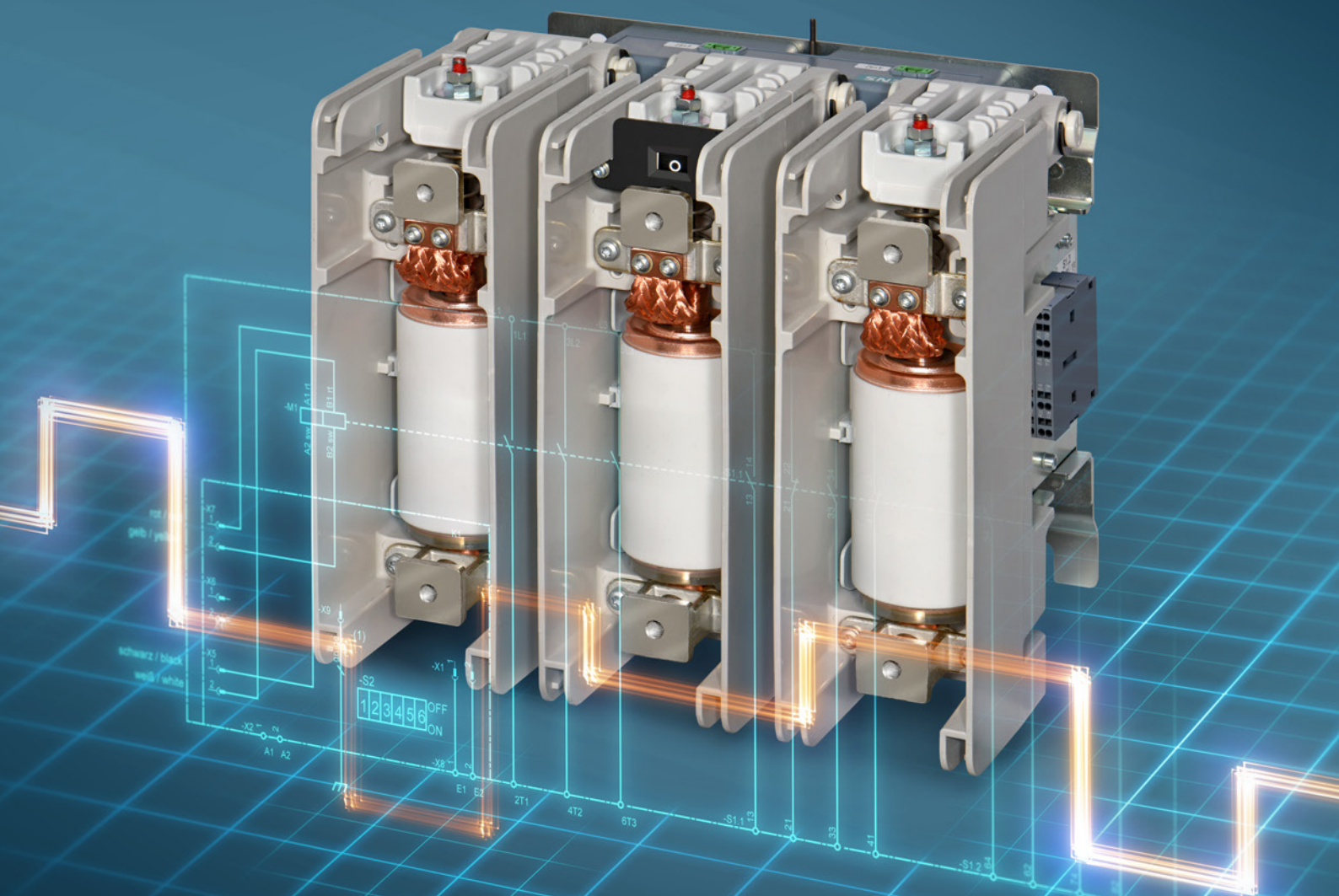


SIEMENS



Medium-Voltage Equipment

Vacuum Contactors

Catalog
HG 11.23

Edition
2021

[siemens.com/3TM](https://www.siemens.com/3TM)



Medium-Voltage Equipment Catalog HG 11.23 · 2021

Invalid:
Catalog HG 11.23 · 2019

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3TM Vacuum Contactors

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The products and systems described in this catalog are manufactured and sold according to a certified management system (acc. to ISO 9001, ISO 14001 and BS OHSAS 18001).



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Industrial application: Refinery

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Description

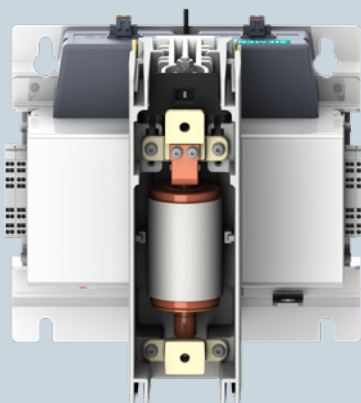
General

1.1

3TM vacuum contactors – the new contactor generation

3TM vacuum contactors are electromechanical, monostable load breaking devices with a limited short-circuit making and breaking capacity. They can be used for high switching rates of up to one million electrical and mechanical operating cycles and unlimited operating time, as well as for fast switching frequencies.

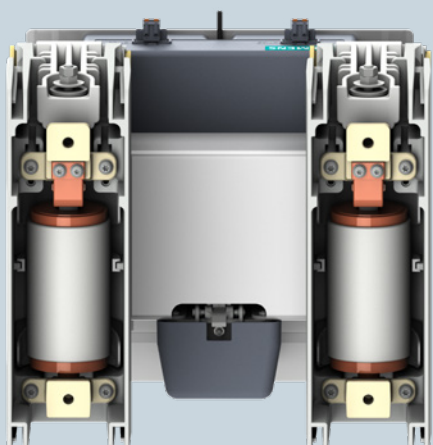
3TM1 vacuum contactors



3tm.3TM1 Front.png

Contactor, front (high-voltage side)

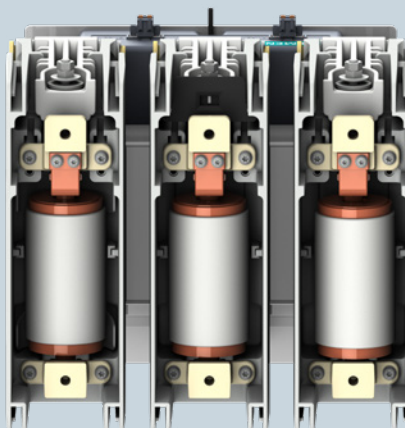
3TM2 Vacuum Contactors *)



3tm.3TM2 Front.png

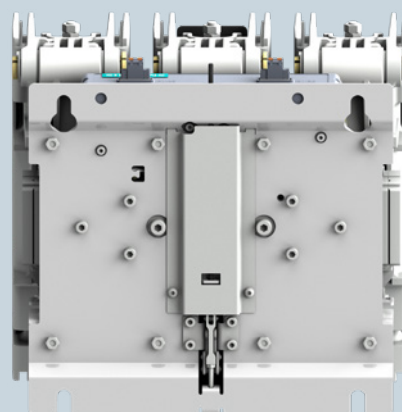
Contactor, front (high-voltage side)

3TM3 vacuum contactors



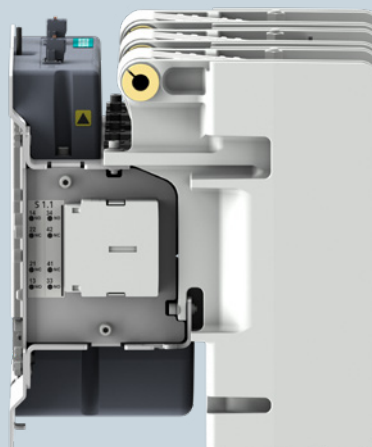
3tm.3TM3 Front.png

Contactor, front (high-voltage side)



35.3TM3 Back.png

Contactor, rear (fixing side)



3TM.3TM3 Side.png

Contactor, side view

*) On request

Applications

3TM vacuum contactors are suitable for operational switching of AC circuits of any kind, such as:

- Three-phase motors for reversing, inverting or direct duty (utilization category AC-1 to AC-4)
- Transformers
- Capacitors, also back-to-back
- Reactors
- Resistive consumers.

They are used in conveying and elevator systems, pumping stations, air conditioning systems, as well as in systems for reactive power compensation, on ships, in wind power plants, in open-cast mining, in earthquake zones and in railway operation, and can therefore be found in almost every industrial sector.

Switching medium

3TM vacuum contactors make use of vacuum switching technology, which has been proven and fully developed for more than 40 years. Siemens vacuum interrupters operate constantly and reliably throughout their entire service life – without any maintenance.

Design and function

3TM vacuum contactors consist of:

- A high-voltage part, with vacuum interrupters, customer connections and position indicator
- A low-voltage part, with magnetic actuator and control electronics
- Auxiliary switches
- Optionally, a closing latch as well as a manual latch release (emergency off), and a shunt release.

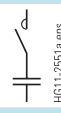
The high-voltage part contains individual, independent pole shells, which can take up the corresponding vacuum interrupters. In this way, various pole-center distances are possible. The vacuum interrupters are operated by a common magnetic actuator, which is characterized by a very low holding power in continuous operation. The auxiliary switches are located at the side of the operating mechanism and are freely accessible from the outside. A mechanical closing latch and corresponding latch release modules can be ordered separately. Remote tripping takes place via an electro-magnetic shunt release. The manual mechanic latch release (emergency off) is available for various operating directions.



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Application, switching of consumers	Symbols	Application examples
Medium-voltage three-phase motors	 HG11-2547h eps	Conveyor and elevator systems, compressors, ventilation and heating
Transformers	 HG11-2548b eps	Ring-main units, industrial system distributions
Reactors	 HG11-2549a eps	Industrial system distributions, DC-link reactors, reactive power compensation systems
Resistive consumers	 HG11-2550b eps	Heating resistors, electric furnaces
Capacitors	 HG11-2551a eps	Reactive power compensation systems, capacitor banks
Small generators	 	Wind power plants
Resistive earth electrode	 	Earthing systems

Description

Construction and mode of operation

1.1

Function and mode of operation

The drive lever (3) with the pivot point in A is designed as an angle lever. It represents the kinematic connection between the magnetic actuator and the vacuum interrupters. In case of non-excited magnet, the return springs keep the drive lever in "OPEN" position.

Thus, the drive lever (3) is in its upper position via the bearing (4) of the guide nut (5). In this way, the contacts of the vacuum interrupter (8) are separated from each other, and thus kept in "OPEN" position.

For closing, the magnet system (7) is excited. The magnet armature (6) attached to the drive lever (3) is thus attracted against the force of the two return springs. This releases the vacuum interrupter (8), so that the external air pressure can press the moving contact towards the fixed contact.

The drive lever (3) compresses the contact pressure springs (9), thus generating an additional contact force.

The distance between the bearing (4) and the guide nut (5) in "CLOSED" position is a measure for the wear within the vacuum interrupter.

3TM vacuum contactors can be used for cable or bar connections.

The base plate (17) serves for installation without distortion through the four bolting holes.

Control supply voltage, wide-area coils

3TM vacuum contactors can be optionally operated with DC or AC. The control supply voltage should correspond to the data on the rating plate.

Customer-side modifications are possible considering the standards provided in the operating instructions.

Safety shutdown of the magnetic actuator in case of deviation from the normal closing time

3TM vacuum contactors feature a safety shutdown to protect the magnet coils against non-conforming thermal overload during closing. Within certain limits, impermissible and non-conforming delays in the closing process are thus detected and the devices are protected from damage.

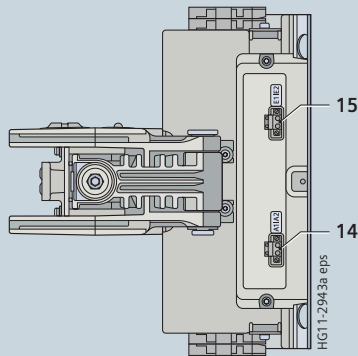
Intermittent periodic duty and rapid operation

3TM vacuum contactors are able to perform fast switching frequencies for a short time.

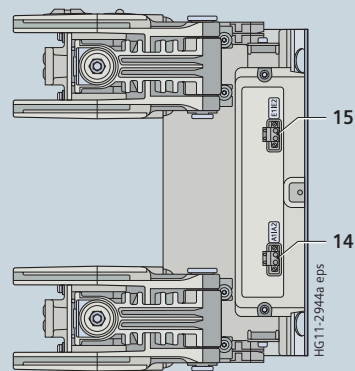
In case of switching under high current load, longer dead times have to be kept. In this case, please contact your responsible sales partner.

Top view

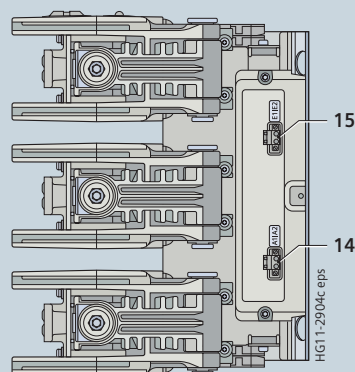
1-pole design



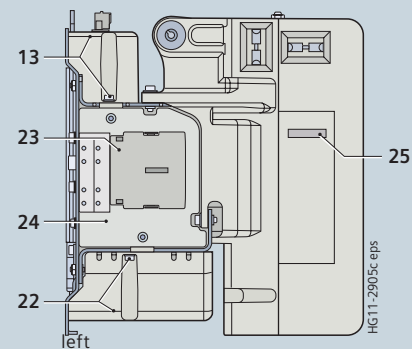
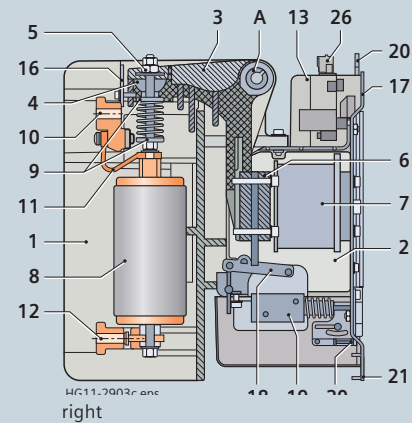
2-pole design *)



3-pole design



Side view



- | | | |
|---------------------------------------|--|-----------------------------------|
| 1 Molded-plastic housing (pole shell) | 10 Connection, top | 18 Closing latch |
| 2 Operating mechanism box | 11 Flexible connector | 19 Shunt release |
| 3 Drive lever | 12 Connection, bottom | 20 Manual release (emergency off) |
| 4 Bearing | 13 Controller | 21 Earthing connection |
| 5 Guide nut + locknut | 14 Connection for control voltage A1 A2 (incl. supplied plug) | 22 Cover for latching |
| 6 Magnet armature | 15 Connection for el.magn. release E1 E2 (incl. supplied plug) | 23 Auxiliary switch |
| 7 Magnet system | 16 Position indicator | 24 Side plate with fixing bolts |
| 8 Vacuum interrupter | 17 Base plate (fixing) | 25 Rating plate |
| 9 Contact pressure spring | | 26 Plug A1 A2 (and E1 E2) |

*) On request

Description

Construction and mode of operation

1.1

Mechanical closing latch (optionally)

When the 3TM vacuum contactor is closed, the mechanical closing latch (18) is activated. After reaching the latching position, there is an automatic changeover to no-load holding operation. Opening takes place via:

- Electromagnetic latch release (remote tripping via the electromagnetic shunt release) (19), or
- Manual mechanical latch release (20).

