … 0.75)	
• Solid - Without end sleeves	mm^2	1 x (0.2 … 2.5), 2 x (0.2 … 0.75)	
• Finely stranded - With end sleeves	mm^2	1 x (0.2 … 2.5), 2 x (0.25 … 0.75)	
• Finely stranded - Without end sleeves	mm^2	1 x (0.2 … 2.5), 2 x (0.2 … 0.75)	
AWG number as coded connectable conductor cross-section		26 … 14	
Tightening torque for screw terminals	Nm	0.35 … 0.4	

Selection and ordering data

	Type of power supply via IO-Link master	Protocol is supported IO-Link protocol	Number of NO contacts	IO-Link transfer rate	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Electronic modules for ID key-operated switches[1)]										
3SU1400-1GC10-1AA0	--	No	5	--	▶	**3SU1400-1GC10-1AA0**		1	1 unit	41J
3SU1400-1GD10-1AA0	Yes	Yes	5	COM2 (38.4 kBaud)	▶	**3SU1400-1GD10-1AA0**		1	1 unit	41J

1) Only use in conjunction with plastic holder 3SU1500-0AA10-0AA0.

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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: Standard	Number of digital inputs: Safety-related	Number of digital outputs	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V					d				
Interface modules for PROFINET										
3SU1400-1LK10-1AA1							**Screw terminals**			
		Interface modules								
	24	1	0	0	0	5	**3SU1400-1LK10-1AA1**		1	1 unit
		--	4	0	1	5	**3SU1400-1LK10-1BA1**		1	1 unit
							Spring-type terminals			
	24	1	0	0	0	5	**3SU1400-1LK10-3AA1**		1	1 unit
		--	4	0	1	5	**3SU1400-1LK10-3BA1**		1	1 unit
							Screw terminals			
3SU1400-1LL10-3BA1		***Fail-safe interface modules***								
	24	1 SIL CL 3	4	0	1	5	**3SU1400-1LL10-1BA1**		1	1 unit
							Spring-type terminals			
	24	1 SIL CL 3	4	0	1	5	**3SU1400-1LL10-3BA1**		1	1 unit

Selection and ordering data

	Type of product	Color of light source	SD	Insulation displacement connection: Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Terminal modules							
3SU1401-1ME60-1DA1	With 2 contacts	--	5	**3SU1400-1MA10-1BA1**		1	1 unit
	With 2 contacts and integrated LED	Amber	5	**3SU1401-1MC00-1CA1**		1	1 unit
		Red	5	**3SU1401-1MC20-1CA1**		1	1 unit
		Yellow	5	**3SU1401-1MC30-1CA1**		1	1 unit
		Green	5	**3SU1401-1MC40-1CA1**		1	1 unit
		Blue	5	**3SU1401-1MC50-1CA1**		1	1 unit
		White	5	**3SU1401-1MC60-1CA1**		1	1 unit
	With integrated LED	Amber	5	**3SU1401-1ME00-1DA1**		1	1 unit
		Red	5	**3SU1401-1ME20-1DA1**		1	1 unit
		Yellow	5	**3SU1401-1ME30-1DA1**		1	1 unit
		Green	5	**3SU1401-1ME40-1DA1**		1	1 unit
		Blue	5	**3SU1401-1ME50-1DA1**		1	1 unit
		White	5	**3SU1401-1ME60-1DA1**		1	1 unit

	Type of product	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Memory modules for 3SK2						
3RK3931-0AA00	For backing up the complete parameterization of the 3SK2 safety system without a PC/PG through the system interface	2	**3RK3931-0AA00**		1	1 unit

Flat ribbon cable, see page 11/161. onwards.

LED modules for mounting on printed-circuit boards, see page 11/115 onwards.

Enclosures

General data

Overview

Design

Enclosures with standard fittings

Enclosed SIRIUS ACT pushbuttons and indicator lights are used as hand-operated control devices for separately allocated control units and cabinets. The devices are suitable for use in any climate and all have IP66, IP67, IP69 (IP69K) degree of protection, including those with cable glands.

Standards

IEC/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:

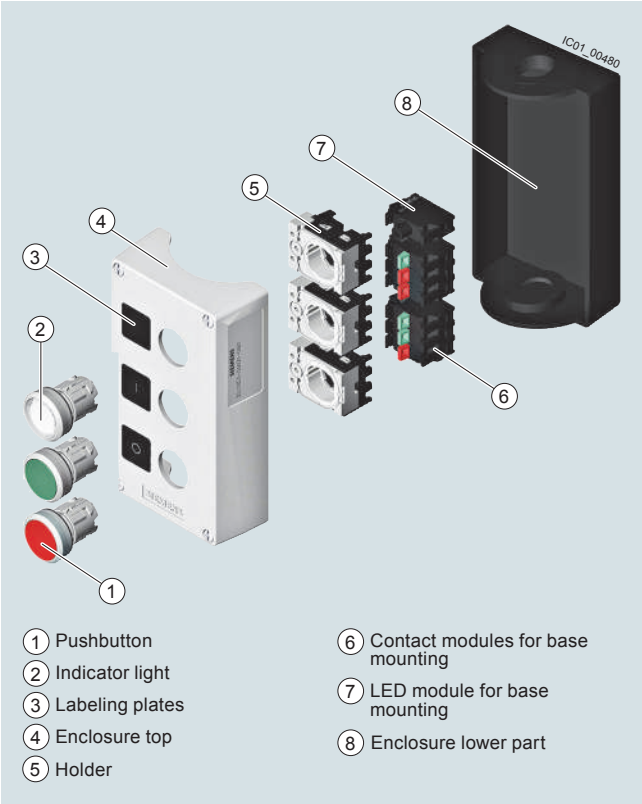
- Empty enclosures with between 1 and 6 command points (the installed components must be ordered separately; modules for base mounting or 1-pole contact and LED modules can be used)
- Enclosures with standard fittings with 1 to 3 command points, e.g. EMERGENCY STOP enclosure with EMERGENCY STOP mushroom pushbutton
- Enclosures with customized fittings with 1 to 6 command points
- Special enclosure for 4-position selector switches, coordinate switches, ID key-operated switches and sensor switches

Color of the enclosures

Top: • Gray, RAL 7035
• Yellow, RAL 1004 for EMERGENCY STOP

Base: • Black, RAL 9005

Enclosures with standard fittings



Pushbuttons and indicator lights in the enclosure

Customized enclosures

The fittings and labeling of the command point can be chosen using the Configurator on the Internet. The prices depend on the equipment selected, see www.siemens.com/sirius-act/configurator.

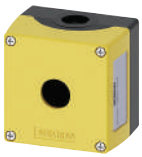
Application

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

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*
				d				
Enclosures for surface mounting								
	Plastic							
 3SU1801-0AA00-0AA2	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
		2	With recess for labeling plate	▶	**3SU1802-0AA00-0AB2**		1	1 unit
3SU1802-0AA00-0AB1	Gray	1	With recess for labeling plate	▶	**3SU1801-0AA00-0AB1**		1	1 unit
		2	With recess for labeling plate	▶	**3SU1802-0AA00-0AB1**		1	1 unit
		3	With recess for labeling plate	▶	**3SU1803-0AA00-0AB1**		1	1 unit
		4	With recess for labeling plate	▶	**3SU1804-0AA00-0AB1**		1	1 unit
		6	With recess for labeling plate	▶	**3SU1806-0AA00-0AB1**		1	1 unit
	Metal [1]							
3SU1851-0AA00-0AC2	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
			With protective collar for 5 padlocks, mushroom 40 mm	3	**3SU1851-0AA00-0AF2**		1	1 unit
3SU1851-0AA00-0AH1			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
		1	With protective collar for 5 padlocks, mushroom 60 mm NEW	5	**3SU1851-0AA00-0AJ2**		1	1 unit
	Gray	1	With protective collar for 5 padlocks, mushroom 60 mm	3	**3SU1851-0AA00-0AH1**		1	1 unit
		1	With protective collar for 5 padlocks, mushroom 60 mm NEW	5	**3SU1851-0AA00-0AJ1**		1	1 unit
3SU1853-0AA00-0AB1			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
3SU1854-0AA00-0AB1		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
Enclosure for 4-position selector switches, coordinate switches, ID key-operated switches and sensor switches								
	Plastic, front plate mounting							
3SU1801-1AA00-1AA1	Gray	1	Center command point	3	**3SU1801-1AA00-1AA1**		1	1 unit
	Metal, front plate mounting							
	Gray	1	Center command point	5	**3SU1851-1AA00-1AA1**		1	1 unit

[1] Only 3SU185, Metal Enclosure adaptors available to convert Metric Conduit Opening to 1/2" NPT Conduit:
> 3SX1998, 1/2" NPT Metal Adaptor for metal enclosures with M20 x 1.5 (IP65 Max.)
> 3SX1999, 1/2" NPT Metal Adaptor for metal enclosures with M25 x 1.5 (IP65 Max.)

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 NC contacts	Number of NO contacts	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosures with standard fittings										
							Screw terminals			
Plastic										
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	▶	**3SU1801-0NA00-2AA2**		1	1 unit
				2	0	NEW 5	**3SU1801-0NB00-2AA2**		1	1 unit
				1	1	NEW X	**3SU1801-0NP00-2AA2**		1	1 unit
		Center command point A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, with RONIS SB30 lock with key-operated release	Red	1	1	NEW X	**3SU1801-0NN00-2AA2**		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	▶	**3SU1801-0NA00-2AC2**		1	1 unit
				2	0	▶	**3SU1801-0NB00-2AC2**		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 A = Emergency Stop B = "without inscription"	1	1	NEW 5	**3SU1802-0NA00-2AB2**		1	1 unit
			A = Red B = Red A = "Without inscription" B = "Without inscription"	2	1	NEW 3	**3SU1802-0NB00-2AB2**		1	1 unit
	1	Center command point A = EMERGENCY STOP palm pushbuttons with positive latching acc. to ISO 13850, pull to unlatch	Red	1	1	3	**3SU1801-2NG00-2AA2**		1	1 unit
							Spring-type terminals			
		With recess for labeling plate A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red A = I	2	1	5	**3SU1801-0NE00-4AB2**		1	1 unit

3SU1801-0NA00-2AA2

3SU1801-0NA00-2AC2

3SU1802-0NA00-2AB2

3SU1801-2NG00-2AA2

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 NC contacts	Number of NO contacts	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosures with standard fittings											
								Screw terminals			
Plastic											
Gray	1	With recess for labeling plate A = Pushbutton	Green	A = I	0	1	3	**3SU1801-0AB00-2AB1**		1	1 unit
			Red	A = O	1	0	▶	**3SU1801-0AC00-2AB1**		1	1 unit
			White	A = I	0	1	5	**3SU1801-0AD00-2AB1**		1	1 unit
			Black	A = O	1	0	5	**3SU1801-0AE00-2AB1**		1	1 unit
								Spring-type terminals			
		With recess for labeling plate A = Selector switch	Black		0	2 NEW	5	**3SU1801-0BA00-4AB1**		1	1 unit
					0	1 NEW	5	**3SU1801-0BE00-4AB1**		1	1 unit
		With recess for labeling plate A = Pushbutton	Green	A = I	1	0 NEW	5	**3SU1801-0BC00-4AB1**		1	1 unit
					0	1 NEW	5	**3SU1801-0BD00-4AB1**		1	1 unit
								Screw terminals			
	2	With recess for labeling plate A = Pushbutton/ B = Pushbutton	A = Red/ B = Green A = O/ B = I		1	1	3	**3SU1802-0AB00-2AB1**		1	1 unit
			A = Black/ B = Black A = O/ B = I		1	1	5	**3SU1802-0AC00-2AB1**		1	1 unit
	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	▶	**3SU1803-0AB00-2AB1**		1	1 unit
			A = Black/ B = White/ C = Clear A = O/ B = I/ C = "Without inscription"		1	1	5	**3SU1803-0AC00-2AB1**		1	1 unit
		With recess for labeling plate A = Pushbutton/ B = Pushbutton/ C = Pushbutton	A = Red/ B = Black/ C = Black A = O/ B = I/ C = II		1	2	5	**3SU1803-0AD00-2AB1**		1	1 unit
	1	Center command point A = Palm pushbutton, momentary-contact type	Black		0	1	3	**3SU1801-2GA00-2AA1**		1	1 unit

3SU1801-0AB00-2AB1

3SU1802-0AB00-2AB1

3SU1803-0AB00-2AB1

3SU1801-2GA00-2AA1

Enclosures

Pushbuttons and indicator lights in the enclosure

Enclosures with standard fittings

Color of enclosure top	Number of command points	Enclosure version Pushbutton and signaling device equipment	Color of actuating element Marking	Number of NC contacts	Number of NO contacts	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
							Screw terminals			
Metal [1]										
Yellow	1	Center command point A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red	1 2	0 0	3 5	**3SU1851-0NA00-2AA2** **3SU1851-0NB00-2AA2**		1 1	1 unit 1 unit
		With protective collar A = EMERGENCY STOP mushroom pushbuttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red	1 2 2 2	0 0 0 1	▶ 3 NEW 5 5	**3SU1851-0NA00-2AC2** **3SU1851-0NB00-2AC2** **3SU1851-0NC00-2AC2** **3SU1851-0ND00-2AC2**		1 1 1 1	1 unit 1 unit 1 unit 1 unit
	1	Center command point A = EMERGENCY STOP palm pushbuttons with positive latching acc. to ISO 13850 Pull to unlatch	Red	1	1	3	**3SU1851-2NG00-2AA2**		1	1 unit
Gray	1	With recess for labeling plate A = Pushbutton	Green A = I Red A = O White A = I Black A = O	0 1 0 1	1 0 1 0	5 5 5 5	**3SU1851-0AB00-2AB1** **3SU1851-0AC00-2AB1** **3SU1851-0AD00-2AB1** **3SU1851-0AE00-2AB1**		1 1 1 1	1 unit 1 unit 1 unit 1 unit
	2	With recess for labeling plate A = Pushbutton/ B = Pushbutton	A = Red/ B = Green A = O/ B = I	1	1	5	**3SU1852-0AB00-2AB1**		1	1 unit
			A = Black/ B = White A = O/ B = I	1	1	5	**3SU1852-0AC00-2AB1**		1	1 unit
	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	**3SU1853-0AB00-2AB1**		1	1 unit
		With recess for labeling plate A = Pushbutton/ B = Pushbutton/ C = Pushbutton	A = Red/ B = Black/ C = Black A = O/ B = I/ C = II	1	2	5	**3SU1853-0AD00-2AB1**		1	1 unit
	1	Center command point A = Palm pushbutton, momentary-contact type	Black	0	1	3	**3SU1851-2GA00-2AA1**		1	1 unit

3SU1851-0NA00-2AA2

3SU1851-0NA00-2AC2

3SU1851-2NG00-2AA2

3SU1851-0AC00-2AB1

3SU1852-0AB00-2AB1

3SU1853-0AB00-2AB1

3SU1851-2GA00-2AA1

[1] Only 3SU185, Metal Enclosure adaptors available to convert Metric Conduit Opening to 1/2" NPT Conduit:
> 3SX1998, 1/2" NPT Metal Adaptor for metal enclosures with M20 x 1.5 (IP65 Max.)
> 3SX1999, 1/2" NPT Metal Adaptor for metal enclosures with M25 x 1.5 (IP65 Max.)

Enclosures

Pushbuttons and indicator lights in the enclosure

Customized enclosures [1)]

3SU1801-0AZ00 K0Y

3SU1851-0AZ00 K0Y

Number of command points	Product function/ EMERGENCY STOP function	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Plastic						
1	No		**3SU1801-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1801-0NZ00 K0Y**		1	1 unit
2	No		**3SU1802-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1802-0NZ00 K0Y**		1	1 unit
3	No		**3SU1803-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1803-0NZ00 K0Y**		1	1 unit
4	No		**3SU1804-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1804-0NZ00 K0Y**		1	1 unit
6	No		**3SU1806-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1806-0NZ00 K0Y**		1	1 unit
Metal [2)]						
1	No		**3SU1851-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1851-0NZ00 K0Y**		1	1 unit
2	No		**3SU1852-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1852-0NZ00 K0Y**		1	1 unit
3	No		**3SU1853-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1853-0NZ00 K0Y**		1	1 unit
4	No		**3SU1854-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1854-0NZ00 K0Y**		1	1 unit
6	No		**3SU1856-0AZ00 K0Y**		1	1 unit
	Yes		**3SU1856-0NZ00 K0Y**		1	1 unit

1) The fittings and labeling of the command point can be chosen using the Configurator on the Internet. The prices depend on the equipment selected. When ordering, always add the article number and the code K0Y and the CIN number from the Configurator.
Ordering example:
3SU1801-0AZ00 K0Y, CIN20150609140858154554,
see www.siemens.com/sirius-act/configurator.

2) Only 3SU185, Metal Enclosure adaptors available to convert Metric Conduit Opening to 1/2" NPT Conduit:
> 3SX1998, 1/2" NPT Metal Adaptor for metal enclosures with M20 x 1.5 (IP65 Max.)
> 3SX1999, 1/2" NPT Metal Adaptor for metal enclosures with M25 x 1.5 (IP65 Max.)

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 make 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 base:

- 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 DQ)
- Slave with 4 digital inputs and 4 digital outputs (4 DI/4 DQ)
- F slave with 2 safe inputs for EMERGENCY STOP mushroom pushbutton (2 F-DI), also with integrated red LED for the illuminated EMERGENCY STOP mushroom pushbutton.

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 DQ or 4 DI/3 DQ	--
3	1 x slave 4 DI/4 DQ or 4 DI/3 DQ	1 x slave 4 DI/4 DQ or 4 DI/3 DQ + 1 x F slave
4	2 x slave 4 DI/4 DQ or 4 DI/3 DQ	2 x slave 4 DI/4 DQ or 4 DI/3 DQ + 1 x F slave
6	2 x slave 4 DI/4 DQ or 4 DI/3 DQ	2 x slave 4 DI/4 DQ or 4 DI/3 DQ + 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 command 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 command 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, the configurator must be used to select the fittings.
An electronic order form will be generated for the options.

For the Configurator, see 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	SD d	Insulation piercing method Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosures with standard fittings									
	Plastic								
 3SU1801-0NB10-4HB2	Yellow	1	With recess for labeling plate A = EMERGENCY STOP mushroom push-buttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red	5	**3SU1801-0NB10-4HB2**		1	1 unit
 3SU1801-0NB10-4HC2			With protective collar A = EMERGENCY STOP mushroom push-buttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red A = I NEW	3	**3SU1801-0NB10-4HC2**		1	1 unit
 3SU1802-0AB10-4HB1	Gray	2	With recess for labeling plate A = Pushbutton/ B = Pushbutton	A = Red/ B = Green A = O/ B = I	5	**3SU1802-0AB10-4HB1**		1	1 unit
				A = Black/ B = White A = O/ B = I	5	**3SU1802-0AC10-4HB1**		1	1 unit
 3SU1803-0AB10-4HB1		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"	5	**3SU1803-0AB10-4HB1**		1	1 unit
	Metal [1]								
 3SU1851-0NB10-4GB2	Yellow	1	With recess for labeling plate A = EMERGENCY STOP mushroom push-buttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red A = I NEW	5	**3SU1851-0NB10-4GB2**		1	1 unit
 3SU1851-0NB10-4GC2			With protective collar A = EMERGENCY STOP mushroom push-buttons, 40 mm, with positive latching acc. to ISO 13850, rotate to unlatch	Red A = I NEW	5	**3SU1851-0NB10-4GC2**		1	1 unit

[1] Only 3SU185, Metal Enclosure adaptors available to convert Metric Conduit Opening to 1/2" NPT Conduit:
> 3SX1998, 1/2" NPT Metal Adaptor for metal enclosures with M20 x 1.5 (IP65 Max.)
> 3SX1999, 1/2" NPT Metal Adaptor for metal enclosures with M25 x 1.5 (IP65 Max.)

Enclosures

Pushbuttons and indicator lights in the enclosure for AS-Interface

Customized enclosures for AS-Interface[1)]

3SU1801-0NZ10 K0Y

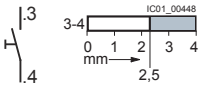
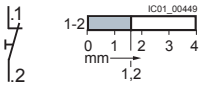
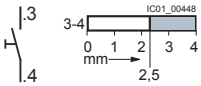
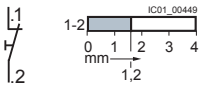
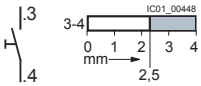
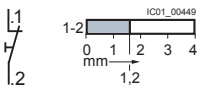
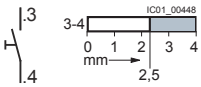
3SU1851-0NZ10 K0Y

Number of command points	Product function/ EMERGENCY STOP function	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Plastic						
1	Yes		**3SU1801-0NZ10 K0Y**		1	1 unit
2	No		**3SU1802-0AZ10 K0Y**		1	1 unit
	No		**3SU1802-0NZ10 K0Y**		1	1 unit
3	No		**3SU1803-0AZ10 K0Y**		1	1 unit
	Yes		**3SU1803-0NZ10 K0Y**		1	1 unit
4	No		**3SU1804-0AZ10 K0Y**		1	1 unit
	Yes		**3SU1804-0NZ10 K0Y**		1	1 unit
6	No		**3SU1806-0AZ10 K0Y**		1	1 unit
	Yes		**3SU1806-0NZ10 K0Y**		1	1 unit
Metal [2)]						
1	Yes		**3SU1851-0NZ10 K0Y**		1	1 unit
2	No		**3SU1852-0AZ10 K0Y**		1	1 unit
	No		**3SU1852-0NZ10 K0Y**		1	1 unit
3	No		**3SU1853-0AZ10 K0Y**		1	1 unit
	Yes		**3SU1853-0NZ10 K0Y**		1	1 unit
4	No		**3SU1854-0AZ10 K0Y**		1	1 unit
	Yes		**3SU1854-0NZ10 K0Y**		1	1 unit
6	No		**3SU1856-0AZ10 K0Y**		1	1 unit
	Yes		**3SU1856-0NZ10 K0Y**		1	1 unit

1) The fittings and labeling of the command point can be chosen using the Configurator on the Internet. The prices depend on the equipment selected, see www.siemens.com/sirius-act/configurator.

2) Only 3SU185, Metal Enclosure adaptors available to convert Metric Conduit Opening to 1/2" NPT Conduit:
> 3SX1998, 1/2" NPT Metal Adaptor for metal enclosures with M20 x 1.5 (IP65 Max.)
> 3SX1999, 1/2" NPT Metal Adaptor for metal enclosures with M25 x 1.5 (IP65 Max.)

Selection and ordering data

	Contact version	Number of NO contacts	Number of NC contacts			SD d	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Contact modules for base mounting										
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	1	0			5	**3SU1400-2AA10-1LA0**		1	1 unit
		0	1	⊖		5	**3SU1400-2AA10-1MA0**		1	1 unit
							Spring-type terminals			
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	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 Limit Switches and Safety.

Certificate:

Enclosures

Modules for enclosures

LED modules[1] for base mounting

3SU1401-2BB60-1AA0

Operational voltage at AC	Operational voltage at DC	Color	SD	Screw terminals	PU (UNIT, SET, M)	PS*
V	V		d	Article No. / Price per PU		
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

[1] Only for use with SIRIUS commanding and signaling devices.

LED modules[1] for base mounting

3SU1401-2BB20-3AA0

Operational voltage at AC	Operational voltage at DC	Color	SD	Spring-type terminals	PU (UNIT, SET, M)	PS*
V	V		d	Article No. / Price per PU		
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

[1] 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		d	Article No.	Price per PU		
LED modules[1] for base mounting · wide voltage range								
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
					Spring-type terminals			
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

[1] 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	d	Article No.	Price per PU		
LED test modules[1] for base mounting							
3SU1400-2CK10-1AA0	6 … 240	6 … 240	▶	**3SU1400-2CK10-1AA0**		1	1 unit

[1] 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 Standard	Safety-related	Number of digital outputs	SD	Spring-type terminals (push-in) Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V					d				
AS-Interface modules, base mounting										
3SU1400-2EJ10-6AA0	30	4 DI/3 DQ AB	4	0	3	5	**3SU1400-2EJ10-6AA0**		1	1 unit
		4 DI/4 DQ	4	0	4	▶	**3SU1400-2EK10-6AA0**		1	1 unit
		2 F-DI	0	2	0	5	**3SU1400-2EA10-6AA0**		1	1 unit
		2 F-DI + 1 LED	0	2	1 For controlling the LEDs	5	**3SU1401-2EE20-6AA0**		1	1 unit
Electronic module for IO-Link, base mounting										
3SU1400-2HL10-6AA0	24	Freely programmable (default 6 DI/2 DQ)	0-8	0	0-8	5	**3SU1400-2HL10-6AA0**		1	1 unit

	Color	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Support terminals						
3SU1400-2DA10-1AA0	Black	3	**3SU1400-2DA10-1AA0**		1	1 unit
	Blue	5	**3SU1400-2DA50-1AA0**		1	1 unit
	Green/Yellow	3	**3SU1400-2DA43-1AA0**		1	1 unit
			Spring-type terminals			
3SU1400-2DA50-3AA0	Black	5	**3SU1400-2DA10-3AA0**		1	1 unit
	Blue	5	**3SU1400-2DA50-3AA0**		1	1 unit
	Green/Yellow	5	**3SU1400-2DA43-3AA0**		1	1 unit

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 and in the case of metal enclosures they are equipped with actuators and indicators made of metal.

The standard equipment comprises:

- 2 black mushroom pushbuttons, diameter 40 mm, 1 NO + 1 NC
- 1 red EMERGENCY STOP mushroom pushbutton according to ISO 13850, diameter 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, evaluation units are used, e.g. 3SK11 safety relays or the 3RK3, 3SK2 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/ operating principle	Color of actuating element	Number of NO contacts	Number of NC contacts	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Two-hand operation consoles									
	Plastic								
3SU1803-3NB00-1AE1	None	--	0	0	5	**3SU1803-3AA00-0AA1**		1	1 unit
	A = Mushroom pushbutton/ momentary contact B = EMERGENCY STOP mushroom pushbutton/ rotate to unlatch C = Mushroom pushbutton/ momentary contact	A = Black/ B = Red/ C = Black	2	4	5	**3SU1803-3NB00-1AE1**		1	1 unit
	Metal								
3SU1853-3AA00-0AA1	None	--	0	0	5	**3SU1853-3AA00-0AA1**		1	1 unit
3SU1853-3NB00-1AA1	A = Mushroom pushbutton/ momentary contact B = EMERGENCY STOP mushroom pushbutton/ rotate to unlatch C = Mushroom pushbutton/ momentary contact	A = Black/ B = Red/ C = Black	2	4	5	**3SU1853-3NB00-1AA1**		1	1 unit
3SU1853-3NB00-1AD1			2	4	5	**3SU1853-3NB00-1AD1**		1	1 unit

	Version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Accessories								
	Stands for two-hand operation consoles							
3SU1950-0HN10-0AA0		Metal	Black	5	**3SU1950-0HN10-0AA0**		1	1 unit

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 11/136.

Selection and ordering data

3SU1900-0AB71-0AA0

3SU1900-0AB71-0DN0

Color	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Insert labels					
For self-inscription					
Clear/Black (label/lettering)	None	B	**3SU1900-0AB71-0AA0**	100	10 units
For customized inscription					
Clear/Black (label/lettering)	None	B	**3SU1900-0AB71-0AZ0**	100	10 units
Inscription in English					
Clear/Black (label/lettering)	On	B	**3SU1900-0AB71-0DJ0**	100	10 units
	Off	B	**3SU1900-0AB71-0DK0**	100	10 units
	Up	B	**3SU1900-0AB71-0DL0**	100	10 units
	Down	B	**3SU1900-0AB71-0DM0**	100	10 units
	Forward+	B	**3SU1900-0AB71-0DN0**	100	10 units
	Right	B	**3SU1900-0AB71-0DQ0**	100	10 units
	Left	B	**3SU1900-0AB71-0DR0**	100	10 units
	Stop	B	**3SU1900-0AB71-0DS0**	100	10 units
	Start	B	**3SU1900-0AB71-0DT0**	100	10 units
	Reset	B	**3SU1900-0AB71-0DU0**	100	10 units
	Test	B	**3SU1900-0AB71-0DV0**	100	10 units
	Open	B	**3SU1900-0AB71-0DW0**	100	10 units
	Close	B	**3SU1900-0AB71-0DX0**	100	10 units
	Running	B	**3SU1900-0AB71-0EB0**	100	10 units
	Fast	B	**3SU1900-0AB71-0EE0**	100	10 units
	Slow	B	**3SU1900-0AB71-0EF0**	100	10 units

Labels

Insert labels

	Color	Marking	Symbol No.	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Insert labels								
	With symbol (ON/OFF)							
3SU1900-0AB71-0QC0	Milky white/ black (label/lettering)	O	5008 IEC	▶	**3SU1900-0AB71-0QA0**		100	10 units
		I	5007 IEC	▶	**3SU1900-0AB71-0QB0**		100	10 units
		II	--	5	**3SU1900-0AB71-0QC0**		100	10 units
		III	--	5	**3SU1900-0AB71-0QD0**		100	10 units
	With symbol (graphic)							
3SU1900-0AB71-0QT0	Milky white/ black (label/lettering)	ARROW DIRECTION TO RIGHT	5022 IEC	▶	**3SU1900-0AB71-0QR0**		100	10 units
		ARROW DIRECTION UP AND TO LEFT	--	▶	**3SU1900-0AB71-0QS0**		100	10 units
		CLOCKWISE ROTATION	0004 ISO	5	**3SU1900-0AB71-0QT0**		100	10 units
		COUNTERCLOCK-WISE ROTATION	--	5	**3SU1900-0AB71-0QU0**		100	10 units
3SU1900-0AB71-0RB0		RAPID TRAVERSE	0266 ISO	5	**3SU1900-0AB71-0QV0**		100	10 units
		FEED	0259 ISO	5	**3SU1900-0AB71-0QW0**		100	10 units
		INCREASE, PLUS	5005 IEC	5	**3SU1900-0AB71-0QX0**		100	10 units
		DECREASE, MINUS	5006 IEC	5	**3SU1900-0AB71-0QY0**		100	10 units
		ELECTRIC MOTOR	0011 ISO	5	**3SU1900-0AB71-0RA0**		100	10 units
		HORN	5014 IEC	5	**3SU1900-0AB71-0RB0**		100	10 units
3SU1900-0AB71-0RN0		WATER INLET	--	5	**3SU1900-0AB71-0RC0**		100	10 units
		PUMP	0134 ISO	5	**3SU1900-0AB71-0RD0**		100	10 units
		COOLANT PUMP	0355 ISO	5	**3SU1900-0AB71-0RE0**		100	10 units
		LOCK, TIGHTEN	5653 IEC	5	**3SU1900-0AB71-0RF0**		100	10 units
		UNLOCK, UNCLAMP	5652 IEC	5	**3SU1900-0AB71-0RG0**		100	10 units
		BRAKE	--	5	**3SU1900-0AB71-0RH0**		100	10 units
		RELEASE BRAKE	0021 ISO	5	**3SU1900-0AB71-0RJ0**		100	10 units
		INTERLOCK	0022 ISO	5	**3SU1900-0AB71-0RK0**		100	10 units
		UNLOCK	0023 ISO	5	**3SU1900-0AB71-0RL0**		100	10 units
		SET UP	0910 ISO	5	**3SU1900-0AB71-0RM0**		100	10 units
		ON/OFF, MOMENTARY CONTACT TYPE	5011 IEC	5	**3SU1900-0AB71-0RN0**		100	10 units
		MANUAL OPERATION	0096 ISO	5	**3SU1900-0AB71-0RP0**		100	10 units
		AUTOMATIC CYCLE	0017 ISO	▶	**3SU1900-0AB71-0RQ0**		100	10 units
		SUCTION	--	5	**3SU1900-0AB71-0RR0**		100	10 units
		BLOWING	--	5	**3SU1900-0AB71-0RS0**		100	10 units

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:

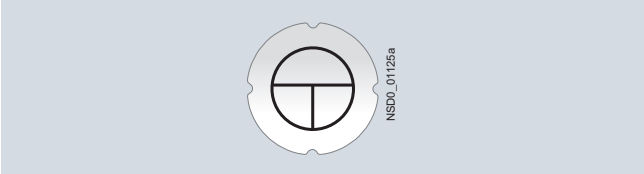
- 10 characters for one line of text
- 8 characters for 2 lines of text
- 6 characters for 3 lines of text, but 10 characters in the middle line

Examples for customized inscription

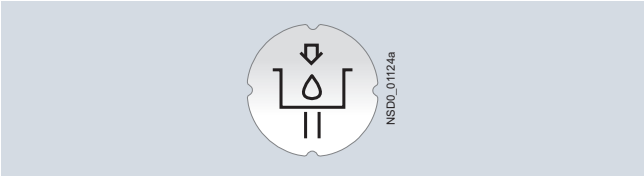
Two-line inscription in upper/lower case lettering (Q0Y)

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
- Electronic Catalog CA 01 on DVD
- Industry Mall: 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

	Material Label holder shape	Label holder color	Label fastening method	Labeling plate size Height	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				mm	mm	d				
Label holders for labeling plates										
3SU1900-0AG10-0AA0	Plastic With rounded bottom	Black	Self-adhesive	12.5	27	▶	**3SU1900-0AG10-0AA0**		100	10 units
				17.5	27	▶	**3SU1900-0AH10-0AA0**		100	10 units
				27	27	▶	**3SU1900-0AJ10-0AA0**		100	10 units
			Snap-on	12.5	27	▶	**3SU1900-0AR10-0AA0**		100	10 units
				17.5	27	▶	**3SU1900-0AS10-0AA0**		100	10 units
				27	27	▶	**3SU1900-0AT10-0AA0**		100	10 units
3SU1900-0AN10-0AA0	Plastic, with square bottom	Black	Self-adhesive	12.5	27	3	**3SU1900-0AN10-0AA0**		100	10 units
				17.5	27	▶	**3SU1900-0AP10-0AA0**		100	10 units
				27	27	5	**3SU1900-0AQ10-0AA0**		100	10 units
	For 2 labeling plates									
3SU1900-0BQ10-0AA0	Plastic, with rounded bottom	Black	Self-adhesive	17.5	27	▶	**3SU1900-0BQ10-0AA0**		1	1 unit
			Snap-on	17.5	27	▶	**3SU1900-0BR10-0AA0**		1	1 unit
	For 4 labeling plates									
3SU1900-0BT10-0AA0	Plastic, with rounded bottom	Black	Self-adhesive	17.5	27	▶	**3SU1900-0BS10-0AA0**		1	1 unit
			Snap-on	17.5	27	▶	**3SU1900-0BT10-0AA0**		1	1 unit
	For actuators and indicators, 30 mm NEW									
3SU1960-0AH10-0AA0	Metal, matte With rounded bottom	Black	Self-adhesive	17.5	27	▶	**3SU1960-0AH10-0AA0**		1	10 units
			Snap-on	17.5	27	▶	**3SU1960-0AS10-0AA0**		1	10 units
Label holders for labeling plates, coordinate switches										
3SU1900-0AL10-0AA0	Plastic, with square bottom	Black	Self-adhesive	27	27	▶	**3SU1900-0AL10-0AA0**		1	1 unit
3SU1900-0AM10-0AA0	Plastic, cross	Black	Self-adhesive	27	27	▶	**3SU1900-0AM10-0AA0**		1	1 unit

Labels

Label holders for labeling plates

	Material Label holder shape	Label holder color	Label fastening method	Labeling plate size Height	 Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				mm	mm	d				
Label holders for labeling plates, twin pushbuttons										
 3SU1900-0AK10-0AA0	Plastic, rectangular	Black	Self-adhesive	12.5	27	►	**3SU1900-0AK10-0AA0**		100	10 units
Single frames										
 3SU1900-0AX10-0AA0	Plastic, square	Black	--	29.8	29.8	►	**3SU1900-0AX10-0AA0**		1	10 units

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 11/144.

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

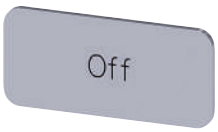
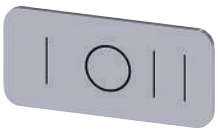
For mounting the labeling plates, you can choose between label holders for stick-on or snap-on mounting.

Selection and ordering data

	Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 12.5 mm x 27 mm							
	For self-inscription						
3SU1900-0AC16-0AA0	Black/White (label/lettering)	None	--	▶	**3SU1900-0AC16-0AA0**	100	10 units
	For custom inscription						
	Black/White (label/lettering)	None	--	▶	**3SU1900-0AC16-0AZ0**	100	10 units
	Inscription in English						
3SU1900-0AC16-0DN0	Black/White (label/lettering)	On	--	B	**3SU1900-0AC16-0DJ0**	100	10 units
		Off	--	B	**3SU1900-0AC16-0DK0**	100	10 units
		Up	--	B	**3SU1900-0AC16-0DL0**	100	10 units
		Down	--	B	**3SU1900-0AC16-0DM0**	100	10 units
		Forward	--	▶	**3SU1900-0AC16-0DN0**	100	10 units
		Reverse	--	B	**3SU1900-0AC16-0DP0**	100	10 units
		Right	--	B	**3SU1900-0AC16-0DQ0**	100	10 units
		Left	--	B	**3SU1900-0AC16-0DR0**	100	10 units
		Stop	--	▶	**3SU1900-0AC16-0DS0**	100	10 units
		Start	--	▶	**3SU1900-0AC16-0DT0**	100	10 units
		Reset	--	B	**3SU1900-0AC16-0DU0**	100	10 units
		Test	--	B	**3SU1900-0AC16-0DV0**	100	10 units
		Open	--	▶	**3SU1900-0AC16-0DW0**	100	10 units
		Close	--	▶	**3SU1900-0AC16-0DX0**	100	10 units
		Jog	--	B	**3SU1900-0AC16-0DE0**	100	10 units
		Running	--	B	**3SU1900-0AC16-0EB0**	100	10 units
		Fault	--	B	**3SU1900-0AC16-0EC0**	100	10 units
		Run	--	B	**3SU1900-0AC16-0ED0**	100	10 units
		Stop Start	--	B	**3SU1900-0AC16-0DC0**	100	10 units
		Off On	--	▶	**3SU1900-0AC16-0DH0**	100	10 units
		Power off	--	B	**3SU1900-0AC16-0DF0**	100	10 units
		Power on	--	B	**3SU1900-0AC16-0DG0**	100	10 units
		Man O Auto	--	B	**3SU1900-0AC16-0DY0**	100	10 units
		Man Auto	--	B	**3SU1900-0AC16-0EA0**	100	10 units
		Hand Auto	--	B	**3SU1900-0AC16-0DB0**	100	10 units
		Hand O Auto	--	B	**3SU1900-0AC16-0DD0**	100	10 units
	With symbol						
3SU1900-0AC16-0QG0	Black/White (label/lettering)	O	--	B	**3SU1900-0AC16-0QA0**	100	10 units
		I	--	B	**3SU1900-0AC16-0QB0**	100	10 units
		O I	--	B	**3SU1900-0AC16-0QG0**	100	10 units
		1 2	--	B	**3SU1900-0AC16-0QJ0**	100	10 units
		↑ ARROW DIRECTION UP	--	B	**3SU1900-0AC16-0QS0**	100	10 units

Labels

Labeling plates

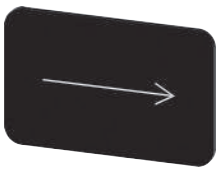
	Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 12.5 mm x 27 mm							
	For self-inscription						
3SU1900-0AC81-0AA0	Silver/Black (label/lettering)	None		A	**3SU1900-0AC81-0AA0**	100	10 units
	For custom inscription						
	Silver/Black (label/lettering)	None		A	**3SU1900-0AC81-0AZ0**	100	10 units
	Inscription in English						
 3SU1900-0AC81-0DK0	Silver/Black (label/lettering)	On	--	B	**3SU1900-0AC81-0DJ0**	100	10 units
		Off	--	B	**3SU1900-0AC81-0DK0**	100	10 units
		Up	--	B	**3SU1900-0AC81-0DL0**	100	10 units
		Down	--	B	**3SU1900-0AC81-0DM0**	100	10 units
		Stop	--	B	**3SU1900-0AC81-0DS0**	100	10 units
		Start	--	B	**3SU1900-0AC81-0DT0**	100	10 units
		Reset	--	B	**3SU1900-0AC81-0DU0**	100	10 units
		Test	--	B	**3SU1900-0AC81-0DV0**	100	10 units
		Open	--	B	**3SU1900-0AC81-0DW0**	100	10 units
		Close	--	B	**3SU1900-0AC81-0DX0**	100	10 units
		Man O Auto	--	B	**3SU1900-0AC81-0DY0**	100	10 units
		Man Auto	--	B	**3SU1900-0AC81-0EA0**	100	10 units
		Running	--	B	**3SU1900-0AC81-0EB0**	100	10 units
		Fault	--	B	**3SU1900-0AC81-0EC0**	100	10 units
		Fast	--	B	**3SU1900-0AC81-0EE0**	100	10 units
		Slow	--	B	**3SU1900-0AC81-0EF0**	100	10 units
		Hand Auto	--	B	**3SU1900-0AC81-0DB0**	100	10 units
		Stop Start	--	B	**3SU1900-0AC81-0DC0**	100	10 units
		Hand O Auto	--	B	**3SU1900-0AC81-0DD0**	100	10 units
	With symbol						
 3SU1900-0AC81-0QK0	Silver/Black (label/lettering)	O	5008 IEC	B	**3SU1900-0AC81-0QA0**	100	10 units
		I	5007 IEC	B	**3SU1900-0AC81-0QB0**	100	10 units
		II	--	B	**3SU1900-0AC81-0QC0**	100	10 units
		III	--	B	**3SU1900-0AC81-0QD0**	100	10 units
		O I	--	B	**3SU1900-0AC81-0QG0**	100	10 units
		I O II	--	B	**3SU1900-0AC81-0QK0**	100	10 units
		1 O 2	--	B	**3SU1900-0AC81-0QL0**	100	10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B	**3SU1900-0AC81-0QR0**	100	10 units
		↑ ARROW DIRECTION UP	--	B	**3SU1900-0AC81-0QS0**	100	10 units

Labels

Labeling plates

3SU1900-0AD16-0AA0

3SU1900-0AD16-0DK0

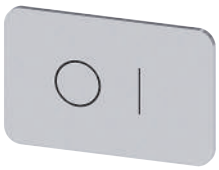


3SU1900-0AD16-0QR0

	Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 17.5 mm x 27 mm							
	For self-inscription						
	Black/White (label/lettering)	None	--	▶	**3SU1900-0AD16-0AA0**	100	10 units
	For custom inscription						
	Black/White (label/lettering)	None	--	▶	**3SU1900-0AD16-0AZ0**	100	10 units
	Inscription in English						
	Black/White (label/lettering)	Stop Start	--	B	**3SU1900-0AD16-0DC0**	100	10 units
		On	--	B	**3SU1900-0AD16-0DJ0**	100	10 units
		Off	--	B	**3SU1900-0AD16-0DK0**	100	10 units
		Up	--	B	**3SU1900-0AD16-0DL0**	100	10 units
		Down	--	B	**3SU1900-0AD16-0DM0**	100	10 units
		Forward	--	B	**3SU1900-0AD16-0DN0**	100	10 units
		Reverse	--	B	**3SU1900-0AD16-0DP0**	100	10 units
		Right	--	B	**3SU1900-0AD16-0DQ0**	100	10 units
		Stop	--	B	**3SU1900-0AD16-0DS0**	100	10 units
		Start	--	B	**3SU1900-0AD16-0DT0**	100	10 units
		Open	--	B	**3SU1900-0AD16-0DW0**	100	10 units
		Close	--	B	**3SU1900-0AD16-0DX0**	100	10 units
		Man Auto	--	B	**3SU1900-0AD16-0EA0**	100	10 units
		Running	--	B	**3SU1900-0AD16-0EB0**	100	10 units
		Fault	--	B	**3SU1900-0AD16-0EC0**	100	10 units
		Hand Auto	--	B	**3SU1900-0AD16-0DB0**	100	10 units
	With symbol						
	Black/White (label/lettering)	O	5008 IEC	B	**3SU1900-0AD16-0QA0**	100	10 units
		I	5007 IEC	B	**3SU1900-0AD16-0QB0**	100	10 units
		O I	--	B	**3SU1900-0AD16-0QG0**	100	10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B	**3SU1900-0AD16-0QR0**	100	10 units
		↑ ARROW DIRECTION UP	--	B	**3SU1900-0AD16-0QS0**	100	10 units

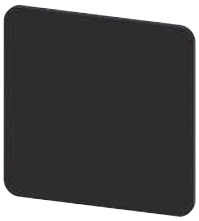
Labels

Labeling plates

	Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 17.5 mm x 27 mm							
	For self-inscription						
3SU1900-0AD81-0AA0	Silver/Black (label/lettering)	None	--	A	**3SU1900-0AD81-0AA0**	100	10 units
	For custom inscription						
	Silver/Black (label/lettering)	None	--	A	**3SU1900-0AD81-0AZ0**	100	10 units
	Inscription in English						
3SU1900-0AD81-0EC0	Silver/Black (label/lettering)	On	--	B	**3SU1900-0AD81-0DJ0**	100	10 units
		Off	--	B	**3SU1900-0AD81-0DK0**	100	10 units
		Stop	--	B	**3SU1900-0AD81-0DS0**	100	10 units
		Start	--	B	**3SU1900-0AD81-0DT0**	100	10 units
		Reset	--	B	**3SU1900-0AD81-0DU0**	100	10 units
		Man O Auto	--	B	**3SU1900-0AD81-0DY0**	100	10 units
		Fault	--	B	**3SU1900-0AD81-0EC0**	100	10 units
		Hand Auto	--	B	**3SU1900-0AD81-0DB0**	100	10 units
		Hand O Auto	--	B	**3SU1900-0AD81-0DD0**	100	10 units
	With symbol						
 3SU1900-0AD81-0QG0	Silver/Black (label/lettering)	O	5008 IEC	B	**3SU1900-0AD81-0QA0**	100	10 units
		I	5007 IEC	B	**3SU1900-0AD81-0QB0**	100	10 units
		O I	--	B	**3SU1900-0AD81-0QG0**	100	10 units
		I O II	--	B	**3SU1900-0AD81-0QK0**	100	10 units
		1 O 2	--	B	**3SU1900-0AD81-0QL0**	100	10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B	**3SU1900-0AD81-0QR0**	100	10 units
		↑ ARROW DIRECTION UP	--	B	**3SU1900-0AD81-0QS0**	100	10 units

Labels

Labeling plates

	Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 27 mm x 27 mm							
	For self-inscription						
 3SU1900-0AE16-0AA0	Black/White (label/lettering)	None	--	▶	**3SU1900-0AE16-0AA0**	100	10 units
	For custom inscription						
	Black/White (label/lettering)	None	--	▶	**3SU1900-0AE16-0AZ0**	100	10 units
	For self-inscription						
3SU1900-0AE81-0AA0	Silver/Black (label/lettering)			A	**3SU1900-0AE81-0AA0**	100	10 units
	For custom inscription						
	Silver/Black (label/lettering)		--	A	**3SU1900-0AE81-0AZ0**	100	10 units
	Inscription in English						
3SU1900-0AE16-0DK0	Black/White (label/lettering)	On	--	B	**3SU1900-0AE16-0DJ0**	100	10 units
		Off	--	B	**3SU1900-0AE16-0DK0**	100	10 units
		Up	--	B	**3SU1900-0AE16-0DL0**	100	10 units
		Down	--	B	**3SU1900-0AE16-0DM0**	100	10 units
		Forward	--	B	**3SU1900-0AE16-0DN0**	100	10 units
		Reverse	--	B	**3SU1900-0AE16-0DP0**	100	10 units
		Stop	--	B	**3SU1900-0AE16-0DS0**	100	10 units
		Start	--	B	**3SU1900-0AE16-0DT0**	100	10 units
		EMERGENCY STOP	--	B	**3SU1900-0AE16-0DA0**	100	10 units
		Stop Start	--	B	**3SU1900-0AE16-0DC0**	100	10 units
		Hand Auto	--	B	**3SU1900-0AE16-0DB0**	100	10 units
	With symbol						
3SU1900-0AE16-0QG0	Black/White (label/lettering)	O I	--	B	**3SU1900-0AE16-0QG0**	100	10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B	**3SU1900-0AE16-0QR0**	100	10 units

Options

Customized inscriptions

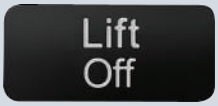
The labels can be inscribed with text and symbols not listed in the ordering data.

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, JEPG, 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
- Electronic Catalog CA 01 on DVD
- Industry Mall: 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 11/147.

Selection and ordering data

	Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 22 mm x 22 mm							
	For self-inscription						
3SU1900-0AF16-0AA0	Black/White (label/lettering)	None	--	▶	**3SU1900-0AF16-0AA0**	100	10 units
	For custom inscription						
	Black/White (label/lettering)	None	--	▶	**3SU1900-0AF16-0AZ0**	100	10 units
	Inscription in English						
3SU1900-0AF16-0DM0	Black/White (label/lettering)	On	--	B	**3SU1900-0AF16-0DJ0**	1	10 units
		Off	--	B	**3SU1900-0AF16-0DK0**	1	10 units
		Up	--	▶	**3SU1900-0AF16-0DL0**	1	10 units
		Down	--	▶	**3SU1900-0AF16-0DM0**	1	10 units
		Forward	--	B	**3SU1900-0AF16-0DN0**	1	10 units
		Right	--	B	**3SU1900-0AF16-0DQ0**	1	10 units
		Left	--	B	**3SU1900-0AF16-0DR0**	1	10 units
		Stop	--	▶	**3SU1900-0AF16-0DS0**	1	10 units
		Start	--	▶	**3SU1900-0AF16-0DT0**	1	10 units
		Reset	--	B	**3SU1900-0AF16-0DU0**	1	10 units
		Test	--	▶	**3SU1900-0AF16-0DV0**	1	10 units
		Open	--	B	**3SU1900-0AF16-0DW0**	1	10 units
		Close	--	B	**3SU1900-0AF16-0DX0**	1	10 units
		Running	--	B	**3SU1900-0AF16-0EB0**	1	10 units
3SU1900-0AF16-0EC0		Fault	--	B	**3SU1900-0AF16-0EC0**	1	10 units
		Fast	--	B	**3SU1900-0AF16-0EE0**	1	10 units
		Slow	--	B	**3SU1900-0AF16-0EF0**	1	10 units
		EMERGENCY STOP	--	▶	**3SU1900-0AF16-0DA0**	1	10 units
	With symbol (ON/OFF)						
3SU1900-0AF16-0QQ0	Black/White (label/lettering)	O	5008 IEC	▶	**3SU1900-0AF16-0QA0**	1	10 units
		I	5007 IEC	▶	**3SU1900-0AF16-0QB0**	1	10 units
		II	--	▶	**3SU1900-0AF16-0QC0**	1	10 units
		III	--	B	**3SU1900-0AF16-0QD0**	1	10 units
		O I	--	B	**3SU1900-0AF16-0QG0**	1	10 units
		I O II	--	B	**3SU1900-0AF16-0QK0**	1	10 units
		I O (one below the other)	--	B	**3SU1900-0AF16-0QP0**	1	10 units
		II O I (one below the other)	--	B	**3SU1900-0AF16-0QQ0**	1	10 units
	With symbol (graphic)						
3SU1900-0AF16-0RW0	Black/White (label/lettering)	→ ARROW DIRECTION TO RIGHT	5022 IEC	▶	**3SU1900-0AF16-0QR0**	1	10 units
		PUMP	0134 ISO	B	**3SU1900-0AF16-0RD0**	1	10 units
		FAN	--	B	**3SU1900-0AF16-0RV0**	1	10 units
		COOLING	--	B	**3SU1900-0AF16-0RW0**	1	10 units
		ILLUMINATION	--	B	**3SU1900-0AF16-0RX0**	1	10 units
		MOTOR	--	B	**3SU1900-0AF16-0RY0**	1	10 units

Labels

Labeling plates for enclosures

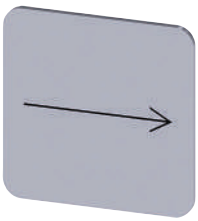
Labeling plates 22 mm x 22 mm

3SU1900-0AF81-0AA0

3SU1900-0AF81-0DU0

3SU1900-0AF81-0DD0

3SU1900-0AF81-QK0



3SU1900-0AF81-0QR0

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
For self-inscription						
Silver/Black (label/lettering)	None	--	A	**3SU1900-0AF81-0AA0**	100	10 units
For custom inscription						
Silver/Black (label/lettering)	None	--	A	**3SU1900-0AF81-0AZ0**	100	10 units
Inscription in English						
Silver/Black (label/lettering)	Stop	--	B	**3SU1900-0AF81-0DS0**	1	10 units
	Start	--	B	**3SU1900-0AF81-0DT0**	1	10 units
	Reset	--	B	**3SU1900-0AF81-0DU0**	1	10 units
	Test	--	B	**3SU1900-0AF81-0DV0**	1	10 units
	Open	--	B	**3SU1900-0AF81-0DW0**	1	10 units
	Hand O Auto	--	B	**3SU1900-0AF81-0DD0**	1	10 units
With symbol (ON/OFF)						
Silver/Black (label/lettering)	O	5008 IEC	B	**3SU1900-0AF81-0QA0**	1	10 units
	I	5007 IEC	B	**3SU1900-0AF81-0QB0**	1	10 units
	II	--	B	**3SU1900-0AF81-0QC0**	1	10 units
	III	--	B	**3SU1900-0AF81-0QD0**	1	10 units
	O I	--	B	**3SU1900-0AF81-0QG0**	1	10 units
	I O II	--	B	**3SU1900-0AF81-0QK0**	1	10 units
	I O (one below the other)	--	B	**3SU1900-0AF81-0QP0**	1	10 units
	II O I (one below the other)	--	B	**3SU1900-0AF81-0QQ0**	1	10 units
With symbol (graphic)						
Silver/Black (label/lettering)	→ ARROW DIRECTION TO RIGHT	5022 IEC	B	**3SU1900-0AF81-0QR0**	1	10 units

Options

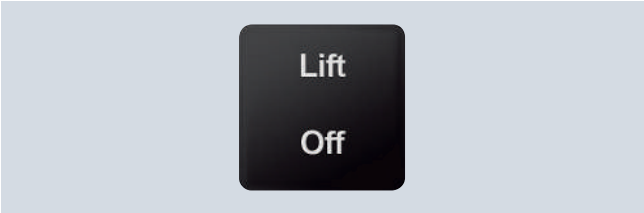
Customized inscriptions

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
- Electronic Catalog CA 01 on DVD
- Industry Mall: 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

Selection and ordering data

	Fastening method	Height	Width	DT	Order No.	PU (UNIT, SET, M)	PS*
		mm	mm				
Labels for printing - insert labels							
3SU1900-0BH60-0AA0	Insert	--	--	B	**3SU1900-0BH60-0AA0**	100	480 units
Labels for printing - labeling plates							
3SU1900-0BJ61-0AA0	Self-adhesive	12.5	27.5	A	**3SU1900-0BJ61-0AA0**	100	480 units
		17.5	27	A	**3SU1900-0BK61-0AA0**	100	720 units
		27	27	A	**3SU1900-0BL61-0AA0**	100	480 units
		22	22	A	**3SU1900-0BM61-0AA0**	100	700 units

Selection and ordering data

	Color	Fastening method	Outer diameter mm	Marking	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
EMERGENCY STOP backing plates									
3SU1900-0BB31-0AT0	Yellow/black (label/lettering)	None	45	None	▶	**3SU1900-0BA31-0AA0**		1	10 units
			45	EMERGENCY STOP (pl) NEW	5	**3SU1900-0BA31-0ND0**		1	10 units
			60	NOT-HALT, EMERGENCY STOP, ARRÊT D'URGENCE, EMERGENZA (de, en, fr, it)	5	**3SU1900-0BN31-0NC0**		1	10 units
			75	None	▶	**3SU1900-0BB31-0AA0**		1	10 units
				NOT-AUS	3	**3SU1900-0BB31-0AS0**		1	10 units
				NOT-HALT	3	**3SU1900-0BB31-0AT0**		1	10 units
				EMERGENCY STOP	5	**3SU1900-0BB31-0DA0**		1	10 units
			75	EMERGENCY STOP (pl) NEW	5	**3SU1900-0BB31-0ND0**		1	10 units
	With customized inscription								
	Yellow/black (label/lettering)	None	45	For inscriptions or symbols, see "Options", page 13/133.		**3SU1900-0BA31-0AZ0**		1	1 unit
			75			**3SU1900-0BB31-0AZ0**		1	1 unit
EMERGENCY STOP backing plates, illuminated (24 V AC/DC) NEW									
3SU1901-0BD31-0AA0	Yellow/black (label/lettering)	Self-adhesive	60	None	5	**3SU1901-0BD31-0AA0**		1	1 unit
				NOT-AUS	5	**3SU1901-0BD31-0AS0**		1	1 unit
				NOT-HALT	5	**3SU1901-0BD31-0AT0**		1	1 unit
				EMERGENCY STOP	5	**3SU1901-0BD31-0DA0**		1	1 unit
				NOT-HALT, EMERGENCY STOP, EMERGENZA, EMERGENCIA (de, en, it, sp)	5	**3SU1901-0BD31-0NB0**		1	1 unit
	With customized inscription								
	Yellow/black (label/lettering)	None	60	For inscriptions or symbols, see page 11/150.		**3SU1901-0BD31-0AZ0**		1	1 unit
EMERGENCY STOP backing plates									
3SU1900-0BC31-0NB0	Yellow/black (label/lettering)	Self-adhesive	75	None	▶	**3SU1900-0BC31-0AA0**		1	10 units
				NOT-AUS	3	**3SU1900-0BC31-0AS0**		1	10 units
				NOT-HALT	▶	**3SU1900-0BC31-0AT0**		1	10 units
				EMERGENCY STOP	▶	**3SU1900-0BC31-0DA0**		1	10 units
				ARRÊT D'URGENCE	3	**3SU1900-0BC31-0GQ0**		1	10 units
				EMERGENZA	3	**3SU1900-0BC31-0JA0**		1	10 units
				Nodstop	5	**3SU1900-0BC31-0LA0**		1	10 units
				EMERGENCY STOP in Chinese	5	**3SU1900-0BC31-0MA0**		1	10 units
				NOT-HALT, EMERGENCY STOP, EMERGENZA, EMERGENCIA (de, en, it, sp)	▶	**3SU1900-0BC31-0NB0**		1	10 units
	With customized inscription								
	Yellow/black (label/lettering)	Self-adhesive	75	For inscriptions or symbols, see "Options", page 13/133.		**3SU1900-0BC31-0AZ0**		1	1 unit
Labeling plates for potentiometers									
3SU1900-0BG16-0RU0	Black/white (label/lettering)	None	40	--	▶	**3SU1900-0BG16-0AA0**		1	10 units
				SYMBOL: 0 ...9	▶	**3SU1900-0BG16-0RT0**		1	10 units
				SYMBOL: 0 ... 10	3	**3SU1900-0BG16-0SA0**		1	10 units
				SYMBOL: Power up	▶	**3SU1900-0BG16-0RU0**		1	10 units

	Color	Label fastening method	Height mm	Width mm	Marking	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Labeling plates for enclosures with EMERGENCY STOP										
3SU1900-0BE31-0AS0	Yellow/black (label/lettering)	Self-adhesive	38	150	None	▶	**3SU1900-0BE31-0AA0**		1	10 units
					NOT-AUS	3	**3SU1900-0BE31-0AS0**		1	10 units
					NOT-HALT NEW	3	**3SU1900-0BE31-0AT0**		1	10 units
Labeling plates for enclosures with EMERGENCY STOP with recess										
3SU1900-0BF31-0AA0	Yellow/black (label/lettering)	Self-adhesive	38	150	None	3	**3SU1900-0BF31-0AA0**		1	10 units
Device labeling plates for modules with front-plate mounting										
3SU1900-0AY61-0AA0	White/black (label/lettering)	Insert	9.5	10.5	None	5	**3SU1900-0AY61-0AA0**		100	10 units

Options

Customized inscriptions

The labels can be inscribed with text and symbols not listed in the ordering data.

The EMERGENCY STOP backing plates can be divided into as many as four radial segments. Each segment can be custom-labeled.

The default typeface used for inscriptions with text is Arial and the text is centered.

EMERGENCY STOP backing plate 75 mm:

The font height is 5 mm.
With two radial segments up to 20 characters are permissible.
With four radial segments up to 10 characters are permissible.

EMERGENCY STOP backing plate 60 mm:

The font height is 4 mm.
With two radial segments up to 16 characters are permissible.
With four radial segments up to 8 characters are permissible.

EMERGENCY STOP backing plate 45 mm:

The font height is 4 mm.
With two radial segments up to 10 characters are permissible.

Ordering notes

Append the following order codes to the article number:

- **Q0Y:** Segment(s) in upper/lower case, always upper case for beginning of segment, e.g. Z1=Not halt Z2=Emergency stop
- **Q1Y:** Segment(s) in upper case, e.g. Z1=NOT HALT Z2=EMERGENCY STOP
- **Q2Y:** Segment(s) in lower case, e.g. Z1=not halt Z2=emergency stop
- **Q5Y:** Segment(s) in upper/lower case, all words begin with upper case letters, e.g. Z1=Not Halt Z2=Emergency Stop
- **Q3Y:** Symbol with number according to ISO 7000 or IEC 60417
- **Q9Y:** 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.

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 ordering channels.

Standard ordering channels:
- Configurator: www.siemens.com/sirius-act/configurator
- Electronic Catalog CA 01 on DVD
- Industry Mall: www.siemens.com/industrymall

With ordering options Q0Y, Q1Y, Q2Y, Q3Y and Q5Y a single-line inscription of two or four radial segments can be implemented. The text or symbol must be assigned to the respective radial segments as follows:

Ordering example 1, two radial segments

An EMERGENCY STOP backing plate, diameter 75 mm, with two radial segments is required

3SU1900-0BB31-0AZ0
Q1Y
Z1=EMERGENCY
Z2=STOP

Ordering example 2, four radial segments

An EMERGENCY STOP backing plate, diameter 75 mm, with four radial segments is required

3SU1900-0BB31-0AZ0
Q1Y
Z1=E-STOP
Z2=EMERGENCIA
Z3=NOT-HALT
Z4=EMERGENZA

Accessories

Protection/access protection

Overview

- Protection and access protection are for actuators and indicators with diameter 22 mm.
- The protective collars cannot be used in conjunction with label holders or single frames.

Selection and ordering data

	Product designation Product version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Protective caps								
 3SU1900-0DA10-0AA0	**Sealable caps for pushbuttons, flat and raised**	Plastic	Black Clear	3 3	**3SU1900-0DA10-0AA0** **3SU1900-0DA70-0AA0**		1 1	1 unit 1 unit
 3SU1900-0EL70-0AA0	**Sealable caps for** • Pushbuttons, raised • Pushbuttons with front ring, raised • Pushbuttons with front ring, raised, castellated	Plastic	Black Clear	3 3	**3SU1900-0EL10-0AA0** **3SU1900-0EL70-0AA0**		1 1	1 unit 1 unit
 3SU1900-0DB70-0AA0	**Silicone protective caps for pushbuttons, flat**	Plastic	Clear	▶	**3SU1900-0DB70-0AA0**		1	1 unit
	Silicone-free protective caps for pushbuttons, flat	Plastic	Clear	▶	**3SU1900-0ED70-0AA0**		1	1 unit
 3SU1900-0DC70-0AA0	**Silicone protective caps for pushbuttons, raised**	Plastic	Clear	▶	**3SU1900-0DC70-0AA0**		1	1 unit
	Silicone-free protective caps for pushbuttons, raised	Plastic	Clear	▶	**3SU1900-0EE70-0AA0**		1	1 unit
 3SU1900-0DD70-0AA0	**Silicone protective caps for selectors, short**	Plastic	Clear	3	**3SU1900-0DD70-0AA0**		1	1 unit
	Silicone-free protective caps for selectors, short	Plastic	Clear	▶	**3SU1900-0EF70-0AA0**		1	1 unit
 3SU1900-0DE70-0AA0	**Silicone protective caps for mushroom pushbuttons 40 mm**	Plastic	Clear	5	**3SU1900-0DE70-0AA0**		1	1 unit
	Silicone-free protective caps for mushroom pushbuttons 40 mm	Plastic	Clear	▶	**3SU1900-0EG70-0AA0**		1	1 unit

Accessories

Protection/access protection

	Product designation Product version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Protective caps								
 3SU1900-0DF70-0AA0	**Silicone protective caps for EMERGENCY STOP, 40 mm**	Plastic	Clear	5	**3SU1900-0DF70-0AA0**		1	1 unit
 3SU1900-0DG70-0AA0	**Silicone protective caps for twin pushbuttons, flat**	Plastic	Clear	▶	**3SU1900-0DG70-0AA0**		1	1 unit
	Silicone protective caps for twin pushbuttons, raised	Plastic	Clear	▶	**3SU1900-0DH70-0AA0**		1	1 unit
	Silicone-free protective caps for twin pushbuttons, raised	Plastic	Clear	▶	**3SU1900-0EK70-0AA0**		1	1 unit
 3SU1900-0EB10-0AA0	**Dust caps for key-operated switches**	Plastic	Clear	▶	**3SU1900-0EB10-0AA0**		1	1 unit
 3SU1900-0EM70-0AA0	**Protective caps for ID key-operated switches**	Plastic	Clear	NEW 5	**3SU1900-0EM70-0AA0**		1	1 unit
	Covers for modules	Plastic	Clear	NEW 5	**3SU1900-0EW70-0AA0**		1	1 unit
Protective collars								
 3SU1900-0DJ10-0AA0	**Sun collar for illuminated push-buttons**	Plastic	Black	5	**3SU1900-0DJ10-0AA0**		1	1 unit
 3SU1900-0DW10-0AA0	**360° protective collars for pushbuttons and selectors, short**	Plastic	Black	3	**3SU1900-0DW10-0AA0**		1	1 unit

Accessories

Protection/access protection

	Product designation Product version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Protective collars								
 3SU1950-0DK80-0AA0	**360° protective collars for pushbuttons, 22 mm Round flush & raised Actuators, Indicator Lights** visibility from the side	Metal	Silver	5	**3SU1950-0DK80-0AA0**		1	1 unit
 3SU1950-0DL80-0AA0	**360° protective collars for mushroom pushbuttons Ø 33.3 mm & 40 mm** visibility from the side	Metal	Silver	5	**3SU1950-0DL80-0AA0**		1	1 unit
 3SU1900-0DY30-0AA0	**Protective collars for EMERGENCY STOP mushroom pushbutton Ø up-to 60 mm** without lock or with RONIS lock	Plastic	Yellow Gray	▶ ▶	**3SU1900-0DY30-0AA0** **3SU1900-0DY80-0AA0**		1 1	1 unit 1 unit
	Includes text: EMERGENCY STOP	Plastic	Yellow	▶	**3SU1900-0DY30-0DA0**		1	1 unit
	Protective Collar fits mushroom pushbutton up to 60 mm (Note: For mushroom pushbuttons > 40 mm we suggest that you add text to the mushroom head cap instead of the protective collar).							
 3SU1950-0DX30-0AA0	**Protective collars for EMERGENCY STOP mushroom pushbuttons** for mounting on enclosures	Plastic	Yellow	NEW 5	**3SU1900-0JH30-0AA0**		1	1 unit
	Protective collars for mushroom pushbutton Ø 40 mm, for 5 padlocks	Metal	Yellow Gray	3 5	**3SU1950-0DX30-0AA0** **3SU1950-0DX80-0AA0**		1 1	1 unit 1 unit
	Ø 60 mm, for 3 padlocks	Plastic	Yellow	NEW 5	**3SU1900-0EX30-0AA0**		1	1 unit
 3SU1900-0EA30-0AA0	**360° protective collars for EMERGENCY STOP, SEMI-industry mushroom pushbutton Ø up-to 60 mm**	Plastic	Yellow	5	**3SU1900-0EA30-0AA0**		1	1 unit
 3SU1900-0EC10-0AA0	**Protection for sensor switches**	Plastic	Black	▶	**3SU1900-0EC10-0AA0**		1	1 unit

Accessories

Protection/access protection

	Product version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Locking devices								
3SU1950-0DM80-0AA0	**Locking devices for pushbuttons** Flat, for raised front ring and raised, castellated front ring	Metal	Silver	5	**3SU1950-0DM80-0AA0**		1	1 unit
3SU1950-0DN80-0AA0	**Locking devices for pushbuttons** Raised	Metal	Silver	5	**3SU1950-0DN80-0AA0**		1	1 unit
3SU1950-0DP80-0AA0	**Locking devices for mushroom pushbuttons D30, D40**	Metal	Silver	5	**3SU1950-0DP80-0AA0**		1	1 unit
3SU1950-0DQ80-0AA0	**Locking devices for selectors** Short/long actuator, in the left position	Metal	Silver	5	**3SU1950-0DQ80-0AA0**		1	1 unit
3SU1950-0DR80-0AA0	**Locking devices for selectors** Short/long actuator, in the center position	Metal	Silver	5	**3SU1950-0DR80-0AA0**		1	1 unit
3SU1950-0DS80-0AA0	**Locking devices for selectors** Short/long actuator, in the right position	Metal	Silver	5	**3SU1950-0DS80-0AA0**		1	1 unit
3SU1950-0DT80-0AA0	**Locking devices for selectors** Short/long actuator, window from center to right, blocked on left	Metal	Silver	5	**3SU1950-0DT80-0AA0**		1	1 unit
3SU1950-0DU80-0AA0	**Locking devices for selectors** Short/long actuator, window from center to left, blocked on right	Metal	Silver	5	**3SU1950-0DU80-0AA0**		1	1 unit
3SU1950-0DV80-0AA0	**Locking device with cover**	Metal	Silver	5	**3SU1950-0DV80-0AA0**		1	1 unit

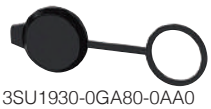
Accessories

Actuators

Selection and ordering data

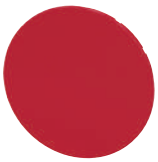
	Material	Mounting diameter	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		mm		d				
Sealing plugs[1], 22 mm								
3SU1900-0FA10-0AA0	Plastic	22	Black	▶	**3SU1900-0FA10-0AA0**		1	1 unit
3SU1950-0FA80-0AA0	Metal, matte	22	Sand gray	▶	**3SU1930-0FA80-0AA0**		1	1 unit
	Metal, shiny	22	Silver	▶	**3SU1950-0FA80-0AA0**		1	1 unit
	Metal, matte	30	Sand gray	▶	**3SU1960-0FA80-0AA0**		1	1 unit

[1] The sealing plug is mounted with a holder.
Modules might already be mounted on the holder.

	Type of product	Mounting diameter	Accessory color	Accessory material	SD	**Screw terminals** Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		mm			d				
USB port									
 3SU1930-0GA80-0AA0	USB 3.0	22	Black	Plastic	3	**3SU1900-0GA10-0AA0**		1	1 unit
			Sand gray	Metal/plastic	3	**3SU1930-0GA80-0AA0**		1	1 unit
			Silver	Metal, shiny	3	**3SU1950-0GA80-0AA0**		1	1 unit
		30	Sand gray	Metal, matte	3	**3SU1960-0GA80-0AA0**		1	1 unit
3SU1960-0GA80-0AA0									
RJ45 connection									
3SU1900-0GB10-0AA0	RJ-45 Cat. 6	22	Black	Plastic	3	**3SU1900-0GB10-0AA0**		1	1 unit
			Sand gray	Metal/plastic	3	**3SU1930-0GB80-0AA0**		1	1 unit
			Silver	Metal, shiny	3	**3SU1950-0GB80-0AA0**		1	1 unit
		30	Sand gray	Metal, matte	3	**3SU1960-0GB80-0AA0**		1	1 unit
3SU1950-0GB80-0AA0									

Accessories

Actuators

	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Buttons, flat[1)]							
	For pushbuttons						
 3SU1900-0FT20-0AA0	Plastic	Black	▶	**3SU1900-0FT10-0AA0**		100	10 units
		Red	▶	**3SU1900-0FT20-0AA0**		100	10 units
		Yellow	▶	**3SU1900-0FT30-0AA0**		100	10 units
		Green	▶	**3SU1900-0FT40-0AA0**		100	10 units
		Blue	▶	**3SU1900-0FT50-0AA0**		100	10 units
		White	▶	**3SU1900-0FT60-0AA0**		100	10 units
	For illuminated pushbuttons						
3SU1901-0FT30-0AA0	Plastic	Amber	5	**3SU1901-0FT00-0AA0**		100	10 units
		Red	▶	**3SU1901-0FT20-0AA0**		100	10 units
		Yellow	▶	**3SU1901-0FT30-0AA0**		100	10 units
		Green	▶	**3SU1901-0FT40-0AA0**		100	10 units
		Blue	▶	**3SU1901-0FT50-0AA0**		100	10 units
		White	▶	**3SU1901-0FT60-0AA0**		100	10 units
		Clear	▶	**3SU1901-0FT70-0AA0**		100	10 units
Buttons, raised[1)]							
	For pushbuttons						
3SU1900-0FS30-0AA0	Plastic	Black	5	**3SU1900-0FS10-0AA0**		1	10 units
		Red	5	**3SU1900-0FS20-0AA0**		1	10 units
		Yellow	5	**3SU1900-0FS30-0AA0**		1	10 units
		Green	5	**3SU1900-0FS40-0AA0**		1	10 units
	For illuminated pushbuttons						
3SU1901-0FS40-0AA0	Plastic	Red	▶	**3SU1901-0FS20-0AA0**		1	10 units
		Yellow	5	**3SU1901-0FS30-0AA0**		1	10 units
		Green	5	**3SU1901-0FS40-0AA0**		1	10 units
		Blue	5	**3SU1901-0FS50-0AA0**		1	10 units
		Clear	5	**3SU1901-0FS70-0AA0**		1	10 units

1) Buttons are not interchangeable between pushbuttons and illuminated pushbuttons with a raised front ring and with a raised front ring, castellated.

Accessories

Actuators

	Material	Key number	Version of RFID coding	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
RONIS keys									
3SU1950-0FB80-0AA0	Metal	SB30[1)] 455	--	Silver	▶ 5	**3SU1950-0FB80-0AA0** **3SU1950-0FC80-0AA0**		1 1	1 unit 1 unit
BKS keys									
3SU1950-0FD80-0AA0	Metal	S1[1)]	--	Silver	5	**3SU1950-0FD80-0AA0**		1	1 unit
O.M.R. keys									
3SU1950-0FJ50-0AA0	Metal	73038 73037 73034 73033	--	Blue Red Black Yellow	3 5 5 5	**3SU1950-0FJ50-0AA0** **3SU1950-0FK20-0AA0** **3SU1950-0FL10-0AA0** **3SU1950-0FM30-0AA0**		1 1 1 1	1 unit 1 unit 1 unit 1 unit
CES keys									
3SU1950-0FP80-0AA0	Metal	LSG1 SSG10[1)] VL5	--	Silver	5 ▶ 5	**3SU1950-0FN80-0AA0** **3SU1950-0FP80-0AA0** **3SU1950-0FQ80-0AA0**		1 1 1	1 unit 1 unit 1 unit
IKON keys									
3SU1950-0FR80-0AA0	Metal	360012K1[1)]	--	Silver	5	**3SU1950-0FR80-0AA0**		1	1 unit
ID keys ID group individual									
3SU1900-0FU60-0AA0	Plastic	--	Individually coded, programmable several times	White	▶	**3SU1900-0FU60-0AA0**		1	1 unit
ID keys									
3SU1900-0FV40-0AA0	Plastic	--	ID group 1 ID group 2 ID group 3 ID group 4	Green Yellow Red Blue	▶ ▶ ▶ ▶	**3SU1900-0FV40-0AA0** **3SU1900-0FW30-0AA0** **3SU1900-0FX20-0AA0** **3SU1900-0FY50-0AA0**		1 1 1 1	1 unit 1 unit 1 unit 1 unit

[1)] Also available with special lock. Supplement the Article No. with **"–Z"** and the order code **"Y04"** and specify the required lock in plain text.
Additional price on request.

Accessories

Enclosures

Selection and ordering data

	Product version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Metric cable glands								
3SU1900-0HG10-0AA0	**M20 for round cable and enclosures** With 1 to 3 command points	Plastic	Black	▶	**3SU1900-0HG10-0AA0**		1	1 unit
	M25 for round cable and enclosure With 4 and 6 command points	Plastic	Black	5	**3SU1900-0HH10-0AA0**		1	1 unit
	M20 for round cable and AS-i enclosure With 1 to 3 command points with 2-pin connector plug for AS-i module	Plastic	Black	3	**3SU1900-0JA10-0AA0**		1	1 unit
	M25 for round cable and AS-i enclosure With 4 and 6 command points with 2-pin connector plug for AS-i module	Plastic	Black	3	**3SU1900-0JB10-0AA0**		1	1 unit
	M20 for round cable and IO-Link enclosure With 1 to 3 command points with 10-pin connector plug for IO-Link	Plastic	Black	▶	**3SU1900-0JC10-0AA0**		1	1 unit
	M25 for round cable and IO-Link enclosure With 4 and 6 command points with 10-pin connector plug for IO-Link	Plastic	Black	▶	**3SU1900-0JD10-0AA0**		1	1 unit
	M20 for AS-i profile cable and AS-i enclosure With 1 to 3 command points with 2-pin connector plug for AS-i module	Plastic	Black	5	**3SU1900-0HE10-0AA0**		1	1 unit
	M25 for AS-i profile cable and AS-i enclosure With 4 and 6 command points with 2-pin connector plug for AS-i module	Plastic	Black	5	**3SU1900-0HF10-0AA0**		1	1 unit
Connection pieces								
3SU1900-0HJ10-0AA0	***For plastic enclosures***							
	M20/M20 connection piece For connecting 2 enclosures	Plastic	Black	▶	**3SU1900-0HJ10-0AA0**		1	1 unit
	M20/M25 connection piece For connecting 2 enclosures	Plastic	Black	5	**3SU1900-0HK10-0AA0**		1	1 unit
	M25/M25 connection piece For connecting 2 enclosures	Plastic	Black	5	**3SU1900-0HL10-0AA0**		1	1 unit
3SU1950-0HJ10-0AA0	***For metal enclosures***							
	M20/M20 connection piece For connecting 2 enclosures	Metal	Silver	5	**3SU1950-0HJ10-0AA0**		1	1 unit
	M20/M25 connection piece For connecting 2 enclosures	Plastic	Silver	5	**3SU1950-0HK10-0AA0**		1	1 unit
	M25/M25 connection piece For connecting 2 enclosures	Plastic	Silver	5	**3SU1950-0HL10-0AA0**		1	1 unit

Accessories

Enclosures

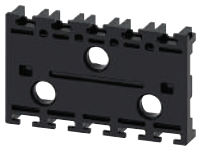
	Product version	Material	Color	SD	Insulation piercing method	PU (UNIT, SET, M)	PS*
				d	Article No. / Price per PU		
Adapters for AS-i shaped cable							
3SU1900-0HX10-0AA0	M20	Plastic	Black	3	**3SU1900-0HX10-0AA0**	1	1 unit
	M25			3	**3SU1900-0HY10-0AA0**	1	1 unit
Adapters for tab connection							
3SU1930-0HS10-0AA0	***For plastic enclosures***						
	Adapter, M12 socket, 4-pin						
	M20 cable entry	Plastic	Black	5	**3SU1930-0HA10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1930-0HB10-0AA0**	1	1 unit
	Adapter, M12 connector, 4-pin						
	M20 cable entry	Plastic	Black	5	**3SU1930-0HC10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1930-0HD10-0AA0**	1	1 unit
	Adapter, M12 socket, 5-pin						
	M20 cable entry	Plastic	Black	5	**3SU1930-0HP10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1930-0HQ10-0AA0**	1	1 unit
	Adapter, M12 connector, 5-pin						
	M20 cable entry	Plastic	Black	5	**3SU1930-0HR10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1930-0HS10-0AA0**	1	1 unit
	Adapter, M12 socket, 8-pin						
	M20 cable entry	Plastic	Black	5	**3SU1930-0HT10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1930-0HU10-0AA0**	1	1 unit
	Adapter, M12 connector, 8-pin						
	M20 cable entry	Plastic	Black	5	**3SU1930-0HV10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1930-0HW10-0AA0**	1	1 unit
3SU1950-0HA10-0AA0	***For metal enclosures***						
	Adapter, M12 socket, 4-pin						
	M20 cable entry	Plastic	Black	5	**3SU1950-0HA10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1950-0HB10-0AA0**	1	1 unit
	Adapter, M12 connector, 4-pin						
	M20 cable entry	Plastic	Black	5	**3SU1950-0HC10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1950-0HD10-0AA0**	1	1 unit
	Adapter, M12 socket, 5-pin						
	M20 cable entry	Plastic	Black	5	**3SU1950-0HP10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1950-0HQ10-0AA0**	1	1 unit
	Adapter, M12 connector, 5-pin						
	M20 cable entry	Plastic	Black	5	**3SU1950-0HR10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1950-0HS10-0AA0**	1	1 unit
	Adapter, M12 socket, 8-pin						
	M20 cable entry	Plastic	Black	5	**3SU1950-0HT10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1950-0HU10-0AA0**	1	1 unit
	Adapter, M12 connector, 8-pin						
	M20 cable entry	Plastic	Black	5	**3SU1950-0HV10-0AA0**	1	1 unit
	M25 cable entry			5	**3SU1950-0HW10-0AA0**	1	1 unit
Enclosure cover monitoring[1)]							
3SU1900-0HM10-0AA0	Module with extension plunger	Plastic	Black	3	**3SU1900-0HM10-0AA0**	1	1 unit

[1)] In addition, a 3SU1400-2AA10-.BA0 contact module is required.

Accessories

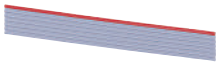
Miscellaneous accessories

Selection and ordering data

	Product designation Product version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Miscellaneous accessories								
 3SU1900-0KA10-0AA0	**PCB carriers**	Plastic	Black	5	**3SU1900-0KA10-0AA0**		100	10 units
 3SU1900-0CK10-0AA0	**Pressure plates for selectors and locks**	Plastic	White	►	**3SU1900-0KC10-0AA0**		100	10 units
 3SU1900-0KF10-0AA0	**Drilling template for grid** 30 x 40, horizontal	Plastic	Black	5	**3SU1900-0KF10-0AA0**		1	1 unit
 3SU1900-0KG10-0AA0	**Extension plungers** For compensation of the distance between the pushbutton and the unlatching button of an overload relay	Plastic	Gray	►	**3SU1900-0KG10-0AA0**		1	1 unit
 3SU1950-0JE80-0AA0	**Strut profile mounting adapters**	Metal	Sand gray	3	**3SU1950-0JE80-0AA0**		1	1 unit
 3SU1900-0JF10-0AA0	**Adapters for enclosures with 1 command point** Between enclosure top and bottom, for installation of 2-pole or two 1-pole contact modules with front plate mounting. Not suitable for 3SU1801-1AA00-1AA1.	Plastic	Black	5	**3SU1900-0JF10-0AA0**		1	1 unit
 3SU1900-0JG10-0AA0	**Adapters for modules with base mounting**	Plastic	Black	30	**3SU1900-0JG10-0AA0**		1	100 units

Accessories

Miscellaneous accessories

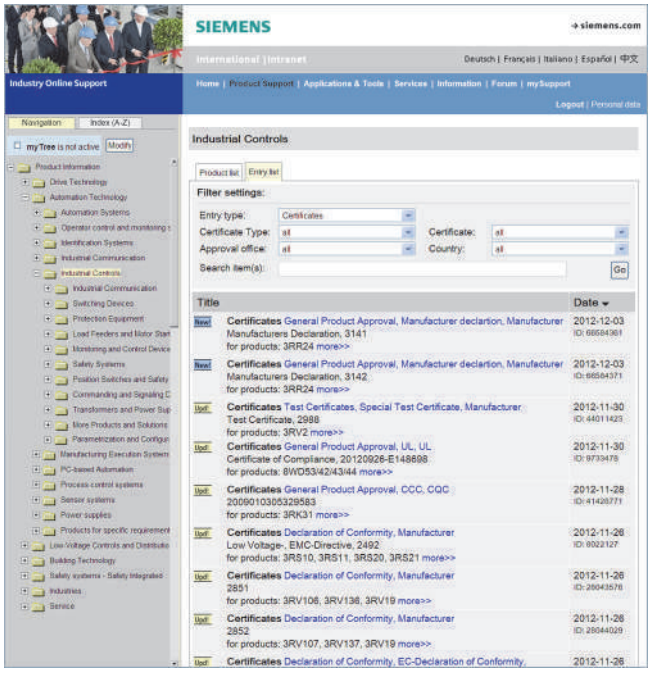
	Product designation Product version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Miscellaneous accessories								
 3SU1900-0KH80-0AA0	**Adapters for standard rail mounting**	Plastic	Black	▶	**3SU1900-0KH80-0AA0**		1	1 unit
	Covers for modules Degree of protection IP54	Plastic	Clear	5	**3SU1900-0EW70-0AA0**		1	1 unit
 3SU1950-0KJ80-0AA0	**Adapters for actuators and indicators** With front ring for flat mounting	Metal	Silver	▶	**3SU1950-0KJ80-0AA0**		1	1 unit
 3SU1950-0KB10-0AA0	**Adapters for 30.5 mm to 22.5 mm mounting hole**	Metal, shiny	Silver	▶	**3SU1950-0KB10-0AA0**		1	1 unit
		Metal, matte	Sand gray	▶	**3SU1960-0KB10-0AA0**		1	1 unit
 3SU1950-0KK80-0AA0	**Grounding studs**	Metal	Silver	5	**3SU1950-0KK80-0AA0**		100	50 units
 3SU1900-0KL10-0AA0	**Connectors for sensor switches, angled socket with screw terminal connection**	Plastic	Black	▶	**3SU1900-0KL10-0AA0**		1	1 unit
 3SU1900-0KP80-0AA0	**Flat ribbon cable** 7 cores							
	• Length 5 m	Plastic	Gray	5	**3SU1900-0KQ80-0AA0**		1	1 unit
	• Length 10 m	Plastic	Gray	5	**3SU1900-0KP80-0AA0**		1	1 unit

Standards and approvals

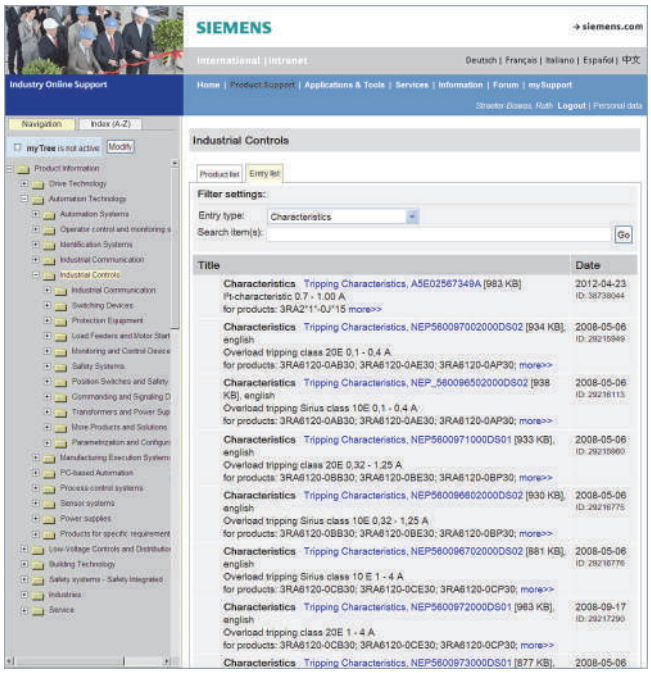
Approvals, test certificates, characteristic curves

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



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.

At www.siemens.com/safety-integrated you will also find examples of functions with calculations according to the current standards.

Definitions

λ *(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 λ 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 reparable 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 (λ_S) and dangerous (λ_D) failures:

$\lambda = \lambda_S + \lambda_D$

or

λ_D = [share of dangerous failures in %] x λ

λ_S = [share of safe failures in %] x λ

The failure rate of the dangerous failures λ_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[1] (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 %

[1] Only applies under the conditions specified in the technical specifications.

The $B10_d$ 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:

$\lambda = 0.1 \cdot C/B10$ [failures/h]
$\lambda = 0.1 \cdot 4/1000000 = 4 \cdot 10^{-7}$ [failures/h]

The dangerous failure rate is calculated with:

λ_D = 20 % of $\lambda = 0.2 \cdot 4 \cdot 10^{-7}$ [failures/h]
$\lambda_D = 8 \cdot 10^{-8}$ [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_{avg}) 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

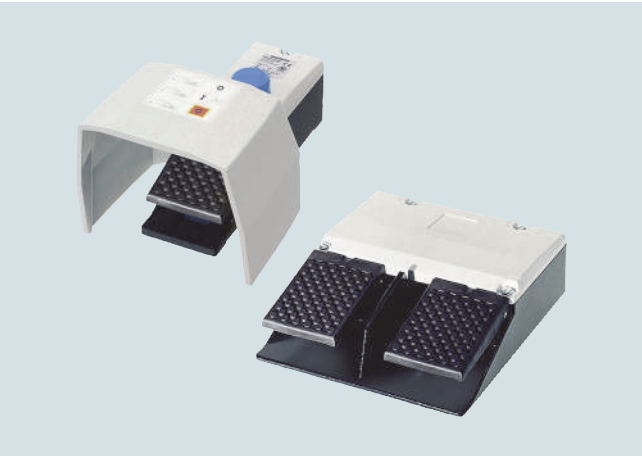
SIRIUS ACT product group (electromechanical components)	Standard failure rates (in FIT)[1]	Share of dangerous failures
3SU1 EMERGENCY-STOP mushroom pushbuttons (with positive-opening contacts)	100	20 %
3SU1 pushbuttons (non-latching, with positive-opening contacts)	100	20 %

[1] The failure rates specified in the table were limited to 100 FIT.

3SE2, 3SE3 Foot Switches

Plastic and metal enclosures

Overview



3SE29 foot switch with metal enclosure

More information

Homepage, see www.siemens.com/sirius-commanding
Industry Mall, see www.siemens.com/product?3SE2
Manual, see https://support.industry.siemens.com/cs/ww/en/view/107194954

Standard switches

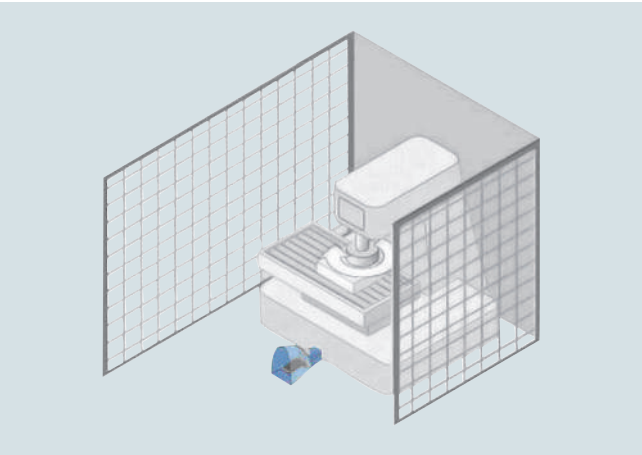
The 3SE29 and 3SE39 foot switch range encompasses versions in a metal enclosure for rugged applications as well as versions with plastic enclosure for less harsh environments. The devices can be supplied with or without a cover and have fixing holes for them to be screwed to the floor.

Depending on the particular application, the metal enclosures can be ordered with contact blocks 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 3SE2924-3AA20 single-pedal safety foot switches are used on machines and plants as OK switches when operation by hand is not possible. The switches have an interlocking function.

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 pushbutton 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).

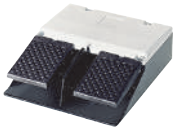
Technical specifications

Type		3SE29	3SE39
Metal and plastic enclosures			
Standards		IEC 60947-5-1	
Electrical load			
• At AC-15, 400 V			
- 1 NO + 1 NC	A	10	--
- 2 NO + 2 NC	A	6	--
- 3SE2924-3AA20 (2 NO + 2 NC)	A	10	--
• At 250 V AC	A	–	5
Short-circuit protection			
- 1 NO + 1 NC	A	10 (slow)	--
- 2 NO + 2 NC	A	6 (slow)	--
- 3SE2924-3AA20 (2 NO + 2 NC)	A	10 (slow)	--
- 1 CO contact	A	--	5 (slow)
Mechanical endurance		> 10^6 operating cycles	
Material			
• Enclosures		Aluminum casting	Impact-resistant thermoplast, self-extinguishing according to UL 94 VO
• Covers		Thermoplast	–
• Guard hoods		Aluminum casting	Metal
Degree of protection		IP65	IP65
Ambient temperature	°C	-25 ... +80	-10 ... +75
Connection		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*
			d				
Metal enclosures, degree of protection IP65							
3SE290.-.AA20 3SE291.-.AA20	**Momentary-contact foot switches, single pedal, non-latching** M20 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC ➔	2	**3SE2902-0AB20**		1	1 unit
		2 NO + 2 NC ➔	10	**3SE2903-1AB20**		1	1 unit
	• With hood	1 NO + 1 NC ➔	2	**3SE2902-0AA20**		1	1 unit
		2 NO + 2 NC ➔	2	**3SE2903-1AA20**		1	1 unit
 3SE2932-.AB20	**Momentary-contact foot switches, single pedal, latching** M20 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC ➔	15	**3SE2912-2AB20**		1	1 unit
	• With hood	1 NO + 1 NC ➔	15	**3SE2912-2AA20**		1	1 unit
3SE2932-.AA20	**Momentary-contact foot switches, two pedals, non-latching** M25 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC ➔	15	**3SE2932-0AB20**		1	1 unit
		2 NO + 2 NC ➔	15	**3SE2932-1AB20**		1	1 unit
	• With hood	1 NO + 1 NC ➔	5	**3SE2932-0AA20**		1	1 unit
		2 NO + 2 NC ➔	5	**3SE2932-1AA20**		1	1 unit
3SE2924-3AA20	**Safety momentary-contact foot switches, non-latching, single pedal** 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
Plastic enclosures, degree of protection IP65							
3SE3902-4CA20	**Momentary-contact pedal switches**, 3 m cable	Microswitch					
	• Single pedal						
	- Without hood	1 CO contact	5	**3SE3902-4CB20**		1	1 unit
	- With hood	1 CO contact	10	**3SE3902-4CA20**		1	1 unit
3SE3934-5CB20	• Two pedals, without hood	2 × 1 CO	10	**3SE3934-5CB20**		1	1 unit
Accessories							
	Protection cover Single pedal foot switch for 3SE2912-2AA20, 3SE2902-0AA20 and 3SE2903-1AA20	--	20	**3SE3980-8M**		1	1 unit
	Contact block, Supersedes momentary-contact foot switch 3SE2903-1A.20[1] and 3SE2932-1A.20[3]	1 NO + 1 NC	X	**3SE3982-0K**		1	1 unit
	Contact block, Supersedes momentary-contact foot switch 3SE2902-0A.20 and 3SE2932-0A.20[2]	1 NO + 1 NC	X	**3SE3982-0L**		1	1 unit
	Contact block, 16 A, Supersedes momentary-contact foot switch 3SE2924-3AA20[1]	1 NO + 1 NC	X	**3SE3982-7J**		1	1 unit
	Contact block, 16 A, 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.

1) Number of contact blocks required for the foot switch = 2

2) Number of contact blocks required per pedal = 1.

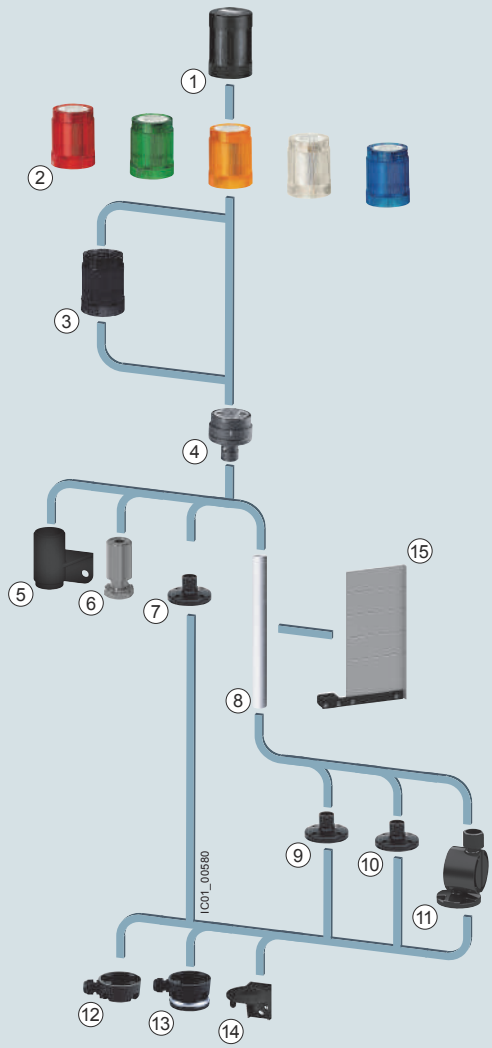
3) Number of contact blocks required per pedal = 2

8WD4 Signaling Columns

General Data

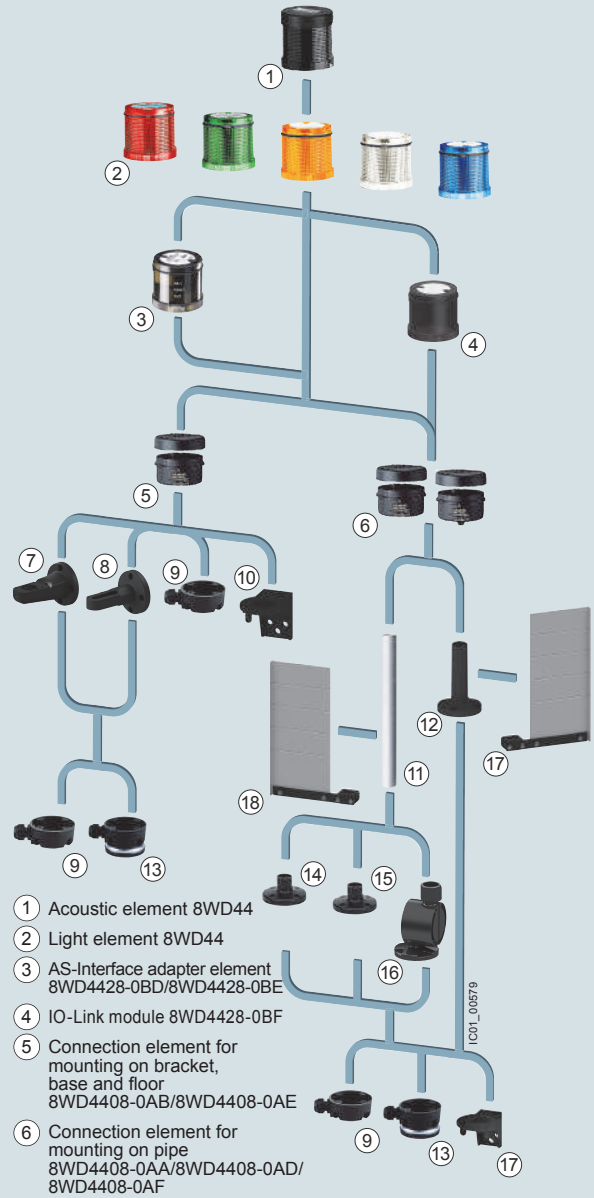
Overview

The 8WD4 signaling columns are flexible in design and versatile in use.



1. Acoustic element 8WD42.0-0FA
2. Light element 8WD42
3. AS-Interface adapter element 8WD4228-0BB
4. Connection element 8WD4208-0AA
5. Bracket for wall mounting 8WD4208-0CD
6. Adapter for single-hole mounting 8WD4208-0EH
7. Foot for base mounting 8WD4208-0DE
8. Pipe 8WD4208-0EF/8WD4308-0E.
9. Foot for mounting with pipe 8WD4308-0DB
10. Foot for mounting with pipe (> 400 mm) 8WD4308-0DC
11. Adjustable-angle foot for mounting on pipes 8WD4408-0DF
12. Socket 8WD4308-0DD
13. Socket (magnetic fixing) 8WD4308-0DE
14. Bracket for mounting with foot 8WD4408-0CC
15. Optional 8WD4408-0FA labeling panel

8WD42 signaling column (width 50 mm) with up to 4 elements



1. Acoustic element 8WD44
2. Light element 8WD44
3. AS-Interface adapter element 8WD4428-0BD/8WD4428-0BE
4. IO-Link module 8WD4428-0BF
5. Connection element for mounting on bracket, base and floor 8WD4408-0AB/8WD4408-0AE
6. Connection element for mounting on pipe 8WD4408-0AA/8WD4408-0AD/ 8WD4408-0AF
7. Bracket for wall mounting 8WD4308-0CA
8. Bracket for wall mounting (two-sided) 8WD4308-0CB
9. Socket 8WD4308-0DD
10. Bracket for base mounting 8WD4408-0CD
11. Pipe 8WD4208-0EF/8WD4308-0E.
12. Foot with pipe 8WD4308-0DA
13. Socket (magnetic fixing) 8WD4308-0DE
14. Foot for mounting with pipe 8WD4308-0DB
15. Foot for mounting with pipe (> 400 mm) 8WD4308-0DC
16. Adjustable-angle foot for mounting on pipes 8WD4408-0DF
17. Bracket for mounting with foot 8WD4408-0CC
18. Optional 8WD4408-0FA labeling panel

8WD44 signaling column (width 70 mm) with up to 5 elements

8WD4 Signaling Columns

General Data

More information
Homepage, see www.siemens.com/sirius-commanding
Industry Mall, see www.siemens.com/product?8WD4
Manual, see https://support.industry.siemens.com/cs/ww/en/view/107194954

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
  - Fast and 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 (without No.), four light elements ②, connection element ④, pipe ⑧, foot ⑨
- 8WD44: Acoustic element with cover ①, two light elements ②, connection element ⑤, foot with pipe ⑪
- 8WD44: Cover (without No.), four light elements ②, AS-Interface adapter element ③, connection element ④, bracket for wall mounting ⑥
- 8WD44: Cover (without No.), three light elements ②, AS-Interface adapter element ③, connection element ⑤, foot with pipe ⑪

Note:

The cover is supplied with the connection 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 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 four signaling elements can then be mounted on it.

The 8WD4228-0BB adapter element 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 8WD4428-0BE adapter element is a standard slave. A maximum of four signaling elements can be mounted on it.

The 8WD4428-0BD adapter element 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 three signaling elements can be mounted on it.

8WD4 Signaling Columns

General Data

Technical specifications

Type		8WD42	8WD44
General data			
Approvals		UL, CSA	UL, CSA
Light and acoustic elements			
Rated voltage, power consumption			
Light elements with incandescent lamp		(AC values for 50/60 Hz)	(AC values for 50/60 Hz)
• Continuous lights		12 V, 24 V, 115 V, 230 V AC/DC	12 V, 24 V, 115 V, 230 V AC/DC
• Blinklights		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, blinklights/flashlights		--	500 mA
Light elements with integrated LED			
• Continuous lights		24 V AC/DC, 60 mA	24 V AC/DC/25 mA; 115 V AC/25 mA; 230 V AC/25 mA
• Blinklights		24 V AC/DC/60 mA; 115 V AC, 60 mA; 230 V AC, 60 mA	24 V AC/DC, 40 mA
• Rotating lights		--	24 V AC/DC/70 mA
Acoustic elements			
• Buzzer element (tone: pulsating or continuous tone)		85 dB: 24 V AC/DC/30 mA; 115 V AC/DC/35 mA; 230 V AC/35 mA	85 dB: 24 V AC/DC/25 mA; 115 V AC/25 mA; 230 V AC/25 mA
• Siren element (8 tones + amplification can be set, 102 dB)		--	24 V AC/DC/80 mA; 115 V AC/30 mA; 230 V AC/16 mA
• Siren element (95 ... 105 dB)		--	24 V DC/100 mA
Power consumption			
• Incandescent lamps, base BA 15d	W	Max. 5	7
• Flashlights, flash energy	Ws	--	2
Service life			
• Flashlights		--	4×10^6 flashes
AS-Interface adapter elements			
IO code/ID code		8/F	8/E
Power supply		Through bus cable	Through bus cable
• Operational voltage	V	18.5 ... 31.6	18.5 ... 31.6
• Power consumption I_{max}	mA	50	100
Protective measures			
• Watchdog		✓	✓
• Short-circuit/overload protection		External back-up fuse M 1.6 A	✓
• Reverse polarity protection		✓	✓
• Induction protection		N/A	✓
Outputs		4 relay outputs	3 electronic outputs
• Load voltage		External auxiliary voltage	Through bus cable or external auxiliary voltage, selectable
	V	0 … 30 DC	
	V	0 ... 230 AC	
• Current carrying capacity ΣI_{max}			
- With external auxiliary voltage	A	1.5	0.3
- Without external auxiliary voltage	A	--	0.2
Operating temperature	°C	–20 ... +50	–20 ... +50
Enclosures			
Enclosure material		Thermoplast (polyamide), impact-resistant, black	Thermoplast (polyamide), impact-resistant, black
Light elements		Thermoplast (polycarbonate)	Thermoplast (polycarbonate)
Mounting			
• Horizontal (base mounting, foot with 25 mm diameter pipe)		✓	✓
• Horizontal (single-hole mounting)		✓	--
• Vertical with bracket		✓	✓
Degree of protection			
• Light elements		IP54	IP65 (seal premounted with every module)
• Acoustic elements, AS-i adapter elements		IP54	IP65
Operating temperature	°C	–20 ... +50	–20 ... +50
Connection		M3 screw terminal	Spring-type terminals/M3 screw terminals
• Conductor cross-sections	mm^2	Max. 2.5	Max. 2.5
• Tightening torque	Nm	Max. 0.4	--/ Max. 0.4

8WD4 Signaling Columns

8WD42 signaling columns, 50 mm diameter

Overview

Features:
- Thermoplast enclosure, diameter 50 mm
- Degree of protection IP54
- Up to four elements can be mounted between the connection element and the cover

Selection and ordering data

	Version	Rated voltage	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V		d				
Acoustic elements[1]								
8WD4220-0FA	**Buzzer elements** 85 dB, tone frequency approx. 2 300 Hz, pulsating or continuous tone, adjustable by means of a wire jumper	24 AC/DC	Black	2	**8WD4220-0FA**		1	1 unit
		115 AC/DC	Black	2	**8WD4240-0FA**		1	1 unit
		230 AC	Black	2	**8WD4250-0FA**		1	1 unit
Light elements for incandescent lamps/LEDs, BA 15d bases[2]								
8WD4200-1AD	**Continuous light elements**	24 ... 230 AC/DC	Red	2	**8WD4200-1AB**		1	1 unit
			Green	2	**8WD4200-1AC**		1	1 unit
			Yellow	2	**8WD4200-1AD**		1	1 unit
			Clear	2	**8WD4200-1AE**		1	1 unit
			Blue	2	**8WD4200-1AF**		1	1 unit
Light elements with integrated LED								
8WD4220-5AB	**Continuous light elements**	24 AC/DC	Red	2	**8WD4220-5AB**		1	1 unit
			Green	2	**8WD4220-5AC**		1	1 unit
			Yellow	2	**8WD4220-5AD**		1	1 unit
			Clear	2	**8WD4220-5AE**		1	1 unit
			Blue	2	**8WD4220-5AF**		1	1 unit
8WD4240-5AC		115 AC	Red	2	**8WD4240-5AB**		1	1 unit
			Green	2	**8WD4240-5AC**		1	1 unit
			Yellow	2	**8WD4240-5AD**		1	1 unit
			Clear	2	**8WD4240-5AE**		1	1 unit
			Blue	2	**8WD4240-5AF**		1	1 unit
		230 AC	Red	2	**8WD4250-5AB**		1	1 unit
			Green	2	**8WD4250-5AC**		1	1 unit
			Yellow	2	**8WD4250-5AD**		1	1 unit
			Clear	2	**8WD4250-5AE**		1	1 unit
			Blue	2	**8WD4250-5AF**		1	1 unit
8WD4220-5BD	**Blinklight elements**	24 AC/DC	Red	2	**8WD4220-5BB**		1	1 unit
			Green	2	**8WD4220-5BC**		1	1 unit
			Yellow	2	**8WD4220-5BD**		1	1 unit
			Clear	2	**8WD4220-5BE**		1	1 unit
			Blue	2	**8WD4220-5BF**		1	1 unit
8WD4240-5BE		115 AC	Red	2	**8WD4240-5BB**		1	1 unit
			Green	2	**8WD4240-5BC**		1	1 unit
			Yellow	2	**8WD4240-5BD**		1	1 unit
			Clear	2	**8WD4240-5BE**		1	1 unit
			Blue	2	**8WD4240-5BF**		1	1 unit
8WD4250-5BF		230 AC	Red	2	**8WD4250-5BB**		1	1 unit
			Green	2	**8WD4250-5BC**		1	1 unit
			Yellow	2	**8WD4250-5BD**		1	1 unit
			Clear	2	**8WD4250-5BE**		1	1 unit
			Blue	2	**8WD4250-5BF**		1	1 unit
	Flashlight elements	24 AC/DC	Red	2	**8WD4220-0CB**		1	1 unit
			Green	2	**8WD4220-0CC**		1	1 unit
			Yellow	2	**8WD4220-0CD**		1	1 unit
			Clear	2	**8WD4220-0CE**		1	1 unit
			Blue	2	**8WD4220-0CF**		1	1 unit
Adapter elements for AS-Interface								
8WD4228-0BB	**AS-Interface adapter elements** With external auxiliary voltage	For 4 signaling elements 24 V DC	Black	2	**8WD4228-0BB**		1	1 unit

[1] 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.

[2] The lamp is not included in the scope of supply. Please order separately.

8WD4 Signaling Columns

8WD42 signaling columns, 50 mm diameter

	Version	Rated voltage V	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Connection elements								
	Connection elements with cover For mounting on pipes, floors and brackets Essential part for assembling the signaling columns		Black	2	**8WD4208-0AA**		1	1 unit
Mounting								
	Feet, single	Plastic, for mounting on pipes		2	**8WD4308-0DB**		1	1 unit
		Metal, for pipe lengths > 400 mm		2	**8WD4308-0DC**		1	1 unit
		Plastic, for floor mounting (without pipe)		2	**8WD4208-0DE**		1	1 unit
	Adjustable-angle feet For positioning in 7.5° increments[1]	Plastic, for mounting on pipes, incl. rubber seal		2	**8WD4408-0DF**		1	1 unit
	Pipes, single	Length 100 mm		2	**8WD4208-0EF**		1	1 unit
		Length 150 mm		2	**8WD4308-0EE**		1	1 unit
		Length 250 mm		2	**8WD4308-0EA**		1	1 unit
		Length 400 mm		2	**8WD4308-0EB**		1	1 unit
		Length 1 000 mm		2	**8WD4308-0ED**		1	1 unit
	Sockets for feet	Side cable outlet		2	**8WD4308-0DD**		1	1 unit
		Side cable outlet, with magnetic fixing[2]		2	**8WD4308-0DE**		1	1 unit
	Brackets for mounting with foot			2	**8WD4408-0CC**		1	1 unit
	Brackets for wall mounting (plastic)	Mounting without feet or pipe		2	**8WD4208-0CD**		1	1 unit
	Adapters for single-hole mounting	Mounting without feet and pipe, with M18 thread and fixing nut		2	**8WD4208-0EH**		1	1 unit
Lamps								
	Incandescent lamps, 5 W							
	Base BA 15d	24 AC/DC	Clear	2	**8WD4328-1XX**		1	10 units
		115 AC	Clear	2	**8WD4348-1XX**		1	10 units
		230 AC	Clear	2	**8WD4358-1XX**		1	10 units
	LEDs							
	BA 15d bases	24 AC/DC	Red	2	**8WD4428-6XB**		1	1 unit
			Green	2	**8WD4428-6XC**		1	1 unit
			Yellow	2	**8WD4428-6XD**		1	1 unit
			Clear	2	**8WD4428-6XE**		1	1 unit
			Blue	2	**8WD4428-6XF**		1	1 unit
		115 AC	Red	2	**8WD4448-6XB**		1	1 unit
			Green	2	**8WD4448-6XC**		1	1 unit
			Yellow	2	**8WD4448-6XD**		1	1 unit
			Clear	2	**8WD4448-6XE**		1	1 unit
			Blue	2	**8WD4448-6XF**		1	1 unit
		230 AC	Red	2	**8WD4458-6XB**		1	1 unit
			Green	2	**8WD4458-6XC**		1	1 unit
			Yellow	2	**8WD4458-6XD**		1	1 unit
			Clear	2	**8WD4458-6XE**		1	1 unit
			Blue	2	**8WD4458-6XF**		1	1 unit

For labeling panels see 8WD44, page 11/174.

[1] Markings for 30°, 45°, 60° and 90°.

[2] 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 five elements can be mounted

Selection and ordering data

	Version	Rated voltage	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V		d				
Acoustic elements[1]								
	Buzzer elements 85 dB, pulsating or continuous tone, adjustable by means of a wire jumper	24 AC/DC	Black	2	**8WD4420-0FA**		1	1 unit
		115 AC	Black	2	**8WD4440-0FA**		1	1 unit
		230 AC	Black	2	**8WD4450-0FA**		1	1 unit
	Siren elements, multi-tone, 102 dB, 8 tones and volume are adjustable	24 AC/DC	Black	2	**8WD4420-0EA2**		1	1 unit
		115 AC	Black	2	**8WD4440-0EA2**		1	1 unit
		230 AC	Black	2	**8WD4450-0EA2**		1	1 unit
	Siren elements 95 ... 105 dB, IP40, alternating continuous tone	24 DC	Black	2	**8WD4420-0EA**		1	1 unit
Light elements for incandescent lamps/LEDs, BA 15d bases[2]								
	Continuous light elements	12 ... 230 AC/DC	Red	2	**8WD4400-1AB**		1	1 unit
			Green	2	**8WD4400-1AC**		1	1 unit
			Yellow	2	**8WD4400-1AD**		1	1 unit
			Clear	2	**8WD4400-1AE**		1	1 unit
			Blue	2	**8WD4400-1AF**		1	1 unit
Light elements with integrated flash lamps[3]								
	Flashlight elements with integrated electronic flash	24 DC	Red	2	**8WD4420-0CB**		1	1 unit
			Green	2	**8WD4420-0CC**		1	1 unit
			Yellow	2	**8WD4420-0CD**		1	1 unit
			Clear	2	**8WD4420-0CE**		1	1 unit
			Blue	2	**8WD4420-0CF**		1	1 unit
		115 AC	Red	2	**8WD4440-0CB**		1	1 unit
			Green	20	**8WD4440-0CC**		1	1 unit
			Yellow	2	**8WD4440-0CD**		1	1 unit
			Clear	20	**8WD4440-0CE**		1	1 unit
			Blue	20	**8WD4440-0CF**		1	1 unit
		230 AC	Red	2	**8WD4450-0CB**		1	1 unit
			Green	2	**8WD4450-0CC**		1	1 unit
			Yellow	2	**8WD4450-0CD**		1	1 unit
			Clear	2	**8WD4450-0CE**		1	1 unit
			Blue	2	**8WD4450-0CF**		1	1 unit

1) 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.

2) The lamp is not included in the scope of supply. Please order separately.

3) The lamp is included in the scope of supply.

8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter

	Version	Rated voltage	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V		d				
Light elements with integrated LED								
	Continuous light elements	24 AC/DC	Red	2	**8WD4420-5AB**		1	1 unit
			Green	2	**8WD4420-5AC**		1	1 unit
			Yellow	2	**8WD4420-5AD**		1	1 unit
			Clear	2	**8WD4420-5AE**		1	1 unit
			Blue	2	**8WD4420-5AF**		1	1 unit
		115 AC	Red	2	**8WD4440-5AB**		1	1 unit
			Green	2	**8WD4440-5AC**		1	1 unit
			Yellow	2	**8WD4440-5AD**		1	1 unit
			Clear	2	**8WD4440-5AE**		1	1 unit
			Blue	2	**8WD4440-5AF**		1	1 unit
		230 AC	Red	2	**8WD4450-5AB**		1	1 unit
			Green	2	**8WD4450-5AC**		1	1 unit
			Yellow	2	**8WD4450-5AD**		1	1 unit
			Clear	2	**8WD4450-5AE**		1	1 unit
			Blue	2	**8WD4450-5AF**		1	1 unit
	Blinklight elements	24 AC/DC	Red	2	**8WD4420-5BB**		1	1 unit
			Green	2	**8WD4420-5BC**		1	1 unit
			Yellow	2	**8WD4420-5BD**		1	1 unit
			Clear	2	**8WD4420-5BE**		1	1 unit
			Blue	2	**8WD4420-5BF**		1	1 unit
		115 AC	Red	2	**8WD4440-5BB**		1	1 unit
			Green	2	**8WD4440-5BC**		1	1 unit
			Yellow	2	**8WD4440-5BD**		1	1 unit
			Clear	2	**8WD4440-5BE**		1	1 unit
			Blue	2	**8WD4440-5BF**		1	1 unit
		230 AC	Red	2	**8WD4450-5BB**		1	1 unit
			Green	2	**8WD4450-5BC**		1	1 unit
			Yellow	2	**8WD4450-5BD**		1	1 unit
			Clear	2	**8WD4450-5BE**		1	1 unit
			Blue	2	**8WD4450-5BF**		1	1 unit
	Rotating light elements	24 AC/DC	Red	2	**8WD4420-5DB**		1	1 unit
			Green	2	**8WD4420-5DC**		1	1 unit
			Yellow	2	**8WD4420-5DD**		1	1 unit
			Clear	2	**8WD4420-5DE**		1	1 unit
			Blue	2	**8WD4420-5DF**		1	1 unit
Adapter elements for AS-Interface								
	AS-Interface adapter elements							
	With/without external auxiliary voltage, switchable							
	• A/B technology	For 3 signaling elements 24 V DC	Black	2	**8WD4428-0BD**		1	1 unit
	• Standard AS-i	For 4 signaling elements 24 V DC	Black	2	**8WD4428-0BE**		1	1 unit
	Adapter elements for IO-Link				**8WD4428-0BF**			
Connection elements[1]								
	Connection elements with cover		Black					
	Screw terminals	• For mounting on pipes		2	**8WD4408-0AA**		1	1 unit
		• For mounting on brackets and floors		2	**8WD4408-0AB**		1	1 unit
	Spring-type terminals	• For mounting on pipes		2	**8WD4408-0AD**		1	1 unit
		• For mounting on brackets and floors		2	**8WD4408-0AE**		1	1 unit
	IO-Link Connection Element with M12 connector, 5-pole			2	**8WD4408-0AF**		1	1 unit
	Cover (replacement)			2	**8WD4408-0XA**		1	1 unit

[1] 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
Mounting						
	Foot with pipe	Plastic foot with pipe length 100 mm	A	**8WD43 08-0DA**	1	1 unit
	Feet, single	Plastic, for mounting on pipes	A	**8WD43 08-0DB**	1	1 unit
		Metal, for pipe lengths > 400 mm	A	**8WD43 08-0DC**	1	1 unit
	Adjustable-angle feet for positioning in 7.5° increments[1]	Plastic, for mounting on pipes, incl. rubber seal	X	**8WD44 08-0DF**	1	1 unit
	Pipes, single	Length 100 mm	A	**8WD42 08-0EF**	1	1 unit
		Length 150 mm	A	**8WD43 08-0EE**	1	1 unit
		Length 250 mm	A	**8WD43 08-0EA**	1	1 unit
		Length 400 mm	A	**8WD43 08-0EB**	1	1 unit
		Length 1000 mm	A	**8WD43 08-0ED**	1	1 unit
	Sockets for feet	Side cable outlet (can also be used without feet)	A	**8WD43 08-0DD**	1	1 unit
		Side cable outlet, with magnetic fixing[2]	A	**8WD43 08-0DE**	1	1 unit
	Brackets for wall mounting (mounting without feet and pipe)	For single-sided mounting	A	**8WD43 08-0CA**	1	1 unit
		For double-sided mounting	A	**8WD43 08-0CB**	1	1 unit
	Brackets for mounting with foot		A	**8WD44 08-0CC**	1	1 unit
	Brackets for base mounting	Mounting without feet and pipe	A	**8WD44 08-0CD**	1	1 unit
	Adapter for mounting on pipes according to NPT	Mounting on pipes, 25 mm, with NPT 1/2" thread	A	**8WD43 08-0DF**	1	1 unit

[1] Markings for 30°, 45°, 60° and 90°.

[2] For horizontal mounting, only 1 element is recommended.

8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter

	Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS
		V					
Lamps							
	Incandescent lamps, 5 W						
	Base BA 15d	24 AC/DC		A	**8WD43 28-1XX**	1	10 units
		115 AC		A	**8WD43 48-1XX**	1	10 units
		230 AC		A	**8WD43 58-1XX**	1	10 units
	LEDs						
	Base BA 15d	24 AC/DC	Red	A	**8WD44 28-6XB**	1	1 unit
			Green	A	**8WD44 28-6XC**	1	1 unit
			Yellow	A	**8WD44 28-6XD**	1	1 unit
			Clear	A	**8WD44 28-6XE**	1	1 unit
			Blue	A	**8WD44 28-6XF**	1	1 unit
		115 AC	Red	A	**8WD44 48-6XB**	1	1 unit
			Green	A	**8WD44 48-6XC**	1	1 unit
			Yellow	A	**8WD44 48-6XD**	1	1 unit
			Clear	A	**8WD44 48-6XE**	1	1 unit
			Blue	A	**8WD44 48-6XF**	1	1 unit
		230 AC	Red	A	**8WD44 58-6XB**	1	1 unit
			Green	A	**8WD44 58-6XC**	1	1 unit
			Yellow	A	**8WD44 58-6XD**	1	1 unit
			Clear	A	**8WD44 58-6XE**	1	1 unit
			Blue	A	**8WD44 58-6XF**	1	1 unit
Inscriptions							
	Labeling panels With fixing accessories for mounting on pipe ∅ 25 mm Inscription area/ step 50 mm x 140 mm Suitable for standard labels, e.g. • Zweckform 3425 • Herma 4457			A	**8WD44 08-0FA**	1	1 unit
Pre-assembled 8WD44 Signal Columns							
	Pre-assembled Connection Element, Foot and Pipe			A	**8WD4421-0GA05-0AG0**	1	1 unit
	Pre-assembled Signal Column			A	**8WD4423-5AK05-0AE0**	1	1 unit
	Pre-assembled Signal Column			A	**8WD4423-5AK05-0AF0**	1	1 unit

8WD5 Integrated Signal Lamps

8WD53 integrated signal lamps, 70 mm diameter

Overview

8WD53 integrated signal lamps

More information
Homepage, see www.siemens.com/sirius-commanding
Industry Mall, see www.siemens.com/product?8WD5
Manual, see https://support.industry.siemens.com/cs/ww/en/view/107194954

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

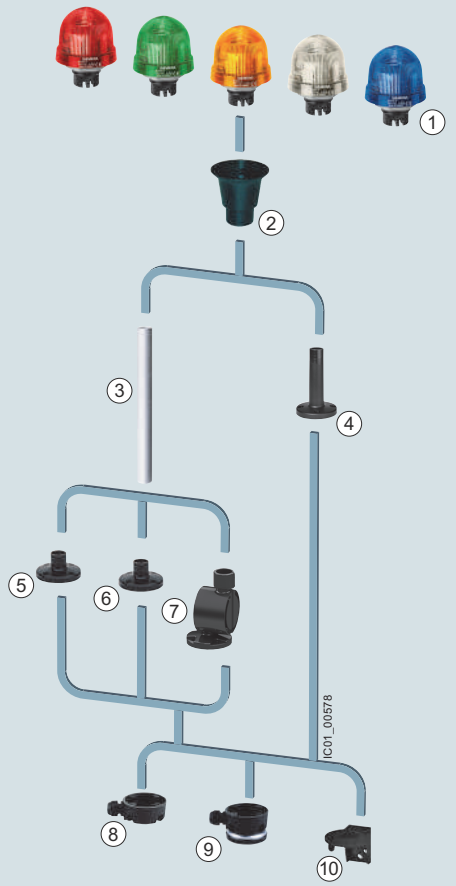
The special shape of the integrated signal lamps means that the light is emitted optimally in every direction (to the sides and upwards). Continuous lights (with incandescent lamp or LED) and single-flash lights are available in five colors. As well as the continuous-light version, a flashing-light or all-round light version is also available.

The LED versions of the integrated signal lamps offer a considerably longer endurance than the incandescent lamp versions.

They all have the high degree of protection IP65 and are made of a material highly resistant to impact.

Mounting

8WD53 integrated signal lamps can be mounted at any point of the machine for the purpose of giving visual signals. They are mounted by means of a PG-29 screw base with nut.



1. Integrated signal lamp 8WD53
2. Pipe adapter 8WD5308-0EG
3. Pipe 8WD4208-0EF/8WD4308-0E.
4. Foot with pipe 8WD4308-0DA
5. Foot for mounting with pipe 8WD4308-0DB
6. Foot for mounting with pipe (> 400 mm) 8WD4308-0DC
7. Adjustable-angle foot for mounting on pipes 8WD4408-0DF
8. Socket 8WD4308-0DD
9. Socket (magnetic fixing) 8WD4308-0DE
10. Bracket for mounting with foot 8WD4408-0CC

Application

SIRIUS 8WD53 integrated signal lamps can be used as visual signaling devices in harsh ambient conditions and in outdoor installations.

Visual signaling devices for indicating operating conditions can be used for the following applications:

- Manufacturing plants
- Injection molding machines
- Conveyors
- Assembly systems for electronic components

8WD5 Integrated Signal Lamps

8WD53 integrated signal lamps, 70 mm diameter

Selection and ordering data

	Version	Rated voltage	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V		d				
Luminaires for incandescent lamps/LED[1], BA 15d base								
	Continuous lights[2]	12 ... 230 AC/DC	Red	2	**8WD5300-1AB**		1	1 unit
			Green	2	**8WD5300-1AC**		1	1 unit
			Yellow	2	**8WD5300-1AD**		1	1 unit
			Clear	2	**8WD5300-1AE**		1	1 unit
			Blue	2	**8WD5300-1AF**		1	1 unit
Luminaires with integrated flash lamp								
	Single-flash lights with integrated electronic flash	24 AC/DC	Red	2	**8WD5320-0CB**		1	1 unit
			Green	2	**8WD5320-0CC**		1	1 unit
			Yellow	2	**8WD5320-0CD**		1	1 unit
			Clear	2	**8WD5320-0CE**		1	1 unit
			Blue	2	**8WD5320-0CF**		1	1 unit
		115 AC	Red	2	**8WD5340-0CB**		1	1 unit
			Green	2	**8WD5340-0CC**		1	1 unit
			Yellow	2	**8WD5340-0CD**		1	1 unit
			Clear	2	**8WD5340-0CE**		1	1 unit
			Blue	20	**8WD5340-0CF**		1	1 unit
		230 AC	Red	2	**8WD5350-0CB**		1	1 unit
			Green	20	**8WD5350-0CC**		1	1 unit
			Yellow	2	**8WD5350-0CD**		1	1 unit
			Clear	2	**8WD5350-0CE**		1	1 unit
			Blue	20	**8WD5350-0CF**		1	1 unit
Luminaires with integrated LED[1]								
	Continuous lights	24 AC/DC	Red	2	**8WD5320-5AB**		1	1 unit
			Green	2	**8WD5320-5AC**		1	1 unit
			Yellow	2	**8WD5320-5AD**		1	1 unit
			Clear	2	**8WD5320-5AE**		1	1 unit
			Blue	2	**8WD5320-5AF**		1	1 unit
	Blinklight lamps	24 AC/DC	Red	2	**8WD5320-5BB**		1	1 unit
			Green	2	**8WD5320-5BC**		1	1 unit
			Yellow	2	**8WD5320-5BD**		1	1 unit
			Clear	2	**8WD5320-5BE**		1	1 unit
			Blue	2	**8WD5320-5BF**		1	1 unit
	Rotating lights	24 AC/DC	Red	2	**8WD5320-5DB**		1	1 unit
			Green	2	**8WD5320-5DC**		1	1 unit
			Yellow	2	**8WD5320-5DD**		1	1 unit
			Clear	2	**8WD5320-5DE**		1	1 unit
			Blue	2	**8WD5320-5DF**		1	1 unit
Accessories for mounting (optional)								
	Pipe adapters For mounting on pipes[3]			2	**8WD5308-0EG**		1	1 unit

[1] Only for use with SIRIUS commanding and signaling devices.

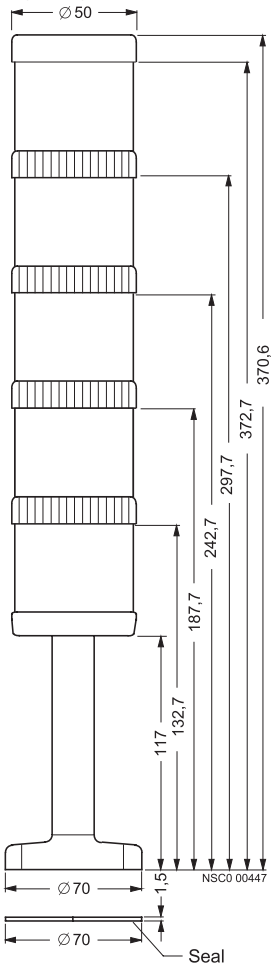
[2] Lamp not included in scope of supply, see Signaling Columns, page 11/174..

[3] For pipes and feet, see Signaling Columns, page 11/173.

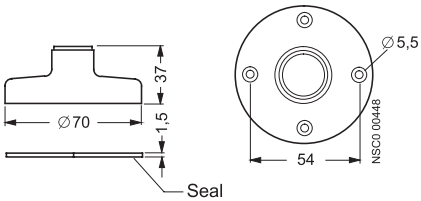
8WD4 Signaling Columns

Dimension drawings

Signaling column (4-tier)

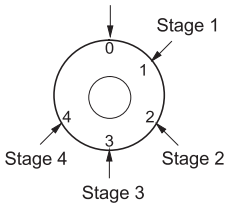


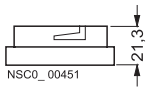
Foot

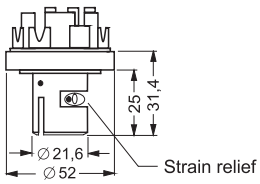


Connection element

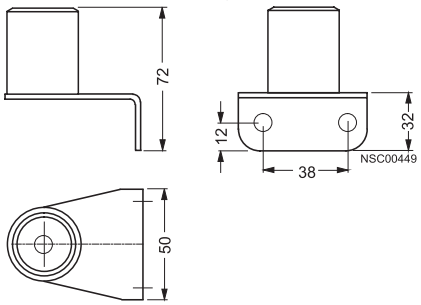
Connection diagram
Common conductor



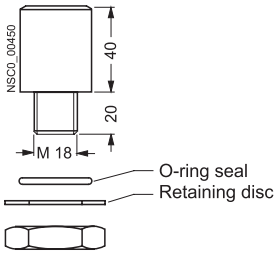




Bracket for wall mounting

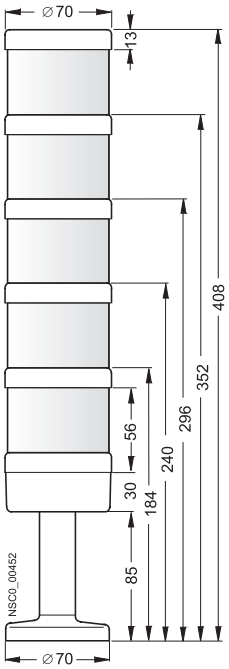


Adapter for single-hole mounting

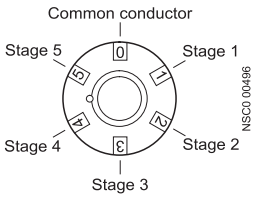


Dimension drawings

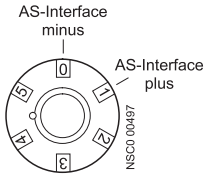
Signaling column (5-tier)



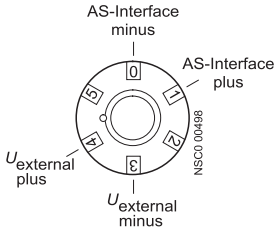
Connection diagrams



conventional

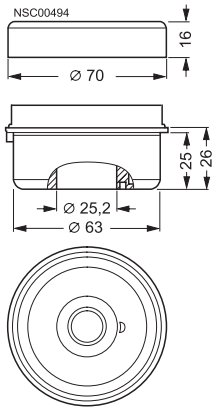


with AS-Interface, without external auxiliary voltage

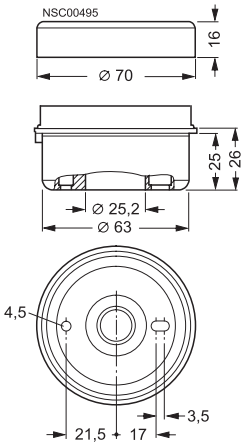


with external auxiliary voltage

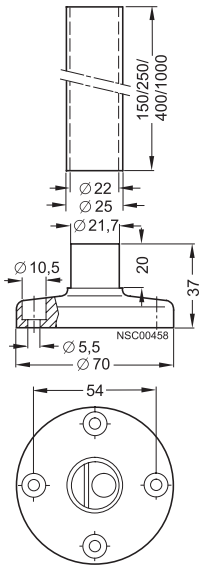
Connection element and cover for mounting on pipes



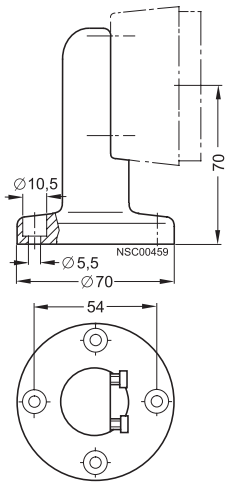
Connection element and cover for mounting on floor/bracket



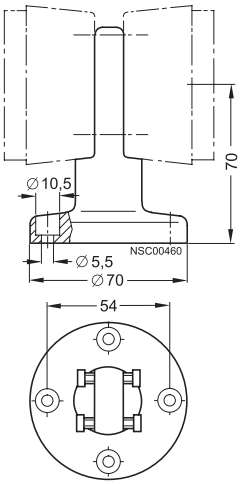
Foot with pipe



Bracket for single-sided mounting



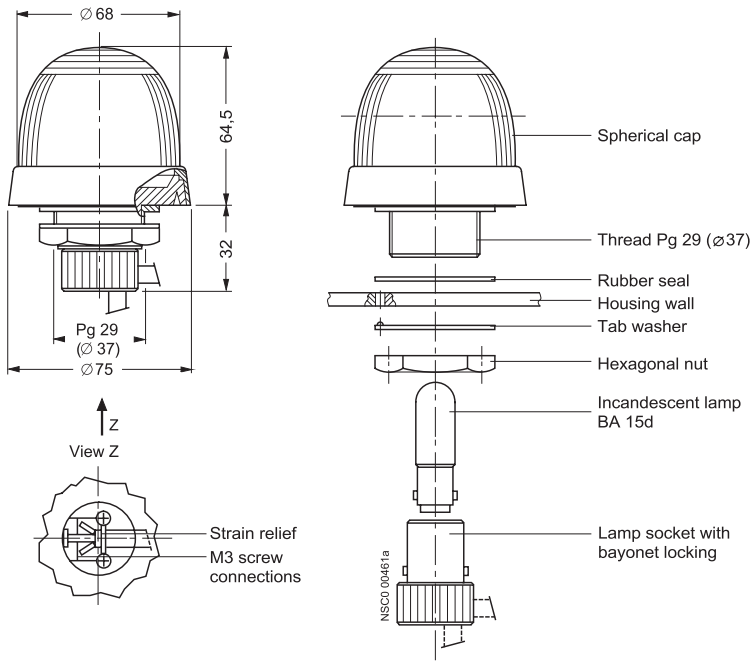
Bracket for double-sided mounting



8WD53 Beacons

Dimension drawings

Dimension drawings



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 11/204 – 11/207
- Selector Position and Contact Operation: page 11/202 – 11/203.
- Legend Plates: page 11/216.
- Enclosures: page 11/217.
- Technical Specifications: page 11/218.

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.

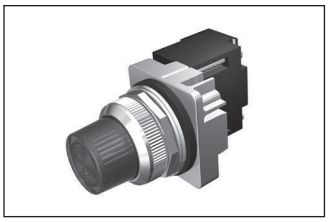
Integrated LED Module Type Pilot Lights

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.).

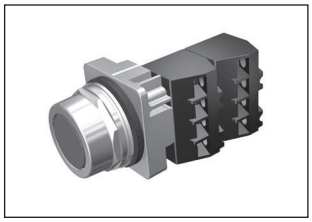
Selector Operators

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.

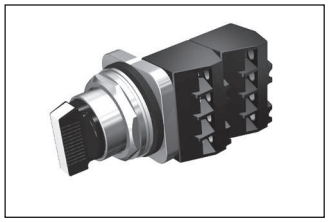
Lever color inserts are available in 8 colors.



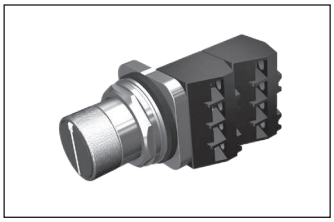
Indicator Light



Push Button



Selector Switch



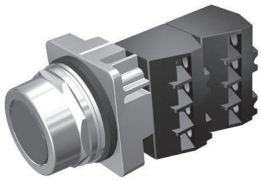
Selector Push Button

30mm Water, Oil Tight & Corrosion Resistant – Class 52

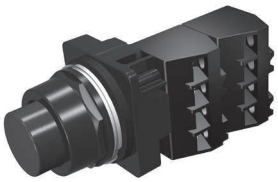
Push Button

Selection Guid

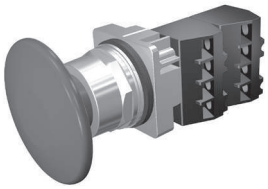
Momentary Push Button - Non-Illuminated



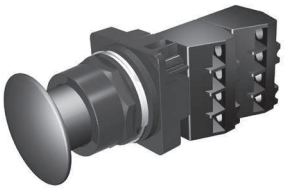
Flush Head



Extended Head



Large Mushroom Head 2 1/2″



Small Mushroom Head 1 3/4″

Part Number	52	____	M	____	____	____
		a	b	c	d	e[1]

a	Code	Finish
	P	Chrome - Command 52
	B	Epoxy Coated - Black Max

b	Code	Type
	M	Momentary Push Button

c	Code	Style / Head Type
		Flush / Extended Cap[2]
	8A	Flush
	8B	Extended
		Mushroom Head Metal
	9A	Small Mushroom Head 1 3/4" (44.5mm)
		Mushroom Head Plastic
	9W	Small Mushroom Head 1 3/4" (44.5mm)
	9V	Large Mushroom Head 2 1/2" (63.5mm)

d	Code	Plastic	Metal
	1	Black	—
	2	Red	Red
	3	Green	Green
	4	Yellow	—
	5	Blue	—
	6	Gray	—
	7	All Color Caps	—
	8	Orange	—
	C	—	Chrome

e[1]	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

1 For operator without contact blocks leave position e blank.
2 Products available fall 2014. For current product offer please refer to the 2010 Industrial Control Catalog.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Push Buttons

Selection Tables

Momentary Push Button - Non-Illuminated

Head Style	Contacts	Color	Finish: Chrome	Finish: Black Max
Flush	—	Less cap	**52PM8**	**52BM8**
		Black	**52PM8A1**	**52BM8A1**
		Red	**52PM8A2**	**52BM8A2**
		Green	**52PM8A3**	**52BM8A3**
		Yellow	**52PM8A4**	**52BM8A4**
	1 NO - 1 NC	Black	**52PM8A1A**	**52BM8A1A**
		Red	**52PM8A2A**	**52BM8A2A**
		Green	**52PM8A3A**	**52BM8A3A**
	1 NO	Black	**52PM8A1K**	**52BM8A1K**
		Red	**52PM8A2K**	**52BM8A2K**
		Green	**52PM8A3K**	**52BM8A3K**
	1 NC	Red	**52PM8A2J**	**52BM8A2J**
Extended	—	Black	**52PM8B1**	**52BM8B1**
		Red	**52PM8B2**	**52BM8B2**
		Green	**52PM8B3**	**52BM8B3**
	1 NO	Black	**52PM8B1K**	**52BM8B1K**
		Red	**52PM8B2K**	**52BM8B2K**
	1 NC	Red	**52PM8B2J**	**52BM8B2J**
Mushroom Head Plastic Ø 1 3/4”	—	Less cap	**52PM9**	**52BM9**
		Red	**52PM9W2**	**52BM9W2**
	1 NO	Green	**52PM9W3K**	**52BM9W3K**
	1 NO - 1 NC	Black	**52PM9W1A**	**52BM9W1A**
		Red	**52PM9W2A**	**52BM9W2A**
	1 NO - 1 NC	Green	**52PM9W3A**	**52BM9W3A**
Mushroom Head Plastic Ø 2 1/2”	—	Red	**52PM9V2**	**52BM9V2**
	1 NO - 1 NC	Black	**52PM9V1A**	**52BM9V1A**
		Red	**52PM9V2A**	**52BM9V2A**
		Green	**52PM9V3A**	**52BM9V3A**

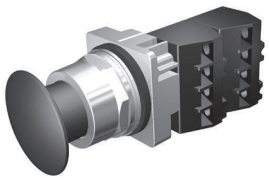
Readily available items are in **bold**.
This is a small representation of stocked items.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Push Pull

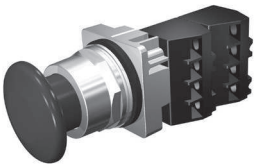
Selection Guide

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″

Part Number	52	____	P	____	____	____	____
		a	b	c	d	e	f[3]

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	P	Push Pull

c	Code	Function
	2	2 positions - maintained[1]
	3	3 positions - momentary in - momentary out
	7	3 positions - maintained in - momentary out

d	Code	Style
	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)

e	Code	Color	
		Plastic	Metal
	1	Black	—
	2	Red[1]	Red[1]
	3	Green	Green
	4	Yellow	—
	5	Blue	—
	6	Gray	—
	8	Orange	—
	C	—	Chrome
		No Operating Head	
	Z	No head	

f[3]	Code	Contact Blocks
		2 Position
	A	1 NO + 1 NC[1]
	B	2 NO + 2 NC[1]
	C	3 NO + 3 NC[1]
	D	4 NO + 4 NC[1]
	E	1 NC (LB)
	F	2 NO
	G	2 NC[1]
	H	1 NO (EM)
	J	1 NC[1]
	K	1 NO
	Q	1 NO - 1 NC (ELB)
		3 Position
	U	1 NO - 1 NC extra late break[2]

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 For operator without contact blocks leave position f blank.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Push Pull

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	—	—	**52PP2W1**	52BP2W1	52PP2V1	2BP2V1
	Red	**52PP2A2**	52BP2A2	**52PP2W2**	**52BP2W2**	**52PP2V2**	52BP2V2
	Green	52PP2A3	52BP2A3	**52PP2W3**	52BP2W3	52PP2V3	52BP2V3
	Yellow	—	—	52PP2W4	52BP2W4	52PP2V4	52BP2V4
1 NO - 1 NC	Red	**52PP2A2A**[1]	**52BP2A2A**[1]	**52PP2W2A**[1]	**52BP2W2A**[1]	**52PP2V2A**[1]	52BP2V2A[1]
	Green	**52PP2A3A**	52BP2A3A	**52PP2W3A**	52BP2W3A	**52PP2V3A**	—
	Yellow	—	—	**52PP2W4A**	52BP2W4A	52BP2V4A	52BP2V4A
	Chrome	**52PP2ACA**	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	**52PP3W2**	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	**52PP7A2**	52BP7A2	52PP7W2	52BP7W2	52PP7V2	52BP7V2
	Green	52PP7A3	52BP7A3	52PP7W3	52BP7W3	52PP7V3	52BP7V3
	Chrome	52PP7AC	52BP7AC	—	—	—	—
1 NO - 1 NCELB	Red	52PP7A2U	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.

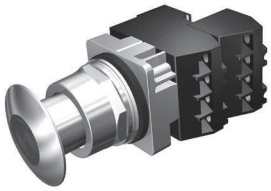
[1] EMERGENCY-STOP control devices according to IEC 60947-5-5

30mm Water, Oil Tight & Corrosion Resistant – Class 52

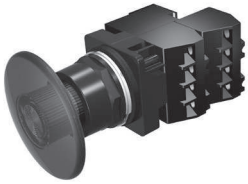
Illuminated Push Pull & Push Button

Selection Guide

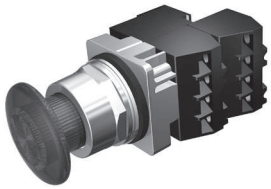
2 & 3 Position Push-Pull Mushroom Head Devices - Illuminated



Mushroom Head Metal Ø 1 3/4”



Mushroom Head Plastic Ø 2 1/2”



Mushroom Head Plastic Ø 1 3/4”

Part Number	52	___	P	___	___	___	___	___
		a	b	c	d	e	f	g

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[1]
3	3 positions - momentary in - momentary out[2]
7	3 positions - maintained in - momentary out[2]

d

Code	Operation	
	Full Voltage[3] (AC/DC)	
	Incandescent	LED[4]
B	6-8V	6V
C	12-13V	—
D	24-28V	24-28V
E	120V	120V
	Transformer[3]	
G	120V AC	
H	240V AC	
J	480V AC	
K	600V AC	
	Integrated LED Light Module	
L	6-24V AC/DC	
U	24-240V AC/DC	

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.

5 Not available in 120V or 240V.

e

Code	Style / Color
	Mushroom Head Metal Ø 1 3/4” (44.5mm)
2	Red[1]
3	Green
5	Blue
9	Amber
A	Clear
B	White
	Mushroom Head Plastic Ø 1 3/4” (44.5 mm)
R	Red[1]
S	Green
T	Amber
	Mushroom Head Plastic Ø 2 1/2” (63.5mm)
D	Red[1]
E	Green
F	Amber
	No Head (full voltage & transformer only)
Z	No head

f

Code	Contact Blocks
	2 Position
A	1 NO + 1 NC[1]
B	2 NO - 2 NC[1]
F	2 NO
G	2 NC[1]
J	1 NC[1]
K	1 NO
Q	1 NO - 1 NC (ELB)
	3 Position
U	1 NO - 1 NC extra late break[2]

g

Code	Bulb Type
Blank	Incandescent
B	LED
Y	Super-Bright LED[5]

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Pull

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	**52PP2D2AB[1]**	**52BP2D2AB[1]**	**52PP2DRAB[1]**	52BP2DRAB[1]
			Green	1 NO - 1 NC	**52PP2D3AB**	52BP2D3AB	52PP2DSAB	52BP2DSAB
	Incandescent	24V	Red	1 NO - 1 NC	**52PP2D2A[1]**	52BP2D2A[1]	**52PP2DRA[1]**	52BP2DRA[1]
			Green	1 NO - 1 NC	**52PP2D3A**	52BP2D3A	**52PP2DSA**	52BP2DSA
		120V	Red	1 NO - 1 NC	52PP2E2A[1]	52BP2E2A[1]	52PP2ERA[1]	52BP2ERA[1]
				—	52PP2E2	52BP2E2	52PP2ER	52BP2ER
Transformer (AC)	LED	120V	Red	1 NO - 1 NC	**52PP2G2AB[1]**	52BP2G2AB[1]	52PP2GRAB[1]	52BP2GRAB[1]
			Green	1 NO - 1 NC	**52PP2G3AB**	52BP2G3AB	52PP2GSAB	52BP2GSAB
	Incandescent	120V	Red	1 NO - 1 NC	**52PP2G2A[1]**	52BP2G2A[1]	**52PP2GRA[1]**	52BP2GRA[1]
			Green	1 NO - 1 NC	**52PP2G3A**	**52BP2G3A**	**52PP2GSA**	52BP2GSA

					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
	Incandescent	24V	Green	1 NO - 1 NCELB	52PP3D3U	52BP3D3U	52PP3DSU	52BP3DSU
			Red	1 NO - 1 NCELB	52PP3D2U	52BP3D2U	52PP3DRU	52BP3DRU
		120V	Red	—	52PP3E2	52BP3E2	52PP3ER	52BP3ER
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB	52PP3G2UB	52BP3G2UB	52PP3GRUB	52BP3GRUB
			Green	1 NO - 1 NCELB	**52PP3G3UB**	52BP3G3UB	52PP3GSUB	52BP3GSUB
	Incandescent	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
	Incandescent	24V	Green	1 NO - 1 NCELB	52PP7D3U	52BP7D3U	52PP7DSU	52BP7DSU
			Red	1 NO - 1 NCELB	52PP7D2U	52BP7D2U	52PP7DRU	52BP7DRU
		120V	Red	—	52PP7E2	52BP7E2	52PP7ER	52BP7ER
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB	52PP7G2UB	52BP7G2UB	52PP7GRUB	52BP7GRUB
			Green	1 NO - 1 NCELB	52PP7G3UB	52BP7G3UB	52PP7GSUB	52BP7GSUB
	Incandescent	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.

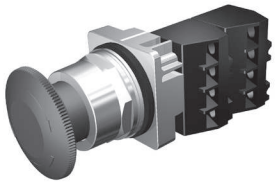
[1] EMERGENCY-STOP control devices according to IEC 60947-5-5

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

Part Number	52	___	R	8	W	___	___
		a	b	c	d	e	f[2]

Finish	Function	Style	Color	Contacts	Part Number
Chrome	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	1 NO - 1 NC	**52PR8W2A**
Black Max	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	1 NO - 1 NC	**52BR8W2A**
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.

a

Code	Finish
P	Chrome-Command 52
B	Epoxy Coated-Black Max

b

Code	Function
R	2 Position Twist-to-Release, Maintained[1]

c

Code	Style
8	Plastic 1 3/4" Mushroom Head

d

Code	Lamp Type
W	Non-Illuminated

e

Code	Color
2	Red[1]
3	Green
4	Yellow
Z	No head

f[2]

Code	Contact Blocks
A	1 NO + 1 NC[1]
B	2 NO + 2 NC[1]
C	3 NO + 3 NC[1]
D	4 NO + 4 NC[1]
E	1 NC (LB)
F	2 NO
G	2NC[1]
H	1NO (EM)
J	1 NC[1]
K	1 NO

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.

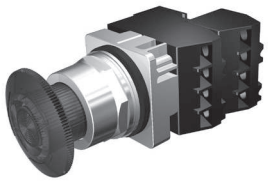
2 For operator without contact blocks leave position f blank.

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	52	____	R	8	____	____	____	____
		a	b	c	d	e	f	g

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[2] (AC/DC)	
	Incandescent	LED[3]
B	6-8V	6V
C	12-13V	—
D	24-28V	24-28V
E	120V	120V
	Transformer[2]	
G	120V AC	
H	240V AC	
J	480V AC	
K	600V AC	
	Integrated LED Light Module	
L	6-24V AC/DC	
U	24-240V AC/DC	

e

Code	Color
R	Red[1]
S	Green
T	Amber
Z	No head

f

Code	Contact Blocks
A	1 NO + 1 NC[1]
B	2 NO + 2 NC[1]
C	3 NO + 3 NC[1]
D	4 NO + 4 NC[1]
E	1 NC (LB)
F	2 NO
G	2NC[1]
H	1NO (EM)
J	1 NC[1]
K	1 NO

g

Code	Bulb Type
Blank	Incandescent
B	LED
Y	Super-Bright LED[4]

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.

4 Not available in 120V or 240V.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Indicator Light

Selection Guide

Indicator Light

Plastic Lens

Glass Lens

Part Number	52	____	L	____	____	____	____
		a	b	c	d	e	f

a

Code	Finish
P	Chrome-Command 52
B	Epoxy Coated-Black Max

b

Code	Type
L	Indicator Light

c

Code	Style
4	Plastic Lens
5	Glass Lens

d

Code	Operation	
	Full Voltage[1] (AC/DC)	
	Incandescent	LED[2]
B	6-8V	6V
C	12-13V	—
D	24-28V	24-28V
E	120V	120V
	Transformer[1]	
G	120V AC	
H	240V AC	
J	480V AC	
K	600V AC	
T	277V AC	
	Integrated LED Light Module	
L	6-24V AC/DC	
U	24-240V AC/DC	

e

Code	Color
2	Red
3	Green
5	Blue
7	All Colors
9	Amber
A	Clear
B	White
N	No Lens

f

Code	Bulb Type
Blank	Incandescent
XB	LED
XY	Super-Bright LED[3]

1 Default bulb type is incandescent. For LED options, append field f. LED option not available on units sold "No Lens".

2 LED voltages apply to table f option code XB and XY.

3 Not available in 120V or 240V.

Selection Tables

Indicator Light

Type	Lamp Type	Voltage	Color	Plastic Lens	
				Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	**52PL4D2XB**	**52BL4D2XB**
			Green	**52PL4D3XB**	**52BL4D3XB**
			Blue	**52PL4D5XB**	**52BL4D5XB**
			Amber	**52PL4D9XB**	**52BL4D9XB**
			White	**52PL4DBXB**	**52BL4DBXB**
		120V	Red	**52PL4E2XB**	**52BL4E2XB**
			Green	**52PL4E3XB**	**52BL4E3XB**
			Amber	**52PL4E9XB**	**52BL4E9XB**
			Clear	**52PL4EAXB**	**52BL4EAXB**
			White	**52PL4EBXB**	**52BL4EBXB**
	Incandescent	24V	Red	**52PL4D2**	**52BL4D2**
			Green	**52PL4D3**	**52BL4D3**
			Blue	**52PL4D5**	**52BL4D5**
			Amber	**52PL4D9**	**52BL4D9**
			White	**52PL4DB**	**52BL4DB**
			No Lens	**52PL4DN**	**52BL4DN**
		120V	Red	**52PL4E2**	**52BL4E2**
			Green	**52PL4E3**	**52BL4E3**
			Amber	**52PL4E9**	**52BL4E9**
			No Lens	**52PL4EN**	**52BL4EN**
Transformer (AC)	LED	120V	Red	**52PL4G2XB**	**52BL4G2XB**
			Green	**52PL4G3XB**	**52BL4G3XB**
			Amber	**52PL4G9XB**	**52BL4G9XB**
			White	**52PL4GBXB**	**52BL4GBXB**
		480V	Red	**52PL4J2XB**	**52BL4J2XB**
			Green	**52PL4J3XB**	**52BL4J3XB**
			White	**52PL4JBXB**	**52BL4JBXB**
	Incandescent	120V	Red	**52PL4G2**	**52BL4G2**
			Green	**52PL4G3**	**52BL4G3**
			Amber	**52PL4G9**	**52BL4G9**
			White	**52PL4GB**	**52BL4GB**
			No Lens	**52PL4GN**	**52BL4GN**
		240V	Red	**52PL4H2**	**52BL4H2**
			Green	**52PL4H3**	**52BL4H3**
		480V	Red	**52PL4J2**	**52BL4J2**
			Green	**52PL4J3**	**52BL4J3**
			Amber	**52PL4J9**	**52BL4J9**

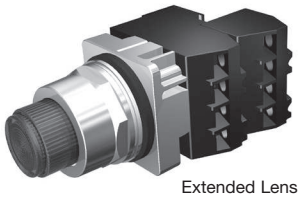
Readily available items are in **bold**.
This is a small representation of stocked items.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

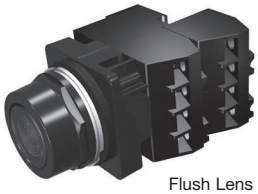
Illuminated Push Button & Push-to-Test

Selection Guide

Push Button & Push-to-Test - Illuminated



Extended Lens



Flush Lens

Part Number	52	____ a	T b	____ c	____ d	____ e	____ f	____ g

a

Code	Finish
P	Chrome-Command 52
B	Epoxy Coated-Black Max

b

Code	Function
T	Illuminated Push Button / Push-to-Test[1]

c

Code	Style
6	Extended Lens
8	Flush Lens

d

Code	Operation	
	Full Voltage[2] (AC/DC)	
	Incandescent	LED[3]
B	6-8V	6V
C	12-13V	—
D	24-28V	24-28V
E	120V	120V
	Transformer[2]	
G	120V AC	
H	240V AC	
J	480V AC	
K	600V AC	
	Integrated LED Light Module	
L	6-24V AC/DC	
U	24-240V AC/DC	

1 For push-to-test functionality, wire according to wiring diagram below.

e

Code	Color
2	Red
3	Green
5	Blue
7	All Colors
9	Amber
A	Clear
B	White
N	No Lens

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[4]

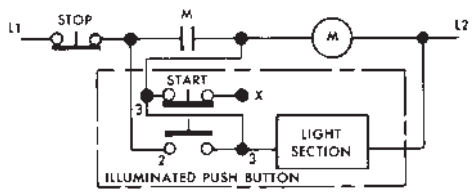
2 Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "No Lens".

3 LED voltages apply to table g option code B and Y.

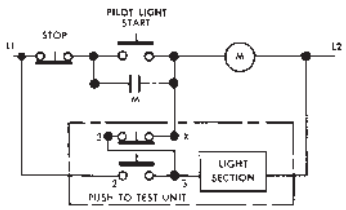
4 Not available in 120V or 240V.

Wiring Diagrams

Illuminated Push Button



Push to Test



30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Buttons & Push-to-Test

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	**52PT6D2AB**	**52BT6D2AB**
			Green	1 NO - 1 NC	**52PT6D3AB**	**52BT6D3AB**
			Blue	1 NO - 1 NC	**52PT6D5AB**	**52BT6D5AB**
			Amber	1 NO - 1 NC	**52PT6D9AB**	**52BT6D9AB**
			White	1 NO - 1 NC	**52PT6DBAB**	**52BT6DBAB**
		120V	Red	1 NO - 1 NC	**52PT6E2AB**	**52BT6E2AB**
			Green	1 NO - 1 NC	**52PT6E3AB**	**52BT6E3AB**
	Incandescent	24V	Red	1 NO - 1 NC	**52PT6D2A**	**52BT6D2A**
			Green	1 NO - 1 NC	**52PT6D3A**	**52BT6D3A**
			Blue	1 NO - 1 NC	**52PT6D5A**	**52BT6D5A**
			Amber	1 NO - 1 NC	**52PT6D9A**	**52BT6D9A**
			White	1 NO - 1 NC	**52PT6DBA**	**52BT6DBA**
		120V	Red	1 NO - 1 NC	**52PT6E2A**	**52BT6E2A**
			Green	1 NO - 1 NC	**52PT6E3A**	**52BT6E3A**
Transformer (AC)	LED	120V	Red	1 NO - 1 NC	**52PT6G2AB**	**52BT6G2AB**
			Green	1 NO - 1 NC	**52PT6G3AB**	**52BT6G3AB**
			Amber	1 NO - 1 NC	**52PT6G9AB**	**52BT6G9AB**
			White	1 NO - 1 NC	**52PT6GBAB**	**52BT6GBAB**
		240V	Red	1 NO - 1 NC	**52PT6H2AB**	**52BT6H2AB**
			Green	1 NO - 1 NC	**52PT6H3AB**	**52BT6H3AB**
	Incandescent	120V	Red	1 NO - 1 NC	**52PT6G2A**	**52BT6G2A**
			Green	1 NO - 1 NC	**52PT6G3A**	**52BT6G3A**
			Amber	1 NO - 1 NC	**52PT6G9A**	**52BT6G9A**
			White	1 NO - 1 NC	**52PT6GBA**	**52BT6GBA**
			No Lens	1 NO - 1 NC	**52PT6GNA**	**52BT6GNA**
		240V	Green	1 NO - 1 NC	**52PT6H3A**	**52BT6H3A**
		480V	Clear	1 NO - 1 NC	**52PT6JAA**	**52BT6JAA**

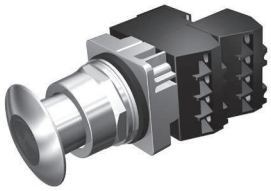
Readily available items are in **bold**.
This is a small representation of stocked items.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

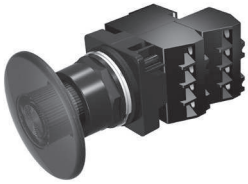
Illuminated Push Button

Selection Guide

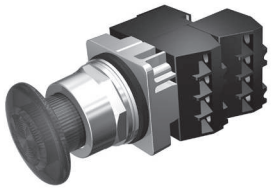
Push Button Mushroom Head Devices – Illuminated



Mushroom Head Metal Ø 1 3/4”



Mushroom Head Plastic Ø 2 1/2”



Mushroom Head Plastic Ø 1 3/4”

Part Number	52	___	T	9	___	___	___	___
		a	b	c	d	e	f	g

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	
	Full Voltage[2] (AC/DC)	
	Incandescent	LED[3]
B	6-8V	6V
C	12-13V	—
D	24-28V	24-28V
E	120V	120V
	Transformer[2]	
G	120V AC	
H	240V AC	
J	480V AC	
K	600V AC	
	Integrated LED Light Module	
L	6-24V AC/DC	
U	24-240V AC/DC	

e

Code	Style / Color
	Mushroom Head Metal Ø 1 3/4” (44.5mm)
2	Red[1]
3	Green
5	Blue
9	Amber
A	Clear
B	White
	Mushroom Head Plastic Ø 1 3/4” (44.5 mm)
R	Red
S	Green
T	Amber
	Mushroom Head Plastic Ø 2 1/2” (63.5mm)
D	Red[1]
E	Green
F	Amber
	No Head (full voltage & transformer only)
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[4]

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.

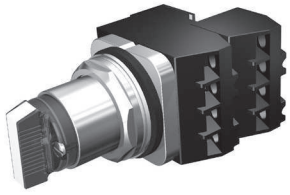
4 Not available in 120V or 240V.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

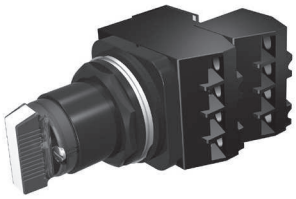
Illuminated Selector Switches

Selection Guide

Selector Switches – Illuminated



Short Lever – Chrome



Short Lever – Black Max

Part Number	52	S		7						
		a	b	c	d	e	f	g	h	i

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	**52SA7AGN**
Chrome	Maintained	3 Position: CAM C	120V AC	No Insert	None	**52SA7CGN**

Readily available items are in **bold**.
This is a small representation of stocked items.

a

Code	Type
S	Selector Switch

b

Code	Finish
A	Chrome - Command 52
X	Epoxy Coated - Black Max

c

Code	Style
7	Maintained

d

Code	Function
A	2 Position: CAM A
B	3 Position: CAM B
C	3 Position: CAM C

e

Code	Operation	
	Full Voltage[1] (AC/DC)	
	Incandescent	LED[2]
B	6-8V	6V
C	12-13V	—
D	24-28V	24-28V
E	120V	120V
	Transformer[1]	
G	120V AC	
H	240V AC	
J	480V AC	
K	600V AC	
	Integrated LED Light Module	
L	6-24V AC/DC	
U	24-240V AC/DC	

f

Code	Color
2	Red
3	Green
5	Blue
9	Amber
A	Clear
N	No Insert

g

Code	Contact Blocks
A	1 NO - 1 NC
E	1 NC (LB)
H	1 NO (EM)
J	1 NC
K	1 NO

h

Code	Contact Quantity & Location	
	A CAM & C CAM Left	B CAM Right
0	1	—
1	—	1
3	2	—
4	—	2

i

Code	Bulb Type
Blank	Incandescent
B	LED
Y	Super-Bright LED[3]

1 Default bulb type is incandescent. For LED options, append field i. LED option not available on units sold "no head".

2 LED voltages apply to table i option code B and Y.

3 Not available in 120V or 240V.

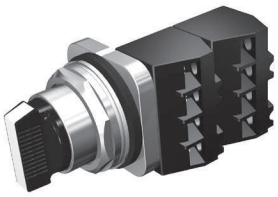
For CAM selection see page 11/202.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Selector Switch

Selection Guide

Selector Switch – Non-Illuminated



Short Lever

Long Lever

Part Number	52	S		2					
		a	b	c	d	e	f	g[2]	h[2]

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 [1]
	D	3 Position: CAM D
	E	3 Position: CAM E
	G	3 Position: CAM G
	H	4 Position: CAM H

e	Code	Type	
		2 Position	
		Maintained	Spring Return
	A	All	–
	C	Left	Right
		3 Position	
		Maintained	Spring Return
	A	All	–
	B	Center, Right	Left
	C	Center, Left	Right
	D	Center	Left, Right
		4 Position	
		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[2]	Code	Contact Blocks
	A	1 NO - 1 NC
	E	1 NC (LB)
	H	1 NO (EM)
	J	1 NC
	K	1 NO

h[2]	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

1 C CAM on spring return selectors is limited to 4 contact blocks.
For CAM selection see page 11/202.

2 For operator without contact blocks leave positions g and h blank.

Selector Switch, Non-Illuminated[1)]

Contact Type	Contact	Switch Position Left	Switch Position Right	Type M = Maintained S = Spring Return	Chrome Short Lever	Chrome Long Lever	Black Max Short Lever	Black Max Long Lever
					2-Position Operator			
No Contacts	—	—	—	M M	**52SA2AAB**	**52SB2AAB**	**52SX2AAB**	**52SW2AAB**
				M<---S	**52SA2ACB**	**52SB2ACB**	**52SX2ACB**	52SW2ACB
1 N.O.	A	O	X	M M	**52SA2AABK1**	**52SB2AABK1**	**52SX2AABK1**	**52SW2AABK1**
				M<---S	**52SA2ACBK1**	**52SB2ACBK1**	**52SX2ACBK1**	**52SW2ACBK1**
1 N.O.	A	O	X	M M	**52SA2AABA1**	**52SB2AABA1**	**52SX2AABA1**	**52SW2AABA1**
1 N.C.	B	X	O	M<---S	**52SA2ACBA1**	**52SB2ACBA1**	**52SX2ACBA1**	**52SW2ACBA1**

Contact Type	Contact	Switch Position Left	Switch Position Center	Switch Position Right	Type M = Maintained S = Spring Return	Chrome Short Lever	Chrome Long Lever	Black Max Short Lever	Black Max Long Lever
					3-Position Operator				
No Contacts	—	—	—	—	M M M	**52SA2CAB**	**52SB2CAB**	**52SX2CAB**	**52SW2CAB**
					M M M	**52SA2BAB**	**52SB2BAB**	**52SX2BAB**	**52SW2BAB**
					S--->M M	**52SA2BBB**	52SB2BBB	**52SX2BBB**	52SW2BBB
					M M<----S	**52SA2BCB**	**52SB2BCB**	52SX2BCB	52SW2BCB
					S--->M<---S	**52SA2BDB**	**52SB2BDB**	**52SX2BDB**	**52SW2BDB**
1 N.O.	A	O	O	X	M M M	**52SA2CABA1**	**52SB2CABA1**	**52SX2CABA1**	**52SW2CABA1**
					S--->M M	**52SA2CBBA1**	**52SB2CBBA1**	**52SX2CBBA1**	52SW2CBBA1
1 N.C.	B	X	O	O	M M<----S	**52SA2CCBA1**	**52SB2CCBA1**	**52SX2CCBA1**	**52SW2CCBA1**
					S--->M<---S	**52SA2CDBA1**	**52SB2CDBA1**	**52SX2CDBA1**	**52SW2CDBA1**
1 N.O.	A	O	O	X	M M M	**52SA2CABA2**	**52SB2CABA2**	**52SX2CABA2**	**52SW2CABA2**
1 N.C.	B	X	O	O	S--->M M	**52SA2CBBA2**	**52SB2CBBA2**	**52SX2CBBA2**	52SW2CBBA2
1 N.O.	C	O	O	X	M M<----S	**52SA2CCBA2**	**52SB2CCBA2**	**52SX2CCBA2**	**52SW2CCBA2**
1 N.C.	D	X	O	O	S--->M<---S	**52SA2CDBA2**	**52SB2CDBA2**	**52SX2CDBA2**	**52SW2CDBA2**
1 N.O.	A	O	O	X					
1 N.C.	B	X	O	O	M M M	**52SA2GABJ2K1**	**52SB2GABJ2K1**	**52SX2GABJ2K1**	**52SW2GABJ2K1**
1 N.C.	C	O	X	O					

Contact Type	Contact	Switch Position Left	Switch Position Left Center	Switch Position Right Center	Switch Position Right	Type M = Maintained S = Spring Return	Chrome Short Lever	Chrome Long Lever	Black Max Short Lever	Black Max Long Lever
							4-Position Operator			
No Contacts	—	—	—	—	—	M M M M	**52SA2HAB**	**52SB2HAB**	**52SX2HAB**	52SW2HAB
1 N.O.	A	X	O	O	O					
1 N.C.	B	O	X	O	O	M M M M	**52SA2HABJ2K1**	52SB2HABJ2K1	52SX2HABJ2K1	52SW2HABJ2K1
1 N.C.	C	O	O	X	O					
1 N.O.	A	O	O	O	X					
1 N.O.	B	X	O	O	O	M M M M	**52SA2HABJ2K2**	**52SB2HABJ2K2**	52SX2HABJ2K2	52SW2HABJ2K2
1 N.C.	C	O	X	O	O					
1 N.C.	D	O	O	X	O					

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	52	S	C						
		a	b	c	d	e	f [3]	g [3]	h

a

Code	Type
S	Selector Switch

b

Code	Finish
C	Chrome – Command 52

c

Code	Style
5	Non-Standard Lock/Key[1a]
6	Standard Lock/Key

d

Code	Function
A	2 Position: CAM A
B	3 Postion: CAM B
C	3 Postion: CAM C [2]
D	3 Postion: CAM D
E	3 Postion: CAM E
G	3 Postion: CAM G
H	4 Postion: CAM H

e

Code	Lock Type			
	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	—	
	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
	4 Position				
	Maintained Position	Key Removal			
		Left	Left Center	Right Center	Right
E	All	X	X	X	X
F	All	X	—	—	—
G	All	—	—	—	X

f [3]

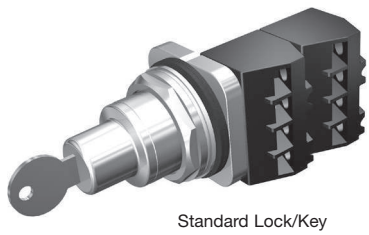
Code	Contact Blocks
A	1 NO - 1 NC
J	1 NC
K	1 NO
E	1 NC (LB)
H	1 NO (EM)

g [3]

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

h

Code	Key Type[1b]
Blank	501CH
X298	550CH
X299	549CH
X300	548CH
X301	547CH
X302	506CH



Standard Lock/Key

1a. See page 11/199 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 11/202.

