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# Electrical Components for the Railway Industry

Catalog IC 12

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> Edition 2019

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#### **Related catalogs**

Industrial Controls SIRIUS

# IC 10





PDF (E86060-K8280-A101-A7-7600) Print (E86060-K8280-A101-A6-7600)

ALPHA FIX Terminal Blocks



PDF (E86060-K1852-A101-A4-7600) PDF/print (E86060-K1852-A101-A2-7600)

**DELTA** Switches and Socket Outlets ET D1

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PDF

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# Electrical Components for the Railway Industry

SIRIUS

SIPLUS

Medium-voltage SENTRON / DELTA

High-voltage

Network components



#### Catalog IC 12 · 2019

Refer to the Industry Mall for current updates of this catalog: www.siemens.com/industrymall

The products contained in this catalog can also be found in the Interactive Catalog CA 01. Article No.: E86060-D4001-A510-D8-7600.

Please contact your local Siemens branch.

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Industrial Controls SIPLUS extreme RAIL and SIDOOR Low-Voltage Power Distribution **Medium-Voltage Components** Surge Arresters for Railway Applications **Network Components** Appendix



The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with EN ISO 9001

(For Certified Registration No., see www.siemens.com/system-certificates/cp). The certificate is recognized by all IQNet countries. Large temperature fluctuations, condensation, shock, vibration, electromagnetic interference, and more: Electrical and mechanical components for the railway industry must provide safe and reliable operation even under extreme application conditions at all times. This is why, Siemens leaves nothing to chance when developing these components. Right from the start, sound technology, application and service know- how go hand in hand with the highest quality standards.

As a global technology and innovation leader, we continuously push progress and help our customers overcome challenges e.g. by using the so-called digital twin. This cross-domain digital model integrates all data of a physical asset (product, plant or infrastructure systems) from the early design phase to engineering, commissioning, and service. The digital twin offers real value throughout the entire asset lifecycle, reducing over-engineering as well as improving component reliability with predictive engineering system simulation. It also reduces the costs for design, dimensioning and commissioning and accelerates your engineering and project execution.

We have been your reliable partner in the railway industry for decades. Our comprehensive experience in the fields of rolling stock and infrastructure is directly incorporated in the development of our components as is the knowledge we have gained from close cooperation with international standards committees. Therefore, you can rely on our components' guaranteed compliance with railway-specific requirements and standards.

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# Developed, tested and certified in accordance with current standards and directives

Siemens is a founding member of the IRIS Initiative, and consistently implements its requirements.

Our railway components comply with all the relevant standards, for example: DIN, EN, IEC, IEEE, ISO, EAC/GOST and ANSI, as well as the current fire protection standard EN45545.

With our certified components, we actively support the worldwide vehicle approval process.



# **Technical Assistance**

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both before and after delivery.





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 Conversion tool – the easy and efficient way to find successor products www.siemens.com/sirius/conversion-tool © Siemens AG 2018

# Introduction



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#### Electrical components for the railway industry - SIRIUS

# Overview

#### SIRIUS range of electrical components for the railway industry

Whether for rolling stock or infrastructure applications, we offer a comprehensive portfolio of electrical components for countless applications. One of our portfolio highlights is SIRIUS, the complete range for industrial controls. SIRIUS offers everything required for the switching, protection, or starting of

loads, as well as for their monitoring, control, detection, commanding, signaling, or supply. Our portfolio is rounded out by numerous products specifically developed and tested for the railway industry.

#### SIRIUS 3RV2 motor starter protectors for motor protection

- Spring-loaded or screw-type connection system on the terminals (also ring cable lug connection on request)
- For screw and snap-on mounting on DIN rail
- Short-circuit breaking capacity up to 100 kA
- Trip class 10 (sizes S00-S3)
- Integrated motor protection up to 100 A at +70 °C
- Comprehensive accessories/infeed systems
- Rated current:
- Up to +60 °C 100 % Up to +70 °C 87 %
- Mechanical service life:
- 250 to 500 switching cycles

#### SIRIUS 3RT2 motor contactors up to 45 kW



- · Spring-loaded or screw-type connection system on the terminals (also ring cable lug connection on request)
- · Coil with suppressor diode or varistor circuit
- For screw and snap-on mounting on DIN rail
- Extended operating range: 0.7 1.25 x Us
- Communication via IO-Link for stationary applications
- Mounting:
- Electronic coil: clearance up to
- ambient temperatures of 70 °C is not required
- Contacts:
- Electronic coil: Auxiliary switches expandable in the same way as standard contactors

#### SIRIUS 3RT1 motor contactors from 55 to 250 kW

- Screw-type connection system via busbar connection or box terminal
- Optional control via a separate control signal input of 24 to 110 V DC (operating range from 0.7 to 1.25 x Us)
- Can be used at ambient temperatures up to 70 °C
- Contacts:
  - Two NO contacts and two NC contacts as standard
- Auxiliary switches expandable in the same way as standard contactors

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#### Electrical components for the railway industry - SIRIUS

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SIRIUS 3RF solid-state switching devices

# Solid-state switching devices for switching 1- and 3-phase resistive and 3-phase motor loads

- Spring-loaded, screw-type and ring cable lug connection system
- Extremely durable, low-maintenance, rugged, and reliable thanks to long switching service life
- Wear- and noise-free switching, also for noise-sensitive areas
- Expandable functionality through plug-on function modules
- Vibration resistance in accordance with EN 61373 Category 1, Class B

#### SIRIUS 3TC DC contactors



- 3TC44 for screw and snap-on mounting on DIN rail
- 3TC48 to 3TC78 for screw mounting
- Solenoid coil fitted with varistor
- Extended operating range: 0.7 1.25 x Us
- Contactors for switching DC voltages up to 1500 V
- Version with series resistor:
  - Mounting clearance up to ambient temperatures of 70 °C is not required
     Mounting: with size 2 (3TC44) a clearance of 10 mm is required
  - Contacts: auxiliary switches not expandable; two NO contacts and one NC contact as standard



# Electrical components for the railway industry - SIRIUS

#### SIRIUS 3RH2 contactor relavs

- Spring-loaded and screw-type connection system on all terminals (also ring cable lug connection on request)
- Coil with suppressor diode or varistor circuit
- For screw and snap-on mounting on DIN rail
- Extended operating range: 0.7 to 1.25 x Us
- · Electronic coil with very low switch-on and holding power
- With electronic coil:
  - Ambient temperature up to 70 °C
     Mounting without clearance
- A 4-pole auxiliary switch block can be mounted
- Standard coil (coupling contactors):
- Ambient temperature > 60 °C
   Mounting with a clearance of 10 mm
- It is not possible to mount an auxiliary switch block

#### SIRIUS 3RH2 latched contactor relays



- Screw-type connection system
- · Solenoid coil fitted with varistor
- For screw and snap-on mounting on DIN rail
- Extended operating range: 0.7 1.25 x Us
- Electronic coil with very low switch-on and holding power
- With electronic coil:
- Ambient temperature up to 70 °C
- Mounting without clearance
- A 4-pole auxiliary switch block can be mounted

#### SIRIUS 3TH4 contactor relays with 8 and 10 contacts

- Screw-type connection system
- · Solenoid coil fitted with varistor
- For screw and snap-on mounting on DIN rail
- Extended operating range: 0.7 1.25 x Us
- The contacts are not expandable
- Mounting:
- At ambient temperatures between 55 °C and 70 °C a clearance of 10 mm is required for side-by-side mounting

#### SIRIUS ACT push buttons and signaling devices



- Modern design and flexible concept:
- 4 design lines in plastic, shiny metal and matte metal in 22/30 mm Actuators, holders, contact module and LED modules can be ordered
- individually and combined freely
- Broad product range:
- State-of-the-art functions, such as ID key-operated switches on RFID basis
   Customized variants, e.g. special tumbler arrangements, labeling, pre-assembled enclosures
- Communication:
- Communication-enabled due to optional connection to AS-Interface, IO-Link or PROFINET
- Ruggedness:
- Degree of protection IP69K is our standard

	Electrical components for the railway industry – SIRIUS
SIRIUS monitoring relays	
	<ul> <li>Monitoring relays for electrical parameters, thermistor motor protection, temperature, filling level, speed</li> <li>All versions with removable terminals, featuring either spring-loaded or screw-type connection system</li> <li>Applicability in all networks thanks to wide voltage range</li> <li>Variable adjustability</li> <li>3-phase current monitoring integrated in the main circuit</li> <li>Communication via IO-Link for stationary applications</li> </ul>
SIRIUS 3RQ coupling relays	
	<ul> <li>SIRIUS 3RQ2 coupling relays in robust industrial housing (22.5 mm width) and 3RQ3 coupling relays in slim design (6.2 mm)</li> <li>Coupling technology with power, plug-in and coupling relays in accordance with the railway standard</li> <li>Coupling links with two-tier design and connections on two levels</li> <li>Versions with removable terminals, featuring either spring-loaded or screw-type connection system</li> <li>Versions with very slim design of only 6.2 mm (3RQ3)</li> <li>Versions with up to 3 changeover contacts in width of only 22.5 mm (3RQ2), also available with hard gold-plated contacts for switching of small currents</li> <li>Low power consumption</li> <li>Applicability in all networks thanks to wide voltage range</li> <li>Version with solid-state compatible outputs (hard gold-plating)</li> </ul>
SIRIUS 3RP2 timing relays	
	<ul> <li>Electronic timing relays (multifunction) with up to 15 time ranges</li> <li>Electronic timing relays with two changeover contacts and positively-driven relay contacts</li> <li>Individual or selectable time ranges</li> <li>Switch position and voltage indication via LED</li> <li>With removable terminals, featuring either spring-loaded or screw-type connection system</li> <li>For screw and snap-on mounting on DIN rail</li> <li>Electronic timing relays with positively-driven relay contacts: <ul> <li>2 changeover contacts</li> <li>Vibration resistance in accordance with DIN EN 61373 Category 1, Class B</li> <li>Interference immunity in accordance with EN 50121-3-2</li> </ul> </li> </ul>
SIRIUS 3SK1 safety relays	
	<ul> <li>Suitable for all safety applications up to SIL 3/PL e</li> <li>Modular hardware configuration</li> <li>Simple commissioning using DIP switches and software parameter assignment</li> <li>Simple selection thanks to a small number of multifunctional devices</li> <li>SIRIUS safety relays can be integrated into systems simply and independently of the automation solution</li> <li>More functionality and flexibility through freely configurable safety logic</li> <li>Vibration resistance in according with DIN EN 61373 Category 1, Class B</li> <li>Interference immunity in accordance with EN 50121-3-2 Table 1</li> </ul>
SIRIUS 3SE5 position switches	
	<ul> <li>Modular device design with easy plug-in connection system</li> <li>Four different enclosure versions in plastic and metal</li> <li>Optional LED display for all enclosures</li> <li>Positive opening of NC contacts</li> <li>Area of application up to SIL 3 in accordance with IEC 62061</li> <li>High contact reliability, also with 5 V DC/1 mA</li> <li>Safety position switches with separate actuator with/without tumbler</li> <li>High degree of protection up to IP 66/IP 67</li> <li>Extended temperature range: -40 °C to +85 °C</li> <li>Versions with increased corrosion protection</li> </ul>

#### Electrical components for the railway industry - SENTRON

# Overview

#### SENTRON protection and switching devices

Tested protection and switching devices from the SENTRON portfolio ensure reliable low-voltage power distribution in infrastructure and railway applications.

The perfectly coordinated components offer outstanding flexibility, convenience, and safety for the railway industry.

#### 5SY4 MCBs



- Optional top or bottom infeed thanks to identical terminals
- Convenient entry thanks to large and easily accessible wiring space
- Rapid manual removal from the busbar assembly
- Vibration- and shock-proof in accordance with DIN EN 61373 and DIN EN 50155 "1B"
- Applicability at ambient temperatures from -40 °C to +70 °C, with max. humidity of 95 %
- Rated switching capacity: 10 kA AC
- Vibration resistance:
- According to IEC 60068-2-6. 50 m/s<sup>2</sup> with 25 to 150 Hz and 60 m/s<sup>2</sup> with 35 Hz (4sec)
- According to EN 61373 Category 1, Class B

#### 5SY5 MCBs



- Optional top or bottom infeed thanks to identical terminals
- Convenient entry thanks to large and easily accessible wiring space
- Rapid manual removal from the busbar assembly
- Vibration- and shock-proof in accordance with DIN EN 61373 and DIN EN 50155 "1B"
- $\bullet$  Applicability at ambient temperatures from -40 °C to +70 °C, with max. humidity of 95 %
- Rated switching capacity: 10 kA AC and 1 kA DC
- Vibration resistance:
  - According to IEC 60068-2-6. 50 m/s<sup>2</sup> with 25 to 150 Hz and 60 m/s<sup>2</sup> with 35 Hz (4sec)
  - According to EN 61373 Category 1, Class B

#### 5ST3010 auxiliary switches (AS) for MCBs



- 5ST3 add-on components: can be combined with 5SY MCBs and 5SU1 RCBOs
- Signaling of the miniature circuit breaker's contact position by the auxiliary switch (AS) released by hand or due to fault
- Auxiliary switch version with test button for testing of the control circuit without switching the miniature circuit breaker
- Rated breaking capacity: 60 A
- Ambient temperatures: -25 °C to +55 °C
- Climate resistance: according to IEC 60068-2-30 28 cycles

#### **5SV RCCBs**



- Enhanced comfort and safety due to improved design
- Comprehensive uniform accessories for additional functions
- Consistent busbar system concept for all RCCBs with N connection on the right or left
- Easy removal of individual equipment from the linked assembly
- Rated residual current: 30, 300 mA
- Quick and easy replacement thanks to fast manual removal of the RCCBs from the assembly

	Electrical components for the railway industry – SENTRON
5SU1 RCBOs	
10 - 12 	<ul> <li>Clear, visible and controllable connection of the supply line</li> <li>Convenient entry thanks to large and easily accessible wiring space</li> <li>Peak withstand current (&gt; 1 kA) for safe operation</li> <li>Retrofitting of add-on components for miniature circuit breakers on the right side</li> <li>Rated residual current: 10, 30, 300 mA, Rated current: 6 to 40 A</li> <li>Width: 2 WU</li> <li>For all 10 kA versions up to 40 A: <ul> <li>Full insulation through integrated, movable terminal covers in the area of conductor entries</li> <li>Replacement time savings thanks to rapid manual removal of the miniature circuit breakers from the assembly when changing the connections</li> </ul> </li> </ul>
Remote controlled mechanisms 5ST30	
	<ul> <li>The market's most modular system</li> <li>Easy selection between manual/off/RC mode</li> <li>Easy connection to RCBOs, RCDs, MCBs, and other devices with adapters</li> <li>Rated voltages: 12 30/177 270 V AC or 1248 V DC</li> <li>Width: 2 WU</li> <li>Applicability at ambient temperatures from -40 °C to +70 °C</li> <li>Climate resistance: according to IEC 60068-2-30 28 cycles</li> <li>Vibration resistance: according to IEC 60068-2-6. 50 m/s<sup>2</sup> with 10 to 150 Hz</li> </ul>
3NA3360, 3NA3812 LV HRC fuse links	
	<ul> <li>Fuse links with combined indicator: fuse disconnection signaled by color change from red to white</li> <li>Insulated metal grip lugs embedded in upper and lower cover of the fuse link in plastic for increased safety during replacement</li> <li>Imprinted sign for insulated grip lugs</li> <li>Rated breaking capacity: 25 kA DC</li> <li>Rated current: 2 to 315 A</li> <li>Contact blade: corrosion-free, silver-plated</li> <li>Climatic withstand capability: -20 °C up to +50 °C with 95% relative humidity</li> </ul>
3NH3030 LV HRC fuse bases and accessories	
	<ul> <li>Made of ceramic material for screw mounting</li> <li>With flat connections, screw</li> <li>Weight per product unit: 0.217kg</li> </ul>
Vacuum interrupters for medium-voltage contac	tors and circuit breakers
	<ul> <li>Extremely safe switching and long service life due to vacuum design</li> <li>Many years of manufacturing experience, with more than 5 million interrupters supplied</li> <li>Customer-specific development according to OEM customer requirements</li> <li>High product variance for different switching applications</li> <li>Use in: <ul> <li>Medium- and low-voltage switching devices</li> <li>Medium-voltage contactors, circuit breakers, load-break switches and switch disconnectors for railway applications</li> </ul> </li> </ul>
3AH47 VCB for traction applications	
	<ul> <li>Hated voltages up to 27.5 kV, frequencies of 16.7 - 60 Hz, Rated current up to 2500 A</li> <li>Rated short-circuit breaking current up to 50 kA</li> <li>1-, 2- and 3-pole version</li> <li>Vertical pole assembly fixed to operating mechanism via post insulators</li> <li>Customer benefits: <ul> <li>compact &amp; high mechanically stable design</li> <li>various additional equipment available</li> <li>economical integration</li> <li>competent consultation by our experts</li> </ul> </li> </ul>
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#### Electrical components for the railway industry - Surge arresters

# Overview

#### Siemens surge arresters for railway applications - reliable, stable and safe overvoltage protection

Siemens has been designing and manufacturing surge arresters for all kinds of applications since 1925. For more than 80 years we've been manufacturing surge arresters for rail systems. Continuous research and development, the wealth of Siemens know-how, and comprehensive worldwide experience give Siemens surge arresters a leading edge in overvoltage protection Their uncompromising quality ensures a long service life and the highest reliability in any application.

Siemens surge arresters are an indispensable aid to insulation coordination in electrical power systems. Valuable equipment, such as traction vehicles, is optimally protected against lightning and switching overvoltages. Siemens surge arresters have been designed to meet the requirements of a wide range of common installation environments, from arctic cold to the heat of the desert and the dampness of tropical climates.

All Siemens surge arresters feature a superior sealing system that reliably prevents moisture ingress to ensure the highest possible degree of overvoltage protection and decades of trouble-free service.

#### 3EB4 surge arrester for railway applications



- Housing made of glass fiber reinforced plastic (FRP) tube and silicone rubber sheds
- For AC systems up to 25 kV
- For DC systems up to 3 kV
- Train speeds up to 420 km/h
- Short circuit current capability 50 kA
- Tested according to IEC 60099-4 (AC version) and EN 50526-1 (DC version)
- Fire test according to DIN EN 45545-2
- Shock and vibration test according to IEC 61373
- For use on:
  - High-speed trains and intercity trains
  - Commuter and regional trains
- (Multi-traction) locomotives
- Urban transportation (light rail, metros and tram cars)

#### 3EB5 surge arrester for railway applications

• Cage design<sup>TM</sup> with directly molded silicone rubber housing



- For AC systems up to 25 kV
- For DC systems up to 3 kV
- Travel speed up to 200 km/h
- Short circuit current capability 65 kA
- Tested according to IEC 60099-4 (AC version) and EN 50526-1 (DC version)
- Fire test according to DIN EN 45545-2
- Shock and vibration test according to IEC 61373
- For use on:
- Intercity trains
- Commuter and regional trains
- (Multi-traction) locomotives
- Urban transportation (light rail, metros and tram cars)



#### Electrical components for the railway industry - SIDOOR

# Overview

#### SIDOOR – Innovative door control systems and now also for metro gap filler control systems

In the field of railway applications, we offer SIDOOR automatic control system for platform screen doors (PSDs), train doors and now also for gap fillers.

Safe and convenient operation of the doors or steps is always ensured (friction and energy limitation).

#### Controller for gap filler – SIDOOR ATE530G coated



- Extends a step until 30 kg within 1 s by a maximum of 163 mm against a fixed stop
- Project specific EC motor
- Ice function: A higher extension force can be created within the first 50 mm (parameterizable)
- Variant with additional, transparent protective coating to prevent impairment or damage by moisture and atmospheric pollutants
- Certified according to: DIN EN 50657: 2017 (Basic Integrity)

#### Controllers for platform screen doors – SIDOOR ATE530S and SIDOOR ATE531S





- Less mounting and wiring effort thanks to PROFINET. Furthermore, program changes, software updates and the teach-in drive of all SIDOOR systems can be started from a platform or even from the metro line control center. This substantially reduces commissioning times.
- Seamless integration into the TIA system architecture and expansion of the inputs and outputs for additional actuators and sensors, for example by SIPLUS ET 200SP RAIL
- Detailed diagnostics and parameter assignment options
- The 5 inputs and 2 outputs can be individually configured
- Freely configurable unlocking sequences
- Certified according to: IEC 62061 (SIL 2 for named functions), EN 60335-1, EN ISO 13849-1, EN 14752 (power and energy)
- SIDOOR ATE530S coated (fig. without lid)
- Variant with additional, transparent protective coating to prevent impairment or damage by moisture and atmospheric pollutants
   Corresponds to EN 50155 chapter 12, chapter 9.4
- SIDOOR ATE531S (fig. without lid)
  - Coated like ATE530S, and with temperature range extended to +70 °C

Motors for platform screen doors – SIDOOR MEG251 and SIDOOR MED280

- Low noise, low heat rise, maintenance-free
- SIDOOR MEG251 left/right:
  - Compact size EC geared motor for door weights up to 250 kg
     For retrofit applications (replacement for SIDOOR ATE250S, including SIDOOR MEG250)



- SIDOOR MED280:
  - Gearless EC direct drive for door weights up to 280 kg provides even higher reliability and energy balance = less wear = long service life
  - Just one motor for different installation orientations = asset minimization

#### Door drive for interior railway doors - SIDOOR ATD400T with SIDOOR MDG180 DIN EN 45545-2



- Complies with the new fire protection standard for components in rail vehicles according to DIN EN 45545-2 – Hazard Level HL 3
- Certified safety according to DIN EN 14752 (fail-safe limitation of force and energy)
- $\bullet$  Extended operating temperature range: -25 °C to +70 °C and for 10 minutes up to +85 °C with reduced track-related speed profile parameters
- SIDOOR MDG180 DIN EN 45545-2 left/right:
  Compact design DC geared motor for door weights up to 180 kg
  SIDOOR ATD400T:
- Including push-to-open and push-to-close function

#### Electrical components for the railway industry - SIPLUS extreme RAIL

#### Overview

#### SIPLUS extreme RAIL – automation with railway approvals

Thanks to their extensive approvals and conformity to railway standards, the new SIPLUS extreme RAIL products are the perfect choice for a wide range of rolling stock and trackside applications. Based on SIMATIC industrial controllers, common

SIPLUS extreme RAIL-Controller

 Basic and advanced controller for use in simple applications such as sanding systems and hygiene cubicles up to complex setups such as HVAC,

features such as integrated system diagnostics and security and

distributed - SIPLUS extreme RAIL offers a durable and robust

safety are already included. Whether simple, complex or

• Compliant to EN 50155, EN 45545 and EN 50124

signaling systems and interlockings

- Failsafe controller certified for EN 50126, EN 50128, EN 50129 and EN 50159
- Insulation testing for every item
- Conformal Coating
- Temperature classes TX: -40 °C to +85 °C\* and T1: -25 °C to +70 °C\* (\* includes +15 K overtemperature for 10 minutes)

solution for your automation tasks.

- PROFINET, Ethernet, CAN, OPC UA and PROFISAFE communication
- High electromagnetic immunity to interference (EMC) and mechanical resilience (vibration and shock)
- Integrated system diagnostics and security
- 110 V IOs available

#### SIPLUS extreme Rail HMI



SIPLUS extreme Rail Distributed I/O



- HMI Panels for visualization of simple, medium and complex applications
  Compliant to EN 50155, EN 45545 and EN 50124
- Insulation testing for every item
- Conformal Coating
- Temperature class T1: -25 °C to +70 °C\*
- (\* includes +15 K overtemperature for 10 minutes)
- PROFINET, Ethernet, CAN, OPC UA and PROFISAFE communication
- High electromagnetic immunity to interference (EMC) and mechanical resilience (vibration and shock)
- Integrated system diagnostics and security
- Horizontal installation
- Distributed I/O controller for medium and complex applications
- Compliant to EN 50155, EN 45545 and EN 50124
- Failsafe controller certified for EN 50126, EN 50128, EN 50129 and EN 50159
- Insulation testing for every item
- Conformal Coating
- Temperature classes TX: -40 °C to +85 °C\* and T1: -25 °C to +70 °C\* (\* includes +15 K overtemperature for 10 minutes)
- Seamless integration into the common TIA Portal engineering framework
- PROFINET, Ethernet, CAN, OPC UA and PROFISAFE communication
- High electromagnetic immunity to interference (EMC) and mechanical resilience (vibration and shock)
- Integrated system diagnostics and security

#### Electrical components for the railway industry – SCALANCE | RUGGEDCOM

## Overview

#### Communication solutions for railway industry with SCALANCE and RUGGEDCOM

Siemens offers a wide range of communication products and technologies that are specifically designed to give railway operators all the tools they need for continuously trouble-free railway operation based on current security standards - from the integration of legacy infrastructure to long-haul fiber backbones and widespread wireless connectivity for mobile and stationary applications. Siemens is active worldwide, and has the knowledge and experience to deliver complete, standardized communication solutions to the railway industry.

#### SCALANCE XC-200

	<ul> <li>Meets the railway standard EN 50121-4 (trackside)</li> <li>Redundant power supply</li> <li>Up to 24 x RJ45 ports 10/100 Mbit/s for mounting in the control cabinet</li> <li>Additional versions with optical ports (SC/ST/LC) up to 1 Gbit/s and with conformal coating (XC-200EEC) available</li> <li>Slot for optional C-PLUG removable data storage medium for easy device replacement without additional equipment such as a field PG</li> <li>Fast mobile network diagnostics by smartphone or tablet via WLAN and NFC (Near Field Communication)</li> </ul>
SCALANCE XP208EEC, XP208PoE EEC, XP216E	EC and XP216PoE EEC
	<ul> <li>Meets the railway standards EN 50155 and EN 45545-2 (train- and trackside)</li> <li>Managed Switch, high degree of protection (IP 65) for use outside the control cabinet, temperature range -40 °C to +70 °C with coated PCBs (conformal coating), stable metal enclosure</li> <li>Flat type for installing in partitions etc., many mounting options</li> <li>Clearly highlighted diagnostic area</li> <li>Supports PoE ports (IEEE 802.3 at type 2, 30 W per port)</li> <li>Variants: <ul> <li>XP208EEC: 8-port managed switch</li> <li>XP208PoE EEC: 8-port managed switch, 4 ports with PoE function</li> <li>XP216EEC: 16-port managed switch, 8 ports with PoE function</li> </ul> </li> </ul>
SCALANCE XR324-12M TS / XR324-4M PoE TS	
1999年1999年	<ul> <li>Meets the railway standards EN 50155, EN 45545-2 and EN 50121-4 (train- and trackside)</li> <li>Modular, managed Layer 2 Industrial Ethernet 19" rack switches</li> <li>Redundancy functions for highly available ring topologies, tried and tested in industrial applications (MRP/HRP), equipped with additional IT functions, e.g. VLAN, RSTP, MSTP</li> </ul>
RESERVER	<ul> <li>Gigabit Ethernet support on all 24 ports</li> <li>Ambient temperature -40 °C to +70 °C</li> <li>Can be used in harsh environments due to vibration-proof/shock-proof plug-in connection</li> <li>Variants: <ul> <li>SCALANCE XR324-12 M TS: 12 slots for electrical (RJ45 / M12) and/or</li> </ul> </li> </ul>
	<ul> <li>optical 2-port media modules (multi-mode or single-mode), which are inserted into the media module slots of the basic unit</li> <li>SCALANCE XR324-4M PoE TS: <ul> <li>16 integrated RJ45 ports, of which 8 are PoE-capable</li> <li>4 slots for electrical (RJ45 / M12) and/or optical 2-port media modules, which are inserted into the media module slots (multi- or single-mode) of the basic unit</li> </ul> </li> </ul>
SCALANCE XM408-8C with Port Extender PE408	BPoE
	Meets the railway standard EN 50121-4 (trackside)     SCALANCE XM08 8C with 8 ports available in total of which



- SCALANCE XM408-8C with 8 ports available in total, of which up to 8 x 10/100/1000 Mbit/s are RJ45 ports with retaining collars up to 8 x SFP slots (combo ports), 100 or 1000 Mbit/s of either electric port or SFP slot
- Two port extenders with 8 ports each can be connected to implement a maximum of 24 ports in one switch
- Fast mobile network diagnostics by smartphone or tablet via WLAN and NFC
- High-speed media redundancy through integral redundancy manager even for large networks, for both Gigabit Ethernet and Fast Ethernet
- Opt. activation of the Layer 3 functions in connection with the KEY-PLUG XM-400
- PE408PoE Port Extender for SCALANCE XM-400 managed modular IE switch; extension by 8 x 10/100/1000 Mbit/s RJ45 with up to 8 ports PoE according to IEEE 802.3 at type 2



Electrical components for the railway industry	- SCALANCE   RUGGEDCOM
IWLAN accessories: antennas and cables	
	<ul> <li>Remote antennas increase the reliability of wireless links by optimizing signal reception and emission</li> <li>Use in Industrial Wireless LAN (IWLAN) and WLAN according to IEEE 802.11 with 2.4 GHz and 5 GHz with data transfer rates up to 450 Mbit/s</li> <li>The connection cables meet the increased requirements for environmental conditions and fire protection that are required for use in vehicles (including EN 45545-2)</li> </ul>
RUGGEDCOM RS900G / RS900GP	
	<ul> <li>Meets the railway standard EN 50121-4</li> <li>Managed Ethernet switch for reliable operation in critical infrastructure</li> <li>Multiple fiber connector types (LC, SC, ST, SFP)</li> <li>Long-haul optics allow Gigabit uplinks for distances up to 70 km</li> <li>Operating temperature from -40 °C to +85 °C</li> <li>Variants: <ul> <li>RS900G: Managed Ethernet switch with 10 ports, Gigabit fiber-optic uplinks and 128 bit encryption</li> <li>RS900GP: Managed Ethernet switch with 10 ports, of which 8 are Power-over-Ethernet (PoE) ports and 2 Gigabit uplinks, with 128 bit encryption</li> </ul> </li> </ul>
RUGGEDCOM RSG920P	
	<ul> <li>Meets the railway standards EN 45545-2 and EN50121-4</li> <li>High port density to meet the Ethernet requirements along the track</li> <li>Compact layer 2 Gigabit switch with 20 Gigabit ports, including 4 PoE ports and 4 SFP slots and I/Os with PoE supply</li> <li>SFP ports for greater flexibility and migration in future Ethernet networks</li> <li>19" switch performance features in compact design to save space</li> <li>Application and commissioning with USB console and MicroSD firmware/configuration</li> <li>RPS1300 power supply suitable for Power-over-Ethernet devices, max. power 140 W</li> </ul>
RUGGEDCOM RSG907R / RSG909R	
	<ul> <li>Meets the railway standard EN 50121-4</li> <li>PRP/HSR coupling functionality to cover all types of redundant network topologies</li> <li>3 x RNA (Redundant Network Access) and coupler Ethernet ports according to IEC 62439-3 (1000BASE-X), plus RSG907R: 4 x SAN (Singly Attached Node) fiber optic ports (LC, 100BASE-FX) RSG909R: 6 x SAN (Singly Attached Node) copper Ethernet (RJ45)</li> <li>Power redundancy: Integrated power supply with redundant inputs</li> <li>Universal high voltage range: 88 – 300 VDC or 85 – 264 VA;</li> <li>Universal low voltage power supply range: 10 – 60 VDC</li> </ul>
RUGGEDCOM RX1400	
	<ul> <li>Meets the railway standard EN 50121-4</li> <li>Rugged Industrial Ethernet switch and TCP/IP router with LTE and fiber-optic WAN options in compact design</li> <li>For safe, cost-effective implementation of extensive communication applications and a high processing performance in harsh industrial environments</li> <li>4 x Fast Ethernet copper ports and 2 x Gigabit SFP slots (Small Form Factor Pluggable)</li> <li>Supports multi-mode and single-mode SFPs for distances up to 100 km</li> <li>Equipped with GPS input</li> <li>Available with or without LTE modem for Europe, North America, the Asia-Pacific Region and Japan</li> <li>Operating temperatures from -40 °C to +85 °C; fanless operation</li> <li>The RUGGEDCOM VPE1400 provides a virtualized environment to run a guest Linux operating system and third party applications on the RX1400, enabling intelligence at the network edge</li> </ul>

1

Ele	ctrical components for the railway industry – SCALANCE   RUGGEDCOM
RUGGEDCOM RX1500	
RUGGEDCOM RSG2100 / RSG2100P	<ul> <li>Meets the railway standards EN 50155 and EN 50121-4</li> <li>Modular and field-replaceable layer 2 and layer 3 switch and router</li> <li>M12 line modules with very wide range of functions (M12/RJ45, Fast Ethernet / Gigabit, etc.)</li> <li>ROX II software features with integrated router/firewall / VPN / VRRP/MPLS</li> <li>Input voltage: 24 V DC, 48 V DC, 88 to 300 V DC, and 85 to 264 V AC for worldwide operability</li> <li>Operating temperature from -40 °C to +85 °C</li> </ul>
	Meets the railway standard EN 50121-4
	<ul> <li>Modular fully managed Ethernet switch for use in electrically harsh and climatically demanding environments</li> <li>Up to 3 Gigabit Ethernet ports and 16 Fast Ethernet ports (copper and /or fiber optic)</li> <li>2-port modules for outstanding flexibility</li> <li>Store and forward switching</li> <li>Supports many fiber-optic types (multi-mode, single-mode) with diverse connectors (ST, MTRJ, LC, SC, SFP)</li> <li>Fully integrated, dual redundant (optional) power supplies</li> <li>Variant available with up to 4 ports conforming with IEEE 802.3af (10/100BaseTX)</li> </ul>
RUGGEDCOM RSG2300 / RSG2300P	
	<ul> <li>Meets the railway standard EN 50121-4</li> <li>Fully managed Ethernet rack switch with 32 ports and 4 modular Gigabit uplink ports and 24 Fast Ethernet copper ports</li> <li>Optional: up to 4 x 1000LX Gigabit Ethernet ports (copper and/or fiber-optic) and up to 8 x 100FX Fast Ethernet ports (copper and/or fiber-optic)</li> <li>Non-blocking, store and forward switching</li> <li>Supports many fiber-optic types (multi-mode, single-mode) with diverse connectors (ST, MTRJ, LC, SC, SFP)</li> <li>Fully integrated, doubly redundant (optional) power supplies</li> <li>Variant available with up to four ports conforming with IEEE 802.3af (10/100BaseTX)</li> </ul>
RUGGEDCOM RST2228 / RST2228P	(,
	<ul> <li>Meets the railway standard EN 50121-4</li> <li>19" Layer 2 rack switch with up to 28 Ports: 4 x 1/10 Gigabit ports (SFP), 24 Gigabit/Fast Ethernet ports (SFP, RJ45, LC)</li> <li>Power-over-Ethernet Variant available</li> <li>Supports IEEE 8023.at/802.3bt (draft) with max. 60W per port</li> <li>Maximum Power budget 500W</li> <li>Modular; field-replaceable Ethernet media modules with 4 ports for outstanding flexibility</li> <li>Supports IEEE 1588 v2 time synchronization with hardware time stamping and transparent clock</li> <li>Non-blocking, store and forward switching</li> <li>Integrated dual redundant power supplies</li> </ul>
RUGGEDCOM WIN	
	<ul> <li>First broadband wireless product portfolio designed for private networks delivering the benefits of 4G technology to critical infrastructure applications in harsh environments</li> <li>Provides enhanced security, network simplicity and private network feature set</li> <li>Mobile WiMAX compliance based on IEEE 802.16e standard and WiMAX Forum Wave2 (MIMO) certification</li> <li>Lowest frequency use: leverages OFDMA and built-in GPS to enable users to deploy an entire network on a single frequency channel</li> <li>Quality of service: separate traffic types over the air and guarantee latency, minimum bandwidth and jitter, according to application needs</li> <li>Stand-alone architecture: does not require an entire network infrastructure to be in place, while maintaining the interoperability and technology advances of broadband wireless</li> <li>Improved security: built-in features ensure NERC CIP compliance, such as two-factor mutual authentication and AES encryption</li> <li>Operating temperature from -40 °C to +75 °C</li> </ul>

Siemens IC 12 · 2019 1/15

Electrical components for the railway industry – Siemens Propulsion System

## Overview

#### Components for the propulsion system

Siemens, as the inventor of electric traction, has always felt itself obligated to provide efficient, reliable drive systems for highspeed trains, locomotives, EMUs, metros, tram cars, trolley buses and mining trucks. Following this tradition, we offer tailor-made components which are of course perfectly coordinated with one another (for example as a motor-gear unit). We are innovation drivers of energy efficiency, and offer extensive, worldwide service solutions, including retrofits, from a single source.