When retrofitting (selection B at the 10th digit of the order number) with a closing latch or a latch release, the following modules are to be ordered and mounted subsequently:

- Mechanical closing latch with shunt release (19)
- Latch release mechanism to be operated manually with push or pull rod.

Closing and opening delay

3TM vacuum contactors feature a short closing and opening time. (See page 31).

They can also be configured with an additional closing and opening delay for selective operation with other contactors or fuses. Both delays are independent of each other and add to the closing and opening time.

Mounting position

3TM vacuum contactors can be mounted in vertical and horizontal position:

- As fixed-mounted design
- Mounted on a withdrawable part or a truck.

Site altitude

3TM vacuum contactors can be used for various site altitudes.

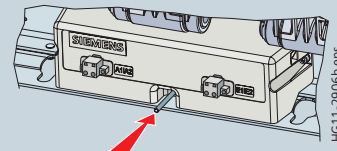
As a standard, 3TM vacuum contactors can be used from –1250 m to +2000 m above sea level.

For higher site altitudes, a configuration is offered from 2000 m to 5000 m.

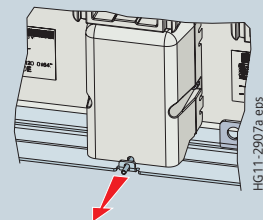
Severe conditions

For very heavy mechanical stress such as earthquakes or extraordinary shock and swinging loads, a special configuration is offered.

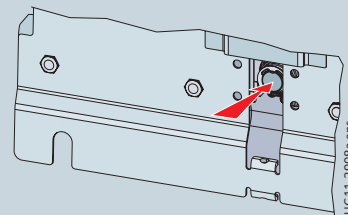
Modes of operation and operating directions: Mechanical latch release (emergency off)



Manual latch release with push rod (10th position of MLFB = F with MLFB supplement J67)

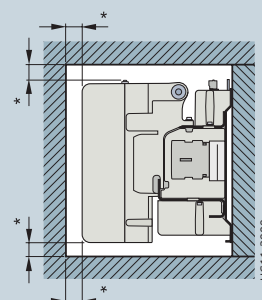


Manual latch release with pull rod (10th position of MLFB = F with MLFB supplement J68)

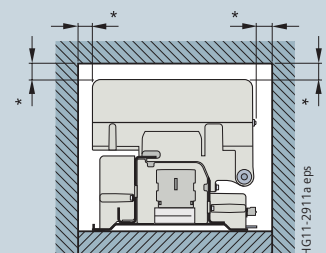


Manual latch release via shunt release (push operation)

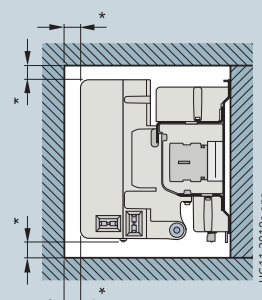
Mounting position



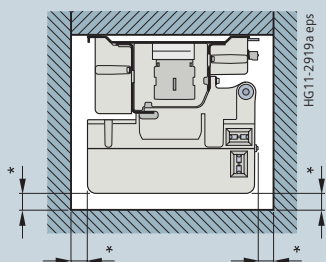
Vertical wall mounting



Horizontally on the back

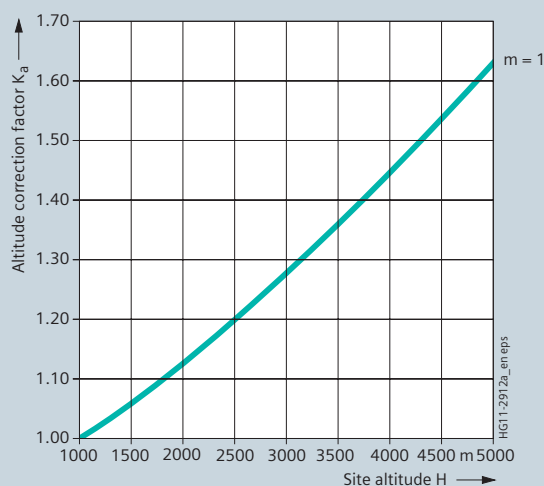
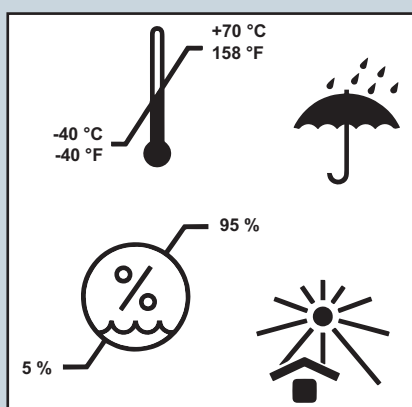


Vertical wall mounting, turned by 180°

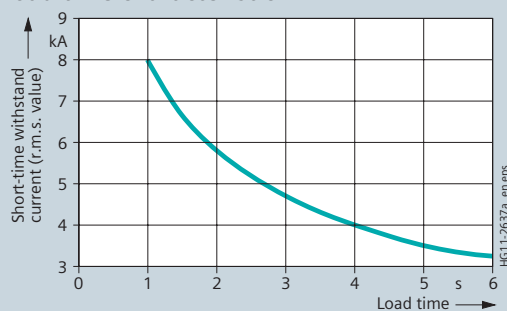


Suspended installation

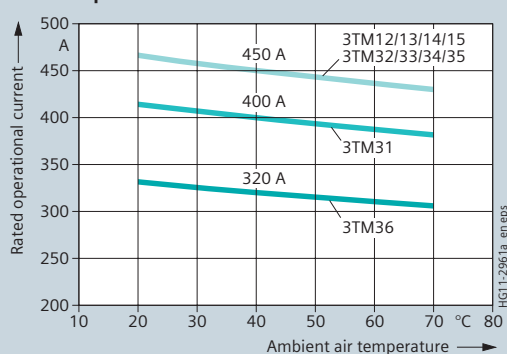
*) Observe the distance to high voltage and to earthed components!



**Short-time withstand current/
load time characteristic**



Rated operational current characteristic



Ambient conditions

3TM vacuum contactors are suitable for operational use in the following climatic classes according to IEC 60721:

Ambient conditions	Class	Standards
Climatic ambient conditions	3K22 ¹⁾ , 3KA24 ²⁾	IEC 60721-3-3
Biological ambient conditions	3B1	IEC 60721-3-3
Mechanical ambient conditions	3M11	IEC 60721-3-3
Chemically active substances	C3 ³⁾	ISO 9223
Mechanically active substances	3S6 ⁴⁾	IEC 60721-3-3

1) Maximum of 24-hour mean: +70 °C

2) Up to -40 °C

3) Without appearance of saline fog and simultaneous condensation

4) Restriction: Clean insulation parts

Dielectric strength

The dielectric strength of air insulation decreases with increasing altitude due to low air density. According to IEC 62271-106, the values of the rated lightning impulse withstand voltage and the rated short-duration power-frequency withstand voltage specified for 3TM vacuum contactors apply to a site altitude of 1000 m above sea level. For an altitude above 1000 m, the insulation level must be corrected.

To select the devices, the following applies:

$$U \geq U_0 \times K_a$$

$$K_a = e^{m \times (H - 1000)/8150}$$

U Rated withstand voltage under reference atmosphere

U_0 Rated withstand voltage requested for the place of installation

K_a Altitude correction factor according to the opposite diagram

Example:

For a requested rated lightning impulse withstand voltage of 75 kV at an altitude of 2500 m, an insulation level of 90 kV under standard reference atmosphere is required as a minimum:

$$90 \text{ kV} \geq 75 \text{ kV} \times e^{1 \times (2500 - 1000)/8150} \\ \approx 75 \text{ kV} \times 1.2$$

Short-time withstand current

The short-time withstand current is the r.m.s. value of the current that a 3TM vacuum contactor in closed position can carry for a certain time until a short-circuit protection device has responded.

Rated operational currents depending on ambient air temperature

The rated operational currents stated in the catalog are valid for an ambient air temperature of +40 °C. Lower or higher ambient air temperatures result in different values (see diagram).

Description

Switching duties

1.1

Utilization categories

According to IEC 62271-106, vacuum contactors are divided into different utilization categories. The opposite table shows typical applications in accordance with the respective utilization category.

Switching of motors

3TM vacuum contactors are especially suitable for frequent operation of motors. As the chopping currents of the contactors are ≤ 3 A, no impermissibly high overvoltages are produced when accelerated motors are switched during normal operation. However, when high-voltage motors with starting currents of ≤ 600 A are stopped during start-up, switching overvoltages may arise. The magnitude of these overvoltages can be reduced to harmless values by means of special surge limiters.

Switching of transformers

When inductive currents are interrupted, current chopping can produce overvoltages at the contact gap. As the chopping current of the Siemens vacuum contactor is less than 3 A, no dangerous overvoltages are produced when the unloaded transformer is switched off.

Surge protection via limiters

Overvoltages can arise as a consequence of multiple restrikes or by virtual current chopping, e.g. when motors are switched in braked condition or during start-up. Motors with a starting current ≤ 600 A are endangered. Safe protection against overvoltages is ensured by surge limiters. These can be arranged in parallel to the cable sealing ends, preferably in the cable compartment.

Switching of capacitors

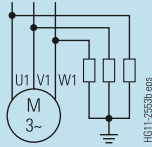
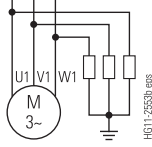
3TM vacuum contactors can interrupt capacitive currents up to 315 A up to the rated voltage of 12 kV without restrikes, and thus without overvoltages.

Short-circuit protection

3TM vacuum contactors are not designed to switch short-circuit currents. Therefore, a short-circuit protection must be provided. The best protection is provided by HV HRC fuses or circuit-breakers.

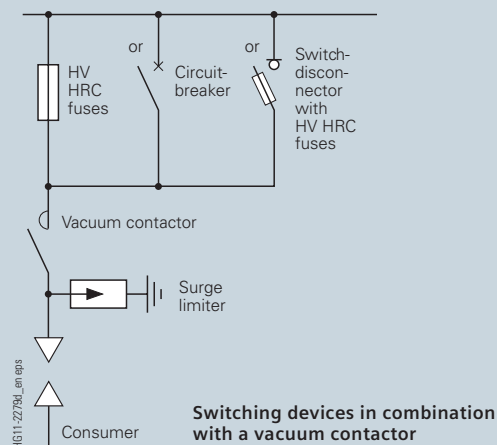
Utilization categories	Typical applications
AC-1	Non-inductive or slightly inductive loads, resistance furnaces
AC-2	Slip-ring motors: Starting, switching off
AC-3	Squirrel-cage motors: Starting, switching off during running
AC-4	Squirrel-cage motors: Starting, plugging ¹⁾ , reversing ¹⁾ , inching ²⁾

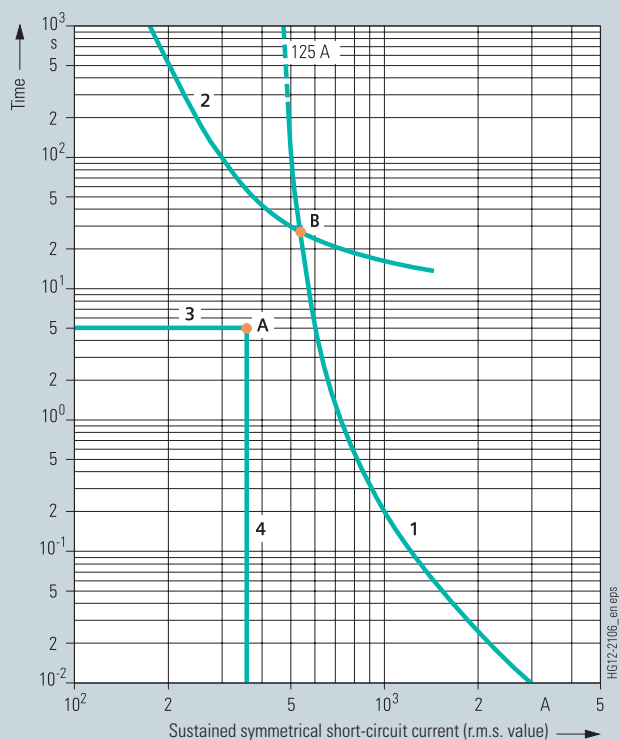
- 1) By plugging or reversing is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running
- 2) By inching is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism

Circuit diagram	Type of duty
	Switching of accelerated motors
	Occasional switching of just accelerated motors in case of fault ¹⁾
	Frequent switching in AC-4 operation ¹⁾

Circuit examples for surge protection of three-phase motors with a starting current ≤ 600 A

1) With surge limiter





Example for the coordination of an HV HRC fuse characteristic 125 A with a motor characteristic

- 1 Characteristic of the HV HRC fuse
- 2 Characteristic of the time-overcurrent protection
- 3 Motor starting time
- 4 Motor starting current

Short-circuit protection via HV HRC fuses

At high short-circuit currents, HV HRC fuses have a current-limiting effect, i.e. the fuse limits the short-circuit current to the let-through current. When selecting the fuses, the type of consumer must be observed, e.g. motor, transformer, capacitor.

The opposite diagram shows an example for the coordination of an HV HRC fuse with a time-overcurrent protection.

Coordinating the components of the motor circuit

- The time-current characteristic must be located on the right of the motor starting current (point A).
- The rated current of the HV HRC fuse-link must exceed the normal current of the motor.
- The current corresponding to the intersection B of the HV HRC fuse-link characteristic and the characteristic of the time-overcurrent protection must be higher than the minimum breaking current of the HV HRC fuse-link.
- If this is not feasible, it must be ensured that overload currents that are smaller than the minimum breaking current of the HV HRC fuse-link are interrupted by the switching device via the striker. This prevents thermal overloading of the HV HRC fuse-link, which would otherwise be destroyed.
- The selected HV HRC fuse-link limits the sustained symmetrical short-circuit current I_K to the let-through current I_D , shown in the diagram for the current-limiting characteristics (I_D as a function of I_K for HV HRC fuse-links with different rated currents). The maximum tested let-through current is $I_D = 46$ kA.