3 For operator without contact blocks leave positions f and g blank.

Key-operated Selector Switch, Non-Illuminated[1)]

Contact Type	Contact	Switch Position Left	Switch Position Right	Type M = Maintained S = Spring Return	Key Removal Left	Key Removal Both
					2-Position Operator	
No Contacts	—	—	—	M M	**52SC6AF**	**52SC6AE**
				M<---S	**52SC6AX**	—
1 N.O.	A	O	X	M M	**52SC6AFK1**	**52SC6AEK1**
				M<---S	**52SC6AXK1**	—
1 N.O.	A	O	X	M M	**52SC6AFA1**	**52SC6AEA1**
1 N.C.	B	X	O	M<---S	**52SC6AXA1**	—

Contact Type	Contact	Switch Position Left	Switch Position Center	Switch Position Right	Type M = Maintained S = Spring Return	Key Removal Left	Key Removal Right	Key Removal Center	Key Removal Left & Center	Key Removal Left & Right	Key Removal Center & Right	Key Removal All Positions
						3-Position Operator						
No Contacts	—	—	—	—	M M M	52SC6CF	52SC6CG	52SC6CH	52SC6CK	52SC6CJ	52SC6CM	**52SC6CE**
					M M M	**52SC6BF**	**52SC6BG**	52SC6BH	52SC6BK	52SC6BJ	52SC6BM	**52SC6BE**
					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	**52SC6CEA1**
					S--->M M	—	52SC6CWA1	52SC6CTA1	—	—	52SC6CYA1	—
1 N.C.	B	X	O	O	M M<----S	—	—	52SC6CUA1	52SC6CZA1	—	—	—
					S--->M<---S	—	—	52SC6CVA1	—	—	—	—
1 N.O.	A	O	O	X	M M M	52SC6CFA2	52SC6CGA2	52SC6CHA2	52SC6CKA2	52SC6CJA2	52SC6CMA2	**52SC6CEA2**
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	**52SC6GEJ2K1**
1 N.C.	B	X	O	O								
1 N.C.	C	O	X	O								

Contact Type	Contact	Switch Position Left	Switch Position Left Center	Switch Position Right Center	Switch Position Right	Type M = Maintained S = Spring Return	Key Removal Right	Key Removal All Positions
							4-Position Operator	
No Contacts	—	—	—	—	—	M M M M	**52SC6HG**	52SC6HE
1 N.O.	A	X	O	O	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.C.	B	O	X	O	O			
1 N.C.	C	O	O	X	O			
1 N.O.	A	O	O	O	X	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.O.	B	X	O	O	O			
1 N.C.	C	O	X	O	O			
1 N.C.	D	O	O	X	O			

Note: X = Closed / O = Open

All Operatores listed above are furnished with Lock No. 501CH

1) Readily available items are in bold.

This is a small representation of stocked items.

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

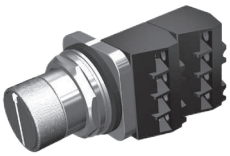
Selector Push Button

Selection Guide

Selector Push Button

Part Number	52	S	A				
		a	b	c	d	e	f [1]

Finish	Style	Function	Color	Contacts	Part Number
Chrome	Flush Selector Push Button	2 Position CAM Q	Black	None	**52SA3Q1**
Chrome	Flush Selector Push Button	2 Position CAM R	Black	None	52SA3R1
Chrome	Flush Selector Push Button	2 Position CAM P	Black	None	52SA3P1



Selector Push Buttons

Readily available items are in **bold**.
This is a small representation of stocked items.

a

Code	Type
S	Selector Push Buttons

b

Code	Finish
A	Chrome - Command 52

c

Code	Style
3	Flush Button
4	Extended Button - 1/2”

d

Code	Function
P	2 Position: CAM P
Q	2 Position: CAM Q
R	2 Position: CAM R
S	3 Position: CAM S

e

Code	Color
1	Black
2	Red

f [1]

Code	Contact Blocks							
	CAM P (2 Selector Position)							
	Left		Center		Right		Contact Blocks	Mounting Position
	N	D	N/A	N/A	N	D		
J0	X	O	—	—	O	O	NC	Left
K0	O	X	—	—	X	X	NO	Left
	CAM Q (2 Selector Position)							
	Left		Center		Right		Contact Blocks	Mounting Position
	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
	CAM R (2 Selector Position)							
	Left		Center		Right		Contact Blocks	Mounting Position
	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
	CAM S (3 Selector Position)							
	Left		Center		Right		Contact Blocks	Mounting Position
	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

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Special devices

Selection and ordering data

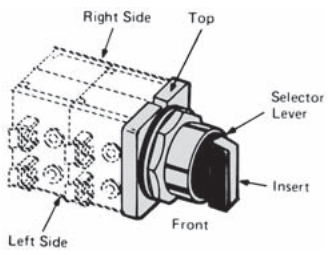
	Version	Ohms / color	Order no.	Pack
				Unit
	Potentiometer operator 2 Watts, 500 V AC/DC (NEMA Type 4)	50	**52MA3B01**	1
		150	**52MA3B03**	
		250	**52MA3B04**	
		500	**52MA3B06**	
		750	**52MA3B07**	
		1 K	**52MA3B08**	
		2.5 K	**52MA3B10**	
		5 K	**52MA3B12**	
		10 K	**52MA3B14**	
		15 K	**52MA3B15**	
		25 K	**52MA3B16**	
		50 K	**52MA3B18**	
		100 K	**52MA3B20**	
		150 K	**52MA3B21**	
		250 K	**52MA3B22**	
		500 K	**52MA3B24**	
		1 M	**52MA3B26**	
		1.5 M	**52MA3B27**	
		2 M	**52MA3B28**	
		5 M	**52MA3B31**	
	2 Button maintained operator	black (flush) / red (flush)	**52MP2A1A2**	1
		black (flush) / red (extended)	**52MP2A1B2**	
		black (flush) / yellow (mushroom)	**52MP2A1W4**	
		green (flush) / red (flush)	**52MP2A3A2**	
		green (flush) / red (extended)	**52MP2A3B2**	
		green (flush) / red (mushroom)	**52MP2A3W2**	
		green (flush) / green (mushroom)	**52MP2A3W3**	
	Button remains depressed when pushed	less caps	**52MP2**	
	Wobble stick 2.5” operator For use with 52BAJ (NC) contact block	red	**52ABW2**①	1
		green	**52ABW3**①	
		grey	**52ABW6**①	

① For use with 52BAJ (NC) contact block

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Cam selection

Selection and ordering data



Ordering Information

- Contact blocks are ordered separately, see page 11/202
- 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 **52SX2**D**AB.**

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	O	NO (52BAK)	B			R
O	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	

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Custom selector switch designs

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

A = 1 NO - 1 NC, **52BJK**
E = NC Late Break, **52BAE**
H = NO Early Make, **52BAH**
J = NC, **52BAJ**
K = NO, **52BAK**

Position Suffix

	Quantity and Location	
Suffix	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

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Selection and ordering data

	Version	Suitable for	Color	Order no.
	Flush actuator lens cap The 52RC1 Screw-on style caps shown are used on the new 52BM8 & 52PM8 Pushbutton Operators. To order Snap-on style replacement caps for the old style 52PA8 & 52PX8 Pushbutton Operators change the 4th character from "C" to "A" (i.e. 52RA1A1).	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**
	Extended actuator lens cap The 52RC1 Screw-on style caps shown are used on the new 52BM8 & 52PM8 Pushbutton Operators. To order Snap-on style replacement caps for the old style 52PA8 & 52PX8 Pushbutton Operators change the 4th character from "C" to "A" (i.e. 52RA1B1).	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**
	Mushroom head cap - Plastic set-screw type replacement caps are for discontinued 52PB9 and 52PX9 operators only	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**
	Mushroom head cap - Metal set-screw type	For small 1 5/8"(41.3mm) type, set screw non-illuminated mushroom pushbuttons	chrome red green	**52RB3FC** **52RB3F2** **52RB3F3**
	Replacement Lens for Indicator Lights	For catalog numbers starting with 52PL or 52BL①② 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**
	Replacement Lens forPush to Test/ Illuminated Pushbuttons The 52RA5S Raised lens caps shown are used on the 52BT6 & 52PT6 PTT/Illuminated Pushbutton Operators. To order Flush lens caps for the new style 52BT8 & 52PT8 PTT/ Illuminated Pushbutton Operators change the 52RA5S prefix to 52RC5P (i.e. 52RC5P2).	For catalog numbers starting with 52PT or 52BT②③ 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.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Selection and ordering data

	Version	Suitable for	Color	Order no.
	Mushroom head push pull illuminated plastic screw-on type	For small 1 3/4" type, push-pull units	red	**52RC3JR**
			green	**52RC3JS**
			amber	**52RC3JT**
		For large 2 1/2" type, push-pull units	red	**52RC3KR**
			green	**52RC3KS**
			amber	**52RC3KT**
	Mushroom head push pull illuminated metal screw-on type	Chrome, for small 1 3/4" type, push-pull units	red	**52RB3H2**
			green	**52RB3H3**
			amber	**52RB3H9**
			white	**52RB3HB**
		BlackMax, for small 1 3/4" type, push-pull units	red	**52RX3H2**
			green	**52RX3H3**
			amber	**52RX3H9**
			white	**52RX3HB**
	Mushroom head push pull non-illuminated plastic screw-on type	For small 1 3/4" type, push-pull units (catalog numbers starting with 52PP, 52BP, 52PM9 or 52BM9)	black	**52RC3D1**
			red	**52RC3D2**
			green	**52RC3D3**
			yellow	**52RC3D4**
			blue	**52RC3D5**
			gray	**52RC3D6**
			orange	**52RC3D8**
			1 of each color	**52RC3DN**
		For large 2 1/2" type, push-pull units (catalog numbers starting with 52PP, 52BP, 52PM9 or 52BM9)	black	**52RC3E1**
			red	**52RC3E2**
			green	**52RC3E3**
			yellow	**52RC3E4**
			blue	**52RC3E5**
			gray	**52RC3E6**
			orange	**52RC3E8**
			1 of each color	**52RC3EN**
	Mushroom head push pull non-illuminated metal screw-on type	For small 1 3/4" type, push-pull units (catalog numbers starting with 52PP or 52BP)	red	**52RC3F2**
			green	**52RC3F3**
			chrome	**52RC3FC**
	Twist to release head illuminated plastic screw-on type	For small twist to release units	red	**52RC3RR**
			green	**52RC3RS**
			amber	**52RC3RT**
	Twist to release head non-illuminated plastic screw-on type	For small twist to release units	red	**52RC3R2**
			green	**52RC3R3**
			yellow	**52RC3R4**
	Replacement lens kit for Illuminated selector switches (Knob with Insert)		red	**52RA6P2**
			green	**52RA6P3**
			blue	**52RA6P5**
			amber	**52RA6P9**
			clear	**52RA6PA**
			white	**52RA6PB**
	Lever inserts		red	**52RA2A2**
	Short lever		green	**52RA2A3**
			yellow	**52RA2A4**
			blue	**52RA2A5**
			gray	**52RA2A6**
			orange	**52RA2A8**
			white	**52RA2AB**
	Long lever		red	**52RA2B2**
			green	**52RA2B3**
			yellow	**52RA2B4**
			blue	**52RA2B5**
			gray	**52RA2B6**
			orange	**52RA2B8**
			white	**52RA2BB**

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Selection and ordering data

	Version	Suitable for	Color	Order no.
	Protective boot Offers protection from ice and foreign sub-stances from interfering with button operation	Flush pushbutton operations	clear black	**52AABA** **52AAB1**
	Guards Prevents accidental operation	Non-illuminated basic pushbuttons	chrome blackmax	**52AAGP** **52AXGP**
		1 5/8" mushroom pushbuttons, 1 3/4" push-pull units①, and twist to release units	chrome blackmax	**52AAGM** **52AXGM**
		Push to test/illuminated pushbutton and indicator lights	chrome blackmax	**52AAGL** **52AXGL**
	EMERGENCY-STOP Backing Ring	Yellow 90mm E-STOP Backing Ring		**52AAR**
	Locknuts Replacement front ring	Non-illuminated basic pushbuttons	chrome blackmax	**52AANP** **52AXNP**
		Non-illuminated mushroom pushbuttons	chrome blackmax	**52AANL** **52AXNL**
		Push-pull and twist-to-release units (only for push-pull units starting with 52PP or 52BP)②	chrome blackmax	**52CANP** **52CXNP**
		Indicator Lights	blue amber	**52AANL** **52AXNL**
		Selector switches	chrome blackmax	**52AANS** **52AXNS**
	Mounting Accessories	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	**52AAQ** **52AAD**
	Padlock attachments	Non-illuminated basic pushbuttons	flush extended	**52AALA** **52AALB**
	EMERGENCY-STOP Lock Out	Class 52 Illuminated Mushroom Head Pushbuttons; 304 Stainless Steel	chrome (304 SS)	**52AALE**
	Padlock cover Lock devices in off position	Pushbuttons, selector switches, and non-illuminated mushroom heads		**52AALS**
	Lock nut wrench	All devices		**52MAWB**
	Hole plugs		corrosion resistant steel, grey stainless steel	**52AAH6** **52ABH6** **52ABHS**
	Spare keys (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	**52KEY-501CH** **52KEY-506CH** **52KEY-547CH** **52KEY-548CH** **52KEY-549CH** **52KEY-550CH**
	Grounding kit	All devices		**52AL109145**
52 BAJ	**Touchsafe contact blocks with gold flashing**			
	1 NO			**52BAK**
	1 NC			**52BAJ④**
	1 NO - 1 NC			**52BJK④**
52 BAK	1 NO early make	closes before 52BAK		**52BAH**
	1 NC late break	opens after 52 BAJ		**52BAE**
	1 NO - 1 NC	Reed switch; UL listed for class 1 division 2; .25A Max, 200V AC, 10 Watt max .5A Max, 200V DC, 10 Watt max		**52BAR③**
52 BAR	1 NC extra late break			**52BAU**

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.

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Selection and ordering data

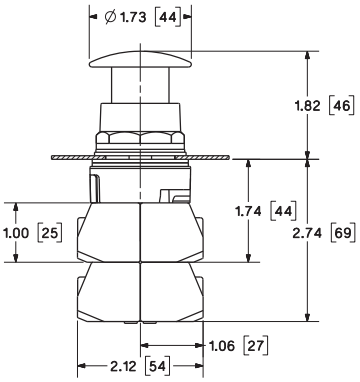
Version	Suitable for	Lamp voltage	Color	Order no.
Lamps with screw connection, miniature bayonet (BA 9s style)				
Incandescent lamps,				
Flashing, type 267 lamp (replaces 755 lamp)	51, 52	6 V		**52AABNF**
6V type 755 lamp (Rated 150 mA)	51, 52	6 V		**52AABN**
12V type 756 (Rated 80 mA)	51, 52	12 V		**52AACN**
24V type 757 (Rated 80 mA)	51, 52	24 V		**52AADN**
48V, 2W	52	48 V		**3SB1902-1AP**
60V, 2W	52	60 V		**3SR9424**
120V, 2.5W, type #120MB (Rated 250 mA)	52	120 V		**52AAENC1**
Neon (uses resistors) type B2A (NE-51H)	52	120 V		**52AAPN**
Candelabra, 120V, 3W, Full voltage type 3S6/5	52 older revision styles	120 V		**52AAENC**
LED bulbs①				
LED, BA9s type	Class 52	6 V AC/DC		**52AEB□**
		24 V AC/DC		**52AED□**
		120 V AC/DC		**52AEE□**
Super-Bright LED	Class 52	6 V AC/DC		**52AEB□7**
		24 V AC/DC		**52AED□7**
LED lighting module with integrated LED.				
Single LED	Class 52	6-24 V AC/DC		**52AAIL□**
		24-240V AC/DC		**52AAIU□**
Full voltage lighting module accessory with BA9s type lamp①				
LED	Class 52	6 V AC/DC		**52AAFB□B**
		24 V AC/DC		**52AAFD□B**
		120 V AC/DC		**52AAFE□B**
Super-Bright LED	Class 52	6 V AC/DC		**52AAFB□Y**
		24 V AC/DC		**52AAFD□Y**
Incandescent bulb	Class 52	6 V AC/DC		**52AAFB**
		24 V AC/DC		**52AAFD**
		120 V AC/DC		**52AAFE**
Transformer lighting module accessory with BA9s type lamp①				
LED	Class 52	120 V AC		**52AATG□B**
		240 V AC		**52AATH□B**
		277 V AC		**52AATT□B**
		480 V AC		**52AATJ□B**
		600 V AC		**52AATK□B**
Super-Bright LED	Class 52	120 V AC		**52AATG□Y**
		240 V AC		**52AATH□Y**
		277 V AC		**52AATT□Y**
		480 V AC		**52AATJ□Y**
		600 V AC		**52AATK□Y**
Incandescent bulb	Class 52	120 V AC		**52AATGN**
		240 V AC		**52AATHN**
		277 V AC		**52AATTN**
		480 V AC		**52AATJN**
		600 V AC		**52AATKN**
		Color options:	red	**2**
			green	**3**
			yellow/amber	**4**
			blue	**5**
			white/clear	**B**

① Standard LED lamps are recommended for indoor applications,
Super-Bright LED Lamps are recommended for outdoor applications.

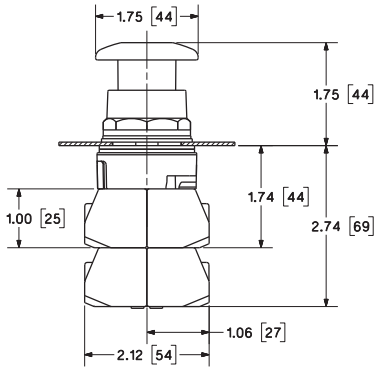
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

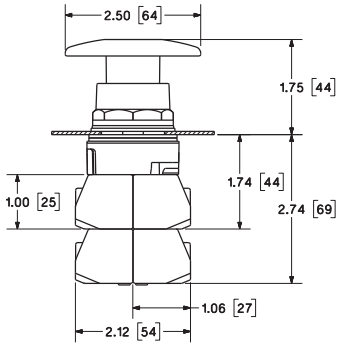
Non-Illuminated Push-Pull Metal Mushroom Head



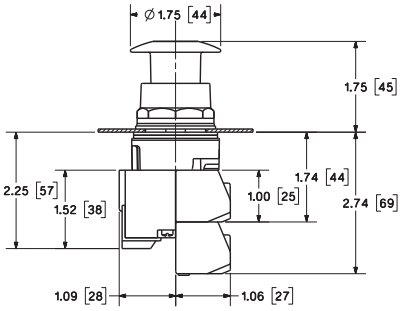
Non-Illuminated Push-Pull Small Plastic Mushroom Head



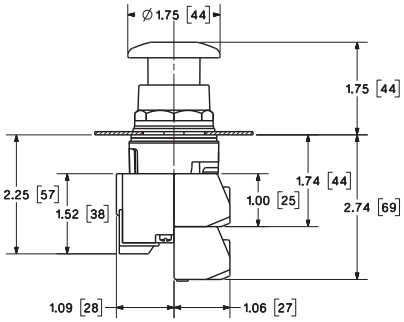
Non-Illuminated Push-Pull Large Plastic Mushroom Head



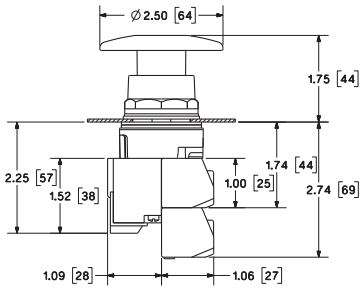
Illuminated Push-Pull Metal Mushroom Head



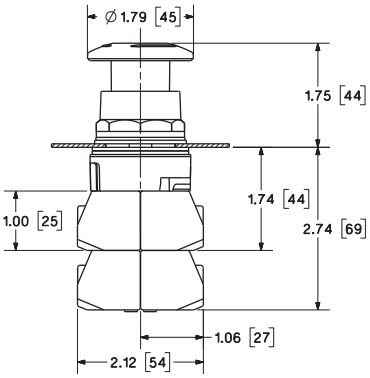
Fully Illuminated Push-Pull Small Plastic Mushroom Head



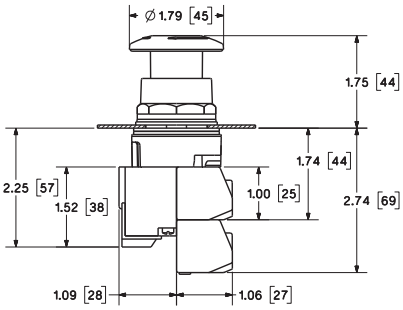
Illuminated Push-Pull Large Plastic Mushroom Head



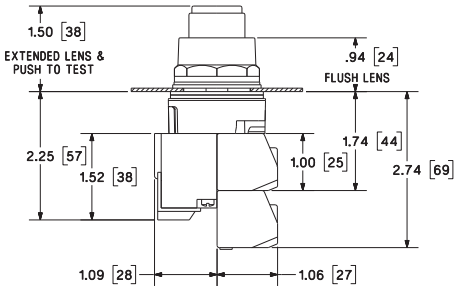
Non-Illuminated Twist Release Plastic Mushroom Head



Illuminated Twist Release Plastic Mushroom Head



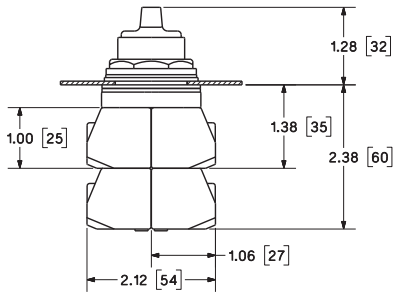
Illuminated Pushbutton Flush Lens
Illuminated Pushbutton Extended Lens
Illuminated Push to Test



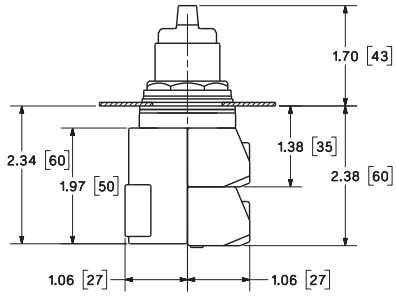
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

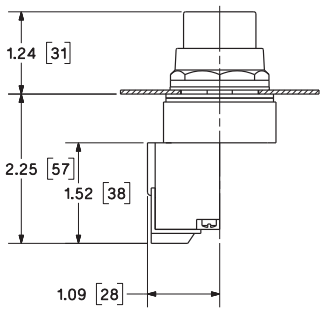
Selector Switch Non-Illuminated



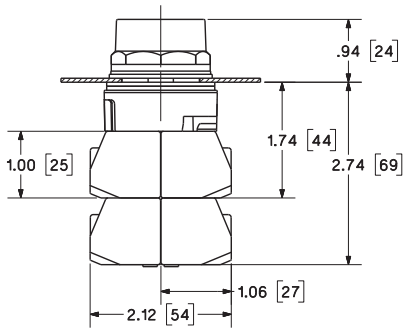
Selector Switch Illuminated



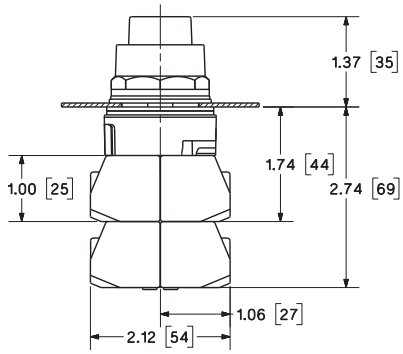
Indicator Light Plastic Lens



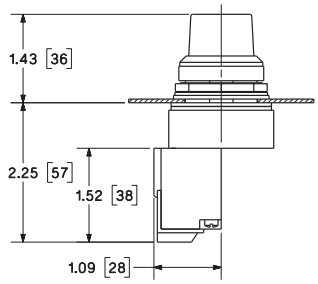
Momentary Pushbutton Non-Illuminated Flush Cap



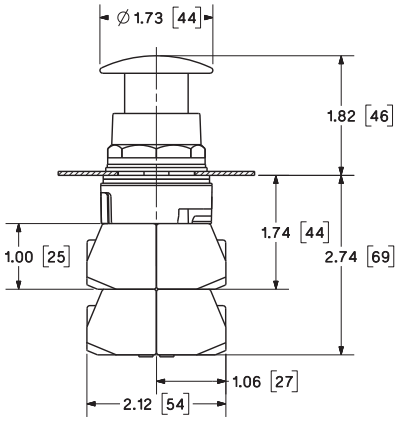
Momentary Pushbutton Non-Illuminated Raised Cap



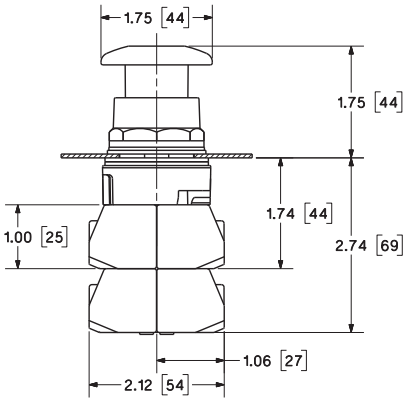
Indicator Light Glass Lens



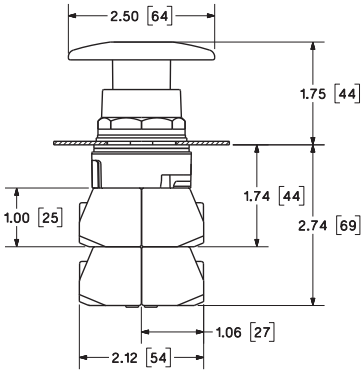
Momentary Pushbutton Metal Mushroom Head



Momentary Pushbutton Small Plastic Mushroom Head



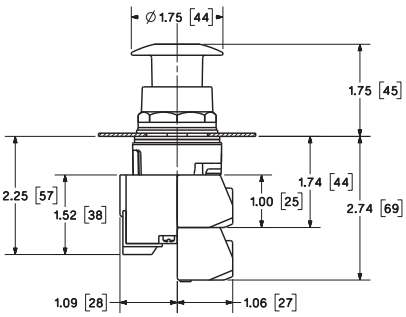
Momentary Pushbutton Large Plastic Mushroom Head



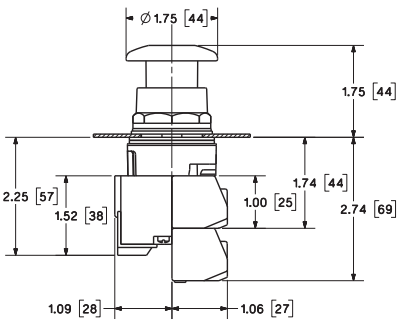
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

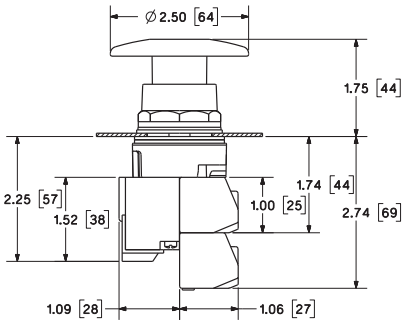
Illuminated Momentary Pushbutton Metal Mushroom Head



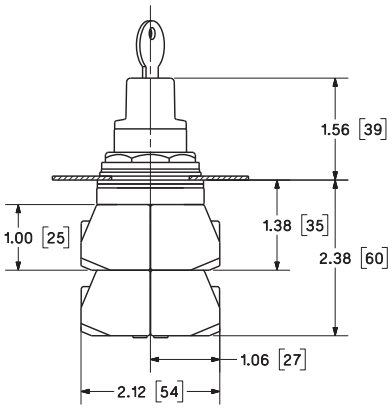
Illuminated Momentary Pushbutton Small Plastic Mushroom Head



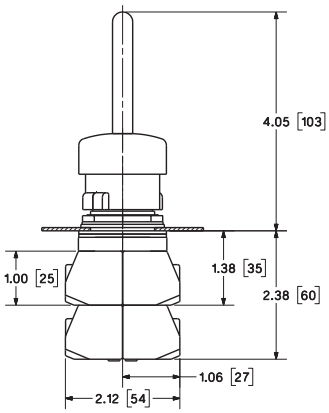
Illuminated Momentary Pushbutton Large Plastic Mushroom Head



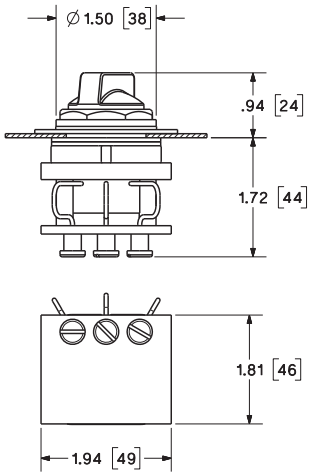
Selector Switch Keyed



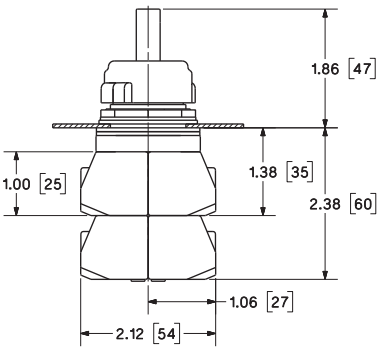
Wobble Switch



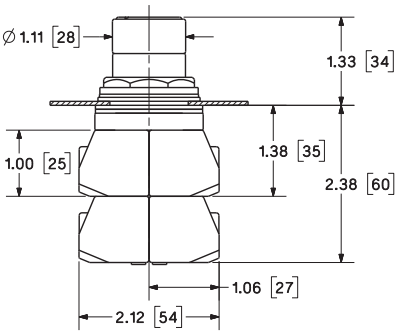
Potentiometer Switch



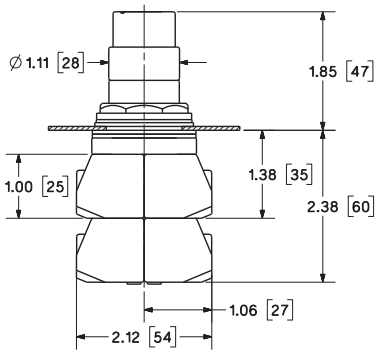
Toggle Switch



Selector Pushbutton Switch Flush Cap



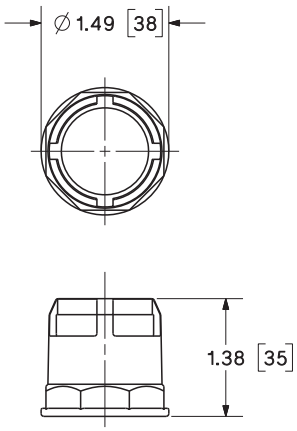
Selector Pushbutton Switch Raised Cap



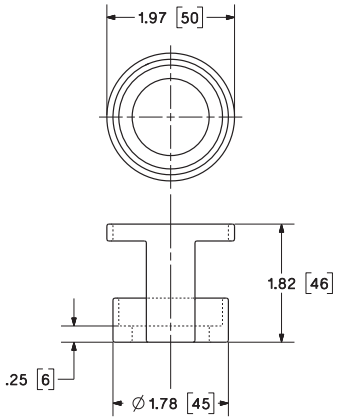
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

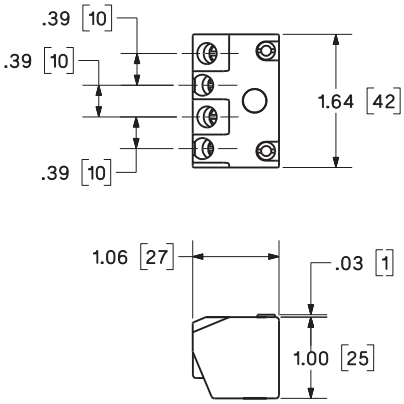
Momentary Pushbutton Guard
Illuminated Push to Test Guard



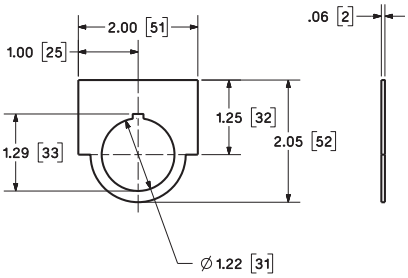
Mushroom Head Guard



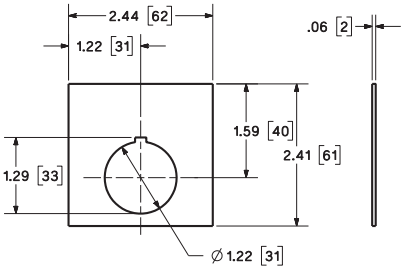
Contact Block



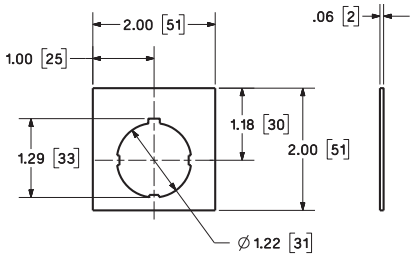
Large Metal Legend Plate



Automotive Metal Legend Plate



Large Plastic Legend Plate



Break Glass and Emergency Power Off Pushbutton (EPO) Stations NEW

Selection and ordering data

Description	Degree of protection	Conduit Entry 3/4" NPT	No. of command points	Contact①	Legend Plate	Order no.
Class 52 Oiltight Pushbutton Stations③						
Break Glass Pushbutton Station	NEMA 4X	Side	1	1NO-1NC	"EMERGENCY SHUT-OFF"	**52G112FB**
					"EMERGENCY OFF"	**52G113FB**
					"EMERGENCY POWER OFF"	**52G114FB**
					"EMERGENCY GENERATOR STOP"	**52G115FB**
		Rear②			"EMERGENCY SHUT-OFF"	**52G112FR**
					"EMERGENCY OFF"	**52G113FR**
					"EMERGENCY POWER OFF"	**52G114FR**
					"EMERGENCY GENERATOR STOP"	**52G115FR**
		Side and Rear②			"EMERGENCY SHUT-OFF"	**52G112FD**
					"EMERGENCY OFF"	**52G113FD**
					"EMERGENCY POWER OFF"	**52G114FD**
					"EMERGENCY GENERATOR STOP"	**52G115FD**
Emergency Power Off EPO Pushbutton Station	NEMA 4X	Side	1	1NO-1NC	"EMERGENCY POWER OFF"	**52C114EB**
	NEMA 12/13	N/A	1	1NO-1NC	"EMERGENCY POWER OFF"	**52C114A**

Accessories

Break Glass Pushbutton with 1NO-1NC, 4 Extra Glass Lens Inserts		**52PM8AGA**
Break Glass Pushbutton with 1NO-1NC, 4 Extra Glass Lens Inserts, Mallet, Chain, Clip, Mounting Screw④		**52PM8AGAH**
Replacement Glass Lens Insert Kit (5 piece pack)		**52RC1AG**
Break Glass Legend Plates⑤	"EMERGENCY SHUT-OFF"	**52NL112R**
	"EMERGENCY OFF"	**52NL113R**
	"EMERGENCY POWER OFF"	**52NL114R**
	"EMERGENCY GENERATOR STOP"	**52NL115R**
EPO Legend Plate⑤	"EMERGENCY POWER OFF"	**52NF214R**
Enclosure, NEMA 4X Aluminum with ANSI 61 Gray finish comes with one 3/4" - 14 NPT conduit entry in side of enclosure, and one Empty Command Point for fitting 30mm Round Devices.		**P30EMS01EB**

① Pushbutton Station comes with 1) 52BJK, 1NO-1NC contact rated NEMA A600/P600. One additional Class 52 contact block may be field installed if required.
② Versions with Conduit Entry from the Rear available February 2020.
③ All Glass Break Pushbutton Stations come with 4 Extra Glass Lens Inserts.
④ Sealant is not supplied with 52PM8AGAH kits. Note: Teflon Tape or Pipe Dope is required on the Mallet Mounting Clip Screw when field installed in a NEMA 4X Enclosure.
⑤ For a more comprehensive list of our most common legend plates, see page 10/238 of the Siemens IC Catalog.

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 protection①	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	**52C101A**	
	A = Momentary raised pushbutton red, label “STOP”	NEMA 12	1NO - 1NC	1	**52C103A**	
	A = Momentary mushroom head red, label “STOP”	NEMA 12	1NO - 1NC	1	**52C104A**	
	A = Maintained metal mushroom head red, label “EMERGENCY STOP”	NEMA 12	1NO - 1NC	1	**52C117A**	
	A = 2 position selector switch “OFF-ON”	NEMA 12	1NO - 1NC	1	**52C159A**	
	A = 3 position selector switch “HAND-OFF-AUTO”	NEMA 12	1NO - 1NC	1	**52C156A**	
	A = Indicator light, red	NEMA 12	120V Transformer type	1	**52C131A**	
	A = Indicator light, green	NEMA 12	120V Transformer type	1	**52C135A**	
	A = Momentary flush pushbutton black, label “START”	NEMA 4X Stainless Steel	1NO - 1NC	1	**52C101S**	
	A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Stainless Steel	1NO - 1NC	1	**52C103S**	
	A = Momentary mushroom head red, label “STOP”	NEMA 4X Stainless Steel	1NO - 1NC	1	**52C104S**	
	A = Maintained plastic mushroom head red, label “EMERGENCY STOP”	NEMA 4X Stainless Steel	1NO - 1NC	1	**52C116S**	
	A = 2 position selector switch “OFF-ON”	NEMA 4X Stainless Steel	1NO - 1NC	1	**52C159S**	
	A = 3 position selector switch “HAND-OFF-AUTO”	NEMA 4X Stainless Steel	1NO - 1NC	1	**52C156S**	
	A = Momentary flush pushbutton black, label “START”	NEMA 4X Fiberglass	1NO - 1NC	1	**52C101X**	
	A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Fiberglass	1NO - 1NC	1	**52C103X**	
	A = Momentary mushroom head red, label “STOP”	NEMA 4X Fiberglass	1NO - 1NC	1	**52C104X**	
	A = Maintained plastic mushroom head red, label “EMERGENCY STOP”	NEMA 4X Fiberglass	1NO - 1NC	1	**52C116X**	
	A = 2 position selector switch “OFF-ON”	NEMA 4X Fiberglass	1NO - 1NC	1	**52C159X**	
	A = 3 position selector switch “HAND-OFF-AUTO”	NEMA 4X Fiberglass	1NO - 1NC	1	**52C156X**	
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	**52C201A**	
	B = Momentary flush pushbutton black, label “START” A = Momentary Mushroom head pushbutton red, label “STOP”	NEMA 12	1NO, 1NC 1NO, 1NC	2	**52C202A**	
	B = Momentary flush pushbutton, label “FORWARD” A = Momentary flush pushbutton, label “REVERSE”	NEMA 12	1NO, 1NC 1NO, 1NC	2	**52C204A**	
	B = Momentary flush pushbutton, label “UP” A = Momentary flush pushbutton, label “DOWN”	NEMA 12	1NO, 1NC 1NO, 1NC	2	**52C223A**	
	B = Indicator light, red, label “RUN” A = Maintained selector switch, label “HAND-OFF-AUTO”	NEMA 12	120V Transformer type	2	**52C224A**	
	B = Indicator light, red A = Indicator light, green	NEMA 12	120V Transformer type	2	**52C230A**	
	B = Momentary flush pushbutton black, label “START” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	**52C201S**	
	B = Momentary flush pushbutton black, label “START” A = Momentary Mushroom head pushbutton red, label “STOP”	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	**52C202S**	
	B = Momentary flush pushbutton, label “UP” A = Momentary flush pushbutton, label “DOWN”	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	**52C223S**	
	B = Indicator light, red, label “RUN” A = Maintained selector switch, label “HAND-OFF-AUTO”	NEMA 4X Stainless Steel	120V Transformer type 1NO, 1NC	2	**52C224S**	
	B = Momentary flush pushbutton black, label “START” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	**52C201X**	
	B = Momentary flush pushbutton black, label “START” A = Momentary Mushroom head pushbutton red, label “STOP”	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	**52C202X**	
	B = Momentary flush pushbutton, label “UP” A = Momentary flush pushbutton, label “DOWN”	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	**52C223X**	
	B = Indicator light, red, label “RUN” A = Maintained selector switch, label “HAND-OFF-AUTO”	NEMA 4X Fiberglass	120V Transformer type 1NO, 1NC	2	**52C224X**	

① NEMA 4X Stainless Steel Enclosure is 304 SS.

30mm Water, Oil Tight & Corrosion Resistant - Class 52

Class 52 oiltight pushbutton stations

Selection and ordering data

3 unit control station

Actuator identification	Degree of protection①	Contact / voltage	No. of command points	Order no.	Pack Unit
C = Indicator light, red B = Momentary flush pushbutton black, label “START” A = Momentary raised pushbutton red, label “STOP”	NEMA 12	120V 1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C307A**	
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	**52C301A**	
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	**52C332A**	
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	**52C333A**	
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	**52C334A**	
C = Indicator light, red B = Momentary flush pushbutton black, label “START” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Stainless Steel	120V 1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C307S**	
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	**52C301S**	
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	**52C332S**	
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	**52C333S**	
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	**52C334S**	
C = Indicator light, red B = Momentary flush pushbutton black, label “START” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Fiberglass	120V 1NO, 1NC 1NO, 1NC	3	**52C307X**	
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	**52C301X**	
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	**52C332X**	
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	**52C333X**	
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	**52C334X**	

① NEMA 4X Stainless Steel Enclosure is 304 SS.

30mm Water, Oil Tight & Corrosion Resistant - Class 52

Empty enclosures

Selection and ordering data

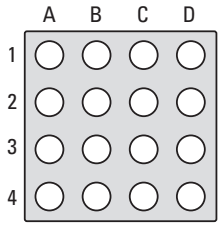
Standard enclosures come with 2 1/4" leg center for legend spacing. Automotive end plates require 2 1/2 " spacing. For more than 2 contact blocks on the right or left, use extra deep enclosure.

Mounting hole arrangement

1 thu 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

Version	Number of command points	Degree of protection	Order No.①	Pack Unit
	1	NEMA Type 12/13	**P30EMS01**	
	1	NEMA Type 12/13 extra deep	**P30EMS01D**	
	1	NEMA Type 4/4X stainless steel	**P30EMS014**	
	1	NEMA Type 4/4X Fiberglass	**P30EMS01X**	
	2	NEMA Type 12/13	**P30EMS02**	
	2	NEMA Type 12/13 extra deep	**P30EMS02D**	
	2	NEMA Type 4/4X stainless steel	**P30EMS024**	
	2	NEMA Type 4/4X Fiberglass	**P30EMS02X**	
	3	NEMA Type 12/13	**P30EMS03**	
	3	NEMA Type 12/13 extra deep	**P30EMS03D**	
	3	NEMA Type 4/4X stainless steel	**P30EMS034**	
	3	NEMA Type 4/4X Fiberglass	**P30EMS03X**	
	4	NEMA Type 12/13	**P30EMS04**	
	4	NEMA Type 12/13 extra deep	**P30EMS04D**	
	4	NEMA Type 4/4X stainless steel	**P30EMS044**	
	4	NEMA Type 4/4X Fiberglass	**P30EMS04X**	
	6	NEMA Type 12/13	**P30EMS06**	
	6	NEMA Type 12/13 extra deep	**P30EMS06D**	
	6	NEMA Type 4/4X stainless steel	**P30EMS064**	
	9	NEMA Type 12/13	**P30EMS09**	
	9	NEMA Type 12/13 extra deep	**P30EMS09D**	
	9	NEMA Type 4/4X stainless steel	**P30EMS094**	
	12	NEMA Type 12/13	**P30EMS12**	
	12	NEMA Type 12/13 extra deep	**P30EMS12D**	
	12	NEMA Type 4/4X stainless steel	**P30EMS124**	
	16	NEMA Type 12/13	**P30EMS16**	
	16	NEMA Type 12/13 extra deep	**P30EMS16D**	
	16	NEMA Type 4/4X stainless steel	**P30EMS164**	

Order Form



Enclosure Hole Arrangement

Ordering Information

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.

- Select enclosure
- 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
- List location No. and applicable catalog numbers in the table below. Use complete catalog numbers where possible

Order No./Item No.

Customer

Enclosure Catalog No.

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

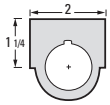
Legend plates for Class 51 and 52

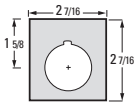
Design

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 ingraved.

When ordering custom engraved legend plates, specify the required inscription text.

Selection and ordering data



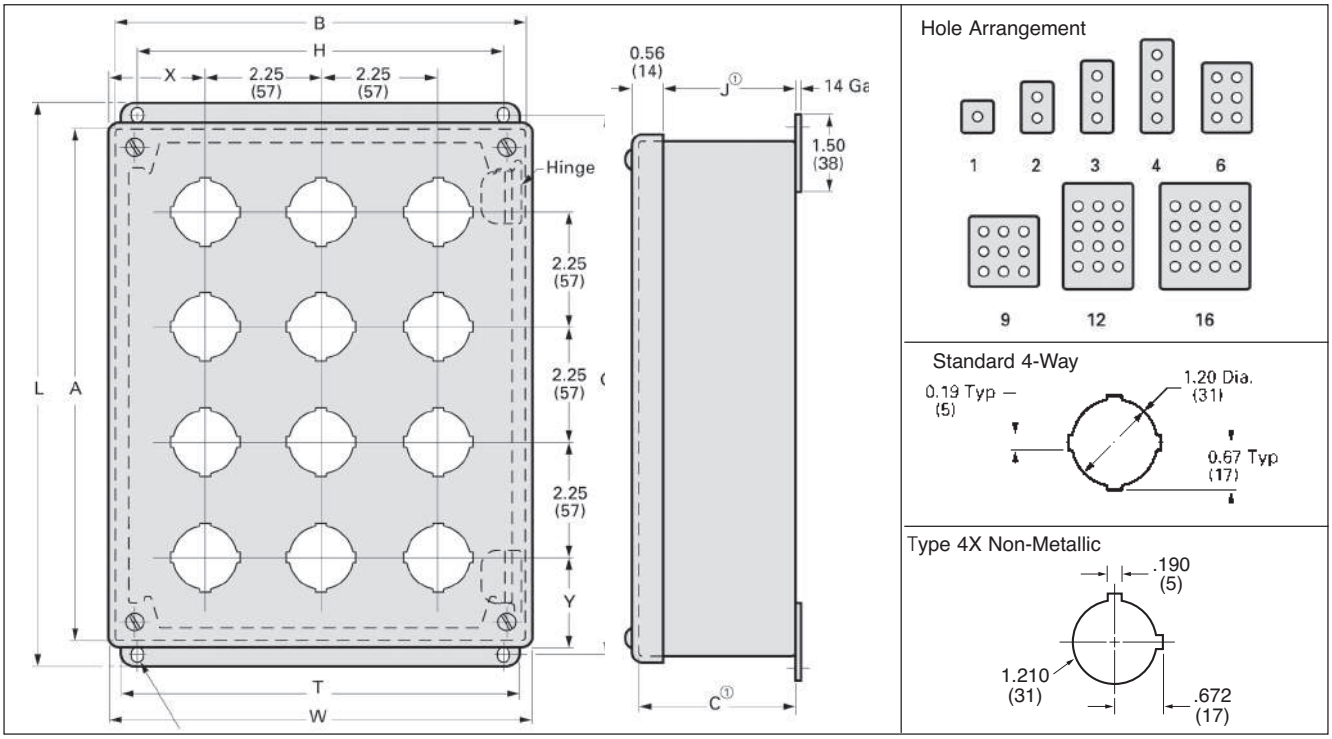


Inscription	Large (1 1/4" x 2") Order No.	Automotive① (2 7/16" x 2 7/16") Order No.	Large Plastic② (2 1/16" x 2") Order No.	Automotive Plastic①② (2 7/16" x 2 7/16") Order No.
"Blank (brushed aluminum)"	**52NL02**	**52NA02**	—	—
"Blank (red)"	**52NL02R**	**52NA02R**	**52ND02R**	**52NE02R**
"Blank (Black)"	**52NL02B**	**52NA02B**	**52ND02B**	**52NE02B**
Inscribed legend plates with large brushed aluminum background				
Close	**52NL18**	**52NA18**	—	—
Down	**52NL10**	**52NA10**	—	—
Emerg Stop	**52NL16**	**52NA16**	—	—
Emerg Stop (red)	**52NL16R**	**52NA16R**	—	—
Fast-Slow	**52NL33**	**52NA33**	—	—
Forward	**52NL05**	**52NA05**	—	—
For-Off-Rev	**52NL38**	**52NA38**	—	—
For-Rev	**52NL31**	**52NA31**	—	—
Hand-Off-Auto	**52NL37**	**52NA37**	—	—
High	**52NL07**	**52NA07**	—	—
High-Low	**52NL30**	**52NA30**	—	—
High-Off-Low	**52NL44**	**52NA44**	—	—
In	**52NL21**	**52NA21**	—	—
Jog	**52NL13**	**52NA13**	—	—
Jog-Forward	**52NL24**	**52NA24**	—	—
Jog-Reverse	**52NL25**	**52NA25**	—	—
Low	**52NL08**	**52NA08**	—	—
Lower	**52NL20**	**52NA20**	—	—
Man-Auto	**52NL35**	**52NA35**	—	—
Off	**52NL12**	**52NA12**	—	—
Off-On	**52NL26**	**52NA26**	—	—
On	**52NL11**	**52NA11**	—	—
On-Off-Auto	**52NL40**	**52NA40**	—	—
Open	**52NL17**	**52NA17**	—	—
Open-Close	**52NL34**	**52NA34**	—	—
Open-Off-Close	**52NL41**	**52NA41**	—	—
Out	**52NL22**	**52NA22**	—	—
Pull to Start Push to Stop	**52NL47**	**52NA47**	—	—
Raise	**52NL19**	**52NA19**	—	—
Raise-Lower	**52NL36**	**52NA36**	—	—
Reset	**52NL14**	**52NA14**	—	—
Reverse	**52NL06**	**52NA06**	—	—
Run	**52NL23**	**52NA23**	—	—
Run-Jog	**52NL29**	**52NA29**	—	—
Safe-Run	**52NL27**	**52NA27**	—	—
Slow-Off-Fast	**52NL39**	**52NA39**	—	—
Start	**52NL03**	**52NA03**	—	—
Start-Jog	**52NL28**	**52NA28**	—	—
Start-Stop	**52NL32**	**52NA32**	—	—
Stop	**52NL04**	**52NA04**	—	—
Stop (red)	**52NL04R**	**52NA04R**	—	—
Up	**52NL09**	**52NA09**	—	—
Up-Down	**52NL49**	**52NA49**	—	—
Up-Off-Down	**52NL42**	**52NA42**	—	—
Inscription plates with custom engraving				
"Custom engraved (brushed aluminum)"	**52NL02E**	**52NA02E**	—	—
"Custom engraved (red)"	**52NL02RE**	**52NA02RE**	**52ND02RE**	**52NE02RE**
"Custom engraved (Black)"	**52NL02BE**	**52NA02BE**	**52ND02BE**	**52NE02BE**
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

	Enclosure Size			Mounting		Overall					
Units	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[2])	11.75 (298)	10.75 (273)	3.00 (76)	12.25 (311)	9.88 (251)	12.75 (324)	10.97 (279)	2.56 (65)[2])	10.50 (267)	2.11 (54)	2.61 (66)

Type 12/13 Extra Deep Enclosures

	Enclosure Size			Mounting		Overall					
Units	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[2])	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

	Enclosure Size		Mounting		Overall		
Units	A	B	C	G	H	L	W
1	6.00	3.19	3.63	4.88	2.94	6.63	3.81
2	6.00	3.19	3.63	4.88	2.94	6.63	3.81
3	8.26	3.19	3.63	7.13	2.94	8.88	3.81
4	10.51	3.19	3.63	9.37	2.94	11.13	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

Standards	UL Listed File # E22655	CSA Certified File # LR6535
Utilization	Category NEMA	A600/P600
Degree of Protection	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

Voltage AC	Make Amps	Break Amps
120V	**60**	**6**
240V	**30**	**3**
480V	**15**	**1.5**
600V	**12**	**1.2**
Total VA	**7200**	**720**

NEMA P600 – Rating Codes for DC Control Circuit Application

Thermal Continuous Test Current Amps	5.0
Maximum Make or Break; Current / Amps	
125V	1.10
250V	0.55
301-600V	0.20
Maximum Make or Break Volt amperes at 300V or Less	138

Contact Blocks	52BAK, -BAJ①, -BAH, -BAU, -BJK① 52BAR	600VAC Maximum, Heavy Duty 200VAC .25 Amp, 10 Watt Maximum 200VDC .50 Amp, 10 Watt Maximum

① ⊕ 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*

Pilot Light	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
Push-to-Test	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
Illuminated Push-Pull	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
Twist-to-Release	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
Illuminated Selector Switch	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

Vibration	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.	
Pushbuttons	Momentary, Non-illuminated Momentary, Illuminated	5,000,000 Operating Cycles 300,000 Operating Cycles
Push-Pull	Maintained Momentary	300,000 Operating Cycles 2,000,000 Operating Cycles
Twist-to-Release		300,000 Operating Cycles
Selector Switches	Non-illuminated Illuminated, Key-operated	2,000,000 Operating Cycles 2,000,000 Operating Cycles
Contact Operation	Standard Contact Black Logic Reed	
Wire Gauge	#18-12 AWG	
Terminal Screw Torque	2-10 lb-in / 20 lb-in max; 8 lb-in recommended	
Locknut Torque	15 ft. lbs. max	
Temperature Range	Operating Storage	31F to +158F (-35C to +70C) 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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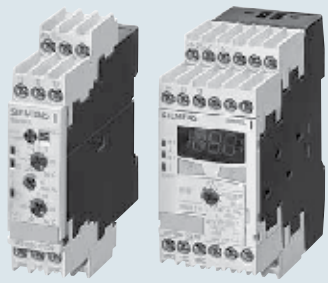
3RS10/3RS20 temperature monitoring relays



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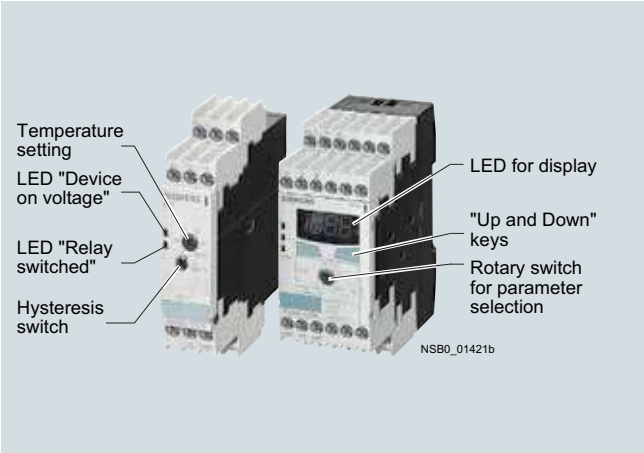
Overview



SIRIUS 3RS temperature monitoring relays

More information
Homepage, see www.siemens.com/relays
Industry Mall, see www.siemens.com/product?3RS10

The 3RS10, 3RS11, 3RS20 and 3RS21 temperature monitoring relays can be used for measuring temperatures in solid, liquid and gas media. The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored for overshoot, undershoot or location within a specified range (window function).

The range comprises adjustable analog units with one or two threshold values, digital units for 1 sensor, which are also a good alternative to temperature controllers for the low-end range, and digital units for up to 3 sensors which have been optimized for monitoring large motors.

Article No. scheme

Product versions		Article number									
Temperature monitoring relays		**3RS**	□	□	□	□	–	□	□	□	□	**0**
Device type	e.g. 10 = analogically adjustable, 1 sensor		□	□							
Version and type of sensor	e.g. 00 = one threshold value, Pt100 sensor				□	□					
Connection type	Screw terminals							**1**			
	Spring-type terminals (push-in)							**2**			
Number and type of outputs	e.g. C = 1 NO + 1 NC								□		
Control supply voltage	e.g. D = 24 V AC/DC									□	
Measuring range	e.g. 0 = -50 ... +50 °C										□
Example		**3RS**	**1**	**0**	**0**	**0**	**–**	**1**	**C**	**D**	**0**	**0**

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.

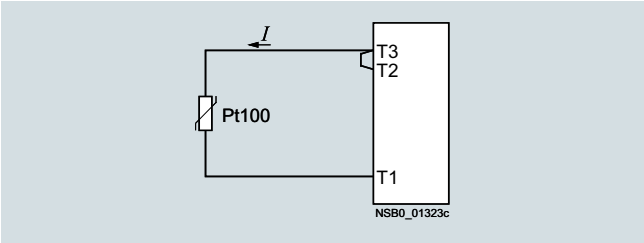
Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16369/td Manual and internal circuit diagrams, see https://support.industry.siemens.com/cs/ww/en/view/54999309	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16369/faq

Connection of resistance-type thermometers

Two-wire measurement

When two-wire temperature sensors are used, the resistances of the sensor and wiring are added. The resulting systematic error must be taken into account when the signal evaluation unit is calibrated. A jumper must be clamped between terminals T2 and T3 for this purpose.



Wiring errors

The errors that are generated by the wiring comprise approximately 2.5 K/Ω. If the resistance of the cable is not known and cannot be measured, the wiring errors can also be estimated using the following table.

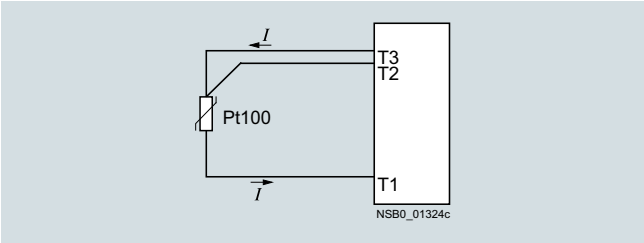
Temperature drift dependent on the length and cross-section of the cable with Pt100 sensors and an ambient temperature of 20 °C, in K:

Cable length in m	Cross-section mm²			
	0.5	0.75	1	1.5
	Temperature drift in K:			
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

Example: On a Pt100 sensor with a cable length of 10 m and a conductor cross-section of 1 mm^2 the temperature drift equals 0.9 K.

Three-wire measurement

To minimize the effects of the line resistances, a three-wire circuit is often used. Using the additional cable, two measuring circuits can be formed of which one is used as a reference. The signal evaluation unit can then automatically calculate the line resistance and take it into account.



Connection of thermocouples

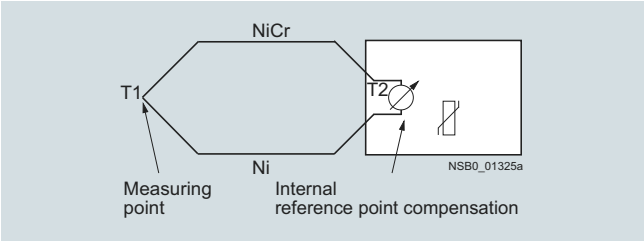
Based on the thermo-electrical effect, a differential temperature measurement will be performed between the measuring point and the signal evaluation unit.

This principle assumes that the signal evaluation unit knows the temperature at the clamping point (T2). For this reason, the 3RS11 temperature monitoring relay has an integral compensator that determines this comparison temperature and builds it into the result of the measurement. The thermal sensors and cables must be insulated therefore.

The absolute temperature is therefore calculated from the ambient temperature of the signal evaluation unit and the temperature difference measured by the thermocouple.

Temperature detection is therefore possible (T1) without needing to know the precise ambient temperature of the clamping point at the signal evaluation unit (T2).

The connecting cable is only permitted to be extended using connecting leads that are made from the same material as the thermocouple. If a different type of conductor is used, an error will result in the measurement.



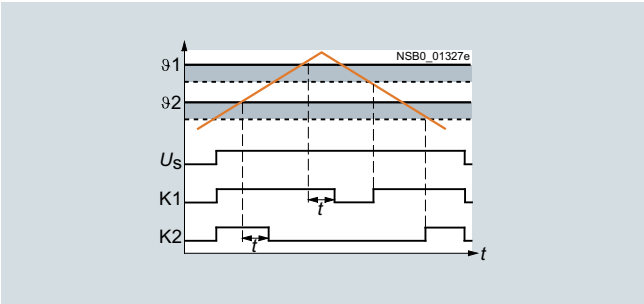
Principle of operation

Once the temperature has reached the set threshold value ϑ1, the output relay K1 changes its switching state as soon as the set time *t* has elapsed (K2 responds in the same manner to ϑ2). The delay time can only be adjusted with digital units (on analog units *t* = 0).

The relays return to their original state as soon as the temperature reaches the set hysteresis value.

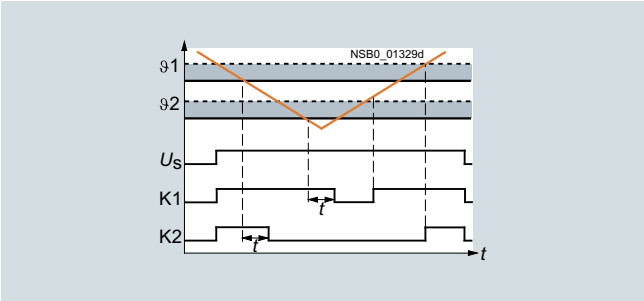
Temperature overshoot

Closed-circuit principle



Temperature undershoot

Closed-circuit principle

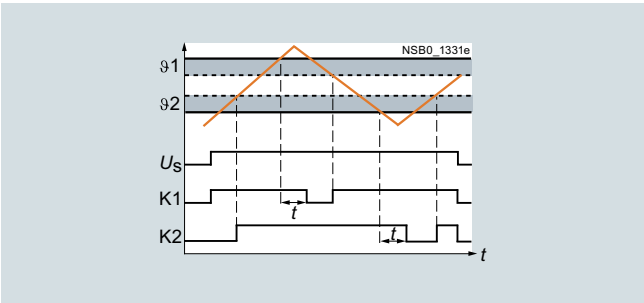


Range monitoring (digital units only)

Once the temperature has reached the upper threshold value ϑ1, the output relay K1 changes its switching state as soon as the set time *t* has elapsed. The relay returns to its original state as soon as the temperature reaches the set hysteresis value.

K2 responds in the same manner to the lower threshold value of ϑ2.

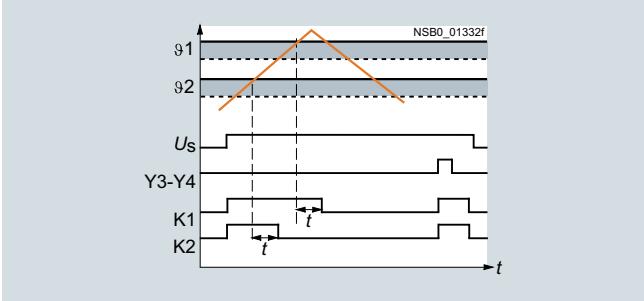
Closed-circuit principle



Principle of operation with memory function (3RS1042, 3RS1142) based on the example of temperature overshoot

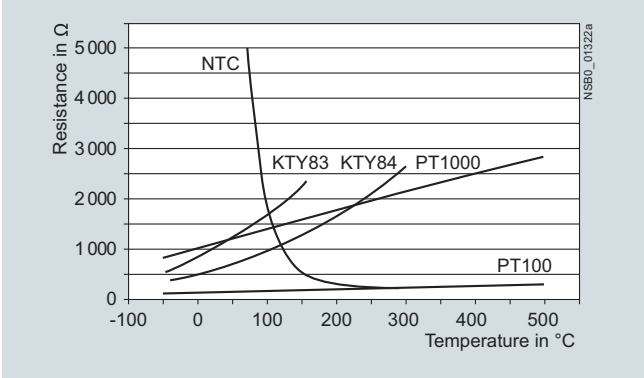
Once the temperature has reached the set threshold value ϑ1, the output relay K1 changes its switching state as soon as the set time t has elapsed (K2 responds in the same manner to ϑ2). The relays only return to the original state when the temperature falls below the set hysteresis value and when terminals Y3-Y4 have been briefly jumpered.

Closed-circuit principle



Characteristic curves

For resistance sensors



The short-circuit and open-circuit detection as well as the measuring range is limited, depending on the sensor type.

Measuring ranges in °C for resistance sensors

Sensor type	Short circuit	Open circuit	3RS1040/ 3RS1041 Measuring range in °C	3RS1042 Measuring range in °C
Pt100	✓	✓	-50 ... +500	-50 ... +750
Pt1000	✓	✓	-50 ... +500	-50 ... +500
KTY83-110	✓	✓	-50 ... +175	-50 ... +175
KTY84	✓	✓	-40 ... +300	-40 ... +300
NTC[1)]	✓	--	80 ... 160	80 ... 160

✓ Detection possible
-- Detection not possible

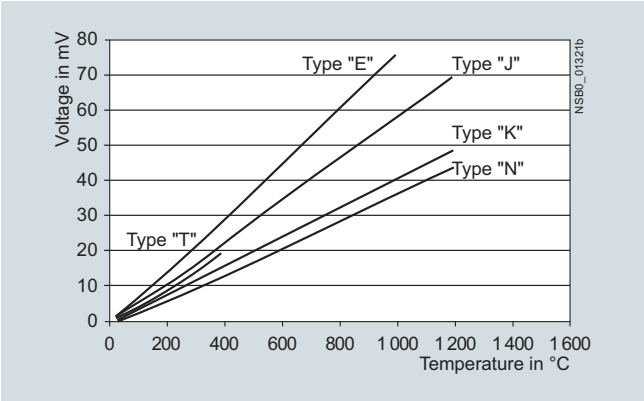
[1)] NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

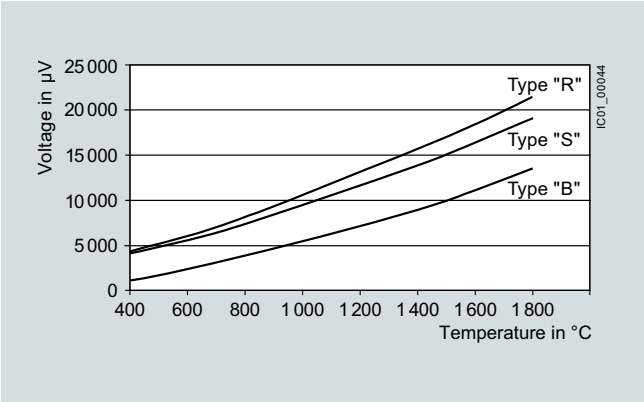
General Data

Characteristic curves

For thermocouples



Characteristic curves for sensor types J, K, T, E, N



Characteristic curves for sensor types S, R and B

Measuring range in °C for thermocouples

Sensor type	Short circuit	Open circuit	3RS1140 Measuring range in °C	3RS1142 Measuring range in °C
J	--	✓	-99 ... +999	-99 ... +1 200
K	--	✓	-99 ... +999	-99 ... +1 350
T	--	✓	-99 ... +400	-99 ... +400
E	--	✓	-99 ... +999	-99 ... +999
N	--	✓	-99 ... +999	-99 ... +999
S	--	✓	--	0 ... 1 750
R	--	✓	--	0 ... 1 750
B	--	✓	--	400 ... 1 800

✓ Detection possible
-- Detection not possible

Type			3RS10, 3RS11 analog	3RS10, 3RS11, 3RS20, 3RS21 digital
General technical specifications				
Dimensions (W x H x D)				
• Screw terminals		mm	22.5 x 102 x 91	45 x 106 x 91
• Spring-type terminals		mm	22.5 x 103 x 91	45 x 108 x 91
Permissible ambient temperature				
• During operation		°C	-25 ... +60	
Connection type			**Screw terminals**	
• Terminal screw			M3 (for standard screwdriver, size 2 and Pozidriv 2)	
• Solid		mm^2	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve		mm^2	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)	
Connection type			**Spring-type terminals**	
• Solid		mm^2	2 x (0.25 ... 1.5)	
• Finely stranded, with end sleeve acc. to DIN 46228		mm^2	2 x (0.25 ... 1.5)	
• Finely stranded		mm^2	2 x (0.25 ... 1.5)	
• AWG cables, solid or stranded		AWG	2 x (24 ... 16)	

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, analogically adjustable for 1 sensor

Overview

SIRIUS 3RS analog temperature monitoring relays for 1 sensor

The 3RS10, 3RS11 analog temperature monitoring relays can be used for measuring temperatures in solid, liquid and gas media. The temperature is detected by the sensors in the medium, evaluated by the device and monitored for overshoot or undershoot. When the threshold values are reached, the output relay switches on or off depending on the parameterization.

Benefits

- All devices except for 24 V AC/DC feature electrical separation
- Extremely easy operation using a rotary potentiometer
- Adjustable hysteresis
- Adjustable working principle for devices with 2 threshold values
- All versions with removable terminals
- All versions with screw terminals, many versions alternatively with spring-type terminals

Application

The analogically adjustable SIRIUS 3RS10, 3RS11 temperature monitoring relays can be used in almost any application in which temperature overshoot or undershoot is not permitted, e.g. in the monitoring of set temperature limits and the output of alarm messages for:

- Motor and system protection
- Control cabinet temperature monitoring
- Freeze monitoring
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

Technical specifications

Type		3RS1000, 3RS1010	3RS1100, 3RS1101	3RS1020, 3RS1030	3RS1120, 3RS1121
Auxiliary circuit					
Rated operational currents I_e					
• AC-15/24 ... 250 V	A	3			
• DC-13 at					
- 24 V	A	1			
- 125 V	A	0.2			
- 250 V	A	0.1			
Measuring accuracy at 20 °C ambient temperature (T20)		< ± 5% of full-scale value			
Reference point accuracy	K	--	< ± 5	--	< ± 5
Deviations due to ambient temperature In % of the measuring range		< 2	< 3	< 2	< 3
Hysteresis settings					
• For temperature 1	%	2 ... 20 from upper limit of scale			
• For temperature 2	%	5 from upper limit of scale			
Sensor circuit					
Typical sensor current					
• Pt100	mA	1	--	1	--
Open-circuit detection		No			
Short-circuit detection		No			
Three-wire conductor connection[1]		Yes	--	Yes	--
Enclosure					
Rated insulation voltage U_i (pollution degree 3)	V	300			

[1] Two-wire connection of resistance sensors with wire jumper between T2 and T3.

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, analogically adjustable for 1 sensor

Selection and ordering data

- For temperature monitoring with resistance sensors or thermocouples
- Temperature range -55 °C to +1 000 °C, depending on the sensor type
- Wide voltage range versions are electrically separated
- Analogically adjustable, setting accuracy ± 5%
- Versions with 2 separately adjustable threshold values and adjustable open/closed-circuit principle
- Hysteresis for threshold value 1 is adjustable (2 to 20%), hysteresis for threshold value 2 is non-adjustable (5%)
- 1 NC + 1 NO for versions with one threshold value
- 1 CO for threshold value 1 and 1 NO for threshold value 2

PU (UNIT, SET, M) = 1
PS* = 1 unit

	Sensors	Function	Measuring range	Rated control supply voltage U_S 50/60 Hz AC	SD	Screw terminals	SD	Spring-type terminals
			°C	V	d	Article No. / Price per PU	d	Article No. / Price per PU
Analogically adjustable, 1 threshold value, width 22.5 mm; closed-circuit principle; without memory; 1 NO + 1 NC								
3RS1000-1CD10	Pt100 (resistance sensor)	Overshoot	- 50 … + 50	24 AC/DC	10	**3RS1000-1CD00**	10	**3RS1000-2CD00**
				110/230 AC	10	**3RS1000-1CK00**	10	**3RS1000-2CK00**
			0 … + 100	24 AC/DC	10	**3RS1000-1CD10**	10	**3RS1000-2CD10**
				110/230 AC	2	**3RS1000-1CK10**	2	**3RS1000-2CK10**
			0 … + 200	24 AC/DC	10	**3RS1000-1CD20**	10	**3RS1000-2CD20**
				110/230 AC	2	**3RS1000-1CK20**	10	**3RS1000-2CK20**
		Undershoot	- 50 … + 50	24 AC/DC	10	**3RS1010-1CD00**		--
				110/230 AC	10	**3RS1010-1CK00**		--
			0 … + 100	24 AC/DC	10	**3RS1010-1CD10**		--
				110/230 AC	10	**3RS1010-1CK10**		--
			0 … + 200	24 AC/DC	10	**3RS1010-1CD20**		--
				110/230 AC	10	**3RS1010-1CK20**		--
3RS1000-2CD10	Type J (thermo-couple)	Overshoot	0 … + 200	24 AC/DC	10	**3RS1100-1CD20**	10	**3RS1100-2CD20**
				110/230 AC	10	**3RS1100-1CK20**		--
			0 … + 600	24 AC/DC	10	**3RS1100-1CD30**		--
				110/230 AC	10	**3RS1100-1CK30**		--
	Type K (thermo-couple)	Overshoot	0 … + 200	24 AC/DC	10	**3RS1101-1CD20**		--
				110/230 AC	10	**3RS1101-1CK20**		--
			0 … + 600	24 AC/DC	10	**3RS1101-1CD30**		--
				110/230 AC	10	**3RS1101-1CK30**		--
			+ 500 … + 1 000	24 AC/DC	10	**3RS1101-1CD40**		--
				110/230 AC	10	**3RS1101-1CK40**		--
Analogically adjustable for warning and disconnection (2 threshold values), 22.5 mm width; open/closed-circuit principle switchable; without memory; 1 NO + 1 CO								
3RS1020-1DD00	Pt100 (resistance sensor)	Overshoot	- 50 … + 50	24 AC/DC	10	**3RS1020-1DD00**		--
				24 … 240 AC/DC	10	**3RS1020-1DW00**		--
			0 … + 100	24 AC/DC	10	**3RS1020-1DD10**		--
				24 ... 240 AC/DC	10	**3RS1020-1DW10**		--
			0 … + 200	24 AC/DC	10	**3RS1020-1DD20**		--
				24 ... 240 AC/DC	2	**3RS1020-1DW20**	10	**3RS1020-2DW20**
		Undershoot	-50 … + 50	24 AC/DC	10	**3RS1030-1DD00**		--
				24 ... 240 AC/DC	10	**3RS1030-1DW00**		--
			0 … + 100	24 AC/DC	10	**3RS1030-1DD10**		--
				24 ... 240 AC/DC	10	**3RS1030-1DW10**		--
			0 … + 200	24 AC/DC	10	**3RS1030-1DD20**	10	**3RS1030-2DD20**
				24 ... 240 AC/DC	10	**3RS1030-1DW20**		--
3RS1120-2DD20	Type J (thermo-couple)	Overshoot	0 … + 200	24 AC/DC	10	**3RS1120-1DD20**	10	**3RS1120-2DD20**
				24 ... 240 AC/DC	10	**3RS1120-1DW20**		--
			0 … + 600	24 AC/DC	10	**3RS1120-1DD30**		--
				24 ... 240 AC/DC	10	**3RS1120-1DW30**		--
	Type K (thermo-couple)	Overshoot	0 ... + 200	24 ... 240 AC/DC	10	**3RS1121-1DW20**		--
			0 ... + 600	24 ... 240 AC/DC	10	**3RS1121-1DW30**		--
			+ 500 … + 1 000	24 AC/DC	10	**3RS1121-1DD40**		--

For accessories, see page 12/14.

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, digitally adjustable for 1 sensor

Overview

SIRIUS 3RS digital temperature monitoring relay for 1 sensor

The 3RS10, 3RS11, 3RS20 and 3RS21 temperature monitoring relays can be used for measuring temperatures in solid, liquid and gas media. The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored for overshoot, undershoot or location within a specified range (window function). The 3RS10 and 3RS11 units indicate the measured temperature in °C, the 3RS20 and 3RS21 units in °F.

The units are also an excellent alternative to temperature controllers in the low-end performance range (two- or three-point control).

Benefits

- Very simple operation without complicated menu selections
- Two- or three-point control can be parameterized quickly
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The temperature monitoring relays can be used in almost any application in which temperature overshoot or undershoot is not permitted, e.g. in the monitoring of set temperature limits and the output of alarm messages for:

- Plant and environment protection
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Temperature limits for district heating plants
- Exhaust temperature monitoring
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

Technical specifications

Type		3RS1040, 3RS1042, 3RS2040	3RS1140, 3RS2140	3RS1142
Auxiliary circuit				
Rated operational currents I_e				
• AC-15/24 ... 250 V	A	3		
• DC-13 at:				
- 24 V	A	1		
- 125 V	A	0.2		
- 250 V	A	0.1		
Evaluation unit				
Measuring accuracy at 20 °C ambient temperature (T20)		< ± 2 K, ± 1 digit	< ± 5 K, ± 1 digit	< ± 7 K, ± 1 digit
Reference point accuracy		--	< ± 5 K	
Deviations due to ambient temperature In % of measuring range	%	0.05 °C per K deviation from T20		
Measuring cycle	ms	500		
Hysteresis settings for temperature	K	1 ... 99, for both values		
Adjustable delay time	s	0 ... 999		
Sensor circuit				
Typical sensor current				
• Pt100	mA	1	--	--
• Pt1000/KTY83/KTY84/NTC	mA	0.2	--	--
Open-circuit detection		Yes[1]	Yes	Yes
Short-circuit detection		Yes	No	No
Three-wire conductor connection		Yes[2]	--	--
Enclosure				
Rated insulation voltage U_i (pollution degree 3)	V AC	300		

[1] Not for NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

[2] Two-wire connection of resistance sensors with wire jumper between T2 and T3.

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, digitally adjustable for 1 sensor

Selection and ordering data

- For temperature monitoring with resistance sensors or thermocouples
- Temperature range dependent on sensor type
- Wide voltage range versions are electrically separated
- Non-volatile
- Short-circuit and open-circuit detection in sensor circuit
- Digitally adjustable, with illuminated LCD
- Overshoot, undershoot or range monitoring adjustable
- Exact sensor type can be set
- 2 separately adjustable threshold values
- 1 hysteresis applies to both thresholds (0 to 99 K)
- 1 delay time applies to both thresholds (0 to 999 s)
- Adjustable open/closed-circuit principle
- Adjustable Manual/remote RESET
- Permanent display of actual value in °C or °F and tripping state
- 1 CO contact each per threshold value
- 1 NO for sensor monitoring

PU (UNIT, SET, M) = 1
PS* = 1 unit

	Sensors	Measuring range (measuring range limit depends on the sensor)	Rated control supply voltage U_s 50/60 Hz AC	SD	Screw terminals		SD	Spring-type terminals	
			V	d	Article No.	Price per PU	d	Article No.	Price per PU
Temperature monitoring relay, digitally adjustable, 2 threshold values, width 45 mm, 1 CO + 1 CO + 1 NO, memory function possible with external jumper, device parameters are non-volatile									
3RS1040-1GD50	Pt100/1000; KTY83/84; NTC (resistance sensors)[1]	- 50 … + 500 °C	24 AC/DC	2	**3RS1040-1GD50**		2	**3RS1040-2GD50**	
			24 ... 240 AC/DC	2	**3RS1040-1GW50**		2	**3RS1040-2GW50**	
		- 58 … + 932 °F	24 AC/DC	10	**3RS2040-1GD50**		10	**3RS2040-2GD50**	
			24 ... 240 AC/DC	10	**3RS2040-1GW50**		10	**3RS2040-2GW50**	
3RS1040-2GW50	TYPE J, K, T, E, N (thermocouple)	- 99 … + 999 °C	24 AC/DC	2	**3RS1140-1GD60**		10	**3RS1140-2GD60**	
			24 ... 240 AC/DC	2	**3RS1140-1GW60**		10	**3RS1140-2GW60**	
		- 99 … + 1 830 °F	24 AC/DC	10	**3RS2140-1GD60**		15	**3RS2140-2GD60**	
			24 ... 240 AC/DC	10	**3RS2140-1GW60**		15	**3RS2140-2GW60**	
Temperature monitoring relay, digitally adjustable, 2 threshold values, width 45 mm, 1 CO + 1 CO + 1 NO, tripping state and device parameters are non-volatile									
	Pt100/1000; KTY83/84; NTC (resistance sensors)[1]	- 50 … + 750 °C	24 AC/DC	10	**3RS1042-1GD70**		10	**3RS1042-2GD70**	
			24 ... 240 AC/DC	2	**3RS1042-1GW70**		10	**3RS1042-2GW70**	
	TYPE J, K, T, E, N, R, S, B (thermocouple)	- 99 … +1 800 °C	24 AC/DC	10	**3RS1142-1GD80**		10	**3RS1142-2GD80**	
			24 ... 240 AC/DC	2	**3RS1142-1GW80**		10	**3RS1142-2GW80**	

[1] NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

For accessories, see page 12/14.

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, digitally adjustable for up to 3 sensors

Overview

SIRIUS 3RS digital temperature monitoring relay for up to 3 sensors

The 3RS10, 3RS20 temperature monitoring relays can be used for measuring temperatures in solid, liquid and gas media. The temperature is detected by the sensor in the medium, evaluated by the device and monitored for overshoot or undershoot or for staying within an operating range (window function). The 3RS10 units indicate the measured temperature in °C, the 3RS20 units in °F. The evaluation unit can evaluate up to 3 resistance sensors at the same time and is specially designed for monitoring motor windings and bearings.

Benefits

- Very simple operation without complicated menu selections
- Space-saving with 45 mm width
- Two- or three-point control can be parameterized quickly
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The 3RS10, 3RS20 temperature monitoring relays can be used in almost any application in which several temperatures have to be monitored simultaneously for overshoot or undershoot or within a range.

Monitoring of set temperature limits and output of alarm messages for:

- Plant and environment protection
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

Technical specifications

Type		3RS1041, 3RS2041
Auxiliary circuit		
Rated operational currents I_e		
• AC-15/24 ... 250 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
DIAZED fuse protection		
• Operational class gG	A	4
Evaluation unit		
Measuring accuracy at 20 °C ambient temperature (T20)		< ± 2 K, ± 1 digit
Deviations due to ambient temperature In % of measuring range	%	0.05 per K deviation from T20
Measuring cycle	ms	500
Hysteresis settings for temperature 1		1 ... 99 K, for both values
Adjustable delay time	s	0 ... 999
Sensor circuit		
Typical sensor current		
• Pt100	mA	1
• Pt1000/KTY83/KTY84/NTC	mA	0.2
Open-circuit detection		Yes[1)]
Short-circuit detection		Yes
Three-wire conductor connection		Yes[2)]
Enclosure		
Rated insulation voltage U_i (pollution degree 3)	V AC	300

1) Not for NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

2) Two-wire connection of resistance sensors with wire jumper between T2 and T3.

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, digitally adjustable for up to 3 sensors

Selection and ordering data

- For temperature monitoring of solids, liquids, and gases
- For two- and three-conductor resistance sensors or thermocouples
- Temperature range dependent on sensor type
  - for 3RS10: - 50 to + 500 °C
  - for 3RS20: - 58 to + 932 °F
- Wide voltage range versions are electrically separated
- Non-volatile
- Short-circuit and open-circuit detection in sensor circuit
- Digitally adjustable, with illuminated LCD
- Overshoot, undershoot or range monitoring adjustable
- Exact sensor type and number of sensors can be set
- 2 separately adjustable threshold values
- 1 hysteresis; applies to both thresholds (0 to 99 K)
- 1 delay time; applies to both thresholds (0 to 999 s)
- Adjustable open-/closed-circuit principle
- With connectable and disconnectable error memory
- Permanent display of actual value in °C or °F and tripping state
- 1 CO contact each per threshold value
- 1 NO for sensor monitoring

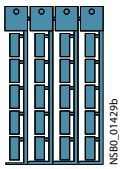
PU (UNIT, SET, M) = 1
PS* = 1 unit

	Sensors	Number of sensors	Measuring range (limit of measuring range dependent on sensor)	Rated control supply voltage U_s	SD	Screw terminals	SD	Spring-type terminals
				V	d	Article No. / Price per PU	d	Article No. / Price per PU
Motor monitoring relays, digitally adjustable for up to 3 sensors, width 45 mm; 1 CO + 1 CO + 1 NO								
3RS1041-1GW50	Pt100/1000; KTY83/84; NTC (resistance sensors)[1]	1 ... 3 sensors	-50 ... +500 °C	24 ...240 AC/DC	2	**3RS1041-1GW50**	2	**3RS1041-2GW50**
			-58 ... +932 °F	24 ...240 AC/DC	10	**3RS2041-1GW50**	15	**3RS2041-2GW50**

[1] NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

For accessories, see page 12/14.

Selection and ordering data

	Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Blank labels							
 3RT1900-1SB20	For 3RS10, 3RS11, 3RS20, 3RS21	**Unit labeling plates** For SIRIUS devices 20 mm x 7 mm, pastel turquoise	20	**3RT1900-1SB20**		100	340 units
	For 3RS10, 3RS11, 3RS20, 3RS21	**Adhesive labels** for SIRIUS devices • 19 mm x 6 mm, pastel turquoise	15	**3RT1900-1SB60**		100	3 060 units
		• 19 mm x 6 mm, zinc yellow	15	**3RT1900-1SD60**		100	3 060 units
Push-in lugs and covers							
3RP1903	For 3RS10, 3RS11, 3RS20, 3RS21	**Push-in lugs** For screw fixing, 2 units are required for each device	5	**3RP1903**		1	10 units
3RP1902	For 22.5 mm wide 3RS10, 3RS11, 3RS20, 3RS21	**Sealable covers** For securing against unauthorized adjustment of setting knobs	5	**3RP1902**		1	5 units
Tools for opening spring-type terminals							
3RA2908-1A	For auxiliary circuit connections	**Screwdrivers** 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	**Spring-type terminals** **3RA2908-1A**		1	1 unit

For matching sensors, see www.siemens.com/temperature

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

General data

Overview

SIRIUS 3RS14, 3RS15 temperature monitoring relay

More information
Homepage, see www.siemens.com/relays
Industry Mall, see www.siemens.com/product?3RS14

The temperature monitoring relays for IO-Link are used to measure temperatures in solid, liquid and gas media.

The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored up to two limit values for overshooting or undershooting a working range (window function).

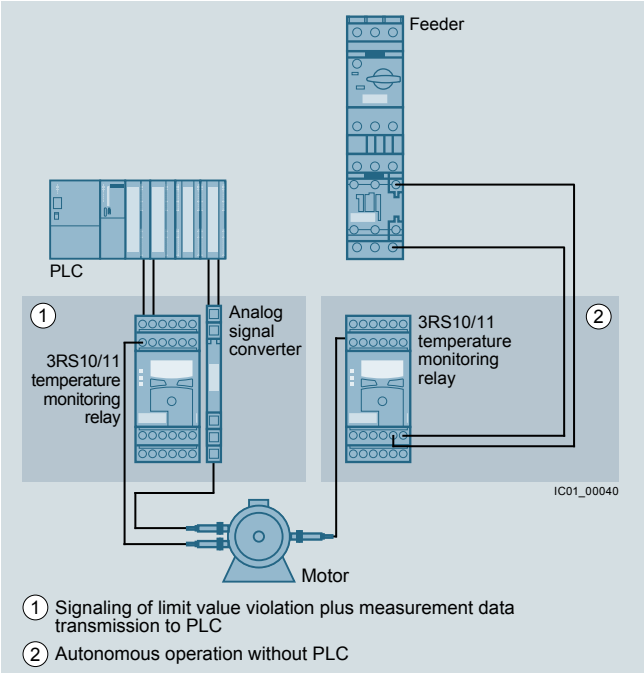
In addition to warnings and disconnection in case of temperature deviations, the devices can also be used as a temperature controller (one-point, two-point or three-point control).

The devices differ from one another in terms of the type and number of connectable temperature sensors.

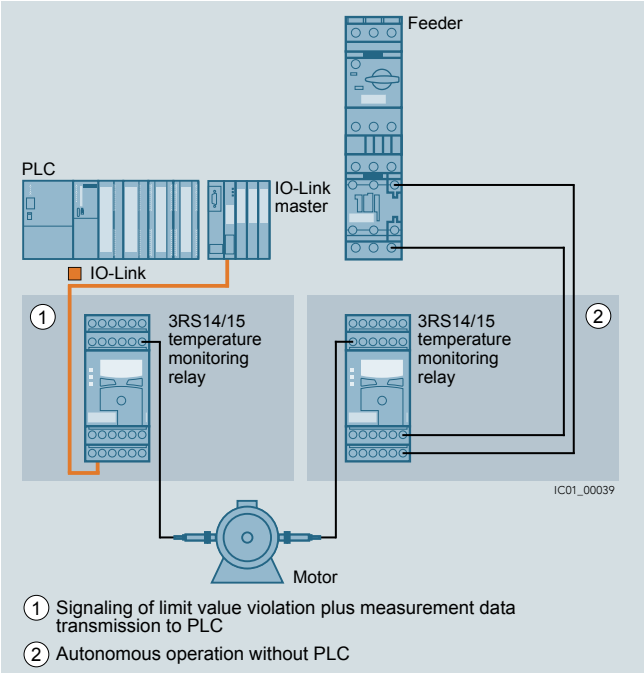
- 3RS14: Connection for resistance sensor
- 3RS15: Connection for thermocouples

Function	Temperature monitoring relays		
	3RS1440	3RS1441	3RS1540
Connectable sensor type			
Number of sensors monitored	1	3	1
Resistance sensor	✓	✓	--
Thermocouples	--	--	✓
Temperature monitoring			
Temperature monitoring – overshoot	✓	✓	✓
Temperature monitoring – undershoot	✓	✓	✓
Number of adjustable limit values	2	2	2

✓ Function supported
-- Function not supported



Conventional temperature monitoring relays



Temperature monitoring relays for IO-Link

Notes:

Devices required for the communication via IO-Link:

- Consult Catalog ST 70 for any controller that supports IO-Link (e.g. ET 200SP with CPU or S7-1200), see www.support.industry.siemens.com

Each monitoring relay requires an IO-Link channel.

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.

Article No. scheme

Product versions		Article number									
Temperature monitoring relays		**3RS**	□	□	□	□	–	□	□	□	□	**0**
Device type	e.g. 14 = digitally adjustable, 1 sensor		□	□								
Version and type of sensor	e.g. 40 = one threshold value, Pt100/Pt1000, KTY83/KTY84, NTC				□	□						
Connection type	Screw terminals							**1**				
	Spring-type terminals (push-in)							**2**				
Number and type of outputs	e.g. H = 1 CO								□			
Control supply voltage	e.g. B = 24 V DC									□		
Measuring range	e.g. 5 = -50 ... +750 °C										□	
Example		**3RS**	**1**	**4**	**4**	**0**	**–**	**1**	**H**	**B**	**5**	**0**

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.

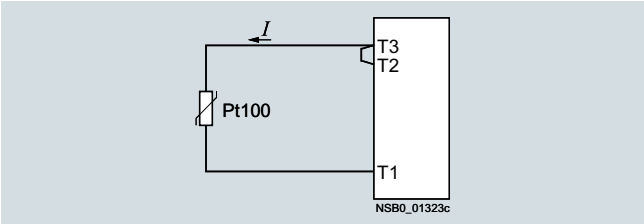
Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16370/td Manual and internal circuit diagrams, see https://support.industry.siemens.com/cs/ww/en/view/54375463	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16370/faq

Connection for resistance sensors

Two-wire measurement

When two-wire temperature sensors are used, the resistances of the sensor and wiring are added. The resulting systematic error must be taken into account when the signal evaluation unit is calibrated. A jumper must be clamped between terminals T2 and T3 for this purpose.



Wiring errors

The errors that are generated by the wiring comprise approximately 2.5 K/ . If the resistance of the cable is not known and cannot be measured, the wiring errors can also be estimated using the following table.

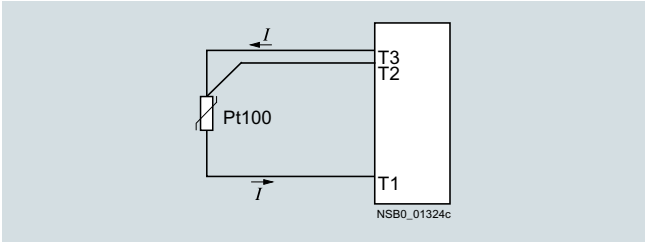
Temperature drift dependent on the length and cross-section of the cable with Pt100 sensors and an ambient temperature of 20 °C, in K:

Cable length in m	Cross-section mm²			
	0.5	0.75	1	1.5
	Temperature drift in K:			
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

Example: On a Pt100 sensor with a cable length of 10 m and a conductor cross-section of 1 mm^2 the temperature drift equals 0.9 K.

Three-wire measurement

To minimize the effects of the line resistances, a three-wire circuit is often used. Using the additional cable, two measuring circuits can be formed of which one is used as a reference. The signal evaluation unit can then automatically calculate the line resistance and take it into account.



Connection of thermocouples

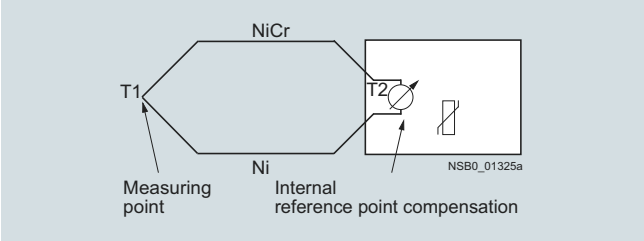
Based on the thermo-electrical effect, a differential temperature measurement will be performed between the measuring point and the signal evaluation unit.

This principle assumes that the signal evaluation unit knows the temperature at the clamping point (T2). For this reason, the 3RS15 temperature monitoring relay has an integral compensator that determines this comparison temperature and builds it into the result of the measurement. The thermal sensors and cables must be insulated therefore.

The absolute temperature is therefore calculated from the ambient temperature of the signal evaluation unit and the temperature difference measured by the thermocouple.

Temperature detection is therefore possible (T1) without needing to know the precise ambient temperature of the clamping point at the signal evaluation unit (T2).

The connecting cable is only permitted to be extended using connecting leads that are made from the same material as the thermocouple. If a different type of conductor is used, an error will result in the measurement.



Principle of operation

When the temperature has reached the set upper limit value ϑ1, the K1 output relay changes its switching state after the configured time *t* has expired. The delay time can be adjusted. The K2 output relay responds in the same manner to the lower limit value of ϑ2.

The output relays return immediately to their original state (the RESET response is configured at Auto RESET) once the temperature reaches the respective hysteresis value.

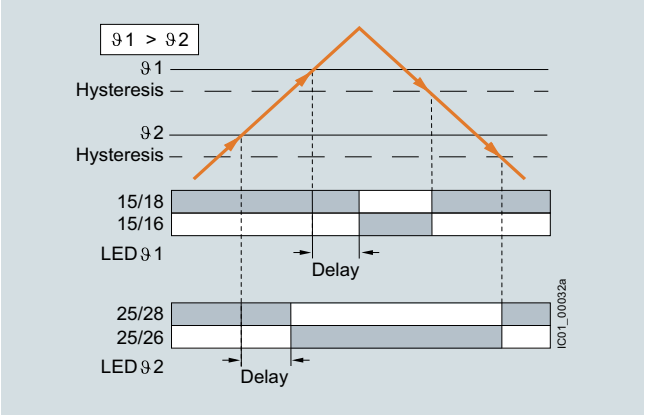
Both thresholds ϑ1 and ϑ2 can be parameterized for overshooting or undershooting. This makes it possible to use a limit value for issuing an alarm signal to announce that a limit value is about to be overshot or undershot. The other limit value can be used for disconnection or to implement two-point or three-point control.

Note:

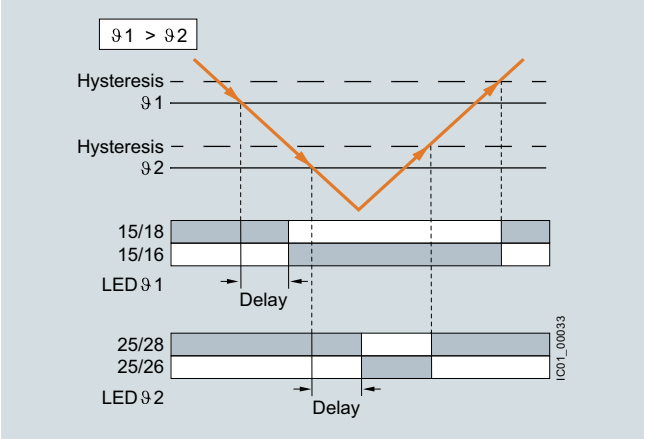
The "Temperature monitoring mode" parameter can be used to set the desired type of monitoring (monitoring for overshooting or undershooting or range monitoring).

With the closed-circuit principle selected

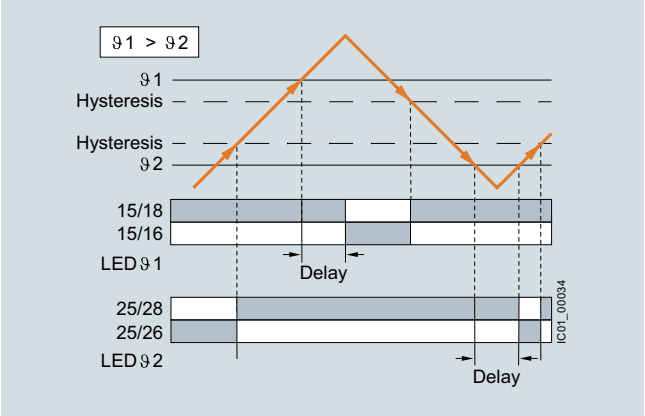
Temperature overshoot



Temperature undershoot



Range monitoring



Memory function

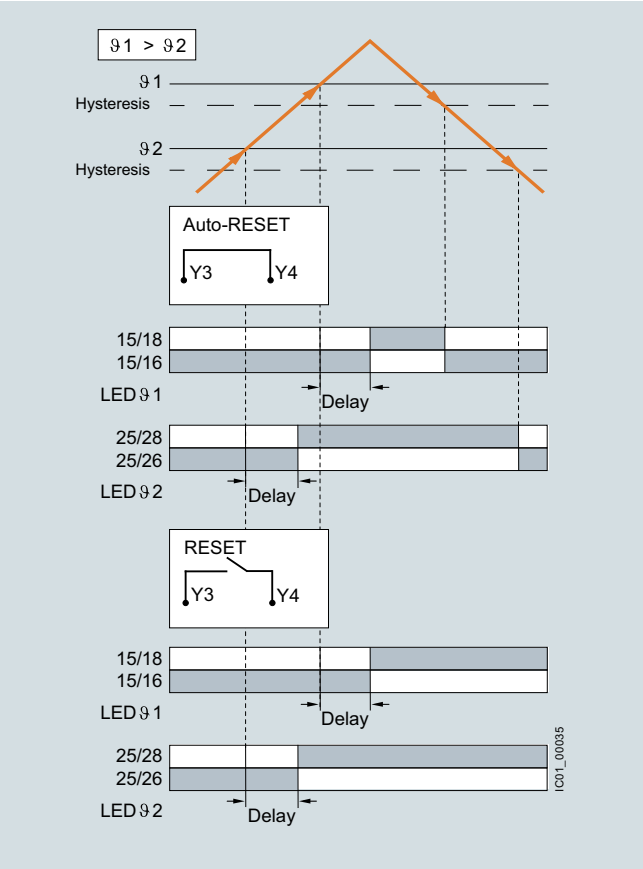
The digitally adjustable temperature monitoring relays for IO-Link have a memory function. The memory function is illustrated below by the example of a temperature overshoot.

When the temperature has reached the set limit value ϑ1, the output relay K1 changes its switching state after the configured time *t* has expired (output relay K2 responds to ϑ2 in the same way).

The temperature monitoring relays for IO-Link respond as described below:

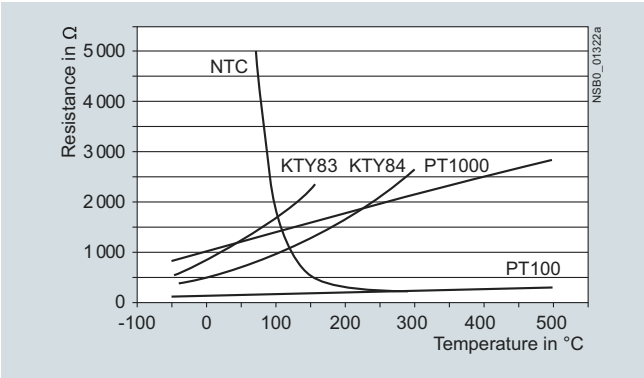
- With temperature monitoring relays for IO-Link the memory function is activated as standard (RESET). The output relays only return to the original state when the temperature falls below the set hysteresis value and when one of the following steps is performed:
  - Brief jumpering of the Y3/Y4 terminals
  - Set the rotary knob to "RUN" position and press the right-hand arrow key
  - Perform a RESET via IO-Link
- If the Y3/Y4 terminals are permanently jumpered, the memory function is deactivated (Auto RESET). The output relays return immediately to their original state once a previously occurred fault has been rectified and the temperature falls below the respective hysteresis value.

With the closed-circuit principle selected



Characteristic curves

For resistance sensors



The short-circuit and open-circuit detection as well as the measuring range is limited, depending on the sensor type. Measuring ranges for resistance sensors

Sensor type	Short circuit	Open circuit	3RS1440, 3RS1441	
			Measuring range in °C	Measuring range in °F
Pt100	✓	✓	-50 ... +750	-58 ... +1 382
Pt1000	✓	✓	-50 ... +500	-58 ... +932
KTY83-110	✓	✓	-50 ... +175	-58 ... +347
KTY84	✓	✓	-40 ... +300	-40 ... +572
NTC[1)]	✓	--	+80 ... +160	+176 ... +320

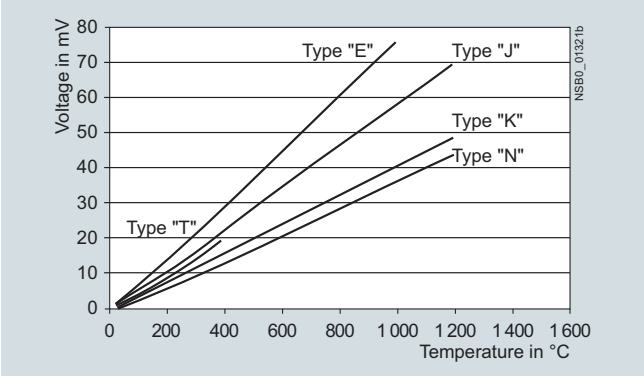
✓ Detection possible
-- Detection not possible

[1)] NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

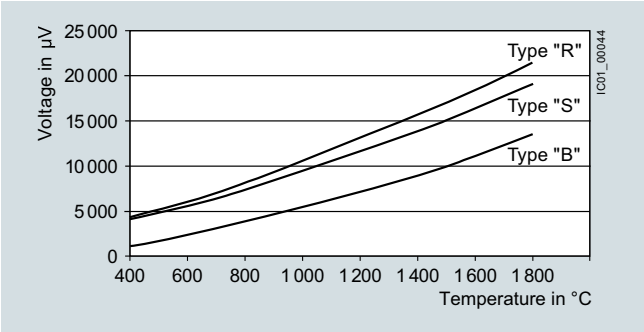
SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

General data

For thermocouples



Characteristic curves for sensor types K, N, J, E and T



Characteristic curves for sensor types S, R and B

Measuring ranges for thermocouples

Sensor type	Short circuit	Open circuit	3RS1540 Measuring range in °C	Measuring range in °F
K	--	✓	-99 ... +1 350	-146.2 ... +2 462
N	--	✓	-99 ... +1 300	-146.2 ... +2 372
J	--	✓	-99 ... +1 200	-146.2 ... +2 192
E	--	✓	-99 ... +999	-146.2 ... +1 830.2
T	--	✓	-99 ... +400	-146.2 ... +752
S	--	✓	0 ... 1 750	32 ... 3 182
R	--	✓	0 ... 1 750	32 ... 3 182
B	--	✓	400 ... 1 800	752 ... 3 272

✓ Detection possible
-- Detection not possible

Type			3RS14, 3RS15
General technical specifications			
Dimensions (W x H x D)			
• Screw terminals		mm	45 x 106 x 91
• Spring-type terminals		mm	45 x 108 x 91
Permissible ambient temperature			
• During operation		°C	-25 ... +60
Connection type			**Screw terminals**
• Terminal screw			M3 (for standard screwdriver, size 2 and Pozidriv 2)
• Solid		mm^2	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)
• Finely stranded with end sleeve		mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)
• Tightening torque		Nm	0.8 … 1.2
Connection type			**Spring-type terminals**
• Solid		mm^2	2 x (0.25 ... 1.5)
• Finely stranded, with end sleeve acc. to DIN 46228		mm^2	2 x (0.25 ... 1.5)
• Finely stranded		mm^2	2 x (0.25 ... 1.5)
• AWG cables, solid or stranded		AWG	2 x (24 ... 16)

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for 1 sensor

Overview

SIRIUS 3RS1440 digital monitoring relay for 1 sensor

The 3RS14 and 3RS15 temperature monitoring relays for IO-Link are used to measure temperatures in solid, liquid and gas media. The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored for overshooting or undershooting a working range (window function). The digital temperature monitoring relays have two separately adjustable limit values, are non-volatile and can be operated as desired using the open- or closed-circuit principle.

The devices differ in terms of the number of temperature sensors which can be evaluated. The 3RS1440 and 3RS1540 for IO-Link temperature monitoring relays can be digitally adjusted for one sensor and represent an alternative to temperature controllers in the low-end range (two-point or three-point control).

The devices with two-point control can, for example, be used as a thermostat. The devices with three-point control can, for example, independently switch between heating and cooling.

The 3RS1441 temperature monitoring relays for IO-Link can be digitally adjusted to evaluate up to three resistance sensors at one time. The devices were designed specifically for monitoring motor windings and positions.

The temperature monitoring relays are powered through the control supply voltages IO-Link (L+) and ground (L-) or via an external 24 V DC power supply.

Monitoring

When the temperature has reached the set limit value $\vartheta 1$, the output relay K1 changes its switching state after the configured time *t* has expired (output relay K2 responds to $\vartheta 2$ in the same way). The delay time can be adjusted.

The output relays return immediately to their original state once the temperature reaches the respective hysteresis value.

When the temperature has reached the upper limit value $\vartheta 1$, the output relay K1 changes its switching state after the configured time *t* has expired. The output relay returns immediately to its original state once the temperature reaches the respective hysteresis value.

The K2 output relay responds in the same manner to the lower limit value of $\vartheta 2$. Both thresholds $\vartheta 1$ and $\vartheta 2$ can be parameterized for overshooting or undershooting. This makes it possible to use a limit value for issuing an alarm signal to announce that a limit value is about to be overshot or undershot.

Note:

The "Temperature monitoring mode" parameter can be used to set the desired type of monitoring (monitoring for overshooting or undershooting or range monitoring).

Benefits

- Very simple operation without complicated menu selections
- Two- or three-point control can be parameterized quickly
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The temperature monitoring relays can be used in almost any application in which temperature overshoot or undershoot is not permitted, e.g. in the monitoring of set temperature limits and the output of alarm messages for:

- Plant and environment protection
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Temperature limits for district heating plants
- Exhaust temperature monitoring
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for 1 sensor

Technical specifications

Type		3RS1440	3RS1540
Auxiliary circuit			
Rated operational currents I_e			
• AC-15/24 ... 250 V	A	3	
• DC-13 at			
- 24 V	A	1	
- 125 V	A	0.2	
- 250 V	A	0.1	
Evaluation unit			
Measuring accuracy at 20 °C ambient temperature (T20)		< ± 2 K, ± 1 digit	< ± 5 K, ± 1 digit
Reference point accuracy		--	< ± 5 K
Deviations due to ambient temperature In % of measuring range	%	0.05 °C per K deviation from T20	
Measuring cycle	ms	500	
Hysteresis settings for temperature	K	1 ... 99, for both values	
Adjustable delay time	s	0 ... 999.9	
Sensor circuit			
Typical sensor current			
• Pt100	mA	1	--
• Pt1000/KTY83/KTY84/NTC	mA	0.2	--
Open-circuit detection		✓[1]	✓
Short-circuit detection		✓	--
Three-wire conductor connection		✓[2]	--
Enclosure			
Rated insulation voltage U_i Pollution degree 2	V AC	300	

✓ Available

-- Not available

1) Not for NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

2) Two-wire connection of resistance sensors with wire jumper between T2 and T3.

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for 1 sensor

Selection and ordering data

- To monitor temperatures with a resistance sensor or thermocouple
- Temperature range dependent on sensor type
  - 99 to + 1 800 °C or - 146.2 to + 3 272 °F
- Short-circuit and open-circuit detection in sensor circuit
- 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
- Exact sensor type can be set
- 2 limit values, can be adjusted separately
- Adjustable open-/closed-circuit principle
- Can be adjusted by Manual or remote RESET (via an external contact)
- Actual value, tripping state for control displayed and conveyed, adjustable in °C or °F
- 1 CO contact per limit value
- 1 CO contact for monitoring sensors and devices

PU (UNIT, SET, M) = 1
PS* = 1 unit

3RS1440-1HB50

3RS1540-1HB80

3RS1440-2HB50

3RS1540-2HB80

Sensors	Measuring range (limit of measuring range dependent on sensor)	Adjustable hysteresis for ϑ1 and ϑ2	Tripping delay time adjustable for ϑ1 and ϑ2 DELAY	Supply voltage U_s	SD	Screw terminals	SD	Spring-type terminals
						Article No. / Price per PU		Article No. / Price per PU
		K	s	V DC	d		d	
Temperature monitoring relay, digitally adjustable for a sensor, non-volatile fault storage can be selected								
Pt100/Pt1000, KTY83/KTY84, NTC (resistance sensor)[1]	- 50 … + 750 °C or - 58 … +1 382 °F	0 ... 99	0 ... + 999.9	24	2	**3RS1440-1HB50**	2	**3RS1440-2HB50**
Type B, E, J, K, N, R, S, T (thermocouples)	- 99 … + 1 800 °C or - 146.2 … + 3 272 °F	0 ... 99	0 ... + 999.9	24	2	**3RS1540-1HB80**	2	**3RS1540-2HB80**

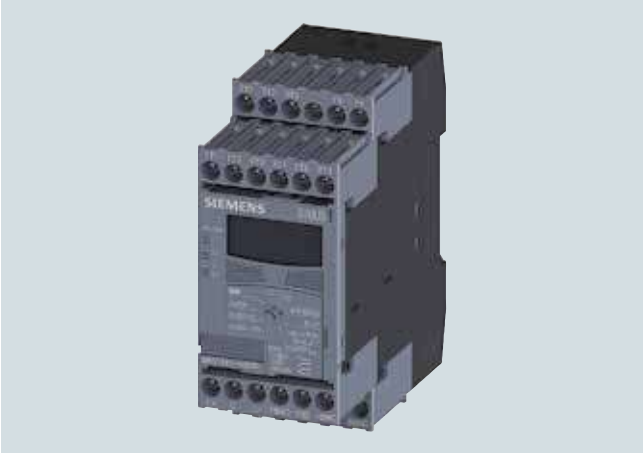
[1] NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

For accessories, see page 12/14.

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for up to 3 sensors

Overview



SIRIUS 3RS1441 digital temperature monitoring relay for up to 3 sensors

The 3RS14 temperature monitoring relays can be used to measure temperatures in solid, liquid and gas media. The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored for overshooting or undershooting a working range (window function).

The devices can be parameterized to indicate the measured temperature in °C or °F. The 3RS1441 evaluation unit can evaluate up to 3 resistance sensors at the same time.

Benefits

- Very simple operation without complicated menu selections
- Space-saving with 45 mm width
- Two- or three-point control can be parameterized quickly
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The 3RS1441 temperature monitoring relays can be used almost anywhere where several temperatures must be monitored at one time for overshooting, undershooting or staying within a certain range.

Monitoring of set temperature limits and output of alarm messages for:

- Plant and environment protection
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

Technical specifications

Type		3RS1441
Auxiliary circuit		
Rated operational currents I_e		
• AC-15/24 ... 250 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
DIAZED fuse protection		
• Operational class gG	A	4
Evaluation unit		
Measuring accuracy at 20 °C ambient temperature (T20)		< ±2 K, ±1 digit
Deviations due to ambient temperature In % of measuring range	%	0.05 per K deviation from T20
Measuring cycle	ms	500
Hysteresis settings for temperature 1	K	1 ... 99, for both values
Adjustable delay time	s	0 ... 999.9
Sensor circuit		
Typical sensor current		
• Pt100	mA	1
• Pt1000/KTY83/KTY84/NTC	mA	0.2
Open-circuit detection		✓[1]
Short-circuit detection		✓
Three-wire conductor connection		✓[2]
Enclosure		
Rated insulation voltage U_i Pollution degree 2	V AC	300

✓ Available

1) Not for NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

2) Two-wire connection of resistance sensors with wire jumper between T2 and T3.

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for up to 3 sensors

Selection and ordering data

- For temperature monitoring with up to 3 resistance sensors
- Temperature range dependent on sensor type
  - 50 to + 750 °C or - 58 to + 1 382 °F
- Short-circuit and open-circuit detection in sensor circuit
- 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
- Exact sensor type and number of sensors can be set
- 2 limit values, can be adjusted separately
- Adjustable open-/closed-circuit principle
- Can be adjusted by manual or remote RESET (via an external contact)
- Actual value, tripping state for control displayed and conveyed, adjustable in °C or °F
- 1 CO contact per limit value
- 1 CO contact for monitoring sensors and devices

PU (UNIT, SET, M) = 1
PS* = 1 unit

3RS1441-1HB50

3RS1441-2HB50

Sensors	Number of sensors that can be set	Measuring range (limit of measuring range dependent on sensor)	Adjustable hysteresis for ϑ1 and ϑ2	Tripping delay time adjustable for ϑ1 and ϑ2 DELAY	Supply voltage U_s	SD	Screw terminals	SD	Spring-type terminals
			K	s	V DC	d	Article No. / Price per PU	d	Article No. / Price per PU
Temperature monitoring relay, digitally adjustable for up to 3 sensors, non-volatile fault storage can be selected									
Pt100/Pt1000, KTY83/KTY84, NTC (resistance sensor)[1]	1 ... 3 sensors	-50 ... +750 °C or -58 ... +1 382 °F	0 ... 99	0 ... 999.9	24	2	**3RS1441-1HB50**	2	**3RS1441-2HB50**

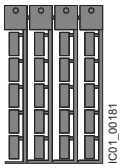
[1] NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

For accessories, see page 12/25.

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Accessories

Selection and ordering data

	Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Blank labels							
 3RT2900-1SB20	For 3RS14 and 3RS15	**Unit labeling plates** For SIRIUS devices					
		20 mm x 7 mm, titanium gray	20	**3RT2900-1SB20**		100	340 units
	For 3RS14 and 3RS15	**Adhesive labels** for SIRIUS devices					
		• 19 mm x 6 mm, pastel turquoise	15	**3RT1900-1SB60**		100	3 060 units
		• 19 mm x 6 mm, zinc yellow	15	**3RT1900-1SD60**		100	3 060 units
Push-in lugs and covers							
3RP1903	For 3RS14 and 3RS15	**Push-in lugs** For screw fixing, 2 units are required for each device	5	**3RP1903**		1	10 units
Tools for opening spring-type terminals							
3RA2908-1A	For auxiliary circuit connections	**Screwdrivers** For all SIRIUS devices with spring-type terminals		**Spring-type terminals**			
		3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit

For matching sensors, www.siemens.com/temperature.

Thermistor Motor Protection

3RN2

Overview

SIRIUS 3RN2 thermistor motor protection

More information

Homepage, see www.siemens.com/relays
Industry Mall, see www.siemens.com/product?3RN2
For the conversion tool, e.g. from 3RN1 to 3RN2, see 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.

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).

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.

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

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

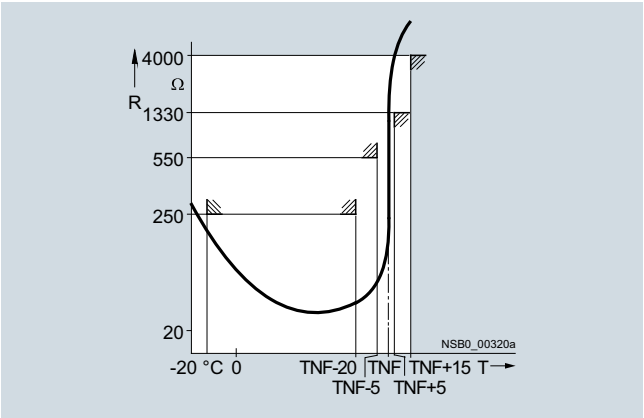
FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/24302/faq

For more information on explosion protection (ATEX), see www.siemens.com/sirius/atex

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, Thermoclick) 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.

⚠ 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 mm²	2 x 2800 m
1.5 mm²	2 x 1500 m
0.5 mm²	2 x 500 m

Maximum length of sensor circuit cables for evaluation units with short-circuit detection[1)]

Cable cross-section	3RN2011, 3RN2012, 3RN2013, 3RN2023
2.5 mm²	2 x 250 m
1.5 mm²	2 x 150 m
0.5 mm²	2 x 50 m

1) 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.

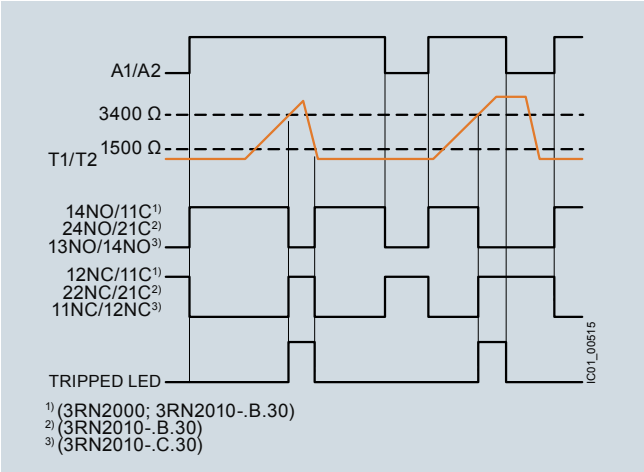
3RN2010, 3RN2011, 3RN2012 and 3RN2013 compact/standard evaluation units

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.

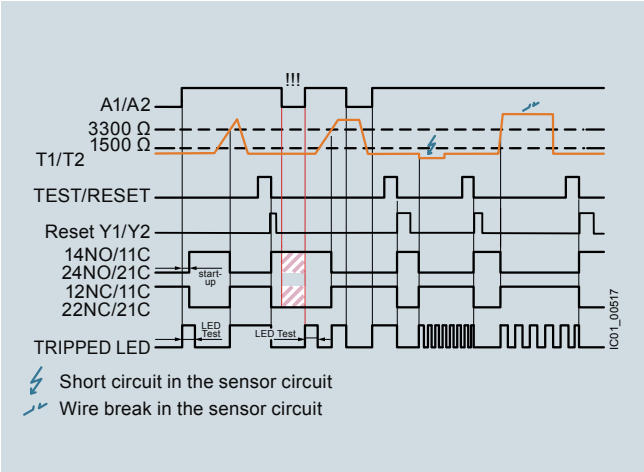
3RN2023 "warning and disconnection" evaluation units

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, T2) 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, T2) 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.

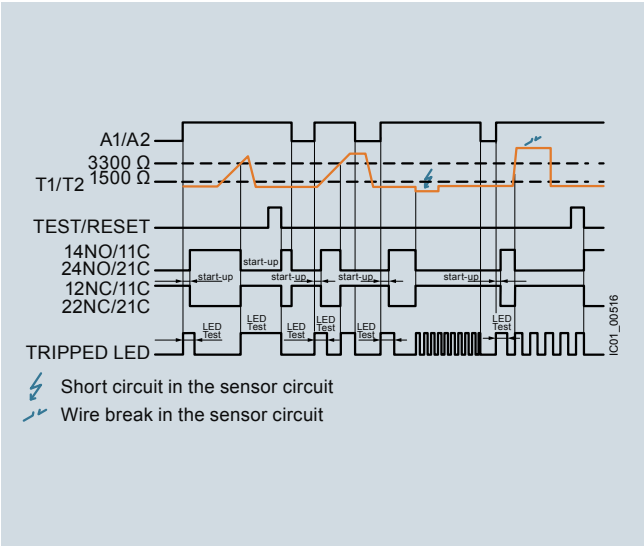
Function diagrams



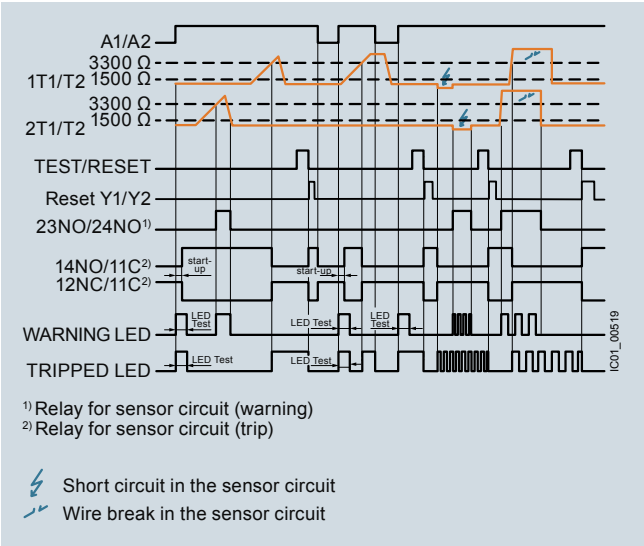
3RN2000, 3RN2010



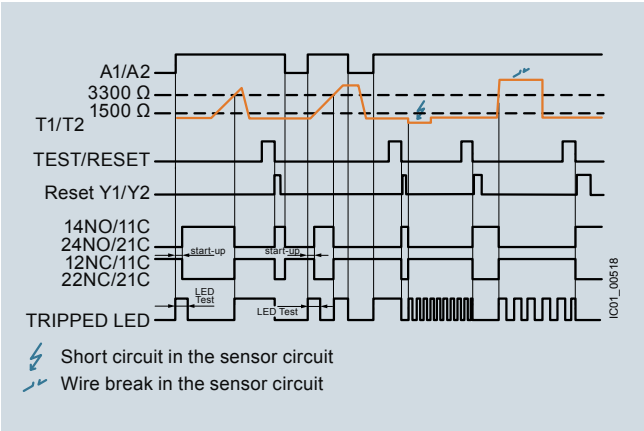
3RN2012-.BW31: resetting via the TEST/RESET button or external push-button



3RN2011: resetting via external pushbutton or interruption of the supply voltage



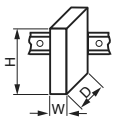
3RN2023: resetting via the TEST/RESET button or external pushbutton



3RN2012-.B.30, 3RN2013: resetting via the TEST/RESET button or external pushbutton

Thermistor Motor Protection

3RN2

Article number		3RN2000-.A, 3RN2010-.C	3RN201.-.B, 3RN2013-.G, 3RN2023-.D
Width x height x depth 	mm	17.5 x 100 x 90	22.5 x 100 x 90

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
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 • Mounting position • Installation altitude at height above sea level, maximum	 m	For screw-fixing and snap-on mounting to 35 mm standard mounting rail Any 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		1 500 ... 1 650			1 500 ... 1 550					
Thermistor resistance return value		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
Control circuit										
Current carrying capacity of the output relay										
• 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								
Thermal current of the non-solid-state contact blocks, maximum	A	5								
Continuous current of the output relay's DIAZED fuse link	A	6								
Supply voltage										
Control supply voltage										
• 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	
Operating range factor of the control supply voltage, rated value										
• 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
Type of electrical connection		**Screw terminals**	**Spring-type terminals (push-in)**
Tightening torque	Nm	0.6 ... 0.8	--
Type of connectable conductor cross-sections			
• Solid	mm^2	1x (0.5 ... 4.0 mm^2), 2x (0.5 ... 2.5 mm^2)	1x (0.5 ... 4 mm^2)
• Finely stranded with end sleeve	mm^2	1x (0.5 ... 4 mm^2), 2x (0.5 ... 1.5 mm^2)	1x (0.5 ... 2.5 mm^2)
• For AWG cables			
- Solid	AWG	1x (20 ... 12), 2x (20 ... 14)	1x (20 ... 12)
- Stranded	AWG	--	1x (20 ... 12)

Thermistor Motor Protection

3RN2

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 Manual RESET External RESET Error memory	2	0	0	AgSnO2	24 ... 240	24 ... 240	2	**3RN2012-□BW31**	1	1 unit
Standard evaluation unit with ATEX approval, open-circuit and short-circuit detection in the sensor circuit[1)]										
Manual RESET External RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	**3RN2011-□BA30**	1	1 unit
					24 ... 240	24 ... 240	2	**3RN2011-□BW30**	1	1 unit
Non-volatile[3)]										
Auto RESET Manual RESET External RESET Error memory	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	**3RN2012-□BA30**	1	1 unit
					24 ... 240	24 ... 240	2	**3RN2012-□BW30**	1	1 unit
Protective separation, non-volatile [2)3)]										
Auto RESET Manual RESET External RESET Error memory	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	**3RN2013-□BA30**	1	1 unit
					24 ... 240	24 ... 240	2	**3RN2013-□BW30**	1	1 unit
				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 [2)3)]										
Auto RESET Manual RESET External RESET Error memory	1	1	0	AgSnO2	24 ... 240	24 ... 240	2	**3RN2023-□DW30**	1	1 unit

Type of electrical connection

- Screw terminals **1**
- Spring-type terminals (push-in) **2**

1) For 3RN2011: The unit can be reset with the RESET button or by disconnecting the control supply voltage.

2) Protective separation up to 300 V acc. to DIN/VDE 0160, IEC 60947-1.

3) 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.

Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
Terminals for SIRIUS devices in the industrial standard mounting rail enclosure					
3ZY1122-1BA00	**Removable terminals**		**Screw terminals**		
	• 2-pole, up to 2 x 2.5 mm² or 1 x 4 mm²	2	**3ZY1122-1BA00**	1	6 units
			Spring-type terminals (push-in)		
	• 2-pole, up to 1 x 4 mm² or 2 x 1.5 mm²	2	**3ZY1122-2BA00**	1	6 units
Accessories for enclosures					
3ZY1311-0AA00	**Push-in lugs** For wall mounting	2	**3ZY1311-0AA00**	1	10 units
3ZY1440-1AA00	**Coding pins** 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", https://support.industry.siemens.com/cs/ww/en/ps/24302/man	2	**3ZY1440-1AA00**	1	12 units
Tools for opening spring-type terminals					
3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-type terminals		**Spring-type terminals (push-in)**		
	3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**	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

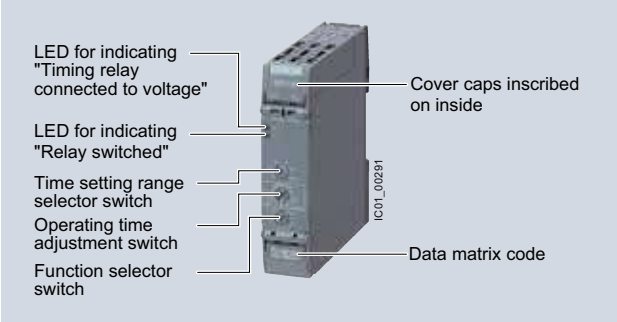
Wye-delta timing relay

- 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

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 2021 "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.

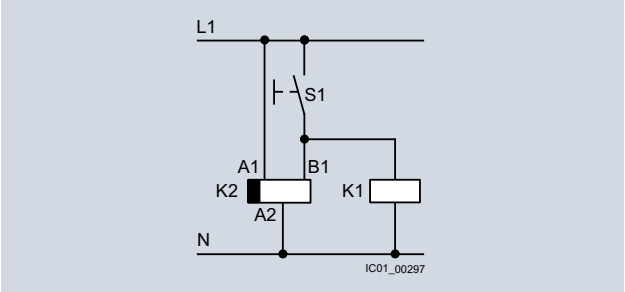
With a set of foil labels the timing relay can be legibly marked with the functions which can be selected on the timing relay. This is supplied together with the multifunctional timing relay.

The same potential must be applied to terminals A. and B.

Functions, see the overview of functions on page 12/37.

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

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.

Article No. scheme

Digit of the Article No.	1st - 5th	6th	7th		8th	9th	10th	11th	12th
	□□□□□	□	□	–	□	□	□	□	0
Timing relays in industrial enclosure 17.5 mm and 22.5 mm	**3 R P 25**								
Functions/time setting ranges		□	□						
Connection type					□				
Contacts						□			
Rated control supply voltage							□	□	
Example	**3 R P 25**	**0**	**5**	**–**	**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.

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

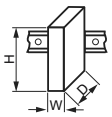
Timing relays are used in control, starting, and protective circuits for all switching operations involving time delays. They guarantee a high level of functionality and a high repeat accuracy of timer settings.

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.

Technical specifications

Type		3RP2505-.A, 3RP2505-.C, 3RP251., 3RP2525-.A, 3RP2527, 3RP253., 3RP255.	3RP2505-.B, 3RP2505-.R, 3RP2525-.B, 3RP254., 3RP256., 3RP257.
Width	mm	17.5	22.5
Height	mm	100	100
Depth	mm	90	90

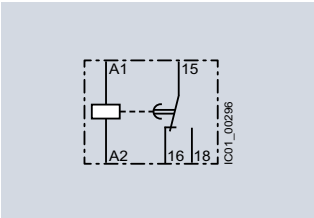


Type		3RP25..-.AB30, 3RP25..-.AW30, 3RP25..-.BB30, 3RP25..-.BW30, 3RP25..-.NW30, 3RP25..-.SW30	3RP25..-.BT20, 3RP25..-.NM20	3RP25..-.CW30	3RP25..-.EW30	3RP25..-.RW30
Insulation voltage For overvoltage category III According to IEC 60664 For pollution degree 3, rated value	V AC	300	500	300	--	300
Ambient temperature						
• During operation	°C	-25 ... +60				-40 ... +70
• During storage	°C	-40 ... +85				
Operating range factor Of the control supply voltage, rated value						
• At AC						
- At 50 Hz		0.85 ... 1.1				0.7 ... 1.1
- At 60 Hz		0.85 ... 1.1				0.7 ... 1.1
• At DC		0.85 ... 1.1	--	0.85 ... 1.1	0.85 ... 1.1	0.7 ... 1.1
Switching capacity current With inductive load	A	0.01 ... 3	0.01 ... 3	0.01 ... 1	0.01 ... 6	0.01 ... 3
Operational current of the auxiliary contacts						
• At AC-15						
- At 24 V	A	3	3	1	--	3
- At 250 V	A	3	3	1	--	3
- At 400 V	A	--	3	--	--	--
• At DC-12						
- At 24 V	A	--	--	1	--	--
- At 125 V	A	--	--	1	--	--
- At 250 V	A	--	--	1	--	--
• At DC-13						
- At 24 V	A	1	1	--	--	1
- At 125 V	A	0.2	0.2	--	--	0.2
- At 250 V	A	0.1	0.1	--	--	0.1
Uninterrupted thermal current I_{th}	A	5	5	1	0.6	5
Mechanical endurance	(Operating cycles) Typical	10×10^6				
Electrical endurance For AC-15 at 230 V, typical	(Operating cycles)	1×10^5				

Type		3RP25
Connection type		**Screw terminals**
• Design of thread of connection screw		M3
• Solid	mm^2	1 x (0.5 ... 4.0)/2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm^2	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
Connection type		**Spring-type terminals**
• Solid	mm^2	1 x (0.5 ... 4)
• Finely stranded with end sleeve	mm^2	1 x (0.5 ... 2.5)
• AWG cables, solid	AWG	1 x (20 ... 12)

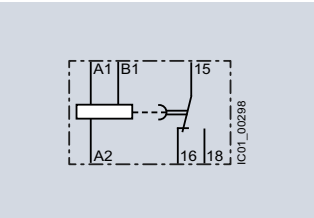
Internal circuit diagrams 3RP25

Multifunction 3RP2505-.A, 13 functions, 1 CO



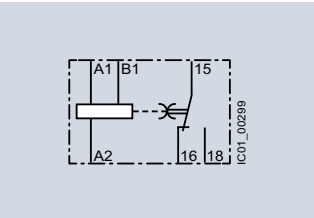
3RP2505-.A (A)

ON-delay



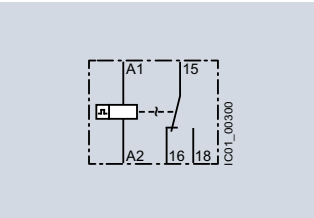
3RP2505-.A (B)

OFF-delay with control signal



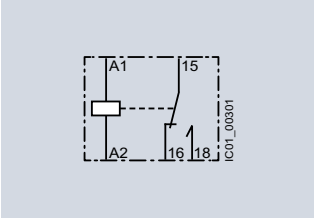
3RP2505-.A (C)

ON-delay/OFF-delay with control signal



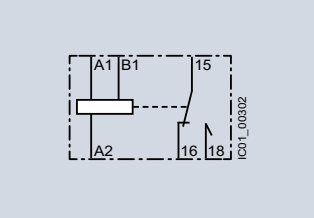
3RP2505-.A (D)

Flashing, symmetrical, starting with interval



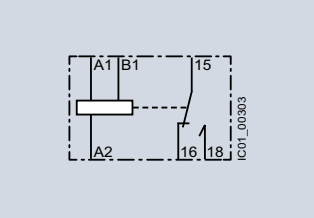
3RP2505-.A (E)

Passing make contact, interval relay



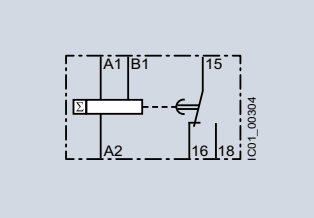
3RP2505-.A (F)

Retriggerable interval relay with deactivated control signal (passing break contact with control signal)



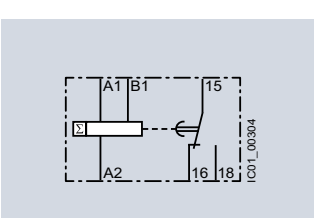
3RP2505-.A (G)

Passing make contact with control signal, not retriggerable (pulse-forming with control signal)



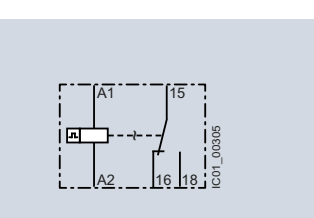
3RP2505-.A (H)

Additive ON-delay, instantaneous OFF with control signal



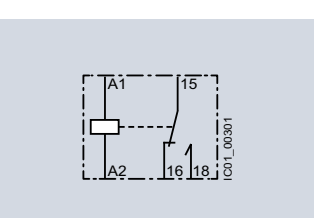
3RP2505-.A (I)

Additive ON-delay with control signal



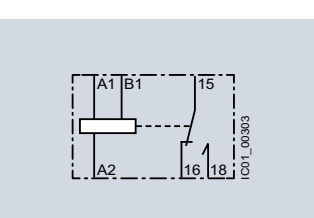
3RP2505-.A (J)

Flashing, symmetrical, starting with pulse



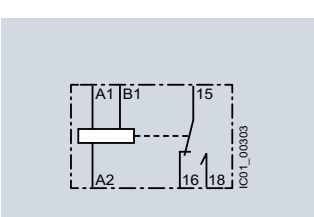
3RP2505-.A (K)

Pulse-delayed (fixed pulse (at 1 s) and settable pulse delay)



3RP2505-.A (L)

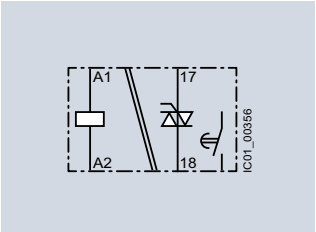
Pulse-delayed with control signal (fixed pulse (at 1 s) and settable pulse delay)



3RP2505-.A (M)

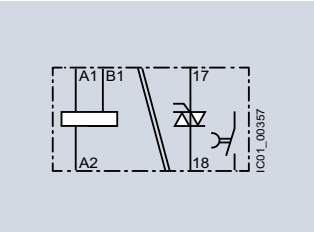
Retriggerable interval relay with activated control signal (watchdog)

Multifunction 3RP2505-.C, 13 functions, 1 NO (semiconductor)



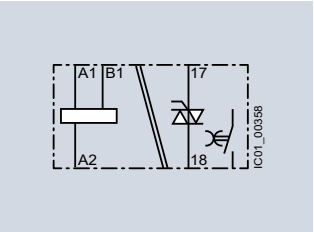
3RP2505-.C (A)

ON-delay



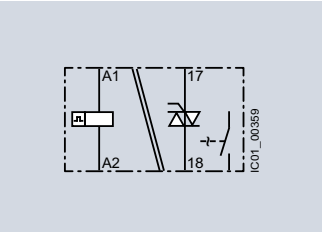
3RP2505-.C (B)

OFF-delay with control signal



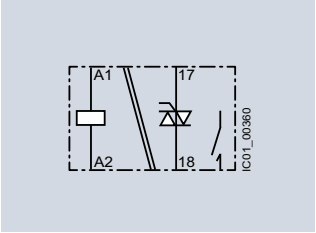
3RP2505-.C (C)

ON-delay/OFF-delay with control signal



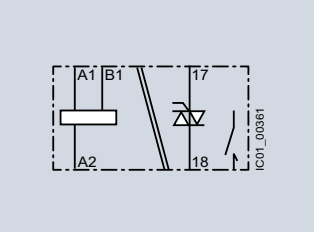
3RP2505-.C (D)

Flashing, symmetrical, starting with interval



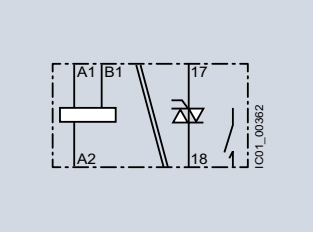
3RP2505-.C (E)

Passing make contact, interval relay



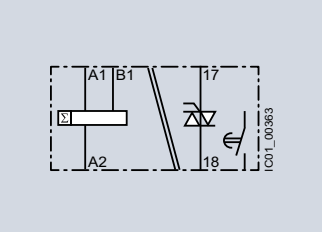
3RP2505-.C (F)

Retriggerable interval relay with deactivated control signal (passing break contact with control signal)



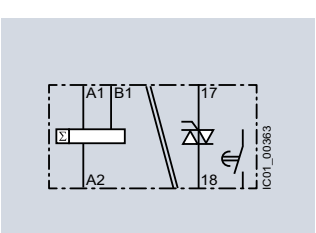
3RP2505-.C (G)

Passing make contact with control signal, not retriggerable (pulse-forming with control signal)



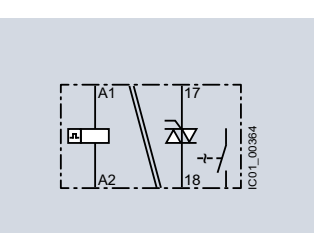
3RP2505-.C (H)

Additive ON-delay, instantaneous OFF with control signal



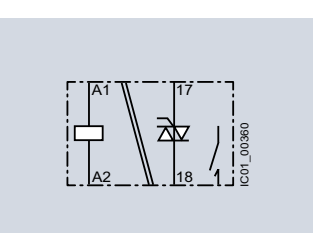
3RP2505-.C (I)

Additive ON-delay with control signal



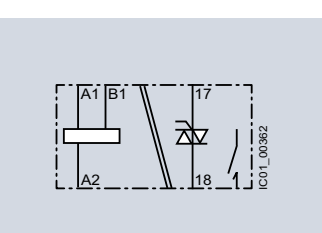
3RP2505-.C (J)

Flashing, symmetrical, starting with pulse



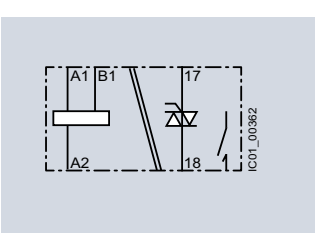
3RP2505-.C (K)

Pulse-delayed (fixed pulse (at 1 s) and settable pulse delay)



3RP2505-.C (L)

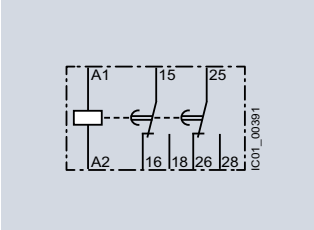
Pulse-delayed with control signal (fixed pulse (at 1 s) and settable pulse delay)



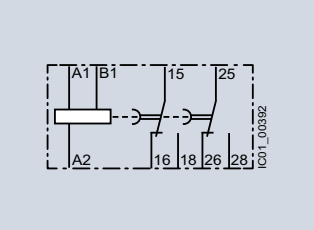
3RP2505-.C (M)

Retriggerable interval relay with activated control signal (watchdog)

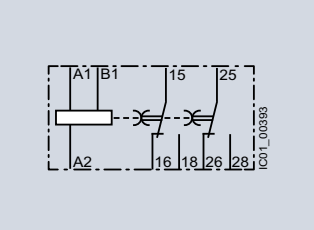
Multifunction 3RP2505-.B, 27 functions, 2 CO switched in parallel with delay/
multifunction 3RP2505-.R, 13 functions, 2 CO positively driven, and switched in parallel with delay (see also note below)



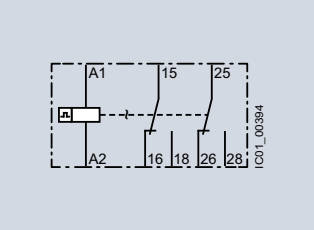
3RP2505-.B (A)
ON-delay



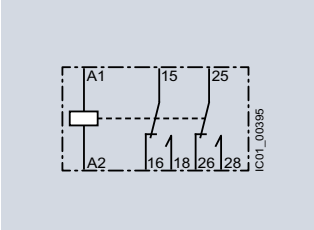
3RP2505-.B (B)
OFF-delay with control signal



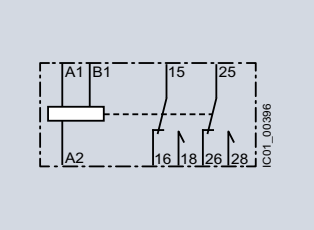
3RP2505-.B (C)
ON-delay/OFF-delay
with control signal



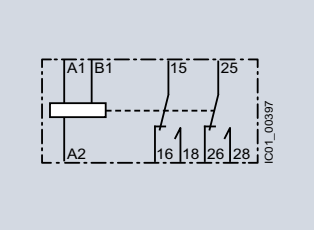
3RP2505-.B (D)
Flashing, symmetrical,
starting with interval



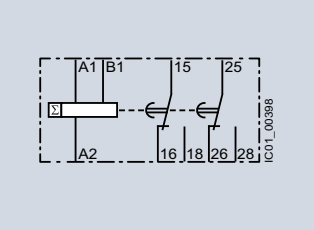
3RP2505-.B (E)
Passing make contact, interval relay



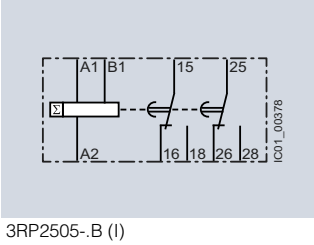
3RP2505-.B (F)
Retriggerable interval relay with
deactivated control signal (passing
break contact with control signal)



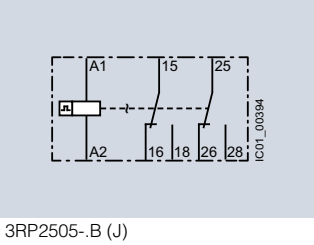
3RP2505-.B (G)
Passing make contact with
control signal, not retriggerable
(pulse-forming with control signal)



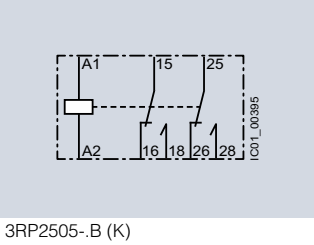
3RP2505-.B (H)
Additive ON-delay, instantaneous OFF
with control signal



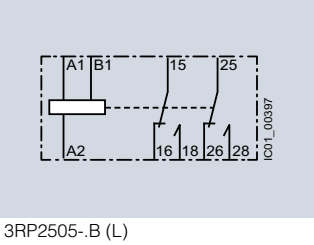
3RP2505-.B (I)
Additive ON-delay with control signal



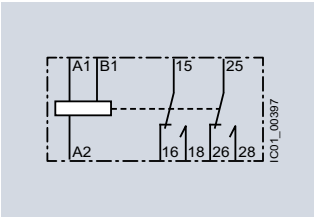
3RP2505-.B (J)
Flashing, symmetrical,
starting with pulse



3RP2505-.B (K)
Pulse-delayed (fixed pulse (at 1 s)
and settable pulse delay)

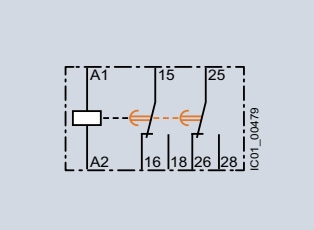


3RP2505-.B (L)
Pulse-delayed with control signal (fixed
pulse (at 1 s) and settable pulse delay)



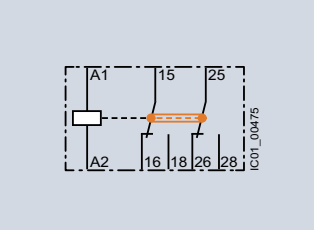
3RP2505-.B (M)
Retriggerable interval relay with
activated control signal (watchdog)

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)

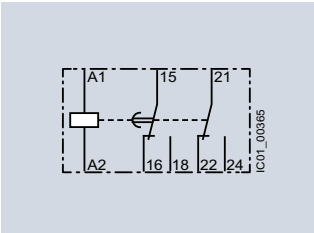
ON-delay



3RP2505-.R (A)
with positively driven contacts

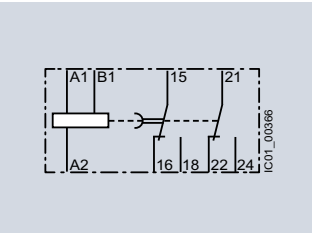
ON-delay

Multifunction 3RP2505-.B, 27 functions, 1 CO delayed + 1 CO instantaneous (continued)



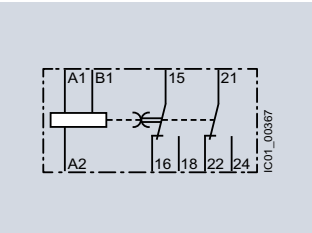
3RP2505-.B (A)

ON-delay and instantaneous contact



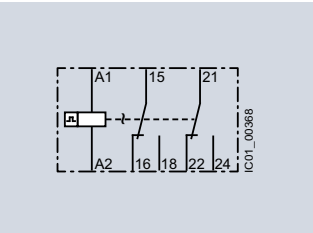
3RP2505-.B (B)

OFF-delay with control signal and instantaneous contact



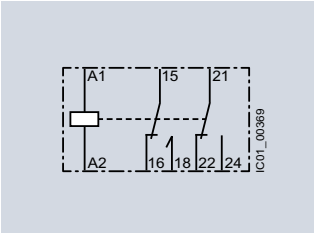
3RP2505-.B (C)

ON-delay/OFF-delay with control signal and instantaneous contact



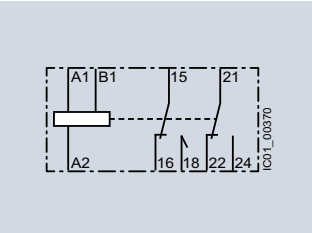
3RP2505-.B (D)

Flashing, symmetrical, starting with interval and instantaneous contact



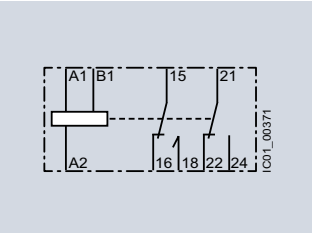
3RP2505-.B (E)

Passing make contact, interval relay and instantaneous contact



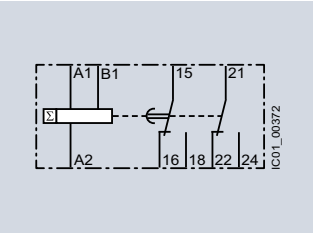
3RP2505-.B (F)

Retriggerable interval relay with deactivated control signal (passing break contact with control signal) and instantaneous contact



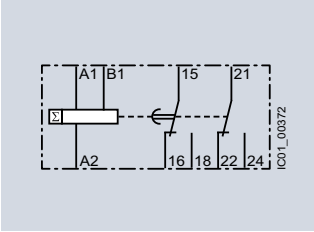
3RP2505-.B (G)

Passing make contact with control signal, not retriggerable (pulse-forming with control signal) and instantaneous contact



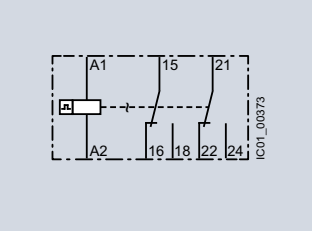
3RP2505-.B (H)

Additive ON-delay, instantaneous OFF with control signal and instantaneous contact



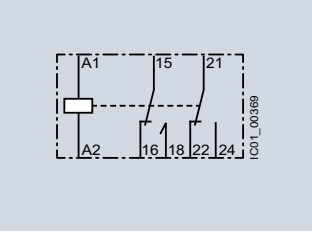
3RP2505-.B (I)

Additive ON-delay with control signal and instantaneous contact



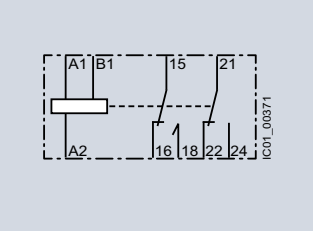
3RP2505-.B (J)

Flashing, symmetrical, starting with pulse and instantaneous contact



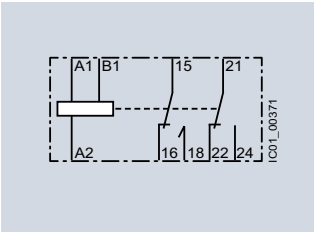
3RP2505-.B (K)

Pulse-delayed (fixed pulse (at 1 s) and settable pulse delay) and instantaneous contact



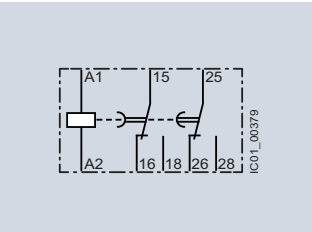
3RP2505-.B (L)

Pulse-delayed with control signal (fixed pulse (at 1 s) and settable pulse delay) and instantaneous contact



3RP2505-.B (M)

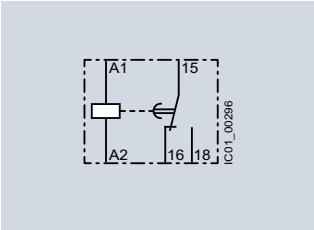
Retriggerable interval relay with activated control signal and instantaneous contact (watchdog)



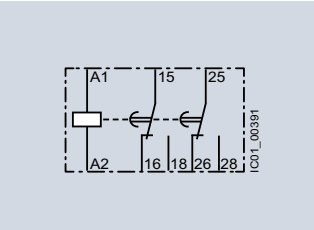
3RP2505-.B

Wye-delta function

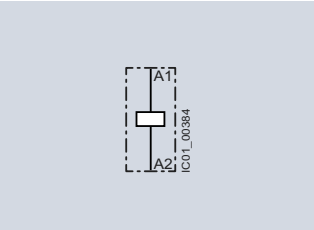
Monofunctions 3RP251. up to 3RP257.[1)]



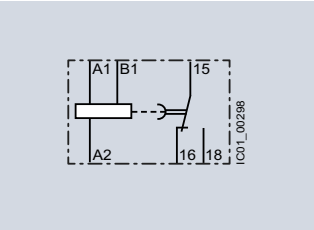
3RP251., 3RP2525-.A
ON-delay



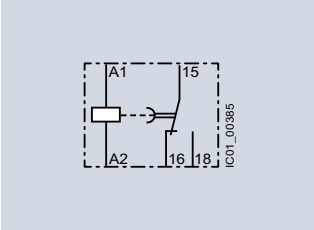
3RP2525-.B
ON-delay



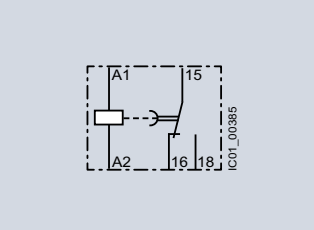
3RP2527
ON-delay, two-wire design



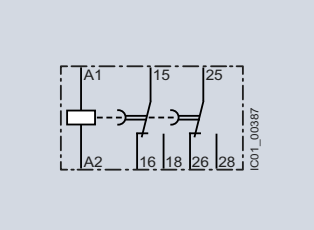
3RP2535
OFF-delay with control signal



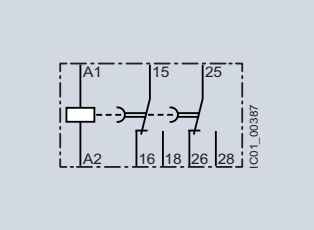
3RP2540-.A (N)[1)]
OFF-delay



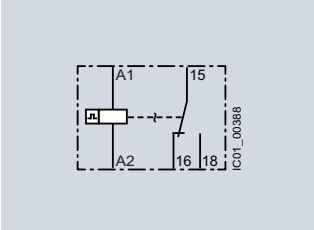
3RP2540-.A (O)[1)]
Positive passing make contact



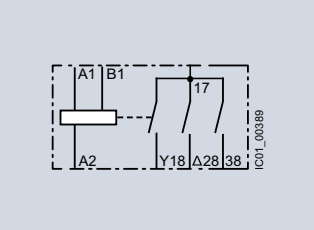
3RP2540-.B (N)[1)]
OFF-delay



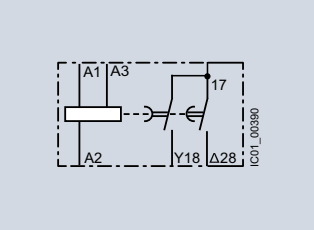
3RP2540-.B (O)[1)]
Positive passing make contact



3RP2555
Flashing, asymmetrical, starting with interval (clock-pulse relay)



3RP2560
Wye-delta function with overtravel function (idling)

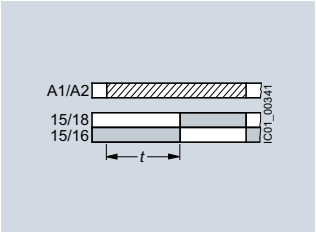


3RP257.
Wye-delta function

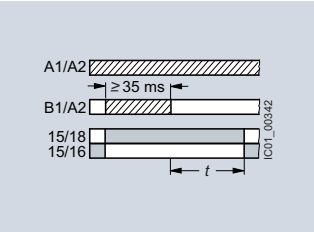
1) 3RP2540 has a double function:
Function N = OFF-delay
Function O = Positive passing make contact.