#### Pantograph



Transformers



- Rated voltage: 0.6 25 kV; AC/DC
- Rated current: up to 4000 A
- Operating speed: up to 400 km/h
- (Static) contact force: 60-150 N
- Working height: up to 3200 mm
- Pan profiles: 1450, 1550, 1600, 1800, 1950 mm
- Option:
  - Automatic dropping device (ADD), raised height limit, electronic control for contact force tracking, lowered position monitoring, lowered position locking, monitoring of the wear on the contact strips
- Rated voltage: 1.5/3 kV DC; 12/15/25 kV AC and special voltages
- Frequency: 16 2/3 60 Hz
- Rated power: up to 12 MVA
- Installation location: Underfloor, roof, machine room
- Feature:
  - Integrated transformer & inductor design, cooling system and expansion tank
  - High-class insulating material for maximum energy density
  - Ester cooling and insulating fluid for the highest environmental and fire protection requirements
- Option:
- Multi-system transformers for cross-border travel, as well as integrated line
- filter & 2ndharmonic inductors, HEP/AUX transformers with filter, auxiliary
- and heating circuit windings according to customer specifications

Traction converter



- Rated voltage: 600/750/1500/3000 V DC
- Rated power: up to 1.6 MW per axle; in group supply up to 2.2 MW
- Efficiency: up to 98%
- Installation location: underfloor, roof, machine room
- Feature:
- Cooling: Naturally or forced air cooling, water cooling
   Ambient temperatures: -40 °C to +70 °C
- Option:
- Single and multi-system configuration; group, bogie and individual axle control including redundancy concept; integrated on-board converter

#### Battery charger



- Rated voltage: 670/750/1500 V DC
- Rated power: 6 kW to 60 kW
- Output voltage: 24 110 V DC
- Feature:
- Cooling: Naturally or forced air cooling, water cooling
- Option:
- SiC technology, bidirectional, suitable for deserts and / or low temperatures



Siemens IC 12 · 2019 1/17

# **Industrial Controls**



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# Switching Devices – Contactors and Contactor Assemblies

Power Contactors for Switching Motors

# Introduction

#### Overview

#### More information

Home page, see www.siemens.com/railway-components Conversion tool, e.g. from 3RT10 to 3RT20, see

Catalog IC 10, see www.siemens.com/ic10

Home page, see www.siemens.com/sirius

Industry Mall, see www.siemens.com/product?3RT\_3TK\_3TC

www.siemens.com/sirius/conversion-tool

Online configurator for 3RT2 contactors, see www.siemens.com/sirius/configurators

TIA Selection Tool Cloud (TST Cloud), see https://mall.industry.siemens.com/spice/TSTWeb/?kmat=Contactor





Туре			<b>S00</b> 3RT201				<b>S0</b> 3RT202					
3RT20 conta	actors											
Туре			3RT2015	3RT2016	3RT2017	3RT2018	3RT2023	3RT2024	3RT2025	3RT2026	3RT2027	3RT2028
AC, DC operat	ion		(p. 2/37, 2/	(64)			(p. 2/39, 2/	65)				
AC-3			r.				r.					
I <sub>e</sub> /AC-3/400 V		А	7	9	12	16	9	12	17	25	32	38
<b>400 V</b> 230 V 690 V 1 000 V		<b>kW</b> kW kW kW	<b>3</b> 1.5 4 	<b>4</b> 2.2 5.5	<b>5.5</b> 3 5.5 	<b>7.5</b> 4 7.5 	<b>4</b> 2.2 7.5 	<b>5.5</b> 3 7.5 	<b>7.5</b> 4 11 	<b>11</b> 5.5 11 	<b>15</b> 7.5 18.5 	<b>18.5</b> 11 18.5 
<b>AC-4</b> (at $I_a = 6$	$\times I_{\rm e})$											
400 V		kW	3	4	4	5.5	4	5.5	7.5	7.5	11	11
400 V (200 000 cycles)	) operating	kW	1.15	2	2	2.5	2	2.6	3.5	4.4	6	6
<b>AC-1</b> (40 °C, ≤	690 V)											
I <sub>e</sub>	3RT20	Α	18	22	22	22	40	40	40	40	50	50
Accessories for contactors												
Auxiliary switch blocks	<ul><li>On front</li><li>Lateral</li></ul>		3RH29, 3R 3RH29	A28		(p. 2/52) (p. 2/56)	3RH29, 3R 3RH29	A28				(p. 2/52) (p. 2/56)
Auxiliary switch blocks 3RU2 and 3I	On front     Lateral	elays	3RH29, 3R 3RH29	A28	_	(p. 2/52) (p. 2/56)	3RH29, 3R 3RH29	A28	_	_		(p. 2/52) (p. 2/56)
Auxiliary switch blocks 3RU2 and 3F 3RU thermal o	On front     Lateral     RB3 overload re     verload relays	elays	3RH29, 3R 3RH29 3RU2116	2 <b>A28</b> 0.11 16 /	4	(p. 2/52) (p. 2/56)	3RH29, 3R 3RH29 3RU2126	4 <b>A28</b> 1.8 40 A				(p. 2/52) (p. 2/56)
Auxiliary switch blocks 3RU2 and 3F 3RU thermal o 3RB electronic	On front     Lateral     RB3 overload re     verload relays     c overload relays	elays	3RH29, 3R 3RH29 3RU2116	0.11 16 /	4	(p. 2/52) (p. 2/56)	3RH29, 3R 3RH29 3RU2126	1.8 40 A	<u></u>			(p. 2/52) (p. 2/56)
Auxiliary switch blocks 3RU2 and 3 3RU thermal o 3RB electronic • For standard	On front     Lateral <b>RB3 overload relays c overload relays</b> applications	elays	3RH29, 3R 3RH29 3RU2116 3RB3016 3RB3113	0.11 16 / 0.1 16 A	4	(p. 2/52) (p. 2/56)	3RH29, 3R 3RH29 3RU2126 3RB3026 3RB3123	1.8 40 A	<u>.</u>			(p. 2/52) (p. 2/56)
Auxiliary switch blocks 3RU2 and 3 3RU thermal o 3RB electronic • For standard • For High-Fea	On front     Lateral     RB3 overload relays     c overload relays     applications ture applications	elays	3RH29, 3R 3RH29 3RU2116 3RB3016 3RB3113 3RB22, 3R with 3RB2 module	0.11 16 / 0.1 16 A B23 and 3R 906-2.G1 ct 0.3 25 A	A B24 urrent meas	(p. 2/52) (p. 2/56) suring	3RH29, 3R 3RH29 3RU2126 3RB3026 3RB3123 3RB22, 3R with 3RB2	1.8 40 A 0.1 40 A B23 and 3f 906-2.G1 c 0.3 25 A	RB24 urrent mea	suring mod	dule	(p. 2/52) (p. 2/56)
Auxiliary switch blocks 3RU2 and 3 3RU thermal o 3RB electronic • For standard • For High-Fea 3RV20 moto	On front     Lateral     RB3 overload relays     coverload relays     applications     ture applications     or starter protect	elays	3RH29, 3R 3RH29 3RU2116 3RB3016 3RB3113 3RB22, 3R with 3RB2 module	0.11 16 / 0.1 16 A B23 and 3R 906-2.G1 ct 0.3 25 A	A B24 urrent meas	(p. 2/52) (p. 2/56) suring	3RH29, 3R 3RH29 3RU2126 3RB3026 3RB3123 3RB22, 3R with 3RB2	1.8 40 A 0.1 40 A B23 and 3F 906-2.G1 c 0.3 25 A	RB24 urrent mea	suring mod	dule	(p. 2/52) (p. 2/56)
Auxiliary switch blocks 3RU2 and 3 3RU thermal o 3RB electronic • For standard • For High-Fea 3RV20 moto Motor starter	On front     Lateral     RB3 overload relays     coverload relays     applications     ture applications     r starter protect protectors	elays tors	3RH29, 3R 3RH29 3RU2116 3RB3016 3RB3113 3RB22, 3R with 3RB2 module 3RV2011	0.11 16 / 0.1 16 A B23 and 3R 906-2.G1 ct 0.3 25 A 0.11 16 /	A B24 urrent meas	(p. 2/52) (p. 2/56) suring	3RH29, 3R 3RH29 3RU2126 3RB3026 3RB3123 3RB22, 3R with 3RB2 3RV2021	A28 1.8 40 A 0.1 40 A B23 and 3f 906-2.G1 c 0.3 25 A 0.45 40	RB24 urrent mea	suring mod	dule	(p. 2/52) (p. 2/56)

#### Note:

Safety characteristics for contactors, see www.siemens.com/ic10, Chapter 16 "Standards and Approvals".

3RU2 and 3RB3 overload relays and 3RV20 motor starter protectors, see www.siemens.com/ic10, Chapter 7

# Switching Devices – Contactors and Contactor Assemblies

Power Contactors for Switching Motors

Introduction

Size		S2				53			
Туре		3RT203				3RT204			
3RT20 contactors		OD TOOOL		0.0.7.0.0.7	0 <b>DT</b> 0000	0070045	0 D T 00 /0	0070047	
Type AC, DC operation		3R12035 (p. 2/41, 2/66)	3R12036	3R12037	3R12038	3R12045 (p. 2/66)	3R12046	3R12047	
AC-3		u , ,				. ,			
<i>I</i> <sub>e</sub> /AC-3/400 V	А	40	50	65	80	80	95	110	
400 V	<b>kW</b>	18.5	22 15	<b>30</b>	<b>37</b>	<b>37</b>	<b>45</b>	<b>55</b>	
690 V	kW	22	22	37	45	55	22 75	90	
1 000 V	kW					37	37	37	
<b>AC-4</b> (at $I_a = 6 \times I_e$ )	LAM	40 E	22	20	97	27	45		
400 V 400 V (200 000 operating cycles)	KVV kW	11.6	<b>22</b> 12.6	<b>30</b> 14.7	<b>37</b> 15.8	<b>37</b> 17.9	<b>45</b> 22	<b>55</b> 24.3	
<b>AC-1</b> (40 °C, ≤ 690 V)									
Ie	Α	60	70	80	90	125	130	130	
Accessories for contactors	S								
Auxiliary• On frontswitch blocks• Lateral		3RH29, 3RA2 3RH29	8		(p. 2/52) (p. 2/56)	3RH29, 3RA 3RH29	28		(p. 2/52) (p. 2/56)
Function modules• Direct-on-line s • IO-Link, AS-Inter	starting erface	3RA283. 3RA271AA(	00			3RA283. 3RA271AA	400		
Surge suppressors		3RT2936				3RT2936 <sup>1)</sup> , 3RT2946			
Terminal covers		3RT2936-4EA	2			3RT2946-4E	A2		
3RU2 and 3RB overload re	lays								
3RU thermal overload relays		3RU2136	11 80 A			3RU2146	28 100 A		
3RB electronic overload relays	5								
<ul> <li>For standard applications</li> </ul>		3RB3036 12.5 80 A 3RB3133				<b>3RB3046</b> 12.5 115 A <b>3RB3143</b>			
For High-Feature applications	3RB22, 3RB2 with 3RB2906	<b>3 and 3RB24</b> 5-2JG1 curren 10 100 A	t measuring n	nodule	3RB22, 3RB with 3RB290	23 and 3RB24 06-2JG1 current 10 100 A	nt measuring modu	ıle	
3RV20 motor starter protect	ctors	_							
Motor starter protectors		3RV2031, 3R\	/2032	9.5 80 A		3RV2041, 3F	RV2042	28 100 A	
Link modules		3RA2931				3RA1941			

 From product version E03 onwards, 3RT2936-1B/-1E surge suppressors can be used for 3RT2.4 contactors.

#### Note:

Safety characteristics for contactors, see www.siemens.com/ic10, Chapter 16 "Standards and Approvals".

3RU2 and 3RB overload relays and 3RV20 motor starter protectors, see www.siemens.com/ic10, Chapter 7

### Switching Devices – Contactors and Contactor Assemblies

Power Contactors for Switching Motors

#### Introduction



#### Note:

Safety characteristics for contactors, see www.siemens.com/ic10, Chapter 16 "Standards and Approvals".

3RB2 overload relays and 3RV10 molded case circuit breakers, see www.siemens.com/ic10, Chapter 7

#### 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



2

Accessories and spare parts, see pages 2/44 to 2/58.

# General data

### 3RT2 contactors

Size S0 with mountable accessories



- (19) Mechanical interlocks<sup>1</sup>)
- 20 Two connecting clips for two contactors 1)

For contactors

For contactors and coupling contactors

<sup>1)</sup> The parts (19) and (20) can only be ordered together as 3RA2912-2H mechanical connectors.

Accessories and spare parts, see pages 2/44 to 2/58.

General data





Accessories and spare parts, see pages 2/44 to 2/58.

#### General data

#### 3RT2 contactors Size S3 with mountable accessories



Accessories and spare parts, see pages 2/44 to 2/58.

is required for momentary-contact operation.

General data



Accessories and spare parts, see pages 2/44 to 2/58.

3RT1 contactors

Sizes S6 to S12 with mountable accessories

O Different accessories for sizes S6 and S10/S12

#### **General data**

3RT12 vacuum contactors Sizes S10 to S12 with mountable accessories (illustration for basic unit)



- (2) 2-pole auxiliary switch block, laterally mountable left or right
- (3) Withdrawable coils for 3RT1...-.A... contactors with conventional operating mechanism
- (4) Withdrawable coils for 3RT1...-.N... contactors with solid-state operating mechanism
- (5) Surge suppressor (RC element) for plugging into top of withdrawable coil
- 6 Terminal cover for cable lug and busbar connection
- (7) Terminal cover for box terminal
- 8 Box terminal block

Accessories and spare parts, see pages 2/44 to 2/58.

General data



For accessories and spare parts for

• 3RT10 contactors, see page 2/44

### Overview



Contactors with screw terminals: 3RT2 (sizes S00 to S3) and 3RT1 (sizes S6 to S12)

#### 3RT contactors, sizes S00 to S12

#### Our power range:

- · Contactors for switching motors:
- Size S00: 3RT201 up to 7.5 kW
- Size S0: 3RT202 up to 18.5 kW
   Size S2: 3RT203 up to 37 kW
   Size S3: 3RT204 up to 55 kW

- Sizes S6 to S12: 3RT10 up to 250 kW
- · For vacuum contactors for switching motors, see from page XX/X onwards:
  - Sizes S10 and S12: 3RT12 up to 250 kW
  - Size 14: 3TF6 up to 450 kW

#### Standards

IEC/EN 60947-1. IEC/EN 60947-4-1 IEC/EN 60947-5-1 (auxiliary switches)

#### Ambient conditions

If the devices are used in ambient conditions which deviate from common industrial conditions (IEC 60721-3-3 "Stationary Use, Weather-Protected"), information must be obtained about possible restrictions with regard to the reliability and endurance of the device and possible protective measures. In this case contact our Technical Assistance, Tel.: +49 (911) 895-5900

E-mail: technical-assistance@siemens.com

#### Auxiliary contact complement

- Size S00: An auxiliary contact is integrated in the basic device
- Sizes S0 to S3: The basic units contain two integrated auxiliary contacts (1 NO + 1 NC). All basic units, with the exception of coupling relays S00 and S0, can be expanded using auxiliary switch blocks, see page 2/46 for the permitted selection of auxiliary switches.
- Sizes S6 to S12: These contactors are supplied with two laterally mounted auxiliary switch blocks. The fitting of auxiliary switches is possible on the front and on the side (the 3RT12 vacuum contactor is an exception: only lateral fitting of auxiliary switches is possible here).

For detailed information about fitting of auxiliary switches, see pages 2/46 to 2/51.

#### Contact reliability

If voltages  $\leq$  110 V and currents  $\leq$  100 mA are to be switched, the auxiliary contacts of the 3RT contactors or 3RH contactor relays should be used as they guarantee a high level of contact reliability.

These auxiliary contacts are particularly suitable for solid-state circuits with currents  $\geq$  1 mA at a voltage  $\geq$  17 V.
SIRIUS 3RT contactors, 3-pole up to 250 kW

#### **Connection methods**

#### Main circuit

- Sizes S00 and S0: screw or spring-type terminals, spring-type terminals with convenient plug-in design for device connectors
- Sizes S2 and S3: screw terminals with box terminal; direct connection to the connecting bar possible with cable lugs for S3 when the box terminal is removed.
- Sizes S6 to S12: screw terminals with connecting bars that the cables can be connected to using either cable lugs or flexible or rigid busbars. Alternatively, box terminals are available as accessories.

#### Auxiliary/control circuit

• Sizes S00 to S12: Screw or spring-type terminals

#### Electromagnetic compatibility (EMC)

The 3RT contactors fulfill the requirements for environment category A.

#### Note:

When the contactors are used in an environment with frequency converters, the configuration notes in the Manual "SIRIUS – SIRIUS 3RT Contactors/Contactor Assemblies" must be observed, see "More information" on page 2/15.

#### Short-circuit protection

Refer to the manuals for details of short-circuit protection of the contactors with overload relays; see "More information" on page 2/15.

#### Ratings of three-phase motors

The quoted rating (in kW) refers to the output power on the motor shaft (according to the nameplate).

The power rating specifications of the contactors in kW (in accordance with IEC 60947-4-1, Table G) are guide values for 4-pole standard motors at 50 Hz AC and specified voltage (e.g. 400 V). The actual starting and rated data of the motor to be switched must be considered when selecting the units. The motor current, motor protection device and the permissible contactor current according to the utilization category must be aligned with each other.

# Contactors with voltage tap-off

#### 3RT2 contactors

The size S00 to S3 contactors with voltage tap-off are special versions for mounting the SIRIUS 3RA27 function modules for connection to the control system via IO-Link or AS-Interface (see page 2/12).

Without a function module, these contactors can be used like the standard versions.

For more information on IO-Link and AS-Interface, see Catalog IC 10 "Industrial Communication", from page 2/1 onwards.

#### Control supply voltage

Different versions of operating mechanisms are available depending on the contactor size:

- AC or DC operation for sizes S00 to S3
- AC/DC operating mechanism for sizes S0 to S12 that can operate on AC (50 to 60 Hz) or DC.

#### Operating mechanism types

#### 3RT2 contactors

3RT2 contactors are available as versions with conventional AC or DC operating mechanisms or as versions with a wide-range solid-state operating mechanism and a universal actuating voltage (AC or DC operation possible).

DC coupling contactors with reduced power consumption are also ideally suited for connection to the controller.

With an operating range between 0.8 to  $1.1 \times U_s$ , control takes place via the control supply voltage connection A1 - A2 as is typically the case.

#### 3RT1 contactors

The following control and/or actuator versions are available in sizes S6 to S12:

- · Conventional operating mechanisms
- Solid-state operating mechanisms
- Overvoltage damping of the operating mechanism coil is already integrated in the electronics for contactors with solidstate operating mechanisms. The operating mechanisms are powered via a supply voltage with an operating range from 0.8 to 1.1 x Us, optionally also controlled depending on the chosen mode of operation. Alternatively, control is via the separate 24 V DC control signal input. Various rated voltage ranges for AC/DC control are available.

The following versions are available:

- With two operating modes: Direct control or via CPU input
- As above, but additionally with remaining lifetime indication (RLT)
- With fail-safe PLC input for simplification of safety applications (without mode of operation selection)

#### Solenoid coils/drive units

#### 3RT2 contactors

Coil replacement is possible for sizes S0 to S3.

#### 3RT1 contactors

The operating mechanisms for 3RT10...A/-.N/-.P contactors are removable and can be replaced simply by unlocking and pulling them out.

IMPORTANT: Removal or changing of the operating mechanism is not permitted for 3RT10..-.S contactors with fail-safe control.

### SIRIUS 3RT contactors, 3-pole up to 250 kW

### Article No. scheme

Product versions		Article No.
SIRIUS power contactors		3RT2 0 0 0 - 0 0 0 0 0 - 0 0 0 0
Device type	e.g. 0 = 3-pole motor contactor	
Size of the contactor	e.g. 4 = S3	
Power dependent on size	e.g. 5 = 37 kW in the case of S3	
Type of electrical connection	e.g. 1 = screw terminals (main and auxiliary circuits)	
Operating range/solenoid coil circuit	e.g. A = AC standard/without coil circuit	
Rated control supply voltage	e.g. P0 = 230 V AC, 50 Hz	
Auxiliary switches	e.g. 0 = in the case of S3: 1 NO + 1 NC integrated	
Special version		
Example		3RT2 0 4 5 - 1 A P 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.

SIRIUS 3RT contactors, 3-pole up to 250 kW

More information         Technical specifications, see         https://support.industry.siemens.com/cs/ww/en/ps/16134/dar         FAOs, see https://support.industry.siemens.com/cs/ww/en/ps/16134/dar         FAOs, see https://support.industry.siemens.com/cs/ww/en/ps/16134/dar         Participation         Size         Size         Solution         Acc. to IEC/EN 08047-5-1         Data applies to integrate daviliary contacts         Acc. to IEC/EN 08047-5-1         Data applies to integrated auxiliary contacts         Acc. to IEC/EN 08047-5-1         Data applies to integrated auxiliary switch blocks         V       690         For laterally mountable auxiliary switch blocks         V       690         For rated operational current I_AC-15/AC-14         • For rated operational current I_AC-15/AC-14         • For rated operational current I_AC-15/AC-14         • For rated operational current I_AC-12         Part add operational current I_AC-13         Exted operational current I_AC-13         Per rated operational current I_AC-13/AC-14         • For rated operational voltage U_0         20 V       A         10 V       3         60 V       A         10 V       3	echnical specifications						
Technical specifications, see       Manuals, see       • System Manual 'SIRIUS – System Overview', https://support.industry.siemens.com/cs/Ww/en/ps/16134/taq         FAQs, see https://support.industry.siemens.com/cs/Ww/en/ps/16134/taq       • System Manual 'SIRIUS – System Overview', https://support.industry.siemens.com/cs/Ww/en/view/6031131         Manual's SIRUS – Sirius Siriu	Nore information						
Type         3RT20 contactors         3RT10         S00 to S2         S3         S6 to S12         S6 to S12           Rated data of the auxiliary contacts and conventional contacts in the auxiliary switch blocks         500         1000	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		Ma • S • M • M • A • A	<ul> <li>Manuals, see</li> <li>System Manual "SIRIUS – System Overview", https://support.industry.siemens.com/cs/WW/en/view/60311318</li> <li>Manual "SIRIUS – SIRIUS 3RT Contactors/Contactor Assemblies", https://support.industry.siemens.com/cs/WW/en/view/60306557</li> <li>Application Manual "SIRIUS Controls with IE3/IE4 motors; https://support.industry.siemens.com/cs/ww/en/view/94770820</li> </ul>			
Size       S00 to S2       S3       S6 to S12         Rated data of the auxiliary contacts and conventional contacts in the auxiliary switch blocks         Rated insulation voltage $U_i$ (pollution degree 3)       V       690       1000 (3RT20OCC0: 690)       ~         For laterally mountable auxiliary switch blocks       V       690       690       690       500         Conventional current $I_{a}$ =       A       10         For front mountable auxiliary switch blocks       V       690       690       690       690         Conventional thermal current $I_a$ /AC-12       A       10       10       - <th>ype</th> <th></th> <th>3R</th> <th>T20 contactors</th> <th></th> <th>3RT10</th>	ype		3R	T20 contactors		3RT10	
Rated data of the auxiliary contacts         Acc. to IEC/EN 60947-5-1       Contacts and conventional contacts in the auxiliary switch blocks       V       690       1 000 (3RT200CO: 690)          Rated lated insulation voltage $U_i$ (pollution degree 3)       V       690       690       690       500       690         • For laterally mountable auxiliary switch blocks       V       690       690       690       690       690         • For Interrally mountable auxiliary switch blocks       V       690       690       690       690       690         • For Interrally mountable auxiliary switch blocks       V       690       690       690       690         • For Interral thermal current $I_a$ /AC-12       A       10       10       7       7         Act do operational current $I_a/AC-15/AC-14$ •       6       3	Size		SO	0 to S2	S3	S6 to S12	
Acc. to IEC/EN 60947-5-1       Data applies to integrated auxiliary contacts and conventional contacts in the auxiliary switch blocks	Rated data of the auxiliary contacts						
Rated insulation voltage $U_i$ (pollution degree 3)V6901000 (3RT200CC0: 690)-• For laterally mountable auxiliary switch blocksV690690690690• For front mountable auxiliary switch blocksV690690690690Conventional thermal current $I_{el}$ AC-12A10666AC loadRated operational current $I_e/AC-15/AC-14$ 22• For rated operational voltage $U_e$ Up to 230 VA10^{1)}663 $400 V$ A322222 $690 V$ A10^{1/}6633DC loadRated operational voltage $U_e$ 24 VA101066 $110 V$ A22222222 $200 V$ A1010666 <t< td=""><td>Acc. to IEC/EN 60947-5-1 Data applies to integrated auxiliary contacts and co contacts in the auxiliary switch blocks</td><td>onventional</td><td></td><td></td><td></td><td></td></t<>	Acc. to IEC/EN 60947-5-1 Data applies to integrated auxiliary contacts and co contacts in the auxiliary switch blocks	onventional					
• For laterally mountable auxiliary switch blocks       V       690       690       500         • For front mountable auxiliary switch blocks       V       690       690       690         Conventional thermal current $I_c/AC$ -12       10       10       10         AC load       Rated operational current $I_c/AC$ -15/AC-14       -       -       -         • For rated operational current $I_c/AC$ -15/AC-14       -       -       -       -         • For rated operational current $I_c/AC$ -15/AC-14       -       10 <sup>10</sup> 6       6       3         • For rated operational current $I_c/AC$ -15/AC-14       -       -       12 <sup>10</sup> 12 <sup>10</sup> • For rated operational current $I_c/DC$ -12       -       -       12 <sup>10</sup> 12 <sup>10</sup> DC load       -       -       -       -       12 <sup>10</sup> Act operational voltage $U_c$ 24 V       A       10       6       6         • For rated operational voltage $U_c$ 24 V       A       10       6       3         • For rated operational voltage $U_c$ 24 V       A       10       6       3         • For rated operational voltage $U_c$ 24 V       A       10 <sup>10</sup> 10 <sup>3</sup> 10 <sup>3</sup> <	Rated insulation voltage U <sub>i</sub> (pollution degree 3)	V	69	0	1 000 (3RT200CC0: 690)		
• For front mountable auxiliary switch blocks       V       690       690       690       690         Conventional thermal current $I_{e}$ /AC-12       A       10	For laterally mountable auxiliary switch blocks	V	69	0	690	500	
Conventional thermal current $I_{u}^{+}$ A       10         AC load       Kated operational current $I_{a}^{-}$ /AC-15/AC-14       Kated operational current $I_{a}^{-}$ /AC-15/AC-14         • For rated operational current $I_{a}^{-}$ /AC-15/AC-14       01       6       6       3	For front mountable auxiliary switch blocks	V	69	0	690	690	
AC load       Rated operational current $I_p/AC-15/AC-14$ • For rated operational voltage $U_e$ Up to 230 V       A       10 <sup>1)</sup> 6       6 $400 V A$ 3       3       2       2       2       2 $690 V A$ 1       12       12       12       12         DC load         Rated operational current $I_p/DC-12$ 10       6       6       10       10       6       10       10       6       10       1	Conventional thermal current $I_{th}$ = ated operational current $I_0/AC-12$	А	4 10				
Rated operational current $I_{g}/AC-15/AC-14$ • For rated operational voltage $U_{e}$ Up to 230 V       A       10 <sup>1)</sup> 6       6         400 V       A       3       3       3       3         500 V       A       2       2       2       600 V       A       1       12 <sup>0</sup> DC load         Rated operational current $I_{g}/DC-12$ -       10       6       6       6         110 V       A       3       3       3       3       3       3       3         • For rated operational voltage $U_{e}$ 24 V       A       10       10       6       6       6       3	AC load						
• For rated operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ DC load Rated operational current $I_{e}$ /DC-12 • For rated operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ • For rated operational current $I_{e}$ /DC-13 • For rated operational current $I_{e}$ /DC-13 • For rated operational voltage $U_{e}$ • For rated operational current $I_{e}$ /DC-13 • For rated operational voltage $U_{e}$ • Operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ • Operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ • Operational voltage	Rated operational current I <sub>e</sub> /AC-15/AC-14						
DC load       Rated operational current $I_e$ /DC-12       10       10       60       4       6       60       4       6       10       60       4       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10       6       10 <td< td=""><td>For rated operational voltage <math>U_{\rm e}</math></td><td>Up to 230 V A 400 V A 500 V A 690 V A</td><td>A 10 A 3 A 2 A 1</td><td>1)</td><td>6</td><td>6 3 2 1<sup>2)</sup></td></td<>	For rated operational voltage $U_{\rm e}$	Up to 230 V A 400 V A 500 V A 690 V A	A 10 A 3 A 2 A 1	1)	6	6 3 2 1 <sup>2)</sup>	
Rated operational current $I_e$ /DC-12         • For rated operational voltage $U_e$ $24 \lor A$ 10       10 $60 \lor A$ 6       6       6 $110 \lor A$ 3       3 $125 \lor A$ 2       2 $220 \lor A$ 1       1 $440 \lor A$ 0.3       0.3 $600 \lor A$ 0.15       0.15 <sup>2</sup> )         Rated operational current $I_e$ /DC-13         • For rated operational voltage $U_e$ $24 \lor A$ 10 <sup>1</sup> )       10 <sup>3</sup> $600 \lor A$ 2       2       2 $100 \lor A$ 2       2       2 $220 \lor A$ 10 <sup>1</sup> )       10 <sup>3</sup> $110 \lor A$ 2       2       2 $100 \lor A$ 2       2       2 $110 \lor A$ 1       1       1 $125 \lor A$ 0.9       0.9       0.9 $220 \lor A$ 0.14       0.14       0.14 $0.14$ 0.14       0.14       0.14	DC load						
• For rated operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ • For rated operational current $I_{e}/DC-13$ • For rated operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ • Correct operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ • Correct operational voltage $U_{e}$	Rated operational current I <sub>e</sub> /DC-12						
Rated operational current I <sub>e</sub> /DC-13         10 <sup>1)</sup> 10 <sup>3)</sup> • For rated operational voltage U <sub>e</sub> 24 V         A         10 <sup>1)</sup> 2           10 V         A         2         2         1           125 V         A         0.9         0.9         0.9           220 V         A         0.3         0.3         0.14           600 V         A         0.1         0.15 <sup>2</sup> 0.15 <sup>2</sup>	For rated operational voltage U <sub>e</sub>	24 V A 60 V A 110 V A 125 V A 220 V A 440 V A 600 V A	A 10 A 6 A 3 A 2 A 1 A 0.3 A 0.1	3		10 6 3 2 1 0.3 0.15 <sup>2)</sup>	
• For rated operational voltage $U_{e}$ • For rated operational voltage $U_{e}$ $60 \lor A$ $10^{1}$ $60 \lor A$ 2 $10^{1}$ 2 $10^{3}$ 2 0.9 $220 \lor A$ 0.3 0.14 0.14 $0.15^{2}$	Rated operational current I <sub>e</sub> /DC-13						
	For rated operational voltage U <sub>e</sub>	24 V A 60 V A 110 V A 125 V A 220 V A 440 V A	A 10 A 2 A 1 A 0.9 A 0.3 A 0.1 A 0.1	1) ) ] 4		$10^{3)}$ 2 1 0.9 0.3 0.14 0.15 <sup>2</sup> )	
<b>Contact reliability at 17 V. 1 mA</b> <b>Frequency of contact faults <math>&lt; 10^{-8}</math> i.e. <math>&lt; 1</math> fault per 100 million or</b>	Contact reliability at 17 V. 1 mA	000 V A	, U.I	equency of conta	ct faults < $10^{-8}$ i.e. < 1 fault n	er 100 million operating cycles	

# Contact reliability at 17 V, 1 mA Acc. to IEC/EN 60947-5-4

<sup>1)</sup> 3RH22, 3RH29, 3RT2...-...4, 3RT2...-...6: I<sub>e</sub> = 6 A at AC-15/AC-14 and DC-13.

<sup>2)</sup> For laterally mountable auxiliary switch blocks, only the rated operational voltages up to 500 V apply.

<sup>3)</sup> For laterally mountable auxiliary switch blocks, DC-13/at 24 V: max. 6 A.

#### **3RT contactors** S00 to S12

Sizes S00 to S3

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.

30 NSB0 02061c Basic unit Million operating cycles (106) 10 Basic unit with 5 4 3 attachable AC-15/AC 14 contact block – 2 Basic unit with DC-13-1 220 V 110 V attachable contact block 0,5 DC-13 24 V 0,1 0,05 0,01 0,01 0,03 0,05 0,1  $I_{a}(A)$ 0,3 0,5 1 2 3 4 567 10 <sup>*I*</sup><sub>e</sub> -DC-13 <sup>*I*</sup><sub>e</sub> -DC-13 220 V 110 V <sup>*I*</sup><sub>e</sub>-DC-13 <sup>*I*</sup><sub>e</sub>-AC-15 24 V < 230 V Diagram legend:

I<sub>a</sub> = Breaking current  $I_{e}$  = Rated operational current

The characteristic curves apply to:

Integrated auxiliary contacts on 3RT20
3RH2911, 3RH2921 auxiliary switch blocks<sup>1)</sup>

#### Sizes S6 to S12



 $I_{e}$  = Rated operational current

- The characteristic curves apply to: Integrated auxiliary contacts on 3RT10 3RH1911, 3RH1921 auxiliary switch blocks<sup>3)</sup>
- <sup>1)</sup> 3RH22, 3RH29, 3RT2...-...4, 3RT2...-...6:  $I_{\rm e}$  = 6 A for AC-15/AC-14 and DC-13, 3RT2.4:  $I_{\rm e}$  = 6 A for AC-15/AC-14.
- <sup>2)</sup> For laterally mountable auxiliary switch blocks, DC-13/at 24 V: max. 6 A.
- <sup>3)</sup> For laterally mountable auxiliary switch blocks, only the rated operational voltages up to 500 V apply.

Туре

Size

#### Size Contact endurance of the main contacts

Type

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:

$$X = \frac{A}{1 + \frac{C}{100} \left(\frac{A}{B} - 1\right)}$$

Characters in the equation:

- X Contact endurance for mixed operation in operating cycles
- Α Contact endurance for normal operation  $(I_a = I_e)$  in operating cycles
- Contact endurance for inching В
- $(I_a =$ multiple of  $I_e)$  in operating cycles Inching operations as a percentage of С total switching operations

#### 3RT2 contactors S00 and S0

#### Size S00



#### Size S0



### SIRIUS 3RT contactors, 3-pole up to 250 kW

Туре Size Contact endurance of the main contacts

3RT2 contactors S2 to S12

# Size S2



### Size S3





#### Sizes S6 to S12



		0	
-		Contactors	
iype		3R12015, 3R12016	3R12017, 3R12018
Size		500	
General data			
Permissible mounting position			
The contactors are designed for operation on a vertical mounting surface.		360° 22,5° 22,5° 22	
Upright mounting position		NSB0_00477a	
		Special version required	
Mechanical endurance			
Basic unit	Operat- ing cy- cles	30 million	
Basic unit with mounted auxiliary switch block	Operat- ing cy-	10 million	
Basic unit with solid-state compatible auxiliary switch block	cles Operat-	5 million	
- Dasie anit with solid state compatible davinary switch block	ing cy- cles	o minori	
Electrical endurance		For contact endurance of the main co	ontacts, see page 2/17.
Rated insulation voltage U <sub>i</sub> (pollution degree 3)	V	690	
Rated impulse withstand voltage Uimp	kV	6	
Protective separation between the coil and the main contacts according 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 uni and the mounted auxiliary switch bloc	t as well as to between the basic unit ck acc. to IEC 60947-4-1, Appendix F
3RH2919NF solid-state compatible auxiliary switch blocks		Have 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	e terminals)
Connecting terminal		IP20 (screw terminals and spring-type	e terminals)
Touch protection acc. to IEC 60529		Finger-safe (screw terminals and spri	ng-type terminals)
Shock resistance			
<ul> <li>Rectangular pulse</li> <li>AC operation</li> <li>DC operation</li> </ul>	g/ms g/ms	6.7/5 and 4.2/10 6.7/5 and 4.2/10	7.3/5 and 4.7/10 7.3/5 and 4.7/10
• Sine pulse			
- AC operation - DC operation	<i>g</i> /ms <i>g</i> /ms	10.5/5 and 6.6/10 10.5/5 and 6.6/10	11.4/5 and 7.3/10 11.4/5 and 7.3/10

### SIRIUS 3RT contactors, 3-pole up to 250 kW

		Contactors	
Туре		3RT2015, 3RT2016	3RT2017, 3RT2018
Size		S00	
Control			
Solenoid coil operating range			
AC operation	50 Hz 60 Hz	0.8 1.1 x <i>U</i> s 0.85 1.1 x <i>U</i> s	
DC operation	Up to 50 °C Up to 60° C	0.8 1.1 x <i>U</i> s 0.85 1.1 x <i>U</i> s	
Power consumption of the solenoid coils (for cold coil and $1.0 \times U_s$ )			
<ul> <li>AC operation, 50/60 Hz, standard version</li> <li>Closing</li> <li>P.f.</li> <li>Closed</li> <li>P.f.</li> </ul>	VA VA	27/24.3 0.8/0.75 4.2/3.3 0.25/0.25	37/33 5.7/4.4
<ul> <li>AC operation, 50 Hz, for USA/Canada</li> <li>Closing</li> <li>P.f. for closing</li> <li>Closed</li> <li>P.f. for closed</li> </ul>	VA VA	26.4 0.81 4.4 0.24	36 0.8 5.9
<ul> <li>AC operation, 60 Hz, for USA/Canada</li> <li>Closing</li> <li>P.f. for closing</li> <li>Closed</li> <li>P.f. for closed</li> </ul>	VA VA	31.7 0.81 4.8 0.25	43 0.8 6.5
<ul> <li>DC operation (closing = closed)</li> </ul>	W	4	
Permissible residual current of the electronics (with 0 signal)			
AC operation		< 3 mA x (230 V/U <sub>s</sub> ) <sup>1)</sup>	< 4 mA x (230 V/U <sub>s</sub> ) <sup>1)</sup>
DC operation		< 10 mA x (24 V/U <sub>s</sub> ) <sup>1)</sup>	
Operating times for 1.0 x $U_s^{(2)}$			
Total break time = Opening delay + Arcing time			
<ul> <li>AC operation</li> <li>Closing delay</li> <li>Opening delay</li> </ul>	ms ms	9.5 24 4 14	9 22 4.5 15
<ul> <li>DC operation</li> <li>Closing delay</li> <li>Opening delay</li> </ul>	ms ms	35 50 7 12	
Arcing time	ms	10 15	

<sup>1)</sup> The 3RT2916-1GA00 additional load module is recommended for higher residual currents.