Requirements

- It must be ensured that the vacuum contactor cannot open until the fuse has interrupted the overload current. If necessary, the contactor opening time must be extended. 3TM vacuum contactors feature the corresponding setting facility. This does not apply if a mechanical closing latch is used. In this case, the time delay between tripping of the fuse and the latch release signal must be considered by the operator.
- Due to the arising motor starting current, the instant when the motor starts represents the maximum stress for the HV HRC fuse. This stress must neither operate nor predamage the fuse.

Other factors of influence on the stress of the HV HRC fuses are the starting time and the starting frequency of the motors.

Description

Standards and type approval

1.1

Short-circuit protection for "class E2 controllers" according to UL 347/CSA C22.2

For using 3TM vacuum contactors as "class E2 controllers", fuses are specified for short-circuit protection. If two fuse-links are connected in parallel, the symmetrical short-circuit current determined has to be divided by two, and the associated let-through current for one fuse-link must be stated. This value must then be multiplied by two in order to obtain the total let-through current, which must not exceed the permissible value for the vacuum contactor. The parallel connection should ensure that the resistance values in the two branches are almost the same. When the fuses operate, the vacuum contactor must be switched off. A suitable device, actuated by the striker of the HV HRC fuse-link, has to be provided.

Short-circuit protection by circuit-breakers

Consumers for which no suitable fuses are available can also be protected by circuit-breakers. During the longer break time of the circuit-breakers (as a rule, 35 to 60 ms), the symmetrical short-circuit current must not exceed the maximum permissible value.

Overvoltage category

3TM vacuum contactors can be used up to overvoltage category III.

When used in higher categories, surge arresters must be integrated in the control circuits.

Trip-free mechanism

The contacts of the 3TM vacuum contactors are trip-free. In the event of an opening command being given after a closing operation has been initiated, the moving contacts return to the open position and remain there even if the closing command is sustained. This means that the contacts are momentarily in the closed position.

Standards

3TM vacuum contactors correspond to the standards:

- IEC/DIN EN 62271-1
High-voltage switchgear and controlgear – Part 1: Common specifications
- IEC/DIN EN 62271-106
High-voltage switchgear and controlgear – Part 106: Contactors and controllers
- GB/T14808
High voltage alternating current contactors and contactor-based motor-starters
- UL347, 6th edition
Medium-Voltage AC Contactors, Controllers, and Control Centers (Additional UL label can be ordered via order code Y47)
- CSA C22.2 253-09, Medium-voltage AC contactors, controllers, and control centres

- IEC 61000-4-18, EN 61000-6-2, EN 61000-6-4, EN 55011
Electromagnetic compatibility (EMC)
- DNVGL-CG-0339 Classification and construction standards for ship technology.

Type approval according to German X-ray regulations

The vacuum interrupters fitted in the switching devices are type-approved in accordance with §8 of the X-ray regulations (RöV = Röntgenverordnung) of the Federal Republic of Germany as interference radiators, and they meet the requirements for interference radiators according to Annex 2 No. 5 of the latest RöV up to the rated voltage specified in the approval document.

Performance in case of voltage dips or reductions of the control supply voltage U_a

3TM vacuum contactors fulfill the requirements concerning voltage dips and reductions with the values requested according to IEC 61000-4-29/08.2000, IEC 61000-4-11.

Mirror contacts

3TM vacuum contactors are equipped with mirror contacts.

Positive opening/Positive driving

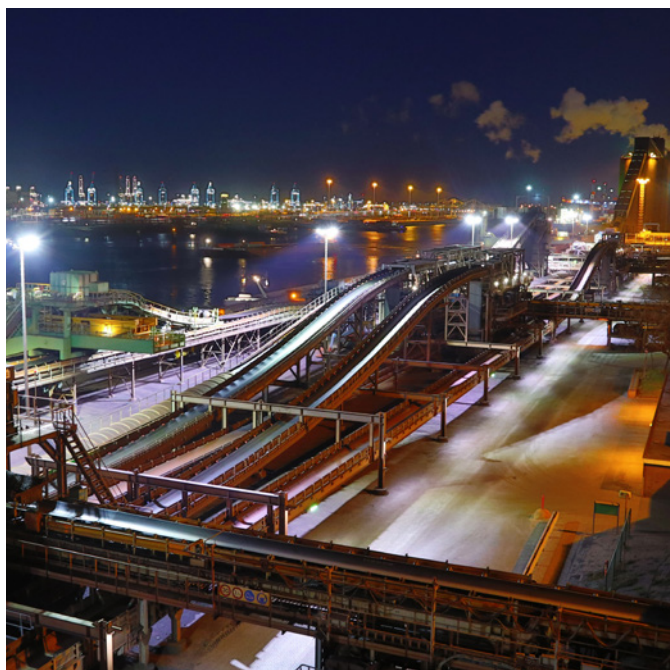
The auxiliary switches are mechanically connected with the operating system and are positively moved and driven (positive opening/closing).

Degree of pollution

3TM vacuum contactors fulfill the conditions according to pollution degree 3.

Degree of protection

3TM vacuum contactors fulfill the degree of protection IP43, except for the main circuit and the connections for which the degree of protection IP00 applies.



Industrial conveyor system

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1.2

Equipment Selection

Order number structure, configuration example

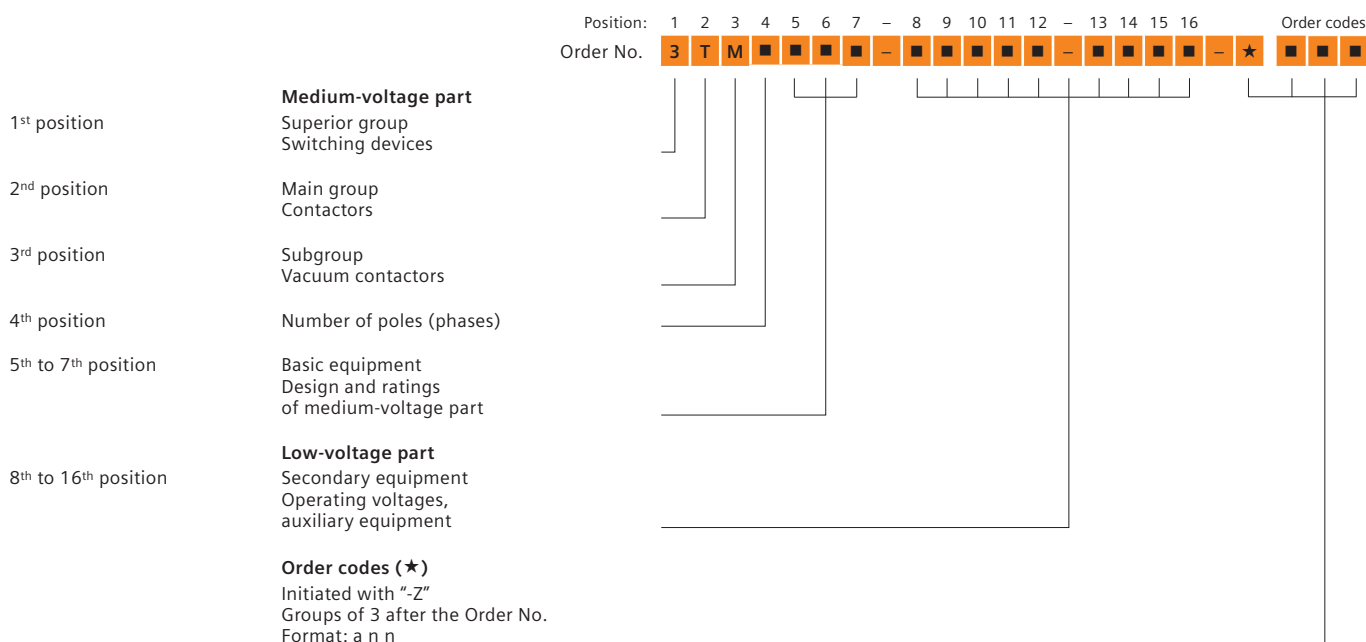
1.2

Order number structure

3TM vacuum contactors consist of a medium-voltage and a low-voltage part. The relevant data make up a 16-digit order number. The medium-voltage part covers the main electrical data of the poles. The low-voltage part covers all auxiliary devices which are necessary for operating and controlling the contactor.

Order codes (★)

In case of special versions and additional equipment, **“-Z”** is added to the order number and explained in more detail with a 3-digit order code. Several order codes can be added to the order number in succession and in any sequence. In this context, the suffix **“-Z”** is listed only once. If a requested special version or additional equipment is not in the catalog and can therefore not be ordered via order code, it has to be identified with **Y 9 9** and a clear text specification. The agreement hereto is made directly between your responsible sales partner and the order processing department in the Switchgear Factory Berlin.



Configuration example

In order to simplify the selection of the correct order number for the requested contactor, you will find three configuration examples on page 19 in the chapter “Equipment Selection”.

On the foldout page we offer a configuring aid. Here you can fill in the order number you have determined for your contactor. Alternatively you can configure your contactor in our online configurator and order it directly through the Siemens Industry Mall.

Example for Order No.:

Order codes:

[illegible]



Configuration example

In order to simplify the selection of the correct order number for the requested vacuum contactor, you will find three configuration examples below.

	Position:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	Order codes				
Configuration example	Order No.:	3	T	M	3	■	■	■	-	■	■	■	■	■	-	■	■	■	■	★	■	■	■	
3TM vacuum contactor, three-pole		3	T	M	3																			
Rated voltage $U_r = 7.2$ kV (BIL 60 kV/PFWV 20 kV)						2																		
Rated operational current $I_e = 450$ A						3																		
Rated short-circuit breaking current $I_{SC} = 5$ kA								1	-															
Controller version Standard										1														
Operating voltage for magnet system 230 V AC											Q													
Additional blocks closing latch												A												
Pole-center distance 120 mm													2											
Additional closing delay 50 ms														1	-									
Additional opening delay 65 ms																	2							
Latch release voltage without latch release																	A							
Auxiliary contacts 4 NO + 4 NC																		C						
Language selection for rating plate and operating instructions *)	German																	0						
	English																	2						
	French																	4						
	Spanish																	6						
	Portuguese																	9	-	Z	R	1	C	
	Italian																	9	-	Z	R	1	F	
	Russian																	9	-	Z	R	1	G	
	Polish																	9	-	Z	R	1	K	
	Turkish																	9	-	Z	R	1	L	
Example for order no. with order codes		3	T	M	3	2	3	1	-	1	Q	A	2	1	-	2	A	C	9	-	Z	R	1	C

*) If you order the supplement F20, you can find the routine test certificate at the 16th position in the selected language.

Equipment Selection

Configuration example

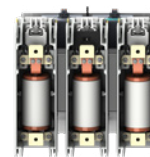


Configuration example

In order to simplify the selection of the correct order number for the requested vacuum contactor, you will find three configuration examples below.

	Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes
Configuration example	Order No.:	3	T	M	3	■	■	■	■	■	■	■	■	■	■	■	■	■
3TM vacuum contactor, three-pole		3	T	M	3	■	■	■	■	■	■	■	■	■	■	■	■	■
Rated voltage $U_r = 12 \text{ kV}$ (BIL 75 kV / PFWV 28 kV)					4													
Rated operational current $I_e = 450 \text{ A}$						3												
Rated short-circuit breaking current $I_{SC} = 5 \text{ kA}$							1	-										
Controller version Standard									1									
Operating voltage for magnet system 110 – 125 V DC / 100 – 120 V AC									V									
Additional blocks closing latch										F								
Pole-center distance 150 mm											6							
Additional closing delay 0 ms												0	-					
Additional opening delay 0 ms														0				
Latch release voltage: 110 – 125 V DC / 100 – 120 V AC														V				
Auxiliary contacts 6 NO + 6 NC															D			
Language selection for rating plate and operating instructions *)	German														0			
	English														2			
	French														4			
	Spanish														6			
	Portuguese														9	-	Z	R 1 C
	Italian														9	-	Z	R 1 F
	Russian														9	-	Z	R 1 G
	Polish														9	-	Z	R 1 K
	Turkish														9	-	Z	R 1 L
Accessories	With spring-loaded terminal incl. plug															-	Z	B 3 0
	Mechanical latch release with pull rod															-	Z	J 6 8
Example for order no. with order codes		3	T	M	3	4	3	1	-	1	V	F	6	0	-	0	V	D 0 - Z B 3 0

*) If you order the supplement F20, you can find the routine test certificate at the 16th position in the selected language.



Configuration example

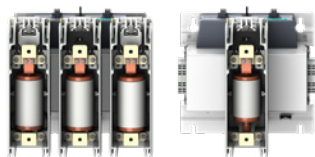
In order to simplify the selection of the correct order number for the requested vacuum contactor, you will find three configuration examples below.

	Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes
Configuration example	Order No.:	3	T	M	1	■	■	■	■	■	■	■	■	■	■	■	■	■
3TM vacuum contactor, one-pole		3	T	M	1	■	■	■	■	■	■	■	■	■	■	■	■	■
Rated voltage (L-L) $U_r = 7.2 \text{ kV}$ (BIL 60 kV / PFWV 20 kV)					2													
Rated operational current $I_e = 450 \text{ A}$						3												
Rated short-circuit breaking current $I_{SC} = 5 \text{ kA}$							1	-										
Controller version Standard									1									
Operating voltage for magnet system 230 V AC										Q								
Additional blocks closing latch											A							
Without pole-center distance												0						
Additional closing delay 0 ms													0	-				
Additional opening delay 0 ms															0			
Latch release voltage without latch release																A		
Auxiliary contacts 4 NO + 4 NC																	C	
Language selection for rating plate and operating instructions *) German																	0	
English																	2	
French																	4	
Spanish																	6	
Portuguese																	9	- Z R 1 C
Italian																	9	- Z R 1 F
Russian																	9	- Z R 1 G
Polish																	9	- Z R 1 K
Turkish																	9	- Z R 1 L
Accessories With spring-loaded terminal incl. plug																	- Z	B 3 0
Mechanical latch release with pull rod																	- Z	J 6 8
Example for order no. with order codes		3	T	M	1	2	3	1	-	1	Q	A	0	0	-	0	A	C 0 - Z B 3 0

*) If you order the supplement F20, you can find the routine test certificate at the 16th position in the selected language.