3RP25 function diagrams

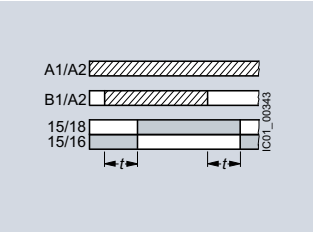
Multifunction 3RP2505-.A, 1 CO, 13 functions and 3RP2505-.C, 1 NO (semiconductor), 13 functions



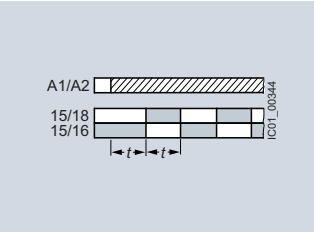
A
ON-delay



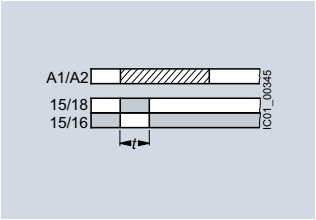
B
OFF-delay with control signal



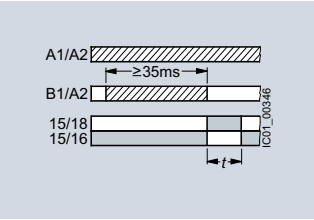
C
ON-delay/OFF-delay
with control signal



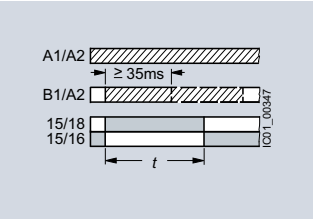
D
Flashing, symmetrical,
starting with interval



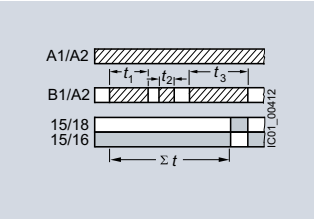
E
Passing make contact, interval relay



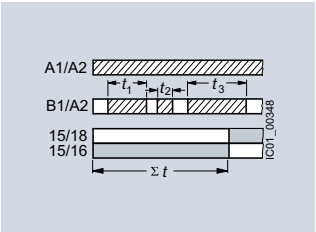
F
Retriggerable interval relay with
deactivated control signal (passing
break contact with control signal)



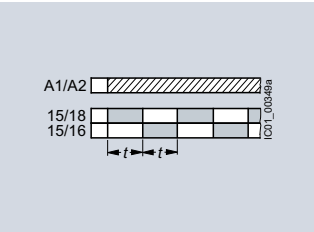
G
Passing make contact with
control signal, not retriggerable
(pulse-forming with control signal)



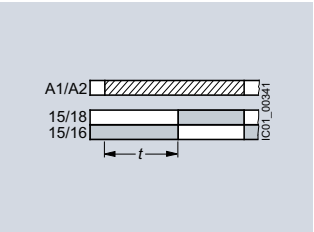
H
Additive ON-delay, instantaneous OFF
with control signal



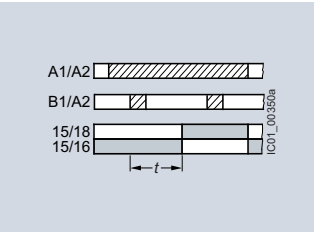
I
Additive ON-delay,with control signal



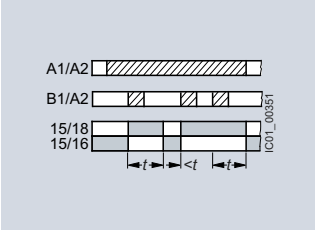
J
Flashing, symmetrical,
starting with pulse



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

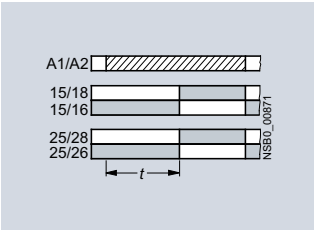
A ... M Identification letters

Timing relay energized

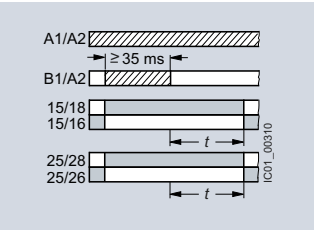
Contact closed

Contact open

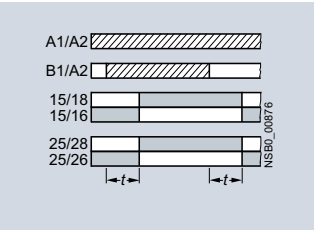
Multifunction 3RP2505-.B, 13 functions, 2 CO positively driven and switched in parallel with delay



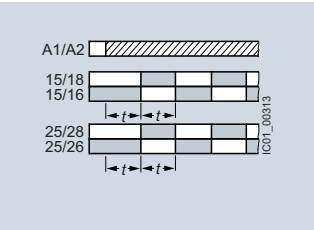
A
ON-delay



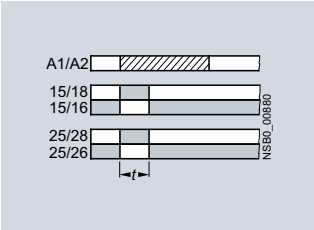
B
OFF-delay with control signal



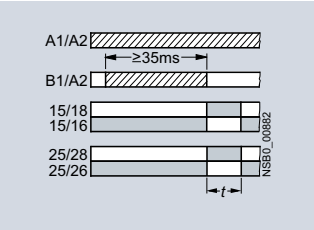
C
ON-delay/OFF-delay
with control signal



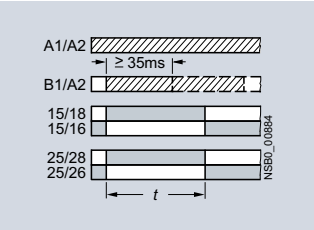
D
Flashing, symmetrical,
starting with interval



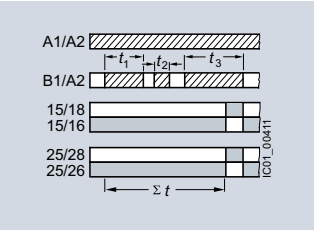
E
Passing make contact, interval relay



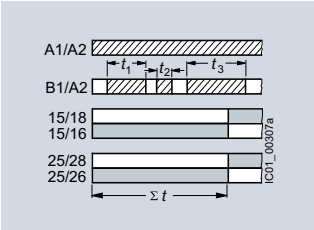
F
Retriggerable interval relay with
deactivated control signal (passing
break contact with control signal)



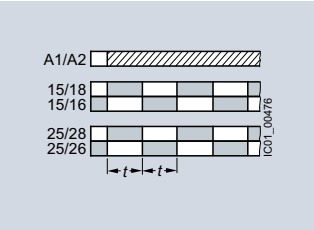
G
Passing make contact with
control signal, not retriggerable
(pulse-forming with control signal)



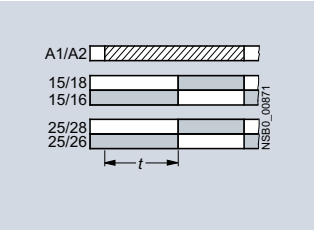
H
Additive ON-delay, instantaneous OFF
with control signal



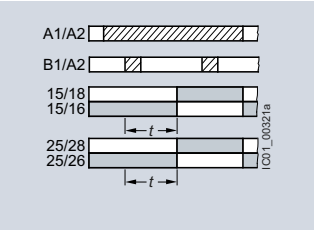
I
Additive ON-delay with control signal



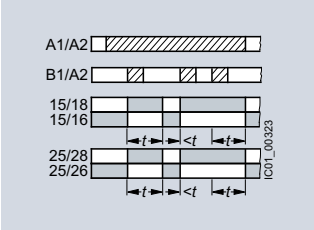
J
Flashing, symmetrical,
starting with pulse



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

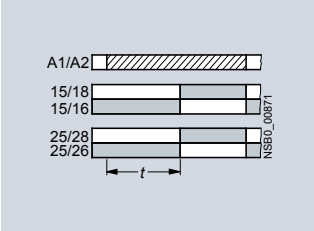
Timing Relays

3RP25 timing relays, 17.5 mm and 22.5 mm

Multifunction 3RP2505-.B, 27 functions, 2 CO

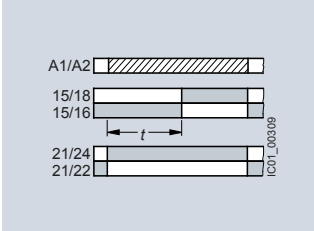
A

2 CO switched in parallel



ON-delay

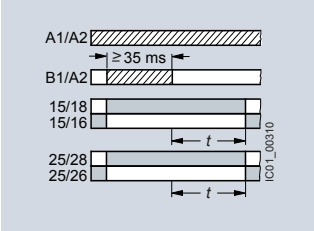
1 CO delayed +
1 CO instantaneous



ON-delay and instantaneous contact

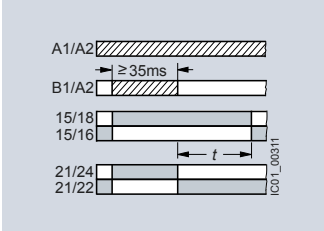
B

2 CO switched in parallel



OFF-delay with control signal

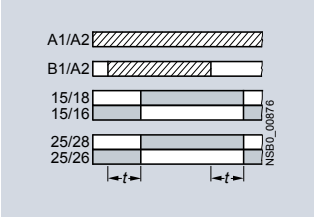
1 CO delayed +
1 CO instantaneous



OFF-delay with control signal and instantaneous contact

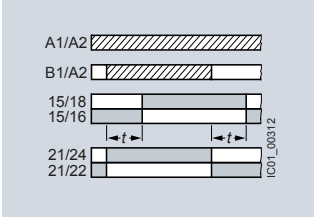
C

2 CO switched in parallel



ON-delay/OFF-delay
with control signal

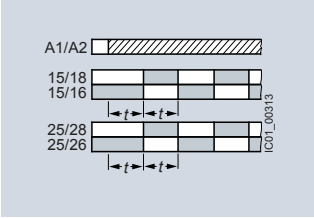
1 CO delayed +
1 CO instantaneous



ON-delay/OFF-delay with control
signal and instantaneous contact

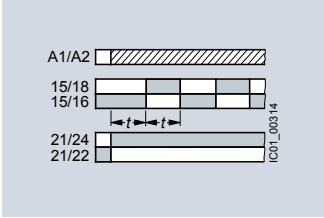
D

2 CO switched in parallel



Flashing, symmetrical,
starting with interval

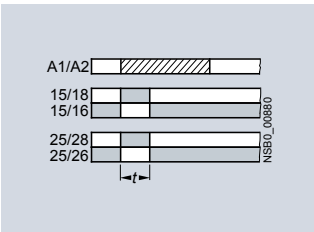
1 CO delayed +
1 CO instantaneous



Flashing, symmetrical, starting with
interval and instantaneous contact

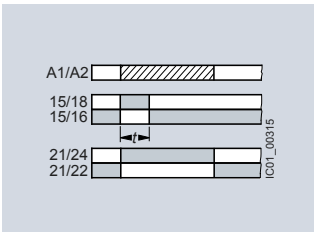
E

2 CO switched in parallel



Passing make contact, interval relay

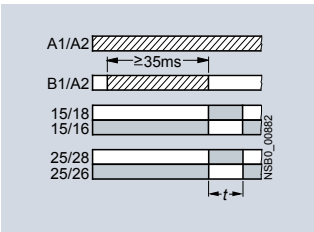
1 CO delayed +
1 CO instantaneous



Passing make contact, interval relay
and instantaneous contact

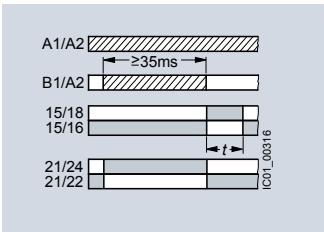
F

2 CO switched in parallel



Retriggerable interval relay with
deactivated control signal (passing
break contact with control signal)

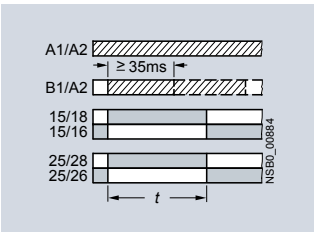
1 CO delayed +
1 CO instantaneous



Retriggerable interval relay with
deactivated control signal (passing
break contact with control signal)
and instantaneous contact

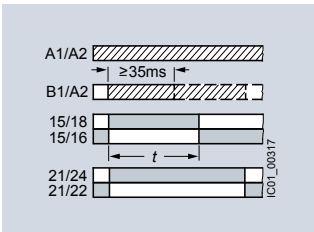
G

2 CO switched in parallel



Passing make contact with
control signal, not retriggerable
(pulse-forming with control signal)

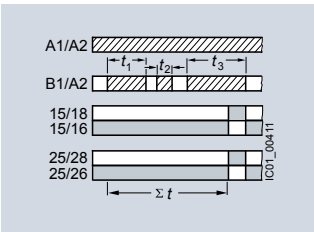
1 CO delayed +
1 CO instantaneous



Passing make contact with
control signal, not retriggerable
(pulse-forming with control signal)
and instantaneous contact

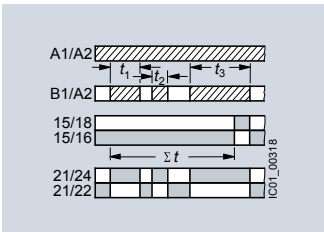
H

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

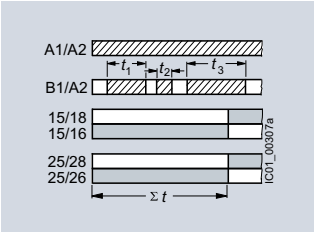
Contact closed

Contact open

Multifunction 3RP2505-.B, 27 functions, 2 CO (continued)

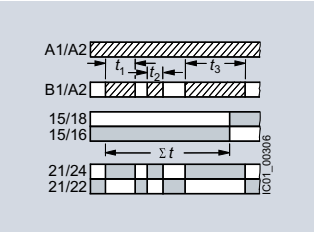
I

2 CO switched in parallel



Additive ON-delay with control signal

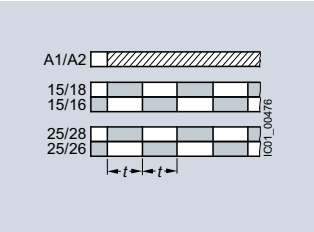
1 CO delayed + 1 CO instantaneous



Additive ON-delay with control signal and instantaneous contact

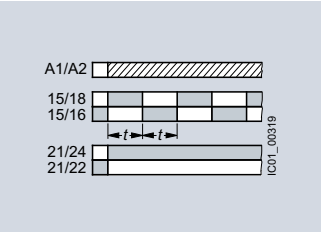
J

2 CO switched in parallel



Flashing, symmetrical, starting with pulse

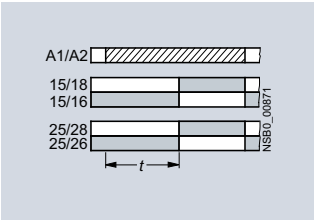
1 CO delayed + 1 CO instantaneous



Flashing, symmetrical, starting with pulse and instantaneous contact

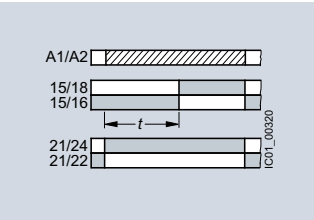
K

2 CO switched in parallel



Pulse-delayed (fixed pulse at 1 s and settable pulse delay)

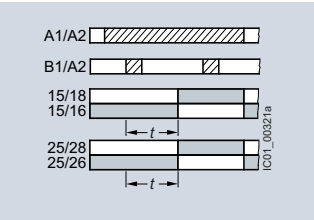
1 CO delayed + 1 CO instantaneous



Pulse-delayed (fixed pulse at 1 s and settable pulse delay) and instantaneous contact

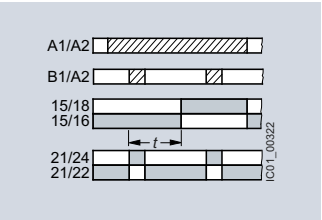
L

2 CO switched in parallel



Pulse-delayed with control signal (fixed pulse at 1 s and settable pulse delay)

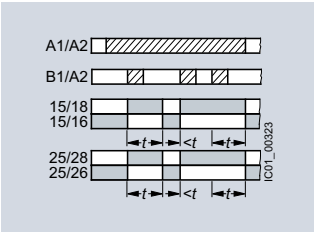
1 CO delayed + 1 CO instantaneous



Pulse-delayed with control signal (fixed pulse at 1 s and settable pulse delay) and instantaneous contact

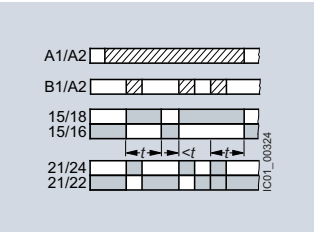
M

2 CO switched in parallel



Retriggerable interval relay with activated control signal (watchdog)

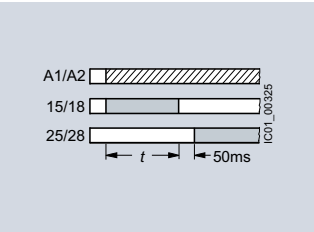
1 CO delayed + 1 CO instantaneous



Retriggerable interval relay with activated control signal and instantaneous contact (watchdog)

Y∆

2 CO switched in parallel or 1 CO delayed + 1 CO instantaneous



Wye-delta function

Legend

A ... M Identification letters

Timing relay energized

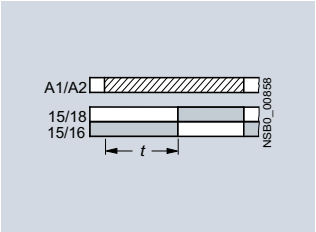
Contact closed

Contact open

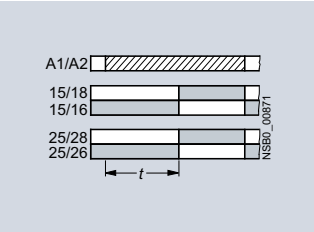
Timing Relays

3RP25 timing relays, 17.5 mm and 22.5 mm

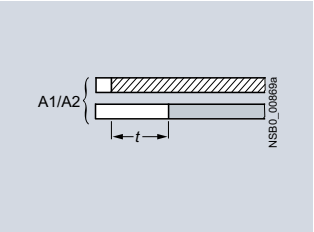
Monofunctions 3RP251. up to 3RP257.[1)]



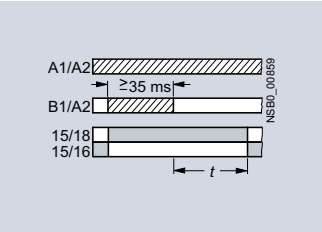
3RP251.-.AW30, 1 CO, ON-delay



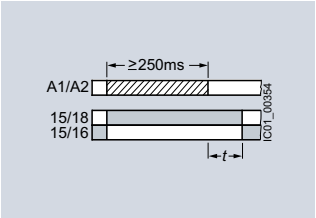
3RP2525-..W30, 2 CO, ON-delay



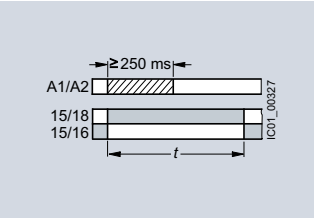
3RP2527-.EW30, 1 NO (semiconductor), ON-delay



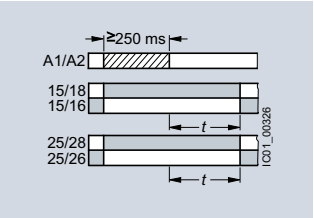
3RP2535-.AW30, 1 CO, OFF-delay with control signal



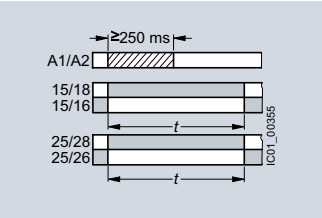
3RP2540-.A.30, 1 CO, OFF-delay (N)[1)]



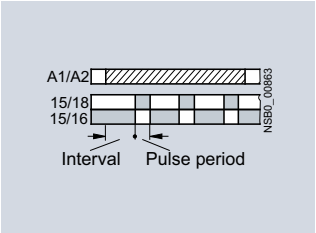
3RP2540-.A.30, 1 CO, positive passing make contact (O)[1)]



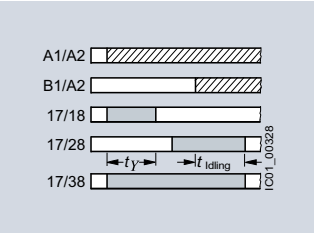
3RP2540-.B.30, 2 CO, OFF-delay (N)[1)]



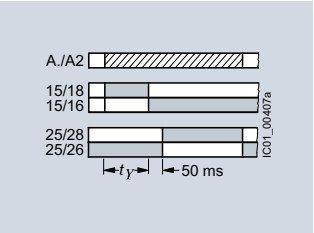
3RP2540-.B.30, 2 CO, positive passing make contact (O)[1)]



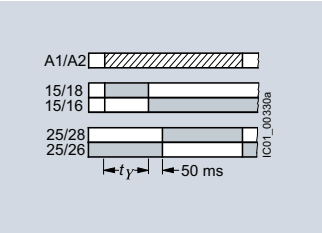
3RP2555-.AW30, 1 CO, flashing, asymmetrical, starting with interval (clock-pulse relay)



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

1) 3RP2540 has a double function:
Function N = OFF-delay
Function O = positive passing make contact.

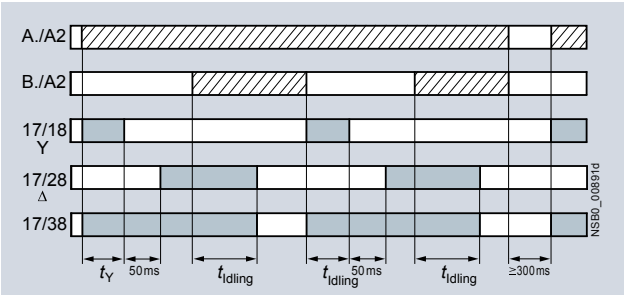
Possibilities of operation of the 3RP2560-.SW30 timing relay

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 ⅄Δ 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:

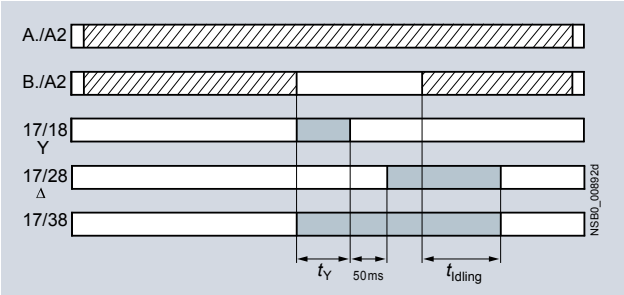
Observe response time (dead time) of 400 ms on energizing control supply voltage until contacts 17/18 and 17/16 close.



Operation 1

Operation 2: Start contact B./A2 is closed when control supply voltage A./A2 is applied

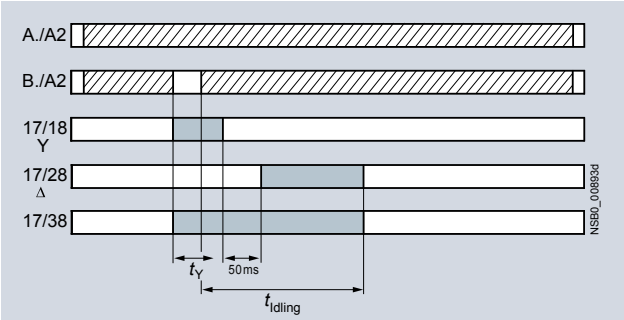
If the control signal B./A2 is already present when the control supply voltage A./A2 is applied, **no** timing is started. The timing is only started when the control signal B./A2 is switched off.



Operation 2

Operation 3: Start contact B./A2 closes while star time is running

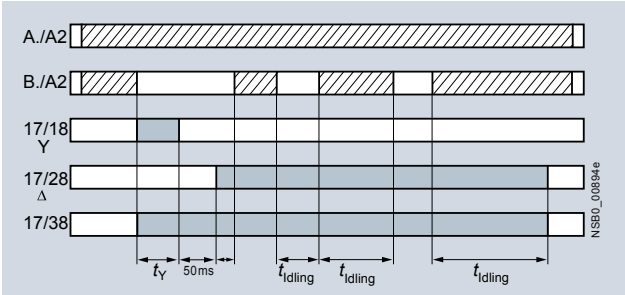
If the control signal B./A2 is applied again during the star time, the idling time starts and the timing is terminated normally.



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 ⅄Δ 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

3RP2505-2AB30

3RP2505-2BB30

3RP2525-2AW30

3RP2540-2AW30

3RP2555-2AW30

3RP2576-2NW30

PU (UNIT, SET, M)= 1
PS* = 1 unit

Number of NO contacts: Instantaneous switching	Number of NO contacts: Delayed switching	Number of CO contacts: Instantaneous switching	Number of CO contacts: Delayed switching	Semiconductor output	Adjustable time	Control supply voltage: At AC 50/60 Hz (V)	Control supply voltage: At DC (V)	DT	Screw terminals: Article No.	Screw terminals: Price per PU	DT	Spring-type terminals (push-in): Article No.	Spring-type terminals (push-in): 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 functions on page 12/37.													
0	0	0	1	--	0.05 s ... 100 h	24	24	A	**3RP2505-1AB30**		A	**3RP2505-2AB30**	
						12 ... 240	12 ... 240	A	**3RP2505-1AW30**		A	**3RP2505-2AW30**	
0	1	0	0	✓	0.05 s ... 100 h	12 ... 240	12 ... 240	A	**3RP2505-1CW30**		A	**3RP2505-2CW30**	
3RP2505-.R timing relays suitable for railway applications, 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 functions on page 12/37.													
0	0	--	2[1]	--	0.05 s ... 100 h	24 ... 240	24 ... 240	A	**3RP2505-1RW30**		A	**3RP2505-2RW30**	
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 functions on page 12/37.													
0	0	--	2[2]	--	0.05 s ... 100 h	24	24	A	**3RP2505-1BB30**		A	**3RP2505-2BB30**	
						400 ... 440	--	A	**3RP2505-1BT20**		A	**3RP2505-2BT20**	
						12 ... 240	12 ... 240	A	**3RP2505-1BW30**		A	**3RP2505-2BW30**	
3RP251. and 3RP252. timing relays, ON-delay													
0	0	0	1	--	0.5 ... 10 s	12 ... 240	12 ... 240	A	**3RP2511-1AW30**		A	**3RP2511-2AW30**	
					1 ... 30 s	12 ... 240	12 ... 240	A	**3RP2512-1AW30**		A	**3RP2512-2AW30**	
					5 ... 100 s	12 ... 240	12 ... 240	A	**3RP2513-1AW30**		A	**3RP2513-2AW30**	
					0.05 s ... 100 h	12 ... 240	12 ... 240	A	**3RP2525-1AW30**		A	**3RP2525-2AW30**	
0	0	0	2	--	0.05 s ... 100 h	24	24	A	**3RP2525-1BB30**		A	**3RP2525-2BB30**	
						12 ... 240	12 ... 240	A	**3RP2525-1BW30**		A	**3RP2525-2BW30**	
0	1	0	0	✓	0.05 s... 240 s	12 ... 240	12 ... 240	A	**3RP2527-1EW30**		A	**3RP2527-2EW30**	
3RP2535 timing relays, OFF-delay with control signal													
0	0	0	1	--	0.05 s ... 100 h	12 ... 240	12 ... 240	A	**3RP2535-1AW30**		A	**3RP2535-2AW30**	
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	**3RP2540-1AB30**		A	**3RP2540-2AB30**	
						12 ... 240	12 ... 240	A	**3RP2540-1AW30**		A	**3RP2540-2AW30**	
0	0	0	2	--	0.05 s ... 600 s	24	24	A	**3RP2540-1BB30**		A	**3RP2540-2BB30**	
						12 ... 240	12 ... 240	A	**3RP2540-1BW30**		A	**3RP2540-2BW30**	
3RP2555 timing relays, clock-pulse relay, flashing, asymmetrical													
0	0	0	1	--	0.05 s ... 100 h	12 ... 240	12 ... 240	A	**3RP2555-1AW30**		A	**3RP2555-2AW30**	
3RP2560 timing relays, wye-delta function with overtravel function (idling)													
1	2	0	0	--	1 ... 20 s	12 ... 240	12 ... 240	A	**3RP2560-1SW30**		A	**3RP2560-2SW30**	
3RP257. timing relays, wye-delta function													
1	1	0	0	--	1 ... 20 s	380 ... 440[3]	--	A	**3RP2574-1NM20**		A	**3RP2574-2NM20**	
						12 ... 240	12 ... 240	A	**3RP2574-1NW30**		A	**3RP2574-2NW30**	
1	1	0	0	--	3 ... 60 s	380 ... 440[3]	--	A	**3RP2576-1NM20**		A	**3RP2576-2NM20**	
						12 ... 240	12 ... 240	A	**3RP2576-1NW30**		A	**3RP2576-2NW30**	

For accessories,

✓ 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 12/52.

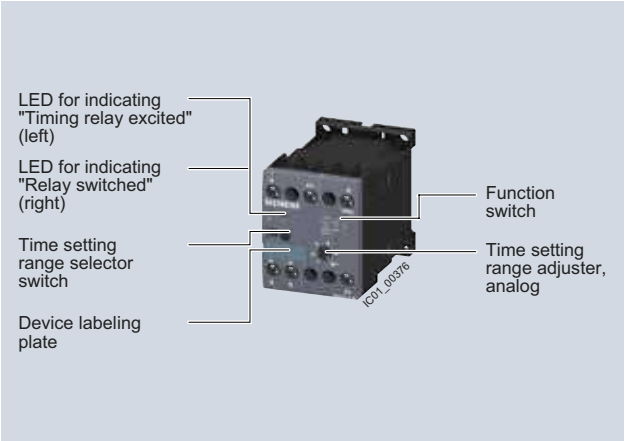
Accessories

	Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Accessories for enclosures						
	Sealing covers					
3ZY1321-1AA00	• 17.5 mm	A	**3ZY1321-1AA00**		1	5 units
3ZY1321-2AA00	• 22.5 mm	A	**3ZY1321-2AA00**		1	5 units
3ZY1311-0AA00	**Push-in lugs** For wall mounting	A	**3ZY1311-0AA00**		1	10 units
3ZY1440-0AA00	**Coding pins** For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; enable the mechanical coding of terminals	A	**3ZY1440-1AA00**		1	12 units
Terminals for SIRIUS devices in the industrial standard mounting rail enclosure						
	Removable terminals		**Screw terminals**			
3ZY1122-1BA00	• 2-pole, screw terminals 1 x 4 mm²	A	**3ZY1122-1BA00**		1	6 units
			Spring-type terminals (push-in)			
3ZY1122-2BA00	• 2-pole, push-in terminals 1 x 4 mm²	A	**3ZY1122-2BA00**		1	6 units
Tools for opening spring-type terminals						
	Screwdrivers For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated		**Spring-type terminals**			
3RA2908-1A		A	**3RA2908-1A**		1	1 unit

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"

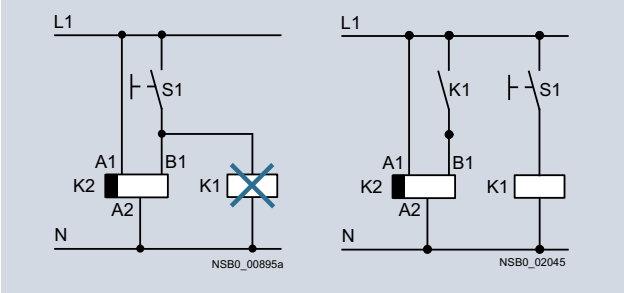
Multifunction

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 12/58.

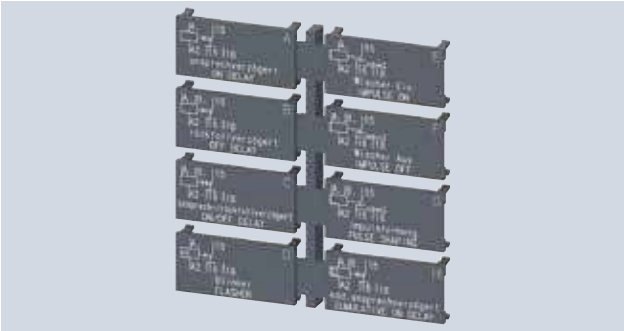
Note:

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	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.

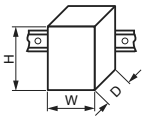
Benefits

- 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

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.

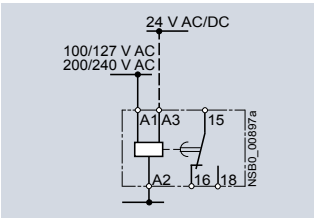
Technical specifications

Type			3RP2005, 3RP2025
Dimensions (W x H x D)		mm	45 x 57 x 73
Rated insulation voltage Pollution degree 3 Overvoltage category III		V AC	300
Permissible ambient temperature • During operation • During storage		 °C °C	 -25 ... +60 -40 ... +85
Operating range at excitation[1]			0.85 ... 1.1 x U_s at AC; 0.8 ... 1.25 x U_s at DC; 0.95 ... 1.05 times the rated frequency
Mechanical endurance		Operating cycles	10 x 10^6
Electrical endurance at I_e		Operating cycles	1 x 10^5
Connection type			**Screw terminals**
• Terminal screw • Solid • Finely stranded with end sleeve • Stranded • AWG cables • Tightening torque		 mm^2 mm^2 AWG AWG Nm	M3 (for standard screwdriver, size 2 and Pozidriv 2) 2 x (0.5 ... 1.5)[2], 2 x (0.75 ... 2.5)[2] 2 x (0.5 ... 1.5)[2], 2 x (0.75 ... 2.5)[2] 2 x (0.5 ... 1.5)[2], 2 x (0.75 ... 2.5)[2] 2 x (18 ... 14) 0.8 … 1.2
Connection type			**Spring-type terminals**
• Solid • Finely stranded with end sleeve • Finely stranded without end sleeve • AWG cables, solid or stranded • Max. external diameter of the conductor insulation		mm^2 mm^2 mm^2 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

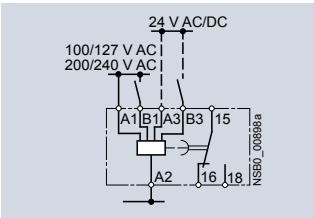
[1] If nothing else is stated.

[2] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

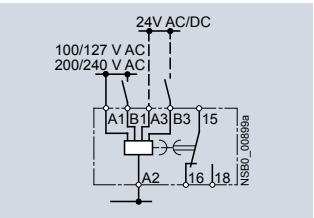
3RP20 internal circuit diagrams



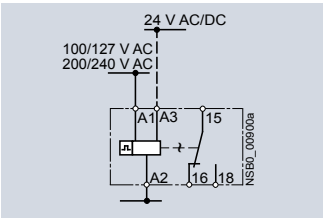
3RP2005, 3RP2025
ON-delay



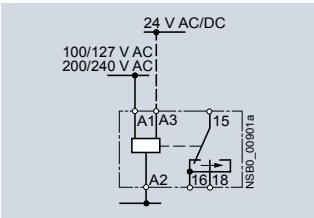
3RP2005
OFF-delay
with control signal



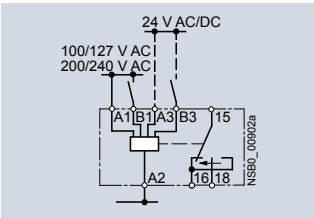
3RP2005
ON-delay and OFF-delay
with control signal



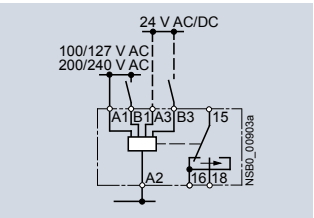
3RP2005
Flashing, starting with interval



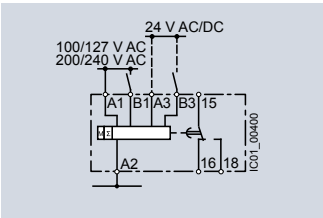
3RP2005
Passing make contact



3RP2005
Passing break contact
with control signal



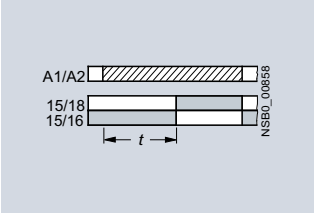
3RP2005
Pulse-forming
with control signal



3RP2005
Additive ON-delay
with control signal

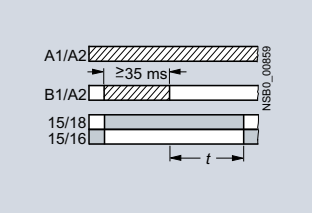
3RP20 function diagrams and 3RP2901 label set

1 CO contact



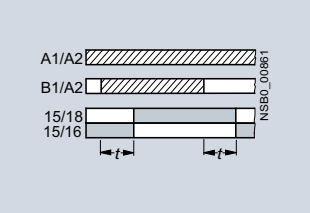
A

3RP2005-.A, 3RP2025
ON-delay



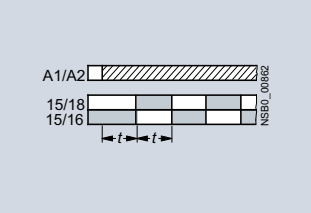
B[1)]

3RP2005-.A
OFF-delay with control signal



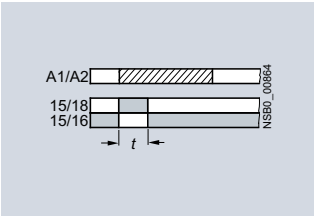
C[1)]

3RP2005-.A
ON-delay and OFF-delay
with control signal ($t = t_{on} = t_{off}$)



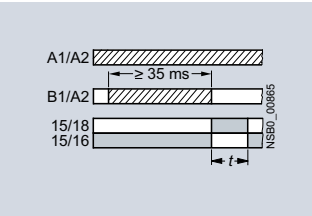
D

3RP2005-.A
Flashing, starting with interval
(pulse/interval 1:1)



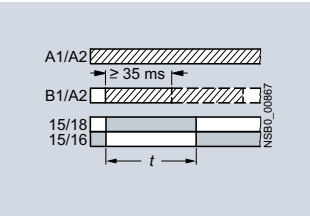
E

3RP2005-.A
Passing make contact



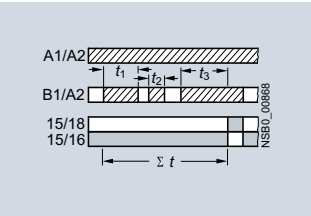
F[1)]

3RP2005-.A
Passing break contact
with control signal



G[1)]

3RP2005-.A
Pulse-forming with control signal
(pulse generation at the output does
not depend on duration of energizing)



H[1)]

3RP2005-.A
Additive ON-delay with control signal

Legend

A ... H Identification letters for 3RP2005

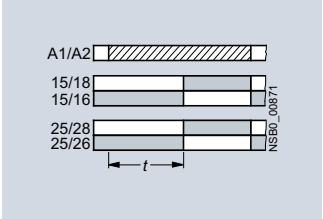
Timing relay energized

Contact closed

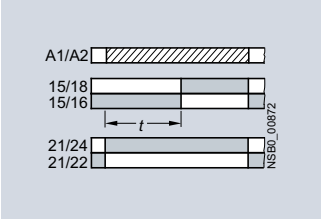
Contact open

[1)] 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.

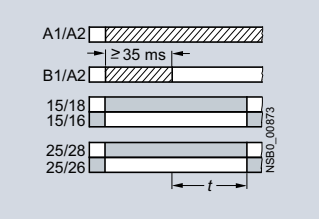
2 CO contacts



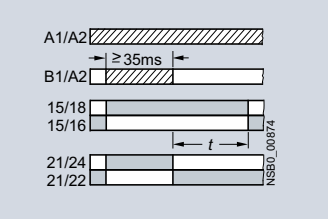
A
3RP2005-.B
ON-delay



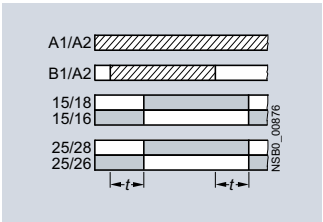
A●
3RP2005-.B
ON-delay and instantaneous contact



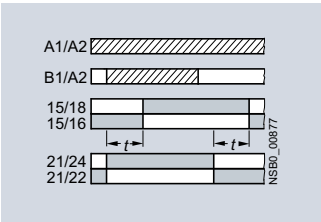
B[1)]
3RP2005-.B
OFF-delay with control signal



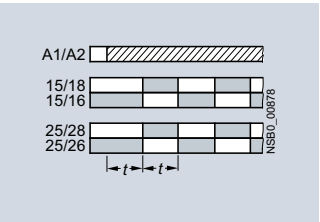
B●[1)]
3RP2005-.B
OFF-delay with control signal
and instantaneous contact



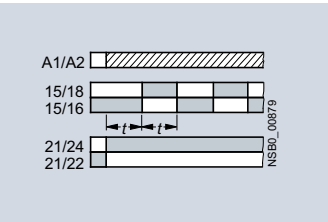
C[1)]
3RP2005-.B
ON-delay and OFF-delay
with control signal ($t = t_{on} = t_{off}$)



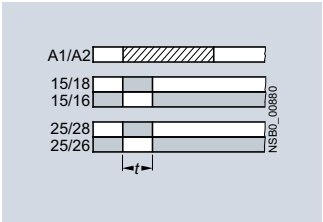
C●[1)]
3RP2005-.B
ON-delay and OFF-delay
with control signal and instantaneous
contact
($t = t_{on} = t_{off}$)



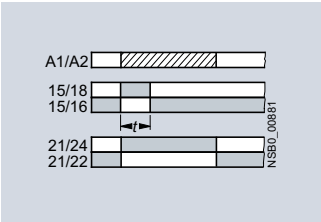
D
3RP2005-.B
Flashing, starting with interval
(pulse/interval 1:1)



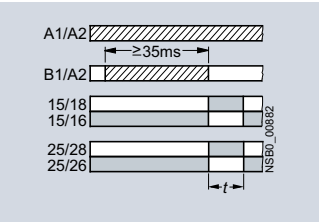
D●
3RP2005-.B
Flashing, starting with interval
(pulse/interval 1:1) and instantaneous
contact



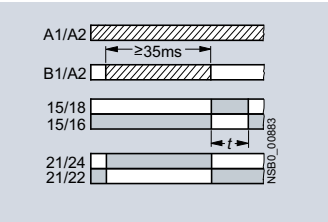
E
3RP2005-.B
Passing make contact



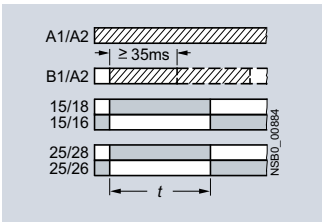
E●
3RP2005-.B
Passing make contact and
instantaneous contact



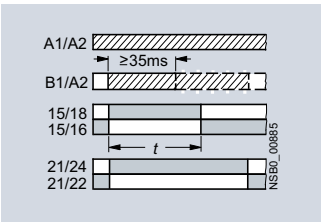
F[1)]
3RP2005-.B
Passing break contact
with control signal



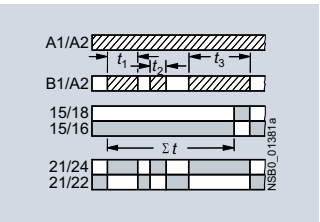
F●[1)]
3RP2005-.B
Passing break contact
with control signal
and instantaneous contact



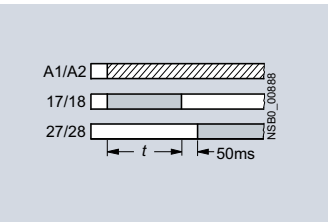
G[1)]
3RP2005-.B
Pulse-forming with control signal
(pulse generation at the output does
not depend on duration of energizing)



G●[1)]
3RP2005-.B
Pulse-forming with control signal
and instantaneous contact (pulse
generation at the output does not
depend on duration of energizing)



H●[1)]
3RP2005-.B
Additive ON-delay with control signal
and instantaneous contact



Y Δ
3RP2005-.B
Wye-delta function

Legend

A ... H Identification letters for 3RP2005

▨ Timing relay energized

▩ Contact closed

□ Contact open

[1)] 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.

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit

3RP2005-1AP30

3RP2005-1BW30

3RP2005-2AP30

3RP2025-2BW30

Version	Time setting range *t*	Rated control supply voltage U_s 50/60 Hz AC V	DC V	DT	Screw terminals Article No.	Price per PU	DT	Spring-type terminals 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 3RP2505 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 12/58.									
With LED and 1 CO contact[1], 8 functions	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 ∞ [2]	24/100 ... 127 24/200 ... 240	24 24	▶ ▶	**3RP2005-1AQ30** **3RP2005-1AP30**		A ▶	**3RP2005-2AQ30** **3RP2005-2AP30**	
With LED and 2 CO contacts, 16 functions		24 ... 240[3]	24 ... 240[4]	▶	**3RP2005-1BW30**		A	**3RP2005-2BW30**	
3RP2025. timing relays, ON-delay, 15 time setting ranges									
With LED and 1 CO contact[1]	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 ∞ [2]	24/100 ... 127 24/200 ... 240	24 24	▶ ▶	**3RP2025-1AQ30** **3RP2025-1AP30**		▶ ▶	**3RP2025-2AQ30** **3RP2025-2AP30**	

For accessories, see page 12/58.

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 x U_s.

4) Operating range 0.7 to 1.1 x U_s.

Accessories

	Version	Function	Identification letter	Use	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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	A	For devices with 1 CO	C	**3RP2901-0A**		1	5 units
		OFF-delay with control signal	B						
		ON-delay and OFF-delay with control signal	C						
		Flashing, starting with interval	D						
		Passing make contact	E						
		Passing break contact with control signal	F						
		Pulse-forming with control signal	G						
		Additive ON-delay with control signal	H						
3RP2901-0B	1 label set (1 unit) with 16 functions	ON-delay	A	For devices with 2 CO contacts	C	**3RP2901-0B**		1	5 units
		OFF-delay with control signal	B						
		ON-delay and OFF-delay with control signal	C						
		Flashing, starting with interval	D						
		Passing make contact	E						
		Passing break contact with control signal	F						
		Pulse-forming with control signal	G						
		ON-delay and instantaneous contact	A•						
		OFF-delay with control signal and instantaneous contact	B•						
		ON-delay and OFF-delay with control signal and instantaneous contact	C•						
		Flashing, starting with interval, and instantaneous contact	D•						
		Passing make contact and instantaneous contact	E•						
		Passing break contact with control signal and instantaneous contact	F•						
		Pulse-forming with control signal and instantaneous contact	G•						
		Additive ON-delay with control signal and instantaneous contact	H•						
		Wye-delta function	Y∆						
Blank inscription labels for 3RP20									
	Blank labels, 20 mm x 7 mm, pastel turquoise			For 3RP20	D	**3RT1900-1SB20**		100	340 units

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:

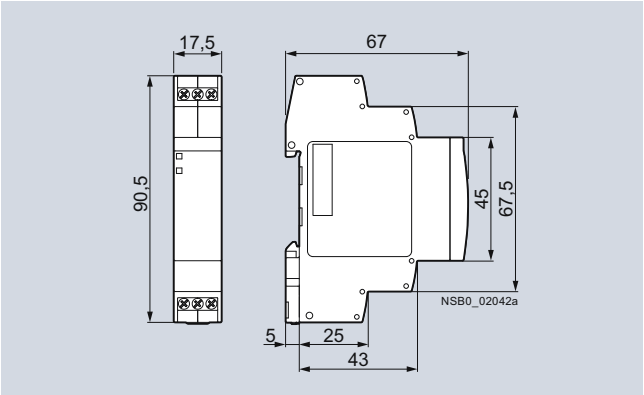
- IEC 60721-3-3 "Classification of environmental conditions"
- IEC 61812-1 "Time relays for industrial and residential use"
- IEC 61000-6-2 and EN 61000-6-4 "Electromagnetic compatibility"
- IEC 60947-5-1 "Low-voltage switchgear and controlgear – Electromechanical control circuit devices"
- DIN 43880 "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

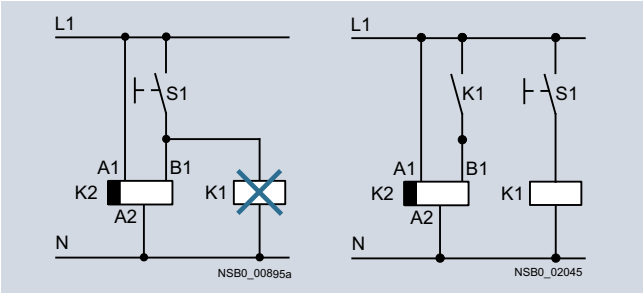
All timing relays are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60715. The enclosure complies with DIN 43880, 1 MW.



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.	1st - 5th	6th	7th		8th	9th	10th	11th	12th
	□□□□□	□	□	–	□	□	□	□	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

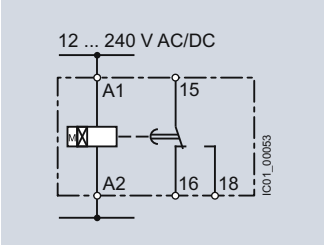
Timing relays are used in control, starting and protective circuits for all switching operations involving time delays, e.g. in non-residential buildings, airports, industrial buildings etc.

Technical specifications

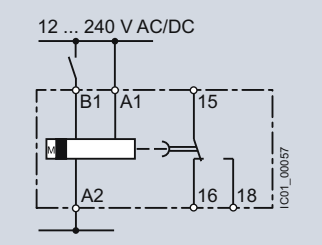
Type		7PV15
Rated insulation voltage Pollution degree 2, overvoltage category III	V AC	300
Permissible ambient temperature		
• During operation	°C	-25 ... +55
• During storage	°C	-40 ... +70
Operating range at excitation[1]		0.85 ... 1.1 x U_s at V AC/DC, 50/60 Hz 0.8 ... 1.25 x U_s 24 V DC 0.95 ... 1.05 times the rated frequency
Rated operational current I_e		
• AC-15 at 24 ... 240 V, 50 Hz	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
Uninterrupted thermal current I_{th}	A	5
Mechanical endurance	Operating cycles	1 x 10^6
Electrical endurance at I_e	Operating cycles	1 x 10^5
Connection type		**Screw terminals**
• Terminal screw		M3 (for standard screwdriver, size 2 and Pozidriv 2)
• Solid	mm^2	1 x (0.2 ... 2.5)
• Finely stranded with end sleeve	mm^2	1 x (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	1 x (0.2 ... 1.5)
• AWG cables, solid or stranded	AWG	1 x (24 ... 14)
• Tightening torque	Nm	0.4 ... 0.5

[1] If nothing else is stated.

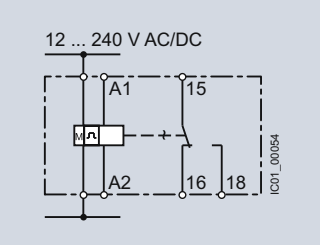
7PV15 internal circuit diagrams



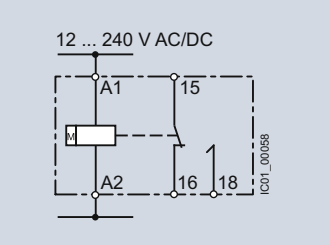
7PV1508-1AW30
ON-delay



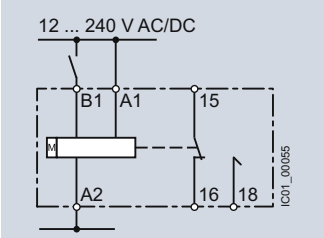
7PV1508-1AW30
OFF-delay



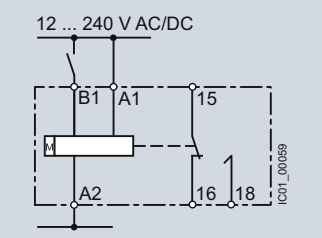
7PV1508-1AW30
Flashing, starting with interval



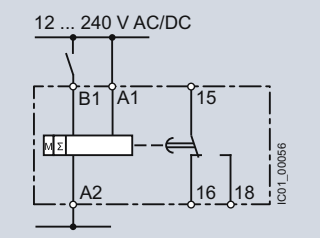
7PV1508-1AW30
Passing make contact



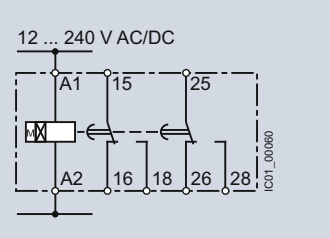
7PV1508-1AW30
Passing break contact
with control signal



7PV1508-1AW30
Pulse-forming
with control signal

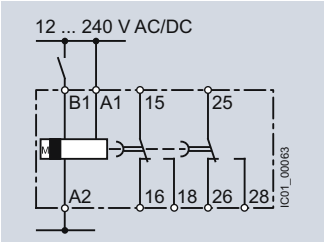


7PV1508-1AW30
Additive ON-delay,
with control signal

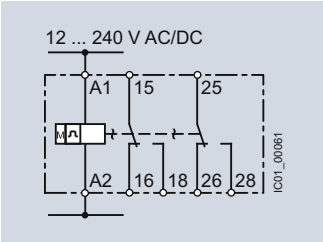


7PV1508-1BW30
ON-delay

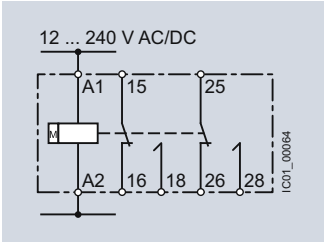
7PV15 internal circuit diagrams (continued)



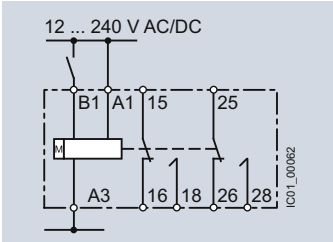
7PV1508-1BW30
OFF-delay
with control signal



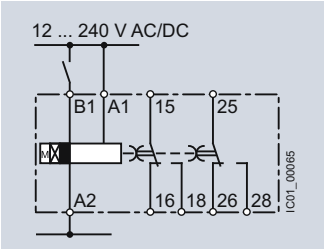
7PV1508-1BW30
Flashing,
starting with interval



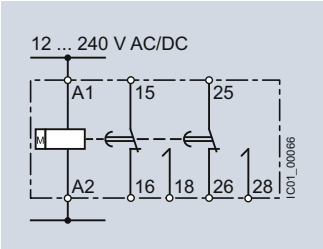
7PV1508-1BW30
Passing make contact



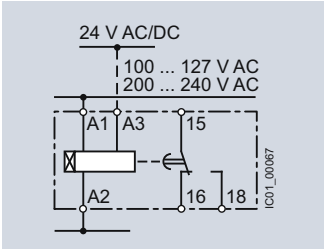
7PV1508-1BW30
Pulse-forming
with control signal



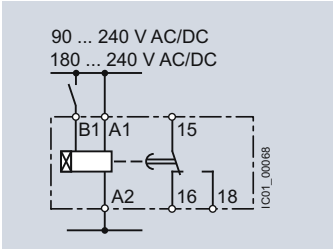
7PV1508-1BW30
ON and OFF-delay



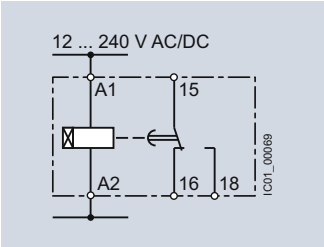
7PV1508-1BW30
Fixed pulse after ON-delay



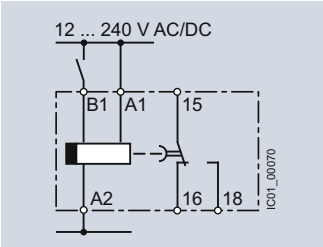
7PV151.-1AQ30, 7PV151.-1AP30
ON-delay



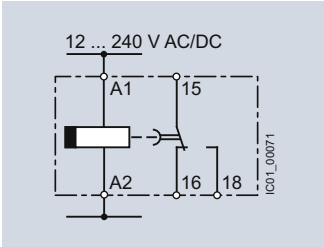
7PV1518-1AJ30, 7PV1518-1AN30
ON-delay



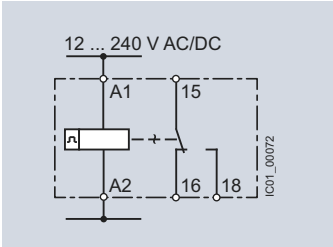
7PV1518-1AW30
ON-delay



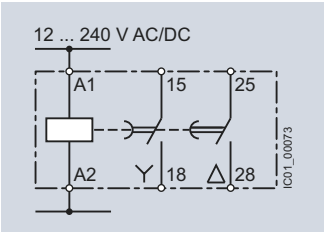
7PV1538-1AW30
OFF-delay
with control signal



7PV1540-1AW30
OFF-delay
without control signal



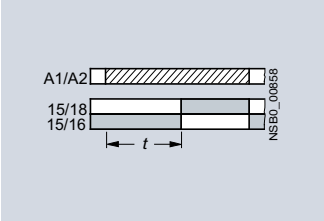
7PV1558-1AW30
Clock-pulse relay



7PV1578-1BW30
Wye-delta

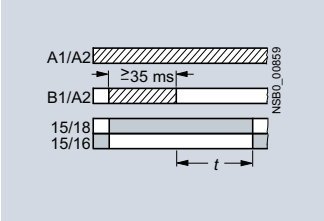
7PV15 function diagrams

1 CO contact



A

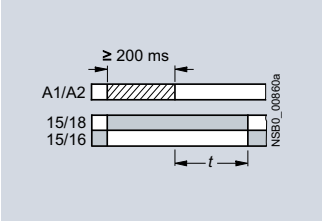
7PV1508-1A, 7PV1511, 7PV1512, 7PV1513, 7PV1518
ON-delay



B[1)]

7PV1508-1A, 7PV1538

OFF-delay with control signal



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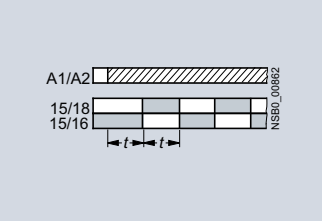
7PV1540

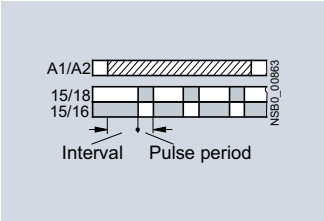
OFF-delay without control signal



C

7PV1508-1A

Flashing, starting with interval (pulse/interval 1:1)



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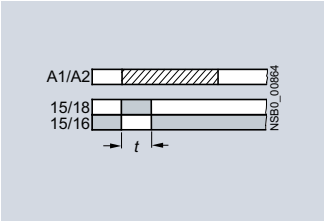
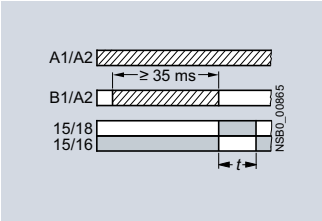
7PV1558
Clock-pulse, starting with interval (dead period, pulse time, and time setting ranges each separately adjustable)



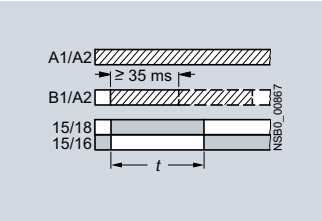
D

7PV1508-1A
Passing make contact



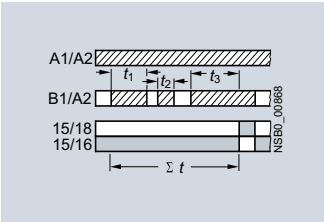
E[1]

7PV1508-1A
Passing break contact with control signal



F[1)]

7PV1508-1A
Pulse-forming with control signal (pulse generation at the output does not depend on duration of energizing)



G[1)]

7PV1508-1A
Additive ON-delay with control signal

Legend

A ... G Identification letters for 7PV1508

Timing relay energized

Contact closed

Contact open

1) 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.

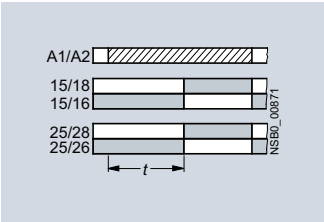
Note:

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.

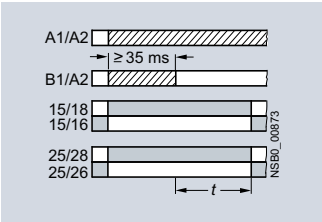
Timing Relays

7PV15 timing relays in enclosure, 17.5 mm

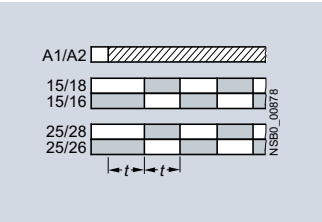
2 CO contacts



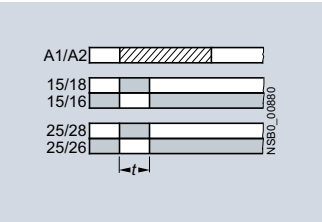
A
7PV1508-1B
ON-delay



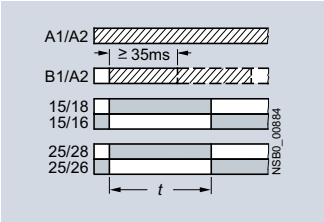
B[1)]
7PV1508-1B
OFF-delay with control signal



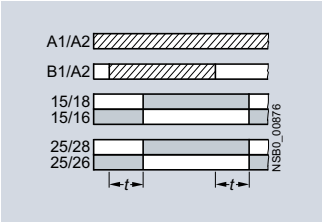
C
7PV1508-1B
Flashing, starting with interval (pulse/interval 1:1)



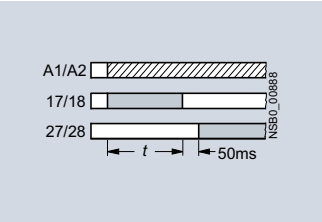
D
7PV1508-1B
Passing make contact



F[1)]
7PV1508-1B
Pulse-forming with control signal (pulse generation at the output does not depend on duration of energizing)

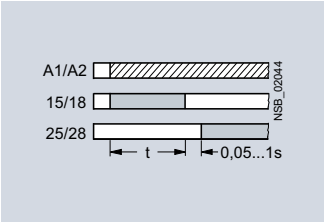


H[1)]
7PV1508-1B
ON-delay and OFF-delay with control signal



I
7PV1508-1B
Fixed pulse after ON-delay

2 NO contacts



--
7PV1578
Wye-delta function[2)]

Legend

A ... D, F, H, I Identification letters for 7PV1508

Timing relay energized

Contact closed

Contact open

1) 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.

2) 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.

Selection and ordering data

7PV1508-1AW30

7PV1512-1AP30

7PV1518-1AW30

7PV1538-1AW30

7PV1540-1AW30

7PV1558-1AW30

7PV1578-1BW30

Version	Time setting range *t* adjustable by rotary switch to	Rated control supply voltage U_s 50/60 Hz AC V	DC V	DT	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*
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 30 s ... 10 min 3 min ... 1 h 30 min ... 10 h 5 ... 100 h	12 ... 240	12 ... 240	▶	**7PV1508-1AW30**		1	1 unit
With LED and 2 CO contacts, 7 functions		12 ... 240	12 ... 240	▶	**7PV1508-1BW30**		1	1 unit
7PV151. timing relays, ON-delay, 1 time setting range								
With LED and 1 CO contact	0.05 ... 1 s	24/200 ... 240	24	▶	**7PV1511-1AP30**		1	1 unit
	0.5 ... 10 s	24/100 ... 127	24	▶	**7PV1512-1AQ30**		1	1 unit
		24/200 ... 240	24	▶	**7PV1512-1AP30**		1	1 unit
	5 ... 100 s	24/100 ... 127	24	▶	**7PV1513-1AQ30**		1	1 unit
		24/200 ... 240	24	▶	**7PV1513-1AP30**		1	1 unit
7PV1518 timing relays, ON-delay, 7 time setting ranges								
With LED and 1 CO contact	0.05 ... 1 s 0.5 ... 10 s 5 ... 100 s 30 s ... 10 min 3 min ... 1 h 30 min ... 10 h 5 ... 100 h	12 ... 240	12 ... 240	▶	**7PV1518-1AW30**		1	1 unit
		90 ... 127	90 ... 127	▶	**7PV1518-1AJ30**		1	1 unit
		180 ... 240	180 ... 240	▶	**7PV1518-1AN30**		1	1 unit
7PV1538 timing relays, OFF-delay, with control signal, 7 time setting range								
With LED and 1 CO contact	0.05 ... 1 s 0.5 ... 10 s 5 ... 100 s 30 s ... 10 min 3 min ... 1 h 30 min ... 10 h 5 ... 100 h	12 ... 240	12 ... 240	▶	**7PV1538-1AW30**		1	1 unit
7PV1540 timing relays, OFF-delay, without control signal, 7 time setting ranges								
With LED and 1 CO contact	0.05 ... 1 s 0.15 ... 3s 0.3 ... 6 s 0.5 ... 10 s 1.5 ... 30 s 3 ... 60 s 5 ... 100 s	12 ... 240	12 ... 240	▶	**7PV1540-1AW30**		1	1 unit
7PV1558 timing relays, clock-pulse relay, 7 time setting ranges								
With LED and 1 CO contact	0.05 ... 1 s 0.5 ... 10 s 5 ... 100 s 30 s ... 10 min 3 min ... 1 h 30 min ... 10 h 5 ... 100 h	12 ... 240	12 ... 240	▶	**7PV1558-1AW30**		1	1 unit
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 0.5 ... 10 s 5 ... 100 s 30 s ... 10 min 3 min ... 1 h 30 min ... 10 h 5 ... 100 h	12 ... 240	12 ... 240	▶	**7PV1578-1BW30**		1	1 unit

3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

General data

Overview

SIRIUS 3UG4 monitoring relay

More information
Homepage, see www.siemens.com/relays
Industry Mall, see www.siemens.com/product?3UG45
For the conversion tool, e.g. from 3UG3 to 3UG4, see 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									
Monitoring relays		**3UG4**	□	□	□	–	□	□	□	□	**0**
Type of setting	e.g. 5 = analogically adjustable		□								
Functions	e.g. 11 = line monitoring			□	□						
Connection type	Screw terminals						**1**				
	Spring-type terminals						**2**				
Contacts	e.g. A = 1 CO contact							□			
Supply voltage	e.g. N2 = 160 ... 260 V AC								□	□	
Example		**3UG4**	**5**	**1**	**1**	**–**	**1**	**A**	**N**	**2**	**0**

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.

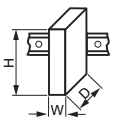
The positive result: More selective avoidance of production faults – sustained increases in availability and productivity.

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 Manual and internal circuit diagrams, see https://support.industry.siemens.com/cs/ww/en/view/54397927	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16367/faq

Type		3UG
General data		
Dimensions (W x H x D) 		
• For 2 terminal blocks		
- Screw terminals	mm	22.5 x 83 x 91
- Spring-type terminals	mm	22.5 x 84 x 91
• For 3 terminal blocks		
- Screw terminals	mm	22.5 x 92 x 91
- Spring-type terminals	mm	22.5 x 94 x 91
• For 4 terminal blocks		
- Screw terminals	mm	22.5 x 103 x 91
- Spring-type terminals	mm	22.5 x 103 x 91
Permissible ambient temperature		
• During operation	°C	-25 ... +60
Connection type		**Screw terminals**
• Terminal screw		M3 (for standard screwdriver, size 2 and Pozidriv 2)
• Solid	mm^2	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm^2	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)
Connection type		**Spring-type terminals**
• Solid	mm^2	2 x (0.25 ... 1.5)
• Finely stranded, with end sleeve acc. to DIN 46228	mm^2	2 x (0.25 ... 1.5)
• Finely stranded	mm^2	2 x (0.25 ... 1.5)
• AWG cables, solid or stranded	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 overshot 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	• Direction of rotation of the drive
Phase failure	• A fuse has tripped • Failure of the control supply voltage • Broken cable
Phase asymmetry	• Overheating of the motor due to asymmetrical voltage • Detection of asymmetrically loaded networks
Undervoltage	• Increased current on a motor with corresponding overheating • Unintentional resetting of a device • Network collapse, particularly with battery power
Overvoltage	• Protection of a plant against destruction due to overvoltage

Technical specifications

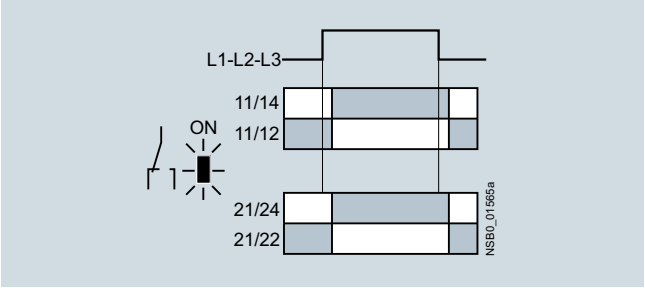
3UG4511 monitoring relays

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.

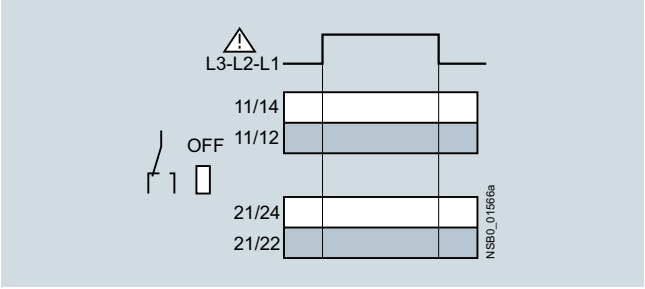
Note:

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



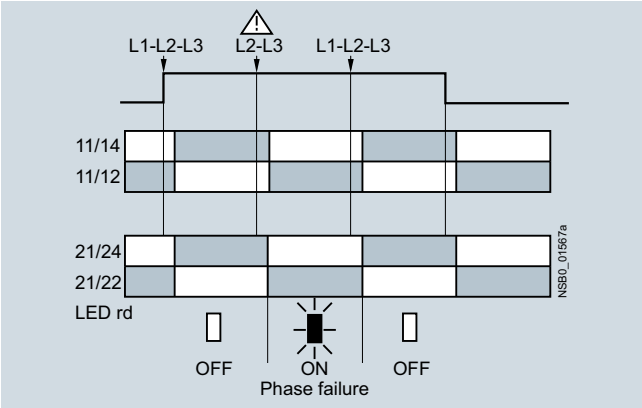
3UG4512 monitoring relays

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.

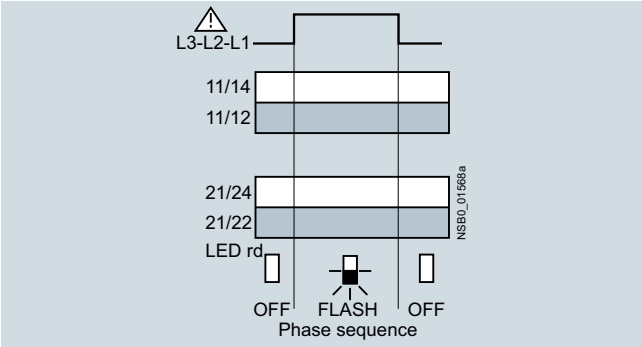
Note:

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



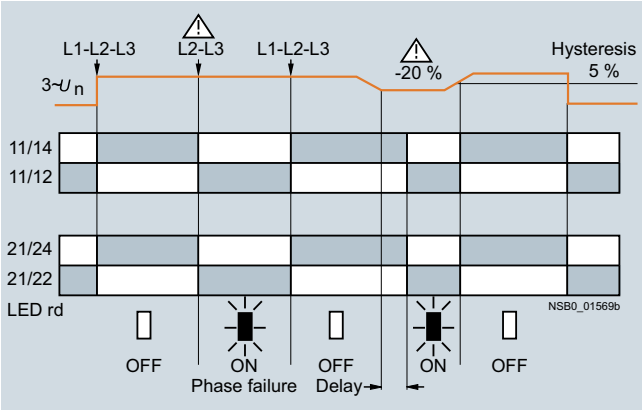
3UG4513 monitoring relays

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.

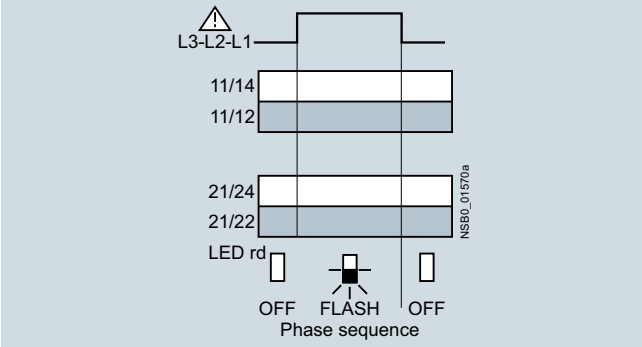
Note:

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

Line monitoring

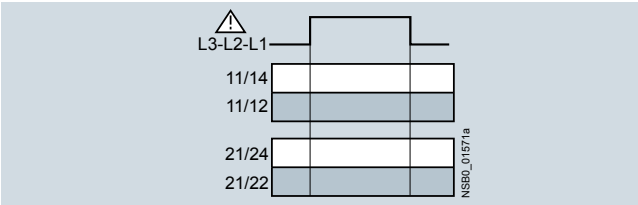
3UG4614 monitoring relays

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%.

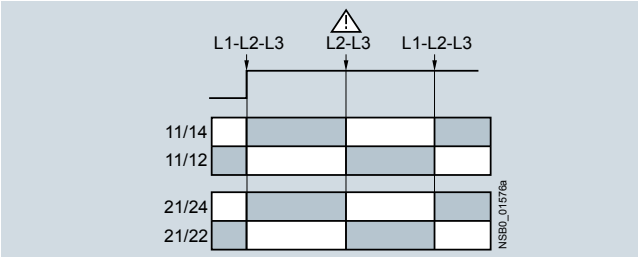
The 3UG4614 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

With the closed-circuit principle selected

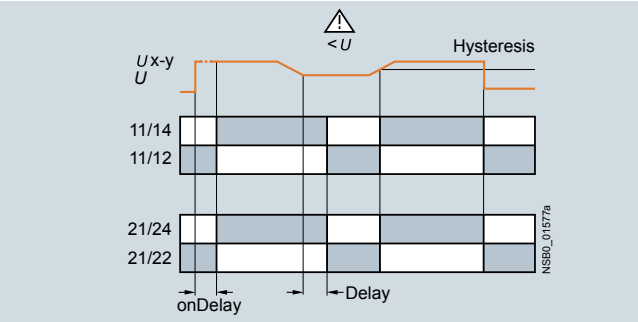
Wrong phase sequence



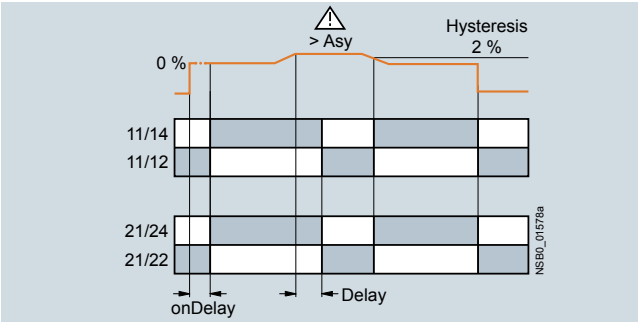
Phase failure



Undervoltage



Unbalance



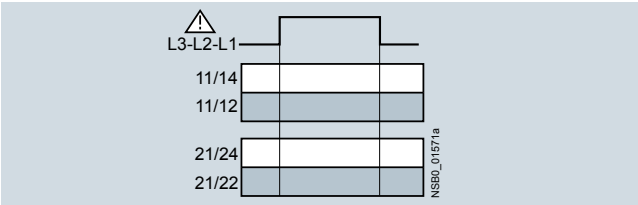
3UG4615/3UG4616 monitoring relays

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%.

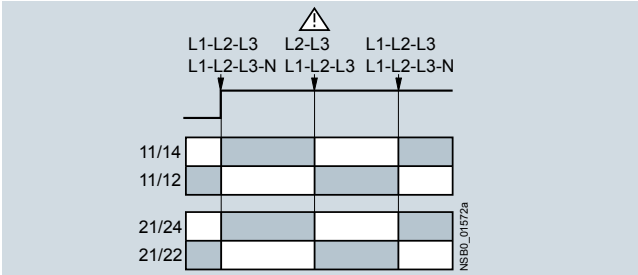
The 3UG4615/3UG4616 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

With the closed-circuit principle selected

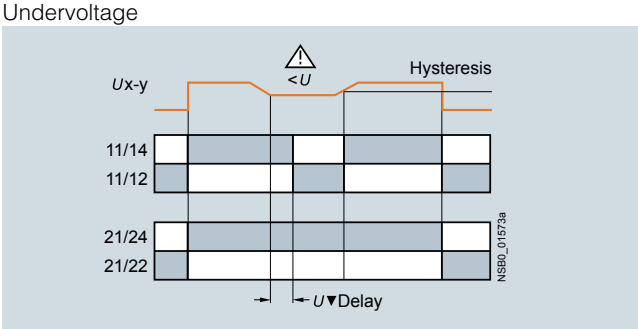
Wrong phase sequence



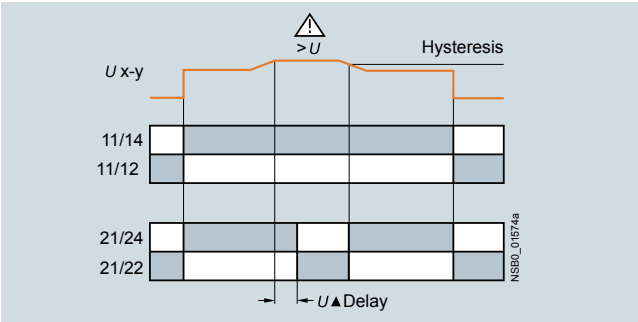
Phase failure



Undervoltage



Overvoltage



3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

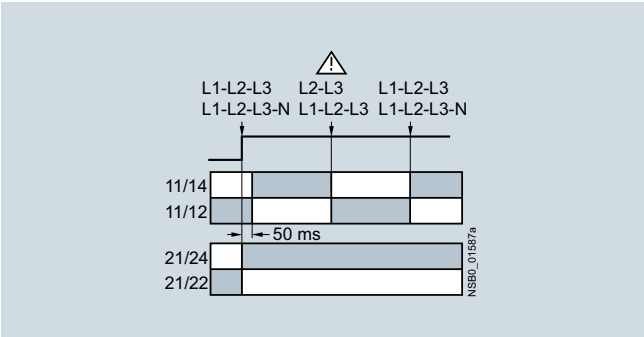
Line monitoring

3UG4617/3UG4618 monitoring relays

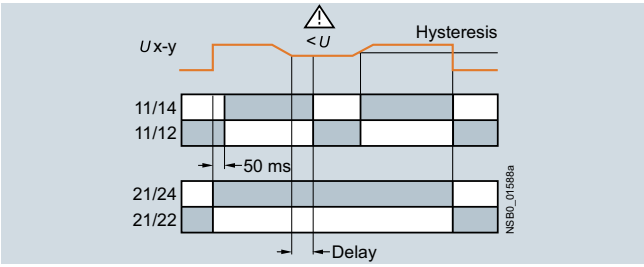
The 3UG4617/3UG4618 line monitoring relay has an internal power supply and can automatically correct a wrong direction of rotation. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V AC and feedback through the load of up to 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

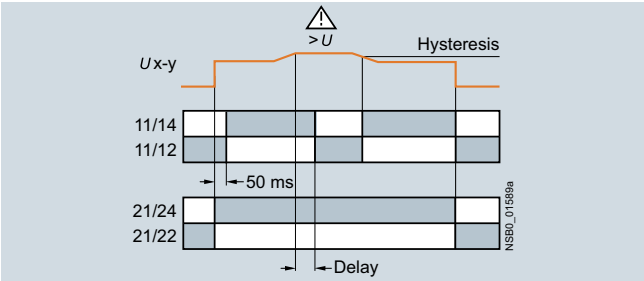
Phase failure



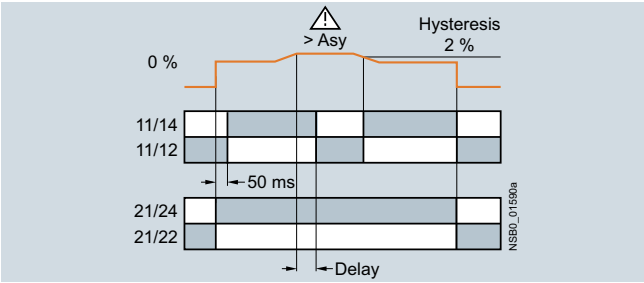
Undervoltage



Overvoltage



Unbalance



Type		3UG4511 ... 3UG4513, 3UG4614 ... 3UG4618
General data		
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Control circuit		
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	 A A A A	 3 1 0.2 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

3UG4511-1AP20

3UG4615-1CR20

3UG4616-1CR20

3UG4617-1CR20

3UG4618-1CR20

3UG4511-2BP20

3UG4512-2BR20

Adjustable hysteresis	Under-voltage detec-tion	Over-voltage detec-tion	Stabiliza-tion time adjustable stDEL	Tripping delay time adjustable Del	Version of auxiliary contacts	Measurable line voltage[1]	SD	Screw terminals	SD	Spring-type terminals
			s	s	CO contact	V	d	Article No. / Price per PU	d	Article No. / Price per PU
Monitoring of phase sequence										
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**
Monitoring of phase sequence, phase failure and phase unbalance										
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**
Monitoring of phase sequence, phase failure, unbalance and undervoltage										
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	0.1 … 20	2	160 … 690 AC	2	**3UG4614-1BR20**	2	**3UG4614-2BR20**
Monitoring of phase sequence, phase failure, overvoltage and undervoltage										
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle										
adjustable 1 ... 20 V	✓	✓	--	0.1 … 20[2]	2[2]	160 … 690 AC	2	**3UG4615-1CR20**	2	**3UG4615-2CR20**
Monitoring of phase sequence, phase and N conductor failure, overvoltage and undervoltage										
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle										
adjustable 1 ... 20 V	✓	✓	--	0.1 … 20[2]	2[2]	90… 400 AC against N	2	**3UG4616-1CR20**	2	**3UG4616-2CR20**
Automatic correction of the direction of rotation in case of wrong phase sequence, phase failure, unbalance, overvoltage and undervoltage										
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[3]	160 … 690 AC	2	**3UG4617-1CR20**	2	**3UG4617-2CR20**
Automatic correction of the direction of rotation in case of wrong phase sequence, phase and N conductor failure, phase unbalance, overvoltage and undervoltage										
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[3]	90 … 400 AC against N	2	**3UG4618-1CR20**	2	**3UG4618-2CR20**

✓ Function available
-- Function not available
[1] Absolute limit values.
[2] 1 CO contact each and one tripping delay time each for U_{min} and U_{max}.
[3] 1 CO contact each for power system fault and phase sequence correction.

For accessories, see page 12/96

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

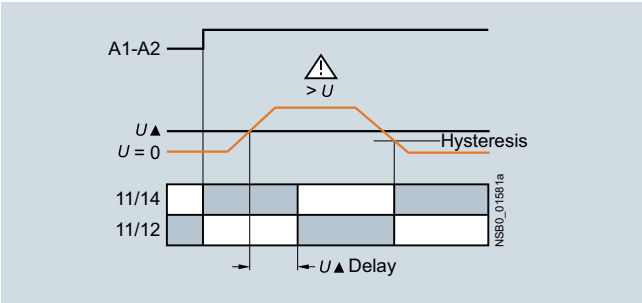
3UG4631/3UG4632 monitoring relays

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.

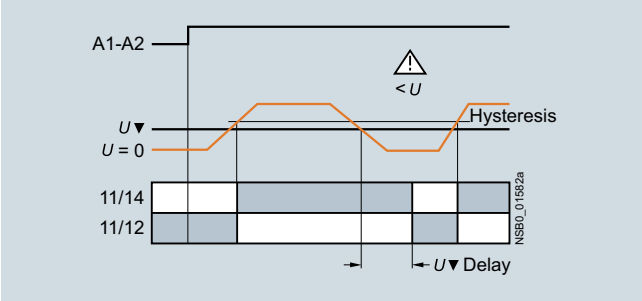
The measuring range extends from 0.1 to 60 V or 10 to 600 V AC/DC. The threshold values for overshoot or undershoot can be freely configured within this range. If one of these threshold values is reached, the output relay responds according to the set principle of operation as soon as the delay time 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

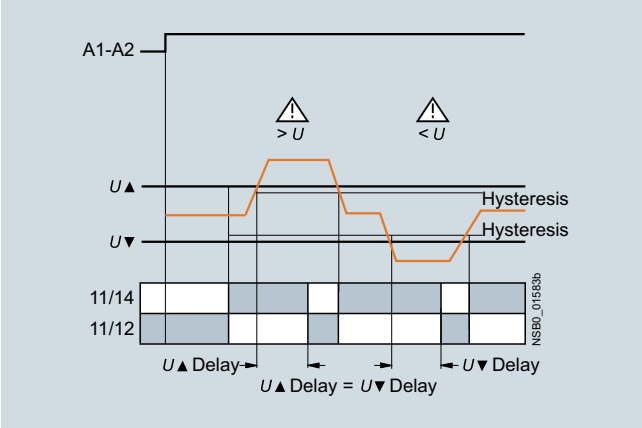
Overvoltage



Undervoltage



Range monitoring



33UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Voltage monitoring

3UG4633 monitoring relay

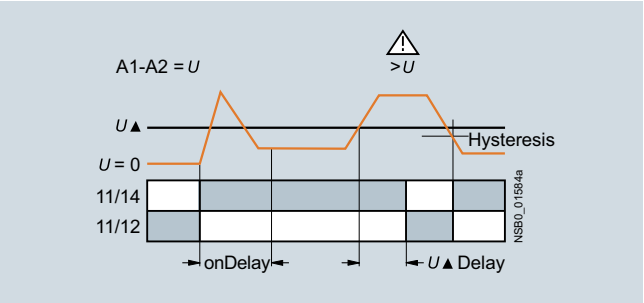
The 3UG4633 voltage monitoring relay has an internal power supply and performs overshoot, undershoot or range monitoring of the voltage depending on parameterization. The device is equipped with a display and is parameterized using three buttons.

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.

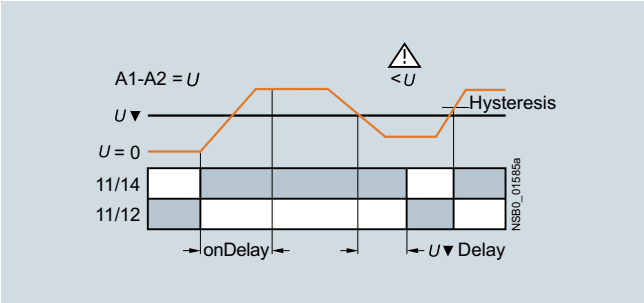
The hysteresis is adjustable from 0.1 to 150 V. The device can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. One output change-over contact is available as signaling contact.

With the closed-circuit principle selected

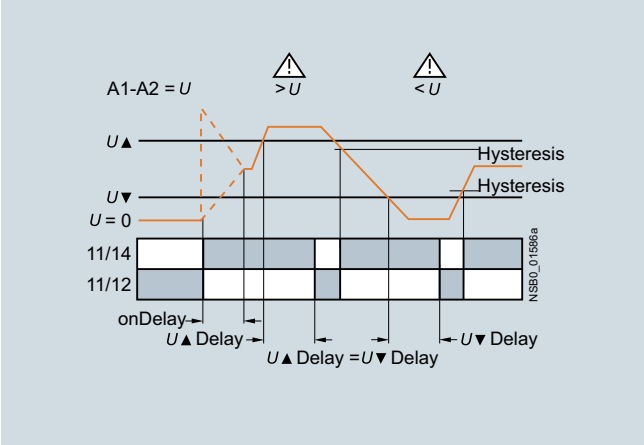
Overvoltage



Undervoltage



Range monitoring



Type		3UG4631	3UG4632	3UG4633
General data				
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690		
Rated impulse withstand voltage U_{imp}	kV	6		
Measuring circuit				
Permissible measuring range single-phase AC/DC voltage	V	0.1 … 68	10 … 650	17 … 275
Measuring frequency	Hz	40 ... 500		
Setting range single-phase voltage	V	0.1 ... 60	10 ... 600	17 ... 275
Control circuit				
Load capacity of the output relay • Thermal current I_{th}	A	5		
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	 A A A A	 3 1 0.2 0.1		
Minimum contact load 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

3UG4631-1AA30

3UG4633-2AL30

Measuring range	Adjustable hysteresis	Rated control supply voltage U_s	SD	Screw terminals		SD	Spring-type terminals	
				Article No.	Price per PU		Article No.	Price per PU
V	V	V	d			d		
Internal power supply without auxiliary voltage, separately adjustable ON-delay and tripping delay 0.1 ... 20 s								
17 ... 275 AC/DC	0.1 ... 150	17 ... 275 AC/DC[1]	2	**3UG4633-1AL30**		2	**3UG4633-2AL30**	
Externally supplied with auxiliary voltage, tripping delay adjustable 0.1 ... 20 s								
0.1 ... 60 AC/DC	0.1 ... 30	24 AC/DC	2	**3UG4631-1AA30**		2	**3UG4631-2AA30**	
10 ... 600 AC/DC	0.1 ... 300		2	**3UG4632-1AA30**		2	**3UG4632-2AA30**	
0.1 ... 60 AC/DC	0.1 ... 30	24 ... 240 AC/DC	2	**3UG4631-1AW30**		2	**3UG4631-2AW30**	
10 ... 600 AC/DC	0.1 ... 300		2	**3UG4632-1AW30**		2	**3UG4632-2AW30**	

[1] Absolute limit values.

For accessories, see page 12/96

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

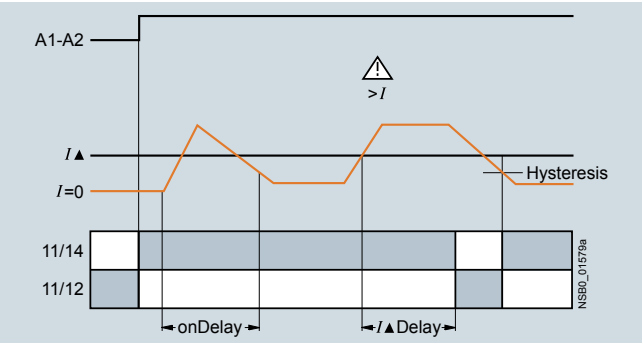
The 3UG4621 or 3UG4622 current monitoring relay is supplied with an auxiliary voltage of 24 V AC/DC or 24 to 240 V AC/DC and performs overshoot, undershoot or range monitoring of the current depending on parameterization. The device is equipped with a display and is parameterized using three buttons.

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.

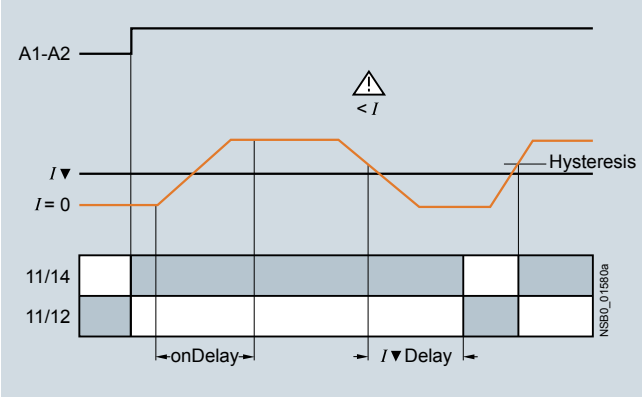
The hysteresis is adjustable from 0.1 to 250 mA or 0.01 to 5 A. The device can be operated with Manual or Auto RESET and on the basis of either the open-circuit or closed-circuit principle. You can decide here whether the output relay is to respond when the supply voltage U_S = ON is applied, or not until the lower measuring range limit of the measuring current (I > 3 mA/50 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

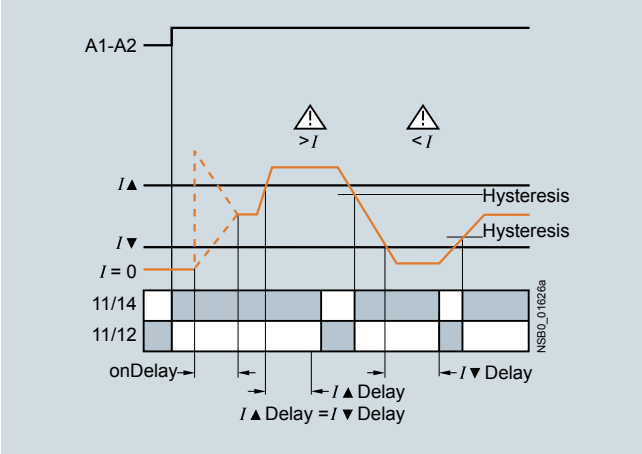
Current overshoot



Current undershoot



Range monitoring



3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Current monitoring

Type		3UG4621-.AA	3UG4621-.AW	3UG4622-.AA	3UG4622-.AW
General data					
Rated insulation voltage U_i Pollution degree 3; overvoltage category III according to VDE 0110	V	690			
Rated impulse withstand voltage U_{imp}	kV	6			
Measuring circuit					
Measuring range for single-phase AC/DC current	A	0.003 … 0.6		0.05 … 15	
Measuring frequency	Hz	40 ... 500			
Setting range for single-phase current	A	0.003 ... 0.5		0.05 ... 10	
Load supply voltage	V	24	Max. 300[1)] Max. 500[2)]	24	Max. 300[1)] Max. 500[2)]
Control circuit					
Load capacity of the output relay • Thermal current I_{th}	A	5			
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	 A A A A	 3 1 0.2 0.1			
Minimum contact load at 17 V DC	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

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	d	Article No.	Price per PU
Monitoring of undercurrent and overcurrent, start up delay and tripping delay times can be adjusted separately 0.1 ... 20 s								
3 … 500 mA AC/DC 0.05 … 10 A AC/DC	0.1 ... 250 mA 0.01 ... 5 A	24 AC/DC [1)]	2 2	**3UG4621-1AA30** **3UG4622-1AA30**		2 2	**3UG4621-2AA30** **3UG4622-2AA30**	
3 … 500 mA AC/DC 0.05 … 10 A AC/DC	0.1 ... 250 mA 0.01 ... 5 A	24 ... 240 AC/DC [2)]	2 2	**3UG4621-1AW30** **3UG4622-1AW30**		2 2	**3UG4621-2AW30** **3UG4622-2AW30**	

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 12/96

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.

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

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}▼= 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.

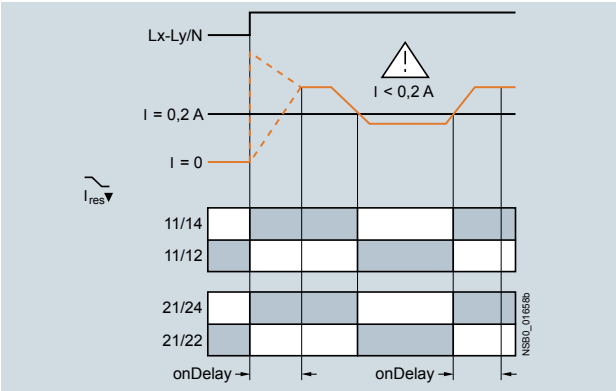
The relay operates either according to the open-circuit or closed-circuit principle. If the device is set to Auto RESET (Memory = No), depending on the set principle of operation, the switching relay returns to its initial state and the flashing ends when the hysteresis threshold is reached.

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.

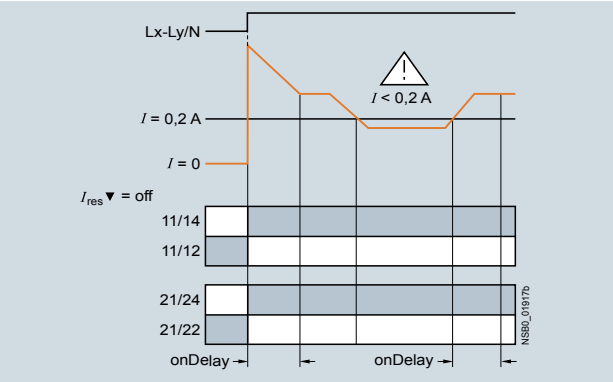
With the closed-circuit principle selected

Response in the event of undershooting the measuring range limit

- With activated monitoring of I_{res}▼



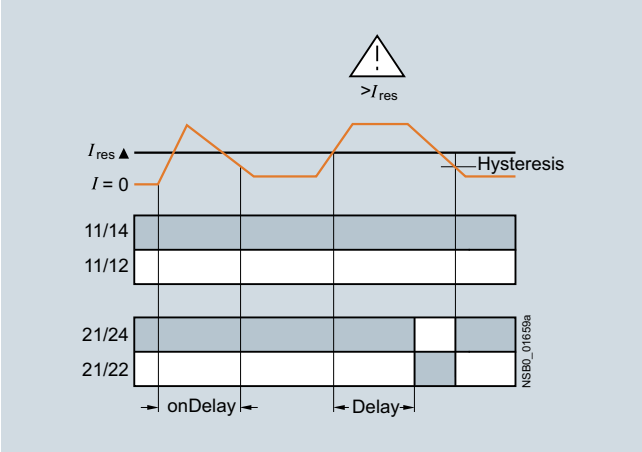
- With deactivated monitoring of active current undershooting



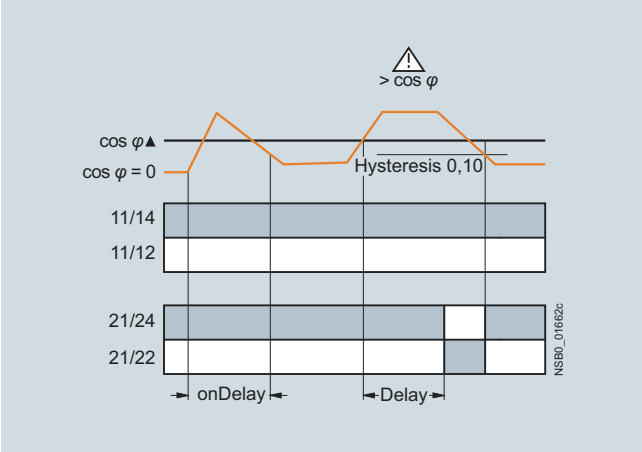
3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Power factor and active current monitoring

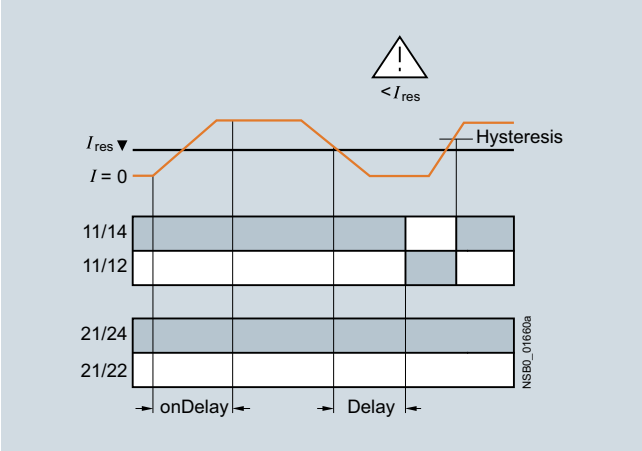
Overshooting of active current



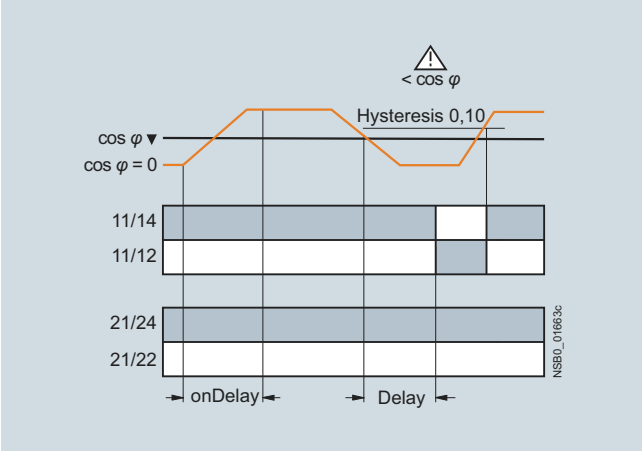
Overshooting of power factor



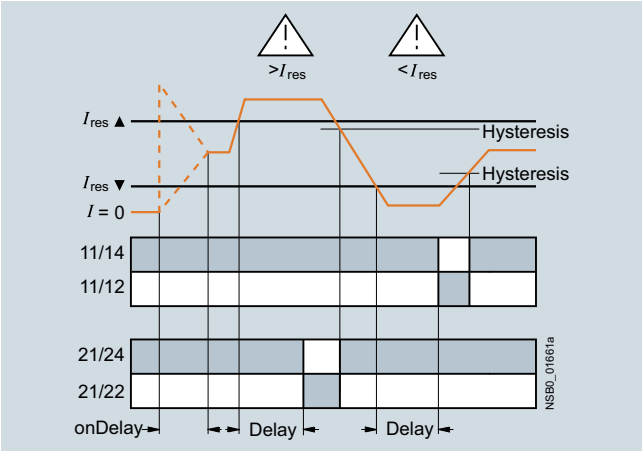
Undershooting of active current



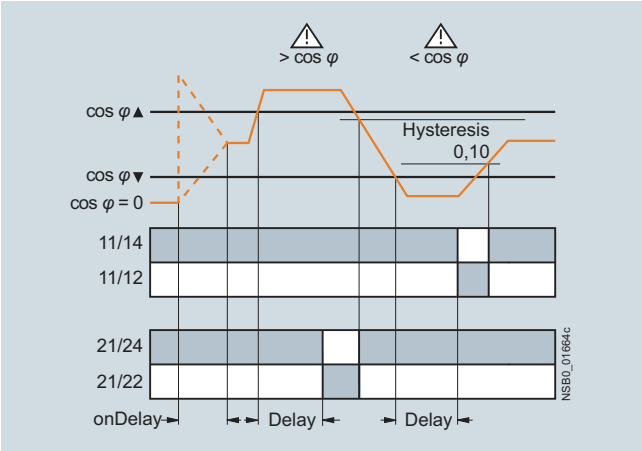
Undershooting of power factor



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
General data		
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Control circuit		
Number of CO contacts for auxiliary contacts		2
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	 A A A A	 3 1 0.2 0.1
Minimum contact load at 17 V DC	mA	5

Selection and ordering data

- For monitoring the power factor and the active current I_{res} (p.f. x 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

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 [1] 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}					Article No.	Price per PU		Article No.	Price per PU
P.f.	A	P.f.	A	s	s	V	d			d		
0.10 ... 0.99	0.2 ... 10.0	0.1	0.1 ... 2.0	0 ... 99	0.1 ... 20.0	90 ... 690	2	**3UG4641-1CS20**		2	**3UG4641-2CS20**	

[1] Absolute limit values.

For accessories, see page 12/96

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).

Benefits

- Worldwide use thanks to wide voltage range from 24 to 240 V AC/DC
- High measuring accuracy of ± 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.

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 overshot.

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.

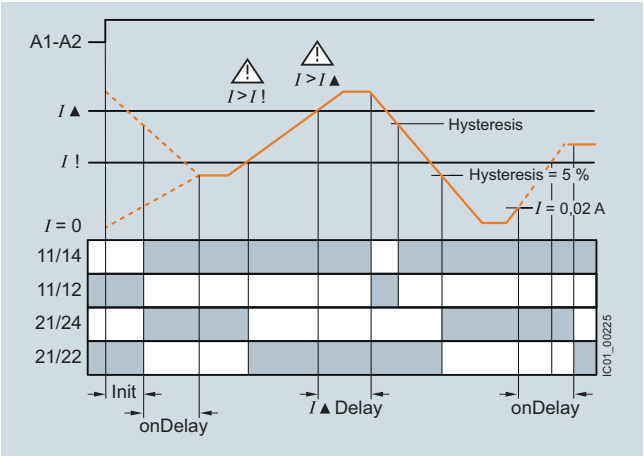
ON-delay time for motor start

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 overshot 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.

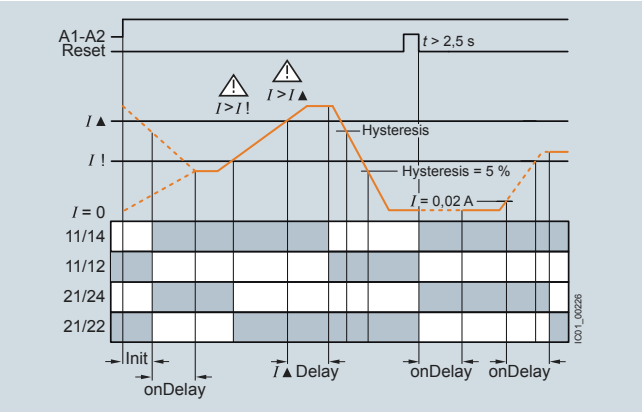
The associated relay changes its switching state if the value falls below the fixed hysteresis value of 5% of the set warning value.

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.

Type		3UG4625-1CW30, 3UG4625-2CW30
General data		
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
Control circuit		
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		
• 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

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

3UG4625-1CW30

3UG4625-2CW30

Measurable current	Adjustable response value current	Switching hysteresis	Adjustable ON-delay time	Control supply voltage For AC at 50 Hz rated value	For AC at 60 Hz rated value	At DC rated value	SD	Screw terminals Article No.	Price per PU	SD	Spring-type terminals 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	**3UG4625-1CW30**		2	**3UG4625-2CW30**	

For accessories, see page 12/96

For 3UL23 residual-current transformers, see page 12/82.

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*
mm	mm^2	d	Article No.	Price per PU		
Residual-current transformers (essential accessories for 3UG4625, 3UG4825)						
35	2.5	2	**3UL2302-1A**		1	1 unit
55	2.5	2	**3UL2303-1A**		1	1 unit
80	2.5	2	**3UL2304-1A**		1	1 unit
110	2.5	2	**3UL2305-1A**		1	1 unit
140	2.5	2	**3UL2306-1A**		1	1 unit
210	4	2	**3UL2307-1A**		1	1 unit

Accessories

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Adapters						
3UL2900	**Adapters** For mounting onto standard rail for 3UL23 to diameter 55 mm	2	**3UL2900**		1	2 units

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

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
General data				
Setting range for the setpoint response values				
• 1 ... 100 kΩ		✓	✓	✓
• 2 ... 200 kΩ		--	--	✓
Rated voltage of the network being monitored				
• 0 ... 250 V AC		--	✓	--
• 0 ... 440 V AC		✓	--	✓
• 0 ... 690 V AC		--	--	✓ [1]
• 0 … 300 V DC		--	✓	--
• 0 … 600 V DC		--	--	✓
• 0 ... 1 000 V DC		--	--	✓ [1]
Max. leakage capacitance of the system				
• 10 µF		✓	✓	--
• 20 µF		--	--	✓
Output contacts				
• 1 CO		✓	✓	--
• 2 CO or 1 CO + 1 CO, adjustable		--	--	✓
Number of limit values				
• 1		✓	✓	--
• 1 or 2, adjustable		--	--	✓
Principle of operation		Closed-circuit principle	Closed-circuit principle	Open-circuit/closed-circuit principle, adjustable
Rated control supply voltage				
• 24 ... 240 V AC/DC		✓	✓	✓
Rated frequency				
• 15 ... 400 Hz		--	✓	✓
• 50/60 Hz		✓	--	--
Auto or Manual RESET		✓ Adjustable	✓ Adjustable	✓ Adjustable
Remote RESET		✓ Via control input	✓ Via control input	✓ Via control input
Non-volatile error memory		--	--	✓ Adjustable
Broken wire detection		--	--	✓ Adjustable
Replacement for				
Rated control supply voltage U_s	Voltage range of the network being monitored			
3UG3081-1AK20 110 ... 130/220 ... 240 V AC/DC	3 x 230/400 V AC	✓	--	--
3UG3081-1AW30 24 ... 240 V AC/DC	3 x 230/400 V AC	✓	--	--
3UG3082-1AW30 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.

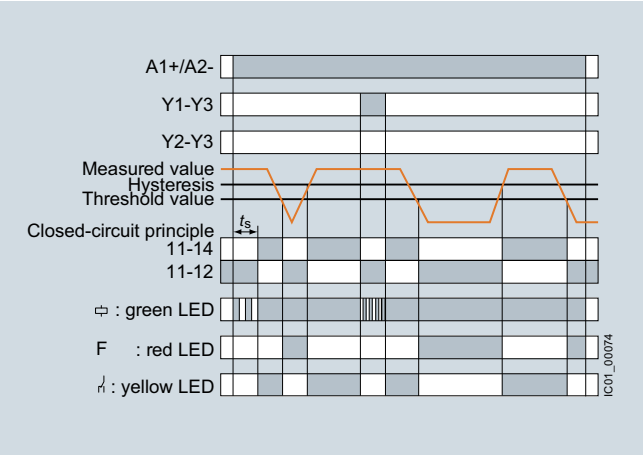
In the case of 3UG4581 a higher-level DC measuring signal is used. The higher-level DC measuring signal and the resulting current are used to determine the value of the insulation resistance of the network which is to be measured.

Technical specifications

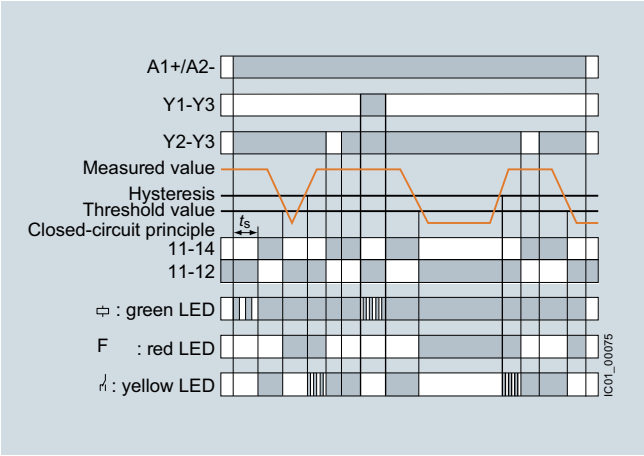
3UG4581 monitoring relay

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with Auto RESET

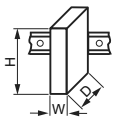


Insulation resistance monitoring with fault storage and Manual RESET



3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Insulation monitoring for ungrounded AC networks

Type		3UG4581
Dimensions (W x H x D) 	mm	22.5 x 100 x 100
Connection type		**Screw terminals**
• Solid	mm^2	2 x (0.5 ... 4)
• Finely stranded with end sleeve	mm^2	2 x (0.75 ... 2.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)
General data		
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to IEC 60664	V	400 supply circuit/measuring circuit 300 supply circuit/output circuit
Rated impulse withstand voltage U_{imp}	kV	6
Rated control supply voltage	V	24 ... 240 AC/DC
Rated frequency	Hz	15 ... 400
Measuring circuit		
Rated line voltage of the network being monitored	V	0 ... 400
Rated frequency of the network being monitored	Hz	50 ... 60
Setting range for insulation resistance	kΩ	1 ... 100
Control circuit		
Load capacity of the output relay • Thermal current I_{th}	A	4
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V	A A	3 2
Minimum contact load at 24 V DC	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*
	V AC	kΩ	V	µF	d	Article No.	Price per PU		
Insulation monitors for ungrounded AC networks									
3UG4581-1AW30	0 ... 400	1 ... 100	24 ... 240 AC/DC	Max. 10	5	**3UG4581-1AW30**		1	1 unit

For accessories, see page 12/96

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

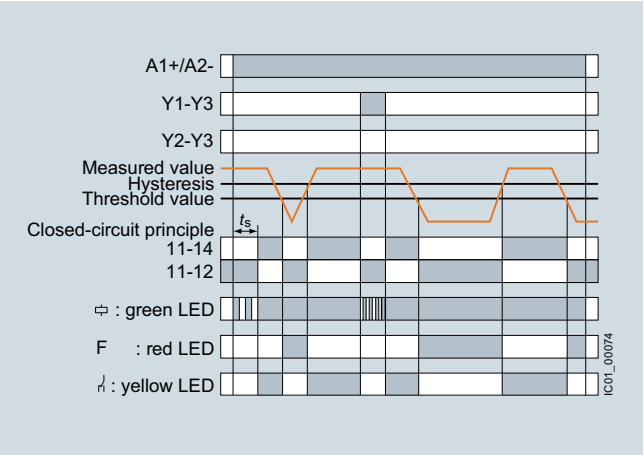
The 3UG4983 passive voltage reducer module can be used to allow the 3UG4583 insulation monitoring relay to be used for insulation monitoring of IT networks with rated voltages of up to 690 V AC and 1 000 V DC.

Technical specifications

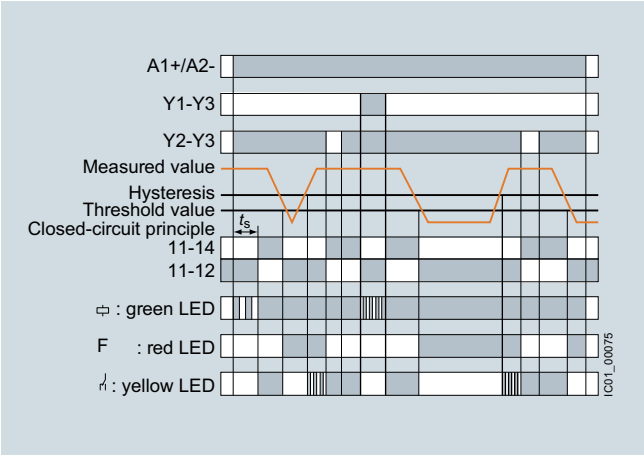
3UG4582 monitoring relays

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with Auto RESET



Insulation resistance monitoring with fault storage and Manual RESET



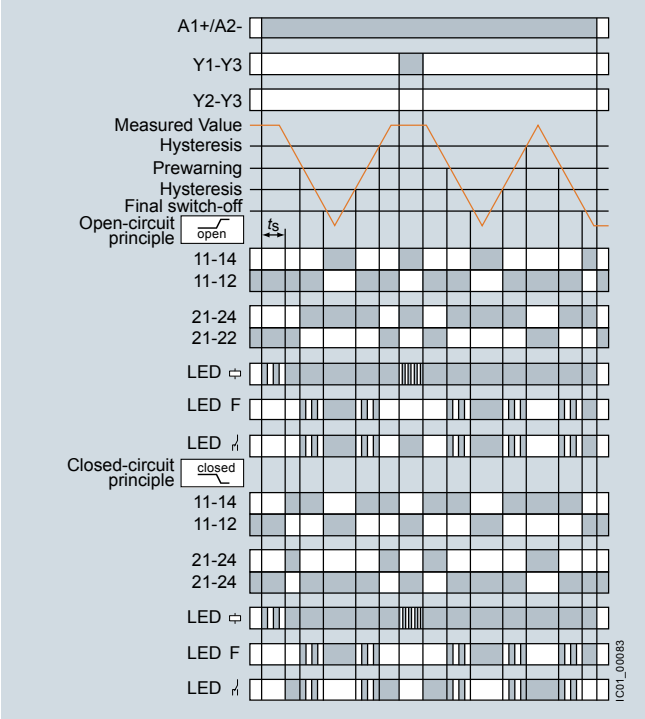
3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Insulation monitoring for ungrounded DC and AC networks

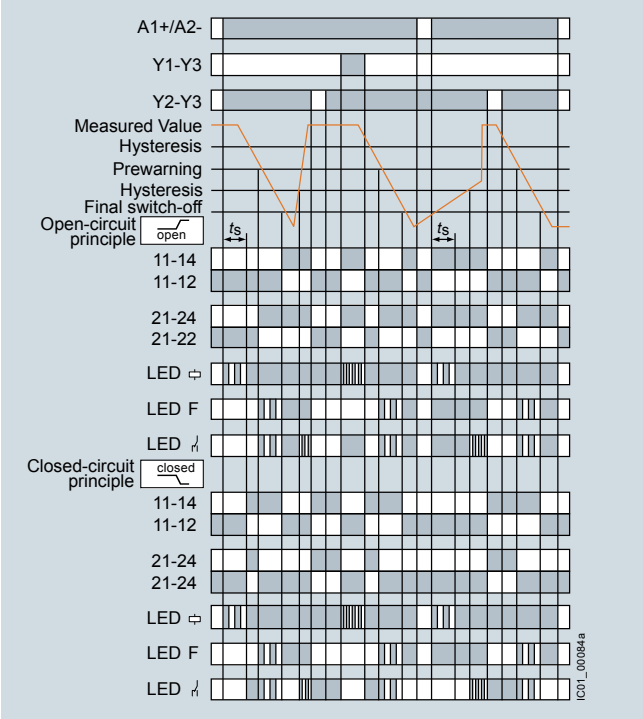
3UG4583 monitoring relays

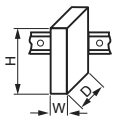
With the closed-circuit principle selected

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**	
• Solid • Finely stranded with end sleeve • AWG cables, solid or stranded	mm^2 mm^2 AWG	2 x (0.5 ... 4) 2 x (0.75 ... 2.5) 2 x (20 ... 14)	
General data			
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to IEC 60664	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
Rated impulse withstand voltage U_{imp}	kV	6	
Rated control supply voltage	V AC/DC	24 ... 240	
Rated frequency	Hz	15 ... 400	
Measuring circuit			
Rated line voltage of the network being monitored	V 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)
Control circuit			
Number of CO contacts for auxiliary contacts		1	2 or 1 + 1, adjustable
Load capacity of the output relay • Thermal current I_{th}	A	4	
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V	A A	3 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*
	V	µF		kΩ		d	Article No. / Price per PU		
3UG4582 insulation monitors									
3UG4582-1AW30	0 ... 250 AC, 0 ... 300 DC	Max. 10	1 CO	1 ... 100	✓	5	**3UG4582-1AW30**	1	1 unit
3UG4583 insulation monitors									
3UG4583-1CW30	0 ... 400 AC, 0 ... 600 DC[1]	Max. 20	2 CO or 1 CO + 1 CO, adjustable	1 ... 100, 2 ... 200 for 2nd limit value, adjustable	✓ Adjustable	5	**3UG4583-1CW30**	1	1 unit
	Voltage reducer module for 3UG4583								
3UG4983-1A	For extending the network voltage range to max. 690 V AC and 1 000 V DC					5	**3UG4983-1A**	1	1 unit

✓ Available

[1] 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 12/96

3UG45, 3UG46 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

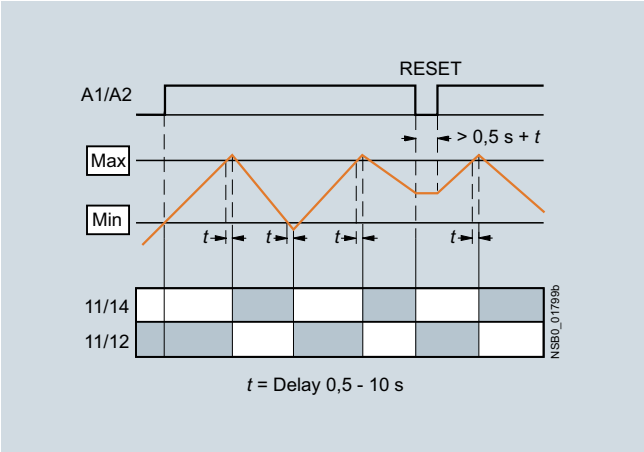
3UG4501 monitoring relays

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.

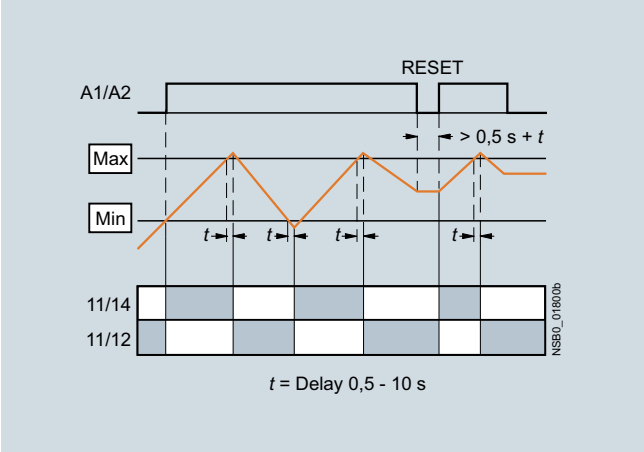
Two-point control

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.

3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Insulation monitoring for ungrounded DC and AC networks

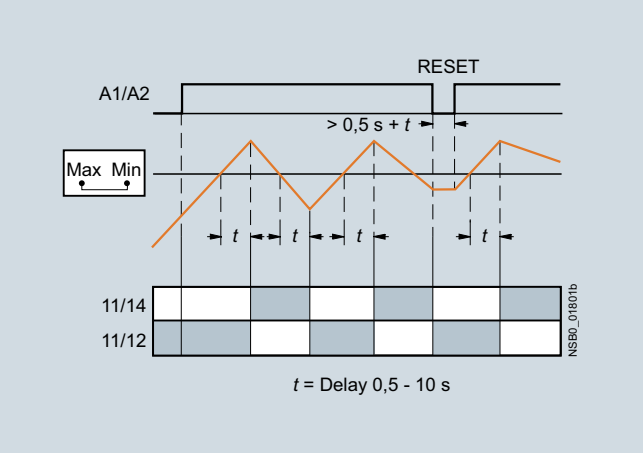
Single-point control

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.

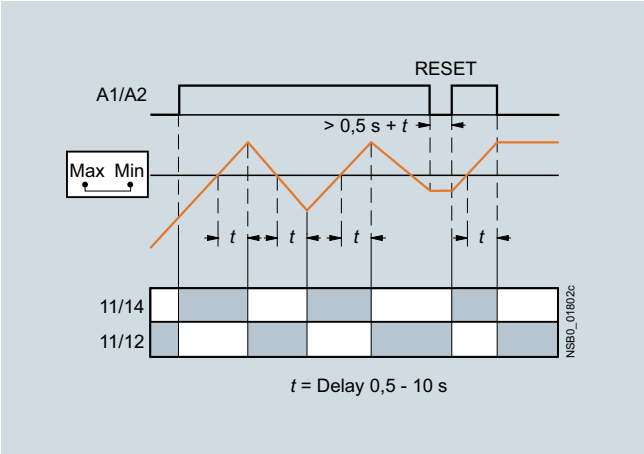
In order to prevent premature tripping of the switching function caused by wave motion or frothing, even though the set level has not been reached, it is possible to delay this function by 0.5 to 10 s.

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
General data		
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Measuring circuit		
Electrode current, max. (typ. 70 Hz)	mA	1
Electrode voltage, max. (typ. 70 Hz)	V	15
Sensor feeder cable	m	Max. 100
Conductor capacitance of sensor cable[1)]	nF	Max. 10
Control circuit		
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

1) 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

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

Sensitivity	Tripping delay time	Rated control supply voltage U_s	SD	**Screw terminals**		SD	**Spring-type terminals**	
kΩ	s	V AC/DC	d	Article No.	Price per PU	d	Article No.	Price per PU
2 ... 200	0.5 ... 10	24[1]	2	**3UG4501-1AA30**		2	**3UG4501-2AA30**	
		24 ... 240	2	**3UG4501-1AW30**		2	**3UG4501-2AW30**	

[1] The rated control supply voltage and the measuring circuit are not electrically separated.

For accessories, see page 12/96

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 underspeed.

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)

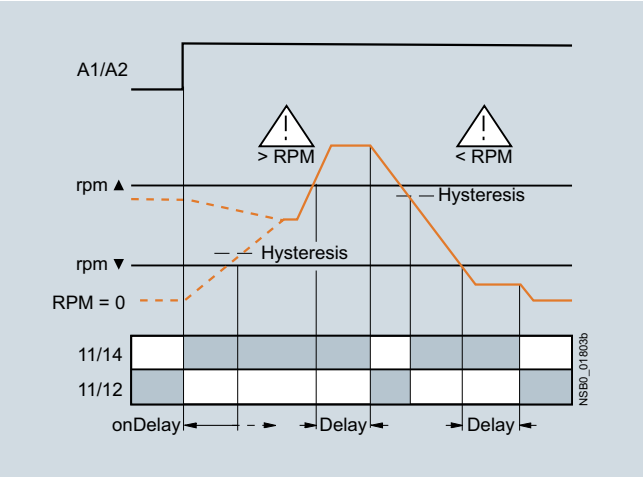
If Manual RESET is selected in the menu, the output relay remains in its current switching state and the current measured value and the symbol for overshooting/undershooting continue to flash, even when the speed returns to a permissible value. This stored fault status can be reset by simultaneously 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

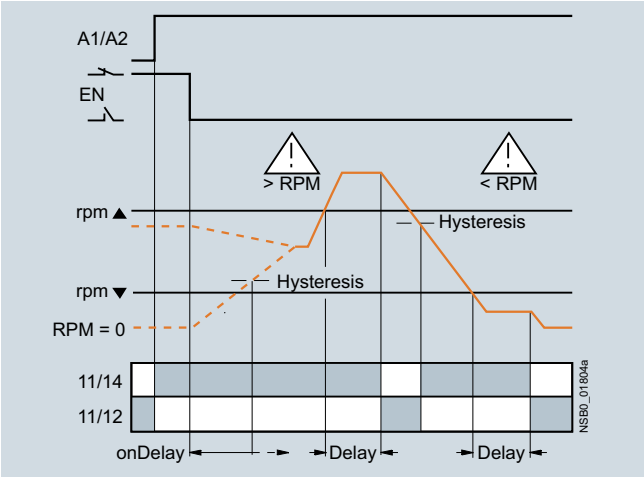
Speed monitoring

With the closed-circuit principle selected

Range monitoring without enable input



Range monitoring with enable input



Type		3UG4651
General data		
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Measuring circuit		
Sensor supply		
• For 3-wire sensor (24 V/0 V)	mA	Max. 50
• For 2-wire NAMUR sensor (8V2)	mA	Max. 8.2
Signal input		
• IN1	kΩ	16, 3-wire sensor, pnp operation
• IN2	kΩ	1, floating contact, 2-wire NAMUR sensor
Voltage level		
• For level 1 at IN1	V	4.5 ... 30
• For level 0 at IN1	V	0 ... 1
Current level		
• For level 1 at IN2	mA	> 2.1
• For level 0 at IN2	mA	< 1.2
Minimum pulse duration of signal	ms	5
Minimum interval between 2 pulses	ms	5
Control circuit		
Number of CO contacts for auxiliary contacts		1
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

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

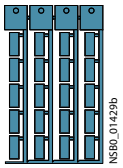
PU (UNIT, SET, M) = 1
PKG* = 1 UNIT

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[1]	2	**3UG4651-1AA30**		2	**3UG4651-2AA30**	
					24 ... 240	2	**3UG4651-1AW30**		2	**3UG4651-2AW30**	

[1] The rated control supply voltage and the measuring circuit are not electrically separated.

For accessories, see page 12/96

Selection and ordering data

	Use	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Blank labels							
 3RT1900-1SB20	For 3UG4	**Unit labeling plates** For SIRIUS devices					
		20 mm x 7 mm, pastel turquoise	20	**3RT1900-1SB20**		100	340 units
	For 3UG4	**Adhesive labels** for SIRIUS devices					
		• 19 mm x 6 mm, pastel turquoise	15	**3RT1900-1SB60**		100	3 060 units
		• 19 mm x 6 mm, zinc yellow	15	**3RT1900-1SD60**		100	3 060 units
Push-in lugs and covers							
3RP1903	For 3UG4	**Push-in lugs** For screw fixing, 2 units are required for each device	5	**3RP1903**		1	10 units
3RP1902	For 3UG4	**Sealable covers** For securing against unauthorized adjustment of setting knobs	5	**3RP1902**		1	5 units
	For 3UG45	**Sealing foil** For securing against unauthorized adjustment of setting knobs	▶	**3TK2820-0AA00**		1	1 unit
Covers for insulation monitoring relays							
3UG4981-0C	For 3UG4581 and 3UG4582	**Sealable, transparent covers**	5	**3UG4981-0C**		1	1 unit
3UG4983-0C	For 3UG4583		5	**3UG4983-0C**		1	1 unit
Tools for opening spring-type terminals							
3RA2908-1A	For auxiliary circuit connections	**Screwdrivers** 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	**Spring-type terminals** **3RA2908-1A**		1	1 unit

Note:

For products for mechanical bearing monitoring, e.g. condition monitoring systems, see 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
Industry Mall, see www.siemens.com/product?3UG48
For the conversion tool, e.g. from 3UG3 to 3UG4, see 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, see Section 14 AS-Interface & IO-Link.

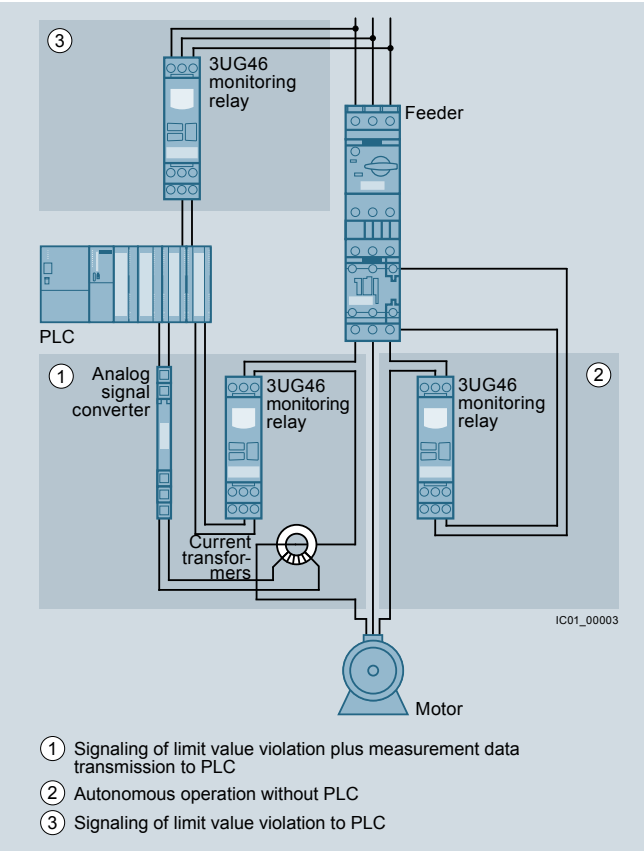
Notes on security

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.

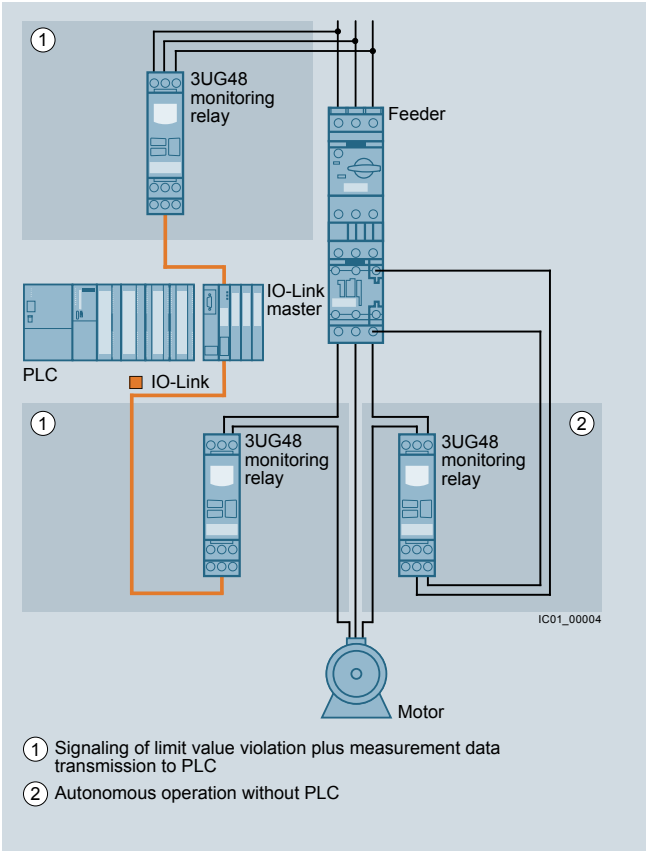
For more information on Industrial Security, see www.siemens.com/industrialsecurity.

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								
3UG4 monitoring relay with IO-Link		**3UG4**	□	□	□	–	□	□	□	**0**
Type of setting	e.g. 8 = analogically adjustable		□							
Functions	e.g. 15 = line monitoring			□	□					
Connection type	Screw terminals						**1**			
	Spring-type terminals (push-in)						**2**			
Contacts	e.g. A = 1 CO contact							□		
Supply voltage	e.g. A4 = 160 ... 690 V AC								□	□
Example		**3UG4**	**8**	**1**	**5**	**–**	**1**	**A**	**A**	**4**	**0**

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 funcionality.

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
General technical specifications		
Dimensions (W x H x D)		
• For 3 terminal blocks		
- Screw terminals	mm	22.5 x 92 x 91
- Spring-type terminals	mm	22.5 x 94 x 91
• For 4 terminal blocks		
- Screw terminals	mm	22.5 x 103 x 91
- Spring-type terminals	mm	22.5 x 103 x 91
Permissible ambient temperature		
• During operation	°C	-25 ... +60
Connection type		**Screw terminals**
• Terminal screw		M3 (for standard screwdriver, size 2 and Pozidriv 2)
• Solid	mm^2	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)
• Tightening torque	Nm	0.8 ... 1.2
Connection type		**Spring-type terminals**
• Solid	mm^2	2 x (0.25 ... 1.5)
• Finely stranded, with end sleeve acc. to DIN 46228	mm^2	2 x (0.25 ... 1.5)
• Finely stranded	mm^2	2 x (0.25 ... 1.5)
• AWG cables, solid or stranded	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 overshot 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	• Direction of rotation of the drive
Phase failure	• A fuse has tripped • Failure of the control supply voltage • Broken cable
Phase asymmetry	• Overheating of the motor due to asymmetrical voltage • Detection of asymmetrically loaded networks
Undervoltage	• Increased current on a motor with corresponding overheating • Unintentional resetting of a device • Network collapse, particularly with battery power
Overvoltage	• Protection of a plant against destruction due to overvoltage

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.

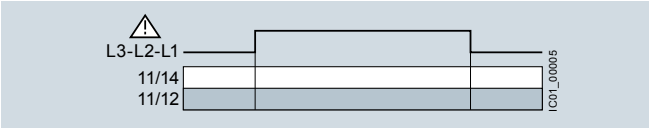
The 3UG4815 and 3UG4816 monitoring relays can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

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.

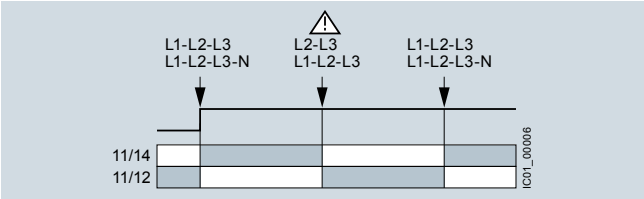
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected

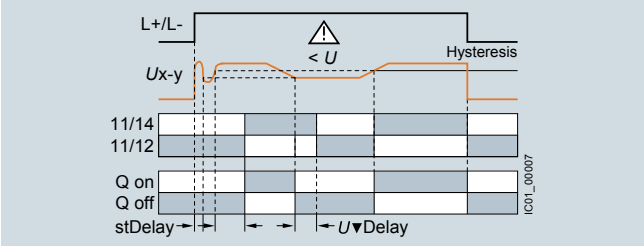
Wrong phase sequence



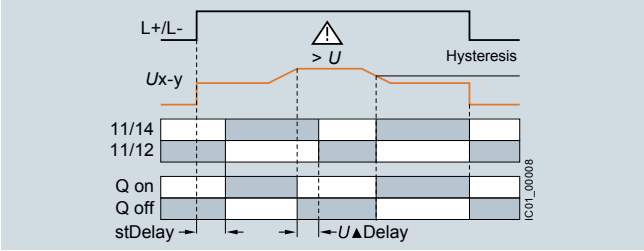
Phase failure



Undervoltage



Overvoltage



Type		3UG4815, 3UG4816
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Control circuit		
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13 at - 24 V - 125 V - 250 V	 A A A A	 3 1 0.2 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

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

3UG4815-1AA40

3UG4816-1AA40

3UG4815-2AA40

3UG4816-2AA40

Adjustable hysteresis	Undervoltage detection	Overvoltage detection	Stabilization time adjustable stDEL	Tripping delay time adjustable Del	Version of auxiliary contacts	Measurable line voltage[1]	SD	Screw terminals	SD	Spring-type terminals
V			s	s		V AC	d	Article No. / Price per PU	d	Article No. / Price per PU
Monitoring of phase sequence, phase failure, phase asymmetry, overvoltage and undervoltage										
1 ... 20	✓	✓	0.1 … 999.9	0.1 … 999.9	1 CO + 1 Q[2]	160 … 690	2	**3UG4815-1AA40**	2	**3UG4815-2AA40**
Monitoring of phase sequence, phase and N conductor failure, phase asymmetry, overvoltage and undervoltage										
1 ... 20	✓	✓	0.1 … 999.9	0.1 … 999.9	1 CO + 1 Q[2]	90 … 400 to N	2	**3UG4816-1AA40**	2	**3UG4816-2AA40**

✓ Function supported

[1] Absolute limit values.
[2] In SIO mode.

For accessories, see page 12/119

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*▲Del/*U*▼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.

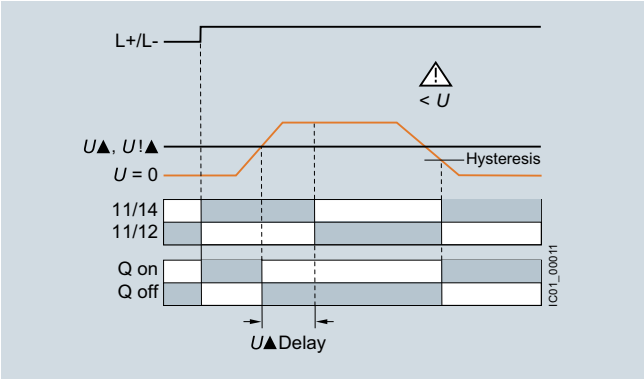
The device can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. One output changeover contact is available as a signaling contact, and a semiconductor output is available in addition in SIO mode.

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.

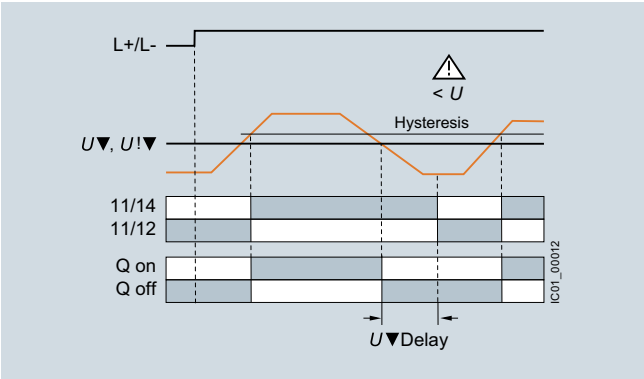
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected

Overvoltage



Undervoltage

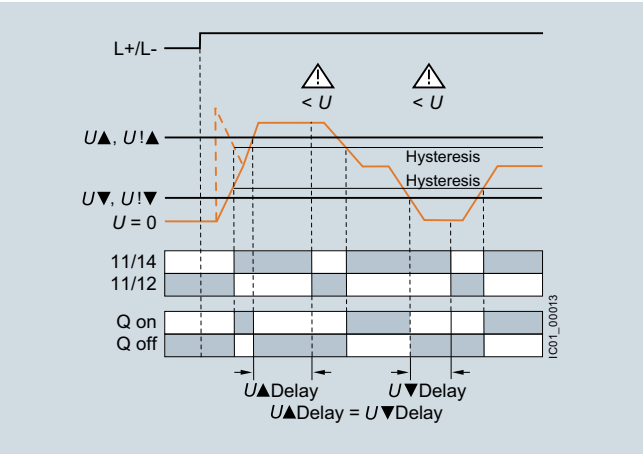


3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Voltage monitoring

With the closed-circuit principle selected

Range monitoring



Type		3UG4832
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Measuring circuit		
Permissible measuring range single-phase AC/DC voltage	V	10 … 690
Measuring frequency	Hz	40 ... 500
Setting range single-phase voltage	V	10 ... 600
Control circuit		
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13 at - 24 V - 125 V - 250 V	 A A A A	 3 1 0.2 0.1
Minimum contact load 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

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	d	Article No. / Price per PU
Monitoring of voltage for overshoot or undershoot							
10 … 600	0.1 ... 300	0 … 999.9	0 … 999.9	2	**3UG4832-1AA40**	2	**3UG4832-2AA40**

For accessories, see page 12/119.

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*▲Del/*I*▼Del has elapsed. This time and the ON-delay time onDel are adjustable from 0 to 999.9 s.

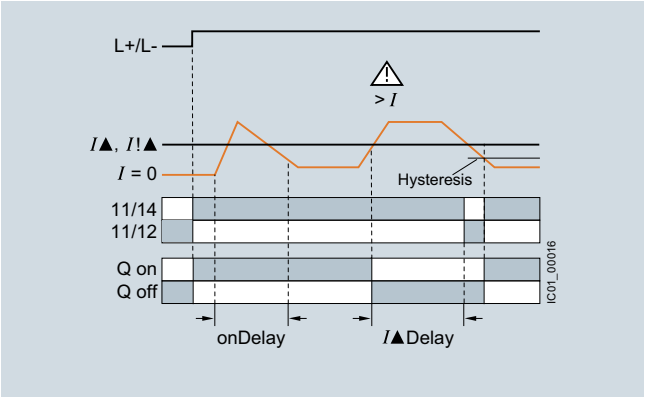
The hysteresis is adjustable from 0.01 to 5 A. The device can be operated with Manual or Auto RESET and on the basis of either the open-circuit or closed-circuit principle. You can decide here whether the output relay is to respond when the supply voltage U_S = ON is applied, or not until the lower measuring range limit of the measuring current (I > 50 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▲ and DOWN▼ keys for 2.5 s.

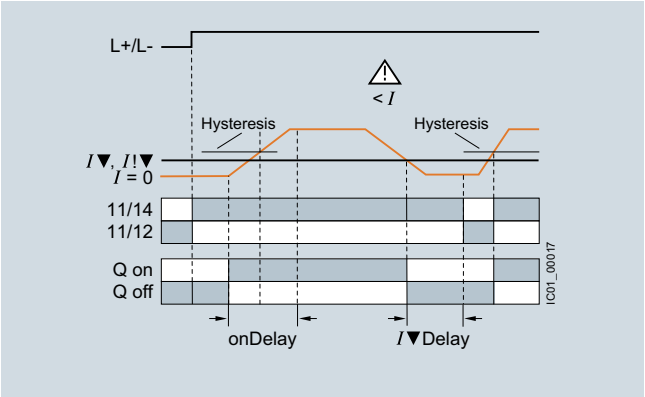
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected upon application of the control supply voltage

Current overshoot



Current undershoot

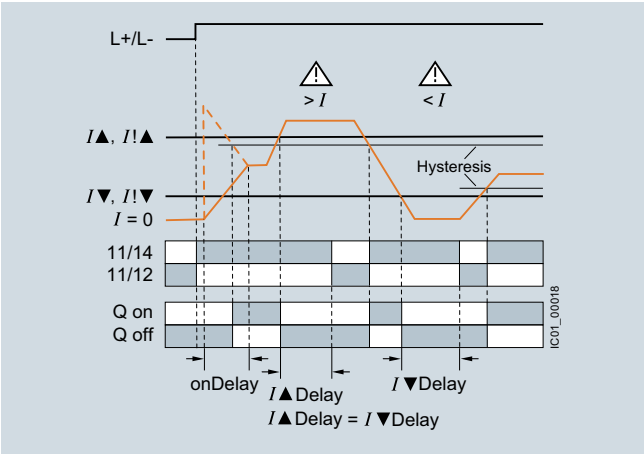


3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Current monitoring

With the closed-circuit principle selected upon application of the control supply voltage

Range monitoring



Type		3UG4822
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Measuring circuit		
Measuring range for single-phase AC/DC current	A	0.05 … 15
Measuring frequency	Hz	40 ... 500
Setting range for single-phase current	A	0.05 ... 10
Load supply voltage	V	Max. 300 (with protective separation) Max. 500 (with simple separation)
Control circuit		
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13 at - 24 V - 125 V - 250 V	 A A A A	 3 1 0.2 0.1
Minimum contact load 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

3UG4822-1AA40

3UG4822-2AA40

Measuring range	Adjustable hysteresis	ON-delay time adjustable onDel	Tripping delay time separately adjustable I▲Del/I▼Del	SD	Screw terminals	SD	Spring-type terminals
					Article No. / Price per PU		Article No. / Price per PU
A AC/DC	A	s	s	d		d	
Monitoring of current for overshooting and undershooting							
0.05 … 10	0.01 ... 5	0.1 … 999.9	0.1 … 999.9	2	**3UG4822-1AA40**	2	**3UG4822-2AA40**

For accessories, see page 12/119.

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, underrange 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}▼= 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.

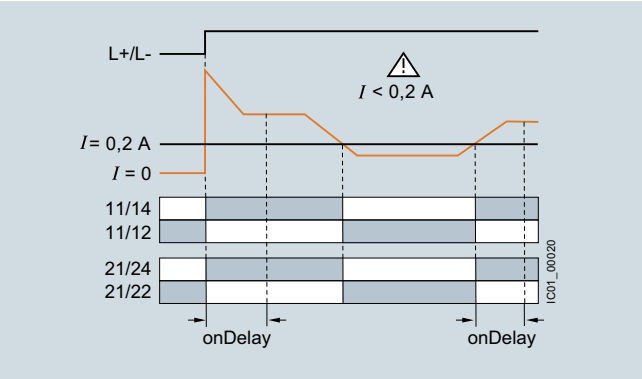
If the device is set to Auto RESET (Memory = No), depending on the set principle of operation, the switching relay returns to its initial state and the flashing ends when the hysteresis threshold is reached.

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.

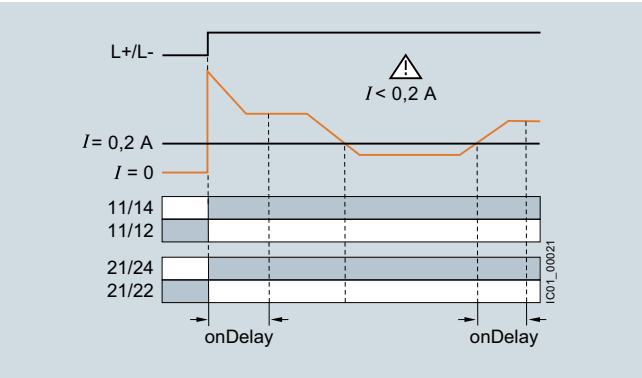
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected

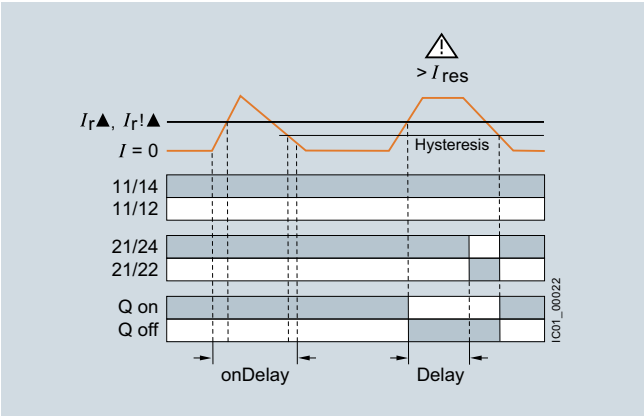
Response in the event of undershooting the measuring range limit with activated monitoring of I_{res}▼



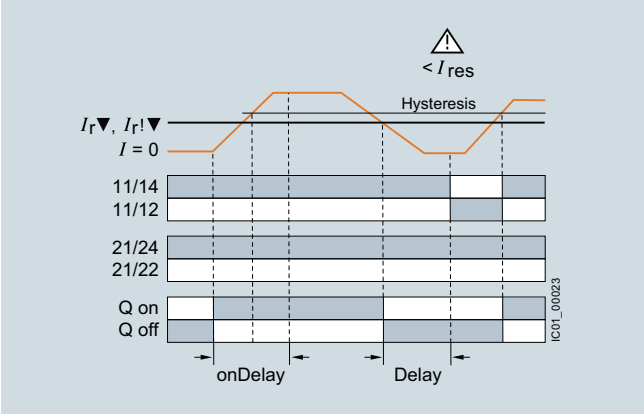
Response in the event of undershooting the measuring range limit with deactivated monitoring of active current undershooting



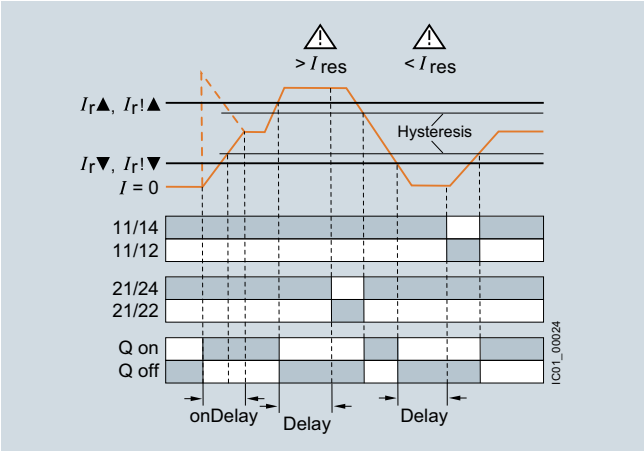
Overshooting of active current



Undershooting of active current



Range monitoring of active current

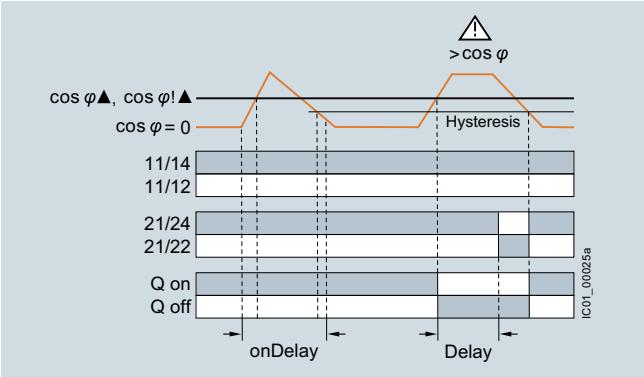


3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

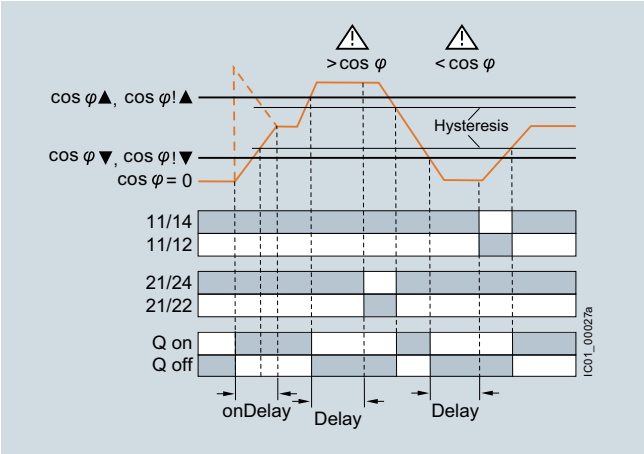
Power factor and active current monitoring

With the closed-circuit principle selected

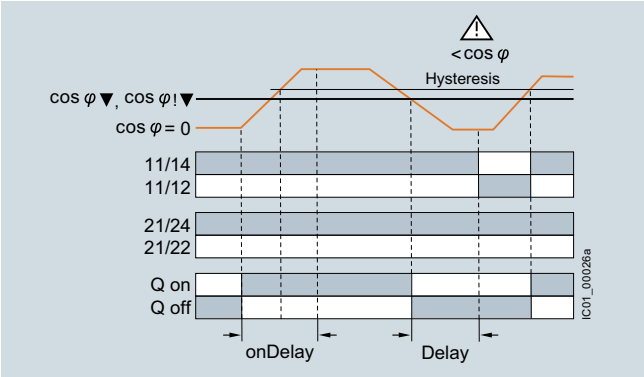
Overshooting of power factor



Range monitoring of power factor



Undershooting of power factor



Type		3UG4841
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III according to IEC 60664-1	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Control circuit		
Number of CO contacts for auxiliary contacts		2
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13 at - 24 V - 125 V - 250 V	 A A A A	 3 1 0.2 0.1
Minimum contact load at 17 V DC	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. x 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

3UG4841-1CA40

3UG4841-2CA40

Measuring range		Voltage range of the measuring voltage[1]	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}	50/60 Hz AC	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		d	
Monitoring of power factor and active current for overshooting or undershooting										
0.1 ... 0.99	0.2 ... 10	90 ... 690	0.1 ... 0.2	0.1 ... 3	0 ... 999.9	0 ... 999.9	2	**3UG4841-1CA40**	2	**3UG4841-2CA40**

[1] Absolute limit values.

For accessories, see page 12/119.

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 ± 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 m
- 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 overshot.

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.

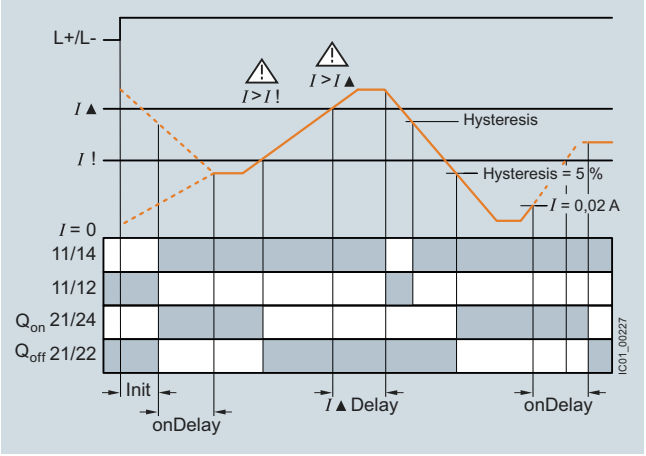
ON-delay time for motor start

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 overshot 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.

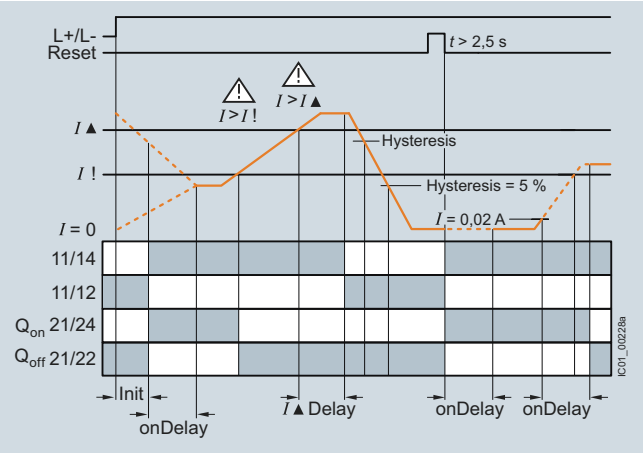
The associated relay changes its switching state if the value falls below the fixed hysteresis value of 5% of the warning value.

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
General data		
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
Control circuit		
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		
• 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

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 Article No.	Price per PU	SD	Spring-type terminals Article No.	Price per PU
A	A	%	s	V	d			d		
0.01 ... 43	0.03 ... 40	0 ... 50	0 ... 999.9	24	2	**3UG4825-1CA40**		2	**3UG4825-2CA40**	

For accessories, see page 12/119.

For 3UL23 residual-current transformers and accessories for 3UL23, see page 12/82.

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).

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

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).

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.

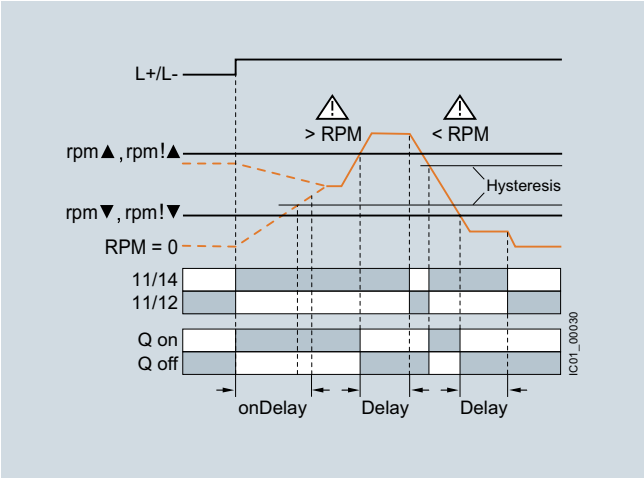
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

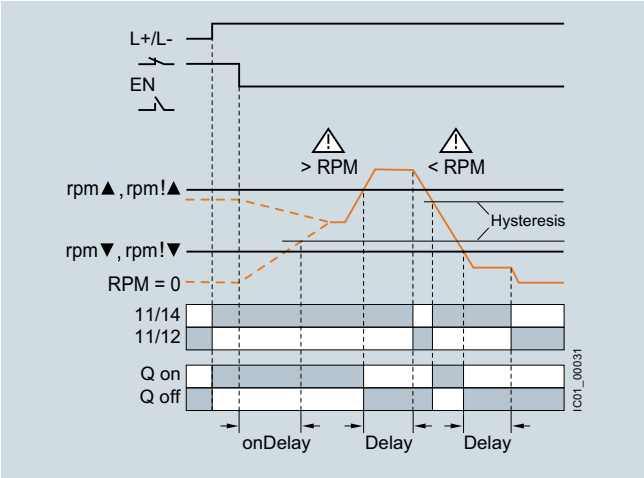
Speed monitoring

With the closed-circuit principle selected

Range monitoring without enable input



Range monitoring with enable input



Type		3UG4851
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III acc. to VDE 0110	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Measuring circuit		
Sensor supply		
• For 3-wire sensor (24 V/0 V)	mA	Max. 50
• For 2-wire NAMUR sensor (8V2)	mA	Max. 8.2
Signal input		
• IN1	kΩ	16, 3-wire sensor, pnp operation
• IN2	kΩ	1, floating contact, 2-wire NAMUR sensor
Voltage level		
• For level 1 at IN1	V	4.5 ... 30
• For level 0 at IN1	V	0 ... 1
Current level		
• For level 1 at IN2	mA	> 2.1
• For level 0 at IN2	mA	< 1.2
Minimum pulse duration of signal	ms	5
Minimum interval between 2 pulses	ms	5
Control circuit		
Number of CO contacts for auxiliary contacts		1
Load capacity of the output relay Thermal current I_{th}	A	5
Rated operational current I_e at		
• AC-15/24 ... 250 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
Minimum contact load at 17 V DC	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

3UG4851-1AA40

3UG4851-2AA40

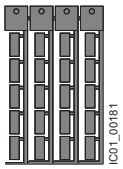
Measuring range	Adjustable hysteresis	ON-delay time adjustable onDel	Tripping delay time separately adjustable rpm▲Del/ rpm▼Del	Pulses per revolution	SD	Screw terminals	SD	Spring-type terminals
						Article No. / Price per PU		Article No. / Price per PU
rpm	rpm	s	s		d		d	
Speed monitoring for overshooting and undershooting								
0.1 ... 2 200	OFF 1 ... 99.9	0 ... 999.9	0 ... 999.9	1 ... 10	2	**3UG4851-1AA40**	2	**3UG4851-2AA40**

For accessories, see page 12/119.

3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Accessories

Selection and ordering data

	Use	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Blank labels							
 3RT2900-1SB20	For 3UG48	**Unit labeling plates** For SIRIUS devices					
		20 mm x 7 mm, titanium gray	20	**3RT2900-1SB20**		100	340 units
	For 3UG48	**Adhesive labels** for SIRIUS devices					
		• 19 mm x 6 mm, pastel turquoise	15	**3RT1900-1SB60**		100	3 060 units
		• 19 mm x 6 mm, zinc yellow	15	**3RT1900-1SD60**		100	3 060 units
Push-in lugs and covers							
3RP1903	For 3UG48	**Push-in lugs** For screw fixing, 2 units are required for each device	5	**3RP1903**		1	10 units
3RP1902	For 3UG48	**Sealable covers** For securing against unauthorized adjustment of setting knobs	5	**3RP1902**		1	5 units
Tools for opening spring-type terminals							
3RA2908-1A	For auxiliary circuit connections	**Screwdrivers** For all SIRIUS devices with spring-type terminals		**Spring-type terminals**			
		3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit

Coupling Relays – Narrow Design

SIRIUS 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 (not plug-in)

AC and DC operation

IEC/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 (not plug-in)

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.

Coupling Relays – Narrow Design

SIRIUS 3RQ3

Article No. scheme

Product versions		Article number
Coupling relays with relay output (not plug-in)		**3RQ30 □ 8 – □ A □ 0 □**
Design and type of output	Output coupler, without manual/automatic switch	**1**
	Input coupler	**3**
Type of electrical connection	Screw terminals	**1**
	Spring-type terminals (push-in)	**2**
Control supply voltage	24 V AC/DC	**B**
	115 V AC/DC	**E**
	230 V AC/DC	**F**
Material of switching contacts	e.g.	
	0 = AgSnO2	□
	1 = AgSnO2 hard gold-plated	□
Example		**3RQ30 1 8 – 1 A B 0 1**

Product versions		Article number
Coupling relays with relay output (not plug-in)		**3RQ30 1 8 – 2 A □ 0 8 – 0 A A 0**
Railway version with extended operating range 0.7 ... 1.2 x U_s		
Control supply voltage	24 V DC	**M**
	110 V DC	**N**
Example		**3RQ30 1 8 – 2 A M 0 8 – 0 A A 0**

Product versions		Article number
Coupling relays with plug-in relays		**3RQ31 1 8 – □ A □ 0 □**
Type of electrical connection	Screw terminals	**1**
	Spring-type terminals (push-in)	**2**
Control supply voltage	24 V AC/DC	**B**
	115 V AC/DC	**E**
	230 V AC/DC	**F**
	24 V DC	**M**
Material of switching contacts	AgSnO2	**0**
	AgSnO2 hard gold-plated	**1**
Example		**3RQ31 1 8 – 1 A B 0 1**

Product versions		Article number		
Coupling relays with semiconductor output (not plug-in)		**3RQ30 □ □ – □ S □ □ 0**		
	Current carrying capacity of the semiconductor output		Control supply voltage	Switching voltage of the semiconductor output
Output coupler				
• Without manual/automatic switch	1 mA ... 0.5 A	**3RQ30 5 0 – □ S M 5 0**	11 ... 30 V DC	10 ... 60 V DC
	5 mA ... 2 A	**3RQ30 5 2 – □ S M 3 0**	11 ... 30 V DC	10 ... 30 V DC
	1 mA ... 2 A	**3RQ30 5 2 – □ S M 4 0**	11 ... 30 V DC	10 ... 60 V DC
	5 mA ... 2 A	**3RQ30 5 2 – □ S M 5 0**	11 ... 30 V DC	20 ... 264 V AC
	1 mA ... 3 A	**3RQ30 5 3 – □ S G 3 0**	110 ... 230 V AC/DC	10 ... 30 V DC
	5 mA ... 5 A	**3RQ30 5 5 – □ S M 3 0**	11 ... 30 V DC	10 ... 30 V DC
• With manual/automatic switch	5 mA ... 5 A	**3RQ30 6 5 – □ S M 3 0**	11 ... 30 V DC	10 ... 30 V DC
Input coupler	10 mA ... 0.5 A	**3RQ30 7 0 – □ S B 3 0**	11 ... 30 V AC/DC	10 ... 30 V DC
		3RQ30 7 0 – □ S G 3 0	110 ... 230 V AC/DC	10 ... 30 V DC
Type of electrical connection	Screw terminals	**1**		
	Spring-type terminals (push-in)	**2**		
Example		**3RQ30 7 0 – 1 S B 3 0**		

Note:

These Article No. schemes show 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.

Coupling Relays – Narrow Design

SIRIUS 3RQ3

Benefits

General

- All versions with screw terminals or spring-type terminals (push-in technology)
- TOP wiring with spring-type terminals (push-in) for quick and reliable wiring
- Low space requirements 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 (not plug-in)

- Relays fixed in enclosure for increased contact reliability
- Device variants with hard gold-plated contacts, hence high contact reliability at low currents

Coupling relays with plug-in relays

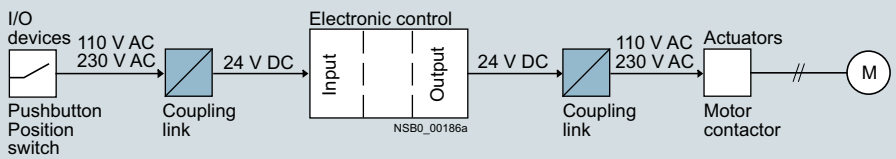
- Fast replacement of the relays with existing wiring
- Shorter installation times thanks to certified complete units
- Individual relays available as spare parts
- Device variants with hard gold-plated contacts, hence high contact reliability at low currents

Coupling relays with semiconductor output (not plug-in)

- 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

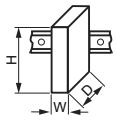
Coupling Relays – Narrow Design

SIRIUS 3RQ3

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16198/td FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16198/faq	Operating instructions, see https://support.industry.siemens.com/cs/ww/en/ps/16198/man

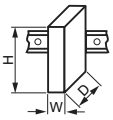
Coupling relays with relay output (not plug-in)

Article number		3RQ30.8-.AB00	3RQ30.8-.AB01	3RQ30.8-.AE00	3RQ30.8-.AE01	3RQ30.8-.AF00	3RQ30.8-.AF01	3RQ3018-2AM08-0AA0	3RQ3018-2AN08-0AA0
General technical specifications									
Width x height x depth 	mm	6.2 x 93 x 72.5							
Insulation voltage for overvoltage category III acc. to IEC 60664 for pollution degree 3	V	300							
Max. permissible voltage for protective separation between control circuit and auxiliary circuit	V	300							
Ambient temperature									
• During operation	°C	-25 ... +60						-40 ... +70	
• During storage	°C	-40 ... +85							
Degree of protection		IP20							
Version of the fuse link required for short-circuit protection of the auxiliary switch		Fuse gG: 4 A							
Operational current of the auxiliary contacts									
• 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							
Contact reliability of the auxiliary contacts (one contact failure per 100 million)		17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	
Mechanical endurance (operating cycles) typical		10 000 000							
Electrical endurance (operating cycles) for AC-15 at 230 V typical		100 000							
Operating range factor of the control supply voltage, rated value									
• At AC									
- At 50 Hz		0.8 ... 1.25		0.8 ... 1.1				--	
- At 60 Hz		0.8 ... 1.25		0.8 ... 1.1				--	
• At DC		0.8 ... 1.25		0.8 ... 1.1				0.7 ... 1.25	
Active power input	W	0.3		0.5		1		0.3	0.6
Thermal current	A	6							

Coupling Relays – Narrow Design

3RQ3

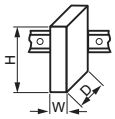
Coupling relays with plug-in relay

Article number		3RQ3118-.AB00	3RQ3118-.AB01	3RQ3118-.AE00	3RQ3118-.AE01	3RQ3118-.AF00	3RQ3118-.AF01	3RQ3118-.AM00	3RQ3118-.AM01
General technical specifications									
Width x height x depth 	mm	6.2 x 93 x 76							
Insulation voltage for overvoltage category III acc. to IEC 60664 for pollution degree 3	V	300							
Max. permissible voltage for protective separation between control circuit and auxiliary circuit	V	300							
Ambient temperature									
• During operation	°C	-25 ... +60							
• During storage	°C	-40 ... +85							
Degree of protection		IP20							
Version of the fuse link required for short-circuit protection of the auxiliary switch		Fuse gG: 4 A							
Operational current of the auxiliary contacts									
• 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							
Contact reliability of the auxiliary contacts (one contact failure per 100 million)		17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA
Mechanical endurance (operating cycles) typical		10 000 000							
Electrical endurance (operating cycles) for AC-15 at 230 V typical		100 000							
Operating range factor of the control supply voltage, rated value									
• At AC									
- At 50 Hz		0.8 ... 1.25		0.8 ... 1.1				--	
- At 60 Hz		0.8 ... 1.25		0.8 ... 1.1				--	
• At DC		0.8 ... 1.25		0.8 ... 1.1				0.8 ... 1.25	
Active power input	W	0.3		0.5		1		0.3	
Thermal current	A	6							

Coupling Relays – Narrow Design

3RQ3 with relay output

Coupling relays with semiconductor output (not plug-in)

Article number		3RQ3050-.SM50	3RQ3052-.SM30	3RQ3052-.SM40	3RQ3052-.SM50	3RQ3053-.SG30	3RQ3055-.SM30	3RQ3065-.SM30	3RQ3070-.SB30	3RQ3070-.SG30
General technical specifications										
Width x height x depth 	mm	6.2 x 93 x 72.5						6.2 x 93 x 75	6.2 x 93 x 72.5	
Insulation voltage for overvoltage category III acc. to IEC 60664 for pollution degree 3	V	50			300		50			--
Ambient temperature										
• During operation	°C	-25 ... +60								
• During storage	°C	-40 ... +85								
Degree of protection		IP20								
Switching voltage of the semiconductor output										
• At AC	V	--			20 ... 264	--				
• At DC	V	10 ... 60	10 ... 30	10 ... 60	--	10 ... 30				
Current carrying capacity of the semiconductor output										
• At AC		--			5 mA ... 2 A	--				
• At DC		1 mA ... 0.5 A	5 mA ... 2 A	1 mA ... 2 A	--	1 mA ... 3 A	5 mA ... 5 A		10 mA ... 0.5 A	
Operating range factor of the control supply voltage, rated value										
• At AC										
- At 50 Hz		--				1 ... 1	--		1 ... 1	
- At 60 Hz		--				1 ... 1	--		1 ... 1	
• At DC		1 ... 1								
Active power input	W	0.3			0.25	0.3			0.5	
Thermal current	A	0.5	2			3	5		0.5	

Article number	3RQ3...-1....	3RQ3...-2....
Type of electrical connection for auxiliary and control circuits	**Screw terminals**	**Spring-type terminals (push-in)**
Type of connectable conductor cross-sections		
• Solid	1x (0.25 ... 2.5) mm^2	
• Finely stranded		
- Without end sleeves	--	1x (0.25 ... 2.5) mm^2
- With end sleeves	1x (0.25 ... 1.5) mm^2	
• Solid for AWG cables	1x (20 ... 14)	

Coupling Relays – Narrow Design

SIRIUS 3RQ3

Selection and ordering data

Type of voltage	Control supply voltage At AC At 50 Hz	At AC At 60 Hz	At DC	Number of CO contacts for auxiliary contacts	Material of switching contacts	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V	V	V			d				
Coupling relays with relay output (not plug-in)										
Output coupling links										
AC/DC	24	24	24	1	AgSnO2	2	**3RQ3018-☐AB00**		1	5 units
					AgSnO2 hard gold-plated	2	**3RQ3018-☐AB01**		1	5 units
	115	115	115	1	AgSnO2	2	**3RQ3018-☐AE00**		1	5 units
	230	230	230	1	AgSnO2	2	**3RQ3018-☐AF00**		1	5 units
DC	--	--	24	1	AgSnO2	2	**3RQ3018-2AM08-0AA0**		1	5 units
			110	1	AgSnO2	2	**3RQ3018-2AN08-0AA0**		1	5 units
Input coupling links										
AC/DC	24	24	24	1	AgSnO2	2	**3RQ3038-☐AB00**		1	5 units
					AgSnO2 hard gold-plated	2	**3RQ3038-☐AB01**		1	5 units
	115	115	115	1	AgSnO2	2	**3RQ3038-☐AE00**		1	5 units
					AgSnO2 hard gold-plated	2	**3RQ3038-☐AE01**		1	5 units
	230	230	230	1	AgSnO2	2	**3RQ3038-☐AF00**		1	5 units
					AgSnO2 hard gold-plated	2	**3RQ3038-☐AF01**		1	5 units
Coupling relays with plug-in relay										
Output coupling links										
AC/DC	24	24	24	1	AgSnO2	2	**3RQ3118-☐AB00**		1	5 units
					AgSnO2 hard gold-plated	2	**3RQ3118-☐AB01**		1	5 units
	115	115	115	1	AgSnO2	2	**3RQ3118-☐AE00**		1	5 units
					AgSnO2 hard gold-plated	2	**3RQ3118-☐AE01**		1	5 units
	230	230	230	1	AgSnO2	2	**3RQ3118-☐AF00**		1	5 units
					AgSnO2 hard gold-plated	2	**3RQ3118-☐AF01**		1	5 units
DC	--	--	24	1	AgSnO2	2	**3RQ3118-☐AM00**		1	5 units
					AgSnO2 hard gold-plated	2	**3RQ3118-☐AM01**		1	5 units

3RQ30.8-2....

3RQ3118-2....

Type of electrical connection

- Screw terminals **1**
- Spring-type terminals (push-in) **2**

Type of voltage	Control supply voltage At AC At 50 Hz	At AC At 60 Hz	At DC	Current carrying capacity of the semiconductor output At AC	At DC	Operating mode selectable via switch position	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
							d				
Coupling relays with semiconductor output (not plug-in)											
Output coupling links											
DC	--	--	11 ... 30 V	--	1 mA ... 0.5 A	--	2	**3RQ3050-☐SM50**		1	5 units
					5 mA ... 2 A	--	2	**3RQ3052-☐SM30**		1	5 units
					1 mA ... 2 A	--	2	**3RQ3052-☐SM40**		1	5 units
				5 mA ... 2 A	--	--	2	**3RQ3052-☐SM50**		1	5 units
				--	5 mA ... 5 A	--	2	**3RQ3055-☐SM30**		1	5 units
						Manual/ Off/ Automatic	2	**3RQ3065-☐SM30**		1	5 units
AC/DC	110 ... 230 V	110 ... 230 V	110 ... 230 V	--	1 mA ... 3 A	--	2	**3RQ3053-☐SG30**		1	5 units
Input coupling links											
AC/DC	11 ... 30 V	11 ... 30 V	11 ... 30 V	--	10 mA ... 0.5 A	--	2	**3RQ3070-☐SB30**		1	5 units
	110 ... 230 V	110 ... 230 V	110 ... 230 V	--	10 mA ... 0.5 A	--	2	**3RQ3070-☐SG30**		1	5 units

3RQ3050-2SM50

Type of electrical connection

- Screw terminals **1**
- Spring-type terminals (push-in) **2**

Coupling Relays – Narrow Design

SIRIUS 3RQ3

Accessories

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Galvanic isolation plates						
3RQ3900-0A	For electrical separation of different potentials when devices of different types are installed side by side	2	**3RQ3900-0A**		1	10 units
Connecting combs						
3RQ3901-0B	For linking the same potentials, current carrying capacity for infeed max. 6 A					
	• 2-pole	2	**3RQ3901-0A**		1	10 units
	• 4-pole	2	**3RQ3901-0B**		1	10 units
	• 8-pole	2	**3RQ3901-0C**		1	10 units
	• 16-pole	2	**3RQ3901-0D**		1	10 units
Clip-on labels[1)]						
3RQ3902-0A	For terminal and equipment labeling, white					
	• 5 x 5 mm	2	**3RQ3902-0A**		100	2 000 units
	• 6 x 12 mm	2	**3RQ3902-0B**		100	1 200 units
Tools for opening spring-type terminals						
			Spring-type terminals (push-in)			
3RA2908-1A	**Screwdriver** 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	**3RA2908-1A**		1	1 unit

1) PC labeling system for individual inscription of unit labeling plates available from Conta-Clip Verbindungstechnik GmbH.