<sup>2)</sup> 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		
Туре		3RT201HB4.	3RT201JB4.	3RT201KB4.
Size		S00		
Control				
Solenoid coil operating range		0.7 1.25 x U <sub>s</sub>		
Power consumption of the solenoid coils (for cold coil) closing = closed	At Us 24 V DC W	2.8		
Permissible residual current of the electronics (with 0 signal)		< 6 mA x (24 V/U <sub>s</sub> )		
Upright mounting position		On request		
Overvoltage configuration of the solenoid coil		No overvoltage damping	Built-in diode	Built-in suppressor diode 
Operating times				
<ul> <li>Closing delay</li> <li>ON-delay NO</li> <li>OFF-delay NC</li> <li>Opening delay</li> <li>ON-delay NO</li> </ul>	ms ms	35 60 25 40 7 20	38 65	7 20
- OFF-delay NC	ms	20 30	55 75	20 30

		Coupling contactors		
Туре		3RT2011MB40KT0	3RT2011VB4.	3RT2011SB4.
Size		S00		
Control				
Solenoid coil operating range		0.85 1.85 x <i>U</i> s		
Power consumption of the solenoid coils (for cold coil) closing = closed	At Us 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 — 권숙—
Operating times				
<ul> <li>Closing delay</li> <li>ON-delay NO</li> <li>OFF-delay NC</li> </ul>	ms ms	25 90 15 80		
<ul> <li>Opening delay</li> <li>ON-delay NO</li> <li>OFF-delay NC</li> </ul>	ms ms	5 20 10 30	20 80 30 90	5 20 10 30

# SIRIUS 3RT contactors, 3-pole up to 250 kW

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

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

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

SIRIUS 3RT contactors, 3-pole up to 250 kW

			Contactors	
Туре			3RT2015	3RT2016 to 3RT2018
Size			S00	
Rated data of main contacts (continued)				
Load rating with DC				
Utilization category DC-1, switching resistive loads ( $L/R \le 1 \text{ ms}$ )				
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>				
- 1 conducting path	Up to 24 V 60 V 110 V	A A A	15 15 1.5	20 20 2.1
	220 V 440 V 600 V	A A A	0.6 0.42 0.42	0.8 0.6 0.6
- 2 conducting paths in series	Up to 24 V 60 V 110 V	A A A	15 15 8.4	20 20 12
	220 V 440 V 600 V	A A A	1.2 0.6 0.5	1.6 0.8 0.7
- 3 conducting paths in series	Up to 24 V 60 V 110 V	A A A	15 15 15	20 20 20
	220 V 440 V 600 V	A A A	15 0.9 0.7	20 1.3 1
Utilization category DC-3/DC-5, shunt-wound and series-wound motors ( $L/R \le 15$ ms)				
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>				
- 1 conducting path	Up to 24 V 60 V 110 V	A A A	15 0.35 0.1	20 0.5 0.15
	220 V 440 V 600 V	A A A	  	
- 2 conducting paths in series	Up to 24 V 60 V 110 V 220 V 440 V	A A A	15 3.5 0.25 	20 5 0.35
	600 V	Â		
- 3 conducting paths in series	Up to 24 V 60 V 110 V	A A A	15 15 15	20 20 20
	220 V 440 V 600 V	A A A	1.2 0.14 0.14	1.5 0.2 0.2

<sup>1)</sup> Dependence of the switching frequency *z*' on the operational current *I*' and operational voltage *U*':  $z' = z \cdot (I_{e}/I') \cdot (U_{e}/U')^{1.5} \cdot 1/h.$ 

_		Contactors	
lype		3R12023 to 3R12025	3R12026 to 3R12028
Size		50	
General data			
Permissible mounting position			
The contactors are designed for operation on a vertical mounting surface.		360° 22,5° 22,5° 38,	
Upright mounting position		NSB0_00477a Special version required, also applies to 3RT202K.40 couplir	ng contactors
Mechanical endurance			
Basic unit and     basic unit with mounted auxiliary switch block	Operat- ing cy- cles	10 million	
Basic unit with solid-state compatible auxiliary switch block	Operat- ing cy- cles	5 million	
Electrical endurance		For contact endurance of the main co	ontacts, see page 2/17.
Rated insulation voltage U <sub>i</sub> (pollution degree 3)	V	690	
Rated impulse withstand voltage U <sub>imp</sub>	kV	6	
<b>Protective separation</b> between the coil and the main contacts (according 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.			
<ul> <li>Integrated auxiliary switches</li> </ul>		Yes, acc. to IEC 60947-4-1, Appendix	k F
3RT2.2. (removable auxiliary switch block)		Yes, acc. to IEC 60947-4-1, Appendix	k 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-typ	e terminals)
Connecting terminal		IP20 (screw terminals and spring-typ	e terminals)
Touch protection acc. to IEC 60529		Finger-safe (screw terminals and spri	ing-type terminals)
Shock resistance			
<ul> <li>Rectangular pulse</li> <li>AC operation</li> <li>DC operation</li> </ul>	<i>g</i> /ms <i>g</i> /ms	7.5/5 and 4.7/10 10/5 and 7.5/10	8.3/5 and 5.310
<ul> <li>Sine pulse</li> <li>AC operation</li> <li>DC operation</li> </ul>	<i>g</i> /ms <i>g</i> /ms	11.8/5 and 7.4/10 15/5 and 10/10	13.5/5 and 8.3/10

# SIRIUS 3RT contactors, 3-pole up to 250 kW

			Contactors	5				
Туре			3RT2023	3RT2024	3RT2025	3RT2026	3RT2027	3RT2028
Size			S0					
Rated data of the main contacts								
Load rating with AC								
Utilization category AC-1, switching resistive load								
• Rated operational current Ie	At 40 °C up to 690 V At 60 °C up to 690 V	A A	40 35				50 42	
• Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	230 V 400 V 690 V	kW kW kW	13.3 23 40				15.5 27.5 47.5	
<ul> <li>Minimum conductor cross-section for loads with I<sub>e</sub></li> </ul>	At 40 °C At 60 °C	mm <sup>2</sup> mm <sup>2</sup>	10 10					
Utilization categories AC-2 and AC-3								
Rated operational currents <i>I</i> <sub>e</sub>	Up to 400 V 440 V 500 V 690 V	A A A A	9 9 9 9	12 12 12	17 17 17 13	25 22 18	32 32 32 21	38 35
Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V 400 V 690 V	kW kW kW	2.2 4 7.5	3 5.5	4 7.5 11	5.5 11	7.5 15 18.5	11 18.5
Thermal load capacity	10 s current	А	80	110	150	200	260	300
Power loss per conducting path	At I <sub>e</sub> /AC-3	W	0.4	0.5	0.9	1.6	2.7	3.8
<b>Utilization category AC-4</b> (for $I_a = 6 \times I_e$ )								
Maximum values:								
- Rated operational current Ie	Up to 400 V	А	8.5	12.5	15.5		22	
<ul> <li>Rated power for squirrel-cage motors with 50 Hz and 60 Hz</li> </ul>	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 Ie	Up to 400 V 690 V	A A	4.1 3.3	5.5 5.5	7.7 7.7	9 9	12 12	
<ul> <li>Rated power for squirrel-cage motors with 50 Hz and 60 Hz</li> </ul>	At 110 V 230 V 400 V 690 V	kW kW kW kW	0.5 1.1 2 2.5	0.73 1.5 2.6 4.6	1 2 3.5 6	1.2 2.5 4.4 7.7	1.6 3.4 6 10.3	

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

### SIRIUS 3RT contactors, 3-pole up to 250 kW

			Contactors	
Туре			3RT2023 to 3RT2025	3RT2026 to 3RT2028
Size			S0	
Rated data of main contacts (continued)				
Load rating with DC				
Utilization category DC-1, switching resistive loads ( $L/R \le 1 \text{ ms}$ )				
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>				
- 1 conducting path	Up to 24 V 60 V 110 V	A A A	35 20 4.5	
	220 V 440 V 600 V	A A A	1 0.4 0.25	
- 2 conducting paths in series	Up to 24 V 60 V 110 V	A A A	35 35 35	
	220 V 440 V 600 V	A A A	5 1 0.8	
- 3 conducting paths in series	Up to 24 V 60 V 110 V	A A A	35 35 35	
	220 V 440 V 600 V	A A A	35 2.9 1.4	
Utilization category DC-3/DC-5, shunt-wound and series-wound motors ( $L/R \le 15$ ms)				
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>				
- 1 conducting path	Up to 24 V 60 V 110 V	A A A	20 5 2.5	
	220 V 440 V 600 V	A A A	1 0.09 0.06	
- 2 conducting paths in series	Up to 24 V 60 V 110 V	A A A	35 35 15	
	220 V 440 V 600 V	A A A	3 0.27 0.16	
- 3 conducting paths in series	Up to 24 V 60 V 110 V	A A A	35 35 35	
	220 V 440 V 600 V	A A A	10 0.6 0.6	

Dependence of the switching frequency z' on the operational current I' and operational voltage U': z' = z · (I<sub>e</sub>/I') · (U<sub>e</sub>/U')<sup>1.5</sup> · 1/h.
 If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

		Contactors			
Туре		3RT2035	3RT2036	3RT2037	3RT2038
Size		S2			
General data					
Permissible mounting position					
The contactors are designed for operation on a		360° 22.5° 2	22.5° ∞		
vertical mounting surface.			0047		
		-(·-+·+·+·)			
I loright mounting position					
opigit mounting position					
		NSB0_00477a Specia	al version required		
Mechanical endurance					
Basic units and	Operat-	10 million			
basic units with mounted auxiliary switch block	ing cy-				
Basic units with solid-state compatible auxiliary switch block	Operat-	5 million			
	ing cy-				
	cles				
Electrical endurance		For contact endu	rance of the main o	contacts, see page	e 2/18 onwards.
Rated insulation voltage U <sub>i</sub> (pollution degree 3)	V	690			
Rated impulse withstand voltage U <sub>imp</sub>	kV	6			
<b>Protective separation</b> between the coil and the main contacts (according 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.					
<ul> <li>Integrated auxiliary switches</li> </ul>		Yes, acc. to IEC 6	60947-4-1, Append	ix F	
3RT2.3. (removable auxiliary switch block)		Yes, acc. to IEC 6	60947-4-1, Append	ix 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 d	egree of protection	n, use additional te	erminal covers)
Touch protection acc. to IEC 60529		Finger-safe for ve	rtical touching from	n the front	
Shock resistance					
Rectangular pulse     AC operation	alme	11.8/5 and 7.4/10			
- DC operation	g/ms	7.7/5 and 4.5/10	,		
Sine pulse	5				
- AC operation	<i>g</i> /ms	18.5/5 and 11.6/1	0		
- DC operation	<i>g</i> /ms	12/5 and 7/10			

# SIRIUS 3RT contactors, 3-pole up to 250 kW

			Contactors			
Туре			3RT2035	3RT2036	3RT2037	3RT2038
Size			S2			
Rated data of the main contacts						
Load rating with AC						
Utilization category AC-1, switching resistive load						
• Rated operational current $I_{\rm e}$	At 40 °C up to 690 V At 60 °C up to 690 V	A A	60 55	70 60	80 70	90 80
• Rated power for AC loads <sup>1)</sup> P.f. = 0.95 (at 60 °C)	230 V 400 V 690 V	kW kW kW	23 39 68	26 46 79	30 53 91	34 59 102
<ul> <li>Minimum conductor cross-section for loads with I<sub>e</sub></li> </ul>	At 40 °C At 60 °C	mm <sup>2</sup> mm <sup>2</sup>	16 16	25	25	35
Utilization categories AC-2 and AC-3						
• Rated operational currents I <sub>e</sub>	Up to 400 V 440 V 500 V 690 V	A A A A	40 40 40 24	50 50 50	65 65 65 47	80 80 80 58
Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V 400 V 690 V	kW kW kW	11 18.5 22	15 22	18.5 30 37	22 37 45
Thermal load capacity	10 s current	А	400	420	520	640
Power loss per conducting path	At I <sub>e</sub> /AC-3	W	2.2	4	3.8	5.7
<b>Utilization category AC-4</b> (for $I_a = 6 \times I_e$ )						
Maximum values						
<ul> <li>Rated operational current I<sub>e</sub></li> </ul>	Up to 400 V	А	35	41	55	
<ul> <li>Rated power for squirrel-cage motors with 50 Hz and 60 Hz</li> </ul>	At 400 V	kW	18.5	22	30	
• The following applies to a contact endurance of about 200 000 operating cycles:						
- Rated operational currents Ie	Up to 400 V 690 V	A A	22 18.5	24 20	28 22	30 24
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 110 V 230 V 400 V 690 V	kW kW kW kW	3.2 6.7 11.6 16.8	3.5 7.3 12.6 18.2	4.1 8.5 14.7 20	4.3 9.1 15.8 21.8

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

		_				
			Contactors			
Туре			3RT2035	3RT2036	3RT2037	3RT2038
Size			S2			
Rated data of main contacts (continued)						
Load rating with DC						
Utilization category DC-1, switching resistive loads $(I/B \le 1 \text{ ms})$						
Bated operational currents L (at 60 °C)						
- 1 conducting path	Up to 24 V 60 V 110 V	A A A	55 23 4 5			
	220 V 440 V 600 V	A A A	1 0.4 0.25			
- 2 conducting paths in series	Up to 24 V 60 V 110 V	A A A	55 45 45			
	220 V 440 V 600 V	A A A	5 1 0.8			
- 3 conducting paths in series	Up to 24 V 60 V 110 V	A A A	55 55 55			
	220 V 440 V 600 V	A A A	45 2.9 1.4			
Utilization category DC-3/DC-5, shunt-wound and series-wound motors ( $L/R \le 15$ ms)						
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>						
- 1 conducting path	Up to 24 V 60 V 110 V	A A A	35 6 2.5			
	220 V 440 V 600 V	A A A	1 0.1 0.06			
- 2 conducting paths in series	Up to 24 V 60 V 110 V	A A A	55 45 25			
	220 V 440 V 600 V	A A A	5 0.27 0.16			
- 3 conducting paths in series	Up to 24 V 60 V 110 V	A A A	55 55 55			
	220 V 440 V 600 V	A A A	25 0.6 0.35			

		Contactors		
Туре		3RT2045	3RT2046	3RT2047
Size		S3		
General data				
Permissible mounting position				
The contactors are designed for operation on a vertical mounting surface.		360° 22,5° 22,5° 	NSB0_00478c	
Upright mounting position		NSB0_00477a Special version	n 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, se	ee page 2/18.
Rated insulation voltage U <sub>i</sub> (pollution degree 3)	V	1 000 (3RT200CC0:	690)	
Rated impulse withstand voltage Uimp	kV	6		
<b>Protective separation</b> between the coil and the main contacts (according 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.	l			
<ul> <li>Integrated auxiliary switches</li> </ul>		Yes, acc. to IEC 60947	-4-1, Appendix F	
<ul> <li>3RT2.4. (removable auxiliary switch block)</li> </ul>		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 addit	tional terminal covers)
Touch protection acc. to IEC 60529		Finger-safe for vertical	touching from the front	
Shock resistance				
<ul> <li>Rectangular pulse</li> <li>AC operation</li> <li>DC operation</li> </ul>	<i>g</i> /ms <i>g</i> /ms	10.3/5 and 6.7/10 6.7/5 and 4.0/10 (3RT2	04KB40: 6.3/5 and 3.	6/10)
<ul> <li>Sine pulse</li> <li>AC operation</li> <li>DC operation</li> </ul>	g/ms g/ms	16.3/5 and 10.5/10 10.6/5 and 6.3/10 (3RT	204KB40: 9.8/5 and {	5.6/10)

# SIRIUS 3RT contactors, 3-pole up to 250 kW

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

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

			Contactors		
Туре			3RT2045	3RT2046	3RT2047
Size			S3		
Rated data of main contacts (continued)					
Load rating with DC					
Utilization category DC-1, switching resistive loads ( $L/R \le 1 \text{ ms}$ )					
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>					
- 1 conducting path	Up to 24 V 60 V 110 V 220 V 440 V 600 V	A A A A A	100 60 9 2 0.6 0.4		
- 2 conducting paths in series	Up to 24 V 60 V 110 V 220 V 440 V 600 V	A A A A A	100 100 100 10 1.8 1.0		
- 3 conducting paths in series	Up to 24 V 60 V 110 V	A A A	100 100 100		
	220 V 440 V 600 V	A A A	80 4.5 2.6		
Utilization category DC-3/DC-5, shunt-wound and series-wound motors ( $L/R \le 15$ ms)					
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>					
- 1 conducting path	Up to 24 V 60 V 110 V	A A A	40 6 2.5		
	220 V 440 V 600 V	A A A	1 0.15 0.06		
- 2 conducting paths in series	Up to 24 V 60 V 110 V	A A A	100 100 100		
	220 V 440 V 600 V	A A A	7 0.42 0.16		
- 3 conducting paths in series	Up to 24 V 60 V 110 V	A A A	100 100 100		
	220 V 440 V 600 V	A A A	35 0.8 0.35		

			SIRIUS 3	RT contac	tors, 3-pole up	to 250 kW
Туре		3RT1054	3RT1055, 3RT1056	3RT1064, 3RT1065, 3RT1066	3RT1075	3RT1076
Size		S6		S10	S12	
General data						
Permissible mounting position			22,5°,22,5°	19a		
The contactors are designed for operation on a vertical mounting surface.		90° +++++ 9		NSB0_0064		
Mechanical endurance	Operating cycles	10 million				
Electrical endurance		For contact	endurance of	of the main cor	ntacts, see page 2/18	8.
Rated insulation voltage U <sub>i</sub> (pollution degree 3)	V	1 000				
Rated impulse withstand voltage Uimp	kV	8				
Protective separation between the coil and the main contacts according to IEC 60947-1, Appendix N	V	690				
Mirror contacts		Yes, acc. to	IEC 60947-4	4-1, Appendix	F	
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.						
Permissible ambient temperature						
During operation	°C	-25 +60				
During storage	°C	-55 +80				
Degree of protection acc. to IEC 60529						
• On front		IP00 (IP20 with b	oox terminal/o	cover)		
Connecting terminal		IP00 (for higher	degree of pro	otection, use a	dditional terminal co	vers)
Touch protection acc. to IEC 60529		Finger-safe	for vertical to	ouching from t	he front with cover	
Shock resistance						
Rectangular pulse	<i>g</i> /ms	8.5/5 and 4	.2/10			
Sine pulse	<i>g</i> /ms	13.4/5 and	6.5/10			
Electromagnetic compatibility (EMC)		See page 2	2/13			

Туре			3RT105.	3RT106.	3RT107.		
Size			S6	S10	S12		
Control							
Operating range of the solenoid operating mechanism	AC/DC		0.8 x <i>U</i> <sub>s min</sub> 1.1 x	0.8 x U <sub>s min</sub> 1.1 x U <sub>s max</sub>			
Power consumption of the solenoid opera (with cold coil and rated range $U_{\rm S min} \dots U_{\rm S min}$	ating mechanism <sub>nax</sub> )						
<ul> <li>Conventional operating mechanisms</li> </ul>							
- AC operation	Closing at $U_{\rm s\ min}$ Closing at $U_{\rm s\ max}$ Closed at $U_{\rm s\ min}$ Closed at $U_{\rm s\ max}$	VA/p.f. VA/p.f. VA/p.f. VA/p.f.	250/0.9 300/0.9 4.8/0.8 5.8/0.8	490/0.9 590/0.9 5.6/0.9 6.7/0.9	700/0.9 830/0.9 7.6/0.9 9.2/0.9		
- DC operation	Closing at $U_{s min}$ Closing at $U_{s max}$ Closed at $U_{s min}$ Closed at $U_{s max}$	W W W W	300 360 4.3 5.2	540 650 6.1 7.4	770 920 8.5 10		
<ul> <li>Solid-state operating mechanisms</li> </ul>							
- AC operation	Closing at $U_{\rm s\ min}$ Closing at $U_{\rm s\ max}$ Closed at $U_{\rm s\ min}$ Closed at $U_{\rm s\ max}$	VA/p.f. VA/p.f. VA/p.f. VA/p.f.	190/0.8 280/0.8 3.5/0.6 4.8/0.6	400/0.8 530/0.8 5.5/0.5 8.5/0.4	560/0.8 750/0.8 5.6/0.5 9/0.4		
- DC operation	Closing at $U_{\rm s\ min}$ Closing at $U_{\rm s\ max}$ Closed at $U_{\rm s\ min}$ Closed at $U_{\rm s\ max}$	W W W W	250 320 2.1 2.8	440 580 2.8 3.4	600 800 3 3.6		
PLC control input acc. to IEC 60947-1							
<ul> <li>Conventional operating mechanism 3RT10A</li> </ul>			Type 2				
<ul> <li>Solid-state operating mechanism</li> </ul>							
- 3RT10N/P			Type 2				
- 3RT10S			Type 1				
<ul> <li>Rated voltage</li> </ul>		V DC	24				
<ul> <li>Operating range</li> </ul>		V DC	17 30				
<ul> <li>Power consumption</li> </ul>		mA	≤ 30				
Recovery time after mains failure, typical (applicable only for fail-safe version 3RT10S)		S	2				
<b>Operating times</b> for rated range $U_{\text{s min}} \dots U_{\text{s max}}$ (Total break time = Opening delay + Arcing time)							
<ul> <li>Conventional operating mechanism (3RT10A)</li> </ul>	Closing delay Opening delay	ms ms	25 50 40 60	35 50 50 80	50 70 70 100		
<ul> <li>Solid-state operating mechanism</li> </ul>							
- Actuated via A1/A2 (3RT10N/P)	Closing delay Opening delay	ms ms	100 120 80 100	110 130	125 150		
<ul> <li>Actuated via PLC input (3RT10N/P)</li> </ul>	Closing delay Opening delay	ms ms	40 60 80 100	50 65	65 80		
<ul> <li>Actuated via F-PLC input (3RT10S)</li> </ul>	Closing delay Opening delay	ms ms	60 75 115 130				
Arcing time		ms	10 15				

# SIRIUS 3RT contactors, 3-pole up to 250 kW

Туре		3RT1054	3RT1055	3RT1056	3RT1064	3RT1065	3RT1066	3RT1075	3RT1076
Size		S6			S10			S12	
Rated data of the main contacts									
Load rating with AC									
Utilization category AC-1 switching resistive load									
<ul> <li>Rated operational currents I<sub>e</sub></li> </ul>									
- At 40 °C up to 690 V - At 60 °C up to 690 V - At 60 °C up to 1 000 V	A A A	160 140 80	185 160 90	215 185 100	275 250	330 300 150		430 400 200	610 550
<ul> <li>Rated power for AC loads<sup>1</sup>) with p.f. = 0.95 (at 60 °C)</li> </ul>									
- At 230 V - At 400 V - At 500 V - At 690 V - At 1 000 V	kW kW kW kW	53 92 115 159 131	60 105 131 181 148	70 121 152 210 165	94 164 205 283 164	113 197 246 340 246		151 263 329 454 329	208 362 452 624
Minimum conductor cross-section for loads with Ie									
- At 40 ℃ - At 60 ℃	mm <sup>2</sup> mm <sup>2</sup>	70 50	95 70	95	150 120	185 185		2 x 150 240	2 x 185 2 x 185
Utilization categories AC-2 and AC-3									
<ul> <li>Rated operational currents I<sub>e</sub></li> </ul>									
- Up to 500 V - At 690 V - At 1 000 V	A A A	115 115 53	150 150 65	185 170	225 225 68	265 265 95	300 280	400 400 180	500 450
<ul> <li>Rated power for slipring or squirrel-cage motors at 50 and 60 Hz</li> </ul>									
- At 230 V - At 400 V - At 500 V - At 690 V - At 1 000 V	kW kW kW kW	37 64 81 113 75	50 84 105 146 90	61 104 132 167	73 128 160 223	85 151 189 265 132	97 171 215 280	132 231 291 400 250	164 291 363 453
Thermal load capacity, 10 s current	А	1 100	1 300	1 480	1 800	2 400		3 200	4 000
Power loss per main conducting path at $I_{\rm e}/{\rm AC}$ -3/500 V	W	7	9	13	17	18	22	35	55
Utilization category AC-4 (for $I_a = 6 \times I_e$ )									
Maximum values:									
<ul> <li>Rated operational current I<sub>e</sub></li> </ul>									
- Up to 400 V	A	97	132	160	195	230	280	350	430
<ul> <li>Rated power of squirrel-cage motors at 50 and 60 Hz</li> </ul>									
- At 400 V	kW	55	75	90	110	132	160	200	250
The following applies to a contact endurance of about 200 000 operating cycles:									
<ul> <li>Rated operational currents I<sub>e</sub></li> </ul>									
- Up to 500 V - Up to 690 V	A A	54 48	68 57	81 65	96 85	117 105	125 115	150 135	175 150
Rated power of squirrel-cage motors At 50 and 60 Hz									
- At 230 V - At 400 V - At 500 V - At 690 V	kW kW kW kW	16 29 37 48	20 38 47 55	25 45 57 65	30 54 67 82	37 66 82 102	40 71 87 112	48 85 105 133	56 98 123 148

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

Туре		3RT1054 3RT105	5 3RT1056	3RT1064	3RT1065	3RT1066	3RT1075	3RT1076
Size		S6		S10			S12	
Rated data of main contacts (continued	)							
Load rating with DC								
Utilization category DC-1, switching resistive loads ( $L/R \le 1$ ms)								
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>								
- 1 conducting path	Up to 24 V A 60 V A 110 V A	160 160 18		200 200	300 300 33		400 330	
	220 V A 440 V A 600 V A	3.4 0.8 0.5			3.8 0.9 0.6			
- 2 conducting paths in series	Up to 24 V A 60 V A 110 V A	160 160 160		200 200 200	300 300 300		400 400 400	
	220 V A 440 V A 600 V A	20 3.2 1.6			300 4 2		400	
- 3 conducting paths in series	Up to 24 V A 60 V A 110 V A	160 160 160		200 200 200	300 300 300		400 400 400	
	220 V A 440 V A 600 V A	160 11.5 4		200	300 11 5.2		400	
Utilization category DC-3/DC-5, shunt-wound and series-wound motors ( $L/R \le$	15 ms)							
<ul> <li>Rated operational currents I<sub>e</sub> (at 60 °C)</li> </ul>								
- 1 conducting path	Up to 24 V A 60 V A 110 V A	160 7.5 2.5		200	300 11 3		400	
	220 V A 440 V A 600 V A	0.6 0.17 0.12			0.18 0.125			
- 2 conducting paths in series	Up to 24 V A 60 V A 110 V A	160 160 160		200 200 200	300 300 300		400 400 400	
	220 V A 440 V A 600 V A	2.5 0.65 0.37						
- 3 conducting paths in series	Up to 24 V A 60 V A 110 V A	160 160 160		200 200 200	300 300 300		400 400 400	
	220 V A 440 V A 600 V A	160 1.4 0.75		200	300		400	

### Selection and ordering data

### DC operation for direct control from the PLC

- Coupling contactors with adapted power consumption
- Suitable for solid-state PLC/F-PLC outputs
- · Cannot be extended with auxiliary switch blocks

#### PU (UNIT, SET, M) = 1

PS*	= 1 unit
PG	= 41B



3RT201.-2.B4

Rated data AC-2 and AC $t_{\rm U}$ : Up to 60° (	-3, C	AC-1, t <sub>u</sub> : 40 °C	Auxiliary contacts		Rated control supply voltage $U_{\rm S}$	SD	Spring-type terminals	) PU (UNIT, SET,	PS*	PG	Weight per PU approx.	
Operational current <i>I</i> <sub>e</sub> up to	Ratings of three-phase motors at 50 Hz and	Opera- tional current <i>I</i> <sub>e</sub> up to	Ident No.	Version	, 7			Article No.	101)			
400 V	400 V	690 V					-1					l.e.
A For screw	kw fixing and sna	A p-on mou	ntina onto <sup>·</sup>	NO TH 35 s	standa	v DC rd mounting ra	ail					кg

#### Size S00

Diode, varistor or RC element, attachable

(no auxiliary switch blocks can be mounted)

Operating range 0.7 ... 1.25 x U<sub>s</sub>, power consumption of the solenoid coils 2.8 W at 24 V

7	3	18	10 01	1 	 1	24 24	5 5	3RT2015-2HB41 3RT2015-2HB42	1 1 unit 41B 0.317 1 1 unit 41B 0.317
9	4	22	10 01	1 	 1	24 24	5 5	3RT2016-2HB41 3RT2016-2HB42	1 1 unit 41B 0.300 1 1 unit 41B 0.315
12	5.5 <sup>1)</sup>	22	10 01	1 	 1	24 24	5 5	3RT2017-2HB41 3RT2017-2HB42	1 1 unit 41B 0.317 1 1 unit 41B 0.316
Operatir	ng range <b>0.85</b> '	1.85 x <i>U</i> <sub>s</sub> , pov	ver consump	ption of the	soleno	id coils 1.6	<b>W</b> at 24 V		
7	3	18	10 01	1 	 1	24 24	5 5	3RT2015-2MB41-0KT0 3RT2015-2MB42-0KT0	1 1 unit 41B 0.319 1 1 unit 41B 0.317
9	4	22	10 01	1 	 1	24 24	5 5	3RT2016-2MB41-0KT0 3RT2016-2MB42-0KT0	1 1 unit 41B 0.317 1 1 unit 41B 0.316
12	5.5 <sup>1)</sup>	22	10 01	1 	 1	24 24	5 5	3RT2017-2MB41-0KT0 3RT2017-2MB42-0KT0	1 1 unit 41B 0.318 1 1 unit 41B 0.317

### With integrated coil circuit (diode)<sup>1)</sup>

(no auxiliary switch blocks can be mounted)

Operating range 0.7 ... 1.25 x U<sub>s</sub>, power consumption of the solenoid coils 2.8 W at 24 V

7	3	18	10 01	1 	 1	24 24	2 5	3RT2015-2JB41 3RT2015-2JB42	1 1 unit 41B 0.315 1 1 unit 41B 0.316
9	4	22	10 01	1 	 1	24 24	5 5	3RT2016-2JB41 3RT2016-2JB42	1 1 unit 41B 0.316 1 1 unit 41B 0.317
12	5.5 <sup>1)</sup>	22	10 01	1 	 1	24 24	5 5	3RT2017-2JB41 3RT2017-2JB42	1 1 unit 41B 0.316 1 1 unit 41B 0.316
Operatir	ng range <b>0.85 1</b>	1.85 x <i>U</i> <sub>s</sub> , po	wer consump	otion of the	e solenoi	d coils 1.0	6 W at 24 V		
7	3	18	10 01	1 	 1	24 24	5 5	3RT2015-2VB41 3RT2015-2VB42	1 1 unit 41B 0.316 1 1 unit 41B 0.323
9	4	22	10 01	1 	 1	24 24	5 5	3RT2016-2VB41 3RT2016-2VB42	1 1 unit 41B 0.320 1 1 unit 41B 0.318
12	5.5 <sup>1)</sup>	22	10 01	1 	 1	24 24	5 5	3RT2017-2VB41 3RT2017-2VB42	1 1 unit 41B 0.320 1 1 unit 41B 0.320

<sup>1)</sup> When using contactors with IE3/IE4 motors, use contactors fitted with varistors instead of diodes. In the case of 5.5 kW coupling contactors of size S00, use 5.5 kW coupling contactors of size S0, see page 2/39.

Other voltages, see www.siemens.com/ic10, Chapter 3 on request.

Accessories and spare parts, see pages 2/44 to 2/58.

### SIRIUS 3RT contactors, 3-pole up to 250 kW

### DC operation for direct control from the PLC

- · Coupling contactors with adapted power consumption
- Suitable for solid-state PLC/F-PLC outputs •
- · Cannot be expanded with auxiliary switch blocks

PU (UNIT, SET, M) = 1PS' PG = 1 unit = 41B



Weight per PU Rated data Auxiliary contacts Rated control SD Spring-type terminals PU PS' PG (UNIT, supply voltage  $U_{\rm s}$ AC-2 and AC-3 AC-1, approx. *t*<sub>u</sub>: 40 °C SET  $t_{\rm u}$ : Up to 60° C M) Operational current Ie Ratings of Opera-Ident No. Version three-phase tional Article No. current Ie up to motors at 50 Hz and up to 400 V 400 V 690 V kW А NO NC V DC d kg

For screw fixing and snap-on mounting onto TH 35 standard mounting rail

#### Size S00

А

#### With integrated coil circuit (suppressor diode)<sup>1)</sup>

(no auxiliary switch blocks can be mounted)

Operating range 0.7 ... 1.25 x Us, power consumption of the solenoid coils 2.8 W at 24 V

	0 0	371									
7	3	18	10	1		24	2	3RT2015-2KB41	1 1 unit	41B	0.315
			01		1	24		3RT2015-2KB42	1 1 unit	41B	0.318
9	4	22	10	1		24	2	3RT2016-2KB41	1 1 unit	41B	0.315
			01		1	24	2	3RT2016-2KB42	1 1 unit	41B	0.316
12	5.5 <sup>1)</sup>	22	10	1		24		3RT2017-2KB41	1 1 unit	41B	0.316
			01		1	24		3RT2017-2KB42	1 1 unit	41B	0.316
Operatir	ng range <b>0.85</b>	1.85 x <i>U</i> <sub>s</sub> , po	wer consump	otion of the	e soleno	id coils 1.6	<b>W</b> at 24 V				
7	3	18	10	1		24	5	3RT2015-2SB41	1 1 unit	41B	0.310
			01		1	24	5	3RT2015-2SB42	1 1 unit	41B	0.318
9	4	22	10	1		24	5	3RT2016-2SB41	1 1 unit	41B	0.317
			01		1	24	5	3RT2016-2SB42	1 1 unit	41B	0.312
12	5.5 <sup>1)</sup>	22	10	1		24	5	3RT2017-2SB41	1 1 unit	41B	0.323
			01		1	24	5	3RT2017-2SB42	1 1 unit	41B	0.321

1) When using contactors with IE3/IE4 motors, use contactors fitted with varistors instead of diodes. In the case of 5.5 kW coupling contactors of size S00, use 5.5 kW coupling contactors of size S0, see page 2/39.

Other voltages, see www.siemens.com/ic10, Chapter 3 on request.

Accessories and spare parts, see pages 2/44 to 2/58.

### DC operation for direct control from the PLC

- Coupling contactors with adapted power consumption
  Suitable for solid-state PLC outputs
  Cannot be expanded with auxiliary switch blocks



3RT202.-2KB40

Rated data AC-2 and AC $t_{u}$ : Up to 60° (	Rated data           AC-2 and AC-3,         AC-1,           t <sub>u</sub> : Up to 60° C         t <sub>u</sub> : 40 °C           Operational         Bating of three-		Auxiliary co	ntacts		Rated control supply voltage U <sub>s</sub>	SD	Spring-type terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Operational	Rating of three-	Opera-	Ident No.	Versio	n							
current I <sub>e</sub> up to	phase motors at 50 Hz and	tional current I <sub>e</sub> up to		Y	ł			Article No.				
400 V	400 V	690 V										
А	kW	А		NO	NC	V DC	d					kg
For screw	fixing and sna	p-on mou	nting onto	TH 35	standa	rd mounting r	ail					

### Size S0

### With integrated coil circuit (varistor)

(no auxiliary switch blocks can be mounted)

Operating range 0.7 ... 1.25 x Us, power consumption of the solenoid coils 4.5 W at 24 V

9	4	40	11	1	1	24		3RT2023-2KB40	1 1 unit 41B 0.635
12	5.5	40	11	1	1	24	5	3RT2024-2KB40	1 1 unit 41B 0.645
17	7.5	40	11	1	1	24	2	3RT2025-2KB40	1 1 unit 41B 0.643
25	11	40	11	1	1	24	2	3RT2026-2KB40	1 1 unit 41B 0.643
32	15	50	11	1	1	24	5	3RT2027-2KB40	1 1 unit 41B 0.650

Other voltages, see www.siemens.com/ic10, Chapter 3 on request.

Accessories and spare parts, see pages 2/44 to 2/58.

### SIRIUS 3RT contactors, 3-pole up to 250 kW

### AC/DC operation (50/60 Hz AC and DC)

- Extended operating range of the solenoid coil 0.7 to 1.3 x U<sub>s</sub>
  Reduced power consumption when closing and in the closed state



ADTOOD ( ONIDOO

				3111202211.30								
Rated data AC-2 and AC	-3,	AC-1,	Auxiliary co	ntacts		Rated control supply voltage U <sub>s</sub>	SD	Spring-type terminals	PU (UNIT, SET,	PS*	PG	Weight per PU approx.
Operational	perational Rating of three- Oper urrent $I_{e}$ phase motors at tional		Ident No.	ent No. Version					M)			
current I <sub>e</sub> up to	phase motors at 50 Hz and	tional current I <sub>e</sub> up to		Y	7			Article No.				
400 V	400 V	690 V		1	1							
А	kW	A		NO	NC	V AC/DC	d					kg
For screw trail	fixing and sna	p-on mou	nting onto	TH 35	standa	rd mounting						
Size S0 With integrated coil circuit (varistor)												

12	5.5	40	11	1	1	21 28 95 130 200 280	5 5 2	3RT2024-2NB30 3RT2024-2NF30 3RT2024-2NP30	1 1 unit 41B 0.608 1 1 unit 41B 0.581 1 1 unit 41B 0.585
17	7.5	40	11	1	1	21 28 95 130 200 280	5 5 2	3RT2025-2NB30 3RT2025-2NF30 3RT2025-2NP30	1 1 unit 41B 0.609 1 1 unit 41B 0.583 1 1 unit 41B 0.586
25	11	40	11	1	1	21 28 95 130 200 280	2 5 5	3RT2026-2NB30 3RT2026-2NF30 3RT2026-2NP30	1 1 unit 41B 0.618 1 1 unit 41B 0.582 1 1 unit 41B 0.587
32	15	50	11	1	1	21 28 95 130 200 280	2 5 5	3RT2027-2NB30 3RT2027-2NF30 3RT2027-2NP30	1 1 unit 41B 0.626 1 1 unit 41B 0.590 1 1 unit 41B 0.595
38	18.5	50	11	1	1	21 28 95 130 200 280	5 5 5	3RT2028-2NB30 3RT2028-2NF30 3RT2028-2NP30	1 1 unit 41B 0.619 1 1 unit 41B 0.585 1 1 unit 41B 0.594

Other voltages, see www.siemens.com/ic10, Chapter 3 on request.

Accessories and spare parts, see pages 2/44 to 2/58.

### AC/DC operation (50/60 Hz AC and DC)

- Extended operating range of the solenoid coil 0.8 to 1.1 x  $U_{\rm s}$  Reduced power consumption when closing and in the closed
- state

PU (UNIT, SET, M) = 1 PS\* PG = 1 unit = 41B



Rated data			Auxiliary	cont	acts	Rated control	SD	Spring-type	Weight
AC-2 and AC-3, $t_{\rm u}$ : Up to 60° C		AC-1, <i>t</i> <sub>u</sub> : 40 °C				supply voltage Us "			approx.
Operational current I <sub>e</sub> up to	Rating of three- phase motors at	Operational current Ie	ldent No.	Vers	sion				
	50 Hz and	up to		,I	Ļ			Article No.	
400 V	400 V	690 V			(				
A	kW	А		NO	NC	V AC/DC	d		kg
For screw fixing an	d snap-on mount	ing onto TH 35 sta	andard n	noui	ntin	g rail			
Size S2									
With integrated coil cir	cuit (varistor)								
40	18.5	60	11	1	1	20 33		3RT2035-3NB30	1.112
						83 155 175 280	5 5	3RT2035-3NF30 3RT2035-3NP30	1.112
50	22	70	11	1	1	20 33		3RT2036-3NB30	1.100
						83 155	5	3RT2036-3NF30	1.115
65	20	80	11	1	1	20 22	5	3RT2030-3NF30	1.112
05	30	00		I	1	83 155	5	3RT2037-3NF30	1.127
						175 280	5	3RT2037-3NP30	1.116
80	37	90	11	1	1	20 33		3RT2038-3NB30	1.107
						83 155 175 280	э 2	3RT2038-3NP30	1.121

Other voltages, see www.siemens.com/ic10, Chapter 3 on request.

Accessories and spare parts, see pages 2/44 to 2/58.

\* You can order this quantity or a multiple thereof.

### SIRIUS 3RT contactors, 3-pole up to 250 kW

### AC/DC operation (50/60 Hz AC and DC)

- Extended operating range of the solenoid coil 0.8 to 1.1 x  $U_{\rm s}$  Reduced power consumption when closing and in the closed state

PU (UNIT, SET, M) = 1 PS\* PG = 1 unit = 41B



3BT204.-3N.30

								011204. 011.00		
Rated data AC-2 and AC-3, t : 1 to 60° C	Rated data AC-2 and AC-3, J: Up to 60° C Department Bating of		Auxiliary conta AC-1, C 40 °C			Rated control supply voltage U <sub>s</sub> <sup>1)</sup>	SD	Spring-type terminals		Weight per PU approx.
Operational	Rating of	Operational	Ident No.	Vers	sion					
current I <sub>e</sub> up to	three-phase motors at 50 Hz and	current I <sub>e</sub> up to		1	Ļ			Article No.	Price per PU	
400 V	400 V	690 V		Ì	1					
А	kW	A		NO	NC	V AC/DC	d			kg
For screw fixin	g and snap-on mounti	ng onto TH 35	standard m	ounti	ng rai	l				
Size S3										
With integrated c	oil circuit (varistor)									
80	37	125	11	1	1	20 33 83 155 175 280	2 5 5	3RT2045-3NB30 3RT2045-3NF30 3RT2045-3NP30		1.830 1.815 1.820
05	45	100	44	-		00 00	~			4 00 4

						170 200	0	51(12045 51(150	1.020
95	45	130	11	1	1	20 33	2	3RT2046-3NB30	1.834
						83 155	5	3RT2046-3NF30	1.815
						175 280	5	3RT2046-3NP30	1.748
110	55	130	11	1	1	20 33	2	3RT2047-3NB30	1.833
						83 155	5	3RT2047-3NF30	1.815
						175 280	5	3RT2047-3NP30	1.818

Other voltages, see www.siemens.com/ic10, Chapter 3 on request.

Accessories and spare parts, see www.siemens.com/ic10, Chapter 3.