Equipment Selection

Selection of 3TM3 and 3TM1 vacuum contactors



1.2

7.2 kV

50/60 Hz

7.2 kV 50/60 Hz						Position: Order No.:																Order codes						
Rated voltage (L-L) U_r kV	Rated voltage (L-N) U_r kV	Rated lightning impulse withstand voltage, to earth U_p kV	Rated short-duration power-frequency withstand voltage, open contact gap U_d kV	Rated operational current I_e A	Rated short-circuit breaking current I_{sc} kA	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–	★			
7.2	4.15	60	20	450	5	3	T	M	1	2	3	1	–	1	see page 23	see page 23	see page 23	see page 23	–	–	–	–	–	–	–	–	–	–
7.2	4.15	60	32	450	5	3	T	M	1	3	3	1	–	1														
7.2	–	60	20	400	5	3	T	M	3	1	2	1	–	1														
7.2	–	60	20	450	5	3	T	M	3	2	3	1	–	1														
7.2	–	60	32	450	5	3	T	M	3	3	3	1	–	1														

Applies only for 3TM3: Please select supplement Y88 when the vacuum contactors are used in connection with back-to-back capacitor banks.

12 kV

50/60 Hz

06700 H2																																	
U_r kV	U_r kV	U_p kV	U_d kV	I_e A	I_{sc} kA																												
12	6.9	75	28	450	4.5	3	T	M	1	4	3	0	–	1																			
12	6.9	75	42	450	4.5	3	T	M	1	5	3	0	–	1																			
12	–	75	28	450	5	3	T	M	3	4	3	1	–	1																			
12	–	75	42	450	5	3	T	M	3	5	3	1	–	1																			

Applies only for 3TM3: Please select supplement Y88 when the vacuum contactors are used in connection with back-to-back capacitor banks.

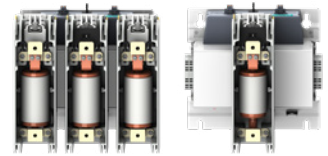
15 kV

50/60 Hz

S3750 H2																											
U_r kV	U_r kV	U_p kV	U_d kV	I_e A	I_{sc} kA																						
15	–	75	36	320	4.5	3	T	M	3	6	1	0	–	1													

Equipment Selection

Secondary equipment 3TM3 and 3TM1



9th position

Operating voltage for magnet system

	Position: Order No.:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes
AC operation with voltage		3	T	M	■	■	■	■	■	■	■	■	■	■	■	■	■	■
24 – 32 V DC										T								
48 – 60 V DC										U								
110 – 125 V DC / 100 – 120 V AC										V								
220 – 250 V DC / 230 – 240 V AC										W								

10th position

Additional components closing latch and latch release

Without closing latch (no retrofitting) Switching off when voltage is removed (standard)																		
Without closing latch (prepared for retrofitting) Switching off when voltage is removed (standard)										B								
Closing latch, switched off via shunt release										E								
Closing latch, switched off both via shunt release and manual operation (push or pull rod)										F								J67 ¹⁾ J68 ¹⁾

- 1) J67: Manual switch-off with push rod
J68: Manual switch-off with pull rod
cf. illustration on page 12

11th position

Pole-center distance

120 mm																		
150 mm										6								
Not relevant (only 3TM1)										0								
Other pole-center distances possible on request																		

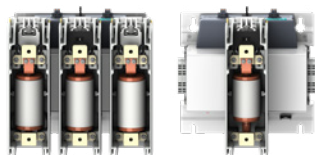
12th position

Additional closing delay

Without																		0
50 ms																		1

Equipment Selection

Secondary equipment 3TM3 and 3TM1



1.2

13th position

Additional opening delay ¹⁾

		Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes		
Order No.:			3	T	M																
24 – 60 V DC	100 – 250 V AC/DC																		see page 25		
Without	Without														0						
50 ± 10 ms	–														1						
–	30 ± 10 ms														2						
–	60 ± 10 ms														3						
–	90 ± 10 ms														5						

1) Only possible without closing latch

14th position

Latch release voltage

Without																					
24 – 32 V DC																A					
48 – 60 V DC																T					
110 – 125 V DC / 100 – 120 V AC																U					
220 – 250 V DC / 230 – 240 V AC																V					
																W					

15th position

Auxiliary contacts

4 NO + 4 NC																					
6 NO + 6 NC (only for 3TM3)																					
																C					
																D					

16th position

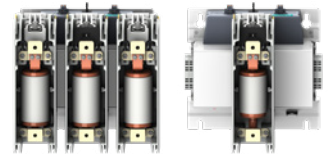
Accessories

Language selection for rating plate and operating instructions ^{*)}																					
German																					
English																					
French																					
Spanish																					
Portuguese																					
Italian																					
Russian																					
Polish																					
Turkish																					

*) If you order the supplement F20, you can find the routine test certificate at the 16th position in the selected language.

Equipment Selection

Special versions and additional equipment



Special versions and additional equipment

	Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes			
	Order No.:	3	T	M	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Options																					
Additional rating plate, loose delivery																		-	Z	B	0 0
Plug A1/A2 or E1/E2 with spring-loaded terminal for connecting the control lines																		-	Z	B	3 0
ANSI type plate: 5 kV (60 kV / 20 kV) only with 3TM for 7.2 kV ¹⁾																		-	Z	E	3 0
ANSI type plate: 7.65 kV (60 kV / 20 kV) only with 3TM for 12 kV ¹⁾																		-	Z	E	3 1
ANSI type plate: 8.25 kV (75 kV / 20 kV) only with 3TM for 12 kV ¹⁾																		-	Z	E	3 2
Routine test certificate																		-	Z	F	2 0
Routine test certificate to orderer																		-	Z	F	2 3
Customer acceptance test																		-	Z	F	5 0
Manual switch-off with push rod ²⁾																		-	Z	J	6 7
Manual switch-off with pull rod ²⁾																		-	Z	J	6 8
Operating instructions in English are enclosed with the product																					
Factory setting for site altitudes > +2000 m to +5000 m above sea level																		-	Z	R	5 7
For heavy stress, high swinging and shock resistance																		-	Z	R	5 8
UL/CSA test mark ³⁾																		-	Z	Y	4 7
Use of vacuum contactor in connection with back-to-back capacitor banks ⁴⁾																		-	Z	Y	8 8
Clear text specifications																		-	Z	Y	9 9

1) Contains UL/CSA test marks; the order code Y47 must not be selected additionally

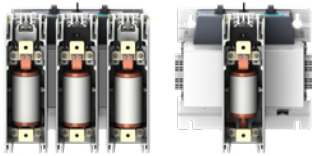
2) See page 12

3) 3TM1 and 3TM36 on request

4) Not available for 3TM1 and 3TM2

Equipment Selection

Spare parts and accessories



Spare parts and accessories

The order numbers are applicable to contactors of current manufacture. When mounting parts or spare parts are being ordered for an existing vacuum contactor, always quote the type designation, serial number and the year of manufacture

of the contactor to be sure to get the correct delivery. This data is given on the rating plate (page 27). Spare parts must only be replaced by instructed personnel.

Spare parts	Remark	Operating voltage	Order No.
Vacuum interrupter*)	3TM31		3TY5 900-0BA1
	3TM12, 3TM13, 3TM32 and 3TM33		3TY5 900-0AA0
	3TM14 and 3TM34		3TY5 900-0CA0
	3TM15, 3TM35 and 3TM36		3TY5 900-0CA1
	3TM32, 3TM34 with supplement Y88		3TY5 900-0DA0
	3TM33, 3TM35 with supplement Y88		3TY5 900-0DA1
Auxiliary switch	for 3TM3 with 2 NO + 2 NC (without wiring) left		3TY5 901-0AA0
	for 3TM3 with 2 NO + 2 NC (without wiring) right		3TY5 901-0AB0
	for 3TM1 with 2 NO + 2 NC (without wiring) left		3TY5 901-0AA1
	for 3TM1 with 2 NO + 2 NC (without wiring) right		3TY5 901-0AB1
	for 3TM3 with 3 NO + 3 NC (without wiring) left		3TY5 901-0BA0
	for 3TM3 with 3 NO + 3 NC (without wiring) right		3TY5 901-0BB0
	pluggable for 3TM3 with 2 NO + 2 NC S1.1 (without wiring) left		3TY5 901-0DA0
	pluggable for 3TM3 with 2 NO + 2 NC S1.2 (without wiring) right		3TY5 901-0DB0
	pluggable for 3TM1 with 2 NO + 2 NC S1.1 (without wiring) left		3TY5 901-0DA1
	pluggable for 3TM1 with 2 NO + 2 NC S1.2 (without wiring) right		3TY5 901-0DB1
	pluggable for 3TM3 with 3 NO + 3 NC S1.1 (without wiring) left		3TY5 901-0EA0
	pluggable for 3TM3 with 3 NO + 3 NC S1.2 (without wiring) right		3TY5 901-0EB0
Controller		24 – 60 V DC	3TY5 902-0AB0
		48 – 60 V AC	3TY5 902-0AA0
		110 – 125 V DC / 100 – 120 V AC and 220 – 250 V DC / 230 – 240 V AC	3TY5 902-0AB1
		110 – 250 V AC	3TY5 902-0AA1
Shunt release	Latching system	24 V DC	3TY5 903-0AB0
		24–32 V DC	3TY5 903-0AT0 ¹⁾
		30 V DC	3TY5 903-0AC0
		48 V DC	3TY5 903-0AD0
		48–60 V DC	3TY5 903-0AU0 ¹⁾
		60 V DC	3TY5 903-0AE0
		110 V DC	3TY5 903-0AF0
		110–125 V DC	3TY5 903-0AV0 ¹⁾
		125 V DC	3TY5 903-0AG0
		220 V DC	3TY5 903-0AH0
		250 V DC	3TY5 903-0AJ0
		220–250 V DC	3TY5 903-0AW0 ¹⁾
		100 V AC	3TY5 903-0AL0
		110 V AC	3TY5 903-0AM0
		115 V AC	3TY5 903-0AN0
		120 V AC	3TY5 903-0AP0
		100–120 V AC	3TY5 903-0AV0 ¹⁾
		230 V AC	3TY5 903-0AQ0
		240 V AC	3TY5 903-0AR0
		230–240 V AC	3TY5 903-0AW0 ¹⁾

*) Replacement of individual vacuum interrupters is not recommended.

1) Can only be used from contactor serial number 3TM/00008509 onwards

Spare parts	Remark	Operating voltage	Order No.
Latching system for retrofitting	With shunt release	24 V DC	3TX5 903-0AB0
		24–32 V DC	3TX5903-0AT0
		30 V DC	3TX5 903-0AC0
		48 V DC	3TX5 903-0AD0
		48–60 V DC	3TX5903-0AU0
		60 V DC	3TX5 903-0AE0
		110 V DC	3TX5 903-0AF0
		110 – 125 V DC / 100 – 120 V AC	3TX5 903-0AV0
		125 V DC	3TX5 903-0AG0
		220 V DC	3TX5 903-0AH0
		220 – 250 V DC / 230 – 240 V AC	3TX5903-0AW0
		250 V DC	3TX5 903-0AJ0
		100 V AC	3TX5 903-0AL0
		110 V AC	3TX5 903-0AM0
		115 V AC	3TX5 903-0AN0
		120 V AC	3TX5 903-0AP0
		230 V AC	3TX5 903-0AQ0
		240 V AC	3TX5 903-0AR0
Mechanical latch release for latching system ¹⁾	With pull rod		3TX5 904-0AA0
	With push rod		3TX5 904-0AA1

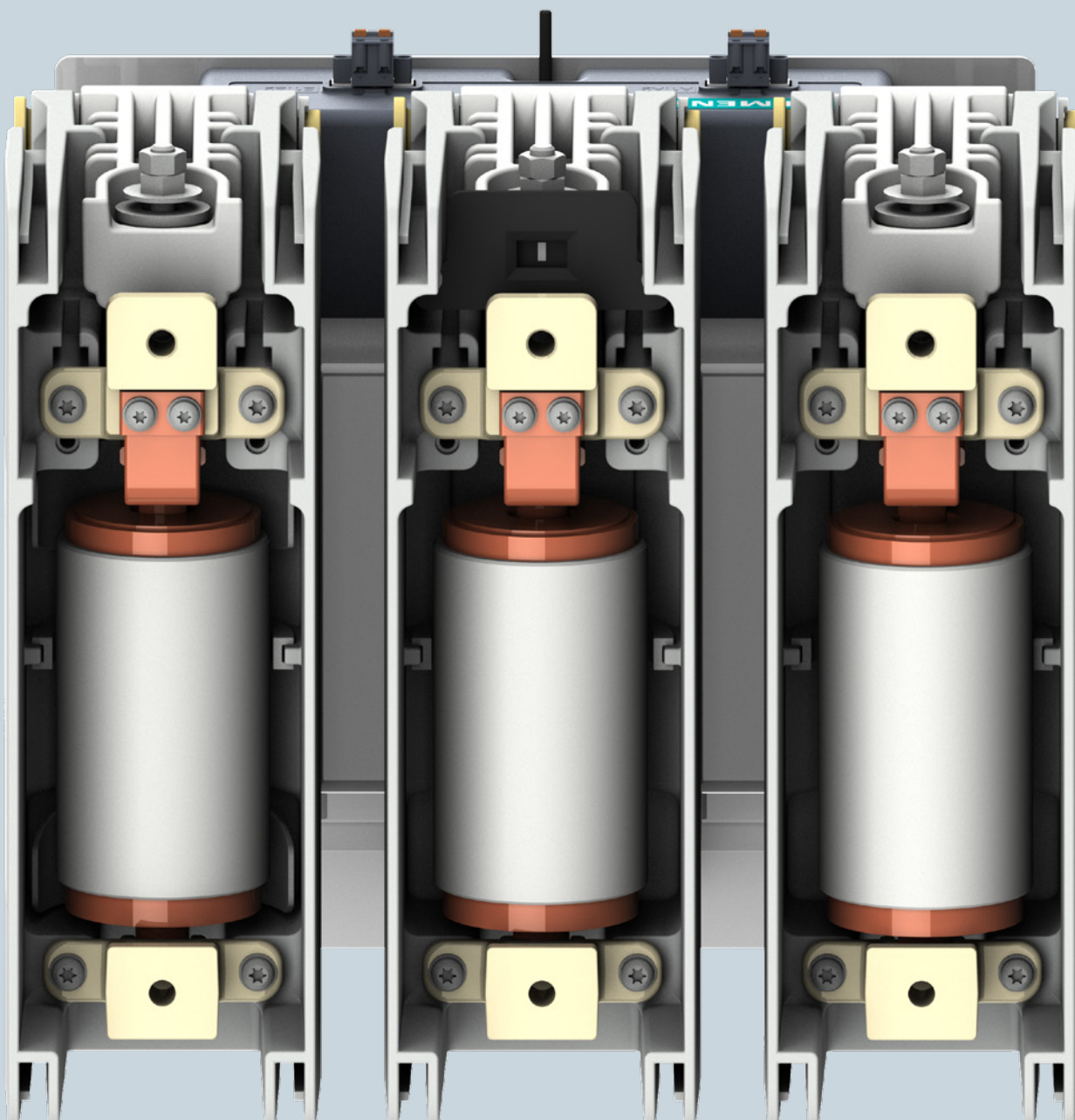
1) See page 12

Rating plate

Data on the rating plate

			
SIEMENS			
Vacuum contactor			
IEC 62271-106			
...			
DNV GL			
3TM...			
...			
S.3TM...			
Rated voltage	U_r	...	kV
Rated lightning impulse withstand voltage	U_p	...	kV
Rated short-duration power-frequency withstand voltage	U_d	...	kV
Rated frequency	f_r	50-60	Hz
Rated operational current AC1 ... AC4	I_e	...	A
Thermal current	I_{th}	...	A
Rated short-circuit breaking current	I_{sc}	...	kA
Rated supply voltage M1	U_a	...	V
Add. closing time delay (preset)	$t_{(c)}$	...	ms
Add. opening time delay (preset)	$t_{(o)}$	...	ms
Release voltage Y1	U	...	V
Altitude above sea level	...	...	m
Mech. stress adjustment	...	...	x
Weight	...	...	kg
Manufacturing date	...	...	z
Made in Germany			