	Coupling relays with plug-in relay	Control supply voltage	Material of switching contacts	Number of CO contacts for auxiliary contacts	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	Type	V			d				
Replacement modules for 3RQ3118 coupling relays with plug-in relay									
	3RQ3118-.AM00	24 DC	AgSnO2	1	2	**3TX7014-7BM00**		1	15 units
	3RQ3118-.AM01		AgSnO2 hard gold-plated		2	**3TX7014-7BM02**		1	15 units
	3RQ3118-.AB00	24 AC/DC	AgSnO2	1	2	**3TX7014-7BM00**		1	15 units
	3RQ3118-.AB01		AgSnO2 hard gold-plated		2	**3TX7014-7BM02**		1	15 units
	3RQ3118-.AE00	115 AC/DC	AgSnO2	1	2	**3TX7014-7BP00**		1	15 units
	3RQ3118-.AF00	230 AC/DC	AgSnO2						
	3RQ3118-.AE01	115 AC/DC	AgSnO2 hard gold-plated	1	2	**3TX7014-7BP02**		1	15 units
	3RQ3118-.AF01	230 AC/DC	AgSnO2 hard gold-plated						

Coupling Relays with Industrial Enclosure

SIRIUS 3RQ2 NEW

Overview

SIRIUS 3RQ2 coupling relays, screw terminals, 3 changeover contacts

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3RQ2

For the conversion tool, e.g. from 3RS18 to 3RQ2, see www.siemens.com/sirius/conversion-tool

3RQ2 coupling relays in their 22.5 mm industrial enclosure serve to couple control signals to and from a controller and replace the 3RS18 coupling relays. The 3RQ2 has an impressively high-quality industrial enclosure finished in modern titanium gray so that it fits in visually with the SIRIUS series of relays.

The series consists of devices with up to three changeover contacts with screw or spring-type terminals (push-in) and, with its wide voltage range from 24 to 240 V AC/DC, is a genuine highlight in the coupling relay market.

Thanks to terminal assignment that is identical to the previous version, existing products can easily be converted.

The reduced variety of components simplifies product selection and standardization.

Numerous accessories are available for the 3RQ2 coupling relays, for example replacement terminals, push-in lugs for wall mounting and coding pins.

Article No. scheme

Product versions		Article number					
Coupling relays, standard		**3RQ2000 –**	□	□	□	**0**	□
Connection methods	Screw terminals		**1**				
	Spring-type terminals (push-in)		**2**				
Outputs	1 CO contact			**A**			
	2 CO contacts			**B**			
	3 CO contacts			**C**			
Rated control supply voltage	24 ... 240 V AC/DC				**W**		
Material of switching contacts	0 = AgSnO2						**0**
	1 = AgNi +Au						**1**
Example		**3RQ2000 –**	**1**	**C**	**W**	**0**	**1**

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

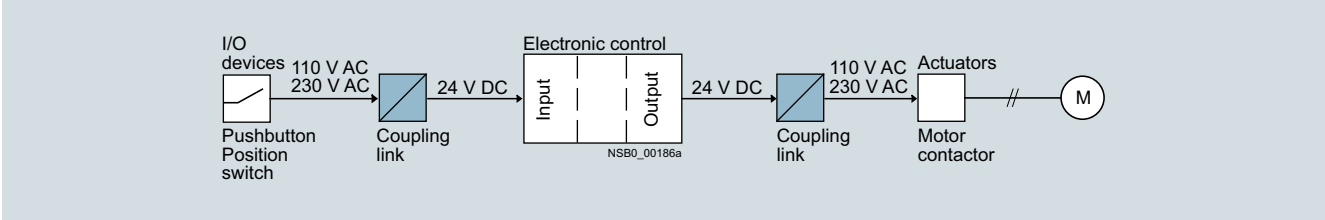
For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

- Permanent wiring thanks to removable terminals in screw or spring-type technology (push-in)
- Replacement of individual terminals minimizes wiring effort
- A product for all voltages from 24 to 240 V AC/DC
- Reduced costs thanks to fewer versions
- Especially high contact reliability even at low currents thanks to versions with hard gold-plated contacts
- International standards and certifications including CE, UL/CSA, EAC and confirmations for rail, and more

Application

- Electrical separation between the input and output circuit
- Adjustment of different signal levels
- Signal amplification
- Contact multiplication



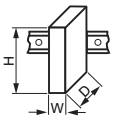
Application example motor controller

Coupling Relays with Industrial Enclosure

SIRIUS 3RQ2 NEW

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/25158/td	Operating instructions, see https://support.industry.siemens.com/cs/ww/en/ps/25158/man

Type		3RQ2000-.AW00 3RQ2000-.BW00 3RQ2000-.CW00	3RQ2000-.CW01
General data			
Dimensions (W x H x D) 	mm	22.5 x 100 x 90	
Insulation voltage for overvoltage category III acc. to IEC 60664 for pollution degree 3	V	300	
Max. permissible voltage for protective separation between control circuit and auxiliary circuit acc. to IEC 60947-1	V	300	
Ambient temperature			
• During operation	°C	-25 ... +60	
• During storage	°C	-40 ... +80	
Degree of protection		IP20	
Control circuit			
Control supply voltage	V	24 ... 240 AC/DC; 50/60 Hz	
Operating range factor of control supply voltage		0.7 ... 1.1	
Load circuit			
Thermal current of the non-solid-state contact blocks, maximum	A	5	
Current carrying capacity of the output relay			
• At AC-15 at 250 V	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	
Mechanical endurance (operating cycles) typical		10 000 000	
Electrical endurance (operating cycles) for AC-15 at 230 V, typical		100 000	
Material of switching contacts		AgSnO2	AgNi + Au

Article number		3RQ2000-1	3RQ2000-2
Type of electrical connection		**Screw terminals**	**Spring-type terminals (push-in)**
Type of connectable conductor cross-sections			
• Solid	mm^2	1x (0.5 ... 4.0 mm^2), 2x (0.5 ... 2.5 mm^2)	1x (0.5 ... 4 mm^2)
• Finely stranded with end sleeve	mm^2	1x (0.5 ... 4 mm^2), 2x (0.5 ... 1.5 mm^2)	1x (0.5 ... 2.5 mm^2)
• Solid for AWG cables	AWG	1x (20 ... 12), 2x (20 ... 14)	1x (20 ... 12)
Tightening torque	Nm	0.6 ... 0.8	--

Coupling Relays with Industrial Enclosure

SIRIUS 3RQ2 NEW

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 UNIT

	Control supply voltage at AC at 50 Hz	Control supply voltage At DC	Number of CO contacts for auxiliary contacts	Material of switching contacts	SD	Screw terminals		SD	Spring-type terminals (push-in)	
	V	V	W		d	Article No.	Price per PU		Article No.	Price per PU
Coupling relays in industrial enclosure, 22.5 mm										
3RQ2000-1CW00 3RQ2000-2CW00	24 ... 240	24 ... 240	1	AgSnO2	2	**3RQ2000-1AW00**		2	**3RQ2000-2AW00**	
			2	AgSnO2	2	**3RQ2000-1BW00**		2	**3RQ2000-2BW00**	
			3	AgSnO2	2	**3RQ2000-1CW00**		2	**3RQ2000-2CW00**	
			3	AgNi + Au	2	**3RQ2000-1CW01**		2	**3RQ2000-2CW01**	

Accessories

More information	
Operating instructions, see https://support.industry.siemens.com/cs/ww/en/ps/25158/man	Conversion tool, e.g. from 3RS18 to 3RQ2, see www.siemens.com/sirius/conversion-tool

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Terminals for SIRIUS devices in the industrial standard mounting rail enclosure						
3ZY1122-1BA00	**Removable terminals**		**Screw terminals**			
	• 2-pole, up to 1 x 4 mm² or 2 x 2.5 mm²	2	**3ZY1122-1BA00**		1	6 units
			Spring-type terminals (push-in)			
	• 2-pole, up to 1 x 4 mm² or 2 x 1.5 mm²	2	**3ZY1122-2BA00**		1	6 units
Accessories for enclosures						
3ZY1450-1AB00	**Hinged cover** replacement cover, without terminal labeling, titanium gray, 22.5 mm wide	2	**3ZY1450-1AB00**		1	5 units
3ZY1311-0AA00	**Push-in lugs** For wall mounting	2	**3ZY1311-0AA00**		1	10 units
3ZY1440-1AA00	**Coding pins** For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; they enable the mechanical coding of terminals	2	**3ZY1440-1AA00**		1	12 units
Tools for opening spring-type terminals						
3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-type terminals		**Spring-type terminals (push-in)**			
	3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit

Coupling Relays with Industrial Enclosure

SIRIUS 3RQ2 NEW

More information

Code conversion table

SIRIUS 3RS18 coupling relays				Comparison type SIRIUS 3RQ2 coupling relays			
Screw terminals	Spring-type terminals	Version	Contacts	Screw terminals	Spring-type terminals (push-in)	Version	Contacts
3RS1800-1AQ00	3RS1800-2AQ00	24 V AC/DC; 110 ... 120 V AC	1 CO contact	3RQ2000-1AW00	3RQ2000-2AW00	24 ... 240 V AC/DC	1 CO contact
3RS1800-1AP00	3RS1800-2AP00	24 V AC/DC; 220 ... 240 V AC					
3RS1800-1BW00	3RS1800-2BW00	24 ... 240 V AC/DC	2 CO contacts	3RQ2000-1BW00	3RQ2000-2BW00	24 ... 240 V AC/DC	2 CO contacts
3RS1800-1BQ00	3RS1800-2BQ00	24 V AC/DC; 110 ... 120 V AC					
3RS1800-1BP00	3RS1800-2BP00	24 V AC/DC; 220 ... 240 V AC					
3RS1800-1HW00	3RS1800-2HW00	24 ... 240 V AC/DC	3 CO contacts	3RQ2000-1CW00	3RQ2000-2CW00	24 ... 240 V AC/DC	3 CO contacts
3RS1800-1HQ00	3RS1800-2HQ00	24 V AC/DC; 110 ... 120 V AC					
3RS1800-1HP00	3RS1800-2HP00	24 V AC/DC; 220 ... 240 V AC					
3RS1800-1HW01	3RS1800-2HW01	24 ... 240 V AC/DC	3 CO contacts, hard gold-plated	3RQ2000-1CW01	3RQ2000-2CW01	24 ... 240 V AC/DC	3 CO contacts, hard gold-plated
3RS1800-1HQ01	3RS1800-2HQ01	24 V AC/DC; 110 ... 120 V AC					
3RS1800-1HP01	3RS1800-2HP01	24 V AC/DC; 220 ... 240 V AC					

Overview

SIRIUS 3RS70 signal converters

More information
Homepage, see www.siemens.com/relays
Industry Mall, see www.siemens.com/product?3RS70
For the conversion tool, e.g. from 3RS17 to 3RS70, see www.siemens.com/sirius/conversion-tool

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 (generic standard for emitted interference)
- IEC 61000-6-2 (generic standard for interference immunity)

The analog signals comply with

- IEC 60381-1/2

Article No. scheme

Product versions		Article number								
Signal converters		**3RS70**	□	□	–	□	□	□	**0**	**0**
Product function/type of input signal	Single-range converters, active		**0**	**0**						3-way separation, input 0 ... 10 V
			0	**2**						3-way separation, input 0 ... 20 mA,
			0	**3**						3-way separation, input 4 ... 20 mA,
	Switchable multi-range converters, active		**0**	**5**						3-way separation, 3 standard signals can be switched 0 ... 10 V, 0/4 ... 20 mA
	Switchable universal converters, active		**0**	**6**						3-way separation, 16 signals can be switched
	Single-range converters, passive		**2**	**0**						2-way separation, 4 ... 20 mA
	Switchable multi-range converters, active		**2**	**5**						3-way separation, with manual/automatic switch and setting potentiometer
Connection type	Screw terminals					**1**				
	Spring-type terminals (push-in)					**2**				
Type of output signal	0 ... 10 V						**A**			
	0 ... 20 mA						**C**			
	4 ... 20 mA						**D**			
	Loop power isolator 4 ... 20 mA						**E**			
	3 standard signals can be switched						**F**			
	4 frequencies can be switched						**K**			
Supply voltage	24 V AC/DC							**E**		
	None							**T**		
	24 ... 240 V AC/DC							**W**		
Example		**3RS70**	**0**	**0**	**–**	**1**	**A**	**E**	**0**	**0**

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.

Coupling Relays and Signal Converters/Interface Converters

SIRIUS 3RS70 signal converters

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

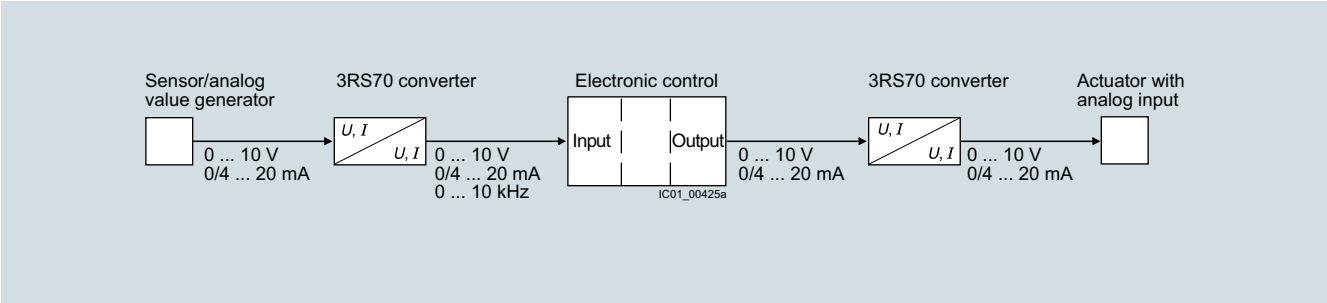
- Electrical separation
- Conversion of normalized and non-normalized signals
- Amplification and impedance adaptation
- Conversion to a frequency for processing by a digital input
- Overvoltage and EMC protection
- Short-circuit protection of the outputs

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%.

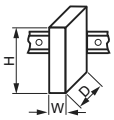
Example: When it is set for an output of 4 ... 20 mA, the left stop on the potentiometer represents an output current of 4 mA and the right stop represents an output current of 20 mA. In the "Auto" switch position, the output signal follows the input signal proportionally regardless of the potentiometer setting.



Application example of analog signal processing

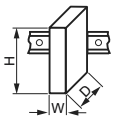
Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16691/td Operating instructions, see https://support.industry.siemens.com/cs/ww/en/view/109475738	Circuit diagrams, see https://support.industry.siemens.com/cs/ww/en/view/109475738

Article number		3RS7000-.AE00	3RS7002-.AE00, 3RS7003-.AE00	3RS7000-.CE00, 3RS7000-.DE00	3RS7002-.CE00, 3RS7002-.DE00, 3RS7003-.CE00, 3RS7003-.DE00	3RS7020-.ET00
Product designation Product version		Single-range converters, active				Single-range converters, passive
General data:						
Width x height x depth 	mm	6.2 × 93 × 72.5				6.2 × 93 × 71
Ambient temperature • During operation • During storage	 °C °C	 -25 ... +60 -40 ... +80				
Relative humidity during operation	%	10 ... 95				
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value	V	50				
Active power input	W	0.29				--
Degree of protection		IP20				
Input:						
Input voltage • Max.	 V	 30				
Input impedance • Of current input, maximum • Of voltage input, minimum	 Ω kΩ	 -- 330	 100 --	 -- 330	 100 --	
Output:						
Load • Maximum at current output • Minimum at voltage output	 Ω kΩ	 -- 2		 500 --		 1 000 --
Relative measuring accuracy	%	0.1				
Short-circuit-proof		Yes				No

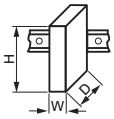
Coupling Relays and Signal Converters/Interface Converters

SIRIUS 3RS70 signal converters

Article number		3RS7005-.FE00	3RS7005-.KE00	3RS7005-.FW00	3RS7005-.KW00	3RS7025-.FE00	3RS7025-.FW00
Product designation Product version		Switchable multi-range converters, active				Switchable multi-range converters, active, with manual/automatic switch and setting potentiometer	
General data:							
Width x height x depth 	mm	6.2 × 93 × 72.5		17.5 × 93 × 72.5		17.5 × 93 × 75	
Ambient temperature • During operation • During storage	 °C °C	 -25 ... +60 -40 ... +80					
Relative humidity during operation	%	10 ... 95					
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value	V	50		300		50	300
Active power input	W	0.29		0.5	0.34	0.5	
Degree of protection		IP20					
Input:							
Input voltage • Max.	 V	 30					
Input impedance • Of current input, maximum • Of voltage input, minimum	 Ω kΩ	 100 330					
Output:							
Load • Maximum at current output • Minimum at voltage output	 Ω kΩ	 500 2	 -- --	 500 2	 -- --	 500 2	
Relative measuring accuracy	%	0.1					
Short-circuit-proof		Yes					

Coupling Relays and Signal Converters/Interface Converters

SIRIUS 3RS70 signal converters

Article number		3RS7006-.FE00	3RS7006-.FW00
Product designation Product version		Switchable universal converters, active	
General data:			
Width x height x depth 	mm	17.5 × 93 × 72.5	
Ambient temperature • During operation • During storage	 °C °C	 -25 ... +60 -40 ... +80	
Relative humidity during operation	%	10 ... 95	
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value	V	50	300
Active power input	W	0.5	
Degree of protection		IP20	
Input:			
Input voltage • Max.	 V	 30	
Input impedance • Of current input, maximum • Of voltage input, minimum	 Ω kΩ	 100 330	
Output:			
Load • Maximum at current output • Minimum at voltage output	 Ω kΩ	 500 2	
Relative measuring accuracy	%	0.1	
Short-circuit-proof		Yes	

Article number	3RS70..-1....	3RS70..-2....
Type of electrical connection	**Screw terminals**	**Spring-type terminals (push-in)**
Type of connectable conductor cross-sections • Solid • Finely stranded - Without end sleeves - With end sleeves • Solid for AWG cables	 1x (0.25 ... 2.5 mm²) -- 1x (0.25 ... 1.5 mm²) 1x (20 ... 14)	 1x (0.25 ... 2.5 mm²) 1x (0.25 ... 2.5 mm²) 1x (0.25 ... 1.5 mm²) 1x (20 ... 14)

Selection and ordering data

Signal type At the input	At the output	Supply voltage	Width mm	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Single-range converters								
Passive								
Type of electrical isolation, 2-way								
4 ... 20 mA	4 ... 20 mA	--	6.2	2	**3RS7020-□ET00**		1	1 unit
Single-range converters								
Active								
Type of electrical isolation, 3-way								
0 ... 10 V	0 ... 10 V	24 V AC/DC	6.2	2	**3RS7000-□AE00**		1	1 unit
0 ... 20 mA	0 ... 10 V	24 V AC/DC	6.2	2	**3RS7002-□AE00**		1	1 unit
4 ... 20 mA	0 ... 10 V	24 V AC/DC	6.2	2	**3RS7003-□AE00**		1	1 unit
0 ... 10 V	0 ... 20 mA	24 V AC/DC	6.2	2	**3RS7000-□CE00**		1	1 unit
0 ... 20 mA	0 ... 20 mA	24 V AC/DC	6.2	2	**3RS7002-□CE00**		1	1 unit
4 ... 20 mA	0 ... 20 mA	24 V AC/DC	6.2	2	**3RS7003-□CE00**		1	1 unit
0 ... 10 V	4 ... 20 mA	24 V AC/DC	6.2	2	**3RS7000-□DE00**		1	1 unit
0 ... 20 mA	4 ... 20 mA	24 V AC/DC	6.2	2	**3RS7002-□DE00**		1	1 unit
4 ... 20 mA	4 ... 20 mA	24 V AC/DC	6.2	2	**3RS7003-□DE00**		1	1 unit
Multi-range converters								
Active, switchable								
Type of electrical isolation, 3-way								
0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	24 V AC/DC	6.2	2	**3RS7005-□FE00**		1	1 unit
		24 ... 240 V AC/DC	17.5	2	**3RS7005-□FW00**		1	1 unit
	0 ... 50 Hz, 0 ... 100 Hz, 0 ... 1 kHz, 0 ... 10 kHz	24 V AC/DC	6.2	2	**3RS7005-□KE00**		1	1 unit
		24 ... 240 V AC/DC	17.5	2	**3RS7005-□KW00**		1	1 unit
Multi-range converters								
Active, with manual/automatic switch and setting potentiometer								
Type of electrical isolation, 3-way								
0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	24 V AC/DC	17.5	2	**3RS7025-□FE00**		1	1 unit
		24 ... 240 V AC/DC	17.5	2	**3RS7025-□FW00**		1	1 unit
Universal converters								
Active, switchable								
Type of electrical isolation, 3-way								
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	17.5	2	**3RS7006-□FE00**		1	1 unit
		24 ... 240 V AC/DC	17.5	2	**3RS7006-□FW00**		1	1 unit

3RS7000-1AE00

3RS7000-2AE00

3RS7005-1FW00

3RS7006-1FE00

Type of electrical connection

- Screw terminals **1**
- Spring-type terminals (push-in) **2**

Accessories

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Galvanic isolation plates						
3RQ3900-0A	**Galvanic isolation plates** For electrical separation of different potentials when devices of different types are installed side by side	2	**3RQ3900-0A**		1	10 units
Connecting combs						
3RQ3901-0B	**Connecting combs** For linking the same potentials, current carrying capacity for infeed max. 6 A					
	• 2-pole	2	**3RQ3901-0A**		1	10 units
	• 4-pole	2	**3RQ3901-0B**		1	10 units
	• 8-pole	2	**3RQ3901-0C**		1	10 units
	• 16-pole	2	**3RQ3901-0D**		1	10 units
Clip-on labels						
	Clip-on labels For terminal marking and equipment labeling, white					
	• 5 x 5 mm	2	**3RQ3902-0A**		100	2 000 units
Tools for opening spring-type terminals						
			Spring-type terminals (push-in)			
3RA2908-1A	**Screwdrivers** 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	**3RA2908-1A**		1	1 unit

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_s	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	**3TG10 10-0AL2** **3TG10 10-0AG2** **3TG10 10-0AC2**		0.15	10
				3	1	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	**3TG10 01-0AL2** **3TG10 01-0AG2** **3TG10 01-0AC2**		0.15	10
• DC operation										
	20	5	8.4	4 3	– 1	DC 24 V DC 24 V	**3TG10 10-0BB4** **3TG10 01-0BB4**		0.15	10
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	**3TG10 10-1AL2** **3TG10 10-1AG2** **3TG10 10-1AC2**		0.14	10
				3	1	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	**3TG10 01-1AL2** **3TG10 01-1AG2** **3TG10 01-1AC2**		0.14	10
• DC operation										
	16	5	8.4	4 3	– 1	DC 24 V DC 24 V	**3TG10 10-1BB4** **3TG10 01-1BB4**		0.14	10

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.

Technical data

General data

Mechanical endurance	operating cycles				3 mill.
Electrical endurance at I_e	operating cycles	AC-1 AC-3			0.1 million 0.4 million
Rated insulation voltage U_i (pollution degree 3)			V		400
Rated impulse withstand voltage U_{imp}			kV		4
Safe isolation acc. to DIN VDE 0106 Part 101 and A1 (draft 2/89) between coil and contacts			V		up to 300
Permissible ambient temperature	in operation[1] when stored		°C °C		–25 ... +55 –50 ... +80
Degree of protection acc. to IEC 60 947-1 and IEC 60 529 (VDE 0470 Part 1)					IP 00, coil system IP 20
Power consumption of the coils (with coil in cold state and 1.0 x U_s)					
	AC operation 45 – 450 Hz		VA		4.4
	p.f.				0.9 (hum-free)
	DC operation		W		4
Coil voltage tolerance					0.85 to 1.1 x U_s
Operating times (break-time = opening time + arcing time)				AC operation	DC operation
	Closing	closing time	NO	ms	10 ... 50	11 ... 50
		opening time	NC	ms	5 ... 45	5 ... 45
	Opening	opening time	NO	ms	20 ... 30	19 ... 35
		closing time	NC	ms	20 ... 30	21 ... 39
	Arcing time			ms	10 to 15	
Shock resistance					
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
Operating frequency *z* 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

Fuse links Utilisation category gL/gG	NH DIAZED NEOZED	Type 3NA Type 5SB Type 5SE		
acc. to IEC 60 947-4-1 (DIN VDE 0660 Part 102)	Type of coordination "1" Type of coordination "2"		A A	25 10
Miniature circuit-breaker	C-characteristic		A	10

Load ratings with AC

AC-1 utilisation category, switching resistive load				
Rated operational current I_e at 55 °C to 400 V [1] with screw connection with tab connector			A A	20 16
Ratings U_e of three-phase loads p.f. = 1			V	400	230/220
with screw connection			kW	13	7.5
with tab connector			kW	10	6.0
Minimum conductor cross-section with $I_{e\ load}$			mm²	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

Load ratings with AC

AC-2 and AC-3 utilisation categories										
Rated operational currents I_e up to 400 V		A	8.4							
Ratings of motors with slipring or squirrel-cage rotor at 50 Hz and 60 Hz and at 400 V		kW	4							
AC-5a utilisation category (permissible supply impedance: ≥ 0.5 Ω) **Switching gas discharge lamps** 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	
Switching gas discharge lamps with correction, electronic ballast 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		µF	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 x26	2 x 26	2 x1
AC-5b utilisation category, switching incandescent lamps per main conducting path at 50 Hz 230 V		kW	1.6							

Load ratings with DC

DC-1 utilisation category, switching resistive load ($\frac{L}{R}$ ≤ 1 ms)						
Rated operational current I_e	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
DC-3 and DC-5 utilisation categories, shunt and series motors	($\frac{L}{R}$ ≤ 15 ms)					
Rated operational current I_e	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

Conductor cross-sections for designs

with screw connections			
Screw connection			M3
Finely stranded with end sleeve (DIN 46 228, style A/D/C)		mm²	2 x (0.75 to 2.5)
Solid		mm²	2 x (1 to 2.5)
		mm²	1 x 4
with tab connectors			
Finely stranded	6.3 to 1	mm²	0.5 to 1
When using push-on contact acc. to DIN 46 245/46 247	6.3 to 2.5	mm²	1 to 2.5

CSA and UL ratings (screw connection)

Rated insulation voltage	AC	V	600	
Conventional thermal current	Free air and enclosed	A	20	
Maximum horsepower ratings (CSA and UL-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
	230 V	hp	1 1/2	3
	460 V/575 V	hp	–	5
	600 V	hp	–	5

Coupling Relays and Interfaces

3TG10 power relays

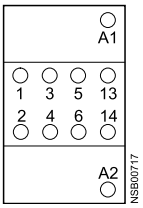
Accessories

For contactor	Design		Order No.	List Price $	Weight approx.	Pack
	Max. rated operational currents I_e/AC-1 (at 55 °C) of contactors	Max. conductor cross-sections				
Type	A	mm²	PG 101		kg	Units
Links for paralleling (star jumpers)						
• **3-pole without terminal** 1)2)						
3TG10	16 Star jumpers can be reduced by one pole	–	**3RT1 916-4BA31**		0.004	1
• **3-pole with terminal** 1)3)						
3TG10	40	25	**3RT1 916-4BB31**		0.013	1
• **4-pole with terminal** 1)4)						
3TG10	50	25	**3RT1 916-4BB41**		0.02	1

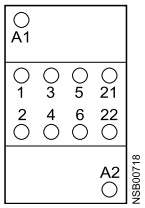
Circuit diagrams

Position of terminals

3TG10 10
1 NO

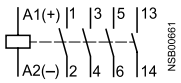


3TG10 01
1 NC

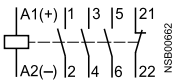


Internal circuit diagram

3TG10 10
1 NO
Ident. 10E



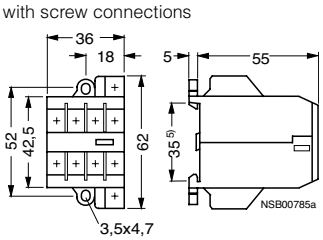
3TG10 01
1 NC
01E



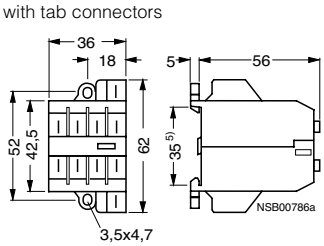
Dimension drawings

AC and DC operation

3TG10 ..-0..
with screw connections

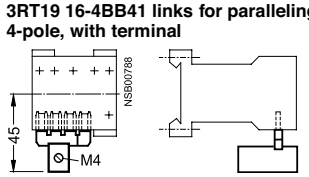


3TG10 ..-1..
with tab connectors



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 and LZS plug-in relays

Selection and ordering data

Siemens offers two lines of plug-in style relays to meet your industrial needs – **3TX71** and **LZS**.

3TX71 relays are available as open power, enclosed power and plug-in style relays. The plug-in family includes basic, premium and bifurcated styles, screw terminals only, and must be ordered as individual components; the selection guide shows which base and accessories belong with which relay. Basic style relays are the most economical and are equipped with a mechanical flag indicator only. Premium style relays offer LED and mechanical flag indication, push-to-test and a latching function for testing without power to the coil. Premium Bifurcated style relays are ideal for low minimum holding current requirements on the contacts (3mA vs. 100mA).

LZS plug-in relays can be ordered as complete units or as individual components and are available with screw or push-in terminals. Complete unit order numbers include the relay, base, LED (with surge suppression in 24VDC version) and retainer/ejector clip and are available with changeover contacts (1CO to 4CO) and coil voltages from 12VDC to 230VAC. PT & MT versions have a push-to-test and a latching function for testing without power to the coil. RT versions are miniature, only 15mm wide and feature 1CO or 2CO contacts. MT versions are 11-pin octal base relays, with 3CO contacts with or without LED and components must be ordered individually.

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-
DPDT	12	24 VDC	3TX7111-3DC03C	3TX7111-3LC03	4E5	1L11	B	3L7
		24 VAC	3TX7111-3DC13C	3TX7111-3LC13	4E5	1L11	B	3L7
		120 VAC	3TX7111-3DF13C	3TX7111-3LF13	4E5	1L11	B	3L7
DPDT	15	12 VDC	3TX7114-5DB03C	3TX7114-5LB03	4E6	1L11	B	3L7
		24VDC	3TX7114-5DC03C	3TX7114-5LC03	4E6	1L11	B	3L7
		24VAC	3TX7114-5DC13C	3TX7114-5LC13	4E6	1L11	B	3L7
		120 VAC	3TX7114-5DF13C	3TX7114-5LF13	4E6	1L11	B	3L7
		240 VAC	—	3TX7114-5LH13	4E6	1L11	B	3L7
DPDT	10	12 VDC	3TX7115-5DB03C	—	4E4	1L12	A	—
		24VDC	3TX7115-5DC03C	3TX7115-5LC03	4E4	1L12	A	—
		24VAC	3TX7115-5DC13C	3TX7115-5LC13	4E4	1L12	A	—
		120 VAC	3TX7115-5DF13C	3TX7115-5LF13	4E4	1L12	A	—

Option	Basic	Premium
Mechanical Flag	√	√
Push To Test		√
Lock Down Door		√
LED		√

Note: See page 12/145 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	3TX7115-5FC03C	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	1L11	B	3L7	—
		24VAC	3TX7111-3HC13C	3TX7111-3PC13	3TX7111-5PC13B	4E5	1L11	B	3L7	—
		120 VAC	3TX7111-3HF13C	3TX7111-3PF13	3TX7111-5PF13B	4E5	1L11	B	3L7	—
		240 VAC	—	3TX7111-3PG13	—	4E5	1L11	B	3L7	—
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 12/145 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.

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
SPDT		277 VAC	3TX7130-0BS13	1M0
DPDT	40	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
		48 VDC	3TX7130-0DD03	1M0
		110 VDC	3TX7130-0DF03	1M0
DPST NO	40	24 VAC	3TX7130-0CC13	1M0
		120 VAC	3TX7130-0CF13	1M0
		240 VAC	3TX7130-0CH13	1M0
		12 VDC	3TX7130-0CB03	1M0
		24 VDC	3TX7130-0CC03	1M0
		48 VDC	3TX7130-0CD03	1M0
DPDT (Mag Blowout)	40	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 12/145 for socket accessories.

Coupling Relays and Interfaces

3TX71 plug-in relays

General specifications

Contact Characteristics		Units	3TX7110		3TX7111			
Number and Type of Contacts			SPDT	SPDT	DPDT	DPDT	4PDT	4PDT
Contact Material			Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy
Thermal (Carrying) Current		A	15	3 (Bifurcated)	12	3 (Bifurcated)	6	3 (Bifurcated)
Maximum Switching Voltage		V	300	300	300	300	300	300
Switching Current at Voltage		Resistive	15A @240V	3A @240V	—	3A @240V	6A @240V	3A @240V
		Resistive	15A @120V	—	12A @120V	3A @120V	6A @120V	3A @120V
		Resistive	15A @ 28	—	12A @ 28	3A @ 30	6A @ 28	3A @ 30
		HP	1/2 @ 120VAC	—	1/3 @ 120VAC	1/16 @ 120VAC	1/3 @ 120VAC	1/16 @ 120VAC
		HP	1 @ 240VAC	—	—	—	1 @ 240VAC	—
		Pilot Duty	B300	—	B300	—	B300	—
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)
Coil Characteristics								
Voltage Range	AC	V	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
Operating Range	AC	%	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
Average Consumption	AC	VA	0.9	0.9	1.2	1.2	1.2	1.2
	DC	W	0.7	0.7	0.9	0.9	0.9	0.9
Drop-out Voltage Threshold	AC	%	15	15	15	15	15	15
	DC	%	10	10	10	10	10	10
Performance Characteristics								
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	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
Operating Time (response time)		ms	20	20	20	20	20	20
Dialectric Strength	Between Coil and Contact	V(rms)	2500	2500	2500	2500	2500	2500
	Between Poles	V(rms)	1500	1500	1500	1500	1500	1500
	Between Contacts	V(rms)	1500	1500	1500	1500	1500	1500
Environment								
Product Certifications	Standard Version		UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS
Ambient Air Temperature	Storage	°C	-40…+85	-40…+85	-40…+85	-40…+85	-40…+85	-40…+85
around the Device	Operational	°C	-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
Shock Resistance		g-n	10	10	10	10	10	10
Degree of Protection			IP40	IP40	IP40	IP40	IP40	IP40
Weight		grams	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	10	15	10	10	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)
Coil Characteristics									
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	1.2	1.5	1.5
	DC	W	0.9	0.9	0.9	0.9	0.9	1.4	1.5
Drop-out Voltage Threshold	AC	%	15	15	15	15	15	15	15
	DC	%	10	10	10	10	10	10	10
Performance Characteristics									
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
Dialectric 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
Environment									
Product Certifications	Standard Version		UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS
Ambient Air Temperature	Storage	°C	-40…+85	-40…+85	-40…+85	-40…+85	-40…+85	-40…+85	-40…+85
around the Device	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

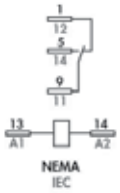
General specifications

Contact Characteristics		Units	3TX7127			3TX7130
Number and Type of Contacts			DPDT	4PDT	4PDT	All
Contact Material			Silver Alloy	Fine Silver	Silver Alloy	Silver Alloy
Thermal (Carrying) Current		A	12	3	5	40
Maximum Switching Voltage		V	300	300	300	600
Switching Current at Voltage		Resistive	12A @240V	3A @240V	12A @240V	40A @277V
		Resistive	12A @120V	3A @120V		—
		Resistive	12A @ 28	3A @ 30		40A @ 28
		HP	1/3 @ 120VAC	1/16 @ 120VAC	—	—
		HP	1/2 @ 240VAC	1/10 @ 240VAC	—	—
		Pilot Duty	B300	—	—	—
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)	10 @ 5VDC (.5W)	100 @ 5VDC (.5W)	1000 @ 12VAC/DC
Coil Characteristics						
Voltage Range	AC	V	6…240	6…240	6…240	6…600
	DC	V	6…125	6…125	6…125	6…600
Operating Range	AC	%	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
Average Consumption	AC	VA	1.2	1.2	1.2	10
	DC	W	0.9	0.9	0.9	4
Drop-out Voltage Threshold	AC	%	15	15	15	10
	DC	%	10	10	10	10
Performance Characteristics						
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000	100,000	100,000	100,000
Mechanical Life	Unpowered		10,000,000	10,000,000	10,000,000	1,000,000
Operating Time (response time)		ms	20	20	20	30
Dialectric Strength	Between Coil and Contact	V(rms)	1,500	1240	1240	2200
	Between Poles	V(rms)	1,500	1240	1240	2200
	Between Contacts	V(rms)	1500	500	500	1500
Environment						
Product Certifications	Standard Version		UL,RoHS	UL,RoHS	UL,RoHS	UL
Ambient Air Temperature	Storage	°C	-40…+85	-40…+85	-40…+85	-40…+85
around the Device	Operational	°C	-40…+55	-40…+70	-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			IP67	IP67	IP67	Open
Weight		grams	130	45	45	227 to 312

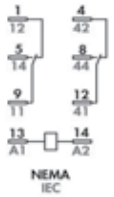
Contact Characteristics		Units	3TX7131			3TX7132
Number and Type of Contacts			DPST-NO	DPDT	DPDT	SPDT
Contact Material			Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy
Thermal (Carrying) Current		A	30	30 DPDT-NO	3 DPDT-NC	30 SPDT-NO
Maximum Switching Voltage		V	600	300	300	300
Switching Current at Voltage		Resistive	20A @300V	30A @277V	3A @277V	30A @277V
		Resistive	—	—	—	—
		Resistive	20A @ 28	20A @ 28	3A @ 28	10A @ 28
		HP	1/3 @ 120VAC	1 @ 120VAC	—	1 @ 120VAC
		HP	1/2 @ 600VAC	3 @ 240VAC	—	2 @ 240VAC
		Pilot Duty	—	—	—	—
Minimum Switching Requirement		mA	500 @ 12VAC/DC	500 @ 12VAC/DC	500 @ 12VAC/DC	1000 @ 12VAC/5VDC
Coil Characteristics						
Voltage Range	AC	V	12…240	12…240	12…240	12…277
	DC	V	6…110	6…110	6…110	5…110
Operating Range	AC	%	85 to 120	85 to 120	85 to 120	85 to 120
	DC	%	75 to 120	75 to 120	75 to 120	75 to 120
Average Consumption	AC	VA	4	4	4	2.8
	DC	W	1.7	1.7	1.7	1
Drop-out Voltage Threshold	AC	%	10	10	10	10
	DC	%	10	10	10	10
Performance Characteristics						
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000	100,000	100,000	100,000
Mechanical Life	Unpowered		5,000,000	5,000,000	5,000,000	10,000,000
Operating Time (response time)		ms	15	15	15	15
Dialectric Strength	Between Coil and Contact	V(rms)	4000	4000	4000	2500
	Between Poles	V(rms)	2000	2000	2000	1500
	Between Contacts	V(rms)	1500	1500	1500	1500
Environment						
Product Certifications	Standard Version		UL	UL	UL	UL
Ambient Air Temperature	Storage	°C	-40…+85	-40…+85	-40…+85	-40…+85
around the Device	Operational	°C	-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
Shock Resistance		g-n	10	10	10	10
Degree of Protection			—	—	—	—
Weight		grams	86	86	86	33

Circuit diagrams

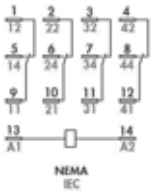
3TX7110
SPDT



3TX7111
DPDT

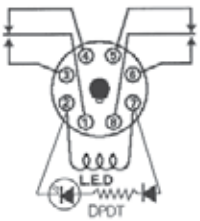


3TX7111
4PDT

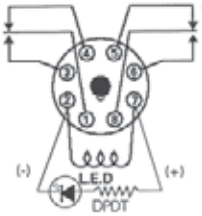


3TX7112
DPDT

AC COIL CIRCUIT

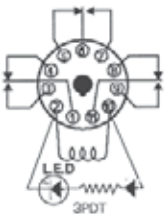


DC COIL CIRCUIT

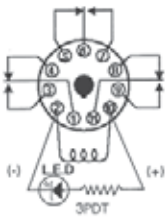


3TX7112
3PDT

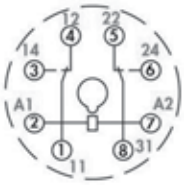
AC COIL CIRCUIT



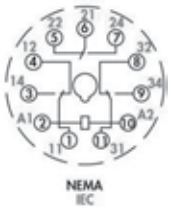
DC COIL CIRCUIT



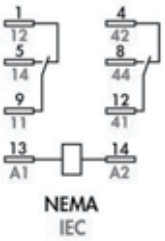
3TX7112-1L, -1D
DPDT



3TX7112-1N, -1F
3PDT



3TX7114
DPDT



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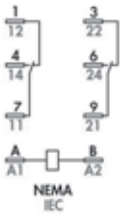
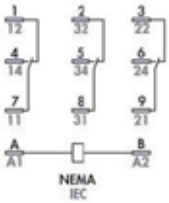
DPDT



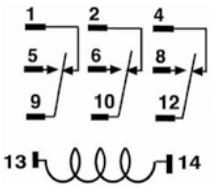
3TX7115
3PDT



Circuit diagrams

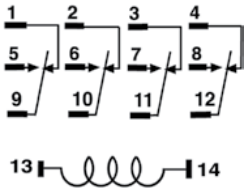
3TX7116

3PDT



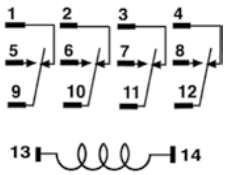
3TX7117

4PDT

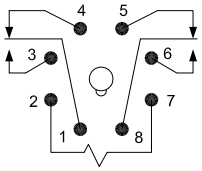


3TX7127

4PDT



3TX7127 (DPDT)



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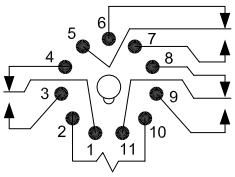
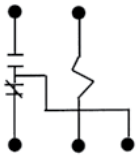


3TX7130

SPST-NO

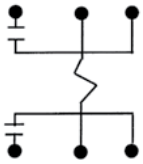
3TX7130

SPDT



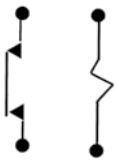
3TX7130

DPST-NO



3TX7130

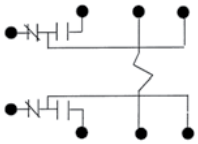
SPST-NC



SPST-NC-DB

3TX7130

DPDT



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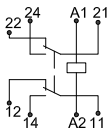
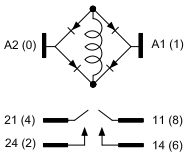
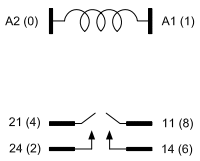


3TX7131 (DPST-NO) (AC)



Circuit diagrams

3TX7131 (DPST-NO) (DC)



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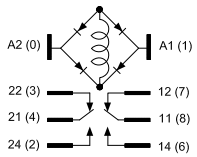

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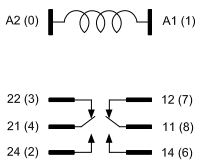
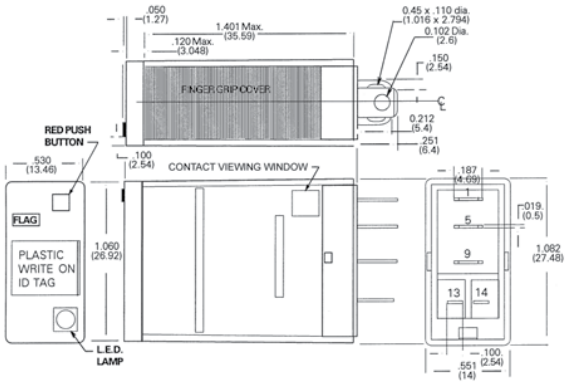
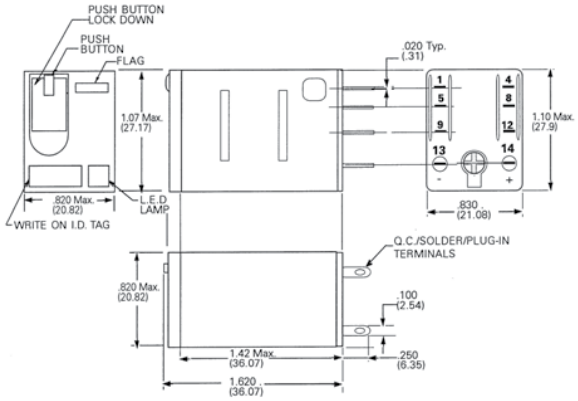


Dimension drawings

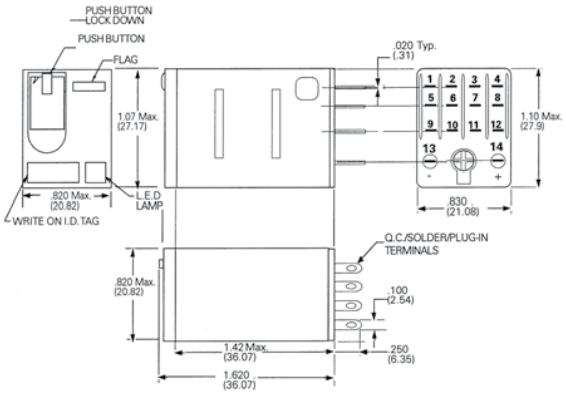
3TX7110 SPDT



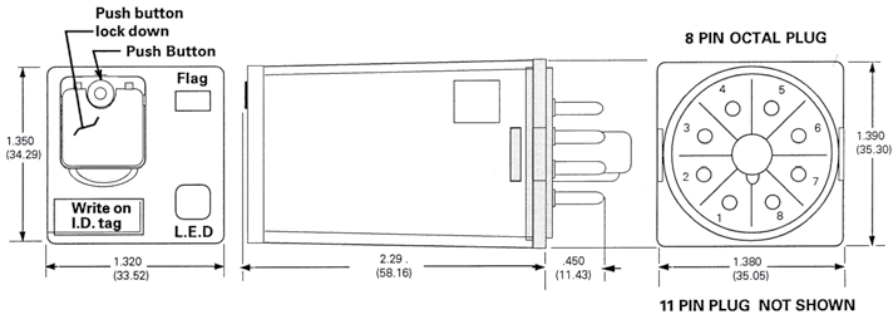
3TX7111 DPDT



3TX7111 4PDT



3TX7112 DPDT

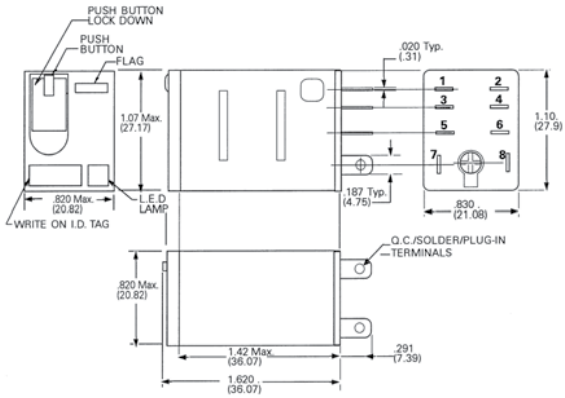


Coupling Relays and Interfaces

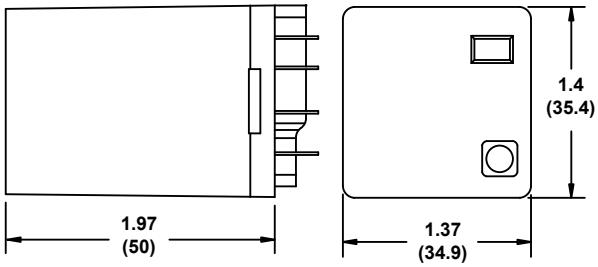
3TX71 plug-in relays

Dimension drawings

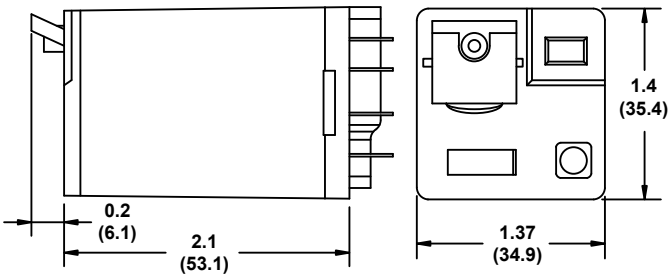
3TX7114 DPDT



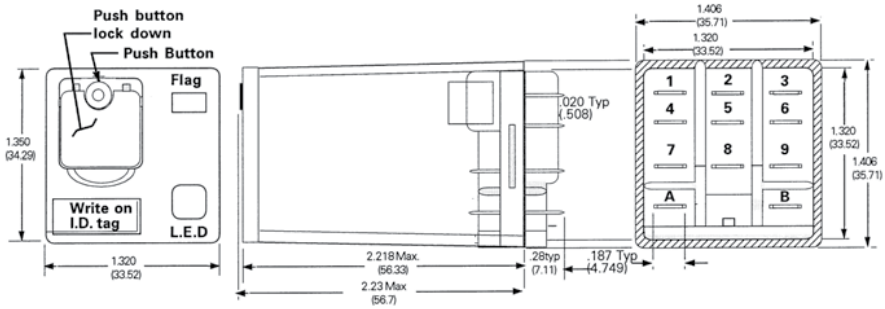
3TX7115 (DPDT) (clear cover)



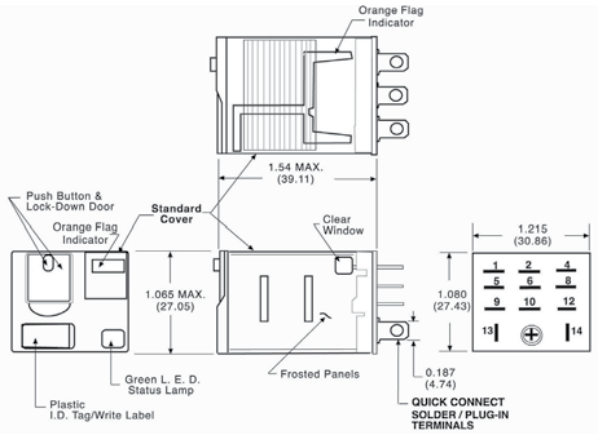
3TX7115 (DPDT) (full feature)



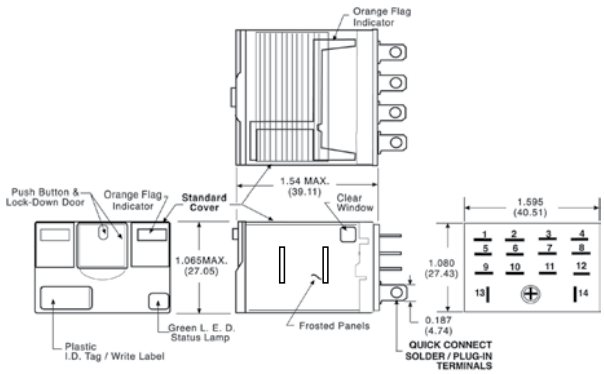
3TX7115 3PDT



3TX7116 3PDT

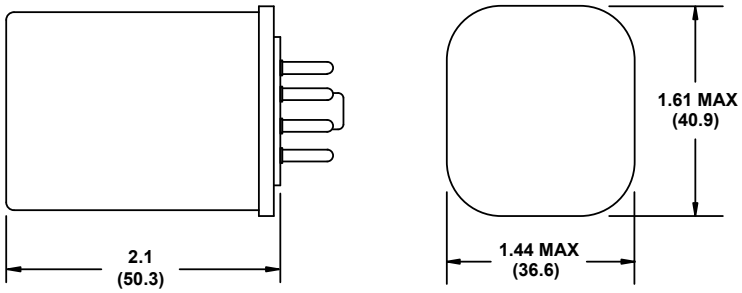


3TX7117 4PDT

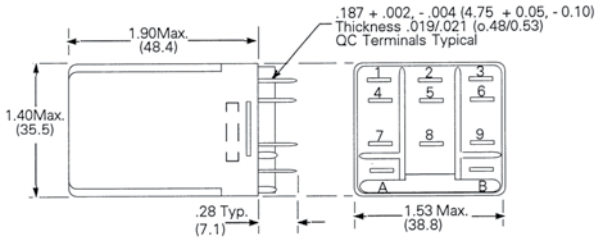


Dimension drawings

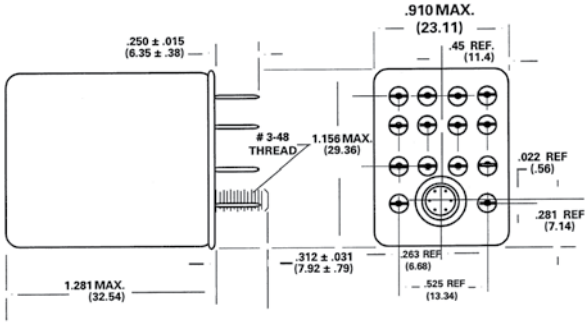
3TX7127 (DPDT)



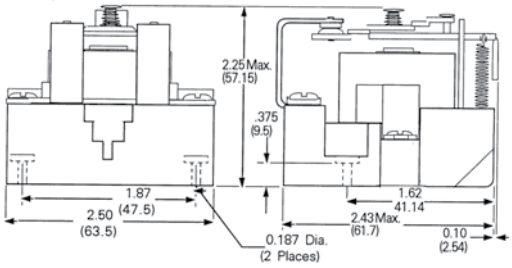
3TX7127 3PDT



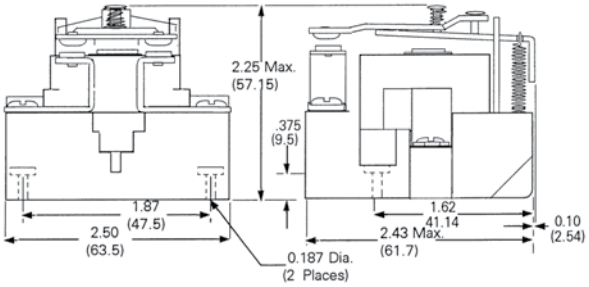
3TX7127 4PDT



3TX7130 SPST NC

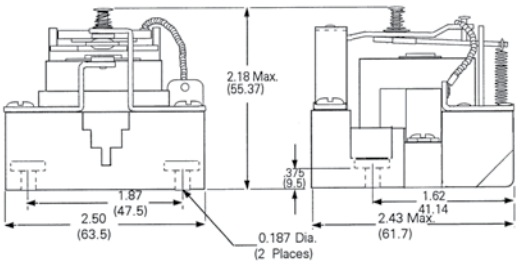


3TX7130 SPST NO

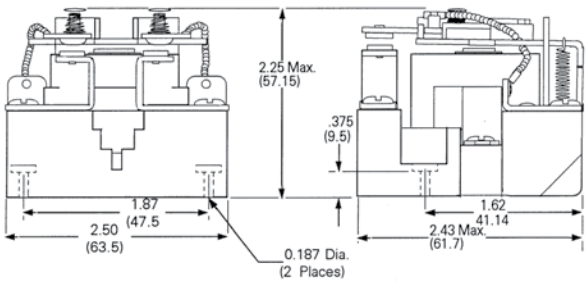


Dimension drawings

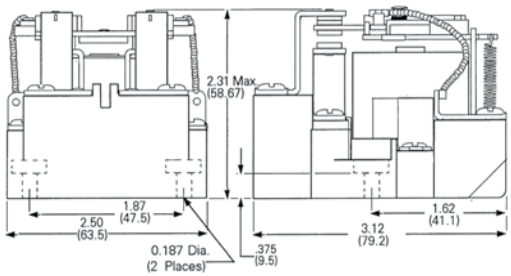
3TX7130 SPDT



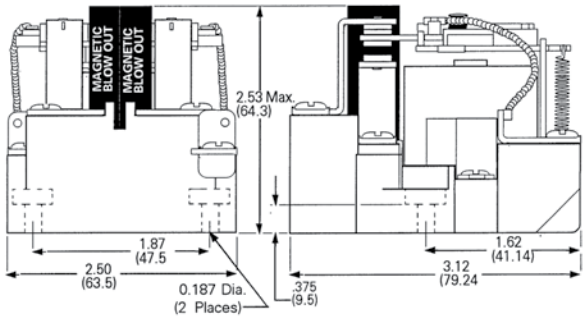
3TX7130 DPST NO



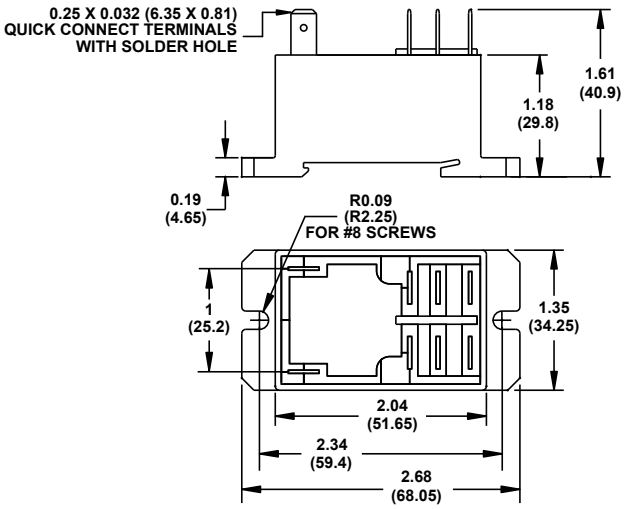
3TX7130 DPDT



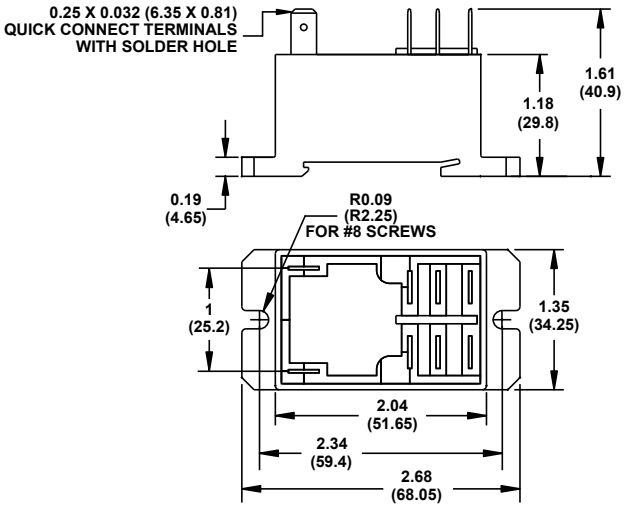
3TX7130 DPDT with magnetic blowout



3TX7131 (DPST-NO)

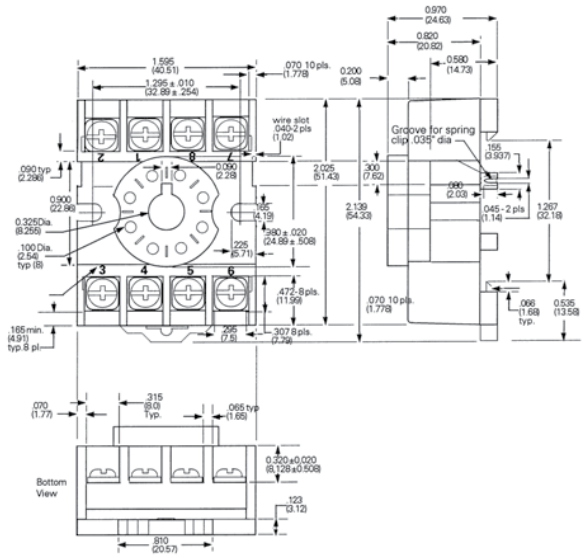


3TX7131 (DPDT)

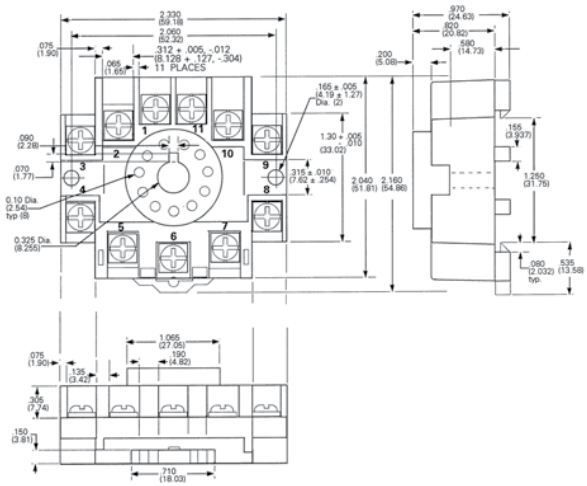


Dimension drawings

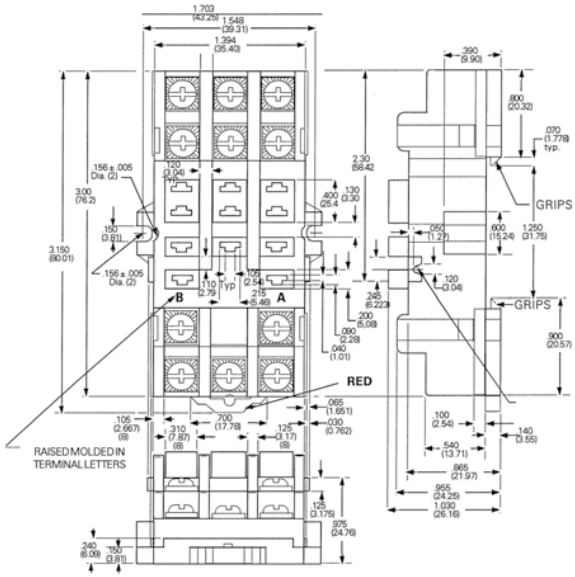
3TX7144-1E2



3TX7144-1E3

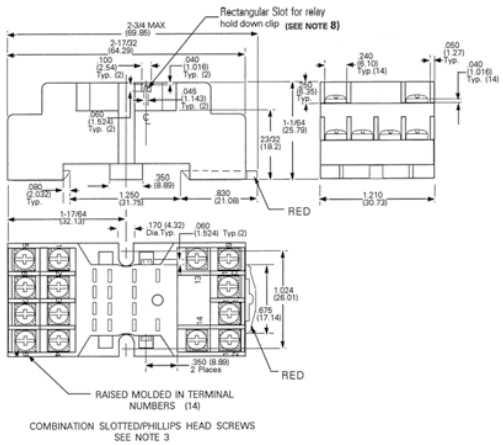


3TX7144-1E4

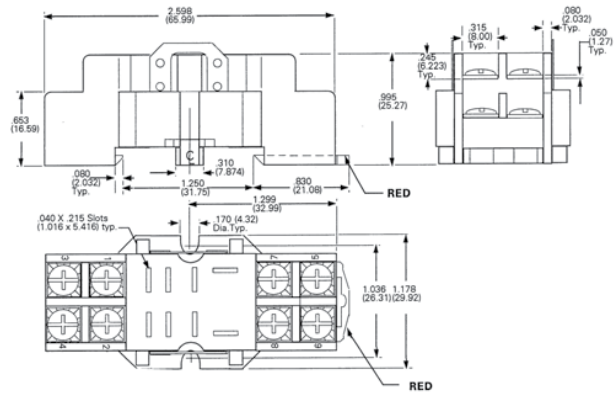


Dimension drawings

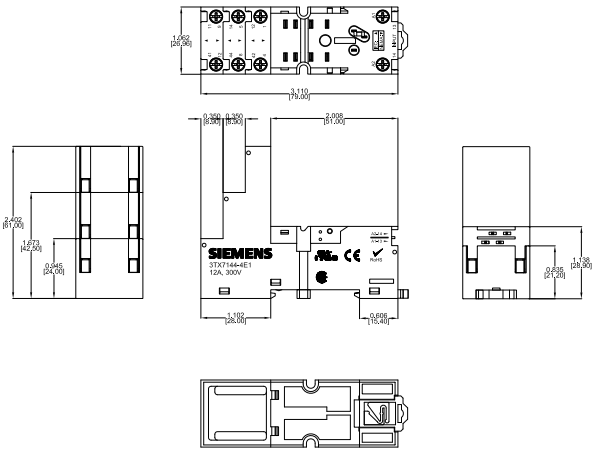
3TX7144-1E5



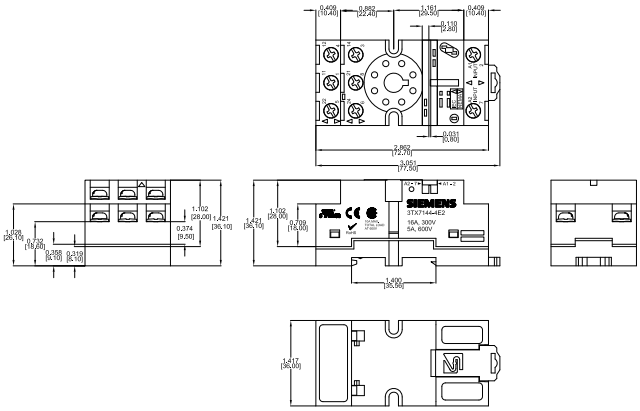
3TX7144-1E6



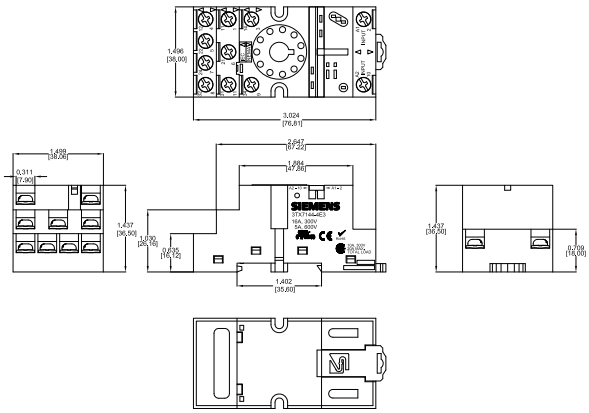
3TX7144-4E1



3TX7144-4E2

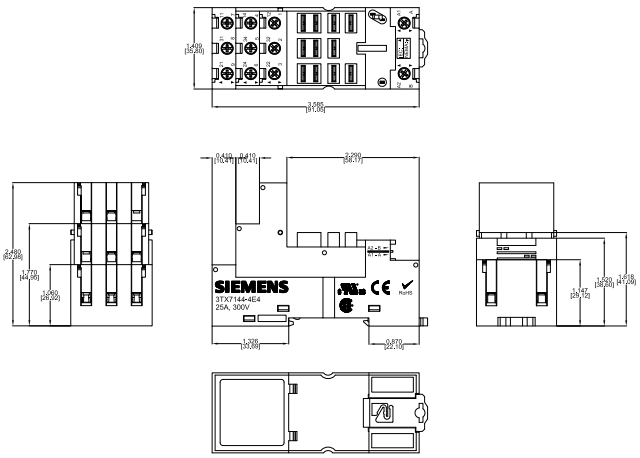


3TX7144-4E3

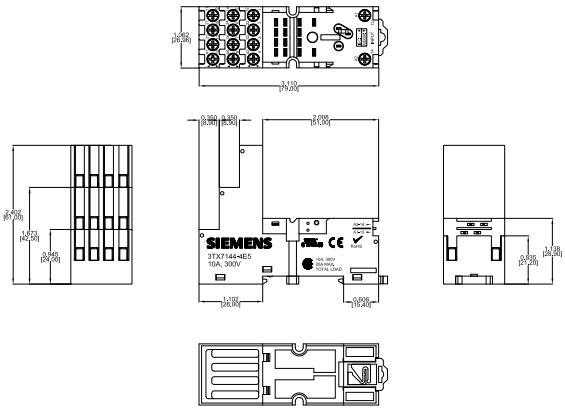


Dimension drawings

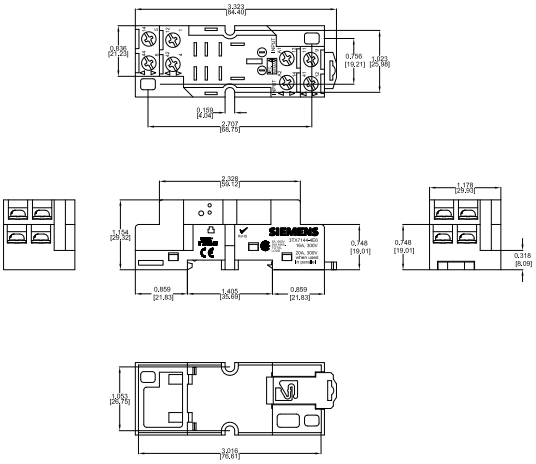
3TX7144-4E4



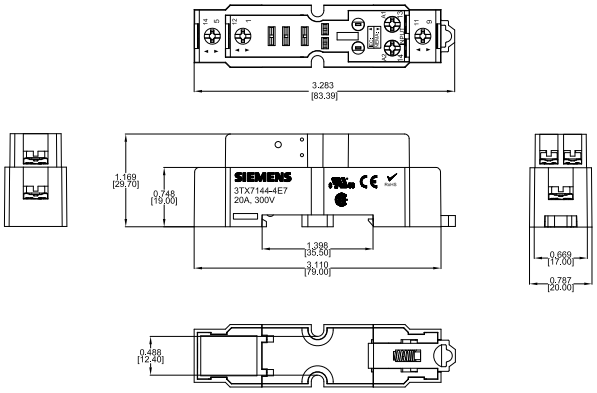
3TX7144-4E5



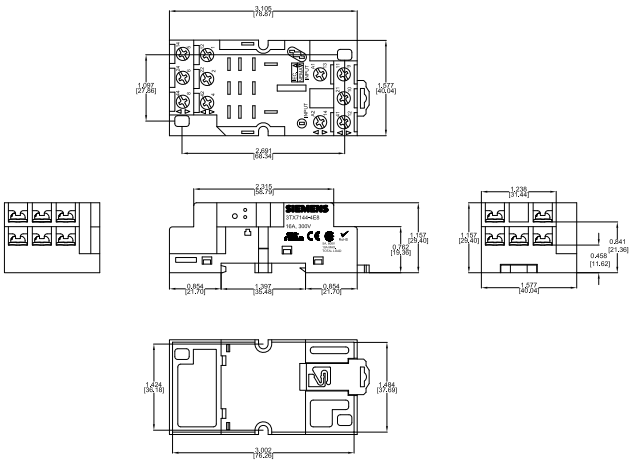
3TX7144-4E6



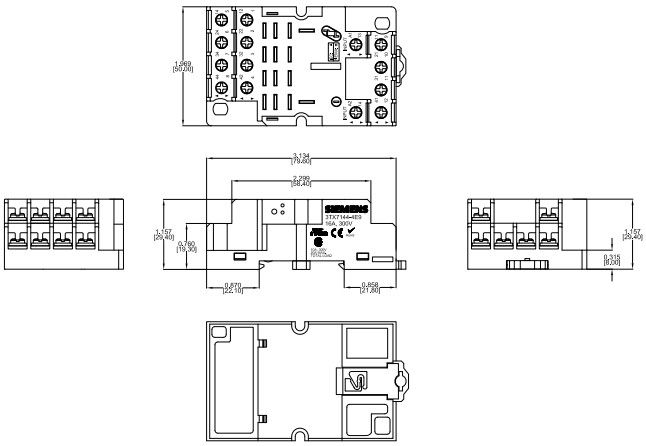
3TX7144-4E7



3TX7144-4E8



3TX7144-4E9



Coupling Relays

LZS coupling relays with plug-in relays

Selection and ordering data

	Version	Rated control supply voltage U_s (at AC: 50/60 Hz)	Contacts, number of CO contacts	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V		mm	d				
Complete units, 3CO and 4CO contacts, PT series									
LZS:PT3A5L24	**Complete units with plug-in base** For snap-on mounting onto DINrail Comprising: • Plug-in relays • Standard plug-in base with screw terminals • LED module (24 V DC version: LED module with freewheel diode) • Fixing/ejection brackets • Labels					**Screw terminals**			
	3 CO contacts	24 DC	3	28	2	**LZS:PT3A5L24**		1	5 units
		24 AC			2	**LZS:PT3A5R24**		1	5 units
		115 AC			2	**LZS:PT3A5S15**		1	5 units
		230 AC			2	**LZS:PT3A5T30**		1	5 units
	4 CO contacts	24 DC	4	28	2	**LZS:PT5A5L24**		1	5 units
		24 AC			2	**LZS:PT5A5R24**		1	5 units
		115 AC			2	**LZS:PT5A5S15**		1	5 units
		230 AC			2	**LZS:PT5A5T30**		1	5 units
	Complete units with plug-in base **With logical separation** For snap-on mounting onto DIN rail Comprising: • Plug-in relays • Plug-in base with logical separation and screw terminals • LED module (24 V DC version: LED module with freewheel diode) • Fixing/ejection brackets • Labels								
	4 CO contacts	24 DC	4	28	2	**LZS:PT5B5L24**		1	5 units
		24 AC			2	**LZS:PT5B5R24**		1	5 units
		115 AC			2	**LZS:PT5B5S15**		1	5 units
		230 AC			2	**LZS:PT5B5T30**		1	5 units
Complete units, 2CO and 4CO contacts, PT series									
LZS:PT5D5L24	**Complete units with plug-in base** **With logical separation** For snap-on mounting onto DIN rail Comprising: • Plug-in relays • Plug-in base with logical separation and push-in terminals • LED module (24 V DC version: LED module with freewheel diode) • Fixing/ejection brackets • Labels					**Push-in terminals**			
	2 CO contacts	24 DC	2	28	2	**LZS:PT2D5L24**		1	5 units
		230 AC			2	**LZS:PT2D5T30**		1	5 units
	4 CO contacts	24 DC	4	28	2	**LZS:PT5D5L24**		1	5 units
		24 AC			2	**LZS:PT5D5R24**		1	5 units
		115 AC			2	**LZS:PT5D5S15**		1	5 units
		230 AC			2	**LZS:PT5D5T30**		1	5 units

Note:

Logical separation: The terminals for the contacts and the terminals for the coil are arranged on separate levels, e.g. above for contacts and below for the coil. Logical separation is not necessarily protective separation.

Protective separation: Protective separation prevents voltage of one circuit affecting another circuit with sufficient protection (IEC 61140).

Coupling Relays

LZS coupling relays with plug-in relays

Individual modules for customer assembly, PT series

LZX:PT370024

Version	Rated control supply voltage U_s at 50/60 Hz AC	Contacts, number of CO contacts	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V		mm	d				
Mini industrial relays								
• With push-to-test and mechanical flag, without LED[1]								
	24 DC	2	22.5	▶	**LZX:PT270024**		1	1 unit
		3		▶	**LZX:PT370024**		1	1 unit
		4		▶	**LZX:PT570024**		1	1 unit
	24 AC	2	22.5	▶	**LZX:PT270524**		1	1 unit
		3		2	**LZX:PT370524**		1	1 unit
		4		▶	**LZX:PT570524**		1	1 unit
	115 AC	2	22.5	5	**LZX:PT270615**		1	1 unit
		3		2	**LZX:PT370615**		1	1 unit
		4		▶	**LZX:PT570615**		1	1 unit
	230 AC	2	22.5	▶	**LZX:PT270730**		1	1 unit
		3		▶	**LZX:PT370730**		1	1 unit
		4		▶	**LZX:PT570730**		1	1 unit
• With hard gold-plating								
	24 DC	4	22.5	▶	**LZX:PT580024**		1	1 unit
	230 AC			▶	**LZX:PT580730**		1	1 unit
• Without push-to-test								
	24 DC	4	22.5	▶	**LZX:PT520024**		1	1 unit
	230 AC			5	**LZX:PT520730**		1	1 unit
Plug-in bases for PT relays								
Standard plug-in bases For mounting onto DIN rail					**Screw terminals**			
	--	2	28	▶	**LZS:PT78720**		1	1 unit
		3		▶	**LZS:PT78730**		1	1 unit
		4		▶	**LZS:PT78740**		1	1 unit
Plug-in bases with logical separation For mounting onto DIN rail								
	--	2	28	▶	**LZS:PT78722**		1	1 unit
		4		▶	**LZS:PT78742**		1	1 unit
Plug-in bases with logical separation For mounting onto DIN rail					**Push-in terminals**			
	--	2	28	▶	**LZS:PT7872P**		1	1 unit
		4		▶	**LZS:PT7874P**		1	1 unit

LZS:PT78740

LZS:PT78722

LZS:PT7874P

[1] The push-to-test is designed to be non-latching. If the push-to-test is pressed further until 90° has been reached, two small lugs break off and the push-to-test can be latched in position.

Note:

Logical separation: The terminals for the contacts and the terminals for the coil are arranged on separate levels, e.g. above for contacts and below for the coil. Logical separation is not necessarily protective separation.

Protective separation: Protective separation prevents voltage of one circuit affecting another circuit with sufficient protection (IEC 61140).

Coupling Relays

LZS coupling relays with plug-in relays

	Version	Rated control supply voltage U_s at 50/60 Hz AC	Contacts, number of CO contacts	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V		mm	d				
Individual modules for customer assembly, PT series									
	More individual modules								
	LED modules								
	• Red								
	- With freewheel diode	24 DC	--	12.5	▶	**LZS:PTML0024**		1	1 unit
LZS:PTML0024	- Without freewheel diode	24 AC/DC			▶	**LZS:PTML0524**		1	1 unit
		110 … 230 AC/DC			▶	**LZS:PTML0730**		1	1 unit
	• Green								
	- With freewheel diode	24 DC	--	12.5	▶	**LZS:PTMG0024**		1	1 unit
	- Without freewheel diode	24 AC/DC			▶	**LZS:PTMG0524**		1	1 unit
		110 … 230 AC/DC			▶	**LZS:PTMG0730**		1	1 unit
LZS:PT17021	**Fixing/ejection brackets for PT base with logical separation**								
	Screw terminals and plug-in terminals (push-in)	--	--	26	▶	**LZS:PT17021**		100	10 units
LZS:PT17024	**Fixing/ejection brackets for standard plug-in base without logical separation**								
	Screw terminals	--	--	26	▶	**LZS:PT17024**		100	10 units
LZS:PT17040	**Labels**								
		--	--	26	▶	**LZS:PT17040**		100	10 units
	RC elements								
		6 ... 60 AC	--	26	▶	**LZS:PTMU0524**		1	1 unit
LZS:PTMU0730		110 … 230 AC			▶	**LZS:PTMU0730**		1	1 unit
	Freewheel diodes with connection to A1								
		6 … 230 DC	--	26	▶	**LZS:PTMT00A0**		1	1 unit
	Connecting cables, 24-pole								
	Current carrying capacity 12 A, with supply cable, blue				2	**3TX7004-8BA00**		1	1 unit
		--	--	--					
	Connecting combs for PT screw base								
	6-pole, 10 A current carrying capacity, natural-colored								
		--	--	--	5	**LZS:PT170R6**		1	10 units
3TX7004-8BA00	**Connecting brackets for PT push-in base**								
	2-pole, 10 A current carrying capacity, natural-colored				5	**LZS:PT170P1**		1	10 units
		--	--	--					
Individual modules for customer assembly, MT series, octal base									
	Industrial relays, 3CO								
	Industrial relays with push-to-test								
	Without LED	24 DC	3	35.5	2	**LZX:MT321024**		1	1 unit
	With LED				▶	**LZX:MT323024**		1	1 unit
	Without LED	24 AC	3	35.5	2	**LZX:MT326024**		1	1 unit
	With LED				15	**LZX:MT328024**		1	1 unit
LZX:MT326024	Without LED	115 AC	3	35.5	15	**LZX:MT326115**		1	1 unit
	With LED				15	**LZX:MT328115**		1	1 unit
	Without LED	230 AC	3	35.5	2	**LZX:MT326230**		1	1 unit
	With LED				2	**LZX:MT328230**		1	1 unit
	Plug-in bases For mounting onto DIN rail					**Screw terminals**			
		--	--	38	▶	**LZS:MT78750**		1	1 unit
	Fixing brackets								
		--	--	38	▶	**LZS:MT28800**		1	1 unit
LZS:MT78750									

Note:

Logical separation: The terminals for the contacts and the terminals for the coil are arranged on separate levels, e.g. above for contacts and below for the coil. Logical separation is not necessarily protective separation.

Protective separation: Protective separation prevents voltage of one circuit affecting another circuit with sufficient protection (IEC 61140).

Coupling Relays

LZS coupling relays with plug-in relays

	Version	Rated control supply voltage U_s at 50/60 Hz AC	Contacts, number of CO contacts	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V		mm	d				
Complete units, 1CO and 2CO, 5 mm pinning, RT series									
LZS:RT4A4T30	**Complete units with standard plug-in base** For snap-on mounting onto DIN rail Comprising: • Plug-in relays • Standard plug-in base with screw terminals • LED module (24 V DC version: LED module with freewheel diode) • Fixing/ejection brackets • Labels					**Screw terminals**			
	1 CO contact	24 DC	1	15.5	2	**LZS:RT3A4L24**		1	5 units
		24 AC			2	**LZS:RT3A4R24**		1	5 units
		115 AC			2	**LZS:RT3A4S15**		1	5 units
		230 AC			2	**LZS:RT3A4T30**		1	5 units
	2 CO contacts	24 DC	2	15.5	2	**LZS:RT4A4L24**		1	5 units
		24 AC			2	**LZS:RT4A4R24**		1	5 units
		115 AC			2	**LZS:RT4A4S15**		1	5 units
		230 AC			2	**LZS:RT4A4T30**		1	5 units
LZS:RT4B4T30	**Complete units with plug-in base** **With logical separation** For snap-on mounting onto DIN rail Comprising: • Plug-in relays • Plug-in base with logical separation and screw terminals • LED module (24 V DC version: LED module with freewheel diode) • Fixing/ejection brackets • Labels								
	1 CO contact	24 DC	1	15.5	2	**LZS:RT3B4L24**		1	5 units
		24 AC			2	**LZS:RT3B4R24**		1	5 units
		115 AC			2	**LZS:RT3B4S15**		1	5 units
		230 AC			2	**LZS:RT3B4T30**		1	5 units
	2 CO contacts	24 DC	2	15.5	2	**LZS:RT4B4L24**		1	5 units
		24 AC			2	**LZS:RT4B4R24**		1	5 units
		115 AC			2	**LZS:RT4B4S15**		1	5 units
		230 AC			2	**LZS:RT4B4T30**		1	5 units
LZS:RT3D4L24	**Complete units with plug-in base** **With logical separation** For snap-on mounting onto DIN rail Comprising: • Plug-in relays • Plug-in base with logical separation and push-in terminals • LED module (24 V DC version: LED module with freewheel diode) • Fixing/ejection brackets • Labels					**Push-in terminals**			
	1 CO contact	24 DC	1	15.5	2	**LZS:RT3D4L24**		1	5 units
		24 AC			2	**LZS:RT3D4R24**		1	5 units
		115 AC			2	**LZS:RT3D4S15**		1	5 units
		230 AC			2	**LZS:RT3D4T30**		1	5 units
	2 CO contacts	24 DC	2	15.5	2	**LZS:RT4D4L24**		1	5 units
		24 AC			2	**LZS:RT4D4R24**		1	5 units
		115 AC			2	**LZS:RT4D4S15**		1	5 units
		230 AC			2	**LZS:RT4D4T30**		1	5 units

Note:

Logical separation: The terminals for the contacts and the terminals for the coil are arranged on separate levels, e.g. above for contacts and below for the coil. Logical separation is not necessarily protective separation.

Protective separation: Protective separation prevents voltage of one circuit affecting another circuit with sufficient protection (IEC 61140).

Coupling Relays

LZS coupling relays with plug-in relays

LZX:RT314024

LZS:RT78725

LZS:RT78726

LZS:RT7872P

LZS:PTML0024

LZS:RT17016

LZS:RT17040

LZS:PTMU0730

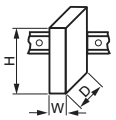
3TX7004-8BA00

Version	Rated control supply voltage U_s at 50/60 Hz AC	Contacts, number of CO contacts	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	V		mm	d				
Individual modules for customer assembly, RT series								
Print relays, 1CO and 2CO, 5 mm pinning								
Print relays								
With hard gold-plating								
Version with 1 CO contact								
	24 DC	1	12.7	▶	**LZX:RT315024**		1	1 unit
	230 AC			15	**LZX:RT315730**		1	1 unit
Print relays								
Version with 1 CO contact								
	24 DC	1	12.7	▶	**LZX:RT314024**		1	1 unit
	24 AC			15	**LZX:RT314524**		1	1 unit
	115 AC			15	**LZX:RT314615**		1	1 unit
	230 AC			▶	**LZX:RT314730**		1	1 unit
Version with 2 CO contacts								
	12 DC	2	12.7	5	**LZX:RT424012**		1	1 unit
	24 DC			▶	**LZX:RT424024**		1	1 unit
	24 AC			▶	**LZX:RT424524**		1	1 unit
	115 AC			▶	**LZX:RT424615**		1	1 unit
	230 AC			▶	**LZX:RT424730**		1	1 unit
Standard plug-in bases For mounting onto DIN rail					**Screw terminals**			
	--	--	15.5	▶	**LZS:RT78725**		1	1 unit
Plug-in bases with logical separation For mounting onto DIN rail								
	--	--	15.5	▶	**LZS:RT78726**		1	1 unit
Plug-in bases with logical separation For mounting onto DIN rail					**Push-in terminals**			
	--	--	15.5	▶	**LZS:RT7872P**		1	1 unit
LED modules								
• Red								
With freewheel diode	24 DC	--	15.5	▶	**LZS:PTML0024**		1	1 unit
Without freewheel diode	24 AC/DC	--		▶	**LZS:PTML0524**		1	1 unit
	110 ... 230 AC/DC	--		▶	**LZS:PTML0730**		1	1 unit
• Green								
With freewheel diode	24 DC	--	15.5	▶	**LZS:PTMG0024**		1	1 unit
Without freewheel diode	24 AC/DC	--		▶	**LZS:PTMG0524**		1	1 unit
	110 ... 230 AC/DC	--		▶	**LZS:PTMG0730**		1	1 unit
Fixing/ejection brackets for RT base								
	--	--	15.5	▶	**LZS:RT17016**		100	10 units
Labels								
	--	--	15.5	▶	**LZS:RT17040**		100	10 units
RC elements								
	6 ... 60 AC	--	15.5	▶	**LZS:PTMU0524**		1	1 unit
	110 ... 230 AC			▶	**LZS:PTMU0730**		1	1 unit
Freewheel diodes with connection to A1								
	6 … 230 DC	--	15.5	▶	**LZS:PTMT00A0**		1	1 unit
Connecting cables, 24-pole								
Current carrying capacity 12 A, with supply cable, blue	--	--	--	2	**3TX7004-8BA00**		1	1 unit
Connecting combs for RT screw base								
8-pole, 10 A current carrying capacity, natural-colored	--	--	--	▶	**LZS:RT170R8**		1	10 units
Connecting brackets for push-in base								
2-pole, 10 A current carrying capacity, natural-colored	--	--	--	5	**LZS:RT170P1**		100	10 units

Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16204/td	Manuals, see https://support.industry.siemens.com/cs/ww/en/ps/16204/man

Relay type		LZX:RT print relay, 8-pin, (12.7 mm) 1 CO / 2 CO				LZX:PT industrial relay, 8-, 11- and 14-pin, (22.5 mm) 2 CO / 3 CO / 4 CO			
General data									
Dimensions (W x H x D)									
• LZS:RT.A4 / LZS:PT.A5	mm	15.5 x 78 x 71				28 x 74 x 72			
• LZS:RT.B4 / LZS:PT.B5	mm	15.5 x 77 x 71				28 x 77 x 79			
• LZS:RT.D4 / LZS:PT.D5	mm	15.5 x 98 x 71				28 x 98 x 79			
Rated control supply voltage U_s [1]	V	24 DC	24 AC	115 AC	230 AC	24 DC	24 AC	115 AC	230 AC
Rated insulation voltage U_i (Pollution degree 3)	V	250							
Overvoltage category Acc. to IEC 60664-1		III							
Protective separation Between coil and contacts Acc. to IEC 60947-1, Appendix N		Up to 250 V (with plug-in base LZS:RT78726) No (for complete units with standard base)				No			
Degree of protection									
• Relays		IP67				IP50			
• Bases		IP20							
Permissible ambient temperature									
• During operation	°C	-40 ... +70							
• During storage	°C	-40 ... +80							
Conductor cross-sections									
Connection type		**Screw terminals**							
• Solid	mm^2	2 x 2.5							
• Finely stranded with end sleeve	mm^2	2 x 1.5							
• Corresponding opening tool		Screwdriver, size 3.0 ... 3.5 mm x 0.5 mm (3RA2908-1A)							
Connection type		**Push-in terminals**							
• Solid	mm^2	1 x (0.75 ... 1.5), 2 x (0.75 ... 1.0), 2 x 1.5							
• Finely stranded without end sleeve	mm^2	1 x (0.75 ... 1.5), 2 x (0.75 ... 1.0), 2 x 1.5							
• Finely stranded with end sleeve	mm^2	1 x (0.75 ... 1.0), 2 x 0.75, 1 x 1.5							



[1] AC voltages, 50 Hz; for 60 Hz operation, the lower response value must be increased by 10%; the power loss will decrease slightly.

Coupling Relays

LZS coupling relays with plug-in relays

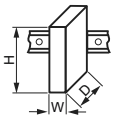
Relay type		LZX:RT print relay, 8-pin, (12.7 mm) 1 CO / 2 CO				LZX:PT industrial relay, 8-, 11- and 14-pin, (22.5 mm) 2 CO / 3 CO / 4 CO			
Rated control supply voltage U_s[1]	V	**24 DC**	**24 AC**	**115 AC**	**230 AC**	**24 DC**	**24 AC**	**115 AC**	**230 AC**
Control side									
Operating range factor		0.9 ... 1.4	0.9 ... 1.1			0.9 ... 1.4	0.9 ... 1.1		
Power consumption at U_s									
• AC	VA	--	0.75			--	1		
• DC	W	0.4	--			0.75	--		
Release voltage	V	2.4	7.2	34.5	69	3.6	7.2	34.5	69
Protection circuit		Freewheel diode for complete unit	--			Freewheel diode in LED module	--		
Load side									
Switching voltage AC/DC	V	24 ... 250							
Rated currents[2]									
• Conventional thermal current I_{th}									
- 1 CO contact	A	16				--			
- 2 CO contacts	A	6				12			
- 3 CO contacts	A	--				10			
- 4 CO contacts	A	--				6			
• Rated operational current I_e /AC-15 acc. to utilization categories (IEC 60947-5-1)	A	RT3 (1 CO contact): 6 RT4 (2 CO contacts): 2.5				PT2 (2 CO contacts): 5 PT3 (3 CO contacts): 5 PT5 (4 CO contacts): 4 (DC coils), 2 (AC coils)			
• Rated operational current I_e DC-13 with suppressor diode acc. to utilization categories (IEC 60947-5-1)	A	2 at 24 V, 0.27 at 230 V				PT2, PT3, PT5: 4 at 24 V, 0.5 at 230 V			
Short-circuit protection									
Short-circuit test with fuse links of operational class gG with short-circuit current I_k = 1 kA acc. to IEC 60947-5-1									
• DIAZED, type 5SB	A	10				6			
Min. contact load (reliability: 1 ppm)		Standard 17 V, 10 mA; hard gold-plated 17 V/0.1 mA				Standard 17 V, 10 mA; hard gold-plated 20 V/1 mA			
Mechanical endurance	Operating cycles	30×10^6	10×10^6						
Electrical endurance (resistive load at 250 V AC)	Operating cycles	1×10^5							

1) AC voltages, 50 Hz; for 60 Hz operation, the lower response value must be increased by 10%; the power loss will decrease slightly.

2) Capacitive loads can result in micro-welding on the contacts.

Coupling Relays

LZS coupling relays with plug-in relays

Relay type		LZS industrial relays: MT, 11-pin, octal base (35.5 mm) 3 CO contacts			
General data					
Dimensions (W x H x D) 	mm	36 x 69 x 36			
Rated control supply voltage U_s[1]	V	24 DC	24 AC	115 AC	230 AC
Rated insulation voltage U_i (Pollution degree 3)	V	250			
Overvoltage category Acc. to IEC 60664-1		III			
Protective separation Between coil and contacts Acc. to IEC 60947-1, Appendix N		No			
Degree of protection of relays/bases					
• Relays		IP50			
• Bases		IP20			
Permissible ambient temperature					
• During operation	°C	-40 ... +60	-45 ... +50		
• During storage	°C	-45 ... +80			
Conductor cross-sections					
Connection type		**Screw terminals**			
• Solid	mm^2	2 x 2.5			
• Finely stranded with or without end sleeve	mm^2	2 x 1.5			
• Corresponding opening tool		Screwdriver, size 1 or Pozidriv 1			
Control side					
Operating range	V	18 ... 38	19.2 ... 38	92 ... 137	184 ... 264
Power consumption					
• AC	VA	--	2.3		
• DC	W	1.2	--		
Release voltage	V	2.4	9.6	46	92
Protection circuit		--			
Load side					
Switching voltage • AC/DC	V	24 ... 250			
Rated currents[2]					
• Conventional thermal current I_{th}	A	10			
• Rated operational current I_e /DC-13 acc. to utilization categories (IEC 60947-5-1)	A	2 at 24 V, 0.27 at 230 V			
• Rated operational current I_e /AC-15 acc. to utilization categories (IEC 60947-5-1)	A	5 at 24 V and 230 V			
Short-circuit protection Short-circuit test with fuse links of operational class gG with short-circuit current I_k = 1 kA acc. to IEC 60947-5-1					
• DIAZED, type 5SB	A	10			
Min. contact load (reliability: 1 ppm)		12 V DC/10 mA			
Mechanical endurance	Operating cycles	20 x 10^6			
Electrical endurance (resistive load at 250 V AC)	Operating cycles	4 x 10^5			

1) AC voltages, 50 Hz; for 60 Hz operation, the lower response value must be increased by 10%; the power loss will decrease slightly.
2) Capacitive loads can result in micro-welding on the contacts.

3SE5 position switches with plastic and metal enclosures

3SE5 safety switches with head for separate actuator

3SE5 safety hinge switches

3SE5 mechanical position switch, roller plunger

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3SE524., 3SF1244

3SE513., 3SE511., 3SF1114

3SE512., 3SF1124

3SE516.

3SE5413, 3SE5423

3SE5250

	Position switches, standard					Compact design	Open-type
Enclosure							
Plastic	✓	✓	✓	--	--	--	✓
Metal	✓	--	✓	✓	✓	✓	--
Dimensions (W x H x D) in mm	31 × 68 × 33	50 × 53 × 33	40 × 78 × 38	56 × 78 × 38	56 × 100 × 38	30 × 50 × 16 40 × 50 × 16	30 × 48.5 × 20
Degree of protection	IP65, IP66/IP67	IP66/IP67	IP66/IP67	IP66/IP67	IP66/IP67	IP66/IP67	IP10 or IP20
Standards 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 50041	--	Mounting and operating points acc. to EN 50047
Approvals	CE, TÜV, UL, CSA, CCC		CE, TÜV, UL, CSA, CCC			CE, UL, CSA, CCC	CE, TÜV, UL, CSA, CCC
Contact blocks							
2 slow-action contacts	1 NO + 1 NC; 2 NC		1 NO + 1 NC; 2 NC		2 × (1 NO + 1 NC)	--	1 NO + 1 NC
2 snap-action contacts	1 NO + 1 NC		1 NO + 1 NC		2 × (1 NO + 1 NC)	1 NO + 1 NC	1 NO + 1 NC
• Short stroke	1 NO + 1 NC		✓		--	--	✓
• With 2 × 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; 2 NO + 1 NC
• With make-before-break	1 NO + 2 NC		1 NO + 2 NC		2 × (1 NO + 2 NC)	--	1 NO + 2 NC
3 snap-action contacts	1 NO + 2 NC		1 NO + 2 NC		--	--	1 NO + 2 NC
Special features							
LED status display	✓		✓		--	--	--
Increased corrosion protection	✓		✓		✓	--	--
ASIsafe integrated	✓		✓		--	--	--
Electrical specifications							
Insulation voltage U_i	400 V		400 V			400 V	400 V
Conventional thermal current I_{th}	6 A/10 A (3-/2-pole)		6 A/10 A (3-/2-pole)			6 A	6 A
Connections							
Cable entry	1 × M20 × 1.5	2 × M20 × 1.5	1 × M20 × 1.5	3 × M20 × 1.5	3 × M20 × 1.5	--	--
M12 plug, 4-, 5- or 8-pole	✓	✓	✓	✓	✓	✓	--
Plug, 6-pole + PE	--	--	✓	✓	--	--	--
Molded cables	--	--	--	--	--	✓	--
Actuators							
Rounded plungers and roller plungers	✓		✓		✓	--	--
Roller levers and angular roller levers	✓		✓		✓	--	--
Spring rod	✓		✓		--	--	--
Twist levers and rod actuators	✓		✓		✓	--	--
Fork lever	--		✓		--	--	--
Hinge switches	--		--		--	--	--
Plungers, twist levers	--		--		✓	✓	✓
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✓ Available -- Not available

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3SE5112, 3SE5122, 3SF11.4

3SE5322, 3SE5312, 3SF13.4

	Safety hinge switches		Safety switches with separate actuator		Safety switches with tumbler
Enclosure					
Plastic	✓	✓	✓	✓	✓
Metal	✓	✓	✓	✓	✓
Dimensions (W x H x D) in mm	31 × 68 × 33	40 × 78 × 38	31 × 68 × 33, 50 × 53 × 33	40 × 78 × 38, 56 × 78 × 38	54 × 185 × 44
Degree of protection	IP65, IP66/IP67	IP66/IP67	IP65, IP66/IP67	IP66/IP67	IP66/IP67, IP69K
Standards IEC 60947-5-1	Mounting and operating points acc. to EN 50047	Mounting and operating points acc. to EN 50041	Mounting acc. to EN 50047	Mounting acc. to EN 50041	EN ISO 14119
Approvals	CE, TÜV, UL, CSA, CCC		CE, TÜV, UL, CSA, CCC		CE, TÜV, UL, CSA, CCC
Contact blocks/outputs					
2 slow-action contacts	--		1 NO + 1 NC; 2 NC		--
2 snap-action contacts	1 NO + 1 NC		--		--
• Short stroke	--		--		--
• With 2 × 2 mm contact gap	--		--		--
3 slow-action contacts	--		1 NO + 2 NC		2 × (1 NO + 2 NC)
• With make-before-break	--		--		--
3 snap-action contacts	1 NO + 2 NC		--		--
Electronic safety outputs	--		--		--
Special features					
LED status display	✓		✓		✓
Increased corrosion protection	✓		✓		✓
ASIsafe integrated	✓		✓		✓
Electrical specifications					
Insulation voltage U_i	400 V		400 V		400 V
Conventional thermal current I_{th}	6 A/10 A (3-/2-pole)		6 A		6 A
Connections					
Cable entry	1 × M20 × 1.5	1 × M20 × 1.5	1 × M20 × 1.5, 2 × M20 × 1.5	1 × M20 × 1.5, 3 × M20 × 1.5	3 × M20 × 1.5
M12 plug, 4-, 5- or 8-pole	✓		✓	✓	✓
Molded cables	--		--	--	--
AS-Interface	--		✓	✓	✓
Actuators					
Plungers, twist levers	--		--	--	--
Separate actuators	--		✓	✓	✓
Hinge switches	✓		--	--	--
Page					
Complete units	13/67	13/67	13/51, 13/54	13/52, 13/55	13/61, 13/63
Modular system	—	—	—	—	—
ASIsafe	13/73	—	13/83	—	13/84
ATEX	13/100	13/101	13/94	13/95	13/98, 13/99

✓ Available
-- Not available

Introduction

	3SE66, 3SE67	3SE66, 3SE67	3SE63
	Safety switches, solenoid	**Safety switches, solenoid supplementary range in new design[1)]**	**RFID safety switches[1)]**
Enclosure			
Plastic	✓	✓	✓
Metal	--	--	--
Dimensions (W x H x D) in mm	M30; 25 x 88; 25 x 33	25 x 88; 26 x 36	25 × 91 × 22
Degree of protection	IP67	IP67	IP69K
Standards	IEC 60947-5-3 Category 4 acc. to ISO 13849-1, PL e acc. to ISO 13849-1, SIL 3 acc. to IEC 61508	IEC 60947-5-3	Category 4 acc. to ISO 13849-1, PL e acc. to ISO 13849-1, SIL 3 acc. to IEC 61508
Approvals	CE, TÜV, UL, CSA, CCC	CE, TÜV, UL, CSA	CE, TÜV, UL, CSA
Contact blocks/outputs			
Reed contacts	1 NO + 1 NC 2 NC 1 NO + 1 NC (+ 1 NC signaling contact)	1 NO + 1 NC (+ 1 NC signaling contact) 2 NC 2 NC (+ 1 NC signaling contact)	--
Special features			
LED status display	--	✓	✓
Increased corrosion protection	--	--	✓
ASIsafe integrated	--	--	--
Electrical specifications			
Insulation voltage U_i	100 V AC/DC 24 V DC	75 V DC 50 V AC	--
Conventional thermal current I_{th}	250 mA 400 mA	250 mA	--
Connections			
M8 plug, 4-pole	✓	✓	--
8 mm ∅, latching connection, plug, 6-pole	--	✓	--
M12 plug, 4-pole	✓	--	✓
Molded cables	✓	✓	--
AS-Interface	--	--	--
Actuators			
RFID	--	--	✓
Switching magnet	✓	✓	--
Page	13/102	13/102	13/108

✓ Available
-- Not available
1) CCC not required for voltages < 36 V.

SIRIUS 3SE5 Mechanical Position Switches

General data

Overview

More information
Homepage, see www.siemens.com/sirius
Industry Mall, see www.siemens.com/product?3SE
Configurator, see www.siemens.com/sirius/configurators
System Manual, see https://support.industry.siemens.com/cs/ww/en/view/43920150
Conversion tool, see www.siemens.com/sirius/conversion-tool

The innovative SIRIUS 3SE5 position switches are modern in design, compact, modular and simple to connect. They save time and increase flexibility during installation of a whole range of switch variants. In principle it is possible to combine any enclosure with any operating mechanism, paying due consideration to the EN 50041 and EN 50047 standards where necessary.

Complete units

Popular versions of the position switches in standard enclosures are available as complete units.

3SE5 position switches with plastic and metal enclosures

Modular system

The 3SE5 series is the modular system comprising different sizes of the basic switch and an actuator which must be ordered separately. Thanks to the modular design 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.

Simple plug-in mounting enables fast replacement of the actuator heads.

Examples of selection options in the modular system

Design

All enclosure variants have an integrated chlorinated rubber diaphragm for high functional safety in cold and aggressive environments.

Enclosure sizes

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
- 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
- XL metal enclosures with 4 to 6 contacts, 56 mm wide, IP66/IP67, 3 cable entries

Enclosure versions

Various basic switches can be selected for the enclosures of the 3SE5 series:

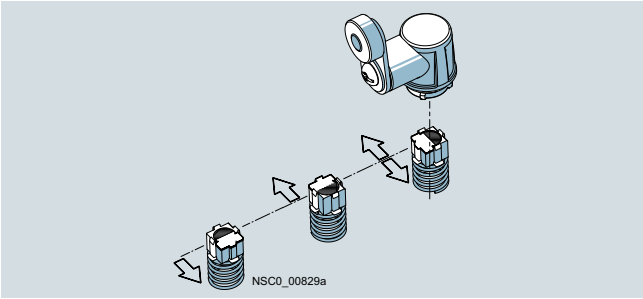
- With contact blocks with two or three contacts (screw terminals) designed as slow-action or snap-action contacts; the slow-action contacts also with make-before-break
- Optional LED status display
- With mounted 4- or 5-pole M12 device plug (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole device plug + PE on the metal enclosures
- Versions with increased corrosion protection
- Versions for operating temperatures down to -40 °C
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 13/85).

Actuator variants

All operating mechanisms can be rotated around the axis in increments of 22.5°. The following actuator variants are available:

- Plain, rounded and roller plungers
- Roller levers and angular roller levers
- Spring rod
- Twist levers and rod actuators with twist actuator
- Fork levers with twist actuator

The actuator rollers are available with various materials and diameters.



Twist actuator for twist levers and rod levers,
with setting of switching direction to right, left or right/left
(standard for all twist actuators except fork levers)

SIRIUS 3SE5 Mechanical Position Switches

General data

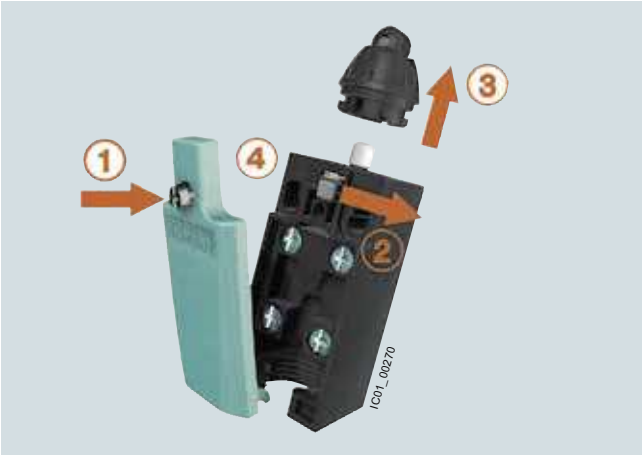
Cover design

The mechanical position switches have a turquoise cover and the mechanical safety switches have a yellow cover.

On request the switches can be delivered ex works with a yellow cover. The cover has no effect on the mode of operation. Both versions can be used in safety applications, (see also page 13/16).

Mounting

Easy plug-in method for fast replacement of the actuator heads



Open the cover (1)
Actuate the locking lever (2)
Replace the head (turnable by 16 x 22.5°) (3)
Lock and close the cover (4)

Diverse contact types

Exchangeable two- and three-pole contact blocks for all enclosure sizes

The three-pole contact block with snap-action or slow-action contacts is regularly available for all enclosure forms. The same installation space is required as for a two-pole block. The version with 1 NO + 2 NC offers, for example, more safety through redundant shutdowns (2 NC contacts) with simultaneous signaling (NO contact). The three-pole blocks are also available with make-before-break and with 2 NO + 1 NC.

Contact reliability

The 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".

Quick-connect technology

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%.

A cable gland with seal must be used with the quick-connect method.

Optional LED indicators

LED indicators are available for all enclosure sizes except for XL. The enclosures are 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 LEDs are implemented in 24 V DC and 230 V AC.

SIRIUS 3SE5 Mechanical Position Switches

General data

Article No. scheme

Product versions		Article number										
SIRIUS position and safety switches		3 S E	□	□	□	□	–	□	□	□	□	□
Series			5									
Standard	EN 50041 EN 50047 with tumbler			1 2 3								
Enclosure material and width	e.g. 1 = metal, narrow				□							
Connection	Cable entry, device plug					2 4/5						
LEDs	None 24 V DC 115 V AC 230 V AC							0 1 2 3				
Version of contacts	e.g. C = snap-action 1 NO + 1 NC								□			
Version of operating mechanism	e.g. C02 = rounded plunger									□	□	□
Example		3 S E	5	1	1	2	–	0	C	C	0	2

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

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, page 13/8).
- 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, page 13/8).
- All enclosure variants have an integrated chlorinated rubber diaphragm for high functional safety in cold and aggressive environments.
- All contact blocks are replaceable (see page 13/47).
- The three-pole contact blocks are available for all enclosure sizes (see picture, page 13/8).
- 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 shutdown and signaling, particularly in the elevator industry.
- XL metal 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 approx. 20 to 25% of the time when connecting (see picture, page 13/8).

Application

With the standard position switches, mechanical positions of moving machine parts are converted into electrical signals. Through their modular and uniform design and large number of variants, the devices can comply with 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 contact blocks best suited for the particular purpose. And many different actuator variants are available to match the mechanical configuration of the moving machine 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/EN 60947-5-1

The protective measure of "total insulation" by the molded-plastic enclosure is ensured by the use of molded-plastic screw glands.

Safety position switches

For controls according to IEC/EN 60204-1, the devices can be used as a safety position switch. They comply with the standard EN ISO 14119. A TÜV certificate is available. To secure position switches against changes in their position, keyed techniques must be employed on installation.

Safety circuits

The IEC/EN 60947-5-1 standard requires positive opening of the NC contacts. In other words, 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 in accordance with the standard IEC 60947-5-1 with the symbol ➔.

Category 2 according to EN ISO 13849-1 can be attained with 3SE5 position switches with ➔, and category 3 or 4 when using an additional position switch, if the corresponding fail-safe evaluation units are selected and correctly connected. Example: 3SK or 3TK28 safety relays or the corresponding devices from the ASIsafe, SIMATIC or SINUMERIK programs. The operating mechanisms (actuators) must also be connected to the enclosure by keyed techniques. The corresponding operating mechanisms are marked in the catalog with ➔.

SIRIUS 3SE5 Mechanical Position Switches

General data

Contacts for every 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 every 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 levers 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 high starting speeds (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

Monitoring with fail-safe evaluation units from the 3SK and 3RK3 series

Safe evaluation units		Maximum achievable safety level according to type of switch				
		Compact	Standard	Hinge	Separate actuator	Tumbler
3SK	3RK3	3SE54	3SE51/3SE52	3SE51/3SE52	3SE51/3SE52	3SE53
Use of only one position/safety switch						
Monitoring with 1 contact: 1 x NC contact		**SIL 1 / PL c**				
Monitoring with 2 contacts: 2 x NC contact or 1 x NC contact + 1 x NO contact		**SIL 1 / PL c**		**SIL 2 / PL d**		
Use of a second position/safety switch						
Standard switch	3SE51/3SE52	**SIL 3 / PL e**				
Safety switch/hinge switch	3SE51/3SE52					
Safety switch with separate actuator	3SE51/3SE52					
Safety switch with tumbler	3SE53					

Note:

Taking account of certain fault exclusions (e.g. actuator breakage), use of just one hinge switch or a switch with separate actuator with or without tumbler up to SIL 2 or PL d is possible as described in the table.

Since the machine manufacturer must provide proof of fault exclusion, the component manufacturer is unable to carry out a definitive assessment of the measures taken.

For more information, see https://support.industry.siemens.com/cs/ww/en/view/35443942.

The maximum achievable SIL or PL always depends on other assumptions as well. Factors to be taken into account include the DC (declaration), the CCF, and the number of actuations.

For information on the safe evaluation units and an introduction to safety systems, see page 13/133 onwards.

SIRIUS 3SE5 Mechanical Position Switches

General data

Technical specifications

Type		3SE51..[1], 3SE52..[1]	3SE541.	3SE542.
General data				
Standards		IEC/EN 60947-5-1, EN ISO 14119		
Rated insulation voltage U_i	V	400[2]	400	
Degree of pollution according to IEC 60664-1		Class 3	Class 3	
Rated impulse withstand voltage U_{imp}	kV	6	4	
Rated operational voltage U_e	V	400 AC; over 300 V AC same potential only[3]	300 AC	
Conventional thermal current I_{th}	A	10	10	
Rated operational current I_e				
• For alternating current 50/60 Hz		I_e / AC-15	I_e / AC-15	
- At 24 V	A	6	6	
- At 120 V	A	6	6	
- At 240 V	A	6	3	
- At 400 V	A	4	--	
• For direct current		I_e / DC-13	I_e / DC-13	
- At 24 V	A	3	3	
- At 125 V	A	0.55	0.55	
- At 250 V	A	0.27	0.27	
- At 400 V	A	0.12	--	
Short-circuit protection[4]				
• With DIAZED fuse links, utilization category gG	A	6	10	
• With miniature circuit breaker, C char. ($I_{K< 400A}$)	A	1	3	
Mechanical endurance				
• Basic switch		15 ×10^6 operating cycles	10 ×10^6 operating cycles	10 ×10^6 operating cycles
• With spring rod, 3SE5...-..R..		10 ×10^6 operating cycles	--	--
• With fork lever, 3SE51..-..T..		1 ×10^6 operating cycles	--	--
Electrical endurance				
• With 3RH.1, 3RT contactors in size S00, S0		10 ×10^6 operating cycles	500 000 operating cycles	500 000 operating cycles
• For utilization category AC-15 when switching off I_e / AC-15 at 240 V		100 000 operating cycles	100 000 operating cycles	100 000 operating cycles
• With utilization category DC-12/DC-13		For direct current depending on the loading of the switch		
Switching frequency With 3RH.1, 3RT contactors in size S00, S0		6 000 operating cycles/h	1 800 operating cycles/h	
Switching accuracy				
• For repeated switching, measured at the plunger of the contact block	mm	0.05	0.05	
• With twist actuators		1°	1°	
Rated data according to CSA, UL and RU				
• Rated voltage	V	300	300	
• Uninterrupted current	A	6	10	
• Switching capacity		Heavy duty, A 300/B 300/Q 300	A 300/Q 300	

1) Special versions, see data sheet.
2) For slow-action contacts 1 NO + 2 NC with make-before-break ("M") and 2 NO + 1 NC ("P") the following applies: 250 V.
3) For slow-action contacts 1 NO + 2 NC with make-before-break ("M") and 2 NO + 1 NC ("P") the following applies: Over 250 V AC same potential only.
4) Without any welds according to IEC 60947-5-1.

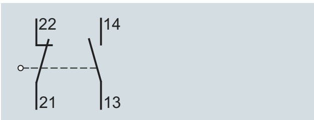
Type		3SE523.	3SE513.	3SE524.	3SE521.	3SE511.	3SE512., 3SE516.	3SE54..	3SE525.
Enclosure									
• Material		Plastic P66			Zinc die-casting			Zn/Al	--
• Width	mm	31	40	50	31	40	56	30/40	30
Degree of protection acc. to IEC 60529		IP65	IP66/IP67[1]					IP67	IP20, IP10
Ambient temperature									
• During operation	°C	-25 ... +85; -40...+85 for 3SE5*-1AJ0 and 3SE5*-1AY0 versions						-25 ... +85	-25 ... +85
• In operation, switch with LEDs	°C	-25 ... +60						--	--
• Storage, transport	°C	-40 ... +90						-40 ... +90	-40 ... +90
Mounting position		Any							
Connection									
Cable entry		1 x (M20 x 1.5)		2 x (M20 x 1.5)	1 x (M20 x 1.5)		3 × (M20 x 1.5)	--	--
Conductor cross-sections									
• Solid	mm^2	1 x (0.5 ... 1.5), 2 x (0.5 ... 0.75)							
• Finely stranded with end sleeve	mm^2	1 x (0.5 ... 1.5), 2 x (0.5 ... 0.75)							
• AWG cables, solid or stranded	AWG	1 x (AWG 20 ... 16), 2 x (AWG 20 ... 18)							
Tightening torque, contact block	Nm	0.8 ... 1.0							
Protective conductor connection inside enclosure		--			M3.5			--	--

1) For actuator heads with spring rod and rod actuators: IP65/IP67.

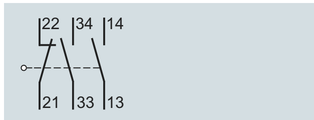
Circuit diagrams

Enclosure widths 31, 40, 50 and 56 mm

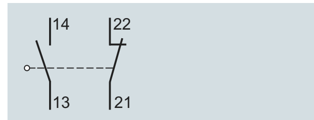
Slow-action contacts
1 NO + 1 NC
3SE5...-.B..., -.R...



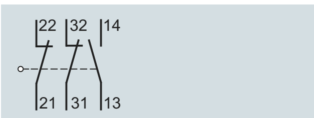
Slow-action contacts
2 NO + 1 NC
3SE5...-.P...



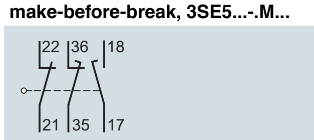
Snap-action contacts
1 NO + 1 NC
3SE5...-.C..., -.F..., -.G..., -.H..., -.N...



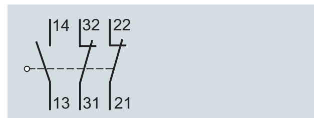
Slow-action contacts
1 NO + 2 NC
3SE5...-.K..., -.Q...



Slow-action contacts
1 NO + 2 NC with
make-before-break, 3SE5...-.M...

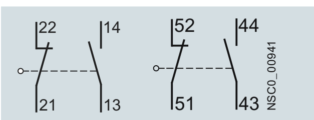


Snap-action contacts
1 NO + 2 NC
3SE5...-.L...

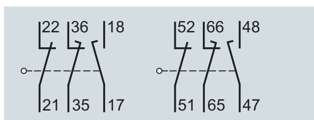


XL enclosures, width 56 mm

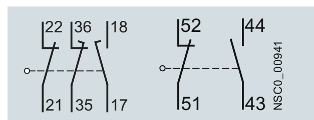
Slow-action contacts
2 x (1 NO + 1 NC)
3SE5162-0B...



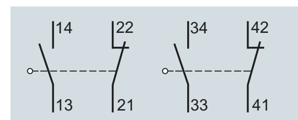
Slow-action contacts
2 x (1 NO + 2 NC) with
make-before-break, 3SE5162-0D...



Slow-action contacts
1 NO + 2 NC with make-before-break,
1 NO + 1 NC
3SE5162-0E...

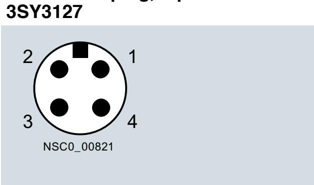


Snap-action contacts
2 x (1 NO + 1 NC)
3SE5162-0C...

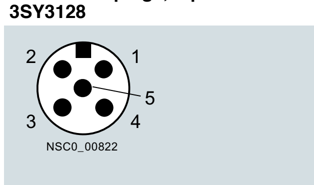


3SE5 pin assignment

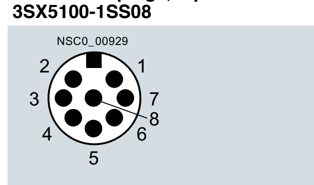
M12 device plug, 4-pole
3SY3127



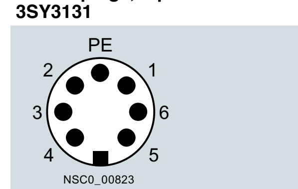
M12 device plugs, 5-pole
3SY3128



M12 device plugs, 8-pole
3SX5100-1SS08



Device plugs, 6-pole + PE
3SY3131



Type	**Device plugs**	**Contacts**	**LEDs**	**Connections**								
	Type	Version	Version	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	PE
M12 device plugs, 4-, 5- or 8-pole												
3SE5..4-0....-1AC4	3SY3127	1 NO + 1 NC	--	21	22	13	14	--	--	--	--	--
3SE5..4-0....-1AL0	3SY3128	1 NO + 1 NC	--	21	22	13	14	PE	--	--	--	--
3SE5..4-0....-1AE0	3SY3127	2 NC	--	21	22	31	32	--	--	--	--	--
3SE5..4-0....-1AE1	3SY3128	2 NC	--	21	22	31	32	PE	--	--	--	--
3SE5..4-1C...-1AF5	3SY3128	1 NO + 1 NC snap-action	2 LEDs	21	22	13/ LED gn	14/ LED ye	Ground LED	--	--	--	--
3SE5..4-1B...-1AF3	3SY3128	1 NO + 1 NC slow-action	2 LEDs	21	22	14/ LED gn	13/ LED ye	Ground LED	--	--	--	--
3SE5..4-1L...-1AD4	3SY3134	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	3SY3134	1 NO + 2 NC slow-action	2 LEDs	21	22	14/ LED gn	13/ LED ye	31	32	Ground LED	PE	--
Device plugs, 6-pole + PE												
3SE5..5-0....-1AD0	3SY3131	1 NO + 1 NC	--	21	22	13	14	--	--	--	--	✓
3SE5..5-0....-1AD1	3SY3131	1 NO + 2 NC	--	21	22	13	14	31	32	--	--	✓
3SE5..5-.C...-1AF2	3SY3131	1 NO + 1 NC snap-action	2 LEDs	21	22	13/ LED gn	14/ LED ye	--	Ground LED	--	--	✓
3SE5..5-.B...-1AF2	3SY3131	1 NO + 1 NC slow-action	2 LEDs	21	22	14/ LED gn	13/ LED ye	--	Ground LED	--	--	✓
3SE5..5-.L...-1AD2	3SY3131	2 NC snap-action	2 LEDs	21	22	31	32	13/ LED gn	Ground LED	--	--	✓
3SE5..5-.K...-1AD2	3SY3131	2 NC slow-action	2 LEDs	21	22	31	32	14/ LED gn	Ground LED	--	--	✓

Legend: gn = green, ye = yellow ✓ Connected -- Not available

SIRIUS 3SE5 Mechanical Position 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 differences between the units are indicated in the selection and ordering data by the symbols shown on orange 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 M12 device plug and/or with 2 LEDs
- Version with M12 device plug or 6-pole + PE

Support functions

The 3SE5/3SF1 position and safety switches can also be ordered using an online configurator.

This also enables a complete documentation to be prepared:

- Product data sheets
- Dimension drawings
- Operating travel diagrams
- CAD data in 2D and 3D model images
- Ordering data
- Product photos

For online configurator, see 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 ☐
		Article No.
Complete units · Enclosure width 31 mm		
	Angular roller lever **With metal lever and plastic roller 13 mm** Slow-action contacts 1 NO + 1 NC	**3SE5232-0BF10**

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

To be ordered separately:

	Version	Modular system ◇
		Article No.
Basic switches · Enclosure width 31 mm		
	With teflon plunger Slow-action contacts 1 NO + 1 NC	**3SE5232-0BC05**
		+
Operating mechanisms		
	Angular roller levers Metal lever, plastic roller	**3SE5000-0AF10**

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 levers, high-grade steel lever and plastic roller

To be ordered separately:

	Version	Modular system ◇
		Article No.
Basic switches · Enclosure width 31 mm		
	With teflon plunger Slow-action contacts 1 NO + 1 NC	**3SE5232-0BC05**
		+
Twist actuators		
	Twist actuators	**3SE5000-0AK00**
	Twist levers High-grade steel lever, plastic roller	**3SE5000-0AA31**

3SE5, Plastic Enclosures

Enclosure width 31 mm according to EN 50047

Selection and ordering data

Complete units for installation in control cabinets

2 contacts · Degree of protection IP40 · Cable entry by means of a locking plug with ∅ 6 mm

	Version	Contacts	LEDs	SD	Complete units	PU (UNIT, SET, M)	PS*
				d	Article No. / Price per PU		
Complete units[1] • Enclosure width 31 mm							
	Control cabinet type, IP40, rounded plungers, type B, acc. to EN 50047						
3SE5232-0HC05-1AB1	**Flat cover** Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔ 5	**3SE5232-0HC05-1AB1**	1	1 unit
3SE5232-0HC05-1AB2	With mounting plate and screws for attachment profile Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔ 5	**3SE5232-0HC05-1AB2**	1	1 unit
3SE5232-0HC05-1AB3	**Standard cover** Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔ 5	**3SE5232-0HC05-1AB3**	1	1 unit
3SE5232-0HC05-1AB4	With mounting plate and screws for attachment profile Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔ 5	**3SE5232-0HC05-1AB4**	1	1 unit
Accessories							
3SX5100-1A	**Mounting plate** Suitable for 3SE523. and 3SE521. position switches with a width of 31 mm	--	--	5	**3SX5100-1A**	1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] The control cabinet types are not basic switches for the modular system.

[2] Subsequent replacement of contact blocks is not possible.

3SE5, Plastic Enclosures

Enclosure width 31 mm according to EN 50047

Complete units

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5[1)]

Version	Contacts	LEDs		SD	Complete units		PU (UNIT, SET, M)	PS*
				d	Article No.	Price per PU		
Complete units[2)] • Enclosure width 31 mm								
Rounded plungers, type B, acc. to EN 50047								
With teflon plunger								
Slow-action contacts	1 NO + 1 NC	--	➔	▶	**3SE5232-0BC05**		1	1 unit
Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0CC05**		1	1 unit
Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	▶	**3SE5232-0HC05**		1	1 unit
Snap-action contacts • Short stroke, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5232-0FC05**		1	1 unit
Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	--	➔	15	**3SE5232-0GC05**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔	▶	**3SE5232-0KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔	▶	**3SE5232-0LC05**		1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	2	**3SE5232-0MC05**		1	1 unit
Slow-action contacts	2 NO + 1 NC	--	➔	2	**3SE5232-0PC05**		1	1 unit
With increased corrosion protection								
Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0BC05-1CA0**		1	1 unit
Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0CC05-1CA0**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0KC05-1CA0**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LC05-1CA0**		1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	5	**3SE5232-0MC05-1CA0**		1	1 unit
Slow-action contacts	2 NO + 1 NC	--	➔	5	**3SE5232-0PC05-1CA0**		1	1 unit
With M12 device plug, 4-pole (250 V, 4 A)								
Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5234-0BC05-1AC4**		1	1 unit
Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	2	**3SE5234-0HC05-1AC4**		1	1 unit
Slow-action contacts	2 NC	--	➔	5	**3SE5234-0KC05-1AE0**		1	1 unit
Snap-action contacts	2 NC	--	➔	2	**3SE5234-0LC05-1AE0**		1	1 unit
With 2 LEDs, yellow/green								
Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5232-1KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5232-1LC05**		1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5232-3KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5232-3LC05**		1	1 unit
With M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs								
Slow-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5234-1BC05-1AF3**		1	1 unit
Snap-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5234-1CC05-1AF3**		1	1 unit
With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[4)] NEW								
Snap-action contacts	1 NO + 1 NC	24 V DC	➔	X	**3SE5234-0LC05-1AE2**		1	1 unit

3SE5232-0HC05-1AB1

3SE5232-0BC05-1CA0

3SE5232-1KC05

3SE5234-0LC05-1AE2

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) A cable gland with seal must be used with the quick-connect method.

2) Popular versions.

3) Subsequent replacement of contact blocks is not possible.

4) The 3SE5234-.....-1AE2 position switches, prewired with an M12 plug, 5-pole, have the same pin assignment as all compact block I/O modules with a PROFINET connection in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series with IP65/IP67 degree of protection for cabinet-free installation directly at the machine.

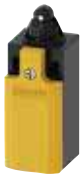
3SE5, Plastic Enclosures

Enclosure width 31 mm according to EN 50047

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5[1)]

Version	Contacts	LEDs		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units[2)] · Enclosure width 31 mm								
Roller plungers, type C, acc. to EN 50047								
With plastic roller 10 mm								
Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0BD03**		1	1 unit
Snap-action contacts • Integrated[3)]	1 NO + 1 NC	--	➔	▶	**3SE5232-0HD03**		1	1 unit
Snap-action contacts • Short stroke, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5232-0FD03**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0KD03**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LD03**		1	1 unit
Actuator head rotated by 90°								
Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LD03-1AH0**		1	1 unit
With M12 device plug, 4-pole (250 V, 4 A)								
Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5234-0HD03-1AC4**		1	1 unit
With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[4)] NEW								
Snap-action contacts	1 NO + 2 NC	--	➔	X	**3SE5234-0LD03-1AE2**		1	1 unit
With yellow cover								
Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LD03-1AG0**		1	1 unit
Roller plungers with central fixing								
With plastic roller 10 mm								
Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5232-0HD10**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0KD10**		1	1 unit
Roller levers, type E acc. to EN 50047								
With metal lever and plastic roller 13 mm								
Slow-action contacts	1 NO + 1 NC	--	➔	2	**3SE5232-0BE10**		1	1 unit
Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	▶	**3SE5232-0HE10**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0KE10**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LE10**		1	1 unit
With increased corrosion protection, with high-grade steel lever and plastic roller 13 mm								
Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0CE12-1CA0**		1	1 unit
With M12 device plug, 4-pole (250 V, 4 A)								
Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5234-0HE10-1AC4**		1	1 unit
With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[4)] NEW								
Snap-action contacts	1 NO + 2 NC	--	➔	X	**3SE5234-0LE11-1AE2**		1	1 unit
With high-grade steel lever and plastic roller 13 mm								
Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LE12**		1	1 unit
Angular roller lever								
With metal lever and plastic roller 13 mm								
Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0BF10**		1	1 unit
Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	2	**3SE5232-0HF10**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0KF10**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LF10**		1	1 unit

3SE5232-0BD03


3SE5232-0LD03-1AG0

3SE5232-0HD10

3SE5232-0HE10

3SE5232-0BF10

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) A cable gland with seal must be used with the quick-connect method.

2) Popular versions.

3) Subsequent replacement of contact blocks is not possible.

4) The 3SE5234-.....-1AE2 position switches, prewired with an M12 plug, 5-pole, have the same pin assignment as all compact block I/O modules with a PROFINET connection in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series with IP65/IP67 degree of protection for cabinet-free installation directly at the machine.

3SE5, Plastic Enclosures

Enclosure width 31 mm according to EN 50047

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5[1)]

	Version	Contacts	LEDs		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units[2)] • Enclosure width 31 mm									
3SE5232-0HR01	***Spring rod***								
	Length 142.5 mm, with plastic plunger 50 mm								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--		2	**3SE5232-0HR01**		1	1 unit
	With M12 device plug, 4-pole (250 V, 4 A)								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--		5	**3SE5234-0HR01-1AC4**		1	1 unit
3SE5232-0BK21	***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	--	➔	2	**3SE5232-0BK21**		1	1 unit
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5232-0HK21**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0KK21**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LK21**		1	1 unit
	With M12 device plug, 4-pole (250 V, 4 A)								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5234-0HK21-1AC4**		1	1 unit
	With metal lever 35 mm and plastic roller 19 mm								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5232-0HK15**		1	1 unit
3SE5232-0HK60	***Twist levers, adjustable length***								
	With metal lever with grid hole and plastic roller 19 mm								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	2	**3SE5232-0HK60**		1	1 unit
3SE5232-0BK50	**With metal lever and plastic roller 19 mm**								
	Slow-action contacts	1 NO + 1 NC	--		5	**3SE5232-0BK50**		1	1 unit
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--		▶	**3SE5232-0HK50**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--		5	**3SE5232-0LK50**		1	1 unit
	With M12 device plug, 4-pole (250 V, 4 A)								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--		5	**3SE5234-0HK50-1AC4**		1	1 unit
3SE5232-0HK80	***Rod actuator***								
	With aluminum rod, length 200 mm								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--		5	**3SE5232-0HK80**		1	1 unit
	With plastic rod, length 200 mm								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--		5	**3SE5232-0HK82**		1	1 unit
	With M12 device plug, 4-pole (250 V, 4 A)								
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--		5	**3SE5234-0HK82-1AC4**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.
1) A cable gland with seal must be used with the quick-connect method.
2) Popular versions.
3) 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 13/18.

3SE5, Plastic Enclosures

Enclosure width 31 mm according to EN 50047

Modular system

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5[1)]

	Version	Contacts	LEDs		SD	Modular system	PU (UNIT, SET, M)	PS*
					d	Article No. / Price per PU		
Basic switches • Enclosure width 31 mm (with rounded plunger[2)])								
3SE5232-0BC05	**Teflon plungers**							
	Slow-action contacts	1 NO + 1 NC	--	➔	▶	**3SE5232-0BC05**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0CC05**	1	1 unit
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	▶	**3SE5232-0HC05**	1	1 unit
	Snap-action contacts • Short stroke, integrated[3)]	1 NO + 1 NC	--	➔	5	**3SE5232-0FC05**	1	1 unit
	Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	--	➔	15	**3SE5232-0GC05**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	▶	**3SE5232-0KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	▶	**3SE5232-0LC05**	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	2	**3SE5232-0MC05**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	2	**3SE5232-0PC05**	1	1 unit
3SE5232-0BC05-1CA0	**Increased corrosion protection[4)]**							
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0BC05-1CA0**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0CC05-1CA0**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0KC05-1CA0**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LC05-1CA0**	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	5	**3SE5232-0MC05-1CA0**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	5	**3SE5232-0PC05-1CA0**	1	1 unit
3SE5234-0HC05-1AC4	**M12 device plug, 4-pole (250 V, 4 A)**							
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5234-0BC05-1AC4**	1	1 unit
	Snap-action contacts, integrated[3)]	1 NO + 1 NC	--	➔	2	**3SE5234-0HC05-1AC4**	1	1 unit
	Slow-action contacts	2 NC	--	➔	5	**3SE5234-0KC05-1AE0**	1	1 unit
	Snap-action contacts	2 NC	--	➔	2	**3SE5234-0LC05-1AE0**	1	1 unit
3SE5232-1KC05	**2 LEDs yellow/green**							
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5232-1KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5232-1LC05**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5232-3KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5232-3LC05**	1	1 unit
3SE5234-1BC05-1AF3	**M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs**							
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5234-1BC05-1AF3**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5234-1CC05-1AF3**	1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[5)] NEW							
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔	X	**3SE5234-0LC05-1AE2**	1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) A cable gland with seal must be used with the quick-connect method.

2) For enclosures with widths of 31 mm, the basic switch is a complete unit with rounded plungers.

3) Subsequent replacement of contact blocks is not possible.

4) Use corresponding high-grade steel lever.

5) The 3SE5234-.....-1AE2 position switches, prewired with an M12 plug, 5-pole, have the same pin assignment as all compact block I/O modules with a PROFINET connection in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series with IP65/IP67 degree of protection for cabinet-free installation directly at the machine.

Note:

For the selection aid, see page 13/13

3SE5, Plastic Enclosures

Enclosure width 31 mm according to EN 50047

	Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
3SE5000-0AD03	**Roller plungers, type C, acc. to EN 50047**					
	Plastic rollers	10	➔ 2	**3SE5000-0AD03**	1	1 unit
	High-grade steel rollers	10	➔ 5	**3SE5000-0AD04**	1	1 unit
3SE5000-0AD10	**Roller plungers with central fixing**					
	Plastic rollers	10	➔ 2	**3SE5000-0AD10**	1	1 unit
	High-grade steel rollers	10	➔ 5	**3SE5000-0AD11**	1	1 unit
3SE5000-0AE10	**Roller levers, type E, acc. to EN 50047**					
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AE10**	1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE11**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AE12**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE13**	1	1 unit
3SE5000-0AF10	**Angular roller levers**					
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AF10**	1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF11**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 2	**3SE5000-0AF12**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF13**	1	1 unit
3SE5000-0AR01	**Spring rods**					
	(for switches with snap-action contacts only)					
	Plunger made of plastic, spring of high-grade steel:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR01**	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		5	**3SE5000-0AR03**	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		5	**3SE5000-0AR04**	1	1 unit
	Plunger and spring made of high-grade steel:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR02**	1	1 unit
3SE5000-0AK00	**Twist actuators, for 31 mm/50 mm, EN 50047**					
	Switching right and/or left, adjustable		➔ 2	**3SE5000-0AK00**	1	1 unit
3SE5000-0AA21	***Levers***					
	Twist levers 21 mm, straight, type A acc. to EN 50047					
	Metal lever, plastic roller	19	➔ 2	**3SE5000-0AA21**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA22**	1	1 unit
	Metal lever, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA23**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA25**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA31**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA32**	1	1 unit
3SE5000-0AA60 3SE5000-0AA50	**Twist levers 30 mm, straight**					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**	1	1 unit
	Twist levers, adjustable length, with grid hole					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**	1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA67**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**	1	1 unit
3SE5000-0AA80	**Twist levers, adjustable length**					
	Metal lever, plastic roller	19	2	**3SE5000-0AA50**	1	1 unit
	Metal lever, high-grade steel roller	19	5	**3SE5000-0AA51**	1	1 unit
	Metal lever, plastic roller	30	5	**3SE5000-0AA55**	1	1 unit
	Metal lever, plastic roller	50	5	**3SE5000-0AA57**	1	1 unit
	Metal lever, rubber roller	50	5	**3SE5000-0AA58**	1	1 unit
	High-grade steel lever, plastic roller	19	5	**3SE5000-0AA52**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	5	**3SE5000-0AA53**	1	1 unit
	Rod actuator					
	Aluminum rod, length 200 mm	6	5	**3SE5000-0AA80**	1	1 unit
	Spring rod, length 200 mm	6	5	**3SE5000-0AA81**	1	1 unit
	Plastic rod, length 200 mm	6	5	**3SE5000-0AA82**	1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

3SE5, Plastic Enclosures

Enclosure width 40 mm according 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	SD	Complete units	PU (UNIT, SET, M)	PS*
				d	Article No. / Price per PU		
Complete units[1] • Enclosure width 40 mm							
3SE5132-0BB01	***Plain plungers***						
	With high-grade steel plunger						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5132-0BB01**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5132-0CB01**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0KB01**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0LB01**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5132-0PB01**	1	1 unit
3SE5132-0BC03	***Rounded plungers, type B, acc. to EN 50041***						
	With plastic plunger						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5132-0BC03**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5132-0CC03**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0KC03**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0LC03**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5132-0PC03**	1	1 unit
3SE5132-0BD05	***Roller plungers, type C, acc. to EN 50041***						
	With plastic roller 13 mm						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5132-0BD05**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5132-0CD05**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0KD05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0LD05**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5132-0PD05**	1	1 unit
3SE5132-0BE05	***Roller levers***						
	With metal lever and plastic roller 22 mm						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5132-0BE05**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5132-0CE05**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0KE05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0LE05**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5132-0PE05**	1	1 unit
3SE5132-0BF05	***Angular roller lever***						
	With metal lever and plastic roller 22 mm						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5132-0BF05**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5132-0CF05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0LF05**	1	1 unit
3SE5132-0CR01	***Spring rod***						
	Length 142.5 mm, with plastic plunger 50 mm						
	Snap-action contacts	1 NO + 1 NC	--	5	**3SE5132-0CR01**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	5	**3SE5132-0LR01**	1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

3SE5, Plastic Enclosures

Enclosure width 40 mm according to EN 50041

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version	Contacts	LEDs		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Complete units[1] • Enclosure width 40 mm									
3SE5132-0BJ01	***Twist levers, type A, acc. to EN 50041***								
	With metal lever 27 mm and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	2	**3SE5132-0BJ01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	2	**3SE5132-0CJ01**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5132-0KJ01**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5132-0LJ01**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	5	**3SE5132-0PJ01**		1	1 unit
3SE5132-0CJ60	***Twist levers, adjustable length***								
	With metal lever with grid hole and plastic roller 19 mm								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5132-0CJ60**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5132-0LJ60**		1	1 unit
3SE5132-0CJ50	**With metal lever and plastic roller 19 mm**								
	Snap-action contacts	1 NO + 1 NC	--		2	**3SE5132-0CJ50**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--		5	**3SE5132-0LJ50**		1	1 unit
3SE5132-0CJ80	***Rod actuators, type D, acc. to EN 50041***								
	With aluminum rod, length 200 mm								
	Snap-action contacts	1 NO + 1 NC	--		5	**3SE5132-0CJ80**		1	1 unit
	With plastic rod, length 200 mm								
	Snap-action contacts	1 NO + 1 NC	--		2	**3SE5132-0CJ82**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

Note:

If the device you require is not available as a complete unit, see Modular system, page 13/22.

3SE5, Plastic Enclosures

Enclosure width 40 mm according to EN 50041

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version	Contacts	LEDs		SD	Modular system		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Basic switches • Enclosure width 40 mm									
3SE5132-0BA00	**Connecting thread M20 × 1.5**								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5132-0BA00**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5132-0CA00**		1	1 unit
	• Gold-plated contacts			➔	5	**3SE5132-0CA00-1AC1**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5132-0KA00**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5132-0LA00**		1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	5	**3SE5132-0MA00**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	5	**3SE5132-0PA00**		1	1 unit
3SE5132-0BA00-1CA0	**Increased corrosion protection[1)]**								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5132-0BA00-1CA0**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5132-0CA00-1CA0**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5132-0KA00-1CA0**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5132-0LA00-1CA0**		1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	5	**3SE5132-0MA00-1CA0**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	5	**3SE5132-0PA00-1CA0**		1	1 unit
3SE5134-0BA00-1AC4	**M12 device plug, 4-pole (250 V, 4 A)**								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5134-0BA00-1AC4**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5134-0CA00-1AC4**		1	1 unit
	Slow-action contacts	2 NC	--	➔	5	**3SE5134-0KA00-1AE0**		1	1 unit
	Snap-action contacts	2 NC	--	➔	5	**3SE5134-0LA00-1AE0**		1	1 unit
3SE5132-1KA00	**2 LEDs, yellow/green**								
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5132-1KA00**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5132-1LA00**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5132-3KA00**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5132-3LA00**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) Use corresponding high-grade steel lever.

Note:

For the selection aid, see page 13/13

3SE5, Plastic Enclosures

Enclosure width 40 mm according to EN 50041

	Version	Diameter mm	SD d	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operating mechanisms							
3SE5000-0AB01	**Plain plungers**						
	High-grade steel plunger	10	➔ 2	**3SE5000-0AB01**		1	1 unit
3SE5000-0AC03 3SE5000-0AD05	**Rounded plungers, type B, acc. to EN 50041**						
	Plastic plungers	10	➔ 5	**3SE5000-0AC03**		1	1 unit
	Roller plungers, type C, acc. to EN 50041						
	Plastic plunger, plastic roller	13	➔ 5	**3SE5000-0AD05**		1	1 unit
	Plastic plunger, high-grade steel roller	13	➔ 5	**3SE5000-0AD06**		1	1 unit
3SE5000-0AE05	**Roller levers**						
	Metal lever with plastic roller, plastic base	22	➔ 5	**3SE5000-0AE05**		1	1 unit
3SE5000-0AF05	**Angular roller levers**						
	Metal lever with plastic roller, plastic base	22	➔ 5	**3SE5000-0AF05**		1	1 unit
3SE5000-0AR01	**Spring rods** (for switches with snap-action contacts only)						
	Plunger made of plastic, spring of high-grade steel:	7					
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR01**		1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		5	**3SE5000-0AR03**		1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		5	**3SE5000-0AR04**		1	1 unit
	Plunger and spring made of high-grade steel:	7					
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR02**		1	1 unit
Twist actuators							
3SE5000-0AH00	**Twist actuators, for 40 mm, EN 50041**						
	• For twist levers and rod actuators, switching right and/or left, adjustable		➔ 2	**3SE5000-0AH00**		1	1 unit
	Levers						
	Twist levers, offset, type A, acc. to EN 50041						
3SE5000-0AA01	Metal lever 27 mm, plastic roller	19	➔ 2	**3SE5000-0AA01**		1	1 unit
	Metal lever 27 mm, high-grade steel roller	19	➔ 2	**3SE5000-0AA02**		1	1 unit
	Metal lever 27 mm, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA03**		1	1 unit
	Metal lever 27 mm, 2 plastic rollers	19	➔ 5	**3SE5000-0AA04**		1	1 unit
	Metal lever 27 mm, plastic roller	30	➔ 5	**3SE5000-0AA05**		1	1 unit
	Metal lever 27 mm, rubber roller	50	➔ 5	**3SE5000-0AA08**		1	1 unit
	High-grade steel lever 27 mm, plastic roller	19	➔ 5	**3SE5000-0AA11**		1	1 unit
	High-grade steel lever 27 mm, high-grade steel roller	19	➔ 5	**3SE5000-0AA12**		1	1 unit
	Metal lever 35 mm, plastic roller	19	➔ 5	**3SE5000-0AA15**		1	1 unit
	High-grade steel lever 35 mm, plastic roller	19	➔ 5	**3SE5000-0AA16**		1	1 unit
3SE5000-0AA60 3SE5000-0AA50	**Twist levers 30 mm, straight**						
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**		1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**		1	1 unit
	Twist levers, adjustable length, with grid hole						
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**		1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**		1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**		1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**		1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**		1	1 unit
3SE5000-0AA80	**Twist levers, adjustable length**						
	Metal lever, plastic roller	19	2	**3SE5000-0AA50**		1	1 unit
	Metal lever, high-grade steel roller	19	5	**3SE5000-0AA51**		1	1 unit
	Metal lever, plastic roller	30	5	**3SE5000-0AA55**		1	1 unit
	Metal lever, rubber roller	50	5	**3SE5000-0AA58**		1	1 unit
	High-grade steel lever, plastic roller	19	5	**3SE5000-0AA52**		1	1 unit
	High-grade steel lever, high-grade steel roller	19	5	**3SE5000-0AA53**		1	1 unit
	Rod actuators, type D, acc. to EN 50041						
	Aluminum rod, length 200 mm	6	5	**3SE5000-0AA80**		1	1 unit
	Spring rod, length 200 mm	6	5	**3SE5000-0AA81**		1	1 unit
	Plastic rod, length 200 mm	6	5	**3SE5000-0AA82**		1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 2 × (M20 × 1.5)

Version	Contacts	LEDs		SD	Complete units		PU (UNIT, SET, M)	PS*
					Article No.	Price per PU		
				d				
Complete units[1] • Enclosure width 50 mm								
Rounded plungers								
With teflon plunger								
Slow-action contacts	1 NO + 1 NC	--	⊖	2	**3SE5242-0BC05**		1	1 unit
Snap-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5242-0CC05**		1	1 unit
Snap-action contacts, integrated[2]	1 NO + 1 NC	--	⊖	▶	**3SE5242-0HC05**		1	1 unit
Snap-action contacts • Short stroke, integrated[2]	1 NO + 1 NC	--	⊖	15	**3SE5242-0FC05**		1	1 unit
Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	--	⊖	30	**3SE5242-0GC05**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5242-0KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5242-0LC05**		1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	--	⊖	5	**3SE5242-0MC05**		1	1 unit
Slow-action contacts	2 NO + 1 NC	--	⊖	2	**3SE5242-0PC05**		1	1 unit
With increased corrosion protection								
Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5242-0BC05-1CA0**		1	1 unit
Snap-action contacts, integrated[2]	1 NO + 1 NC	--	⊖	30	**3SE5242-0HC05-1CA0**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5242-0KC05-1CA0**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5242-0LC05-1CA0**		1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	--	⊖	5	**3SE5242-0MC05-1CA0**		1	1 unit
Slow-action contacts	2 NO + 1 NC	--	⊖	5	**3SE5242-0PC05-1CA0**		1	1 unit
With 2 LEDs, yellow/green								
Slow-action contacts	1 NO + 2 NC	24 V DC	⊖	5	**3SE5242-1KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	⊖	5	**3SE5242-1LC05**		1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	⊖	5	**3SE5242-3KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	⊖	5	**3SE5242-3LC05**		1	1 unit
Roller plunger								
With plastic roller 10 mm								
Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5242-0BD03**		1	1 unit
Snap-action contacts, integrated[2]	1 NO + 1 NC	--	⊖	5	**3SE5242-0HD03**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5242-0LD03**		1	1 unit

3SE5242-0BC05

3SE5242-0BC05-1CA0

3SE5242-1KC05

3SE5242-0BD03

⊖ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

[2] Subsequent replacement of contact blocks is not possible.

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		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Complete units[1] • Enclosure width 50 mm									
3SE5242-0BE10	***Roller levers***								
	With metal lever and plastic roller 13 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5242-0BE10**		1	1 unit
	Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔	2	**3SE5242-0HE10**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5242-0LE10**		1	1 unit
	With M12 device plug, 4-pole right (250 V, 4 A)								
	Snap-action contacts	2 NC	--	➔	5	**3SE5244-0LE10-1AE0**		1	1 unit
3SE5242-0BK21	***Twist levers***								
	With metal lever 21 mm and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5242-0BK21**		1	1 unit
	Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔	5	**3SE5242-0HK21**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5242-0LK21**		1	1 unit
3SE5242-0HK50	***Twist levers, adjustable length***								
	With metal lever and plastic roller 19 mm								
	Snap-action contacts, integrated[2]	1 NO + 1 NC	--		5	**3SE5242-0HK50**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.
[1] Popular versions.
[2] 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 13/26.

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	SD	Modular system	PU (UNIT, SET, M)	PS*
				d	Article No. / Price per PU		
Basic switches • Enclosure width 50 mm (with rounded plunger[1])							
3SE5242-0BC05	**Teflon plungers**						
	Slow-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5242-0BC05**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5242-0CC05**	1	1 unit
	Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔ ►	**3SE5242-0HC05**	1	1 unit
	Snap-action contacts • Short stroke, integrated[2]	1 NO + 1 NC	--	➔ 15	**3SE5242-0FC05**	1	1 unit
	Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	--	➔ 30	**3SE5242-0GC05**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5242-0KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5242-0LC05**	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔ 5	**3SE5242-0MC05**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔ 2	**3SE5242-0PC05**	1	1 unit
3SE5242-0BC05-1CA0	**Increased corrosion protection[3]**						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5242-0BC05-1CA0**	1	1 unit
	Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔ 30	**3SE5242-0HC05-1CA0**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5242-0KC05-1CA0**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5242-0LC05-1CA0**	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔ 5	**3SE5242-0MC05-1CA0**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5242-0PC05-1CA0**	1	1 unit
3SE5242-1KC05	**2 LEDs yellow/green**						
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔ 5	**3SE5242-1KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔ 5	**3SE5242-1LC05**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔ 5	**3SE5242-3KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	➔ 5	**3SE5242-3LC05**	1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) For enclosures with widths of 50 mm, the basic switch is a complete unit with rounded plungers.

2) Subsequent replacement of contact blocks is not possible.

3) Use corresponding high-grade steel lever.

Note:

For the selection aid, see page 13/13

	Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Operating mechanisms						
3SE5000-0AD03	**Roller plungers, type C, acc. to EN 50047**					
	Plastic rollers	10	➔ 2	**3SE5000-0AD03**	1	1 unit
	High-grade steel rollers	10	➔ 5	**3SE5000-0AD04**	1	1 unit
3SE5000-0AD10	**Roller plungers with central fixing**					
	Plastic rollers	10	➔ 2	**3SE5000-0AD10**	1	1 unit
	High-grade steel rollers	10	➔ 5	**3SE5000-0AD11**	1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

3SE5, Plastic Enclosures

Enclosure width 50 mm

	Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Operating mechanisms						
3SE5000-0AE10	**Roller levers, type E, acc. to EN 50047**					
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AE10**	1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE11**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AE12**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE13**	1	1 unit
3SE5000-0AF10	**Angular roller levers**					
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AF10**	1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF11**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 2	**3SE5000-0AF12**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF13**	1	1 unit
3SE5000-0AR01	**Spring rods** (for switches with snap-action contacts only)					
	Plunger made of plastic, spring of high-grade steel:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR01**	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		5	**3SE5000-0AR03**	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		5	**3SE5000-0AR04**	1	1 unit
	Plunger and spring made of high-grade steel:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR02**	1	1 unit
Twist actuators						
3SE5000-0AK00	**Twist actuators, for 31 mm/50 mm, EN 50047**					
	Switching right and/or left, adjustable		➔ 2	**3SE5000-0AK00**	1	1 unit
	Levers					
	Twist levers 21 mm, straight, type A acc. to EN 50047					
3SE5000-0AA21	Metal lever, plastic roller	19	➔ 2	**3SE5000-0AA21**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA22**	1	1 unit
	Metal lever, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA23**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA25**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA31**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA32**	1	1 unit
3SE5000-0AA60 3SE5000-0AA24	**Twist levers 30 mm, straight**					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**	1	1 unit
	Twist levers, adjustable length, with grid hole					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**	1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA67**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**	1	1 unit
3SE5000-0AA50	**Twist levers, adjustable length**					
	Metal lever, plastic roller	19	2	**3SE5000-0AA50**	1	1 unit
	Metal lever, high-grade steel roller	19	5	**3SE5000-0AA51**	1	1 unit
	Metal lever, plastic roller	30	5	**3SE5000-0AA55**	1	1 unit
	Metal lever, plastic roller	50	5	**3SE5000-0AA57**	1	1 unit
	Metal lever, rubber roller	50	5	**3SE5000-0AA58**	1	1 unit
	High-grade steel lever, plastic roller	19	5	**3SE5000-0AA52**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	5	**3SE5000-0AA53**	1	1 unit
	Rod actuator					
	Aluminum rod, length 200 mm	6	5	**3SE5000-0AA80**	1	1 unit
	Spring rod, length 200 mm	6	5	**3SE5000-0AA81**	1	1 unit
	Plastic rod, length 200 mm	6	5	**3SE5000-0AA82**	1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

3SE5, Metal Enclosures

Enclosure width 31 mm according 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	SD	Complete units	PU (UNIT, SET, M)	PS*
				d	Article No. / Price per PU		
Complete units[1] • Enclosure width 31 mm							
	Rounded plungers, type B, acc. to EN 50047						
	With plunger						
	Slow-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5212-0BC05**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5212-0CC05**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 2	**3SE5212-0LC05**	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔ 2	**3SE5212-0MC05**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5212-0PC05**	1	1 unit
	With increased corrosion protection						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0BC05-1CA0**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0CC05-1CA0**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0KC05-1CA0**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0LC05-1CA0**	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔ 5	**3SE5212-0MC05-1CA0**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5212-0PC05-1CA0**	1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A)						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5214-0BC05-1AC5**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5214-0CC05-1AC5**	1	1 unit
	Slow-action contacts	2 NC	--	➔ 5	**3SE5214-0KC05-1AE1**	1	1 unit
	Snap-action contacts	2 NC	--	➔ 5	**3SE5214-0LC05-1AE1**	1	1 unit
	With 2 LEDs, yellow/green						
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔ 5	**3SE5212-1KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔ 2	**3SE5212-1LC05**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔ 5	**3SE5212-3KC05**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	➔ 5	**3SE5212-3LC05**	1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs						
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔ 5	**3SE5214-1BC05-1AF3**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	➔ 5	**3SE5214-1CC05-1AF3**	1	1 unit
	Plain plungers						
	With high-grade steel plunger						
	Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0BB01**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0CB01**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0KB01**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0LB01**	1	1 unit
	Roller plungers, type C, acc. to EN 50047						
	With plastic roller 10 mm						
	Slow-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5212-0BD03**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0CD03**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0KD03**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0LD03**	1	1 unit

3SE5212-0BC05

3SE5212-0BC05-1CA0

3SE5212-1KC05

3SE5212-0BB01

3SE5212-0BD03

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

3SE5, Metal Enclosures

Enclosure width 31 mm according to EN 50047

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version	Contacts	LEDs		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units[1] • Enclosure width 31 mm									
3SE5212-0KD10	***Roller plungers with central fixing***								
	With plastic roller 10 mm								
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0KD10**		1	1 unit
3SE5212-0BE10	***Roller levers, type E acc. to EN 50047***								
	With metal lever and plastic roller 13 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5212-0BE10**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5212-0CE10**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0KE10**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0LE10**		1	1 unit
3SE5212-0BF10	***Angular roller lever***								
	With metal lever and plastic roller 13 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5212-0BF10**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5212-0CF10**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0KF10**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0LF10**		1	1 unit
3SE5212-0BK21	***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	--	➔	5	**3SE5212-0BK21**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5212-0CK21**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0KK21**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0LK21**		1	1 unit
3SE5212-0CK60	***Twist levers, adjustable length***								
	With metal lever with grid hole and plastic roller 19 mm								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5212-0CK60**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0KK60**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0LK60**		1	1 unit
	With metal lever and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--		5	**3SE5212-0BK50**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--		5	**3SE5212-0CK50**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--		5	**3SE5212-0LK50**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

Note:

If the device you require is not available as a complete unit, see Modular system, page 13/30.

3SE5, Metal Enclosures

Enclosure width 31 mm according to EN 50047

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	SD	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Basic switches • Enclosure width 31 mm (with rounded plunger[1])							
Plunger							
Slow-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5212-0BC05**		1	1 unit
Snap-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5212-0CC05**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔ 2	**3SE5212-0LC05**		1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔ 2	**3SE5212-0MC05**		1	1 unit
Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5212-0PC05**		1	1 unit
Increased corrosion protection[2]							
Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0BC05-1CA0**		1	1 unit
Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0CC05-1CA0**		1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0KC05-1CA0**		1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0LC05-1CA0**		1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔ 5	**3SE5212-0MC05-1CA0**		1	1 unit
Slow-action contacts	2 NO + 1 NC	--	➔ 5	**3SE5212-0PC05-1CA0**		1	1 unit
M12 device plug, 5-pole (125 V, 4 A)							
Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5214-0BC05-1AC5**		1	1 unit
Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5214-0CC05-1AC5**		1	1 unit
Slow-action contacts	2 NC	--	➔ 5	**3SE5214-0KC05-1AE1**		1	1 unit
Snap-action contacts	2 NC	--	➔ 5	**3SE5214-0LC05-1AE1**		1	1 unit
2 LEDs yellow/green							
Slow-action contacts	1 NO + 2 NC	24 V DC	➔ 5	**3SE5212-1KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	➔ 2	**3SE5212-1LC05**		1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	➔ 5	**3SE5212-3KC05**		1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	➔ 5	**3SE5212-3LC05**		1	1 unit
M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs							
Slow-action contacts	1 NO + 1 NC	24 V DC	➔ 5	**3SE5214-1BC05-1AF3**		1	1 unit
Snap-action contacts	1 NO + 1 NC	24 V DC	➔ 5	**3SE5214-1CC05-1AF3**		1	1 unit
Snap-action contacts NEW	1 NO + 1 NC	24 V DC	➔ 5	**3SE5114-1CA00-1AF5**		1	1 unit

3SE5212-0BC05

3SE5212-0BC05-1CA0

3SE5214-0BC05-1AC5

3SE5212-1KC05

3SE5214-1BC05-1AF3

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) For enclosures with widths of 31 mm, the basic switch is a complete unit with rounded plungers.

2) Use corresponding high-grade steel lever.

Note:
For the selection aid, see page 13/13

Version	Diameter	SD	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	mm	d				
Operating mechanisms						
Plain plungers						
High-grade steel plunger	10	➔ 2	**3SE5000-0AB01**		1	1 unit
Roller plungers, type C, acc. to EN 50047						
Plastic rollers	10	➔ 2	**3SE5000-0AD03**		1	1 unit
High-grade steel rollers	10	➔ 5	**3SE5000-0AD04**		1	1 unit

3SE5000-0AB01

3SE5000-0AD03

➔ Positively driven actuator, necessary in safety circuits.

3SE5, Metal Enclosures

Enclosure width 31 mm according to EN 50047

	Version	Diameter mm	SD d	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operating mechanisms							
3SE5000-0AD10	**Roller plungers with central fixing**						
	Plastic rollers	10	➔ 2	**3SE5000-0AD10**		1	1 unit
	High-grade steel rollers	10	➔ 5	**3SE5000-0AD11**		1	1 unit
3SE5000-0AE10	**Roller levers, type E, acc. to EN 50047**						
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AE10**		1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE11**		1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AE12**		1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE13**		1	1 unit
3SE5000-0AF10	**Angular roller levers**						
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AF10**		1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF11**		1	1 unit
	High-grade steel lever, plastic roller	13	➔ 2	**3SE5000-0AF12**		1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF13**		1	1 unit
3SE5000-0AR01	**Spring rods** (for switches with snap-action contacts only)						
	Plunger made of plastic, spring of high-grade steel:	7					
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR01**		1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		5	**3SE5000-0AR03**		1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		5	**3SE5000-0AR04**		1	1 unit
	Plunger and spring made of high-grade steel:	7					
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR02**		1	1 unit
Twist actuators							
3SE5000-0AK00	**Twist actuators, for 31 mm/50 mm, EN 50047**						
	Switching right and/or left, adjustable		➔ 2	**3SE5000-0AK00**		1	1 unit
	Levers						
	Twist levers, straight, type A, acc. to EN 50047						
3SE5000-0AA21	Metal lever 21 mm, plastic roller	19	➔ 2	**3SE5000-0AA21**		1	1 unit
	Metal lever 21 mm, high-grade steel roller	19	➔ 5	**3SE5000-0AA22**		1	1 unit
	Metal lever 21 mm, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA23**		1	1 unit
	Metal lever 21 mm, plastic roller	30	➔ 5	**3SE5000-0AA25**		1	1 unit
	High-grade steel lever 21 mm, plastic roller	19	➔ 5	**3SE5000-0AA31**		1	1 unit
	High-grade steel lever 21 mm, high-grade steel roller	19	➔ 5	**3SE5000-0AA32**		1	1 unit
	Twist levers 30 mm, straight						
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**		1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**		1	1 unit
3SE5000-0AA60 3SE5000-0AA50	**Twist levers, adjustable length, with grid hole**						
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**		1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**		1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA67**		1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**		1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**		1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**		1	1 unit
	Twist levers, adjustable length						
	Metal lever, plastic roller	19	2	**3SE5000-0AA50**		1	1 unit
	Metal lever, high-grade steel roller	19	5	**3SE5000-0AA51**		1	1 unit
	Metal lever, plastic roller	30	5	**3SE5000-0AA55**		1	1 unit
	Metal lever, plastic roller	50	5	**3SE5000-0AA57**		1	1 unit
	Metal lever, rubber roller	50	5	**3SE5000-0AA58**		1	1 unit
	High-grade steel lever, plastic roller	19	5	**3SE5000-0AA52**		1	1 unit
	High-grade steel lever, high-grade steel roller	19	5	**3SE5000-0AA53**		1	1 unit
3SE5000-0AA80	**Rod actuators, type D, acc. to EN 50041**						
	Aluminum rod, length 200 mm	6	5	**3SE5000-0AA80**		1	1 unit
	Spring rod, length 200 mm	6	5	**3SE5000-0AA81**		1	1 unit
	Plastic rod, length 200 mm	6	5	**3SE5000-0AA82**		1	1 unit
	Plastic rod, length 330 mm	6	5	**3SE5000-0AA83**		1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

3SE5, Metal Enclosures

Enclosure width 40 mm according 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		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Complete units[1] · Enclosure width 40 mm									
3SE5112-0BB01	***Plain plungers***								
	With high-grade steel plunger								
	Slow-action contacts	1 NO + 1 NC	--	➔	2	**3SE5112-0BB01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	2	**3SE5112-0CB01**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0KB01**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LB01**		1	1 unit
3SE5112-0BC02	***Rounded plungers, type B, acc. to EN 50041***								
	With high-grade steel plungers, with 3 mm overtravel								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BC02**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	▶	**3SE5112-0CC02**		1	1 unit
	Snap-action contacts[2]	1 NO + 1 NC	--	➔	5	**3SE5112-0CC02-1AA7**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0KC02**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LC02**		1	1 unit
	Snap-action contacts with M12 device plug, 4-pole	1 NO + 1 NC	--	➔	5	**3SE5114-0CC02-1AC4**		1	1 unit
3SE5112-0BD02	***Roller plungers, type C, acc. to EN 50041***								
	With high-grade steel roller 13 mm, with 3 mm overtravel								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BD02**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	▶	**3SE5112-0CD02**		1	1 unit
	Snap-action contacts[2]	1 NO + 1 NC	--	➔	5	**3SE5112-0CD02-1AA7**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0KD02**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LD02**		1	1 unit
	Snap-action contacts[2]	1 NO + 2 NC	--	➔	5	**3SE5112-0LD02-1AA7**		1	1 unit
	Slow-action contacts[2]	2 NO + 1 NC	--	➔	5	**3SE5112-0PD02-1AA7**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A)								
	Snap-action contacts with 2 LEDs	1 NO + 1 NC	24 V DC	➔	5	**3SE5114-1CD02-1AF3**		1	1 unit
	Snap-action contacts with 2 LEDs NEW	1 NO + 1 NC	24 V DC	➔	5	**3SE5114-1CD02-1AF5**		1	1 unit
	Snap-action contacts without LED	1 NO + 1 NC	24 V DC	➔	5	**3SE5114-0CD02-1AC5**		1	1 unit
	Snap-action contacts without LED[2)3]	1 NO + 1 NC	24 V DC	➔	5	**3SE5114-0CD02-1AL0**		1	1 unit
3SE5112-0BE01	**With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[3]**								
	Snap-action contacts without LED NEW	1 NO + 2 NC	24 V DC	➔	X	**3SE5114-0LD02-1AE3**		1	1 unit
	Roller levers								
	With metal lever and plastic roller 22 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BE01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	▶	**3SE5112-0CE01**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0KE01**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LE01**		1	1 unit
3SE5112-0BF01	***Angular roller lever***								
	With metal lever and plastic roller 22 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BF01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	2	**3SE5112-0CF01**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LF01**		1	1 unit
3SE5112-0CR01	***Spring rod***								
	Length 142.5 mm, with plastic plunger 50 mm								
	Snap-action contacts	1 NO + 1 NC	--		▶	**3SE5112-0CR01**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) Popular versions.

2) Increased operation or restoring force 30 N; only available as complete unit, no modular design

3) The 3SE5114-.....-1AE3 position switches, prewired with an M12 plug, 5-pole, have the same pin assignment as all compact block I/O modules with a PROFINET connection in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series with IP65/IP67 degree of protection for cabinet-free installation directly at the machine.

3SE5, Metal Enclosures

Enclosure width 40 mm according to EN 50041

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version	Contacts	LEDs		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Complete units[1] · Enclosure width 40 mm									
	Twist levers, type A, acc. to EN 50041								
	With metal lever 27 mm and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BH01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	▶	**3SE5112-0CH01**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0KH01**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LH01**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A)								
	Snap-action contacts	1 NO + 1 NC	--	➔	2	**3SE5114-0CH01-1AC5**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[3] NEW								
	Snap-action contacts	1 NO + 2 NC	--	➔	X	**3SE5114-0LH01-1AE3**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs								
	Snap-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5114-1CH01-1AF3**		1	1 unit
	With metal lever 27 mm and high-grade steel roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BH02**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	2	**3SE5112-0CH02**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5114-1CH02-1AF3**		1	1 unit
	With metal lever 30 mm and plastic roller 19 mm								
	Snap-action contacts	1 NO + 1 NC	--	➔	▶	**3SE5112-0CH24**		1	1 unit
	Twist levers, adjustable length								
	Metal lever, grid hole and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BH60**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	▶	**3SE5112-0CH60**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LH60**		1	1 unit
	Metal lever, grid hole with high-grade steel roller NEW								
	Snap-action contacts	1 NO + 1 NC	--		X	**3SE5114-0CH61-1AC5**		1	1 unit
	With metal lever and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--		5	**3SE5112-0BH50**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--		▶	**3SE5112-0CH50**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--		5	**3SE5112-0LH50**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs								
	Snap-action contacts	1 NO + 1 NC	24 V DC		5	**3SE5114-1CH60-1AF3**		1	1 unit
	With M12 device plug, 8-pole (30 V, 2 A), and 2 LEDs								
	Snap-action contacts	1 NO + 2 NC	24 V DC		5	**3SE5114-1LH50-1AD4**		1	1 unit
	With metal lever and high-grade steel roller 19 mm								
	Snap-action contacts	1 NO + 1 NC	--		5	**3SE5112-0CH51**		1	1 unit
	Fork levers, latching								
	With metal lever and 2 plastic rollers 19 mm								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0CT11**		1	1 unit
	Rod actuators, type D, acc. to EN 50041								
	With aluminum rod, length 200 mm								
	Snap-action contacts	1 NO + 1 NC	--		▶	**3SE5112-0CH80**		1	1 unit
	With plastic rod, length 200 mm								
	Snap-action contacts	1 NO + 1 NC	--		5	**3SE5112-0CH82**		1	1 unit
	Nagara switch[2] With M12 device plug, 5-pole (125 V, 4 A) NEW								
	Snap-action contacts, short-stroke	1 NO + 1 NC	--		5	**3SE5114-0NH82-1AM2**		1	1 unit

3SE5112-0BH01

3SE5112-0BH60

3SE5112-0BH50

3SE5112-0CT11

3SE5112-0CH80

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) Popular versions.