### AC/DC operation (50/60 Hz AC and DC)

- Withdrawable coils with integrated coil switch (varistor)
- Auxiliary and control conductors: Screw or spring-type terminals
  Main conductors: Busbar connections, for 3RT1054 (55 kW) box terminals<sup>1)</sup>

3RT10	D5.					3RT106.					SRT107.					
Size	Rated dat AC-2 and $t_{u}$ : Up to 6	ta AC-3, 50° C	vo of			AC-1, <i>t</i> <sub>u</sub> : 40 °C	Auxili conta latera	ary .cts, .l	Rated control supply voltage U <sub>s</sub>	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Upera- tional current I <sub>e</sub> up to 500 V	three- at 50 I	phase m phase m Hz and <b>400 V</b>	notors 500 V	690 V	tional current <i>I</i> <sub>e</sub> up to 690 V		pn 								
	A	kW	kW	kW	kW	A	NO	NC	V AC/DC	d						kg
Solie e.g.	d-state op for contr	peratir ol by I	ng mec PLC	hanisn	ns ⋅ wit	:h 24 V [	OC CO	ntrol s	signal input							
		( 	<sup>3/L2</sup>  5 	5/L3  13   	21  31  43 # 22  32  44						Spring-type terminals for coil and auxiliary switch terminals					
S6	115	37	55	75	110	160	2	2	96 127 200 277	5 5	3RT1054-3NF36 3RT1054-3NP36		1 1	1 unit 1 unit	41B 41B	3.624 3.618
	150	45	75	90	132	185	2	2	96 127 200 277	5 5	3RT1055-2NF36 3RT1055-2NP36		1 1	1 unit 1 unit	41B 41B	3.333 3.350
	185	55	90	110	160	215	2	2	96 127 200 277	5 5	3RT1056-2NF36 3RT1056-2NP36		1 1	1 unit 1 unit	41B 41B	3.353 3.350
S10	225	55	110	160	200	275	2	2	96 127 200 277	5 5	3RT1064-2NF36 3RT1064-2NP36		1 1	1 unit 1 unit	41B 41B	6.610 6.462
	265	75	132	160	250	330	2	2	96 127 200 277	5 5	3RT1065-2NF36 3RT1065-2NP36		1 1	1 unit 1 unit	41B 41B	6.656 6.549
	300	90	160	200	250	330	2	2	96 127 200 277	5 5	3RT1066-2NF36 3RT1066-2NP36		1 1	1 unit 1 unit	41B 41B	6.720 6.599
S12	400	132	200	250	400	430	2	2	96 127 200 277	5 5	3RT1075-2NF36 3RT1075-2NP36		1 1	1 unit 1 unit	41B 41B	10.352 10.095
	500	160	250	355	400	610	2	2	96 127 200 277	5 5	3RT1076-2NF36 3RT1076-2NP36		1 1	1 unit 1 unit	41B 41B	10.501 10.340

 $^{1)}\,$  Alternatively, the 3RT1054 contactor (55 kW) can also be supplied with

In the 8th position of the article number, the "1" must be replaced with "6" for screw terminals, e.g. 3RT1054-6N..., for spring-type terminals, the "3" must be replaced with "2", e.g. 3RT1054-2N....

Other voltages, see www.siemens.com/ic10, Chapter 3 on request.

Accessories and spare parts, see www.siemens.com/ic10, Chapter 3.

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

## General data

### Overview

Extensive accessories and spare parts are available for SIRIUS 3RT power contactors and SIRIUS 3RH2 contactor relays.

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

- Overview graphics with mountable accessories
- For 3RT2 contactors, see pages 2/5 to 2/8
- For 3RT1 contactors, see pages 2/9 to 2/11
- For 3RH2 contactor relays, see page 2/84

#### More information

TIA Selection Tool Cloud (TST Cloud), see https://mall.industry.siemens.com/spice/TSTWeb/?kmat=Contactor

Version	For contactors		Selection and
	3RT2,	3RT1, Sizes S6 to S12	ordering data
	3RH2, Size S00	Sizes 30 to 312	Page
Accessories for 3RT contactors and 3RH2 contactor relays			
Auxiliary switch blocks			
Instantaneous	3RH29.1	3RH19.1	
Delayed			
<ul> <li>Pneumatic time-delay auxiliary switch blocks</li> </ul>	3RT2926-2P1		
Solid-state time-delay auxiliary switch blocks	3RA2813, 3RA2814, 3RA2815	3RT1926-2E/-2F/-2G	
Surge suppressors			
Without LED	3RT29.6-1B/-1C/-1D/-1E	3RT1956-1C	
With LED	3RT29.6-1J/-1L/-1M		
Modules for contactor control			
Coupling links for control by PLC	3RH29.4GP11		
3RA28 function modules			
For direct on-line starting: ON delay or OFF-delay	3RA2811, 3RA2812, 3RA2831, 3RA2832		
• For star-delta (wye-delta) starting	3RA2816		
3RA27 function modules for IO-Link or AS-Interface			
• For direct-on-line, reversing or star-delta (wye-delta) starting	3RA271A/.B/.C		
Mechanical latching blocks	3RT2926-3A.31		
OFF-delay devices for contactors with AC/DC and DC operation	3RT2916-2B.01		
Link modules			
Link modules from motor starter protector to contactor	3RA.9.1		
Safety main current connectors for two contactors	3RA29.6-1A		
Assembly kits			
For reversing contactor assemblies	3RA29.3-2AA.	3RA19.3-2A	
For contactor assemblies for star-delta (wye-delta) starting	3RA292BB., 3RA29.3-2C	3RA1953-3G, 3RA19.3-2./-3.	
Single wiring modules	3RA.9.3-3.A.	3RA19.3-3.	
Star jumpers (links for paralleling), 3-pole	3RT.9.6-4BA3.	3RT19.6-4BA31	
Mechanical interlock kits for two contactors	3RA29.2-2H		
Mechanical interlocks for contactor assemblies	3RA2934-2B	3RA1954-2.	
Mechanical connectors for contactor assemblies	3RA29.2-2.	3RA1932-2D	
Terminal modules/adapters			
Links for paralleling for main circuits	3RT.9.6-4BB.1		
Single-phase infeed terminals	3RA2943-3L		
Three-phase infeed terminals	3RA2913-3K, 3RV29.5-5A.		
<ul> <li>With increased clearances and creepage distances</li> </ul>	3RV2935-5E		
Three-phase busbars	3RV1915-1AB		
Box terminal blocks		3RT194G	
Box terminal for auxiliary conductor connection		3TX7500-0A	
Solder pin adapters for contactor assembly on printed circuit boards	3RT1916-4KA.		
Coil connection modules for connections from top or from below	3RT2926-4R.1.		
Motor feeder connector	3RT1900-4RE01		
Covers			
Terminal covers	3RT29.6-4EA.	3RT19.6-4EA., 3TX65.6-3B	
Sealable covers	3RT2916-4MA10	3RT1926-4MA10	

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

			General data
	-		
Version	For contactors		Selection and
	3RT2, Sizes S00 to S3; 3RH2,	3RT1, Sizes S6 to S12	ordering data
	Size S00		Page
Accessories for 3RT contactors and 3RH2 contactor relays (contin	ued)		
Miscellaneous accessories			
Base plates			
<ul> <li>For reversing contactor assemblies</li> </ul>		3RT19.2-2A	
<ul> <li>For contactor assemblies for star-delta (wye-delta) starting</li> </ul>	3RA29.2-2F	3RA19.2-2.	
Adapters for screw fixing	3RT1926-4P		
EMC suppression modules	3RT2916-1P		
Additional load modules	3RT2916-1GA00		
LED modules for displaying contactor operation	3RT2926-1QT00	3RT1926-1QT00	
Control kit for manual operation	3RT29.6-4MC00		
Insulation stop for securely holding back the conductor insulation for conductors up to 1 $\mbox{mm}^2$	3RT2916-4JA02	3RT1916-4JA02	
Tools for opening spring-type terminals	3RA2908-1A	3RA2908-1A	
Blank labels	3RT2900-1SB.0	3RT1900-1S0	
Spare parts for 3RT2 contactors			
Solenoid coils	3RT2951		
Withdrawable coils		3RT195	
Contacts with fixing parts	3RT296.	3RT196.	
Arc chambers		3RT197.	

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

#### Auxiliary switch blocks, instantaneous

### Selection and ordering data

#### Auxiliary switch: 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:

Example 2

3RT20 motor contactor S0 with 1 NO + 1 NC

1st digit: number of normally open contacts (NO)

3RT20 motor contactor S00 with 1 NO

2nd digit: number of normally closed contacts (NC)

Examples:

Туре

- 31 = 3 NO + 1 NC
- 40 = 4 NO

Example 1

#### Selection aid 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 3RT2 power contactors as well as for 3RH2 contactor relays.

The possible combinations of basic unit and mounted auxiliary switch block can be found in the tables, see pages 2/47 to 2/51.

Where the columns and lines intersect (blue and green in the ex-



Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous

Additional auxilia	blocks	3-pole co	ntactors		4-pole co	ontactors			Contactor relays				
Article number	Auxiliary contacts Version			S00 S0 to S3 3RT201 3RT202, 3RT203, 3RT204, 3RT204, 3RT244			S00 3RT231	3RT251	S0 to S3 3RT232, 3RT233, 3RT234	3RT252, 3RT253, 3RT254	S00 3RH21, 3RH24		
	NO	NC		10	01	11			11	11	40E	31E	22E
	ł	ł		13   14  2, 3, 4, 5	21 	13  21 	1, 2, 3, 4,	1, 2, 3, 4,	13 21 	13 21 	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	13 21 33 43 14 22 34 44 5. 6. 7. 8	13 21 31 43 14 22 32 44 5. 6. 7. 8.
				Accordin	a to EN	50012 <sup>1)</sup>	Accordin	a to EN 5	0012 <sup>1)</sup>		According to	EN 50011 <sup>1)</sup>	
Auxiliarv switc	h bl	ocks	s. front					<u> </u>					
Without NO co	ntac	t											
3RH2911-□HA01		1	.1 	11	02	12	01	01	12	12	41X	32X	23X
3RH2911-□HA02		2	.1  .1 	12	03	13	02	02	13		42E	33X	24
3RH2911-□HA03		3		13	04	14	03				43	34	
3RH2911-□FA04		4	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	14							44E		
3RH2911-□HA10	1			20	11	21	10	10	21	21	50E	41E	32E
3RH2911-□HA11	1	1		21	12	22	11	11	22	22	51X	42X	33X
3RH2911-□HA12	1	2	1.2 1.4 1.1 1.3 - $ -$	22	13	23	12	12	23		52	43	34
3RH2911-□HA13	1	3	1.2 $1.2$ $1.41.1$ $1.1$ $1.31.2$ $1.2$ $1.41.1$ $1.31.2$ $1.2$ $1.41.2$ $1.2$ $1.4$	23	14	24	13				53X	44X	
With 2 NO cont	acts	5											
3RH2911-□HA20	2			30	21	31	20	20	31	31	60E	51X	42X
3RH2911-⊡HA21	2	1		31	22	32	21	21	32	32	61	52	43
3RH2911-□HA22	2	2		32	23	33	22	22	33		62X	53	44X
3RH2911-□FA22	2	2	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32	23	33	22	22	33		62X	53	44X
With 3 NO contacts													
3RH2911-□HA30	3			40	31	41	30	30	41	41	70	61	52
3RH2911-□HA31	3	1	1 3 3 3 1 3 3 3 1 3 1 3 1 3 1 3 1	41	32	42	31	31	42	42	71X	62X	53X
With 4 NO contacts													
3RH2911-□FA40	4			50	41	51	40	40	51	51	80E	71X	62X

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

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous

Additional auxili	blocks	3-pole contactors			4-pole contactors				Contactor relays					
Article number	Au Ve	xiliary rsion	contacts	S00 S0 to S3 3RT201 3RT202, 3RT203, 3RT204, 3RT244		S00 3RT231	3RT251	S0 to S3 3RT232, 3RT252, 3RT233, 3RT253, 3RT234 3RT254		S00 3RH21, 3RH24				
	NC	D NC		10	01	11	S00		S0 to S3		40E	31E	22E	
	ł	ŀ		-\ <u> 13</u> -\14	21 	13  21 \ 14  22			13 21  14 22	13  21  14  22	13  23  33  43 	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.	
Auviliary swit	ch b	locks	front	According to EN 50005			According to EN 50005				According to EN 50005			
(continued)		NUCKE	, 110111											
With make-be	fore	-brea	<b>k</b> <sup>1)</sup>											
3RH2911-□FB11	1	1		21	12	22	11	11	22	22	51	42	33	
3RH2911-□FB22	2 2	2	.3 .1 .5 .7	32	23	33	22	22	33		62	53	44	
3RH2911-□FC22	2 2	2		32	23	33	22	22	33		62	53	44	
L8 I.8 I.6 I.6														
3RH2911-1AA10	1	1011 W		20	11	21	10	10	21	21	50	41	32	
	Ċ		-\	20			10						02	
			74											
3RH2911-1BA10	1		73	20	11	21	10	10	21	21	50	41	32	
3RH2911-14 401		1	174 171	11	02	12	01	01	12	12	41	32	23	
					02	12	01	01	12	12		02	20	
			72											
3RH2911-1BA01		1	71 •	11	02	12	01	01	12	12	41	32	23	
			72											
3RH2911-1LA11	1	1	73 81	21	12	22	11	11	22	22	51	42	33	
			\											
			74 82		10							10		
3RH2911-1MA11	1	1		21	12	22	11	11	22	22	51	42	33	
			74 82											
3RH2911-1LA20	2		73 83	30	21	31	20	20	31	31	60	51	42	
			\'\'											
2012044 414402	0		174 84	20	21	21	20	20	21	21	60	51	10	
3KH2911-1MA20	2		1/3/83	30	21	31	20	20	51	51	00	51	42	
			74 84											

1) Contacts with make-before-break have no mirror contact function.
Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous

Additional auxiliary switch blocks				3-pole contactors			4-pole contactors			Contactor rela	ys			
Article number	Auxiliary contacts Version			S00 3RT201		S0 to S3 3RT202, 3RT203, 3RT204, 3RT244	S00 3RT231	3RT251	S0 to S3 3RT232, 3RT233, 3RT234	3RT252, 3RT253, 3RT254	500 3RH21, 3RH24			
	NO	NC		10	01	11			11	11	40E	31E	22E	
	ł	7		)  13  14	21 	13 21 			13 21  14 22	13  21  14  22	13  23  33  43 	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.	
	h hl	ooko	front	Accordin	g to EN :	00005	Accordi	ng to EN	50005		According to	EN 50011.7		
With complete	in or ince	ocks	, nom on (for conta	otor rola	(c) <sup>2</sup> )									
3RH2911-□GA40	4										80E			
3RH2911-⊡GA31	3	1	53 61 73 83								71E			
3RH2911-□GA22	2	2	53 61 71 83 54 62 72 84								62E			
3RH2911-□GA13	1	3	53 61 71 81 54 62 72 82								53E			
3RH2911-□GA04		4	51 61 71 81 4 4 4 52 62 72 82								44E			
Complete inscr	ipti	on												
3RH2911-□XA40 -0MA0	4		53 63 73 83 54 64 74 84	50	41	51	40	40	51	51	80E	71X	62X	
3RH2911-□XA31 -0MA0	3	1	53 61 73 83 	41	32	42	31	31	42	42	71E	62X	53	
3RH2911-□XA22 -0MA0	2	2	53 61 71 83 	32	23	33	22	22	33		62E	53	44X	
3RH2911-□XA04 -0MA0		4	51 61 71 81 	14							44E			
Solid-state con	npat	tible												
3RH2911-□NF02		2	.1 	12	03	13	02	02	13		42	33	24	
3RH2911-□NF11	1	1	.3  .1 	21	12	22	11	11	22	22	51	42	33	
3RH2911-⊡NF20	2		$ \begin{array}{c}  .3 \\ \hline .4 \\ .4 \\  .4 $	30	21	31	20	20	31	31	60	51	42	

Combinations according to EN 50011 and IEC 60947-5-1 are in **bold** print. All combinations comply with EN 50005.
 Selection and ordering data, see page 2/54.

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous

Additional auxilia	arv «	switch	blocks	3-pole conta	ctors		Contactor relay	s	
Article number	Au	xiliary	contacts	S00		S0 to S3	S00		
	Ve	rsion		3RT201		3RT202, 3RT20	3, 3RH21, 3RH24		
	NC	) NC		10	01	11	40E	31E	22E
	J	L		13	21	13  21	13  23  33  43	13  21  33  43	13  21  31  43
	Y	1		$-\frac{1}{2}$	<u> </u>	\/*	$\frac{1}{1} + \frac{1}{1} + \frac{1}{1} + \frac{1}{1}$	$\frac{1}{2}$	<del>↓ ∳ ∳ ↓</del>
	Ľ.			14	22	14 22	14 24 34 44	14 22 34 44	14 22 32 44
				2.3.4.5.	5. 6. 7. 8.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8.	5. 6. 7. 8.
Lateral auxilia	rv s	witcl	h blocks	According to	D EN 50012"		According to El	N 50011 7	
For size S00			Left Right						
3RH2911-□DA02		2	21 3	1 <b>12</b>					
			7-1						
		4	22  3	2					
3KH2911-LIDAU2		4		21 14					
			42 52 22	32					
3RH2911-□DA11	1	1	21 3	3 <b>21</b>					
			产弋						
	_	0	22 3	4					
3RH2911-⊔DA11	2	2		32					
			42 54 22	34					
3RH2911-DA20	2		23	33 30					
			/-+						
			24	34					
3RH2911-□DA20	4		43 53 23	33 50					
			44 54 24	34					
3RH2911-□DA20	2		43 53 21 3	3 <b>41</b>					
+ 3RH2911-□DA11	1	1	\-\ /+						
			44 54 22 3	34					
3RH2911-□DA20 +	2			31 <b>32</b>					
3RH2911-□DA02		2	44 54 22 3	32					
3RH2911-□DA11	1	1	41 53 21	31 <b>23</b>					
+ 3RH2911-□DA02		2	F\ F-7	2					
<b>E</b> 1 00.1			42 54 22 3	32					
3RH2921-DA02		2	Lett Right	11 12	03	13			
UNITZUE I-LIDAUZ		4		2	00				
			32	12					
3RH2921-□DA02		4	51 61 31	14					
			7777	-					
2PH2021-CDA11	1	1	152 162 132 14	12 13 - 21	10	22			
JKH2921-LIDATI		1		10 21	12	22			
			32	14					
3RH2921-□DA11	2	2	51 63 31	43 32	23	33			
			7 / / /						
	0		152 164 132 4	14 20	01	34			
3RH2921-∐DA20	2		$\binom{-1}{33}$	43 30	21	31			
			34	44					
3RH2921-□DA20	4		53 63 33	43 50	41	51			
			/-/ /-/						
			54 64 34	44					

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

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous

Additional auxiliary switch blocks			blocks	3-pole contactors	5		Contactor relays			
Article number	Aux	iliary	contacts	S00		S0 to S3	S00			
	Vers	sion		3RT201		3RT202, 3RT203,	3RH21, 3RH24			
	NO	NC		10	01	3R12.4 11	40E	31E	22E	
	1	1		113	21	113 121	113 23 33 43	13 21 33 43	13 121 131 143	
	Ň	7		-1			+-+-+-/			
	1	I		14	22	14 22	14 24 34 44	14 22 34 44	14 22 32 44	
				2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8.	5. 6. 7. 8.	
				According to EN	50012 <sup>1)</sup>		According to EN	50011 <sup>1)</sup>		
Lateral auxiliar	y sv	vitch	n blocks							
For sizes S00 t	o S3	3	Left Right		22	10				
3RH2921-⊔DA20 +	2			41	32	42				
3RH2921-DDA11	1	1	54 64 32 44							
3RH2921-□DA20	2		53 63 31 41	32	23	33				
+ 3RH2921-□DA02		2	54 64 32 42							
3RH2921-DDA11	1	1	51 63 31 41	23	14	24				
+ 3RH2921-□DA02		2								
For contactor r	elay	′s <sup>2)</sup>	Left							
3RH2921-DA02		2	51 61				42Z	33X	24	
			77							
			152 162							
3RH2921-LIDA11	1	1	51 63				51X	42X	33X	
			52 64							
3RH2921-□DA20	2		53 63				60Z	51X	42X	
			$\sqrt{-1}$							
			54 64							
Solid-state con	npat	tible								
For size S00			Left Right							
3RH2911-2DE11	1	1		21						
			24 32							
3RH2911-2DE11	2	2	41 53 23 31	32						
			/≠-\' \ <u>'</u> /'							
			42 54 24 32							
For sizes S00 to S	S3		Left Right							
3RH2921-2DE11	1	1	33 41	21	12	22				
			77							
3042021-20544	2	2	134 142	30	23	33				
SKH2921-2DE11	2	2		52	20	55				
			52 64 34 42							
For contactor rela	ays <sup>2)</sup>	)	Left							
3RH2921-2DE11	1	1	51 63				51X	42X	33X	
			۲۲)							
			52 64							

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

<sup>2)</sup> Without positively driven operation.

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous



			3RH2911-2HA22				
For contactors/ contactor relays <sup>1)</sup>	Auxiliary contacts Version	SD	Spring-type terminals 00	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	\ <i>\</i>		Article No.				
Туре	I I NO NC	d					kg
Auxiliary switch bloc	ks for snapping onto the front						
Sizes Sou to S3 3RT2.1, 3RT2.2, 3RT2.3, 3RT2.4	1   1 		3RH2911-2HA01	1	1 unit	41B	0.040
3RH21, 3RH24	2  .1  .1 <b>p</b> 		3RH2911-2HA02	1	1 unit	41B	0.058
	3  .1  .1  .1 + + + 	5	3RH2911-2HA03	1	1 unit	41B	0.059
			3RH2911-2HA10	1	1 unit	41B	0.052
			3RH2911-2HA11	1	1 unit	41B	0.405
			3RH2911-2HA12	1	1 unit	41B	0.045
		•	3RH2911-2HA13	1	1 unit	41B	0.058
	$2  -  \begin{vmatrix} .3 \\ - \\ - \end{vmatrix} \stackrel{.3}{}_{.4} \stackrel{.3}{}_{.4}$		3RH2911-2HA20	1	1 unit	41B	0.057
	2 1 $\begin{vmatrix} 1 & 3 \\ 2 & - \\ 2 & - \end{vmatrix}$ 3 $\begin{vmatrix} 3 \\ - \\ - \\ - \end{vmatrix}$	•	3RH2911-2HA21	1	1 unit	41B	0.046
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		3RH2911-2HA22	1	1 unit	41B	0.057
	$3 - \frac{ 3 }{ 4  4  4 }$	5	3RH2911-2HA30	1	1 unit	41B	0.058
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	•	3RH2911-2HA31	1	1 unit	41B	0.046

<sup>1)</sup> For detailed information on use, see page 2/47.

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous



For contactors/ contactor relays <sup>1)</sup>	Connections Position	Auxiliary contacts Version	SD	Spring-type terminals	PU (UNIT, SET, M)	PG Weight per PU approx.
				Article No.		
Туре		NO NC NO NC	d			kg
Auxiliary s	witch blocks	for snapping onto the front				
Sizes S00	to S3					
3RT2.1, 3RT2.2, 3RT2.3, 3RT2.4		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		3RH2911-2FA40	1 1 unit	41B 0.049
3RH21, 3RH24		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	•	3RH2911-2FA22	1 1 unit	41B 0.049
		4  .1  .1  .1  .1 <u>+</u> <u>+</u> <u>+</u> <u>+</u> .2  .2  .2  .2	•	3RH2911-2FA04	1 1 unit	41B 0.049
		1 1  .7  .5 	•	3RH2911-2FB11	1 1 unit	41B 0.049
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	•	3RH2911-2FB22	1 1 unit	41B 0.049
		2 2  7  .7  .5  .5 	•	3RH2911-2FC22	1 1 unit	41B 0.049

<sup>1)</sup> For detailed information on use, see pages 2/47 and 2/48.

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous



						3RH2911-	2GA22				
For contactor relays <sup>1)</sup>	Contactor relay with auxiliary switch block	Auxi	liary	contacts	SD	Spring-ty	pe terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Ident No.	vers	ion								
		ł	7			Article No					
Туре		NO	NC		d						kg
Auxiliary sv	witch blocks	for s	snap	pping onto the front							
Size S00						•					
Blocks for the	e assembly of	conta	acto	r relays with 8 contacts							
3RH2140, 3RH2440, Ident No. 40E	80E	4		53 63 73 83	ß	3RH2911	-2GA40	1	1 unit	41B	0,049
	71E	3	1	53 61 73 83 54 62 74 84	Ø	3RH2911	-2GA31	1	1 unit	41B	0.049
	62E	2	2		Ø	3RH2911	-2GA22	1	1 unit	41B	0.049
	53E	1	3	53 61 71 81 4 4 4	Ø	3RH2911	-2GA13	1	1 unit	41B	0.049
	44E		4	54 102 172 182 51 61 71 81 4 4 4 4 52 62 72 82	Ø	3RH2911	-2GA04	1	1 unit	41B	0,058

<sup>1)</sup> For detailed information on use, see page 2/49.



3RH2911-2XA22-0MA0

For contactors/ contactor relays <sup>1)</sup>	Auxiliary contacts Version	SD	Spring-type terminals	PU PS* (UNIT, SET,	PG Weight per PU approx.
			Article No.	M)	
Туре	NO NC	d			kg
Auxiliary switch bloc	ks for snapping onto the front				
Sizes S00 to S3					
3RT2.1, 3RT2.2, 3RT2.3, 3RT2.4	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		3RH2911-2XA40-0MA0	1 1 unit	41B 0,049
3RH21, 3RH24	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		3RH2911-2XA31-0MA0	1 1 unit	41B 0.049
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		3RH2911-2XA22-0MA0	1 1 unit	41B 0.049
	4 $51 61 71 81$ 	5	3RH2911-2XA04-0MA0	1 1 unit	41B 0.049

<sup>1)</sup> For detailed information on use, see page 2/49.

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous



				3RH 1921-20			
For contactors	Auxiliary conta	acts	SD	Spring-type terminals	PU PS (UNIT,	PG	Weight per PU
	Ident No.	Version		Article No.	SET, M)		approx.
		\					
Туре		NO NC NO NC	d				kg
Auxiliary sv	witch blocks	for snapping onto the front					
Sizes S6 to	S12						
	4-pole auxilia	ry switch blocks					
	• Acc. to EN	50012					
3RT1.5 3RT1.7	22	2 2 [53 61 [71 ]83 +	20	3RH1921-2XA22-0MA0	1 1 uni	41B	0.060
	1-pole auxilia	ry switch blocks					
	• Acc. to EN	50005 and EN 50012					
3RT1.5 3RT1.7	10	1  .3 		3RH1921-2CA10	1 1 uni	41B	0.016
	01	1  .1 -#-  .2		3RH1921-2CA01	1 1 uni	41B	0.015

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous

					3RH2911-2DA02				
For contactors <sup>1)</sup>	Auxiliar	y contacts		SD	Spring-type terminals	PU (UNIT,	PS*	PG	Weight per PU
	Version				Article No.	SET, M)			approx.
	\ \								
Туре	NO NC	)		d					kg
Laterally mountable mounting on the rig 2-pole	auxiliary s ht and/or o	switch blo on the left	ocks, ,						
Size S00		Left	Right						
3RT2.1	2		21  31 	2	3RH2911-2DA02	1	1 unit	41B	0.050
	1 1	41  53 42  54	21  33 22  34	2	3RH2911-2DA11	1	1 unit	41B	0.050
	2	43  53 \  44  54	23  33 )	2	3RH2911-2DA20	1	1 unit	41B	0.050
Sizes S0 to S3		Left	Right						
3RT2.2, 3RT2.3 <sup>2)</sup> , 3RT2.4	2	51 61 	31  41 	2	3RH2921-2DA02	1	1 unit	41B	0.051
	1 1	51 63 52 64	31  43 • 32  44	2	3RH2921-2DA11	1	1 unit	41B	0.050
	2	53 63 	$\begin{pmatrix} 33 \\ - \\ 34 \\ 44 \end{pmatrix}$	2	3RH2921-2DA20	1	1 unit	41B	0.050

<sup>1)</sup> For detailed information on use, see pages 2/50 and 2/51.

 $^{2)}\,$  With 3RT232. and 3RT252. contactors, mountable only on the right.

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

Auxiliary switch blocks, instantaneous

			3RH1921-2DA11, 3RH1921-2JA11, 3RH1921-2JA11, 3RH1921-2EA, 3RH1921-2KA				
For contactors	Auxiliary contacts	SD	Spring-type terminals	PU (UNIT,	PS*	PG	Weight per PU
	Version		Article No.	SET, M)			approx.
Type Lateral auxiliary switch	NO NC blocks,	d					kg
mounting on the left or 2-pole	right,						
Sizes S6 to S12	Left Right						
	First auxiliary switch block <ul> <li>Acc. to EN 50012</li> </ul>						
3RT1.5 3RT1.7	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	•	3RH1921-2DA11	1	1 unit	41B	0.051
	• Acc. to EN 50005						
3RT1.5 3RT1.7	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		3RH1921-2EA20	1	1 unit	41B	0.050
	-2 $51 61$ $71 81-2$ $-2$ $-2$ $-2-2$ $-2$ $-2-2$ $-2$ $-2$		3RH1921-2EA02	1	1 unit	41B	0.051
	Second auxiliary switch block						
	• Acc. to EN 50012					440	0.054
3RT1.5 3RT1.7	$\begin{bmatrix} 1 & 1 & 1 & 53 & 71 & 83 \\ \hline & & & & & \\ 62 & 54 & & 72 & 84 \end{bmatrix}$		3KH1921-2JA11	1	1 UNIT	41B	0.051
	• Acc. to EN 50005						
3RT1.5 3RT1.7	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	20	3RH1921-2KA20	1	1 unit	41B	0.050
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	20	3RH1921-2KA02	1	1 unit	41B	0.051

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# **Power Contactors for Switching Motors**

Accessories and Spare Parts for SIRIUS 3RT Contactors and SIRIUS 3RH2 Contactor Relays

# Auxiliary switch blocks, instantaneous

Contacts

1 NO NC

Version



Sizes	300	το	33	

Hard gold-plated contacts

for 3RT2 contactors,

For contactors/

Туре

contactor relays<sup>1)</sup>

0.200 000 10 00									
3RT2.1, 3RT2.2, 3RT2.3, 3RT2.4		2	.1 	2	3RH2911-2NF02	1	1 unit	41B	0.046
3RH21, 3RH24	1	1	\	•	3RH2911-2NF11	1	1 unit	41B	0.047
	2		$ \underbrace{ 3}_{4} \underbrace{ 3}_{4} \underbrace{ 3}_{4} $	Þ	3RH2911-2NF20	1	1 unit	41B	0.047

Lateral auxiliary switch blocks,	mounting on	the right
and/or on the left	-	-

acc. to EN 50012

Size S00		Left	Right						
	Auxilia	y switch bl	lock						
3RT2.1	1 1	41 53 42 54	23  31 	2	3RH2911-2DE11	1	1 unit	41B	0.047
Sizes S0 to S3		Left	Right						
	Auxilia	y switch b	lock						
3RT2.2, 3RT2.3, 3RT2.4	1 1	51 63 52 64	33 41 	2	3RH2921-2DE11	1	1 unit	41B	0.050
Sizes S6 to S12		Left	Right						
	First au	xiliary swit	ch block						
3RT1.5 3RT1.7	1 1	$21   13 \\ 4 \\ 22   14 $	31  43 2 32  44	•	3RH1921-2DE11	1	1 unit	41B	0.050
	Second	auxiliary s	witch block						
3RT1.5 3RT1.7	1 1	61 53 £ 1 62 54	71  83 	•	3RH1921-2JE11	1	1 unit	41B	0.050

<sup>1)</sup> For detailed information on use, see pages 2/49 and 2/51.

Weight per PU

approx.

kg

ΡU

(UNIT,

SET

M)

PS\*

PG

# Switching Devices – Contactors and Contactor Assemblies

Contactors for Special Applications

Introduction

# Overview

#### More information

Home page, see www.siemens.com/railway-components	Conversion tool e.g. from 3RT13 to 3RT23, see www.siemens.com/sirius/conversion-tool
Home page, see www.siemens.com/sirius Industry Mall. see www.siemens.com/product?3RT_3TK_3TC	Online configurator for 3RT20 contactors, see www.siemens.com/sirius/configurators
······································	

4-pole 3K123, 3K1	12 <b>3</b> , 3N	115	contactors - 5-pole 5	N124, SN114 COMac	1015		
Туре			3RT2446	3RT2448	3RT1456	3RT1466	3RT1476
Number of main conta	acts		3 NO		3 NO		
<b>AC-1</b> (≤ 690 V)							
Ie	40 °C	Α	140	160	275	400	690
	60 °C	А	130	140	250	380	650
P at 400 V	40 °C	kW	92	105	180	263	454
At 230 V At 500 V At 690 V At 1 000 V	40 °C 60 °C	kW kW kW kW	53  159 	61  182 	105 225 310 165	151 329 454 247	261 568 783 410
AC-2 and AC-3							
<i>I</i> <sub>e</sub> /400 ∨		А	44	44	97	138	170
P at 400 V		kW	22	22	55	75	90
At 230 V At 500 V At 690 V		kW kW kW	12.7 29.9 38.2	12.7 29.9 38.2	30 55 90	37 90 132	55 110 160

# Accessories for contactors

Accessories for contactor	3		
Auxiliary switch blocks	<b>3RH29</b> (p. 2/52)	<b>3RH19 3RT1926</b> (p. 2/55) (p. 2/181)	
Terminal covers	<b>3RT2946-4EA2</b> (p. 2/177)	3RT1956-4EA.	
Surge suppressors	3RT2936 <sup>1)</sup> , 3RT2946	<b>3RT1956-1C</b> (RC element)	

<sup>1)</sup> From product version E03 onwards, 3RT2936-1B/-1E surge suppressors can be used for 3RT2.4 contactors.

# Note:

Safety characteristics for contactors, see www.siemens.com/ic10, Chapter 16 "Standards and Approvals".

Accessories for contactors, see www.siemens.com/ic10 Chapter 3

# Contactors for railway applications

- For SIRIUS 3RT contactors with extended operating range, 3-pole, see page 2/63
- For SIRIUS 3RH2 contactor relays with extended operating range, see page 2/68
- For 3TH4 contactor relays, 8-pole, see page 2/71
- For 3TC contactors for switching DC voltage, 2-pole, see page 2/72

# SIRIUS 3RT.4 contactors for resistive loads (AC-1), 3-pole

# 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 contactors are suitable for use in any climate. They are finger-safe according to IEC 60529.

3RT.4 contactors are used for switching resistive loads (AC-1) or as contactors, that normally only have to carry the current, for example for variable-speed drives.

The accessories and spare parts of the 3RT contactors can also be used here, see from page 2/44 onwards.

For a general description of 3RT contactors, sizes S3 to S12, see from page 2/5 onwards.

#### Size S3: AC or AC/DC operation

- · Coil circuits (varistors, diodes, etc.) can be retrofitted
- · Auxiliary switches can be retrofitted
- · Main and control conductors: Screw terminals

# Technical specifications

# Sizes S6 to S12: AC/DC operation (50/60 Hz AC and DC)

- Withdrawable coils with integrated coil circuit (varistor)
- · Auxiliary and control conductors: Screw terminals
- Main conductors: Busbar connections

# Operating mechanism types

Two types of solenoid operation are available:

- Conventional operating mechanisms
- · Solid-state operating mechanisms
  - The operating mechanism for the contactors features solidstate control of the contactor coil. Overvoltage damping of the operating mechanism coil is already integrated in the electronics. The operating mechanisms are powered via a supply voltage with an operating range from 0.7 to 1.25 x U<sub>s</sub>, optionally also controlled depending on the chosen mode of operation. Alternatively, control is via the separate 24 V DC control signal input. Various rated voltage ranges for AC/DC control are available.
  - This version is additionally available with a 24 V DC PLC relay output and a remaining lifetime indicator (RLT).

More information					
Technical specifications,see https://support.industry.siemens.com/cs/ww/en/ps/13613/td FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/13613	3/faq	Manuals, see • System Manual https://support.i • Manual "SIRIUS https://support.i • Application Mar https://support.i	"SIRIUS – System ndustry.siemens. – SIRIUS 3RT Co ndustry.siemens. nual "SIRIUS Cont ndustry.siemens.	Overview <sup>*</sup> , com/cs/WW/en/view intactors/Contactor, com/cs/WW/en/view rols with IE3/IE4 mo com/cs/ww/en/view/	/60311318 Assemblies", /60306557 tors, 94770820
Type Size General data	3RT2446 S3	3RT2448	3RT1456 S6	3RT1466 S10	3RT1476 S12
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.	360°	22,5° 22,5° 32,000 08,500	90° +++++ 90°	22,5°, 22,5°	
Upright mounting position					

		NSB0_00477a	
		Special version required	
Mechanical endurance			
<ul> <li>Basic units and basic units with mounted auxiliary switch block</li> </ul>	Operating cycles	10 million	
<ul> <li>Basic units with solid-state compatible auxiliary switch block</li> </ul>	Operating cycles	5 million	
Electrical endurance for utilization category AC-1, at <i>I</i> e	Operating cycles	0.5 million	

		SIRIUS 3	RI.4 contactor	s for resistive lo	ads (AC-1), 3-pd
Туре		3RT2446 3RT2448	3 3RT1456	3RT1466	3RT1476
Size		S3	S6	S10	S12
General data (continued)					
Rated insulation voltage U <sub>i</sub> (pollution degree 3)	V	1 000			
Rated impulse withstand voltage Uimp	kV	6	8		
Protective separation between the coil and the main contacts according to IEC 60947-1, Appendix N	V	400	690		
Mirror contacts according to IEC 60947-4-1, Appendix F					
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.					
<ul> <li>Integrated auxiliary switches</li> </ul>		Yes			
Removable auxiliary switch block			Yes		
Permissible ambient temperature					
During operation	°C	-25 +60			
During storage	°C	-55 +80			
Degree of protection acc. to IEC 60529					
On front		IP20	IP00 (IP20 with bo	ox terminal/cover)	
Connecting terminal		IP00 (for higher degree of	of protection: use ad	ditional terminal cove	rs)
Touch protection acc. to IEC 60529		Finger-safe for vertical touching from front	Finger-safe the for vertical to	ouching from the front	with cover
Shock resistance					
<ul> <li>Rectangular pulse</li> <li>AC operation</li> <li>DC operation</li> </ul>	<i>g</i> /ms <i>g</i> /ms	10.3/5 and 10.5/10 6.7/5 and 4.0/10	8.5/5 and 4.1 8.5/5 and 4.1	2/10 2/10	
<ul> <li>Sine pulse</li> <li>AC operation</li> <li>DC operation</li> </ul>	- g/ms g/ms	16.3/5 and 10.5/10 10.6/5 and 6.3/10	13.4/5 and 6 13.4/5 and 6	5.5/10 5.5/10	

# SIRIUS 3RT.4 contactors for resistive loads (AC-1), 3-pole

Туре		3RT2446	3RT2448	3RT1456	3RT1466	3RT1476
Size		S3		S6	S10	S12
Rated data of the main contacts						
Utilization category AC-1, switching resistive loads						
Rated operational currents I <sub>e</sub>	At 40 °C up to 690 V A At 60 °C up to 690 V A At 1 000 V A	140 130 60	160 140 80	275 250 100	400 380 150	690 650 <sup>1)</sup> 250
• Rated power for AC loads <sup>2)</sup> with p.f. = 0.95 (at 60 °C)	At 230 V kW 400 V kW 500 V kW 690 V kW	49 86 107 148	53 92 115 159	95 165 205 285	145 250 315 430	245 430 535 740
$\bullet$ Minimum conductor cross-section for loads with $I_{\rm e}$	At 40 °C mm <sup>2</sup> At 60 °C mm <sup>2</sup>	50 50	70	2 x 70 120	247 240 240	2 x 240 2 x 240
Utilization categories AC-2 and AC-3	operating avalag					
• Rated operational currents $I_{\rm e}$	Up to 400 V A Up to 690 V A	44 44		97 97	138 138	170 170
<ul> <li>Rated power for slipring or squirrel-cage motors at 50 and 60 Hz</li> </ul>	At 230 V kW 400 V kW 500 V kW 690 V kW	12.7 37 39.9 38.2		30 55 55 90	37 75 90 132	55 90 110 160
Power loss per conducting path	At I <sub>e</sub> /AC-1 W			20	27	55
Load rating with DC						
Utilization category DC-1, switching resistive loads ( $L/R \le 1$ ms) • Rated operational currents $I_{e}$ (at 60 °C)						
- 1 conducting path	Up to 24 V A 60 V A 110 V A 220 V A 440 V A	130 80 12 2.5 0.8	140	250 250 18 3.4 0.8	380 380 33 3.8 0.9	500 500
- 2 conducting paths in series	Up to 24 V A 60 V A 110 V A 220 V A 440 V A	130 130 130 130 13 2.4	140 140 140	250 250 250 20 3.2	0.6 380 380 380 380 4	500 500 500 500
- 3 conducting paths in series	600 V A Up to 24 V A 60 V A 110 V A 220 V A 440 V A 600 V A	1.3 130 130 130 130 6 3.4	140 140 140 140	1.6 250 250 250 250 11.5 4	2 380 380 380 380 11 5.2	500 500 500 500
Utilization category DC-3/DC-5, shunt-wound and series-wound motors	( <i>L/</i> R ≤ 15 ms)					
<ul> <li>Alled operational currents <i>I</i><sub>e</sub> (all 60°C)</li> <li>1 conducting path</li> </ul>	Up to 24 V A 60 V A 110 V A 220 V A 440 V A 600 V A	6 3 1.25 0.35 0.15 0.1		250 7.5 2.5 0.6 0.17 0.12	380 11 3 0.18 0.125	500
- 2 conducting paths in series	Up to 24 V A 60 V A 110 V A 220 V A	130 130 130 1.75	140 140 140	250 250 250 2.5 2.5	380 380 380 380	500 500 500
- 3 conducting paths in series	440 V A 600 V A Up to 24 V A 60 V A 110 V A 220 V A	0.42 0.27 130 130 130 4	140 140 140	0.65 0.37 250 250 250 250	380 380 380 380	500 500 500 500
	600 V A	0.8		0.75		

# Note:

Further information on the products can be found in the Catalog IC 10 catalogue and on the Internet at www.siemens.com/sirius <sup>1)</sup> 600 A for 3RT1476.N. contactor

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

Contactors for Railway Applications

SIRIUS 3RT contactors with extended operating range, 3-pole

# Overview

# Standards

IEC 60947-4-1, EN 60947-4-1, IEC 60077-2, EN 60077-2

The contactors are finger-safe according to IEC 60529 (exception: S3 series resistor). The auxiliary conductor and coil terminals are all spring-type terminals.