- a Manufacturer
- b Type designation
- c Classification according to IEC standard
- d Classification according to UL/CSA standard
- e Classification according to other standard
- f DNV GL
- g MRPD supplement
- h Special versions and additional equipment
- i Serial number
- k Rated voltage U_r
- l Rated lightning impulse withstand voltage U_p
- m Rated power-frequency withstand voltage U_d
- n Rated frequency f_r
- o Rated operational current I_e AC1... AC4
- p Thermal current I_{th}
- r Rated short-circuit breaking current I_{sc}
- s Rated supply voltage U_a
- t Additional closing delay $t_{(c)}$
- u Additional opening delay $t_{(o)}$
- v Latch release voltage U
- w Altitude above sea level
- x Mechanical stress adjustment
- y Weight
- z Manufacturing date mmyy





Excavator, open-cast mining

R4G11-2331_cmyk.jpg



Wind power plant

R4G11-2332_cmyk.tif

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Low-voltage part

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Auxiliary contacts

32

Dimension drawings

Dimension drawings for 3TM3

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Dimension drawings for 3TM1, single-pole

34

Transport dimensions and weights**35**

1.3

Technical Data

Electrical data, dimensions and weights

1.3

Medium-voltage part

Order No.	Rated voltage U_r kV	Rated voltage (L-N) U_r kV	Rated frequency f_r Hz	Rated operational current I_e A	Thermal current I_{th} A	Switching capacity at rated making current I_m kA	Switching capacity at rated breaking current I_c kA	Rated short-circuit breaking current (limit switching capacity) I_{SC} kA	Rated short-time withstand current (r.m.s. value) 1 s ¹⁾ I_k kA	Rated making current for a back-to-back capacitor bank I_{bi} kA peak	Rated single capacitor bank breaking current (rated normal current of capacitor) I_{bi} A	Contactor class	Switching rate without closing latch Oper. cycles/h	Mechanical endurance of contactor without closing latch Oper. cycles	Electrical endurance (AC-3) while breaking the rated operational current Oper. cycles	Rated lightning impulse withstand voltage to earthed parts and from phase to phase U_p kV	Rated lightning impulse withstand voltage across the open contact gap U_p kV	Rated short-duration power-frequency withstand voltage to earthed parts and from phase to phase U_d kV	Rated short-duration power-frequency withstand voltage across the open contact gap U_d kV	Weight ²⁾ kg	Detailed dimension drawing ³⁾
3TM31...	7.2	–	50-60	400	315	4	3.2	5	8	–	315	C1	1200	0.25 mill.	0.25 mill.	60	60	20	20	20–25	S_A7E_142_01900_xxx
3TM32...	7.2	–	50-60	450	450	4.5	3.6	5	8	10	315	C2	1200	1 mill.	0.5 mill.	60	60	20	20	20–25	S_A7E_142_01900_xxx
3TM33...	7.2	–	50-60	450	450	4.5	3.6	5	8	10	315	C2	1200	1 mill.	0.5 mill.	60	60	32	32	20–25	S_A7E_142_01900_xxx
3TM34...	12	–	50-60	450	450	4.5	3.6	5	8	10	315	C2	1200	1 mill.	0.5 mill.	75	75	28	28	20–25	S_A7E_142_01900_xxx
3TM35...	12	–	50-60	450	450	4.5	3.6	5	8	10	315	C2	1200	1 mill.	0.5 mill.	75	75	42	42	20–25	S_A7E_142_01900_xxx
3TM36...	15	–	50-60	320	320	3.2	2.56	4.5	8	10	315	C2	600	1 mill.	0.5 mill.	75	75	20	20	20–25	S_A7E_142_01900_xxx
3TM12...	7.2	4.15	50-60	450	450	4.5	3.6	5	8	–	–	–	600	0.1 mill.	0.1 mill.	60	60	20	20	16	S_A7E_142_01900_xxx
3TM13...	7.2	4.15	50-60	450	450	4.5	3.6	5	8	–	–	–	600	0.1 mill.	0.1 mill.	60	60	32	32	16	S_A7E_142_01900_xxx
3TM14...	12	6.9	50-60	450	450	4.5	3.6	4.5	8	–	–	–	600	0.1 mill.	0.1 mill.	75	75	28	28	16	S_A7E_142_01900_xxx
3TM15...	12	6.9	50-60	450	450	4.5	3.6	4.5	8	–	–	–	600	0.1 mill.	0.1 mill.	75	75	42	42	16	S_A7E_142_01900_xxx

1) For short-time withstand currents > 1 s, please observe the diagram on page 13

2) Depending on the selected equipment

3) S_A7E_142_01900_xxx with
Three-pole
xxx = 001: without latching and latch release system, pole-center distance 120 mm, 4 NO + 4 NC
xxx = 002: with latching and latch release system, pole-center distance 120 mm, 4 NO + 4 NC
xxx = 011: without latching and latch release system, pole-center distance 150 mm, 4 NO + 4 NC
xxx = 012: with latching and latch release system, pole-center distance 150 mm, 4 NO + 4 NC
xxx = 301: without latching and latch release system, pole-center distance 120 mm, 6 NO + 6 NC
xxx = 301: with latching and latch release system, pole-center distance 120 mm, 6 NO + 6 NC
xxx = 311: without latching and latch release system, pole-center distance 150 mm, 6 NO + 6 NC
xxx = 312: with latching and latch release system, pole-center distance 150 mm, 6 NO + 6 NC

Single-pole

xxx = 003: without latching and latch release system, without pole-center distance, 4 NO + 4 NC
xxx = 004: with latching and latch release system, without pole-center distance, 4 NO + 4 NC

Low-voltage part

Order No.	Power consumption of the drive solenoid Holding power W	Voltage range of the drive solenoid Operating voltage V	Closing time Lower and upper limit values at room temperature ¹⁾ ms	Optionally adjustable additional delay of the closing time ms	Minimum operating time for the drive solenoid ms	Opening time without latching system Lower and upper limit values at room temperature ¹⁾ ms	Optionally adjustable additional delay of the opening time ms	Opening time with latching system Lower and upper limit values at room temperature ¹⁾ ms	Closing latch Endurance Oper. cycles	Closing latch Switching rate Oper. cycles/h
3TM31...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	30 – 50	20 – 40 / 50 – 70 / 80 – 100 ³⁾	25 – 45	200.000	60
3TM32...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	30 – 50	20 – 40 / 50 – 70 / 80 – 100 ³⁾	25 – 45	200.000	60
3TM33...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	30 – 50	20 – 40 / 50 – 70 / 80 – 100 ³⁾	25 – 45	200.000	60
3TM34...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	30 – 50	20 – 40 / 50 – 70 / 80 – 100 ³⁾	25 – 45	200.000	60
3TM35...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	30 – 50	20 – 40 / 50 – 70 / 80 – 100 ³⁾	25 – 45	200.000	60
3TM36...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	30 – 50	20 – 40 / 50 – 70 / 80 – 100 ³⁾	25 – 45	200.000	60
3TM12...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	65 – 85	50 ±10 or 40 – 60	25 – 45	100.000	60
3TM13...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	65 – 85	50 ±10 or 40 – 60	25 – 45	100.000	60
3TM14...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	65 – 85	50 ±10 or 40 – 60	25 – 45	100.000	60
3TM15...	10 – 20	0.85 to 1.1 U_a	40 – 70 ²⁾	40 – 60	100	65 – 85	50 ±10 or 40 – 60	25 – 45	100.000	60

1) At 1.00 U_a

2) At 24 V and 48 V, the switch-on time is between 60 - 120 ms

3) With 24 V to 60 V, 40 - 60 ms is valid

Technical Data

Electrical data, dimensions and weights

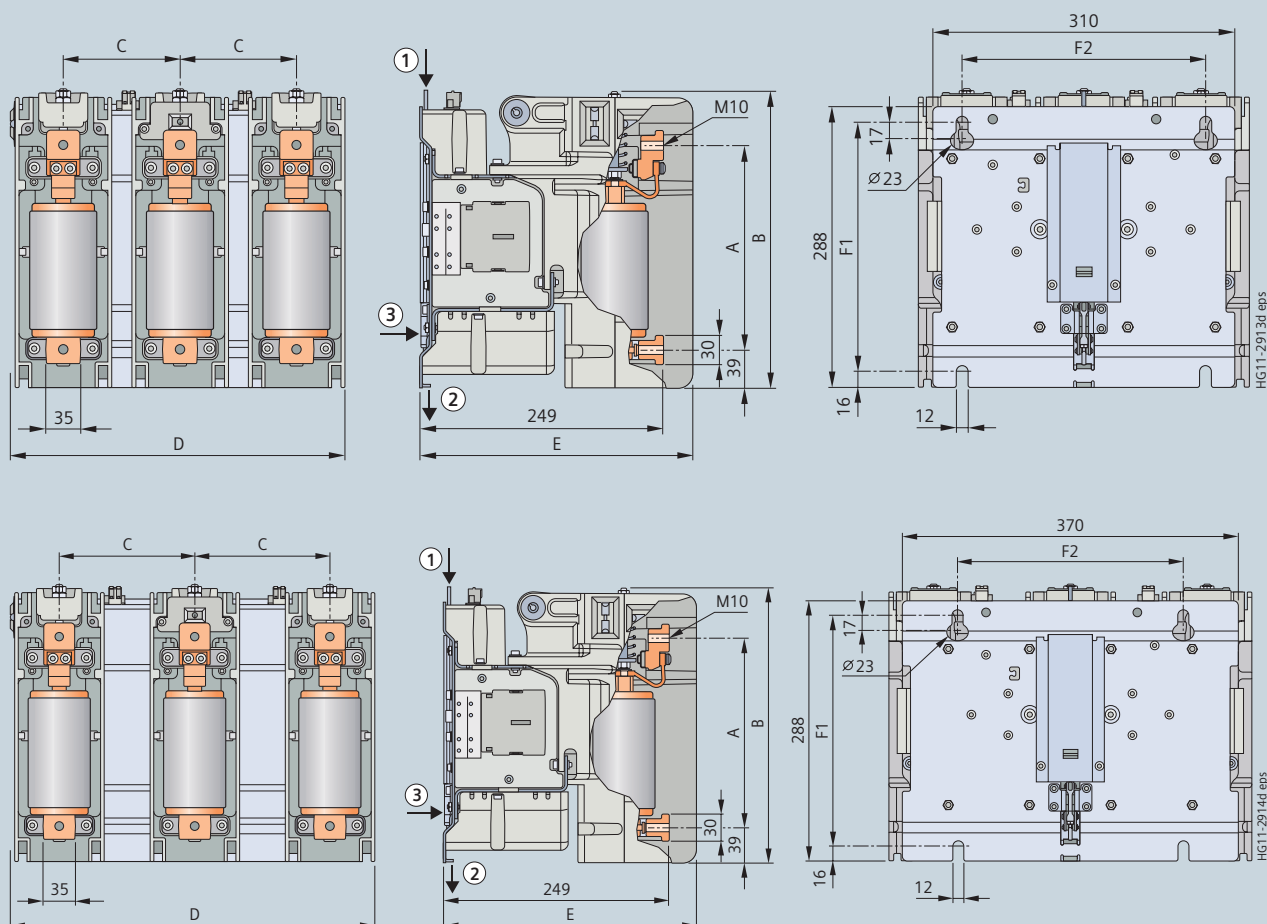
1.3

Auxiliary contacts

Order No.	Number of auxiliary contacts	Rated continuous current I_{th} A	Rated operational current I_e at rated voltage U_r , Utilization category AC-12 for alternating current		Rated operational current I_e at rated voltage U_r , Utilization category AC-14 for alternating current I_e A	Rated operational current I_e at rated voltage U_r , Utilization category AC-15 for alternating current			Rated operational current I_e at rated voltage U_r , Utilization category DC-13 for direct current			
			AC 24 V I_e A	AC 230 V I_e A		AC 24 V I_e A	AC 230 V I_e A	AC 400 V I_e A	DC 24 V I_e A	DC 60 V I_e A	DC 110 V I_e A	DC 220 V I_e A
3TM31...	4 NO + 4 NC 6 NO + 6 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM32...	4 NO + 4 NC 6 NO + 6 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM33...	4 NO + 4 NC 6 NO + 6 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM34...	4 NO + 4 NC 6 NO + 6 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM35...	4 NO + 4 NC 6 NO + 6 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM36...	4 NO + 4 NC 6 NO + 6 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM12...	4 NO + 4 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM13...	4 NO + 4 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM14...	4 NO + 4 NC	10	10	10	6	6	6	3	6	2	1	0.3
3TM15...	4 NO + 4 NC	10	10	10	6	6	6	3	6	2	1	0.3

Connection cross-sections of the auxiliary contacts acc. to IEC EN 60947-5-1	Application examples
With wire end ferrule	2x (0.5 – 1.5)
For AWG connections	2x (20 – 14)

Dimension drawings for 3TM3



- ① Manual switch-off via push rod (J67)
- ② Manual switch-off via pull rod (J68)
- ③ Switching off via shunt release