2) Start switch triggerable via one-hand operation (during operation)

3) The 3SE5114-.....-1AE3 position switches, prewired with an M12 plug, 5-pole, have the same pin assignment as all compact block I/O modules with a PROFINET connection in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series with IP65/IP67 degree of protection for cabinet-free installation directly at the machine.

Note:

If the device you require is not available as a complete unit, see Modular system, page 13/34.

3SE5, Metal Enclosures

Enclosure width 40 mm according to EN 50041

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version	Contacts	LEDs		SD	Modular system	PU (UNIT, SET, M)	PS*
					d	Article No. / Price per PU		
Basic switches · Enclosure width 40 mm								
3SE5112-0BA00	**Connecting thread M20 × 1.5**							
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BA00**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	2	**3SE5112-0CA00**	1	1 unit
	• Gold-plated contacts			➔	5	**3SE5112-0CA00-1AC1**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	2	**3SE5112-0KA00**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	2	**3SE5112-0LA00**	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	2	**3SE5112-0MA00**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	2	**3SE5112-0PA00**	1	1 unit
3SE5112-0BA00-1CA0	**Increased corrosion protection[1]**							
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0BA00-1CA0**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0CA00-1CA0**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0KA00-1CA0**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LA00-1CA0**	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	5	**3SE5112-0MA00-1CA0**	1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	5	**3SE5112-0PA00-1CA0**	1	1 unit
3SE5114-0BA00-1AC5	**M12 device plug, 5-pole (125 V, 4 A)**							
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5114-0BA00-1AC5**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5114-0CA00-1AC5**	1	1 unit
	Slow-action contacts	2 NC	--	➔	5	**3SE5114-0KA00-1AE1**	1	1 unit
	Snap-action contacts	2 NC	--	➔	5	**3SE5114-0LA00-1AE1**	1	1 unit
3SE5115-0KA00-1AD1	**With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[2]** NEW							
	Snap-action contacts	1 NO + 2 NC	--	➔	X	**3SE5114-0LA00-1AE3**	1	1 unit
	Device plug, 6-pole + PE (250 V, 10 A)							
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5115-0KA00-1AD1**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5115-0LA00-1AD1**	1	1 unit
3SE5112-1KA00	**Device plug, 6-pole + PE (250 V, 10 A), and quick-release device**							
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5115-0CA00-1AD0**	1	1 unit
	2 LEDs, yellow/green							
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5112-1KA00**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5112-1LA00**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5112-3KA00**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5112-3LA00**	1	1 unit
3SE5114-1BA00-1AF3	**M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs**							
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5114-1BA00-1AF3**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5114-1CA00-1AF3**	1	1 unit
3SE5115-1BA00-1AF2	**M12 device plug, 8-pole (30 V, 2 A), and 2 LEDs**							
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5114-1LA00-1AD4**	1	1 unit
	Device plug, 6-pole + PE (10 A), and 2 LEDs							
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5115-1BA00-1AF2**	1	1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5115-1CA00-1AF2**	1	1 unit
	Snap-action contacts	2 NC	24 V DC	➔	5	**3SE5115-1LA00-1AD2**	1	1 unit

[1] Use corresponding high-grade steel lever.

[2] The 3SE5114-.....-1AE3 position switches, prewired with an M12 plug, 5-pole, have the same pin assignment as all compact block I/O modules with a PROFINET connection in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series with IP65/IP67 degree of protection for cabinet-free installation directly at the machine.

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

Note:

For the selection aid, see page 13/13

3SE5, Metal Enclosures

Enclosure width 40 mm according to EN 50041

	Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. Price per PU		
Operating mechanisms						
3SE5000-0AC02 3SE5000-0AD02	**Plain plungers**					
	High-grade steel plunger	10	➔ 2	**3SE5000-0AB01**	1	1 unit
	Rounded plungers, type B, acc. to EN 50041					
	High-grade steel plungers, with 3 mm overtravel	10	➔ 5	**3SE5000-0AC02**	1	1 unit
	Roller plungers, type C, acc. to EN 50041					
	High-grade steel roller, with 3 mm overtravel	13	➔ 5	**3SE5000-0AD02**	1	1 unit
3SE5000-0AE01	**Roller levers**					
	Metal lever, plastic roller	22	➔ 2	**3SE5000-0AE01**	1	1 unit
	Metal lever, high-grade steel roller	22	➔ 5	**3SE5000-0AE02**	1	1 unit
	High-grade steel lever, plastic roller	22	➔ 5	**3SE5000-0AE03**	1	1 unit
	High-grade steel lever, high-grade steel roller	22	➔ 5	**3SE5000-0AE04**	1	1 unit
3SE5000-0AF01	**Angular roller levers**					
	Metal lever, plastic roller	22	➔ 2	**3SE5000-0AF01**	1	1 unit
	Metal lever, high-grade steel roller	22	➔ 5	**3SE5000-0AF02**	1	1 unit
	High-grade steel lever, plastic roller	22	➔ 5	**3SE5000-0AF03**	1	1 unit
	High-grade steel lever, high-grade steel roller	22	➔ 5	**3SE5000-0AF04**	1	1 unit
3SE5000-0AR01	**Spring rods** (for switches with snap-action contacts only)					
	Plunger made of plastic, spring of high-grade steel:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR01**	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		5	**3SE5000-0AR03**	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		5	**3SE5000-0AR04**	1	1 unit
	Plunger and spring made of high-grade steel:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR02**	1	1 unit
Twist actuators						
3SE5000-0AH00	**Twist actuators, for 40/56/56 XL mm EN 50041**					
	• For twist levers and rod actuators, switching right and/or left, adjustable		➔ 2	**3SE5000-0AH00**	1	1 unit
	• For fork levers, latching		➔ 5	**3SE5000-0AT10**	1	1 unit
	Levers					
	Twist levers, offset, type A, acc. to EN 50041					
3SE5000-0AA01	Metal lever 27 mm, plastic roller	19	➔ 2	**3SE5000-0AA01**	1	1 unit
	Metal lever 27 mm, high-grade steel roller	19	➔ 2	**3SE5000-0AA02**	1	1 unit
	Metal lever 27 mm, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA03**	1	1 unit
	Metal lever 27 mm, 2 plastic rollers	19	➔ 5	**3SE5000-0AA04**	1	1 unit
	Metal lever 27 mm, plastic roller	30	➔ 5	**3SE5000-0AA05**	1	1 unit
	Metal lever 27 mm, rubber roller	50	➔ 5	**3SE5000-0AA08**	1	1 unit
3SE5000-0AA60 3SE5000-0AA50	High-grade steel lever 27 mm, plastic roller	19	➔ 5	**3SE5000-0AA11**	1	1 unit
	High-grade steel lever 27 mm, high-grade steel roller	19	➔ 5	**3SE5000-0AA12**	1	1 unit
	Metal lever 35 mm, plastic roller	19	➔ 5	**3SE5000-0AA15**	1	1 unit
	High-grade steel lever 35 mm, plastic roller	19	➔ 5	**3SE5000-0AA16**	1	1 unit
	Twist levers 30 mm, straight					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**	1	1 unit
	Twist levers, adjustable length, with grid hole					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**	1	1 unit
3SE5000-0AT01	**Twist levers, adjustable length**					
	Metal lever, plastic roller	19	2	**3SE5000-0AA50**	1	1 unit
	Metal lever, high-grade steel roller	19	5	**3SE5000-0AA51**	1	1 unit
	Metal lever, plastic roller	30	5	**3SE5000-0AA55**	1	1 unit
	Metal lever, rubber roller	50	5	**3SE5000-0AA58**	1	1 unit
	High-grade steel lever, plastic roller	19	5	**3SE5000-0AA52**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	5	**3SE5000-0AA53**	1	1 unit
3SE5000-0AA80	**Fork levers** (for switches with snap-action contacts only)					
	2 metal levers, 2 plastic rollers	19	➔ 5	**3SE5000-0AT01**	1	1 unit
	2 metal levers, 2 high-grade steel rollers	19	➔ 5	**3SE5000-0AT02**	1	1 unit
	2 high-grade steel levers, 2 plastic rollers	19	➔ 5	**3SE5000-0AT03**	1	1 unit
	Rod actuators, type D, acc. to EN 50041					
	Aluminum rod, length 200 mm	6	5	**3SE5000-0AA80**	1	1 unit
	Spring rod, length 200 mm	6	5	**3SE5000-0AA81**	1	1 unit
	Plastic rod, length 200 mm	6	5	**3SE5000-0AA82**	1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

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		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units[1] • Enclosure width 56 mm									
3SE5122-0BB01	***Plain plungers***								
	With high-grade steel plunger								
	Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5122-0BB01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5122-0CB01**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5122-0KB01**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5122-0LB01**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	⊖	5	**3SE5122-0PB01**		1	1 unit
3SE5122-0BC02	***Rounded plungers***								
	With high-grade steel plungers, with 3 mm overtravel								
	Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5122-0BC02**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	⊖	▶	**3SE5122-0CC02**		1	1 unit
	Snap-action contacts[2]	1 NO + 1 NC	--	⊖	5	**3SE5122-0CC02-1AA7**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5122-0KC02**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5122-0LC02**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	⊖	5	**3SE5122-0PC02**		1	1 unit
3SE5122-0BD02	***Roller plunger***								
	With high-grade steel roller 13 mm, with 3 mm overtravel								
	Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5122-0BD02**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	⊖	2	**3SE5122-0CD02**		1	1 unit
	Snap-action contacts[2]	1 NO + 1 NC	--	⊖	5	**3SE5122-0CD02-1AA7**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5122-0KD02**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5122-0LD02**		1	1 unit
3SE5122-0BE01	***Roller levers***								
	With metal lever and plastic roller 22 mm								
	Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5122-0BE01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	⊖	2	**3SE5122-0CE01**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5122-0KE01**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5122-0LE01**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	⊖	5	**3SE5122-0PE01**		1	1 unit
	With metal lever and high-grade steel roller 22 mm								
	Snap-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5122-0CE02**		1	1 unit
3SE5122-0BF01	***Angular roller lever***								
	With metal lever and plastic roller 22 mm								
	Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5122-0BF01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5122-0CF01**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	⊖	5	**3SE5122-0PF01**		1	1 unit

⊖ Positive opening according to IEC 60947-5-1, Appendix K.

1) Popular versions.

2) Increased operation or restoring force 30 N; only available as complete unit, no modular design

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		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Complete units[1] • Enclosure width 56 mm									
3SE5122-0CR01	***Spring rod***								
	Length 142.5 mm, with plastic plunger 50 mm								
	Snap-action contacts	1 NO + 1 NC	--		5	**3SE5122-0CR01**		1	1 unit
3SE5122-0BH01	***Twist levers***								
	With metal lever 27 mm and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5122-0BH01**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	2	**3SE5122-0CH01**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0KH01**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0LH01**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	5	**3SE5122-0PH01**		1	1 unit
	With metal lever 27 mm and high-grade steel roller 19 mm								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5122-0CH02**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0LH02**		1	1 unit
3SE5122-0BH60	***Twist levers, adjustable length***								
	With metal lever with grid hole and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5122-0BH60**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5122-0CH60**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0LH60**		1	1 unit
	With metal lever and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC	--		5	**3SE5122-0BH50**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--		2	**3SE5122-0CH50**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--		5	**3SE5122-0LH50**		1	1 unit
3SE5122-0CT11	***Fork levers, latching***								
	With metal lever and 2 plastic rollers 19 mm								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5122-0CT11**		1	1 unit
3SE5122-0CH80	***Rod actuator***								
	With aluminum rod, length 200 mm								
	Snap-action contacts	1 NO + 1 NC	--		5	**3SE5122-0CH80**		1	1 unit
	With plastic rod, length 200 mm								
	Snap-action contacts	1 NO + 1 NC	--		5	**3SE5122-0CH82**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

Note:

If the device you require is not available as a complete unit, see Modular system, page 13/38.

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		SD	Modular system		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Basic switches • Enclosure width 56 mm									
3SE5122-0BA00	**With 3 × connection thread M20 × 1.5**								
	Slow-action contacts	1 NO + 1 NC	--	➔	2	**3SE5122-0BA00**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	2	**3SE5122-0CA00**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0KA00**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	2	**3SE5122-0LA00**		1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	2	**3SE5122-0MA00**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	2	**3SE5122-0PA00**		1	1 unit
3SE5122-0BA00-1CA0	**With increased corrosion protection[1)]**								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5122-0BA00-1CA0**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5122-0CA00-1CA0**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0KA00-1CA0**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0LA00-1CA0**		1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	5	**3SE5122-0MA00-1CA0**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	--	➔	5	**3SE5122-0PA00-1CA0**		1	1 unit
3SE5122-1KA00	**With 2 LEDs, yellow/green**								
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5122-1KA00**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5122-1LA00**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5122-3KA00**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5122-3LA00**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) Use corresponding high-grade steel lever.

Note:
For the selection aid, see page 13/13

	Version	Diameter		SD	Modular system		PU (UNIT, SET, M)	PS*
		mm		d	Article No.	Price per PU		
Operating mechanisms								
3SE5000-0AC02 3SE5000-0AD02	**Plain plungers**							
	High-grade steel plungers	10		➔ 2	**3SE5000-0AB01**		1	1 unit
	Rounded plungers, type B, acc. to EN 50041							
	High-grade steel plungers, with 3 mm overtravel	10		➔ 5	**3SE5000-0AC02**		1	1 unit
	Roller plungers, type C, acc. to EN 50041							
	High-grade steel roller, with 3 mm overtravel	13		➔ 5	**3SE5000-0AD02**		1	1 unit
3SE5000-0AE01	**Roller levers**							
	Metal lever, plastic roller	22		➔ 2	**3SE5000-0AE01**		1	1 unit
	Metal lever, high-grade steel roller	22		➔ 5	**3SE5000-0AE02**		1	1 unit
	High-grade steel lever, plastic roller	22		➔ 5	**3SE5000-0AE03**		1	1 unit
	High-grade steel lever, high-grade steel roller	22		➔ 5	**3SE5000-0AE04**		1	1 unit
3SE5000-0AF01	**Angular roller levers**							
	Metal lever, plastic roller	22		➔ 2	**3SE5000-0AF01**		1	1 unit
	Metal lever, high-grade steel roller	22		➔ 5	**3SE5000-0AF02**		1	1 unit
	High-grade steel lever, plastic roller	22		➔ 5	**3SE5000-0AF03**		1	1 unit
	High-grade steel lever, high-grade steel roller	22		➔ 5	**3SE5000-0AF04**		1	1 unit
3SE5000-0AR01	**Spring rods** (for switches with snap-action contacts only)							
	Plunger made of plastic, spring of high-grade steel:	7						
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)			5	**3SE5000-0AR01**		1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)			5	**3SE5000-0AR03**		1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)			5	**3SE5000-0AR04**		1	1 unit
	Plunger and spring made of high-grade steel:	7						
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)			5	**3SE5000-0AR02**		1	1 unit

3SE5, Metal Enclosures

Enclosure width 56 mm

	Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Twist actuators						
3SE5000-0AH00	**Twist actuators, for 40/56/56 XL mm EN 50041**					
	• For twist levers and rod actuators, switching right and/or left, adjustable		➔ 2	**3SE5000-0AH00**	1	1 unit
	• For fork levers, latching		➔ 5	**3SE5000-0AT10**	1	1 unit
	Levers					
3SE5000-0AA01	**Twist levers 27 mm, offset, type A, acc. to EN 50041**					
	Metal lever, plastic roller	19	➔ 2	**3SE5000-0AA01**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 2	**3SE5000-0AA02**	1	1 unit
	Metal lever, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA03**	1	1 unit
	Metal lever, 2 plastic rollers	19	➔ 5	**3SE5000-0AA04**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA05**	1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA07**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA08**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA11**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA12**	1	1 unit
	Twist levers 35 mm, offset					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA15**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA16**	1	1 unit
	Twist levers 30 mm, straight (can be mounted rotated by 180°)					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**	1	1 unit
3SE5000-0AA60 3SE5000-0AA50	**Twist levers, adjustable length, with grid hole**					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**	1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA67**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**	1	1 unit
	Twist levers, adjustable length					
	Metal lever, plastic roller	19	2	**3SE5000-0AA50**	1	1 unit
	Metal lever, high-grade steel roller	19	5	**3SE5000-0AA51**	1	1 unit
	Metal lever, plastic roller	30	5	**3SE5000-0AA55**	1	1 unit
	Metal lever, plastic roller	50	5	**3SE5000-0AA57**	1	1 unit
	Metal lever, rubber roller	50	5	**3SE5000-0AA58**	1	1 unit
	High-grade steel lever, plastic roller	19	5	**3SE5000-0AA52**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	5	**3SE5000-0AA53**	1	1 unit
3SE5000-0AT01	**Fork levers** (for switches with snap-action contacts only)					
	2 metal levers, 2 plastic rollers	19	➔ 5	**3SE5000-0AT01**	1	1 unit
	2 metal levers, 2 high-grade steel rollers	19	➔ 5	**3SE5000-0AT02**	1	1 unit
	2 high-grade steel levers, 2 plastic rollers	19	➔ 5	**3SE5000-0AT03**	1	1 unit
	2 high-grade steel levers, 2 high-grade steel rollers	19	➔ 5	**3SE5000-0AT04**	1	1 unit
3SE5000-0AA80	**Rod actuators, type D, acc. to EN 50041**					
	Aluminum rod, length 200 mm	6	5	**3SE5000-0AA80**	1	1 unit
	Spring rod, length 200 mm	6	5	**3SE5000-0AA81**	1	1 unit
	Plastic rod, length 200 mm	6	5	**3SE5000-0AA82**	1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

3SE5, 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	SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units[1] · Enclosure width 56 mm, XL								
3SE5162-0CB01	***Plain plungers*** **With high-grade steel plunger** Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0CB01**		1	1 unit
3SE5162-0EC02	***Rounded plungers*** **With high-grade steel plungers, with 3 mm overtravel** Slow-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5162-0EC02**		1	1 unit
	Slow-action contacts with make-before-break 2 mm travel difference	1 NO + 2 NC						
3SE5162-0BD02	***Roller plunger*** **With high-grade steel roller 13 mm, with 3 mm overtravel** Slow-action contacts	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0BD02**		1	1 unit
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ 2	**3SE5162-0CD02**		1	1 unit
3SE5162-0BE01	***Roller levers*** **With metal lever and plastic roller 22 mm** Slow-action contacts	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0BE01**		1	1 unit
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ 2	**3SE5162-0CE01**		1	1 unit
	With metal lever and high-grade steel roller 22 mm Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0CE02**		1	1 unit
3SE5162-0CF01	***Angular roller lever*** **With metal lever and plastic roller 22 mm** Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0CF01**		1	1 unit
3SE5162-0CH01	***Twist levers*** **With metal lever 27 mm and plastic roller 19 mm** Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ 2	**3SE5162-0CH01**		1	1 unit
	With high-grade steel lever 27 mm and high-grade steel roller 19 mm, increased corrosion protection Snap-action contacts (gold contacts)	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0CH12-1CC1**		1	1 unit
	Twist levers, adjustable length **High-grade steel lever with grid hole and high-grade steel roller 19 mm, increased corrosion protection Adapter 3SX5100-3B included** Snap-action contacts (gold contacts)	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0CH63-1AN4**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

Note:

If the device you require is not available as a complete unit, see Modular system, page 13/41.

3SE5, 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	SD	Modular system	PU (UNIT, SET, M)	PS*
				d	Article No. / Price per PU		
Basic switches • Enclosure width 56 mm, XL							
3SE5162-0BA00	**With 3 × connection thread M20 × 1.5**						
	Slow-action contacts	2 × (1 NO + 1 NC)	--	➔ 2	**3SE5162-0BA00**	1	1 unit
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ 2	**3SE5162-0CA00**	1	1 unit
	Slow-action contacts with make-before-break	2 × (1 NO + 2 NC)	--	➔ 30	**3SE5162-0DA00**	1	1 unit
	With increased corrosion protection[1)]						
	Slow-action contacts	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0BA00-1CA0**	1	1 unit
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ 5	**3SE5162-0CA00-1CA0**	1	1 unit
	Slow-action contacts with make-before-break	2 × (1 NO + 2 NC)	--	➔ 30	**3SE5162-0DA00-1CA0**	1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) Use corresponding high-grade steel lever.

Note:
For the selection aid, see page 13/13

	Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Operating mechanisms						
3SE5000-0AB01	**Plain plungers**					
	High-grade steel plunger	10	➔ 2	**3SE5000-0AB01**	1	1 unit
3SE5000-0AC02	**Rounded plungers, type B, acc. to EN 50041**					
	High-grade steel plungers, with 3 mm overtravel	10	➔ 5	**3SE5000-0AC02**	1	1 unit
3SE5000-0AD02	**Roller plungers, type C, acc. to EN 50041**					
	High-grade steel roller, with 3 mm overtravel	13	➔ 5	**3SE5000-0AD02**	1	1 unit
3SE5000-0AE01	**Roller levers**					
	Metal lever, plastic roller	22	➔ 2	**3SE5000-0AE01**	1	1 unit
	Metal lever, high-grade steel roller	22	➔ 5	**3SE5000-0AE02**	1	1 unit
	High-grade steel lever, plastic roller	22	➔ 5	**3SE5000-0AE03**	1	1 unit
	High-grade steel lever, high-grade steel roller	22	➔ 5	**3SE5000-0AE04**	1	1 unit
3SE5000-0AF01	**Angular roller levers**					
	Metal lever, plastic roller	22	➔ 2	**3SE5000-0AF01**	1	1 unit
	Metal lever, high-grade steel roller	22	➔ 5	**3SE5000-0AF02**	1	1 unit
	High-grade steel lever, plastic roller	22	➔ 5	**3SE5000-0AF03**	1	1 unit
	High-grade steel lever, high-grade steel roller	22	➔ 5	**3SE5000-0AF04**	1	1 unit
3SE5000-0AR01	**Spring rods** (for switches with snap-action contacts only)					
	Plunger made of plastic, spring of high-grade steel:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR01**	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		5	**3SE5000-0AR03**	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		5	**3SE5000-0AR04**	1	1 unit
	Plunger and spring made of high-grade steel:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		5	**3SE5000-0AR02**	1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

3SE5, Metal Enclosures

Enclosure width 56 mm, XL

Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
	mm	d	Article No. / Price per PU		
Twist actuators					
Twist actuators, for 40/56/56 XL mm EN 50041					
• For twist levers and rod actuators, switching right and/or left, adjustable		➔ 2	**3SE5000-0AH00**	1	1 unit
• For fork levers, latching		➔ 5	**3SE5000-0AT10**	1	1 unit
Levers					
Twist levers 27 mm, offset, type A, acc. to EN 50041					
Metal lever, plastic roller	19	➔ 2	**3SE5000-0AA01**	1	1 unit
Metal lever, high-grade steel roller	19	➔ 2	**3SE5000-0AA02**	1	1 unit
Metal lever, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA03**	1	1 unit
Metal lever, 2 plastic rollers	19	➔ 5	**3SE5000-0AA04**	1	1 unit
Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA05**	1	1 unit
Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA07**	1	1 unit
Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA08**	1	1 unit
High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA11**	1	1 unit
High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA12**	1	1 unit
Twist levers 35 mm, offset					
Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA15**	1	1 unit
High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA16**	1	1 unit
Twist levers 30 mm, straight					
Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**	1	1 unit
Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**	1	1 unit
Twist levers, adjustable length, with grid hole					
Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**	1	1 unit
Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**	1	1 unit
Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA67**	1	1 unit
Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**	1	1 unit
High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**	1	1 unit
High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**	1	1 unit
Twist levers, adjustable length					
Metal lever, plastic roller	19	2	**3SE5000-0AA50**	1	1 unit
Metal lever, high-grade steel roller	19	5	**3SE5000-0AA51**	1	1 unit
Metal lever, plastic roller	30	5	**3SE5000-0AA55**	1	1 unit
Metal lever, plastic roller	50	5	**3SE5000-0AA57**	1	1 unit
Metal lever, rubber roller	50	5	**3SE5000-0AA58**	1	1 unit
High-grade steel lever, plastic roller	19	5	**3SE5000-0AA52**	1	1 unit
High-grade steel lever, high-grade steel roller	19	5	**3SE5000-0AA53**	1	1 unit
Fork levers (for switches with snap-action contacts only)					
2 metal levers, 2 plastic rollers	19	➔ 5	**3SE5000-0AT01**	1	1 unit
2 metal levers, 2 high-grade steel rollers	19	➔ 5	**3SE5000-0AT02**	1	1 unit
2 high-grade steel levers, 2 plastic rollers	19	➔ 5	**3SE5000-0AT03**	1	1 unit
2 high-grade steel levers, 2 high-grade steel rollers	19	➔ 5	**3SE5000-0AT04**	1	1 unit
Rod actuators, type D, acc. to EN 50041					
Aluminum rod, length 200 mm	6	5	**3SE5000-0AA80**	1	1 unit
Spring rod, length 200 mm	6	5	**3SE5000-0AA81**	1	1 unit
Plastic rod, length 200 mm	6	5	**3SE5000-0AA82**	1	1 unit
Plastic rod, length 330 mm	6	5	**3SE5000-0AA83**	1	1 unit

3SE5000-0AH00

3SE5000-0AA01

3SE5000-0AA60
3SE5000-0AA50

3SE5000-0AT01

3SE5000-0AA80

➔ Positively driven actuator, necessary in safety circuits.

3SE5, Metal Enclosures

Compact design

Overview

Compact design in width 30 mm

Particularly in harsh environments or on equipment with limited space, the small 3SE54 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 spaces.

3SE54 compact position switches are available in two different widths as complete units:

- The 3SE5413 series complies with the EU standard and features a 30-mm-wide enclosure with drilled holes at a distance of 20 mm.
- The 3SE5423 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 actuator head are made of metal and comply with the high IP67 degree of protection. The following actuators are available:

- Rounded plungers
- Rounded plungers with central fixing
- Rounded plungers with external seal
- Roller plungers
- Roller plungers 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 device plug

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
- Roller plungers can be rotated through 90°
- Twist levers can be rotated through 180°; twist levers can be adjusted in 15° increments
- 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

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 device plug

	Operating mechanism	Enclosure width		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		mm		d				
Complete units • Enclosure width 30 or 40 mm								
	Rounded plungers							
3SE5413-0CC20-1EA2	• Standard mounting							
	- With 2 m cable 5 x 0.75 mm²	30	➔	2	**3SE5413-0CC20-1EA2**		1	1 unit
		40	➔	2	**3SE5423-0CC20-1EA2**		1	1 unit
	- With 5 m cable 5 x 0.75 mm²	30	➔	5	**3SE5413-0CC20-1EA5**		1	1 unit
	- With M12 device plug, 5-pole	30	➔	2	**3SE5413-0CC20-1EB1**		1	1 unit
		40	➔	5	**3SE5423-0CC20-1EB1**		1	1 unit
3SE5413-0CC21-1EA2	• With central fixing M12 x 1							
	- With 2 m cable 5 x 0.75 mm²	30	➔	2	**3SE5413-0CC21-1EA2**		1	1 unit
		40	➔	5	**3SE5423-0CC21-1EA2**		1	1 unit
3SE5413-0CC22-1EA2	• With external seal							
	- With 2 m cable 5 x 0.75 mm²	30	➔	5	**3SE5413-0CC22-1EA2**		1	1 unit
		40	➔	5	**3SE5423-0CC22-1EA2**		1	1 unit
	Roller plungers							
3SE5413-0CD20-1EA2	• Standard mounting							
	- With 2 m cable 5 x 0.75 mm²	30	➔	2	**3SE5413-0CD20-1EA2**		1	1 unit
		40	➔	2	**3SE5423-0CD20-1EA2**		1	1 unit
	- With 5 m cable 5 x 0.75 mm²	30	➔	5	**3SE5413-0CD20-1EA5**		1	1 unit
	- With M12 device plug, 5-pole	30	➔	2	**3SE5413-0CD20-1EB1**		1	1 unit
		40	➔	2	**3SE5423-0CD20-1EB1**		1	1 unit
3SE5413-0CD23-1EA2	• With central fixing M12 x 1							
	- With 2 m cable 5 x 0.75 mm²	30	➔	2	**3SE5413-0CD21-1EA2**		1	1 unit
		40	➔	5	**3SE5423-0CD21-1EA2**		1	1 unit
	• Actuator head rotated 90°							
	- With 2 m cable 5 x 0.75 mm²	30	➔	2	**3SE5413-0CD23-1EA2**		1	1 unit
	Twist levers							
3SE5413-0CN20-1EA2	• Standard mounting							
	- With 2 m cable 5 x 0.75 mm²	30	➔	2	**3SE5413-0CN20-1EA2**		1	1 unit
		40	➔	5	**3SE5423-0CN20-1EA2**		1	1 unit
	- With 5 m cable 5 x 0.75 mm²	30	➔	2	**3SE5413-0CN20-1EA5**		1	1 unit
	- With M12 device plug, 5-pole	30	➔	2	**3SE5413-0CN20-1EB1**		1	1 unit
		40	➔	5	**3SE5423-0CN20-1EB1**		1	1 unit
	• Twist levers with a smaller mounting depth and lower height							
	- With 2 m cable 5 x 0.75 mm²	30	➔	5	**3SE5413-0CP20-1EA2**		1	1 unit
	• Twist levers, adjustable length		NEW					
	- With 2 m cable 5 x 0.75 mm²	30	➔	X	**3SE5413-0CQ20-1EA2**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

3SE5, Open-Type Design

Enclosure width 30 mm

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 snap-action, slow-action or slow-action with make-before-break versions. The stroke is 6 mm.

The empty enclosure can be equipped with all contact block versions, (see page 13/47).

Improved version

The switches have a robust metal plunger with increased abrasion resistance (instead of the teflon plunger). This enables the switch to be approached from a 30° angle.

Selection and ordering data

2 or 3 contacts · Degree of protection IP20 (2 contacts), IP10 (3 contacts)

	Version	Contacts		SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Plastic enclosures • Enclosure width 30 mm								
	With metal plunger							
3SE5250-0BC05	Slow-action contacts	1 NO + 1 NC	➔	2	**3SE5250-0BC05**		1	1 unit
	Snap-action contacts	1 NO + 1 NC	➔	▶	**3SE5250-0CC05**		1	1 unit
3SE5250-0KC05	Slow-action contacts	1 NO + 2 NC	➔	5	**3SE5250-0KC05**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	➔	▶	**3SE5250-0LC05**		1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	➔	2	**3SE5250-0MC05**		1	1 unit
	Slow-action contacts	2 NO + 1 NC	➔	2	**3SE5250-0PC05**		1	1 unit
3SE5250-0AC05	Empty enclosures without contact block	--	➔	5	**3SE5250-0AC05**		1	1 unit
3SE5050-0BA00	**Contact blocks with 2 contacts** For open-type design[1]							
	• Slow-action contacts	1 NO + 1 NC	➔	5	**3SE5050-0BA00**		1	1 unit
	• Snap-action contacts	1 NO + 1 NC						
	- Standard		➔	5	**3SE5050-0CA00**		1	1 unit
	- 2 × 2 mm switching interval		➔	30	**3SE5050-0GA00**		1	1 unit
	- Short stroke		➔	30	**3SE5050-0NA00**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Contact blocks with 3 contacts, see page 13/47.

SIRIUS 3SE5 Mechanical Position Switches

Accessories and spare parts

Selection and ordering data

The quick-release devices and plug-in connections are used for fast installation and replacement of position switches.

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Quick-release devices for enclosure width 40 mm						
3SY3110 3SY3027	**Adapter plates with screws**	5	**3SY3110**		1	1 unit
	Base plate with locking lever	5	**3SY3027**		1	1 unit
Plug-in connections for M20 × 1.5 connecting threads						
3SY3131 3SY3136	**Device plugs (6-pole + PE), for M20 × 1.5** For max. 250 V, 10 A With connecting cable 0.75 mm^2, plastic, degree of protection IP65, ambient temperature -40 ... +90 °C	5	**3SY3131**		1	1 unit
	Cable box (6-pole + PE)[1] With terminal compartment, can be pre-assembled, plastic, degree of protection IP65	2	**3SY3136**		1	1 unit
3SY3127 3SX5100-1SS51	**Device plugs (4-pole), M12, for M20 × 1.5, fixed** For max. 250 V, 4 A, U_{imp} = 2 500 V With 4 connecting cables 0.25 mm^2, plastic, degree of protection IP67, ambient temperature -40 ... +85 °C	5	**3SY3127**		1	1 unit
	Device plugs (5-pole), M12, for M20 × 1.5, fixed For max. 125 V, 4 A, U_{imp} = 1 500 V With 5 connecting cables 0.25 mm^2, plastic, degree of protection IP67, ambient temperature -40 ... +85 °C	5	**3SY3128**		1	1 unit
	Device plugs (8-pole), M12, for M20 × 1.5, fixed, plastic version[2] For max. 30 V, 1.5 A, U_{imp} = 800 V With 8 connecting cables 0.25 mm^2, metal, degree of protection IP67, ambient temperature -25 ... +85 °C	NEW X	**3SX5100-1SS51**		1	1 unit
3RK1902-4CA00-4AA0	**M12 cable box, angled, 4-pole** For AS-Interface, max. 4 A With cabling box, max. 0.75 mm^2	5	**3RK1902-4CA00-4AA0**		1	1 unit
Adapters and cable glands for M20 × 1.5 connecting threads						
3SX9917 3SX9918	**Adapters acc. to CSA, UL and RU,** For cable entry from M20 × 1.5 to NPT 1/2					
	• Metal	5	**3SX9917**		1	1 unit
	• Plastic	30	**3SX9918**		1	1 unit
3SX9926	**Cable glands M20 × 1.5** Plastic					
	• Plastic, degree of protection IP67	2	**3SX9926**		1	1 unit
	• High degree of protection IP69, IEC 60529	5	**3SX5601-1A**		1	1 unit

[1] For wiring, a crimping tool is necessary, max. conductor cross-section 1 mm^2.

[2] Suitable for wiring sensors to be connected to all compact block I/O modules in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series.

SIRIUS 3SE5 Mechanical Position Switches

Accessories and spare parts

	Version	Color/ contacts		SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Optional accessories for 3SE51, 3SE52								
3SE5000-0AC30	**Protective caps** For rounded plungers acc. to EN 50047, 3SE5...-..C05	Black		2	**3SE5000-0AC30**		1	1 unit
3SX5100-3B	**Adapters** with screw[1] For an increase in the mounting depth on the 3SE5000-0AH00 twist actuator, in combination with twist lever with adjustable length or rod actuator			5	**3SX5100-3B**		1	1 unit
3SX5100-1A	**Mounting plate** Suitable for 3SE523. and 3SE521. position switches with a width of 31 mm (in particular for control cabinet types)			5	**3SX5100-1A**		1	1 unit
Spare parts for 3SE51, 3SE52								
3SE5232-0AC05	**Empty enclosures, plastic**	Turquoise						
	Enclosure width 31 mm			5	**3SE5232-0AC05**		1	1 unit
	• With increased corrosion protection			5	**3SE5232-0AC05-1CA0**		1	1 unit
	Enclosure width 40 mm			5	**3SE5132-0AA00**		1	1 unit
	Enclosure width 50 mm			5	**3SE5242-0AC05**		1	1 unit
	• With increased corrosion protection			5	**3SE5242-0AC05-1CA0**		1	1 unit
3SE5212-0AC05	**Empty enclosures, metal**	Turquoise						
	Enclosure width 31 mm			5	**3SE5212-0AC05**		1	1 unit
	• With increased corrosion protection			5	**3SE5212-0AC05-1CA0**		1	1 unit
	Enclosure width 40 mm			5	**3SE5112-0AA00**		1	1 unit
	• With increased corrosion protection			5	**3SE5112-0AA00-1CA0**		1	1 unit
	Enclosure width 56 mm			5	**3SE5122-0AA00**		1	1 unit
	• With increased corrosion protection			5	**3SE5122-0AA00-1CA0**		1	1 unit
	Enclosure width 56 mm, XL[2]			5	**3SE5162-0AA00**		1	1 unit
3SE5000-0BA00	**Contact blocks with 2 contacts**[3]							
	• Slow-action contacts	1 NO + 1 NC	➔	5	**3SE5000-0BA00**		1	1 unit
	• Snap-action contacts	1 NO + 1 NC						
	- Standard		➔	5	**3SE5000-0CA00**		1	1 unit
	- Gold-plated contacts		➔	5	**3SE5000-0CA00-1AC1**		1	1 unit
	- 2 × 2 mm switching interval		➔	30	**3SE5000-0GA00**		1	1 unit
	- Short stroke		➔	5	**3SE5000-0NA00**		1	1 unit
3SE5000-0KA00	**Contact blocks with 3 contacts**							
	• Slow-action contacts	1 NO + 2 NC	➔	5	**3SE5000-0KA00**		1	1 unit
	• Snap-action contacts	1 NO + 2 NC	➔	5	**3SE5000-0LA00**		1	1 unit
	• Slow-action contacts with make-before-break	1 NO + 2 NC	➔	2	**3SE5000-0MA00**		1	1 unit
	• Slow-action contacts	2 NO + 1 NC	➔	2	**3SE5000-0PA00**		1	1 unit
3SE5060-0BA00	**Contact blocks for XL enclosure**[2]							
	• Slow-action contacts	1 NO + 1 NC	➔	5	**3SE5060-0BA00**		1	1 unit
	• Snap-action contacts	1 NO + 1 NC	➔	5	**3SE5060-0CA00**		1	1 unit
	• Slow-action contacts with make-before-break	1 NO + 2 NC	➔	30	**3SE5060-0MA00**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) Possibly required for the conversion from 3SE21 to 3SE51.

2) Equip XL enclosures only with contact combinations, see pages 13/12, 13/40 and 13/41

3) Unsuitable for open-type position switches, see page 13/45.

SIRIUS 3SE5 Mechanical Position Switches

Accessories and spare parts

	Version	Rated voltage LED	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		V	d				
Spare parts for 3SE51, 3SE52							
3SE5230-1AA00	**Covers for plastic enclosures, width 31 mm**						
	• Turquoise with LED	24 DC	5	**3SE5230-1AA00**		1	1 unit
		230 AC	5	**3SE5230-3AA00**		1	1 unit
	• Yellow	--	5	**3SE5230-0AA00-1AG0**		1	1 unit
	• Yellow with LED	24 DC	5	**3SE5230-1AA00-1AG0**		1	1 unit
		230 AC	5	**3SE5230-3AA00-1AG0**		1	1 unit
3SE5130-1AA00-1AG0	**Covers for plastic enclosures, width 40 mm**						
	• Turquoise with LED	24 DC	5	**3SE5130-1AA00**		1	1 unit
		230 AC	5	**3SE5130-3AA00**		1	1 unit
	• Yellow	--	5	**3SE5130-0AA00-1AG0**		1	1 unit
	• Yellow with LED	24 DC	5	**3SE5130-1AA00-1AG0**		1	1 unit
		230 AC	5	**3SE5130-3AA00-1AG0**		1	1 unit
3SE5240-1AA00	**Covers for plastic enclosures, width 50 mm**						
	• Turquoise with LED	24 DC	5	**3SE5240-1AA00**		1	1 unit
		230 AC	5	**3SE5240-3AA00**		1	1 unit
	• Yellow	--	5	**3SE5240-0AA00-1AG0**		1	1 unit
	• Yellow with LED	24 DC	5	**3SE5240-1AA00-1AG0**		1	1 unit
		230 AC	5	**3SE5240-3AA00-1AG0**		1	1 unit
3SE5210-1AA00	**Covers for metal enclosures, width 31 mm**						
	• Turquoise with LED	24 DC	5	**3SE5210-1AA00**		1	1 unit
		230 AC	5	**3SE5210-3AA00**		1	1 unit
	• Yellow	--	5	**3SE5210-0AA00-1AG0**		1	1 unit
	• Yellow with LED	24 DC	5	**3SE5210-1AA00-1AG0**		1	1 unit
		230 AC	5	**3SE5210-3AA00-1AG0**		1	1 unit
3SE5110-1AA00	**Covers for metal enclosures, width 40 mm**						
	• Turquoise with LED	24 DC	5	**3SE5110-1AA00**		1	1 unit
		230 AC	5	**3SE5110-3AA00**		1	1 unit
	• Yellow	--	5	**3SE5110-0AA00-1AG0**		1	1 unit
	• Yellow with LED	24 DC	5	**3SE5110-1AA00-1AG0**		1	1 unit
		230 AC	5	**3SE5110-3AA00-1AG0**		1	1 unit
3SE5120-0AA00-1AG0	**Covers for metal enclosures, width 56 mm**						
	• Turquoise with LED	24 DC	5	**3SE5120-1AA00**		1	1 unit
		230 AC	5	**3SE5120-3AA00**		1	1 unit
	• Yellow	--	5	**3SE5120-0AA00-1AG0**		1	1 unit
	• Yellow with LED	24 DC	5	**3SE5120-1AA00-1AG0**		1	1 unit
		230 AC	5	**3SE5120-3AA00-1AG0**		1	1 unit
	Covers for XL metal enclosures, width 56 mm						
	• Yellow	--	5	**3SE5160-0AA00-1AG0**		1	1 unit

With Separate Actuator

Overview

Safety switches with separate actuator are used where the position of doors, covers or protective grilles must be monitored for safety reasons.

3SE5 safety switches with separate actuator have the same enclosures as the 3SE5 position switches (modular system).

3SE5 safety switches with head for separate actuator

Design

Enclosure sizes

The 3SE5 safety switches are available in four different 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 are safety switches in the 3SE2 series which have been developed 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 device plug (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole device plug + PE on the metal enclosures
- Similarly with a combination of plug and LED indicators
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 13/93).

For a description of the basic switches, (see page 13/7).

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 × 90°. The switches can also be approached from above.

The actuator heads of the 3SE2243 and 3SE2257 switches with special enclosures cannot be changed. The switches can be approached from the two broad sides and from above.

The actuator is not included in the scope of supply of the safety switches and must be ordered separately from a choice of different versions to suit the application (see page 13/56).

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

Radius actuators

The safety switches with radius actuators are particularly suitable for rotary 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 security (see page 13/56).

Blocking inserts with padlock

Dust protection

For use in dusty environments, a rubber cap is offered that protects the actuator entries of the actuator head from contamination (see page 13/56).

Contact reliability

The 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".

With Separate Actuator

3SE5, plastic enclosures, enclosure width 31 mm according to EN 50047

Benefits

The 3SE5 safety switches with separate actuator differ from the previous series through the following new properties:

- All enclosure sizes with increased corrosion protection are optionally available with an 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 approx. 20 to 25% of the time when connecting.
- The ASIsafe electronics are integrated in the enclosure for the versions with AS-Interface connection (see page 13/93); an additional adapter is not required. .

Application

Safety switches with separate actuator are used where the position of doors, covers or protective grilles must be monitored for safety reasons.

The safety 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. The high-grade steel actuator IP69K with optimized geometry is suitable for extreme environmental conditions as low as -40 °C. Different control tasks can be performed with the best contact blocks suited for the particular purpose. Dimensions and 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/EN 60947-5-1

The protective measure of "total insulation" by the molded-plastic enclosure is ensured by the use of molded-plastic screw glands.

Safety position switches

For controls according to IEC/EN 60204-1, the devices can be used as a safety position switch. They comply with the standard EN ISO 14119. A TÜV certificate is available. To secure position switches against changes in their position, keyed techniques must be employed on installation.

Safety circuits

The IEC/EN 60947-5-1 standard requires positive opening of the NC contacts. In other words, 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 in accordance with the standard IEC 60947-5-1 with the symbol ➔.

Category 3 according to EN ISO 13849-1 can be attained with a safety switch with separate actuator if the corresponding fail-safe evaluation units are selected and correctly installed, e.g. the 3SK, 3TK28 safety relays or matching units from the ASI-safe, SIMATIC or SINUMERIK product ranges.

Category 4 can be achieved when using an additional 3SE5 safety switch.

Technical specifications

Type		3SE51..-..V.., 3SE52..-..V..	3SE2257-.XX..		3SE2243-.XX..	
General data						
Standards		IEC 60947-5-1, EN 60947-5-1, EN ISO 14119				
Rated insulation voltage U_i	V	400	500			
Degree of pollution according to IEC 60664-1		Class 3	Class 3			
Rated impulse withstand voltage U_{imp}	kV	6				
Rated operational voltage U_e	V	400 AC; over 300 V AC same potential only	500 AC; over 380 V AC same potential only			
Conventional thermal current I_{th}	A	6	10			
Rated operational current I_e			1-pole		3-pole	
• With alternating current 50/60 Hz		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	10	10	10	10
- At 120 V	A	6	10	10	10	10
- At 240 V	A	4	10	6	10	4
- At 400 V	A	4	10	4	10	4
- At 500 V	A	--	10	3	10	3
• For direct current		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	10	10	10	10
- At 125 V	A	0.55	--	--	--	--
- At 250 V	A	0.27	--	--	--	--
- At 110 V	A	--	4	1	4	1
- At 220 V	A	--	1	0.4	1	0.4
- At 400 V	A	0.12	--	--	--	--
- At 440 V	A	--	0.5	0.2	0.5	0.2
Short-circuit protection						
• With DIAZED fuse links, operational class gG	A	6	6			
• With fuse links, quick	A	--	10			
• With miniature circuit breaker, C char. ($I_{K< 400A}$)	A	1	--			
Mechanical endurance		1×10^6 operating cycles				
Electrical endurance						
• With 3RH.1, 3RT contactors in size S00, S0		1×10^6 operating cycles	$> 1 \times 10^6$ operating cycles			
• For utilization category AC-15 when switching off I_e / AC-15 at 240 V		100 000 operating cycles	500 000 operating cycles			
Switching frequency With 3RH.1, 3RT contactors in size S00, S0		6 000 operating cycles/h				
Minimum pull-out force for positive opening	N	20	10		30	

With Separate Actuator

3SE5, plastic enclosures, enclosure width 40 mm according to EN 50041

Selection and ordering data

2 or 3 contacts · 5 directions of approach · Degree of protection IP65 · Cable entry M20 × 1.5

	Version[1]	Contacts	LEDs		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Enclosure width 31 mm according to EN 50047									
3SE5232-0RV40	Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5232-0RV40**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	⊖	▶	**3SE5232-0QV40**		1	1 unit
	With increased minimum pull-out force 30 N								
	Slow-action contacts	1 NO + 2 NC	--	⊖	5	**3SE5232-0QV40-1AA1**		1	1 unit
3SE5234-0RV40-1AC4	**With M12 device plug, 4-pole (250 V, 4 A)**								
	Slow-action contacts	1 NO + 1 NC	--	⊖	5	**3SE5234-0RV40-1AC4**		1	1 unit
	Slow-action contacts	2 NC	--	⊖	5	**3SE5234-0QV40-1AE0**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[2] NEW								
	Slow-action contacts	2 NC	--	⊖	X	**3SE5234-0QV40-1AE2**		1	1 unit
3SE5232-1RV40	**With 2 LEDs, yellow/green**								
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊖	5	**3SE5232-1RV40**		1	1 unit
	Slow-action contacts	1 NO + 1 NC	230 V AC	⊖	5	**3SE5232-3RV40**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A)**, and 2 LEDs**								
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊖	5	**3SE5234-1RV40-1AF3**		1	1 unit

⊖ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/56).

2) The 3SE5234-.....-1AE2 position switches, prewired with an M12 plug, 5-pole, have the same pin assignment as all compact block I/O modules with a PROFINET connection in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series with IP65/IP67 degree of protection for cabinet-free installation directly at the machine.

With Separate Actuator

3SE5, plastic enclosures, enclosure width 40 mm according to EN 50041

Selection and ordering data

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version[1]	Contacts	LEDs		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Enclosure width 40 mm acc. to EN 50041									
3SE5132-0QV20	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5132-0QV20**		1	1 unit
3SE5132-1QV20	**With 2 LEDs, yellow/green**								
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5132-1QV20**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5132-3QV20**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately (see page 13/56).

With Separate Actuator

3SE5, plastic enclosures, enclosure width 50 mm

Selection and ordering data

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version[1]	Contacts	LEDs		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosure width 50 mm									
3SE5242-0QV40	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5242-0QV40**		1	1 unit
	With increased minimum pull-out force 30 N								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5242-0RV40-1AA1**		1	1 unit
3SE5242-1QV40	**With 2 LEDs, yellow/green**								
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5242-1QV40**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5242-3QV40**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/56).

With Separate Actuator

3SE5, metal enclosures, enclosure width 31 mm according to EN 50047

Selection and ordering data

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version[1]	Contacts	LEDs		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Enclosure width 31 mm according to EN 50047									
3SE5212-0RV40	Slow-action contacts	1 NO + 1 NC	--	➔	2	**3SE5212-0RV40**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5212-0QV40**		1	1 unit
3SE5212-1RV40	**With 2 LEDs, yellow/green**								
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5212-1RV40**		1	1 unit
	Slow-action contacts	1 NO + 1 NC	230 V AC	➔	5	**3SE5212-3RV40**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately (see page 13/56).

With Separate Actuator

3SE5, metal enclosures, enclosure width 40 mm according to EN 50041 / 56 mm

Selection and ordering data

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version[1]	Contacts	LEDs		SD	Complete units		PU (UNIT, SET, M)	PS*
					d	Article No.	Price per PU		
Enclosure width 40 mm acc. to EN 50041									
3SE5112-0QV10	Slow-action contacts	1 NO + 2 NC	--	➔	▶	**3SE5112-0QV10**		1	1 unit
	With increased minimum pull-out force 30 N								
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0QV10-1AA7**		1	1 unit
3SE5114-0RV10-1AC5	**With M12 device plug, 5-pole (125 V, 4 A)**								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5114-0RV10-1AC5**		1	1 unit
	Slow-action contacts	2 NC	--	➔	5	**3SE5114-0QV10-1AE1**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), with pin assignment as for SIMATIC ET 200[2] NEW								
	Slow-action contacts	2 NC	--	➔	X	**3SE5114-0QV10-1AE3**		1	1 unit
	With device plug, 6-pole + PE (250 V, 10 A)								
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5115-0QV10-1AD1**		1	1 unit
3SE5112-1QV10	**With 2 LEDs, yellow/green**								
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5112-1QV10**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5112-3QV10**		1	1 unit
	With M12 device plug, 5-pole (125 V, 4 A), and 2 LEDs								
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5114-1RV10-1AF3**		1	1 unit
	With device plug, 6-pole + PE (250 V, 10 A), and 2 LEDs								
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔	5	**3SE5115-1RV10-1AF2**		1	1 unit
Enclosure width 56 mm									
3SE5122-0QV10	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0QV10**		1	1 unit
	With increased minimum pull-out force 30 N								
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0QV10-1AA7**		1	1 unit
3SE5122-1QV10	**With 2 LEDs, yellow/green**								
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	5	**3SE5122-1QV10**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	5	**3SE5122-3QV10**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/56).

2) The 3SE5114-.....-1AE3 position switches, prewired with an M12 plug, 5-pole, have the same pin assignment as all compact block I/O modules with a PROFINET connection in the SIMATIC ET 200eco PN, ET 200eco PN-F and ET 200AL series with IP65/IP67 degree of protection for cabinet-free installation directly at the machine.

Selection and ordering data

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
IP66/IP67						
3SE5000-0AV01	**Standard actuator**					
	• Length 75.6 mm	▶	**3SE5000-0AV01**		1	1 unit
3SE5000-0AV02	• With vertical fixing, length 53 mm	5	**3SE5000-0AV02**		1	1 unit
3SE5000-0AV03	• With transverse fixing, length 47 mm	5	**3SE5000-0AV03**		1	1 unit
3SE5000-0AW11	• With transverse fixing, plastic[1], length 40 mm	5	**3SE5000-0AW11**		1	1 unit
3SE5000-0AW51	**High-grade steel actuator, IP69K[2]**					
	• Length 75.6 mm	5	**3SE5000-0AW51**		1	1 unit
3SE5000-0AV06	**Radius actuator**, length 51 mm					
	• Direction of approach from the left	2	**3SE5000-0AV04**		1	1 unit
	• Direction of approach from the right	5	**3SE5000-0AV06**		1	1 unit
3SE5000-0AV05-1AA6	**Universal radius actuator**					
	• Length 77 mm	5	**3SE5000-0AV05**		1	1 unit
	• Length 77 mm, tab rotated 90°	5	**3SE5000-0AV05-1AA6**		1	1 unit
3SE5000-0AV07	**Universal radius actuator, heavy duty**					
	• Length 67 mm	2	**3SE5000-0AV07-1AK2**		1	1 unit
	• Length 77 mm	5	**3SE5000-0AV07**		1	1 unit
Optional accessories for 3SE5						
3SE5000-0AV08-1AA2	**Protective caps**, black rubber For the actuator head, to protect the actuator openings from contamination (Only for enclosure width 40 or 56 mm)	5	**3SE5000-0AV08-1AA2**		1	1 unit
3SE5000-0AV08-1AA3	**Blocking inserts**, high-grade steel, for actuator head For up to eight padlocks	5	**3SE5000-0AV08-1AA3**		1	1 unit
Connections for 3SE5, 3SE2						
3SY3127 3SX9926	**Device plugs (4-pole), M12, fixed for M20 × 1.5** With connecting cable 0.25 mm², plastic, degree of protection IP67, ambient temperature -40 to +85 °C					
	For max. 250 V, 4 A	5	**3SY3127**		1	1 unit
	For max. 125 V, 4 A	5	**3SY3128**		1	1 unit
	Cable glands M20 × 1.5 Plastic	2	**3SX9926**		1	1 unit

[1] Not suitable for safety switches with tumbler.

[2] With optimized geometry and suitable for extreme environmental conditions such as -40 °C

With Separate Actuator

3SE2, plastic enclosures, special width 52 mm

Selection and ordering data

1 or 3 contacts · 3 directions of approach · Degree of protection IP67

	Version	Operation		SD	Complete units		PU (UNIT, SET, M)	PS*
				d	Article No.	Price per PU		
Plastic enclosures in special width of 52 mm								
3SE2243	**Lateral and front-end actuation**[1]	6 mm stroke						
	• With connecting thread M20 × 1.5							
	- Slow-action contacts 1 NO + 2 NC	Holding force 5 N	➔	2	**3SE2243-0XX40**		1	1 unit
		Holding force 30 N	➔	2	**3SE2243-0XX**		1	1 unit
		With automatic ejection	➔	2	**3SE2243-0XX30**		1	1 unit
	- Slow-action contacts 1 NC	Holding force 5 N	➔	15	**3SE2257-6XX40**		1	1 unit
		Holding force 30 N	➔	15	**3SE2257-6XX**		1	1 unit
		With automatic ejection	➔	5	**3SE2257-6XX30**		1	1 unit
	• With connecting thread M16 × 1.5							
	- Slow-action contacts 1 NO + 2 NC	Holding force 30 N	➔	10	**3SE2243-0XX18**		1	1 unit
Accessories								
	Actuators							
3SX3218	• Standard actuators (r_{min} = 150 mm), length 28 mm			2	**3SX3218**		1	1 unit
3SX3228	• Universal radius actuator (r_{min} = 45 mm), length 34 mm			2	**3SX3228**		1	1 unit
3SX3256	• Radius actuator, adjustable radius, length 34 mm			10	**3SX3256**		1	1 unit
3SX3217	• Ball locating, force adjustable up to max. 100 N by 2 adjustable screws, length 28 mm			2	**3SX3217**		1	1 unit
3SX3234	• Actuator, length 34 mm, with dust protection and slit cover			30	**3SX3234**		1	1 unit
	Accessories							
	• Slit cover (1 set = 3 units)			30	**3SX3233**		1	3 units

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator.

With Tumbler

General data

Overview

The safety switches with tumbler are exceptional safety-related devices which 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 switched-off machine).

3SE5 safety switch with tumbler

The safety switches with tumbler are comprised of a switch part with electromechanical tumbler 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 safety switches with tumbler are offered in plastic or metal enclosures.

Dimensions (W × H × D): 54 mm × 185 mm × 43.5 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 switches can also be approached from above.

The actuator is not included in the scope of supply of the safety switches and must be ordered separately from a choice of different versions to suit the application (see page 13/64).

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 safety switches with radius actuators are particularly suitable for rotary 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 security (see page 13/65).

Dust protection

A rubber cap to protect the actuator entry of the actuator head from contamination is available for operation in dusty environments (see page 13/65).

Tumbler

There are two versions for interlocking the actuator:

- Spring-actuated lock (closed-circuit principle) with various release mechanisms
- Solenoid-locked (open-circuit principle)

The spring-actuated lock switch is equipped with an auxiliary release for emergency situations or setup mode. Available as options:

- Escape release or
- Emergency release

Contact blocks

The safety switches with tumbler have one switching block each for:

- Monitoring the actuator or the position of the protective door
- Monitoring the position of the solenoid

The mechanical design of the switches corresponds to the requirements of the fail-safe principle according to EN ISO 14119.

Optical signaling equipment

The safety switches with tumbler are available with an optional optical signaling device.

The signaling device indicates the switch position of the interlock and the protective device optically by means of 2 LEDs on the front.

Protective device	Tumbler	Display	Meaning
Closed	Released		Actuator able to be pulled
Closed	Locked		Actuator locked
Open	Released		Actuator pulled

Internal wiring:

- The yellow LED is pre-wired to the solenoid monitoring NO contact.
- The green LED is pre-wired to the actuator monitoring NC contact.
- LED ground is pre-wired to the ground of the solenoid.

Note:

- The operational voltage must be connected to the corresponding contacts by the customer.
- This voltage for the LEDs must match the operational voltage of the solenoid (same potential).

With Tumbler

General data

Benefits

The new generation of 3SE53 safety switches offers:

- More safety through higher locking forces:
  - 1 300 N with plastic enclosure
  - 2 600 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 versions: Plastic, metal or with integrated ASIsafe
- An extensive range of actuators
- An optional LED status display 24 V DC, 115 V or 230 V AC for all switch versions
- Devices with ASIsafe electronics integrated in the enclosure/ wired to 8-pole M12 device plug (see page 13/97).
- 3SE5322-1S.21-1AG4 series with high degree of protection IP69, IP69K in accordance with IEC 60529, cover with foamed seal

Application

The safety switches with tumbler are exceptional safety-related devices which 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 switched-off machine).

The safety position switches with tumbler 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 tumbler

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 fail-safe principle according to EN ISO 14119.

Approvals

The switches are approved for use with locking devices according to EN ISO 14119 and EN 292, Parts 1 and 2.

Category 3 according to EN ISO 13849-1 can be attained with a safety switch with tumbler if the corresponding fail-safe evaluation units are selected and correctly installed, e.g. the 3SK or 3TK28 safety relays or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.

Category 4 can be achieved when using an additional 3SE5 safety switch.

These switches are approved according to UL 508, UL 50 and UL 746-C.

Tumbler

The separate actuator works like a key using coding 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 safety 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 3SE5 3 safety switches are also available with an escape release or emergency release.

- Personnel working inside the hazard zone can use the escape release feature to manually release the tumbler 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 tumbler 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 of the mechanical lock.

Escape release from the front

Emergency release from the back

Solenoid-locked (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 coasting times.

Technical specifications

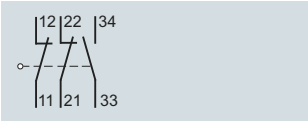
Type		3SE5322	3SE5312
General data			
Standards		IEC/EN 60947-5-1, EN ISO 14119	
Rated insulation voltage U_i	V	250	
Degree of pollution according to IEC 60664-1		Class 3	
Rated impulse withstand voltage U_{imp}	kV	4	
Rated operational voltage U_e			
• DC	V	24	
• 50/60 Hz AC	V	230	
Conventional thermal current I_{th}	A	6	
Rated operational current I_e			
• With alternating current 50/60 Hz		I_e / AC-15 or B300	
- At 24 V	A	6	
- At 120 V	A	6	
- At 240 V	A	3	
• For direct current		I_e / DC-13 or Q300	
- At 24 V	A	3	
- At 125 V	A	0.55	
- At 250 V	A	0.27	
Solenoid			
• Locking force, max.	N	1 300	2 600
• Locking force acc. to EN ISO 14119	N	1 000	2 000
• Power consumption at U_c	W	3.5	
Short-circuit protection[1]			
• With DIAZED fuse links, utilization category gG	A	6	
• With miniature circuit breaker, C char.	A	0.5	
Mechanical endurance	Operating cycles	1×10^6	
Electrical endurance			
• With 3RH.1, 3RT contactors in size S00, S0	Operating cycles	1×10^6	
• For utilization category AC-15 when switching off I_e / AC-15 at 230 V	Operating cycles	100 000	
• With utilization category DC-12/DC-13		For direct current depending on the loading of the switch	
Switching frequency With 3RH.1, 3RT contactors in size S00, S0	Operating cycles/h	6 000	
Shock resistance acc. to IEC 60068-2-27	g/ms	30/11	

[1] Without any welds according to IEC 60947-5-1.

Circuit diagrams

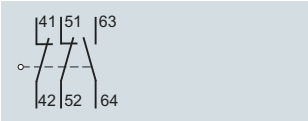
Monitoring the actuator

Slow-action contacts 1 NO + 2 NC



Monitoring the solenoid

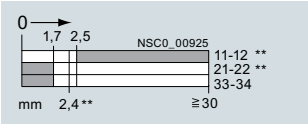
Slow-action contacts 1 NO + 2 NC



Operating travel

Monitoring the actuator

Slow-action contacts 1 NO + 2 NC



With Tumbler

3SE5, plastic enclosures with locking force greater than 1 200 N

Selection and ordering data

6 slow-action contacts 5 directions of approach Degree of pr otection IP66/IP67 Cable entry 3 × M20 × 1.5 Locking force 1 30 0 N

	Tumbler[1]	LEDs	Solenoid, rated operational voltage		SD	Complete units Position monitoring: Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC	PU (UNIT, SET, M)	PS*
			V		d	Article No. / Price per PU		
1 300 N locking force · Enclosure width 54 mm								
3SE5322-0SD21	**Spring-actuated lock**							
	• With auxiliary release	--	24 DC	⊖	▶	**3SE5322-0SD21**	1	1 unit
		--	115 AC	⊖	5	**3SE5322-0SD22**	1	1 unit
		--	230 AC	⊖	5	**3SE5322-0SD23**	1	1 unit
		Yellow/Green	24 DC	⊖	2	**3SE5322-1SD21**	1	1 unit
		Yellow/Green	115 AC	⊖	5	**3SE5322-2SD22**	1	1 unit
		Yellow/Green	230 AC	⊖	5	**3SE5322-3SD23**	1	1 unit
3SE5322-0SE21	• With auxiliary release with lock	--	24 DC	⊖	5	**3SE5322-0SE21**	1	1 unit
		--	115 AC	⊖	5	**3SE5322-0SE22**	1	1 unit
		--	230 AC	⊖	5	**3SE5322-0SE23**	1	1 unit
		Yellow/Green	24 DC	⊖	5	**3SE5322-1SE21**	1	1 unit
		Yellow/Green	115 AC	⊖	5	**3SE5322-2SE22**	1	1 unit
		Yellow/Green	230 AC	⊖	5	**3SE5322-3SE23**	1	1 unit
3SE5322-0SF21	• With escape release from the front	--	24 DC	⊖	5	**3SE5322-0SF21**	1	1 unit
		--	115 AC	⊖	5	**3SE5322-0SF22**	1	1 unit
		--	230 AC	⊖	5	**3SE5322-0SF23**	1	1 unit
		Yellow/Green	24 DC	⊖	5	**3SE5322-1SF21**	1	1 unit
		Yellow/Green	115 AC	⊖	5	**3SE5322-2SF22**	1	1 unit
		Yellow/Green	230 AC	⊖	5	**3SE5322-3SF23**	1	1 unit
	• With escape release from the front and emergency release from the back	--	24 DC	⊖	5	**3SE5322-0SL21**	1	1 unit
3SE5322-0SG21	• With escape release from the back and auxiliary release from the front	--	24 DC	⊖	5	**3SE5322-0SG21**	1	1 unit
		--	115 AC	⊖	5	**3SE5322-0SG22**	1	1 unit
		--	230 AC	⊖	5	**3SE5322-0SG23**	1	1 unit
		Yellow/Green	24 DC	⊖	5	**3SE5322-1SG21**	1	1 unit
		Yellow/Green	115 AC	⊖	5	**3SE5322-2SG22**	1	1 unit
		Yellow/Green	230 AC	⊖	5	**3SE5322-3SG23**	1	1 unit
	• With escape release from the back and auxiliary release with lock from the front	--	24 DC	⊖	5	**3SE5322-0SH21**	1	1 unit
3SE5322-0SJ21	• With emergency release from the back and auxiliary release from the front	--	24 DC	⊖	5	**3SE5322-0SJ21**	1	1 unit
		--	115 AC	⊖	5	**3SE5322-0SJ22**	1	1 unit
		--	230 AC	⊖	5	**3SE5322-0SJ23**	1	1 unit
		Yellow/Green	24 DC	⊖	5	**3SE5322-1SJ21**	1	1 unit
		Yellow/Green	115 AC	⊖	5	**3SE5322-2SJ22**	1	1 unit
		Yellow/Green	230 AC	⊖	5	**3SE5322-3SJ23**	1	1 unit
3SE5322-1SB21	**Solenoid-locked**	--	24 DC	⊖	▶	**3SE5322-0SB21**	1	1 unit
		--	115 AC	⊖	5	**3SE5322-0SB22**	1	1 unit
		--	230 AC	⊖	5	**3SE5322-0SB23**	1	1 unit
	• With device plug, 8-pole Head rotated clockwise by 90°	Yellow/Green	24 DC	NEW ⊖	5	**3SE5324-0SB21-1AC8**	1	1 unit
		Yellow/Green	24 DC	NEW ⊖	5	**3SE5324-0SB21-1AP0**	1	1 unit
		Yellow/Green	24 DC	⊖	2	**3SE5322-1SB21**	1	1 unit
		Yellow/Green	115 AC	⊖	5	**3SE5322-2SB22**	1	1 unit
		Yellow/Green	230 AC	⊖	5	**3SE5322-3SB23**	1	1 unit

⊖ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately (see page 13/64).

With Tumbler

3SE5, plastic enclosures with locking force greater than 1 200 N

6 slow-action contacts · 5 directions of approach · **Degree of protection IP69K** · Cable entry 3 × M20 × 1.5 · Locking force 1 300 N

- With foamed seal and special cover

	Tumbler[1]	LEDs	Solenoid, rated operational voltage		SD	**Complete units** Position monitoring: Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC		PU (UNIT, SET, M)	PS*
			V		d	Article No.	Price per PU		
1 300 N locking force · Enclosure width 54 mm · Degree of protection IP69K									
3SE5322-1SD21-1AG4	**Spring-actuated locks** • With auxiliary release	Yellow/Green	24 DC	➔	5	**3SE5322-1SD21-1AG4**		1	1 unit
3SE5322-1SE21-1AG4	• With auxiliary release with lock	Yellow/Green	24 DC	➔	5	**3SE5322-1SE21-1AG4**		1	1 unit
3SE5322-1SF21-1AG4	• With escape release from the front	Yellow/Green	24 DC	➔	5	**3SE5322-1SF21-1AG4**		1	1 unit
3SE5322-1SG21-1AG4	• With escape release from the back and auxiliary release from the front	Yellow/Green	24 DC	➔	5	**3SE5322-1SG21-1AG4**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately (see page 13/64).

Accessories

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Accessories						
3SX5601-1A	**Cable glands M20 × 1.5** Plastic High degree of protection IP69, IEC 60529	5	**3SX5601-1A**		1	1 unit

With Tumbler

3SE5, metal enclosures with locking force greater than 2 000 N

Selection and ordering data

6 slow-action contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry 3 × M20 × 1.5 · Locking force 2 600 N

	Tumbler[1]	LEDs	Solenoid, rated operational voltage		SD	Complete units Position monitoring: Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC		PU (UNIT, SET, M)	PS*
			V		d	Article No.	Price per PU		
2 600 N locking force · Enclosure width 54 mm									
3SE5312-0SD11	**Spring-actuated locks**								
	• With auxiliary release	--	24 DC	⊕	▶	**3SE5312-0SD11**		1	1 unit
		--	115 AC	⊕	5	**3SE5312-0SD12**		1	1 unit
		--	230 AC	⊕	5	**3SE5312-0SD13**		1	1 unit
		Yellow/Green	24 DC	⊕	5	**3SE5312-1SD11**		1	1 unit
		Yellow/Green	115 AC	⊕	5	**3SE5312-2SD12**		1	1 unit
		Yellow/Green	230 AC	⊕	5	**3SE5312-3SD13**		1	1 unit
3SE5312-0SE11	• With auxiliary release with lock	--	24 DC	⊕	5	**3SE5312-0SE11**		1	1 unit
		--	115 AC	⊕	5	**3SE5312-0SE12**		1	1 unit
		--	230 AC	⊕	5	**3SE5312-0SE13**		1	1 unit
		Yellow/Green	24 DC	⊕	5	**3SE5312-1SE11**		1	1 unit
		Yellow/Green	115 AC	⊕	5	**3SE5312-2SE12**		1	1 unit
		Yellow/Green	230 AC	⊕	5	**3SE5312-3SE13**		1	1 unit
3SE5312-0SF11	• With escape release from the front	--	24 DC	⊕	5	**3SE5312-0SF11**		1	1 unit
		--	115 AC	⊕	5	**3SE5312-0SF12**		1	1 unit
		--	230 AC	⊕	5	**3SE5312-0SF13**		1	1 unit
		Yellow/Green	24 DC	⊕	5	**3SE5312-1SF11**		1	1 unit
		Yellow/Green	115 AC	⊕	5	**3SE5312-2SF12**		1	1 unit
		Yellow/Green	230 AC	⊕	5	**3SE5312-3SF13**		1	1 unit
3SE5312-0SG11	• With escape release from the back and auxiliary release from the front	--	24 DC	⊕	5	**3SE5312-0SG11**		1	1 unit
		--	115 AC	⊕	5	**3SE5312-0SG12**		1	1 unit
		--	230 AC	⊕	5	**3SE5312-0SG13**		1	1 unit
		Yellow/Green	24 DC	⊕	5	**3SE5312-1SG11**		1	1 unit
		Yellow/Green	115 AC	⊕	5	**3SE5312-2SG12**		1	1 unit
		Yellow/Green	230 AC	⊕	5	**3SE5312-3SG13**		1	1 unit
	• With escape release from the back and auxiliary release with lock from the front	--	24 DC	⊕	5	**3SE5312-0SH11**		1	1 unit
3SE5312-0SJ11	• With emergency release from the back and auxiliary release from the front	--	24 DC	⊕	5	**3SE5312-0SJ11**		1	1 unit
		--	115 AC	⊕	5	**3SE5312-0SJ12**		1	1 unit
		--	230 AC	⊕	5	**3SE5312-0SJ13**		1	1 unit
		Yellow/Green	24 DC	⊕	5	**3SE5312-1SJ11**		1	1 unit
		Yellow/Green	115 AC	⊕	5	**3SE5312-2SJ12**		1	1 unit
		Yellow/Green	230 AC	⊕	5	**3SE5312-3SJ13**		1	1 unit
3SE5312-0SB11	**Solenoid-locked**	--	24 DC	⊕	▶	**3SE5312-0SB11**		1	1 unit
		--	115 AC	⊕	5	**3SE5312-0SB12**		1	1 unit
		--	230 AC	⊕	5	**3SE5312-0SB13**		1	1 unit
		Yellow/Green	24 DC	⊕	5	**3SE5312-1SB11**		1	1 unit
		Yellow/Green	115 AC	⊕	5	**3SE5312-2SB12**		1	1 unit
		Yellow/Green	230 AC	⊕	5	**3SE5312-3SB13**		1	1 unit

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately (see page 13/64).

Selection and ordering data

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
IP66/IP67						
3SE5000-0AV01	**Standard actuator**	▶	**3SE5000-0AV01**		1	1 unit
	• Length 75.6 mm					
3SE5000-0AV02	• With vertical fixing, length 53 mm	5	**3SE5000-0AV02**		1	1 unit
3SE5000-0AV03	• With transverse fixing, length 47 mm	5	**3SE5000-0AV03**		1	1 unit
3SE5000-0AW51	**High-grade steel actuator, IP69K[1)]**					
	• Length 75.6 mm	5	**3SE5000-0AW51**		1	1 unit
3SE5000-0AW52	• With vertical fixing, length 53 mm	5	**3SE5000-0AW52**		1	1 unit
3SE5000-0AW53	• With transverse fixing, length 47 mm	5	**3SE5000-0AW53**		1	1 unit
3SE5000-0AV06	**Radius actuator**, length 51 mm					
	• Direction of approach from the left	2	**3SE5000-0AV04**		1	1 unit
	• Direction of approach from the right	5	**3SE5000-0AV06**		1	1 unit
3SE5000-0AV05-1AA6	**Universal radius actuator**					
	• Length 77 mm	5	**3SE5000-0AV05**		1	1 unit
	• Length 77 mm, tab rotated 90°	5	**3SE5000-0AV05-1AA6**		1	1 unit
3SE5000-0AV07	**Universal radius actuator, heavy duty**					
	• Length 67 mm	2	**3SE5000-0AV07-1AK2**		1	1 unit
	• Length 77 mm	5	**3SE5000-0AV07**		1	1 unit

For further plug versions, see page 13/46.

1) With optimized geometry and suitable for extreme environmental conditions such as -40 °C

With Tumbler

Accessories

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Optional accessories for 3SE5						
3SE5000-0AV08-1AA2	**Protective caps**, black rubber For the actuator head, to protect the actuator openings from contamination	5	**3SE5000-0AV08-1AA2**		1	1 unit
3SE5000-0AV08-1AA3	**Blocking inserts**, high-grade steel, for actuator head For up to eight padlocks	5	**3SE5000-0AV08-1AA3**		1	1 unit
Spare parts for 3SE5						
	Spare keys	5	**3SX5100-1F**		1	1 unit
Connection for 3SE5						
3SY3127	**Device plugs (4-pole), M12, fixed for M20 × 1.5** For max. 250 V, 4 A With connecting cable 0.25 mm^2, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	5	**3SY3127**		1	1 unit
	Device plugs (5-pole), M12, fixed for M20 × 1.5 For max. 125 V, 4 A With connecting cable 0.25 mm^2, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	5	**3SY3128**		1	1 unit
3SX9926	**Cable glands M20 × 1.5** Plastic					
	• Degree of protection IP67	2	**3SX9926**		1	1 unit
	• High degree of protection IP69, IEC 60529	5	**3SX5601-1A**		1	1 unit

For further plug versions, see page 13/46.

General data

Overview

3SE5 hinge switches have the same enclosures as the 3SE5 position 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:

- With two or three-pole switching elements designed as snap-action contacts
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 13/100).

For a description of the basic switches, (see page 13/7).

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

3SE2283 hinge switches

The 3SE2283 hinge switches with integrated hinge are available in a special design. They are particularly suitable for use in machine doors and flaps.

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, page 13/8).
- The new three-pole contact block 1 NO + 2 NC is available for all enclosure sizes (see picture, page 13/8).
- The plastic enclosure with a width of 31 mm has simple and fast wiring equipment which makes it possible to save approx. 20 to 25% of the time when connecting (see picture, page 13/8).
- The ASIsafe electronics are integrated in the enclosure for the versions with AS-Interface connection (see page 13/85); 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 flaps 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 contact blocks best 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/EN 60947-5-1

The protective measure of "total insulation" by the plastic enclosure is ensured by the use of molded-plastic screw glands.

Safety position switches

For controls according to IEC/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

The IEC/EN 60947-5-1 standard requires positive opening of the NC contacts. In other words, 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 in accordance with IEC 60947-5-1 with the symbol ⊖.

Category 4 according to EN ISO 13849-1 can be attained with the 3SE5 hinge switches with ⊖ if the corresponding fail-safe evaluation units are selected and correctly installed, e.g. the 3SK or 3TK28 safety relays or matching devices from the ASIsafe, SIMATIC or SINUMERIK product ranges.

3SE5, Plastic Enclosures

Enclosure width 31 mm acc. to EN 50047 / 40 mm according to EN 50041

Technical specifications

The technical specifications are the same as for the standard switches, (see page 13/11).

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		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Plastic enclosures · Enclosure width 31 mm acc. to EN 50047								
3SE5232-0HU21	**With hollow shaft**							
	Operating angle 10°	1 NO + 1 NC[1)]	➔	5	**3SE5232-0HU21**		1	1 unit
	Operating angle 10°	1 NO + 2 NC	➔	5	**3SE5232-0LU21**		1	1 unit
3SE5232-0HU22	**With solid shaft**							
	Operating angle 10°	1 NO + 1 NC[1)]	➔	5	**3SE5232-0HU22**		1	1 unit
	Operating angle 10°	1 NO + 2 NC	➔	5	**3SE5232-0LU22**		1	1 unit
Plastic enclosures · Enclosure width 40 mm acc. to EN 50041								
3SE5132-0LU21	**With hollow shaft**							
	Operating angle 10°	1 NO + 2 NC	➔	5	**3SE5132-0LU21**		1	1 unit
3SE5132-0LU22	**With solid shaft**							
	Operating angle 10°	1 NO + 2 NC	➔	5	**3SE5132-0LU22**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) Contact blocks permanently integrated, replacement not available.

Spare parts

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Actuator heads						
3SE5000-0AU21	**With hollow shaft**					
	Operating angle 10°	5	**3SE5000-0AU21**		1	1 unit
3SE5000-0AU22	**With solid shaft**					
	Operating angle 10°	5	**3SE5000-0AU22**		1	1 unit

Note: The respective actuators are included in the scope of supply for the complete units.

3SE5, Plastic Enclosures

Enclosure width 31 mm acc. to EN 50047 / 40 mm according to EN 50041

Selection and ordering data

Complete units

3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version	Snap-action contacts		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Metal enclosures · Enclosure width 31 mm acc. to EN 50047								
3SE5212-0LU21	**With hollow shaft** Operating angle 10°	1 NO + 2 NC	➔	5	**3SE5212-0LU21**		1	1 unit
3SE5212-0LU22	**With solid shaft** Operating angle 10°	1 NO + 2 NC	➔	5	**3SE5212-0LU22**		1	1 unit
Metal enclosures · Enclosure width 40 mm acc. to EN 50041								
3SE5112-0LU21	**With hollow shaft** Operating angle 10°	1 NO + 2 NC	➔	5	**3SE5112-0LU21**		1	1 unit
3SE5112-0LU22	**With solid shaft** Operating angle 10°	1 NO + 2 NC	➔	5	**3SE5112-0LU22**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

Spare parts

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Actuator heads						
3SE5000-0AU21	**With hollow shaft** Operating angle 10°	5	**3SE5000-0AU21**		1	1 unit
3SE5000-0AU22	**With solid shaft** Operating angle 10°	5	**3SE5000-0AU22**		1	1 unit

Note: The respective actuators are included in the scope of supply for the complete units.

3SE2, Plastic Enclosures

With integrated hinge

Overview

The 3SE2283 hinge switches with built-in hinge 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 the 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° or 8°
- Protection against personal injury provided by positively driven NC contacts according to IEC 60947-5-1
- Simultaneous shutdown and signaling by 1 NO + 2 NC contacts

Technical specifications

Type		3SE2283
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 × 10^6 operating cycles
Switching frequency		1 200 operating cycles/h
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^2 / AWG 15

3SE2, Plastic Enclosures

With integrated hinge

Selection and ordering data

3 contacts · Degree of protection IP65 · Cable entry 2 × (M20 × 1.5)

Version	Slow-action contacts		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Plastic enclosures with integrated hinge							
3SE2283							
With integrated hinge (Scope of supply includes additional hinge and fixing accessories)							
• Aluminum hinge							
- 4° actuating angle	1 NO + 2 NC	➔	15	**3SE2283-0GA43**		1	1 unit
- 4° actuating angle	3 NC	➔	5	**3SE2283-6GA43**		1	1 unit
- 8° actuating angle	1 NO + 2 NC	➔	10	**3SE2283-0GA53**		1	1 unit
- 8° actuating angle	3 NC	➔	15	**3SE2283-6GA53**		1	1 unit
• High-grade steel hinge							
- 4° actuating angle	1 NO + 2 NC	➔	5	**3SE2283-0GA44**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

Accessories/spare parts

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Accessories					
3SX3225					
Additional hinge (Scope of supply includes fixing accessories)					
• Made of aluminum	10	**3SX3225**		1	1 unit

SIRIUS 3SE5 Mechanical Position Switches, Shock and Vibration Test

3SE5, plastic enclosures, enclosure width 31 mm according to EN 50047

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5, with increased corrosion protection

	Version	Contacts		SD	Complete units		PU (UNIT, SET, M)	PS*
				d	Article No.	Price per PU		
Complete units[1] • Enclosure width 31 mm								
3SE5232-0LK21-1AY0	***Twist levers, 21 mm long, acc. to EN 50047*** **With plastic roller 19 mm** Snap-action contacts	1 NO + 2 NC	➔	5	**3SE5232-0LK21-1AY0**		1	1 unit
3SE5232-0LE10-1AY0	***Roller levers, acc. to EN 50047*** **With plastic roller 13 mm** Snap-action contacts	1 NO + 2 NC	➔	5	**3SE5232-0LE10-1AY0**		1	1 unit
3SE5232-0HK82-1AY0	***Rod actuators, acc. to EN 50047*** **Plastic rod, length 200 mm** Snap-action contacts	1 NO + 1 NC		30	**3SE5232-0HK82-1AY0**		1	1 unit
3SE5232-0HR01-1AY0	***Spring rod*** Snap-action contacts	1 NO + 1 NC		30	**3SE5232-0HR01-1AY0**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

[1] Popular versions.

SIRIUS 3SE5 Mechanical Safety Switches with Tumbler, Shock & Vibration Test

3SE5, plastic enclosures, enclosure width 54 mm

Selection and ordering data

6 slow-action contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry 3 × M20 × 1.5 · Locking force 1 300 N

	Tumbler[1]	Solenoid, rated operational voltage	SD	Complete units Position monitoring: Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC		PU (UNIT, SET, M)	PS*
		V	d	Article No.	Price per PU		
1 300 N locking force · Enclosure width 54 mm							
3SE5322-0SD21-1AY0	**Spring-actuated locks** • With front auxiliary release	24 DC	➔ 5	**3SE5322-0SD21-1AY0**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately.

Accessories/spare parts

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Accessories						
3SE5000-0AV01	**Standard actuator** • Length 75.6 mm	▶	**3SE5000-0AV01**		1	1 unit
	High-grade steel actuator, standard, IP69K[1]					
3SE5000-0AW51	• Length 75.6 mm	5	**3SE5000-0AW51**		1	1 unit
3SE5000-0AW52	• With vertical fixing, length 53 mm	5	**3SE5000-0AW52**		1	1 unit
3SE5000-0AW53	• With transverse fixing, length 47 mm	5	**3SE5000-0AW53**		1	1 unit

[1] With optimized geometry and suitable for extreme environmental conditions such as -40 °C

SIRIUS 3SE5 Mechanical Safety Hinge Switches, Shock and Vibration Test

3SE5, plastic enclosures, enclosure width 31 mm according to EN 50047

Selection and ordering data

With increased corrosion protection

	Version	Contacts		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units[1] • Enclosure width 31 mm								
3SE5232-0HU21-1AY0	***Hinge switches, acc. to EN 50047*** **With hollow shaft D = 8 mm, operating angle 10 degrees,** Snap-action contacts	1 NO + 1 NC	➔	30	**3SE5232-0HU21-1AY0**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) With optimized geometry and suitable for extreme environmental conditions such as -40 °C

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, plastic enclosures, enclosure width 31 mm according to EN 50047 / 50 mm

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5, with increased corrosion protection

	Version	Contacts	LEDs	SD	Complete units	PU (UNIT, SET, M)	PS*
				d	Article No. / Price per PU		
Complete units[1] • Enclosure width 31 mm							
3SE5234-0CD03-1AJ1	***Roller plungers, type C, acc. to EN 50047*** **With plastic roller 10 mm, with M12 device plug, 4-pole (250 V, 4 A)**						
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5234-0CD03-1AJ1**	1	1 unit
3SE5232-0CD10-1AJ0	***Roller plungers with central fixing***						
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5232-0CD10-1AJ0**	1	1 unit
3SE5232-0CK31-1AJ0	***Twist levers, type A, acc. to EN 50047*** **With high-grade steel lever 21 mm and plastic roller 19 mm**						
	Snap-action contacts	1 NO + 1 NC	--	➔ 2	**3SE5232-0CK31-1AJ0**	1	1 unit
3SE5232-0CK62-1AJ0	***Twist levers, adjustable length*** **With high-grade steel lever with grid hole and plastic roller 19 mm**						
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5232-0CK62-1AJ0**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5232-0LK62-1AJ0**	1	1 unit
Complete units[1] • Enclosure width 50 mm							
3SE5242-0HK21-1AJ0	***Twist levers*** **With metal lever 21 mm and plastic roller 19 mm**						
	Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔ 5	**3SE5242-0HK21-1AJ0**	1	1 unit
	Twist levers, adjustable length **With high-grade steel lever with grid hole and plastic roller 19 mm**						
	Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔ 5	**3SE5242-0HK62-1AJ0**	1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) Popular versions.

2) 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 13/75.

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, plastic enclosures, enclosure width 31 mm according to EN 50047 / 50 mm

Modular system

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5, with increased corrosion protection

	Version	Contacts	LEDs		SD d	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Basic switches • Enclosure width 31 mm (with rounded plunger[1])									
3SE5232-0CC05-1AJ0	**With teflon plunger**								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0CC05-1AJ0**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0KC05-1AJ0**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5232-0LC05-1AJ0**		1	1 unit
Basic switches • Enclosure width 50 mm (with rounded plunger[1])									
3SE5242-0BC05-1AJ0	**With teflon plunger**								
	Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5242-0BC05-1AJ0**		1	1 unit
	Snap-action contacts, integrated[2]	1 NO + 1 NC	--	➔	5	**3SE5242-0HC05-1AJ0**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) For enclosures with widths of 31 and 50 mm, the basic switch is a complete unit with rounded plungers.

2) Subsequent replacement of contact blocks is not possible.

Note:

For the selection aid, see page 13/13

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, plastic enclosures, enclosure width 31 mm according to EN 50047 / 50 mm

	Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Operating mechanisms						
3SE5000-0AD03	**Roller plungers, type C, acc. to EN 50047**					
	Plastic roller	10	➔ 5	**3SE5000-0AD03-1AJ0**	1	1 unit
	Roller levers, type E, acc. to EN 50047					
	Metal lever, plastic roller	13	➔ 5	**3SE5000-0AE10-1AJ0**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AE12-1AJ0**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE13-1AJ0**	1	1 unit
3SE5000-0AF10-1AJ0	**Angular roller levers**					
	Metal lever, plastic roller	13	➔ 5	**3SE5000-0AF10-1AJ0**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AF12-1AJ0**	1	1 unit
Twist actuators						
3SE5000-0AK00-1AJ0	**Twist actuators, for 31 mm/50 mm, EN 50047**					
	Switching right and/or left, adjustable		➔ 5	**3SE5000-0AK00-1AJ0**	1	1 unit
3SE5000-0AA21-1AJ0	***Levers***					
	Twist levers straight, 21 mm, type A acc. to EN 50047					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA21-1AJ0**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA31-1AJ0**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA32-1AJ0**	1	1 unit
3SE5000-0AA60-1AJ0	**Twist levers, adjustable length, with grid hole**					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60-1AJ0**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62-1AJ0**	1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, plastic enclosures, enclosure width 40 mm according to EN 50041

Selection and ordering data

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5, with increased corrosion protection

Version	Contacts	LEDs	SD	Modular system	PU (UNIT, SET, M)	PS*
			d	Article No. / Price per PU		
Basic switches • Enclosure width 40 mm						
With connecting thread M20 × 1.5						
Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5132-0CA00-1AJ0**	1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0KA00-1AJ0**	1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5132-0LA00-1AJ0**	1	1 unit

3SE5132-0CA00-1AJ0

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

Note:
For the selection aid, see page 13/13

Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
	mm	d	Article No. / Price per PU		
Operating mechanisms					
Rounded plungers, type B, acc. to EN 50041					
Plastic plungers	10	➔ 5	**3SE5000-0AC03-1AJ0**	1	1 unit
Roller plungers, type C, acc. to EN 50041					
Plastic plunger, plastic roller	13	➔ 5	**3SE5000-0AD05-1AJ0**	1	1 unit
Roller levers					
Metal lever with plastic roller, plastic base	22	➔ 5	**3SE5000-0AE05-1AJ0**	1	1 unit
Twist actuators					
Twist actuators, for 31 mm/50 mm, EN 50047					
• For twist levers and rod actuators, switching right and/or left, adjustable		➔ 5	**3SE5000-0AH00-1AJ0**	1	1 unit
Levers					
Twist levers, type A, acc. to EN 50041					
Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA01-1AJ0**	1	1 unit
High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA11-1AJ0**	1	1 unit
Twist levers, adjustable length, with grid hole					
Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60-1AJ0**	1	1 unit
High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62-1AJ0**	1	1 unit

3SE5000-0AC03-1AJ0

3SE5000-0AD05-1AJ0

3SE5000-0AE05-1AJ0

3SE5000-0AH00-1AJ0

3SE5000-0AA01-1AJ0

3SE5000-0AA60-1AJ0

➔ Positively driven actuator, necessary in safety circuits.

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, metal enclosures, enclosure width 31 mm according to EN 50047

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5, with increased corrosion protection

Version	Contacts	LEDs	SD	Modular system	PU (UNIT, SET, M)	PS*
			d	Article No. / Price per PU		
Complete units • Enclosure width 31 mm						
Rounded plungers, type B, acc. to EN 50047						
Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0CC05-1AJ0**	1	1 unit
Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0KC05-1AJ0**	1	1 unit
Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0LC05-1AJ0**	1	1 unit
Twist levers, type A, acc. to EN 50047						
With metal lever 21 mm and high-grade steel roller 19 mm, twist actuator for 40 mm						
Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0CH22-1AJ0**	1	1 unit

3SE5212-0CC05-1AJ0

3SE5212-0CH22-1AJ0

➔ 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, page 13/77.

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, metal enclosures, enclosure width 31 mm according to EN 50047

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5, with increased corrosion protection

	Version	Contacts	LEDs	SD	Modular system	PU (UNIT, SET, M)	PS*
				d	Article No. / Price per PU		
Basic switches • Enclosure width 31 mm (with rounded plunger[1])							
3SE5212-0CC05-1AJ0	**With plunger**						
	Snap-action contacts	1 NO + 1 NC	--	➔ 5	**3SE5212-0CC05-1AJ0**	1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0KC05-1AJ0**	1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔ 5	**3SE5212-0LC05-1AJ0**	1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) For enclosures with widths of 31 mm, the basic switch is a complete unit with rounded plungers.

Note:

For the selection aid, see page 13/13

	Version	Diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Operating mechanisms						
3SE5000-0AD03-1AJ0	**Roller plungers, type C, acc. to EN 50047**					
	Plastic roller	10	➔ 5	**3SE5000-0AD03-1AJ0**	1	1 unit
3SE5000-0AE10-1AJ0	**Roller levers, type E, acc. to EN 50047**					
	Metal lever, plastic roller	13	➔ 5	**3SE5000-0AE10-1AJ0**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AE12-1AJ0**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE13-1AJ0**	1	1 unit
3SE5000-0AF10-1AJ0	**Angular roller levers**					
	Metal lever, plastic roller	13	➔ 5	**3SE5000-0AF10-1AJ0**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AF12-1AJ0**	1	1 unit
Twist actuators						
3SE5000-0AK00-1AJ0	**Twist actuators, for 31 mm/50 mm, EN 50047**					
	Switching right and/or left, adjustable		➔ 5	**3SE5000-0AK00-1AJ0**	1	1 unit
3SE5000-0AA21-1AJ0	***Levers***					
	Twist levers straight, 21 mm, type A acc. to EN 50047					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA21-1AJ0**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA31-1AJ0**	1	1 unit
3SE5000-0AA60-1AJ0	**Twist levers, adjustable length, with grid hole**					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60-1AJ0**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62-1AJ0**	1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, metal enclosures, enclosure width 40 mm according to EN 50041 / 56 mm, XL

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5, with increased corrosion protection

	Version	Contacts		SD	Complete units		PU (UNIT, SET, M)	PS*
				d	Article No.	Price per PU		
Complete units • Enclosure width 40 mm								
3SE5112-0CC02-1AJ0	***Rounded plungers, type B, acc. to EN 50041*** **With high-grade steel plungers, with 3 mm overtravel** Snap-action contacts	1 NO + 1 NC	➔	5	**3SE5112-0CC02-1AJ0**		1	1 unit
3SE5112-0LD02-1AJ0	***Roller plungers, type C, acc. to EN 50041*** **With high-grade steel plungers, with 3 mm overtravel** Snap-action contacts	1 NO + 2 NC	➔	5	**3SE5112-0LD02-1AJ0**		1	1 unit
3SE5112-0LH11-1AJ0	***Twist levers, type A, acc. to EN 50041*** **With high-grade steel lever 27 mm and plastic roller 19 mm** Snap-action contacts	1 NO + 2 NC	➔	5	**3SE5112-0LH11-1AJ0**		1	1 unit
	With high-grade steel lever 27 mm and high-grade steel roller 19 mm Snap-action contacts	2 × (1 NO + 1 NC) NEW	➔	10	**3SE5162-0CH12-1AN5**		1	1 unit
3SE5112-0CH62-1AJ0	***Twist levers, adjustable length*** **With high-grade steel lever with grid hole and plastic roller 19 mm** Snap-action contacts	1 NO + 1 NC	➔	5	**3SE5112-0CH62-1AJ0**		1	1 unit
Complete units • Enclosure width 56 mm, XL, 3 x M20 x 1.5								
3SE5162-0CH60-1AJ0	***Twist levers, adjustable length*** **With metal lever with grid hole and plastic roller 19 mm** Snap-action contacts	1 NO + 1 NC	➔	5	**3SE5162-0CH60-1AJ0**		1	1 unit
	With high-grade steel lever and high-grade steel roller 19 mm Snap-action contacts	2 × (1 NO + 1 NC) NEW	➔	10	**3SE5162-0CH63-1AN6**		1	1 unit

➔ 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, page 13/81.

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, metal enclosures, enclosure width 40 mm according to EN 50041 / 56 mm / 56 mm, XL

Selection and ordering data

Modular system

2, 3 or 4 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5, with increased corrosion protection

	Version	Contacts	LEDs		SD d	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Basic switches • Enclosure width 40 mm									
3SE5112-0CA00-1AJ0	**With connecting thread M20 × 1.5**								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5112-0CA00-1AJ0**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0KA00-1AJ0**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5112-0LA00-1AJ0**		1	1 unit
Basic switches • Enclosure width 56 mm									
3SE5122-0CA00-1AJ0	**With 3 x connecting thread M20 × 1.5**								
	Snap-action contacts	1 NO + 1 NC	--	➔	5	**3SE5122-0CA00-1AJ0**		1	1 unit
	Slow-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0KA00-1AJ0**		1	1 unit
	Snap-action contacts	1 NO + 2 NC	--	➔	5	**3SE5122-0LA00-1AJ0**		1	1 unit
Basic switches • Enclosure width 56 mm, XL									
3SE5162-0BA00-1AJ0	**With 3 × connection thread M20 × 1.5**								
	Slow-action contacts	2 × (1 NO + 1 NC)	--	➔	5	**3SE5162-0BA00-1AJ0**		1	1 unit
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔	5	**3SE5162-0CA00-1AJ0**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K or positively driven actuator, necessary in safety circuits.

Note:
For the selection aid, see page 13/13

SIRIUS 3SE5 Mechanical Position Switches, Shock & Vibration Railway Standard

3SE5, metal enclosures, enclosure width 40 mm according to EN 50041 / 56 mm / 56 mm, XL

	Version	Diameter mm	SD d	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Operating mechanisms							
3SE5000-0AC02-1AJ0	**Rounded plungers, type B, acc. to EN 50041**						
	High-grade steel plunger, with 3 mm overtravel	10	➔ 5	**3SE5000-0AC02-1AJ0**		1	1 unit
3SE5000-0AD02-1AJ0	**Roller plungers, type C, acc. to EN 50041**						
	High-grade steel roller, with 3 mm overtravel	10	➔ 5	**3SE5000-0AD02-1AJ0**		1	1 unit
3SE5000-0AE01-1AJ0	**Roller levers**						
	Metal lever, plastic roller	13	➔ 5	**3SE5000-0AE01-1AJ0**		1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AE03-1AJ0**		1	1 unit
3SE5000-0AF01-1AJ0	**Angular roller levers**						
	Metal lever, plastic roller	13	➔ 5	**3SE5000-0AF01-1AJ0**		1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AF03-1AJ0**		1	1 unit
Twist actuators							
3SE5000-0AH00-1AJ0	**Twist actuators, for 40/56/56 XL mm EN 50041**						
	Switching right and/or left, adjustable		➔ 5	**3SE5000-0AH00-1AJ0**		1	1 unit
3SE5000-0AA01-1AJ0	***Levers***						
	Twist levers, type A, acc. to EN 50041						
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA01-1AJ0**		1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA11-1AJ0**		1	1 unit
3SE5000-0AA60-1AJ0	**Twist levers, adjustable length, with grid hole**						
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60-1AJ0**		1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62-1AJ0**		1	1 unit

➔ Positively driven actuator, necessary in safety circuits.

SIRIUS 3SE5 Mechanical Safety Switches, Separate Actuator, Shock & Vibration Railway Std

3SE5, plastic enclosures, enclosure width 31 mm according to EN 50047

Selection and ordering data

Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP65 (31 mm) or IP66/IP67 (50 mm) · Cable entry M20 × 1.5

	Version	Contacts	LEDs		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosure width 31 mm according to EN 50047									
3SE5232-0RV40-1AJ0	***Ambient temperature down to -40° C*** **With increased corrosion protection** Slow-action contacts	1 NO + 1 NC	--	➔	5	**3SE5232-0RV40-1AJ0**		1	1 unit

Accessories/spare parts

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Accessories						
3SE5000-0AW11	**Standard actuator** • With transverse fixing, plastic, length 40 mm	5	**3SE5000-0AW11**		1	1 unit
3SE5000-0AW51	**High-grade steel actuator**[1] • Length 75.6 mm	5	**3SE5000-0AW51**		1	1 unit
3SE5000-0AW52	• With vertical fixing, length 53 mm	5	**3SE5000-0AW52**		1	1 unit
3SE5000-0AW53	• With transverse fixing, length 47 mm	5	**3SE5000-0AW53**		1	1 unit

[1] With optimized geometry and suitable for extreme environmental conditions such as -40 °C

SIRIUS 3SE5 Mechanical Safety Switches with Tumbler, Shock & Vibration Railway Std

3SE5, plastic enclosures

Selection and ordering data

6 slow-action contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry 3 × M20 × 1.5 · Locking force 1 300 N

	Tumbler[1]	Solenoid, rated operational voltage		SD	Complete units Position monitoring: Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC		PU (UNIT, SET, M)	PS*
		V		d	Article No.	Price per PU		
1 300 N locking force • Enclosure width 54 mm								
3SE5322-0SL21-1AJ0	**Spring-actuated locks**							
	• With escape release from the front and emergency release from the back	24 DC	➔	5	**3SE5322-0SL21-1AJ0**		1	1 unit
	• With auxiliary release		NEW	5	**3SE5322-0SD21-1AJ0**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately.

Accessories/spare parts

	Version		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Accessories							
3SE5000-0AV01	**Standard actuator** • Length 75.6 mm		▶	**3SE5000-0AV01**		1	1 unit
	High-grade steel actuator[1]						
3SE5000-0AW51	• Length 75.6 mm		5	**3SE5000-0AW51**		1	1 unit
3SE5000-0AW52	• With vertical fixing, length 53 mm	NEW	5	**3SE5000-0AW52**		1	1 unit
3SE5000-0AW53	• With transverse fixing, length 47 mm		5	**3SE5000-0AW53**		1	1 unit

1) With optimized geometry and suitable for extreme environmental conditions such as -40 °C

General data

Overview

The 3SF1 position switches with safety-related communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be wired up conventionally.

With the 3SF1 position switches the ASIsafe electronics are integrated in the switch enclosure.

Examples of selection options in the modular system

Modular system

The position switches of the 3SF11.4 and 3SF12.4 series are designed as a modular system comprising different versions of the basic switch and an actuator which must be ordered separately. Thanks to the modular design of the switch the end users can select the right solution for their application from numerous versions and install it themselves in a very short time.

Design

The 3SF1 switches are available in four different enclosure sizes:

- Plastic and metal enclosures according to EN 50047, 31 mm wide, with M12 device plug
- Metal enclosures according to EN 50041, 40 mm wide, with M12 device plug
- Plastic enclosures, 50 mm wide, with M12 device plug and M12 socket
- Metal enclosures, 56 mm wide, with M12 device plug and M12 socket

Display

The switches have a status display with three LEDs:

- LED 1 (yellow): F-IN1
- LED 2 (yellow): F-IN2
- LED 3 (green/red):AS-i/FAULT

Connection

Connection to the AS-Interface is by means of a 4-pole M12 device plug (plastic version) connected to the yellow AS-Interface bus cable.

The wide enclosures (50 or 56 mm) also have an M12 socket for connecting a second position switch. Category 4 according to EN ISO 13849-1 is thus achieved.

Benefits

The new generation of 3SF1 position switches offers:

- ASIsafe electronics integrated in the enclosure, with low power consumption < 60 mA
- An extensive range of actuators
- Status display with three LEDs
- Can be integrated easily via TIA Portal

Application

With the standard position switches, mechanical positions of moving machine parts are converted into electrical signals. Through their modular and uniform design and large number of variants, the devices can comply with 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 contact blocks best suited for the particular purpose. And many different actuator variants are available to match the mechanical configuration of the moving machine 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

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 fail-safe principle according to EN ISO 14119.

Approvals

AS-Interface according to EN 50295 and IEC 62026-2.

With a 3SF1 position switch it is possible to achieve Category 2 according to EN ISO 13849-1 or SIL 1 according to IEC 61508.

Categories 3 or 4 according to EN ISO 13849-1 or SIL 2 or 3 according to IEC 61508 can be achieved by using a second 3SE5 position switch.

The 3SF1 position switches are approved according to UL 508, UL 50 and UL 746-C.

Technical specifications

Type		3SF11.., 3SF12..
General data		
Standards		IEC/EN 60947-5-1, EN ISO 14119
According to AS-Interface specification		
• I/O configuration/ID configuration		0/B
• ID1 code/ID2 code (Hex)		F/F
• Power consumption, overall	mA	≤ 60
Inputs		
• Low signal range		Contact open
• High signal range		Contact closed, I_{in} dynamic (I_{peak} ≥ 5 mA)
Status display		Green/red dual LED
Rated impulse withstand voltage U_{imp}	kV	0.6
EMC strength		
• IEC 61000-1-2	kV	4
• IEC 61000-4-3	V/m	10
• IEC 61000-4-4 (A/B)	kV	1/2
Mechanical endurance		
• Basic switch		15 ×10^6 operating cycles
• With separate actuator, 3SF1...-..V..		1 ×10^6 operating cycles
PFH value		
Probability of failure upon request of the safety function, with 1 actuation per hour and B10 = 5 × 10^6		
• Basic switch	1/h	4 ×10^{-9}
• With separate actuator, 3SF1...-..V..	1/h	2 ×10^{-9}
• Hinge switches, 3SF1...-..U..	1/h	2 ×10^{-9}
Shock resistance acc. to IEC 60068-2-27		30 *g* /11 ms

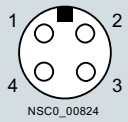
Type		3SF1234	3SF1134	3SF1244	3SF1214	3SF1114	3SF1124
Enclosure							
Enclosure							
• Material		Ultramid A3X2G7			Zinc die casting GD Zn Al4 Cu1		
• Width	mm	31	40	50	31	40	56
• Dimensions according to EN		EN 50047	EN 50041	--	EN 50047	EN 50041	--
Degree of protection acc. to IEC 60529		IP65	IP66/IP67				
Ambient temperature							
• During operation	°C	-25 ... +60					
• Storage, transport	°C	-40 ... +80					
Mounting position		Any					

Pin assignment

M12 device plug, 4-pole

1 ASi +
2 Not assigned
3 ASi –
4 Not assigned

M12 socket, 4-pole



1 Channel 2
2 Channel 2
3 Not assigned
4 Not assigned

LEDs

Status display (operating state)

LED	No voltage on AS-Interface chip	Communication OK	Communication failed	Slave has address "0"
ASi/Fault (GN/RD)				

Safe inputs

LED	Not actuated	Actuated		
F-IN1 (YE)				
F-IN2 (YE)				

3SF1, plastic enclosures, enclosure width 31 mm according to EN 50047 / 50 mm

Selection and ordering data

Modular system

For the ASIsafe version of the position switch, the basic switch and actuator must be ordered separately.

1 or 2 contacts · 3 LEDs · Degree of protection IP65 (31 mm) or IP66/IP67 (50 mm) · M12 device plug

	Version	Contacts	LEDs	SD	Modular system		PU (UNIT, SET, M)	PS*
				d	Article No.	Price per PU		
Basic switches (with rounded plunger[1]) • Enclosure width 31 mm acc. to EN 50047								
3SF1234-1KC05-1BA1	**With teflon plunger**							
	With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on NC contact							
	Slow-action contacts	2 NC	24 V DC	➔ 5	**3SF1234-1KC05-1BA1**		1	1 unit
	Snap-action contacts	2 NC	24 V DC	➔ 5	**3SF1234-1LC05-1BA1**		1	1 unit
Basic switches (with rounded plunger[1]) • Enclosure width 50 mm								
3SF1244-1KC05-1BA2	**With teflon plunger**							
	With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on M12 socket, right							
	Slow-action contacts	1 NC	24 V DC	➔ 5	**3SF1244-1KC05-1BA2**		1	1 unit
	Snap-action contacts	1 NC	24 V DC	➔ 5	**3SF1244-1LC05-1BA2**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, for use in safety circuits.

1) For enclosures with widths of 31 mm and 50 mm, the basic switch is a complete unit with rounded plungers.

Note:

For the selection aid, see page 13/13

3SF1, plastic enclosures, enclosure width 31 mm according to EN 50047 / 50 mm

	Version	Roller diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Operating mechanisms						
3SE5000-0AD03	**Roller plungers, type C, acc. to EN 50047**					
	Plastic roller	10	➔ 2	**3SE5000-0AD03**	1	1 unit
	High-grade steel roller	10	➔ 5	**3SE5000-0AD04**	1	1 unit
3SE5000-0AD10	**Roller plungers with central fixing**					
	Plastic roller	10	➔ 2	**3SE5000-0AD10**	1	1 unit
	High-grade steel roller	10	➔ 5	**3SE5000-0AD11**	1	1 unit
3SE5000-0AE10	**Roller levers, type E, acc. to EN 50047**					
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AE10**	1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE11**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AE12**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE13**	1	1 unit
3SE5000-0AF10	**Angular roller levers**					
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AF10**	1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF11**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 2	**3SE5000-0AF12**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF13**	1	1 unit
Twist actuators with lever						
3SE5000-0AK00	**Twist actuators, for 31 mm/50 mm, EN 50047**					
	Switching right or left, adjustable		➔ 2	**3SE5000-0AK00**	1	1 unit
3SE5000-0AA21	***Levers***					
	Twist levers, type A, acc. to EN 50047					
	Metal lever, plastic roller	19	➔ 2	**3SE5000-0AA21**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA22**	1	1 unit
	Metal lever, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA23**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA25**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA31**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA32**	1	1 unit
	Twist levers 30 mm, straight[1]					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**	1	1 unit
3SE5000-0AA60	**Twist levers, adjustable length, with grid hole**					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**	1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA67**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**	1	1 unit

➔ Positively driven actuator, for use in safety circuits.

[1] Can be clinch mounted (turned through 180°, rear of lever).

3SF1, metal enclosures, enclosure width 31 mm according to EN 50047

Selection and ordering data

Modular system

For the ASIsafe version of the position switch, the basic switch and actuator must be ordered separately.

2 contacts · 3 LEDs · Degree of protection IP66/IP67 · M12 device plug

	Version	Contacts	LEDs		SD	Modular system		PU (UNIT, SET, M)	PS*
						Article No.	Price per PU		
					d				
Basic switches (with rounded plunger[1]) • Enclosure width 31 mm acc. to EN 50047									
3SF1214-1KC05-1BA1	**With plunger**								
	With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on NC contact								
	Slow-action contacts	2 NC	24 V DC	➔	5	**3SF1214-1KC05-1BA1**		1	1 unit
	Snap-action contacts	2 NC	24 V DC	➔	5	**3SF1214-1LC05-1BA1**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, for use in safety circuits.

1) For enclosures with widths of 31 mm, the basic switch is a complete unit with rounded plungers.

Note:

For the selection aid, see page 13/13

3SF1, metal enclosures, enclosure width 31 mm according to EN 50047

	Version	Roller diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Operating mechanisms						
3SE5000-0AB01	**Plain plungers**					
	High-grade steel plunger	10	➔ 2	**3SE5000-0AB01**	1	1 unit
3SE5000-0AD03	**Roller plungers, type C, acc. to EN 50047**					
	Plastic roller	10	➔ 2	**3SE5000-0AD03**	1	1 unit
	High-grade steel roller	10	➔ 5	**3SE5000-0AD04**	1	1 unit
3SE5000-0AD10	**Roller plungers with central fixing**					
	Plastic roller	10	➔ 2	**3SE5000-0AD10**	1	1 unit
	High-grade steel roller	10	➔ 5	**3SE5000-0AD11**	1	1 unit
3SE5000-0AE10	**Roller levers, type E, acc. to EN 50047**					
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AE10**	1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE11**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 5	**3SE5000-0AE12**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AE13**	1	1 unit
3SE5000-0AF10	**Angular roller levers**					
	Metal lever, plastic roller	13	➔ 2	**3SE5000-0AF10**	1	1 unit
	Metal lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF11**	1	1 unit
	High-grade steel lever, plastic roller	13	➔ 2	**3SE5000-0AF12**	1	1 unit
	High-grade steel lever, high-grade steel roller	13	➔ 5	**3SE5000-0AF13**	1	1 unit
Twist actuators with lever						
3SE5000-0AK00	**Twist actuators, for 31 mm/50 mm, EN 50047**					
	Switching right or left, adjustable		➔ 2	**3SE5000-0AK00**	1	1 unit
3SE5000-0AA21	***Levers***					
	Twist levers, type A, acc. to EN 50047					
	Metal lever, plastic roller	19	➔ 2	**3SE5000-0AA21**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA22**	1	1 unit
	Metal lever, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA23**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA25**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA31**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA32**	1	1 unit
	Twist levers 30 mm, straight[1)]					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**	1	1 unit
3SE5000-0AA60	**Twist levers, adjustable length, with grid hole**					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**	1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA67**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**	1	1 unit

➔ Positively driven actuator, for use in safety circuits.

1) Can be clinch mounted (turned through 180°, rear of lever).

3SF1, metal enclosures, enclosure width 40 mm according to EN 50041 / 56 mm

Selection and ordering data

Modular system

For the ASIsafe version of the position switch, the basic switch and actuator must be ordered separately.

1 or 2 contacts · 3 LEDs · Degree of protection IP66/IP67 · M12 device plug

	Version	Contacts	LEDs	SD	Modular system	PU (UNIT, SET, M)	PS*
					Article No. / Price per PU		
				d			
Basic switches · Enclosure width 40 mm acc. to EN 50041							
3SF1114-1KA00-1BA1	With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on NC contact						
	Slow-action contacts	2 NC	24 V DC	➔ 5	**3SF1114-1KA00-1BA1**	1	1 unit
	Snap-action contacts	2 NC	24 V DC	➔ 5	**3SF1114-1LA00-1BA1**	1	1 unit
Basic switches · Enclosure width 56 mm							
3SF1124-1KA00-1BA2	With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on M12 socket, right						
	Slow-action contacts	1 NC	24 V DC	➔ 5	**3SF1124-1KA00-1BA2**	1	1 unit
	Snap-action contacts	1 NC	24 V DC	➔ 5	**3SF1124-1LA00-1BA2**	1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, for use in safety circuits.

Note:

For the selection aid, see page 13/13

	Version	Roller diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
				Article No. / Price per PU		
		mm	d			
Operating mechanisms						
3SE5000-0AB01	**Plain plungers**					
	High-grade steel plunger	10	➔ 2	**3SE5000-0AB01**	1	1 unit
3SE5000-0AC02	**Rounded plungers, type B, acc. to EN 50041**					
	High-grade steel plunger, with 3 mm overtravel	10	➔ 5	**3SE5000-0AC02**	1	1 unit
3SE5000-0AD02	**Roller plungers, type C, acc. to EN 50041**					
	High-grade steel roller, with 3 mm overtravel	13	➔ 5	**3SE5000-0AD02**	1	1 unit

➔ Positively driven actuator, for use in safety circuits.

3SF1, metal enclosures, enclosure width 40 mm according to EN 50041 / 56 mm

	Version	Roller diameter	SD	Modular system	PU (UNIT, SET, M)	PS*
		mm	d	Article No. / Price per PU		
Operating mechanisms						
3SE5000-0AE01	**Roller levers**					
	Metal lever, plastic roller	22	➔ 2	**3SE5000-0AE01**	1	1 unit
	Metal lever, high-grade steel roller	22	➔ 5	**3SE5000-0AE02**	1	1 unit
	High-grade steel lever, plastic roller	22	➔ 5	**3SE5000-0AE03**	1	1 unit
	High-grade steel lever, high-grade steel roller	22	➔ 5	**3SE5000-0AE04**	1	1 unit
3SE5000-0AF01	**Angular roller levers**					
	Metal lever, plastic roller	22	➔ 2	**3SE5000-0AF01**	1	1 unit
	Metal lever, high-grade steel roller	22	➔ 5	**3SE5000-0AF02**	1	1 unit
	High-grade steel lever, plastic roller	22	➔ 5	**3SE5000-0AF03**	1	1 unit
	High-grade steel lever, high-grade steel roller	22	➔ 5	**3SE5000-0AF04**	1	1 unit
Twist actuators with lever						
3SE5000-0AH00	**Twist actuators, for 40/56/56 XL mm EN 50041**					
	• For twist levers, switching right or left, adjustable					
	- For enclosure width 40 and 56 mm		➔ 2	**3SE5000-0AH00**	1	1 unit
	• For fork levers, latching		➔ 5	**3SE5000-0AT10**	1	1 unit
3SE5000-0AA01	***Levers***					
	Twist levers 27 mm, offset, type A, acc. to EN 50041					
	Metal lever, plastic roller	19	➔ 2	**3SE5000-0AA01**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 2	**3SE5000-0AA02**	1	1 unit
	Metal lever, high-grade steel roller with ball bearing	19	➔ 5	**3SE5000-0AA03**	1	1 unit
	Metal lever, 2 plastic rollers	19	➔ 5	**3SE5000-0AA04**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA05**	1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA07**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA08**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA11**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA12**	1	1 unit
	Twist levers 35 mm, offset					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA15**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA16**	1	1 unit
	Twist levers 30 mm, straight[1]					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA24**	1	1 unit
	Metal lever, plastic roller	30	➔ 5	**3SE5000-0AA26**	1	1 unit
3SE5000-0AA60	**Twist levers, adjustable length, with grid hole**					
	Metal lever, plastic roller	19	➔ 5	**3SE5000-0AA60**	1	1 unit
	Metal lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA61**	1	1 unit
	Metal lever, plastic roller	50	➔ 5	**3SE5000-0AA67**	1	1 unit
	Metal lever, rubber roller	50	➔ 5	**3SE5000-0AA68**	1	1 unit
	High-grade steel lever, plastic roller	19	➔ 5	**3SE5000-0AA62**	1	1 unit
	High-grade steel lever, high-grade steel roller	19	➔ 5	**3SE5000-0AA63**	1	1 unit
3SE5000-0AT01	**Fork levers** (for switches with snap-action contacts only)					
	Metal lever, 2 plastic rollers	19	➔ 5	**3SE5000-0AT01**	1	1 unit
	Metal lever, 2 high-grade steel rollers	19	➔ 5	**3SE5000-0AT02**	1	1 unit
	High-grade steel lever, 2 plastic rollers	19	➔ 5	**3SE5000-0AT03**	1	1 unit
	High-grade steel lever, 2 high-grade steel rollers	19	➔ 5	**3SE5000-0AT04**	1	1 unit

➔ Positively driven actuator, for use in safety circuits.

[1] Can be clinch mounted (turned through 180°, rear of lever).

With Separate Actuator

General data

Overview

The 3SF1 safety switches with safety-related communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be wired up conventionally.

With the 3SF1 safety switches the ASIsafe electronics are integrated in the switch enclosure.

3SF1 safety switches with head for separate actuator and with integrated ASIsafe electronics

3SF1 safety switches with separate actuator have the same enclosures as the 3SF1 position switches.

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 × 90°. The switches can also be approached from above.

The actuators are not included in the scope of supply of the safety switch and must be ordered separately from a choice of different versions to suit the application, (see page 13/96).

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety.

A rubber cap to protect the actuator head from contamination is available for operation in dusty environments.

Display

The switches have a status display with three LEDs:

- LED 1 (yellow): F-IN1
- LED 2 (yellow): F-IN2
- LED 3 (green/red): AS-i/FAULT

Connection

Connection to the AS-Interface is by means of a 4-pole M12 device plug (plastic version) connected to the yellow AS-Interface bus cable.

The wide enclosures (50 or 56 mm) also have an M12 socket for connecting a second safety switch. Category 4 according to EN ISO 13849-1 is thus achieved.

Benefits

The new generation of 3SF1 safety switches with separate actuator offers

- ASIsafe electronics integrated in the enclosure, with low power consumption < 60 mA
- An extensive range of actuators
- Status display with three LEDs

Application

Safety switches with separate actuator are used where the position of doors, covers or protective grilles must be monitored for safety reasons.

The safety 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 contact blocks best suited for the particular purpose. Dimensions and 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

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 fail-safe principle according to EN ISO 14119.

Approvals

AS-Interface according to EN 50295 and IEC 62026-2.

With a 3SF1 safety switch it is possible to achieve Category 3 according to EN ISO 13849-1 or SIL 2 according to IEC 61508.

Category 4 according to EN ISO 13849-1 or SIL 3 according to IEC 61508 can be achieved by using an additional 3SE5 safety switch.

The 3SF1 safety switches are approved according to UL 508, UL 50 and UL 746-C.

With Separate Actuator

3SF1, plastic enclosures, enclosure width 31 mm according to EN 50047 / 50 mm

Overview

- Contacts: 1 or 2 slow-action contacts
- Status display with 3 LEDs 24 V DC;
  1: F–IN1, 2: F–IN2, 3: AS-i/FAULT
- Degree of protection IP65 (31 mm) or IP66/IP67 (50 mm)

Selection and ordering data

	Version[1]	Contacts		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosure width 31 mm according to EN 50047								
3SF1234-1QV40-1BA1	**5 directions of approach** With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on NC contact Slow-action contacts	2 NC	➔	5	**3SF1234-1QV40-1BA1**		1	1 unit
Enclosure width 50 mm								
3SF1244-1QV40-1BA2	**5 directions of approach** With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on M12 socket, right Slow-action contacts	1 NC	➔	5	**3SF1244-1QV40-1BA2**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately (see page 13/96).

With Separate Actuator

3SF1, metal enclosures, enclosure width 31 mm according to EN 50047 / 40 mm according to EN 50041 / 56 mm

Overview

- Contacts: 1 or 2 slow-action contacts
- Status display with 3 LEDs 24 V DC;
  1: F–IN1, 2: F–IN2, 3: AS-i/FAULT
- Degree of protection IP66/IP67

Selection and ordering data

	Version[1]	Contacts		SD d	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosure width 31 mm acc. to EN 50047								
3SF1214-1QV40-1BA1	**5 directions of approach** With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on NC contact Slow-action contacts	2 NC	➔	5	**3SF1214-1QV40-1BA1**		1	1 unit
Enclosure width 40 mm acc. to EN 50041								
3SF1114-1QV10-1BA1	**5 directions of approach** With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on NC contact Slow-action contacts	2 NC	➔	5	**3SF1114-1QV10-1BA1**		1	1 unit
Enclosure width 56 mm								
3SF1124-1QV10-1BA2	**5 directions of approach** With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on M12 socket, right Slow-action contacts	1 NC	➔	5	**3SF1124-1QV10-1BA2**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately (see page 13/96).

Selection and ordering data

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Actuators						
	Standard actuator					
3SE5000-0AV01	• Length 75.6 mm	▶	**3SE5000-0AV01**		1	1 unit
3SE5000-0AV02	• With vertical fixing, length 53 mm	5	**3SE5000-0AV02**		1	1 unit
3SE5000-0AV03	• With transverse fixing, length 47 mm	5	**3SE5000-0AV03**		1	1 unit
3SE5000-0AW11	• With transverse fixing, plastic[1], length 40 mm	5	**3SE5000-0AW11**		1	1 unit
	Radius actuators					
3SE5000-0AV04	• Length 51 mm, direction of approach from the left	2	**3SE5000-0AV04**		1	1 unit
3SE5000-0AV06	• Length 51 mm, direction of approach from the right	5	**3SE5000-0AV06**		1	1 unit
	Universal radius actuator					
3SE5000-0AV05-1AA6	• Length 77 mm	5	**3SE5000-0AV05**		1	1 unit
	• Length 77 mm, tab rotated 90°	5	**3SE5000-0AV05-1AA6**		1	1 unit
	Universal radius actuator, heavy duty					
3SE5000-0AV07	• Length 67 mm	2	**3SE5000-0AV07-1AK2**		1	1 unit
	• Length 77 mm	5	**3SE5000-0AV07**		1	1 unit
Optional accessories						
3SE5000-0AV08-1AA2	**Protective caps**, black rubber For the actuator head, to protect the actuator openings from contamination (Only for enclosure width 40 mm or 56 mm)	5	**3SE5000-0AV08-1AA2**		1	1 unit
3SE5000-0AV08-1AA3	**Blocking inserts**, high-grade steel, for actuator head For up to eight padlocks	5	**3SE5000-0AV08-1AA3**		1	1 unit

[1] Not suitable for safety switches with tumbler.

With Tumbler

General data

Overview

The 3SF1 safety switches with safety-related communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be wired up conventionally.

With the 3SF1 safety switches the ASIsafe electronics are integrated in the switch enclosure.

3SF1 safety switch with tumbler and with integrated ASIsafe electronics

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 × 90°. The switches can also be approached from above.

The actuators are not included in the scope of supply of the safety switch and must be ordered separately from a choice of different versions to suit the application, (see page 13/96).

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety.

A rubber cap to protect the actuator entry of the actuator head from contamination is available for operation of the enclosures in dusty environments.

Tumbler

There are two versions for interlocking the actuator:

- Spring-actuated lock (closed-circuit principle) with various release mechanisms
- Solenoid-locked (open-circuit principle)

For more explanations, (see page 13/59).

Display

The switches have a status display with four LEDs:

- LED 1 (green): AS-i
- LED 2 (red): FAULT
- LED 3 (yellow): F-IN1
- LED 4 (yellow): F-IN2

Connection

Connection to the AS-Interface is by means of a 4-pole M12 device plug (plastic version) connected to the yellow AS-Interface bus cable (no additional supply of auxiliary power is required thanks to the low current consumption of the solenoid of max. 170 mA).

Benefits

The new generation of 3SF13 safety switches with tumbler offers:

- More safety through higher locking forces:
  - 1 300 N for the plastic version
  - 2 600 N for the metal version
- Various release mechanisms: lock release, escape release and emergency release
- ASIsafe electronics integrated in the enclosure; connected through 4-pole M12 device plug
- Current consumption of the solenoid no more than 170 mA
- Two contact blocks as standard equipment, hence fewer versions needed
- Same dimensions for all enclosure versions: plastic, metal
- An extensive range of actuators
- Status display with four LEDs
- 3SF1324-1S.21-1BK4 series with high degree of protection IP69K, IP69 in accordance with IEC 60529, cover with foamed seal

Application

The safety switches with tumbler are exceptional safety-related devices which 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 switched-off machine).

The safety switches with tumbler 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 tumbler

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 fail-safe principle according to EN ISO 14119.

Approvals

AS-Interface according to EN 50295 and IEC 62026-2

The switches are approved for use with locking devices according to EN ISO 14119 and EN 292, Parts 1 and 2.

3SF13 safety switches with tumbler have a VDE test mark.

With a 3SF13 safety switch with tumbler it is possible to achieve Category 3 according to EN ISO 13849-1 or SIL 2 according to IEC 61508.

Category 4 according to EN ISO 13849-1 or SIL 3 according to IEC 61508 can be achieved by using an additional 3SE5 safety switch.

The 3SF1 safety switches are approved according to UL 508, UL 50 and UL 746-C.

With Tumbler

3SF1, plastic enclosures with locking force greater than 1 200 N

Overview

Versions

- 1BA1: ASIsafe channel 1 on 1 NC contact from the actuator, and channel 2 on 1 NC contact from the solenoid
- 1BA3: ASIsafe channel 1 on the first NC contact from the actuator and channel 2 on the second NC contact from the actuator
- 1BA4: ASIsafe channel 1 on 2 NC contacts (two-channel) from the actuator, and channel 2 on 1 NC contact from the solenoid. The position switch transfers the information of actuators to a transfer channel because the discrepancy of the two actuator contacts is already evaluated in the switch.

The 3SF1324-1S.21-1BA4 safety switches are also recommended where there are several protective door tumblers and reliable diagnostics and quick restart capability of equipment is required.

- A response is received from the solenoid.
- No opening of the doors required after the solenoid is unlocked.

In connection with an ASIsafe MSS modular safety system or an ET 200SP F-CM AS-i Safety ST module, it is possible to achieve SIL 2 according to IEC 61508 or PL d according to ISO 13849-1. They comply with the standard EN ISO 14119. A TÜV certificate is available.

Features:

- Slow-action contacts
- 5 directions of approach
- Solenoid: Rated operational voltage 24 V DC
- 1 300 N locking force
- Degree of protection IP66/IP67 (IP69K)
- Status display with 4 LEDs 24 V DC;
  1: AS-i, 2: FAULT, 3: F–IN1, 4: F–IN2

Comparison of versions

Safety switches Type	Contacts Actuator/solenoid	Achievable safety level	Diagnostics Feedback from the solenoid	Reclosing condition after unlocking the solenoid (depending on the type of evaluation)
3SF1324-1S.21-1BA1	1 NC/1 NC	SIL 1/PL c	✓	Door does not have to be opened
	1 NC/1 NC	SIL 2/PL d	✓	Door must be opened
3SF1324-1S.21-1BA3	2 NC/--	SIL 2/PL d	--	Door does not have to be opened
3SF1324-1S.21-1BA4	2 NC/1 NC	SIL 2/PL d	✓	Door does not have to be opened
3SF1324-1S.21-1BK4 (IP69K)	2 NC/1 NC	SIL 2/PL d	✓	Door does not have to be opened

✓ Available -- Not available

Selection and ordering data

Tumbler[1]	Contacts Actuator/ solenoid	SD	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
1 300 N locking force · Enclosure width 54 mm						
Spring-actuated locks						
• With auxiliary release	1 NC/1 NC	➔ 5	**3SF1324-1SD21-1BA1**		1	1 unit
	2 NC/--	➔ 5	**3SF1324-1SD21-1BA3**		1	1 unit
	2 NC/1 NC	➔ 5	**3SF1324-1SD21-1BA4**		1	1 unit
- Degree of protection IP69 acc. to 60529; IP69K acc. to DIN 40050	2 NC/1 NC	➔ 5	**3SF1324-1SD21-1BK4**		1	1 unit
• With auxiliary release with lock	1 NC/1 NC	➔ 5	**3SF1324-1SE21-1BA1**		1	1 unit
• With escape release from the front	1 NC/1 NC	➔ 5	**3SF1324-1SF21-1BA1**		1	1 unit
	2 NC/1 NC	➔ 5	**3SF1324-1SF21-1BA4**		1	1 unit
- Degree of protection IP69 acc. to 60529; IP69K acc. to DIN 40050	2 NC/1 NC	➔ 5	**3SF1324-1SF21-1BK4**		1	1 unit
• With escape release from the back and auxiliary release from the front	1 NC/1 NC	➔ 5	**3SF1324-1SG21-1BA1**		1	1 unit
	2 NC/1 NC	➔ 5	**3SF1324-1SG21-1BA4**		1	1 unit
- Degree of protection IP69 acc. to 60529; IP69K acc. to DIN 40050	2 NC/1 NC	➔ 5	**3SF1324-1SG21-1BK4**		1	1 unit
• With emergency release from the back and auxiliary release from the front	1 NC/1 NC	➔ 5	**3SF1324-1SJ21-1BA1**		1	1 unit
Solenoid-locked	1 NC/1 NC	➔ 5	**3SF1324-1SB21-1BA1**		1	1 unit
	2 NC/--	➔ 5	**3SF1324-1SB21-1BA3**		1	1 unit

3SF1324-1SD21-1BA1

3SF1324-1SF21-1BA1

3SF1324-1SB21-1BA1

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately.
For actuators and optional accessories, see page 13/64.

With Tumbler

3SF1, metal enclosures with locking force greater than 2 000 N

Overview

Version

- 1BA1: ASIsafe channel 1 on 1 NC contact from the actuator, and channel 2 on 1 NC contact from the solenoid

Features

- Slow-action contacts
- Solenoid: Rated operational voltage 24 V DC
- 2 600 N locking force
- Degree of protection IP66/IP67
- Status display with 4 LEDs 24 V DC; 1: AS-i, 2: FAULT, 3: F–IN1, 4: F–IN2

Comparison of versions

Safety switches Type	Contacts Actuator/solenoid	Achievable safety level	Diagnostics Feedback from the solenoid	Reclosing condition after unlocking the solenoid (depending on the type of evaluation)
3SF1314-1S.11-1BA1	1 NC/1 NC	SIL 1/PL c	✓	Door does not have to be opened

✓ Available

Selection and ordering data

	Tumbler[1]	Contacts Actuator/ solenoid	SD	Complete units Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
2 600 N locking force · Enclosure width 54 mm							
3SF1314-1SD11-1BA1	**Spring-actuated locks**						
	• With auxiliary release	1 NC/1 NC	➔ 5	**3SF1314-1SD11-1BA1**		1	1 unit
	• With auxiliary release with lock	1 NC/1 NC	➔ 5	**3SF1314-1SE11-1BA1**		1	1 unit
3SF1314-1SF11-1BA1	• With escape release from the front	1 NC/1 NC	➔ 5	**3SF1314-1SF11-1BA1**		1	1 unit
	• With escape release from the back and auxiliary release from the front	1 NC/1 NC	➔ 5	**3SF1314-1SG11-1BA1**		1	1 unit
	• With escape release from the back and auxiliary release with lock from the front	1 NC/1 NC	➔ 5	**3SF1314-1SH11-1BA1**		1	1 unit
	• With emergency release from the back and auxiliary release from the front	1 NC/1 NC	➔ 5	**3SF1314-1SJ11-1BA1**		1	1 unit
3SF1314-1SB11-1BA1	**Solenoid-locked**	1 NC/1 NC	➔ 5	**3SF1314-1SB11-1BA1**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately.

For actuators and optional accessories, see page 13/64.

Safety Hinge Switches

3SF1, plastic enclosures, enclosure width 31 mm according to EN 50047 / 50 mm

Overview

The 3SF1 safety hinge switches with safety-related communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be wired up conventionally.

With the 3SF1 hinge switches the ASIsafe electronics are integrated in the switch enclosure.

The hinge switches are provided for mounting on hinges. There are two actuator variants here:
- Hollow shaft, inner diameter 8 mm, outer 12 mm
- Solid shaft, diameter 10 mm

For the ASIsafe version of the hinge switch, the basic switch and actuator head must be ordered separately. The basic switches correspond to the 3SF1 position switches (use only versions with snap-action contacts).

The provisions and approvals are the same as for the 3SF1 standard switches, see page 13/85.

Selection and ordering data

Modular system

1 or 2 contacts · 3 LEDs · Degree of protection IP65 (31 mm) or IP66/IP67 (50 mm) · M12 device plug

	Version	Contacts	LEDs		SD d	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Basic switches · Enclosure width 31 mm acc. to EN 50047									
3SF1234-1LC05-1BA1	**With Teflon plunger, with M12 device plug**, 4-pole, channel 1 on NC contact, channel 2 on NC contact Snap-action contacts	2 NC	24 V DC	➔	5	**3SF1234-1LC05-1BA1**		1	1 unit
Basic switches · Enclosure width 50 mm									
3SF1244-1LC05-1BA2	**With Teflon plunger, with M12 device plug**, 4-pole channel 1 on NC contact, channel 2 on M12 socket, right Snap-action contacts	1 NC	24 V DC	➔	5	**3SF1244-1LC05-1BA2**		1	1 unit
Actuator heads									
3SE5000-0AU21	**With hollow shaft** Operating angle 10°				5	**3SE5000-0AU21**		1	1 unit
3SE5000-0AU22	**With solid shaft** Operating angle 10°				5	**3SE5000-0AU22**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

Safety Hinge Switches

3SF1, metal enclosures, enclosure width 31 mm according to EN 50047 / 40 mm according to EN 50041 / 56 mm

Overview

The 3SF1 safety hinge switches with safety-related communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be wired up conventionally.

With the 3SF1 hinge switches the ASIsafe electronics are integrated in the switch enclosure.

The hinge switches are provided for mounting on hinges. There are two actuator variants here:
- Hollow shaft, inner diameter 8 mm, outer 12 mm
- Solid shaft, diameter 10 mm

For the ASIsafe version of the hinge switch, the basic switch and actuator head must be ordered separately. The basic switches correspond to the 3SF1 position switches (use only versions with snap-action contacts).

The provisions and approvals are the same as for the 3SF1 standard switches, see page 13/85.

Selection and ordering data

Modular system

1 or 2 contacts · 3 LEDs · Degree of protection IP66/IP67 · M12 device plug

	Version	Contacts	LEDs		SD d	Modular system Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Basic switches · Enclosure width 31 mm acc. to EN 50047									
3SF1214-1LC05-1BA1	**With plunger** With M12 device plug, 4-pole, channel 1 on NC contact, channel 2 on NC contact Snap-action contacts	2 NC	24 V DC	➔	5	**3SF1214-1LC05-1BA1**		1	1 unit
Basic switches · Enclosure width 40 mm acc. to EN 50041									
3SF1114-1LA00-1BA1	**With M12 device plug**, 4-pole, channel 1 on NC contact, channel 2 on NC contact Snap-action contacts	2 NC	24 V DC	➔	5	**3SF1114-1LA00-1BA1**		1	1 unit
Basic switches · Enclosure width 56 mm									
3SF1124-1LA00-1BA2	**With M12 device plug**, 4-pole, channel 1 on NC contact, channel 2 on M12 socket, right Snap-action contacts	1 NC	24 V DC	➔	5	**3SF1124-1LA00-1BA2**		1	1 unit
Actuator heads									
3SE5000-0AU21	**Hollow shaft** Operating angle 10°				5	**3SE5000-0AU21**		1	1 unit
3SE5000-0AU22	**Solid shaft** Operating angle 10°				5	**3SE5000-0AU22**		1	1 unit

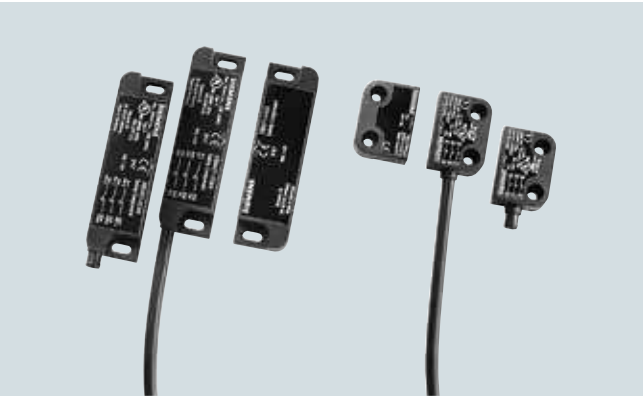
➔ Positive opening according to IEC 60947-5-1, Appendix K.

3SE66, 3SE67 magnetically operated switches

Overview

3SE66 contact blocks and 3SE67 switching magnets

A magnetically operated switch comprises a coded switching magnet and a contact block (sensor unit). The switch must be connected to a safety relay, e.g. SIRIUS 3SK1, or a bus system, e.g. SIMATIC ET 200SP, for evaluation. The switches use reed contacts as mechanical contacts. The status of the contacts is monitored using an evaluation unit.



3SE66 contact blocks and 3SE67 switching magnets, supplementary range in new design

Safety relays

3SK safety relays can be used worldwide since they possess all the required certification. Since they satisfy the most exacting safety requirements, they are suitable for all kinds of safety applications.

The following can be selected:

- 3SK1 Standard basic units:
  simple and compact to satisfy all the essential requirements of safety sensor monitoring systems
- 3SK1 Advanced basic units:
  multifunctional series with relay enabling circuits, semiconductor outputs or time-delay outputs
- 3SK2 basic units:
  multifunctional series whose functionality is parameterized using software. The basic units have solid-state outputs. Relay outputs from the 3SK1 portfolio can also be connected via device connectors.
- Expansion units for inputs and outputs

The 3SE6806 safety relay is also available with two floating enabling circuits (safe circuits) as NO contact circuits and one floating signaling circuit as an NC contact circuit.

Benefits

Standard range

- Non-contact round, rectangular, small (25 mm x 33 mm) and larger (25 mm x 88 mm) versions
- Small, compact, safe
- Simple mounting with alignment of sensor and actuator, and concealed installation also easy
- Suitable for restricted spaces

Supplementary range

- New design for rectangular shape
- More functionality
- Greater switching intervals and a larger horizontal or vertical displacement
- Various mounting positions possible (e.g. at 90° offset)
- SIL 3 and PL e diagnostics possible because there are two safety contacts and one signaling contact
- LED variant
- Fast connection possible using plug-in variants

3SE66, 3SE67 magnetically operated switches

Application

SIRIUS 3SE6 magnetically operated switches are designed for mounting on movable protective guards (hoods, hinged covers, doors, etc.). Evaluation can be performed by means of a safety relay or through connection to a bus system.

The 3SE66 non-contact, magnetically operated safety switches stand out due to their enclosed design with degree of protection IP67. Since they are coded, they do not have to be concealed when installed. 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 (+ 1 NC signaling contact) or 2 NC (+ 1 NC signaling contact) are used, the 3SK safety relay, for example, provides a high degree of protection against manipulation and can be installed in safety circuits up to SIL 3 according to IEC 62061 and PL e according to EN ISO 13849-1.

Non-contact safety magnetically operated switches (with plug or cable) for right-hinged door

Non-contact safety magnetically operated switches (with plug or cable) for left-hinged door

Magnet

3SE66, 3SE67 magnetically operated switches

Combination of monitoring units and magnetically operated switches

Monitoring units			Magnetically operated switches (contact block + switching magnet)			Achievable SIL (IEC 61508, IEC 62061) Performance Level (EN ISO 13849-1)
			1 NO + 1 NC 3SE6605-.BA.. 3SE6704-.BA	**2 NC** 3SE6604-2BA.. **1 NO + 2 NC** 3SE6606-2BA04 3SE6704-2BA	--	
			1 NO + 1 NC (+ 1 NC signaling contact) 3SE6616-3CA01 3SE6626-3CA01 3SE6714-3CA 3SE6724-3CA	**2 NC; 2 NC (+ 1 NC signaling contact)** 3SE6614-4CA01 3SE6624-4CA01 3SE6617-2CA01 3SE6627-2CA01 3SE6617-2CA04 3SE6627-2CA04 3SE6714-2CA 3SE6724-2CA	**2 NC (+ 1 NC signaling contact)** 3SE6617-3CA01 3SE6627-3CA01 3SE6617-3CA04 3SE6627-3CA04 3SE6714-3CA 3SE6724-3CA	
Relay output						
SIRIUS safety relays	3SK1121, 3TK2826		✓	✓	✓	SIL 3/PL e
Solid-state outputs						
SIRIUS safety relays	3SK1112, 3SK1122		--/✓	✓	✓	SIL 3/PL e
	3SK2112, 3SK2122		✓	✓	✓	SIL 3/PL e
ASIsafe compact safety modules	3RK1205, 3RK1405		--	✓	✓	SIL 3/PL e
Modular Safety System (MSS)	3RK3		✓	✓	✓	SIL 3/PL e
SIMATIC S7-1200F	F-DI 16 x 24 V DC		✓	✓	✓	SIL 3/PL e
SIMATIC ET 200SP PROFIsafe	4/8 F-DI, 24 V DC		✓	✓	✓	SIL 3/PL e
SIMATIC ET 200eco	4/8 F-DI, 24 V DC		✓	✓	✓	SIL 3/PL e
SIMATIC ET 200pro	8/16 F-DI, 24 V DC, 4/8 F-DI/4 F-DQ 2 A, 24 V DC, F-Switch		✓	✓	✓	SIL 3/PL e
SIMATIC ET 200SP	8F-DI, 24 V DC F-PM-E 24 V DC		✓	✓	✓	SIL 3/PL e
SIMATIC ET 200MP	16 F-DI, 24 V DC		✓	✓	✓	SIL 3/PL e

✓ Suitable magnetically operated switch

-- Not available

Magnet

3SE66, 3SE67 magnetically operated switches

Selection and ordering data

	Version	Size	Contacts	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		mm		d				
Standard range – Round sensor units								
3SE6704-1BA	**Switching magnet (coded)**	M30	--	2	**3SE6704-1BA**		1	1 unit
3SE6505-1BA	**Contact blocks**							
	• With cable 3 m	M30	1 NO + 1 NC	2	**3SE6605-1BA**		1	1 unit
	• With M12 plug, 4-pole	M30	1 NO + 1 NC	2	**3SE6605-1BA02**		1	1 unit
Standard range – Rectangular sensor units								
3SE6704-2BA	**Switching magnet (coded)**	25 × 88	--	2	**3SE6704-2BA**		1	1 unit
3SE660.-2BA	**Contact blocks**							
	• With cable 3 m	25 × 88	1 NO + 1 NC	2	**3SE6605-2BA**		1	1 unit
			2 NC	2	**3SE6604-2BA**		1	1 unit
			1 NO + 2 NC	10	**3SE6606-2BA04**		1	1 unit
	• With cable 10 m	25 × 88	1 NO + 1 NC	5	**3SE6605-2BA10**		1	1 unit
			2 NC	2	**3SE6604-2BA10**		1	1 unit
	• With M8 plug, 4-pole	25 × 88	1 NO + 1 NC	2	**3SE6605-2BA01**		1	1 unit
			2 NC	2	**3SE6604-2BA01**		1	1 unit
3SE660.-3BA	**Switching magnet (coded)**	25 × 33	--	2	**3SE6704-3BA**		1	1 unit
	Contact blocks							
	• With cable 3 m	25 × 33	1 NO + 1 NC	2	**3SE6605-3BA**		1	1 unit
	• With cable 5 m			2	**3SE6605-3BA05**		1	1 unit
	• With cable 10 m			2	**3SE6605-3BA10**		1	1 unit
Supplementary range in new design – Rectangular sensor units for left-hinged door								
3SE6714-2CA	**Switching magnets (coded)**							
	• Same level	25 x 88	--	5	**3SE6714-2CA**		1	1 unit
	• 90° offset			5	**3SE6724-2CA**		1	1 unit
3SE6614-4CA01	**Contact blocks**							
	• With M8 plug, 4-pole, with LED	25 × 88	2 NC	5	**3SE6614-4CA01**		1	1 unit
	• 8 mm ∅, latching connection, plug, 6-pole		2 NC + 1 NC[1)]	5	**3SE6617-2CA01**		1	1 unit
	• With cable 3 m		2 NC + 1 NC[1)]	5	**3SE6617-2CA04**		1	1 unit
3SE6714-3CA	**Switching magnets (coded)**							
	• Same level	26 x 36	--	5	**3SE6714-3CA**		1	1 unit
	• 90° offset			5	**3SE6724-3CA**		1	1 unit
3SE6616-3CA01	**Contact blocks**							
	• 8 mm ∅, latching connection, plug, 6-pole	26 × 36	1 NO + 1 NC + 1 NC[1)]	5	**3SE6616-3CA01**		1	1 unit
			2 NC + 1 NC[1)]	5	**3SE6617-3CA01**		1	1 unit
	• With cable 3 m		2 NC + 1 NC[1)]	5	**3SE6617-3CA04**		1	1 unit

[1)] The NC is a signaling contact, not a safety contact.

Magnet

3SE66, 3SE67 magnetically operated switches

	Version	Size	Contacts	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		mm		d				
Supplementary range in new design – Rectangular sensor units for right-hinged door								
3SE6714-2CA	**Switching magnets (coded)**							
	• Same level	25 x 88	--	5	**3SE6714-2CA**		1	1 unit
	• 90° offset			5	**3SE6724-2CA**		1	1 unit
3SE6624-4CA01	**Contact blocks**							
	• With M8 plug, 4-pole, with LED	25 x 88	2 NC	5	**3SE6624-4CA01**		1	1 unit
	• 8 mm ∅, latching connection, plug, 6-pole		2 NC + 1 NC[1)]	5	**3SE6627-2CA01**		1	1 unit
	• With cable 3 m		2 NC + 1 NC[1)]	5	**3SE6627-2CA04**		1	1 unit
3SE6714-3CA	**Switching magnets (coded)**							
	• Same level	26 x 36	--	5	**3SE6714-3CA**		1	1 unit
	• 90° offset			5	**3SE6724-3CA**		1	1 unit
3SE6626-3CA01	**Contact blocks**							
	• 8 mm ∅, latching connection, plug, 6-pole	26 × 36	1 NO + 1 NC + 1 NC[1)]	5	**3SE6626-3CA01**		1	1 unit
			2 NC + 1 NC[1)]	5	**3SE6627-3CA01**		1	1 unit
	• With cable 3 m		2 NC + 1 NC[1)]	5	**3SE6627-3CA04**		1	1 unit
Accessories for standard range								
3SX3260	**Spacer**	25 × 88	--	2	**3SX3260**		1	1 unit
		25 × 33	--	5	**3SX3261**		1	1 unit
3SX3261	**Coupling** With connecting cable, 5 m							
	• With M8 socket, 4-pole		--	5	**3SX5601-3GA05**		1	1 unit
Accessories for supplementary range in new design								
3SX5600-2GA01	**Spacer**	25 × 88	--	5	**3SX5600-2GA01**		1	1 unit
3SX5600-2GA02		26 × 36	--	5	**3SX5600-2GA02**		1	1 unit
3SX5601-3GA05	**Coupling** With connecting cable, 5 m							
	• With M8 socket, 4-pole		--	5	**3SX5601-3GA05**		1	1 unit
	• With 8 mm ∅ socket, 8 mm, latching connection, 6-pole		--	5	**3SX5601-4GA05**		1	1 unit

[1)] The second NC is a signaling contact, not a safety contact.

Magnet

3SE66, 3SE67 magnetically operated switches

	Version	Rated control voltage	Number of sensors	Enabling/ signaling circuits	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Monitoring units									
	3SK1 safety relays								
	Standard or Advanced basic units								
3SK1121-1AB40	With relay output	24 V DC	6[1)]	3 NO/1 NC	▶	**3SK1121-1AB40**		1	1 unit
	With semiconductor output	24 V DC	1	2 x F-DQ/ 1 QM	2	**3SK1112-1BB40**		1	1 unit
	3SK2 safety relays								
	Basic units								
3SK2112-1AA10	With semiconductor output	24 V DC	5	2 x F-DQ/ 1 QM	2	**3SK2112-1AA10**		1	1 unit
			10	4 x F-DQ/ 2 QM	2	**3SK2122-1AA10**		1	1 unit

[1)] Only when up to 5 3SK1220 expansion units are used, see page 13/25.

For more monitoring units, see page 13/109.

Overview

Non-contact RFID safety switches with maximum tamper resistance

RFID 3SE63 non-contact safety switches comply with the highest safety requirements, SIL 3 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 connection 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 variant 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.

Mounting and maintenance

Various options for mounting save on enclosure variants:

- Mounting of the switch on the right or left side
- The actuator can be mounted on all sides

Quick and easy mounting thanks to universal mounting holes:

- Standard gauge/holes for 3SE6 magnetically operated switches
- Fine adjustment thanks to slotted holes

Little adjustment or maintenance required:

- Threshold indication by LED display on the switch for quick and easy adjustment during mounting 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

Optional accessories (mounting)

- 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 high-pressure cleaners, for example

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 increased 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 detection 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 proof diagnostics output. The signals can then be used for central displays or non-safety-related control tasks.

There are the following diagnostics functions:

- Crossover monitoring
- Open-circuit monitoring
- External voltage monitoring
- Ambient temperature too high
- Wrong or defective actuator
- Switching interval threshold identification with LED display

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 function of a safety switch results in the disconnection of the safety channels after a 30-minute delay. However, the diagnostics output switches off instantaneously.

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 detection 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 plug
- Two solid-state 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 hinge switches 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
  IP69 does not automatically mean that it can be used outdoors. The devices must be installed with corresponding protection for this purpose. UV radiation additionally affects the enclosure
- 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 non-contact 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 suitable for solid-state inputs and in which the built-in crossover monitoring function can be deactivated, e.g.:

Monitoring units	
Relay output	
SIRIUS safety relays	3SK1111-.AB30, 3SK1121
SIRIUS safety relays	3TK2826-.BB4.
Solid-state outputs	
SIRIUS safety relays	3SK1112, 3SK1122, 3SK2112, 3SK2122
SIRIUS safety relays	3TK2841, 3TK2842, 3TK2845 3TK2853-.BB40
Modular Safety System (MSS)	3RK3 (safe inputs)
SIMATIC ET 200S	6ES7138-4FA0.-0AB0 6ES7138-4FC0.-0AB0
SIMATIC ET 200M	6ES7326-1BK0.-0AB0
SIMATIC ET 200eco	6ES7148-3FA00-0XB0
SIMATIC ET 200pro	6ES7148-4F.00-0AB0
SIMATIC ET 200SP	6ES7136-6BA00-0CA0 6ES7136-6PA00-0BC0
SIMATIC ET 200MP	6ES7526-3BH00-0AB0
SIMATIC S7-1200F	6ES7226-6BA32-0XB0

These safety categories can be achieved in safety circuits:

- Category 4 according to EN ISO 13849-1
- PL e according to EN ISO 13849-1
- SIL 3 according to IEC 61508

Technical specifications

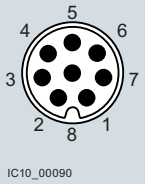
Type		3SE63
General data		
Standards		IEC 60947-5-3, IEC 61508, EN ISO 13849-1, EN ISO 14119
Enclosure material		Glass-fiber reinforced thermoplast, self-extinguishing
Degree of protection		IP65/IP67/IP69K
Ambient temperature		
• During operation	°C	-25 ... +70
• During storage, transport	°C	-25 ... +85
Shock resistance		30 *g* /11 ms
Vibration resistance		10 ... 55 Hz, amplitude 1 mm

Type		3SE63
Electrical specifications		
Rated insulation voltage U_i	V	32
Degree of pollution according 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 EN 60204-1)	V DC	24 –15/+10%
Protection class		II
Overvoltage category		III
Rated operational current I_e	A	0.6
Lowest operating current I_m	mA	0.5
No-load current I_0	mA	35

3SE63 RFID safety switches

Type		3SE63
Inputs/outputs		
Safety inputs X1/X2		
• Input voltage	V DC	24 –15/+10%
• Power consumption per input	mA	5
Safety outputs OSSD1/OSSD2		p operation
• Max. rated operating current $I_{e\ max}$	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
Diagnostics output		p operation
• Max. rated operating 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

Pin assignment

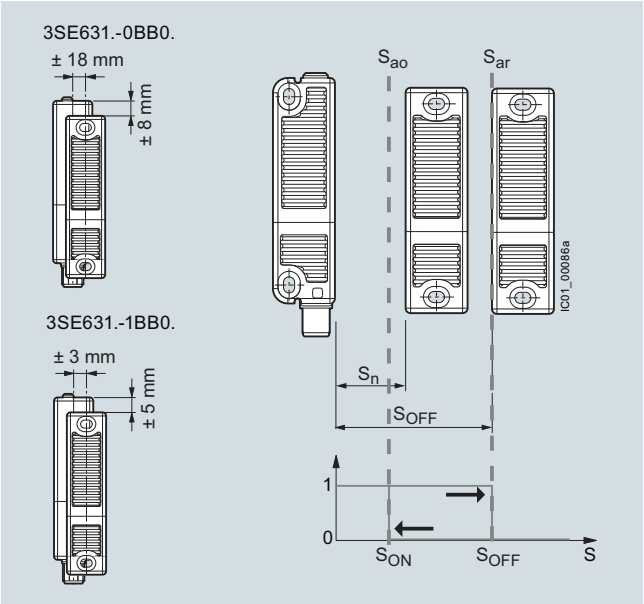


Pin 1: A1 rated operational voltage 24 V DC
Pin 2: X1 safety input 24 V DC
Pin 3: A2 grounding
Pin 4: OSSD1 safety output
Pin 5: OUT conventional diagnostics output
Pin 6: X2 safety input 24 V DC
Pin 7: OSSD2 safety output
Pin 8: Not used

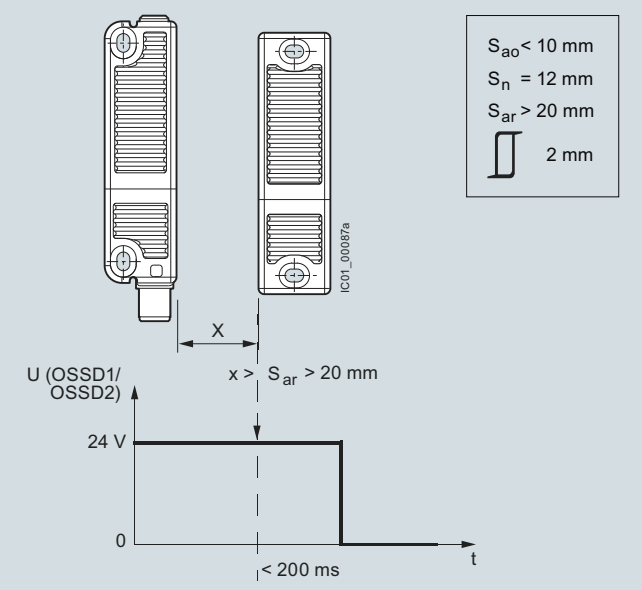
Pin assignment

Directions of approach and switching interval

The side area permits a maximum height offset of the switch and actuator of ± 8 mm (e.g. mounting tolerance or due to sagging of the protective door). The transverse offset also equals max. ± 18 mm.



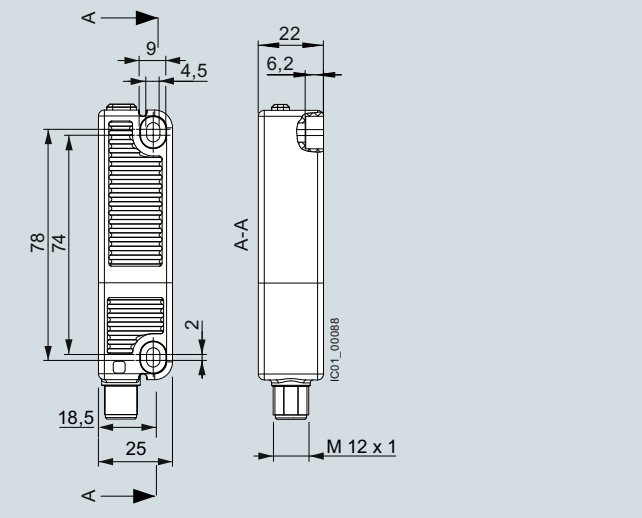
Switching interval: Output signal with hysteresis



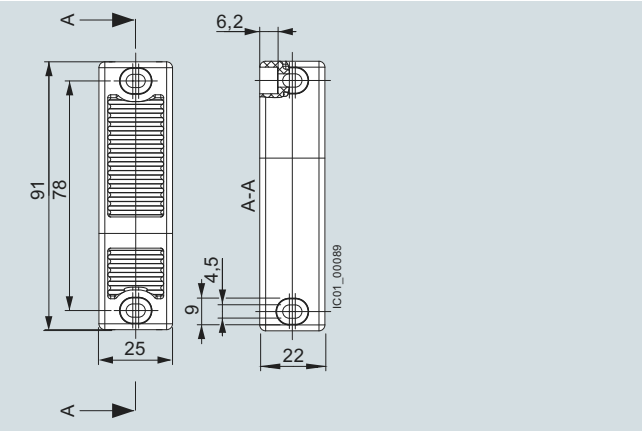
Switching interval: Output signal with OFF delay

Dimension drawings

RFID switch
3SE6315

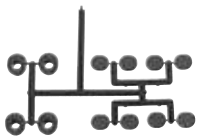


RFID actuator
3SE6310



Selection and ordering data

With M12 connection plug, 8-pole

	Version/coding	Latching/length	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Rectangular safety switches 91 mm x 25 mm[1)]							
3SE6315	**RFID safety switch**						
	• Family coded	None	2	**3SE6315-0BB01**		1	1 unit
		With 18 N magnetic catch	2	**3SE6315-1BB01**		1	1 unit
	• Individually coded, programmable several times	None	2	**3SE6315-0BB02**		1	1 unit
		With 18 N magnetic catch	5	**3SE6315-1BB02**		1	1 unit
	• Individually coded, programmable once	None	2	**3SE6315-0BB03**		1	1 unit
		With 18 N magnetic catch	5	**3SE6315-1BB03**		1	1 unit
3SE6310	**RFID actuator**						
	• Standard	None	2	**3SE6310-0BC01**		1	1 unit
		With 18 N magnetic catch	2	**3SE6310-1BC01**		1	1 unit
Optional accessories							
 3SX5600-1G	**Covers and spacers** One pack (1 unit) contains 8 covers and 4 spacers		2	**3SX5600-1G**		1	1 unit
3SX5601-2GA03	**Connecting cables, 8-pole,** with 1 straight M12 socket Rated voltage 30 V Rated current 2 A	Length 3 m	2	**3SX5601-2GA03**		1	1 unit
		Length 5 m	2	**3SX5601-2GA05**		1	1 unit
		Length 10 m	2	**3SX5601-2GA10**		1	1 unit

1) Not connectable via AS-i modules.

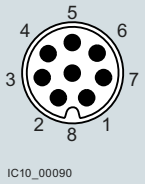
For more monitoring units, see page 13/109.

SIRIUS 3SE5 Mechanical Position Switches

General data

Type		3SE63
Inputs/outputs		
Safety inputs X1/X2		
• Input voltage	V DC	24 –15/+10%
• Power consumption per input	mA	5
Safety outputs OSSD1/OSSD2		p operation
• Max. rated operating current $I_{e\ max}$	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
Diagnostics output		p operation
• Max. rated operating 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

Pin assignment

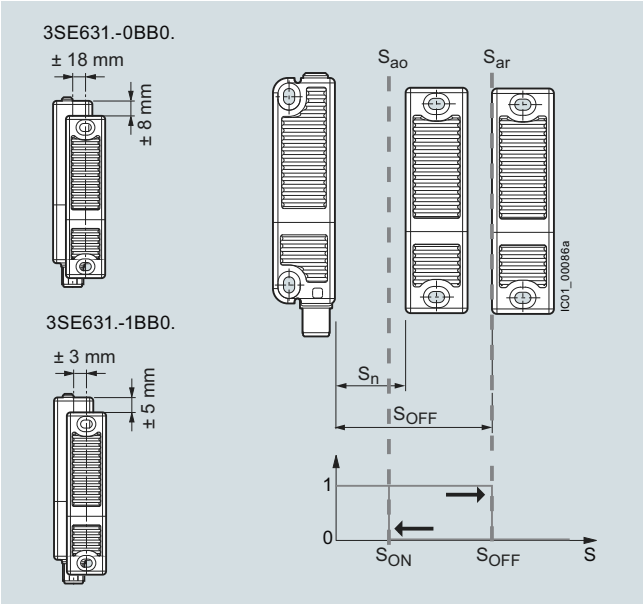


Pin 1: A1 rated operational voltage 24 V DC
Pin 2: X1 safety input 24 V DC
Pin 3: A2 grounding
Pin 4: OSSD1 safety output
Pin 5: OUT conventional diagnostics output
Pin 6: X2 safety input 24 V DC
Pin 7: OSSD2 safety output
Pin 8: Not used

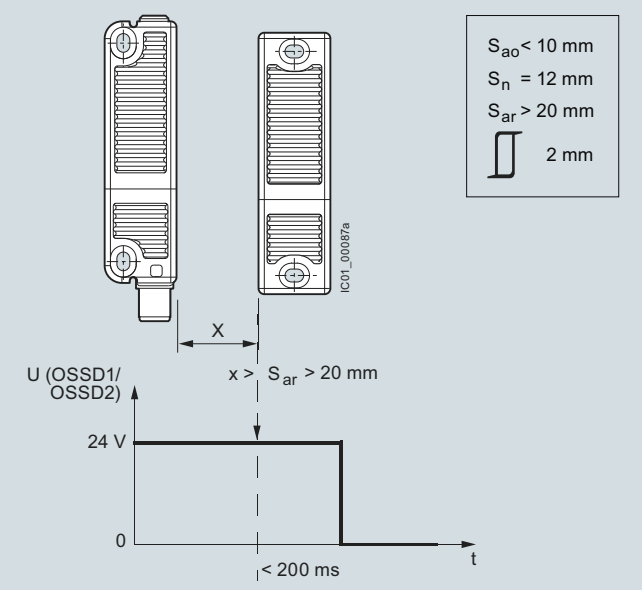
Pin assignment

Directions of approach and switching interval

The side area permits a maximum height offset of the switch and actuator of ± 8 mm (e.g. mounting tolerance or due to sagging of the protective door). The transverse offset also equals max. ± 18 mm.



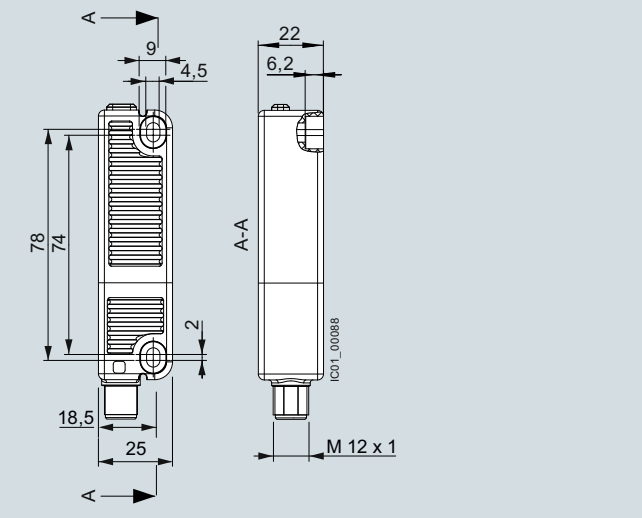
Switching interval: Output signal with hysteresis



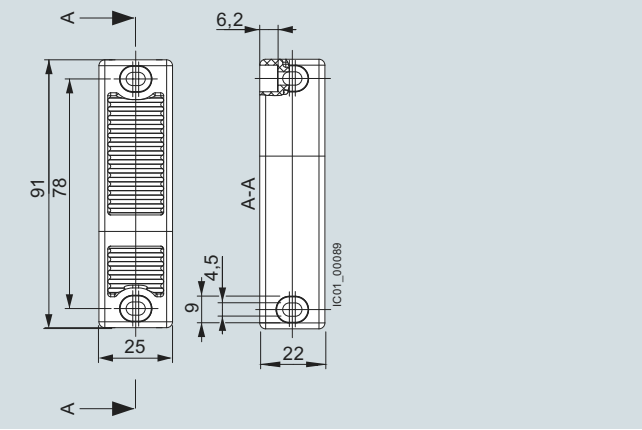
Switching interval: Output signal with OFF delay

Dimension drawings

RFID switch
3SE6315



RFID actuator
3SE6310

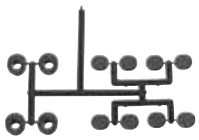


SIRIUS 3SE5 Mechanical Position Switches

General data

Selection and ordering data

With M12 connection plug, 8-pole

	Version/coding	Latching/length	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Rectangular safety switches 91 mm x 25 mm[1)]							
3SE6315	**RFID safety switch**						
	• Family coded	None	2	**3SE6315-0BB01**		1	1 unit
		With 18 N magnetic catch	2	**3SE6315-1BB01**		1	1 unit
	• Individually coded, programmable several times	None	2	**3SE6315-0BB02**		1	1 unit
		With 18 N magnetic catch	5	**3SE6315-1BB02**		1	1 unit
	• Individually coded, programmable once	None	2	**3SE6315-0BB03**		1	1 unit
		With 18 N magnetic catch	5	**3SE6315-1BB03**		1	1 unit
3SE6310	**RFID actuator**						
	• Standard	None	2	**3SE6310-0BC01**		1	1 unit
		With 18 N magnetic catch	2	**3SE6310-1BC01**		1	1 unit
Optional accessories							
 3SX5600-1G	**Covers and spacers** One pack (1 unit) contains 8 covers and 4 spacers		2	**3SX5600-1G**		1	1 unit
3SX5601-2GA03	**Connecting cables, 8-pole,** with 1 straight M12 socket Rated voltage 30 V Rated current 2 A	Length 3 m	2	**3SX5601-2GA03**		1	1 unit
		Length 5 m	2	**3SX5601-2GA05**		1	1 unit
		Length 10 m	2	**3SX5601-2GA10**		1	1 unit

1) Not connectable via AS-i modules.

For more monitoring units, see page 13/109.

3SE03 Heavy Duty Limit Switches

General Information

Features

Modular plug-in

Product Description
These heavy duty switches define the industry standard with versatility of design and high reliability for low maintenance, installation and inventory costs. Standard Viton gaskets, seals and boots and a zinc die cast enclosure provide exceptional chemical resistance to the common coolants, cleansing agents, and hydraulic fluids found in machine tool, automotive, waste water treatment and other heavy duty industrial applications. Mounting dimensions accommodate both U.S. and DIN standards for easy retrofit installations.