#### Ambient temperature

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

#### Performance range

3RT contactors are available in all sizes from S00 to S12 up to 250 kW or 500 A (AC-3 at 400 V).

# Operating range of contactor operating mechanisms

# Sizes S00 to S3

The solenoid coils of the 3RT2 contactors have an extended coil operating range from max. 0.7 to 1.25 x  $U_{\rm s}$  and are fitted as standard with surge suppressors. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

# Sizes S6 to S12

The operating mechanism for the 3RT10 contactors features solid-state control of the contactor coil. Overvoltage damping of the operating mechanism coil is already integrated in the electronics. The operating mechanisms are powered via a supply voltage with an operating range of 0.7 to  $1.25 \times U_{\rm s}$ , optionally also controlled depending on the chosen mode of operation. Alternatively, control is via the separate 24 to 110 V DC control signal input.

Three rated voltage ranges are available as direct voltage (DC):

- 24 V DC
- 72 V DC
- 110 V DC

# Application

Besides standard approval in compliance with IEC 60974-4-1, the contactors with an extended operating range are also approved in compliance with IEC 60077-2, thus fulfilling the requirement for use in railway applications.

Thus, their suitability for increased requirements such as an

- extended temperature range in comparison with the regular
- standard IEC 60497-4-1 or • extended operating range of the solenoid coils or also
- increased resistance to mechanical oscillations and vibrations is warranted. The design of the terminals in the spring-type connection system also contributes toward vibration resistance.

## 3RT20 contactors with conventional coil

# Control and auxiliary circuits

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

# Note:

An additional auxiliary switch block cannot be mounted.

# Side-by-side mounting

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

#### 3RT201 contactors with series resistor

# Control and auxiliary circuits

The solenoid coils of these contactors have an extended coil operating range from 0.7 to  $1.25 \times U_{\rm s}$  (exception 3RT204,-.X...-0LA2: 0.7 to  $1.2 \times U_{\rm s}$ ) and are fitted as standard with a surge suppressor (suppressor diode or varistor as preferred).

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

# 3RT201 to 3RT204 contactors with solid-state operating mechanism, extended operating range

# Control and auxiliary circuits

The solenoid coils of these contactors have an extended coil operating range from 0.7 to  $1.25 \times U_{\rm S}$  (exception 3RT204.-.X...-0LA2: 0.7 to  $1.2 \times U_{\rm S}$ )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 1.25 x  $U_{\rm s}$  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 possibility of mounting auxiliary switches is the same as that for equivalent standard contactors for switching motors in the matching size (see overview diagrams of the 3RT20 contactors from page 2/5 onwards).

# Side-by-side mounting

With these contactor versions in sizes S00 and S0, side-by-side mounting is permitted at ambient temperatures up to 70 °C.

Contactors for Railway Applications

SIRIUS 3RT contactors with extended operating range, 3-pole

# Selection and ordering data

DC operation Spring-type terminals For screw fixing and snap-on mounting onto standard mounting rails Solenoid coil fitted with surge suppressor

													۲	
										3RT2012K.4.	3RT201	2K.42	2-0LA0	
Rated AC-2 a	data and AC-( °C	3			Auxiliar	y contac	sts	Rated control supply voltage	SD	Spring-type terminals	) PU J (UNIT, SET,	PS*	PG	Weight per PU approx.
Opera	- Ratin	gs of			Ident N	lo. Versi	ion	-5			M)			-1-1
tional curren	three- t at	-phase mo	tors			,I	Ļ			Article No.				
I <sub>e</sub> at						Ì	(							
400 V	230 V	400 V	500 V	690 V										
А	kW	kW	kW	kW		NO	NC	V DC	d					kg
3RT2	0 cont	actors fo	r switch	ing mot	ors									
Size S	S00		<i></i>											
With c (coupl	onventi	onal coll, tactors)	fitted wit	h suppre	ssor dio	de								
• 1 NC	), Ident I	No. <b>10</b>			• 1 NC	, Ident N	o. <b>01</b>							
>⊕	A1(+)	1/L1 3/L2	2 5/L3 13	5	)	A1(+)	1/L1 3/	L2 5/L3 21						
>≇	A2(-)				<u>*</u>	→ A2(–)								
12	3	5.5	5.5	5.5	10 <sup>1)</sup>	1		24		3RT2017-2KB41	1	1 unit	41B	0.316
					1)			110	5	3RT2017-2KF41	1	1 unit	41B	0.316
12	3	5.5	5.5	5.5	01")		1	24 110	► 5	3RT2017-2KB42 3RT2017-2KF42	1	1 unit 1 unit	41B 41B	0.316 0.316
With c	onventi	onal coil,	fitted wit	h varisto	r									
• 1 NC	), Ident I	No. <b>10</b>			• 1 NC	, Ident N	o. <b>01</b>							
υψ	A1(+)	1/L1 3/L2	5/L3 13			A1(+)	1/L1 3/L	2 5/L3 21						
<u>1</u>	A2(-)	2/T1 4/T2	6/T3 14		<u>Б</u>	A2(-)	2/T1 4/T	2 6/T3 22						
12	3	5.5	5.5	5.5	10 <sup>1)</sup>	1		24	5	3RT2017-2LB41	1	1 unit	41B	0.317
10	2	<b>5 5</b>	E	5 5	o1 <sup>1</sup> )		4	110	5	3RT2017-2LF41	1	1 unit	41B	0.318
12	3	5.5	5.5	5.5	01 /		I	24 110	э 5	3RT2017-2LF42	1	1 unit	41B 41B	0.319
With s	eries re	sistor, fitt	ed with s	uppresso	or diode									
	<sup>1(+)</sup> 1/L	_1  3/L2  5/	L3 T3											
12	3	5.5	5.5	5.5	2)		1 <sup>3)</sup>	24 110	5 5	3RT2017-2KB42-0LA0 3RT2017-2KF42-0LA0	1 1	1 unit 1 unit	41B 41B	0.329 0.322
16	4	7.5	10	11	2)		1 <sup>3)</sup>	24 110	5 5	3RT2018-2KB42-0LA0 3RT2018-2KF42-0LA0	1 1	1 unit 1 unit	41B 41B	0.330 0.325
With s	eries re	sistor, fitt	ed with v	aristor										
	◆E1(+) →	1/L1 3/L2	5/L3											
12	3	5.5	5.5	5.5	2)		1 <sup>3)</sup>	24 110	5 5	3RT2017-2LB42-0LA0 3RT2017-2LF42-0LA0	1	1 unit 1 unit	41B 41B	0.332 0.323
16	4	7.5	10	11	2)		1 <sup>3)</sup>	24	5	3RT2018-2LB42-0LA0	1	1 unit	41B	0.333
								ΠU	Э	3K12010-2LF42-0LAU	1	i unit	41B	0.327

 $^{1)}$  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.

<sup>2)</sup> One 4-pole auxiliary switch block according to EN 50005 can be mounted from -40 to 70 °C; no clearance required.

<sup>3)</sup> NC contact cannot be used because it is used for switching of the series resistor.

Accessories and spare parts, see page 2/44 onwards.

# **Contactors for Special Applications** Contactors for Railway Applications

SIRIUS 3RT contactors with extended operating range, 3-pole

# DC operation Spring-type terminals For screw fixing and snap-on mounting onto standard mounting rails Solenoid coil fitted with varistor

	3RT20 <sup>-1</sup>	2X.41-	OLA2		3RT2012	2X.42-0				ЭRT2022К.40	3RT202	2X.40		
Rated d AC-2 an	ata d AC-3				Auxiliary o	contacts	S	Rated control supply voltage	SD	Spring-type terminals	PU (UNIT.	PS*	PG	Weight per PU
t <sub>u</sub> : 70 °C	Rating	e of			Ident No	Versio	n	Us			SET, M)			approx.
tional current $I_{e}$ at	three-p at	hase mot	ors				7			Article No.				
400 V	230 V	400 V	500 V	690 V										
A 3RT20	kW contac	kW ctors for	kW r switch	kW ina mot	ors	NO	NC	V DC	d					kg
Size S	00		ountoin	ing mot										
With so	lid-state	operatir	ng mecha	inism, wi	th integrat	ed vari	stor							
• 1 NO,	Ident No	D. <b>10</b>	15/1 2 13		• 1 NC, Ic	lent No.	. <b>01</b> L4 12/L2	5/1 2 1 21						
″₽ C	A1(+)	2/T1 4/T2	6/T3 14			1(+) 1/1 2(-) 2/	T1 4/T2	6/T3 22						
12	3	5.5	5.5	5.5	10 <sup>1)</sup>	1		24 110	5	3RT2017-2XB41-0LA2	1	1 unit	41B 41B	0.310
12	3	5.5	5.5	5.5	01 <sup>1)</sup>		1	24	5	3RT2017-2XB42-0LA2	1	1 unit	41B	0.310
16	4	7.5	10	11	10 <sup>1)</sup>	1		110 24	5 5	3RT2017-2XF42-0LA2 3RT2018-2XB41-0LA2	1	1 unit 1 unit	41B 41B	0.310 0.310
10	4	7 6	10		0(1)			110	5	3RT2018-2XF41-0LA2	1	1 unit	41B	0.300
16	4	7.5	10		01.7		I	24 110	5 5	3RT2018-2XB42-0LA2 3RT2018-2XF42-0LA2	1	1 unit 1 unit	41B 41B	0.340
Size So With co (couplin 1 NO +	0 nvention ng conta 1 NC, Io	nal opera actors) dent No. 1	ating med	hanism <sup>1</sup>	)									
	A1(+) 1 A2(-)	/L1  3/L2	5/L3  13	21										
17	4	<b>7.5</b>	10	11	11	1	1	24	2	3RT2025-2KB40	1	1 unit	41B	0.643
25	5.5	11	11	11	11	1	1	110 24	5 2	3RT2025-2KF40 3RT2026-2KB40	1	1 unit 1 unit	41B 41B	0.627 0.643
20	7.5	45	10.5	10.5				110	5	3RT2026-2KF40	1	1 unit	41B	0.629
32	7.5	15	18.5	18.5	11	I	I	24 110	5 5	3RT2027-2KF40 3RT2027-2KF40	1	1 unit	41B 41B	0.639
With so 1 NO +	lid-state 1 NC, Ic	e operatin dent No. 1	ng mecha I1	inism										
	A1(+) 1 A2(-)	/L1  3/L2 	5/L3 13	21										
17	4	7.5	10	11	11	1	1	24	5	3RT2025-2XB40-0LA2	1	1 unit	41B	0.612
25	5.5	11	11	11	11	1	1	110 24	5 5	3R12025-2XF40-0LA2 3RT2026-2XB40-0LA2	1	1 unit 1 unit	41B 41B	0.578 0.613
32	75	15	18 5	18.5	11	1	1	110 24	5 5	3RT2026-2XF40-0LA2	1	1 unit	41B 41B	0.583
02	1.0			10.0				110	5	3RT2027-2XF40-0LA2	1	1 unit	41B	0.591
38	7.5	18.5	18.5	18.5	11	1	1	24 110	5 5	3RT2028-2XB40-0LA2 3RT2028-2XF40-0LA2	1 1	1 unit 1 unit	41B 41B	0.620 0.594
1) It is no is requ	ot possib uired for	le to mou side-by-s	unt an aux side mour	iliary swit	ch block. A nbient temp	cleara	nce of 1 es > 60	I0 mm Acc °C.	esso	pries and spare parts, see pag	ge 2/44	onwa	rds.	

Contactors for Railway Applications

# SIRIUS 3RT contactors with extended operating range, 3-pole

DC operation Spring-type terminals For screw fixing and snap-on mounting onto standard mounting rails Solenoid coil fitted with varistor



40	11	18.5	22	22	11	1	1	24-34 72-125	5 5	3RT2035-3XB40-0LA2 3RT2035-3XF40-0LA2	1	1 unit 1 unit	41B 41B	1.109 1.115
50	15	22	30	22	11	1	1	24-34 72-125	5 5	3RT2036-3XB40-0LA2 3RT2036-3XF40-0LA2	1 1	1 unit 1 unit	41B 41B	1.110 1.115
65	18.5	30	37	37	11	1	1	24-34 72-125	5 5	3RT2037-3XB40-0LA2 3RT2037-3XF40-0LA2	1 1	1 unit 1 unit	41B 41B	1.113 1.117
80	22	37	37	45	11	1	1	24-34 72-125	5 5	3RT2038-3XB40-0LA2 3RT2038-3XF40-0LA2	1 1	1 unit 1 unit	41B 41B	1.109 1.128

Size S3

With solid-state operating mechanism

1 NO + 1 NC, Ident No. 11

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$													
80	22	37	45	55	11	1	1	24 110					
95	22	45	55	75	11	1	1	24 110					
110	30	55	75	75	11	1	1	24 110					

5	3RT2045-3XB40-0LA2	1	1 unit	41B	1.824
5	3RT2045-3XF40-0LA2	1	1 unit	41B	1.817
5	3RT2046-3XB40-0LA2	1	1 unit	41B	1.826
5	3RT2046-3XF40-0LA2	1	1 unit	41B	1.820
5	3RT2047-3XB40-0LA2	1	1 unit	41B	1.828
5	3RT2047-3XF40-0LA2	1	1 unit	41B	1.748

Accessories and spare parts, see page 2/44 onwards.

Contactors for Railway Applications

SIRIUS 3RT contactors with extended operating range, 3-pole

DC o Sprir For s With	peration ng-type te crew fixin drawable	rminals ng onto standard operating mecha	mounting rails	grate	ed cir	cuit (varisto	r)	-				
3BI10	D55-2X 46-0		3BI1064-2X.46-					3BT1075-2X 46-0I A2				
Size	Rated data	a according to IEC 60	947-4-1	Aux	iliary	Rated control	SD	Article No.	PU	PS*	PG	Weight
	AC-2 and $t_{11}$ : Up to 70	AC-3, ) °C		con late	tacts, ral	supply voltage U <sub>s</sub>			(UNIT, SET,			per PU approx.
	Operationa	Ratings of three-	phase motors	Vers	sion				M)			
	400 V	400 V		ł	ŀ							
	А	kW		NO	NC	V DC	d					kg
Solid	d-state ope for contro	erating mechanisn I by PLC	n with 24 110 V	DC C	ontro	l signal input						
		1/L1  3/L2  5/L3  13 	21 31 43 7 - 7 - 1 22 32 44					Spring-type terminals of coil and auxiliary switch terminals				
S6	115	55		2	2	24 72 110	5 5 5	3RT1054-2XB46-0LA2 3RT1054-2XJ46-0LA2 3RT1054-2XF46-0LA2	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	3.336 3.326 3.278
	150	75		2	2	24 72 110	5 5 5	3RT1055-2XB46-0LA2 3RT1055-2XJ46-0LA2 3RT1055-2XF46-0LA2	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	3.411 3.265 3.350
	185	90		2	2	24 72 110	5 5 5	3RT1056-2XB46-0LA2 3RT1056-2XJ46-0LA2 3RT1056-2XF46-0LA2	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	3.420 3.259 3.403
S10	225	110		2	2	24 72 110	5 5 5	3RT1064-2XB46-0LA2 3RT1064-2XJ46-0LA2 3RT1064-2XF46-0LA2	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	6.470 6.462 6.530
	265	132		2	2	24 72 110	5 5 5	3RT1065-2XB46-0LA2 3RT1065-2XJ46-0LA2 3RT1065-2XF46-0LA2	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	6.482 6.700 6.610
	300	160		2	2	24 72 110	5 5 5	3RT1066-2XB46-0LA2 3RT1066-2XJ46-0LA2 3RT1066-2XF46-0LA2	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	6.607 6.599 6.618
S12	400	200		2	2	24 72 110	5 5 5	3RT1075-2XB46-0LA2 3RT1075-2XJ46-0LA2 3RT1075-2XF46-0LA2	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	10.340 10.095 10.283
	500	250		2	2	24 72 110	5 5 5	3RT1076-2XB46-0LA2 3RT1076-2XJ46-0LA2 3RT1076-2XF46-0LA2	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	10.850 1.034 10.411

Accessories and spare parts, see page 2/44 onwards.

Contactors for Railway Applications

# SIRIUS 3RH2 contactor relays with extended operating range

# Overview

# DC operation

IEC 60947-4-1, EN 60947-4-1

The contactor relays are finger-safe according to IEC 60529. 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.

# 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 buffering to extend the operating time in the event of battery charge failure.

#### Contactor relays with conventional coil

# Control and auxiliary circuits

These contactor relays have an extended operating range from 0.7 to  $1.25 \times U_{\rm s}$ ; the coils are fitted with suppressor diodes as standard. An additional series resistor is not required.

## Note:

An additional auxiliary switch block cannot be mounted.

#### Side-by-side mounting

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

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  $1.25 \times U_s$  and are fitted as standard with surge suppressors. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

#### Contactor relays with series resistor

#### Control and auxiliary circuits

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

The size S00 contactor relays are supplied prewired with a plugon module containing the series resistor. A surge suppressor (a suppressor diode or varistor as preferred) 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 permissible at ambient temperatures up to 70  $^{\circ}\text{C}.$ 

#### Contactor relays with solid-state operating mechanism

# Control and auxiliary circuits

The solenoid coils of these contactor relays have an extended coil operating range from 0.7 to  $1.25 \times U_s$  and are fitted as standard with varistors to provide protection against overvoltage.

The contactor relays are energized via upstream control electronics which ensure the coil operating range of 0.7 to 1.25 x  $U_{\rm s}$  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.

Contactors for Railway Applications

SIRIUS 3RH2 contactor relays with extended operating range

# DC operation Spring-type terminals For screw fixing and snap-on mounting onto standard mounting rails Solenoid coil with surge suppression





3RH2122-2K.40

3RH2122-2K.40-0LA0



#### Size S00

# With conventional coil, fitted with suppressor diode

Terminal designations according to EN 50011

Selection and ordering data



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

Other voltages on request.

Contactors for Railway Applications

# SIRIUS 3RH2 contactor relays with extended operating range

# DC operation

Spring-type terminals For screw fixing and snap-on mounting onto standard mounting rails Solenoid coil with surge suppression



<sup>1)</sup> 4-pole auxiliary switch block according to EN 50005 can be mounted.

Accessories, see page 2/44 onwards. Other voltages on request.

Contactors for Railway Applications

3TH4 contactor relays, 8-pole

# Overview

# Standards

IEC 60947-4-1, EN 60947-4-1

The contactor relays are finger-safe according to IEC 60529. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

# Ambient temperature

The permissible ambient temperature for operation of the contactors (across the full coil operating range) is

# Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e.g. in railway applications. -50 to +70 °C. Uninterrupted duty at temperatures < -25 °C and > +55 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 55 °C. There is no need to reduce the technical specifications.

#### Control and auxiliary circuits

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

# Selection and ordering data

Solenoid coil fitted with varistor



										31114244-UL				
Contacts	Rated op	perational o	current		Contacts <sup>1)</sup>		Rated control supply voltage	SD	Screw terminals	PU (UNIT, SET	PS*	PG	Weight per PU	
	<i>I</i> <sub>e</sub> /AC-15 <b>230 V</b>	/AC-14 400 V	500 V	690 V	Ident No. acc. to EN 50011	Vers	sion	Us		Article No.	M)			αρρισχ.
						ł	7							
Number	Α	А	А	А		NO	NC	V DC	d					kg
For scre	ew fixing	and sna	ap-on mo	ounting o	nto TH 35	stan	dard	mounting rail						
DC oper	ration													
	2(-) 13 23 23 24 24 24 24 24 24 24 24 24 24 24 24 24	33 43 51 6 77 34 44 52 62	1 71 81 7 7 2 72 82											
8	10	6	4	2	44E	4	4	24 110		3TH4244-0LB4 3TH4244-0LF4	1 1	1 unit 1 unit	41A 41A	0.682 0.644
	2(-) 14 24	33 43 53 6 <sup>-</sup> 34 44 54 62	1 71 81 7 7 2 72 82											
8	10	6	4	2	53E	5	3	24 110		3TH4253-0LB4 3TH4253-0LF4	1 1	1 unit 1 unit	41A 41A	0.692 0.648
	1(+) 13 23 2(-) 14 24	33 43 53 6 34 44 54 62	1 71 83 7 2 72 84											
8	10	6	4	2	62E	6	2	24 110		3TH4262-0LB4 3TH4262-0LF4	1 1	1 unit 1 unit	41A 41A	0.674 0.660
1) Contact	ts not exte	ndable.						Other vo	oltag	jes on request.				
								Accesso	ories	s. see page 2/44 onwards.				

\* You can order this quantity or a multiple thereof.

Contactors for Railway Applications

# 3TC contactors for switching DC voltage, 2-pole

# Overview

# Standards

IEC 60947-4-1, EN 60947-4-1

The contactors are finger-safe according to IEC 60529 (exception: series resistor). Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

All specifications and technical specifications not mentioned here are identical to those of the standard 3TC contactors.

#### Ambient temperature

The permissible ambient temperature for operation of the contactors (across the full coil operating range) is -50 to +70 °C. Uninterrupted duty at temperatures < -25 °C and > +55 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

At ambient temperatures > 55 °C, a clearance of 10 mm is required for side-by-side mounting of size 2 contactors. There is no need to reduce the technical specifications.

#### Ratings of three-phase motors

The quoted rating (in kW) refers to the output power on the motor shaft (according to the nameplate).

The power rating specifications of the contactors in kW are guide values for 4-pole standard motors at 50 Hz AC and specified voltage (e.g. 400 V). The actual starting and rated data of the motor to be switched must be considered when selecting the units.

#### Series resistor

The DC solenoid systems of the 3TC contactors must be modified (to hold-in coil) by means of a series resistor. This series resistor is supplied separately packed with the contactors.

With types 3TC48, the series resistor must be attached onto the right-hand side of the auxiliary switch block by means of the enclosed mounting parts and sets of links provided, while in the case of the 3TC44 it must be mounted and wired between the contactor poles. With types 3TC52 and 3TC56, the series resistor must be attached separately next to the contactors.

#### Auxiliary contacts

The contactors are equipped with two lateral auxiliary switch blocks each with 1 NO + 1 NC contact. Further auxiliary switch blocks cannot be fitted to the DC-operated contactors.

One NC contact is required for the series resistor function. Two NO contacts and one NC contact are thus freely available.

#### **Reversing contactors**

With the 3TC52 and 3TC56 contactors, the series resistor must be connected using an additional K2 reversing contactor (3RT1317-1F.40). This contactor is automatically included in the scope of supply in the same packaging as the contactor.

# Dimensions

Attaching resistors and varistors increases the width of the contactors.

# Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e.g. in railway applications.

#### 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 varistors to provide protection against overvoltage. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

# 3TC contactors for switching DC voltage, 1-pole and 2-pole



Siemens IC 12 · 2019

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# 3TC contactors for switching DC voltage, 1-pole and 2-pole

# Selection and ordering data

#### 3TC44: For screw fixing and snap-on mounting onto 35 mm standard mounting rail 3TC48 to 3TC56: For screw fixing Solenoid coil fitted with varistor

											3TC48				
Size	Utilization category	Rated opera- tional current I <sub>e</sub> at	Rated power A of loads c at N			Auxi cont Vers	iliary acts <sup>1)</sup> ion	Rated control supply voltage U <sub>s</sub>	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.	
		750 V	220 V	440 V	600 V	750 V	ł	ŀ			Article No.				
		А	kW	kW	kW	kW	NO	NC	V DC	d					kg
Contactors for switching DC voltage															

DC operation

Terminal designations according to EN 50012 and EN 50005

2	DC-1 DC-3/DC-5	32 7.5	7 5	14 9	19.2 9	24 4	2	1 <sup>2)</sup>	24 110	5 10	3TC4417-0LB4 3TC4417-0LF4	1 1 unit 1 1 unit	41B 41B	1.322 1.304
4	DC-1 DC-3/DC-5	75 75	16.5 13	33 27	45 38	56 45	2	1 <sup>2)</sup>	24 110	15 15	3TC4817-0LB4 3TC4817-0LF4	1 1 unit 1 1 unit	41B 41B	4.700 4.620
8	DC-1 DC-3/DC-5	170 170	48 41	97 82	132 110	165 110	2	1 <sup>2)</sup>	24 110	15 15	3TC5217-0LB4 3TC5217-0LF4	1 1 unit 1 1 unit	41B 41B	10.435 10.334
12	DC-1 DC-3/DC-5	400 400	88 70	176 140	240 200	300 250	2	1 <sup>2)</sup>	24 110	15 15	3TC5617-0LB4 3TC5617-0LF4	1 1 unit 1 1 unit	41B 41B	30.000 21.837

The number of auxiliary contacts cannot be increased.
 One NC contact used for series resistor.

Other rated control supply voltages according to page 2/78 on request.

# Accessories

Accessories, see Basic units of the 3TC contactors, from page 2/75 onwards.

## Spare parts

For contactors		Remarks	Rated control supply voltage Us	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Size	Туре		V DC	d					kg
Arc chutes									
For contactors wit	h extended operatin	ng range							
2	3TC4417-0L	With cutout for resistor mounting		5	3TY2442-0B	1	1 unit	41B	0.160
Solenoid coils									
For contactors wit	h extended operatin	ng range							
2	3TC44	With series resistor, without varistor	24 110	15 15	3TY6443-0LB4 3TY6443-0LF4	1 1	1 unit 1 unit	41B 41B	0.364 0.345
4	3TC48		24 110	15 15	3TY6483-0LB4 3TY6483-0LF4	1 1	1 unit 1 unit	41B 41B	1.239 1.167

All spare parts not mentioned here are identical to those of the basic units of the 3TC contactors, see page 2/78.

# 3TC contactors for switching DC voltage, 1-pole and 2-pole

# Overview

# 3TC4 and 3TC5

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 contactors are finger-safe according to IEC 60529. 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. For voltages over 220 V, the two conducting paths are to be switched in series, see "Rated data of the main contacts", page 2/73.

# Auxiliary contacts

The contactors are equipped with two lateral auxiliary switch blocks each with 1 NO + 1 NC contact. On the contactors 3TC48 to 3TC56 with AC operation, a second auxiliary switch block can be mounted on the right and left. On contactors with DC operation, expansion of the auxiliary contacts is not possible.

# 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 and  $1.2 \times U_{\rm s}$ .

3TC74 contactors can be used at up to 750 V/400 A and 50 Hz in AC-1 operation.

For voltages over 750 V, the two conducting paths (3TC74: two contactors) are to be switched in series, see "Rated data of the main contacts", page 2/76.

# Application

The contactors are suitable for switching and controlling DC motors as well as all other DC circuits.

A version with an especially large actuating voltage is available for operation in electrically driven vehicles and in switchgear with a particularly large coil operating range (see page 2/80).

# Technical specifications

		_	-	
Туре			3TC4 and 3TC7	3TC5
Rated data of the auxiliary contacts				
Rated insulation voltage U <sub>i</sub> (pollution degree 3)		V	690	
Conventional thermal current $I_{th}$ = rated operational current $I_e$ /AC-12		А	10	10
AC load				
Rated operational current I <sub>e</sub> /AC-15/AC-14				
• For rated operational voltage $U_{\rm e}$	24 V 110 V 125 V 220 V 230 V 380 V	A A A A A	10 10 10 6 5.6 4	10 10 10 6 5.6 4
	400 V 500 V 660 V 690 V	A A A A	3.6 2.5 2.5 	3.6 2.5 2.5 
DC load				
Rated operational current I <sub>e</sub> /DC-12				
• For rated operational voltage U <sub>e</sub>	24 V 60 V 110 V 125 V	A A A A	10 10 3.2 2.5	10 10 8 6
	220 V 440 V 600 V	A A A	0.9 0.33 0.22	2 0.6 0.4
Rated operational current I <sub>e</sub> /DC-13				
• For rated operational voltage U <sub>e</sub>	24 V 48 V 110 V 125 V	A A A A	10 5 1.14 0.98	10 5 2.4 2.1
	220 V 440 V 600 V	A A A	0.48 0.13 0.07	1.1 0.32 0.21

# 3TC contactors for switching DC voltage, 1-pole and 2-pole

Туре			3TC74	3TC78
Design			1-pole contactors	2-pole contactors
General data				
Permissible mounting position			22,5°,22,5° 22,5°,22,5° g	
The contactors are designed for operation on a vertical mounting surface.				
Mechanical endurance		Oper- ating cycles	30 million	
Electrical endurance			See page 2/73	
Rated insulation voltage U <sub>i</sub> (pollution degree 3)		V	1 500	
Rated impulse withstand voltage U <sub>imp</sub>		kV	8	
Protective separation between the coil and the main contacts according to IEC 60947-1, Appendix N		V	630	
Permissible ambient temperature		°C	-25 +55	
Degree of protection acc. to IEC 60529				
<ul> <li>Connecting terminals</li> </ul>			IP00	
Touch protection acc. to IEC 60529			Finger-safe with terminal covers	
Rated data of the main contacts				
Load rating with DC				
Utilization category DC-1, switching resistive loads (L/R $\leq$ 1	ms)			
<ul> <li>Rated operational current I<sub>e</sub>/DC-1 (at 55 °C)</li> </ul>		А	500	
<ul> <li>Minimum conductor cross-section</li> </ul>		mm <sup>2</sup>	2 x 150	
<ul> <li>Rated power</li> <li>(≤ 750 V DC: one conducting path,</li> <li>&gt; 750 V DC: two conducting paths in series)</li> </ul>	At 220 V 440 V 600 V	kW kW kW	110 220 300	
	750 V 1 200 V 1 500 V	kW kW kW	375  	600 750
Critical currents, without arc extinction	At 440 V 600 V 750 V	A A A	≤ 7 ≤ 13 ≤ 15	
	≤ 800 V 1 200 V 1 500 V	A A A		≤ 7 ≤ 13 ≤ 15
Utilization categories DC-3 and DC-5, shunt-wound and series-wound motors ( $L/R \le 15$ ms)				
<ul> <li>Rated operational current I<sub>e</sub> (at 55 °C)</li> </ul>		А	400	
<ul> <li>Rated power at U<sub>e</sub></li> <li>(≤ 220 V DC: one conducting path,</li> <li>&gt; 220 V DC: two conducting paths in series)</li> </ul>	At 110 V 220 V 440 V 600 V 750 V 1 200 V 1 500 V	kW kW kW kW kW kW	35 70 140 200 250 	400 500
Permissible rated current for regenerative braking at 110 600 V		А	400	

Rated data of the auxiliary contacts, see page 2/75.

# 3TC contactors for switching DC voltage, 1-pole and 2-pole



 $^{3)}$  Upper operating range limit at 230 V AC: 1.14 x  $U_{\rm s}.$ 

# 3TC contactors for switching DC voltage, 1-pole and 2-pole

# Options

# Rated control supply voltages, possible on request (change of the 10th and 11th digits of the Article No.)

Delivery time on request

Rated control supply voltage $U_{\rm s}$	Contactor type	3TC44	3TC48	3TC52/3TC56	3TC74/3TC78
DC operation					
24 V DC		B4	B4	B4	B
48 V DC		W4	W4		
60 V DC		E4	E4		
110 V DC		F4	F4	F4	F
125 V DC		G4	G4		
220 V DC		M4	M4	M4	M

 $^{1)}$  Operating range at 220 V AC: 0.85 to 1.15  $\times$   $U_{\rm S};$  lower operating range limit according to IEC 60947.

<sup>2)</sup> Upper operating range limit at 230 V AC:  $1.14 \times U_{\rm s}$ .

Accessories												
	For contac	otors	Versior Auxilia contac	n ry ts	Auxiliary switch Left	block Right	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			ł	7				Article No.				
	Size	Туре	NO	NC			d					kg
Second auxili	iary switc	h blocks (	for AC	opera	tion only)							
	4	3TC48	2nd au 1	ixiliary s 1	witch block, left		20	3TY6501-1K	1	1 unit	41B	0.047
			2nd au 1	ixiliary s 1	is4 l62 witch block, right	171 183	20	3TY6501-1L	1	1 unit	41B	0.042
						₹ 72  84						
	8 and 12	3TC52, 3TC56	2nd au 1	ixiliary s 1	witch block, left		20	3TY6561-1K	1	1 unit	41B	0.085
			2nd au 1	ixiliary s 1	witch block, right 	71  83   <b>4</b>    72  84	20	3TY6561-1L	1	1 unit	41B	0.081
Solid-state co	ompatible	auxiliary	switch	block	S							
5TY7561-1.	2 and 4	3TC44, 3TC48	For op- solid-s I <sub>e</sub> /AC- <sup>-</sup> 2nd au (replac 1 CO c	eration i tate circ 14 and I uxiliary s cement f contact	n dusty atmosphe puits with rated op DC-13 from 1 30 witch block, left o for 3TY6561-1U, 3	ores and in erational currents 20 mA at 3 60 V r right TY6561-1V) 61 62 64	5	3TY7561-1UA00	1	1 unit	41B	0.055

# 3TC contactors for switching DC voltage, 1-pole and 2-pole

	For contac	tors	Version	Rated contr voltage U <sub>s</sub>	ol supply	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Size	Туре		V AC	V DC	d					kg
Surge suppressors	s · Varistor 2	rs 3TC44 <sup>1)</sup>	Varistors <sup>2)</sup> 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 	2 2 2 20 20	3TX7402-3G 3TX7402-3H 3TX7402-3J 3TX7402-3K 3TX7402-3I	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B 41B	0.014 0.015 0.015 0.023 0.023
3TX7402-3.	4	3TC48	Varistors <sup>2)</sup> 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  	2 5 2 5 5 5	3TX7462-3G 3TX7462-3H 3TX7462-3J 3TX7462-3K 3TX7462-3L	1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B 41B	0.014 0.014 0.015 0.016 0.016
	8 and 12	3TC52, 3TC56	Varistors For sticking onto the contactor base or for mounting separately	24 48 48 127 127 240 240 400 400 600	   	2 5 2 5 5	3TX7462-3G 3TX7462-3H 3TX7462-3J 3TX7462-3K 3TX7462-3L	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B 41B	0.014 0.014 0.015 0.016 0.016
3TX7462-3.	8 and 12	3TC52, 3TC56	Varistors <sup>2</sup> ) For separate screw fixing or snapping onto TH 35 standard mounting rail		24 70 70 150 150 250	5 5 5	3TX7522-3G 3TX7522-3H 3TX7522-3J	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	0.090 0.072 0.089
Surge suppressor	s · RC elen	nents				-					
	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	20 5 2 5 2 5 2 5 2 5 2 5	3TX7462-3R 3TX7522-3R 3TX7462-3S 3TX7522-3S 3TX7462-3T 3TX7522-3T 3TX7462-3U 3TX7462-3U 3TX7462-3V	1 1 1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B 41B 41B 41B 41B	0.084 0.085 0.088 0.090 0.091 0.089 0.095 0.089
3TX7462-3., 3TX7522-3.	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	   	5 5 5 5 5	3TX7522-3R 3TX7522-3S 3TX7522-3T 3TX7522-3U 3TX7522-3V	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B 41B	0.085 0.090 0.089 0.088 0.084
3TX7462-3.	4 to 12	3TC48, 3TC52, 3TC56	Diode assemblies <sup>3)</sup> (Diode and Zener diode) for DC solenoid system, for sticking onto the contactor base or for mounting separately		24 250	2	3TX7462-3D	1	1 unit	41B	0.014
<ol> <li>The connection piece slightly.</li> </ol>	e for mountir	ng the su	rge suppressor must be	e bent	<ol> <li><sup>2)</sup> Include</li> <li><sup>3)</sup> Not for</li> </ol>	s the DC ec	peak value of the alternating vo conomy circuit.	oltage or	the DC	side.	
Fo	r contactors	Ve	rsion			SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Siz	е Тур	e				d		,			kg

3TX6526-3B

# 3TC contactors for switching DC voltage, 1-pole and 2-pole

# Spare parts

	For contac	otors	Version	Auxi cont	liary acts	Auxiliary swi Left	tch block Right	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				$\langle  $	4				Article No.				
	Size	Туре		I NO	I NC			d					ka
Auxiliary s	witch blo	cks											
M	For latera	l mountii	ng										
	2 and 4	3TC44, 3TC48	Auxiliary switch block (replacement for 3TY6 501- 1A/-1B)	1	1	13 21 7 14 22	31  43 <b>4</b> 32  44	20	3TY6501-1AA00	1	1 unit	41B	0.055
	8 and 12	3TC52, 3TC56	Auxiliary switch block, left	1	1			20	3TY6561-1A	1	1 unit	41B	0.081
3TY6561-1A			Auxiliary switch block, right	1	1		31 43 • 32 44	20	3TY6561-1B	1	1 unit	41B	0.081
	12	3TC74	Auxiliary switch block	4	4	13 21 31 43 	53 61 71 83 	5	3TY2741-2J	1	1 unit	41B	0.271
	12	3TC78	Auxiliary switch block, left	2	2	13 21 31 43 \		20	3TY2781-2C	1	1 unit	41B	0.193
			Auxiliary switch block, right	2	2		53]61]71]83 	15	3TY2781-2D	1	1 unit	41B	0.179
	For contac	otors	Version			Rated controver voltage $U_s$	l supply	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
-		Туре				V AC/DC		d					kg
Surge sup	oressors	Varisto	ors			0.1		45	ATV0740.05			44.0	0.010
	12	3107	For sticking on contactor base	to the		24 110		15 10	31X2746-2F 3TX2746-2G	1	1 unit 1 unit	41B 41B	0.012 0.050
	For contac	otors	Version					SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Size	Туре						d					kg
Solenoid c	oils												
	2 4 8 12	3TC44 3TC48 3TC52 3TC56 ation <sup>1</sup> )							3TY6443-0B 3TY6483-0B 3TY6523-0B 3TY6563-0B				
	2 4 8 12	3TC44 3TC48 3TC52 3TC56							3TY7403-0A 3TY6483-0A 3TY6523-0A 3TY6566-0A				
Contacts w	vith fixing	parts	a such as full						l				
and the second s	only origin	nal replac	peration of the c	shou	ld be i	used.							
3TY2520-0A	2 4 8 12	3TC44 3TC48 3TC52 3TC56	(1 set = 2 movi	ng an	d 4 fix	ed switching e	lements)	5 5 5 5	3TY2440-0A 3TY2480-0A 3TY2520-0A 3TY2560-0A	1 1 1	1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B	0.065 0.102 0.233 0.421
	12	3TC7	Main contacts	(1 set) nits re	auired	per contactor		5	3TY2740-0E	1	1 unit	41B	0.357
Arc chutes			, 0, 01070. 2 U	1110 10	quireu								
	2 4 8 12	3TC44 3TC48 3TC52 3TC56	Arc chutes, 2-p	ole				15 15 15 15	3TY2442-0A 3TY2482-0A 3TY2522-0A 3TY2562-0A	1 1 1	1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B	0.160 0.470 1.100 2.080
3TY2482-0A	ı≥ ontrol suppl	v voltage	ror 31078:20	nits re	quired	i per contactor	The 10	15 th and	11th digits of the article num	ber must	i unit be supi	4 IB	3.856

# Switching Devices – Contactors and Contactor Assemblies

Contactor Relays and Relays

Introduction

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More information	
Home page, see siemens.com/railway-components	Industry Mall, see www.siemens.com/product?3RH_3TH
Catalog IC 10, see www.siemens.com/ic10	Conversion tool, see www.siemens.com/sirius/conversion-tool
Home page, see www.siemens.com/sirius	

## The advantages at a glance







3TH43 Page

Size S00 Type 3RH21	3TH42
	Article No.