Dimensions of 3TM3 vacuum contactor, with auxiliary switches 4 NO/4 NC

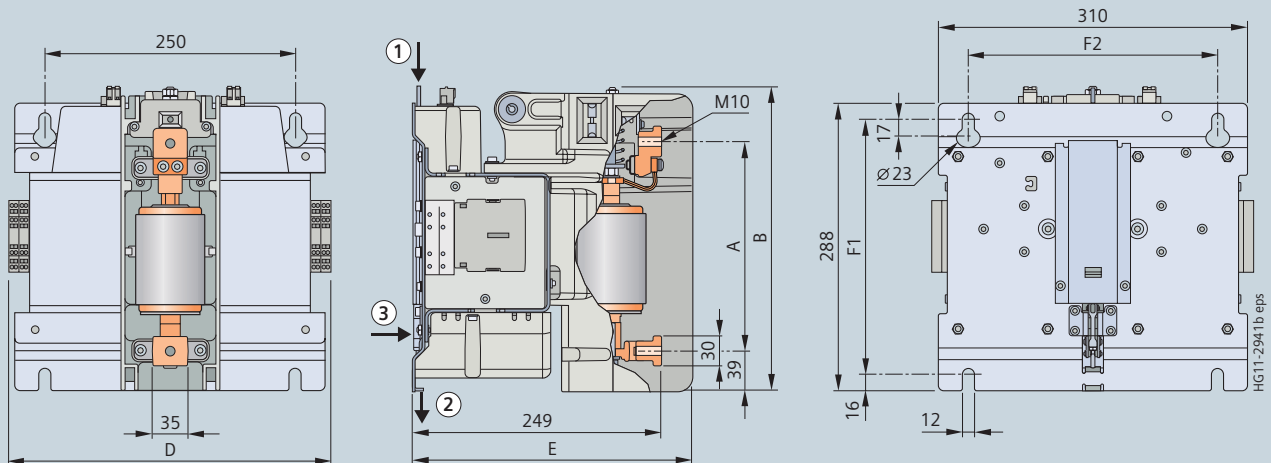
Voltage level kV	3TM 3-pole	Terminal distance	Pole-center distance	Height	Width for 4 NO + 4 NC	Depth	Installation dimensions		Terminal connections	Weight	Rated current
		A	C	B	D	E	F1	F2	Screwed		
		mm	mm	mm	mm	mm	mm	mm		kg	A
7.2 kV – 15 kV	3TM3	210	120	310	342	280	256	250	M10	approx. 20–22	320 – 450
7.2 kV – 15 kV	3TM3	210	150	310	410	280	256	250	M10	approx. 23–25	320 – 450

Technical Data

Dimension drawings

1.3

Dimension drawings for 3TM1, single-pole



- ① Manual switch-off via push rod (J67)
- ② Manual switch-off via pull rod (J68)
- ③ Switching off via shunt release

Dimensions of 3TM1 vacuum contactor, with auxiliary switches 4 NO/4 NC

Voltage level kV	3TM 1-pole	Terminal distance	Pole-center distance	Height	Width for 4 NO + 4 NC	Depth	Installation dimensions		Terminal connections	Weight	Rated current
		A	C	B	D	E	F1	F2	Screwed		
		mm	mm	mm	mm	mm	mm	mm		kg	A
7.2 kV – 12 kV 4.15 to 6.9 kV (L-N)	3TM1	210	–	310	322	280	256	250	M10	16	450

Transport by truck, rail, airfreight or ship

Packing type	3TM3			3TM1		
	Number	Dimensions Length / width / height mm	Volume m ³	Number	Dimensions Length / width / height mm	Volume m ³
Cardboard box with wooden base	1	600 x 500 x 500	0.150	1	600 x 500 x 500	0.150
	2	920 x 640 x 780	0.459	2	920 x 640 x 780	0.459
	4 – 8	1120 x 820 x 1130	1.038	4 – 8	1120 x 820 x 1130	1.038

Packing weight	Number	Maximum weight	Number	Maximum weight
		kg		kg
	1	35	1	26
	2	70	2	52
	3	105	3	78
	4	125	4	89
	5	150	5	105
	6	175	6	121
	7	200	7	137
	8	225	8	153



68x.jpg

3TL71 Vacuum Contactors

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Industrial application: Refinery

raffinerie gettyimages 945670494_original.jpg

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Description

General

3TL71 vacuum contactors

3TL vacuum contactors are three-pole contactors with electromagnetic operating mechanism for medium-voltage switchgear. They are load breaking devices with a limited short-circuit making and breaking capacity for

applications with high switching rates of up to 0.5 million electrical operating cycles or 1 million mechanical operating cycles.

2.1

3TL71 vacuum contactors – the Slim



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71x.jpg

In 3TL71 contactors, the assemblies of the low-voltage part and of the medium-voltage part are not arranged one above the other. This provides a slim design which can easily be mounted on the different switchgear and frame structures.

Application

The vacuum contactors are suitable for operational switching of alternating current consumers.

The contactors are used in conveying and elevator systems, pumping stations, air conditioning systems, as well as in systems for reactive power compensation, and can therefore be found in almost every industrial sector.

Switching medium

The vacuum switching technology, proven and fully developed for more than 40 years, serves as arc-quenching principle by using vacuum interrupters.

Construction

3TL vacuum contactors consist of a medium-voltage and a low-voltage part. Together with the main conductor terminals, the vacuum interrupters constitute the medium-voltage part. All components required to operate the vacuum interrupter, such as the operating mechanism, closing latch and control unit make up the low-voltage part. The modules are arranged one above the other.

Mode of operation

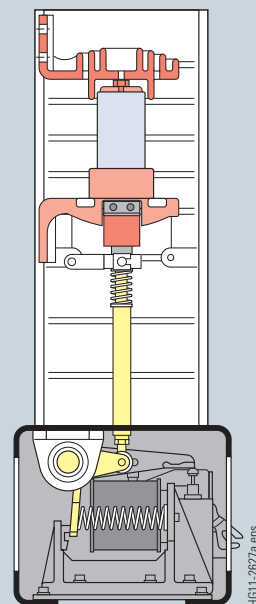
The tubes of the 3TL71 contactor are operated via a linear mechanical connection (7). By using a special double coil, the magnetic actuator is designed for the switch-on and holding operation.

Installation position

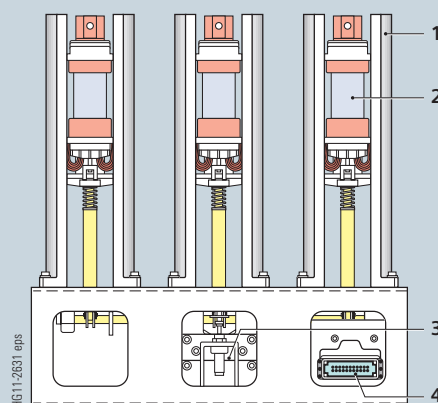
Contrary to the 3TM, the 3TL71 can only be installed in vertical position.

Adjustment to the site altitude

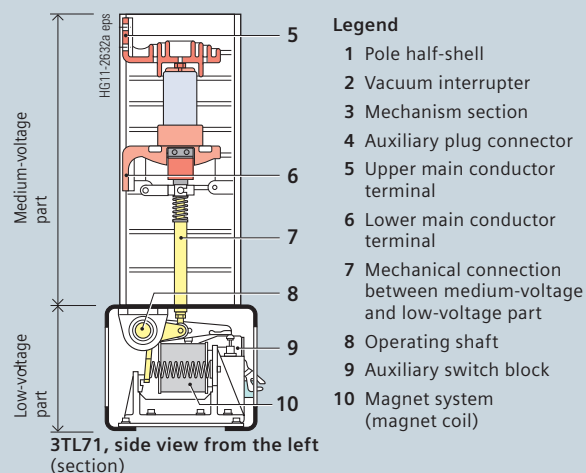
On the 3TL71, the site altitude is selected directly at the 14th position of the order number. The standard site altitude is between –50 m and +1250 m.



3TL71 vacuum contactor



Construction of the 3TL71 vacuum contactor (front view)



Description

Switching duties

Utilization categories

In IEC 62271-106, power contactors are divided into different utilization categories. According to these categories, 3TL vacuum contactors are dimensioned for different electrical consumers and operating conditions. The opposite table shows typical applications in accordance with the respective utilization category.

Utilization categories	Typical applications
AC-1	Non-inductive or slightly inductive loads, resistance furnaces
AC-2	Slip-ring motors: Starting, switching off
AC-3	Squirrel-cage motors: Starting, switching off during running
AC-4	Squirrel-cage motors: Starting, plugging ¹⁾ , reversing ¹⁾ , inching ²⁾

- 1) By plugging or reversing is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running
- 2) By inching is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism

Application examples

3TL vacuum contactors are three-pole contactors with electromagnetic operating mechanism for medium-voltage switchgear. They are load breaking devices with a limited short-circuit making and breaking capacity, and are used for high switching rates (> 10,000 operating cycles).

The vacuum contactors are suitable for operational switching of alternating current consumers in indoor switchgear, and can be used, e.g., for the following switching duties:

- Three-phase motor starting
- Plugging or reversing the direction of rotation of motors
- Switching of three-phase motors in AC-3 and AC-4 operation
- Switching of transformers
- Switching of reactors
- Switching of resistive consumers such as electrical furnaces
- Switching of capacitors.

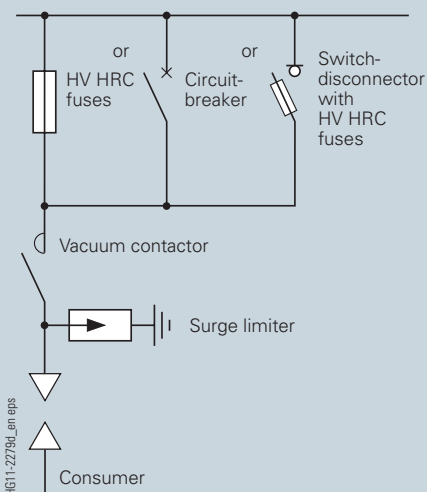
In contactor-type reversing starter combinations (reversing duty), only one contactor is required for each direction of rotation if HV HRC fuses are used for short-circuit protection.

Application, switching of consumers	Symbols	Application examples
Medium voltage three-phase motors	 HG11-2547b eps	Conveyor and elevator systems, compressors, ventilation and heating
Transformers	 HG11-2548b eps	Ring-main units, industrial system distributions
Reactors	 HG11-2549a eps	Industrial system distributions, DC-link reactors, reactive power compensation systems
Resistive consumers	 HG11-2550b eps	Heating resistors, electric furnaces
Capacitors	 HG11-2551a eps	Reactive power compensation systems, capacitor banks

Circuit diagram	Mode of operation
	Switching of accelerated motors
	Occasional switching of just accelerated motors in case of fault ¹⁾
	Frequent switching in AC-4 operation ¹⁾

Circuit examples for surge protection of three-phase motors with a starting current ≤ 600 A

1) With surge limiter



Switching devices in combination with a vacuum contactor

Switching of motors

3TL vacuum contactors are especially suitable for frequent operation of motors. As the chopping currents of the contactors are ≤ 3 A, no unpermissibly high overvoltages are produced when accelerated motors are switched during normal operation. However, when high-voltage motors with starting currents of ≤ 600 A are stopped during start-up, switching overvoltages may arise. The magnitude of these overvoltages can be reduced to harmless values by means of special surge limiters.

Switching of transformers

When inductive currents are interrupted, current chopping can produce overvoltages at the contact gap. As the chopping current of the Siemens vacuum contactor is less than 3 A, no dangerous overvoltages are produced when the unloaded transformer is switched off.

Switching of capacitors

3TL vacuum contactors can interrupt capacitive currents up to 400 A up to the rated voltage of 24 kV without restrikes, and thus without overvoltages.

Surge protection via limiters

Overvoltages can arise as a consequence of multiple re-strikes or by virtual current chopping, e.g. when motors are switched in braked condition or during start-up. Motors with a starting current ≤ 600 A are endangered. Safe protection against overvoltages is ensured by surge limiters 3EF. These can be arranged in parallel to the cable sealing ends, preferably in the cable compartment. The surge limiters consist of non-linear resistors (metal-oxide varistors SIOV) and a series-connected spark gap. During installation it must be observed that the surge limiter is flexibly mounted on one side for mechanical reasons.

Short-circuit protection

3TL vacuum contactors are not designed to switch short-circuit currents. It is therefore absolutely essential to provide short-circuit protection. The best protection is provided by HV HRC fuses, but circuit-breakers can also be used for this purpose.

Description

Switching duties

Short-circuit protection via HV HRC fuses

At high short-circuit currents, HV HRC fuses have a current-limiting effect, i.e. the fuse limits the short-circuit current to the let-through current. When selecting the fuses, the type of consumer must be observed, e.g. motor, transformer, capacitor.

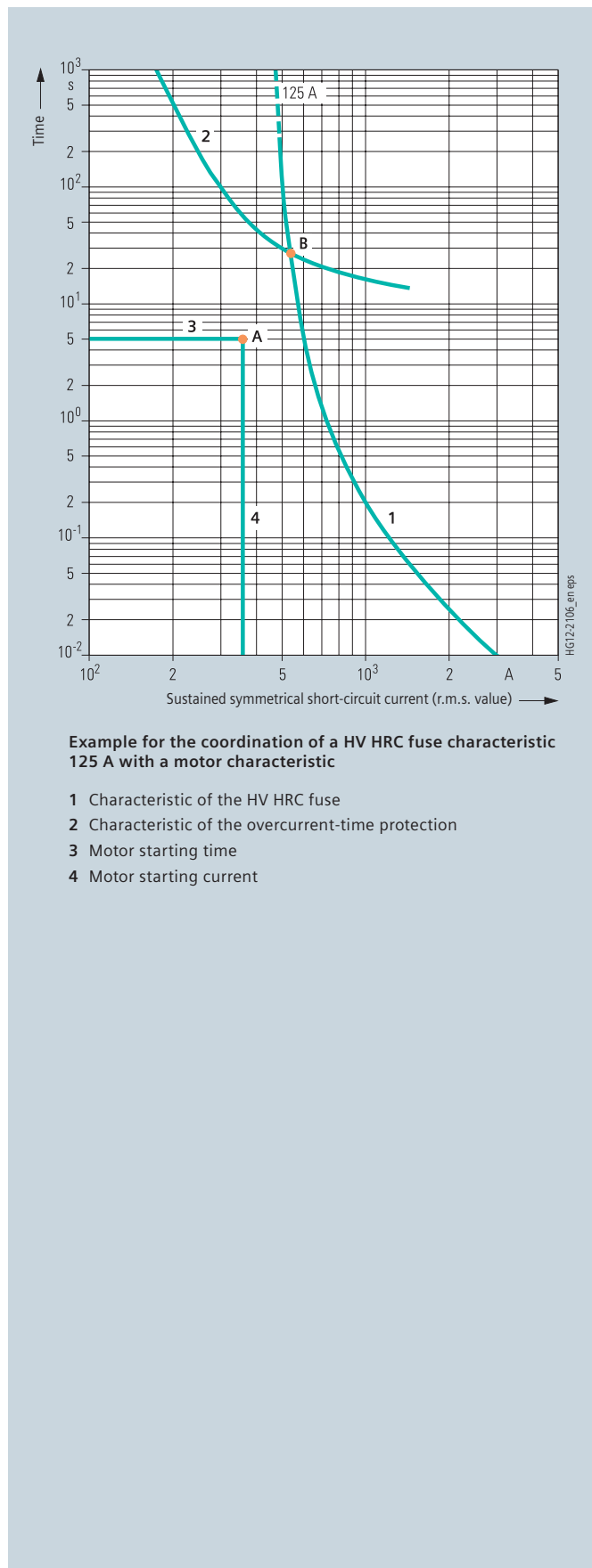
The opposite diagram shows an example for the coordination of a HV HRC fuse with an overcurrent-time protection.