Features
- Manufactured to take the physical and environmental abuse (including cutting fluids and chemicals) of harsh industrial environments
- Modular, plug-in components (head and switch body) provide application flexibility, reduced inventory and less downtime
- Chemical resistant Viton gaskets, seals and boots are standard, and so are captive, posi-drive screws
- A special internal seal on the switch body prevents fluid from entering even when the operating head is not attached
- 600V rating, ridge-topped contacts and wiping action assure continuity even to logic level circuits
- Factory wired cable features a 350 pound pullout capacity
- Keyed, four direction head positioning. Standard 5° pre-travel and 90° total travel
- Rotary heads are field convertible CW, CCW, or both, without special tools

Standards and Certifications
- UL Listed
- CSA certified
- CE (single pole only)
- RoHS Compliant

Factory Sealed

Product Description
These heavy duty switches were specifically designed to withstand the penetrating properties of cutting fluids and coolants, such as those used in the automotive industry, as well as extreme shock, vibration and temperature fluctuations. The one-piece, epoxy filled switch body is prewired at the factory to ensure leak-proof, submersible performance. This unique construction positively stops fluid from finding its way to any and all critical connections. Our 6P+ switches can be ordered in separate components or as complete assembled devices. They are available with prewired 16 AWG cables or mini-connectors. Standard and custom cable lengths are available, and these switches use the same operating heads as the standard 3SE03 switches.

Features
- Manufactured to take the physical and environmental abuse (including cutting fluids and chemicals) of harsh industrial environments
- Modular, plug-in components (head and switch body) provide application flexibility, reduced inventory and less downtime
- Chemical resistant Viton gaskets, seals and boots are standard, and so are captive, posi-drive screws
- A special internal seal on the switch body prevents fluid from entering even when the operating head is not attached
- 600V rating, ridge-topped contacts and wiping action assure continuity even to logic level circuits
- Factory wired cable features a 350 pound pullout capacity
- Keyed, four direction head positioning. Standard 5° pre-travel and 90° total travel
- Rotary heads are field convertible CW, CCW, or both, without special tools

!! DANGER !!
THIS SENSOR IS NOT A SAFETY DEVICE AND IS NOT INTENDED TO BE USED AS A SAFETY DEVICE.

3SE03 switches are designed only to detect and read certain data in an electronic manner and perform no use apart from that, specifically no safety-related use. This sensor product does not include self-checking redundant circuitry, and the failure of this sensor product could cause either an energized or de-energized output condition, which could result in death, serious bodily injury, or property damage.

For safety-rated limit switches, see page 13/7.

3SE03 Heavy Duty Limit Switches

Modular, plug-in and NEMA type 6P submersible

Technical data

Type	Modular, Plug-in and NEMA Type 6P Submersible
Mechanical life	Side rotary: 13 x 10^6 make-break operations minimum All others: 10 x 10^6 make-break operations minimum
Electrical life	Single Pole: 1 x 10^6 operations typical at full load Double Pole: 1 x 10^5 operations typical at full load
Switching frequency	8 x 10^3 make-break operations per hour (maximum)
Operating point accuracy	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)
Cable entry	1/2 in.-NPT, Prewired Cable or Prewired Receptacle with Pin Connector
Ambient temperature	Without Cable: –10° to +121°C, 14° to 250°F With Cable: –10° to +105°C, 14° to 221°F
Degree of protection	NEMA Type 1, 3, 3S, 4, 4X, 6, 6P, 13; IP67
Conductor size	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)
Mounting	Any position
Tightening Torque	Switch body screws: 25–30 lb-in. Operating head screws: 14–18 lb-in.

NEMA rating	DC, NEMA R300		AC, NEMA A600			
Maximum current at	**125V**	**250V**	**120V**	**240V**	**480V**	**600V**
Make	0.22A	0.11A	60A	30A	15A	12A
Break	0.22A	0.11A	6A	3A	1.5A	1.2A
Max. volt-ampere						
Make	28VA	28VA	7200VA	7200VA	7200VA	7200VA
Break	28VA	28VA	720VA	720VA	720VA	720VA
Rated thermal current	DC, 1A		AC, 10A			
Rated operating voltage	DC, 300V		AC, 600V			

Operating temperature [1]) [2])

Temperature rating	Operation		Temperature range	
	Type	**Return**	**Without cable**	**With cable**
1	Side rotary[3])	Momentary CW only or CCW only	10°F to 200°F -12°C to 94°C	10°F to 200°F -12°C to 94°C
2	Center neutral Side rotary Side plunger Two-sided plunger Roller side plunger[4])	Momentary CW or CCW Maintained Momentary Maintained Momentary	14°F to 200°F -10°C to 94°C	14°F to 200°F -10°C to 94°C
3	Top plunger Top roller plunger[4]) Wobble head	Momentary Momentary Momentary	14°F to 250°F -10°C to 121°C	14°F to 221°F -10°C to 105°C

1) Temperature ranges below +32°F (0°C) are based on absence of freezing moisture or water.

2) For temperature rating of specific switch, refer to page 13/70, Operating Heads.

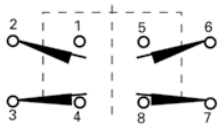
3) For CW only or CCW only operation, upper temperature limit increases to 250°F (121°C) without cable, and 221°F (105°C) with pre-wired cable.

4) Roller direction can be converted in the field.

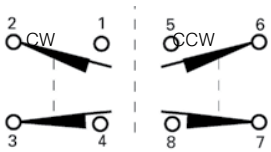
3SE03 Heavy Duty Limit Switches

Modular, plug-in metal housing

Complete switches without lever - threaded cable entry:

Plug-In module type	Standard single pole 1 NO + 1 NC (3SE03-SA)	Standard double pole 2 NO + 2 NC (3SE03-SB)
Receptacle type surface mount	Single pole (3SE03-RA) 	Double pole (3SE03-RB) 

Operating head type			Composite catalog number consisting of head, module and receptacle					
			DT	Catalog Number	List Price $ 1 unit	DT	Catalog Number	List Price $ 1 unit
Side rotary CW and CCW operation convertible to CW only or CCW only	Standard momentary (3SE03-DR1)		►	**3SE03-AR1** ①		►	**3SE03-BR1** ①	
	Standard maintained (3SE03-DM1)		►	**3SE03-AM1**		►	**3SE03-BM1**	
	Low torqued momentary (3SE03-DL1)		►	**3SE03-AL1** ②			**3SE03-BL1** ②	
Plain side plunger	Momentary (3SE03-DS1)		►	**3SE03-AS1**		►	**3SE03-BS1**	
Roller side plunger	Momentary (3SE03-DS3)		►	**3SE03-AS3**			**3SE03-BS3**	
Two-sided plunger	Maintained (3SE03-DH1)			**3SE03-AH1**			**3SE03-BH1**	
Plain top plunger	Momentary (3SE03-DT1)		►	**3SE03-AT1**			**3SE03-BT1**	
Roller top plunger	Momentary (3SE03-DT3)			**3SE03-AT3**		►	**3SE03-BT3**	
Wobble head (without lever)	Momentary (3SE03-DW1)		►	**3SE03-AW1**		►	**3SE03-BW1**	

Plug-In module type	Center neutral Double pole 2 NO + 2 NC (3SE03-SN)
Receptacle type surface mount	Center neutral (3SE03-RB) 

Operating head type			Composite catalog number consisting of head, module and receptacle		
			DT	Catalog Number	List Price $ 1 unit
Side rotary (momentary)	Center Neutral	(3SE03-DN1) (3SE03-DN2)	► ►	**3SE03-NN1** ① **3SE03-NN2** ②	

① 5° pretravel to operate contacts. ② 15° pretravel to operate contacts.

3SE03 Heavy Duty Limit Switches

NEMA type 6P submersible, prewired cable

Complete switches without lever - prewired cable:

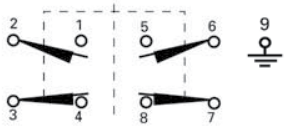
Switch body type—prewired cable with 8 foot cable

Single pole
1 NO + 1 NC
(3SE03-SA6P)

Cable color code
1 - White
2 - Black
3 - Red
4 - Orange
5 - Green

Double pole
2 NO + 2 NC
(3SE03-SB6P)

Cable color code
1 - White
2 - Black
3 - Red
4 - Orange
5 - Brown
6 - Pink
7 - Yellow
8 - Blue
9 - Green



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
	Side rotary CW and CCW operation convertible to CW only or CCW only	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**	
	Plain side plunger	Momentary (3SE03-DS1)		**3SE03-AS16P**		**3SE03-BS16P**	
	Roller side plunger	Momentary (3SE03-DS3)		**3SE03-AS36P**		**3SE03-BS36P**	
	Two-sided plunger	Maintained (3SE03-DH1)		**3SE03-AH16P**		**Not available**	
	Plain top plunger	Momentary (3SE03-DT1)		**3SE03-AT16P**		**3SE03-BT16P**	
	Roller top plunger	Momentary (3SE03-DT3)		**3SE03-AT36P**		**3SE03-BT36P**	
	Wobble head (without lever)	Momentary (3SE03-DW1)		**3SE03-AW16P**		**3SE03-BW16P**	

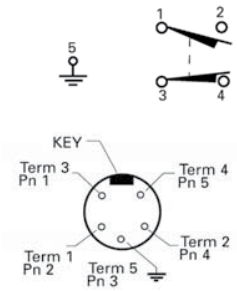
3SE03 Heavy Duty Limit Switches

NEMA type 6P submersible, prewired receptacle

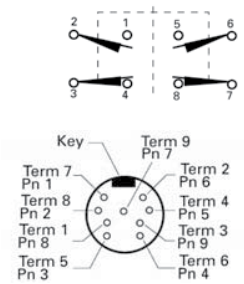
Complete switches without lever - prewired receptacle with pin connector:

Switch Body Type—prewired receptacle with pin connector

Single pole
1 NO + 1 NC
(3SE03-SA6PC)



Double pole
2 NO + 2 NC
(3SE03-SB6PC)



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
	Side rotary CW and CCW operation convertible to CW only or CCW only	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**	
	Plain side plunger	Momentary (3SE03-DS1)		**3SE03-AS16PC**		**3SE03-BS16PC**	
	Roller side plunger	Momentary (3SE03-DS3)		**Not available**		**3SE03-BS36PC**	
	Two-sided plunger	Maintained (3SE03-DH1)		**3SE03-AH16PC**		**3SE03-BH16PC**	
	Plain top plunger	Momentary (3SE03-DT1)		**3SE03-AT16PC**		**3SE03-BT16PC**	
	Roller top plunger	Momentary (3SE03-DT3)		**3SE03-AT36PC**		**3SE03-BT36PC**	
	Wobble head (without lever)	Momentary (3SE03-DW1)		**3SE03-AW16PC**		**3SE03-BW16PC**	

3SE03 Heavy Duty Limit Switches

Modular, plug-in and NEMA type 6P submersible

Components:

Plug-in module

Plug-in module	DT	Catalog Number	List Price $ 1 unit
Standard single pole 1 NO + 1 NC	►	3SE03-SA	
Standard double pole 2 NO + 2 NC	►	3SE03-SB	
Center neutral 2 NO + 2 NC①	►	3SE03-SN	

Receptacle

Receptacle for plug-in module		Catalog Number	List Price $ 1 unit
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:

Prewired cable

Prewired receptacle

	Prewired cable 8 foot length			Prewired receptacle with pin connector		
Switch body	DT	Catalog Number	List Price $ 1 unit	DT	Catalog Number	List Price $ 1 unit
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 heads②:

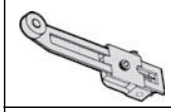
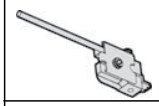
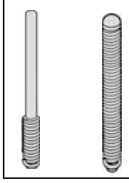
Operating head type		Nominal operating data								
		Total travel	Pretravel	Operating force	Release position	Minimum return force	Operating temp range④	DT	Catalog Number	List Price $ 1 unit
Side rotary⑤	Standard momentary⑥	90°	5°	3 lb-in.	2°	4.5 oz-in.	1	►	3SE03-DR1	
	Low torqued momentary⑥	90°	15°	1.5 lb-in.	6°	2.5 oz-in.	1	►	3SE03-DL1	
	Standard maintained	90°	50°	3 lb-in.	50°	–	2	►	3SE03-DM1	
Plain side plunger	Momentary	0.25 in.	0.065 in.	4 lbs	0.03 in.	8 oz.	2	►	3SE03-DS1	
Roller side plunger	Momentary⑦	0.25 in.	0.065 in.	4 lbs	0.03 in.	8 oz.	2	►	3SE03-DS3	
Two-sided plunger	Maintained	0.32 in.	0.2 in.	5 lbs	0.13 in.	5 lbs	2	►	3SE03-DH1	
Plain top plunger	Momentary	0.28 in.	0.04 in.	4 lbs	0.02 in.	8 oz.	3	►	3SE03-DT1	
Roller top plunger	Momentary	0.28 in.	0.04 in.	4 lbs	0.02 in.	8 oz.	3	►	3SE03-DT3	
Wobble head ⑤⑧	Momentary	15°	10°	2 lb-in.	6°	2.4 oz-in.	3	►	3SE03-DW1	
Center neutral ⑤⑨	Momentary	90° 90°	5° 15°	1.8 lb-in. 1.8 lb-in.	2° 2°	2.5 oz-in. 2.5 oz-in.	2 2	► ►	3SE03-DN1 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 Heavy Duty Limit Switches

Modular, plug-in metal housing

Levers for plug-in and non-plug-in versions—most widely used

Description		Length①	Roller mounted on side of lever	Roller material	Roller diameter	Roller face width	Max required② return torque (oz-in.)	DT	Catalog Number	List Price $ 1 unit
	Roller crank lever③	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**	
	Fork lever	1.5 (38)	Back / back	Nylatron	0.75 (19)	0.31	–	►	**3SX03-KL204**	
	Adjustable radius lever④	1–3.5 (25–89)	Front	Nylatron	0.75 (19)	0.31 (8)	1.90⑤	►	**3SX03-KL201**	
		1–3.5 (25–89)	Front	Metal	0.75 (19)	0.31 (8)	3.40⑤	►	**3SX03-KL538**	
	Rod lever	9 (229)	–	Stainless steel	–	–	7.00⑤	►	**3SX03-KL220**	
	Adjustable spring rod	12.125 (308)	–	Nylon	–	–	3.50⑤	►	**3SX03-KL556**	
	Flexible loop lever	6 (152)	–	Nylatron	–	–	0.40	►	**3SX03-KL142**	
	**Levers**									
	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	Length①	Roller Type	Roller Diameter	Roller Face (width)	Max required② return torque (oz-in.)	Catalog Number Stainless steel	Catalog Number DT	Catalog Number Cast aluminum	List Price $ 1 unit
Standard lever 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**	
	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 Heavy Duty Limit Switches

Modular, plug-in and NEMA type 6P submersible

Levers for plug-in and non-plug-in versions—most widely used

Operator		Length① Inches (mm)	Roller Type	Roller Diameter In. (mm)	Roller Face width in. (mm)	Min. required return torque oz-in ⑤	Catalog Number DT	Catalog Number Stainless steel	Catalog Number Cast aluminum	List Price $ 1 unit
Roller levers										
Cast aluminum	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**	
Stainless steel	Offset lever (Inboard roller shown)	1.50 (38)	Nylatron	0.75 (19)	0.31 (8)	0.65	►	**3SX03-KL24**	_	
		Inboard roller	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**	_	
		outboard roller	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)②	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)③	Nylatron	0.75 (19)	0.5 (13)	1.90④	►	**3SX03-KL599**		
		1–3.75 (25–95)③	Nylatron	0.75 (19)	1 (25)	3.10④		**3SX03-KL537**		
		1.62–3.75 (41–95)③	Nylatron	1.5 (38)	0.28 (7)	2.50④	►	**3SX03-KL443**		
		0.50–3.75 (13–95)	Large nylatron	4 (102)	0.11 (3)	4.50④	►	**3SX03-KL598**		
		1–3.75 (25–95)③	Ball bearing	0.69 (17)	0.25 (6)	2.50④		**3SX03-KL539**		
		0.50–3.75 (13–95)	Without roller	_	_	1.20④		**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		Length① Inches (mm)	Description Inches (mm)	Min. required return force oz-in.⑤	DT	Catalog Number	List Price $ 1 unit
	Adjustable rod	5.50 (140) Max.	Nylon Rod—0.19 (5) Dia.	0.40④	►	**3SX03-KL399**	
		5.50 (140) Max.	Metal Rod—0.12 (3) Dia.	0.92④	►	**3SX03-KL202**	
		8.75 (222) Max	Metal Rod (Square)—0.12 (3) Max.	2.20④	►	**3SX03-KL581**	
		12 (305) Max.	Steel (Formable) Rod—0.12 (3) Dia.	5.00④	►	**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	1.50④	►	**3SX03-KL533**	
	Adjustable wide roller lever	3.9 (99)	0.75 (19) Dia. Nylatron Roller 0.19 (30) Dia. Rod	4.50④	►	**3SX03-KL37**	
Wobble head operators							
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.

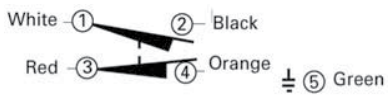
All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

3SE03 Heavy Duty Limit Switches

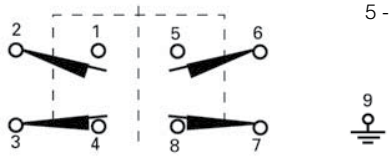
Modular, plug-in and NEMA type 6P submersible

Wiring diagrams

Single Pole
1 NO - 1 NC



Double Pole
1 NO - 1 NC

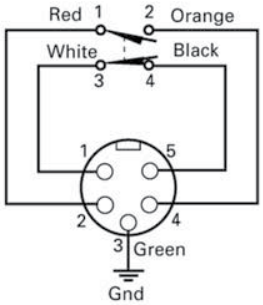


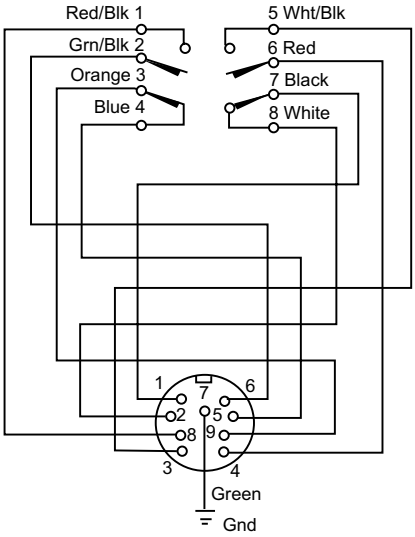
Cable color code

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

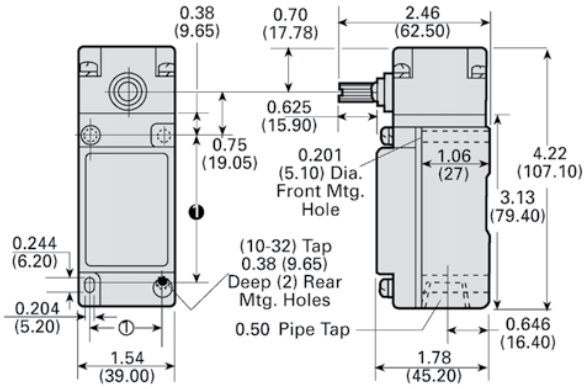
Typical connector cable (supplied by user)

Cable length ft.	Manufacturers part number			
	Daniel Woodhead Brad Harrison	Cooper Crouse-Hinds	Molex (Industrial Interface)	Lumberg USA
5 Pin connector cable				
3	105000A01F030	5000111-3_	14541	RK50-77/1M
6	105000A01F060	5000111-4_	14542	RK50-77/2M
12	105000A01F120	5000111-5_	14544	RK50-77/4M
9 Pin connector cable				
3	309000A01F030	X8990-3	_	_
6	309000A01F060	X8990-4	_	_
12	309000A01F120	X8990-5	_	_

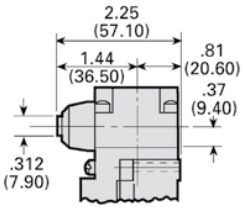
3SE03 Heavy Duty Limit Switches

Modular, plug-in and NEMA type 6P submersible

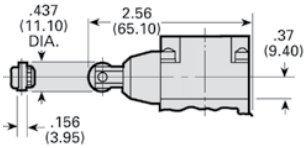
Dimension drawings



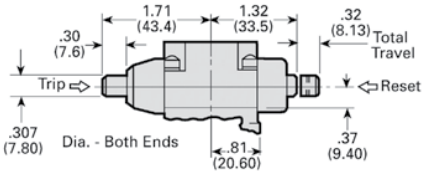
Plain side plunger



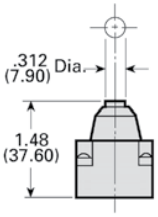
Roller side plunger



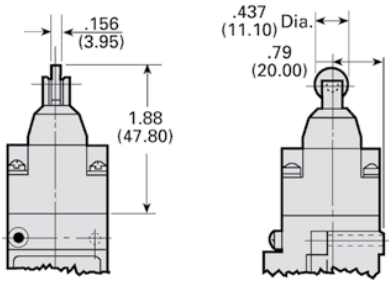
Two side plungers



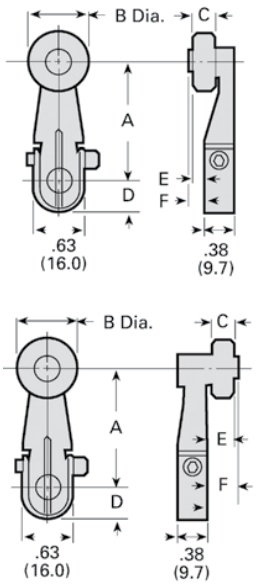
Plain top plunger



Roller top plunger



Rotary lever operators



Catalog Number	Dimensions A	B	C	D	E	F	Catalog Number	Dimensions 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)	**With rollers on reverse side**						
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)

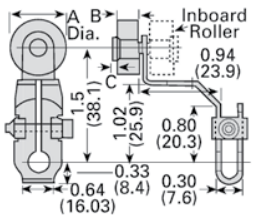
All dimensions shown in inches and (millimeters). For reference purpose only. Not to be used for design or construction purposes.

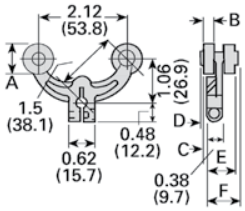
① Can accommodate both U.S. 1.16 (29.4) x 2.34 (59.5) and DIN 1.18 (30.0) x 2.36 (60.0) mounting dimensions.

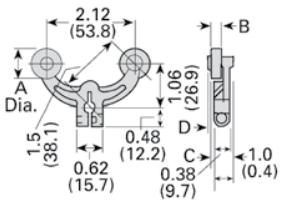
3SE03 Heavy Duty Limit Switches

Modular, plug-in and NEMA type 6P submersible

Dimension drawings







Offset roller levers

Catalog Number	Dimensions		
	A	B	C
Outboard roller			
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)	_
Inboard roller			
3SX03-KL24	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL25	0.75 (19)	0.32 (8)	0.03 (1)

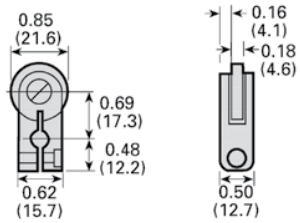
Fork lever, one roller inside, one roller outside

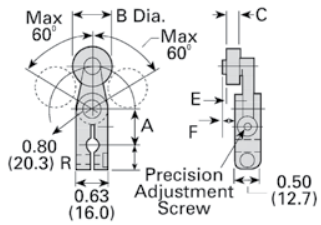
Catalog Number	Dimensions					
	A	B	C	D	E	F
3SX03-KL203	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)	0.73 (19)	0.77 (20)
3SX03-KL541	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)	0.73 (19)	0.77 (20)
3SX03-KL542	0.69 (18)	0.25 (6)	0.08 (2)	0.14 (4)	0.64 (16)	0.70 (18)

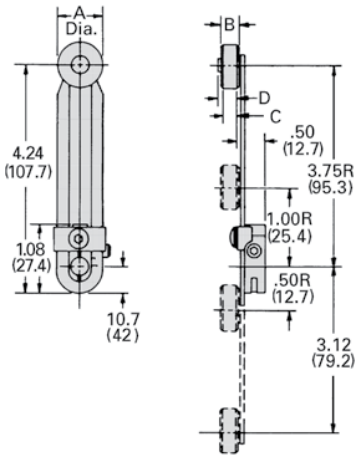
Fork lever - Both rollers on one side

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)

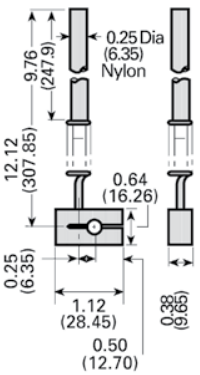
All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

3SE03 Heavy Duty Limit Switches

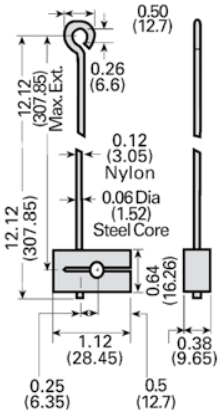
Modular, plug-in and NEMA type 6P submersible

Dimension drawings

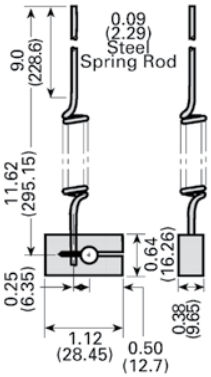
Nylon Spring Rod Actuator
3SX03-KL556



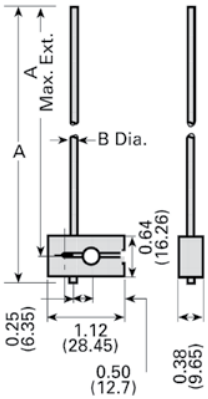
Nylon Covered Wire Actuator
3SX03-KL533



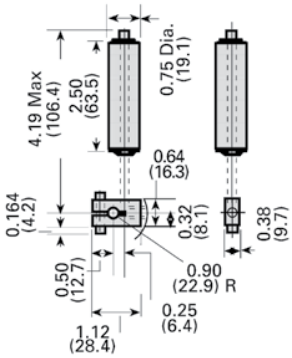
Stainless Steel Spring Actuator
3SX03-KL421



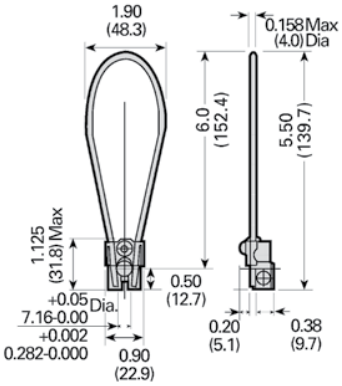
Adjustable Rod Actuator



Adjustable Wire Roller Actuator
3SX03-KL37



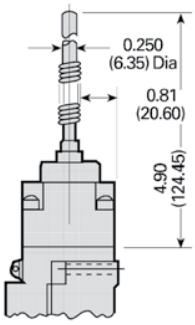
Nylatron Loop Actuator
3SX03-KL142



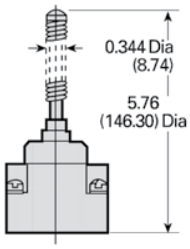
Adjustable rod actuators

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)

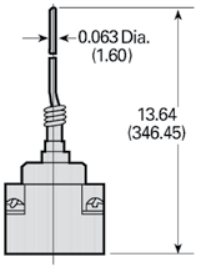
Wobble head with nylon head **3SE03-DW1** **3SX03-KW2**



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 Precision Limit Switches

3SE03 Metal enclosure

Description

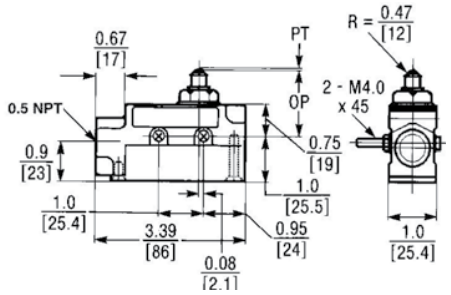
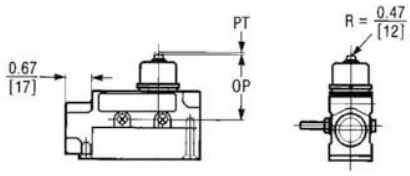
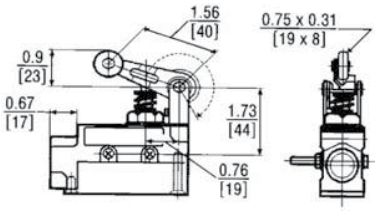
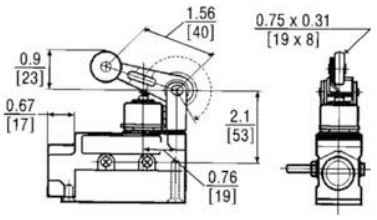
Features

- 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.

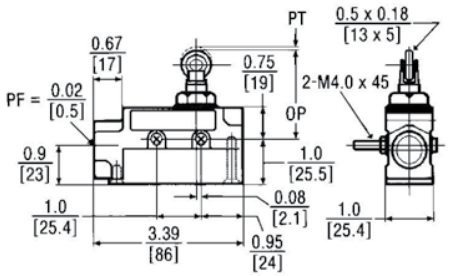
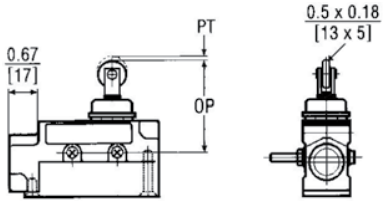
Overall dimensions	Specifications ①	DT	Catalog Number	List Price $ 1 unit
Plunger actuator 	OF Max. - 8.82 - 12.3 oz. (250 - 350 g) RF Min. 4.02 oz. (114 g) PT Max. - 0.016 in. (0.4 mm) OT Min. - 0.217 in. (5.5 mm) MD Max. - 0.002 in. (0.05 mm) OP - 1.504 in. (38.2 mm)	►	**3SE03 - EB05**	
Booted plunger 	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)	►	**3SE03 - EB06**	
Roller lever 	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)	►	**3SE03 - EB32**	
Booted roller lever 	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)	►	**3SE03 - EB33**	

① OF = Operating Force
RF = Return Force
PT = Pretravel
OT = Operating Travel
MD = Movement Differential
OP = Operating Position

3SE03 Precision Limit Switches

3SE03 Metal enclosure

Dimension drawings

Overall dimensions	Specifications	DT	Catalog Number	List Price $ 1 unit
Roller plunger 	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)	►	**3SE03 - EB07**	
Booted roller plunger 	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)	►	**3SE03 - EB08**	

Technical data	
Mechanical Life	3,000,000 operations maximum
Electrical Life	500,000 operations minimum
Operating Speed	0.01 m/second to 1m/second
Cable Entry	1/2" NPT
Temperature Range	-15° to 80° (5° to 176°F)
Degree of Protection	NEMA 1
Mounting	Any Position
NEMA Rating	A600, R300

Rated Voltage (V)[1)2)]	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
125 VAC	15	3	1.5	15	5	2.5	30 maximum	15 maximum
250 VAC	15	2.5	1.25	15	3	1.5		
500 VAC	3	1.5	0.75	2.5	1.5	0.75		
8 VDC	15	3	1.5	15	5	2.5		
14 VDC	15	3	1.5	10	5	2.5		
30 VDC	6 (2)	3	1.5	5	5	2.5		
125 VDC	0.4	0.4	0.4	0.05	0.05	0.05		
250 VDC	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

3SE7 metal enclosures

Overview

3SE7 cable-operated switches

More information
Industry Mall, see www.siemens.com/product?3SE7
For Manual, see https://support.industry.siemens.com/cs/ww/en/view/107194954

The cable-operated switches are used for monitoring or as EMERGENCY STOP devices on particularly endangered system components.

As the effective range of a cable-operated switch is only limited by the length of the trip-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.

Contact blocks

The switches for wire lengths up to 50 m are supplied with 1 NO + 1 NC or 2 NC contacts and those up to 75 m with 1 NO + 3 NC contacts. The switches for wire lengths of 2 x 75 m and the conveyor belt unbalance tracker are supplied with 2 NO + 2 NC contacts.

The NC contacts of the cable-break or cable-pull signaling are positive opening. The NO contact can be used, for example, for signaling purposes.

Free position and display

Cable-operated switches with one-side operation are held in free position by the pre-tension on the turnbuckle.

On switches with interlocking, with a pre-tensioned cable, the locking must be deactivated beforehand in order to return the cable-operated switch to its original position.

The cable-operated switch and the conveyor belt unbalance tracker can be supplied optionally with a factory-fitted LED (red, 24 V DC). This light in innovative chip-on-board technology allows the operating state of the switch to be visible at a distance of at least 50 m.

Application

Standards

The switches are equipped with latching mechanism and positive NC contacts and are thus suitable for operation in EMERGENCY STOP devices according to EN ISO 13850.

Technical specifications

Type		3SE7120	3SE7150	3SE7140	3SE7141	3SE7160	3SE7310
General data							
Standards		IEC/EN 60947-5-1 IEC/EN 60204-1, EN ISO 13850					
Approvals		UL/CSA					
Electrical design		Contacts electrically isolated from each other					
Electrical load							
• 2-pole, at AC-15		400 V AC, 6 A		400 V AC, 6 A	240 V AC, 2 A	400 V AC, 6 A	--
• 3-pole, at AC-15		240 V AC, 2 A		--	--	--	--
• 4-pole, at AC-15		--		--	--	400 V AC, 6 A	400 V AC, 6 A
• Minimum		24 V AC/DC, 10 mA					
Short-circuit protection	A	6 (slow)					
Mechanical endurance		> 100 000 operating cycles					
Contact material		Fine silver					
Operation		By pulling or breaking of wire					
Wire length, maximum	m	10	25	50	75	2 x 100	–
Distance between wire supports, max.	m	3		5		4	–
Enclosures							
Enclosure material		GD Al alloy, coated (color), dark black RAL 9005					
Cover		Shock-resistant thermoplast					
Degree of protection acc. to IEC 60529[1]		IP65			IP67	IP65	
Ambient temperature	°C	–25 ... +70					
Mounting		Designed for M5					
Fixing spacing	mm	30 and 40					
Cable entry		2 x (M20 x 1.5)		1 x (M20 x 1.5)	3 x (M20 x 1.5)	2 x (M25 x 1.5)	
Connection type		Screw terminals M3.5, self-lifting clamp terminal					

[1] IP54 for versions with key-operated release

SIRIUS 3SE7 Cable-Operated Switches

3SE7 metal enclosures

Selection and ordering data

	Version	Wire length	Contacts		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		m			d				
Cable-operated switches									
3SE7120-1BH00	**Metal enclosures, IP65** (cover made of molded plastic)	10							
	• Without latching, only cable pull monitoring		1 NO + 1 NC	➔	2	**3SE7120-2DD01**		1	1 unit
	• With latching and button reset		2 NC	➔	2	**3SE7120-1BF00**		1	1 unit
	- With yellow cover		1 NO + 2 NC	➔	2	**3SE7120-1BH00**		1	1 unit
3SE7150-1BD00	**Metal enclosures, IP65** (cover made of molded plastic), with alignment window	25							
	• Without latching		1 NO + 1 NC	➔	2	**3SE7150-2DD00**		1	1 unit
	• With latching and button reset		1 NO + 1 NC	➔	2	**3SE7150-1BD00**		1	1 unit
			2 NC	➔	2	**3SE7150-1BF00**		1	1 unit
	- With yellow cover		1 NO + 2 NC	➔	5	**3SE7150-1BH00**		1	1 unit
	• With latching and key unlatching		1 NO + 1 NC	➔	5	**3SE7150-1CD00**		1	1 unit
3SE7150-1BD04 3SE7150-1BH04	**Metal enclosures, IP65** (cover made of molded plastic), with alignment window, with LED, red, 24 V DC	25							
	• Without latching		1 NO + 1 NC	➔	5	**3SE7150-2DD04**		1	1 unit
	• With latching and button reset		1 NO + 1 NC	➔	5	**3SE7150-1BD04**		1	1 unit
	• With yellow cover		1 NO + 2 NC	➔	5	**3SE7150-1BH04**		1	1 unit
3SE7140-1B.00	**Metal enclosures, IP65** (cover made of molded plastic)	50							
	• With latching and button reset		1 NO + 1 NC	➔	2	**3SE7140-1BD00**		1	1 unit
			2 NC	➔	5	**3SE7140-1BF00**		1	1 unit
	• In addition with LED, red, 24 V DC		1 NO + 1 NC	➔	5	**3SE7140-1BD04**		1	1 unit
	• With latching and key unlatching		1 NO + 1 NC	➔	5	**3SE7140-1CD00**		1	1 unit
3SE7141-1EG10	**Metal enclosures, IP67** (cover made of molded plastic), with EMERGENCY STOP mushroom, with rotate-to-unlatch mechanism	75	1 NO + 3 NC	➔	2	**3SE7141-1EG10**		1	1 unit
3SE7160-1AE00	**Metal enclosures, IP65** With actuation on both sides	2 x 100							
	• With latching and button reset		2 NO + 2 NC	➔	2	**3SE7160-1AE00**		1	1 unit
			1 NO + 1 NC	➔	5	**3SE7160-1BD00**		1	1 unit
	• In addition with LED, red, 24 V DC		2 NO + 2 NC	➔	5	**3SE7160-1AE04**		1	1 unit

➔ Positive opening according to IEC 60947-5-1, Annex K.

SIRIUS 3SE7 Cable-Operated Switches

3SE7 metal enclosures

Version	Contacts		SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Conveyor belt unbalance trackers							
Metal enclosures, IP65							
• With latching and button reset	2 NO + 2 NC	➔	5	**3SE7310-1AE00**		1	1 unit
• In addition with LED, red, 24 V DC	2 NO + 2 NC	➔	5	**3SE7310-1AE04**		1	1 unit

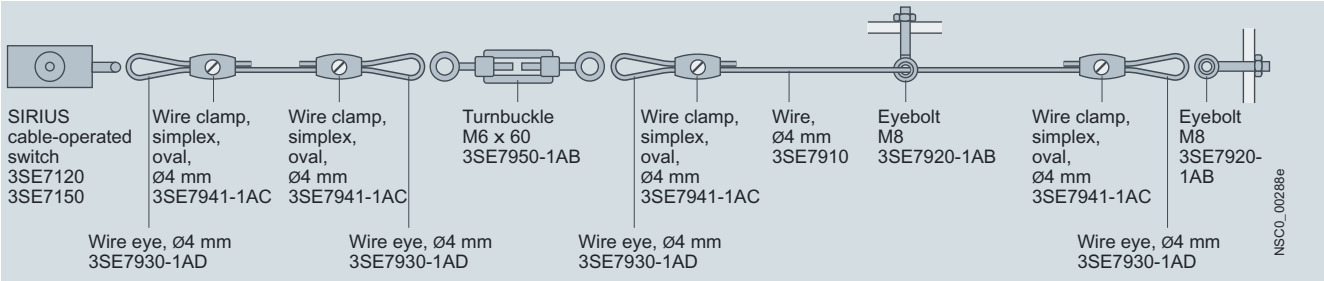
3SE7310-1AE00

➔ Positive opening according to IEC 60947-5-1, Annex K.

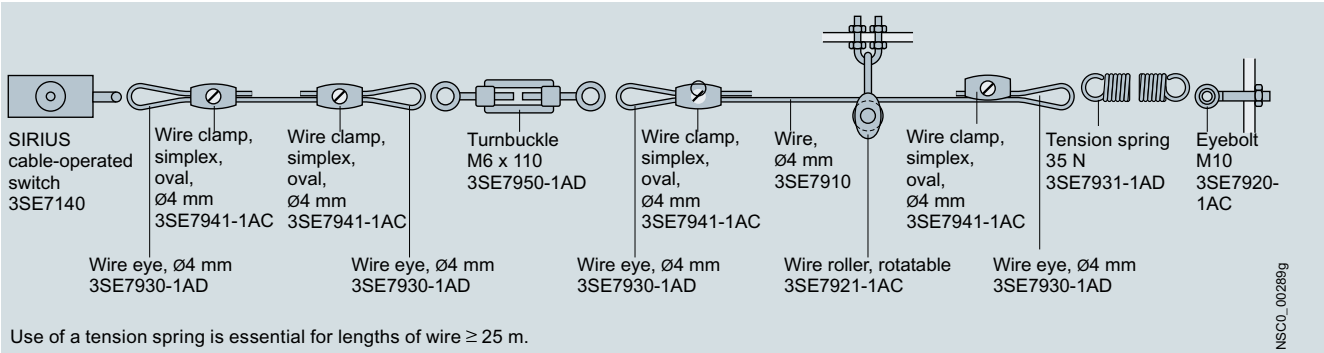
Accessories

Configuration of the cable-operated switches

Short lengths of wire up to 25 m

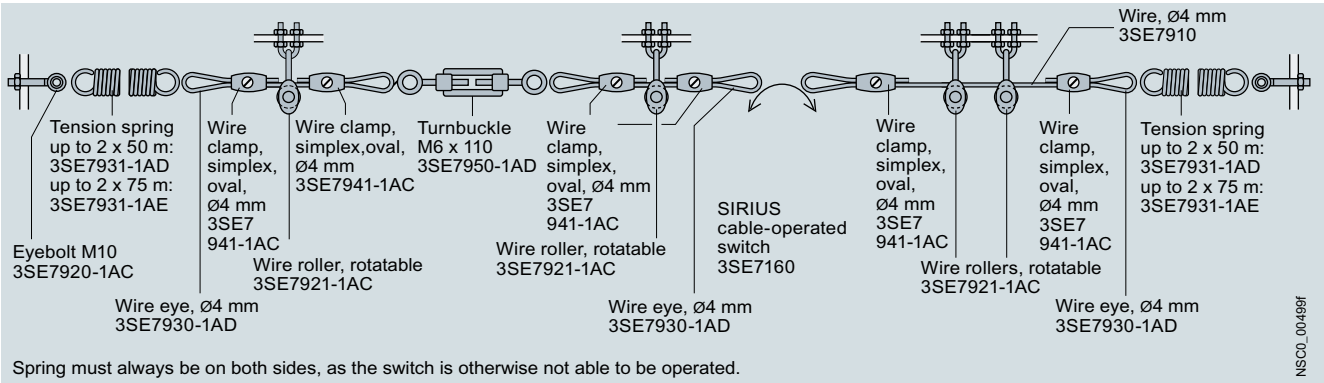


Long lengths of wire up to 50 m



Use of a tension spring is essential for lengths of wire ≥ 25 m.

Pulling from both sides up to 2 x 100 m



Spring must always be on both sides, as the switch is otherwise not able to be operated.

Note:

Large temperature fluctuations require corresponding compensation springs. For reliable connection the PVC sheath must be removed from the clamping area of the steel bowden wire. Bowden wire supports must be used at the recommended intervals.

SIRIUS 3SE7 Cable-Operated Switches

3SE7 metal enclosures

	Version	Length/ diameter	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Trip-wire with fixing							
3SE7910-3AA	**Steel wires**, with red plastic sheath, diameter 4 mm[1)]	10 m	2	**3SE7910-3AA**		1	1 unit
		15 m	2	**3SE7910-3AB**		1	1 unit
		20 m	2	**3SE7910-3AC**		1	1 unit
		50 m	2	**3SE7910-3AH**		1	1 unit
	Wire clamps, galvanized white, zinc-plated						
3SE7941-1AC	• Oval	2 x Ø 4 mm	2	**3SE7941-1AC**		1	1 unit
3SE7942-1AA	• Single (1 set = 4 units)	2 x Ø 4 mm	2	**3SE7942-1AA**		1	4 units
3SE7943-1AC	• Simplex (1 set = 4 units)	2 x Ø 4 mm	2	**3SE7943-1AC**		1	4 units
3SE7944-1AC	• Duplex (1 set = 4 units)	2 x Ø 4 mm	2	**3SE7944-1AC**		1	4 units
3SE7931-1AB	**Tension springs** (zinc-plated) to maintain the counter tension						
	• 13 N		2	**3SE7931-1AB**		1	1 unit
	• 35 N, for cable-operated switches up to 50 m		2	**3SE7931-1AD**		1	1 unit
	• > 35 N, for cable-operated switches up to 2 x 75 m		5	**3SE7931-1AE**		1	1 unit
3SE7921-1AC	**Wire rollers** for changing the direction of the wire, rotatable	Ø 4 mm	2	**3SE7921-1AC**		1	1 unit
3SE7921-1AA	**Fixtures for the wire rollers** (incl. fixing nuts)		2	**3SE7921-1AA**		1	1 unit
3SE7930-1AD	**Wire eyes** for changes in wire direction and improved power transmission at the fixing points (1 set = 4 units)	Ø 4 mm	2	**3SE7930-1AD**		1	4 units
3SE7920-1AB	**Eyebolts** for fixing the wire						
	• Including M8 nut		2	**3SE7920-1AB**		1	1 unit
	• Including M10 nut		2	**3SE7920-1AC**		1	1 unit
3SE7950-1AB	**Turnbuckles** for precise adjustment of the pre-tension						
	• M6 x 60		2	**3SE7950-1AB**		1	1 unit
	• M6 x 110		2	**3SE7950-1AD**		1	1 unit
Spare parts							
3SX3235	**LED lamps,** red 24 V DC diameter 25 mm; for M20 x 1.5 connection		10	**3SX3235**		1	1 unit

[1)] Diameter including casing; the diameter of the steel wire is 3.2 mm.

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 and in the case of metal enclosures they are equipped with actuators and indicators made of metal.

The standard equipment comprises:

- 2 black mushroom pushbuttons, diameter 40 mm, 1 NO + 1 NC
- 1 red EMERGENCY STOP mushroom pushbutton according to ISO 13850, diameter 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, evaluation units are used, e.g. 3SK11 safety relays or the 3RK3, 3SK2 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/ operating principle	Color of actuating element	Number of NO contacts	Number of NC contacts	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Two-hand operation consoles									
	Plastic								
3SU1803-3NB00-1AE1	None	--	0	0	5	**3SU1803-3AA00-0AA1**		1	1 unit
	A = Mushroom pushbutton/ momentary contact B = EMERGENCY STOP mushroom pushbutton/ rotate to unlatch C = Mushroom pushbutton/ momentary contact	A = Black/ B = Red/ C = Black	2	4	5	**3SU1803-3NB00-1AE1**		1	1 unit
	Metal								
3SU1853-3AA00-0AA1	None	--	0	0	5	**3SU1853-3AA00-0AA1**		1	1 unit
3SU1853-3NB00-1AA1	A = Mushroom pushbutton/ momentary contact B = EMERGENCY STOP mushroom pushbutton/ rotate to unlatch C = Mushroom pushbutton/ momentary contact	A = Black/ B = Red/ C = Black	2	4	5	**3SU1853-3NB00-1AA1**		1	1 unit
3SU1853-3NB00-1AD1			2	4	5	**3SU1853-3NB00-1AD1**		1	1 unit

	Version	Material	Color	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Accessories								
	Stands for two-hand operation consoles							
3SU1950-0HN10-0AA0		Metal	Black	5	**3SU1950-0HN10-0AA0**		1	1 unit

SIRIUS 3SK Safety Relays

General data

Overview

SIRIUS 3SK safety relays

More information

Homepage, see www.siemens.com/safety-relays
Industry Mall, see www.siemens.com/product?3SK
Conversion tool, e.g. from 3TK28 to 3SK, see www.siemens.com/sirius/conversion-tool

SIRIUS 3SK safety relays are the key elements of a consistent, cost-effective safety chain. Whether you need EMERGENCY STOP functionality, protective door monitoring, light arrays, laser scanners or the protection of presses or punches – slimline SIRIUS safety relays enable all safety applications to be implemented in the best possible way 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. This reduces device variance, thus bringing advantages in terms of device selection and spare parts management. Optimized solutions when selecting components and reduced spare part inventory requirements are facilitated by a clearly structured component range:

The following device series are available:

- 3SK1 Standard basic units
- 3SK1 Advanced basic units
- 3SK2 basic units
- 3SK1 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:

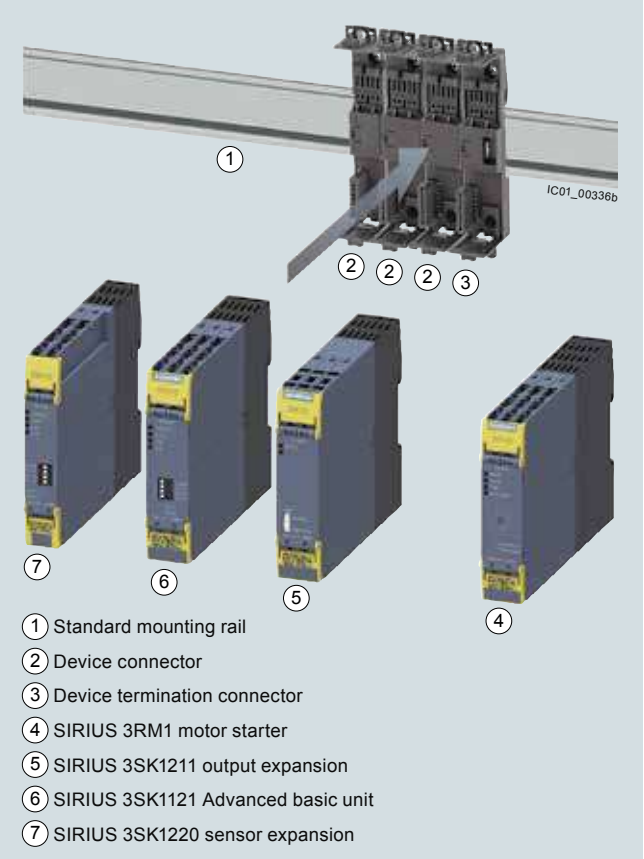
- Universal application possibilities thanks to multifunctionality
- Time-delayed outputs
- Expansion of inputs and outputs

3SK2 basic units

The 3SK2 basic units also offer:

- Up to six fail-safe, independent shutdown functions
- Flexible in use thanks to software parameterization
- Powerful semiconductor outputs
- Convenient diagnostics using diagnostics display and configuration software
- Communication via PROFINET/PROFIBUS by means of communication module

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

SIRIUS 3SK Safety Relays

General data

The 3SK1 Standard and Advanced and 3SK2 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.

Overview of functions of the 3SK series

Type	3SK1 Standard basic units		3SK1 Advanced basic units		3SK2 basic units	
					22.5 mm	45 mm
	Safe relay outputs	Safe semiconductor outputs	Safe relay outputs	Safe semiconductor outputs	Safe semiconductor outputs	Safe semiconductor outputs
Sensors						
• Mechanical	✓	✓	✓	✓	✓	✓
• Non-floating	✓[1]	✓	✓	✓	✓	✓
• Antivalent	--	--	✓	✓	✓	✓
• Expandable	--	✓ by means of cascading	✓	✓	--	--
Inputs	2 x single-channel, 1 x two-channel	2 x single-channel, 1 x two-channel	2 x single-channel, 1 x two-channel	2 x single-channel, 1 x two-channel	Freely configurable: 10 x single-channel, 5 x two-channel	Freely configurable: 20 x single-channel, 10 x two-channel
Parameters						
• Start (auto/monitored)	✓	✓	✓	✓	A variety of functions can be set for each input/output by means of software parameterization.	
• Sensor connection 2 x single-channel/ 1 x two-channel	✓ by means of wiring	✓	✓	✓		
• Cross-circuit detection	✓ by means of wiring	✓	✓	✓		
• Start test ON/OFF	--	✓	✓	✓		
• Monitoring of two-hand operation consoles according to EN 574	--	--	✓	✓		
• Pressure-sensitive mat	--	--	✓	✓		
Safe outputs						
• Instantaneous	✓	✓	✓	✓	Configurable	Configurable
• Time-delayed	--	--	✓	✓	Configurable	Configurable
• Expandable with safe relay outputs	✓ by means of wiring	✓ by means of wiring	✓	✓	✓	✓
• Independent	--	--	--	--	✓[4]	✓[5]
• Device connectors	--	--	✓	✓	✓	✓
Options						
• External memory module	--	--	--	--	--	✓
• Display on the device	--	--	--	--	--	✓
• External diagnostics module can be connected	--	--	--	--	✓	✓
Control supply voltage						
• 24 V DC	✓[2]	✓	✓	✓	✓	✓
• 110 ... 240 V AC/DC	✓	✓[6]	✓[3]	✓[3]	--	--

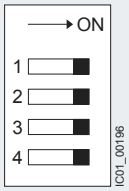
✓ Available
-- Not available

[1] 24 V basic units only.
[2] 24 V AC/DC.
[3] Possible using 3SK1230 power supply via device connector.
[4] Up to four independent safe outputs, two of which via device connectors.
[5] Up to six independent safe outputs, two of which via device connectors.
[6] Possible using 3SK1230 power supply by means of wiring.

Parameter assignment

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 (detect, evaluate, react). A number of functions can be set using the DIP switches on the front. 3SK112 and 3SK1112 are therefore universally applicable.

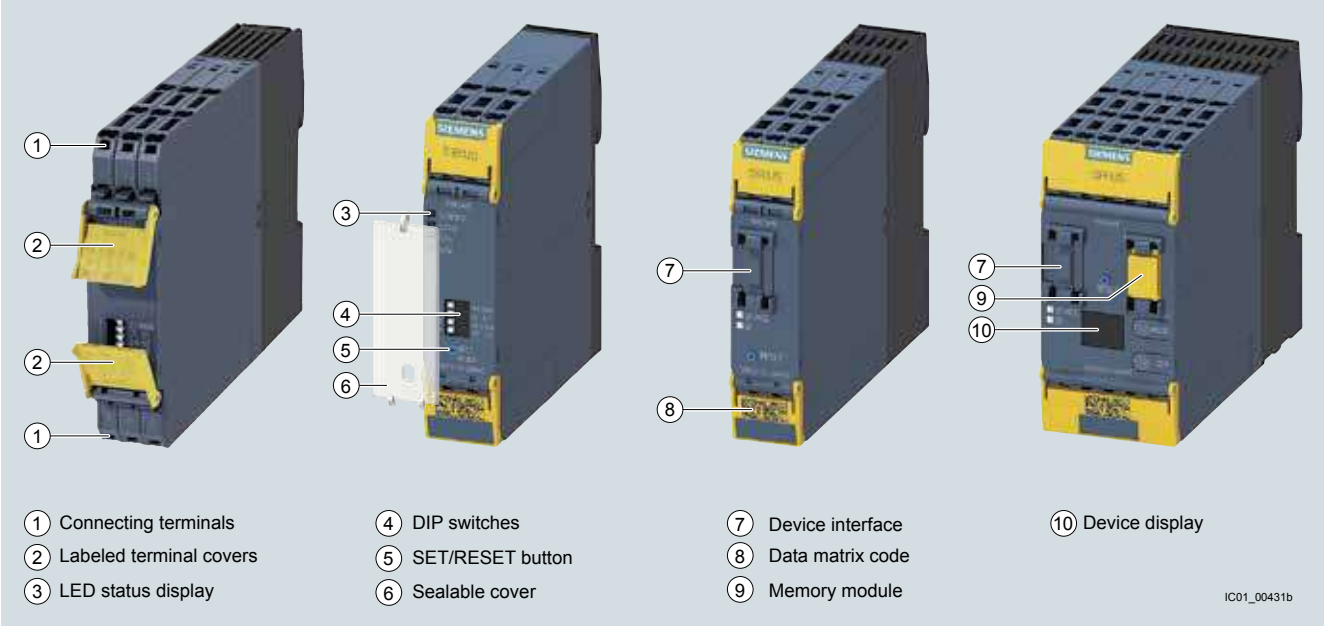
DIP switch No.	OFF	ON	Schematic
1	Sensor input Autostart	Sensor input Monitored start	
2	Without crossover monitoring	With crossover monitoring	
3	2 x single-channel sensor connection	1 x two-channel sensor connection	
4	With start test	Without start test	

Communication

	3SK2112, 22.5 mm	3SK2122, 45 mm
PROFINET	✓	✓
PROFIBUS	✓	✓

✓ Available

Enclosure concept



Innovative enclosure concept for SIRIUS 3SK safety relays

Connection methods

The 3SK safety relays are available with screw or spring-type terminals (push-in).

Spring-type terminals (push-in)

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 or 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.

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.

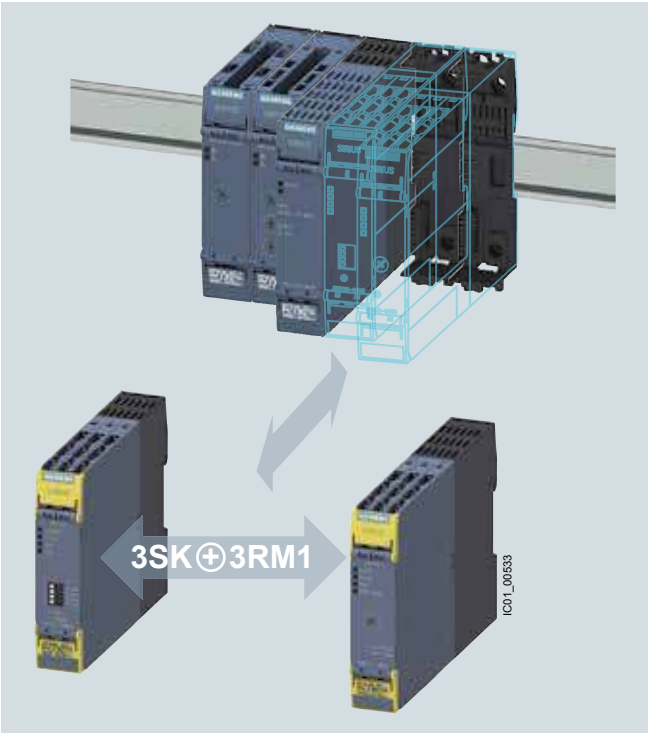
Note:

SIRIUS Safety ES, see page 13/163.

SIRIUS 3SK Safety Relays

General data

Seamlessly integrated safety right through to the main circuit



Problem-free integration of functional safety into the main circuit through the simple combination of 3RM1 and 3SK1 devices

Functional safety in the main circuit needs to be both simple and flexible

The unique compatibility of hybrid 3RM1 fail-safe motor starters and 3SK safety relays means that integrated functional safety right through to the main circuit is no longer a problem.

Their compact design allows the motor starters to be installed to the right of the safety relay in a simple manner, just like an output expansion. The wiring of the safety-related signals to the relay can be performed simply, quickly and in an error-free manner using the device connector.

The ergonomically designed enclosure with removable terminals and terminal labeling in the hinged cover allows for the cables to be conveniently diagonally mounted from the front. Either screw or spring-type terminals with push-in technology are available.

Highlights

- Fail-safe disconnection of motors up to 3 HP
- Problem-free combination of fail-safe motor starters and safety relays
- End-to-end system, simple setup using device connectors
- Ergonomic enclosure

Note:

SIRIUS 3RM1 motor starters, see Section 6 Hybrid Motor Starters

Article No. scheme

Product versions		Article number									
3SK1 safety relays		**3SK1**	□	□	□	–	□	□	□	□	□
Device version	Basic unit		**1**								
	Expansion unit		**2**								
Device variants	3SK11: Standard; 3SK12: Output expansion			**1**							
	3SK11: Advanced; 3SK12: Input expansion			**2**							
Type of outputs	Relay outputs				**1**						
	Semiconductor outputs				**2**						
	Power outputs				**3**						
Connection type	Screw terminals						**1**				
	Spring-type terminals (push-in)						**2**				
Control circuit/actuation	3SK11: 3 enabling circuits							**A**			
	3SK11: 2 enabling circuits							**B**			
	3SK11: 4 enabling circuits							**C**			
Type of control supply voltage	3SK1213: 24 V AC, 50/60 Hz								**B**	**0**	
	3SK1: 24 V AC/DC, 50/60 Hz								**B**	**3**	
	3SK1: 24 V DC								**B**	**4**	
	3SK1213: 115 V AC, 50/60 Hz								**J**	**2**	
	3SK1213: 230 V AC, 50/60 Hz								**L**	**2**	
	3SK1: 110 ... 240 V AC/DC; 50/60 Hz								**W**	**2**	
Time delay	None										**0**
	0.05 ... 3 s										**1**
	0.5 ... 30 s										**2**
	5 ... 300 s										**4**
Example		**3SK1**	**1**	**1**	**1**	**–**	**1**	**A**	**B**	**3**	**0**

SIRIUS 3SK Safety Relays

General data

Product versions		Article number										
3SK2 safety relays		**3SK2**	**1**	**□**	**2**	**–**	**□**	**A**	**A**	**1**	**0**	
Device variants	10 F-DI, 2 F-DQ, width 22.5 mm			**1**								
	20 F-DI, 4 F-DQ, width 45 mm			**2**								
Connection type	Screw terminals						**1**					
	Spring-type terminals (push-in)						**2**					
Example		**3SK2**	**1**	**1**	**2**	**–**	**1**	**A**	**A**	**1**	**0**	

Note:

The Article No. schemes show 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

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 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 frequently switching applications
- Insensitive to vibrations and dirt
- Good electrical endurance

Power outputs (3SK1213 output expansion)

- Different voltages can be switched through the floating contacts
- With the power relay contacts currents up to 10 A AC-15/6 A DC-13 can be switched
- 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

Note:

SIRIUS 3RM1 motor starters, see Section 6 Hybrid Motor Starters

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.

Communication

The 3SK2 safety relays can be easily integrated in the overall application via PROFINET or PROFIBUS using optionally available interface modules.

This provides the following advantages:

- Exchange of signals and information with the plant controller
- Read-out and visualization of diagnostics information of the safety relay via the controller supports troubleshooting and reduces plant downtimes
- Access with the Safety ES engineering software via the fieldbus for parameterization, commissioning and diagnostics

Simulation

The SIRIUS Sim simulation tool for 3SK2 can be used to quickly and easily test configurations that have been created without real devices. The configurations thus created can then be loaded directly into the real devices. Time and costs for engineering are thus reduced, see https://support.industry.siemens.com/cs/document/109763750

SIRIUS 3SK Safety Relays

General data

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.

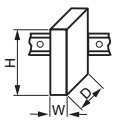
3SK2 safety relays

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 or integration into higher-level control systems for diagnostics via fieldbus. 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

More information	
Manual 3SK1, see https://support.industry.siemens.com/cs/ww/en/view/67585885	Manual 3SK2, see https://support.industry.siemens.com/cs/ww/en/view/109444336
Technical specifications 3SK1230, see https://support.industry.siemens.com/cs/ww/en/ps/16388/td	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16382/faq

SIRIUS 3SK1 safety relays

Article number		3SK1111-.AB30, 3SK1211-.BB00, 3SK1211-.BB40	3SK1111-.AW20, 3SK1121, 3SK1211-.BW20	3SK1112	3SK1120	3SK1122	3SK1213	3SK1220
General data:								
Width x height x depth 	mm	22.5 x 100 x 121.6		22.5 x 100 x 91.6	17.5 x 100 x 121.6	22.5 x 100 x 121.6	90 x 100 x 121.6	17.5 x 100 x 121.6
Ambient temperature • During operation • During storage	 °C °C	 -25 … +60 -40 … +80						
Installation altitude at height above sea level, maximum	m	2 000						
Air pressure acc. to SN 31205	kPa	90 … 106						
Shock resistance		10 *g* /11 ms					5 *g* /10 ms	10 *g* /11 ms
Vibration resistance according to IEC 60068-2-6		5 ... 500 Hz: 0.75 mm						
Degree of protection of the enclosure		IP20						
Touch protection against electric shock		Finger-safe						
Insulation voltage, rated value	V	300		50			300	50
Impulse withstand voltage, rated value	V	4 000		800			4 000	800
Safety integrity level (SIL) according to IEC 61508		3						
Performance level (PL) according to EN ISO 13849-1		e						
T1 value for proof test interval or service duration according to IEC 61508	y	20						
EMC emitted interference		IEC 60947-5-1, class B	IEC 60947-5-1, class A				IEC 60947-5-1, class B	IEC 60947-5-1, class A
Certificate of suitability • UL certification • TÜV approval		 Yes Yes						

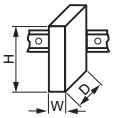
SIRIUS 3SK Safety Relays

General data

Article number		3SK1111, 3SK1121-.AB40, 3SK1211	3SK1112, 3SK1122	3SK1120	3SK1121-.CB4.	3SK1213
Switching capacity current of the NO contacts of the relay outputs						
• At AC-15 at 230 V	A	5	--		3	10
• At DC-13 at 24 V	A	5	--		3	6
Switching capacity current of the semiconductor outputs at DC-13 at 24 V	A	--	2	0.5	--	

Article number		3SK1111-.AB30, 3SK1211	3SK1111-.AW20	3SK1112, 3SK1220	3SK1120, 3SK1122-.AB40	3SK1121-.AB40	3SK1121-.CB4.	3SK1122-.CB4.	3SK1213
PFHD at high demand rate according to EN 62061	1/h	1.7×10^{-9}	1.5×10^{-9}	1.0×10^{-9}	1.3×10^{-9}	2.5×10^{-9}	3.7×10^{-9}	1.5×10^{-9}	1.0×10^{-9}
PFDavg at low demand rate according to IEC 61508		1.0×10^{-6}		7.0×10^{-6}					1.0×10^{-6}

SIRIUS 3SK2 safety relays

Article number		3SK2112-.AA10	3SK2122-.AA10
General data:			
Width x height x depth 	mm	22.5 x 100 x 124.5	45 x 100 x 124.5
Ambient temperature			
• During operation	°C	-25 ... +60	
• During storage	°C	-40 ... +80	
Installation altitude at height above sea level, maximum	m	2 000	
Air pressure acc. to SN 31205	kPa	90 ... 106	
Shock resistance		15 *g* /11 ms	
Vibration resistance acc. to IEC 60068-2-6		5 ... 500 Hz: 0.75 mm	
Degree of protection of the enclosure		IP20	
Touch protection against electric shock		Finger-safe	
Insulation voltage, rated value	V	50	
Impulse withstand voltage, rated value	V	800	
Safety integrity level (SIL) according to IEC 61508		3	
Performance level (PL) according to EN ISO 13849-1		e	
T1 value for proof test interval or service duration according to IEC 61508	y	20	
EMC emitted interference according to IEC 60947-1		Class A	
Certificate of suitability			
• UL certification		Yes	
• TÜV approval		Yes	
Switching capacity current of the semiconductor outputs at DC-13 at 24 V	A	4	
PFHD at high demand rate according to EN 62061	1/h	1.0×10^{-8}	1.2×10^{-8}
PFDavg at low demand rate according to IEC 61508		1.5×10^{-5}	1.8×10^{-5}

SIRIUS 3SK1 Standard basic units

Article number		3SK2511-.FA10
Transmission type for Industrial Ethernet		PROFINET with 100 Mbps full duplex (100BASE-TX)
Number of interfaces acc. to PROFINET		1
Type of interface Ethernet interface		Yes
Type of interface 1 RJ45 (Ethernet)		Yes
PROFINET Conformance Class		B
Network load class according to PROFINET		1
Volume of cyclic user data for PROFINET IO		
• For outputs	bit	64
• For inputs	bit	64

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.

Note:

Use of device connectors not possible.

Selection and ordering data

3SK1111-1AB30

3SK1111-1AW20

3SK1112-1BB40

Control supply voltage at AC at 50 Hz	Control supply voltage at DC	Number of outputs: as contacting contact block, as NO contact, instantaneous switching	as contacting contact block, as NO contact, delayed switching	as contacting contact block, for signaling function, instantaneous switching	as contactless semiconductor contact block, instantaneous switching	as contactless semiconductor contact block, delayed switching	as contactless semiconductor contact block, for signaling function, instantaneous switching	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
V	V							d				
Standard basic units												
24	24	3	0	1	0	0	0	▶	**3SK1111-□AB30**		1	1 unit
110 … 240	110 … 240	3	0	1	0	0	0	1	**3SK1111-□AW20**		1	1 unit
--	24	0	0	0	2	0	1	2	**3SK1112-□BB40**		1	1 unit

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

1
2

SIRIUS 3SK Safety Relays, Basic Units

SIRIUS 3SK1 Advanced basic units

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.

Note:

Use of device connectors possible.

Selection and ordering data

3SK1121-1AB40

3SK1120-1AB40

3SK1122-1AB40

3SK1122-1CB41

Control supply voltage at DC	Number of outputs as contacting contact block: as NO contact, instantaneous switching	as NO contact, delayed switching	as NC contact for signaling function, instantaneous switching	as contactless semiconductor contact block: instantaneous switching	delayed switching	for signaling function, instantaneous switching	Adjustable OFF-delay time	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
V							s	d				
Advanced basic units												
24	3	0	1	0	0	0	--	▶	**3SK1121-□AB40**		1	1 unit
	2	2	0	0	0	0	0.05 ... 3	2	**3SK1121-□CB41**		1	1 unit
							0.5 … 30	1	**3SK1121-□CB42**		1	1 unit
							5 … 300	5	**3SK1121-□CB44**		1	1 unit
24	0	0	0	1	0	0	--	2	**3SK1120-□AB40**		1	1 unit
				3	0	1	--	2	**3SK1122-□AB40**		1	1 unit
				2	2	0	0.05 ... 3	5	**3SK1122-□CB41**		1	1 unit
							0.5 … 30	2	**3SK1122-□CB42**		1	1 unit
							5 … 300	5	**3SK1122-□CB44**		1	1 unit

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

1
2

SIRIUS 3SK Safety Relays, Basic Units

SIRIUS 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 available. The 22.5-mm-wide version of the 3SK2 basic units has 10 x single-channel (5 x two-channel) inputs, while the 45-mm-wide 3SK2 version comes with 20 x single-channel (10 x two-channel) inputs.

Starter Kit

3SK2 (22.5 mm) Starter Kit

The Starter Kit is a favorably-priced complete package for the simple creation of complex safety applications and comprises:

- 3SK2112-2AA10 basic unit, 22.5 mm wide, with spring-type terminals (push-in)
- SIRIUS Safety ES Standard software for configuring, commissioning, operating and diagnosing
- USB PC cable for easy transmission of the configuration to the device by means of USB

PROFINET Starter Kit

3SK2 (45 mm) PROFINET Starter Kit

The Starter Kit is a favourably-priced complete package for the simple creation of complex safety applications and comprises:

- 3SK2122 basic unit, 45 mm wide
- PROFINET interface module
- SIRIUS Safety ES Premium software for configuring, commissioning, operating and diagnosing
- Connecting cable between the basic unit and the PROFINET interface
- Ethernet cable

SIRIUS Sim 3SK2

SIRIUS Sim 3SK2

The SIRIUS 3SK2 simulation tool can be used to quickly and easily test functions and configurations in an office environment. These configurations can then be loaded directly into real devices. Time and costs for engineering are reduced.

SIRIUS Sim 3SK2 is available free of charge as a download, see https://support.industry.siemens.com/cs/ww/en/view/109763750.

SIRIUS 3SK Safety Relays, Basic Units

SIRIUS 3SK2 basic units

Selection and ordering data

3SK2112

3SK2122

Control supply voltage at DC	Number of outputs as contactless semiconductor contact block, safety-related, two-channel	Number of outputs as contactless semiconductor contact block, non-safety-related, two-channel	Number of outputs to the device connector, safety-related	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
V				mm	d				
3SK2 basic units									
24	2	1	2	22.5	2	**3SK2112-□AA10**		1	1 unit
	4	2	2	45	2	**3SK2122-□AA10**		1	1 unit

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

1
2

3SK2511-1FA10

see page 8/85

Interface module *NEW*									
For connecting 3SK2 and 3RK3 safety relays via PROFINET				22.5	2	**3SK2511-□FA10**		1	1 unit

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

1
2

Note:

The 3UF7930-0AA00-0 connection cable is not included in the scope of supply and must be ordered separately, see page 13/196.

Control supply voltage at DC	Number of outputs as contactless semiconductor contact block, safety-related, two-channel	Number of outputs as contactless semiconductor contact block, non-safety-related, two-channel	Number of outputs to the device connector, safety-related	Width	SD	**Spring-type terminals (push-in)** Article No.	Price per PU	PU (UNIT, SET, M)	PS*
V				mm	d				
Starter Kit									
Contains 3SK2122-2AA10 basic unit, PROFINET Interface Module, SIRIUS Safety ES Premium, PROFINET connection cable and Ethernet cable									
24	4	2	2	45	2	**3SK2942-2AA10**		1	1 unit
Contains 3SK2112-2AA10 basic unit, SIRIUS Safety ES Standard and 3UF7941-0AA00-0 USB PC cable									
24	2	1	2	22.5	2	**3SK2941-2AA10**		1	1 unit

SIRIUS 3SK Safety Relays, Expansion Units

Output expansions

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 basic units 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.

Benefits

- Perfect adaptation of the number of outputs
- Simple expansion of instantaneous and time-delayed safe outputs of the Advanced basic units using device connectors
- When using the device connector the outputs on the terminals of the basic device can still be used
- Another two freely configurable shutdown functions on 3SK2 basic units when using device connectors
- Expansion with power contacts for high AC-15/DC-13 currents in the control circuit
- No wiring of the feedback circuit to the basic units is required when using device connectors
- Shorter installation times
- Less configuring and testing required

Selection and ordering data

3SK1211-1BB40

3SK1213-1AB40

Control supply voltage		Number of outputs as contacting contact block			3ZY12 device connectors	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
at AC at 50 Hz	at DC	as NO contact, instantaneous switching	as NO contact, delayed switching	as NC contact instantaneous switching for feedback circuit						
V	V					d				
Output expansions										
24	--	4	0	1	No	5	**3SK1211-□BB00**		1	1 unit
--	24	4	0	1	Yes	1	**3SK1211-□BB40**		1	1 unit
110 ... 240	110 ... 240	4	0	1	No	2	**3SK1211-□BW20**		1	1 unit
--	24	3	0	1	Yes	5	**3SK1213-□AB40**		1	1 unit
115	--	3	0	1	No	5	**3SK1213-□AJ20**		1	1 unit
230	--	3	0	1	No	5	**3SK1213-□AL20**		1	1 unit

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

1
2

SIRIUS 3SK Safety Relays, Expansion Units

Input expansions

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 sensor expansion

The 3SK1220 input expansion allows additional sensors to be integrated easily and flexibly. The device monitors two single-channel sensors or one two-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, see page 13/146.

3SK1230 power supply

The 3SK1230 power supply makes the 3SK1 devices universally usable, whatever control supply voltage is to be used.

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

3SK1220-1AB40

3SK1230-1AW20

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
Sensor expansions					
For safety-related expansion of the 3SK1 Advanced basic units by adding a further two-channel sensor or two single-channel sensors	2	**3SK1220-□AB40**		1	1 unit
Power supply					
For supplying 3SK1 Advanced basic units via 3ZY12 device connectors at voltages of 110 ... 240 V AC/DC	2	**3SK1230-□AW20**		1	1 unit
Type of electrical connection					
• Screw terminals		**1**			
• Spring-type terminals (push-in)		**2**			

Overview

Numerous accessories are available for 3SK, such as device connectors, terminals, cables, adapters, covers, memory and diagnostics modules or software.

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 termination connector. Use of device connectors not possible with 3SK1 standard.

Device connectors are available in various versions specifically for the 3SK safety relays:

For type	Device connectors				Device termination 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)
3SK1 Advanced basic units						
3SK1120	✓	--	--	--	--	--
3SK1121	--	✓	--	--	✓	--
3SK1122	--	✓	--	--	✓	--
3SK2 basic units						
3SK2112	--	--	✓	--	--	--
3SK2122	--	--	--	✓	--	--
Output expansions						
3SK1211	--	✓	--	--	✓	--
3SK1213	--	--	--	--	--	✓
Input expansions						
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**
3SK1 basic units				
3SK1111	--	✓	--	✓
3SK1112	✓	--	✓	--
3SK1120	--	✓	--	✓
3SK1121	--	✓	--	✓
3SK1122	✓ bottom	✓ top	✓ bottom	✓ top
3SK2 basic units				
3SK2112	--	✓	--	✓
3SK2122	--	✓[1)]	--	✓[1)]
Output expansions				
3SK1211	✓	--	✓	--
3SK1213	--	--	--	--
Input expansions				
3SK1220	--	✓ top	--	✓ top
3SK1230	✓ bottom	--	✓ bottom	--

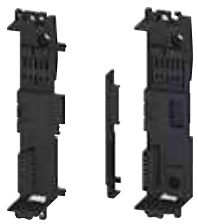
✓ Available

-- Not available

1) Two sets of terminals are required for 3SK2122.

Selection and ordering data

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)
Device connectors for the electrical connection of SIRIUS devices in the industrial standard mounting rail enclosure				
Device connector for 3SK1				
• Width 17.5 mm	2	**3ZY1212-1BA00**		1
• Width 22.5 mm	2	**3ZY1212-2BA00**		1
Device connector for 3SK2				
• Width 22.5 mm	2	**3ZY1212-2GA00**		1
• Width 45 mm	2	**3ZY1212-4GA01**		1
Device termination connectors For 3SK1, width 22.5 mm Note: Observe positions of the slide switch, see Manual "3SK1".	2	**3ZY1212-2DA00**		1
Device daisy chain connectors For 3RM1 and 3SK, 24 V DC, 22.5 mm, for implementation of distances between devices according to the installation guidelines	2	**3ZY1212-2AB00**		1
Device connectors For height adjustment for devices without electrical connection via device connector, with a width of 22.5 mm or greater	2	**3ZY1210-2AA00**		1
Device termination connector set For 3SK1213, width > 45 mm, comprising 3ZY1212-2FA00 and 3ZY1210-2AA00	2	**3ZY1212-0FA01**		1

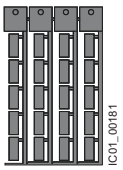


3ZY1212 -1BA00 3ZY1212 -2DA00

SIRIUS 3SK Safety Relays

Accessories

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)
Terminals for SIRIUS devices in the industrial standard mounting rail enclosure					
3ZY1121-1BA00	**Removable terminals**		**Screw terminals**		
	• 2-pole, up to 2 x 1.5 mm² or 1 x 2.5 mm²	2	**3ZY1121-1BA00**		1
	• 3-pole, up to 2 x 1.5 mm² or 1 x 2.5 mm² [1]	2	**3ZY1131-1BA00**		1
	• 4-pole, up to 2 x 1.5 mm2 or 1 x 2.5 mm²	2	**3ZY1141-1BA00**		1
			Spring-type terminals (push-in)		
	• 2-pole, up to 2 x 1.5 mm²	2	**3ZY1121-2BA00**		1
	• 3-pole, up to 2 x 1.5 mm² [1]	2	**3ZY1131-2BA00**		1
	• 4-pole, up to 2 x 1.5 mm²	2	**3ZY1141-2BA00**		1
PC cables and adapters for 3SK2 (essential accessories)					
3UF7941-0AA00-0	**USB PC cables** 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	▶	**3UF7941-0AA00-0**		1
Connecting cables for 3SK2 (essential accessory for diagnostics module)					
3UF7932-0AA00-0	For connecting diagnostics module to 3SK2 basic unit				
	Central units with expansion modules / Diagnostics modules with central unit / Length				
	✓ / ✓ / • 0.025 m (flat)	▶	**3UF7930-0AA00-0**		1
	-- / ✓ / • 0.1 m (flat)	▶	**3UF7931-0AA00-0**		1
	-- / ✓ / • 0.15 m (flat) NEW	▶	**3UF7934-0AA00-0**		1
	-- / ✓ / • 0.3 m (flat)	▶	**3UF7935-0AA00-0**		1
	-- / ✓ / • 0.5 m (flat)	▶	**3UF7932-0AA00-0**		1
	-- / ✓ / • 0.5 m (round)	▶	**3UF7932-0BA00-0**		1
	-- / ✓ / • 1.0 m (round)	▶	**3UF7937-0BA00-0**		1
	-- / ✓ / • 2.5 m (round)	▶	**3UF7933-0BA00-0**		1
Operating and monitoring modules for 3SK2					
3SK2611-3AA00	**Diagnostics modules** For direct display of errors, e.g. of cross-circuits Note: The 3RK3611-3AA00 MSS diagnostics module cannot be operated on the 3SK2 devices.	2	**3SK2611-3AA00**		1
Door adapters for 3SK2					
3UF7920-0AA00-0	For external connection of the system interface, e.g. outside a control cabinet	▶	**3UF7920-0AA00-0**		1
Interface covers for 3SK2					
	For system interface				
3RA6936-0B	• Titanium gray	10	**3RA6936-0B**		1
3UF7950-0AA00-0	• Light gray	▶	**3UF7950-0AA00-0**		1
Memory modules for 3SK2					
3RK3931-0AA00	For backing up the complete parameterization of the 3SK2 safety system without a PC/PG through the system interface	2	**3RK3931-0AA00**		1
Software for 3SK2					
3ZS1316-.C.10-0Y.5	Software for configuring, commissioning, operating and diagnosing of 3SK2 and 3RK3, see page 13/163. 3SK2 and 3RK3, see page 14/22. [1] For 3SK2122 two terminal sets are required.				

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)
Accessories for enclosures					
 3ZY1321-2AA00	**Sealing covers**				
	• 17.5 mm (for 3SK1120 and 3SK1220)	2	**3ZY1321-1AA00**		1
	• 22.5 mm (for all 3SK1 devices except 3SK1120 and 3SK1220)	2	**3ZY1321-2AA00**		1
 3ZY1311-0AA00	**Push-in lugs** For wall mounting	2	**3ZY1311-0AA00**		1
 3ZY1440-1AA00	**Coding pins** For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; they enable the mechanical coding of terminals, see Manual "3SK1"	2	**3ZY1440-1AA00**		1
   3ZY1450-1AB00 3ZY1450-1BB00	**Hinged cover** NEW Replacement cover, without terminal labeling				
	• Titanium gray				
	- 22.5 mm wide (for 3SK1230)	2	**3ZY1450-1AB00**		1
	• Yellow				
	- 17.5 mm wide (for 3SK1220, 3SK1120)	2	**3ZY1450-1BA00**		1
	- 22.5 mm wide (for 3SK11 except 3SK1120, 3SK1211, 3SK2112)	2	**3ZY1450-1BB00**		1
	- 45 mm wide (for 3SK2122)	2	**3ZY1450-1BC00**		1
Blank labels					
 3RT2900-1SB20	**Unit labeling plates** For SIRIUS devices 20 mm x 7 mm, titanium gray[1)]	20	**3RT2900-1SB20**		100
Tools for opening spring-type terminals					
			Spring-type terminals (push-in)		
 3RA2908-1A	**Screwdrivers** 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	**3RA2908-1A**		1

SIRIUS 3TK28 Safety Relays

With special functions

Overview

SIRIUS 3TK2810 safety relays

More information
Homepage, see www.siemens.com/safety-relays
Industry Mall, see https://mall.industry.siemens.com/mall/en/us/Catalog/Products/8260001

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.

Article No. scheme

Product versions		Article number										
Safety relays with special functions		**3TK2810**	**–**	**□**	**□**	**A**	**□**	**□**				
Device version	Standstill monitor			**0**								
	Speed monitor for NPN/PNP proximity switches and encoders			**1**								
Type of control supply voltage	24 V DC				**B**							
	230 V AC, 50/60 Hz				**G**							
	400 V AC, 50/60 Hz				**J**							
	120 ... 240 V AC/DC; 50/60 Hz				**K**							
Time delay	0.2 ... 6 s (standstill)						**0**					
	0 … 999 s (release delay)						**4**					
Connection type	Screw terminals							**1**				
	Spring-type terminals (push-in)							**2**				
Version	Speed monitor for NAMUR proximity switches and encoders								**–**	**0**	**A**	**A** **0**
Example		**3TK2810**	**–**	**0**	**B**	**A**	**0**	**1**				

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

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

SIRIUS 3TK28 Safety Relays

With special functions

Technical specifications

More information

Operating instructions 3TK2810-0, see https://support.industry.siemens.com/cs/ww/en/view/25437254

Manual 3TK2810-1, see https://support.industry.siemens.com/cs/ww/en/view/43707376

Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16391/td

FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16391/faq

Type	3TK2810-0 standstill monitors	3TK2810-1 speed monitors
Sensors		
• Inputs	3	4
• Electronic	--	3
• With contacts	--	1
• Without sensors (measuring inputs)	3	--
• Magnetically operated switch (Reed contacts)	--	--
Safety mats	--	--
Start		
• Auto	✓	✓
• Monitored	--	✓
Cascading input 24 V DC	--	--
Key-operated switch	--	--
Enabling circuit, floating		
• Stop category 0	3 NO + 1 NC	2
• Stop category 1	--	--
Enabling circuit, electronic		
• Stop category 0	--	--
• Stop category 1	--	--

✓ Available
-- Not available

Type	3TK2810-0 standstill monitors	3TK2810-1 speed monitors
Signaling outputs		
• Floating	1 CO	--
• Electronic	2	2
Standards	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
Test certificates	TÜV, UL, CSA	TÜV, UL, CSA
SIL level max. acc. to IEC 61508	3	3
Performance level PL acc. to EN ISO 13849-1	e	e
Probability of a dangerous failure per hour (PFH_d)	1.5×10^{-8} 1/h	3.38×10^{-9} 1/h
Rated control supply voltage		
• 24 V DC	✓	✓
• 230 V AC	✓	--
• 400 V AC	✓	--
• 120 ... 240 V AC/DC	--	✓

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit

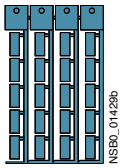
3TK2810-0BA01

3TK2810-0GA02

3TK2810-1BA41

Rated control supply voltage U_s	Times	SD	Screw terminals	SD	Spring-type terminals
V	s	d	Article No. / Price per PU	d	Article No. / Price per PU
Standstill monitors					
3TK2810-0					
• 24 DC	0.2 ... 6 (standstill)	5	**3TK2810-0BA01**	15	**3TK2810-0BA02**
• 230 AC	0.2 ... 6 (standstill)	15	**3TK2810-0GA01**	15	**3TK2810-0GA02**
• 400 AC	0.2 ... 6 (standstill)	15	**3TK2810-0JA01**	15	**3TK2810-0JA02**
Speed monitors					
3TK2810-1 for NPN/PNP proximity switches and encoders					
• 24 DC	0 … 999 (release delay)	2	**3TK2810-1BA41**	2	**3TK2810-1BA42**
• 120 ... 240 AC/DC	0 … 999 (release delay)	5	**3TK2810-1KA41**	5	**3TK2810-1KA42**
3TK2810-1 for NAMUR proximity switches and encoders					
• 24 DC	0 … 999 (release delay)	5	**3TK2810-1BA41-0AA0**	5	**3TK2810-1BA42-0AA0**
• 120 ... 240 AC/DC	0 … 999 (release delay)	5	**3TK2810-1KA41-0AA0**	5	**3TK2810-1KA42-0AA0**

Selection and ordering data

	Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
			d				
Blank labels							
 3RT1900-1SB20	For 3TK28	**Unit labeling plates** For SIRIUS devices					
		20 mm x 7 mm, pastel turquoise	20	**3RT1900-1SB20**		100	340 units
	For 3TK28	**Adhesive labels** For SIRIUS devices					
		• 19 mm x 6 mm, pastel turquoise	15	**3RT1900-1SB60**		100	3 060 units
		• 19 mm x 6 mm, zinc yellow	15	**3RT1900-1SD60**		100	3 060 units
Push-in lugs and covers							
3RP1903	For 3TK28	**Push-in lugs** For screw fixing, 2 units required per device	5	**3RP1903**		1	10 units
Adapters and connection cables for speed monitors							
	For 3TK2810-1	**Adapters** For connecting encoders of type Siemens/Heidenhain					
3TK2810-1A		• 15-pole	2	**3TK2810-1A**		1	1 unit
3TK2810-1B		• 25-pole	2	**3TK2810-1B**		1	1 unit
3TK2810-0A	For 3TK2810-1	**Connection cables** For connecting the speed monitor to the 3TK2810-1A or 3TK2810-1B adapter	15	**3TK2810-0A**		1	1 unit
Tools for opening spring-type terminals							
				Spring-type terminals			
3RA2908-1A	For auxiliary circuit connections	**Screwdrivers** 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	**3RA2908-1A**		1	1 unit

SIRIUS 3RK3 Modular Safety System

General data

Overview

SIRIUS 3RK3 Modular Safety System

More information
Industry Mall, see https://mall.industry.siemens.com/mall/en/us/Catalog/Products/10041776

The 3RK3 Modular Safety System (MSS) is a freely configurable modular safety relay. Depending on the external circuit version, safety-related 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 several safety functions need to be evaluated and the wiring parameterization of safety relays would involve significant 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 logical 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 in AS-Interface and therefore make 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, EMERGENCY STOP command devices, position switches with and without tumbler, or light curtains.

Safety-related disconnection using MSS or by distributed means using safe AS-i outputs and the formation of switch-off groups can be realized very easily. The same applies for any subsequent modifications. They are now possible by simply readdressing, meaning that rewiring 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-related 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 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 using 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. In acyclic mode, both central units can call up diagnostic data.

Diagnostics modules

Actuated sensors or faults, e.g. cross-circuit, are indicated directly on the diagnostics 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.

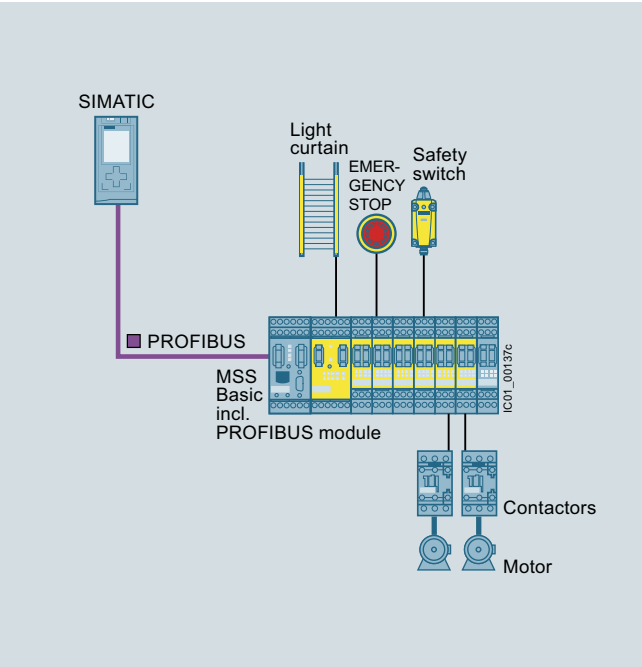
Parameterization software

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 dependencies for example.

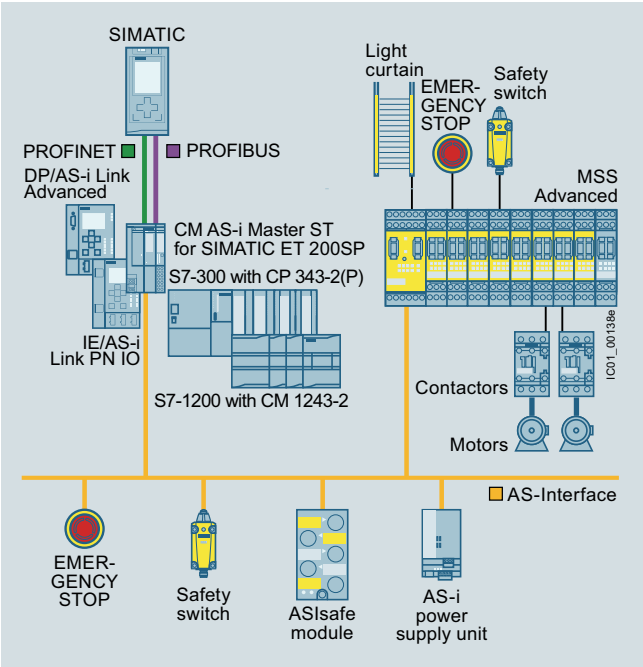
SIRIUS Safety ES also offers comprehensive functions for diagnostics and commissioning. Documentation of the MSS hardware configuration and the parameterized logic is created automatically.

SIRIUS 3RK3 Modular Safety System

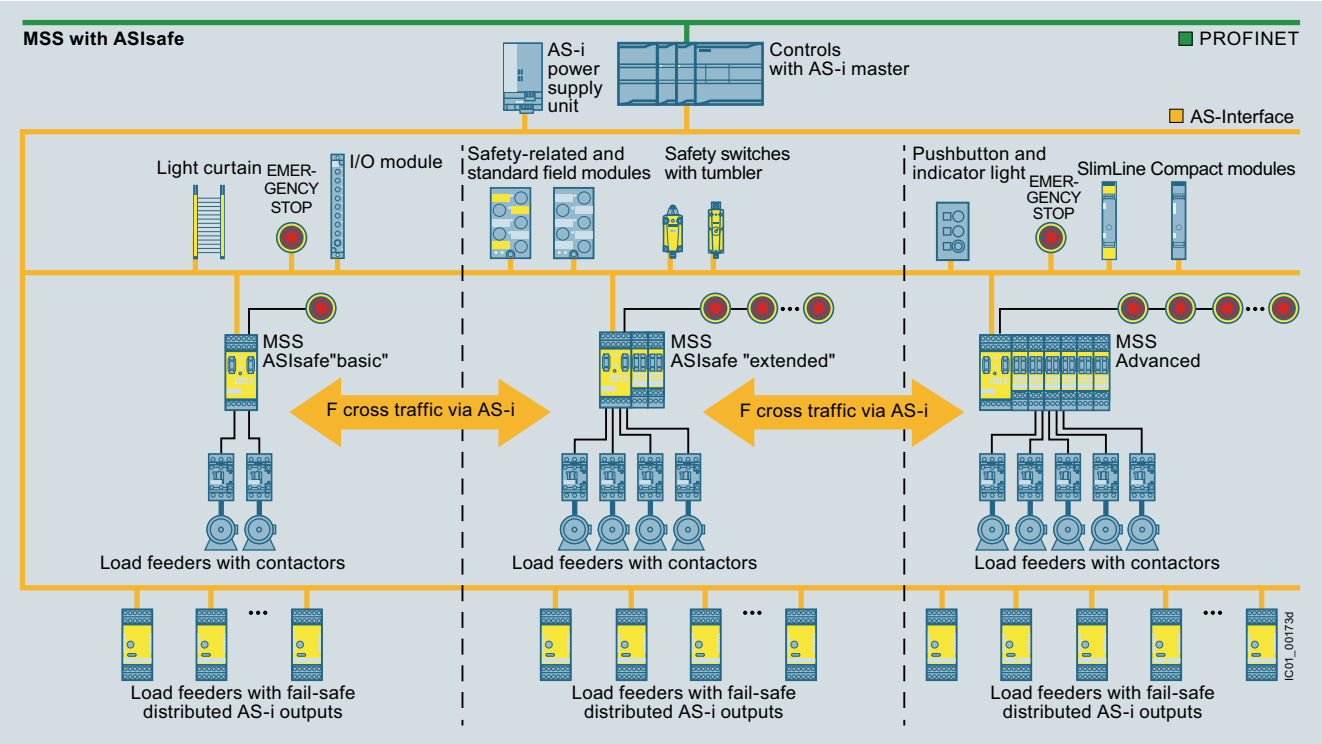
General data



System design of MSS with Basic central unit



System design of MSS with Advanced central unit



System design of MSS as a combination of various central units with AS-Interface

Article No. scheme

Product versions		Article number									
Basic units		**3RK3**	**1**	**□**	**□**	**–**	**□**	**A**	**□**	**□**	**0**
Device variants	3RK3 Basic			**1**	**1**						
	3RK3 ASIsafe "basic" variant			**2**	**1**						
	3RK3 ASIsafe "extended" variant			**2**	**2**						
	3RK3 Advanced			**3**	**1**						
Connection type	Screw terminals						**1**				
	Spring-type terminals						**2**				
Communication 1	None								**A**		
	AS-Interface without master								**C**		
Communication 2	3RK3122: max. 2 expansion modules can be connected									**0**	
	3RK3131: max. 9 expansion modules can be connected									**1**	
Example		**3RK3**	**1**	**1**	**1**	**–**	**1**	**A**	**A**	**1**	**0**

Product versions		Article number									
Expansion modules with safe inputs/outputs		**3RK3**	**2**	**□**	**□**	**–**	**□**	**A**	**A**	**1**	**0**
Device variants	4/8 F-DI			**1**	**1**						
	2/4 F-DI 1/2 F-RO			**2**	**1**						
	2/4 F-DI 2 F-DO			**3**	**1**						
	4 F-DO			**4**	**2**						
	4/8 F-RO			**5**	**1**						
Connection type	Screw terminals						**1**				
	Spring-type terminals						**2**				
Example		**3RK3**	**2**	**1**	**1**	**–**	**1**	**A**	**A**	**1**	**0**

Product versions		Article number									
Expansion modules with standard inputs/outputs		**3RK3**	**3**	**□**	**□**	**–**	**□**	**A**	**A**	**1**	**0**
Device variants	8 DO			**1**	**1**						
	8 DI			**2**	**1**						
Connection type	Screw terminals						**1**				
	Spring-type terminals						**2**				
Example		**3RK3**	**3**	**1**	**1**	**–**	**1**	**A**	**A**	**1**	**0**

Product versions		Article number									
DP interface modules		**3RK3**	**5**	**1**	**1**	**–**	**□**	**B**	**A**	**1**	**0**
Connection type	Screw terminals						**1**				
	Spring-type terminals						**2**				
Example		**3RK3**	**5**	**1**	**1**	**–**	**1**	**B**	**A**	**1**	**0**

Note:

The Article No. schemes show 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 3RK3 Modular Safety System

General 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 production 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 detection of sensors and disconnection of actuators through AS-Interface
- All logic functions can also be used for AS-Interface, e.g. muting, protective door with tumbler
- 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 via PROFIBUS

The 3RK3 Modular Safety System can be connected to PROFIBUS through the DP interface and exchange data with higher-level control systems.

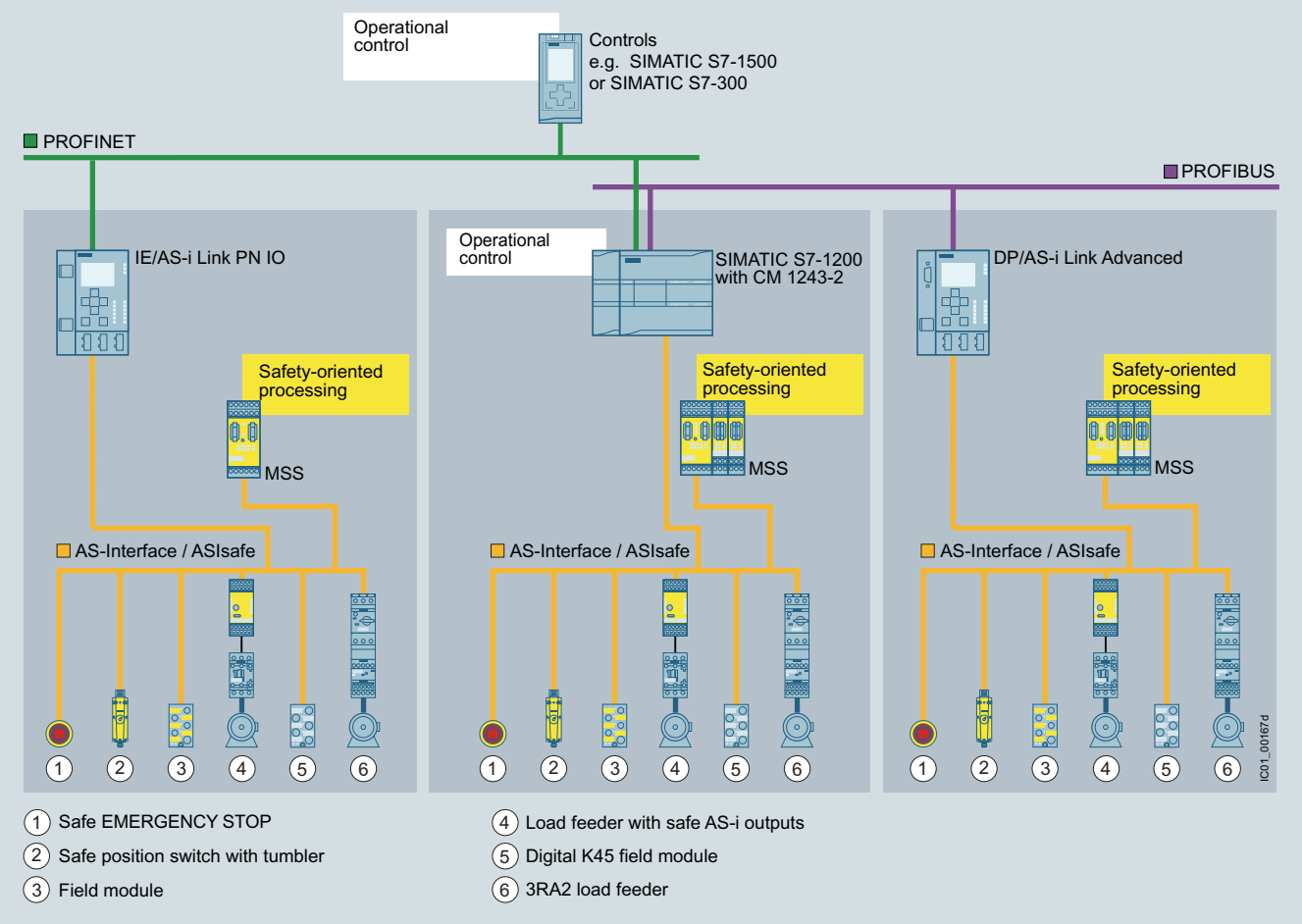
The MSS supports among other things:

- Baud rates up to 12 Mbps
- 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

Using the Advanced and ASIsafe "basic" and "extended" central units, the 3RK3 Modular Safety System can be integrated in AS-Interface.

- MSS can read and evaluate the I/O data of up to 31 AS-i modules
- Up to 12 safe output signals per MSS can be placed on the AS-i bus for switching safe AS-i output modules or for fail-safe cross traffic between multiple MSS stations
- Safe cross traffic between multiple MSS stations or between one MSS and AS-i safety monitors
- Standard signals, e.g. for acknowledgment, can also be output on the AS-i bus



Integration of the MSS into AS-Interface

Notes:

MSS with communication function, see page 13/160 onwards.
Accessories, see page 13/162 onwards.
SIRIUS Safety ES, see page 13/163.

Application

The 3RK3 Modular Safety System can be used for all safety-related requirements in the manufacturing industry and offers the following safety functions:

	Symbol	MSS Basic	MSS Advanced, MSS ASIsafe
Monitoring functions			
Universal monitoring Evaluation of any binary signals from single-channel and two-channel sensors		--	✓
EMERGENCY STOP Evaluation of EMERGENCY STOP devices with positive-opening contacts		✓	✓
Safety shutdown mat Evaluation of switching mats with NC contacts and/or crossover detection		✓	✓
Protective door monitoring Evaluation of protective door signals and/or protective flap signals		✓	✓
Protective door tumbler mechanism Evaluation of protective doors with tumbler and of the actuation/release of this tumbler		--	✓
Approval switches Evaluation of OK buttons with NO contact		✓	✓
Two-hand operator controls Evaluation of two-hand operator controls		✓	✓
ESPE monitoring Evaluation of non-contact protective devices, e.g. light curtains and laser scanners		✓	✓
Muting Temporary bridging of non-contact protective devices, 2/4 sensors in parallel, 4 sensors in sequence		--	✓
Mode selector switches Evaluation of operating mode selector switches with NO contacts		✓	✓
Monitoring AS-i (AS-i 2F-DI) Logic element for monitoring of AS-i input slaves	& AS-I	--	✓

	Symbol	MSS Basic	MSS Advanced, MSS ASIsafe
Logic operation functions			
AND	&	✓	✓
OR	≥1	✓	✓
XOR	=1	✓	✓
NAND	&	✓	✓
NOR	≥1	✓	✓
Negation	1	✓	✓
Flip-flop	SR	✓	✓
Counting functions			
Counter 0 -> 1	2 1	✓	✓
Counter 1 -> 0	2 1	✓	✓
Counter 0 -> 1/1-> 0	2 1	✓	✓
Timer functions			
With ON-delay		✓	✓
Passing make contact		✓	✓
With OFF-delay		✓	✓
Clock-pulsing		✓	✓
Start functions			
Monitored start		✓	✓
Manual start		✓	✓
Output functions			
Standard output	Q	✓	✓
F output	Q	✓	✓
AS-i output function	Q AS-I	--	✓
Status functions			
Element status	i	--	✓

✓ Available

-- Not available

Technical specifications

More information	
Manual, see https://support.industry.siemens.com/cs/ww/en/view/26493228 Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16392/td	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16392/faq

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		
Device data												
Shock resistance (sine pulse)	*g*/ms	15/11										
Touch protection acc. to 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		8	8	2	4	8	4	4	--	--	--	--
• Not fail-safe		--	--	6	4	--	--	--	--	--	8	--
Number of test outputs		2							--			
Number of outputs												
• Relay outputs												
- Single-channel		--	--	--	--	--	2	--	8	--	--	--
- Two-channel		1	1	1	1	--	--	--	--	--	--	--
• Electronic outputs												
- Single-channel		--	--	--	--	--	--	--	--	--	--	8
- Two-channel		1	1	1	1	--	--	2	--	4	--	--
Weight	g	300				160			400	135	125	160
Installation altitude above sea level	m	2 000										
Environmental data												
EMC interference immunity		IEC 60947-5-1										
Vibrations												
• Frequency	Hz	5 ... 500										
• Amplitude	mm	0.75										
Climatic withstand capability		IEC 60068-2-78										

SIRIUS 3RK3 Modular Safety System

General data

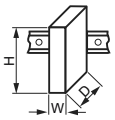
Type		Central units				Expansion modules						
		Basic	Advanced	ASIsafe basic	ASIsafe extended	4/8 F-DI	2/4 F-DI 1/2 F-RO	2/4 F-DI 2 F-DO	4/8 F-RO	4 F-DO	8 DI	8 DO
Electrical specifications												
Rated control supply voltage U_s acc. to IEC 61131-2	V	24 DC ± 15% [1]										
Operating range		0.85 ... 1.15 x U_s										
Rated insulation voltage U_i	V	300				50	300	50	300	50		
Rated impulse voltage U_{imp}	kV	4				0.5	4	0.5	4	0.5		
Total current input	mA	185				60	85		140	8	78	60
Rated power at U_s	W	4.5				1.5	2		3	4.8	1.9	1.5
Utilization category acc. to IEC 60947-5-1												
Relay outputs												
• AC-15 at 230 V	A	2				--	2	--	2	--	--	--
• DC-13 at 24 V	A	1				--	1	--	1	--	--	--
Semiconductor outputs												
• DC-13 at 24 V	A	1.5				--	--	1.2	--	2	--	0.5
Mechanical endurance During rated operation	Operating cycles (relay)	10×10^6				--	10×10^6	--	10×10^6	--		
Switching frequency z At rated operational current	1/h	1 000				--	1 000		360	1 000	--	1 000
Conventional thermal current I_{th}	A	2/1.5				--	1	1.2	3	2	--	0.5
Protection for output contacts Fuse links LV HRC type 3NA, DIAZED type 5SB, NEOZED type 5SE												
• Operational class gG	A	4				--	4	--	4	--		
• Operational class quick	A	6				--	6	--	6	--		
Safety specifications												
Probability of a dangerous failure												
• per hour (PFH_d)	1/h	5.14×10^{-9}	3.8×10^{-9} with AS-i, 2.8×10^{-9} without AS-i			1.89×10^{-9}	3.79×10^{-9}	2.7×10^{-9}	7.15×10^{-9}	3.18×10^{-9}	--	
• On demand (PFD)		1.28×10^{-5}	1.7×10^{-4}			4.29×10^{-6}	5.85×10^{-6}	8.34×10^{-6}	4.36×10^{-5}	2.2×10^{-5}	--	
Parameters for cables												
Line resistance	Ω	100							--		100	--
Cable length from terminal to terminal With Cu 1.5 mm² and 150 nF/km	m	1 000							--		1 000	--
Conductor capacity	nF	330							--		330	--

[1] Device current supply through a power supply unit according to IEC 60536 protection class III (SELV or PELV).

SIRIUS 3RK3 Modular Safety System

General data

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	--
Device data			
Shock resistance (sine pulse)	*g*/ms	15/11	
Touch protection acc. to 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 • During storage and transport	 °C °C	 -20 ... +60 -40 ... +85	
Weight	g	270	90
Installation altitude above sea level	m	2 000	
Environmental data			
EMC interference immunity		IEC 60947-5-1	
Vibrations • Frequency • Amplitude	 Hz mm	 5 ... 500 0.75	
Climatic withstand capability		IEC 60068-2-78	
Electrical specifications			
Rated control supply voltage U_s acc. to IEC 61131-2	V	24 DC ± 15%	24 DC ± 15% via connecting cable to the central unit
Operating range		0.85 ... 1.15 x U_s	
Rated insulation voltage U_i	V	50	
Rated impulse voltage U_{imp}	kV	0.5	
Total current input	mA	--	24
Rated power at U_s	W	--	0.6

Selection and ordering data

3RK3111-1AA10

3RK3121-1AC00
3RK3122-1AC00
3RK3131-1AC10

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
	d				
3RK31 central units					
3RK3 Basic Central units with safety-related inputs and outputs • 8 fail-safe inputs • 1 two-channel relay output • 1 two-channel electronic output Max. 7 expansion modules can be connected Note: Memory module 3RK3931-0AA00 is included in the scope of supply.	2	**3RK3111-□AA10**		1	1 unit
3RK3 Advanced Central units for connecting to AS-Interface with safety-related inputs and outputs and extended functional scope • 8 fail-safe inputs • 1 two-channel relay output • 1 two-channel electronic output Max. 9 expansion modules can be connected Note: Memory module 3RK3931-0AA00 is included in the scope of supply.	2	**3RK3131-□AC10**		1	1 unit
3RK3 ASIsafe Central units for connecting to AS-Interface with safety-related inputs and outputs and extended functional scope • 1 two-channel relay output • 1 two-channel electronic output					
"Basic" version • 2 fail-safe inputs • 6 non-fail-safe inputs No expansion modules can be connected	2	**3RK3121-□AC00**		1	1 unit
"Extended" version • 4 fail-safe inputs • 4 non-fail-safe inputs Max. 2 expansion modules can be connected Note: Memory module 3RK3931-0AA00 is included in the scope of supply.	2	**3RK3122-□AC00**		1	1 unit
Type of electrical connection • Screw terminals • Spring-type terminals (push-in)		**1** **2**			

Selection and ordering data

3RK3211-1AA10
3RK3221-1AA10
3RK3231-1AA10
3RK3242-1AA10

3RK3251-1AA10

3RK3311-1AA10
3RK3321-1AA10

3RK3511-1BA10

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
3RK32, 3RK33 expansion modules					
4/8 F-DI Safety-related input module • 8 inputs	2	**3RK3211-□AA10**		1	1 unit
2/4 F-DI 1/2 F-RO Safety-related input/output module • 4 inputs • 2 single-channel relay outputs	2	**3RK3221-□AA10**		1	1 unit
2/4 F-DI 2F-DO Safety-related input/output module • 4 inputs • 2 two-channel electronic outputs	2	**3RK3231-□AA10**		1	1 unit
4/8 F-RO Safety-related output module • 8 single-channel relay outputs	2	**3RK3251-□AA10**		1	1 unit
4 F-DO Safety-related output module • 4 two-channel electronic outputs	2	**3RK3242-□AA10**		1	1 unit
8 DI Standard input module • 8 inputs	2	**3RK3321-□AA10**		1	1 unit
8 DO Standard output module • 8 electronic outputs	2	**3RK3311-□AA10**		1	1 unit
3RK35 interface modules					
PROFINET Interface NEW PROFINET interface, 100 Mbps, 32-bit cycle data exchange with Basic central unit or 64-bit with Advanced and ASIsafe central unit, acyclic exchange of diagnostics data	2	**3RK2511-□FA10**		1	1 unit
DP interface PROFIBUS DP interface, 12 Mbps, RS 485, 32-bit cyclic data exchange with Basic central unit or 64-bit with Advanced and ASIsafe central unit, acyclic exchange of diagnostics data	2	**3RK3511-□BA10**		1	1 unit
Type of electrical connection • Screw terminals • Spring-type terminals (push-in)		**1** **2**			

Notes:

For the required connection cable, see page 13/162.

Selection and ordering data

	Version			SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
				d				
Connection cables (essential accessory)								
3UF7932-0AA00-0	For connection of							
	Central units with expansion modules or interface module	Diagnostics modules with central unit or interface module	Length					
	✓	✓	• 0.025 m (flat)	▶	**3UF7930-0AA00-0**		1	1 unit
	--	✓	• 0.1 m (flat)	▶	**3UF7931-0AA00-0**		1	1 unit
	--	✓	• 0.15 m (flat) NEW	▶	**3UF7934-0AA00-0**		1	1 unit
	--	✓	• 0.3 m (flat)	▶	**3UF7935-0AA00-0**		1	1 unit
	--	✓	• 0.5 m (flat)	▶	**3UF7932-0AA00-0**		1	1 unit
	--	✓	• 0.5 m (round)	▶	**3UF7932-0BA00-0**		1	1 unit
	--	✓	• 1.0 m (round)	▶	**3UF7937-0BA00-0**		1	1 unit
	--	✓	• 2.5 m (round)	▶	**3UF7933-0BA00-0**		1	1 unit
Operating and monitoring modules for 3RK3								
3SK2611-3AA00	**Diagnostics modules** For direct display of errors, e.g. of cross-circuits			2	**3SK2611-3AA00**		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 3RK3 through the system interface, recommended for use in connection with 3RK3			▶	**3UF7941-0AA00-0**		1	1 unit
Door adapter								
3UF7920-0AA00-0	For external connection of the system interface, e.g. outside a control cabinet			▶	**3UF7920-0AA00-0**		1	1 unit
Interface covers								
3UF7950-0AA00-0	For system interface			▶	**3UF7950-0AA00-0**		1	5 units
Memory modules								
3RK3931-0AA00	For backing up the complete parameterization of the 3RK3 Modular Safety System without a PC/PG through the system interface			2	**3RK3931-0AA00**		1	1 unit
Push-in lugs								
3RP1903	For screw fixing, e.g. on mounting plate, 2 units required per device Can be used for 3RK3			5	**3RP1903**		1	10 units
Software for 3RK3								
3ZS1316-.C.10-0Y.5	**SIRIUS Safety ES** Software for configuring, commissioning, operating and diagnosing of 3SK2 and 3RK3, see page 13/163.							

✓ Available
-- Not available

Overview

More information
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/21192/td
Programming and Operating Manual, see https://support.industry.siemens.com/cs/ww/en/view/109444445.

SIRIUS Safety ES is the engineering software for the configuration, startup and diagnostics of the 3RK3 Modular Safety System and 3SK2 safety relays. The software combines the configuring of the hardware, the parameterization of the safety functions, and the testing and diagnostics of the safety system.

Efficient engineering with three program versions

The SIRIUS Safety ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

SIRIUS Safety ES	Basic	Standard	Premium
Access via the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	✓	✓	✓
Test	--	✓	✓
Integrated graphics editor	✓	✓	✓
Importing/exporting parameters	--	✓	✓
Comparison functions	--	✓	✓
Comfort functions	--	✓	✓
Terminal designator	--	✓	✓
Work on sub-diagrams	--	✓	✓
Standard-compliant printout according to EN ISO 7200	✓	✓	✓
Downloading parameterization via PROFIBUS	--	--	✓
Online diagnostics using PROFIBUS	--	--	✓
Creating, importing and exporting macros	--	--	✓

✓ Function available

-- Function not available

Additional functions

Language selection

The program interface language can be switched during use between German, English and French

Help function

A context-sensitive help function provides useful assistance with questions concerning the use of the program

Consistency check

A consistency check provides clear information about function assignment errors and users are taken directly to errors when the corresponding message is clicked on. Checks are carried out automatically when a project is saved and during the configuration test, but they can also be initiated manually.

Lists

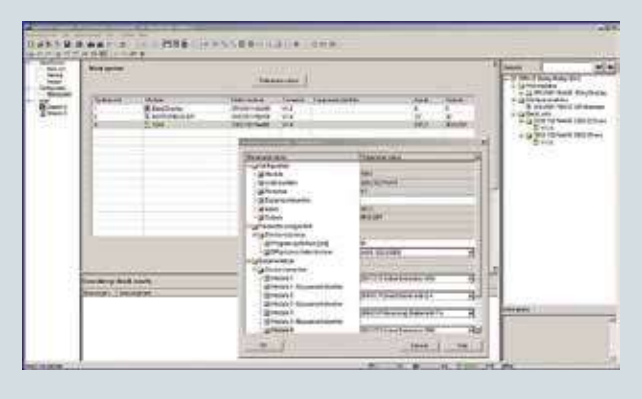
Lists of symbols and cross-references can be issued for effective processing of the project file

Standard-compliant printouts

The programs of the SIRIUS ES software family make machine documentation far easier. They enable parameterization printouts according to EN ISO 7200. The elements to be printed are easy to select and group as required.

Hardware configuration

The device configuration of the 3RK3 or 3SK2 systems is defined in the configuration dialog. The available modules are simply selected from the clearly laid out hardware catalog and positioned in the workspace. Depending on the device system used (3RK3 or 3SK2), only the permitted devices are shown in the hardware catalog in each case. In addition, in the case of the 3RK3, the quantity framework on the AS-i bus can be determined online or configured manually from the AS-i library. For each module, it is optionally possible to issue an equipment ID which is shown in the logic diagram for identification of the inputs and outputs.



Definition of the hardware layout

Graphic parameterizing of the safety logic via drag & drop

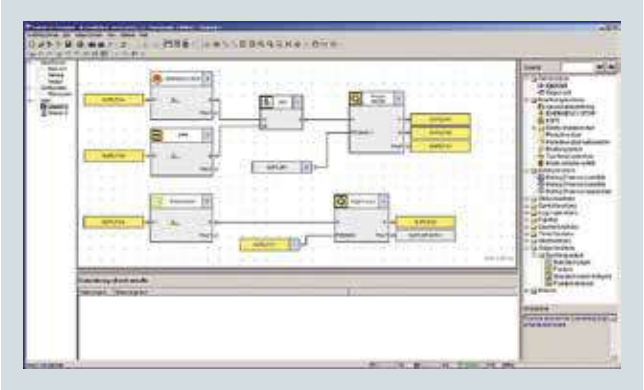
The functionality of the safety logic is laid down with a graphics editor designed for intuitive operation. Safe monitoring functions (EMERGENCY STOP, non-contact protective devices/light arrays, protective doors, etc.), output functions and logic functions (AND/OR operations, counting function, time functions, etc.), non-safety-related input/output functions, device status functions and control functions can be dragged from the extensive functions catalog onto the work interface by drag & drop. Depending on the version, each function has several input and output connecting points through which the functions can be interconnected by simple mouse clicks. Double-clicking on a function symbol opens the related features dialog window in which all the parameters can be displayed and configured: Scope of the function's inputs and outputs, configuring the channel type (single-/two-channel, NC contact/NO contact), activating crossover detection, defining start options, assigning the hardware inputs and outputs, etc. Of course each function can be issued with an individual name so that e.g. the position of a safety switch in the plant can be documented.

SIRIUS 3RK and 3SK Safety Software

SIRIUS Safety ES

The safety logic can be divided into several diagrams in order to enable structured processing of the entire plant. The user can freely position the functions on a quasi infinitely large drawing board, whereby the connecting lines are drawn automatically. If there is not enough space, more pages are automatically added to the diagram in horizontal or vertical direction. Connecting lines extending over several pages are automatically issued with cross-references during print-out. If required in the interest of clarity, the user can divide a connecting line manually into two segments, whereby the mutual reference is marked by reference arrows. For further documentation, freely compilable comment texts can be placed at any point in the diagram. Every point in the logic diagram can be processed with ease by dragging and zooming.

Every project can be saved as a file and be password-protected from unauthorized access.



Processing the safety functions in the graphics editor

AS-Interface

Evaluation of the AS-i slaves connected to the AS-i bus is also parameterized using the tried and tested method described above.

In order to be able to use the AS-i functionalities, a 3RK3 Advanced central unit or 3RK3 ASIsafe central unit (basic/extended) must be used.

User prompting during startup and maintenance

To start up the relevant safety system, the created project file is uploaded to the device. There are two ways of doing this:

- Connect the USB interface of the PC to the device using an appropriate connection cable.
- Use the DP interface to download the parameterization via any PROFIBUS node.

Access to the device can be restricted using a password concept that includes different protection levels.

After the project is loaded, the user switches the device by means of the software from configuring mode to test mode in which the safety functions can be tested.

Activating the diagnostics shows the status of the individual functions in the graphic logic diagram by means of different colors and symbols. In addition, more detailed information about each function element can be displayed in the logic diagram. For the purpose of testing the logic diagram, it is also possible to manually overwrite the signal state of each function element ("forcing").

If the test is completed successfully, the user releases the configuration and switches the device to protection mode, in which case "forcing" is automatically deactivated.

Service personnel can activate the graphic diagnostics in protection mode as well. The I&M (Identification & Maintenance) data saved in the device facilitate maintenance.

Benefits

- Convenient parameterization, operation, monitoring and testing by means of a user-friendly and clear-cut user interface
- Reliable diagnostic tool
- All functions, such as safety and logic functions, are available as modules, and are easy to link to one another
- Automatic creation of comprehensive documentation of safety functions

Selection and ordering data

SIRIUS Safety ES parameterization, start-up and diagnostics software

- Delivered without PC cable

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
SIRIUS Safety ES Basic						
3ZS1316-4CC10-0YA5	**Floating license for one user** Engineering software in limited-function version for diagnostics purposes, software and documentation on CD, 3 languages (German/English/French), communication via system interface					
	• License key on USB flash drive, Class A	2	**3ZS1316-4CC10-0YA5**		1	1 unit
	• License key download, Class A	▶	**3ZS1316-4CE10-0YB5**		1	1 unit
SIRIUS Safety ES Standard						
3ZS1316-5CC10-0YA5	**Floating license for one user** Engineering software, software and documentation on CD, 3 languages (German/English/French), communication via system interface					
	• License key on USB flash drive, Class A	5	**3ZS1316-5CC10-0YA5**		1	1 unit
	• License key download, Class A	▶	**3ZS1316-5CE10-0YB5**		1	1 unit
SIRIUS Safety ES Premium						
3ZS1316-6CC10-0YA5	**Floating license for one user** Engineering software, software and documentation on CD, 3 languages (German/English/French), communication via PROFIBUS or system interface, online diagnostics via PROFIBUS, creating, importing and exporting macros					
	• License key on USB flash drive, Class A	5	**3ZS1316-6CC10-0YA5**		1	1 unit
	• License key download, Class A	▶	**3ZS1316-6CE10-0YB5**		1	1 unit

Notes:

PC cable ordered separately, see Accessories page 13/164.

For a description of the software versions, see page 14/22.

Accessories

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
		d				
Optional accessories						
3UF7941-0AA00-0	**USB PC cables** For connecting to the USB interface of a PC/PG, for communication with 3RK3 and 3SK2 via the system interface, recommended for use in connection with 3RK3 and 3SK2	▶	**3UF7941-0AA00-0**		1	1 unit

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AS-interface Family

AS-i Safety at Work

AS-i Slaves

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AS-i Power

IO-Link Family

IO-Link Masters

Overview

More information	
Homepage, see www.siemens.com/as-interface	Industry Mall, see www.siemens.com/product?as-interface

AS-Interface

AS-i = simple!	AS-i = flexible!	AS-i = efficient!
• Only one cable for data and energy • Time-saving assembly/installation • Engineering in the TIA Portal • User-friendly maintenance	• Flexible topologies • Open standard • Expandability • Safety engineering	• User-friendly addressing • Fast device replacement • Ruggedness and stability • Device and network diagnostics

IC01_00210

AS-Interface – the smart communication standard for universal connection of the field level to the control system

The AS-Interface (AS-i) – the Actuator-Sensor-Interface, to be more precise – is a smart bus system for the field level that connects all the sensors and actuators in the field to the higher-level control system more simply, flexibly and efficiently than any other.

The structure of a complex automation system is not always clear at first glance. The field level in particular, with its large numbers of devices with real-time requirements, needs a clear structure.

That is exactly what the AS-i fieldbus delivers: Via a simple two-wire cable – the yellow AS-i cable – in an AS-i network up to 62 bus nodes can be connected to the AS-i master and simultaneously supplied with power. The standard here is robust data transmission in a rugged environment with a high degree of protection for the AS-Interface.

AS-i from Siemens has everything in its favor

- Complete AS-i product range for bus-based standard and safety technology from a single source
- System-wide integration of the AS-i devices into SIMATIC, SINUMERIK and the TIA Portal engineering framework
- Integration of ASIsafe applications into SIMATIC F controller safety programming
- Central configuration of standard and safety technology in the TIA Portal and in STEP7 Classic – just one engineering framework for controller, AS-i master and safety
- Quick diagnostics of master and slave components via web browser, HMI or TIA Portal
- Planning, calculation and verification of the whole safety chain based on AS-i Safety in the Safety Evaluation Tool (TÜV-approved)
- Integration of lower-level AS-i networks into the PCS 7 process control system
- Global spare parts logistics, consulting and service

		Article No.	Page
ASIsafe			
	ASIsafe enables integration of safety-related components in an AS-Interface network, for example: • EMERGENCY STOP pushbuttons • Protective door switches • Cable-operated switches • Other AS-i safety sensors Your advantage: The simple wiring of AS-Interface is maintained.		
 AS-i Master and AS-i Safety module	**AS-i Master and AS-i Safety module for ET 200SP** The CM AS-i Master ST and F-CM AS-i Safety ST modules are plugged into an ET 200SP configuration and connect an AS-i network, including safety-related inputs and outputs, with the controller. • Single, double and multiple masters possible • Per CM AS-i Master ST module up to 496 DI / 496 DQ / 124 AI / 124 AQ possible • Per F-CM AS-i Safety ST module up to 31 safe input signals (two-channel) / 16 safe output channels possible • Configuring with TIA Portal or STEP 7 Classic • Plant-wide safety programming of the F-CPU via SIMATIC Distributed Safety/ Safety Advanced/F systems • Integrated diagnostics • No other programming tools required Your advantage: Modular connection of fail-safe AS-i networks with system-wide programming in SIMATIC and SINUMERIK controllers.	**6ES7**	From 14/32

		Article No.	Page
ASIsafe (continued)			
3RK3 Modular Safety System	**SIRIUS 3RK3 Modular Safety System** Supplementing the service-proven concept of safety monitors, the 3RK3 Modular Safety System (MSS) offers, for example, the following functions for ASIsafe: • Up to 50 enabling circuits including muting function • Expandable fail-safe and non-fail-safe inputs/outputs • Control of up to 12 ASIsafe outputs or 12 fail-safe independent switch-off groups • Memory module for parameters, e.g. for device replacement • Optional PROFIBUS interface for diagnostics and parameterization • SIRIUS Safety ES, the intuitive graphic parameterization and diagnostics software • AS-i Power24V capability Your advantage: Easy to configure safety functions up to Category 4, PL e, SIL 3.	**3RK3**	See Catalog Section 13
Safety monitor	**AS-Interface safety monitors** • For monitoring safe stations and for linking AS-Interface inputs and outputs • Ensures safe disconnection • Available with one or two release circuits with two-channel configuration • All versions with removable screw terminals or spring-loaded terminals • All safety monitors in revised Version 3 with additional options • Filtering out of brief single-channel interruptions in the sensor circuit with the expanded safety monitor Version 3 • Expanded safety monitor with integrated safe slave for controlling a distributed safe AS-i output or for safe coupling a safe signal from one AS-i network to another AS-i network • ASIMON V3 Configuration software with graphic function diagram presentation Your advantage: Easy to configure safety functions up to Category 4, PL e, SIL 3.	**3RK1**	14/24
K45F SC17.5F S45F SlimLine module, safe AS-i output	**AS-Interface safety modules** • Complete portfolio of ASIsafe modules • For connection of safety switches with contacts (e.g. position switches) • Degree of protection IP65/IP67 or IP20 • Especially compact dimensions, with widths from 17.5 mm • Up to four safe inputs per module • Up to one safe output per module • Standard outputs are available on the module in addition • Up to Category 4, PL e, SIL 3 Your advantage: Easy integration of safe signals both in the switching cabinet and in the field.	**3RK1**	From 14/25
Safety switch	**SIRIUS 3SF1 mechanical safety switches for AS-Interface** • Plastic with degree of protection IP65 and metal with degree of protection IP66/IP67 • ASIsafe electronics integrated into the enclosure • Available with separate actuator, with or without tumbler Your advantage: Conventional wiring of safety functions no longer required.	**3SF1**	See Catalog Section 13
EMERGENCY STOP mushroom pushbutton in enclosure	**SIRIUS ACT EMERGENCY STOP mushroom pushbuttons for AS-Interface** • Degree of protection IP66/IP67/IP69K • Metal or plastic version • Connection of an EMERGENCY STOP device according to EN ISO 13850 to AS-Interface • Safety-related AS-Interface module is snapped onto the commanding device from behind • Can be used up to PL e, SIL 3 Your advantage: Easy direct connection of control elements to ASIsafe.	**3SU14 modules** **3SU18 enclosure**	See Catalog Section 11

Masters

	Article No.	Page
The AS-Interface master connects SIMATIC control systems to AS-Interface. It automatically organizes the data traffic on the AS-Interface cable and handles not only signal processing, but also parameter setting, monitoring and diagnostics functions.		
Masters for SIMATIC S7		
AS-Interface master connections:		
• CM 1243-2 for SIMATIC S7-1200	**3RK7**	From 14/28
• CP 343-2P, CP 343-2 for SIMATIC S7-300 and ET 200M	**6GK7**	From 14/30
Features:		
• Connection of up to 62 AS-Interface slaves		
• Connection of up to 496 inputs and 496 outputs per master or AS-Interface network		
• Integrated analog value transmission		
• Simple configuration by adopting the actual configuration on the AS-Interface network		
• Easy operation in the input/output address area of the SIMATIC S7 comparable to standard I/O modules		
• Monitoring of the control supply voltage on the AS-Interface shaped cable		
Your advantage: Easy connection to SIMATIC controllers.		
Masters for SIMATIC ET 200		
CM AS-i Master ST for SIMATIC ET 200SP	**3RK7**	From 14/32
• Connection of up to 62 AS-Interface slaves per master		
• Connection of up to 496 inputs and 496 outputs per AS-Interface network		
• Integrated analog value transmission		
• Simple configuration by adopting the ACTUAL configuration on the AS-Interface network		
• Easy operation in the input/output address range of the SIMATIC (or other controller) comparable to standard I/O modules		
• Monitoring of the control supply voltage on the AS-Interface shaped cable		
• Integrated ground-fault monitoring		
Your advantage: Easy connection of AS-i networks to distributed I/Os.		
F-CM AS-i Safety ST for SIMATIC ET 200SP	**3RK7**	From 14/36
• Monitoring of up to - 31 fail-safe AS-i input slaves per F-CM - 16 fail-safe AS-i outputs per F-CM		
• Transmission via PROFIsafe into the F-CPU for safety-related applications up to SIL 3 (IEC 61508/EN 62061)/PL e (EN ISO 13849-1)		
• As a result, these sensors become part of the "unlimited programming and data archiving" options of SIMATIC and of Safety Integrated.		
Your advantage: Easy connection of fail-safe AS-i networks to the distributed I/Os.		

CM 1243-2 for SIMATIC S7-1200

CP 343-2, CP 343-2P for SIMATIC S7-300

CM AS-i Master ST for SIMATIC ET 200SP

F-CM AS-i Safety ST for SIMATIC ET 200SP

		Article No.	Page
Routers			
DP/AS-i Link Advanced DP/AS-Interface Link 20E IE/AS-i Link PN IO	• Degree of protection IP20 • PROFIBUS slave or PROFINET IO device and AS-Interface master (single or double master in case of DP/AS-i Link Advanced and IE/AS-i Link PN IO) • Connection of up to 62 AS-Interface slaves per AS-Interface network • Connection of up to 496 digital inputs and 496 outputs per AS-i network, with doubling of the project data volume for double master versions • Integrated ground-fault monitoring (in case of DP/AS-i Link Advanced and IE/AS-i Link PN IO) • User-friendly local diagnostics and local startup by means of a full graphic display and control keys or through a web interface with a standard browser (in case of DP/AS-i Link Advanced and IE/AS-i Link PN IO) • Integrated analog value transmission • Configuring and uploading of AS-Interface configuration in STEP 7 possible • User-friendly selection of AS-Interface slaves Your advantage: Compact transition to PROFIBUS or PROFINET. As an alternative to the IE/AS-i Link PN IO, a high-performance router can be set up between PROFINET and AS-Interface by combining the CM AS-i Master ST and F-CM AS-i Safety ST modules in an ET 200SP station (for safety-related applications), , see pages 14/34 and 14/38.	3RK3, 6GK1	From 14/39
Slaves			
	Slaves contain the AS-Interface electronics and connection options for sensors and actuators in the field and in the control cabinet. A total of up to 62 slaves can be connected to one bus. The slaves then exchange their data in cyclic mode with a control module (master).		
	I/O modules for use in the field, high degree of protection		
K20 digital module K45 digital module K60 digital module	Digital I/O modules, IP67 – K60, K60R, K45 and K20 • Degree of protection IP65/IP67 or IP68/IP69K • Modules available with up to degree of protection IP68/IP69K • Connection sockets in M8/M12 • Up to eight inputs and four outputs • A/B technology available • Contacting protected against polarity reversal • Standard rail mounting and wall mounting possible • Mounting of the module on the base plate using just one screw • Diagnostics LEDs Your advantage: Reduction of mounting and startup times by up to 40%.	3RK1, 3RK2	From 14/50
K60 analog module	Analog I/O modules, IP67 – K60 • Degree of protection IP65/IP67 • Detects or transmits analog signals locally • two-/four-channel • Input modules for up to four sensors with current signal, with voltage signal or with thermal resistor • Output modules for current or voltage • Fast analog modules available for higher access speeds Your advantage: Easy integration of analog values.	3RK1	From 14/60

	Article No.	Page
Slaves (continued)		
SlimLine Compact SC17.5 / SlimLine Compact SC22.5 **I/O modules for use in the control cabinet** • Degree of protection IP20 • No M12 plugs required for connection • Especially narrow design for SlimLine Compact modules with widths of 17.5 mm and 22.5 mm • Analog modules are also available • Removable, finger-safe terminal blocks that cannot be inadvertently interchanged with the SlimLine Compact modules • Flat design of the flat modules for small control cabinets and confined conditions • Connection with screw terminals or spring-loaded terminals • Standard rail mounting and wall mounting possible • Diagnostics LEDs Your advantage: Modules enable space-saving use in control cabinets and small local control boxes.	**3RG9, 3RK1, 3RK2**	From 14/63
F90 module Flat module		
Modules with special functions		
Counter module Counter modules • Degree of protection IP20 • For evaluation of pulses • Connection with screw terminals or spring-loaded terminals Your advantage: Evaluation of pulses which exceed even the clock frequency of AS-Interface.	**3RK1**	14/70
Ground-fault detection module Ground-fault detection modules • Degree of protection IP20 • Display using LEDs • Two signaling outputs Your advantage: Automatic diagnostics of ground faults on AS-Interface	**3RK1**	14/71
Overvoltage protection module Overvoltage protection modules • Degree of protection IP67 • Discharge through ground cable with oil-proof outer sheath • Protection at transition of lightning protection zones Your advantage: The AS-Interface overvoltage protection module protects downstream AS-Interface devices or individual sections in AS-Interface networks from conducted overvoltages.	**3RK1**	14/72

		Article No.	Page
Slaves (continued)			
	Contactors and contactor assemblies		
SIRIUS contactor 3RT203.-1NB30-0CC0	SIRIUS 3RT contactors, 3-pole SIRIUS 3RA23 reversing contactor assemblies SIRIUS 3RA24 contactor assemblies for star-delta (wye-delta) starting • Notable reduction of wiring in the control circuit • Integrated mechanical interlocking • Prevention of wiring errors in the main circuit	**3RT20** **3RA23** **3RA24**	See Catalog Section 2
SIRIUS 3RA2712 function module for AS-Interface	SIRIUS 3RA27 function modules for AS-Interface • Connection of 3RT20 power contactors with communication capability, 3RA23 reversing contactor assemblies, and 3RA24 contactor assemblies for star-delta (wye-delta) starting to AS-Interface • Reduction of control current wiring through plug-in design and integrated monitoring of circuit breaker/motor starter protector and contactor • Reduced space requirement in the control cabinet through fewer digital inputs and outputs in the control system • Easy configuration through operation of feeders instead of individual contactors • Enhanced operational reliability and quick wiring thanks to spring-loaded terminals • Small number of variants through use of identical modules for size S00 to S3 contactors Your advantage: Shortening of mounting and startup times.	**3RA2712**	See Catalog Section 2
	Motor starters for use in the control cabinet		
3RA61 compact starter	SIRIUS 3RA6 compact starters 3RA61 direct-on-line starters, 3RA62 reversing starters • Degree of protection IP20 • Very compact load feeders with the integrated functionality of an electronic overload relay • As direct-on line or reversing starters for motors up to 30 HP/600 V • Easy expansion into a communication-capable load feeder using AS-i add-on modules • On-site safe disconnection also possible using AS-i add-on modules • Standardized integration of the loads in higher-level control systems using AS-i Your advantage: Compact solution with minimum wiring outlay for actuating direct-on-line and reversing starters in the control cabinet.	**3RA6** **3RA61** **3RA62**	See Catalog Section 4
	Motor starters for use in the field, high degree of protection		
SIRIUS M200D motor starter	SIRIUS M200D motor starters for AS-Interface • High degree of protection IP65 for cabinet-free design • As direct-on-line or reversing starters for motors up to 10 HP/600 V • Mechanical or electronic switching for high switching frequencies • Optional with manual operation and brake control • Expanded diagnostics and parameterization possible through AS-Interface • Easy and consistent integration in STEP 7 through AS-Interface Your advantage: The correct solution for all simple applications in conveyor systems with spatially distributed drives.	**3RK1**	See Catalog Section 6

		Article No.	Page
Slaves (continued)			
SINAMICS G110M frequency inverter	**SINAMICS G110M distributed inverters** **Wide power range from 0.37 to 4 kW** • Preconfigured with SIMOGEAR • Rugged, with IP65/IP66 degree of protection, up to 55 °C ambient temperature • Local commissioning via DIP switch, standard USB interface and potentiometer or Intelligent Operator Panel (IOP) • Integrated safety functions (STO locally via F-DI or via PROFIsafe) • Integrated, specific software functionality for conveyor systems - Quick stop function for fast reaction times to sensors - Limit switch functionality, e.g. for rotary table, corner transfer unit Your advantage: The simple solution for compact drives with safety requirements in conveyor technology	**6SL3517 power modules, 6SL3544 control units**	See SINAMICS G110 Catalog
SINAMICS G110D frequency inverter	**SINAMICS G110D distributed inverters** **High degree of protection IP65 for cabinet-free installation** • Wide power range from 0.75 to 7.5 kW (1.0 - 10 HP) • Easy commissioning and maintenance thanks to standardized plug-in connections for bus, energy and I/Os • Expanded diagnostics and parameterization through AS-Interface • Optional maintenance switch • Optional manual local operation • Same plugs used as for the M200D motor starter Your advantage: Easy, consistent implementation of distributed system concepts thanks to scaling of SINAMICS G110D, SINAMICS G120D and SIRIUS M200D products.	**6SL3511**	See SINAMICS G110 Catalog
	Commanding and signaling devices		
AS-Interface module	SIRIUS ACT pushbuttons and indicator lights for AS-Interface • Modular configuration based on individual specifications, or as enclosure with standard components • AS-Interface modules for base mounting or mounting in enclosure • Up to six command points for standard signals or EMERGENCY STOP • Degree of protection IP66/IP67/IP69K • Metal or plastic version • Indicator lights with integrated LED • Any change of equipment possible even after installation Your advantage: Complete operating system with simple AS-Interface connection for your plant.	**3SU14 modules** **3SU18 enclosure**	See Catalog Section 11
Signaling column AS-Interface adapter element	SIRIUS 8WD4 signaling columns • Many optical and acoustic elements can be combined • Up to four signaling elements can be connected using an AS-Interface adapter element • with integrated LEDs or with BA 15d base for LEDs/incandescent lamps • for fastening to connection elements (screw or spring-loaded terminals) • 24 V DC, diameters 50 mm and 70 mm • Connection with bayonet mechanism Your advantage: Signaling columns for monitoring production sequences and for visual or acoustic warnings in emergency situations, with easy AS-Interface connection.	**8WD4**	See Catalog Section 11

		Article No.	Page
Power supply units and data decoupling modules			
	AS-Interface power supply units generate a controlled direct voltage of 30 V DC with high stability and low residual ripple in conjunction with data decoupling. They are an integral component of the AS-Interface network and enable the simultaneous transmission of data and energy on one cable. In conjunction with data decoupling modules, AS-Interface can also be operated with standard power supply units.		
 IP20, 3 A IP20, 8 A	**AS-Interface power supply units** • With wide performance spectrum from 2.6 to 8 A • Degree of protection IP20 • Separation of data and energy by means of the integrated data decoupling • UL/CSA approval means the power supplies can be used worldwide, 2.6 A version with output power restricted to max. 100 W (for Class 2 circuits in accordance with NEC) • Certified for global use • Integrated ground-fault and overload detection save the need for additional components and make applications reliable • Diagnostics memory, remote signaling and remote RESET allow fast detection of faults in the system • Ultra-wide input range enables single- and two-phase applications (8 A version) Your advantage: Optimum performance for each application.	3RX9	14/73
 PSN130S 30 V DC, 8 A	**30 V power supply units** Standard 30 V power supply units without data decoupling • Power spectrum 3 A, 4 A and 8 A • Overload and short-circuit proof in every performance class • Diagnostics: With output voltage > 26.5 V DC LED and signaling contact for output voltage 30 V O.K. • Primary-side connection to 120/230 V AC (single-phase) with automatic range selection Your advantage: Economical alternatives in conjunction with data decoupling modules while making full use of the maximum AS-Interface cable length.	3RX9	From 14/75
 SITOP PSU100M, 24 V DC, 20 A	**24 V power supply units** Standard 24 V power supply units (SITOP), without data decoupling • Power spectrum 2.5 to 40 A • Overload and short-circuit proof in every performance class • Add-on modules for signaling, redundancy, buffering and UPS • Single-phase, two-phase and three-phase versions Your advantage: Economical alternatives in conjunction with data decoupling modules.	6EP	See SITOP Catalog
 S22.5 data decoupling module	**S22.5 data decoupling modules** • Degree of protection IP20, narrow design 22.5 mm • Supply of several AS-i networks with a single power supply unit • Single and double data decoupling • Operation with 24 V DC or 30 V DC Your advantage: Cost-effective installation of AS-i networks in conjunction with standard power supply units.	3RK1	From 14/77
 DCM 1271 data decoupling module	**DCM 1271 data decoupling module for SIMATIC S7-1200** • Simple data decoupling in IP20 design • Supply of several AS-i networks with a single power supply unit • Operation with 24 V DC or 30 V DC Your advantage: Cost-effective installation of AS-i networks in conjunction with standard power supply units in the design of a SIMATIC S7-1200 module.	3RK7	From 14/79
Transmission media			
	AS-Interface shaped cable for connection of network stations		
 Shaped cable	**AS-Interface shaped cable** • No polarity reversal thanks to trapezoidal shape • Cables made of optimized material for different operating conditions • Special version according to UL CLASS 2 available Your advantage: Fast replacement and connection to AS-Interface by piercing method.	3RX9	14/82

		Article No.	Page
System components and accessories			
	Accessories comprise tools for mounting, installation and operating as well as individual components.		
Repeater Compact extension plug	**Repeaters and extension plugs** • Repeaters for extending the AS-Interface cable by 100 m per repeater • Extension plug for extending the AS-Interface segment to max. 200 m • Parallel switching of several repeaters possible (star configuration option) • Maximum size increases (when combined) to more than 600 m • Easy mounting • IP67 module enclosure Your advantage: Lower infrastructure costs, more possibilities of use and greater freedom for plant planning.	**6GK1 repeater** **3RK1 extension plug**	14/83 14/84
Addressing unit for AS-Interface V 3.0	**Addressing units** • Reading out and adjusting the slave address 0 to 31 or 1A to 31A, 1B to 31B, with automatic addressing aid and prevention of double addresses • Reading out the slave profile (IO, ID, ID2) and reading out and setting the ID1 code • Input/output test when commissioning the slaves, on all digital and analog slaves according to AS-Interface specification V3.0, including safe input slaves and complex CTT2 slaves • Display of the operational current in case of direct connection of an AS-i slave (measuring range from 0 to 150 mA) • Storage of complete network configurations (profiles of all slaves) to simplify the addressing Your advantage: Easiest way to address and test the slaves.	**3RK1**	From 14/85
Analyzer	**AS-Interface analyzer** • Diagnostics units for completely checking the quality and function of an AS-Interface installation • Transmission of collected data through an RS 232 interface to a PC, evaluation by software • Easy and user-friendly operation • Automatically generated test logs • Advanced trigger functions enable exact analysis • Process data can be monitored online • In addition to digital I/O data it is possible to view analog values and safety slaves in data mode. Your advantage: Preventative testing of an AS-Interface network is possible, recorded logs facilitate remote diagnostics.	**3RK1**	From 14/87
M12 sealing cap Cable terminating piece	**Miscellaneous accessories** Individual components such as sealing caps, cable adapters, distributors, M12 plugs and cables, AS-Interface System Manual, etc.	**3RK1, 3RT1, 3RX9, 6ES7**	From 14/91

Introduction

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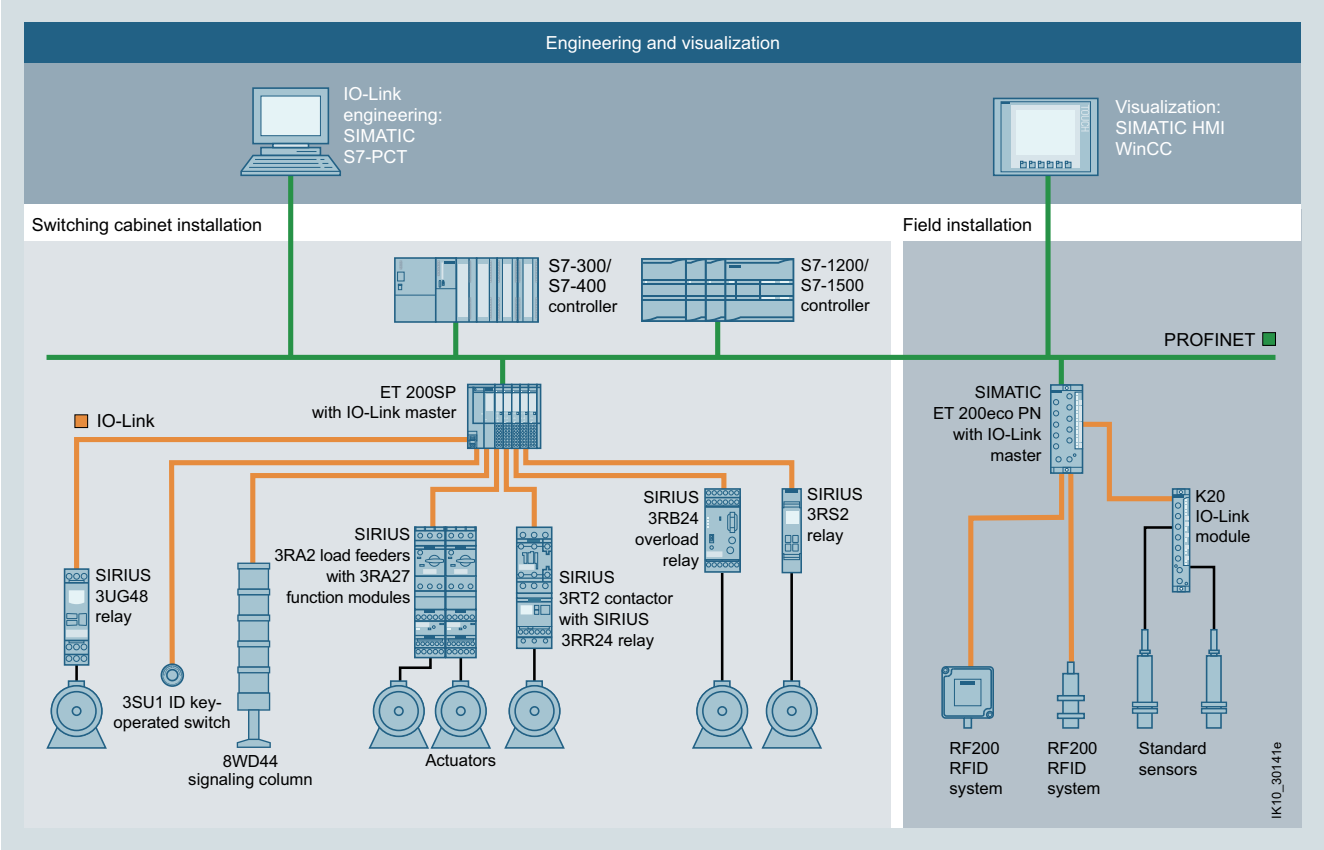
Diagnostics			
Diagnostics for AS-Interface via HMI panels	The following diagnostics block with visualization via HMI or web browser for AS-Interface can be downloaded free of charge in the Industry Online Support Portal: Diagnostics blocks • For CM AS-i Master ST and F-CM AS-i Safety ST in ET 200SP, see https://support.industry.siemens.com/cs/ww/en/view/109479103 • For other Siemens AS-i master and links, see https://support.industry.siemens.com/cs/ww/en/view/50897766 Your advantage: Detailed diagnostic display for fast fault analysis and short downtimes – for easy integration into STEP 7 projects.	--	
Software			
AS-Interface block library for PCS 7	**AS-Interface block library for SIMATIC PCS 7** • Engineering and runtime software • Easy connection of AS-Interface to PCS 7 • Engineering work reduced to positioning and connecting the blocks in the CFC • No additional configuring steps required for connection to the PCS 7 Maintenance Station, diagnostics for the AS-i system optimally guaranteed • See Support Site for more information https://support.industry.siemens.com/cs/document/109759605 Your advantage: Easy connection of AS-Interface to PCS 7, little engineering and configuration.		

Overview

More information	
Homepage, see www.siemens.com/io-link	For important topics at a glance, see https://support.industry.siemens.com/cs/ww/en/view/109737170



Engineering and visualization

IO-Link – more than just another interface

IO-Link is an open communication standard for sensors and actuators – defined by the IO-Link Consortium.

IO-Link is a smart concept for the uniform connection of actuators and sensors to the control level by means of a low-cost point-to-point connection.

As an open interface, IO-Link can be integrated into all standard fieldbus and automation systems.

The IO-Link communication standard below fieldbus level enables central error diagnostics and localization down to actuator/sensor level, and facilitates both startup and maintenance by allowing parameter data to be dynamically changed directly from the application.

The increasing intelligence of field devices and their integration into automation as a whole now allows data to be accessed right down to the lowest field level. The result: greater plant availability and less engineering work.

Transparency in the process through IO-Link

High system availability and data transparency are market requirements that must also be met by the connecting of innovative control technology to a control system. A systematic diagnostics concept and efficient handling of parameter data are required for this purpose in automation.

With the aid of the IO-Link communication standard, a communication link is established between switchgear and controller, and this allows data to be exchanged efficiently. Based on a standard cable, it is therefore possible to integrate parameter, process and diagnostic data and measured values into the plant automation with ease. For example, the available diagnostic data allow potential errors to be detected quickly, thus avoiding lengthy plant downtimes.

As a consequence of their basic function, such as overload protection (SIRIUS 3RB24 electronic overload relays for IO-Link), many controls have measured values. The availability of these via IO-Link now allows conclusions to be drawn at an early stage concerning wear and tear in the application.

At the same time the option of parameterizing via IO-Link supports the device not just when parameters concerning operating time are changed, but also when the device is replaced. In the case of a spare part, for example, the parameters can be quickly transmitted to a new device via the communication system.

Masters

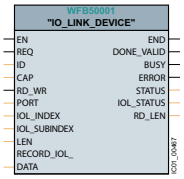
		Article No.	Page
	The IO-Link master modules form the heart of the IO-Link system.		Catalog ST 70
CM 8xIO-Link for SIMATIC S7-1500	**IO-Link master module for SIMATIC S7-1500** CM 8xIO-Link communication module • Communication module for connecting up to 8 IO-Link devices (three-wire connections) or 8 standard sensors according to IO-Link specification V1.1 • Can be used directly downstream of an S7-1500 CPU or distributed in ET 200MP via PROFINET or PROFIBUS • Simple replacement of sensors/actuators without time-consuming parameterization • Data transmission rates COM1 (4.8 kBd), COM2 (38.4 kBd), COM3 (230.4 kBd) Your advantage: Easy connection of IO-Link connections to the SIMATIC S7-1500.	**6ES7**	14/101
SM 1278 4xIO-Link for SIMATIC S7-1200	**IO-Link master module for SIMATIC S7-1200** SM 1278 4xIO-Link master • IO-Link master as serial communication module with four ports (channels) according to IO-Link specification V1.1 • Easy device exchange with automatic data recovery without engineering for IO-Link device • Up to four IO-Link devices (3-wire connections) can be connected to each IO-Link master module • Data transmission rates COM1 (4.8 kBd), COM2 (38.4 kBd), COM3 (230.4 kBd), automatic adjustment to the data transmission rate supported by the device Your advantage: Easy connection of IO-Link connections to the SIMATIC S7-1200.	**6ES7**	14/102
CM 4xIO-Link for ET 200SP	**IO-Link master modules for ET 200SP** CM 4xIO-Link communication module • IO-Link master as serial communication module with four ports (channels) according to IO-Link specification V1.1 • Module replacement with automatic data recovery without engineering for IO-Link master and device • Up to four IO-Link devices (3-wire connections) can be connected to each IO-Link master module. • Data transmission rates COM1 (4.8 kBd), COM2 (38.4 kBd), COM3 (230.4 kBd), automatic adjustment to the data transmission rate supported by the device Your advantage: Easy connection of IO-Link connections to distributed I/Os.	**6ES7**	From 14/103
IO-Link master module for ET 200pro	**IO-Link master module for ET 200pro** 4 IO-Link HF electronic module • IO-Link master as serial communication module with four ports (channels) according to IO-Link specification V1.1 • Easy device exchange with automatic data recovery without engineering for IO-Link device • Up to four IO-Link devices can be connected to each IO-Link master module • Support of IO-Link port class B • Data transmission rates COM1 (4.8 kBd), COM2 (38.4 kBd), COM3 (230.4 kBd), automatic adjustment to the data transmission rate supported by the device Your advantage: Easy connection of sensors and actuators to the I/Os directly in the machine's field area.	**6ES7**	14/104
6ES7148-6JA00-0AB0 6ES7148-6JD00-0AB0	**IO-Link master module for ET 200eco PN** ET 200eco PN IO-Link master • 4 IO-L + 8 DI + 4 DO 24 V DC/1.3 A - Up to four IO-Link devices (IO-Link port class A) can be connected - Up to eight standard sensors (8 DI) and up to four standard actuators (4 DO) can be additionally connected - Enclosure width 60 mm • 4 IO-L - Up to four IO-Link devices (IO-Link port class B) can be connected - Enclosure width 30 mm Your advantage: Easy connection of sensors and actuators to the I/Os directly in the machine's field area.	**6ES7**	From 14/105
CM IO-Link for ET 200AL	**IO-Link master module for ET 200AL** CM IO-Link communication module • IO-Link master as serial communication module with four ports (channels) according to IO-Link specification V1.1 • Easy device exchange with automatic data recovery without engineering for IO-Link device • Up to four IO-Link devices can be connected to each IO-Link master module • Support of IO-Link port class B • Data transmission rates COM1 (4.8 kBd), COM2 (38.4 kBd), COM3 (230.4 kBd), automatic adjustment to the data transmission rate supported by the device Your advantage: Easy connection of sensors and actuators to the I/Os directly in the machine's field area.	**6ES7**	From 14/106

Introduction

		Article No.	Page
Input modules			
	IO-Link input modules make full use of the potential of IO-Link and are a more attractive solution economically than a direct sensor connection.		
IO-Link module K20 with eight digital inputs	**K20 IO-Link modules** • Four or eight digital inputs • Degree of protection IP65/IP67 • Connection sockets in M8/M12 • Contacting protected against polarity reversal Your advantage: Reduction of mounting and startup times by up to 40%.	**3RK5**	14/107
Industrial controls			
	Starters and contactor assemblies for direct-on-line, reversing and star-delta (wye-delta) starting can be connected to IO-Link through function modules without any additional, complicated wiring.		
SIRIUS contactor 3RT201.-1B...-0CC0	**Contactors and contactor assemblies** SIRIUS 3RT contactors, 3-pole SIRIUS 3RA23 reversing contactor assemblies SIRIUS 3RA24 contactor assemblies for star-delta (wye-delta) starting • Notable reduction of wiring in the control circuit • Integrated mechanical interlocking • Prevention of wiring errors in the main circuit	**3RT20** **3RA23** **3RA24**	See Catalog Section 2
SIRIUS 3RA2711 function module for IO-Link	SIRIUS 3RA27 function modules • Connection of 3RT20 power contactors with communication capability, 3RA23 reversing contactor assemblies, and 3RA24 contactor assemblies for star-delta (wye-delta) starting to IO-Link • Reduction of control current wiring through plug-in technology, feeder groups and integrated monitoring of circuit breaker/motor starter protector and contactor • Reduced space requirement in the control cabinet through fewer digital inputs and outputs in the control system • Simple user program through operation of feeders instead of individual contactors • Enhanced operational reliability and quick wiring thanks to spring-loaded terminals • Can be flexibly combined with many automation solutions using the open, standardized IO-Link wiring system • Small number of variants through use of identical modules for size S00 to S3 contactors Your advantage: Shortening of mounting and startup times	**3RA2711**	See Catalog Section 2
SIRIUS 3RB24 overload relay	**Overload relays** SIRIUS 3RB24 electronic overload relays for IO-Link for high-feature applications • Diagnostics and current value transmission via IO-Link • Current measuring modules (3RB29) for current values from 0.3 to 630 A • Controlling direct-on-line, reversing and wye-delta starters via IO-Link in conjunction with contactors • Full motor protection through PTC connection Your advantage: Communication-capable overload relay enables remote diagnostics and preventative maintenance.	**3RB24**	See Catalog Section 3
SIRIUS 3RA64 compact starter	**Motor starters for use in the control cabinet** SIRIUS 3RA64, 3RA65 compact starters for IO-Link • Integrated functionality of a circuit breaker, contactor and electronic overload relay and various functions of optional mountable accessories • Can be used for direct starting of standard induction motors up to 32 A (approx. 30 HP/600 V) • Compact design offers enormous savings in space and wiring in the control cabinet • Low variance of devices thanks to wide setting ranges for the rated current and wide voltage ranges Your advantage: 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.	**3RA6** **3RA64** **3RA65**	See Catalog Section 4

	Article No.	Page
Industrial controls (continued)		
Monitoring relays		
SIRIUS 3RR24 monitoring relay		
SIRIUS 3RR24 monitoring relays for mounting onto 3RT2 contactors for IO-Link • Monitoring relays for mounting onto 3RT2 contactors • Parameterization and diagnostics via the display on the device or via IO-Link • Adjustable warning and switch-off limit values and on/tripping delay times • All current measured values available in the control system Your advantage: Communication-capable monitoring relay enables remote diagnostics and preventative maintenance.	**3RR24**	See Catalog Section 2
SIRIUS 3UG48 monitoring relay		
SIRIUS 3UG48 monitoring relays for stand-alone installation for IO-Link • Monitoring of - Network (3UG481) - Voltage (3UG483) - Current (3UG4822) - Power factor and active current (3UG484) - Fault current (3UG4825) - Speed (3UG485) • Parameterization and diagnostics via the display on the device or via IO-Link • Adjustable warning and switch-off limit values and on/tripping delay times • All current measured values available in the control system Your advantage: Communication-capable monitoring relay enables remote diagnostics and preventative maintenance.	**3UG48**	See Catalog Section 12
SIRIUS 3RS14, 3RS15 temperature monitoring relay		
SIRIUS 3RS14, 3RS15 temperature monitoring relays for IO-Link • Measuring the temperature of solids, liquids and gases • Use of resistance sensors (3RS14) or thermocouples (3RS15) • Parameterization and diagnostics via the display on the device or via IO-Link • Adjustable warning and switch-off limit values and on/tripping delay times • All current measured values available in the control system Your advantage: Independent monitoring easily linked to the control system.	**3RS14, 3RS15**	See Catalog Section 12
SIRIUS ACT pushbuttons and indicator lights		
SIRIUS ACT 3SU1 ID key-operated switch		
SIRIUS ACT 3SU1 ID key-operated switches for IO-Link • Access system and selection system for four authorization levels • Authentication of groups and persons • Five ID keys with different coding • Option for individual coding via IO-Link • For installation in enclosures or fastening on front plate • Electronic module for ID key-operated switches must be ordered separately. Your advantage: Only authorized personnel can work on plants and machines.	**3SU1**	See Catalog Section 11
SIRIUS ACT 3SU1 electronic module		
SIRIUS ACT 3SU1 electronic modules for IO-Link • Eight digital inputs and outputs possible • DI and DQ freely selectable (programmable) • Input and output functions parameterizable • Connection method (push-in) • For installation in enclosures or fastening on front plate Your advantage: No wiring required if ordered in a 3SU1 enclosure via configurator.	**3SU1400**	See Catalog Section 11
SIRIUS 8WD4 signaling columns		
Signaling column 8WD44 IO-Link adapter element		
8WD44 IO-Link adapter element • Up to five signaling elements can be connected using an IO-Link adapter element • 24 V DC, diameter 70 mm • Connection with bayonet mechanism • For fastening on feet, 8WD44 • Connection elements with screw or spring-loaded terminals or connection element with 5-pole M12 plug Your advantage: Signaling columns for monitoring production sequences and for visual or acoustic warnings in emergency situations, with easy IO-Link connection.	**8WD44**	See Catalog Section 11

Introduction

	Article No.	Page
RFID system		
RFID system for IO-Link **SIMATIC RF200 RFID system in the HF range** Products SIMATIC RF210R, SIMATIC RF220R, SIMATIC RF240R, SIMATIC RF250R, SIMATIC RF260R • Simple identification tasks such as reading an ID number (UID) • Reading of user data • Writing of user data • No RFID-specific programming, ideal for those new to RFID • Simple connection via master modules for IO-Link, such as SIMATIC S7-1200, ET 200SP, ET 200pro, ET 200eco PN and ET 200AL • Use with the tried and tested ISO 15693 transponders (MDS Dxxx)	6GT2	Catalog ID 10 - Industrial Identification Systems
Device Description (IODD)		
IODD files for IO-Link **IODD files** These files provide the device description for IO-Link devices. • Comprehensive IODD catalog of SIEMENS IO-Link devices • Freely available for download from Industry Online Support, see https://support.industry.siemens.com/cs/ww/en/ps/15851	--	14/99
IODDfinder for IO-Link **IODDfinder** The entire world of IO-Link under one roof The IODDfinder is a service provided by the IO-Link community. It is a central cross-vendor database for descriptive files (IODDs). In addition, the platform provides an overview of the available IO-Link devices. For more information, see https://ioddfinder.io-link.com/#/.	--	14/99
Software		
STEP 7 PCT **STEP 7 PCT (Port Configuration Tool)** Engineering software for configuring the IO-Link master modules for SIMATIC S7-1200, ET 200SP, ET 200pro, ET 200eco PN and ET 200AL • Available as a stand-alone version or integrated into STEP 7 (V5.5 SP1 or higher) and TIA (V12 or higher) • Engineering of the IO-Link devices connected to the master • Monitoring of the process image of the IO-Link devices • Open interface for importing further IODDs • Freely available for download from Industry Online Support, see https://support.industry.siemens.com/cs/ww/en/view/32469496	--	14/99
 IO-Link device function block for TIA Portal **IO-Link function blocks (IO-Link master and IO-Link device)** STEP 7 function block for easy acyclical data exchange in the user program • Freely available for download from Industry Online Support, see https://support.industry.siemens.com/cs/ww/en/view/82981502	--	14/99
"Siemens IO-Link Devices" block library **"Siemens IO-Link Devices" block library** This library provides function blocks and user-defined data types (UDTs) for all IO-Link devices from the Siemens portfolio. These blocks and UDTs standardize and simplify communication with IO-Link devices. • Freely available for download from Industry Online Support, see https://support.industry.siemens.com/cs/ww/en/ps/90529409	--	14/99

AS-Interface Introduction

Communication overview

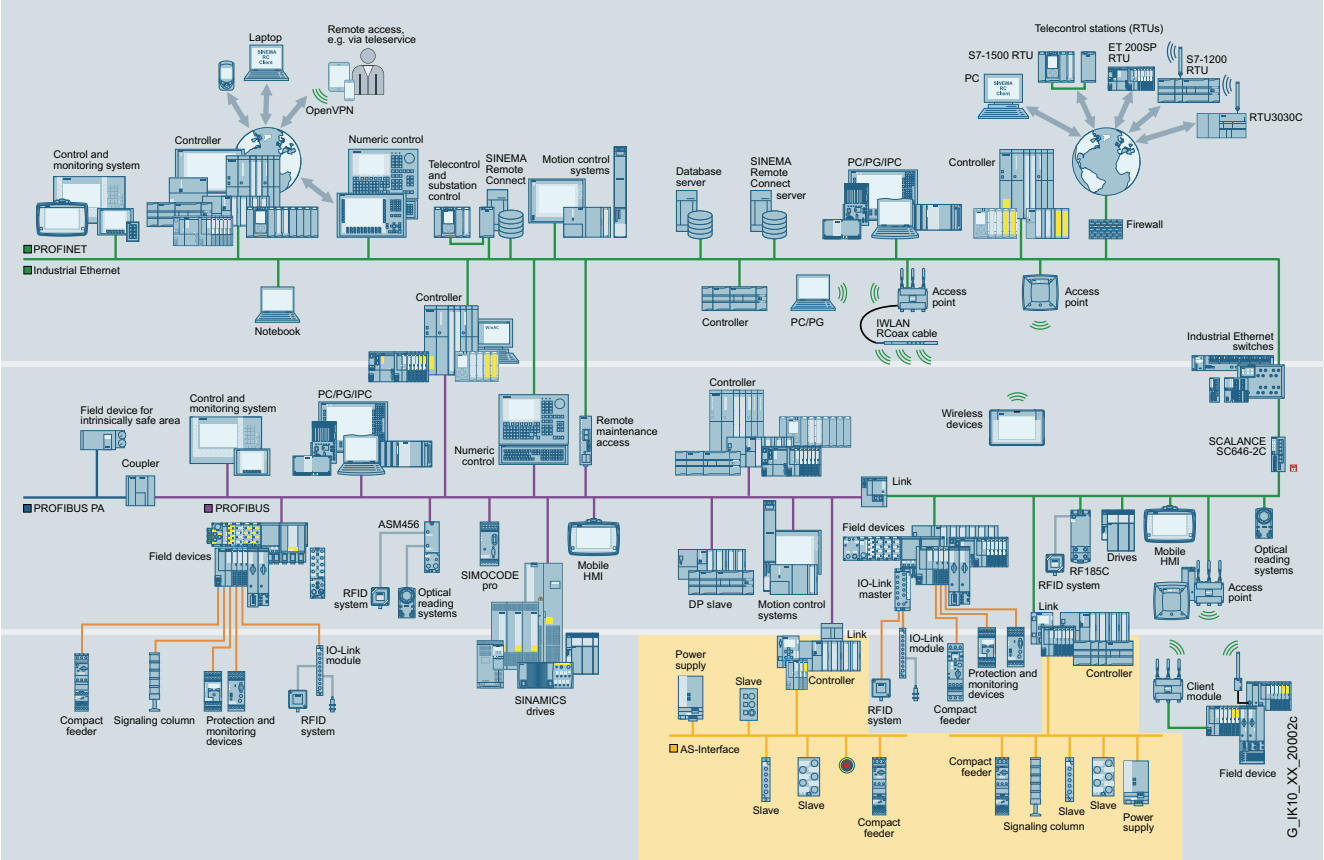
Overview

AS-Interface is an open, international standard according to IEC/EN 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), communication 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.