SIRIUS 3RH2 contactor re	elays		
4-pole	<ul> <li>Screw or spring-type terminals</li> </ul>	3RH21	2/88
8-pole		3RH22	2/88
4-pole, latched		3RH24	2/88
Coupling contactor relays	<ul> <li>Coils for control by PLC</li> </ul>	3RH21	2/89
Contactor relays for railway applications	Coils with extended voltage range	3RH21	
3TH4 contactor relays			
8-pole	Screw terminals	3TH42	2/94
10-pole		3TH43	2/95
Contactor relays for railway applications	Coils with extended voltage range	3TH42	
Accessories for SIRIUS 3	RH2 contactor relays		
Auxiliary switch blocks	On front	3RH29	2/52
	Lateral	3RH29	2/56
Surge suppressors	On front	3RT2916	
Additional load module	On front	3RT2916	

## Note:

Safety characteristics for contactors, see www.siemens.com/ic10, Chapter 16 "Standards and approvals".

Accessories for SIRIUS 3RH2 contactor relays, see www.siemens.com/ic10 Chapter 3

# Switching Devices – Contactors and Contactor Assemblies Contactor Relays and Relays

# Introduction

# The advantages at a glance





Туре	3RQ3		3RS18
		Article No.	Page
SIRIUS 3RQ3 coupling relays,	narrow design		
Coupling relays with relay output (not plug-in)	<ul> <li>Width 6.2 mm, 1 CO, versions with hard gold-plated contacts optionally available</li> <li>Output coupling links</li> <li>Input coupling links</li> </ul>	3RQ301 3RQ303	2/104 2/104
Coupling relays with plug-in relays	<ul> <li>Width 6.2 mm, 1 CO, versions with hard gold-plated contacts optionally available</li> <li>Output coupling links</li> </ul>	3RQ311	2/104
Coupling relays with semiconductor output (not plug-in)	<ul> <li>Width 6.2 mm, output 1 semiconductor, triac or transistor</li> <li>Output coupling links</li> <li>Input coupling links</li> </ul>	3RQ305, 3RQ306 3RQ307	2/104 2/104

# Overview

Contactor relays Size S00 with accessories



- 9 2-pole auxiliary switch block, solid-state compatible version (terminal designations according to EN 50005)
- For increasing the permissible residual current

# **Contactor Relays**

# SIRIUS 3RH2 contactor relays, 4-pole and 8-pole

# Standards

IEC 60947-1, EN 60947-1, IEC 60947-4-1, EN 60947-4-1, IEC 60947-5-1, EN 60947-5-1

The 3RH2 contactor relays are available with screw or springtype terminals. The basic unit contains four contacts with terminal designations according to EN 50011.

The 3RH2 contactor relays are suitable for use in any climate. They are finger-safe according to IEC 60529.

The 3RH21 coupling contactor relays for switching auxiliary circuits are tailored to the special requirements of working with electronic controls.

# Contact reliability

High contact stability at low voltages and currents, suitable for solid-state circuits with currents  $\geq$  1 mA at a voltage of  $\geq$  17 V.

# Surge suppression

RC elements, varistors, diodes or diode assemblies (combination of a diode and a Zener diode) can be plugged onto all 3RH2 contactor relays from the front for damping opening surges in the coil. The plug-in direction is determined by a coding device.

Coupling contactor relays have a low power consumption and an extended solenoid coil operating range.

Depending on the version, the solenoid coils of the coupling contactor relays are supplied without overvoltage damping (versions 3RH21..-.HB40 or 3RH21..-.MB40-0KT0) or with a diode or suppressor diode connected as standard.

## Accessories

The accessories for the 3RT2 contactors in size S00 can also be used for the 3RH2 contactor relays (see from page 2/44 onwards).

#### Auxiliary switch blocks

The 3RH21 contactor relays (with the exception of coupling contactor relays) can be expanded by up to four contacts by the addition of mounted auxiliary switch blocks.

The auxiliary switch block can easily be snapped onto the front of the contactor relays. The auxiliary switch block has a centrally positioned release lever for disassembly.

The conventional front auxiliary contacts fulfill the characteristics of positively driven operation and are therefore suitable for safety applications.

#### Article No. scheme

	Article number	
	3RH2 🗆 🗆 🗕 🗆 🗆 🗆 🗛 –	
e.g. 1 = 4-pole motor contactor		
e.g. 2 = 2 NO		
e.g. 2 = 2 NC		
Screw terminals	1	
Spring-type terminals	2	
e.g. A = AC standard/without coil circuit		
e.g. P0 = 50/60 Hz 230 V AC		
	3RH2 1 2 2 - 1 A P 0 0	
	e.g. 1 = 4-pole motor contactor e.g. 2 = 2 NO e.g. 2 = 2 NC Screw terminals Spring-type terminals e.g. A = AC standard/without coil circuit e.g. P0 = 50/60 Hz 230 V AC	Article number         3RH2       -       -       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       -       0       0       -       0       0       -       0       0       -       0       0       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.
### SIRIUS 3RH2 contactor relays, 4-pole and 8-pole

<ul> <li>Manuals, see</li> <li>System Manual "SIRIUS – System Overview", https://support.industry.siemens.com/cs/de/en/view/60311318</li> <li>Manual "SIRIUS – SIRIUS 3RT Contactors/Contactor Assemblies", https://support.industry.siemens.com/cs/de/en/view/60306557</li> </ul>
Contactor relays 3RH2 S00
360° 22,5° 22,5° 22,5° 22,5° 22,5° 3
NSB0_00477a Special version required with the exception of 3RH21*X* and 3RT201*X*
Explanations: There is positively-driven operation if it is ensured that the NC and NO contacts cannot be closed at the same time. <b>ZH1/457</b> Safety Bules for Controls on Power-Operated Metalworking Presses
<b>IEC 60947-5-1, Appendix L</b> Low-voltage switchgear and controlgear, control circuit devices and switching elements; special requirements for positively-driven contacts
Frequency of contact faults <10 <sup>-8</sup> , i.e. < 1 fault per 100 million operating
30 Basic unit
Basic unit with attachable DC-13 DC-
0,5 0,1 0,05 0,01 0,01 0,05 0,01 0,05 0,01 0,05 0,01 0,05 0,01 0,05 0,05 0,05 0,05 0,05 0,1 0,05 0,0

<sup>1)</sup> 3RH22, 3RH2911:  $I_{e} = 6$  A for AC-15/AC-14 and DC-13.

2

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

### SIRIUS 3RH2 contactor relays, 4-pole and 8-pole

		Contactor relays		
Туре		3RH21	3RH22	3RH24
Size		S00		
General data				
Mechanical endurance				
Basic units	Operat- ing cycles	30 million		5 million
Basic unit with mounted auxiliary switch block	Operat- ing cycles	10 million		5 million
Solid-state compatible auxiliary switch block	Operat- ing cycles	5 million		
Rated insulation voltage U <sub>i</sub> (pollution degree 3)	V	690		
Rated impulse withstand voltage Uimp	kV	6		
Protective separation between coil and contacts in the basic unit, according 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 60529				
On front		IP20 (screw terminals ar	nd spring-type terminals)	
Connecting terminal		IP20 (screw terminals an	nd spring-type terminals)	
Touch protection acc. to IEC 60529		Finger-safe (screw termi	nals and spring-type terr	ninals)
Shock resistance				
Rectangular pulse				
- AC operation	<i>g</i> /ms	7.3/5 and 4.7/10		
- DC operation	<i>g</i> /ms	10/5 and 5/10		
• Sine pulse				
- AC operation	<i>g</i> /ms	11.4/5 and 7.3/10		
- DC operation	<i>g</i> /ms	15/5 and 8/10		

SIRIUS 3RH2 contactor relays, 4-pole and 8-pole

Turne			Contactor relays
iype Size			экп2 900
Pated data of the auxiliary contacts			500
Load rating with AC			
AC 12		^	10
AC-12		A	10
AC-13/AC-14 for fated operational voltage 0 <sub>8</sub>	Up to 230 V 400 V 500 V	A A A	10 <sup>1)</sup> 3 2
	690 V	A	1
Load rating with DC			
Rated operational currents <i>I</i> e			
DC-12 for rated operational voltage $U_{\rm s}$			
<ul> <li>1 conducting path</li> </ul>	24 V	А	10
	60 V 110 V	A A	6
	220 V	A	1
	440 V	A	0.3
• 2 conducting naths in series	24 V	Δ	10
· 2 conducting pairs in series	60 V	Â	10
	110 V	A	4
	220 V 440 V	A A	2
	600 V	A	0.65
<ul> <li>3 conducting paths in series</li> </ul>	24 V	А	10
	60 V 110 V	A	10
	220 V	A	3.6
	440 V	A	2.5
DC-13 for rated operational voltage //-	000 V	A	1.0
1 conducting path	24 V	А	10 <sup>1)</sup>
	60 V	A	2
	110 V	A	1
	220 V 440 V	A	0.14
	600 V	А	0.1
<ul> <li>2 conducting paths in series</li> </ul>	24 V	A	10
	60 V 110 V	A A	3.5
	220 V	A	0.9
	440 V	A	0.2
• 2 conducting paths in sories	V UU0	A	10
<ul> <li>s conducting paths in series</li> </ul>	24 V 60 V	A	4.7
	110 V	A	3
	220 V 440 V	A A	1.2
	600 V	A	0.26

### Selection and ordering data

### DC operation

PU (UNIT, SET, M)	=	1	
PS*	=	1	unit
PG	=	4	1A



3RH2422-1X.40

Rated operational current <i>I<sub>e</sub></i> /AC-15/AC-14 at <b>230 V</b>	Conta Ident No.	icts Vers	sion	Rated control supply voltage $U_{\rm S}$	SD	Screw terminals	SD	Spring-type O terminals	Weight per PU approx.
		ł	ŀ			Article No.		Article No.	
A		NO	NC	V DC	d		d		kg
For screw fixing and sn mounting rail	ap-on	mo	unti	ng onto TH 35 standard					
Latched						-			-
Terminal designations accor	rding to	EN	5001	1					
10	22E	2	2	24	5	3RH2422-1XB40-0LA2			0.584
				110	5	3RH2422-1XF40-0LA2		-	0.584
Other voltages on reque	est.								

Accessories, see page 2/44 onwards.

### DC operation for direct control from the PLC

- Coupling contactor relays with adapted power consumption
  Suitable for solid-state PLC outputs
- · Cannot be expanded with auxiliary switch blocks



### SIRIUS 3RH2 contactor relays, 4-pole and 8-pole

### DC operation for direct control from the PLC

- Coupling contactor relays with adapted power consumption
- Suitable for solid-state PLC outputs
- Cannot be expanded with auxiliary switch blocks



Other voltages on request.

Accessories, see page 2/44 onwards.

### Overview

### Standards

IEC 60947-1, EN 60947-1, IEC 60947-5-1, EN 60947-5-1

The 3TH42 and 3TH43 contactor relays are suitable for use in any climate. They are finger-safe according to IEC 60529.

Note:

The 3TH42 and 3TH43 contactor relays feature positively-driven operation in accordance with IEC 60947-5-1, Ed. 3.1.

#### Terminal designations according to EN 50011

In terms of their terminal designations, identification numbers and identification letters, the 3TH42 and 3TH43 contactor relays conform to the standard EN 50011 for particular contactor relays.

#### **Contact reliability**

High contact stability at low voltages and currents as a result of double-break contacts, suitable for solid-state circuits with currents  $\geq$  1 mA at a voltage of  $\geq$  17 V.

### Technical specifications

### Contactor relays 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.

RC elements or freewheel diodes are suitable as protective measures for the circuits.

#### Surge suppression

The 3TH42 and 3TH43 contactor relays can be equipped with RC elements, varistors, diodes or diode assemblies (combination of a diode and a Zener diode) for damping opening surges. The surge suppressors can be mounted directly on the coil (see page 2/97).

#### Note:

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, varistor +2 to 5 ms).

#### Mounting

### Note:

With 3TH4 contactor relays with AC operation, an overvoltage of 1.1 x  $U_s$ , an ambient temperature  $\geq$  45 °C and 100% ON-period of all contactors, a minimum clearance of 5 mm between the contactors shall be observed in the case of side-by-side mounting.



3TH4 contactor relays, 8-pole and 10-pole

Contactor relays		Туре	3TH42	3TH43
General data				
Permissible mounting position				
The contactor relays are designed for operation on a vertical mounting surface.				
AC operation			360° 22,5° 22,5° 22,5° 30,100° 085N	
DC operation			90° ++++ 90° + 22.5° +22.5° 8° 8° 8° 8° 8° 8° 8° 8° 8° 8° 8° 8° 8°	
Upright mounting position				
AC and DC operation			NSB0_00477a Special version required	I
Mechanical endurance	Basic units	Operat- ing cycles	30 million	
Rated insulation voltage U <sub>i</sub> (pollution degree 3)		V	690	
Rated impulse withstand voltage Uimp		kV	8	
Protective separation between the coil and the main co According to IEC 60947-1, Appendix N	ntacts	V	Up to 500	
Permissible ambient temperature				
During operation		°C	-25 +55	
During storage		°C	-55 +80	
Degree of protection acc. to IEC 60529				
On front			IP20 (with screw terminals)	
<ul> <li>Connecting terminal</li> </ul>			IP20 (with screw terminals)	
Touch protection acc. to IEC 60529			Finger-safe (for screw terminals)	
Shock resistance				
<ul> <li>Rectangular pulse</li> </ul>				
- AC operation - DC operation		<i>g</i> /ms <i>g</i> /ms	7.7/5 and 4.4/10 9.3/5 and 5.4/10	
Sine pulse				
- AC operation - DC operation		<i>g</i> /ms <i>g</i> /ms	12/5 and 6.8/10 14.7/5 and 8.5/10	

### 3TH4 contactor relays, 8-pole and 10-pole

Contactor relays	Туре		3TH42, 3TH43
Rated data of the auxiliary contacts			
Load rating with AC			•
Rated operational currents I <sub>e</sub>			
• AC-12		А	16
AC-15/AC-14, for rated operational voltage U <sub>e</sub>			
	230 V	А	10
	400 V	A	6
	690 V	A	2
Rated power of three-phase motors			
According to utilization categories AC-2 and AC-3, 50 Hz			
	230/220 V	kW	2.4
	400/380 V 500 V	kW	4
	690/660 V	kW	4
Load rating with DC			
Rated operational currents <i>I</i> <sub>e</sub>			
DC-12, for rated operational voltage $U_{\rm e}$			
<ul> <li>1 conducting path</li> </ul>			
	Up to 48 V	A	10
	220 V	A	0.8
	440 V	А	0.6
<ul> <li>2 conducting paths in series</li> </ul>			
	Up to 48 V	A	10
	110 V 220 V	A A	10
	440 V	A	0.8
<ul> <li>3 conducting paths in series</li> </ul>			
	Up to 48 V	A	10
	110 V 220 V	A A	10
	440 V	A	1.3
DC-13, for rated operational voltage $U_{\rm e}$			
<ul> <li>1 conducting path</li> </ul>			
	Up to 24 V	A	10
	48 V 110 V	A A	5
	220 V	A	0.45
	440 V	A	0.25
• 2 conducting paths in series	000 V	A	0.2
2 conducting paths in somes	Up to 24 V	А	10
	48 V	A	10
	110 V	A	2.5
	220 V 440 V	A	0.5
	600 V	А	0.4
<ul> <li>3 conducting paths in series</li> </ul>			
	Up to 24 V	A	10
	48 V 110 V	A	10
	220 V	A	2
	440 V 600 V	A A	0.9

### Selection and ordering data

### 8-pole contactor relays



 $^{1)}$  Operating range at 220 V: 0.85 to 1.1 x  $U_{\rm g};$  lower operating range limit according to IEC 60947.

### Note:

The solenoid coils of the 3TH42 contactor relays are available in various voltages as spare parts (on request).

- AC operation: 3TY7403-0A..

- DC operation: 3TY4803-0B..

The contacts cannot be replaced on 3TH42 contactor relays.

Other voltages according to page 2/96 on request. Accessories, see page 2/97.



#### Note:

The solenoid coils of the 3TH43 contactor relays are available in various voltages as spare parts (on request).

- AC operation: 3TY7403-0A..

- DC operation: 3TY4803-0B..

The contacts cannot be replaced on 3TH43 contactor relays.

### 3TH4 contactor relays, 8-pole and 10-pole

### Options

### Rated control supply voltages, possible on request (change of the 10th and 11th digits of the Article No.)

Delivery time on request

	Contactor type	3TH42/3TH43		Contactor type	3TH42
Rated control supply voltage $U_{\rm s}$	Control supply voltage at		Rated control supply voltage $U_{\rm s}$		
AC operation			DC operation		
Solenoid coils for 50 H	Iz AC		12 V DC		A4
50 Hz	60 Hz		24 V DC		B4
24 V AC 36 V AC 42 V AC	29 V AC 42 V AC 50 V AC	B0 G0 D0	36 V DC 36 V DC 42 V DC 48 V DC		V4 D4 W4
48 V AC 60 V AC 110 V AC	58 V AC 72 V AC 132 V AC	HO EO FO	60 V DC 110 V DC 125 V DC		E4 F4 G4
125/127 V AC 230/220 V AC 240 V AC	150/152 V AC 276 V AC 288 V AC	L0 P0 <sup>1)</sup> U0	220 V DC 230 V DC 240 V DC		M4 P4
400/380 V AC 415 V AC 500 V AC	480/460 V AC 500 V AC 600 V AC	V0 <sup>1)</sup> R0 S0	240 V DC		Q4
For Japan			<u>.</u>		
100 V AC 200 V AC	100 110 V AC 200 220 V AC	G6 <sup>2)</sup> N6 <sup>2)</sup>			
For USA and Canada					
110 V AC 220 V AC	120 V AC 240 V AC	K6 <sup>2)</sup> P6 <sup>2)</sup>			
Solenoid coils for 50 a	nd 60 Hz AC				
50/60 Hz					
24 V AC 42 V AC 110 V AC		C2 D2 G2			
115 V AC 120 V AC 220 V AC		J2 K2 N2			
230 V AC 240 V AC 440 V AC		L2 P2 R2			

 $^{\rm 1)}$  Operating range at 220 V or 380 V: 0.85 to 1.1 x  $U_{\rm s}.$ 

<sup>2)</sup> Operating range at 60 Hz: 0.85 to  $1.1 \times U_{\rm s}$ .

3TH4 Contactor Relays, 8-pole and 4-pole

Accessories for 3TH4 contactor relays

Selection and ord	ering data									
	Version		Rated contro U <sub>s</sub>	I supply voltage	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			AC V	DC	d					ka
Surge suppressor	s <sup>1)</sup> for 3TH4 cor Noise suppress With line spacer,	ntactor relays ion diodes		24 250	2	3TX7402-3A	1	1 unit	41B	0.014
	Diode assemblie (Diode and Zene spacer, DC operation,	r diode) with line		24 250	2	3TX7402-3D	1	1 unit	41B	0.015
517/402-5.	Varistors <sup>2)</sup> With line spacer, for mounting onto	o the coil terminal	24 48 48 127 127 240 240 400 400 600	24 70 70 150 150 250 	2 2 2 20 20	3TX7402-3G 3TX7402-3H 3TX7402-3J 3TX7402-3K 3TX7402-3L	1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B	0.014 0.015 0.015 0.023 0.023
	RC elements With line spacer, for mounting onto	o the coil terminal	24 48 48 127 127 240 240 400 400 600	24 70 70 150 150 250  	2 2 5 20	3TX7402-3R 3TX7402-3S 3TX7402-3T 3TX7402-3U 3TX7402-3V	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B 41B	0.025 0.024 0.021 0.024 0.024
<sup>1)</sup> The OFF-delay of th increased if the con (suppression diode varistor +2 to 5 ms).	<b>Covers</b> for switch e NO contact and t tactor coils are atte 6x to 10x; diode as	n position indicate the ON-delay of the nuated against v ssembly 2x to 6x,	or he NC contact ar roltage peaks	e <sup>2)</sup> Include	X es the	3TX4210-0P peak value of the alternating	1 voltage c	1 unit on the D	41B IC side	0.001
	For contactors	Version	Rated control supply voltage $U_{\rm s}$ 50/60 Hz AC	Time setting range (minimum times)	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Туре		V	S	d	Article No.				ka
<b>ON-delay devices</b>										
	21112									
3TX4180-0A	3TH42, 3TH43	NTC thermistors Time tolerance +100 %, -50 %	220 230	0.1	5	3TX4180-0A	1	1 unit	41B	0.012
3TX4180-0A Coupling links for	Control by PLC	NTC thermistors Time tolerance +100 %, -50 %	220 230 tactor relays	0.1	5	3TX4180-0A	1	1 unit	41B	0.012
3TX4180-0A Coupling links for	Control by PLC 3TH42, 3TH42, 3TH43	NTC thermistors Time tolerance +100 %, -50 % for 3TH4 conf Operating range Power consump • for direct mou - Without sur - With surge s	220 230 tactor relays e: 17 30 V DC otion: 0.5 W at 24 inting on the cont ge suppressor suppressor	0.1 V DC actor coil	5 15 2	3TX4180-0A 3TX4090-0C 3TX4090-0D	1	1 unit 1 unit 1 unit	41B 41B 41B	0.012
3TX4180-0A Coupling links for STX4090 Mounted on contactor	control by PLC 3TH42, 3TH42, 3TH42, 3TH43	NTC thermistors Time tolerance +100 %, -50 % for 3TH4 con Operating range Power consump • for direct mou - Without sur - With surge s	220 230 tactor relays e: 17 30 V DC otion: 0.5 W at 24 inting on the cont ge suppressor suppressor	V DC actor coil	5 15 2	3TX4180-0A 3TX4090-0C 3TX4090-0D	1	1 unit 1 unit 1 unit	41B 41B 41B	0.012 0.055 0.057
3TX4180-0A Coupling links for STX4090 Mounted on contactor	Control by PLC 3TH42, 3TH42, 3TH43 For contactors	NTC thermistors Time tolerance +100 %, -50 % for 3TH4 cont Operating range Power consump • for direct mou - Without sur - Without sur - With surges	220 230 tactor relays e: 17 30 V DC obtion: 0.5 W at 24 inting on the cont ge suppressor suppressor upply OFF-de (minim	0.1 V DC actor coil	5 15 2 SD	3TX4180-0A 3TX4090-0C 3TX4090-0D Screw terminals	1 1 1 (UNIT, SET, M)	1 unit 1 unit 1 unit PS*	41B 41B 41B 41B	0.012 0.055 0.057 Weight per PU approx.
3TX4180-0A Coupling links for Coupling links for STX4090 Mounted on contactor	Control by PLC 3TH42, 3TH42, 3TH43	NTC thermistors Time tolerance +100 %, -50 % for 3TH4 conf Operating range Power consump • for direct mou - Without sur - Without sur - With surges Rated control su voltage U <sub>s</sub>	220 230 tactor relays e: 17 30 V DC bition: 0.5 W at 24 inting on the cont ge suppressor suppressor upply OFF-de (minime)	0.1 V DC actor coil Play um times)	15 2 SD	3TX4180-0A 3TX4090-0C 3TX4090-0D Screw terminals	1 1 1 (UNIT, SET, M)	1 unit 1 unit 1 unit PS*	41B 41B 41B PG	0.012 0.055 0.057 Weight per PU approx.
3TX4180-0A Coupling links for STX4090 Mounted on contactor	Control by PLC 3TH42, 3TH42, 3TH43 For contactors	NTC thermistors         Time tolerance +100 %, -50 %         for 3TH4 cont         Operating range Power consump         • for direct mou         • Without sur         • Without sur         • With surge state         Sol/60 Hz       DC AC         V       V	220 230 tactor relays e: 17 30 V DC bion: 0.5 W at 24 inting on the cont rge suppressor suppressor upply OFF-de (minimus) S	0.1 V DC actor coil	5 15 2 SD	3TX4180-0A 3TX4090-0C 3TX4090-0D Screw terminals	1 1 1 (UNIT, SET, M)	1 unit 1 unit 1 unit PS*	41B 41B 41B 41B	0.012 0.055 0.057 Weight per PU approx. kg
3TX4180-0A Coupling links for Coupling links for STX4090 Mounted on contactor	Control by PLC 3TH42, 3TH42, 3TH43 For contactors	NTC thermistors         Time tolerance +100 %, -50 %         for 3TH4 conf         Operating range Power consump         of direct moutian - Without surges         of direct moutian         Without surges         With surges         So/60 Hz       DC AC V         V       V         With DC operation	220 230 tactor relays e: 17 30 V DC otion: 0.5 W at 24 inting on the cont ge suppressor suppressor upply OFF-de (minime s s ation	0.1 V DC actor coil	5 15 2 SD d	3TX4180-0A 3TX4090-0C 3TX4090-0D Screw terminals	1 1 1 (UNIT, SET, M)	1 unit 1 unit 1 unit PS*	41B 41B 41B PG	0.012 0.055 0.057 Weight per PU approx. kg
JTX4180-0A Coupling links for Coupling links for JTX4090 Mounted on contactor OFF-delay devices	STH42,         3TH42,         3TH42,         3TH42,         3TH42,         3TH42,         STH42,         STH43,	NTC thermistors         Time tolerance +100 %, -50 %         i for 3TH4 conf Operating range Power consump         • for direct mou         • for direct mou         • Without sur         • Without sur         • With surge s         \$0/60 Hz AC       DC AC         V       V         with DC operations u 110	220 230 tactor relays e: 17 30 V DC otion: 0.5 W at 24 inting on the cont ge suppressor suppressor upply OFF-de (minimu c) s ation p to 1.2 sec 0.15 or	0.1 V DC actor coil elay um times)	5 15 2 SD d	3TX4180-0A 3TX4090-0C 3TX4090-0D Screw terminals Article No. 3TX4701-0AN1	1 1 1 (UNIT, SET, M)	1 unit 1 unit 1 unit PS*	41B 41B 41B PG	0.012 0.055 0.057 Weight per PU approx. kg 0.168
STX4180-0A Coupling links for Coupling links for STX4090 Mounted on contactor OFF-delay devices	Control by PLC 3TH42, 3TH42, 3TH43 For contactors For contactors Bridging of voltag 3TH420BF4 3TH430BF4 3TH430BM4	NTC         thermistors         Time tolerance         +100 %, -50 %         if or 3TH4 conf         Operating range         Power consump         • for direct mou         • Without sur         • Without surge s         • Without surge s         • Soloto Hz       DC         AC       V         V       V         with DC operations u       110          220	220 230 tactor relays e: 17 30 V DC otion: 0.5 W at 24 inting on the cont ge suppressor suppressor upply OFF-de (minimustry) s ation p to 1.2 sec 0.15 or 0.6 or	0.1 V DC actor coil elay um times) 0.3 1.2	5 15 2 SD d 2 2 2	3TX4180-0A 3TX4090-0C 3TX4090-0D Screw terminals Article No. 3TX4701-0AN1 3TX4701-0AN1	1 1 1 (UNIT, SET, M) 1 1	1 unit 1 unit 1 unit PS*	41B 41B 41B PG 41B 41B	0.012 0.055 0.057 Weight per PU approx. kg 0.168 0.168
STX4180-0A Coupling links for STX4090 Mounted on contactor OFF-delay devices	Control by PLC 3TH42, 3TH43 3TH43 For contactors For contactors Bridging of voltag 3TH420BF4 3TH430BF4 3TH430BF4 3TH420BP4	NTC thermistors         Time tolerance +100 %, -50 %         for 3TH4 conf         Operating range Power consump         of or direct mou         • for direct mou         • Without sur         • Without sur         • Without surge state         50/60 Hz AC       DC AC         V       V         with DC oper         ge interruptions u         110          220          230	220 230         tactor relays         e: 17 30 V DC         otion: 0.5 W at 24         inting on the control         rge suppressor         supply       OFF-def         upply       OFF-def         y       S         ation       0.15 or         0.6 or       0.6 or	0.1 V DC actor coil elay um times) 0.3 1.2	5 15 2 SD d 2 2 2 2	3TX4180-0A 3TX4090-0C 3TX4090-0D Screw terminals Article No. 3TX4701-0AN1 3TX4701-0AN1 3TX4701-0AN1	1 1 1 (UNIT, SET, M) 1 1 1	1 unit 1 unit 1 unit PS* 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B 41B 41B	0.012 0.055 0.057 Weight per PU approx. kg 0.168 0.168 0.168

3TX4701-0AN1

### SIRIUS 3RQ3 coupling relays, narrow design

### 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 60947-5-1, EN 60947-5-1

The input and output coupling relays differ with regard to the positioning of the terminals and the LEDs.

### Coupling relays with plug-in relays

#### AC and DC operation

IEC 60947-1

The coupling relays are plug-in, so the relay can be replaced quickly at the end of its service life without detaching the wiring.

### Coupling relays with semiconductor output (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.

### SIRIUS 3RQ3 coupling relays, narrow design

### Article No. scheme

Product versions		Article numbe	er		
Coupling relays with relay of	output (not plug-in)	3RQ30 🗆 8 –		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			В	
	115 V AC/DC			E	
	230 V AC/DC			F	
Material of switching	e.g.				
contacts	0 = AgSnO2				
	1 = AgSnO2 hard gold-plated				
Example		3RQ30 1 8 -	1 A	B 0	1
Product versions		Article numbe	er		

Coupling relays with relay	y output (not plug-in)	3RQ30 1 8 - 2 A 🗆 0 8 - 0 A A 0
Railway version with extend	ded operating range 0.7 1.2 x $U_{\rm s}$	
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	on Screw terminals	1
	Spring-type terminals (push-in)	2
Control supply voltage	24 V AC/DC	В
	115 V AC/DC	E
	230 V AC/DC	F
	24 V DC	м
Material of switching	AgSnO2	0
contacts	AgSnO2 hard gold-plated	1
Example		3RQ31 1 8 - 1 A B 0 1

Product versions		Article number								
Coupling relays with semic	onductor output (not plug-in)	3RQ30 🗆 🗆 –		1 S						
	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 -		ß	M 5 0	11 30 V DC	10 60 V DC			
	5 mA 2 A	3RQ30 5 2 -		ı s	6 M 3 0	11 30 V DC	10 30 V DC			
	1 mA 2 A	3RQ30 5 2 -		l S	6 M 4 0	11 30 V DC	10 60 V DC			
	5 mA 2 A	3RQ30 5 2 -		ı s	6 M 5 0	11 30 V DC	20 264 V AC			
	1 mA 3 A	3RQ30 5 3 -		1 S	G 3 0	110 230 V AC/DC	10 30 V DC			
	5 mA 5 A	$3RQ30\ 5\ 5$ –		1 S	6 M 3 0	11 30 V DC	10 30 V DC			
<ul> <li>With manual/automatic switch</li> </ul>	5 mA 5 A	3RQ30 6 5 -		ß	6 M 3 0	11 30 V DC	10 30 V DC			
Input coupler	10 mA 0.5 A	3RQ3070 -		1 S	B 3 0	11 30 V AC/DC	10 30 V DC			
		3RQ3070 -		ı 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:

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 3RQ3 coupling relays, narrow design

### Benefits

#### General

- All versions with screw or spring-type terminals (push-in technology)
- TOP wiring with spring-type terminals (push-in) for quick and reliable wiring
- Reduced space requirement in the control cabinet thanks to a consistent width of 6.2 mm
- Reduced inventory due to fewer variants
- Clearly visible functional state of the coupling relay by green LED
- Integrated reverse polarity protection and EMC arc-suppression diode
- Standardized accessories across the entire 3RQ3 series
- Universal bridging option using connecting combs for all terminals
- Galvanic isolation plate for isolating different voltages for neighboring units
- Clip-on labels available as set for individual labeling

#### Coupling relays with relay output (not plug-in)

- · Permanently soldered relays for enhanced contact reliability
- Device variants with hard gold-plated contacts, hence high contact reliability at low currents

#### Coupling relays with plug-in relays

- · Fast replacement of the relays with existing wiring
- Tested complete units  $\rightarrow$  lower assembly time
- Individual relays available as spare parts
- Device variants with hard gold-plated contacts, hence high contact reliability at low currents

#### Coupling relays with semiconductor output (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

SIRIUS 3RQ3 coupling relays, narrow design

### 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:									
Insulation voltage for overvoltage category III 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							
IP degree of protection		IP20							
Version of the fuse link required for short-circuit protection of the auxiliary switch		Fuse gG: 4	4 A						
Operational current of the auxiliary contacts									
• At AC-15 - At 24 V - At 250 V	A A	3 3							
<ul> <li>At DC-13</li> <li>At 24 V</li> <li>At 125 V</li> <li>At 250 V</li> </ul>	A A A	1 0.2 0.1							
Contact reliability of the auxiliary contacts		17 V,	5 V,	17 V, 1	5 V,	17 V, 1	5 V,	17 V,	
(one contact failure per 100 million)		1 mA	1 mA	mA	1 mA	mA	1 mA	1 mA	
Mechanical endurance (operating cycles) typical		10 000 00	C						
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 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	А	6							

### SIRIUS 3RQ3 coupling relays, narrow design

### 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:									
Insulation voltage for overvoltage category III 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									
<ul> <li>During operation</li> </ul>	°C	-25 +60							
During storage	°C	-40 +85							
IP 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									
<ul> <li>At AC-15</li> <li>At 24 V</li> <li>At 250 V</li> </ul>	A A	3 3							
<ul> <li>At DC-13</li> <li>At 24 V</li> <li>At 125 V</li> <li>At 250 V</li> </ul>	A A A	1 0.2 0.1							
Contact reliability of the auxiliary contacts		17 V,	5 V,						
(one contact failure per 100 million)		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 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	А	6							

SIRIUS 3RQ3 coupling relays, narrow design

### Coupling relays with semiconductor output (not plug-in)

Article number	3RQ3050- .SM50	3RQ3052- .SM30	3RQ3052- .SM40	3RQ3052- .SM50	3RQ3053- .SG30	3RQ30.5- .SM30	3RQ3070- .SB30	3RQ3070- .SG30
General technical specifications:								
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3	50 V			300 V		50 V		
Ambient temperature								
During operation	-25 +60 °C							
During storage	-40 +85 °C							
IP degree of protection	IP20							
Switching voltage of the semiconductor output								
• At AC				20 264 V				
• At DC	10 60 V	10 30 V	10 60 V		10 30 V			
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					11		1 1	
• At DC	11							
Active power input	0.3 W			0.25 W	0.3 W		0.5 W	
Thermal current	0.5 A	2 A			3 A	5 A	0.5 A	
Article number	3RQ31			:	3RQ32			
Type of electrical connection	□ Screw te	erminals			O Spring-	type termina	ls (push-in)	

Screw terminals	Spring-type terminals (push-in)
1x (0.25 2.5) mm <sup>2</sup>	
	1x (0.25 2.5) mm <sup>2</sup>
1x (0.25 1.5) mm <sup>2</sup>	
1x (20 14)	
	 1x (0.25 2.5) mm <sup>2</sup>  1x (0.25 1.5) mm <sup>2</sup> 1x (20 14)

### Selection and ordering data

	Type of voltage	Control at AC at 50 Hz	supply vo at 60 Hz	ltage at DC	Number of CO contacts for auxiliary contacts	Material of switching contacts	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		V	V	V			d					kg
Coupling	g relays	with re	lay outp	ut (not	plug-in)							
-	Output	t couplii	ng links									
e a la l	AC/DC	24	24	24	1	AgSnO2		3RQ3018-□AB00	1	5 units	41H	0.035
A						AgSnO2 hard gold-plated		3RQ3018-□AB01	1	5 units	41H	0.035
		115	115	115	1	AgSnO2		3RQ3018-□AE00	1	5 units	41H	0.036
		230	230	230	1	AgSnO2		3RQ3018-□AF00	1	5 units	41H	0.036
1 2	DC			24	1	AgSnO2	2	3RQ3018-2AM08-0AA0	1	5 units	41H	0.033
				110	1	AgSnO2	2	3RQ3018-2AN08-0AA0	1	5 units	41H	0.033
	Input c	oupling	links									
3RQ30.8- 2	AC/DC	24	24	24	1	AgSnO2		3RQ3038-□AB00	1	5 units	41H	0.035
۵						AgSnO2 hard gold-plated		3RQ3038-□AB01	1	5 units	41H	0.035
		115	115	115	1	AgSnO2		3RQ3038-□AE00	1	5 units	41H	0.035
						AgSnO2 hard gold-plated		3RQ3038-□AE01	1	5 units	41H	0.034
		230	230	230	1	AgSnO2		3RQ3038-□AF00	1	5 units	41H	0.035
						AgSnO2 hard gold-plated		3RQ3038-□AF01	1	5 units	41H	0.035
Coupling	g relays	with plu	u <mark>g-in r</mark> el	ays								
- 44	Output	t couplii	ng links									
-A11	AC/DC	24	24	24	1	AgSnO2		3RQ3118-□AB00	1	5 units	41H	0.035
						AgSnO2 hard gold-plated		3RQ3118-□AB01	1	5 units	41H	0.035
-		115	115	115	1	AgSnO2		3RQ3118-□AE00	1	5 units	41H	0.035
						AgSnO2 hard gold-plated		3RQ3118-□AE01	1	5 units	41H	0.035
100		230	230	230	1	AgSnO2		3RQ3118-□AF00	1	5 units	41H	0.035
1000						AgSnO2 hard gold-plated		3RQ3118-□AF01	1	5 units	41H	0.035
and the second	DC			24	1	AgSnO2		3RQ3118-□AM00	1	5 units	41H	0.035
3RQ3118- 2						AgSnO2 hard gold-plated		3RQ3118-□AM01	1	5 units	41H	0.035

### Type of electrical connection

Screw terminals

• Spring-type terminals (push-in)

Type of voltage	Control at AC at 50 Hz	supply v at 60 Hz	oltage at DC	Current carr of the semic output at AC	ying capacity onductor at DC	Operating mode selectable via switch position	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
							d					kg

### Coupling relays with semiconductor output (not plug-in)

	Output	coupli	ng links	;				-				
4	DC			11		1 mA 0.5 A		3RQ3050-□SM50	1	5 units	41H	0.031
				30 V		5 mA 2 A		3RQ3052-□SM30	1	5 units	41H	0.032
						1 mA 2 A		3RQ3052-□SM40	1	5 units	41H	0.031
					5 mA 2 A			3RQ3052-□SM50	1	5 units	41H	0.034
						5 mA 5 A		3RQ3055-□SM30	1	5 units	41H	0.032
3BO3050-							Manual/ Off/ Automatic	3RQ3065-⊡SM30	1	5 units	41H	0.032
2SM50	AC/DC	110 230 V	110 230 V	110 230 V		1 mA 3 A		3RQ3053-⊡SG30	1	5 units	41H	0.033
	Input c	oupling	links									
	AC/DC	11 30 V	11 30 V	11 30 V		10 mA 0.5 A		3RQ3070-□SB30	1	5 units	41H	0.031
		110 230 V	110 230 V	110 230 V		10 mA 0.5 A		3RQ3070-⊡SG30	1	5 units	41H	0.032
Type of el	ectrical c	onnectio	on									
Screw te	rminals							1				
• Spring-ty	/pe termir	nals (pusl	h-in)					2				



SIRIUS 3RQ3 coupling relays, narrow design

Accessories										
	Version				SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
					d		,			kg
Galvanic isolati	on plates									
	For electrical sep when devices of a	aration of diff different type:	erent potentials s are installed side by s	side	2	3RQ3900-0A	1	10 units	41H	0.014
Connecting con	the									
Connecting con	For linking the sa	me notentials								
Contraction of the second	current carrying c	capacity for in	, ifeed max. 6 A							
3BO3901-0B	<ul> <li>2-pole</li> </ul>				2	3RQ3901-0A	1	10 units	41H	0.001
51100501-00	• 4-pole				2	3RQ3901-0B	1	10 units	41H	0.001
	• 8-pole				2	3RQ3901-0C	1	10 units	41H	0.002
Clin-on Jabels	• 16-pole				2	3K03901-0D	1	TO UNITS	41⊓	0.004
Clip-on labels	For terminal mark	ing and equi	oment labeling, white							
	• 5 x 5 mm	ang ana equi	officint labeling, white		2	3RQ3902-0A	100	2000 units	41H	0.009
	• 6 x 12 mm				2	3RQ3902-0B	100	1200 units	41H	0.020
3RA2908-1A	Screwdrivers For all SIRIUS de 3.0 mm x 0.5 mm length approx. 20 titapium grav/blac	vices with spi , 00 mm,	ing-type terminals,		2	terminals (push-in) 3RA2908-1A	1	1 unit	41B	0.050
	partially insulated	, 			_		_			
	Coupling relays with plug-in relays	Control supply voltage	Material of switching contacts	Number of CO contacts For auxiliary contacts	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Туре	V			d					kg
Replacement m	odules for 3RQ31	18 coupling	relays with plug-ii	n relay	0	ATV7044 7DM00		d E constan	4411	0.007
	3RQ3118AM01	24 DC	AgSnO2 hard	I	2	31X/014-7BM00	1	15 units	41H	0.007
			gold-plated		~					0.007
	3RQ3118AB00	24 AC/DC	AgSnO2	1	2	3TX7014-7BQ00	1	15 units	41H	0.007
	3RQ3118AB01		AgSnO2 hard gold-plated		2	3TX7014-7BQ02	1	15 units	41H	0.007
	3RQ3118AE00	115 AC/DC	AgSnO2	1	2	3TX7014-7BP00	1	15 units	41H	0.006
	3RQ3118AF00	230 AC/DC	AgSnO2 hard gold-plated							
	3RQ3118AE01	115 AC/DC	AgSnO2	1	2	3TX7014-7BP02	1	15 units	41H	0.006
	3RQ3118AF01	230 AC/DC	AgSnO2 hard gold-plated							

### SIRIUS 3RQ2 coupling relays with industrial enclosure

### Overview



SIRIUS 3RQ2 coupling relays, screw terminals, 3 changeover contacts

#### More information

Homepage, see https://www.siemens.com/relais Industry Mall see www.siemens.com/product?3RQ2 Conversion tool, e.g. from 3RS181 to 3RQ3, see http://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 highquality 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 method	Screw terminals	1	
	Spring-type terminals (push-in)	2	
Outputs	1 changeover contact	A	
	2 changeover contacts	В	
	3 changeover contacts	С	
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.