Coordinating the components of the motor circuit:

- The time-current characteristic must be located on the right of the motor starting current (point A).
- The rated current of the HV HRC fuse-link must exceed the normal current of the motor.
- The current corresponding to the intersection B of the HV HRC fuse-link characteristic and the characteristic of the overcurrent-time protection must be higher than the minimum breaking current of the HV HRC fuse-link.
- If this is not feasible, it must be ensured that overload currents that are smaller than the minimum breaking current of the HV HRC fuse-link are interrupted by the switching device via the striker. This prevents thermal overloading of the HV HRC fuse-link, which would otherwise be destroyed.
- The selected HV HRC fuse-link limits the sustained symmetrical short-circuit current I_k to the let-through current I_D shown in the diagram for the current-limiting characteristics (I_D as a function of I_k for HV HRC fuse-links with different rated currents). The maximum permissible let-through current is $I_D = 50$ kA, however, only at 7.2 kV.

Requirements

- The let-through current I_D must not exceed 50 kA at 7.2 kV.
- In case of low-voltage supply via a control transformer, short-circuit currents ranging above the limit breaking capacity must be interrupted within 80 ms. This requirement does not apply if
 - a mechanical latch is provided, or
 - the opening times have been extended so much that – in the a.m. current range – the contactor can only open when the fuse has interrupted the current.
- Due to the arising motor starting current, the instant when the motor starts represents the maximum stress for the HV HRC fuse. This stress must neither operate nor pre-damage the fuse-link.
- Other factors of influence on the stress of the HV HRC fuses are the starting time and the starting frequency of the motors.



Short-circuit protection

For using 3TL71 vacuum contactors, fuses are specified for short-circuit protection. If two fuse-links are connected in parallel, the symmetrical short-circuit current determined has to be divided by two, and the associated let-through current for one fuse-link must be stated. This value must then be multiplied by two in order to obtain the total let-through current, which must not exceed the permissible value for the vacuum contactor. The parallel connection should ensure that the resistance values in the two branches are almost the same. When the fuses operate, the vacuum contactor must be switched off. A suitable device, actuated by the striker of the HV HRC fuse-link, has to be provided.

Fuse monitoring

To prevent a three-phase load (e.g. a motor) from being supplied only by two phases when a fuse has operated, the fuse-bases can be equipped with a "fuse trip indicator". This device can be used either to energize a warning signal or to switch off the vacuum contactor.

Short-circuit protection via circuit-breakers

Consumers for which no suitable fuses are available can also be protected by circuit-breakers. Due to the longer break time of the circuit-breakers (max. permissible 120 ms), the symmetrical short-circuit current must not exceed the maximum permissible value. As a consequence of the longer break time, the interrupters should be replaced immediately by new ones after carrying the maximum permissible symmetrical short-circuit current, as their service life has been considerably reduced.

Overload protection

For protecting high-voltage motors against overload, it is possible to use thermally delayed overcurrent relays with suitable current transformers.

Trip-free mechanism

All contacts of the vacuum contactors are trip-free. The "OPEN" command interrupts the "CLOSE" command, i.e. the instant of the "OPEN" command determines whether the contacts will close or not.

Standards

3TL71 vacuum contactors are designed in open construction, with degree of protection IP00 according to IEC 60529 and DIN EN 60529. They conform to the standard for high-voltage alternating current contactors:

- IEC 62271-106

Furthermore, 3TL71 vacuum contactors are based on the standard IEC 62271-100.

Tests

For the development and type testing of power switching devices according to relevant standards, we have accredited testing laboratories at our disposal:

- Testing laboratories with a high electrical testing capacity
- Testing laboratories to prove the following features:
 - Mechanical operation
 - Reliability
 - Dielectric strength
 - Temperature-rise performance
 - Climatic resistance.

To obtain secure results, comprehensive test series are performed for the type tests defined in the standards.

Description

Ambient conditions and dielectric strength

Ambient conditions

The vacuum contactors are designed for the normal operating conditions defined in the standards.

Condensation can occasionally occur under the ambient conditions shown. Vacuum contactors are suitable for use in the following climatic classes according to IEC 60721:

Ambient conditions	Class	Standards
Climatic ambient conditions	3K22 ¹⁾ , 3KA24 ²⁾	IEC 60721-3-3
Biological ambient conditions	3B1	IEC 60721-3-3
Mechanical ambient conditions	3M11	IEC 60721-3-3
Chemically active substances	C3 ³⁾	ISO 9223
Mechanically active substances	3S6 ⁴⁾	IEC 60721-3-3

1) Maximum of 24-hour mean: +70 °C

2) Up to -40 °C

3) Without appearance of saline fog and simultaneous condensation

4) Restriction: Clean insulation parts

Dielectric strength

The dielectric strength of air insulation decreases with increasing altitude due to low air density. According to IEC 62271-1, the values of the rated lightning impulse withstand voltage and the rated short-duration power-frequency withstand voltage specified in the chapter "Technical Data" apply to a site altitude of 1000 m above sea level. For an altitude above 1000 m, the insulation level must be corrected according to the opposite diagram.

The characteristic shown applies to both rated withstand voltages.

To select the devices, the following applies:

$$U \geq U_0 \times K_a$$

U Rated withstand voltage under reference atmosphere

U_0 Rated withstand voltage requested for the place of installation

K_a Altitude correction factor according to the opposite diagram

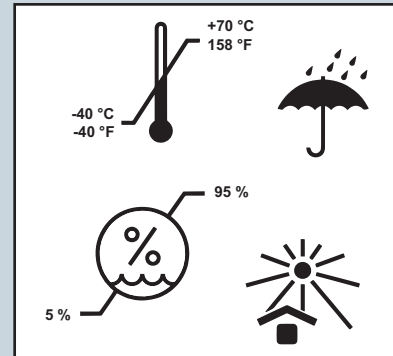
Example

For a requested rated lightning impulse withstand voltage of 60 kV at an altitude of 2500 m, an insulation level of 72 kV under reference atmosphere is required as a minimum:

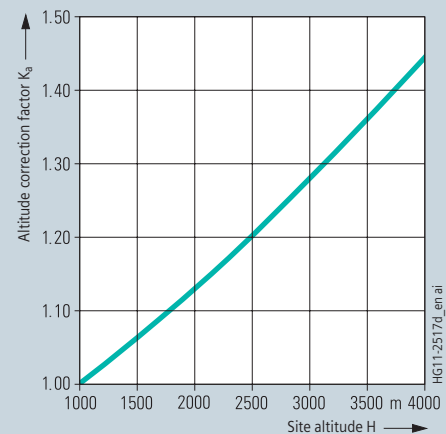
$$72 \text{ kV} \geq 60 \text{ kV} \times 1.2$$

Short-time withstand current

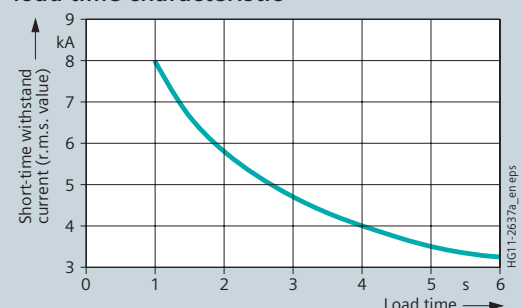
The short-time withstand current is the r.m.s. value of the current that a 3TM vacuum contactor in closed position can carry for a certain time until a short-circuit protection device has responded.



Temperature value	For vacuum contactor
	3TL71
Maximum value	+55 °C
Maximum 24-hour mean value	+50 °C
Minimum value	-40 °C



Short-time withstand current/ load time characteristic





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2.2

Equipment Selection

Order number structure, configuration example

Order number structure

The vacuum contactors consist of a medium-voltage and a low-voltage part. The relevant data make up the 12 to 14-digit order number. The medium-voltage part covers the main electrical data of the poles. The low-voltage part covers all auxiliary devices which are necessary for operating and controlling the contactor.

Order codes

Individual equipment versions are explained more in detail by a 3-digit order code. Several order codes can be added to the order number in succession and in any sequence.

Special versions (★)

In case of special versions, "-Z" is added to the order number and a descriptive order code follows. If several special versions are required, the suffix "-Z" is listed only once. If a requested special version is not in the catalog and can therefore not be ordered via order code, it has to be identified with **Y 9 9** after consultation. The agreement hereto is made directly between your responsible sales partner and the order processing department in the Switchgear Factory Berlin.

2.2

		Position:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	Order codes				
		Order No.:	3	T	L	■	■	■	■	-	■	■	■	■	■	-	■	■	-	★	■	■	■
1 st position	Medium-voltage part Superior group Switching devices																						
2 nd position	Main group Contactors																						
3 rd position	Subgroup Vacuum contactors																						
4 th to 6 th position ¹⁾	Basic equipment Design and ratings of medium-voltage part																						
7 th to 14 th position ¹⁾	Low-voltage part Secondary equipment Operating voltages, auxiliary equipment																						
	Order codes Groups of 3 after the Order No. Format: a n a																						
	Special versions (★) Initiated with "-Z" Groups of 3 after the Order No. Format: a n a																						

1) Deviation in the distribution for the different contactors

Configuration example

In order to simplify the selection of the correct order number for the requested contactor, you will find a configuration example on each page of the chapter "Equipment Selection". This example is continued, so that at the end of the equipment selection of a product group (page 51) a completely configured contactor results as an example.

On the foldout page we offer a configuring aid. Here you can fill in the order number you have determined for your contactor.

Example for Order No.: 3 T L 7 1 2 8 - ■ ■ ■ ■ ■ - ■ ■ ■ ■ ■
Order codes: ■

**24 kV**

50/60 Hz

	Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Order codes
Order No.:		3	T	L	7	■	■	■	■	■	■	■	■	■	■	■
Rated voltage U_r kV		3	T	L	7	1	2									
Rated lightning impulse withstand voltage, to earth U_p kV																
Rated lightning impulse withstand voltage, open contact gap U_p kV																
Rated short-duration power-frequency withstand voltage U_d kV																
Rated normal current I_r A																
													see page 50	see page 50	see page 50	see page 51

7th position**Auxiliary switch**

Options																
4 NO + 4 NC available for customer with 24-pole plug																
8 NO + 8 NC available for customer with 64-pole plug																

8th/9th/10th/11th position**Mode of operation and operating voltage for magnet coil**

DC operation with voltage	AC operation with voltage															
110 V DC																
120 – 125 V DC																
220 V DC																
	110 V AC 50/60 Hz															
	120 V AC 50/60 Hz															
	230 V AC 50/60 Hz															

Other auxiliary voltages on request

Configuration example

3TL71 vacuum contactor

Rated voltage U_r = 24 kVRated lightning impulse withstand voltage U_p (to earth) = 125 kVRated lightning impulse withstand voltage U_p (open contact gap) = 95 kVRated short-duration power-frequency withstand voltage U_d = 50 kVRated normal current I_r = 800 A

Auxiliary switch 8 NO + 8 NC

Mode of operation AC operation for magnet coil

Operating voltage 110 V AC for magnet coil

Example for Order No.:

Order codes:

3	T	L	7	1	2	8	-	0	A	G	2	■	-	■	■	

Equipment Selection

Selection of 3TL71



12th position

Language of operating instructions

Position: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Order codes

Order-No.: 3 T L 7 ■ ■ ■ - ■ ■ ■ ■ ■ ■ ■ - ■ ■ ■ - ★ ■ ■ ■

Option

German/English

See page 51

13th position

Type of construction

Options

Version standard/industry (interrupters in vertical position)

Version with insulating plate (interrupters in vertical position)

0

1

14th position

Site altitude

Optionen

Site altitude -50 m to +1250 m

Site altitude +1250 m to +2500 m

Site altitude +2500 m to +4000 m

Site altitude +4000 m to +5000 m

A

B

D

C

Configuration example

3TL71 vacuum contactor

($U_r = 24 \text{ kV}$, $U_p \text{ (to earth)} = 125 \text{ kV}$, $U_p \text{ (open contact gap)} = 95 \text{ kV}$,

$U_d = 50 \text{ kV}$, $I_r = 800 \text{ A}$)

Language of operating instructions German/English

Type of construction, version with insulating plate (interrupters in vertical position)

Site altitude 0 – 1250 m

3 T L 7

1 2 8 - 0 A G 2

0 -

1

A

Example for Order No.:

Order codes:

3 T L 7 1 2 8 - 0 A G 2 0 - 1 A



Additional equipment

Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Order codes
Order No.:	3	T	L	7												
Options																
Wiring, halogen-free and flame-retardant															- Z	A 1 0
Wiring cables, tinned															- Z	A 1 2
Additional rating plate, loose delivery															- Z	B 0 0
Silver-plated connecting surfaces															- Z	D 0 9
Routine test certificate in English enclosed															- Z	F 2 0
Routine test certificate in German enclosed															- Z	F 2 4
Routine test certificate in French enclosed															- Z	F 2 5
Routine test certificate in Spanish enclosed															- Z	F 2 6
Customer acceptance test															- Z	F 5 0
Special wiring for opening time ≤ 50 ms															- Z	G 0 1

Note on opening times:

Standard	50 to 100 ms
With special wiring G01	≤ 50 ms

Configuration example

3TL71 vacuum contactor

Rated voltage $U_r = 24 \text{ kV}$ Rated lightning impulse withstand voltage U_p (to earth) = 125 kVRated lightning impulse withstand voltage U_p (open contact gap) = 95 kVRated power-frequency withstand voltage $U_d = 50 \text{ kV}$ Rated normal current $I_r = 800 \text{ A}$

Auxiliary switch 8 NO + 8 NC

Mode of operation AC operation for magnet coil

Operating voltage 110 V AC for magnet coil

Language of operating instructions German/English

Type of construction, version with insulating plate (interrupters in vertical position)

Site altitude 0 – 1250 m

Additional rating plate, loose delivery

3 T L 7

1 2

8 -

0 A

G 2

0 -

1

A

- Z

B 0 0

Example for Order No.:

3 T L 7 1 2 8 - 0 A G 2 0 - 1 A - Z

Order codes:

B 0 0

Equipment Selection

Accessories and spare parts

Remark for orders

The order numbers are applicable to contactors of current manufacture. When mounting parts or spare parts are being ordered for an existing vacuum contactor, always quote the

type designation, serial number and the year of manufacture of the contactor to be sure to get the correct delivery. This data is given on the rating plate.