More information

Homepage, see www.siemens.com/as-interface	Industry Mall, see www.siemens.com/product?as-interface



AS-Interface in the SIMATIC NET communications landscape

Benefits

An important characteristic of the AS-Interface technology is the use of a shared two-wire cable for data transmission and distribution of auxiliary power to the sensors and actuators. An AS-i power supply unit or alternatively a standard power supply unit that meets the requirements of the AS-Interface transmission method and has an external AS-i data decoupling module 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 marshaling 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 automatically transfers the inputs and outputs between the controller and the digital and analog AS-Interface slaves. Slave diagnostics information is forwarded to the control system when required.

The latest AS-Interface masters according to the AS-Interface specification 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 can 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.

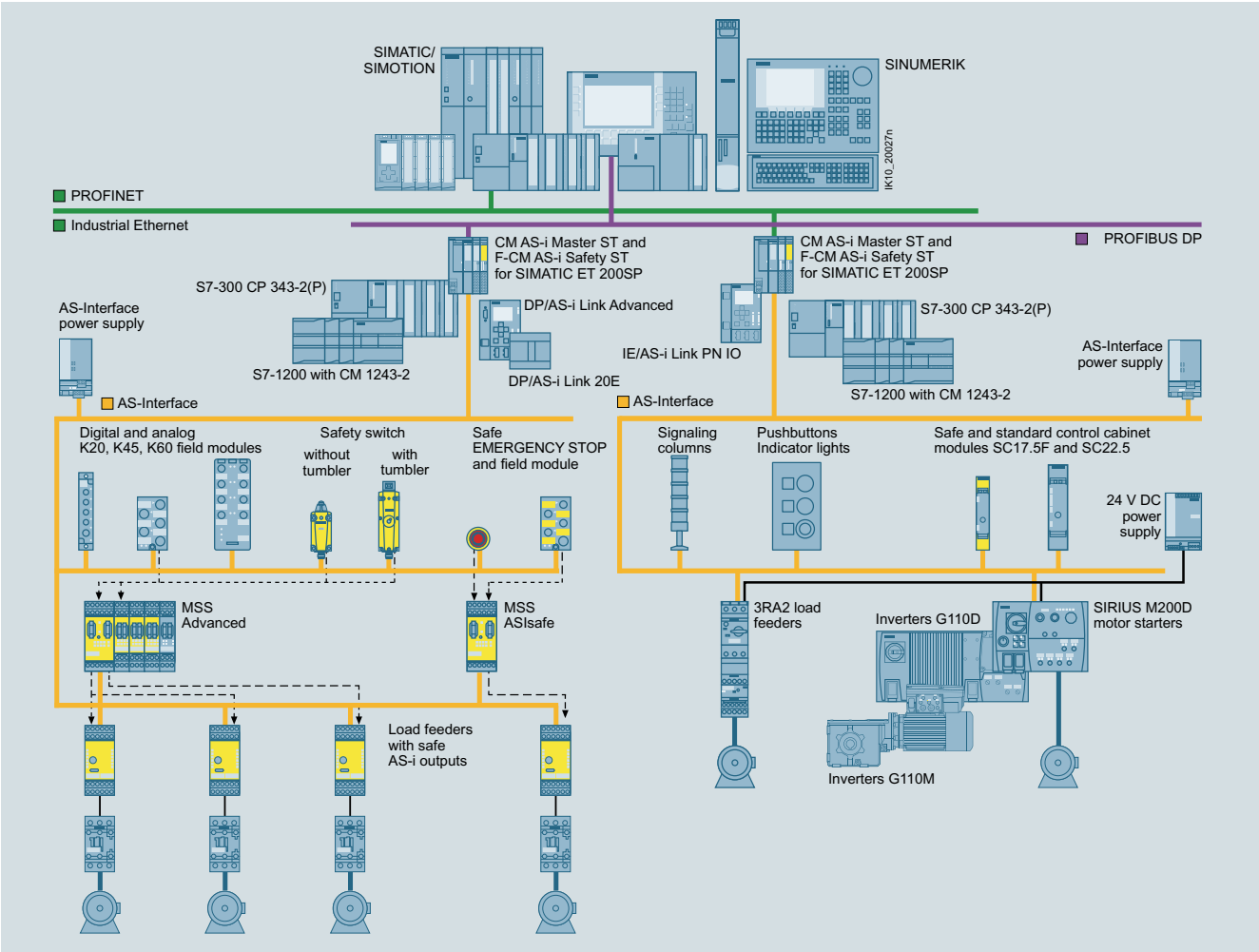
AS-Interface Introduction

System components

Overview

To implement communication, the following components of a system installation are available:

- AS-i modules for central control units such as SIMATIC S7, ET 200M/ET 200SP distributed I/Os, or network transitions from PROFIBUS or PROFINET to AS-Interface
- AS-i power supply unit or alternatively a standard power supply unit in combination with an AS-i data decoupling module for the power supply to the slaves and sensors
- AS-Interface shaped cables
- Network components such as repeaters and extension plugs (cannot be used for AS-i Power24V)
- I/O modules (AS-i slaves) for connection of standard sensors/actuators
- Actuators and sensors with integrated AS-i slave
- Safe I/O modules (ASIsafe slaves) for transmitting safety-related data through AS-Interface
- Addressing device for setting slave addresses during commissioning



Example of a configuration with the system components

Features

Standard	IEC/EN 62026-2
Topology	Line, star or tree structure (same as electrical wiring)
Transmission medium	Unshielded twisted pair (2 x 1.5 mm^2) for data and auxiliary power
Connection methods	Contacting of the AS-Interface cable by insulation piercing method
Maximum cable length	• 100 m without repeater • 200 m with extension plug • 300 m with two repeaters in series connection • 600 m with extension plugs and two repeaters parallel switched Longer cable lengths also possible through parallel switching of more repeaters.

Maximum cycle time	• 5 ms in maximum configuration with 31 standard addresses • 10 ms in maximum configuration with 62 A/B addresses • Profile-specific for slaves with extended data, e.g. analog slaves
Number of stations per AS-Interface line	• Up to 62 slaves (A/B addressing) • Integrated analog value transmission
Number of binary sensors and actuators	max. 496 DI / 496 DQ
Access control	• Cyclic polling master/slave procedure • Cyclic data acceptance from host (PLC, PC)
Error safeguard	Identification and repetition of faulty message frames

Overview

Scope of AS-Interface specification V3.0

Maximum number of slaves			Number of digital inputs	Number of digital outputs
Digital	Analog	ASIsafe	DI	DQ
62	62	31	62 × 8 = 496	62 × 8 = 496

Basic data

- AS-Interface specification 3.0 describes a fieldbus system with an AS-i master and up to 62 AS-i slaves.
- Every AS-i slave with standard addressing occupies one AS-i address (1...31).
- Slaves with extended addressing divide an AS-i 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 slaves with standard addressing and extended addressing (A/B slaves) is possible without difficulty. The AS-i master identifies automatically which type of slave is connected, so no special adjustments are required of the user.
- One digital AS-i slave typically has up to four digital inputs and four digital outputs.
- Transmission of the digital input/output data requires max. 5 ms cycle time for 31 slaves; for further values, see "Communication cycle".
- Integrated analog value transmission permits access to both analog values and digital values without the need for any special function blocks.

Communication cycle

Maximum cycle time (digital signals)
• 5 ms with 31 slaves • 10 ms with 62 slaves • Up to 20 ms for slaves with A/B address 4 DI / 4 DQ • Up to 40 ms for slaves with A/B address 8 DI / 8 DQ

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 of 10 ms will be required to update the data of both slaves.

Slaves with A/B addressing transmit max. 4 DI / 3 DQ in one cycle.

Slaves with A/B addressing and 4 DQ or 4 DI / 4 DQ transmit the output data in two consecutive cycles. The double transmission time of these outputs has no effect in typical applications. The transmission procedure is performed automatically by the AS-i master in accordance with AS-i specification V3.0. These slaves are identified in the selection data with addressing type A/B (spec. V3.0).

Slaves with a single A/B address and 8 DI / 8 DQ transmit the input and output data in four consecutive cycles. The transmission time of the inputs/outputs of these slaves increases accordingly. The transmission procedure is performed automatically by the AS-i master in accordance with AS-i specification V3.0.

The slaves offered by Siemens with 8 DI or 8 DI / 2 DQ use two AS-i addresses so that the time-consuming procedure is not needed and a fast data update is ensured.

All slave types can be mixed and used on a single AS-Interface network.

For more information, such as the addressing type used by the AS-interface slave (standard or A/B address), see the "Selection and ordering data" for the relevant slave.

More information
System Manual "AS-Interface", see https://support.industry.siemens.com/cs/ww/en/view/26250840

AS-Interface product range

AS-Interface products from Siemens use the current AS-Interface specification V3.0, which is standardized internationally as IEC/EN 62026-2.

The alternating pulse modulation developed more than 20 years ago for AS-Interface has proven to be a reliable transmission method with which the direct voltage supply for the bus modules and the connected sensors is provided on the standard two-wire line.

Multiple development stages were implemented to produce the proven-in-use system components with optimum EMC properties available today. The extensive product range with AS-Interface specification V3.0 undergoes constant innovation and is extremely cost-efficient, both to install and operate.

The bus cable can be retrofitted with repeaters of AS-Interface specification V3.0, and the modules function without any reciprocal interference. Master modules from Siemens enable ideal integration into the SIMATIC environment, in particular for the AS-Interface master of the ET 200SP distributed I/O system.

The underlying industrial requirements for the system concept are still applicable today: Numerous individual digital input and output signals are spatially distributed in the machine. Rather than having to install thick cable harnesses from the control cabinet to the sensors and actuators, smaller, more manageable AS-i modules are simply inserted in situ onto the bus cable in the IP67 enclosure, and the sensors and actuators connected with short M12 cables.

An additional AS-i module is installed in proximity to the next sensor to ensure that the length of the M12 cables is kept as short as possible. As analog signals are likewise transmitted without any problems, the AS-Interface also replaces the long, shielded analog cables.

Depending on requirements, the switching devices can also be connected to AS-i modules with terminal connection or conveniently used with the integrated AS-i connection. Motor controllers with digital and analog inputs and outputs are also offered with the current AS-Interface specification V3.0.

Safety signals are also transmitted simply and flexibly by the AS-Interface. The safety-related sensors for protective doors and EMERGENCY STOP buttons can be installed and retrofitted in any position.

The AS-i Safety functionality from Siemens has been continuously optimized and complies with the proven AS-Interface specification V3.0.

For industrial components which require greater transmission capacities, Siemens provide respective solutions with the suitable communication systems.

The AS-Interface system from Siemens continues to provide an ideal and consistent solution for a multitude of simple sensors and actuators, including safety technology and special applications.

Available masters with the latest AS-Interface specification V3.0

- CM AS-i Master ST, F-CM AS-i Safety ST (ET 200SP)
- CM 1243-2 (S7-1200)
- CP 343-2P / CP 343-2 (S7-300 / ET 200M)
- DP/AS-i Link Advanced, DP/AS-Interface Link 20E
- IE/AS-i Link PN IO

Overview

More information

For a complete overview of AS-i Power24V-capable devices currently available from Siemens, see https://support.industry.siemens.com/cs/ww/en/view/42806066

For details of AS-i Power24V, see "AS-Interface" System Manual, https://support.industry.siemens.com/cs/ww/en/view/26250840

AS-Interface data decoupling modules for AS-i Power24V
Left: S22.5 data decoupling module,
Right: DCM 1271 data decoupling module for SIMATIC S7-1200

Parallel wiring frequently dominates, above all, in applications with very few I/Os. AS-Interface can, however, also replace extensive parallel wiring in small applications at a favorable price.

AS-i Power24V enables an already existing standard 24 V DC power supply unit to be used for the AS-i network.

Data and power in the standard AS-Interface network

One of the great advantages of AS-Interface is the ability to convey not only data, but also the power needed for the connected slaves and sensors over the same unshielded two-conductor cable. This is owed to the service-proven AS-Interface power supply units which provide integrated data decoupling as well as overload and short-circuit protection and integrated ground-fault monitoring.

AS-i Power24V

Instead of the AS-Interface power supply unit (with 30 V output voltage and integrated data decoupling) the AS-i cable is supplied via a data decoupling module from a 24 V standard power supply unit. The communication technology of AS-Interface works at the same high level of quality with an operating voltage of both 30 V DC and 24 V DC.

	Key data of AS-i Power24V
Number of slaves	Up to 62 slaves and up to 31 safe slaves
Topology	Any
Range	Up to 50 m
Components	• 24 V power supply unit with low residual ripple and limitation to max. 40 V • AS-i Power24V-capable data decoupling with integrated ground-fault detection • AS-i Power24V-capable masters, slaves and components

Requirements for operation of an AS-i Power24V network

- When 24 V power supply units are used, the maximum network range of 50 m must be observed to reach slaves and sensors with a sufficient level of voltage (at least 18 V).
- The power supply units must comply with the PELV (Protective Extra Low Voltage) or SELV (Safety Extra Low Voltage) standard, have a residual ripple of < 250 mVpp, and must limit the output voltage to a maximum of 40 V in the event of a fault. We recommend SITOP power supplies, see SITOP Catalog or KT10.1, https://support.industry.siemens.com/cs/ww/en/view/109745655.
- When used in conjunction with standard 24 V power supply units, each AS-Interface network requires AS-i Power24V-capable data decoupling, see page 14/77 onwards.
- For reliable operation of an AS-i network with 24 V voltage, it is important that the masters, slaves and other components are approved for AS-i Power24V. AS-i Power24V-capable AS-i components can also be used without restriction in standard 30 V AS-i networks.
- Use of repeaters or extension plugs in AS-i Power24V networks is not permitted.

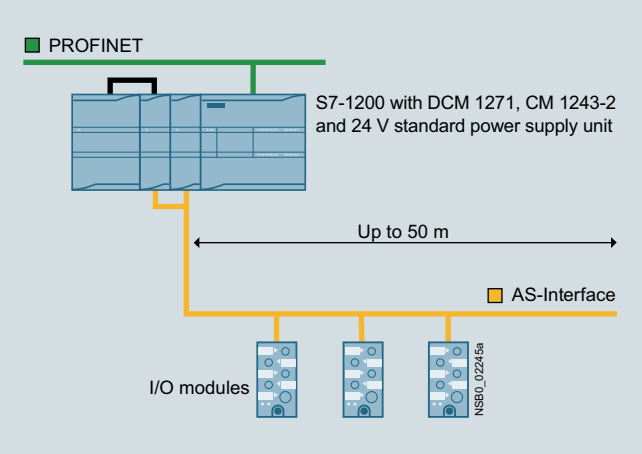
Benefits

In small control cabinets the AS-i power supply unit can be replaced by an AS-i data decoupling module that is connected to an existing 24 V power supply unit.

- The advantages of the AS-i communication system in terms of commissioning, maintenance and diagnostics can be fully exploited.
- If a double data decoupling module is used, two AS-i networks can be supplied.

Application

Configuration of an AS-i Power24V network



Configuration of an AS-i Power24V network with an AS-Interface DCM 1271 data decoupling module and S7-1200 (simple network)

AS-Interface: ASIsafe

Introduction

Overview

More information

For further information and typical circuit diagrams on safety engineering, see https://support.industry.siemens.com/cs/ww/en/view/83150405

ASIsafe – Safety is included

ASIsafe enables the integration of safety-related components such as EMERGENCY STOP pushbuttons, protective door switches, cable-operated switches or other AS-i safety sensors in an AS-Interface network. These are fully compatible with the familiar AS-Interface components (masters, slaves, power supplies, repeaters, etc.) in accordance with IEC/EN 62026-2 and are operated in conjunction with them on the yellow AS-Interface cable.

Tested safety

- Protective door switches
- Cable-operated switches
- Other AS-i safety sensors

The transmission method for safety-related signals is released for applications up to PL e according to EN ISO 13849-1 and up to SIL 3 (IEC 61508/EN 62061).

Higher-level control

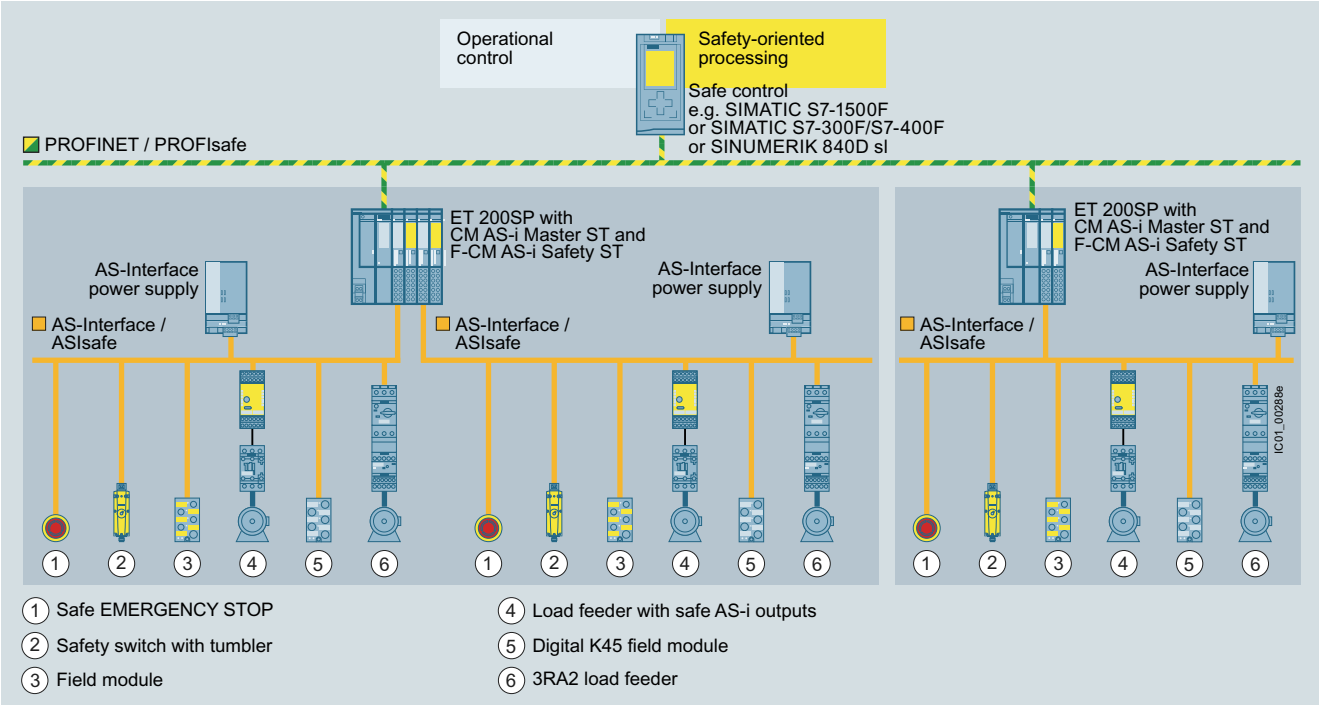
As usual, nodes on the AS-Interface bus are controlled in operation by the standard program of the higher-level SIMATIC (F) CPU or by a SINUMERIK control.

Configuring safety functions

In order to implement safe functions, the information from the safe and standard nodes must be combined logically and further parameters set. The configuration of the safety functions depends on which safety solution is being used:

- AS-i safety solution with F-CPU: In conjunction with the modular safety AS-i master, which is formed by combining the CM AS-i Master ST and F-CM AS-i Safety ST modules in an ET 200SP station, all safety functions and combinations are configured via STEP 7 and processed in the controller (F-CPU) by the fail-safe program.
- In the case of the AS-i safety solution with local evaluation by MSS: In conjunction with the Modular Safety System all safety functions and combinations are configured using the SIRIUS Safety ES software and processed in the MSS central unit.

AS-i safety solution with F-CPU



AS-Interface configuration with AS-i master modules in the ET 200SP

The AS-i communication modules in the ET 200SP facilitate the use of AS-Interface under fail-safe SIMATIC or SINUMERIK controllers.

The allocation of tasks is as follows:

- Acquisition of safety-related signals via safe input slaves on the AS-Interface bus.
  Further signals can be detected through other F-DI modules of the SIMATIC.
- Evaluation and processing of signals via the fail-safe SIMATIC or SINUMERIK control
- Reacting by means of safety output modules on the AS-Interface bus or other SIMATIC F-DQ modules

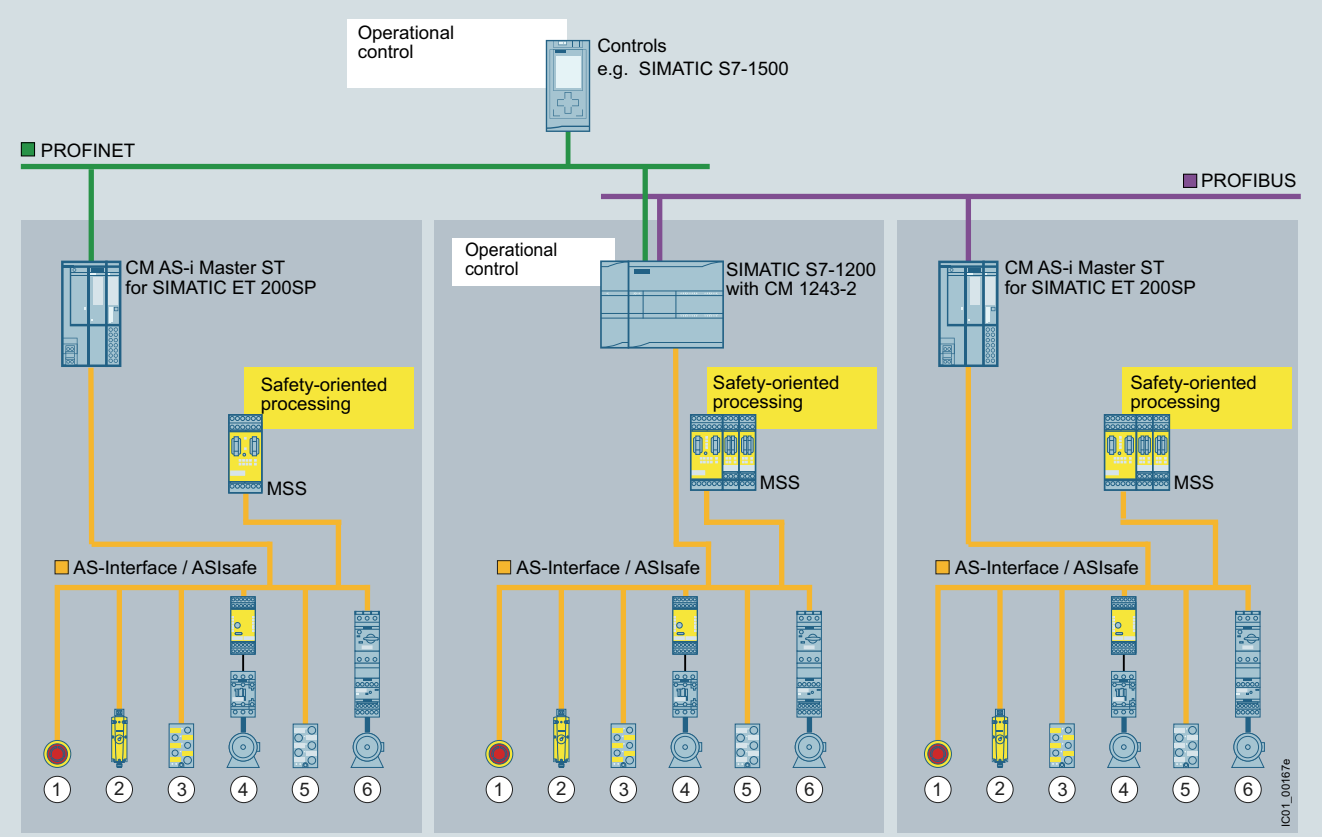
Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-oriented network transition between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion with further I/O modules of the ET 200SP.

Using these design methods, it is possible to create configurations for virtually any application. Besides the single AS-i master, double, triple or generally multiple masters can be realized with or without fail-safe functionality.

AS-Interface: ASIsafe

Introduction

AS-i safety solution with local evaluation by MSS



1 Safe EMERGENCY STOP
2 Safe position switch with tumbler
3 Field module
4 Load feeder with safe AS-i outputs
5 Digital K45 field module
6 3RA2 load feeder

AS-Interface design with 3RK3 Modular Safety System (MSS)

The local AS-i safety solution uses the 3RK3 Modular Safety System (MSS) for safety-related processing. In this case, one standard controller (i.e. no F-CPU) and one standard AS-i master are sufficient.

The allocation of tasks is as follows:

- Acquisition of safety-related signals via safe input slaves on the AS-Interface bus.
  Further signals can be acquired via F-DI inputs of the central unit or the expansion modules of the MSS.
- Evaluation and processing of signals via the central unit of the MSS
- Reaction via safe output modules on the AS-Interface bus or via F-DQ outputs of the central unit or expansion modules of the MSS

SIRIUS 3RK3 Modular Safety System, see Catalog Section 13

Benefits

- Simple system structure thanks to standardized AS-Interface technique
- Safety-related and standard data on the same bus
- Existing systems can be expanded quickly and easily
- Optimum integration in TIA (Safety Diagnostics) and Safety Integrated
- Inclusion of the safety signals in the plant diagnostics, also on existing HMI panels
- Approved to PL e according to EN ISO 13849-1 or SIL 3 according to IEC 61508
- ASIsafe is certified by TÜV (Germany), NRTL (USA) and INRS (France)

Application

Integrated safety technology in the AS-Interface system can be used wherever EMERGENCY STOP buttons, safety gate interlocks, safety switches, light grids and two-hand operation are installed.

Selection and ordering data

3RK1105-1BE04-0CA0

Version	SD	Article No.	PU (UNIT, SET, M)	PS*
	d			
Basic safety monitors Version 3 With screw terminals, removable terminals, width 45 mm		**Screw terminals**		
• 1 enabling circuit (monitor type 1)	2	**3RK1105-1AE04-0CA0**	1	1 unit
• 2 enabling circuits (monitor type 2)	2	**3RK1105-1BE04-0CA0**	1	1 unit
Expanded safety monitors Version 3 With screw terminals, removable terminals, width 45 mm				
• 1 enabling circuit (monitor type 3)	2	**3RK1105-1AE04-2CA0**	1	1 unit
• 2 enabling circuits (monitor type 4)	2	**3RK1105-1BE04-2CA0**	1	1 unit
Expanded safety monitor with integrated safe slave Version 3 With screw terminals, removable terminals, width 45 mm				
• 2 enabling circuits including control of a safe AS-i output/safe coupling (monitor type 6)	2	**3RK1105-1BE04-4CA0**	1	1 unit
Basic safety monitors Version 3 With spring-loaded terminals, removable terminals, width 45 mm		**Spring-loaded terminals**		
• 1 enabling circuit (monitor type 1)	2	**3RK1105-1AG04-0CA0**	1	1 unit
• 2 enabling circuits (monitor type 2)	2	**3RK1105-1BG04-0CA0**	1	1 unit
Expanded safety monitors Version 3 With spring-loaded terminals, removable terminals, width 45 mm				
• 1 enabling circuit (monitor type 3)	2	**3RK1105-1AG04-2CA0**	1	1 unit
• 2 enabling circuits (monitor type 4)	2	**3RK1105-1BG04-2CA0**	1	1 unit
Expanded safety monitor with integrated safe slave Version 3 With spring-loaded terminals, removable terminals, width 45 mm				
• 2 enabling circuits including control of a safe AS-i output/safe coupling (monitor type 6)	2	**3RK1105-1BG04-4CA0**	1	1 unit

Accessories

3RK1901-5AA00

Version	SD	Article No.	PU (UNIT, SET, M)	PS*
	d			
ASIsafe CD Included in the scope of supply: • ASIMON V3 configuration software on CD ROM, for PC with Windows operating system	2	**3RK1802-2FB06-0GA1**	1	1 unit
Cable sets Included in the scope of supply: • PC configuration cable for communication between PC (serial interface) and safety monitor, length approx. 1.50 m • Transfer cable between two safety monitors, length approx. 0.25 m	▶	**3RK1901-5AA00**	1	1 unit
Sealable covers For securing against unauthorized configuration of the safety monitor	5	**3RP1902**	1	5 units
Push-in lugs For screw fixing	5	**3RP1903**	1	10 units

Overview

AS-Interface safety modules: K45F (left), K20F (center) and SC17.5F (right)

S45F SlimLine module, safe AS-i output

Safety modules for AS-Interface (ASIsafe modules) are available for field use in degree of protection IP67 (K20F and K45F compact modules) and for the control cabinet (SC17.5F SlimLine Compact modules) in degree of protection IP20.

A very compact module with an optimum price/performance ratio is thus available for every application.

All modules for the connection of (mechanical) switches and safety sensors with contacts feature crossover monitoring of the connected sensor line.

AS-Interface safety modules

The following modules are available for selection:

K20F compact safety modules for operation in the field

Being only 20 mm wide, the K20F module is particularly well suited for applications where modules need to be arranged in the most confined of spaces. The K20F modules are connected to the AS-Interface with a round cable with M12 cable box instead of with the AS-Interface flat cable. This enables extremely compact installation. The flexibility of the round cable means that it can also be used on moving machine parts without any problems. The K20 modules are also ideal for such applications as their non-encapsulated design makes them particularly light in weight.

K45F compact safety modules for use in the field

The platform of the K45F modules covers the connection of ("mechanical") switches/safety sensors with contacts:

- K45F 2 F-DI: Two safety-related inputs in operation up to Category 2 according to EN ISO 13849-1. If Category 4 is required, a two-channel input is available on the module.
- K45F 2 F-DI / 2 DQ: There are also two standard outputs in addition to the safe inputs. Supplied from the yellow AS-i cable
- K45F 2 F-DI / 2 DQ U_{aux}: same as K45F 2 F-DI/2 DQ, but supplied from the black 24 V DC cable
- K45F 4 F-DI: Four safety-related inputs in operation up to Category 2, two for Category 4. Extremely compact double slave (uses two standard AS-i addresses)

SC17.5F SlimLine Compact safety modules with a width of just 17.5 mm for use in control cabinets and local control boxes

With a width of only 17.5 mm, the safe SC17.5F SlimLine Compact modules are ideal for space-saving use in a control cabinet. The modules have more than two safety inputs for connecting signals to ASIsafe networks in the control cabinet. For operation up to Category 2, both inputs can be separately assigned; if Category 4 is required, a two-channel input is available on the module.

There are also two module variants which have two standard outputs in addition to the two safety inputs. The outputs are supplied either from the yellow AS-Interface cable alone, or via auxiliary voltage from the black 24 V DC cable. The supply voltage is set via a slide switch on the rear of the device.

When using several modules, they can be connected simply via the optional device connector. This simplifies the wiring.
The yellow AS-i bus cable and the 24 V DC auxiliary voltage U_{aux} then only need to be connected to one module.

S45F SlimLine safety modules with safety outputs for the safe distributed disconnection of actuators

With the S45F SlimLine safety module, a safe output signal of the ET 200SP module F-CM AS-i Safety ST can be used for distributed safety-related disconnection via ASIsafe.

To this end, the S45F module has a safety-related two-channel relay output. As an additional possibility the module offers normal switching of the output using an AS-i standard output bit.

The module has three digital inputs and two digital outputs for the additional connection of sensors and actuators. These can be used, among other things, for the required monitoring of downstream contactors of the feedback circuit.

The S45F module can also be controlled in a safety-related manner, for example by the modular 3RK3 ASIsafe/Advanced safety system. The module contains an AS-i slave for the non-safety-related inputs/outputs.

Selection and ordering data

	Version		SD	Article No.	PU (UNIT, SET, M)	PS*
			d			
3RK1205-0BQ30-0AA3	**K20F compact safety modules** Slave addressing type: Standard address					
	I/O type	U_{aux} 24 V				
	2 F-DI	--	2	**3RK1205-0BQ30-0AA3**	1	1 unit
3RK1205-0BQ00-0AA3	**K45F compact safety modules** Slave addressing type: Standard address (modules supplied without mounting plate)					
	I/O type	U_{aux} 24 V				
	2 F-DI	--	▶	**3RK1205-0BQ00-0AA3**	1	1 unit
	4 F-DI[1)]	--	2	**3RK1205-0CQ00-0AA3**	1	1 unit
	2 F-DI / 2 DQ	--	5	**3RK1405-0BQ20-0AA3**	1	1 unit
	2 F-DI / 2 DQ	--	5	**3RK1405-1BQ20-0AA3**	1	1 unit
3RK1405-0BE00-2AA2	**SC17.5F SlimLine Compact safety modules** Slave addressing type: Standard address					
	I/O type	Outputs				
				Screw terminals		
	2 F-DI	--	2	**3RK1205-0BE00-2AA2**	1	1 unit
				Spring-loaded terminals (push-in)		
	2 F-DI	--	2	**3RK1205-0BG00-2AA2**	1	1 unit
				Screw terminals		
	2 F-DI / 2 DQ	U_{ASI}/U_{aux} supply selectable	2	**3RK1405-2BE00-2AA2**	1	1 unit
				Spring-loaded terminals (push-in)		
	2 F-DI / 2 DQ	U_{ASI}/U_{aux} supply selectable	2	**3RK1405-2BG00-2AA2**	1	1 unit
3RK1405-1SE15-0AA2	**S45F SlimLine safety module** (with safe AS-i output)					
	I/O type	U_{aux} 24 V				
				Screw terminals		
	1 F-RQ / 3 DI / 2 DQ	✓	2	**3RK1405-1SE15-0AA2**	1	1 unit
				Spring-loaded terminals (push-in)		
	1 F-RQ / 3 DI / 2 DQ	✓	2	**3RK1405-1SG15-0AA2**	1	1 unit

✓ Available or possible

-- Not available or not possible

1) Module occupies two AS-Interface addresses

Standard I/O modules for AS-Interface

- For degree of protection IP67, see page 14/50 onwards
- For degree of protection IP20, see page 14/65 onwards

The existing SlimLine series of I/O modules for use in the control cabinet and local control boxes is being replaced by the new SlimLine Compact series. We recommend that these new devices are used in future.

For the conversion table, see page 14/67.

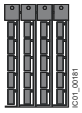
Note:

The previous SlimLine devices are still available for use as replacements in existing systems. As a result of the innovation, the new SlimLine Compact devices are not fully compatible in terms of either mechanical dimensions or electrical properties.

Accessories

More information

For the Equipment Manual "SlimLine Compact Modules", see https://support.industry.siemens.com/cs/ww/en/view/109481489

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
Accessories for compact safety modules					
3RK1901-2EA00	**K45 mounting plates** For mounting K45F				
	• For wall mounting	▶	**3RK1901-2EA00**	1	1 unit
	• For standard rail mounting	▶	**3RK1901-2DA00**	1	1 unit
3RK1901-1AA00	**Input bridges for K45F**				
	• Black version	2	**3RK1901-1AA00**	1	1 unit
	• Red version	30	**3RK1901-1AA01**	1	1 unit
3RK1901-1KA00 3RK1901-1KA01	**AS-Interface sealing caps M12** For free M12 sockets	▶	**3RK1901-1KA00**	100	10 units
	• Tamper proof	2	**3RK1901-1KA01**	100	10 units
Accessories for SlimLine Compact safety modules					
3RK1901-1YA00 3RK1901-1YA01	**Device connectors** For the electrical connection of SlimLine Compact modules (connects AS-i bus cable and 24 V DC auxiliary power supply U_{aux} when using several SlimLine Compact modules)				
	• Width 17.5 mm	2	**3RK1901-1YA00**	1	1 unit
	• Width 22.5 mm	2	**3RK1901-1YA10**	1	1 unit
	Device termination connectors Required for the last module in the network				
	• Width 17.5 mm	2	**3RK1901-1YA01**	1	1 unit
	• Width 22.5 mm	2	**3RK1901-1YA11**	1	1 unit
3ZY1121-2BA00	**Removable terminals**		**Screw terminals**		
	• Screw terminals up to 2 x 1.5 mm² or 1 x 2.5 mm²				
	- 2-pole	2	**3ZY1121-1BA00**	1	6 units
	- 4-pole	2	**3ZY1141-1BA00**	1	6 units
			Spring-loaded terminals (push-in)		
	• Push-in terminals up to 2 x 1.5 mm²				
	- 2-pole	2	**3ZY1121-2BA00**	1	6 units
	- 4-pole	2	**3ZY1141-2BA00**	1	6 units
	Hinged cover Replacement for SlimLine Compact module, without terminal labeling, width 17.5 mm, yellow	2	**3ZY1450-1BA00**	1	5 units
	Push-in lugs for wall mounting Two lugs are required per device	2	**3ZY1311-0AA00**	1	10 units
3ZY1450-1BA00	**Coding pins for removable terminals** For mechanical coding of the terminals	2	**3ZY1440-1AA00**	1	12 units
 3RT2900-1SB20	**Blank labels** Unit labeling plates				
	• 10 mm x 7 mm, titanium gray	20	**3RT2900-1SB10**	100	816 units
	• 20 mm x 7 mm, titanium gray	20	**3RT2900-1SB20**	100	340 units
3RA2908-1A	**Tools for opening spring-loaded terminals**		**Spring-loaded terminals (push-in)**		
	Screwdriver for SIRIUS devices with spring-loaded terminals 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**	1	1 unit

Overview

CM 1243-2 communication module for S7-1200

More information

Manuals, see https://support.industry.siemens.com/cs/ww/en/ps/15750/man

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/61892138

The CM 1243-2 communication module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission
- Supports all AS-Interface master functions in accordance with the AS-Interface specification V3.0
- Indication of the operating state on the front of the device displayed via LED
- Display of operating mode, AS-Interface voltage faults, configuration faults and peripheral faults via LED behind the front panel
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage: A standard 24 V power supply unit can be used in combination with the optional DCM 1271 data decoupling module.
- Configuration and diagnostics via the TIA portal

Design

The CM 1243-2 communication module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It has:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals each respectively
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in scope of supply) can be removed to facilitate installation.

Function

The CM 1243-2 supports all specified functions of the AS-Interface specification V3.0.

The values of the digital AS-i slaves can be activated via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be accessed directly in the process image.

It is also possible to exchange all data of the AS-i master and the connected AS-i slaves with the S7-1200 via the data record interface.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

The optional DCM 1271 data decoupling module (see "Accessories", page 14/29) has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A. For more information on DCM 1271, see page 14/79.

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 about the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Configuration

To configure CM 1243-2, you require STEP 7 V11 + SP2 or higher.

For STEP 7 V11 + SP2 or higher, the additional Hardware Support Package for CM 1243-2 is required. This is available via the Industry Online Support Portal, see https://support.industry.siemens.com/cs/ww/en/view/72341852.

The software enables user-friendly configuration and diagnostics of the AS-Interface master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration at the "touch of a button" via the control panel integrated in the TIA Portal/STEP 7.

When operated on an S7-1200 CPU with firmware version V4.0 or higher, the firmware version V1.1 (or higher) is required for the CM 1243-2.

Benefits

- More flexibility and versatility in the use of SIMATIC S7-1200 as the result of a significant increase in the number of digital and analog inputs/outputs available
- Very easy configuration and diagnostics of the AS-Interface via the TIA Portal (STEP 7 V11+SP2 or higher)
- Simple operation with AS-Interface power supply (see page 14/73) possible without restrictions.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is supplied through an existing 24 V DC PELV power supply unit. For decoupling, the AS-i DCM 1271 data decoupling module is required, see "Accessories" and page 14/79.
- LEDs for indication of fault statuses for fast diagnostics
- Monitoring of AS-Interface voltage facilitates diagnostics

Application

The CM 1243-2 is the AS-Interface master connection for the 12xx CPUs of the SIMATIC S7-1200. Through connection to AS-Interface, the number of digital inputs and outputs available for the S7-1200 is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM).

The integrated analog value processing also makes the analog values available at the AS-Interface for the S7-1200.
Up to 31 analog slaves with a standard address (each with up to four channels) or up to 62 analog slaves with an A/B address (each with up to two channels) are possible per CM.

Operating conditions

- The CM 1243-2 communication module exchanges data with the S7-1200 CPU with a cycle time of 10 ms.
- The AS-i cycle time depends on the AS-i bus capacity and is up to 5 ms in the case of 31 slaves addresses; for more information, see Equipment Manual "AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module", https://support.industry.siemens.com/cs/ww/en/view/57358958.
- For calculation of the maximum switching frequency at inputs/outputs of AS-i slaves, these cycle times and the runtime of the user program must be added up.

Selection and ordering data

	Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		d	Article No.		
3RK7243-2AA30-0XB0	**CM 1243-2 communication module** • AS-Interface masters for SIMATIC S7-1200 • Corresponds to AS-Interface specification V3.0 • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W × H × D/mm): 30 × 100 × 75	2	**3RK7243-2AA30-0XB0**	1	1 unit

Note:

The CM 1243-2 communication module is available as a SIPLUS version under Article No. 6AG1243-2AA30-7XB0 in the extended temperature range (from -25 to 70 °C) and for use in harsh environmental conditions (coated according to environment standard IEC 60721).

For more information, see www.siemens.com/siplus-extreme.

Accessories

	Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		d	Article No.		
3RK7271-1AA30-0AA0	**DCM 1271 data decoupling module** • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W × H × D/mm): 30 × 100 × 75	2	**3RK7271-1AA30-0AA0**	1	1 unit
	Screw terminals (replacement)				
	• 5-pole For AS-i master CM 1243-2 and AS-i DCM 1271 data decoupling module	5	**3RK1901-3MA00**	1	1 unit
	• 3-pole For AS-i DCM 1271 data decoupling module for connecting the power supply unit	5	**3RK1901-3MB00**	1	1 unit

Overview

CP 343-2P/CP 343-2

More information

Manuals, see https://support.industry.siemens.com/cs/ww/en/ps/15754/man

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/61892138

AS-Interface block library for SIMATIC PCS 7 for easy connection of AS-Interface to PCS 7, see Catalog KT10.1 - SITOP Power Supply

The CP 343-2P communications processor is the AS-Interface master for the SIMATIC S7-300 and the ET 200M distributed I/O station, with user-friendly parameterizing options.

The CP 343-2 is the basic version of the module.

The CP 343-2P/CP 343-2 has the following characteristics:

- Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission
- Support of all AS-Interface master functions in accordance with the AS-Interface specification V3.0
- Status displays of operating states and indication of the readiness for operation of connected slaves by means of LEDs in the front panel
- Fault indications (including AS-Interface voltage errors, configuration errors) by means of LEDs on the front plate.
- Compact enclosure in the design of the SIMATIC S7-300
- Suitable for AS-i Power24V (from product version 2 / firmware version 3.1) and for AS-Interface with 30 V voltage
- Additionally for CP 343-2P: Supports the configuration of the AS-Interface network with STEP 7 V5.2 and higher

Design

The CP 343-2P/CP 343-2 is connected like an I/O module to the S7-300. It has:

- Two terminal connections for connecting the AS-Interface cable directly.
- LEDs in the front panel for indicating the operating state and the readiness for operation of all connected and activated slaves
- Pushbuttons for switching over the master operating state and for adopting the existing ACTUAL configuration of the AS-i slave as the TARGET configuration

Function

The CP 343-2P/CP 343-2 support all specified functions of the AS-Interface specification V3.0.

The CP 343-2P/CP 343-2 each occupy 16 bytes in the I/O address area of the SIMATIC S7-300. The digital I/O data of the standard slaves and A slaves is saved in this area. The digital I/O data of the B slaves and the analog I/O data can be accessed with the S7 system functions for read/write data records.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

For more information, see https://support.industry.siemens.com/cs/ww/en/view/51678777.

Notes on security:

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For more information about the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Configuration

All connected AS-Interface slaves are configured at the press of a button. No further configuration of the CP is required.

Additionally for CP 343-2P

The CP 343-2P also supports configuring of the AS-Interface network with STEP 7 V5.2 and higher. Specifying the AS-i configuration in HW-Config facilitates the setting of slave parameters and documentation of the plant. Uploading the ACTUAL configuration of an already configured AS-Interface network is also supported. The saved configuration cannot be overwritten at the press of a button and is therefore tamper-proof.

Benefits

- Shorter startup times through simple configuration at the press of a button
- Design of flexible machine-related structures using the ET 200M distributed I/O system
- Provides diagnostics of the AS-Interface network
- Well suited also for complex applications thanks to connection options for 62 slaves and integral analog value processing
- Reduction of standstill and servicing times in the event of a fault thanks to the LED indicators:
  - Status of the AS-Interface network
  - Slaves connected and their readiness for operation
  - Monitoring of the AS-Interface voltage
- Lower costs for stock keeping and spare parts inventory because the CP can be used for the SIMATIC S7-300 and also for the ET 200M
- Additionally for CP 343-2P: Improved plant documentation and support for service assignments thanks to a description of the AS-Interface configuration in the STEP 7 project
- Simple operation with AS-Interface power supply (see page 14/73) possible without restrictions.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is supplied through an existing 24 V DC PELV power supply unit. An S22.5 AS-i data decoupling module (e.g. 3RK1901-1DE12-1AA0) is required for the decoupling, see page 14/77.

Application

The CP 343-2P/CP 343-2 is the AS-Interface master connection for the SIMATIC S7-300 and the ET 200M.

Through connection to AS-Interface it is possible to access max. 248 DI/248 DQ per CP, using 62 A/B slaves with 4 DI/4 DQ each.

With the integrated analog value processing, it is easy to transmit analog signals. Up to 62 analog slaves with an A/B address (each with up to two channels) or up to 31 analog slaves with a standard address (each with up to four channels) are possible per CP.

The CP 343-2P is the further development of the CP 343-2 and contains its entire functionality. An existing STEP 7 user program for a CP 343-2 can thus be used without restrictions with a CP 343-2P. It is only in STEP 7 HW-Config that the two modules are configured differently, with the CP 343-2P offering additional options. This is why the CP 343-2P is recommended.

Selection and ordering data

	Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
6GK7343-2AH11-0XA0	**CP 343-2P communications processors** • Device version with expanded configuration options for connection of SIMATIC S7-300 and ET 200M to AS-Interface • Configuration of the AS-i network using the SET key or STEP 7 (V5.2 and higher) • Without front connector • Corresponds to AS-Interface specification V3.0 • Dimensions (W x H x D/mm): 40 x 125 x 120	►	**6GK7343-2AH11-0XA0**	1	1 unit
6GK7343-2AH01-0XA0	**CP 343-2 communications processors** • Basic version for connection of SIMATIC S7-300 and ET 200M to AS-Interface • Configuration of the AS-i network using the SET key • Without front connector • Corresponds to AS-Interface specification V3.0 • Dimensions (W x H x D/mm): 40 x 125 x 120	►	**6GK7343-2AH01-0XA0**	1	1 unit

Accessories

Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
Front connector, 20-pole				
• With screw terminals	1	**6ES7392-1AJ00-0AA0**	1	1 unit
• With spring-loaded terminals	1	**6ES7392-1BJ00-0AA0**	1	1 unit

Overview

CM AS-i Master ST for SIMATIC ET 200SP

More information

SIMATIC ET 200SP Manual Collection, see https://support.industry.siemens.com/cs/ww/en/view/84133942

Diagnostics blocks with visualization, see https://support.industry.siemens.com/cs/ww/en/view/109479103

AS-Interface block library for SIMATIC PCS 7 for easy connection of AS-Interface to PCS 7, see Catalog KT10.1 - SITOP Power Supply

Released combinations of the AS-i modules for ET 200SP, see https://support.industry.siemens.com/cs/ww/en/view/103624653

The CM AS-i Master ST communication module is designed for use in the SIMATIC ET 200SP distributed I/O system and has the following features:

- Connection of up to 62 AS-Interface slaves
- Supports all AS-Interface master functions according to the AS-Interface specification V3.0
- User-friendly configuration with graphic display of the AS-i line in TIA Portal V12 or higher, or via GSD in other systems
- Supply via AS-Interface cable
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage
- Integrated ground-fault monitoring for the AS-Interface cable
- Through connection to AS-Interface, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM AS-i Master ST).
- Integrated analog value processing

ET 200SP distributed I/O system

The SIMATIC ET 200SP is a scalable and highly flexible distributed I/O system for connecting the process signals to a central control system via PROFIBUS or PROFINET.

Up to eight CM AS-i Master STs can be plugged into a SIMATIC ET 200SP with the IM 155-6 PN standard interface module.

More information, see the SIMATIC ET 200SP Manual Collection.

Design

The CM AS-i Master ST module has an ET 200SP module enclosure with a width of 20 mm. A C0 type BaseUnit (BU) is required for use in the ET 200SP.

The communication module has LED indicators for diagnostics, operation, AS-i voltage and AS-i slave status and offers informative front-side module inscription for

- Plain-text marking of the module type and function class
- 2D matrix code (Article No. and serial number)
- Circuit diagram
- Color coding of the CM module type: Light gray
- Hardware and firmware version
- Complete article number

Function

The CM AS-i Master ST communication module supports all specified functions of the AS-Interface specification V3.0.

The input/output values of the digital AS-i slaves can be activated via the cyclic process image. The values of the analog AS-i slaves are accessible via the cyclic process image (firmware V1.1 or higher) or via data record transfer.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM AS-i Master ST in STEP 7.

Expansions as from firmware version V1.1

For the implementation of modular machine concepts, the AS-i slaves can be activated or deactivated via the PLC program (option handling). The configuration of AS-i slaves can be modified while being executed, thus enabling variable machine set-ups and tool changing with integrated input/output modules during ongoing operation. AS-i input/output modules can be added to the system without deactivating the controller.

An existing AS-i installation can be read into the STEP 7 hardware configuration and adapted and documented in the project. Analog values are transmitted via the cyclic process image, the length of which is adjustable and extendable up to 288 bytes (depending on the interface module (IM) used).

Diagnostic information is accessed via automatic alarm indications, via the process image or data record reading in the user program or in the STEP 7 engineering system in a graphical overview matrix. The transmission quality of the AS-i network can also be read out. To avoid configuration errors, duplicate addresses can be detected on the AS-i network.

The new functions are available with TIA Portal STEP 7 V13 SP1 or with STEP 7 V5.5 with HSP 2092 V3.0[1]. Configuration is possible with SIMATIC CPUs S7-300 up to S7-1500 and with a SINUMERIK 840D sl or other controller.

In the network view, the AS-i slaves' online diagnostics status can be displayed directly on the slaves (for S7-1500 CPUs with firmware version V2.0 or higher, with TIA Portal STEP 7 V14 or higher).

1) For HSP 2092, see https://support.industry.siemens.com/cs/ww/en/view/23183356.

Notes on security:

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For more information about the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Configuration

The following software is required for configuration of the CM AS-i Master ST module:

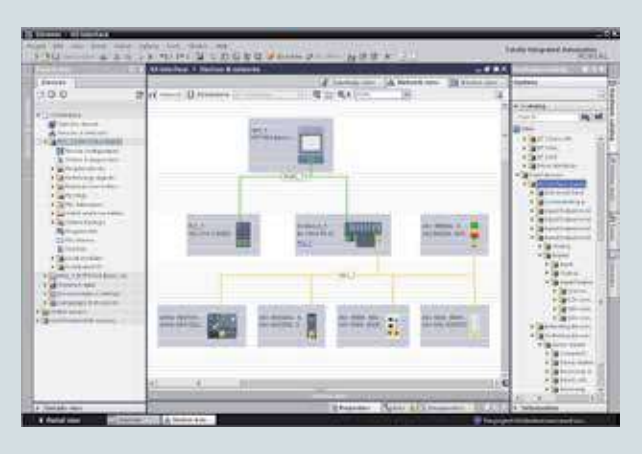
- STEP 7 (TIA Portal) V12 or higher or V13 SP1 or higher (for firmware V1.1) or
- STEP 7 (classic) V5.5 SP3 HF4 or higher with HSP 2092 or HSP 2092 V3.0 (for firmware V1.1) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

STEP 7 enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration as the TARGET configuration at the "touch of a button" via the control panel integrated in the TIA Portal or an optional expansion button. Configuration with the GSD file is possible only with the button.

The CM AS-i Master ST module occupies up to 288 input bytes and up to 288 output bytes in the I/O data of the ET 200SP station. The I/O assignment depends on the configuration in STEP 7.

Together with an ET 200SP CPU 1510SP/1512SP (firmware V1.8 or higher) or 1515SP PC, preprocessing of safe AS-i signals directly in the ET 200SP station and setting up of an independent AS-i Safety station without a higher-level CPU are possible (TIA Portal V13 SP1 Update 4 and higher).



Configuration of an AS-Interface network with CM AS-i Master ST via the TIA Portal

Benefits

The CM AS-i Master ST for ET 200SP communication module enables modular, simple and high-performance expansion of AS-interface networks via engineering in the TIA Portal.

Up to eight CM AS-i Master ST units can be plugged into one ET 200SP station with IM 155-6 PN Standard. The maximum configuration depends on the interface module used.

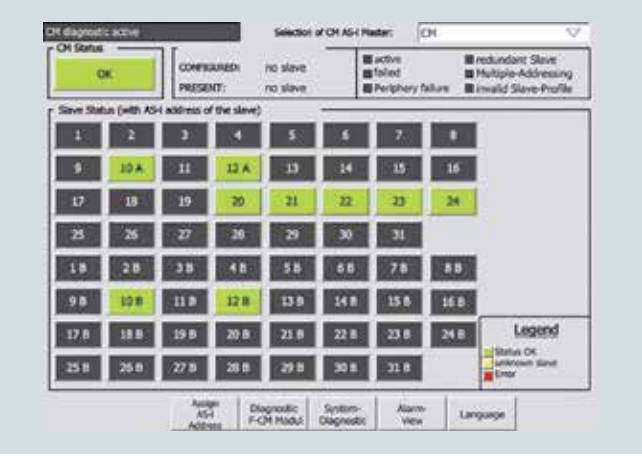
Multiple masters as well as single masters can thus be implemented in the ET 200SP depending on the number of modules.

Together with the interface module, a scalable PROFINET/AS-i Link or PROFIBUS/AS-i Link can be assembled.

Using STEP 7, the AS-i network is consistently configured and programmed with only one configuration tool.

The PRONETA PC program (for ET 200SP with PROFINET interface module) is available for convenient input/output testing during the commissioning of an AS-i network without a CPU; see www.siemens.com/proneta.

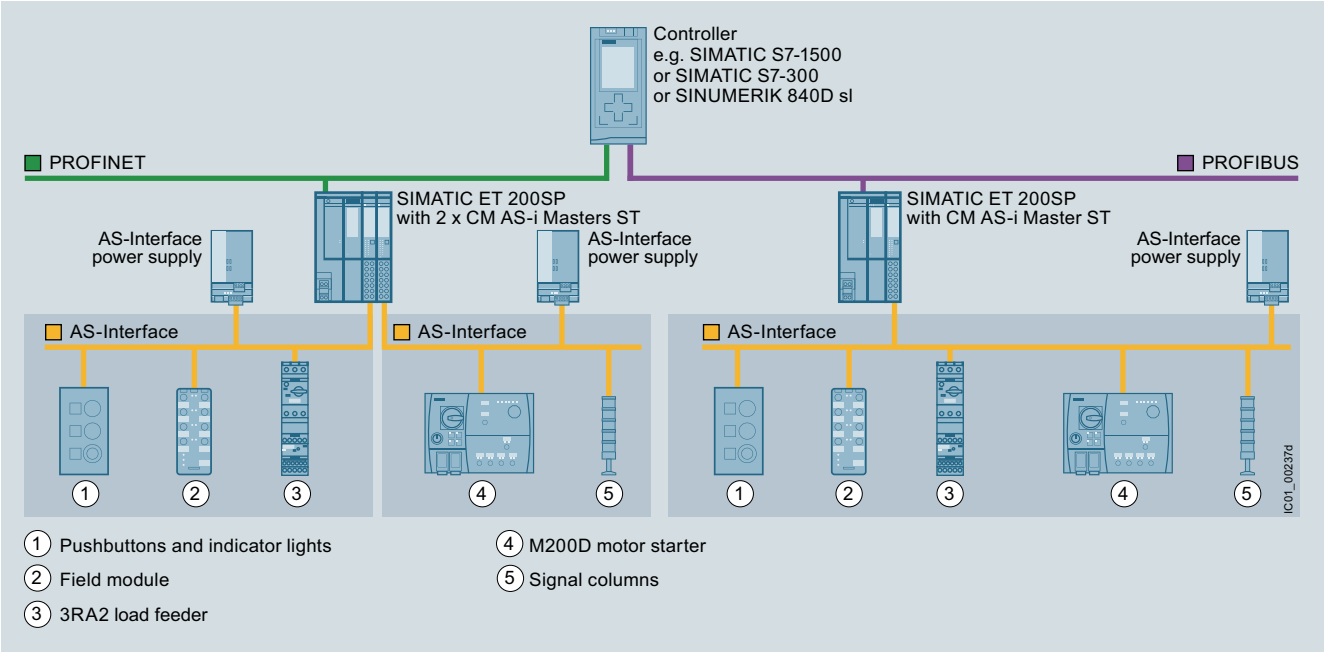
For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/109479103.



CM AS-i Master ST diagnostics block

Application

Configuration examples of AS-Interface networks with CM AS-i Master ST for SIMATIC ET 200SP



Configuration of AS-Interface networks under a SIMATIC ET 200SP

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK7137-6SA00-0BC1	**CM AS-i Master ST communication module** • AS-Interface master for SIMATIC ET 200SP, can be plugged onto BaseUnit type C0 • Corresponds to AS-Interface specification V3.0 • Dimensions (W × H × D/mm): 20 x 73 x 58	2	**3RK7137-6SA00-0BC1**	1	1 unit

Accessories

	Version	SD d	Spring-loaded terminals Article No.	PU (UNIT, SET, M)	PS*
6ES7193-6BP20-0DC0	**BaseUnit BU20-P6+A2+4D** • BaseUnit (light), BU type C0 • Suitable for the CM AS-i Master ST module • For connection of the AS-Interface cable to the CM AS-i Master ST • Start of an AS-i network, isolation of the AS-i voltage from the left-hand module	15	**6ES7193-6BP20-0DC0**	1	1 unit

	Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
6ES7155-6AR00-0AN0 6ES7155-6AA01-0BN0	**PROFINET interface module IM 155-6 PN Basic** Max. 12 I/O modules, max. 32 bytes of I/O data per station				
	• Including server module and 2 x RJ45 ports (supplied without RJ45 plug)	1	**6ES7155-6AR00-0AN0**	1	1 unit
	PROFINET interface modules IM 155-6 PN Standard Max. 32 I/O modules, max. 256 bytes I/O data per station				
	• Including server module and bus adapter 2 x RJ45 (supplied without RJ45 plug)	1	**6ES7155-6AA01-0BN0**	1	1 unit
	• Including server module (bus adapter must be ordered separately, see below)	1	**6ES7155-6AU01-0BN0**	1	1 unit
6ES7155-6AU01-0CN0	**PROFINET interface modules IM 155-6 PN High Feature** Max. 64 I/O modules, max. 1 440 bytes I/O data per station				
	• **IM 155-6 PN/2 High Feature** IM with a bus adapter slot including server module and optional strain relief (bus adapter must be ordered separately, see below)	15	**6ES7155-6AU01-0CN0**	1	1 unit
	• **IM 155-6 PN/3 High Feature** 3-port IM with two bus adapter slots including server module and optional strain relief (bus adapter must be ordered separately, see below)	5	**6ES7155-6AU30-0CN0**	1	1 unit
6ES7155-6AU00-0DN0	**PROFINET interface module IM 155-6 PN High Speed** Max. 30 I/O modules, max. 1 440 bytes I/O data per station				
	• Including server module (bus adapter must be ordered separately, see below)	1	**6ES7155-6AU00-0DN0**	1	1 unit
	PROFIBUS interface module IM 155-6 DP High Feature Max. 32 I/O modules, max. 244 bytes I/O data per station				
	• Including server module and PROFIBUS plug	15	**6ES7155-6BA01-0CN0**	1	1 unit
6ES7193-6AR00-0AA0 6ES7193-6AF00-0AA0	**Bus adapters for PROFINET** For connection of the Ethernet cable to the PROFINET IM 155-6 PN interface module				
	• Connection 2 x RJ45 (supplied without RJ45 plug)	1	**6ES7193-6AR00-0AA0**	1	1 unit
	• Connection 2 x FC (FastConnect)	1	**6ES7193-6AF00-0AA0**	1	1 unit
	For more bus adapters with fiber optic cable connection, see Catalog IK PI or the Industry Mall.				

Overview

F-CM AS-i Safety ST for SIMATIC ET 200SP

More information

SIMATIC ET 200SP Manual Collection, see https://support.industry.siemens.com/cs/ww/en/view/84133942

Diagnostics blocks with visualization, see https://support.industry.siemens.com/cs/ww/en/view/109479103

Released combinations of the AS-i modules for ET 200SP, see https://support.industry.siemens.com/cs/ww/en/view/103624653

The F-CM AS-i Safety ST fail-safe communication module supplements an AS-Interface network without additional wiring to produce a safety-related AS-i network.

Important features:

- Fail-safe communication module for the ET 200SP
  - 31 fail-safe input channels in the process image
  - 16 fail-safe output channels in the process image
  - Certified up to SIL 3 (IEC 61508/EN 62061), PL e (EN ISO 13849-1)
  - Parameterization conforms with other fail-safe I/O modules of the ET 200SP
- The communication module supports PROFIsafe in PROFINET and PROFIBUS configurations. Can be used with fail-safe SIMATIC S7-300F/S7-400F CPUs and S7-1500F CPUs and also the fail-safe versions of the ET 200SP station with ET 200SP F-CPU 1510SP F/1512SP F (firmware V1.8 or higher) or 1515SP PC F.
- For reading up to 31 fail-safe AS-i input slaves
  - Two sensor inputs/signals for each fail-safe AS-i input slave
  - Adjustable evaluation of sensor signals: two-channel or 2 x single-channel
  - Integrated discrepancy evaluation in the case of two-channel signals
  - Integrated AND operation in the case of 2 x single-channel signals
  - Input delay can be parameterized
  - Start-up test can be set
  - Sequence monitoring can be activated
- For control of up to 16 fail-safe AS-i output circuit groups
  - The output circuit groups are controlled independently of one another.
  - One output circuit group can act on one or more actuators (e.g. to switch drives simultaneously).
  - An actuator (e.g. a contactor) is interfaced via a fail-safe AS-i output module (e.g. safe SlimLine module S45F, Article No. 3RK1405-1SE15-0AA2, see page 14/36).
  - Simple fault acknowledgment via the process image
- Simple module replacement thanks to automatic importing of the safety parameters from the coding element
- Comprehensive diagnostic options
- Can be plugged onto type C1 or type C0 BaseUnits (BU)
- Informative automatic alarm indications (firmware V1.0.1 or higher)
- Supply via AS-Interface voltage
- Eight LED indicators for diagnostics, operating state, fault indication and supply voltage
- Informative front-side module inscription
  - Plain-text marking of the module type and function class
  - 2D matrix code (Article No. and serial number)
  - Circuit diagram
  - Color coding of the CM module type: Light gray
  - Hardware and firmware version
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label

Design

The fail-safe F-CM AS-i Safety ST module has an ET 200SP module enclosure with a width of 20 mm.

One AS-i master according to the AS-i specification V3.0 and safe AS-i input slaves and/or safe AS-i output modules are needed for operation. The CM AS-i Master ST communication module (Article No. 3RK7137-6SA00-0BC1) is recommended as the AS-i master for the ET 200SP, see from page 14/32 onwards.

Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-oriented network transition between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion.

Combination of an ET 200SP interface module, CM AS-i Master ST and F-CM AS-i Safety ST

With the digital and analog I/O modules of the ET 200SP, additional local inputs and outputs can be realized so as to ensure that the modular AS-i router complies precisely with customer requirements. Expansion variants for almost every application are possible thanks to the selection of standard and fail-safe I/O modules.

Besides the single AS-i master, double, triple or generally multiple masters can be realized with or without fail-safe functionality.

Supported BaseUnits

With the combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules, the CM module is plugged onto a light type C0 BaseUnit and, immediately to the right of it, the F-CM module is plugged onto a dark type C1 BaseUnit. The AS-i cable is connected only on the light BaseUnit of the CM module.

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 about the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Configuration

The following software is required for configuration of the F-CM AS-i Safety ST module:

- STEP 7 (TIA Portal) V13 and higher with HSP 0070[1] and Safety Advanced.
  STEP 7 V13 SP1 is required for connection to the S7-1500F. When configuring with STEP 7 V13 SP1, the latest version of HSP 0070 V2.0 (or higher) is an essential prerequisite. STEP 7 Safety V13 SP1 Update 4 and HSP 0070 V3.0 (or higher) are needed for configuration of the F-CM AS-i Safety ST module in an ET 200SP station with ET 200SP F-CPU 1510SP F/1512SP F (firmware V1.8 or higher) or 1515SP PC F.

or

- STEP 7 (classic) V5.5 SP3 HF4 or higher with HSP 2093[2] and Distributed Safety V5.4 SP5 or F-Configuration Pack SP11 or SIMATIC S7 F/FH Systems

Configuration and programming are done entirely in the STEP 7 user interface. No additional configuration software is needed for commissioning.

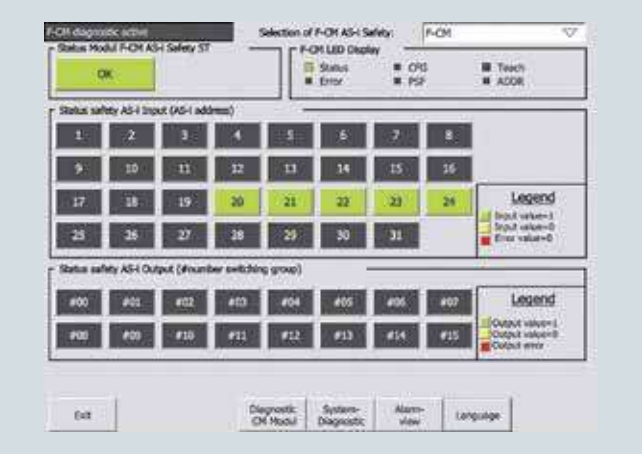
Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

The input and output channels are assigned to the process image automatically and manual linking via configuration blocks is not necessary.

If the F-CM AS-i Safety ST module is replaced, all necessary settings are automatically imported into the new module.

The F-CM AS-i Safety ST module occupies 16 input bytes and 8 output bytes in the I/O data of the ET 200SP station.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/109479103.



Diagnostics block for F-CM AS-i Safety ST

[1] For HSP 0070, see https://support.industry.siemens.com/cs/ww/en/view/72341852.

[2] For HSP 2092, see https://support.industry.siemens.com/cs/ww/en/view/23183356.

Application

Thanks to use of the fail-safe module in the ET 200SP, it is possible to fulfill the safety-related application requirements in a manner that is integrated in the overall automation solution.

The safety functions required for fail-safe operation are integrated in the modules. Communication with the fail-safe SIMATIC S7 CPUs is realized via PROFIsafe.

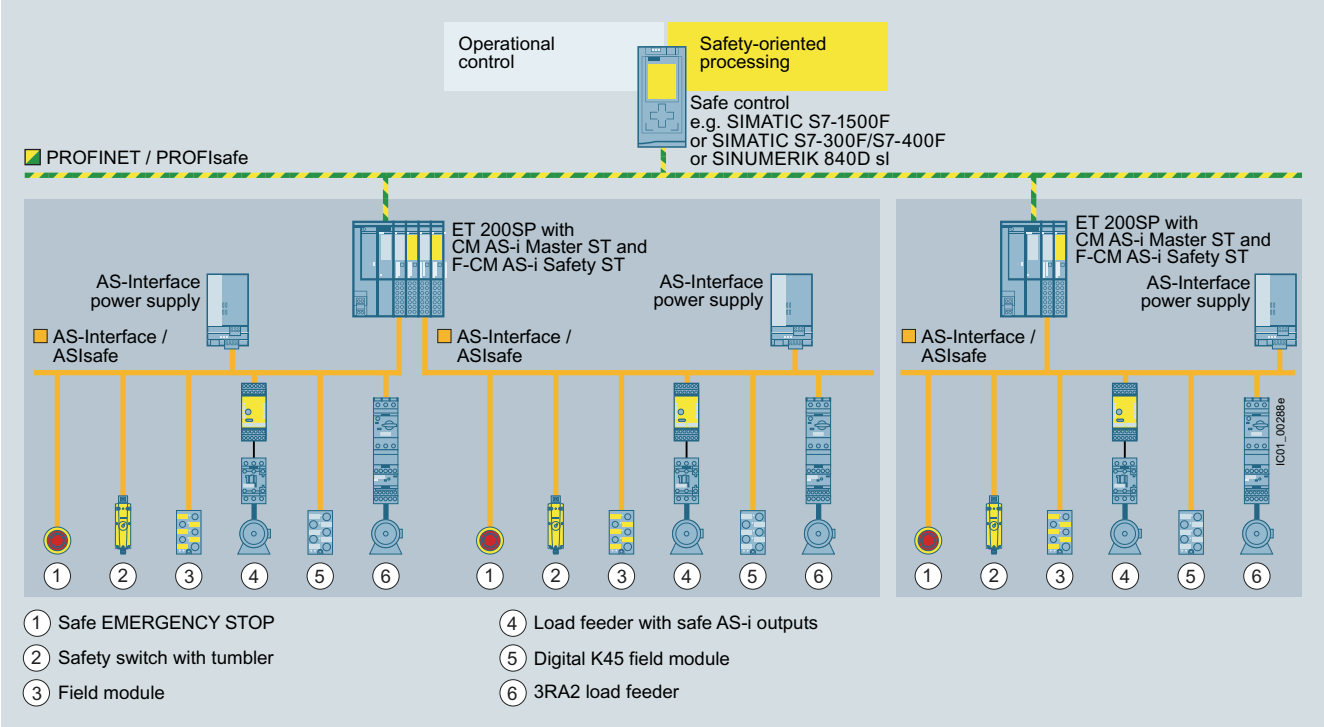
The safety application is programmed in the SIMATIC S7 F-CPU with Distributed Safety/S7 F/FH Systems/Safety Advanced. The fail-safe input signals of the ASIsafe slave modules are read via the AS-i bus line and are combined with any chosen further signals in the fail-safe program.

The fail-safe output signals can be output via safe SIMATIC output modules or also directly via AS-i – with the help of safe AS-i output modules, e.g. safe SlimLine S45F modules, Article No. 3RK1405-1SE15-0AA2 (see page 14/26). No special functions are required for this in the program.

Operation with SINUMERIK 840D sl is possible with SINUMERIK software version V4.7 SP2 HF1 or higher.

Together with an ET 200SP station with ET 200SP F-CPU 1510SP F/1512SP F (firmware V1.8 and higher) or 1515SP PC F, pre-processing of safe AS-i signals directly in the ET 200SP station is possible, as well as the configuration of an autonomous AS-i Safety station without a higher-level CPU.

Configuration examples of AS-Interface networks with CM AS-i Master ST and F-CM AS-i Safety ST for SIMATIC ET 200SP



AS-Interface configuration comprising an ET 200SP station with CM AS-i Master ST and F-CM AS-i Safety ST modules

Selection and ordering data

	Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
3RK7136-6SC00-0BC1	**F-CM AS-i Safety ST communication module** • Fail-safe module for SIMATIC ET 200SP, can be plugged onto BaseUnit type C1 (alternatively type C0) • Operation requires an AS-i master, e.g. CM AS-i Master ST (see page 14/34) • Can be used up to SIL 3 (IEC 62061/IEC 61508), PL e (EN ISO 13849-1) • Coding element type H (included in scope of supply) • Dimensions (W x H x D/mm): 20 x 73 x 58	2	**3RK7136-6SC00-0BC1**	1	1 unit

Accessories

	Version	SD d	**Spring-loaded terminals** Article No.	PU (UNIT, SET, M)	PS*
6ES7193-6BP20-0BC1	**BaseUnit BU20-P6+A2+4B** • BaseUnit (dark), BU type C1 • Suitable for the F-CM AS-i Safety ST fail-safe communication module • Continuation of an AS-i network, connection with the AS-i voltage of the left-hand module	1	**6ES7193-6BP20-0BC1**	1	1 unit
	Coding element type H (spare part) • For the ET 200SP modules F-CM AS-i Safety ST and CM 4xIO-Link • Packing unit 5 items	1	**6ES7193-6EH00-1AA0**	1	5 units

More accessories, see page 14/35.

Overview

DP/AS-i Link Advanced

More information

AS-Interface block library for SIMATIC PCS 7 for easy connection of AS-Interface to PCS 7, see Catalog KT10.1 - SITOP Power Supply

Manual, see https://support.industry.siemens.com/cs/ww/en/ps/24507/man

PN	DP-M	DP-S	AS-i M		
		●	●		

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The DP/AS-i Link Advanced is a compact router between PROFIBUS (DP slave) and AS-Interface, with the following features:

- Single and double AS-Interface master (according to AS-Interface specification V3.0) for connection of 62 AS-Interface slaves or 124 AS-Interface slaves (with a double master)
- Integrated analog value transmission
- Integrated ground-fault monitoring for the AS-Interface cable
- User-friendly local diagnostics and startup by means of a full graphic display and control keys or through a web interface with a standard browser on the PC screen
- Vertical integration (standard web interface) through Industrial Ethernet
- Supply voltage from the AS-Interface cable or alternatively with 24 V DC (optional)
- Suitable for AS-i Power24V (from product version 4 / firmware version 2.2) and for AS-Interface with 30 V voltage
- Module exchange without entering the connection parameters (e.g. PROFIBUS address) using C-PLUG (optional)

Design

- Compact plastic enclosure in degree of protection IP20 for standard rail mounting
- COMBICON plug-in screw terminals
- Compact design:
  - Pixel graphics display in the front panel for detailed display of the operating state and readiness for operation of all connected AS-Interface slaves
  - 6 pushbuttons for starting up and testing the AS-Interface line directly on the DP/AS-i Link Advanced
  - LED indication of the operating state of PROFIBUS DP and AS-Interface
  - Integrated Ethernet port (RJ45 socket) for user-friendly startup, diagnostics and testing of DP/AS-i Link Advanced through a web interface using a standard browser
- Small mounting depth thanks to recessed plug mounting
- Operation without fans and batteries

Functionality

Communications

The DP/AS-i Link Advanced enables a PROFIBUS DP master to cyclically access the I/O data of all the slaves of a lower-level AS-Interface segment.

The DP/AS-i Link Advanced occupies the following address space:

- As a single master: 32 bytes of input data and 32 bytes of output data in which the I/O data of the connected AS-Interface slaves (standard and A/B addressing) of an AS-i line is stored.
- As double master, double the number of bytes
- Optional additional I/O bytes for data from analog slaves

The size of the input/output image can be compressed so that only the actually required I/O address area is occupied in the system of the DP master. The integrated evaluation of analog signals is just as easy as access to digital values because the analog process data also lie directly in the I/O address area of the CPU.

PROFIBUS DP-V1 Masters also provide the option of triggering AS-Interface master calls over the acyclic PROFIBUS services (e.g. write parameters, amend addresses, read diagnostic values). Using an operating display in AS-i Link it is possible to fully commission the lower-level AS-Interface line even without a CPU.

DP/AS-i Link Advanced is equipped with an additional Ethernet port, which enables use of the integrated web server. The web server can be called up with any standard web browser (e.g. Internet Explorer) without additional software. It allows all diagnostics information, the set bus configuration and parameters and, if applicable, any adjustments to be displayed on the PC. Firmware updates are also possible using this port.

The optional C-PLUG supports module exchange without entering the connection parameters (PROFIBUS address etc.), keeping downtimes to a minimum in the event of a fault.

Diagnostics

The following diagnostics is possible using LEDs, the display and control keys, web interface or STEP 7:

- Operating state of the DP/AS-i Link Advanced
- Status of the link as a PROFIBUS DP slave
- Diagnostics of the AS-Interface network
- Message frame statistics
- Standard diagnostics pages in the web interface for fast diagnostics access through Ethernet using a standard browser
- For the use of the web interfaces no network settings are necessary on the PC (Zeroconf procedure)
- The reporting of diagnostic events is optionally possible via email or SNMP Trap. The integrated diagnostic buffer saves the events including time stamp

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 about the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Configuration

The DP/AS-i Link Advanced can be configured as follows:

- With STEP 7 (TIA Portal) V12 or higher or STEP 7 (classic) V5.4 or higher: In the case of STEP 7 configuration, the AS-Interface configuration can be uploaded in STEP 7. Furthermore, AS-Interface slaves can also be conveniently configured in HW-Config (slave selection dialog)
- By adopting the ACTUAL configuration of the AS-Interface on the display
- Alternatively DP/AS-i Link Advanced can be integrated into the engineering tool using the PROFIBUS GSD file (e.g. STEP 7 versions earlier than V5.4 or engineering tools from non-Siemens suppliers)

Benefits

- Short startup times through simple configuration at the press of a button and testing of the AS-Interface line using the display or web interface
- Reduction of standstill and servicing times in the event of a slave failure thanks to user-friendly diagnostics using the display or web interface and through simple module exchange with the help of the C-PLUG exchange medium
- Reduced amount of engineering work thanks to user-friendly configuration of Siemens slaves using the slave catalog in HW-Config (STEP 7)
- Costs saved by the double AS-Interface master when large volumes of project data are involved
- Simple operation with AS-Interface power supply unit (see page 14/73) possible without restrictions, no additional operating voltage is required.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is supplied through an existing 24 V DC PELV power supply unit. An S22.5 AS-i data decoupling module (e.g. 3RK1901-1DE12-1AA0) is required for the decoupling, see page 14/77.
- For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/618921

Application

The DP/AS-i Link Advanced is a PROFIBUS DP-V1 slave (according to IEC 61158/IEC 61784) and an AS-Interface master (based on AS-Interface specification V3.0 according to IEC/EN 62026-2). It enables transparent data access to AS-Interface from PROFIBUS DP.

Exchanging data with the PROFIBUS DP master

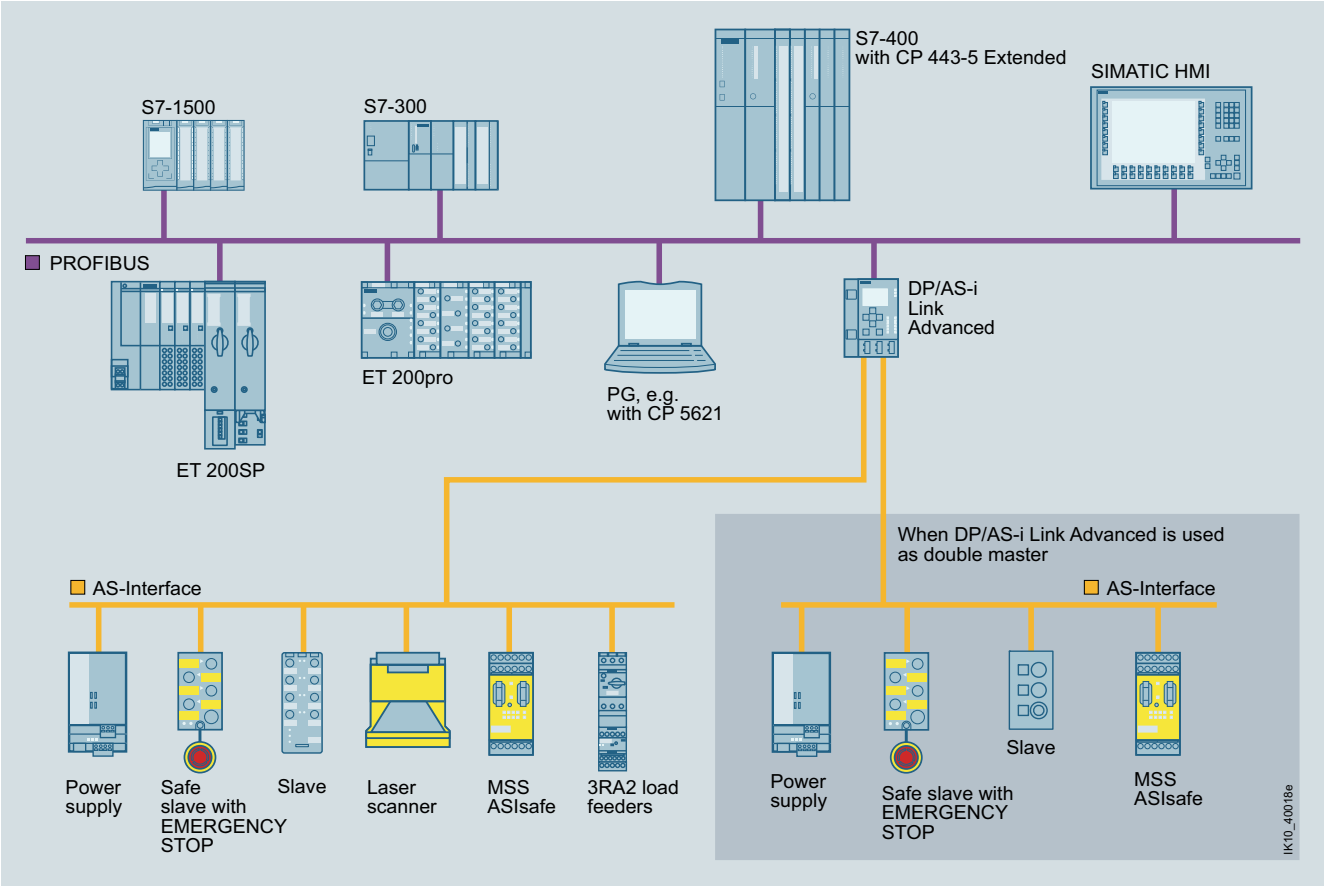
PROFIBUS DP masters (DP-V0) can exchange I/O data cyclically with the AS-Interface. DP masters with acyclic services (DP-V1) are additionally able to initiate AS-Interface master calls (e.g. reading/writing the AS-i configuration during normal operation). As such, the DP/AS-i Link Advanced is particularly well-suited for a distributed construction and for connection of a lower-level AS-Interface network.

Single master

For applications with typical volumes of project data, it is sufficient to use the DP/AS-i Link Advanced in its version as an AS-Interface single master. The single master can operate up to 248 DI / 248 DQ, using 62 A/B slaves with 4 DI / 4 DQ each.

Double master

The AS-Interface double master version of DP/AS-i Link Advanced is suitable for applications with large volumes of data. In this case, twice the volume of project data can be used on two AS-Interface lines running independently of each other. The double master can operate up to 496 DI / 496 DQ, using two AS-i networks each with 62 A/B slaves with 4 DI / 4 DQ each.



Integration of AS-Interface on PROFIBUS through DP/AS-i Link Advanced as single/double master

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
DP/AS-i Link Advanced					
DP/AS-i Link Advanced	Router between PROFIBUS DP and AS-Interface; degree of protection IP20; including COMBICON plug-in screw terminals for connection of an AS-Interface cable (two AS-Interface cables for double masters) and the optional 24 V supply; corresponds to AS-Interface specification V3.0; Dimensions (W x H x D/mm): 90 x 132 x 88.5		**COMBICON connection**		
	• Single master with display	►	**6GK1415-2BA10**	1	1 unit
	• Double master with display	►	**6GK1415-2BA20**	1	1 unit

Accessories

Version	SD	Article No.	PU (UNIT, SET, M)	PS*
	d			
C-PLUG Exchange medium for the simple exchange of devices in the event of a fault; for accommodating configuration and application data; can be used in SIMATIC NET products with a C-PLUG slot	1	**6GK1900-0AB00**	1	1 unit
PROFIBUS FastConnect standard cable GP FastConnect standard type with special design for fast installation, 2-core, shielded	1	**6XV1830-0EH10**	1	1 M
PROFIBUS FastConnect RS 485 bus connector with diagonal cable outlet (35°) With insulation displacement connection, the max. transmission rate is 12 Mbps, activatable terminating resistor is integrated				
• Without PG connection socket	1	**6ES7972-0BA61-0XA0**	1	1 unit
• With PG connection socket	1	**6ES7972-0BB61-0XA0**	1	1 unit
PROFIBUS FastConnect stripping tool Preset stripping tool for speedy stripping of PROFIBUS FastConnect bus cables	1	**6GK1905-6AA00**	1	1 unit
IE FC RJ45 Plug 90 RJ45 plug-in connector for Industrial Ethernet, with robust metal enclosure and integrated insulation displacement contacts for connection of Industrial Ethernet FC installation cables; with 90° cable feeder				
• 1 pack = 1 unit	1	**6GK1901-1BB20-2AA0**	1	1 unit
• 1 pack = 10 units	1	**6GK1901-1BB20-2AB0**	1	10 units
• 1 pack = 50 units	1	**6GK1901-1BB20-2AE0**	1	50 units

DP/AS-Interface Link 20E

Overview

DP/AS-Interface Link 20E manual

More information

Manual "DP/AS-Interface Link 20E", see https://support.industry.siemens.com/cs/ww/en/view/5281638

PN	DP-M	DP-S	AS-i M		
		●	●		

K10_10195a

DP/AS-Interface Link 20E connects PROFIBUS DP to AS-Interface and has the following features:

- PROFIBUS DP slave and AS-Interface master
- Up to 62 AS-Interface slaves, each with four digital inputs and four digital outputs as well as analog slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions according to the AS-Interface specification V3.0
- Supply from AS-Interface cable; hence no additional power supply required
- Suitable for AS-i Power24V (from product version 2 / firmware version 3.1) and for AS-Interface with 30 V voltage
- Supports uploading of the AS-Interface configuration in STEP 7 V5.2 and higher

Design

- Compact plastic enclosure in degree of protection IP20 for standard rail mounting
- LEDs in the front panel for indicating the operating state and functional readiness of all connected slaves
- Setting of PROFIBUS DP address is possible by pressing a button
- LED indication of the PROFIBUS DP slave address, PROFIBUS DP bus faults and diagnostics
- Two pushbuttons for switching over the operating state and for adopting the existing ACTUAL configuration as the TARGET configuration

Functionality

Communications

The DP/AS-Interface Link 20E enables a DP master to access all the slaves of an AS-Interface network.

The DP/AS-Interface Link 20E occupies a standard 32 bytes of input data and 32 bytes of output data in which the digital I/O data of the connected AS-Interface slaves (standard and A/B addressing) of an AS-i line is stored.

The size of the input/output image can be compressed so that only the actually required I/O address area is occupied in the system of the PROFIBUS DP master.

The analog I/O data can be accessed with the S7 system functions for read/write data records.

Configuration

The DP/AS-Interface Link 20E is configured as follows:

- With STEP 7 (TIA Portal) from V12 or STEP 7 (classic) from V5.1 SP2:
  In the case of STEP 7 configuration, the AS-Interface configuration can be uploaded from STEP 7 V5.2. Furthermore, AS-Interface slaves from Siemens can also be conveniently configured in HW Config (slave selection dialog).
- By adopting the ACTUAL configuration of the AS-Interface by using the SET pushbutton on the front panel.
- Alternatively, DP/AS-Interface Link 20E can be integrated by means of the PROFIBUS GSD file in the engineering tool (e.g. for STEP 7 V5.1 and lower or for non-Siemens engineering tools).

Benefits

- Reduction of installation costs because the power is supplied entirely via the AS-Interface cable, which means that no additional power supply is required
- Short startup times thanks to easy configuration at the touch of a button
- The LED indicators help reduce downtime and service times if a slave fails
- Quick and easy commissioning by reading the AS-Interface configuration
- For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/61892138.

DP/AS-Interface Link 20E

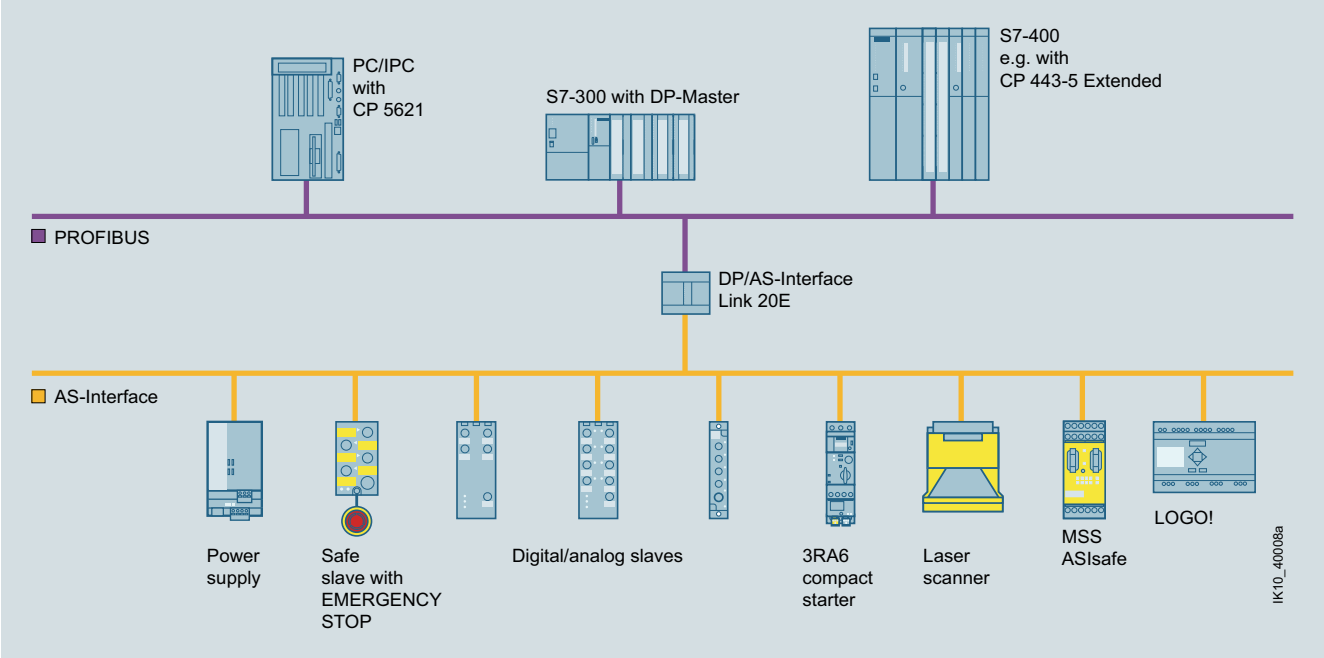
Application

The DP/AS-Interface Link 20E is a PROFIBUS DP slave (according to IEC 61158/IEC 61784) and an AS-Interface master (according to IEC/EN 62026-2). It enables the AS-Interface to be operated on PROFIBUS DP.

Up to 248 DI / 248 DQ can be operated via the DP/AS-Interface Link 20E using 62 A/B slaves with 4 DI / 4 DQ each.

PROFIBUS DP masters (DP-V0) can exchange digital I/O data cyclically with the AS-Interface.

PROFIBUS DP masters with acyclic services (DP-V1) are additionally able to exchange analog I/O data and initiate AS-Interface master calls (e.g. reading/writing the AS-i configuration during normal operation).



Transition from PROFIBUS DP to AS-Interface using DP/AS-Interface Link 20E

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
DP/AS-Interface Link 20E					
6GK1415-2AA10	Router between PROFIBUS DP and AS-Interface in degree of protection IP20; including screw terminals for connection of the AS-Interface cable; corresponds to AS-Interface specification V3.0; dimensions (W x H x D/mm): 90 x 80 x 60 (dimensions without fixing lugs)	▶	**Screw terminals**		
			6GK1415-2AA10	1	1 unit

Accessories

Version	SD	Article No.	PU (UNIT, SET, M)	PS*
	d			
PROFIBUS FC standard cable GP FastConnect standard type with special design for fast installation, 2-core, shielded	1	**6XV1830-0EH10**	1	1 M
PROFIBUS FastConnect bus connector With insulation displacement connection, max. transmission rate 12 Mbps, activatable terminating resistor integrated				
• RS 485 bus connector with 90° cable feeder				
- Without PG connection socket	1	**6ES7972-0BA52-0XA0**	1	1 unit
- With PG connection socket	1	**6ES7972-0BB52-0XA0**	1	1 unit
• RS 485 bus connector with diagonal cable outlet (35°)				
- Without PG connection socket	1	**6ES7972-0BA61-0XA0**	1	1 unit
- With PG connection socket	1	**6ES7972-0BB61-0XA0**	1	1 unit
PROFIBUS FastConnect stripping tool Preset stripping tool for speedy stripping of PROFIBUS FastConnect bus cables	1	**6GK1905-6AA00**	1	1 unit

Overview

IE/AS-i Link PN IO
Single master (picture on left) and double master (picture on right)

More information

Manual, see https://support.industry.siemens.com/cs/ww/en/view/22712154

AS-Interface block library for SIMATIC PCS 7 for easy connection of AS-Interface to PCS 7, see Catalog KT10.1 - SITOP Power Supply

PN	DP-M	DP-S	AS-i M		
●			●		

The IE/AS-i Link PN IO is a compact router between PROFINET and AS-Interface, with the following features:

- Single and double AS-Interface master (according to AS-Interface specification V3.0) for connection of 62 or 124 AS-Interface slaves (with a double master)
- Integrated analog value transmission
- Integrated ground-fault monitoring for the AS-Interface cable
- User-friendly local diagnostics and startup by means of a full graphic display and control keys or through a web interface with a standard browser on the PC screen
- Vertical integration (standard web interface) through Industrial Ethernet
- Supply via AS-Interface cable or with 24 V DC
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage
- Module exchange without entering the PROFINET connection parameters when using the C-PLUG (optional)
- Costs saved by the double AS-Interface master when large volumes of project data are involved

Note:

As an alternative to the IE/AS-i Link PN IO, a high-performance router can be set up between PROFINET and AS-Interface by combining the CM AS-i Master ST and F-CM AS-i Safety ST modules in an ET 200SP station (for safety-related applications), see pages 14/34 and 14/38.

Design

- Compact plastic enclosure in degree of protection IP20 for standard rail mounting
- COMBICON plug-in screw terminals
- Compact design
- Pixel graphics display in the front panel for detailed display of the operating state and readiness for operation of all connected AS-Interface slaves
- Six pushbuttons for starting up and testing the AS-Interface line directly on the IE/AS-i Link PN IO
- LED display of the operating state of PROFINET IO and AS-Interface
- Integrated 2-port switch (RJ45 socket) for connection to Industrial Ethernet
- Small mounting depth thanks to recessed plug mounting
- Operation without fans and batteries

Functionality

Communications

The IE/AS-i Link PN IO enables a PROFINET IO controller to cyclically access the I/O data of all the slaves of a lower-level AS-Interface segment. Also supported are the expanded slave types with higher I/O data volume according to AS-i specification V3.0.

The IE/AS-i Link PN IO occupies the following address space:

- As a single master with full expansion: 62 bytes of input data and 62 bytes of output data in which the I/O data of the connected AS-Interface slaves (standard and A/B addressing) of an AS-i line is stored.
- As double master, double the number of bytes
- Optional additional I/O bytes for data from analog slaves

The size of the input/output image can be compressed so that only the actually required I/O address area is occupied in the system of the IO controller.

The integrated evaluation of analog signals is just as easy as access to digital values because the analog process data also lie directly in the I/O address area of the CPU.

PROFINET IO controllers are additionally able to initiate AS-Interface master calls (e.g. to write parameters, change addresses, read diagnostic values) through the acyclic PROFINET services.

Using an operating display in AS-Interface Link it is possible to fully commission the lower-level AS-i line.

The IE/AS-i Link PN IO is equipped with two Ethernet ports, which are connected by an internal switch. With the Ethernet it is possible in addition to use the integrated web server.
The web server can be called up with any standard web browser (e.g. Internet Explorer) without additional software. It enables the PC to present all diagnostics information and to display the set bus configuration and parameters as well as their adaptation where applicable. Firmware updates are also possible using this port.

The optional C-PLUG supports module replacement without manually entering the connection parameters (PROFINET device name), keeping downtimes to a minimum in the event of a fault.

Diagnostics

The following diagnostics is possible using the display and control keys, web interface or STEP 7:

- Operating state of the IE/AS-i Link PN IO
- State of the link as a PROFINET IO device
- Diagnostics of the AS-Interface network
- Message frame statistics
- Standard diagnostics pages in the web interface for fast diagnostics access through Ethernet using a standard browser
- Reporting of diagnostic events is optionally possible via e-mail or SNMP trap. The integrated diagnostic buffer saves the events including time stamp

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 about the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Configuration

The IE/AS-i Link PN IO is configured as follows:

- With STEP 7 (TIA Portal) from V15 or STEP 7 (classic) from V5.4: In the case of STEP 7 configuration, the AS-Interface configuration can be uploaded from STEP 7 V5.4 SP2. Furthermore, AS-Interface slaves from Siemens can also be conveniently configured in HW-Config (slave selection dialog)
- Alternatively, IE/AS-i Link PN IO can be integrated by means of the PROFINET GSD file in the engineering tool (e.g. for TIA Portal versions earlier than V15 or for STEP 7 versions earlier than V5.4 SP2, or for non-Siemens engineering tools).

Benefits

- Short startup times through simple configuration at the press of a button and testing of the AS-Interface line using the display or web interface
- Reduction of standstill and servicing times in the event of a slave failure thanks to user-friendly diagnostics using the display or web interface
- Costs saved by the double AS-Interface master when large volumes of project data are involved
- Simple operation with AS-Interface power supply unit (see page 14/73) possible without restrictions, no additional operating voltage is required.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is supplied through an existing 24 V DC PELV power supply unit. An S22.5 AS-i data decoupling module (e.g. 3RK1901-1DE12-1AA0) is required for the decoupling, see page 14/77.
- For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/618921

Application

The IE/AS-i Link PN IO is a PROFINET IO device (according to IEC 61158/IEC 61784) and an AS-Interface master (based on AS-Interface specification V3.0 according to IEC/EN 62026-2). It enables transparent data access to AS-Interface from PROFINET.

Exchanging data with PROFINET IO controllers

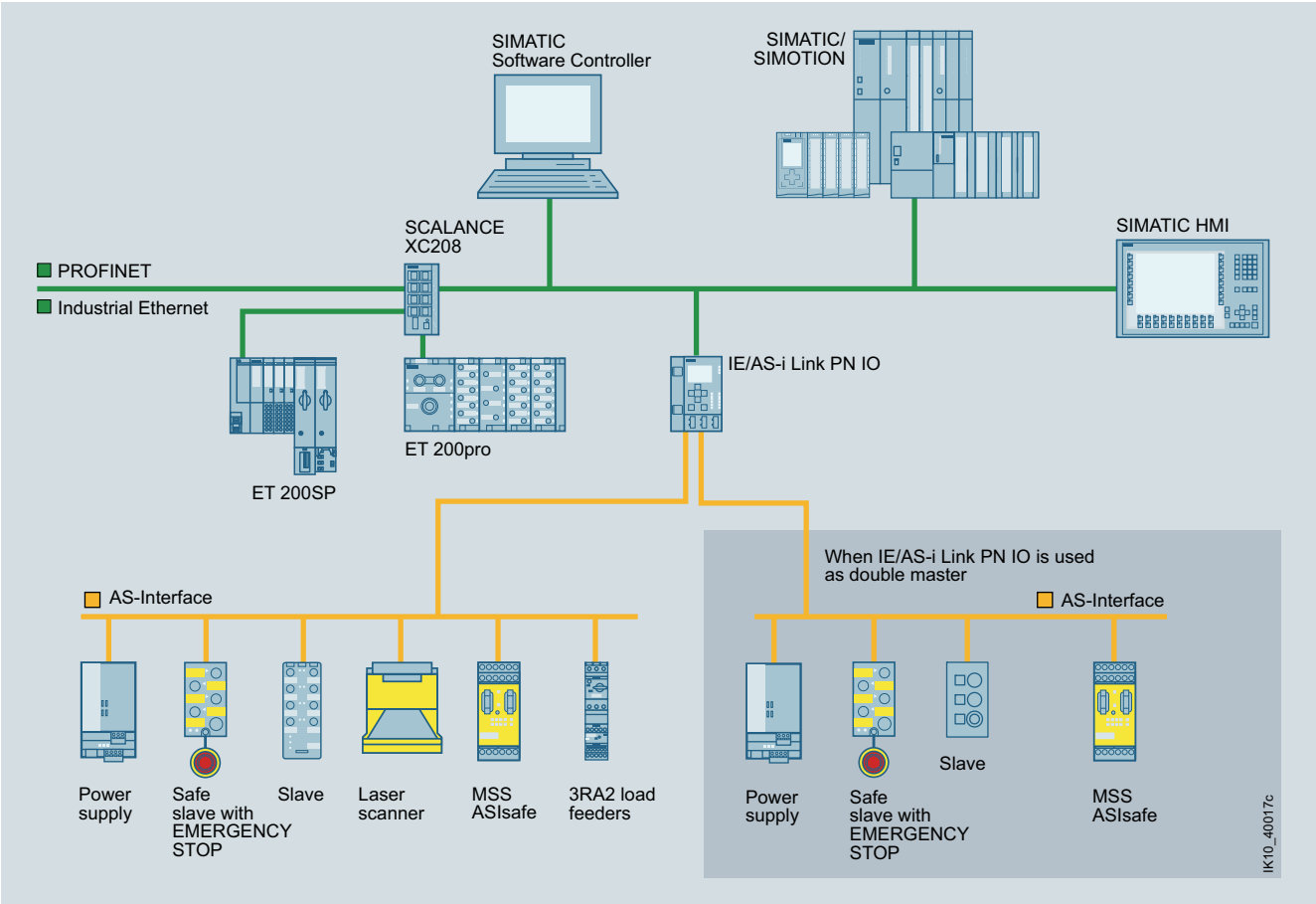
PROFINET IO controllers can exchange I/O data with AS-Interface in cyclic mode and can perform AS-i master calls in addition with acyclic services (e.g. reading/writing the AS-i configuration during normal operation). The IE/AS-i Link PN IO is therefore suitable for distributed configurations and for integrating a lower-level AS-Interface network.

Single master

The AS-i single master version of IE/AS-i i Link PN IO is suitable for applications with typical volumes of data. The single master can operate up to 248 DI / 248 DQ, using 62 A/B slaves with 4 DI / 4 DQ each.

Double master

The AS-i double master version of IE/AS-i Link PN IO is suitable for applications with large volumes of data. In this case, twice the volume of project data can be used on two AS-i lines running independently of each other. The double master can operate up to 496 DI / 496 DQ, using two AS-i networks each with 62 A/B slaves with 4 DI / 4 DQ each.

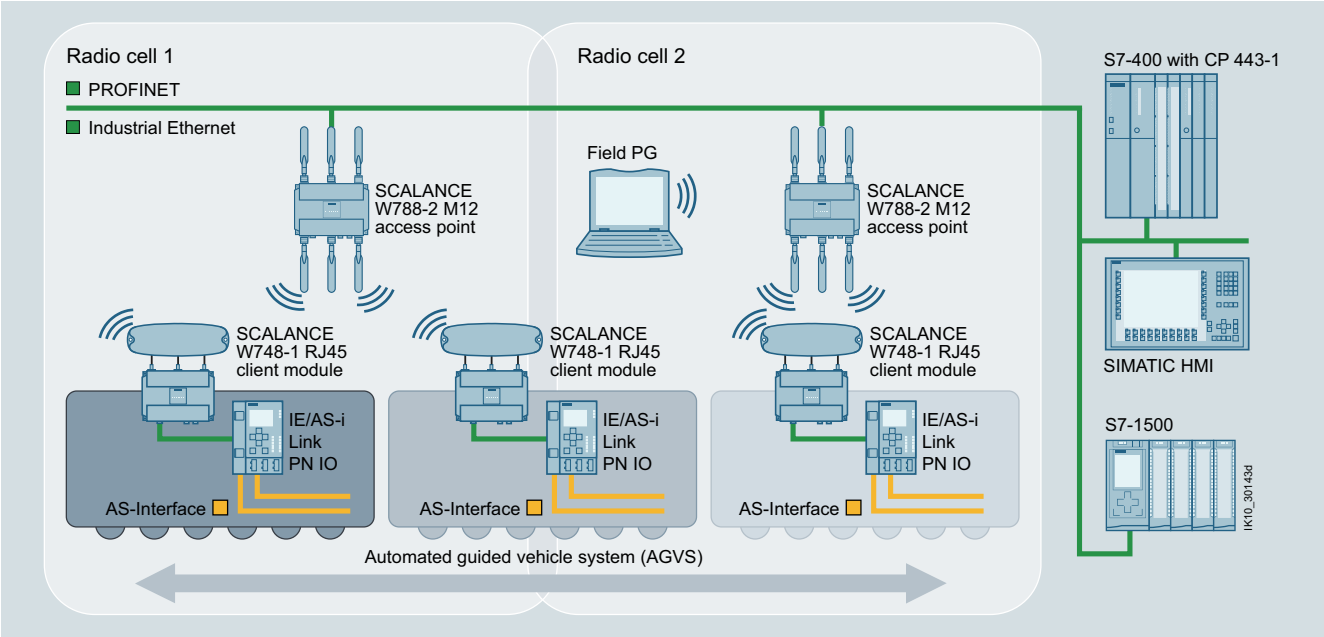


Integration of AS-Interface on PROFINET through IE/AS-i Link PN IO as single/double master

Wireless communication

Using an upstream IWLAN client module, e.g. SCALANCE W748-1 RJ45, an AS-Interface line can be integrated in the PROFINET world by wireless means.

Sample uses are applications which up to now have been performed with fault-prone tow chain or collector wire technology. Maintenance costs are thus reduced.



Wireless communication between Industrial Ethernet and AS-Interface components

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
IE/AS-i Link PN IO					
IE/AS-i Link PN IO	Router between PROFINET and AS-Interface in degree of protection IP20; including COMBICON plug-in screw terminals for connecting an AS-Interface cable (two AS-Interface cables for a double master) and the optional 24 V supply; complies with AS-Interface specification V3.0; dimensions (W x H x D / mm): 90 x 132 x 88.5		**COMBICON connection**		
	• Single master with display	▶	**6GK1411-2AB10**	1	1 unit
	• Double master with display	▶	**6GK1411-2AB20**	1	1 unit

Accessories

Version	SD	Article No.	PU (UNIT, SET, M)	PS*
	d			
C-PLUG Exchange medium for simple exchange of devices in the event of a fault; for accommodating configuration and application data; can be used in SIMATIC NET products with a C-PLUG slot	1	**6GK1900-0AB00**	1	1 unit
IE FC RJ45 Plug 90 RJ45 plug-in connector for Industrial Ethernet, with robust metal enclosure and integrated insulation displacement contacts for connection of Industrial Ethernet FC installation cables; with 90° cable feeder				
• 1 pack = 1 unit	1	**6GK1901-1BB20-2AA0**	1	1 unit
• 1 pack = 10 units	1	**6GK1901-1BB20-2AB0**	1	10 units
• 1 pack = 50 units	1	**6GK1901-1BB20-2AE0**	1	50 units

Overview

K60

K45

K20

Three coordinated series of AS-Interface compact modules with digital and analog compact modules and a high degree of protection are available for use in the field:

- Digital modules with a high degree of protection
  - Series K60, see pages 14/52 and 14/54
  - Series K45, see page 14/57
  - Series K20, see page 14/58
- Analog modules with a high degree of protection
  - Series K60, see page 14/61

All compact modules are characterized by particularly simple handling. The K60 and K45 modules are mounted with a mounting plate. The mounting plate is used to mount the AS-Interface flat cables and enables mounting on a wall or standard mounting rail.

The particularly narrow K20 modules are directly mounted without a mounting plate and connected to the AS-Interface using a round cable.

Connection types

For flexible connection of different sensors and actuators, the following PIN assignments are available on the I/O modules with M12 sockets:

Standard assignment

With the standard assignment, one sensor/actuator is connected per M12 socket. In this case the signal for the outputs is acquired at PIN4 while the signal for the inputs is acquired at PIN4 and PIN2. As the result, sensors can be connected directly to PIN2 and PIN4.

Y-assignment

With the Y-assignment, two sensors or two actuators can be connected to one M12 socket. In this case, both PIN4 and PIN2 are provided for one sensor signal and one actuator signal on each M12 socket.

Y-II assignment

The Y-II assignment offers the following options:

- Individual connection of a sensor/actuator to one M12 socket
- Connection of two sensors/actuators to one M12 socket as follows:
  - The signal of the first sensor/actuator is connected to PIN4 of the first socket.
  - The signal of the second sensor/actuator is connected to PIN2 of the first socket and to PIN4 of the second socket.

  In this case, the second socket is not required and is closed with a sealing cap.

Overview of digital compact modules

The following table provides an overview of the important features of the digital compact modules.

Version	K60	K45	K20
8 inputs/2 outputs	✓	--	--
8 inputs	✓	✓	--
4 inputs/4 outputs	✓	✓	✓
4 inputs/3 outputs	✓	--	--
4 inputs/2 outputs	✓	--	--
4 inputs	✓	✓	✓
2 inputs/2 outputs	--	✓	✓
4 outputs	✓	✓	✓
3 outputs	--	✓	--
AS-Interface connection	Flat cable / round cable	Flat cable	Round cable
I/O connection method	M12	M12/M8	M12/M8
Pin assignment	Standard/Y-II/Y	Standard/Y	Standard/Y
Degree of protection	IP65/IP67/IP68/IP69K	IP65/IP67	IP65/IP67
Addressing type A/B address	✓	✓	✓

✓ Available

-- Not available

Safety modules for AS-Interface, see page 14/26.

Overview

K60

The K60 digital AS-Interface compact modules are characterized by optimized handling characteristics and user-friendliness. They permit the mounting times and startup times of AS-Interface to be reduced by up to 40%.

Mounting and connection of the AS-Interface shaped cables

Assembly of the K60 modules is performed with a mounting plate which accommodates the AS-Interface shaped cables. Two different mounting plates are offered for

- Wall mounting
- Standard rail mounting

The mounting plate and the compact module are joined together by means of a screw, with simultaneous contacting of the AS-Interface cable by the service-proven insulation piercing method.

Addressing and connection of the sensors/actuators

Addressing of the K60 modules is performed using an addressing socket integrated in the compact module. The addresses can also be assigned after installation.

K60 modules with a maximum of four digital inputs and outputs

These compact modules contain the M12 standard connections for inputs and outputs. Using M12 standard plugs, a maximum of four sensors and four actuators can be connected to the compact module.

K60 compact modules with a maximum of eight digital inputs

These modules have eight digital inputs for connection through M12 plugs.

The module requires two AS-Interface addresses for processing all eight inputs. The addressing can thus be performed through a double addressing socket integrated in the module.

K60 data couplers

An AS-Interface data coupler has been added to the K60 compact module range. Integrated in this module are two AS-i slaves which are connected to two different AS-i networks. Each of the two integrated slaves has four virtual inputs and four virtual outputs. The bidirectional data transmission of four data bits between two AS-i networks is thus possible in a simple and cost-effective manner. The data coupler needs its own address in each AS-i network. The data coupler is supplied with power directly from the AS-i cable.

Each AS-i network works with a different cycle time depending on the number of stations. Hence two AS-i networks are not necessarily synchronous. For this reason, the AS-i data coupler can be used to transmit only standard data and no safety data.

Selection and ordering data

3RK1400-1DQ00-0AA3

Digital I/O modules, IP67 – K60

- PNP transistor
- Width 60 mm
- Connection method: M12
- Modules supplied without mounting plate

Type	Current carrying capacity of outputs	Slave addressing type	Pin assignment	Sensor power supply via	SD d	Article No.	PU (UNIT, SET, M)	PS*
8 inputs/ 2 outputs[1]	2 A	A/B	Special	AS-i	2	**3RK2400-1HQ00-0AA3**	1	1 unit
8 inputs[1]	--	Standard	Y-II	AS-i	▶	**3RK1200-0DQ00-0AA3**	1	1 unit
	--	A/B	Y-II	AS-i	▶	**3RK2200-0DQ00-0AA3**	1	1 unit
	--	A/B	Y-II	U_{aux}	5	**3RK2200-1DQ00-1AA3**	1	1 unit
4 inputs/ 4 outputs	2 A	Standard	Y-II	AS-i	▶	**3RK1400-1DQ00-0AA3**	1	1 unit
	2 A	Standard	Standard	AS-i	▶	**3RK1400-1CQ00-0AA3**	1	1 unit
	1 A	Standard	Y-II	AS-i	2	**3RK1400-1DQ01-0AA3**	1	1 unit
	1 A	Standard	Standard	AS-i	▶	**3RK1400-1DQ03-0AA3**	1	1 unit
	2 A	A/B (spec. V3.0)	Y-II	AS-i	2	**3RK2400-1DQ00-0AA3**	1	1 unit
	2 A	A/B (spec. V3.0)	Y-II	U_{aux}	2	**3RK2400-1DQ00-1AA3**	1	1 unit
4 inputs/ 3 outputs	2 A	A/B	Y-II	AS-i	▶	**3RK2400-1FQ03-0AA3**	1	1 unit
4 inputs/ 2 outputs	2 A	Standard	Y-II	AS-i	▶	**3RK1400-1MQ00-0AA3**	1	1 unit
4 inputs	--	Standard	Y-II	AS-i	▶	**3RK1200-0CQ00-0AA3**	1	1 unit
	--	A/B	Y-II	AS-i	2	**3RK2200-0CQ00-0AA3**	1	1 unit
2 x 2 inputs/ 2 x 2 outputs	1 A	Standard	Y	AS-i	15	**3RK1400-1DQ02-0AA3**	1	1 unit
4 outputs	2 A	Standard	Y-II	--	▶	**3RK1100-1CQ00-0AA3**	1	1 unit
	2 A	A/B (spec. V3.0)	Y-II	--	2	**3RK2100-1CQ00-0AA3**	1	1 unit

Digital I/O modules, IP67 – K60 data couplers

Modules supplied without mounting plate

Type	Current carrying capacity of outputs	Slave addressing type	Pin assignment	Sensor power supply via	SD d	Article No.	PU (UNIT, SET, M)	PS*
Data coupler 4 inputs/4 outputs (virtual)	--	Standard	--	--	10	**3RK1408-8SQ00-0AA3**	1	1 unit

[1] Module occupies two AS-Interface addresses

Safety modules for AS-Interface, see page 14/26 onwards.

Accessories

3RK1901-0CA00

Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
K60 mounting plates Suitable for all K60 compact modules				
• Wall mounting	▶	**3RK1901-0CA00**	1	1 unit
• Standard rail mounting	▶	**3RK1901-0CB01**	1	1 unit

3RK1901-1KA00

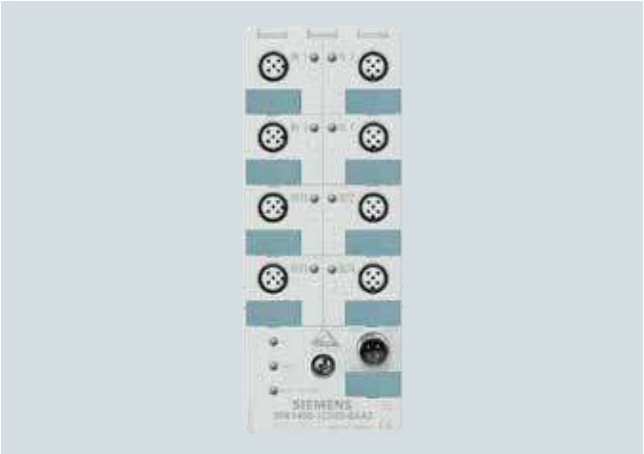
AS-Interface sealing caps M12 For free M12 sockets	▶	**3RK1901-1KA00**	100	10 units

3RK1902-0AR00

Sealing sets • For K60 mounting plate and standard distributor • Cannot be used for K45 mounting plate • One set contains one straight and one shaped seal	2	**3RK1902-0AR00**	100	5 units

Overview

Operation in particularly harsh environments



K60R module in degree of protection IP68/IP69K

Modules with degree of protection IP67 cannot be used in areas exposed to permanently high levels of humidity, in applications with drilling emulsions and cutting oils or when cleaning with high-pressure cleaners. The answer for these applications is provided by the expansion of the K60 compact modules with the K60R module with degree of protection IP68/IP69K.

The K60R modules are connected instead of the AS-Interface flat cable using a round cable with M12 cable box.
The AS-Interface bus cable and the 24 V DC auxiliary power supply are routed in this case in a shared round cable.

Degree of protection IP68 permits many new applications that were impossible with the former field modules with degree of protection IP67. In applications such as filling plants or machine tools, the K60R with degree of protection IP68 enables the module to be used directly in zones exposed to permanent loading by humidity. It is thus possible to make even more rigorous savings in wiring with AS-Interface. For more information on IP68 test conditions, see "IP68/IP69K tests" on page 14/54.

Cleaning with high-pressure cleaners, such as is regularly performed in the food and drinks industry for instance, is possible without difficulty (IP69K).

In applications with tow chains, many users rely on placing the AS-Interface bus cable in a round cable. With the K60R module, a round cable connection is possible for direct connection to a round cable. No adapter is required.

Mounting

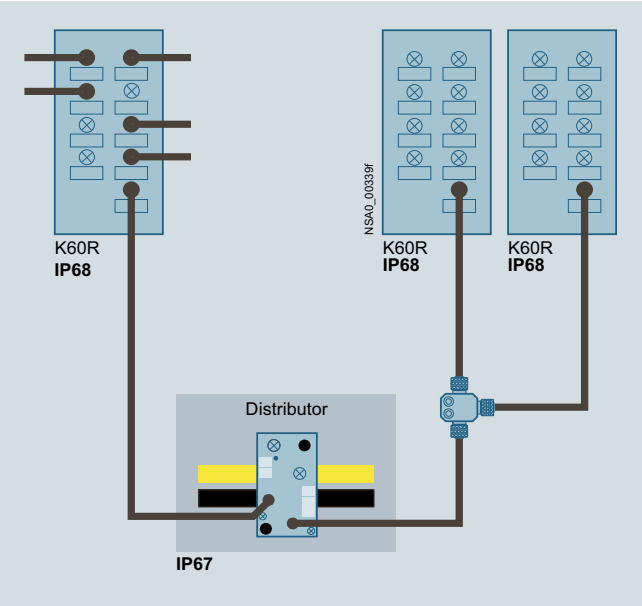
The same mounting plates are used as for the K60 modules. Instead of using flat cables, the K60R is connected using a 4-pole round cable with an M12 connection. With the K60R the mounting plate thus serves only as a fixture and ground terminal.

Addressing

Addressing is performed using the same socket as for the bus connection. Connecting the module to the addressing unit takes place over a 3-pole standard M12 cable.

When the mounting is finished, the module is connected with the addressing cable to the addressing unit and addressed. The addressing cable is then removed and the module connected to the bus cable.

Connection



K60R connection options

In the IP67 environment, the service-proven standard components are connected using flat cables. Spur lines are laid into the IP68 environment by means of an AS-Interface M12 feeder (3RK1901-2NR..). The module is connected with a round cable to an M12 cable box. For this purpose, the module has an M12 bus connection instead of the former addressing socket. The AS-Interface bus cable and the 24 V DC auxiliary voltage are routed together in a 4-pole round cable. There must be no ground conductor in this round cable. Connection to ground is made through the mounting plate.

In the IP68 environment, only cables with extruded M12 plugs may be used.

Please note the following conditions:

- The configuration guidelines for AS-Interface apply. For all M12 connecting cables, the maximum permissible current is limited to 4 A. The cross-section of these cables is just 0.34 mm². For connection of the K60R modules, the aforementioned M12 connecting cables can be used for the spur lines. The voltage drop caused by the ohmic resistance (approx. 0.11 Ω/m) must be taken into account.
- For round cable connections with shared AS-i and U_{aux} in a single cable, the following maximum lengths apply:
  - Per spur line from feeder to module: max. 5 m
  - Total of all round cable segments in an AS-Interface network: max. 20 m

IP68/IP69K tests

K60R modules were tested with the following tests:

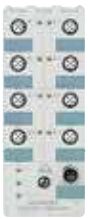
- Stricter test than IP67: 90 min at 1.8 m depth of water (IP67: 30 min at 1 m depth of water)
- Salt water test: Five months in salt water, 20 cm deep, at room temperature
- Test with particularly creepable oil: Five months completely under oil at room temperature
- Test with drilling emulsion: Five months at room temperature (components of the drilling emulsion: Anionic and non-ionic emulsifiers, paraffinic low-aromatic mineral oil, boric acid alkanolamines, corrosion inhibitors, oil content 40%)
- Test in oil bath (Excellence 416 oil) with alternating oil bath temperature: 130 cycles of 15 to 55 °C, two months
- Cleaning with a high-pressure cleaner according to IP69K: 80 to 100 bar, 10 to 15 cm distance, time per side > 30 s, water temperature 80 °C

To simulate requirements as realistically as possible, the modules were artificially aged prior to the tests by 15 temperature cycles of -25/+85 °C. During the test, the modules were connected to 3RX1 connecting cables. Unassigned connections were closed with 3RK1901-1KA00 sealing caps.

Note:

Sealing caps and M12 connections must be tightened with the correct torque.

Selection and ordering data

	Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
 3RK1400-1CR00-0AA3	**Digital I/O modules, IP68/IP69K – K60R** • 4 inputs/4 outputs • Width 60 mm • IP68/IP69K • Standard assignment • Current carrying capacity - 200 mA (inputs) - 2 A (outputs) • Slave addressing type: Standard address • Modules supplied without mounting plate	2	**3RK1400-1CR00-0AA3**	1	1 unit

Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1901-0CA00	**K60 mounting plates** Suitable for all K60 and K60R compact modules				
	• Wall mounting	►	**3RK1901-0CA00**	1	1 unit
	• Standard rail mounting	►	**3RK1901-0CB01**	1	1 unit
3RK1901-1KA00	**AS-Interface sealing caps M12** For free M12 sockets	►	**3RK1901-1KA00**	100	10 units
3RK1901-2NR21	**AS-Interface M12 feeders, current carrying capacity up to 4 A**				
	For flat cable / For / Cable length / Cable end in feeder				
	AS-i/U_{aux} / M12 socket / -- / Not available	2	**3RK1901-2NR20**	1	1 unit
	AS-i/U_{aux} / M12 cable box / 1 m / Not available	2	**3RK1901-2NR21**	1	1 unit
	AS-i/U_{aux} / M12 cable box / 2 m / Not available	2	**3RK1901-2NR22**	1	1 unit
3RK1901-1NR04	**AS-Interface M12 feeders, 4-fold, current carrying capacity up to 4 A**				
	For flat cable / For / Cable length / Cable end in feeder				
	AS-i/U_{aux} / 4-fold M12 socket, delivery includes mounting plate (for wall and standard rail mounting) / -- / Not available	2	**3RK1901-1NR04**	1	1 unit
3RK1902-4PB15-3AA0	**M12 connecting cables** • 3-pole • For addressing AS-i slaves with M12 bus connection • Cable length 1.5 m	5	**3RK1902-4PB15-3AA0**	1	1 unit

Overview

Compact modules K45

The K45 series of compact modules supplements the large K60 compact modules which have a proven track record in industry. They are the logical consequence for rounding off the bottom end of the existing product range.

The acclaimed advantages of the existing K60 compact modules are fully emulated by the K45 modules. The K45 modules have a substantially smaller basic area and installation depth, however.

Yet in spite of these small dimensions all the modules have large labels and an integrated addressing socket.

Two mounting plates are offered for the K45 compact modules:

- Mounting plate for wall mounting
  This has a hole pattern that is identical to that of the K60 compact modules. This means that K60 compact modules can be mounted together with K45 modules in an aligned arrangement. The shaped cables can be inserted in the recesses of the mounting plates where they cause no hindrance.
- Mounting plate for standard rail mounting

Connection of the AS-Interface shaped cables

The mounting plate and the compact module are joined together by means of a screw, with simultaneous contacting of the AS-Interface cable by the service-proven insulation piercing method.

Now, mounting the AS-Interface shaped cables is in fact easier than ever. The yellow and black AS-Interface shaped cable can be inserted into the mounting plates from the left or right regardless of the position of the coding lug. The correct polarity of the applied voltages is thus guaranteed.

Addressing and connection of the sensors/actuators

Addressing of the K45 compact modules is performed using an addressing socket integrated in the module. The addresses can be assigned even when mounted.

K45 modules with a maximum of four digital inputs and outputs

These compact modules contain up to four M12 standard connections or M8 standard connections for inputs and outputs. Using M12 or M8 standard connectors, a maximum of four sensors and four actuators can be connected to the compact module. Depending on the module, the sockets can be assigned in duplicate.
Pin assignment: Y – i.e. via a socket, two sensors or one sensor/one actuator are connected.

K45 modules with a maximum of eight digital inputs

These modules have eight digital inputs for connection through M12 plugs. The sockets have duplicate assignments.
Pin assignment: Y – i.e. via a socket, two sensors or one sensor/one actuator are connected.

The module requires two AS-Interface addresses for processing all eight inputs. The addresses can be assigned through a double addressing socket integrated in the module.

Selection and ordering data

3RK1400-0GQ20-0AA3

Digital I/O modules, IP67 – K45
- PNP transistor
- Width 45 mm
- Current carrying capacity of the inputs: 200 mA
- Modules supplied without mounting plate

Version						SD d	Article No.	PU (UNIT, SET, M)	PS*
Type	Current carrying capacity of outputs	Slave addressing type	Pin assign-ment	U_{aux} 24 V	Connection methods				
8 inputs[1]	--	A/B	Y	--	M12	2	**3RK2200-0DQ20-0AA3**	1	1 unit
4 inputs	--	Standard	Standard	--	M12	▶	**3RK1200-0CQ20-0AA3**	1	1 unit
	--	Standard	Standard	--	M8	2	**3RK1200-0CT20-0AA3**	1	1 unit
	--	A/B	Standard	--	M12	▶	**3RK2200-0CQ20-0AA3**	1	1 unit
	--	A/B	Standard	--	M8	5	**3RK2200-0CT20-0AA3**	1	1 unit
2 x 2 inputs	--	A/B	Y	--	M12	2	**3RK2200-0CQ22-0AA3**	1	1 unit
2 inputs/ 2 outputs	2 A[2]	Standard	Standard	✓	M12	▶	**3RK1400-1BQ20-0AA3**	1	1 unit
2 x (1 input/ 1 output)	0.2 A	Standard	Y	--	M12	2	**3RK1400-0GQ20-0AA3**	1	1 unit
4 x (1 input/ 1 output)	0.2 A	A/B (spec. V3.0)	Y	--	M12	5	**3RK2400-0GQ20-0AA3**	1	1 unit
	0.5 A	A/B (spec. V3.0)	Y	✓	M12	5	**3RK2400-1GQ20-1AA3**	1	1 unit
4 outputs	1 A	A/B (spec. V3.0)	Standard	✓	M12	2	**3RK2100-1CQ20-0AA3**	1	1 unit
3 outputs	1 A	A/B	Standard	✓	M12	▶	**3RK2100-1EQ20-0AA3**	1	1 unit
4 outputs	1 A	Standard	Standard	✓	M12	▶	**3RK1100-1CQ20-0AA3**	1	1 unit
2 outputs/ 2 inputs	2 A	A/B	Standard	✓	M12	2	**3RK2400-1BQ20-0AA3**	1	1 unit

✓ Available

-- Not available

[1] Module occupies two AS-Interface addresses

[2] The typical current carrying capacity per output increases with version "E12" from 1.5 to 2 A (available since approx. 07/2003).

Safety modules for AS-Interface, see page 14/26 onwards.

Accessories

Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
K45 mounting plates				
• For wall mounting	▶	**3RK1901-2EA00**	1	1 unit
• For standard rail mounting	▶	**3RK1901-2DA00**	1	1 unit
Cable termination pieces For sealing of open cable ends (shaped AS-Interface cable) in IP67	▶	**3RK1901-1MN00**	1	10 units
AS-Interface sealing caps				
• For free M12 sockets	▶	**3RK1901-1KA00**	100	10 units
• For free M8 sockets	2	**3RK1901-1PN00**	100	10 units

3RK1901-2EA00

3RK1901-1MN00

3RK1901-1KA00

3RK1901-1PN00

Overview

Digital I/O modules, IP67 – K20

The K20 compact module series rounds off the AS-Interface compact modules with a particularly slim design and only 20-mm width. Thanks to its extremely compact dimensions, these modules are particularly suited for handling machine applications in the field of production engineering where modules need to be arranged in the smallest of spaces.

Robotics is yet another application area. The K20 modules are connected to the AS-Interface with a round cable with M12 cable box instead of with the AS-Interface flat cable. The AS-Interface bus cable and the 24 V DC auxiliary energy are routed in this case in a shared round cable. This enables extremely compact installation.

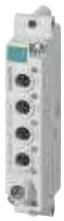
The flexibility of the round cable means that it can also be used on moving machine parts without any problems. The K20 modules are also ideal for such applications as their non-encapsulated design makes them particularly light in weight.

In applications with tow chains, many users rely on placing the AS-Interface bus cable in a round cable. In this case, the K20 modules support direct connection to the round cable. No flat to round cable adapter is required.

The K20 compact module range includes standard AS-Interface modules, as well as an ASIsafe version for the connection of safety-related sensors, such as EMERGENCY STOP pushbuttons or protective door monitoring.

For particularly space-saving dimensions, the sensors and actuators are connected over M8 plug-in connectors. Alternatively, M12 connectors with Y-assignment can be used.

Selection and ordering data



3RK2200-0CT30-0AA3

Version					SD	Article No.	PU (UNIT, SET, M)	PS*
					d			
Digital I/O modules, IP67 – K20								
Width 20 mm								
Type	Current carrying capacity of outputs	Slave addressing type	Pin assignment	Connection methods				
4 inputs	--	A/B	Standard	M8	2	**3RK2200-0CT30-0AA3**	1	1 unit
	--	A/B	Y	M12	5	**3RK2200-0CQ30-0AA3**	1	1 unit
2 inputs/ 2 outputs	1	A/B	Standard	M8	2	**3RK2400-1BT30-0AA3**	1	1 unit
	1	A/B	Y	M12	2	**3RK2400-1BQ30-0AA3**	1	1 unit
4 outputs	1	A/B (spec. V3.0)	Standard	M8	2	**3RK2100-1CT30-0AA3**	1	1 unit
4 inputs/ 4 outputs	1	Standard	Standard	M8	10	**3RK1400-1CT30-0AA3**	1	1 unit
	1	A/B (spec. V3.0)	Standard	M8	2	**3RK2400-1CT30-0AA3**	1	1 unit
2 safe inputs	--	Standard	Y-II	M12	2	**3RK1205-0BQ30-0AA3**	1	1 unit

Safety modules for AS-Interface, see page 14/26 onwards.

Accessories

	Version				SD	Article No.	PU (UNIT, SET, M)	PS*
					d			
3RK1901-1KA00 3RK1901-1PN00	**AS-Interface sealing caps**							
	• For free M12 sockets				▶	**3RK1901-1KA00**	100	10 units
	• For free M8 sockets				2	**3RK1901-1PN00**	100	10 units
3RK1901-2NN10	**AS-Interface compact distributors, for AS-Interface flat cable**				2	**3RK1901-2NN10**	1	1 unit
	Current carrying capacity up to 8 A							
3RX9801-0AA00	**AS-Interface M12 feeders**							
	• Degree of protection IP67							
	• Current carrying capacity up to 2 A							
	For flat cable	For	Cable length	Cable end in feeder				
	AS-i	M12 socket	--	Available	▶	**3RX9801-0AA00**	1	1 unit
3RK1901-2NR10	**AS-Interface M12 feeders**							
	• Degree of protection IP67/IP68/IP69K							
	• Current carrying capacity up to 4 A							
	For flat cable	For	Cable length	Cable end in feeder				
	AS-i	M12 socket	--	Not available	2	**3RK1901-2NR10**	1	1 unit
3RK1901-2NR21	AS-i	M12 cable box	1 m	Not available	2	**3RK1901-2NR11**	1	1 unit
	AS-i	M12 cable box	2 m	Not available	2	**3RK1901-2NR12**	1	1 unit
	AS-i/U_{aux}	M12 socket	--	Not available	2	**3RK1901-2NR20**	1	1 unit
	AS-i/U_{aux}	M12 cable box	1 m	Not available	2	**3RK1901-2NR21**	1	1 unit
	AS-i/U_{aux}	M12 cable box	2 m	Not available	2	**3RK1901-2NR22**	1	1 unit
3RK1901-1NR04	**AS-Interface M12 feeders, 4-fold**							
	Current carrying capacity up to 4 A							
	For flat cable	For	Cable length	Cable end in feeder				
	AS-i/U_{aux}	4-fold M12 socket, delivery includes mounting plate (for wall and standard rail mounting)	--	Not available	2	**3RK1901-1NR04**	1	1 unit
6ES7194-1KA01-0XA0	**M12 Y-shaped coupler plugs**				1	**6ES7194-1KA01-0XA0**	1	1 unit
	For connection of two sensors to one M12 socket with Y-assignment							
3RK1902-4PB15-3AA0	**M12 connecting cables**				5	**3RK1902-4PB15-3AA0**	1	1 unit
	• 3-pole							
	• For addressing AS-i slaves with M12 bus connection							
	• Cable length 1.5 m							

Overview

K60 analog compact module

More information

For the Manual "AS-Interface Analog Modules Profile 7.3/Profile 7.A.9", see https://support.industry.siemens.com/cs/ww/en/view/7643815

AS-Interface analog modules from the K60 compact series detect or issue analog signals locally. These modules are linked to the higher-level controller through an AS-Interface master according to specification V2.1 or specification V3.0.

The analog modules are divided into the following groups:

- Input modules for
  - Sensors with current sensor
  - Sensors with voltage signal
  - Sensors with thermal resistor
- Output modules for
  - Current actuators
  - Voltage actuators

The input modules according to profile 7.3/7.4 are available with two or four input channels. It is possible in addition to convert the two-channel module to using only one input channel, thus enabling very short times before the analog value is available. The conversion is effected by means of a jumper plug at socket 3. The transmission times achieved with analog modules according to Profile 7.A.9 are twice as fast as those achieved with profile 7.3/7.4. Operation is adjustable in this case, e.g. it is possible to choose with the ID1 code whether the module is operated with one or two channels.

The output modules are configured as two-channel modules as standard.

The input and output channels are electrically separated from the AS-Interface network. If sensors with a higher power requirement are to be connected, more power can be supplied through the auxiliary voltage as an alternative to the internal supply.

In the manual "AS-Interface Analog Modules Profile 7.3/Profile 7.A.9", the modules are presented in great detail along with their technical specifications and in-depth notes on operation. Sample function blocks round off the manual, see "More information" above.

Benefits

- Analog modules are just as easy to integrate in AS-Interface as digital modules
- Analog values can be easily detected and issued locally
- Preprocessing of the analog value transfer in the master enables rapid evaluation of the analog values
- Up to four values can be detected using one analog module
- Faster transmission and conversion of analog values thanks to the new option for switching to single-channel operation

In addition, specification V3.0 now also offers:

- A/B technology, now also with analog modules
- On average, double fast transmission times (only 3 or 4 cycles, depending on the resolution selected)
- Variable adjustable mode: 12-bit or 14-bit resolution, single-channel or two-channel, selectable via the ID1 code

Selection and ordering data

3RK1207-1BQ44-0AA3

Version			SD	Article No.	PU (UNIT, SET, M)	PS*
			d			
Analog I/O modules, IP67 – K60, analog profile 7.3 • Slave addressing type: Standard address • Width 60 mm • Modules supplied without mounting plate						
Inputs	Type	Measuring range				
1 or 2 inputs (selectable using jumper plug at socket 3)	Current	4 ... 20 mA or ± 20 mA (selectable)[1]	2	**3RK1207-1BQ40-0AA3**	1	1 unit
	Voltage	± 10 V or 1 ... 5 V (selectable)	2	**3RK1207-2BQ40-0AA3**	1	1 unit
	Thermal resistance	Pt100 or Ni100 or 0 ... 600 Ω (selectable)[1]	2	**3RK1207-3BQ40-0AA3**	1	1 unit
4 inputs	Current	4 ... 20 mA or ± 20 mA (selectable)	2	**3RK1207-1BQ44-0AA3**	1	1 unit
	Voltage	± 10 V or 1 ... 5 V (selectable)	10	**3RK1207-2BQ44-0AA3**	1	1 unit
	Thermal resistance	Pt100 or Ni100 or 0 ... 600 Ω (selectable)	2	**3RK1207-3BQ44-0AA3**	1	1 unit
Outputs	Type	Output range				
2 outputs	Current for 2-wire actuators	4 ... 20 mA or ± 20 mA or 0 ... 20 mA (selectable)[1]	2	**3RK1107-1BQ40-0AA3**	1	1 unit
	Voltage for 2-wire actuators	± 10 V or 0 ... 10 V or 1 ... 5 V (selectable)	2	**3RK1107-2BQ40-0AA3**	1	1 unit

3RK2207-2BQ50-0AA3

Analog I/O modules, IP67 – K60, analog profile 7.A.9 • Slave addressing type: A/B (spec. V3.0) • Width 60 mm • Modules supplied without mounting plate						
Inputs	Type	Measuring range				
1 or 2 inputs (variably adjustable)	Current	4 ... 20 mA or ± 20 mA (selectable)	2	**3RK2207-1BQ50-0AA3**	1	1 unit
	Voltage	± 10 V or 1 ... 5 V (selectable)	2	**3RK2207-2BQ50-0AA3**	1	1 unit

[1] Some modules are available in the extended temperature range (from -25 to 70 °C) and for use in difficult environmental conditions (coated according to environment standard IEC 60721).

Description	SIPLUS article number	Corresponds to module
SIPLUS AS-Interface 2AA, IP67	6AG1107-1BQ40-7AA3	3RK1107-1BQ40-0AA3
SIPLUS AS-Interface 2AI, IP67	6AG1207-1BQ40-7AA3	3RK1207-1BQ40-0AA3
SIPLUS AS-Interface 2AI, IP67	6AG1207-3BQ40-7AA3	3RK1207-3BQ40-0AA3

For more information, see www.siemens.com/siplus-extreme.

Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1901-0CA00	**K60 mounting plates**				
	• Wall mounting	▶	**3RK1901-0CA00**	1	1 unit
	• Standard rail mounting	▶	**3RK1901-0CB01**	1	1 unit
3RK1901-1KA00	**M12 sealing caps**	▶	**3RK1901-1KA00**	100	10 units
3RK1902-0AR00	**Sealing sets** • For K60 mounting plate and distributor • Cannot be used for K45 mounting plate • One set contains one straight and one shaped seal	2	**3RK1902-0AR00**	100	5 units
3RK1901-1AA00	**Jumper plugs** For changing over the two channel input modules	2	**3RK1901-1AA00**	1	1 unit

Overview

SC17.5F, SC17.5 and SC22.5 SlimLine Compact modules

F90 module

Flat module

For AS-Interface applications inside control cabinets, there are various module series for the most diverse requirements:

- SlimLine Compact – particularly slim design ideal for space-saving use in the control cabinet
- F90 module – particularly flat design for flat control boxes
- Flat module – special design for integration into customer-specific solutions

The existing SlimLine series of modules S22.5 and S45 are being replaced by the innovative new devices in the SlimLine Compact SC17.5, SC17.5F and SC22.5 series. The previous SlimLine modules are still available as replacements for existing systems.

Available versions

The following table provides an overview of the key features of the different series of control cabinet modules.

Feature	SlimLine Compact	F90 module	Flat module
Digital I/O	✓	✓	✓
Analog I/O	✓	--	--
Safe inputs	✓	--	--
Relay outputs	✓	--	--
Addressing method A/B address	✓	--	--
Mounting onto TH 35 standard mounting rail according to IEC 60715	✓	✓	--
Wall mounting using push-in lugs	✓	--	--
Integrated lugs for screw fixing	--	--	✓
Width in mm	17.5 or 22.5	90	80

✓ Available

-- Not available

Overview

SlimLine Compact modules

SC17.5 and SC22.5 SlimLine Compact modules with screw terminals

SlimLine Compact module SC22.5 with connector with screw terminals

The AS-Interface module series for the control cabinet SlimLine Compact with degree of protection IP20 creates space in the cabinet and in distributed local control boxes. A width of just 17.5 mm or 22.5 mm ensures considerable space savings in the control cabinet.

The SlimLine Compact module series comprises not only digital and analog I/O modules but also ASIsafe modules with safe inputs. Digital outputs are available as solid-state and relay outputs.

Sensors and actuators, as well as the AS-Interface bus cable, are connected by means of removable screw or push-in spring-loaded terminals. Device connectors available as accessories offer the possibility of looping through the AS-Interface bus cable and the 24 V DC power supply U_{aux} from one module to additional modules. This significantly simplifies the wiring, as the AS-Interface bus cable and U_{aux} only have to be connected to one device.

All devices for the connection of 3-wire sensors offer the option of supplying the sensors either from the AS-Interface bus cable or alternatively from the 24 V DC voltage supply U_{aux} depending on the requirements of the particular application. A slide switch is used to make the selection. If supply via U_{aux} is selected, the wiring of the sensor terminals remains unchanged. This means that no external supply is required for the sensors.

All modules have LEDs on the front that provide diagnostics information and indicate the status of the module inputs and outputs. Devices with semiconductor outputs indicate the status of each output by means of a dual LED. Thus the status (on/off/overload) is displayed for each output. An addressing socket integrated at the front enables the module to be addressed also when it is installed. Integrated adapters permit mounting onto a standard mounting rail – either directly for the module or for the device connector. Alternatively, the modules can also be screw-mounted using push-in lugs (accessories). These lugs for screw fastening must be ordered separately.

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit

More information

For the Equipment Manual "SlimLine Compact Modules", see https://support.industry.siemens.com/cs/ww/en/view/109481489

Version I/O type	Width	Inputs	Outputs	SD	Screw terminals	SD	Spring-loaded terminals (push-in)
	mm			d	Article No.	d	Article No.
SC17.5 and SC22.5 digital SlimLine Compact modules							
Slave addressing type: A/B address							
4 inputs	17.5	2-wire	--	2	**3RK2200-0CE00-2AA2**	2	**3RK2200-0CG00-2AA2**
	22.5	3-wire	--	2	**3RK2200-2CE00-2AA2**	2	**3RK2200-2CG00-2AA2**
4 outputs	22.5	--	2A solid-state	2	**3RK2100-1CE00-2AA2**	2	**3RK2100-1CG00-2AA2**
4 inputs/ 2 outputs, relays	22.5	3-wire	Relay (change-over contact)	2	**3RK2402-2ME00-2AA2**	2	**3RK2402-2MG00-2AA2**
4 inputs/ 4 outputs, relays	22.5	3-wire	Relay (NO contacts)	2	**3RK2402-2CE00-2AA2**	2	**3RK2402-2CG00-2AA2**
4 inputs/ 4 outputs	22.5	3-wire	2A solid-state	2	**3RK2400-2CE00-2AA2**	2	**3RK2400-2CG00-2AA2**
Slave addressing type: Standard address							
4 inputs/ 4 outputs	22.5	3-wire	2A solid-state	2	**3RK1400-2CE00-2AA2**	2	**3RK1400-2CG00-2AA2**
SC22.5 analog SlimLine Compact modules							
Slave addressing type: Standard address							
4 inputs	22.5	Voltage/ current selectable (1 ... 5 V, ± 10 V, 4 ... 20 mA, ± 20 mA)	--	2	**3RK1207-0CE00-2AA2**	2	**3RK1207-0CG00-2AA2**
		Thermal resistance (Pt100, Ni100, 0 ... 600 Ω)	--	2	**3RK1207-3CE00-2AA2**	2	**3RK1207-3CG00-2AA2**
2 outputs	22.5	--	Voltage/ current selectable (0 ... 10 V, 1 ... 5 V, ± 10 V, 0 ... 20 mA, 4 ... 20 mA, ± 20 mA)	2	**3RK1107-0BE00-2AA2**	2	**3RK1107-0BG00-2AA2**
SC17.5F ASIsafe SlimLine Compact modules							
Slave addressing type: Standard address							
2 safe inputs	17.5	For mechanical contacts	--	2	**3RK1205-0BE00-2AA2**	2	**3RK1205-0BG00-2AA2**
2 safe inputs/ 2 standard outputs	17.5	For mechanical contacts	Solid-state, U_{ASI}/U_{aux} supply selectable	2	**3RK1405-2BE00-2AA2**	2	**3RK1405-2BG00-2AA2**

3RK2200-0CG00-2AA2

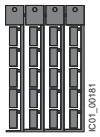
3RK2400-2CG00-2AA2

3RK1207-0CG00-2AA2

3RK1405-2BG00-2AA2

Safety modules for AS-Interface, see page 14/26 onwards.

Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1901-1YA00 3RK1901-1YA10	**Device connectors**				
	For electrical connection of SlimLine Compact modules (connects AS-i bus cable and 24 V DC auxiliary power supply U_{aux} when using several SlimLine Compact modules)				
	• Width 17.5 mm	2	**3RK1901-1YA00**	1	1 unit
	• Width 22.5 mm	2	**3RK1901-1YA10**	1	1 unit
3RK1901-1YA01 3RK1901-1YA11	**Device termination connectors**				
	Required for the last module in the network				
	• Width 17.5 mm	2	**3RK1901-1YA01**	1	1 unit
	• Width 22.5 mm	2	**3RK1901-1YA11**	1	1 unit
3ZY1121-2BA00	**Removable terminals**		**Screw terminals**		
	• Screw terminals up to 2 x 1.5 mm² or 1 x 2.5 mm²				
	- 2-pole	2	**3ZY1121-1BA00**	1	6 units
	- 4-pole	2	**3ZY1141-1BA00**	1	6 units
			Spring-loaded terminals (push-in)		
	• Push-in terminals up to 2 x 1.5 mm²				
	- 2-pole	2	**3ZY1121-2BA00**	1	6 units
	- 4-pole	2	**3ZY1141-2BA00**	1	6 units
3ZY1450-1BA00 3ZY1450-1AB00	**Hinged cover**				
	Replacement for SlimLine Compact module, without terminal labeling				
	• Width 17.5 mm				
	- Titanium gray for SC17.5	2	**3ZY1450-1AA00**	1	5 units
	- Yellow for SC17.5F	2	**3ZY1450-1BA00**	1	5 units
	• Width 22.5 mm				
	- Titanium gray for SC22.5	2	**3ZY1450-1AB00**	1	5 units
3ZY1311-0AA00	**Push-in lugs for wall mounting**	2	**3ZY1311-0AA00**	1	10 units
	Two lugs are required per device				
3ZY1440-1AA00	**Coding pins for removable terminals**	2	**3ZY1440-1AA00**	1	12 units
	For mechanical coding of the terminals				
 3RT2900-1SB20	**Blank labels**				
	Unit labeling plates[1]				
	• 10 mm x 7 mm, titanium gray	20	**3RT2900-1SB10**	100	816 units
	• 20 mm x 7 mm, titanium gray	20	**3RT2900-1SB20**	100	340 units
3RA2908-1A	**Tools for opening spring-loaded terminals**		**Spring-loaded terminals**		
	Screwdriver for SIRIUS devices with spring-loaded terminals	2	**3RA2908-1A**	1	1 unit
	3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated				

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see page 16/15).

More information

SlimLine modules S45 (picture on left) and S22.5 module (picture on right) with spring-loaded terminals

The existing SlimLine series of I/O modules for use in the control cabinet is being replaced by the new, innovative SlimLine Compact series. We recommend that these new devices are used in future.

The Cross reference table indicates the best options for replacing the existing SlimLine devices with SlimLine Compact devices.

Note:

The previous SlimLine devices are still available for use as replacements in existing systems. As a result of the innovation, the new SlimLine Compact devices are not fully compatible in terms of either mechanical dimensions or electrical properties.

The Cross reference table below links the existing S22.5, S22.5F and S45 SlimLine modules with the new SC17.5, SC17.5F and SC22.5 SlimLine Compact devices.

Cross reference table

S22.5, S22.5F and S45 SlimLine			**Comparison type: SC17.5, SC17.5F and SC22.5 SlimLine Compact**		
Screw terminals	Spring-loaded terminals	Version	Screw terminals	Spring-loaded terminals	Version
3RK1200-0CE00-0AA2	3RK1200-0CG00-0AA2	4 DI, 2-wire, standard address	3RK2200-0CE00-2AA2	3RK2200-0CG00-2AA2	4 DI, 2-wire, A/B address
3RK2200-0CE02-0AA2	3RK2200-0CG02-0AA2	4 DI, A/B address	3RK2200-2CE00-2AA2	3RK2200-2CG00-2AA2	4 DI, A/B address
3RK1200-0CE02-0AA2	3RK1200-0CG02-0AA2	4 DI, standard address			
3RK1400-0BE00-0AA2	3RK1400-0BG00-0AA2	2 DI / 2 DQ, standard address	3RK1400-2CE00-2AA2	3RK1400-2CG00-2AA2	4 DI / 4 DQ, standard address
3RK1402-0BE00-0AA2	3RK1402-0BG00-0AA2	2 DI / 2 DQ relay, standard address	3RK2402-2ME00-2AA2	3RK2402-2MG00-2AA2	4 DI / 2 DQ relay, A/B address
3RK1100-1CE00-0AA2	3RK1100-1CG00-0AA2	4 DQ, standard address	3RK2100-1CE00-2AA2	3RK2100-1CG00-2AA2	4 DQ, A/B address
3RK2400-1CE01-0AA2	3RK2400-1CG01-0AA2	4 DI / 4 DQ, A/B address	3RK2400-2CE00-2AA2	3RK2400-2CG00-2AA2	4 DI / 4 DQ, A/B address
3RK2400-1FE00-0AA2	3RK2400-1FG00-0AA2	4 DI / 3 DQ, A/B address			
3RK1400-1CE00-0AA2	3RK1400-1CG00-0AA2	4 DI / 4 DQ, 1A solid-state, standard address	3RK1400-2CE00-2AA2	3RK1400-2CG00-2AA2	4 DI / 4 DQ, 2A solid-state, standard address
3RK1400-1CE01-0AA2	3RK1400-1CG01-0AA2	4 DI / 4 DQ, 2A solid-state, standard address			
3RK1402-3CE01-0AA2	3RK1402-3CG01-0AA2	4 DI / 4 DQ (sensor supply from U_{aux}), standard address			
3RK1402-3CE00-0AA2	3RK1402-3CG00-0AA2	4 DI / 4 DQ relay, standard address	3RK2402-2CE00-2AA2	3RK2402-2CG00-2AA2	4 DI / 4 DQ relay, A/B address
3RK1205-0BE00-0AA2	3RK1205-0BG00-0AA2	2 F-DI, standard address	3RK1205-0BE00-2AA2	3RK1205-0BG00-2AA2	2 F-DI, standard address
3RK1405-0BE00-0AA2	3RK1405-0BG00-0AA2	2 F-DI / 2 DQ, standard address (outputs supplied from U_{ASI})	3RK1405-2BE00-2AA2	3RK1405-2BG00-2AA2	2 F-DI / 2 DQ, standard address (supply U_{ASI}/U_{aux} selectable)
3RK1405-1BE00-0AA2	3RK1405-1BG00-0AA2	2 F-DI / 2 DQ, standard address (outputs supplied from U_{aux})			

Selection and ordering data

3RG9002-0DB00

F90 module

- Slave addressing type: Standard address
- Width 90 mm
- With COMBICON version:
  Delivery without COMBICON plug

Version				SD	Article No.	PU (UNIT, SET, M)	PS*
				d			
F90 module							
Type	Connection	Inputs	Outputs				
4 inputs/ 4 out-puts	Screw	2- and 3-wire PNP transistor	PNP transistor 1 A	5	**3RG9002-0DB00**	1	1 unit
		2- and 3-wire PNP transistor	PNP transistor 2 A	5	**3RG9002-0DA00**	1	1 unit
		2- and 3-wire PNP transistor floating	PNP transistor 2 A	5	**3RG9002-0DC00**	1	1 unit
	COMBICON[1)]	2- and 3-wire PNP transistor	PNP transistor 1 A	5	**3RG9004-0DB00**	1	1 unit
		2- and 3-wire PNP transistor	PNP transistor 2 A	5	**3RG9004-0DA00**	1	1 unit
		2- and 3-wire PNP transistor floating	PNP transistor 2 A	5	**3RG9004-0DC00**	1	1 unit

1) Scope of supply does not include COMBICON connector set 3RX9810-0AA00, this must be ordered separately, see "Accessories".

Accessories

Version	SD	Article No.	PU (UNIT, SET, M)	PS*
	d			
COMBICON connector sets For 4I/4O modules with COMBICON connection; one set comprises: • 4 x 5-pole plug for connection • Standard sensors/actuators • 2 x 4-pole plug for AS-Interface and external auxiliary voltage	5	**3RX9810-0AA00**	1	1 unit

Overview

Flat module 4I/4O

The flat module for the control cabinet in degree of protection IP20 has four inputs and four outputs.

The module is fitted at the front with an LED which indicates the module's status.

With the integrated lugs, the modules can be screwed on.

An integrated addressing socket enables the module to be addressed when it is installed.

Standard sensors/actuators and the AS-Interface cable can be connected using screw terminals.

Selection and ordering data

	Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*
			Article No.		
		d			
3RK1400-0CE00-0AA3	**Flat module 4I/4O** Slave addressing type: Standard address • 4 inputs/4 outputs • 200 mA for all I/Os	2	**3RK1400-0CE00-0AA3**	1	1 unit

Overview

Counter module with spring-loaded terminals

The counter module is used to send hexadecimally coded count values (LSB=D0, MSB=D3) to a higher-level controller. The count value is increased by 1 for each valid count pulse at terminal 8. Beginning at 0, the module counts up to 15 and then begins again at 0. The controller adopts the current value and determines the number of pulses between two host invocations through subtraction from the previous value. The total number of count pulses is determined by adding these differences.

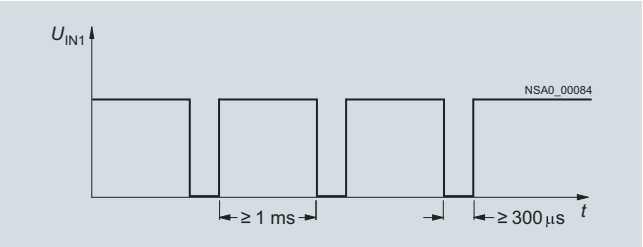
For the values sent to be unambiguous, no more than 15 count values are allowed between two host invocations or AS-Interface master invocations at terminal 8. The maximum permissible transmission frequency is calculated from these times:

$f_{TRmax} = 15 / T_{max}$

T_{max}: max. possible transmission time from the slave to the host

A further condition for the maximum frequency is the required pulse shape. For the counter to accept a pulse as valid, a Low must have been applied at the input for at least 300 µs and a High for at least 1 ms.

This results in a maximum frequency of f_{Zmax} = 1 / 1.3 ms = 769 Hz independently of the control system (see figure below).



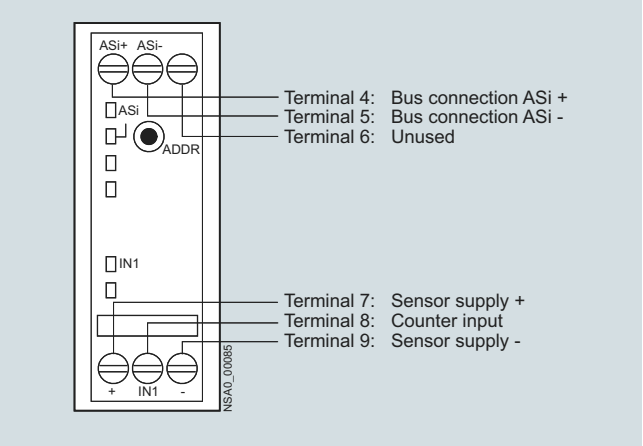
Maximum frequency for the counter module

If the time criterion stipulated in the figure is violated, the count value is rejected.

The counter is active only for the reset parameter P2 (default). The counter is deleted when P2 is set, and the incoming count pulses are not registered until after P2 is reset again.

Note:

A customized function block is necessary or must be programmed.



Counter module connection options

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
	Counter modules				
	Slave addressing type: Standard address				
	Width 22.5 mm				
	• With screw terminals	10	**3RK1200-0CE03-0AA2**	1	1 unit
	• With spring-loaded terminals	10	**3RK1200-0CG03-0AA2**	1	1 unit

3RK1200-0CG03-0AA2

Overview

Ground-fault detection module with spring-loaded terminals

"Ground faults in any control circuit must not lead to unintentional starting or potentially hazardous movements or prevent the machine from stopping." (IEC 60204-1 / VDE 0113-1).

The AS-Interface ground-fault detection module is used to meet these requirements. Using this module from the SlimLine series, ground faults in AS-Interface systems can be reliably detected and reported.

The following ground faults are detected:

- Ground fault from AS-i "+" to ground
- Ground fault from AS-i "-" to ground
- Ground fault on sensors and actuators that are supplied from the AS-Interface voltage

Note:

Not suitable for AS-i Power24V.

Check whether the AS-i power supply unit or the AS-i master module, etc. features integrated ground-fault detection, and therefore whether a separate ground fault detection module can be omitted.

It should be noted that an AS-i cable segment behind an AS-i repeater requires its own ground-fault monitoring.

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1408-8KG00-0AA2	**Ground-fault detection modules**				
	Module does not require an AS-i address				
	Width 22.5 mm				
	• With screw terminals	5	**3RK1408-8KE00-0AA2**	1	1 unit
	• With spring-loaded terminals	5	**3RK1408-8KG00-0AA2**	1	1 unit

Overview

AS-Interface overvoltage protection module

The AS-Interface overvoltage protection module (protection module) protects downstream AS-Interface devices or individual sections in AS-i networks from conducted overvoltages which can be caused by switching operations and remote lightning strikes. The location of the protection module forms the transition from zone 1 to 2/3 within the lightning protection zone concept. Direct lightning strikes must be coped with using additional protective measures at the transitions from lightning protection zone 0A to 1.

With the AS-Interface overvoltage protection module, it is now also possible to integrate AS-Interface in the overall overvoltage protection concept of a plant or machine.

The module has the same design and degree of protection (IP67) as the AS-Interface K45 compact modules. It is a passive module and as such does not need its own address on the AS-Interface network. The module can be used to protect the AS-Interface cable and the cable for the auxiliary voltage from overvoltage. Overvoltages are discharged through a ground cable with a green/yellow oil-proof outer sheath. This cable is fixed in the module and must be connected with low resistance to the system's ground.

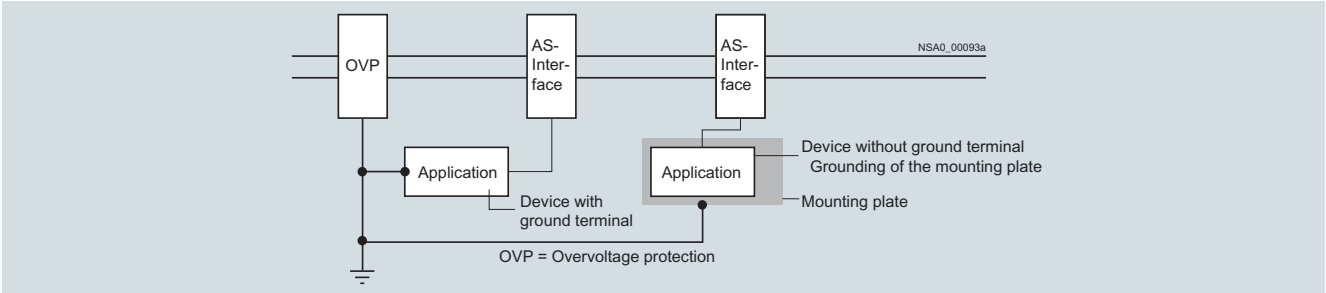
Rated discharge current I_{sn}

The rated discharge current is the peak value of a surge current of the form 8/20 µs (microseconds), for which the protection module is designed in accordance with a specified test program. With an 8/20 waveform, 100% of the value is achieved after 8 µs and 50% after 20 µs.

Protection level U_p

The protection level of a protection module is the highest momentary value of the voltage at the terminals, established in individual tests and characterizes the capability of a protection module to limit overvoltages to a residual level.

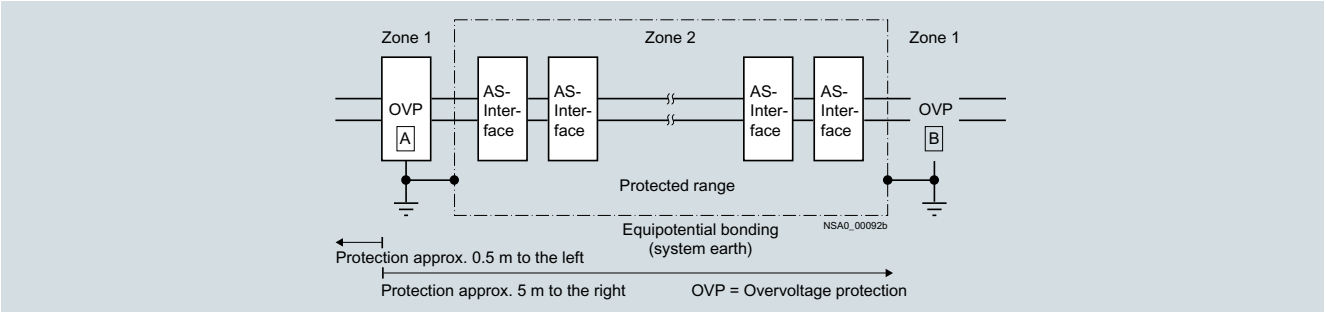
Configuration guidelines



The grounding of protection modules and the units to be protected must be effected through a shared grounding point.

If insulated devices are protected, their mounts must be included in the grounding points.

Sample application



Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
	AS-Interface overvoltage protection module Module does not require an AS-i address Delivery includes mounting plate (for wall and standard rail mounting)	5	**3RK1901-1GA01**	1	1 unit

Overview

AS-Interface power supply unit for 3 A

More information

Operating instructions for AS-i power supply units, see https://support.industry.siemens.com/cs/ww/en/view/21489904 and https://support.industry.siemens.com/cs/ww/en/view/22317836

AS-Interface power supply units feed 30 V DC into the AS-Interface cable and supply the AS-Interface components. They include power-optimized data decoupling for the separation of communication signals and supply voltage. As the result, AS-Interface is able to convey both data and power along a single line. The power supply units are resistant to overload and short circuits.

Dimensions

AS-Interface power supply units have compact dimensions in widths of 50/70/120 mm. No distances from other devices need to be observed when mounting the power supply units.

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 detected and reported 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: Using relay contacts, a ground fault can be signaled and evaluated by a central controller 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/two-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-powered systems or in systems with UPS (uninterruptible power supply).
- Removable terminal blocks with spring-loaded terminals: For easy exchanging of devices, each power supply unit has three removable terminal blocks: 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 in order to operate AS-Interface
- Compact, space-saving dimensions
- Reliable power supply even for large numbers of AS-Interface modules with a high power requirement
- Integrated ground-fault and overload detection saves the need for additional components and enhances safety
- 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)

Selection and ordering data

3RX9501-0BA00

3RX9503-0BA00

Version		SD	Spring-loaded terminals	PU (UNIT, SET, M)	PS*
		d	Article No.		
AS-Interface power supply units, IP20 • AS-i single output 30 V DC • With integrated ground-fault detection • Ambient temperature during operation -10 ... +70 °C • 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	Input voltage				
3 A	120/230 V AC (selectable)	▶	**3RX9501-0BA00**	1	1 unit
5 A	120/230 V AC (selectable)	▶	**3RX9502-0BA00**	1	1 unit
8 A	120/230 ... 500 V AC (selectable)	▶	**3RX9503-0BA00**	1	1 unit
For special applications					
3 A	24 V DC	▶	**3RX9501-1BA00**	1	1 unit
2.6 A/max. 100 W	120/230 V AC (selectable)	2	**3RX9501-2BA00**	1	1 unit

Overview

PSN130S 30 V power supply units for 3 A, 4 A and 8 A

More information

For operating instructions and other technical information, see https://support.industry.siemens.com/cs/ww/en/view/64364000 and https://support.industry.siemens.com/cs/ww/en/view/44030789

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. Data decoupling modules are needed in addition therefore to separate communication signals and control supply voltage, see page 14/77 or 14/79.

The power supply units are resistant to overload and short circuits.

Dimensions

The 30 V power supply units have compact dimensions with widths of 50 and 70 mm. No distances from other devices need to be observed when mounting the power supply units.