#### Benefits

- Permanent wiring due 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

### Application

- · Galvanic isolation between input and output circuit
- Adjustment of different signal levels

- For your orders, please use the article numbers quoted in the selection and ordering data.
- · 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
- Signal amplification
- Contact multiplication



Motor control application example

### SIRIUS 3RQ2 coupling relays with industrial enclosure

20 ... 12

Technical specifications			
More information			
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16203/td		Operating instructions, see https://support.industry.siemens.co	m/cs/ww/en/ps/16203/man
Article number		3RQ2000AW00 3RQ2000BW00 3RQ2000CW00	3RQ2000CW01
General data			
Width x Height x Depth	mm	22.5 x 100 x 90	
Insulation voltage for overvoltage category III according to IEC 60664 with degree of pollution 3	V	300	
maximum permissible voltage for safe isolation between control and auxiliary circuit acc. to IEC 60947-1	V	300	
Ambient temperature			
during operation	°C	-25 +60	
during storage	°C	-40 +80	
Protection class IP		IP20	
Control circuit			
Control supply voltage	V	AC/DC 24 240 50/60 Hz	
Operating range factor control supply voltage rated value		0.7 1.1	
Main circuit			
Thermal current of the switching element with contacts maximum	пA	5	
Ampacity of the output relay			
• at AC-15 at 250 V	А	3	
• at DC-13 at 24 V	А	1	
• at DC-13 at 125 V	А	0.2	
• at DC-13 at 250 V	А	0.1	
Mechanical service life (switching cycles) typical		10 000 000	
Electrical endurance (switching cycles) at 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-type terminals	push-in terminals
Type of connectable conductor cross-sections			
• solid	mm <sup>2</sup>	1x (0.5 4.0 mm <sup>2</sup> ), 2x (0.5 2.5 n	nm²) 0.5 4 mm²
<ul> <li>finely stranded with core end processing</li> </ul>	mm <sup>2</sup>	1x (0.5 4 mm <sup>2</sup> ), 2x (0.5 1.5 mr	n <sup>2</sup> ) 0.5 2.5 mm <sup>2</sup>

AWG

Nm

1x (20 ... 12), 2x (20 ... 14)

0.6 ... 0.8

• at AWG conductors solid

Tightening torque

Selection and orderin	ng data											
PU (UNIT, SET, M) = 1 PS* = 1 u PG = 41	Control sup Init at AC H at 50 Hz	ply voltage at DC	Number of CO contacts for auxiliary contacts	Material of switching contacts	SD	screw-	type terminals	÷	SD p	oush-In tern	ninals	
	V	V	W		Ь	Article	number		A	Article numb	er	
Coupling relays in inc	ustrial enclo	sure, 22.5	mm		u							
	24 240	24 240	1	AgSnO2	2	3RQ20	00-1AW00	2	2 3	RQ2000-2A	W00	
in lii			2	AgSnO2	2	3RQ20	00-1BW00	2	2 3	3RQ2000-2E	8W00	
			3	AgSnO2	2	3RQ20	00-1CW00	2	2 3	3RQ2000-20	W00	
3RQ2000- 1CW00 3RQ2000- 2CW00			3	AgNi + Au	2	3RQ20	00-1CW01		2 :	3RQ2000-20	:W01	
Accessories												
More information												
Operating instructions, see	e mone com/os/w	w/op/pc/25*	159/man	Co	onvers	ion tool,	see	reion	tool			
https://support.industry.sie	mens.com/cs/w	w/en/p3/20	150/11/21	ii.	.p.// w v	ww.sierrie	ens.com/sinus/conve	131011-	1001			
	Product desig	gnation				SD	Article No.			PU (UNIT, SET, M)	PS*	PG
Terminals for SIRIUS enclosure	devices in th	e industri	al standard	mounting r	ail	d				-		
	Removable te	rminals					Screw terminals		Ð	)		
1	• 2-pole, up to	max. 2 x 2.	5 mm² or 1 x 4	mm <sup>2</sup>		2	3ZY1122-1BA00			1	6 units	41L
							Spring-type terminals (push-in)	1		]		
3211122-1BA00	<ul> <li>2-pole, up to</li> </ul>	max. 1 x 4 i	mm <sup>2</sup> or 2 x 1.5	mm <sup>2</sup>		2	3ZY1122-2BA00			1	6 units	41L
Accessories for enclo	Sures					2	2711211 04 400			1	10 upito	411
6.	For wall mount	ing				2	3211311-0AA00			· ·	TO UTILS	41
37Y1311-0AA00												
42	Coding pins					2	3ZY1440-1AA00			1	12 units	41L
	For removable in the industria	terminals of I standard n	SIRIUS device	es nclosure:								
3ZY1440-1AA00	they enable me	echanical co	oding of termin	als								
Tools for opening spr	ing-type tern	ninals			_					_		
	Screwdrivers For all SIRIUS	devices with	n spring-type te	erminals			Spring-type terminals (push-in)			) ]		
	3.0 mm x 0.5 m partially insula	nm, length a ted	pprox. 200 mm	n, titanium gra	y/blac	:k, 2	3RA2908-1A			1	1 units	41B

3RA2908-1A

### SIRIUS 3RQ2 coupling relays with industrial enclosure

### More information

### Code conversion table

SIRIUS 3RS18 cou	pling 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 change-	3RQ2000-1AW00	3RQ2000-2AW00	24 240 V AC/DC	1 change-		
3RS1800-1AP00	3RS1800-2AP00	24 V AC/DC; 220 240 V AC	over contac				over contact		
3RS1800-1BW00	3RS1800-2BW00	24 240 V AC/DC	2 change-	3RQ2000-1BW00	3RQ2000-2BW00	24 240 V AC/DC	2 change-		
3RS1800-1BQ00	3RS1800-2BQ00	24 V AC/DC; 110 120 V AC	over				over		
3RS1800-1BP00	3RS1800-2BP00	24 V AC/DC; 220 240 V AC	Contacs				001112013		
3RS1800-1HW00	3RS1800-2HW00	24 240 V AC/DC	3 change-	3RQ2000-1CW00	3RQ2000-2CW00	24 240 V AC/DC	3 change-		
3RS1800-1HQ00	3RS1800-2HQ00	24 V AC/DC; 110 120 V AC	over				over		
3RS1800-1HP00	3RS1800-2HP00	24 V AC/DC; 220 240 V AC	-00111203				contacts		
3RS1800-1HW01	3RS1800-2HW01	24 240 V AC/DC	3 change-	3RQ2000-1CW01	3RQ2000-2CW01	24 240 V AC/DC	3 change-		
3RS1800-1HQ01	3RS1800-2HQ01	24 V AC/DC; 110 120 V AC	over con-				over con-		
3RS1800-1HP01	3RS1800-2HP01	24 V AC/DC; 220 240 V AC	gold-plated				gold-plated		

### Switching Devices - Solid-State Switching Devices

Home page, see www.siemens.com/railway-components

Catalog IC 10, see www.siemens.com/ic10

Home page, see www.siemens.com/soft-starter Industry Mall, see www.siemens.com/product?3RW

Introduction

More information

Overview







Online configurator, see www.siemens.com/sirius/configurators

https://support.industry.siemens.com/cs/ww/en/view/101494917

Simulation Tool for Soft Starters (STS), see



		Article No.	Page
SIRIUS solid-state switching	g devices for switching resistive/inductive loads		
Solid-state relays			
Solid-state relays	Widths of 22.5 mm and 45 mm	3RF21	2/116
	<ul> <li>Compact and space-saving design</li> </ul>	3RF20	2/121
	<ul> <li>"Zero-point switching" version</li> </ul>		
	<ul> <li>Mounting onto existing heat sinks</li> </ul>		
Solid-state contactors			
Solid-state contactors	<ul> <li>Complete units comprising a solid-state relay and an optimized heat sink, "ready to use"</li> </ul>	3RF23 3RF22	2/126 2/124
	<ul> <li>Compact and space-saving design</li> </ul>		
	<ul> <li>Versions for resistive loads "zero-point switching" and for inductive loads "instantaneous switching"</li> </ul>		
	<ul> <li>Special versions "low noise" and "short-circuit proof"</li> </ul>		
Function modules	For extending the functionality of the 3RF21 solid-state relays and the 3RF23 solid-state contactors for many different applications:		
Converters	<ul> <li>Converters used for converting an analog input signal into an on/off ratio; can also be used on 3RF22 three-phase switching devices</li> </ul>	3RF2900-0EA18	2/140
Load monitoring	For load monitoring of one or more loads (partial loads)	3RF290FA08, 3RF29.0-0GA	2/140
Heating current monitoring	<ul> <li>For load monitoring of one or more loads (partial loads); remote teach</li> </ul>	3RF290JA	2/140
Power controllers	The power controller sets 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.	3RF290KA.	2/140
Power regulators	The power regulator regulates 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	2/140

# Use of SIRIUS solid-state switching devices for switching motors in conjunction with IE3/IE4 motors

Note:

When using SIRIUS solid-state switching devices for switching motors in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see "Configuration Manual for SIRIUS Controls with IE3 Motors",

https://support.industry.siemens.com/cs/ww/en/view/94770820.

### Switching Devices - Solid-State Switching Devices

#### SIRIUS 3RF solid-state switching devices



Three-phase solid-state contactor and single-phase solid-state relay

The SIRIUS 3RF2 solid-state switching devices reliably switch a wide range of different loads with alternating voltages in 50 and 60 Hz systems.

SIRIUS 3RF2 solid-state switching devices for resistive loads:

- Solid-state relays
- Solid-state contactors
- Function modules
- SIRIUS 3RF3 solid-state switching devices for switching motors:
- Solid-state contactors
- Solid-state reversing contactors

### SIRIUS 3RF2 - for almost unending activity

Conventional electromechanical controlgear is often overtaxed by the rise in the number of switching operations. A high switching frequency results in frequent failure and short replacement cycles. However, this does not have to be the case, because with the latest generation of our SIRIUS 3RF2 solid-state switching devices we provide you with solid-state relays and contactors with a particularly long endurance – for almost unending activity even under the toughest conditions and under high mechanical load, but also in noise-sensitive areas.

### Proven time and again in service

SIRIUS 3RF2 solid-state switching devices have firmly established in industrial applications. They are used above all in applications where loads are switched frequently – mainly with resistive load controllers, with the control of electrical heat or the control of valves and motors in conveyor systems. In addition to its use in areas with high switching frequencies, their silent switching means that SIRIUS is also ideally suited for use in noise-sensitive areas, such as offices or hospitals.

#### The most reliable solution for any application

Compared to mechanical controlgear, our SIRIUS 3RF2 solidstate 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 controlgear can also be quite easily expanded by the addition of standardized function modules.

#### Ideal for operation with heating control systems

The 3RF2 solid-state switching devices can be used for example in the SIPLUS HCS300I heating control system. They are optimally connected to the digital output module of the HCS300I

by means of preassembled cables. This saves considerable wiring outlay in the control circuit and shortens mounting time.

The HCS300I is a modular heating control system for the optimization of plastic processing machines. It enables individual solutions for many different heating control applications. With each basic unit it is possible to use up to four 6-channel digital outputs to control solid-state switching devices and four 4-channel temperature measuring modules. Current or current-and-voltage measuring modules can be used to monitor the loads. Communication with the higher-level control system is performed via PROFIBUS DP.



SIPLUS heating control system

### Also for switching motors

In order to achieve higher productivity, the switching frequency is continuously increased. It is no problem for our SIRIUS solidstate contactors to switch motors. With three-phase motors up to 7.5 kW, they can reliably withstand even the highest switching frequencies. Even a continuous change in the direction of rotation is possible with the solid-state reversing contactors. Both versions can be perfectly combined with components from the SIRIUS modular system. Connecting with SIRIUS motor starter protectors or SIRIUS overload relay can be implemented without any further steps.

#### Always on the sunny side with SIRIUS

Because SIRIUS 3RF2 offers even more:

- The space-saving and compact side-by-side mounting ensure reliable operation up to an ambient temperature of +60 °C.
- Thanks to fast configuration and the ease of mounting and start up, you save not only time but also expenses.

#### **Connection methods**

The solid-state switching devices are available with screw terminals (box terminals), spring-type terminals or ring terminal lugs.

Screw terminals
 Spring-type terminals
 Ring terminal lug connection
 The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

### General data

### Overview

Туре	Solid-state relays		Solid-state	contactors	s Function modules								
	Single-pha	ise	Three- phase	Single- phase	Three- phase	Converters	Load monite	oring	Heating current	Power controllers	Power regulators		
	22.5 mm	45 mm	45 mm				Basic	Extended	monitoring				
Usage													
Simple use of existing solid-state relays		1											
Complete unit "Ready to use"				1	1								
Space-saving	1		1	1	1	1	1						
Can be extended with modular function modules	1		1)	1	1)								
Frequent switching and monitoring of loads and solid-state relays/solid-state contactors		-					✓	5	<i>√</i>	<i>√</i>	1		
Monitoring of up to 6 partial loads							1		1	1			
Monitoring of more than 6 partial loads								1					
Control of the heating power through an analog input						<i>√</i>				1	1		
Power control											✓		
Startup													
Easy setting of setpoint values with "Teach" button							1	1		1	1		
"Remote Teach" input for setting setpoints									1				
Mounting													
Mounting onto mounting rails or mounting plates				1	1								
Can be snapped directly onto a solid- state relay or contactor						1	1	1	<i>√</i>	<i>√</i>	✓		
For use with "Coolplate" heat sink	1	1	1										
Cable routing													
Connection of load circuit as for controlgear	1		1	1	1		1	1	1	1	1		
Connection of load circuit from above		1											

✓ Function available

Function possible

-- Function not possible

<sup>1)</sup> The converter can also be used with three-phase devices.

General data

### Article No. scheme

Product versions		Article	number	•				
Solid-state switching devices	Solid-state relays	3RF20						Single-phase, 45-mm width
for resistive/inductive loads		3RF21						Single-phase, 22.5-mm width
	Solid-state contactors	3RF23						Single-phase
Type current	e.g. 10 = 10.5 A							
Connection type	Screw terminals			1				
	Spring-type terminals			2				
	Ring terminal lug connection			3				
Switching function	Zero-point switching			П	Α			
	Instantaneous switching				в			
	Zero-point switching				С			Low Noise
	Zero-point switching				D			Short-circuit-proof with B MCB
Single-phase or number of	Single-phase					A		
controlled phases	Two-phase					в		
	Three-phase					С		
	Reversing contactor					D		
Rated control supply voltage U	<sub>s</sub> 24 V DC					0		
	24 V AC/DC					1		
	110 230 V AC					2		
	110 V AC					3		
	4 30 V DC					4		
	230 V AC					5		
Rated operational voltage Ue	24 230 V AC						2	
	48 460 V AC						4	
	48 600 V AC						5	
	48 600 V AC						6	Blocking voltage 1600 V
Example		3RF21	20-	1	Α	A 0	5	

### 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

#### Features

- · Considerable space savings thanks to a width of only 22.5 mm
- Variety of connection methods: Screw terminal, spring-type connection or ring terminal lug, there is no problem – they are all finger-safe
- Flexible for all applications with function modules for retrofitting
- Possibility of fuseless short-circuit proof design

### Benefits

- Saves time and costs with fast mounting and commissioning, short start up times and easy wiring
- Extremely long life, low maintenance, rugged and reliable
- $\bullet$  Space-saving and safe thanks to side-by-side mounting up to an ambient temperature of +60  $^\circ\mathrm{C}$
- Modular design: Standardized function modules and heat sinks can be used in conjunction with solid-state relays to satisfy individual requirements
- Safety due to lifelong, vibration-resistant and shock-resistant spring-type terminal connection method even under tough conditions

### Application

#### Applications

#### Example: Plastics processing industry

Thanks to their high switching endurance SIRIUS 3RF2 solidstate switching devices are ideal for controlling electrical heat. This is because the more precise the temperature regulation process has to be, the higher the switching frequency. The accurate regulation of electrical heat is used for example in many processes in the plastics processing 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 3RF2 solid-state relays and contactors can be used for the simultaneous control of several heating loads. 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 to be sent to the controller.

#### **General data**

### Use in fuseless load feeders

Compared with the fused configuration of load feeders, short circuit and line protection using miniature circuit breakers is easy to achieve with SIRIUS 3RF2 solid-state relays and contactors.

#### Selection and ordering data

#### Inscription labels for 3RF2 series

A special version of the solid-state contactors can be protected against damage in the case of a short circuit with a miniature circuit breaker with type B tripping characteristic. This allows the low-cost and simple design of fuseless load feeders with full protection of the switchgear.

	Designation	Labeling area (W x H)	Color	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		mm x mm		d					kg
Blank labels									
0 0 0 0	Unit labeling	10 x 7	Pastel turquoise	15	3RT1900-1SB10	100	816 units	41B	0.027
	plates for SIRIUS <sup>1)</sup>	20 x 7	Pastel turquoise	20	3RT1900-1SB20	100	340 units	41B	0.062
	Adhesive labels	19 x 6	Pastel turquoise	15	3RT1900-1SB60	100	3060 units	41B	15.300
NS80_01229	for SIRIUS	19 x 6	Zinc yellow	15	3RT1900-1SD60	100	3060 units	41B	0.005
3RT19 00-1SB20 (1 frame = 20 units)									
<ol> <li>PC labeling system for in of unit labeling plates ar murrplastik Systemtechr Chapter 16.</li> </ol>	ndividual inscription e available from: nik GmbH, see www.s	iemens.com/ic10,				-			

More information

#### 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 in relation to solid-state contactors, e.g. on minimum spacing, and in relation to solid-state relays on the choice of heat sink can be found in the technical specifications and in the product data sheets, see https://support.industry.siemens.com/cs/ww/en/ps/16222.

#### Short-circuit and overload protection

Despite the rugged power semiconductors that are used, solid-state switching devices respond more sensitively to shortcircuits in the load feeder. Consequently, special precautions have to be taken against destruction, depending on the type of design.

Siemens generally recommends using SITOR solid-state 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.

#### Electromagnetic compatibility (EMC)

The solid-state switching devices are suitable for interferencefree 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 solid-state contactors for resistive loads of the special 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. For more information, see www.epcos.com.

#### Product information and technical specifications

For product data sheets with detailed technical specifications, dimensional drawings and characteristic curves, see https://support.industry.siemens.com/cs/ww/en/ps/16222.

For additional information, please enter the article number of the required device under the tab "Product List".

### Solid-State Switching Devices for Resistive/Inductive Loads Solid-State Relays

General data

### Overview

#### Solid-state relays (without heat sink)

SIRIUS solid-state relays are suitable for surface mounting on existing cooling surfaces. Mounting 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.

#### 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 relay 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, in terms of emitted interference, it conforms to limit value curve class B according to IEC 60947-4-3.

#### Single-phase solid-state relays with a width of 22.5 mm

With its compact design and a width of just 22.5 mm, which is not exceeded even for currents of up to 88 A, the 3RF21 solidstate relay offers an ultra-small footprint. The logical connection method, with the power infeed from above and load connection from below, ensures tidy installation in the control cabinet.

#### Single-phase solid-state relays with a width of 45 mm

The solid-state 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 replace existing solid-state relays in existing arrangements. The connection of the control cable is as space-saving as the 22.5 mm design, as it is simply plugged on.

#### Three-phase solid-state relays with a width of 45 mm

With its compact design and a width of just 45 m, which stays the same even at currents of up to 55 A, the 3RF22 solid-state relay offers an ultra small footprint. The logical connection method, with the power infeed from above and load connection from below, ensures tidy installation in the control cabinet.

The three-phase solid-state relays 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)

#### Selection notes

When selecting solid-state relays, in addition to information about the network, 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.

Mounting solid-state relays directly on a mounting plate made of sheet steel is inadequate in terms of heat dissipation.

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

Solid-State Relays

### SIRIUS 3RF21 solid-state relays, single-phase, 22.5 mm

### Overview

### Single-phase solid-state relays (without heat sink) with a width of 22.5 mm

With its compact design and a width of just 22.5 mm, which is not exceeded even for currents of up to 88 A, the 3RF21 solid-state relay offers an ultra-small footprint. The logical connection

method, with the power infeed from above and load connection from below, ensures tidy installation in the control cabinet.

#### Technical specifications

#### More information

System Manual and Manual, see FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16224/faq https://support.industry.siemens.com/cs/ww/en/view/60311318 https://support.industry.siemens.com/cs/ww/en/view/60298187 3RF21..-1.. 3RF21..-2... 3RF21..-3.... Type General data Ambient temperature °C • During operation, derating from 40 °C -25 ... + 60 °C -55 ... + 80 • During storage 0 ... 1 000; derating from 1 000 Installation altitude m Shock resistance acc. to IEC 60068-2-27 15/11 g/ms Vibration resistance acc. to IEC 60068-2-6 2 g IP00 (IP20 when using the terminal cover 3RA2900-Degree of protection IP20 3PA88) Electromagnetic compatibility (EMC) • Emitted interference Conducted interference voltage Class A for industrial applications acc. to IEC 60947-4-3 Emitted, high-frequency interference voltage Class B for residential, business and commercial applications

Mounting	IX V	
acc. to IEC 61000-4-6 - Burst acc. to IEC 61000-4-4 - Surge acc. to IEC 61000-4-5	kV kV	2/5.0 kHz; behavior criterion 2 Conductor - ground 2: conductor - conductor 1: behavior criterion 2
acc. to IEC 61000-4-2 (corresponds to degree of severity 3) - Induced RF fields	MHz	0.15 80; 140 dBµV; behavior criterion 1
Interference immunity     Electrostatic discharge	kV	Contact discharge 4; air discharge 8; behavior criterion 2
acc. to IEC 60947-4-3		

1.5

Nm

Screws (not included in the scope of supply)Tightening torque

Solid-State Relays

### SIRIUS 3RF21 solid-state relays, single-phase, 22.5 mm

Туре	I <sub>max</sub> 1) at R <sub>thha</sub>	$I_{\text{max}}^{1)}$ at $R_{\text{thha}}/T_{\text{u}} = 40 \text{ °C}$		to IEC 60947- /T <sub>u</sub> = 40 °C	4-3 I <sub>e</sub> acc. at R <sub>thha</sub>	<b>to UL/CSA</b> <sub>2</sub> /7 <sub>u</sub> = 50 °C	Power loss at I <sub>max</sub>	Minimum load current	Off-state current
	А	K/W	А	K/W	А	K/W	W	A	mA
Main circuit									
3RF2120	20	2.0	20	1.7	20	1.3	28.6	0.1	10
3RF2130-1	30	1.1	30	0.79	30	0.56	44.2	0.5	10
3RF2150-1 3RF2150-2 3RF2150-3	50 50 50	0.68 0.68 0.68	50 20 50	0.48 2.6 0.48	50 20 50	0.33 2.9 0.33	66 66 66	0.5 0.5 0.5	10 10 10
3RF2170-1	70	0.40	50	0.77	50	0.6	94	0.5	10
3RF2190-1 3RF2190-2 3RF2190-3	88 88 88	0.33 0.33 0.33	50 20 88	0.94 2.8 0.22	50 20 83	0.85 3.5 0.19	118 118 118	0.5 0.5 0.5	10 10 10

<sup>1)</sup> The current I<sub>max</sub> provides information about the performance of the solidstate relay. The actual permitted rated operational current I<sub>e</sub> 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 2/114, "More Information"). The minimum thickness values for the mounting surface must be observed.

Туре	Rated peak withstand current I <sub>tsm</sub>	<i>I</i> <sup>2</sup> <i>t</i> value
	A	A <sup>2</sup> s
Main circuit		
3RF2120	200	200
3RF2130A.2 3RF2130A.4 3RF2130A.5 3RF2130A.6	300 300 300 400	450 450 450 800
3RF2150	600	1 800
3RF2170A.2 3RF2170A.4 3RF2170A.5 3RF2170A.6	1 200 1 200 1 200 1 150	7 200 7 200 7 200 6 600
3RF2190	1 150	6 600

Туре		3RF212	3RF214	3RF215	3RF216
Main circuit					
Rated operational voltage Ue	V AC	24 230	48 460		
<ul> <li>Operating range</li> </ul>	V AC	20 253	40 506	40 660	
<ul> <li>Rated frequency</li> </ul>	Hz	50/60 ± 10 %			
Rated insulation voltage Ui	V	600			
Blocking voltage	V	800	1 200		1 600
Rate of voltage rise	V/µs	1 000			

Туре		3RF210.	3RF21	1.	3RF212.	3RF214.
Control circuit						
Method of operation		DC operation	AC/DC ope	eration	AC operation	DC operation
Rated control supply voltage Us	V	24	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 <sup>1)</sup>	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 <sup>2)</sup>	10 + max. half-wave <sup>2</sup>	one )	40 + max. one half-wave <sup>2)</sup>	1 + max. one half-wave <sup>2)</sup>
• OFF-delay	ms	1 + max. one half-wave	15 + max. half-wave	one	40 + max. one half-wave	1 + max. one half-wave

<sup>1)</sup> Applies to the "Low Power" version 3RF21..-.AA..-OKNO.

<sup>2)</sup> Only for zero-point switching devices.

Solid-State Relays

### SIRIUS 3RF21 solid-state relays, single-phase, 22.5 mm

### Circuit diagrams

DC control supply voltage





### Selection and ordering data

### Single-phase solid-state relays (without heat sink) with a width of 22.5 mm

	Type current/ performance capacity <sup>1)</sup>	Rated control supply voltage $U_{\rm s}$	SD	Screw terminals <sup>2)</sup>	<b>(</b>	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	٨	V	d	Article No.					ka
Zero-point switching,		·	u						ĸġ
	20 30 50 70 90 20 30	24 DC 4 30 DC	2 2 2 5 2 2 2 2 2	3RF2120-1AA02 3RF2130-1AA02 3RF2150-1AA02 3RF2170-1AA02 3RF2190-1AA02 3RF2120-1AA02 3RF2120-1AA42 3RF2130-1AA42		1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C 41C 41C 41C	0.072 0.071 0.080 0.071 0.070 0.071 0.074
3RF2120-1AA02									
rated operational volt	age <i>U<sub>e</sub></i> 48 460 V AC								
	20 30 50 70 90	24 DC	2 2 2 2 2	3RF2120-1AA04 3RF2130-1AA04 3RF2150-1AA04 3RF2170-1AA04 3RF2190-1AA04		1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C	0.072 0.072 0.067 0.100 0.087
Zero-point switching, rated operational volt	age <i>U</i> - 48 600 V AC								
ratea operational ven	70	24 DC Low Power	5	3RF2170-1AA05-0KN0		1	1 unit	41C	0.070
	20 30 50 70 90	4 30 DC	5 5 5 2 5	3RF2120-1AA45 3RF2130-1AA45 3RF2150-1AA45 3RF2170-1AA45 3RF2190-1AA45		1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C	0.072 0.071 0.074 0.070 0.072
Zero-point switching rated operational volt	<ul> <li>Blocking voltage 1 600 age U<sub>a</sub> 48 600 V AC</li> </ul>	V,							
	30 50 70 90	24 DC	2 2 5 5	3RF2130-1AA06 3RF2150-1AA06 3RF2170-1AA06 3RF2190-1AA06		1 1 1 1	1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C	0.070 0.114 0.074 0.063
Instantaneous switch rated operational volt	ing, age <i>U</i> o 48 460 V AC								
	20 30 50 70 90	24 DC	5 5 5 5 5 5	3RF2120-1BA04 3RF2130-1BA04 3RF2150-1BA04 3RF2170-1BA04 3RF2170-1BA04 3RF2190-1BA04		1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C	0.068 0.067 0.069 0.072 0.073
Instantaneous switch rated operational volt	ing · Blocking voltage 1 ( age <i>U</i> _ 48 600 V AC	600 V,							
	50	24 DC	5	3RF2150-1BA06		1	1 unit	41C	0.070
Low Noise <sup>3)</sup> · Zero-po rated oper <u>ational volt</u>	bint switching, age <i>U<sub>e</sub></i> 48 <u>460 V AC</u>								
	70	24 DC	5	3RF2170-1CA04		1	1 unit	41C	0.074
<ol> <li>The type current provide the solid-state relay. The actual permitted rat depending on the conner</li> <li>Please note that this ver approx, 50 A and a com</li> </ol>	es information about the performation about the performance of operational current $I_{e}$ can be denoted by a section method and cooling consistent can only be used for a radiuctor cross-section of 10 mm	rmance capacity of <sup>3)</sup> Se be smaller Oth nditions. ted current of up to 2.	ee pa( er rat	ge 2/115. ted control supply voltag	ges o	n reque	est.		

Solid-State Relays

				SKF21 Solid-State relay	s, sing		,	
	Type current/ performance capacity <sup>1)</sup>	Rated control supply voltag $U_{\rm S}$	e SD	Spring-type terminals <sup>2)</sup>	O PL (UNIT SET M)	PS*	PG	Weight per PU approx.
	٥	V	d	Article No.				ka
Zero-point switching,	A	V	a					кg
rated operational volt	age <i>U<sub>e</sub></i> 24 230 V AC	24 DC	2	3DE2120-24402	-	1 unit	410	0.069
	50 90	24 00	5 5	3RF2120-2AA02 3RF2150-2AA02 3RF2190-2AA02	1	1 unit 1 unit	41C 41C 41C	0.068 0.068
	20	4 30 DC	5	3RF2120-2AA42	1	1 unit	41C	0.068
3RF2120-2AA02								
rated operational volt	age <i>U<sub>e</sub></i> 48 460 V AC							
	20 50 90	24 DC	2 5 5	3RF2120-2AA04 3RF2150-2AA04 3RF2190-2AA04	1	1 unit 1 unit 1 unit	41C 41C 41C	0.066 0.071 0.075
	50	24 AC/DC	5	3RF2150-2AA14	1	1 unit	41C	0.071
Zero-point switching, rated operational volt	age <i>U<sub>e</sub> 48 600 V AC</i>							
	20	4 30 DC	5	3RF2120-2AA45	1	1 unit	41C	0.075
Zero-point switching rated operational volt	• Blocking voltage 1 600 age <i>U</i> e 48 600 V AC	V,						_
	50 90	24 DC	5 5	3RF2150-2AA06 3RF2190-2AA06	1	1 unit	41C 41C	0.070
			•••••		i unit		0.007	
<ol> <li>The type current provide the solid-state relay. The actual permitted rat depending on the connert</li> </ol>	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can action method and cooling co	rmance capacity of <sup>2)</sup> I be smaller nditions. Ot	Please i a rated 2.5 mm per tern her rat	note that the version with spring- current of up to approx. 20 A an <sup>2</sup> . Higher currents can be achiev ninal. ted control supply voltages	ype termind a condu ed by cor on requ	nals can ctor cro inecting	only be ss-sect two co	e used for ion of nductors
<sup>1)</sup> The type current provide the solid-state relay. The actual permitted rat depending on the connert depending on th	es information about the perfo ed operational current $I_e$ can ection method and cooling co Type current/ performance capacity <sup>1</sup> )	rmance capacity of <sup>2)</sup> be smaller nditions. Ot Rated control supply voltag U <sub>s</sub>	Please i a rated 2.5 mm per tern her rat	current of up to approx. 20 A an 2. Higher currents can be achiev ninal. ted control supply voltages <b>Ring terminal lug</b>	ype termi d a condu ed by cor on requ (UNIT SET M)	nals can ctor cro inecting lest. PS*	only be ss-sect two co	Weight per PU approx.
<sup>1)</sup> The type current provide the solid-state relay. The actual permitted rat depending on the conne	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can ection method and cooling co Type current/ performance capacity <sup>1</sup> )	rmance capacity of <sup>2)</sup> be smaller nditions. Ot Rated control supply voltag U <sub>s</sub>	Please in a rated 2.5 mm poer term her rat e SD	Article No.	ype termii d a condu ed by cor s on requ (UNIT SET M)	nals can ctor cro necting lest. PS*	only be ss-sect two co	Weight per PU approx.
<ol> <li>The type current provide the solid-state relay. The actual permitted rat depending on the conne</li> <li>Zero-point switching, rated operational volt</li> </ol>	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can ection method and cooling co Type current/ performance capacity <sup>1</sup> ) A tage <i>U</i> <sub>e</sub> 24 230 V AC	rmance capacity of <sup>2)</sup> be smaller nditions. Ot Rated control supply voltag U <sub>s</sub>	Please r a rated 2.5 mm oer term her rat e SD d	Article No.	ype termi d a condu ed by cor c on requ ON requ (UNIT SET M)	Panta can ctor cro inecting lest. PS*	only be ss-sect two co	Weight per PU approx.
<ul> <li><sup>1)</sup> The type current provide the solid-state relay. The actual permitted rat depending on the conne</li> <li>Zero-point switching, rated operational volt</li> </ul>	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can ection method and cooling coo Type current/ performance capacity <sup>1</sup> ) A age <i>U</i> <sub>e</sub> 24 230 V AC 20 50 90	rmance capacity of <sup>2)</sup> be smaller nditions. Ot Rated control supply voltag U <sub>s</sub> 24 DC	e SD d	Article No.	ype termi d a condu e d by cor c on requ (UNIT SET M)	1 unit nals can ctor cro necting lest. PS* 1 unit 1 unit 1 unit	PG 41C 41C 41C	U.GUT e used for ion of nductors Weight per PU approx. kg 0.077 0.077 0.070
<ul> <li><sup>1)</sup> The type current provide the solid-state relay. The actual permitted rat depending on the conne</li> <li>Zero-point switching, rated operational volt</li> <li><i>Signal Science</i></li> <li><i></i></li></ul>	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can ection method and cooling coo Type current/ performance capacity <sup>1</sup> ) A age <i>U</i> <sub>e</sub> 24 230 V AC 20 50 90	rmance capacity of <sup>2)</sup> he smaller nditions. Ot Rated control supply voltag U <sub>s</sub> 24 DC	e SD d	Article No.	ype termi d a condu e d by cor c on requ (UNIT SET M)	1 unit 1 unit 1 unit 1 unit 1 unit	PG 41C 41C 41C	U.GUT e used for ion of nductors Weight per PU approx. kg 0.077 0.077 0.077
<ul> <li><sup>1)</sup> The type current provide the solid-state relay. The actual permitted rat depending on the conner depending on the conner zero-point switching, rated operational volt</li> <li><u>3RF2120-3AA02</u></li> <li>Zero-point switching, rated operational volt</li> </ul>	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can ection method and cooling col Type current/ performance capacity <sup>1</sup> ) A age <i>U</i> <sub>e</sub> 24 230 V AC 20 50 90	rmance capacity of <sup>2)</sup> be smaller nditions. Ot Rated control supply voltag U <sub>s</sub> 24 DC	d	Article No.	ype termi d a condu- ed by cor on requ (UNIT SET M)	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	PG 41C 41C 41C	U.OUT e used for ion of nductors Weight per PU approx. kg 0.077 0.077 0.077
<ul> <li><sup>1)</sup> The type current provide the solid-state relay. The actual permitted rat depending on the conner depending on the conner zero-point switching, rated operational volt</li> <li><u>3RF2120-3AA02</u></li> <li>Zero-point switching, rated operational volt</li> </ul>	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can ection method and cooling col Type current/ performance capacity <sup>1</sup> ) A age <i>U</i> <sub>e</sub> 24 230 V AC 20 50 90	24 DC	d s s s s s s s s s s s s s s s s s s s	Article No. 3RF2120-3AA02 3RF2120-3AA04 3RF2150-3AA04 3RF2150-3AA04 3RF2150-3AA04 3RF2150-3AA04	ype termi d a condu- ed by cor on requ (UNIT SET M)	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	PG 41C 41C 41C 41C 41C 41C 41C 41C	0.007 e used for ion of nductors Weight per PU approx. kg 0.077 0.077 0.077 0.070
<ul> <li><sup>1)</sup> The type current provide the solid-state relay. The actual permitted rat depending on the conner zero-point switching, rated operational volt</li> <li><i>SRF2120-3AA02</i></li> <li><i>Zero-point switching</i>, rated operational volt</li> </ul>	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can ection method and cooling coo Type current/ performance capacity <sup>1</sup> ) A A age <i>U</i> <sub>e</sub> 24 230 V AC 20 50 90 90 8 Blocking underson 4600	<pre>rmance capacity of <sup>2)</sup> i be smaller nditions. V 24 DC 24 DC 4 30 DC</pre>	e SD d	Article No.	ype termi d a condu e d by cor on requ (UNIT SET M) 1 1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	AIC 4IC 4IC 4IC 4IC 4IC 4IC 4IC 4IC 4IC	0.007 e used for ion of nductors Weight per PU approx. kg 0.077 0.077 0.077 0.070
<ul> <li><sup>1)</sup> The type current provide the solid-state relay. The actual permitted rat depending on the conner Zero-point switching, rated operational volt</li> <li>3RF2120-3AA02</li> <li>Zero-point switching, rated operational volt</li> </ul>	es information about the perfo ed operational current <i>I</i> <sub>e</sub> can ection method and cooling cool Type current/ performance capacity <sup>1)</sup> A A age <i>U</i> <sub>e</sub> 24 230 V AC 20 50 90 90 • Blocking voltage 1600 V age <i>U</i> <sub>e</sub> 48 600 V AC	<pre>rmance capacity of <sup>2)</sup> be smaller nditions.  Ot Rated control supply voltag Us 24 DC 24 DC 4 30 DC V,</pre>	A rated 2.5 mm per tern her rat e SD d 5 5 5 5 5 5	Article No. 3RF2120-3AA02 3RF2120-3AA02 3RF2120-3AA04 3RF2190-3AA04 3RF2100 3RF2100 3RF2100 3RF2100 3RF2100 3RF2100 3RF2	ype termi d a condu- ed by cor on requ (UNIT SET M; 1 1 1 1 1 1 1 1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	PG 41C 41C 41C 41C 41C 41C 41C 41C 41C	0.007 e used for ion of nductors weight per PU approx. kg 0.077 0.077 0.077 0.070

The type current provides information about the performance can the solid-state relay. The actual permitted rated operational current  $I_{\rm e}$  can be smaller depending on the connection method and cooling conditions. es information about the performance capacity of

Other rated control supply voltages on request.