Designation	Remark	Operating voltage	Order No.
Auxiliary switchblock			
	4 NO + 4 NC		3SV9 894-2AA0
	8 NO + 8 NC		3SV9 896-2AA0
Magnet coil		110 V AC, 50/60 Hz	3TY5 741-0AG2
		120 V AC, 50/60 Hz	3TY5 741-0AK2
		230/240 V AC, 50/60 Hz	3TY5 741-0AL2
		110 V DC	3TY5 741-0BF4
		120/125 V DC	3TY5 741-0BG4
		220 V DC	3TY5 741-0BM4
Auxiliary contactor		110 V DC	A7E 1540 2727 001
		120 – 125 V DC	A7E 1540 2727 002
		220 V DC	A7E 1540 2727 003
		110 V AC, 50/60 Hz	A7E 1540 2727 004
		120 V AC, 50/60 Hz	A7E 1540 2727 005
		230 V AC, 50/60 Hz	A7E 1540 2727 006
Semiconductor components			
Varistor module	For overvoltage protection in DC secondary circuit		3AX15 26-0F
Rectifier module	For overvoltage protection in AC secondary circuit		3AX15 25-1F

To select the correct spare vacuum interrupter, please specify the type designation 3TL, serial number and year of manufacture of the contactor. This data is given on the rating plate.

Vacuum interrupters and other spare parts must only be replaced by instructed personnel.

Note:

For any query regarding spare parts, subsequent deliveries, etc. the following details are necessary:

- Type designation (**3TL**)
- Serial no. (**No. S**)
- Year of manufacture (**Year of manuf.**)



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Low-voltage part 54

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load time characteristic 55

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Transport dimensions and weights

Types of transport 57

2.1

Technical Data

Electrical data, dimensions and weights

2.3

Medium-voltage part

Order No.																					
	Rated voltage U_r kV	Rated normal current I_r A	Rated continuous normal current ¹⁾ at ambient air temperature up to +55 °C I_{th} A	Thermal current at ambient air temperature up to +80 °C I_e A	Rated operational current ¹⁾ I_m kA	Switching capacity ²⁾ Rated making current I_c kA	Switching capacity ²⁾ Rated breaking current I_{ba} kA	Rated short-circuit breaking current (limit switching capacity) I_k kA	Rated short-time withstand current (r.m.s. value) 1 s ³⁾ A	Rated single capacitor bank breaking current Rated normal current of capacitor for a parallel capacitor bank kA	Switching rate without mechanical closing latch Oper. cycles/h	Mechanical endurance of the contactor Oper. cycles	Mechanical endurance of the vacuum interrupter Oper. cycles	Electrical endurance (AC-1) while breaking the rated normal current Oper. cycles	Rated lightning impulse withstand voltage to earthed parts and between phases kV	Rated lightning impulse withstand voltage across the open contact gap kV	Rated short-duration power-frequency withstand voltage to earthed parts and between phases kV	Rated short-duration power-frequency withstand voltage across the open contact gap kV	Weight kg	Detailed dimension drawing (can be ordered) s_A7E_	
3TL71 ...	24	800	800	630	450	4.5	3.6	4.5	3.6	400	–	60	1 mill.	1 mill..	0.5 mill.	125	95	50	50	80	154 02492

1) According to utilization category AC-1, AC-2, AC-3 and AC-4

2) According to utilization category AC-4 ($\cos \phi = 0.35$)

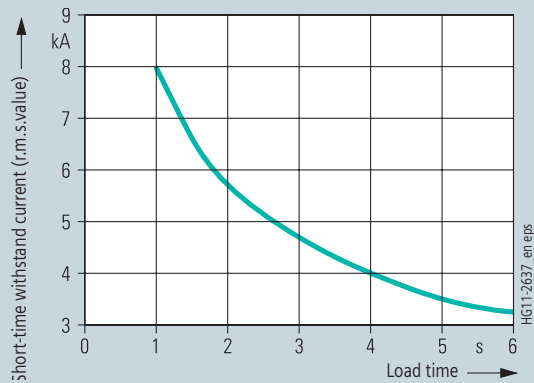
3) For short-time withstand current with longer durations, see short-time withstand current/load time characteristic

Low-voltage part

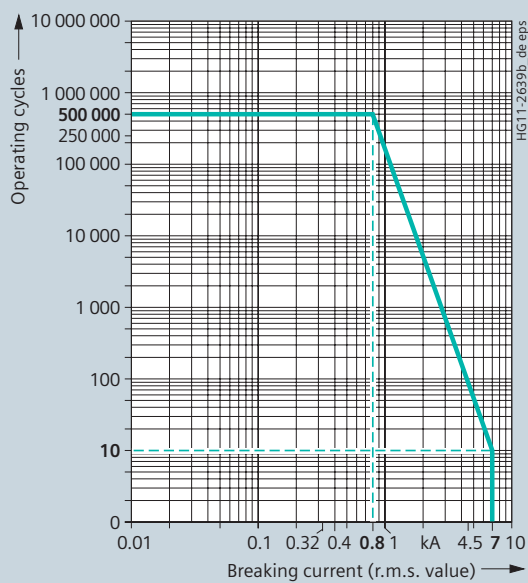
Order No.	Power consumption of the drive solenoid Making capacity W	Power consumption of the drive solenoid Holding power referred to 230 V AC W	Voltage range of the drive solenoid Operating voltage V	Minimum closing command for drive solenoid ms	Closing time (Interval of time between the command and the instant when the contacts touch in all poles) ms	Opening time (Interval of time between the command and the instant of the contact separation in the last pole) ms
3TL71 ...	1200	200	0.85 to 1.1 U_a	100	40 to 60	30 to 100 ¹⁾

1) 3TL71 With special wiring $G01 \leq 50$ ms

Kurzzeitstrom-Belastungszeit-Kennlinie



Operating cycle diagrams

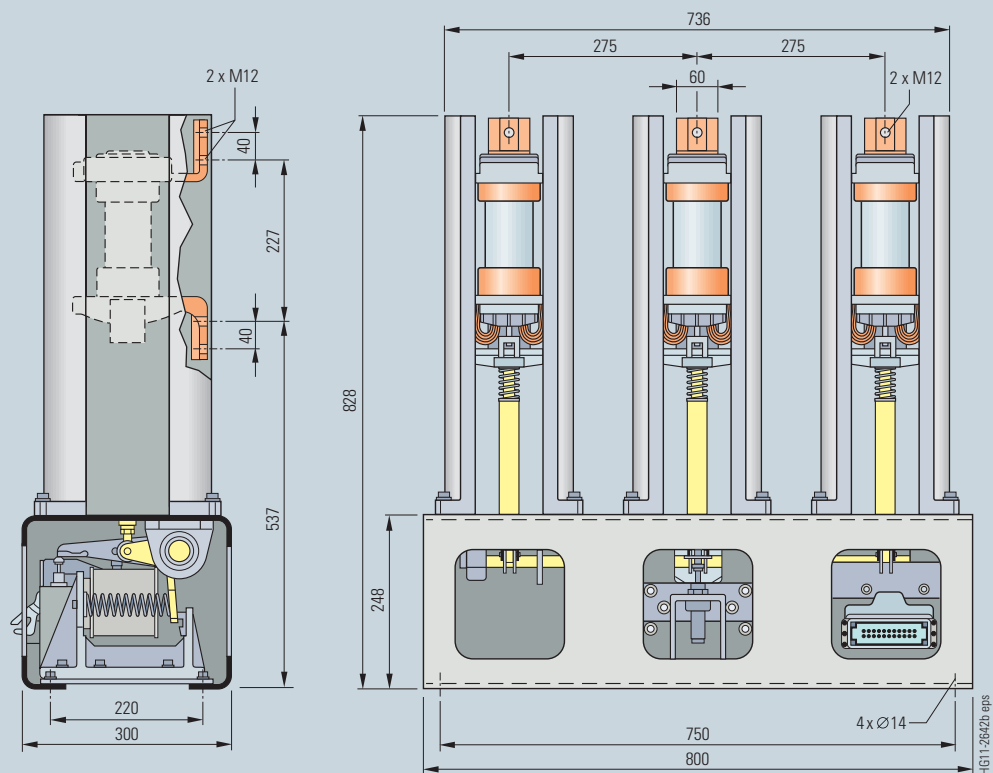


The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). The curve shape shows average values. The number of operating cycles that can actually be reached can be different depending on the respective application.

Technical Data

Electrical data, dimensions and weights

Dimension drawings



3TL71 dimension drawing

Auxiliary contacts

Order No.	Number of auxiliary contacts	Rated continuous current A	Rated normal current Utilization category for AC voltage AC-14/15 at rated voltage								Rated normal current Utilization category for DC voltage DC-13 at rated voltage								Connection cross-sections of the auxiliary contacts acc. to DIN EN 60947 Part 1	
			110 V AC	115 V AC	120 V AC	125 V AC	220 V AC	230 V AC	240 V AC	24 V DC	30 V DC	48 V DC	60 V DC	110 V DC	125 V DC	220 V DC	Single wire mm ²	Finely stranded with wire end ferrule mm ²		
			<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>	<i>I_r</i>				
3TL71 ...	4 NO + 4 NC 8 NO + 8 NC	–	5	–	–	–	2.5	–	–	10	9	9	7	4	–	2	0.6 – 4	0.5 – 2.5		

Ambient conditions

Order No.	Service life at ambient air temperature			Site altitude	Degree of protection according to IEC 60529
	Storage at –40 °C to +65 °C	Operation at –5 °C to +65 °C	Betrieb at –40 °C to –5 °C		
3TL71 ...	20 years	1 mill. oper. cycles	0.5 mill. oper. cycles	50 m below sea level to 5000 m above sea level	IP00

Transport by truck, rail, airfreight or ship

Packing type	3TL71			
	For number of vacuum contactors	Dimensions length/width/height mm	Volume m ³	Gross weight kg
Cardboard box	1 – 2	1120 x 820 x 1130	1.038	150 – 293
	3	1140 x 1020 x 1020	1.186	286 – 400
	3 ¹⁾	1215 x 1040 x 1270	1.605	425 – 431
Lattice box with dust protection foil	1 – 2 ²⁾	1200 x 850 x 900	0.918	199 – 313

1) With partitions

2) Not stackable





Switchgear Factory, Berlin

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Annex

Configuration instructions

You prefer to configure your vacuum contactor on your own?

Please follow the steps for configuration and enter the order number in the configuration aid.

Or use our online configurator on our homepage:

www.siemens.com/3tm-configurator

Instruction for configuration of the 3TM vacuum contactor

1st step: Definition of the primary part

Please specify the following ratings:	Possible options:
Rated voltage (U_r)	U_r : 7.2 kV to 15 kV
Rated lightning impulse withstand voltage (U_p)	U_p : 60 kV to 75 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d : 20 kV to 75 kV
Rated operational current (I_e)	I_e : up to 450 A
Switching rate	Up to 1200 operating cycles/h
Mechanical endurance of the contactor	Up to 1 mill. operating cycles

2nd step: Definition of the equipment

Please specify the following equipment features:	Possible options:
Number of auxiliary contacts	Up to 6 NO + 6 NC
Operating voltage of the magnet coil	Operating voltages from 24 V DC to 60 V DC and 100 to 250 V AC/DC
Operating voltage of the closing latch	Operating voltages from 24 V DC to 60 V DC and 100 to 250 V AC/DC
Site altitude	–1500 m below sea level to +5000 m above sea level

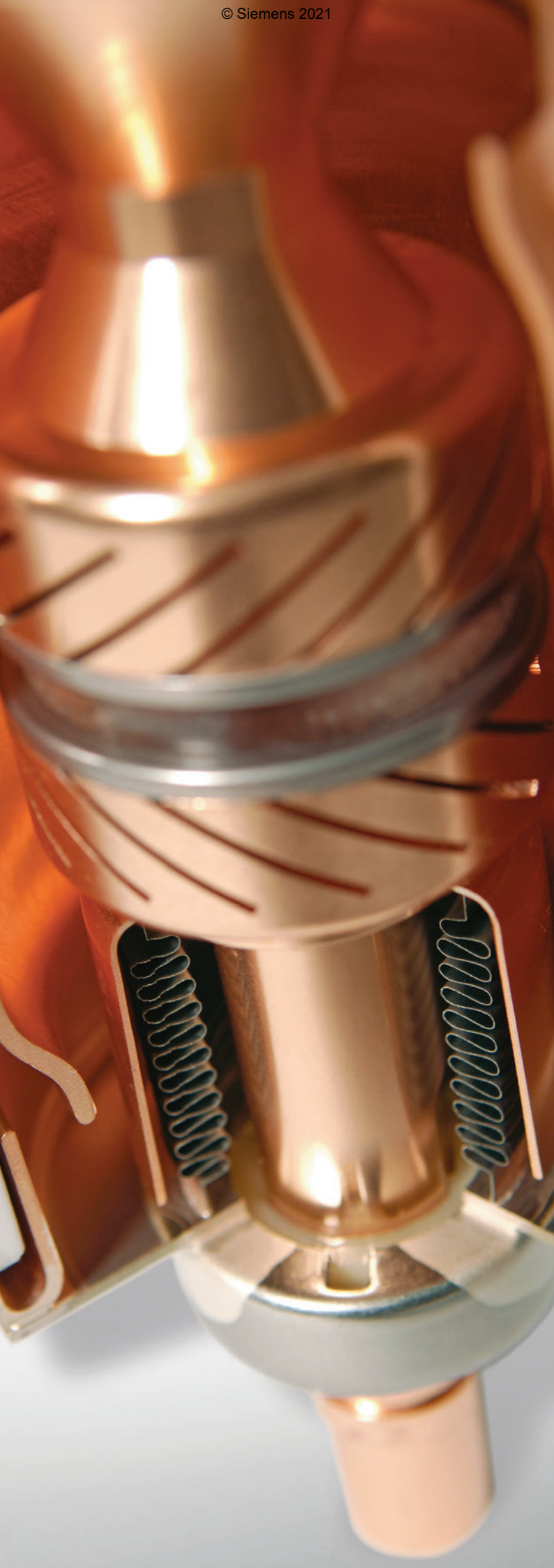
3rd step: Do you still have further requirements concerning the equipment?

Your Siemens sales partner will be pleased to support you.

Notes

For configuration of your
3TL vacuum contactors and 3TM vacuum contactors

1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	
3	T	★	■	■	■	■	-	■	■	■	■	■	-	■	■	■	-	Z
3	T	■					-						-					
				+				+				+						
				+				+				+						
3	T	■					-						-					
				+				+				+						
				+				+				+						
3	T	■					-						-					
				+				+				+						
				+				+				+						
3	T	■					-						-					
				+				+				+						
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3	T	■					-						-					
				+				+				+						
				+				+				+						
3	T	■					-						-					
				+				+				+						
				+				+				+						



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www.siemens.com/lowvoltage

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