Features

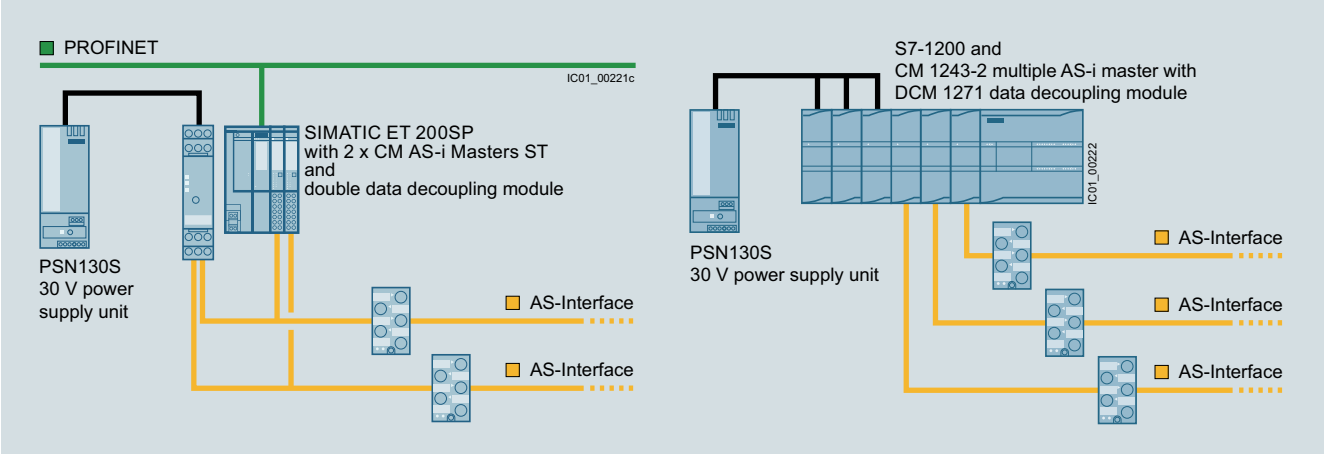
- Primary clocked power supply units for connection to a single-phase AC network
- Power for currents of 3 A, 4 A and 8 A
- The output voltage is floating, and resistant to short-circuits and no-load operation. If there is an overload, the output voltage is reduced or cut-off. After a short-circuit or overload, the devices 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 a high power requirement
- Can be used world-wide thanks to, for example, UL/CSA approval (UL 508)

Application

Configuration examples of AS-Interface networks with a 30 V power supply unit



Configuration of AS-Interface multiple networks with one PSN130S 30 V power supply unit (examples with schematic representation):
Left: Double network based on the S22.5 double data decoupling module and a SIMATIC ET 200SP with two CM AS-i Master ST modules
Right: Triple network based on the SIMATIC S7-1200 with DCM 1271 data decoupling modules and CM 1243-2 communication processors

Technical specifications

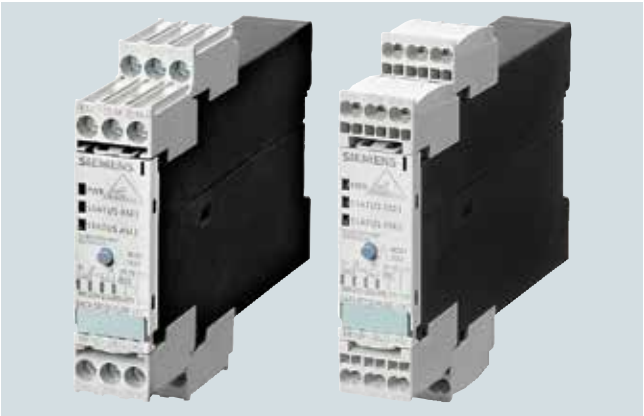
PSN130S 30 V DC power supply unit		3 A	4 A	8 A
Input data				
• Input voltage, rated value U_e	V AC	120/230 V, single-phase, automatic selection		
• Range of input voltage	V AC	85 ... 132/174 ... 264		
• Mains frequency	Hz	50/60		
• Power consumption at full load, typ.	W	103	139	270
Output data				
• Output voltage, rated value U_a	V DC	30		
• Residual ripple	mV_{pp}	< 150		
• Output current, rated value at -20 ... +60 °C	A	3	4	8
• Max. output current at +60 ... +70 °C	A	3	3	4
Degree of efficiency in rated conditions				
• Degree of efficiency	%	87	88	90
• Power loss, typ.	W	12	17	25
Protection and monitoring				
• Output overvoltage protection	V	< 37		
• Current limiting, typ.	A	4	5.5	11
Safety				
• Primary/secondary electrical separation		Output voltage PELV/SELV according to IEC 60950 and EN 50178		
• Protection class		I		
• Degree of protection		IP20		

PSN130S 30 V DC power supply unit		3 A	4 A	8 A
Approvals				
• UL		UL 508/CSA 22.2		
• Pollution degree		IEC 60950		
• Overvoltage category and electrical separation		EN 50178 and IEC 61558		
EMC				
• Emitted interference (class B)		IEC 61000-6-3		
• Line harmonics limit		IEC 61000-3-2		
• Interference immunity		IEC 61000-6-2		
Operating data				
Ambient temperature				
• Operation	°C	-20 ... +70		
• Transport/storage	°C	-40 ... +85		
Pollution degree		2		
Humidity class		Climate class according to DIN 50010, relative air humidity max. 100%, without condensation		
Dimensions and weight				
• Width	mm	50	50	70
• Height x depth	mm	125 x 126.5		
• Weight	kg	0.4	0.4	0.7

Selection and ordering data

	Version		SD	Screw terminals	PU (UNIT, SET, M)	PS*
			d	Article No.		
3RX9511-0AA00	**PSN130S 30 V DC power supply unit (without AS-i data decoupling)** • Output voltage 30 V DC • Dimensions: Width: 50 mm (3 A/4 A); 70 mm (8 A); Height: 125 mm; Depth: 126.5 mm					
	Output current	Input voltage				
	3 A	120/230 V AC (automatic selection)	2	**3RX9511-0AA00**	1	1 unit
3RX9512-0AA00	4 A	120/230 V AC (automatic selection)	2	**3RX9512-0AA00**	1	1 unit
3RX9513-0AA00	8 A	120/230 V AC (automatic selection)	2	**3RX9513-0AA00**	1	1 unit

Overview



AS-Interface S22.5 double data decoupling module:
Screw terminal version (picture left),
Spring-loaded terminal version (picture right)

More information

Operating instructions, see https://support.industry.siemens.com/cs/ww/en/view/44030789

More information on AS-i Power24V, see System Manual "AS-Interface", https://support.industry.siemens.com/cs/ww/en/view/26250840

With the aid of the S22.5 data decoupling module, the AS-Interface network can also be supplied with 24 V DC or 30 V DC from a standard power supply unit and the transmission of data and power can be realized along one cable.

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.

Features of the S22.5 data decoupling unit

- Degree of protection IP20
- Narrow design: 22.5 mm wide
- Version with screw or spring-loaded terminals
- Versions for single and double data decoupling
- Supply of several AS-i networks with a single power supply unit
- Operation with 24 V DC or 30 V DC, grounded or non-grounded
- Adjustable current limiting up to 2 x 4 A
- Integrated ground-fault detection with fault storage, display can optionally be switched off
- Diagnostics LEDs and signaling contacts
- RESET by button or remote RESET

Ground-fault detection

The integrated ground-fault detection works with a grounded and non-grounded supply: The connection of negative pole and ground (upstream from the data decoupling module) customary with 24 V DC power supplies is permitted. A ground fault to the negative or positive pole on the AS-Interface network (downstream from the data decoupling module) is detected and stored as a fault and will be signaled using LEDs and a relay contact.

Using the ground-fault detection in the AS-i master is recommended for non-grounded supply. In this case, the ground-fault indicator can be deactivated in the data decoupling unit to avoid any unwanted LED messages.

Benefits

- Compatible expansion of the AS-Interface system
- An existing standard power supply unit with 24 V DC or 30 V DC can be used for supplying AS-i networks
- The AS-Interface system can also be used in tightly budgeted applications because no AS-Interface power supply unit needs to be purchased
- Applications benefit in addition from the advantages of a modern bus system:
  - High level of standardization
  - Additional diagnostics and maintenance information
  - Faster commissioning
- Easy and cost-efficient design of single and multiple networks is possible

Application

The AS-Interface data decoupling module is designed for AS-Interface networks with 30 V or 24 V supply (AS-i Power24V).

Operation of an AS-i network with the data decoupling module and a 30 V standard power supply unit is technically equivalent to the use of an AS-Interface power supply unit and offers the service-proven features of AS-Interface for all applications.

AS-Interface Power24V uses a 24 V power supply unit in conjunction with a data decoupling module and is particularly suitable for:

- Compact machines using AS-Interface input/output modules
- Applications in the control cabinet for AS-Interface integration of SIRIUS 3RT2 contactors using 3RA27 function modules

When using the double data decoupling module or other data decoupling units, several AS-Interface networks can be operated with a single power supply unit. This results in an additional cost advantage.

Note:

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 mV_{pp}, and in the event of a fault must limit the output voltage to a maximum of 40 V.

We recommend

- SITOP power supplies, see Catalog KT10.1 https://support.industry.siemens.com/cs/ww/en/view/109745655
- PSN130S 30 V power supply units, see page 14/75

Note on AS-i Power24V:

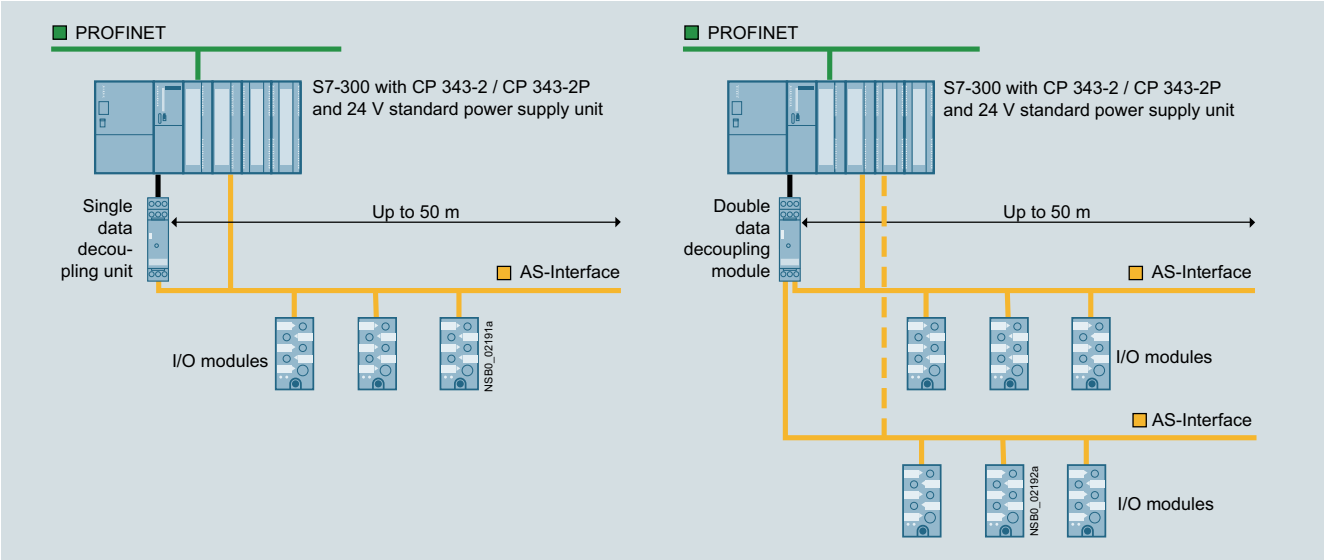
The length of an AS-i Power24V network is restricted to 50 m in order to limit the voltage drop along the cable.

AS-i masters, AS-i slaves and the sensors and actuators supplied through the AS-i cable must be designed for the reduced voltage. Sensors and actuators for the standard voltage range of 10 to 30 V can be supplied with sufficient voltage.

Please also observe the requirements specified in "Extension of AS-i Power24V" for implementation of AS-i Power24V, see page 14/21.

For more information on AS-i Power24V, see "AS-Interface System Manual", https://support.industry.siemens.com/cs/ww/en/view/26250840.

Construction of an AS-i Power24V network with an AS-Interface S22.5 data decoupling module



Left: single network, right: Multiple network

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1901-1DE12-1AA0	**S22.5 data decoupling modules** With screw terminals, removable terminals, width 22.5 mm, height 101 mm, depth 115 mm		**Screw terminals**		
	• Single data decoupling module, 1 x 4 A	2	**3RK1901-1DE12-1AA0**	1	1 unit
	• Double data decoupling module, 2 x 4 A	2	**3RK1901-1DE22-1AA0**	1	1 unit
3RK1901-1DG12-1AA0	**S22.5 data decoupling modules** With spring-loaded terminals, removable terminals, width 22.5 mm, height 105 mm, depth 115 mm		**Spring-loaded terminals**		
	• Single data decoupling module, 1 x 4 A	▶	**3RK1901-1DG12-1AA0**	1	1 unit
	• Double data decoupling module, 2 x 4 A	▶	**3RK1901-1DG22-1AA0**	1	1 unit

Overview

DCM 1271 data decoupling module for SIMATIC S7-1200

More information

Equipment Manual AS-i Master CM 1243-2 and AS-i Data Decoupling Unit DCM 1271 for SIMATIC S7-1200, see https://support.industry.siemens.com/cs/ww/en/view/44030789

More information on AS-i Power24V, see System Manual "AS-Interface", https://support.industry.siemens.com/cs/ww/en/view/26250840

With the aid of the DCM 1271 data decoupling module, the AS-Interface network can also be supplied with 24 V DC or 30 V DC from a standard power supply unit and the transmission of data and power can be realized along one cable.

The DCM 1271 data decoupling module has the same enclosure design as the S7-1200 module and is therefore ideal for combining with the CM 1243-2 AS-i master.

The DCM 1271 data decoupling module has no connection to the backplane bus of the SIMATIC S7-1200 and is not counted as a communication module when calculating the maximum configuration.

Features of the DCM 1271 data decoupling module

- Design: S7-1200, 30 mm wide, degree of protection IP20
- Detachable terminals (scope of supply)
- Single data decoupling
- Supply of several AS-i networks with a single power supply unit
- Operation with 24 V DC or 30 V DC, grounded or non-grounded
- Current limiting at 4 A
- Integrated ground-fault detection
- Diagnostics LEDs for ground faults and overloads
- Signaling contacts for ground-fault detection

Ground-fault detection

The integrated ground-fault detection works with a grounded and non-grounded supply: The connection of negative pole and ground (upstream from the data decoupling module) customary with 24 V DC power supplies is permitted. A ground fault to the negative or positive pole on the AS-Interface network (downstream of the data decoupling module) is identified and signaled via LED and a transistor output.

Benefits

- An existing standard power supply unit with 24 V DC or 30 V DC can be used for supplying AS-i networks
- The AS-Interface system can also be used in tightly budgeted applications because no AS-Interface power supply unit needs to be purchased
- Applications benefit in addition from the advantages of a modern bus system:
  - High level of standardization
  - Additional diagnostics and maintenance information
  - Faster commissioning

Application

The AS-Interface data decoupling module is designed for AS-Interface networks with 30 V or 24 V supply (AS-i Power24V).

Operation of an AS-i network with the data decoupling module and a 30 V standard power supply unit is technically equivalent to the use of an AS-Interface power supply unit and offers the service-proven features of AS-Interface for all applications.

AS-i Power24V uses a 24 V power supply unit in conjunction with a data decoupling module and is particularly suitable for

- Compact machines using AS-Interface input/output modules
- Applications in the control cabinet for AS-Interface integration of SIRIUS 3RT2 contactors using 3RA27 function modules

Note:

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 mV_{pp}, and in the event of a fault must limit the output voltage to a maximum of 40 V.

We recommend

- SITOP power supplies, see Catalog KT10.1 https://support.industry.siemens.com/cs/ww/en/view/109745655
- PSN130S 30 V power supply units, see page 14/75

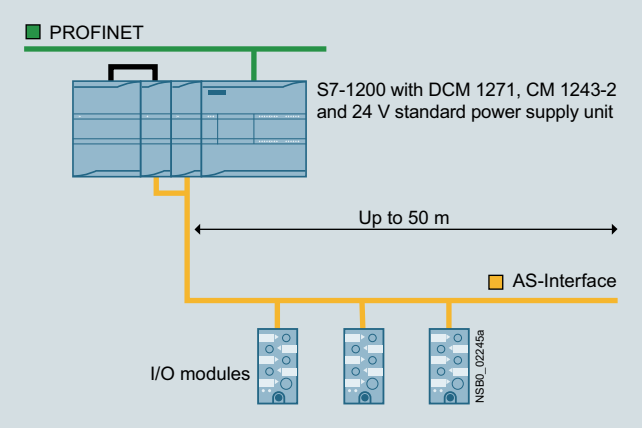
Note on AS-i Power24V:

The length of an AS-i Power24V network is restricted to 50 m in order to limit the voltage drop along the cable.

AS-i masters, AS-i slaves and the sensors and actuators supplied through the AS-i cable must be designed for the reduced voltage. Sensors and actuators for the standard voltage range of 10 to 30 V can be supplied with sufficient voltage.

Please also observe the requirements specified in "AS-i Power24V" for the operation of AS-i Power24V, see page 14/21.

For more information on AS-i Power24V, see "AS-Interface System Manual", https://support.industry.siemens.com/cs/ww/en/view/26250840.



Configuration of an AS-i Power24V network with DCM 1271 AS-Interface data decoupling unit

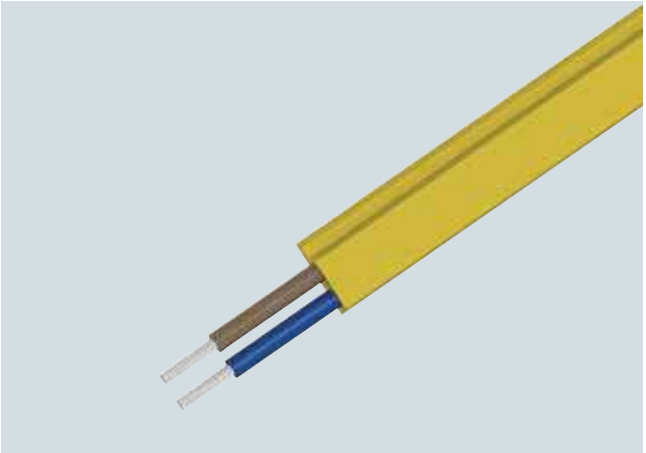
Selection and ordering data

	Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		d	Article No.		
3RK7271-1AA30-0AA0	**DCM 1271 data decoupling module** • With screw terminals, removable terminals (included in the scope of supply) • Max. current: 1 x 4 A • Dimensions (W × H × D/mm): 30 × 100 × 75	2	**3RK7271-1AA30-0AA0**	1	1 unit

Accessories

	Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*
		d	Article No.		
	Screw terminals (replacement)				
	• 5-pole For CM 1234-2 AS-i master and AS-i DCM 1271 data decoupling module	5	**3RK1901-3MA00**	1	1 unit
	• 3-pole For AS-i DCM 1271 data decoupling module for connecting the power supply unit	5	**3RK1901-3MB00**	1	1 unit
3RK7243-2AA30-0XB0	**CM 1243-2 communication module** • AS-Interface masters for SIMATIC S7-1200 • Corresponds to AS-Interface specification V3.0 • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W × H × D/mm): 30 × 100 × 75 See also from page 14/28 onwards	2	**3RK7243-2AA30-0XB0**	1	1 unit

Overview



AS-Interface shaped cable

The actuator-sensor interface – the networking system used for the lowest field area – is characterized by very easy mounting and installation. A new connection method was developed specially for AS-Interface.

The stations are connected using the AS-Interface cable. This two-wire AS-Interface shaped cable has a trapezoidal shape, thus ruling out polarity reversal.

Connection is effected by the insulation piercing method. In other words, male contacts pierce the shaped AS-Interface cable and make reliable contact with the two wires. Cutting to length and stripping are superfluous. Consequently, AS-Interface stations (e.g. I/O modules, intelligent devices) can be connected in the shortest possible time and exchanging devices is quick.

To enable use in the most varied ambient conditions (e.g. in an oily environment), the AS-Interface cable is available in different materials (rubber, TPE, PUR).

For special applications it is also possible to use an unshielded standard round cable H05VV-F 2 x 1.5 mm² according to AS-i specification. With AS-Interface, data and energy for the sensors (e.g. proximity switches) and actuators (e.g. indicator lights) are transmitted over the yellow AS-Interface cable.

The black AS-Interface cable must be used for actuators with a 24 V DC supply (e.g. solenoid valves) and a high power requirement.

Suitable for operation in tow chains

The use of the AS-Interface shaped cables with TPE and PUR outer sheath was checked in a tow chain test with the following conditions:

Chain length	m	6
Travel	m	10
Bending radius	mm	75
Travel speed	m/s	4
Acceleration	m/s²	4
Number of cycles		10 million
Duration of test		approx. 3 years (11 000 cycles per day)

After termination of the 10 million cycles only slight wear was visible due to the lugs of the tow chain. No damage to the cores and core insulation could be detected.

Note:

When using a tow chain, the cables must be installed in such a way that they are not subject to tensile forces. On no account may the cables be twisted, but they must be routed flat through the tow chain.

Selection and ordering data

3RX90..-0AA00

Version			SD	Article No.	PU (UNIT, SET, M)	PS*
			d			
AS-Interface shaped cables						
Material	Color	Quantity				
Rubber	Yellow (AS-Interface)	100 m roll	2	**3RX9010-0AA00**	1	1 unit
	Yellow (AS-Interface)	1 km drum	5	**3RX9012-0AA00**	1	1 unit
	Black (24 V DC)	100 m roll	2	**3RX9020-0AA00**	1	1 unit
	Black (24 V DC)	1 km drum	5	**3RX9022-0AA00**	1	1 unit
TPE	Yellow (AS-Interface)	100 m roll	2	**3RX9013-0AA00**	1	1 unit
	Yellow (AS-Interface)	1 km drum	5	**3RX9014-0AA00**	1	1 unit
	Black (24 V DC)	100 m roll	2	**3RX9023-0AA00**	1	1 unit
	Black (24 V DC)	1 km drum	5	**3RX9024-0AA00**	1	1 unit
TPE special version according to UL Class 2	Yellow (AS-Interface)	100 m roll	5	**3RX9017-0AA00**	1	1 unit
	Black (24 V DC)	100 m roll	5	**3RX9027-0AA00**	1	1 unit
PUR	Yellow (AS-Interface)	100 m roll	2	**3RX9015-0AA00**	1	1 unit
	Yellow (AS-Interface)	1 km drum	5	**3RX9016-0AA00**	1	1 unit
	Black (24 V DC)	100 m roll	2	**3RX9025-0AA00**	1	1 unit
	Black (24 V DC)	1 km drum	5	**3RX9026-0AA00**	1	1 unit

Overview

AS-Interface repeater

The AS-Interface repeater is used to extend the AS-Interface cable.

- In its basic version, an AS-i network comprises one segment with a maximum cable length of 100 m. An extension plug (see page 14/84) can be used to increase the cable length for a segment to a maximum of 200 m.
- If this is insufficient, however, you can use one or more repeaters
- A repeater adds an extra segment to an existing segment. The extra segment can have a cable length of up to 100 m (without extension plug) or up to 200 m (with an extension plug in the extra segment)
- Each segment requires a separate AS-i power supply unit
- Electrical separation of the two AS-Interface shaped cable lines
- Slaves can be used on both sides of the repeater
- The additional power supply can increase the current infeed for slaves/sensors and lower the voltage drop on the AS-i cable
- Separate display of the correct AS-Interface voltage for each segment
- Installed in K45 module enclosure IP67 with mounting plate
- Easy mounting

Benefits

- More possibilities of use and greater freedom for plant planning through extension of the AS-Interface network
- Reduced downtime and servicing times in the event of a fault thanks to separate display of the correct AS-Interface voltage for each side

Design of an AS-Interface network with repeaters

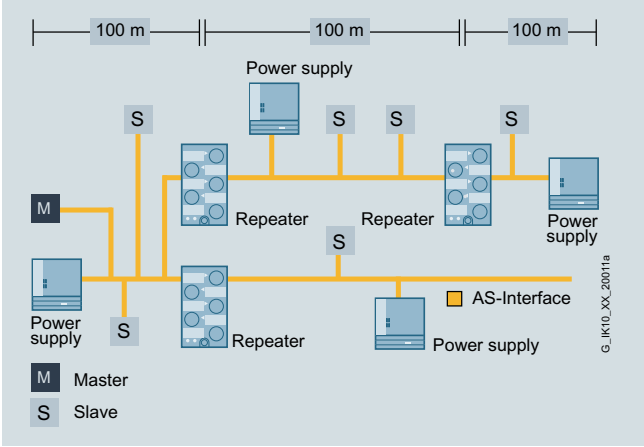
- Parallel switching of several repeaters possible (star configuration)
- Combination of series and parallel switching possible

The following conditions apply:

- When used without an extension plug no more than two repeaters are permitted between AS-i master and slave (repeaters connected in series)
- When used with an extension plug no more than one repeater is permitted between AS-i master and slave

In safety-related applications the following also applies:

- When used without an extension plug, no more than two repeaters are permitted between evaluation unit (e.g. MSS ASIsafe Modular Safety System, F-CM AS-i Safety ST for ET 200SP) and ASIsafe input slave or safe output module.
- When used with an extension plug, no more than one repeater is permitted between the evaluation unit (e.g. MSS ASIsafe Modular Safety System, F-CM AS-i Safety ST for ET 200SP) and ASIsafe input slave or safe output module.



Design of an example AS-Interface network with repeaters (without extension plug)

Note:

The AS-Interface repeater is not suitable for AS-i Power24V networks. It is recommended for use in AS-Interface networks with AS-Interface power supply units (e.g. 3RX9501-0BA00).

Application

The repeater is used to extend the AS-Interface network. In this case there are AS-Interface slaves and one AS-Interface power supply unit on each side of the repeater.

In the case of a line topology with two repeaters and three extension plugs, the maximum possible size of the AS-Interface network is 600 m, see example configuration with extension plug on page 14/84.

Selection and ordering data

	Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
6GK1210-0SA01	**Repeaters for AS-Interface** For cable extension, scope of supply includes mounting plate (for wall and standard rail mounting), module does not require an AS-i address	5	**6GK1210-0SA01**	1	1 unit

Overview

AS-Interface extension plug compact

With the extension plug it is possible to double the cable length possible in an AS-Interface segment from 100 to 200 m.

Only one power supply unit is needed to supply power to the slaves on the up to 200 m long segment.

The extension plug compact can be installed directly onto an AS-i shaped cable. A separate M12 feeder, as was required for earlier extension plug versions, is no longer required with extension plug compact.

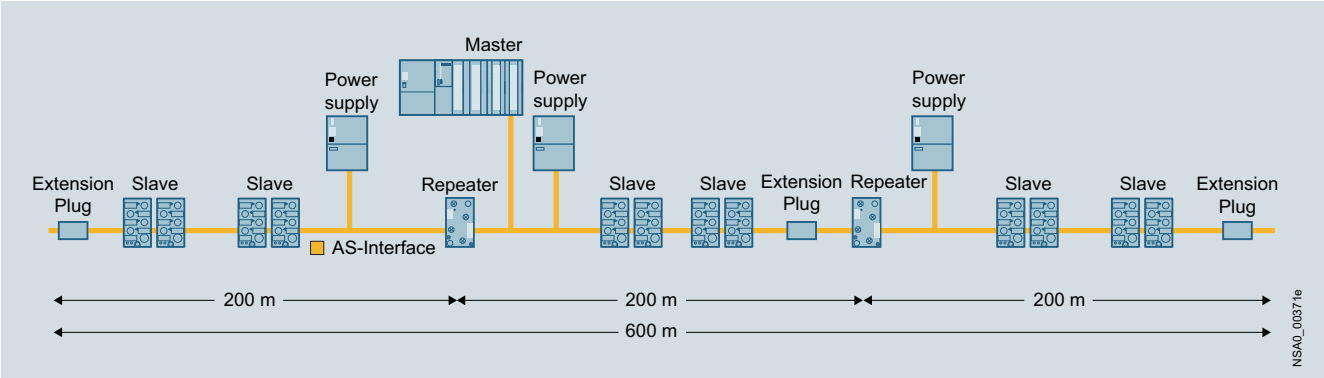
Design of an AS-Interface segment with an extension plug

To construct an AS-Interface segment with a cable length of more than 100 m and up to a maximum of 200 m, the extension plug is installed in a radius of around ± 10 m at the point of the network that is furthest from the power supply unit. The extension plug is not allowed to be used in AS-Interface networks smaller than 100 m. As with all AS-Interface networks, any network structure (line, tree, star) is possible when using the extension plug. Only one extension plug is required per 200 m segment even with a tree or star structure.

Note:

The AS-i bus cable must not terminate in the extension plug compact. The AS-Interface shaped cable can be terminated by means of a cable terminating piece to provide degree of protection IP67 where required, see "Miscellaneous accessories" on page 14/91.

The AS-Interface extension plug is not suitable for AS-i Power24V networks.



Maximum network size with repeaters and extension plug (master at center of network)

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1901-1MX02	**AS-Interface extension plug compact** • Doubling of the cable length to 200 m per AS-Interface segment • With direct connection to AS-Interface shaped cable • Module does not require an AS-i address	2	**3RK1901-1MX02**	1	1 unit

Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1901-1MN00	**Cable terminating piece** For sealing of open cable ends (shaped AS-Interface cable) in IP67	▶	**3RK1901-1MN00**	1	10 units

Overview

The innovated addressing unit for AS-Interface of the AS-i specification V3.0

The addressing unit is used to assign an address during commissioning to each AS-Interface slave. The device detects a connected slave module or a complete AS-i network and displays the found module in the LCD display. Each address can be individually set using the Up/Down keys. By turning the rotary switch, further commissioning functions are selected intuitively. The innovative device has been adapted to the current AS-i specification V3.0 and can now also handle the I/O data of the latest slaves.

Functionality

- Reading out and adjusting the slave address 0 to 31 or 1A to 31A, 1B to 31B, with automatic addressing aid and prevention of double addresses
- Reading out the slave profile (IO, ID, ID2)
- Reading out and adjusting the ID1 code
- Input/output test when commissioning the slaves: Read input signals and write outputs with all digital and analog slaves according to AS-Interface specification V3.0, including safe input slaves and complex CTT2 slaves
- Measuring the voltage on the AS-Interface cable (measuring range from 2 to 35 V)
- Display of the operational current in case of direct connection of an AS-i slave (measuring range from 0 to 150 mA)
- Storage of complete network configurations (profiles of all slaves) to simplify the addressing
- Adjusting the slave parameters for commissioning
- Reading out the identification and diagnostics of CTT2 slaves
- Reading out the code table of safe input slaves (ASIsafe)

Note:

For operation of the addressing unit on an AS-Interface cable with connected power supply unit, the following applies: The AS-Interface addressing unit is suitable for standard AS-i networks and AS-i Power24V networks (min. operational voltage on the AS-Interface cable 19 V).

Benefits

- Increased power supply to the slaves to 150 mA
- Better utilization of the battery capacity thanks to improved circuitry
- Support for the current AS-i specification V3.0
- Expanded display for simultaneously displaying input and output states
- Clearly recognizable display of status of digital inputs/outputs in binary format (0/1), optionally also available as hexadecimal values
- Intuitive display of analog data either as decimal, hexadecimal or as a percentage (e.g. 100% corresponds to input/output value 20 mA)
- I/O data of complex slaves (CTT2 profile) can be displayed
- Decoded display of the input data of safe input slaves, including code table
- Simplification of the operating steps when setting the slave address with automatic read back of the set address
- Addressing cable, ready for operation even without screwing in tight into the M12 socket, thus faster availability of the addressing unit
- Proven compact housing with smooth keys and rotary switch
- Connection of standard AS-i networks possible with 30 V as well as Power24V networks
- Complex slaves with high operating currents can be addressed without external supply
- Longer operating time by automatic shutdown after approx. 5 minutes (or approx. 1 minute when data exchange is active) after last operation
- Can be used with all types of digital and analog slaves
- Comprehensive and fast input/output test of plants, even for A/B slaves with 4 DI/4 DQ and current analog modules with an A/B address
- Faster and more reliable commissioning of the AS-Interface modules
- One-hand operation possible, with unique selection of the functions
- Connection via M12 socket (pin 1: ASI+; pin 3: ASI-; pins 2, 4, 5: not used)
- Universal applicability for all AS-i networks

Selection and ordering data

	Version	SD d	Article No.	PU (UNIT, SET, M)	PS*
 3RK1904-2AB02	**AS-Interface addressing unit V3.0** • For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i specification V3.0 • for setting the AS-i address of slaves with standard addresses, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with four type AA batteries (IEC LR6, NEDA 15) • Degree of protection IP40 • Dimensions (W x H x D) mm: 84 x 195 x 35 • Scope of supply: - Addressing unit with 4 batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m	2	**3RK1904-2AB02**	1	1 unit

Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1902-4PB15-3AA0	**Addressing cable, with M12 plug to M12 socket**[1)] • For addressing slaves with M12 connection, e.g. K20 or K60R modules or light curtains • Length 1.5 m, 3-pole, 3 x 0.34 mm^2	5	**3RK1902-4PB15-3AA0**	1	1 unit
3RX9801-0AA00	**AS-Interface M12 3RX feeder** • Transition of AS-Interface cable to a standard round cable • Insulation piercing method for connection of AS-Interface cable • M12 socket for connection of standard round cable • Current carrying capacity up to 2 A	►	**3RX9801-0AA00**	1	1 unit
3RK1901-2NR10	**AS-Interface M12 3RK feeder** • AS-Interface cable transition without U_{aux}, with M12 socket • Insulation piercing method for connection of AS-Interface cable • M12 socket for connection of standard round cable	2	**3RK1901-2NR10**	1	1 unit
3RK1902-4HB50-5AA0	**M12 cable plug**[2)] • Extruded M12 plug (angled cable feeder 90°), other cable end open • Length: 5 m, 5-pole, color: Black	5	**3RK1902-4HB50-5AA0**	1	1 unit
3RK1902-4BA00-5AA0	**M12 plug, straight**[2)] • For screw fixing, 5-pole screw terminal, max. 0.75 mm^2 • A-coded, max. 4 A	5	**3RK1902-4BA00-5AA0**	1	1 unit

1) Not included in scope of supply of the 3RK1904-2AB02 addressing unit.

2) For connecting the addressing unit to an AS-i network via AS-Interface M12 feeder, a connecting cable (M12 plug to M12 connector) must be produced and requires the following wiring:
- M12 cable plug: Pin 1 / core brown ↔ M12 plug: Pin 1
- M12 cable plug: Pin 3 / core blue ↔ M12 plug: Pin 3
- Pin 2, 4, 5 not connected.

Overview

AS-Interface analyzer

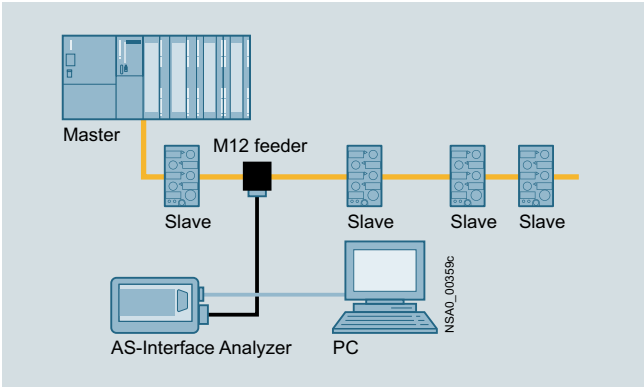
The AS-Interface analyzer is used to test AS-Interface networks.

Installation errors, e.g. loose contacts or EMC interference under extreme loads, can be revealed by this device.

Thanks to the easy-to-use software the user can assess the quality of complete networks even if he lacks detailed specialist knowledge of AS-Interface. In addition it is an easy matter with the AS-Interface analyzer to create test logs from the records produced, thus providing documentation for startups and service assignments.

For advanced AS-Interface users there are trigger functions for detailed diagnostics.

Connection



Connection of AS-Interface analyzer to PC and AS-Interface network

The AS-Interface analyzer follows the communication on the AS-Interface network as a passive station. The unit is supplied simultaneously from the AS-Interface cable.

This analyzer interprets the physical signals on the AS-Interface network and records the communication.

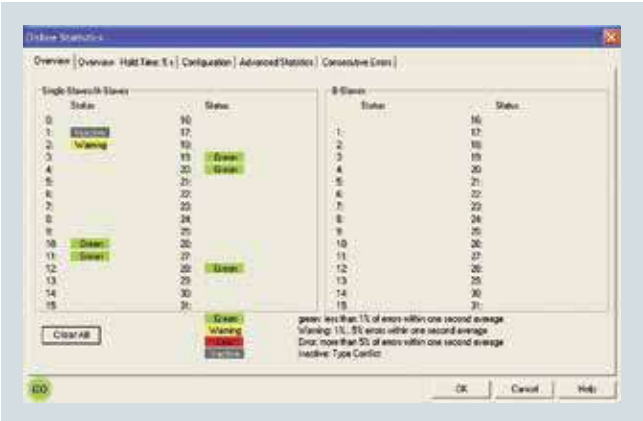
The data thus obtained is transferred through an RS 232 interface to a PC such as a notebook, for evaluation with the supplied diagnostics software.

Benefits

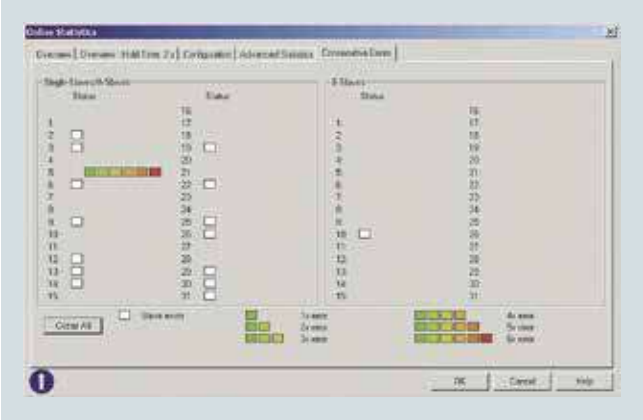
- Simple and user-friendly operation enables diagnostics of AS-Interface networks without help from specialists
- Speedy troubleshooting thanks to intuitive display in statistics mode
- Test logs provide verification of the state and quality of the installation for service and approval
- Recorded logs facilitate remote diagnostics by Technical Support
- Comprehensive trigger functions enable exact analysis
- Process data can be monitored online

Application

Online statistics



Online statistics, overview



Online statistics, details, e.g. here a fault on slave 5

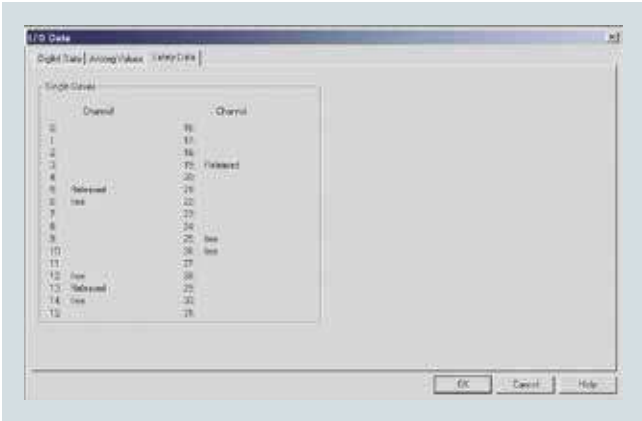
This mode provides a quick overview of the existing AS-Interface system. The error rates are displayed per slave in a traffic-light function (green, yellow, red).

The bus configuration and the currently transmitted data of the slaves are shown in a well arranged presentation.

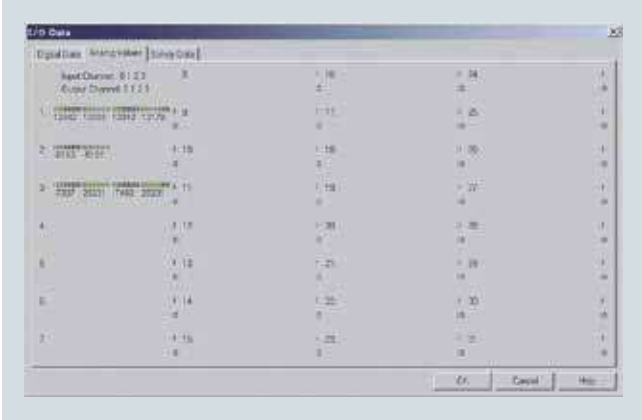
With the expanded statistics function, it is possible to determine the error rates as the number of transmitted or faulty bus message frames.

The bundle error overview shows in steps how many multiple repetitions of message frames occurred in order to enable a selective and look-ahead assessment of the transmission quality.

Data mode



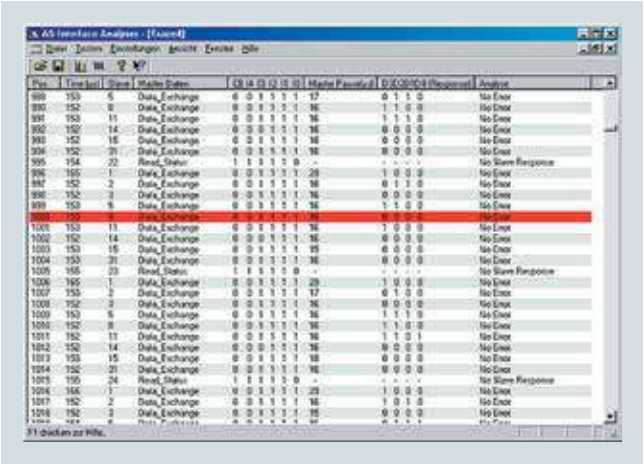
Presentation of the I/O data: Safety data



Presentation of the I/O data: Analog values

In this mode, the analyzer shows not only the digital input/output values but also the current analog values and the input status of the safety slaves.

Trace mode



Presentation of message frames in trace mode

The presentation of message frames in the style of a classic fieldbus analyzer is indispensable for complex troubleshooting. Extensive trigger functions and recording and viewing filters are available for this purpose. An external trigger input and trigger output round off the scope of functions in order to find even the most difficult errors.

For troubleshooting in connection with ASIsafe applications, changes of status in the code tables of safety slaves are identified and assessed.

The AS-i analyzer can be used with an AS-i master in accordance with AS-Interface specification V3.0 or a predecessor version.

The analyzer does not automatically decode the process values for type CTT2 - CTT5 AS-i slaves. As for other slave types, the message frames are recorded and evaluated in the statistics. If required, decoding can also be performed by the user manually.

More information, see https://support.industry.siemens.com/cs/ww/en/view/109746763.

Test log

Example of a test log

The recorded data of the online statistics are easy to output and document using a test log. Verification of the state of the plant can thus be provided for approvals or service assignments.

The integrated measurement assistant records the bus signals for a variable duration, thereby triggering creation of an automatic test log. A standardized quality test of AS-i plants is thus possible.

Note:

The AS-Interface analyzer is suitable for standard AS-i networks and AS-i Power24V networks (min. operating voltage 20 V).

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1904-3AB01	**AS-Interface analyzer** • For testing AS-Interface systems • For troubleshooting and service assignments in installations and networks with AS-Interface systems • Dimensions (W x H x D): 145 x 30 x 92 mm • Scope of supply: - AS-Interface analyzer - RS 232 cable for connecting to a PC - USB-to-serial/RS 232 adapter - Screwdriver - Magnetic adhesive tape for fastening the analyzer to metal surfaces - Service case with foam insert, dimensions (W x H x D/mm): approx. 260 x 70 x 200 - Diagnostics software (CD-ROM) for PC with Windows operating system	2	**3RK1904-3AB01**	1	1 unit

Note:

Download the current version of the diagnostics software for PC with Windows operating system, see https://support.industry.siemens.com/cs/ww/en/view/109750259.

Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RX9801-0AA00	**AS-Interface M12 3RX feeder** • Transition of shaped AS-Interface cable to a standard round cable • Insulation piercing method for connection of AS-Interface cable • M12 socket for connection of standard round cable • Current carrying capacity up to 2 A • Degree of protection IP67	►	**3RX9801-0AA00**	1	1 unit
3RK1901-2NR10	**AS-Interface M12 3RK feeder** • AS-Interface cable transition without U_{aux}, with M12 socket • Insulation piercing method for connection of AS-Interface cable • M12 socket for connection of standard round cable • Max. 4 A • Degree of protection IP67/IP68/IP69K	2	**3RK1901-2NR10**	1	1 unit
3RK1902-4HB50-5AA0	**M12 cable plugs** • PUR cable, 5-pole • Length 5 m • Color black • Extruded M12 plug (angled cable feeder 90°), other cable end open	5	**3RK1902-4HB50-5AA0**	1	1 unit

Selection and ordering data

More information

System Manual "AS-Interface", see
https://support.industry.siemens.com/cs/ww/en/view/26250840

	Version				SD	Article No.	PU (UNIT, SET, M)	PS*
					d			
3RK1901-2NN10	**AS-Interface compact distributors, for AS-Interface flat cable** • Current carrying capacity up to 8 A • Degree of protection IP67/IP68/IP69K				2	**3RK1901-2NN10**	1	1 unit
3RX9801-0AA00	**AS-Interface M12 3RX feeder** • Degree of protection IP67 • Current carrying capacity up to 2 A							
	For flat cable	For	Cable length	Cable end in feeder				
	AS-i	M12 socket	--	Available	▶	**3RX9801-0AA00**	1	1 unit
3RK1901-2NR10	**AS-Interface M12 3RK feeder** • Degree of protection IP67/IP68/IP69K • Current carrying capacity up to 4 A							
	For flat cable	For	Cable length	Cable end in feeder				
3RK1901-2NR21	AS-i	M12 socket	--	Not available	2	**3RK1901-2NR10**	1	1 unit
	AS-i	M12 cable box	1 m	Not available	2	**3RK1901-2NR11**	1	1 unit
	AS-i	M12 cable box	2 m	Not available	2	**3RK1901-2NR12**	1	1 unit
	AS-i/U_{aux}	M12 socket	--	Not available	2	**3RK1901-2NR20**	1	1 unit
	AS-i/U_{aux}	M12 cable box	1 m	Not available	2	**3RK1901-2NR21**	1	1 unit
	AS-i/U_{aux}	M12 cable box	2 m	Not available	2	**3RK1901-2NR22**	1	1 unit
3RK1901-1NR04	**AS-Interface M12 feeders, 4-fold** • Degree of protection IP67 • Current carrying capacity up to 4 A							
	For flat cable	For	Cable length	Cable end in feeder				
	AS-i/U_{aux}	4-fold M12 socket, delivery includes mounting plate (for wall and standard rail mounting)	--	Not available	2	**3RK1901-1NR04**	1	1 unit
6ES7194-1KA01-0XA0	**M12 Y-shaped coupler plugs** For connection of two sensors to one M12 socket with Y-assignment				1	**6ES7194-1KA01-0XA0**	1	1 unit
3RK1901-1KA00 3RK1901-1KA01	**AS-Interface sealing caps** For free M12 sockets • M12							
	- Standard version				▶	**3RK1901-1KA00**	100	10 units
	- Tamper proof				2	**3RK1901-1KA01**	100	10 units
3RK1901-1PN00	• M8 standard version				2	**3RK1901-1PN00**	100	10 units
3RK1901-1MD00	**AS-Interface M20 seals** • For AS-Interface cable, shaped • For insertion in M20 glands				2	**3RK1901-1MD00**	100	10 units

AS-Interface: System Components and Accessories

Miscellaneous accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
3RK1901-3QM00	**Cable adapters for flat cables**				
	Connection of AS-Interface cable to metric gland with insulation piercing method				
	• Continuation using standard cable				
	- For M16 gland	5	**3RK1901-3QM00**	1	1 unit
	- For M20 gland	5	**3RK1901-3QM10**	1	1 unit
	• Continuation using pins				
	- For M16 gland	10	**3RK1901-3QM01**	1	1 unit
	- For M20 gland	5	**3RK1901-3QM11**	1	1 unit
3RK1901-3QA00	**Cable clip for cable adapters**	5	**3RK1901-3QA00**	100	10 units
3RK1901-1MN00	**Cable terminating piece**	►	**3RK1901-1MN00**	1	10 units
	For sealing of open cable ends (shaped AS-Interface cable) in IP67				
3RK1901-2EA00 3RK1901-0CA00	**Mounting plates**				
	• K45				
	- For wall mounting	►	**3RK1901-2EA00**	1	1 unit
	- For standard rail mounting	►	**3RK1901-2DA00**	1	1 unit
	• K60, suitable for all K60 compact modules				
	- For wall mounting	►	**3RK1901-0CA00**	1	1 unit
	- For standard rail mounting	►	**3RK1901-0CB01**	1	1 unit
3RK1902-0AR00	**Sealing set**	2	**3RK1902-0AR00**	100	5 units
	• For K60 mounting plate and standard distributor				
	• Cannot be used for K45 mounting plate				
	• One set contains one straight and one shaped seal				
3RK1902-4GB50-4AA0	**Control cable, assembled at one end**				
	Angular M12 plug for screw fixing, 4-pole, 4 x 0.34 mm^2, A-coded, black PUR sheath, max. 4 A				
	• Cable length 5 m	5	**3RK1902-4GB50-4AA0**	1	1 unit
3RK1902-4CA00-4AA0	**M12 socket, angled**	5	**3RK1902-4CA00-4AA0**	1	1 unit
	For screw fixing, 4-pole screw terminals, max. 0.75 mm^2, A-coded, max. 4 A				
3RK1902-4BA00-5AA0	**M12 plugs**				
	For screw fixing, 5-pole screw terminals, max. 0.75 mm^2, A-coded, max. 4 A				
	• Straight	5	**3RK1902-4BA00-5AA0**	1	1 unit
3RK1902-4DA00-5AA0	• Angled	5	**3RK1902-4DA00-5AA0**	1	1 unit
3RK1902-4H...-5AA0	**Control cable, assembled at one end**				
	Angular M12 plug for screw fixing, 5-pole, 5 x 0.34 mm^2, A-coded, black PUR sheath, max. 4 A				
	• Cable length 1.5 m	5	**3RK1902-4HB15-5AA0**	1	1 unit
	• Cable length 5 m	5	**3RK1902-4HB50-5AA0**	1	1 unit
	• Cable length 10 m	5	**3RK1902-4HC01-5AA0**	1	1 unit
3RK1902-4PB15-3AA0	**Control cable, assembled at both ends**	5	**3RK1902-4PB15-3AA0**	1	1 unit
	Straight M12 plug, straight M12 socket, for screw fixing, 3-pole, 3 x 0.34 mm^2, A-coded, black PUR sheath, max. 4 A				
	• Cable length 1.5 m				
	• Also for addressing AS-i slaves with M12 bus connection (e.g. K20, K60R compact modules, M200D motor starters)				

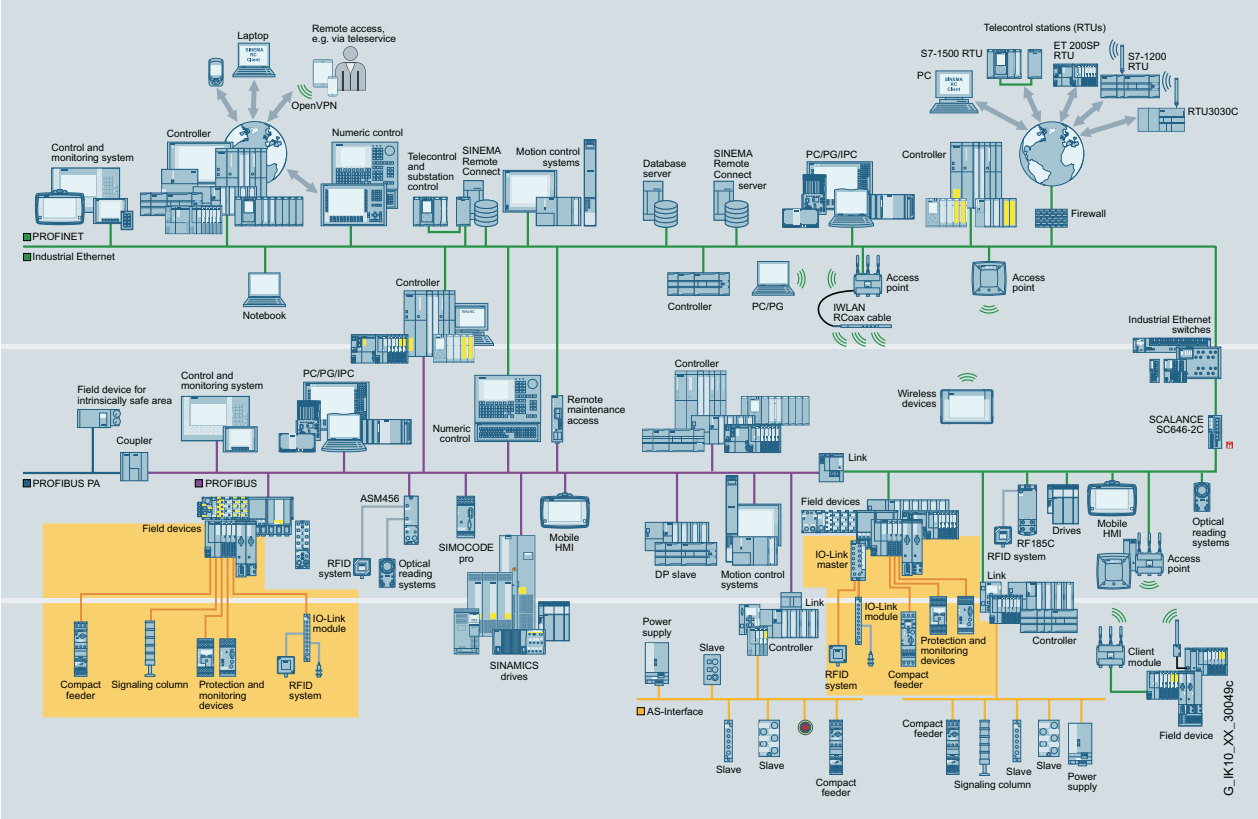
IO-Link Introduction

Communication overview

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.



IO-Link in the SIMATIC NET communications landscape

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 diagnostics 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.

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

IO-Link Introduction

System components

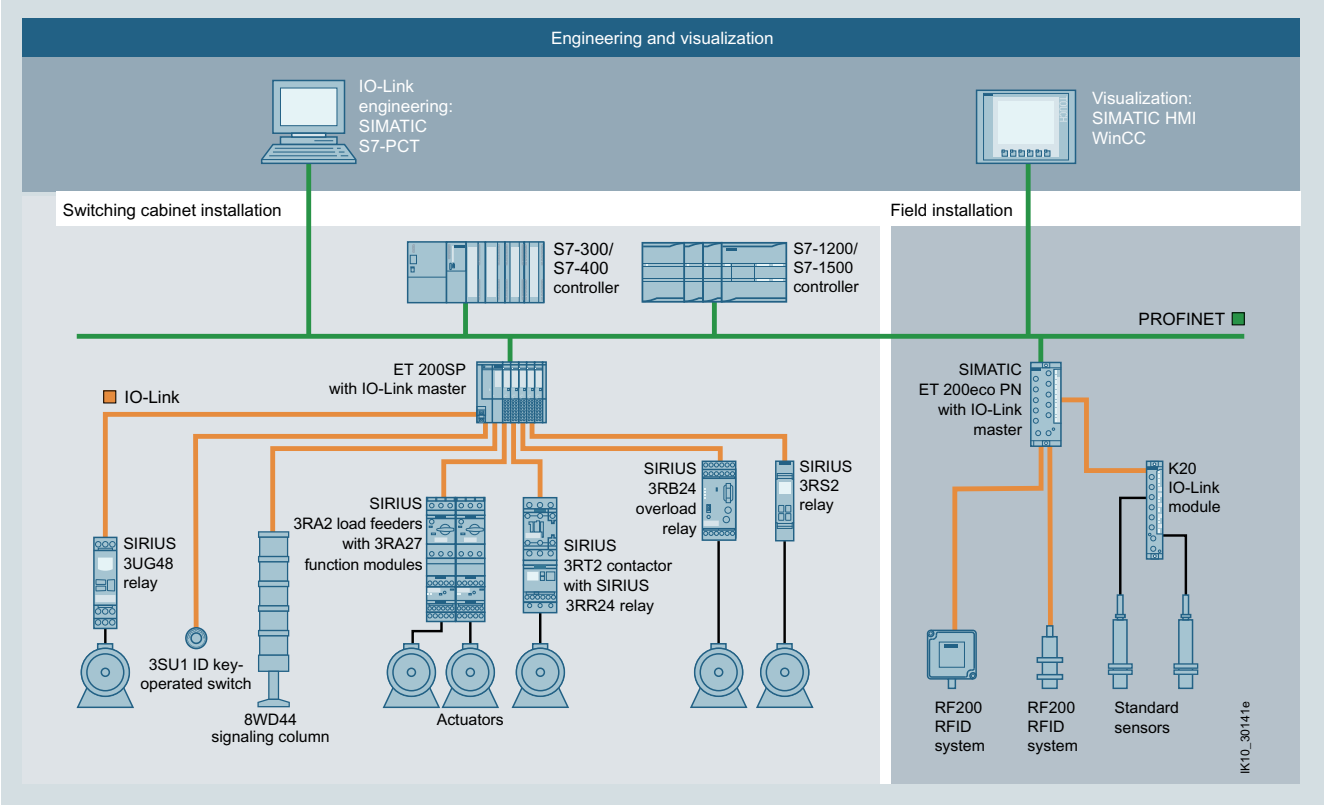
Overview

More information	
Homepage, see www.siemens.com/io-link	For important topics at a glance, see https://support.industry.siemens.com/cs/ww/en/view/109737170

IO-Link product family

To implement communication, a system installation has the following main components:

- An IO-Link master
- One or more IO-Link devices, such as sensors (e.g. RFID systems), actuators or combinations thereof
- A standard 3-wire sensor/actuator cable



Example of a configuration with the system components

IO-Link compatibility

IO-Link ensures compatibility between IO-Link-capable modules and standard modules as follows:

- IO-Link sensors can generally 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.

Analog signals

Another advantage of IO-Link technology is that analog signals are already digitized in the IO-Link sensor itself and are digitally transmitted via IO-Link communication. As the result, faults are prevented and there is no extra cost for cable shielding.

Enhancement with 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 cost-effective with the IO-Link input modules, which allow several sensors to be connected at one time via a cable to the controller.

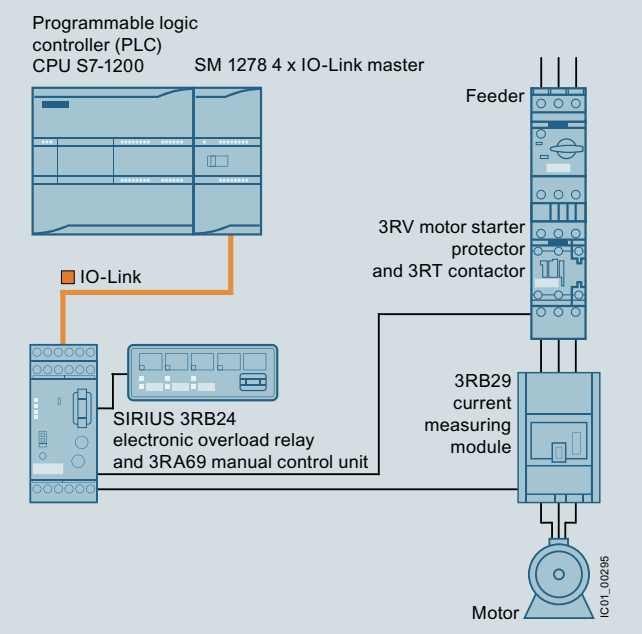
Overload relays

A starter combination, for example, consists of one or more SIRIUS 3RT contactors and one 3RB24 electronic overload relay for IO-Link plus its 3RB29 current measuring module.

3RB24 overload relays with IO-Link are basically designed to provide current-dependent protection for loads against inadmissibly high temperature rises due to overload, phase asymmetry or phase failure.

Direct-on-line starters can, therefore, as shown in the image, be connected to the control system via IO-Link without much wiring. Remote control of connected contactors, current value transmission and immediate remote fault diagnosis are just some examples of the large number of functions that can be implemented with this device.

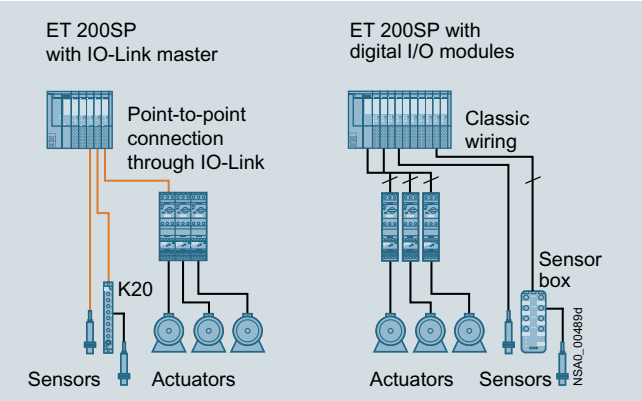
It is also possible to directly address a drive on-site via IO-Link using the optional hand-held device.



Connection of an IO-Link-capable overload relay to a SIMATIC S7-1200 controller

Load feeders and motor starters

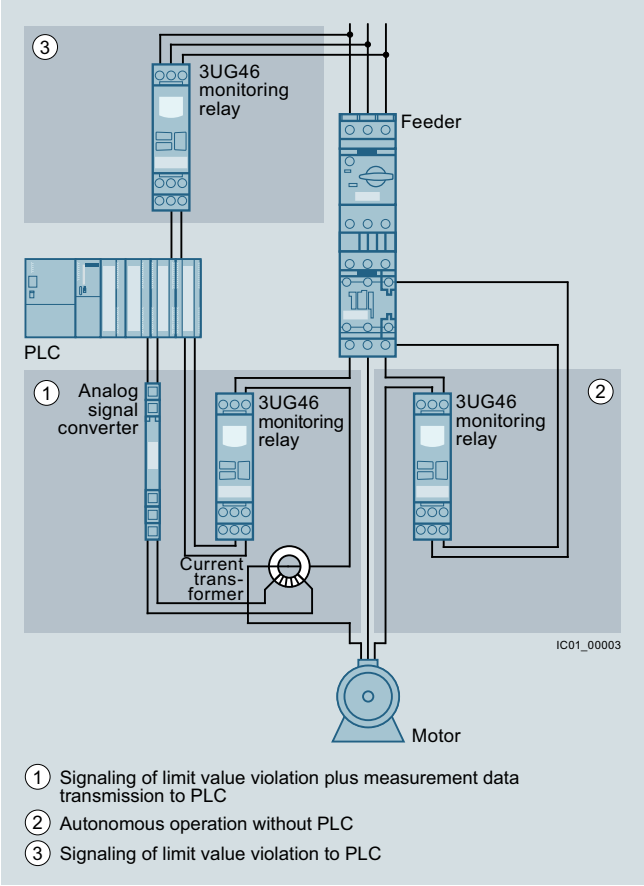
Through IO-Link it is possible to control not only sensors but also actuators in the form of load feeders and motor starters.



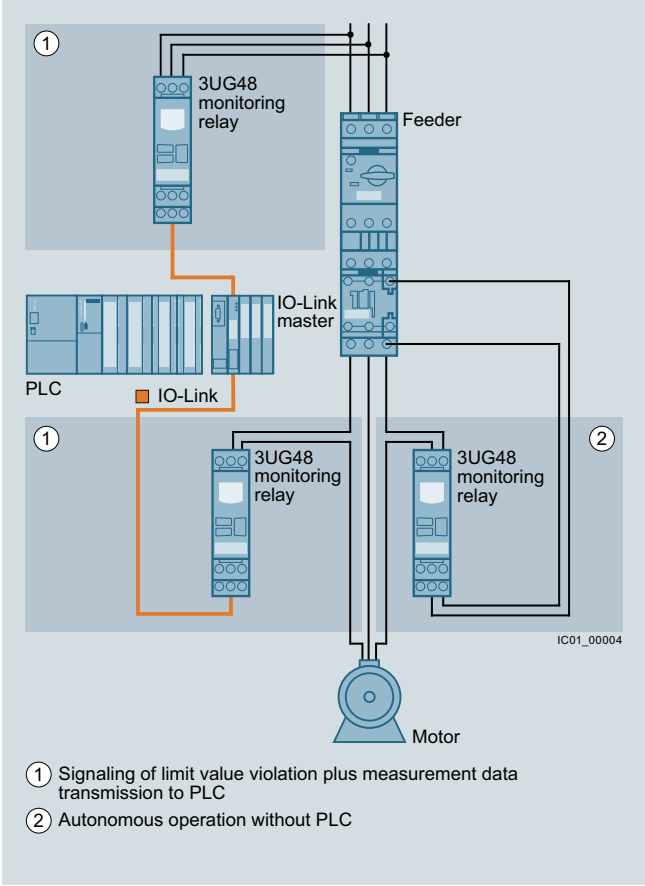
Possibilities for connecting load feeders and motor starters to IO-Link or in the conventional way

Monitoring relays

By using monitoring relays with IO-Link it is now possible to send data that has already been recorded and evaluated in the devices directly to the controller. This avoids the use of duplicated sensors.



Possibilities for interfacing conventional 3UG46 monitoring relays (in comparison with 3UG48)

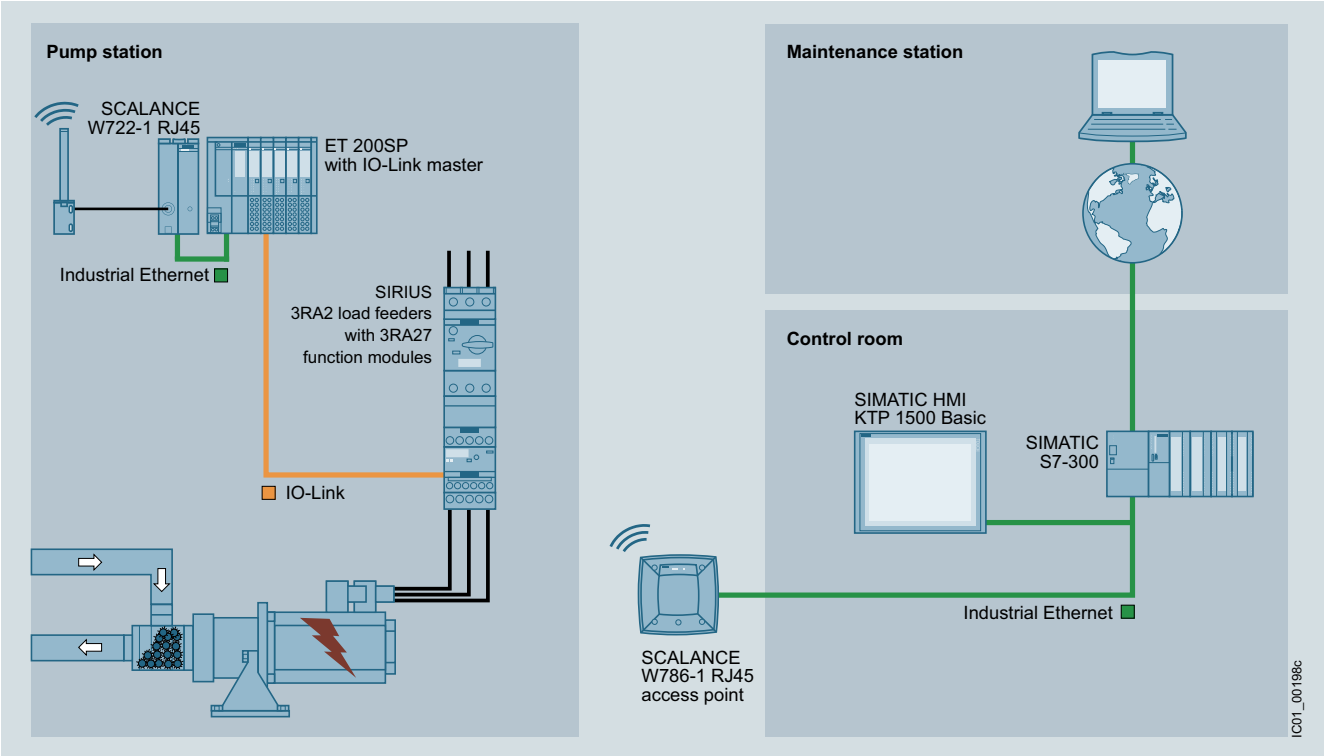


Possibilities of interfacing 3UG48 monitoring relays for IO-Link

Wireless communication

Using an upstream IWLAN client module, such as SCALANCE W722-1 RJ45, 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 Introduction

System components

IO-Link components

IO-Link masters

CM 8xIO-Link for S7-1500

Masters

IO-Link master module for S7-1500
- CM 8xIO-Link communication module, see page 14/102

IO-Link master module for S7-1200
- SM 1278 4xIO-Link signal module, see page 14/102

IO-Link master module for ET 200SP
- CM 4xIO-Link communication module, see page 14/103

IO-Link master module for ET 200pro
- 4 IO-Link HF electronic module, see page 14/104

IO-Link master module for ET 200eco PN
- IO-Link master 4 IO-L + 8DI + 4DO 24 V DC/1.3 A
- IO-Link master 4 IO-L

See page 14/105

IO-Link master module for ET 200AL
- CM IO-Link communication module, see page 14/106

For full product range, see Catalog ST 70.

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

See page 14/108

SIRIUS 3RA2711 function module for IO-Link

Switching with IO-Link

Contactors and contactor assemblies
- SIRIUS 3RT contactors, 3-pole up to 250 kW
- SIRIUS 3RA23 reversing contactor assemblies, up to 55 kW
- SIRIUS 3RA24 contactor assemblies for wye-delta starting, up to 90 kW
- SIRIUS 3RA27 function modules for direct-on-line, reversing, and star-delta (wye-delta) starting

See Catalog Section 2

SIRIUS 3RA64 direct-on-line starter

Motor starters for use in the control cabinet

SIRIUS 3RA64, 3RA65 compact starters for IO-Link, infeed systems and accessories

See Catalog Section 4

SIRIUS 3RB24 overload relay

Contactors with IO-Link

Overload relays

SIRIUS 3RB24 electronic overload relays for IO-Link
- Evaluation modules
- 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 Catalog Section 2

IO-Link devices (continued)

SIRIUS 3RR24 monitoring relay

Monitoring with IO-Link

SIRIUS 3RR24 monitoring relays for mounting onto 3RT2 contactors for IO-Link
- Monitoring of current, phase failure, open circuit and phase sequence
- Designed for mounting on 3RT2 contactors
- Terminal supports for stand-alone installation for separate mounting

See Catalog Section 2

SIRIUS 3UG48 monitoring relay

SIRIUS 3UG48 monitoring relays for stand-alone installation for IO-Link
- Monitoring the supply system, voltage, current, power factor and active current, residual current or speed depending on device design
- On/tripping delay time can be adjusted

See Catalog Section 12

SIRIUS 3RS14 temperature monitoring relay

SIRIUS 3RS14, 3RS15 temperature monitoring relays for IO-Link
- Temperature monitoring with connected sensors
- Two limit values, can be adjusted separately

See Catalog Section 12

SIRIUS ACT 3SU1 ID key-operated switch

Actuating and indicating with IO-Link

SIRIUS ACT 3SU1 ID key-operated switches for IO-Link
- Access system and selection system for four authorization levels
- Authentication of groups and persons
- Five ID keys with different coding
- Option for individual coding via IO-Link
- For installation in enclosures or fastening on front plate
- Electronic module for ID key-operated switches must be ordered separately.

See Catalog Section 11

SIRIUS ACT 3SU1 electronic module

SIRIUS ACT 3SU1 electronic modules for IO-Link
- Eight digital inputs and outputs possible
- DI and DQ freely selectable (programmable)
- Input and output functions parameterizable
- Connection method (push-in)
- For fastening on front plate, see Catalog Section 11
- For installation in enclosure, see Catalog Section 11

Signaling column

8WD44 IO-Link adapter element

8WD44 IO-Link adapter element
- Up to five signaling elements can be connected using an IO-Link adapter element
- 24 V DC, diameter 70 mm
- Connection with bayonet mechanism
- For fastening on feet, 8WD44
- Connection elements with screw or spring-loaded terminals or connection element with 5-pole M12 plug

See Catalog Section 11

IO-Link Introduction

System components

IO-Link RFID systems

RFID system for IO-Link

SIMATIC RF200 RFID system in the HF range

Products SIMATIC RF210R, SIMATIC RF220R, SIMATIC RF240R, SIMATIC RF250R, SIMATIC RF260R

- Simple identification tasks such as reading an ID number (UID)
- Reading of user data
- Writing of user data
- No RFID-specific programming, ideal for those new to RFID
- Simple connection via master modules for IO-Link, such as SIMATIC S7-1200, ET 200SP, ET 200pro, ET 200eco PN and ET 200AL
- Use with the tried and tested ISO 15693 transponders (MDS xxx)

See Catalog ID 10

IO-Link Device Description (IODD)

IODD files for IO-Link

IODD files

These files provide the device description for IO-Link devices.

- Comprehensive IODD catalog of SIEMENS IO-Link devices
- Freely available for download from Industry Online Support, see https://support.industry.siemens.com/cs/ww/en/ps/15851

IODDfinder for IO-Link

IODDfinder

The entire world of IO-Link under one roof

The IODDfinder is a service provided by the IO-Link community. It is a central cross-vendor database for descriptive files (IODDs). In addition, the platform provides an overview of the available IO-Link devices.

For more information, see https://ioddfinder.io-link.com/#/.

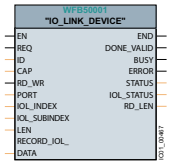
IO-Link software

STEP 7 PCT

STEP 7 PCT (Port Configuration Tool)

Engineering software for configuring the IO-Link master modules for SIMATIC S7-1200, ET 200SP, ET 200pro, ET 200eco PN and ET 200AL

- Available as a stand-alone version or integrated into STEP 7 (V5.5 SP1 or higher) and TIA (V12 or higher)
- Engineering of the IO-Link devices connected to the master
- Monitoring of the process image of the IO-Link devices
- Open interface for importing further IODDs
- Freely available for download from Industry Online Support, see https://support.industry.siemens.com/cs/ww/en/view/32469496



IO-Link device function block

IO-Link function blocks (IO-Link device and IO-Link master)

STEP 7 function block for easy acyclical data exchange in the user program

- Freely available for download from Industry Online Support, see https://support.industry.siemens.com/cs/ww/en/view/82981502

"Siemens IO-Link Devices" block library

"Siemens IO-Link Devices" block library

This library provides function blocks and user-defined data types (UDTs) for all IO-Link devices from the Siemens portfolio. These blocks and UDTs standardize and simplify communication with IO-Link devices.

- Freely available for download from Industry Online Support, see https://support.industry.siemens.com/cs/ww/en/view/90529409

Overview

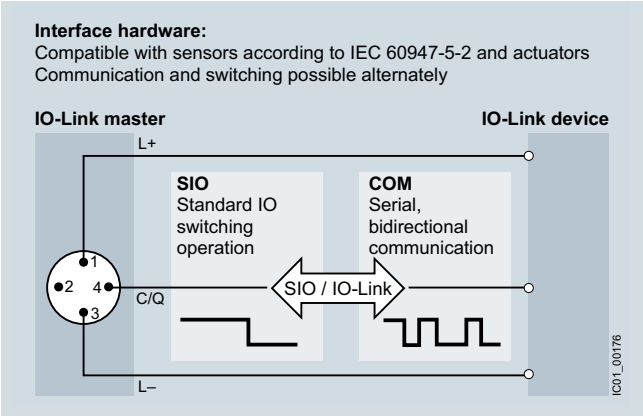
Principles of the IO-Link specification

According to the IO-Link specification, communication functions 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
- 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
- The sensors and actuators are described by the IO Device Description (IODD)
- As a matter of principle, one IO-Link device can be connected to one IO-Link port of the master (point-to-point connection)
- The transmission rates between IO-Link master and the devices are as follows:
  - Via COM1: 4 800 Bd
  - Via COM2: 38 400 Bd
  - Via COM3: 230 400 Bd
- The average cycle time is 2 ms for the reading/writing of 16 data bits at a transmission rate of 38 400 Bd

IO-Link protocol

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

The IO-Link specification makes a distinction between the following data types:

Process data

The process data of the devices are transferred cyclically in a data frame, with the process data width defined by the device. Process data of 0 to 32 bytes are possible per device (input and output in each case). The consistency width of the transmission is not fixed and therefore depends on the master.

Value status

Each port has a value status (PortQualifier). The value status indicates whether the process data are valid or invalid. The value status can be transferred cyclically with the process data.

Device data

Device data can be parameters, identification data and diagnostics information. Device data replacement is acyclic and in response to an inquiry from the IO-Link master. Device data can be written into the device (Write) and also read from the device (Read).

Events

When an event occurs, the device sends a signal to the master to report that an event is active. The master then reads out the event. Events can be fault messages (e.g. short-circuit) and warnings/maintenance data (e.g. contamination, overheating). Fault messages are transferred from the device via the IO-Link master to the controller or HMI. The IO-Link master can also transfer events and states. Events include, for example, cable break or communication breakdown.

Device parameters and events are sent independently of the cyclic transmission of process data. The transmissions do not affect or impair each other.

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 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 contains the parameter server. The parameter server can also be implemented centrally in the PLC or in a system server. In this case the data must be downloaded to the control system by means of the function blocks provided.

IO-Link masters

The IO-Link master is the interface to higher-level control systems. The IO-Link master presents itself to the fieldbus as a normal fieldbus node, and is integrated into the appropriate network configurator via the relevant device description (GSD file).

IO Device Description (IODD)

The IO Device Description (IODD) has been defined to provide a full, transparent description of system characteristics as far as the IO-Link device.

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 V1.1

The IO-Link specification is currently available in Version 1.1, and standardized in accordance with IEC 61131-9.

Specification V1.1 offers the following new features compared with the previous specification V1.0:

- Transmission of up to 32 bytes of process data in one cycle
- Parameter server function

IO-Link: Masters

IO-Link master module for S7-1500 > CM 8xIO-Link NEW

Overview

CM 8xIO-Link master

- Communication module for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors
- Can be used directly downstream of an S7-1500 CPU or distributed in ET 200MP via PROFINET or PROFIBUS
- Powerful diagnostics functions facilitate preventive maintenance to avoid plant standstills
- Simple replacement of sensors/actuators without time-consuming parameterization

Application

IO-Link makes it easy to change the parameters for manufacturing and processing different product versions and batches, even during CPU runtime, down to the sensor/actuator level. Easy, much more detailed diagnostics are also possible down to the sensor or actuator, including remote diagnostics.

The CM 8xIO-Link enables direct connection of up to 8 IO-Link devices directly to SIMATIC S7-1500 and ET 200MP. This makes external stations unnecessary.

This results in savings on wiring, engineering and commissioning, because everything can be configured centrally with the CPU.

Design

- Fastening to the S7-1500 mounting rail with a single screw
- 40-pole front connector, optionally with screw terminals or push-in terminals
- Front flap with expandable cable compartment

Included in the scope of supply:

- One U connector
- Front door

Function

Overview of functions

- Suitable for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors
- IO-Link master according to IO-Link specification V1.1
- Data transmission rates COM1 (4.8 kBd), COM2 (38.4 kBd), COM3 (230.4 kBd)
- Parameterizable diagnostics can be set for each channel
- Master backup with "IO_Link_MASTER_8" function block
- Replacement of the IO-Link device (for V1.1 devices only)
- Support for firmware updating of IO-Link devices
- Variable address range for I/O data with up to 240 byte inputs and 240 byte outputs; expansion limits:
  - Max. 32 bytes of input data and 32 bytes of output data per port
  - Max. 240 bytes of input data and 240 bytes of output data per module
- Port Qualifier Information (PQI)
- IO-Link port configuration with S7-PCT
- IO-Link port configuration with STEP 7 or GSD (without S7-PCT)
- Standard system functions of SIMATIC ET 200MP:
  - Identification and maintenance data IM0
  - Firmware update
  - Unequivocal, front-side module inscription

Configuration

The IO-Link master of the S7-1500 can be conveniently configured using the graphical user interface in the free S7-Port Configuration Tool (S7-PCT, V3.5 and higher, SP1).

In addition to this configuration, commissioning without S7-PCT is also possible. In this case, the port is configured by means of either the TIA Portal or GSD file. The following port modes are supported:

- Operation in "IO-Link autostart" mode (default)
- Operation in "IO-Link manual" mode
- Operation as DI
- Deactivated

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
6ES7547-1JF00-0AB0	**CM 8xIO-Link communication module** Communication module for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors	1	**6ES7547-1JF00-0AB0**	1	1 unit

For more information, see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10355273

Overview

SM 1278 4xIO-Link master

Module for connecting up to four IO-Link devices in accordance with the IO-Link specification V1.1. The IO-Link parameters are configured by means of the Port Configuration Tool (PCT) with version V3.2 and higher.

Application

The SM 1278 module enables an exchange of data with up to four external IO-Link devices through one three-wire cable each or four standard actuators or standard encoders. Control can be flexibly adapted to the communication partners using the comprehensive parameter assignment options. Since IO-Link is compatible with standard sensors, commercially available sensors compliant with IEC 61131 Type 1 can also be operated on the IO-Link master.

Design

- Expansion limits
  - Cable length: Max. 20 m
  - Max. 32 bytes of input data and 32 bytes of output data per port
  - Max. 32 bytes of input data and 32 bytes of output data per module

LED displays

- DIAG: Operating state display (green/red) of the module
- C1..C4: Port status display (green) for ports 1, 2, 3 and 4
- Q1..Q4: Channel status display (green) for ports 1, 2, 3 and 4
- F1..F4: Port error display (red) for ports 1, 2, 3 and 4

Depending on the CPU type used, up to 8 SM 1278 units can be used on one S7-1200 CPU.

Function

Supported functions

- I&M identification data
- Firmware update
- SIO Mode (standard IO mode)
- IO-Link parameter assignment with the S7-PCT interface configuration tool, TIA Portal from V13 and an S7-1200 CPU V4.0 or higher

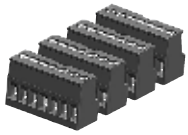
Supported data transmission rates

- COM1 (4.8 kBd)
- COM2 (38.4 kBd)
- COM3 (230.4 kBd)

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
6ES7278-4BD32-0XB0	**SM 1278 4xIO-Link master signal module** For connecting up to four IO-Link devices in accordance with the IO-Link specification V1.1	1	**6ES7278-4BD32-0XB0**	1	1 unit

Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
 6ES7292-1AG30-0XA0	**Terminal block (spare part)** With 7 screws, zinc-plated; 4 units	1	**6ES7292-1AG30-0XA0**	1	4 units

For more information, see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10231178.

Overview

CM 4xIO-Link communication module

- CM 4xIO-Link communication module
  Serial communication module for connecting up to four IO-Link devices in accordance with the IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured by means of the Port Configuration Tool (PCT) with version V3.0 and higher.
- Time-based IO
  Time-based IO ensures that signals are output with a precisely defined response time. By combination of inputs and outputs, products passing by, for example, can be measured exactly or liquids can be perfectly dosed.
- Supported data transmission rates
  - COM1 (4.8 kBd)
  - COM2 (38.4 kBd)
  - COM3 (230.4 kBd)
- Expansion limits
  - Cable length: Max. 20 m
  - Max. 32 bytes of input data and 32 bytes of output data per port
  - Max. 144 bytes of input data and 128 bytes of output data per module
- ET 200SP system functions supported
  - Exchange of IO-Link device parameters (V1.1 devices only) and of IO-Link master parameters without a PG including automatic backup recovery without an engineering tool by means of redundant parameter storage on the e-coding element
  - Reparameterization during ongoing operation
  - I&M identification data
  - Firmware update
  - PROFIenergy
- Can be plugged onto type A0 BaseUnits (BU) with automatic e-coding
- LED displays
  - DIAG: Operating state display (green/red) of the module
  - C1..C4: Port status display (green) for ports 1, 2, 3 and 4
  - Q1..Q4: Channel status display (green) for ports 1, 2, 3 and 4
  - F1..F4: Port error display (red) for ports 1, 2, 3 and 4
  - PWR: Supply voltage display (green)
- Informative front-side module inscription
  - Plain-text marking of the module type and function class
  - 2D matrix code (Article No. and serial number)
  - Circuit diagram
  - CM module class color coding: Silver
  - Hardware and firmware version
  - Complete article number
- Optional accessories
  - Labeling strips
  - Reference identification label
  - Color-coded label with color code CC04
- Optional system-integrated shield connection

Application

- The CM 4x IO-Link communication module enables an exchange of data with up to 4 external IO-Link devices through one three-wire cable each.
- Control can be flexibly adapted to the communication partners using the comprehensive parameter assignment options.
- Since IO-Link is compatible with standard sensors, commercially available sensors compliant with IEC 61131 Type 1 can also be operated on the IO-Link master.

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
6ES7137-6BD00-0BA0	**CM 4xIO-Link V1.1 Standard communication module** • Serial communication module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	1	**6ES7137-6BD00-0BA0**	1	1 unit

For more information, see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10205200.

Overview

4 IO-Link HF electronic module

- 45-mm-wide 4 IO-Link HF electronic module
- 4 IO-Link ports according to IO-Link specification V1.1
- Port class B
- The IO-Link parameters are configured using the Port Configuration Tool (S7-PCT), version V3.4 and higher

Application

The 4 IO-Link HF electronic module enables the exchange of data with up to 4 IO-Link devices.

Since IO-Link is compatible with standard sensors, commercially available sensors compliant with IEC 61131 Type 1 can also be operated on the IO-Link master.

Design

The 4 IO-Link HF electronic module is used together with the CM IO-Link 4 X M12 P connection module. Sensors and actuators are integrated using commercially available 3- or 5-pole M12 plugs on the CM IO-Link 4 X M12 P.

IO-Link devices (e.g. sensors) with a class A port are interconnected by means of a 3-wire cable. IO-Link devices that require an additional supply voltage and have a class B port (e.g. actuators) are interconnected by means of a 5-wire cable.

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
6ES7147-4JD00-0AB0	**4 IO-Link HF electronic module** • 4 IO-Link ports acc. to IO-Link specification V1.1 • Port class B • High Feature • Channel diagnostics • Including bus module • Connection module must be ordered separately	1	**6ES7147-4JD00-0AB0**	1	1 unit

Accessories

Version	SD	Article No.	PU (UNIT, SET, M)	PS*
	d			
CM IO-Link 4 X M12 P connection module 4 M12 sockets for connection of IO-Link devices to ET 200pro 4 IO-Link HF electronic module	1	**6ES7194-4CA20-0AA0**	1	1 unit
Module labeling plates For color coding of CM IOs in the colors white, red, blue and green; pack of 100	1	**6ES7194-4HA00-0AA0**	1	500 units
M12 sealing caps For protection of unused M12 terminals on ET 200pro	▶	**3RX9802-0AA00**	100	10 units

For more information, see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10304039.

Overview

ET 200eco PN IO-Link master modules

The ET200eco PN IO-Link master modules belong to the ET 200eco PN compact block I/O device family and are distinguished by the following features:

- Compact block I/O devices for connection of IO-Link devices and connection to the PROFINET bus system
- Design without a control cabinet in IP67 degree of protection with M12 connection technology
- Very rugged and resistant encapsulated metal enclosure
- Compact module in an enclosure width of 30 mm or 60 mm
- PROFINET connection: 2 x M12 and automatic PROFINET addressing
- 100 Mbps data transmission rate
- LLDP neighborhood detection without PG
- Supply and load voltage connection: 2 x M12
- Channel-exact diagnostics

Application

IO-Link enables easy integration of sensors and actuators from different manufacturers. ET200eco PN IO-Link master modules enable an exchange of data with up to 4 IO-Link devices. Since IO-Link is compatible with standard sensors, commercially available sensors compliant with IEC 61131 Type 1 can also be operated on the IO-Link master.

With a high degree of protection, ruggedness and small dimensions, the IO-Link master modules are especially well-suited for use at the machine level in confined spaces. They have adjustable parameters and diagnostic functions and can therefore be flexibly adapted to individual process requirements.

The following IO-Link masters are available:

- Compact module in an enclosure width of 30 mm for connecting up to 4 IO-Link devices in accordance with the IO-Link specification V1.0 and V1.1 and port class B
- Compact module in an enclosure width of 60 mm for connecting up to 4 IO-Link devices in accordance with the IO-Link specification V1.0 and port class A and an additional 8 digital inputs and 4 digital outputs.

Design

The IO-Link master modules have a screw mounting hole at the front and side, and can be mounted in any position. As a result, they are extremely flexible to install on either a level surface or on aluminum mounting rails using sliding blocks.

ET 200eco PN IO-Link masters are compact modules with M12 connection technology.

Two load power supplies (4 A each) are available that can be used by the compact module or also be looped through to another compact module (line topology). PROFINET is connected via an M12 connection and can be looped through to a further PROFINET device. The maximum cable length to the IO-Link device is 20 m.

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
	ET 200eco PN IO-Link master				
6ES7148-6JA00-0AB0	• 4 IO-L + 8 DI + 4 DQ, 24 V DC/1.3 A; 8 x M12, degree of protection IP67, enclosure width 60 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and port class A as well as 8 digital inputs and 4 digital outputs	1	**6ES7148-6JA00-0AB0**	1	1 unit
6ES7148-6JD00-0AB0	• 4 IO-L 4 x M12, degree of protection IP67, enclosure width 30 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and port class B	1	**6ES7148-6JD00-0AB0**	1	1 unit

For more information, see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10046858.

Overview

CM IO-Link communication module

- 30-mm-wide CM IO-Link communication module
- For connecting up to 4 IO-Link devices in accordance with the IO-Link specification V1.0 and V1.1 and port class B
- The IO-Link parameters are configured by means of the Port Configuration Tool S7-PCT with version V3.2 and higher.

Application

The CM IO-Link communication module supports data exchange between up to four IO-Link devices. IO-Link devices (e.g. sensors) with a class A port are interconnected by means of a 3-wire cable. IO-Link devices that require an additional supply voltage and have a class B port (e.g. actuators) are interconnected by means of a 5-wire cable.

Since IO-Link is compatible with standard sensors, commercially available sensors compliant with IEC 61131 Type 1 can also be operated on the IO-Link master.

The 30-mm-wide I/O modules are ideally suited for use in extremely confined spaces. They have adjustable parameters and diagnostic functions and can therefore be flexibly adapted to individual process requirements.

The following IO-Link masters are available:

- CM 4xIO-Link communication modules, 4XM12

Design

The I/O modules have a screw mounting hole at the front and side, and can be mounted in any position. As a result, they are extremely flexible to install on either a level surface or on aluminum mounting rails using sliding blocks.

The CM IO-Link communication module features:

- A backplane bus connection (Ethernet connection) with M8 connection technology for connection to an interface module or other I/O modules
- A power supply connection with M8 connection technology with loop-through
- LED display for port status
- LED display for channel status in SIO mode
- LED display for module status (DIAG)
- LED display for load voltage 2L+ (PWR)
- Labeling plates for channel, module and slot identification
- Integrated cable tie holder
- Meaningful module inscription on front panel:
  - Plain text marking of module type
  - Interface marking
  - LED label
- Meaningful module inscription on side panel:
  - Article number, function level and FW version
  - 2D matrix code (Article No. and serial number)
  - Pin assignments of all interfaces

Labeling plates for channel, module and slot identification are supplied with the modules. These labeling plates can be inscribed using commercially available inscription machines.

Selection and ordering data

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*
		d			
6ES7147-5JD00-0BA0	**CM IO-Link** CM 4X IO-Link, 4XM12; for the connection of up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and port class B	1	**6ES7147-5JD00-0BA0**	1	1 unit

For more information, see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10233997.

IO-Link: Input Modules

General data

Overview

IO-Link input modules

Using IO-Link technology, it is basically possible to connect standard sensors to IO-Link masters. However, connecting standard sensors directly to the IO-Link master does not exploit the full potential of IO-Link.

The solution lies in the technology of the IO-Link modules. Their use is a more economically attractive solution in comparison to the direct connection of a sensor.

The IO-Link input module technology enhances IO-Link via a pure point-to-point cable connection towards decentralized structures. The maximum cable length of an IO-Link connection between an IO-Link module and an IO-Link master is 20 m. The use of sensor boxes with accordingly complex and error-prone wiring is no longer necessary.

Transmission of parameter and diagnostic signals

The IO-Link input modules also offer the possibility of transmitting parameters and diagnostic signals. This enables for example the inputs of modules to be parameterized as NC contacts or NO contacts through IO-Link. An overload or short-circuit in the sensor supply is signaled to the control system through the IO-Link master.

M8 and M12 terminals

M8 and M12 terminals are available for connecting the sensors. Connection to the IO-Link master is made using a standard M12 connecting cable.

Benefits

Benefits of using IO-Link input modules:

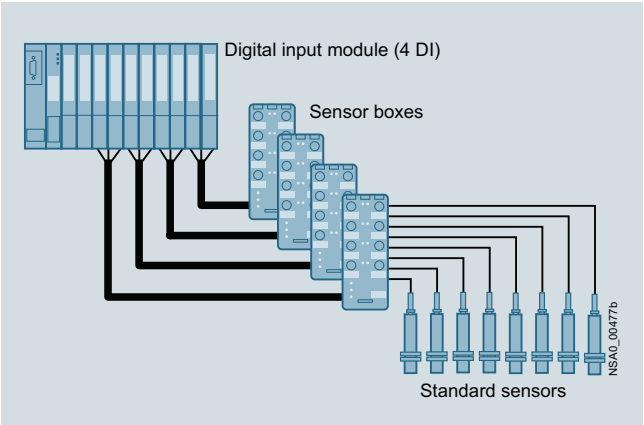
- Economical use of innovative IO-Link technology also for binary sensors
- Optimum use of all ports of the IO-Link master
- Connection of several binary sensors/actuators to one port of the IO-Link master, hence low-cost connection also of binary sensors/actuators to the control system through IO-Link
- Reduction of digital input modules in the peripheral station
- Use of parameters also for binary sensors (e.g. NC contacts, NO contacts and input delay can be parameterized)
- Reduction of cabling and hence less risk of wiring errors by dispensing with sensor boxes
- Expansion toward distributed structures using pure point-to-point wiring
- Easy and elegant integration of sensors within a radius of 20 m around an IO-Link master, e.g. in an ET 200 station
- Possibility of transmitting parameter and diagnostic signals (e.g. sensor supply overload)
- Can also be used in harsh ambient conditions thanks to a very compact design and degree of protection IP67

Application

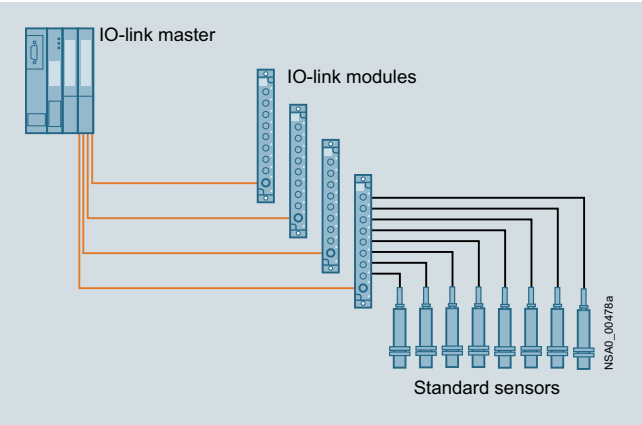
IO-Link input modules are particularly used where sensor boxes had previously been used for the connection of binary sensors.

Application example:

Replacement of sensor boxes by using IO-Link input modules



Former technology with sensor boxes



Technology with IO-Link input modules

Selection and ordering data

3RK5010-0BA10-0AA0

3RK5010-0CA00-0AA0

Type	Pin assignment	Connection	SD	Article No.	PU (UNIT, SET, M)	PS*
			d			
K20 IO-Link modules						
• 4 inputs	Y	M12	5	**3RK5010-0BA10-0AA0**	1	1 unit
• 8 inputs	Standard	M8	5	**3RK5010-0CA00-0AA0**	1	1 unit

Accessories

Version	SD	Article No.	PU (UNIT, SET, M)	PS*
	d			
Sealing caps				
• M12, for free M12 sockets	▶	**3RK1901-1KA00**	100	10 units
• M8, for free M8 sockets	2	**3RK1901-1PN00**	100	10 units
Control cable, assembled at one end				
Angular M12 plug for screw fixing, 4-pole, 4 x 0.34 mm², A-coded, black PUR sheath, max. 4 A				
• Cable length 5 m	5	**3RK1902-4GB50-4AA0**	1	1 unit
M12 socket, angled	5	**3RK1902-4CA00-4AA0**	1	1 unit
For screw fixing, 4-pole screw terminals, max. 0.75 mm², A-coded, max. 4 A				
M12 plugs				
For screw fixing, 5-pole screw terminals, max. 0.75 mm², A-coded, max. 4 A				
• Straight	5	**3RK1902-4BA00-5AA0**	1	1 unit
• Angled	5	**3RK1902-4DA00-5AA0**	1	1 unit
Control cable, assembled at one end				
Angular M12 plug for screw fixing, 5-pole, 5 x 0.34 mm², A-coded, black PUR sheath, max. 4 A				
• Cable length 1.5 m	5	**3RK1902-4HB15-5AA0**	1	1 unit
• Cable length 5 m	5	**3RK1902-4HB50-5AA0**	1	1 unit
• Cable length 10 m	5	**3RK1902-4HC01-5AA0**	1	1 unit
Control cable, assembled at both ends				
Straight M12 plug, straight M12 socket, for screw fixing, 3-pole, 3 x 0.34 mm², A-coded, black PUR sheath, max. 4 A				
• Cable length 1.5 m	5	**3RK1902-4PB15-3AA0**	1	1 unit
M12 Y-shaped coupler plug	1	**6ES7194-1KA01-0XA0**	1	1 unit
For connection of two sensors to one M12 socket with Y-assignment				

3RK1901-1KA00

3RK1901-1PN00

3RK1902-4GB50-4AA0

3RK1902-4CA00-4AA0

3RK1902-4BA00-5AA0

3RK1902-4DA00-5AA0

3RK1902-4H...-5AA0

3RK1902-4PB15-3AA0

6ES7194-1KA01-0XA0

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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		
		Guide No.	File No.	Guide No.		File No.	Guide 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	2)	2)	–	–	–	NMTR2	NMTR8	E 328403
FB busbar adapter system	5	2)	2)	–	–	–	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	1)	1)	NKCR	NKCR7	E 44653	–	–	–

1) c listing for Canada, instead of CSA certification.
2) 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.		File No.	Guide No.		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	1)	1)	NLDX	NLDX7	E 31519	–	–	–
3TX71 plug-in relays	11	–	–	–	–	–	NLDX2	NLDX8	E 14900
3TX71 sockets	11	–	–	–	–	–	SWIV2	SWIV8	E 196786
3UG monitoring relay	11	1)	1)	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	1)	1)	NKCR	-	E 44653	–	–	–
3SK safety relays	13			NKCR	NKCR7	E 44653			
3TK28 safety relay	13	1)	1)	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	1)	1)	NRAQ	NRAQ7	E 143289	NRAQ2	NRAQ8	E 143289
6GK5 ethernet switches	15			NWGQ	NWGQ7	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	2)	2)	–	–	–	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	–	3) E10848
VL circuit breakers	17	Class 1432-01	LR 13077	DIVQ	DIVQ7	E 10848	DKPU2	–	3) E10848
WL circuit breakers	17	–	–	DIVQ	DIVQ7	E 231263	–	–	–
3LD2 disconnect switches	18	1)	230576	NLRV	NLRV7	E 47705	–	–	–
CFS fusible disconnect switches	18	–	222227	WHTY	–	E 121152	WHTY2	–	E 121152
LBR and LBT disconnect switches	18	–	1)	NLRV	–	E 191706	–	–	–
MCS disconnect switches	18	–	154852	–	–	–	WHTY2	–	E 121152
VBII disconnect switches	18	–	154852	–	–	–	WHTY2	–	E 121152
VBII safety switches	18	–	4)	WIAX	WIAX7	E 4776	–	–	–

1) c listing for Canada, instead of CSA certification.
2) c recognition for Canada, instead of CSA certification.
3) Instantaneous only circuit breakers (ETI or MCP).
4) 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

Siemens Industrial Controls Catalog
- with updates to the print Catalog

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

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

Short Circuit Current Ratings (SCCR) to meet UL508A & 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 windblown 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 hose-down, 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

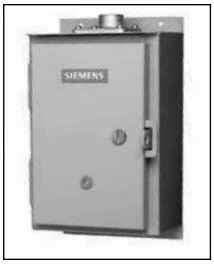
Type 12 enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids. They shall meet drip, dust, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation.

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

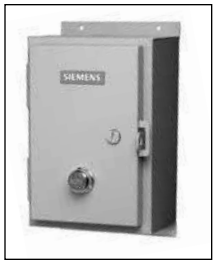


Type 3/3R

Type 4/4X

Type 4X

Type 3, 4, 7 & 9



Type 12 & 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	×	×	×	×	×	×
Rain, snow, and sleet	—	×	×	×	—	—
Windblown dust	—	—	×	×	—	—
Falling dirt	×	—	×	×	×	×
Falling liquids and light splashing	—	—	×	×	×	×
Circulating dust, lint, fibers, and flyings	—	—	×	×	×	×
Settling airborne dust, lint, fibers, and flyings	—	—	×	×	×	×
Hosedown and splashing water	—	—	×	×	—	—
Oil and coolant seepage	—	—	—	—	×	×
Oil or coolant spraying and splashing	—	—	—	—	—	×
Corrosive agents	—	—	—	×	—	—

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	
Protection of persons against access to hazardous parts and protection against penetration of solid foreign objects.		**Protection against ingress of water under test conditions specified in IEC 529.**	
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 catagories

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[1]) control with manual resetting of overload releases
	AC-8b	Hermetic refrigerant compressor motor[1]) 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
U_i	Rated insulation voltage to DIN VDE 0110/DIN VDE 0660
U_e	Rated operational voltage
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
U_s	Rated control supply voltage (Control voltage) to DIN VDE 0660 Part 102, IEC 947-1
U	No-load voltage to IEC 947-2, -3, -5
U_r	Power-frequency recovery voltage (IEC 947-.)
U_o	Transformer no-load voltage to DIN VDE 0532
U_k	Short-circuit impedance voltage to DIN VDE 0532
U_{kr}	Rated value of the impedance voltage in % to DIN VDE 0102, 01.90
I_n	Rated current to IEC 947-.
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_{the}	Conventional enclosed thermal current
I_u	Rated uninterrupted current to IEC 947-1
I_e	Rated operational current
I_s	Selectivity (discrimination) limit current (DIN VDE 0660, IEC 947-1)
I_{cm}	Rated short-circuit making capacity to IEC 947-1
I_{cn}	Rated short-circuit breaking capacity to IEC 947-1
I_{cm}	Rated ultimate short-circuit breaking capacity to IEC 947-1

Symbol	Characteristic Electrical Quantity
I_{cw}	Rated short-time current withstand capacity to IEC 947-1
I_p	Test current (general) to DIN VDE 0660, prospective current to DIN VDE 0636
I_n	Breaking current (r.m.s. value) to DIN VDE 0102
i_p	Peak short-circuit current (maximum instantaneous value) to DIN VDE 0102
I_k	Sustained (symmetrical) short-circuit current (r.m.s. value), DIN VDE 0102. Rated short-time withstand current to DIN VDE 0660
i_p	Let-through current of fuses and rapidly operating switching devices (maximum instantaneous value during the break time) to DIN VDE 0102
I_o	No-load current at the input side of a transformer (unloaded output side) to DIN VDE 0532
I_x	Current carrying capacity (ampacity)
I_{sr}	Rated rotor operational current (DIN VDE 0660, IEC 947-1)
I_r	Setting current ("current setting") to DIN VDE 0660
I_R	Take-over current
R	Ohmic resistance
S''_k	Initial symmetrical AC short-circuit power (simplified: apparent short-circuit power)
X	Reactance, reactive impedance
Z	Impedance (apparent resistance)
x	Factor to determine the peak short-circuit current ip

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[1])	Thermal Continuous Test Current, Amperes	Maximum Make or Break[2]) Current, Amperes			Maximum Make or Break Voltamperes at 300 Volts or Less
		125 Volt	250 Volt	301 to 600 Volt	
N150	10	2.2	—	—	275
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[3])

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	
	I/I_e	U/U_e	I/I_e	U/U_e
AC-12	1	1	1	1
AC-13	2	1	1	1
AC-14	6	1	1	1
AC-15	10	1	1	1

DC Control Circuit Utilization Categories per IEC 947-5-1	Make		Break	
	I/I_e	U/U_e	I/I_e	U/U_e
DC-12	1	1	1	1
DC-13	1	1	1	1
DC-14	10	1	1	1

Example of a Typical IEC Control Circuit Ratings Table[4])

AC

I_e/AC-12 (Continuous Amps)	U_e AC Voltage	I_e/AC-15 Amps
10	24V	6A
	110V	6A
	220/230V	6A
	380/440V	4A

DC

Voltage	I_e/DC-12	I_e/DC-13
24	6A	3A
60	5A	1.5A
110	2.5A	0.7A
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_e Rated operational current
U_e 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

Hp	Syn Speed RPM	200 Volts	230 Volts	460 Volts	575 Volts
¼	1800	1.09	0.95	0.48	0.38
	1200	1.61	1.40	0.70	0.56
	900	1.84	1.60	0.80	0.64
⅓	1800	1.37	1.19	0.60	0.48
	1200	1.83	1.59	0.80	0.64
	900	2.07	1.80	0.90	0.72
½	1800	1.98	1.72	0.86	0.69
	1200	2.47	2.15	1.08	0.86
	900	2.74	2.38	1.19	0.95
¾	1800	2.83	2.46	1.23	0.98
	1200	3.36	2.82	1.46	1.17
	900	3.75	3.26	1.63	1.30
1	3600	3.22	2.80	1.40	1.12
	1800	4.09	3.56	1.78	1.42
	1200	4.32	3.76	1.88	1.50
	900	4.95	4.30	2.15	1.72
1 ½	3600	5.01	4.36	2.18	1.74
	1800	5.59	4.86	2.43	1.94
	1200	6.07	5.28	2.64	2.11
	900	6.44	5.60	2.80	2.24
2	3600	6.44	5.60	2.80	2.24
	1800	7.36	6.40	3.20	2.56
	1200	7.87	6.84	3.42	2.74
	900	9.09	7.90	3.95	3.16
3	3600	9.59	8.34	4.17	3.34
	1800	10.8	9.40	4.70	3.76
	1200	11.7	10.2	5.12	4.10
	900	13.1	11.4	5.70	4.55
5	3600	15.5	13.5	5.76	5.41
	1800	16.6	14.4	7.21	5.78
	1200	18.2	15.8	7.91	6.32
	900	18.3	15.9	7.92	6.33
7 ½	3600	22.4	19.5	9.79	7.81
	1800	24.7	21.5	10.7	8.55
	1200	25.1	21.8	10.9	8.70
	900	26.5	23.0	11.5	9.19
10	3600	29.2	25.4	12.7	10.1
	1800	30.8	25.8	13.4	10.7
	1200	32.2	28.0	14.0	11.2
	900	35.1	30.5	15.2	12.2
15	3600	41.9	36.4	18.2	14.5
	1800	45.1	39.2	19.6	15.7
	1200	47.6	41.4	20.7	16.5
	900	51.2	44.5	22.2	17.8
20	3600	58.0	50.4	25.2	20.1
	1800	58.9	51.2	25.6	20.5
	1200	60.7	52.8	26.4	21.1
	900	63.1	54.9	27.4	21.9

Amperes 60Hz

Hp	Syn Speed RPM	200 Volts	230 Volts	460 Volts	575 Volts
25	3600	69.9	60.8	30.4	24.3
	1800	74.5	64.8	32.4	25.9
	1200	75.4	65.6	32.8	26.2
	900	77.4	67.3	33.7	27.0
30	3600	84.8	73.7	36.8	29.4
	1800	86.9	75.6	37.8	30.2
	1200	90.6	78.8	39.4	31.5
	900	94.1	81.8	40.9	32.7
40	3600	111	96.4	48.2	38.5
	1800	116	101	50.4	40.3
	1200	117	102	50.6	40.4
	900	121	105	52.2	41.7
50	3600	138	120	60.1	48.2
	1800	143	124	62.2	49.7
	1200	145	126	63.0	50.4
	900	150	130	65.0	52.0
60	3600	164	143	71.7	57.3
	1800	171	149	74.5	59.4
	1200	173	150	75.0	60.0
	900	177	154	77.0	61.5
75	3600	206	179	89.6	71.7
	1800	210	183	91.6	73.2
	1200	212	184	92.0	73.5
	900	222	193	96.5	77.5
100	3600	266	231	115	92.2
	1800	271	236	118	94.8
	1200	275	239	120	95.6
	900	290	252	126	101
125	3600	—	292	146	116
	1800	—	293	147	117
	1200	—	298	149	119
	900	—	305	153	122
150	3600	—	343	171	137
	1800	—	348	174	139
	1200	—	350	174	139
	900	—	365	183	146
200	3600	—	458	229	184
	1800	—	452	226	181
	1200	—	460	230	184
	900	—	482	241	193
250	3600	—	559	279	223
	1800	—	568	284	227
	1200	—	573	287	229
	900	—	600	300	240
300	1800	—	278	339	271
	1200	—	684	342	274
400	1800	—	896	448	358

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 mm²	Equivalent Metric C.S.A. mm²	AWG or MCM
0.75	0.635	19 AWG
	0.823	18
	1.04	17
	1.31	16
1.5	1.65	15
	2.08	14
2.5	2.62	13
	3.31	12
4	4.17	11
	5.26	10
6	6.63	9
	8.37	8
10	10.55	7
	13.30	6
16	16.77	5
	21.15	4
25	26.67	3
	33.63	2
35	42.41	1
50	53.48	1/0
	67.43	2/0
70	85.03	3/0
95	107.20	4/0
120	126.64	250 MCM
150	152.00	300
	177.35	350
185	202.71	400
240	253.35	500
300	304.00	600
	354.71	700
400	405.35	800
500	506.71	1000
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[1]), 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)	$\frac{I \times E \times \% EFF \times pf}{746}$	$\frac{I \times E \times 2 \times \% EFF \times pf}{746}$	$\frac{I \times E \times 1.73 \times \% EFF \times pf}{746}$	$\frac{I \times E \times \% EFF}{746}$
Amperes when Horsepower is Known	$\frac{HP \times 746}{E \times \% EFF \times pf}$	$\frac{HP \times 746}{2 \times E \times \% EFF \times pf}$	$\frac{HP \times 746}{1.73 \times E \times \% EFF \times pf}$	$\frac{HP \times 746}{E \times \% EFF}$
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[3])

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 × 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)[2])

Rating or Setting of Automatic Overcurrent Device in Circuit Ahead of Equipment, Conduit etc., Not Exceeding (Amperes)	Size: Copper Wire Number	Size: 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)[2])

Size of Largest Service Entrance Conductor or Equivalent Area for Parallel Conductors: Copper	Size of Largest Service Entrance Conductor or Equivalent Area for Parallel Conductors: Aluminum or Copper Clad Aluminum	Size of Grounding Electrode Conductor: Copper	Size of Grounding Electrode Conductor: 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

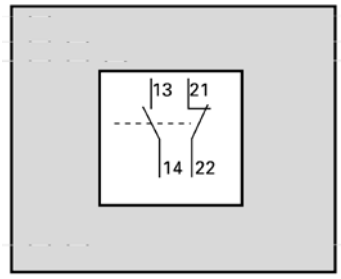
Symbols and Terminal Markings—IEC

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

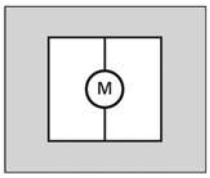
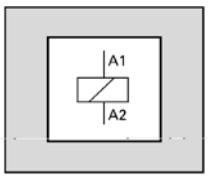
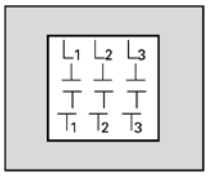
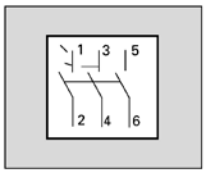
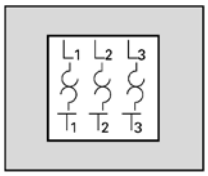
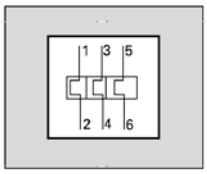
5. The number 2 identifies that this is the second contact in the sequence

6. The numbers 1 and 2 identify this as a normally closed contact

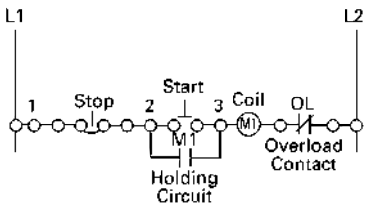
Symbols and Terminal Markings

Control Circuits	NEMA	IEC
Normally Open (NO)		
Normally Closed (NC)		
Time Delay Circuits		
On Delay Normally Open (Timed Closed)		
Normally Closed (Timed Open)		
Off Delay Normally Open (Timed Open)		
Normally Closed (Timed Closed)		

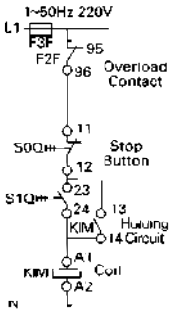
NEMA and IEC Comparisons Contactor/Starter Markings

	NEMA		IEC
Coils		M — Defined by type of coil. No Standard terminal designation.	
Power Contacts 3-Pole Device		Line Side Connections Load Side Connections	
Overload Relay		Line Side Connections Load Side Connections	

Control Circuit Schematic

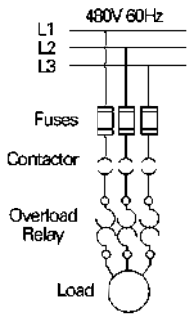


NEMA

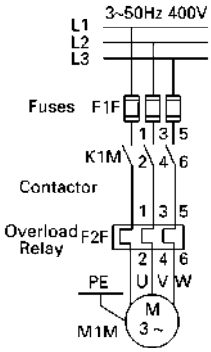


IEC

Power Circuit Schematic



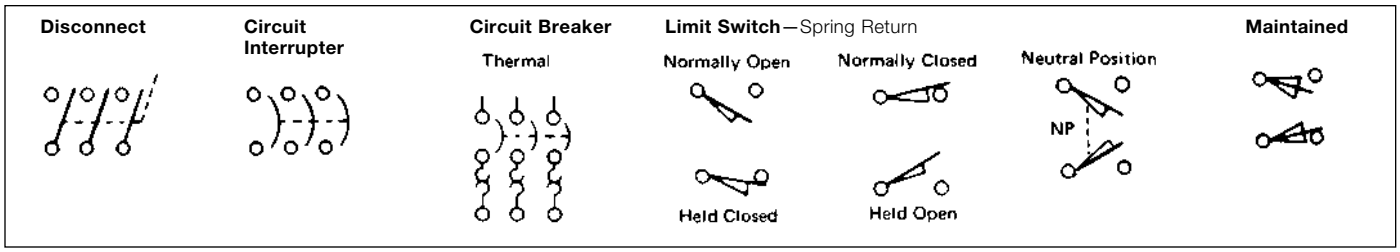
NEMA

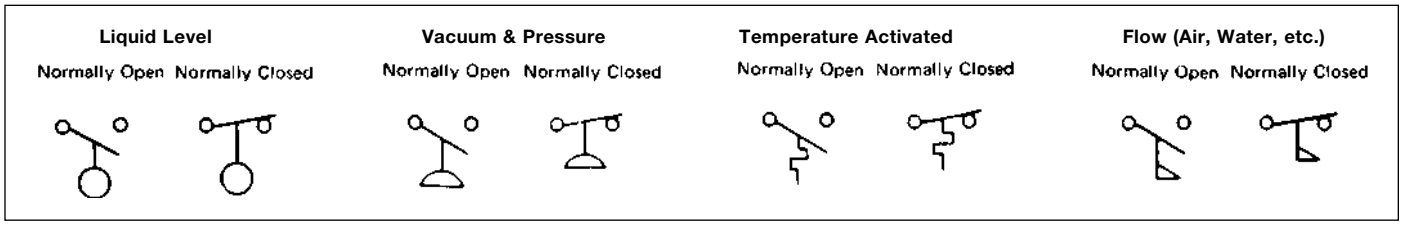


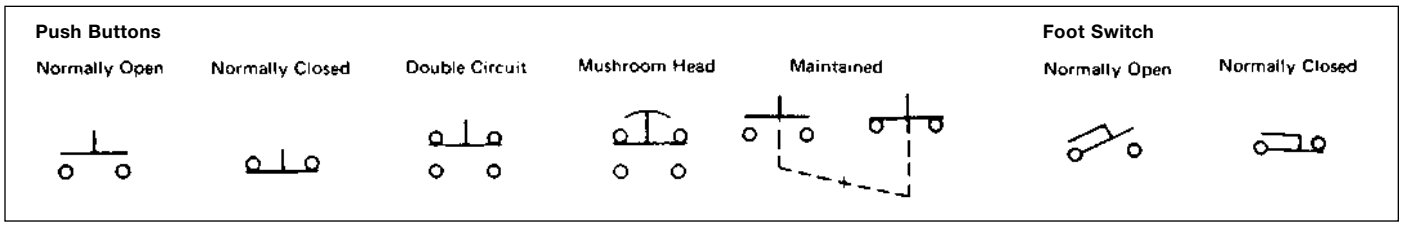
IEC

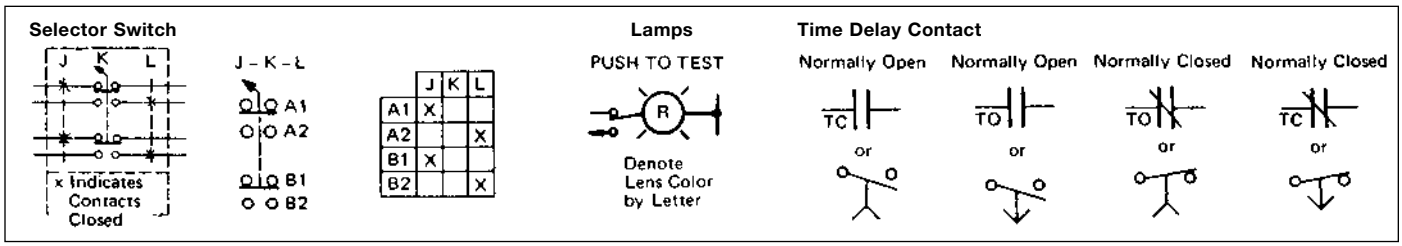
General Information

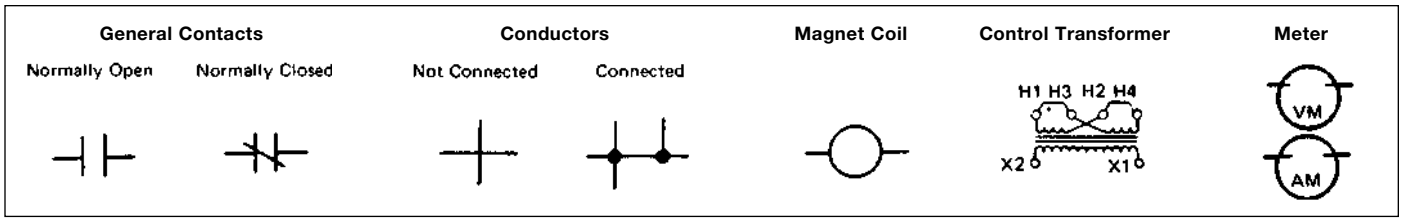
Electrical symbols

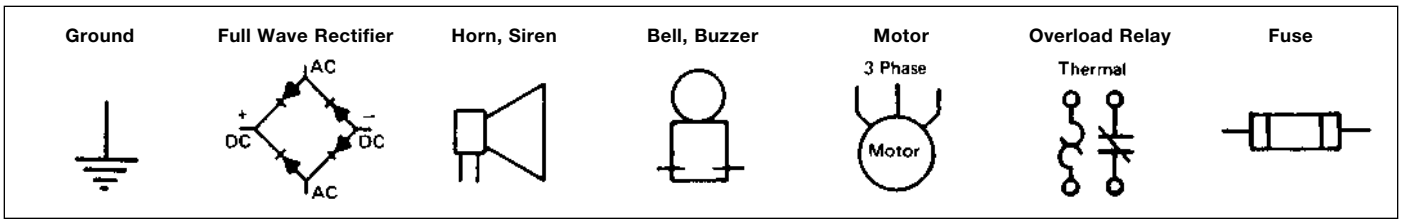


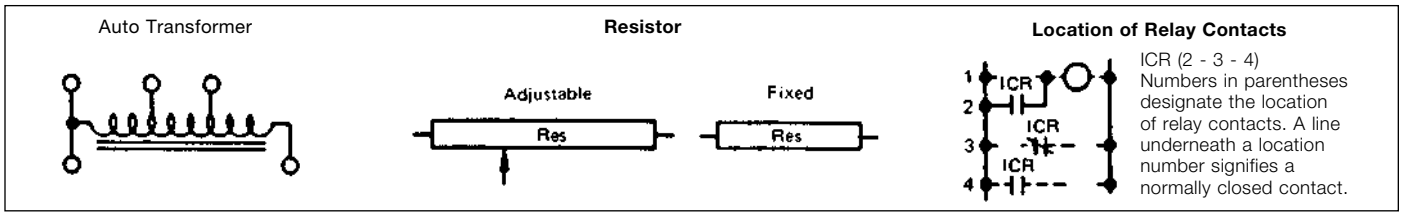












General Information

Control circuit schematics

Figure 1 Three Wire Control Giving Low Voltage Protection Using Single Two Button Station

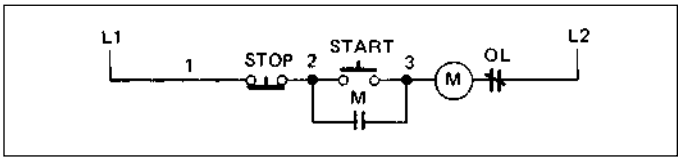


Figure 2 Three Wire Control Giving Low Voltage Protection Using Multiple Two Button Stations

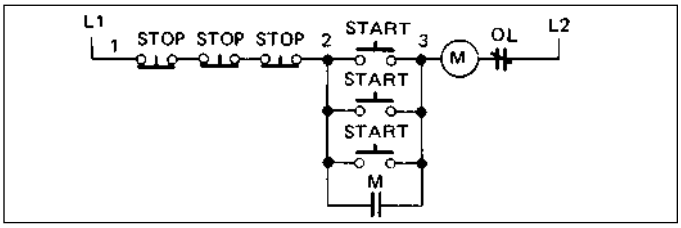


Figure 3 Three Wire Control Giving Low Voltage Protection with Safe-Run Selector Switch

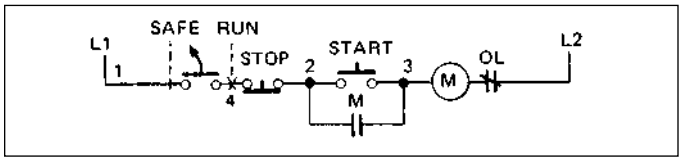


Figure 4 Three Wire Control for Jog or Run Using Start Stop Push Buttons and Jog-Run Selector Switch

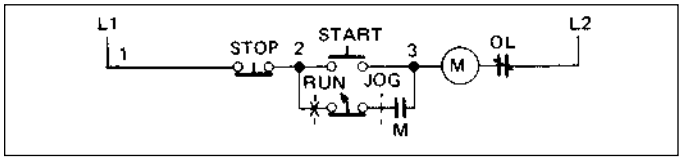


Figure 5 Control for Jog or Run Using Stop Push Button and Jog-Run Selector Push Selector Switch. Selector Push Contacts are Shown for "Run" (Three Wire Operation). Rotate Switch Sleeve and Selector Contact Opens Between "2" and "Stop" Button (Two Wire Operation)

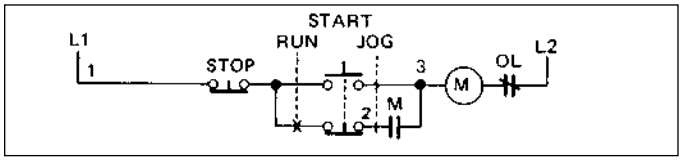


Figure 6 Three Wire Control for Jogging, Start, Stop Using Push Buttons

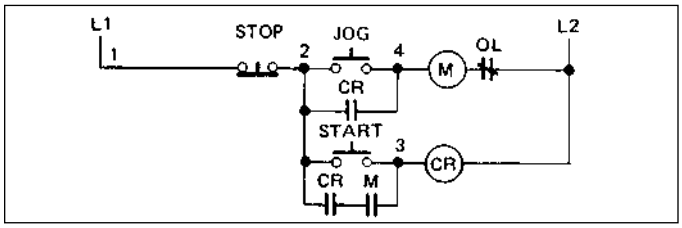


Figure 7 Two Wire Control Giving Low Voltage Release Only Using Hand-Off-Auto Selector Switch

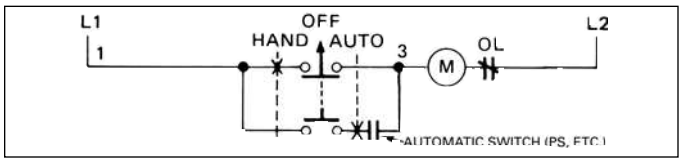


Figure 8 Two Wire Control for Reversing Jogging Using Single Two Button Station

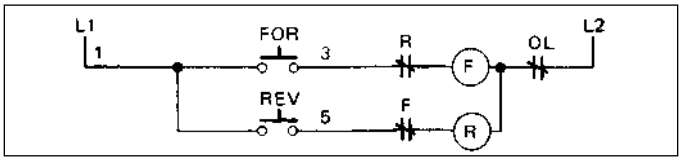


Figure 9 Three Wire Control for Instant Reversing Applications Using Single Three Button Station

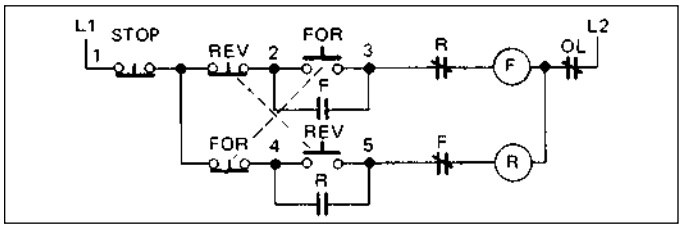


Figure 10 Three Wire Control for Reversing After Stop Using Single Three Button Station

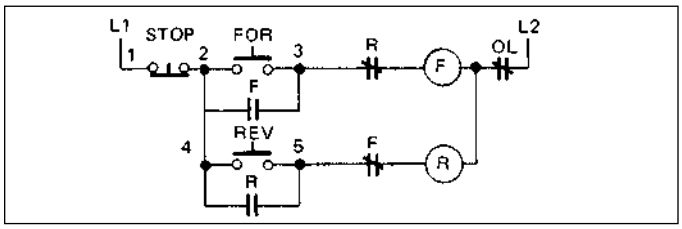


Figure 11 Control for Three Speed with Selective Circuitry to Insure the Stop Button is Pressed Before Going to a Lower Speed

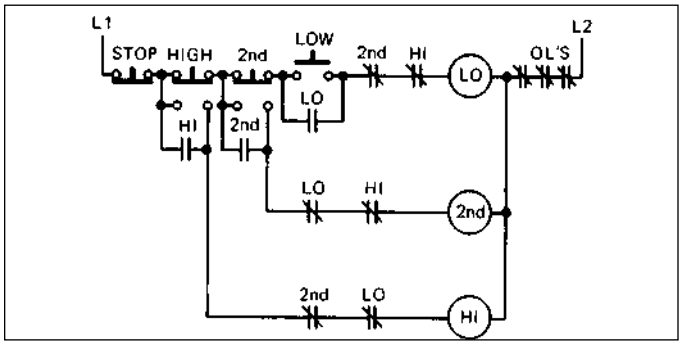
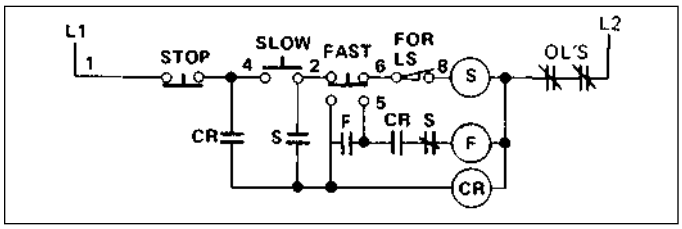


Figure 12 Three Wire Control for Two Speed with a Compelling Relay to Insure Starting on Slow Speed



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

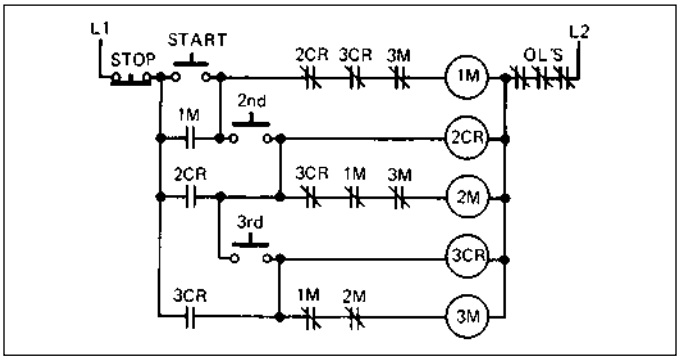


Figure 14 Control for Two Speed to Provide Automatic Acceleration from Low to High Speed

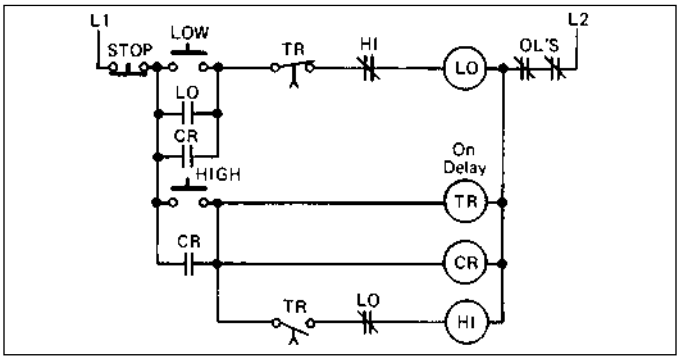


Figure 15 Control for Two Speed to Provide Automatic Deceleration from High to Low Speed

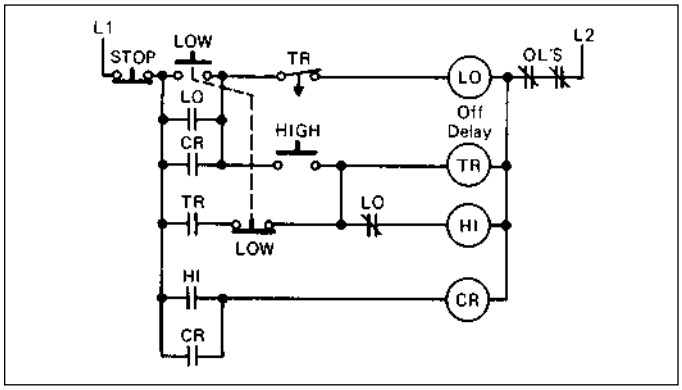
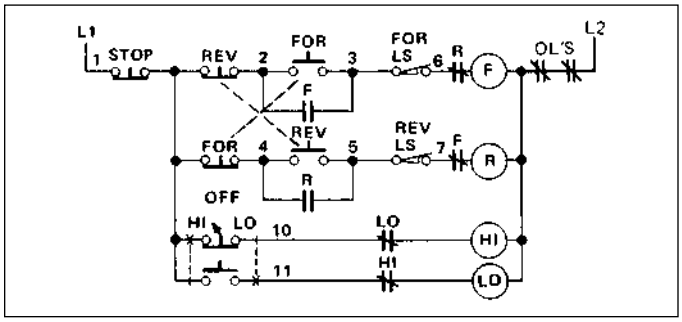
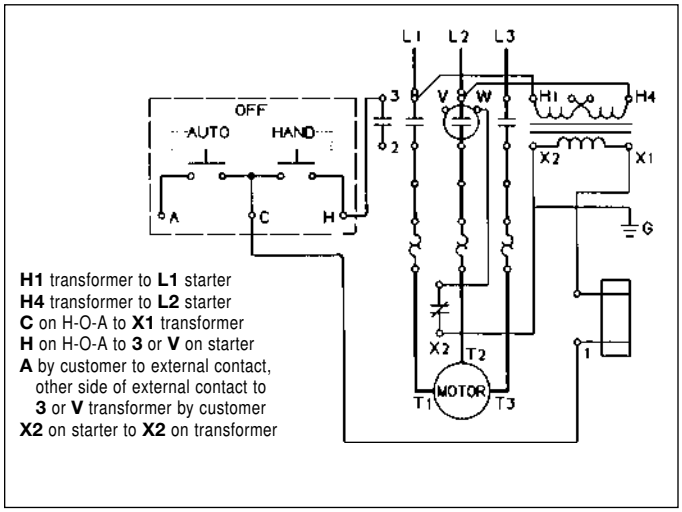


Figure 16 Control for Two Speed Reversing Starter Using Forward, Reverse, Stop Push Buttons and High-Low-Off Selector Switch

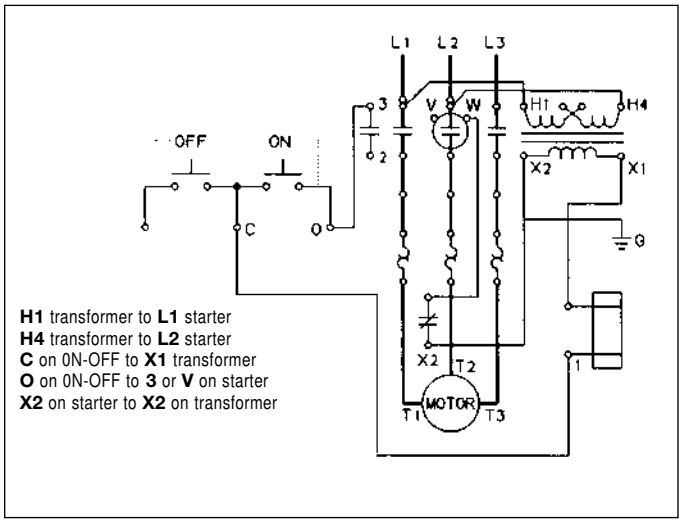


Size 0–2½ Starter with Transformer and 3 Position Selector Switch



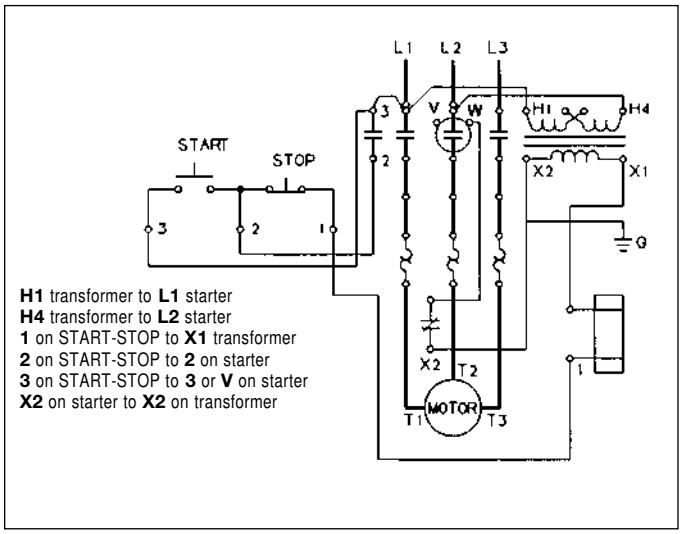
H1 transformer to **L1** starter
H4 transformer to **L2** starter
C on H-O-A to **X1** transformer
H on H-O-A to **3** or **V** on starter
A by customer to external contact, other side of external contact to **3** or **V** transformer by customer
X2 on starter to **X2** on transformer

Size 0–2½ Starter with Transformer and 2 Position Selector Switch



H1 transformer to **L1** starter
H4 transformer to **L2** starter
C on 0N-OFF to **X1** transformer
O on 0N-OFF to **3** or **V** on starter
X2 on starter to **X2** on transformer

Size 0–2½ Starter with Transformer and START-STOP Push Button

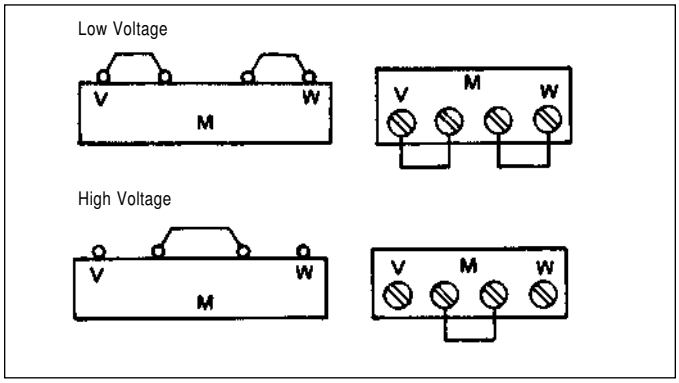


H1 transformer to **L1** starter
H4 transformer to **L2** starter
1 on START-STOP to **X1** transformer
2 on START-STOP to **2** on starter
3 on START-STOP to **3** or **V** on starter
X2 on starter to **X2** on transformer

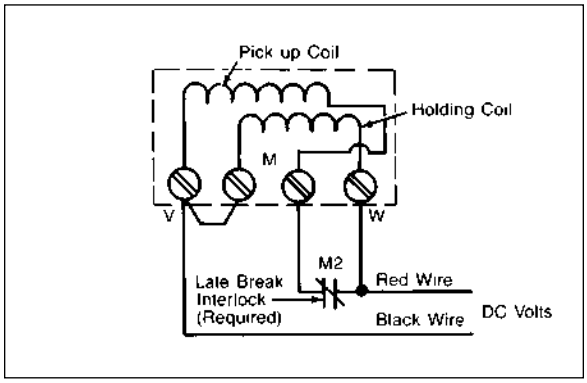
General Information

Pilot control

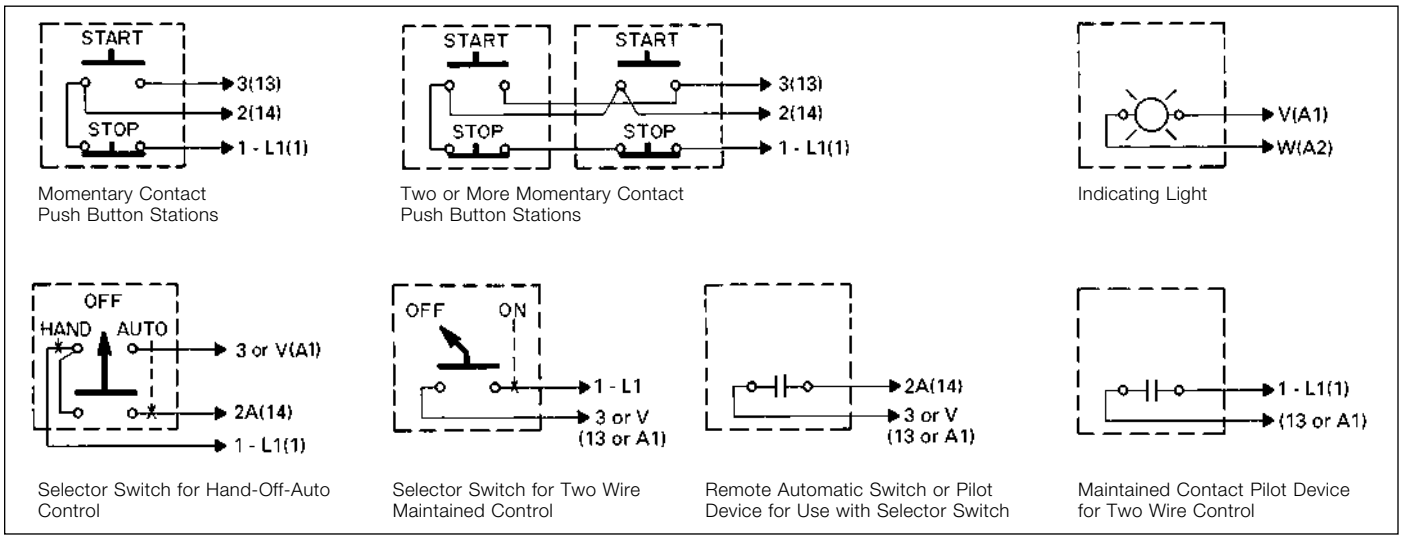
AC Coil—NEMA Size 0–4



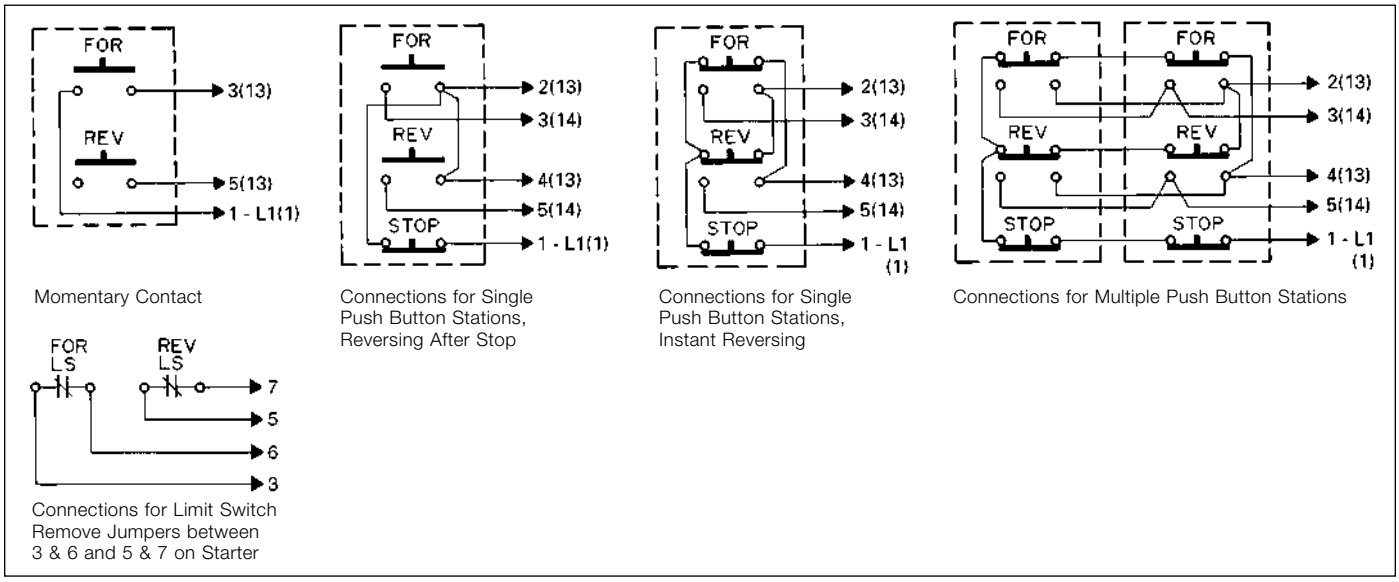
DC Coil—NEMA Size 0–4



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.



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.

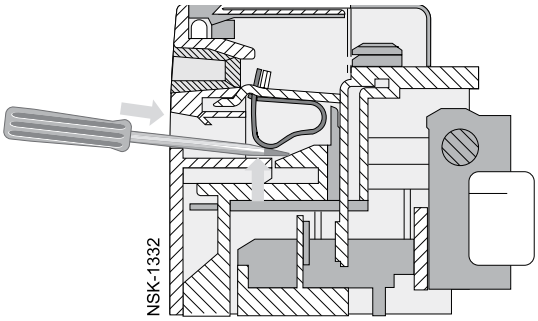
Each terminal connection is equipped with two independently operated spring clamps. Each spring can accept one wire. The clamping force of the spring automatically adjusts to the size of the wire and compensates for any deformation of the wire, such as settling of the strands. The flat clamping face 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.

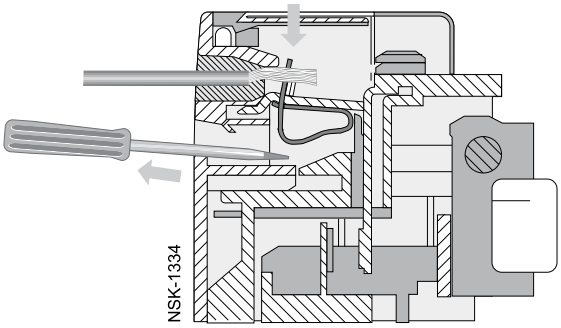
Advantages:

- 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

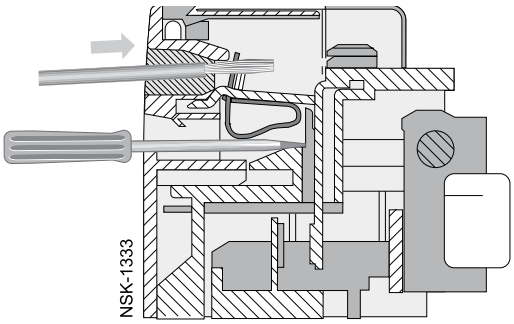
Step 1:
Insert screwdriver;
spring opens.



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.



Software licenses NEW

Overview

Software types

Software requiring a license is categorized into types.
The following software types have been defined:

- Engineering software
- Runtime software

Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third-parties free-of-charge.

Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of supply can be found in the readme file supplied with the relevant product(s).

License types

Siemens Industry Automation & Drive Technologies offers various types of software license:

- Floating license
- Single license
- Rental license
- Rental floating license
- Trial license
- Demo license
- Demo floating license

Floating license

The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.
A license is required for each concurrent user.

Single license

Unlike the floating license, a single license permits only one installation of the software per license.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per instance, per axis, per channel, etc.

One single license is required for each type of use defined.

Rental license

A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific period of time (the operating hours do not have to be consecutive).
One license is required for each installation of the software.

Rental floating license

The rental floating license corresponds to the rental license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Demo license

The demo license support the "sporadic use" of engineering software in a non-productive context, for example, use for testing and evaluation purposes. It can be transferred to another license. After the installation of the license key, the software can be operated for a specific period of time, whereby usage can be interrupted as often as required.

One license is required per installation of the software.

Demo floating license

The demo floating license corresponds to the demo license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

Certificate of License (CoL)

The CoL is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Delivery versions

Software is constantly being updated.
The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

PowerPack

PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.
A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade

An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.
The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.
A separate upgrade must be purchased for each original license of the software to be upgraded.

Software licenses NEW

Overview

ServicePack

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Industry Automation & Drive Technologies supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Software Update Service (SUS)

As part of the SUS contract, all software updates for the respective product are made available to you free of charge for a period of one year from the invoice date. The contract will automatically be extended for one year if it is not canceled three months before it expires.

The possession of the current version of the respective software is a basic condition for entering into an SUS contract.

You can download explanations concerning license conditions from www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

Siemens Canada Ltd. (Seller)

Siemens standard terms and conditions of sale for products

1. APPLICABLE TERMS. This Agreement governs the sale of equipment, components, parts, and materials provided by Siemens ("Products"). Any applicable addenda, these terms, Siemens proposal, price quote, purchase order, or acknowledgement issued by Siemens form the parties' final agreement ("Agreement"). In the event of a conflict between these documents, precedence shall apply in accordance with the order listed in the previous sentence. Siemens' proposal, offer or acceptance is conditioned on Buyer's acceptance of this Agreement. Any additional or conflicting terms in Buyer's request for proposal, specifications, purchase order or any other written or oral communication are not binding on Siemens unless separately signed by Siemens. Siemens' failure to object to Buyer's additional or conflicting terms does not operate as a waiver of any terms contained in this Agreement.

2. PRICING & PAYMENT. Prices and payment terms are: (i) as stated in Siemens' proposal, or if none are stated; (ii) Siemens' standard prices in effect when Siemens receives Buyer's purchase order; or if neither (i) or (ii) apply, then Siemens' standard prices in effect when the Products ship.

(a) Payment. Unless stated in Siemens' proposal, all payments are due net thirty (30) days from the invoice date in Canadian Dollars.

(b) Credit Approval. All orders are subject to credit approval by Siemens. Siemens may modify, suspend or withdraw the credit amount or payment terms at any time. If there is doubt as to Buyer's financial condition, Siemens may withhold manufacturing or shipment, require cash payments, or require other satisfactory security. Siemens may recover shipped Products from the carrier pending such assurances.

(c) Installment Shipment. Where Products are delivered in shipments or only part of a shipment fails to comply with this Agreement, the Buyer may only reject the non-compliant portion. Buyer will separately pay for each shipment. If Siemens holds or stores Products for Buyer, it shall do so at Buyer's sole risk and expense.

(d) Taxes, Shipping, Packing, Handling. Unless stated in writing by Siemens, Siemens' prices exclude charges for freight, unloading, storage, insurance, taxes, excises, fees, duties or other government charges related to the Products. Buyer will pay these amounts or reimburse Siemens. If Buyer claims a tax or other exemption or direct payment permit, Buyer will provide a valid exemption certificate or permit and indemnify, defend and hold Siemens harmless from any taxes, costs and penalties arising from same. Siemens' prices include the costs of its standard domestic packing only. Any packing deviationwill be charged to Buyer. Increases, changes (including in application), adjustments or surcharges which may be incurred are for Buyer's account.

(e) Late Payments. Late payments shall bear interest at an annual percentage rate of twelve percent (12%) or the highest rate allowed by law, whichever is lower.

(f) Disputed Invoice. If Buyer disputes all or any portion of an invoice, it must first deliver written notice to Siemens of the disputed amount and the basis for the dispute within twenty-one (21) days of receiving the invoice. Failure of Buyer to timely notify Siemens of any dispute constitutes a waiver of Buyer's claim. If Buyer only disputes a portion of the invoice, Buyer must pay the undisputed portion in accordance with Article 2(a). Upon resolution of the dispute, Buyer must pay the invoice or the remainder of the invoice, plus any accrued interest on the late payment.

(g) Suspension/Termination Right. Siemens may suspend work if an undisputed invoice is more than thirty (30) days past due. Siemens may terminate this Agreement if an undisputed invoice is more than sixty (60) days past due. Unless prohibited by law, Siemens may also terminate this Agreement immediately in the event of a material adverse change in Buyer's financial condition including, but not limited to, bankruptcy, insolvency, liquidation or similar financial condition.

3. DELIVERY; TITLE; RISK OF LOSS. Products will be delivered F.O.B. Siemens point of shipment with title and risk of loss or damage passing to Buyer at that point. Buyer is responsible for all transportation, insurance and related expenses. The related expenses shall include any taxes, duties or documentation fees. Siemens may make partial shipments. Any shipping, delivery and installation dates are estimated dates only. Siemens is not liable for any loss or expense incurred by Buyer or Buyer's customers if Siemens fails to meet its delivery schedule.

4. DEFERMENT AND CANCELLATION. Buyer has no right to defer shipment but may cancel this Agreement on thirty (30) days written notice if Siemens has not already performed. If Buyer cancels this Agreement, it shall pay all cancellation charges including, without limitation: (i) the full price for any finished Product; (ii) for partially completed product, the portion of the price determined to be due by Siemens based on its percentage of completion of the Product; (iii) reasonable overhead and profit; and (iv) any payments due to subcontractors and/or suppliers for any materials, components or products ordered which cannot be cancelled, refunded, or redirected for other beneficial use.

5. TRANSPORTATION AND STORAGE.

(a) When Products are ready for shipment, Siemens will: (i) inform Buyer, and Buyer will then promptly give shipping instructions to Siemens; (ii) determine the method of transportation and shipment routing; and (iii) ship the Products with freight prepaid by normal transportation. If Buyer fails to provide timely shipping instructions, Siemens will ship the Products by normal transportation means to Buyer or to a storage location selected by Siemens. Buyer will pay or reimburse any excess transportation charges for special or expedited transportation.

(b) If Products are placed into storage, delivery occurs and risk of loss transfers to Buyer when the Products are placed on the carrier for shipment to the storage location. If the Products are to be stored in the facility where manufactured, delivery occurs and risk of loss transfers to Buyer when placed in the storage location.

Buyer will pay all Siemens' storage expenses, including but not limited to, preparation for and placement into storage, handling, freight, storage, inspection, preservation, maintenance, taxes and insurance, upon receipt of an invoice(s) from Siemens. When conditions permit and upon payment to Siemens of all amounts due, Buyer must arrange, at its expense, to remove the Products from storage. Buyer bears the risk of loss, damage or destruction to Products in storage.

6. FORCE MAJEURE / DELAYS. If Siemens' performance is delayed by any cause beyond its reasonable control (regardless of whether the cause was foreseeable), including without limitation acts of God, strikes, labor shortage or disturbance, fire, accident, war or civil disturbance, delays of carriers, cyber-attacks, terrorist attacks, failure of normal sources of supply, or acts or inaction of government, Siemens' time of performance will be extended by a period equal to the length of the delay plus any consequences of the delay. Siemens will notify Buyer within a reasonable time after becoming aware of any such delay.

7. BUYER'S REQUIREMENTS. Siemens' performance is contingent upon Buyer timely fulfilling all of its obligations under this Agreement. These obligations include the Buyer supplying all documents and approvals needed for Siemens to perform, including but not limited to technical information and data, drawing and document approvals, and necessary commercial documentation. Siemens may request a change order for an equitable adjustment in prices and times for performance, as well as for any additional costs or any delay resulting from the failure of Buyer or Buyer's contractors, successors or assigns to meet these obligations.

8. INDEMNITY. Siemens and Buyer (each as an "Indemnitor") shall indemnify the other ("Indemnitee") from and against all third party claims alleging bodily injury, death or damage to a third party's tangible property, but only to the extent caused by the Indemnitor's negligent acts or omissions. If the injury or damage is caused by the parties' joint or contributory negligence, the loss and/or expenses shall be borne by each party in proportion to its degree of fault. No part of the Product(s) or Buyer's site is considered third party property.

Indemnitee shall provide the Indemnitor with prompt written notice of any third party claims covered by this Article. Indemnitor has the unrestricted right to select and hire counsel and the exclusive right to conduct the legal defense and/or settle the claim on the Indemnitee's behalf. The Indemnitee shall not make any admission(s) which might be prejudicial to the Indemnitor and shall not enter into a settlement without the express permission of the Indemnitor.

9. WARRANTIES.

(a) Warranties. Siemens warrants that: (i) each Product is free from defects in material and workmanship; (ii) each Product materially conforms to Siemens' specifications that are attached to, or expressly incorporated into this Agreement; and (iii) at the time of delivery, Siemens has title to each Product free and clear of liens and encumbrances (collectively, the "Warranties"). The Warranties do not apply to software furnished by Siemens. The sole and exclusive warranties for any software are set forth in the applicable Software License/Warranty Addendum.

(b) Conditions to the Warranties. The Warranties are conditioned on: (i) no repairs, modifications or alterations being made to the Product other than by Siemens or its authorized representatives; (ii) Buyer handling, using, storing, installing, operating and maintaining the Product in compliance with any parameters or instructions in any specifications attached to, or incorporated into this Agreement; (iii) compliance with all generally accepted industry standards; (iv)

Siemens Canada Ltd. (Seller)

Siemens standard terms and conditions of sale for products

Buyer discontinuing use of the Product after it has, or should have had, knowledge of any defect; (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 granting Siemens reasonable access to the Products to assess the warranty claims; (vii) Product not having been subjected to accident (including force majeure), alteration, abuse or misuse; and (viii) Buyer not being in default of any payment obligation.

(c) Exclusions from Warranty Coverage. The Warranties do not apply to any equipment not provided by Siemens under this Agreement.

Any Product that is described as being experimental, developmental, prototype, or pilot is specifically excluded from the Warranties and is provided to Buyer "as is" with no warranties of any kind. Normal wear and tear is excluded, including any expendable items that comprise part of the Product (such as fuses, light bulbs and lamps). Siemens does not warrant or guarantee that any Product will be secure from cyber threats, hacking or similar malicious activity. Products that are networked, connected to the internet, or otherwise connected to computers or other devices must be appropriately protected by Buyer and/or end user against unauthorized access.

(D) WARRANTY PERIOD. Buyer must provide written notice of any claims for breach of Warranties by the earlier of twelve (12) months from initial operation of the Product or eighteen (18) months from shipment. Additionally, absent written notice within the warranty period, any use or possession of the Product after expiration of the warranty period is conclusive evidence that the Warranties have been satisfied.

(e) Remedies. Buyer's sole and exclusive remedies for breach of the Warranties are limited, at Siemens' discretion, to repair or replacement of the Product, or its non-conforming parts, within a reasonable time period, or refund of all or part of the purchase price. The warranty on repaired or replaced parts is limited to the remainder of the original warranty period. Unless Siemens agrees otherwise in writing, Buyer will be responsible for any costs associated with: (i) gaining access to the Product; (ii) removal, disassembly, replacement, installation, or reinstallation of any equipment, materials or structures to permit Siemens to perform its warranty obligations; (iii) transportation to and from the Siemens factory or repair facility; and (iv) damage to equipment components or parts resulting in whole or in part from non-compliance by the Buyer with Article 9(b) or from their deteriorated condition. All exchanged Products replaced under this Warranty will become the property of Siemens.

(f) Transferability. The Warranties are only transferable during the warranty period and only to the Product's initial end-user.

(g) THE WARRANTIES IN THIS ARTICLE 9 ARE SIEMENS' SOLE AND EXCLUSIVE WARRANTIES, CONDITIONS AND GUARANTEES AND ARE SUBJECT TO THE LIMITS OF LIABILITY IN ARTICLE 10 BELOW. SIEMENS MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, COURSE OF DEALING AND USAGE OF TRADE.

10. LIMITATION OF LIABILITY. NOTWITHSTANDING ANYTHING IN THIS AGREEMENT TO THE CONTRARY, SIEMENS IS NOT LIABLE, WHETHER BASED IN CONTRACT (INCLUDING FUNDAMENTAL BREACH), WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, INDEMNITY OR ANY OTHER LEGAL OR EQUITABLE THEORY, FOR: LOSS OF USE, REVENUE, SAVINGS, PROFIT, INTEREST, GOODWILL OR OPPORTUNITY, COSTS OF CAPITAL, COSTS OF REPLACEMENT OR SUBSTITUTE USE OR PERFORMANCE, LOSS OF INFORMATION AND DATA, LOSS OR DAMAGE TO PROPERTY OR EQUIPMENT, LOSS OF POWER, VOLTAGE IRREGULARITIES OR FREQUENCY FLUCTUATION, CLAIMS ARISING FROM BUYER'S THIRD PARTY CONTRACTS, OR FOR ANY TYPE OF INDIRECT, SPECIAL, LIQUIDATED, PUNITIVE, EXEMPLARY, COLLATERAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR ANY OTHER LOSS OR COST OF A SIMILAR TYPE.

SIEMENS' MAXIMUM LIABILITY UNDER THIS AGREEMENT IS THE ACTUAL PURCHASE PRICE RECEIVED BY SIEMENS FOR THE PRODUCT THAT GAVE RISE TO THE CLAIM.

THE LIMITATIONS OF LIABILITY IN THIS AGREEMENT REPRESENT THE AGREED AND BARGAINED FOR UNDERSTANDING OF THE PARTIES. BUYER AGREES THAT THE EXCLUSIONS AND LIMITATIONS IN THIS ARTICLE 10 WILL PREVAIL OVER ANY CONFLICTING TERMS AND CONDITIONS IN THIS AGREEMENT AND MUST BE GIVEN FULL FORCE AND EFFECT, WHETHER OR NOT ANY OR ALL SUCH REMEDIES ARE DETERMINED TO HAVE FAILED OF THEIR ESSENTIAL PURPOSE. THESE LIMITATIONS OF LIABILITY ARE EFFECTIVE EVEN IF SIEMENS HAS BEEN ADVISED BY BUYER OF THE POSSIBILITY OF SUCH DAMAGES. THE WAIVERS AND DISCLAIMERS OF LIABILITY, RELEASES FROM LIABILITY AND LIMITATIONS ON LIABILITY EXPRESSED IN THIS ARTICLE 10 EXTEND TO SIEMENS' AFFILIATES, PARTNERS, PRINCIPALS, SHAREHOLDERS, DIRECTORS, OFFICERS, EMPLOYEES, SUPPLIERS, AGENTS, AND SUCCESSORS AND ASSIGNS.

11. PATENT AND COPYRIGHT INFRINGEMENT. Siemens will, at its option and expense, defend or settle any suit or proceeding brought against Buyer based on an allegation that any Product or use thereof for its intended purpose constitutes an infringement of any Patent Cooperation Treaty country member's patent or misappropriation of a third party's trade secret or copyright in the country where the Product is delivered by Siemens. Buyer will promptly give Siemens written notice of the suit or proceeding and the authority, information, and assistance needed to defend the claims. Siemens shall have the full and exclusive authority to defend and settle such claim(s) and will pay the damages and costs awarded in any suit or proceeding so defended. Buyer shall not make any admission(s) which might be prejudicial to Siemens and shall not enter into a settlement without Siemens' consent. Siemens is not responsible for any settlement made without its prior written consent. If the Product, or any part thereof, as a result of any suit or proceeding so defended is held to constitute infringement or its use by Buyer is enjoined, Siemens will, at its option and expense, either: (i) procure for Buyer the right to continue using said Product; (ii) replace it with substantially equivalent non-infringing Product; or (iii) modify the Product so it is non-infringing.

Siemens will have no duty or obligation under this Article 11 if the Product is: (i) supplied according to Buyer's design or instructions and compliance therewith has caused Siemens to deviate from its normal course of performance; (ii) modified by Buyer or its contractors after delivery; or (iii) 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 must protect Siemens in the same manner and to the same extent that Siemens has agreed to protect Buyer under this Article 11.

THIS ARTICLE 11 IS AN EXCLUSIVE STATEMENT OF SIEMENS' DUTIES AND BUYER'S REMEDIES RELATING TO PATENTS, TRADE SECRETS AND COPYRIGHTS, AND DIRECT OR CONTRIBUTORY INFRINGEMENT THEREOF.

12. CONFIDENTIALITY.

(a) Both during and after the term of this Agreement, the parties will treat as confidential all information obtained from the disclosing party and all information compiled or generated by the disclosing party under this Agreement for the receiving party, including but not limited to business information, manufacturing information, technical data, drawings, flow charts, program listings, software code, and other software, plans and projections. Neither party may disclose or refer to the work to be performed under this Agreement in any manner that identifies the other party without advance written permission. However, Siemens has the right to share confidential information with its affiliates and subcontractors, provided those recipients are subject to the same confidentiality obligations set forth herein.

(b) Nothing in this Agreement requires a party to treat as confidential any information which: (i) is or becomes generally known to the public, without the fault of the receiving party; (ii) is disclosed to the receiving party, without obligation of confidentiality, by a third party having the right to make such disclosure; (iii) was previously known to the receiving party, without obligation of confidentiality, which fact can be demonstrated by means of documents which are in the possession of the receiving party upon the date of this Agreement; (iv) was independently developed by receiving party or its representatives, as evidenced by written records, without the use of discloser's confidential information; or (v) is required to be disclosed by law, except to the extent eligible for special treatment under an appropriate protective order, provided that the party required to disclose by law will promptly advise the originating party of any requirement to make such disclosure to allow the originating party the opportunity to obtain a protective order and assist the originating party in so doing.

(c) It is Siemens' policy not to unlawfully or improperly receive or use confidential information, including trade secrets, belonging to others. This policy precludes Siemens from obtaining, directly or indirectly from any employee, contractor, or other individual rendering services to Siemens confidential information of a prior employer, client or any other person which such employee, contractor, or individual is under an obligation not to disclose. Buyer agrees to abide by this policy.

Siemens Canada Ltd. (Seller)

Siemens standard terms and conditions of sale for products

13. COMPLIANCE WITH LAWS. The parties agree to comply with all applicable laws and regulations, including but not limited to those relating to the manufacture, purchase, resale, exportation, transfer, assignment or use of the Products.

14. CHANGES IN WORK. No change will be made to the scope of work unless Buyer and Siemens agree in writing to the change and any resulting price, schedule or other contractual modifications. If any change to any law, rule, regulation, order, code, standard or requirement impacts Siemens' obligations or performance under this Agreement, Siemens may request a change order for an equitable adjustment in the price and time of performance.

15. NON-WAIVER. Any waiver by a party of strict compliance with this Agreement must be in writing, and any failure by the parties to require strict compliance in one instance will not waive its right to insist on strict compliance thereafter.

16. MODIFICATION OF TERMS. This Agreement may only be modified by a written instrument signed by authorized representatives of both parties.

17. ASSIGNMENT. Neither party may assign all or part of this Agreement, or any rights or obligations under this Agreement, without the prior written consent of the other; but either party may assign its rights and obligations, without recourse or consent, to any parent, wholly owned subsidiary, or affiliate or affiliate's successor organization (whether as a result of reorganization, restructuring or sale of substantially all of a party's assets). However, Buyer shall not assign this Agreement to: a competitor of Siemens; an entity in litigation with Siemens; or an entity lacking the financial capability to satisfy Buyer's obligations. Any assignee expressly assumes the performance of any obligation assigned. Siemens may grant a security interest in this Agreement and/or assign proceeds of this Agreement without Buyer's consent.

18. APPLICABLE LAW AND JURISDICTION. This Agreement is governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein, 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. Each party agrees that claims and disputes arising out of this Agreement must be decided exclusively in a federal or provincial court of competent jurisdiction located in a province in which either Buyer or Siemens maintains its principal place of business. Each party submits to the personal jurisdiction of such courts for the purpose of litigating any claims or disputes.

19. SEVERABILITY. If any provision of this Agreement is held invalid, illegal or unenforceable, the remaining provisions will not in any way be affected or impaired. A court may modify the invalid, illegal or unenforceable provision to reflect, as closely as possible, the parties' original intent.

20. EXPORT / IMPORT COMPLIANCE. Buyer acknowledges that Siemens is required to comply with applicable export / import laws and regulations relating to the sale, export, import, transfer, assignment, disposal and use of the Products, including any export / import license requirements. Buyer agrees that Products will not at any time directly or indirectly be used, exported, imported, sold, transferred, assigned or otherwise disposed of in a manner which will result in non-compliance with any applicable Canadian or, to the extent permissible under Canadian law, U.S. export / import laws and regulations. Siemens' continuing performance hereunder is conditioned on compliance with such export / import laws and regulations at all times.

21. PRODUCT RETURNS. Prior to the return of any Product to Siemens, Buyer must identify the Product or portion thereof and obtain written authorization and shipping instructions from Siemens. Siemens has the right, in its sole discretion, to permit or reject any such return. Siemens' authorization to return any Product to Siemens does not relieve Buyer of its obligation to pay for such Product. Upon receipt, inspection, and acceptance of the Product by Siemens, Siemens will issue a credit memo to Buyer, less applicable re-stocking fees. Siemens reserves the right to reject any hazardous material.

22. NUCLEAR. Unless expressly authorized in writing by Siemens, the Products must not be used in or in connection with a nuclear facility or application. If Buyer uses any Product in connection with any nuclear facility or activity, it does so at its own risk and Buyer will indemnify, defend and hold Siemens harmless, and waives and will require its insurers to waive all right of recovery against Siemens for any damage, loss, destruction, injury or death resulting from a "nuclear incident," as defined in the Nuclear Liability and Compensation Act, as amended, whether or not due to Siemens' negligence. Siemens' consent to Buyer's use of the Product in connection with any nuclear facility or application will be subject to additional terms and conditions that Siemens deems necessary to protect its interests.

23. SURVIVAL. The articles titled "Patent and Copyright Infringement," "Limitation of Liability," "Confidentiality," "Delivery; Title; Risk of Loss," "Export / Import Compliance," and "Nuclear" survive termination, expiration or cancellation of this Agreement.

Notes

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