Solid-State Relays

SIRIUS 3RF21 solid-state relays, single-phase, 22.5 mm										
Accessories										
	Version	SD	Article No.		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.		
		d						kg		
<b>Optional accessories</b>										
			Spring-type terminals							
3RA2908-1A	<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals Length approx. 200 mm, 3.0 mm x 0.5 mm titanium gray/black, partially insulated	2	3RA2908-1A		1	1 unit	41B	0.050		
			Ring terminal lug connection	Ð						
3RF2900-3PA88	<b>Terminal covers</b> For 3RF21 solid-state relays and 3RF23 solid-state contactors with ring terminal lug connection (With this terminal cover, degree of protection IP20 can be achieved in the terminal compartment in the case of ring terminal lug connections. It can also be used for screw terminals after simple adaptation)	2	3RF2900-3PA88		1	10 units	41C	0.004		
	Control connectors									
			Screw terminals	$\bigcirc$						
	Replacement control connectors For 3RF20/21/22 and 3RF23/24 Screw terminals	5	3RF2900-1TA88		1	50 units	41C	0.004		
			Spring-type terminals							
	Replacement control connectors For 3RF20/21/22 and 3RF23/24 Spring-type terminals	5	3RF2900-2TA88		1	50 units	41C	0.004		
	Control connectors For 3RF20/21/22 and 3RF23/24 Spring-type terminals with two clamping points per contact	5	3RF2900-2TB88		1	10 units	41C	0.004		
SIRIUS 3RF20 solid-state relays, single-phase, 45 mm

## Overview

#### Single-phase solid-state relays (without heat sink) with a width of 45 mm

The solid-state 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 replace existing solid-state relays in existing arrangements.

The connection of the control cable is as space-saving as the 22.5 mm design, as it is simply plugged on.

#### Technical specifications

# More information System Manual and Manual, see https://support.industry.siemens.com/cs/ww/en/view/60311318 https://support.industry.siemens.com/cs/ww/en/view/60298187 FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16225/faq

Туре		3RF201	3RF204
General data			
Ambient temperature			
<ul> <li>During operation, derating from 40 °C</li> </ul>	°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	<i>g</i> /ms	15 /11	
Vibration resistance acc. to IEC 60068-2-6	g	2	
Degree of protection		IP20	
Electromagnetic compatibility (EMC)			
<ul> <li>Emitted interference</li> <li>Conducted interference voltage acc. to IEC 60947-4-3</li> <li>Emitted, high-frequency interference voltage acc. to IEC 60947-4-3</li> </ul>		Class A for industrial applications Class B for residential, business and comme	ercial applications
<ul> <li>Interference immunity</li> <li>Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)</li> <li>Induced RF fields acc. to IEC 61000-4-6</li> <li>Burst acc. to IEC 61000-4-4</li> <li>Surge acc. to IEC 61000-4-5</li> </ul>	kV MHz kV kV	Contact discharge 4; air discharge 8; behav 0.15 80; 140 dBµV; behavior criterion 1 2/5.0 kHz; behavior criterion 2 Conductor - ground 2; conductor - conductor	ior criterion 2 or 1; behavior criterion 2
Mounting • Screws (not included in the scope of supply) • Tightening torque	Nm	2 x M4 1.5	

Solid-State Relays

## SIRIUS 3RF20 solid-state relays, single-phase, 45 mm

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Type $I_{max}^{(1)}$ at $R_{thha}/T_u = 40 \text{ °C}$		I <sub>e</sub> acc. at R <sub>thha</sub>	<i>I</i> <sub>e</sub> acc. to IEC 60947-4-3 at <i>R</i> <sub>thha</sub> / <i>T</i> <sub>u</sub> = 40 °C		a/T <sub>u</sub> = 50 °C	Power loss at I <sub>max</sub>	Minimum load current	Off-state current	
	А	K/W	А	K/W	А	K/W	W	A	mA
Main circuit									
3RF2020-1.A	20	2.0	20	1.7	20	1.3	28.6	0.1	10
3RF2030-1.A	30	1.1	30	0.79	30	0.56	44.2	0.5	10
3RF2050-1.A	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF2070-1.A	70	0.40	50	0.77	50	0.6	94	0.5	10
3RF2090-1.A	88	0.33	50	0.94	50	0.85	118	0.5	10

<sup>1)</sup> The current  $I_{\rm max}$  provides information about the performance of the solid-state relay. The actual permitted rated operational current  $I_{\rm e}$  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 2/114, "More Information"). The minimum thickness values for the mounting surface must be observed.

Туре	Rated peak withstand current Itsm	<i>I</i> <sup>2</sup> t value
	A	A <sup>2</sup> s
Main circuit		-
3RF2020-1.A	200	200
3RF2030-1.A.2 3RF2030-1.A.4 3RF2030-1.A.6	300 300 400	450 450 800
3RF2050-1.A	600	1 800
3RF2070-1.A.2 3RF2070-1.A.4 3RF2070-1.A.5 3RF2070-1.A.6	1 200 1 200 1 200 1 150	7 200 7 200 7 200 6 600
3RF2090-1.A	1 150	6 600

Туре		3RF20.0-1.A.2	3RF20.0-1.A.4	3RF20.0-1.A.5	3RF20.0-1.A.6
Main circuit					
Rated operational voltage Ue	V AC	24 230	48 460	48 600	
<ul> <li>Operating range</li> </ul>	V AC	20 253	40 506	40 660	
<ul> <li>Rated frequency</li> </ul>	Hz	50/60 ± 10 %			
Rated insulation voltage Ui	V	600			
Blocking voltage	V	800	1 200		1 600
Rate of voltage rise	V/µs	1 000			

Туре		3RF20.0-1.A0.	3RF20.0-1.A2.	3RF20.0-1.A4.
Control circuit				
Method of operation		DC operation	AC operation	DC operation
Rated control supply voltage Us	V	24	110 230	4 30
Rated frequency of the control supply voltage	Hz		50/60 ± 10 %	
Control supply voltage, max.	V	30	253	30
Typical actuating current	mA	20	15	20
Response voltage	V	15	90	4
Drop-out voltage	V	5	40	1
Operating times				
ON-delay	ms	1 + max. one half-wave <sup>1)</sup>	40 + max. one half-wave <sup>1)</sup>	1 + max. one half-wave <sup>1)</sup>
• OFF-delay	ms	1 + max. one half-wave	40 + max. one half-wave	1 + max. one half-wave

<sup>1)</sup> Only for zero-point switching devices.

#### Circuit diagrams

DC control supply voltage

AC control supply voltage



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SIRIUS 3RF20 solid-state relays, single-phase, 45 mm

## Selection and ordering data

## Single-phase solid-state relays (without heat sink) with a width of 45 mm

	Type current/ performance capacity <sup>1)</sup>	Rated control supply voltage $U_{\rm S}$	SD	Screw terminals <sup>2)</sup>	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				Article No.				
	А	V	d					kg
Zero-point switching, rated operational volt	age <i>U</i> e 24 230 V AC							
01. R	20 30 50 70 90	24 DC	2 2 2 2 2	3RF2020-1AA02 3RF2030-1AA02 3RF2050-1AA02 3RF2070-1AA02 3RF2070-1AA02	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C	0.088 0.093 0.080 0.085 0.102
	20 30	4 30 DC	5 5	3RF2020-1AA42 3RF2030-1AA42	1	1 unit 1 unit	41C 41C	0.087 0.089
3RF2020-1AA02								
Zero-point switching, rated operational volt	age <i>U<sub>e</sub></i> 48 460 V AC							
	20 30 50 70 90	24 DC	2 2 2 2 2 2	3RF2020-1AA04 3RF2030-1AA04 3RF2050-1AA04 3RF2070-1AA04 3RF2090-1AA04	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C	0.099 0.084 0.085 0.080 0.101
	50	4 30 DC	2	3RF2050-1AA44	. 1	1 unit	41C	0.085
Zero-point switching, rated operational volt	age <i>U<sub>e</sub> 48 600 V AC</i>							
	20 50 70 90	4 30 DC	5 5 2 5	3RF2020-1AA45 3RF2050-1AA45 3RF2070-1AA45 3RF2090-1AA45	1 1 1	1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C	0.080 0.094 0.085 0.085
Zero-point switching rated operational volt	• Blocking voltage 1600 \ age <i>U<sub>e</sub></i> 48 600 V AC	Ι,						
	30 50 70 90	24 DC	5 5 5 5	3RF2030-1AA06 3RF2050-1AA06 3RF2070-1AA06 3RF2090-1AA06	1 1 1	1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C	0.090 0.090 0.085 0.090
Instantaneous switch rated operational volt	ing, age <i>U<sub>e</sub></i> 48 460 V AC							
	30	24 DC	5	3RF2030-1BA04	1	1 unit	41C	0.085
<ol> <li>The type current provide the solid-state relay. The be smaller depending o</li> </ol>	es information about the perfor actual permitted rated operat n the connection method and	mance capacity of $^{(2)}$ Ple tional current $t_{\rm e}$ can ap cooling conditions.	ease r prox.	note that this version can only be u 50 A and a conductor cross-sectio	sed for a on of 10 i	a rated o mm <sup>2</sup> .	current	of up to
	Type current/ performance capacity <sup>1)</sup>	Rated control supply voltage $U_{\rm S}$	SD	Screw terminals + spring-type terminals (control current side)	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.

 A
 V
 d
 kg

 Zero-point switching, rated operational voltage Ue 24 ... 230 V AC
 50
 24 DC
 5
 3RF2050-4AA02
 1 1 unit 41C
 0.086

 SRF2050-4AA02
 SRF2050-4A

<sup>1)</sup> The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current  $I_{\rm e}$  can be smaller depending on the connection method and cooling conditions.

Solid-State Relays

# SIRIUS 3RF22 solid-state relays, three-phase, 45 mm

# Overview

## Circuit diagrams

Two-phase controlled, DC control supply voltage



Three-phase controlled, DC control supply voltage



Solid-State Switching Devices for Resistive/Inductive Loads

Solid-state Contactors

General data

#### Overview

#### Solid-state contactors (with integrated heat sink)

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 70 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

#### 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, in terms of emitted interference, it conforms to limit value curve class B according to IEC 60947-4-3.

#### 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 below. The following miniature circuit breakers with a B 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 of type <sup>1)</sup>	Max. conductor cross section	Minimum cable length from contactor to load
6 A	5SY4106-6	1 mm <sup>2</sup>	5 m
10 A	5SY4110-6	1.5 mm <sup>2</sup>	8 m
16 A	5SY4116-6	1.5 mm <sup>2</sup>	12 m
		2.5 mm <sup>2</sup>	20 m
20 A	5SY4120-6	2.5 mm <sup>2</sup>	20 m
25 A	5SY4125-6	2.5 mm <sup>2</sup>	26 m

 The miniature circuit breakers can be used up to a maximum rated voltage of 480 V!



#### Solid-state contactor protection

The setup and installation above can also be used for the solidstate relays with a  $I^2t$  value of at least 6 600 A<sup>2</sup>s.

#### Three-phase versions

The three-phase solid-state contactors for resistive loads up to 50 A are available with

- Two-phase control (suitable in particular for circuits without connection to the neutral conductor) and
- Three-phase control (suitable for star circuits with connection to the neutral conductor or for applications in which the system requires all phases to be switched)

The converter function module can be snapped onto both versions for the simple power control of AC loads by means of analog signals.

• Check the correct contactor size with the aid of the rated current diagram, taking account of the installation conditions

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Solid-state Contactors

## SIRIUS 3RF23 solid-state contactors, single-phase

More information						
System Manual and Manual, see https://support.industry.siemens.com/cs https://support.industry.siemens.com/cs	view/60311318 view/60298187	FAQs, see https://su	upport.industry.siemens.com/cs/v	/w/en/ps/16228/faq		
Туре		3RF23A	3RF23B	3RF23C	3RF23D	
Dimensions (W x H x D)						
General data						
Ambient temperature						
<ul> <li>During operation, derating from 40 °C</li> <li>During storage</li> </ul>	°C ℃	-25 +60 -55 +80				
Installation altitude	m	0 1 000; derating	from 1 000			
Shock resistance acc. to IEC 60068-2-27	<i>g</i> /ms	15/11				
Vibration resistance acc. to IEC 60068-2-6	g	2				
Degree of protection		IP20 (for ring termin	nal lug connection when usi	ng the terminal cover 3RA2900-3	PA88, otherwise IP00)	
Electromagnetic compatibility (EMC)						
Emitted interference according to IEC 60947-4-3						
- Conducted interference voltage		Class A for industrial applications Class A for indual applications; Cl. residential, busi commercial app up to 16 A, AC		Class A for industrial applications; Class B for residential, business and commercial applications up to 16 A, AC-51 L ow Noise	Class A for industrial applications	
<ul> <li>Emitted, high-frequency interference voltage</li> </ul>	9	Class B for resident	tial, business and commerc	ial applications		
<ul> <li>Interference immunity</li> <li>Electrostatic discharge acc. to IEC 61000-4-2</li> </ul>	kV	Contact discharge 4; air discharge 8; behavior criterion 2				

	(corresponds to degree of severity 3)		
-	Induced RF fields	MHz	0.15 80; 140 dBµV; behavior criterion 1
	acc. to IEC 61000-4-6		
-	Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 2
-	Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2

Туре	3RF231	3RF232	3RF233
General data			
Grounding stud (not included in the scope of supply)			
<ul> <li>Size (standard screw)</li> </ul>	M5		
Permissible mounting position	±10° ±10°		

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

Туре		3RF232	3RF234	3RF235	3RF236
Main circuit					
Rated operational voltage U <sub>e</sub>	V AC	24 230	48 460	48 600	
<ul> <li>Operating range</li> </ul>	V AC	20 253	40 506	40 660	
<ul> <li>Rated frequency</li> </ul>	Hz	50/60 ± 10 %			
Rated insulation voltage U <sub>i</sub>	V	600			
Blocking voltage	V	800	1 200		1 600
Rate of voltage rise	V/µs	1 000			

Solid-state Contactors

SIRIUS 3RF23 solid-state contactors, single-phase

Туре		3RF230.	3RF231		3RF232.	3RF234.
Control circuit						
Method of operation		DC operation	AC/DC ope	ration	AC operation	DC operation
Rated control supply voltage Us	V	24 DC	24 AC	24 DC	110 230 AC	4 30 DC
Rated frequency of the control supply voltage	Hz		50/60 ± 10 %		50/60 ± 10 %	
Actuating voltage, max.	V	30	26.5 AC	30 DC	253	30
Typical actuating current	mA	20 / Low Power: <10 <sup>1)</sup>	20	20	15	20
Response voltage	V	15	14 AC	15 DC	90	4
Drop-out voltage	V	5	5 AC	55 DC	40	1
Operating times						
ON-delay	ms	1 + max. one half-wave <sup>2)</sup>	10 + max. o half-wave <sup>2)</sup>	one	40 + max. one half-wave <sup>2)</sup>	1 + max. one half-wave <sup>2)</sup>
OFF-delay	ms	1 + max. one half-wave	15 + max. o half-wave	one	40 + max. one half-wave	1 + max. one half-waye

Applies to the "Low Power" version 3RF23..-.AA...-OKNO.
 Only for zero-point switching devices.

Solid-state Contactors

SIRIUS 3RF23 solid-state contactors, single-phase

Туре	Type current AC	C-51/performanc	e capacity <sup>1)</sup>	Power loss	Minimum load	Off-state	Rated peak	I <sup>2</sup> t value
	at I <sub>max</sub>	acc. to	acc. to	at I <sub>max</sub>	current	current	withstand current Item	
	at 40 °C	at 40 °C	at 50 °C					
	A	A	A	W	A	mA	A	A²s
Main circuit								
3RF2310AA.2 3RF2310AA.4 3RF2310AA.5	10.5	7.5	9.6	11	0.1	10	200	200
3RF2310AA.6							400	800
3RF2320AA.2 3RF2320AA.4 3RF2320AA.5 3RF2320AA.6	20	13.2	17.6	20	0.5	10	600	1 800
3RF2320CA.2 3RF2320CA.4					25	600	1 800	
3RF2320DA.2 3RF2320DA.4						10	1 150	6 600
3RF2330AA.2 3RF2330AA.4 3RF2330AA.5 3RF2330AA.6	30	22	27	33	0.5	10	600	1 800
3RF2330CA.2						25	600	1 800
3RF2330DA.4		18.5	26	33	0.5	10	1 150	6 600
3RF2340AA.2 3RF2340AA.4 3RF2340AA.5	40	33	36	44	0.5	10	1 200	7 200
3RF2340AA.6							1 150	6 600
3RF2350AA.2 3RF2350AA.4 3RF2350AA.5 3RF2350AA.6	50	36	45	54	0.5	10	1 150	6 600
3RF2370AA.2 3RF2370AA.4 3RF2370AA.5 3RF2370AA.6	70	70	62	83	0.5	10	1 150	6 600

<sup>1)</sup> The type current provides information about the performance of the solidstate contactor. The actual permitted rated operational current  $I_{\rm e}$  can be smaller depending on the connection method and installation conditions.

Туре	Type current capacity <sup>1)</sup>	AC-51/perfor	mance	Type cur performa	rent AC-15/ Ince capacity 1	Power loss at I <sub>max</sub>	Minimum load current	Off-state current	Rated peak withstand	I <sup>2</sup> t value
	at I <sub>max</sub> at 40 °C	acc. to IEC 60947-4-3 at 40 °C	acc. to UL/CSA at 50 °C	10 x I <sub>e</sub> for 60 ms	Parameters				current I <sub>tsm</sub>	
	A	A	A	A		W	A	mA	A	A²s
Main circuit										
3RF2310BA.2 3RF2310BA.4	10.5	7.5	9.6	6	1200 1/h 50%	11	0.1	10	200	200
3RF2310BA.6					ON period				400	800
3RF2320BA.2 3RF2320BA.4 3RF2320BA.6	20	13.2	17.6	12	1200 1/h 50% ON period	20	0.5	10	600	1 800
3RF2330BA.2 3RF2330BA.4 3RF2330BA.6	30	22	27	15	1200 1/h 50% ON period	33	0.5	10	600	1 800
3RF2340BA.2 3RF2340BA.4	40	33	36	20	1200 1/h 50%	44	0.5	10	1 200	7 200
3RF2340BA.6					ON period				1 150	6 600
3RF2350BA.2 3RF2350BA.4 3RF2350BA.6	50	36	45	25	1200 1/h 50% ON period	54	0.5	10	1 150	6 600
3RF2370BA.2 3RF2370BA.4 3RF2370BA.6	70	70	62	27.5	1200 1/h 50% ON period	83	0.5	10	1 150	6 600

<sup>1)</sup> The type current provides information about the performance of the solidstate contactor. The actual permitted rated operational current  $I_e$  can be smaller depending on the connection method and installation conditions.

Solid-state Contactors

SIRIUS 3RF23 solid-state contactors, single-phase

## Circuit diagrams

DC control supply voltage



#### Selection and ordering data

#### Selection notes

The solid-state contactors are selected on the basis of details of the network, the load and the ambient conditions. As the solidstate contactors are already equipped with an optimally matched heat sink, the selection process is considerably simpler than that for solid-state relays.

AC control supply voltage

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

	Sild-State relays.							
	Type current/ performance capacity <sup>1)</sup> I <sub>max</sub>	Rated control supply voltage $U_{\rm S}$	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				Article No.				
	A	V	d					kg
Zero-point switching rated operational volt	· Integrated heat sink, age <i>U<sub>e</sub></i> 24 230 V AC							
	10.5 20 30 40 50	24 DC	2 2 2 2 2	3RF2310-1AA02 3RF2320-1AA02 3RF2330-1AA02 3RF2340-1AA02 3RF2350-1AA02	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C	0.140 0.195 0.300 0.470 0.470
	20	24 DC Low Power	2	3RF2320-1AA02-0KN0	1	1 unit	41C	0.225
2PE2210.1	10.5	24 AC/DC	2	3RF2310-1AA12	1	1 unit	41C	0.140
Zero-point switching	Integrated heat sink							
rated operational volt	age <i>U<sub>e</sub></i> 48 460 V AC							
	10.5 20 30 40 50	24 DC	2 2 2 2 2	3RF2310-1AA04 3RF2320-1AA04 3RF2330-1AA04 3RF2340-1AA04 3RF2350-1AA04	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C	0.140 0.200 0.300 0.470 0.470
1000	10.5	24 DC Low Power	2	3RF2310-1AA04-0KN0	1	1 unit	41C	0.140
C.	10.5 20 30	4 30 DC	2 2 2	3RF2310-1AA44 3RF2320-1AA44 3RF2330-1AA44	1 1 1	1 unit 1 unit 1 unit	41C 41C 41C	0.140 0.190 0.320
3RF2320-1								
Zero-point switching rated operational volt	• Integrated heat sink, age <i>U<sub>e</sub> 48 600 V AC</i>							
	10.5 20 30 40 50	4 30 DC	5 2 2 2 2	3RF2310-1AA45 3RF2320-1AA45 3RF2330-1AA45 3RF2340-1AA45 3RF2350-1AA45	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C	0.140 0.190 0.300 0.480 0.480
<ol> <li>The type current provide</li> </ol>	es information about the perfor	mance of the solid- Othe	er rat	ed control supply voltages of	n reau	est.		

state contactor. The actual permitted rated operational current  $I_{\rm e}$  can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 2/114, "More information".

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Solid-state Contactors

SIRIUS 3RF23 solid-state contactors, single-phase Weight per PU PS\* Type current/ Rated control supply voltage SD Screw terminals PU PG  $\oplus$ performance capacity<sup>1)</sup> (UNIT,  $U_{\rm S}$ SET, approx. Imax M) Article No. V Δ d kg Zero-point switching · Integrated heat sink, blocking voltage 1 600 V, rated operational voltage Ue 48 ... 600 V AC 24 DC 10.5 5 2 3RF2310-1AA06 0.154 1 unit 41C 1 20 3RF2320-1AA06 41C 0.185 1 1 unit 30 2 3RF2330-1AA06 1 unit 41C 0.300 1 40 5 3RF2340-1AA06 1 unit 41C 0.480 1 50 5 3RF2350-1AA06 1 1 unit 41C 0.470 .0. 1 10 前 3RF2340-1 Low Noise<sup>2)</sup>, zero-point switching  $\cdot$  Integrated heat sink, rated operational voltage  $U_{\rm e}$  24 ... 230 V AC 20 30 24 DC 5 3RF2320-1CA02 1 unit 41C 0.235 3RF2330-1CA02 5 1 1 unit 41C 0.407 3RF2320-1 Low Noise<sup>2)</sup> zero-point switching  $\cdot$  Integrated heat sink, rated operational voltage  $U_{\rm e}$  48 ... 460 V AC 20 24 DC 5 3RF2320-1CA04 1 1 unit 41C 0.180 20 4 ... 30 DC 2 3RF2320-1CA44 1 1 unit 41C 0.190 Short-circuit-proof with B MCB  $\cdot$ Zero-point switching  $\cdot$  Integrated heat sink, rated operational voltage  $U_{\rm e}$  24 ... 230 V AC 24 DC 3RF2320-1DA02 2 1 1 unit 41C 0.180 20 Short-circuit-proof with B MCB  $\cdot$ Zero-point switching  $\cdot$  Integrated heat sink, rated operational voltage  $U_{\rm e}$  48 ... 460 V AC 20 24 DC 2 3RF2320-1DA04 1 1 unit 41C 0.190 20 4 ... 30 DC 2 3RF2320-1DA44 1 unit 41C 0.190 1 30 2 3RF2330-1DA44 41C 0.190 1 1 unit 痴

3RF2320-1

<sup>1)</sup> The type current provides information about the performance of the solidstate contactor. The actual permitted rated operational current I<sub>e</sub> can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 2/114, "More information". Other rated control supply voltages on request.

<sup>2)</sup> See page 2/125.

Solid-state Contactors

SIRIUS 3RF23 solid-state contactors, single-phase

	Type current/ performance capacity <sup>1)</sup> I <sub>max</sub>	Operational current $I_{\rm e}$ /AC-15 <sup>2)</sup>	Rated control supply voltage U <sub>s</sub>	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
					Article No.				
	А	A	V	d					kg
Instantaneous switch rated operational volt	ing · Integrated h age <i>U<sub>e</sub></i> 24 230	neat sink, V AC							
	10.5 20 30 40 50 50	6 12 15 20 25 27.5	24 DC	2 2 5 5 5 5 5	3RF2310-1BA02 3RF2320-1BA02 3RF2330-1BA02 3RF2340-1BA02 3RF2350-1BA02 3RF2370-1BA02	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C 41C	0.140 0.190 0.300 0.480 0.470 1.243
3RF2310-1									
rated operational volt	age U <sub>e</sub> 48 460	v AC							
.0.	10.5 20 30 40 50 50	6 12 15 20 25 27.5	24 DC	2 2 5 5 5	3RF2310-1BA04 3RF2320-1BA04 3RF2330-1BA04 3RF2340-1BA04 3RF2350-1BA04 3RF2350-1BA04	1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C 41C 41C	0.159 0.190 0.300 0.470 0.470 0.690
3RF2320-1	20 30 50	12 15 25	4 30 DC	5 5 5	3RF2320-1BA44 3RF2330-1BA44 3RF2350-1BA44	1 1 1	1 unit 1 unit 1 unit	41C 41C 41C	0.225 0.300 0.470
Instantaneous switch blocking voltage 1 600 rated operational volt	ing · Integrated h 0 V, age <i>U</i> <sub>e</sub> 48 600	neat sink, V AC							
3RF2340-1	10.5 20 30 40 50 50	6 12 15 20 25 27.5	24 DC	5 2 5 5 5 5 5	3RF2310-1BA06 3RF2320-1BA06 3RF2330-1BA06 3RF2340-1BA06 3RF2350-1BA06 3RF2370-1BA06	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C 41C	0.167 0.190 0.445 0.480 0.470 1.250

<sup>1)</sup> The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current *I<sub>e</sub>* can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 2/114, "More information".

<sup>2)</sup> Utilization category AC-15:

Electromagnetic loads, e.g. valves according to IEC 60947-5-1. Parameters: max. 1 200 1/h, 50 % ON period, 10-times inrush current for 60 ms.

Other rated control supply voltages on request.

Solid-state Contactors

SIRIUS 3RF23 solid	-state contactors, sing	lle-phase						
	Type current/ performance capacity <sup>1)</sup> I <sub>max</sub>	Rated control supply voltage $U_{\rm S}$	SD	Spring-type terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				Article No.				
	A	V	d					kg
Zero-point switching rated operational volt	• Integrated heat sink, age <i>U<sub>e</sub></i> 24 230 V AC							
	10.5 20	24 DC	5 2	3RF2310-2AA02 3RF2320-2AA02	1	1 unit 1 unit	41C 41C	0.140 0.180
3RF2320-2								
Zero-point switching rated operational volt	<ul> <li>Integrated heat sink, age U<sub>e</sub> 48 460 V AC</li> </ul>							
	10.5 20	24 DC	2 2	3RF2310-2AA04 3RF2320-2AA04	1 1	1 unit 1 unit	41C 41C	0.206 0.190
Zero-point switching blocking voltage 1 600 rated operational volt	• Integrated heat sink, 0 V, age <i>U</i> e 48 600 V AC							
	10.5 20	24 DC	5 2	3RF2310-2AA06 3RF2320-2AA06	1 1	1 unit 1 unit	41C 41C	0.140 0.180
Low Noise <sup>2)</sup> , zero-point switching - rated operational volt	• Integrated heat sink, age <i>U</i> <sub>e</sub> 24 230 V AC							
	20	24 DC	5	3RF2320-2CA02	1	1 unit	41C	0.225
Low Noise <sup>2)</sup> , zero-point switching rated operational volt	• Integrated heat sink, age <i>U</i> <sub>e</sub> 48 460 V AC							
	20	24 DC	5	3RF2320-2CA04	1	1 unit	41C	0.190
Short-circuit-proof wi zero-point switching rated operational volt	th B MCB, • Integrated heat sink, •age <i>U</i> <sub>e</sub> 48 460 V AC							
	20	24 DC	5	3RF2320-2DA04	1	1 unit	41C	0.190
<ol> <li>The type current provide</li> </ol>	es information about the perfor	mance of the solid- Othe	er rat	ed control supply voltages o	n reque	est.		

<sup>1)</sup> The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current *I<sub>e</sub>* can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 2/114, "More information".

2) See page 2/125.

Solid-state Contactors

			S	IRIUS 3RF23 solid-state c	ontact	ors, s	ingle	-phase
	Type current/ performance capacity <sup>1)</sup> I <sub>max</sub>	Rated control supply voltage $U_{\rm S}$	SD	Ring terminal lug	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	A	V	d	Article No.				kg
Zero-point switching rated operational volt	<ul> <li>Integrated heat sink,</li> <li>age U<sub>2</sub> 24 230 V AC</li> </ul>							
3RF2350-3	10.5 20 30 40 50 70	24 DC	5 5 5 5 5 2	3RF2310-3AA02 3RF2320-3AA02 3RF2330-3AA02 3RF2340-3AA02 3RF2350-3AA02 3RF2370-3AA02 3RF2370-3AA02	1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C 41C	0.167 0.225 0.405 0.589 0.564 0.680
Zero-point switching rated operational volt	• Integrated heat sink, age <i>U</i> _ 48 460 V AC							
rated operational volt	10.5 20 30 40 50 70	24 DC	5 5 2 5 2 2 2	3RF2310-3AA04 3RF2320-3AA04 3RF2330-3AA04 3RF2340-3AA04 3RF2350-3AA04 3RF2350-3AA04 3RF2370-3AA04	1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C 41C	0.173 0.190 0.300 0.470 0.480 0.680
3EF2330-3	20 30 50	4 30 DC	5 5 5	3RF2320-3AA44 3RF2330-3AA44 3RF2350-3AA44	1 1 1	1 unit 1 unit 1 unit	41C 41C 41C	0.242 0.389 0.480
covers optional	Integrated heat sink							
rated operational volt	tage $U_{\rm e}$ 48 600 V AC	4 20.00	F	2050240.24445	-	1 . mit	410	0.490
7	40 70	4 30 DC	5 2	3RF2340-3AA45 3RF2370-3AA45	1	1 unit	41C 41C	0.480
blocking voltage 1 60 rated operational volt	• Integrated neat SINK, 0 V, tage <i>U<sub>e</sub></i> 48 600 V <u>AC</u>							
	10.5 20 30 40 50 70	24 DC	5 5 5 5 5 5 5	3RF2310-3AA06 3RF2320-3AA06 3RF2330-3AA06 3RF2340-3AA06 3RF2350-3AA06 3RF2350-3AA06 3RF2370-3AA06	1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	41C 41C 41C 41C 41C 41C 41C	0.175 0.195 0.389 0.470 0.460 0.680

<sup>1)</sup> The type current provides information about the performance of the solidstate 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 2/114, "More information".

Other rated control supply voltages on request.

Solid-state Contactors

SIRIUS 3RF23 solid-state contactors, single-phase

	Type current/ performance capacity <sup>1)</sup> I <sub>max</sub>	Operational current <i>I<sub>e</sub></i> /AC-15 <sup>2)</sup>	Rated control supply voltage U <sub>s</sub>	SD	Ring terminal lug	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
					Article No.				
	A	A	V	d					kg
Instantaneous switch rated operational volt	ning · Integrated I tage <i>U<sub>e</sub></i> 24 230	neat sink, V AC							
	70	27.5	24 DC	5	3RF2370-3BA02	1	1 unit	41C	1.230
Instantaneous switch rated operational volt	hing · Integrated I tage <i>U<sub>e</sub></i> 48 460	neat sink, V AC							
	70	27.5	24 DC	5	3RF2370-3BA04	1	1 unit	41C	1.251
Instantaneous switch blocking voltage 1 60 rated operational volt	ning · Integrated I 0 V, tage <i>U<sub>e</sub></i> 48 600	neat sink, V AC							
	70	27.5	24 DC	5	3RF2370-3BA06	1	1 unit	41C	1.236
Short-circuit-proof wi Zero-point switching rated operational volt	ith B MCB · Integrated heat tage <i>U<sub>e</sub></i> 24 230	sink, V AC							
	20		24 DC	5	3RF2320-3DA02	1	1 unit	41C	0.239
Short-circuit-proof wi Zero-point switching rated operational volt	ith B MCB · Integrated heat tage <i>U</i> e 48 460	sink, V AC							
	20		24 DC	5	3RF2320-3DA04	1	1 unit	41C	0.243
1) The type current provide state contactor. The actu smaller depending on th	es information about ual permitted rated on the connection metho	the performance of perational current $I_e$ d and installation co	the solid- <sup>2)</sup> L can be E nditions. F	Utilizatio lectron Paramet	on category AC-15: nagnetic loads, e.g. valves accordi ters: max. 1 200 1/h, 50 % ON perio	ng to IE od, 10-ti	C 60947 mes inri	7-5-1. ush cu	rrent for

state contactor. The actual permitted rated operational current  $I_{\rm e}$  can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 2/114, "More information".

60 ms. Other rated control supply voltages on request.

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d					kg
<b>Optional accessories</b>							
			Spring-type terminals				
	<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals Length approx. 200 mm, 3.0 mm x 0.5 mm titanium gray/black, partially insulated	2	3RA2908-1A	1	1 unit	41B	0.050
3KA2908-1A			Ring terminal lug				
3RF2900-3PA88	Terminal covers For 3RF21 solid-state relays and 3RF23 solid-state contactors in ring terminal lug connection (With this terminal cover, degree of protection IP20 can be achieved in the terminal compartment in the case of ring terminal lug connections. It can also be used for screw terminals after simple adaptation)	2	3RF2900-3PA88	1	10 units	41C	0.004
	Control connectors						
			Screw terminals				
	Replacement control connectors For 3RF20/21/22 and 3RF23/24 Screw terminals	5	3RF2900-1TA88	1	50 units	41C	0.004
			Spring-type terminals				
	Replacement control connectors For 3RF20/21/22 and 3RF23/24 Spring-type terminals	5	3RF2900-2TA88	1	50 units	41C	0.004
	Control connectors For 3RF20/21/22 and 3RF23/24 Spring-type terminals with two clamping points per contact	5	3RF2900-2TB88	1	10 units	41C	0.004

**Function Modules** 

General data

## 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 external connections have screw terminals.

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

Туре	Accessories					
	Converters	Load monitoring		Heating current	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended <sup>1)</sup>	monitoring "		
Type current = 3	20 A					
3RF2120-1A.02 3RF2120-1A.04	3RF2900-0EA18 3RF2900-0EA18	3RF2920-0FA08 3RF2920-0FA08	3RF2920-0GA13 3RF2920-0GA16	 3RF2932-0JA16	3RF2920-0KA13 3RF2920-0KA16	3RF2920-0HA13 3RF2920-0HA16
3RF2120-1A.22 3RF2120-1A.24			3RF2920-0GA33 3RF2920-0GA36			
3RF2120-1A.42 3RF2120-1A.45	3RF2900-0EA18 3RF2900-0EA18	3RF2920-0FA08 3RF2920-0FA08	3RF2920-0GA13 3RF2920-0GA16	 3RF2932-0JA16	3RF2920-0KA13 3RF2920-0KA16	3RF2920-0HA13 3RF2920-0HA16
3RF2120-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2120-2A.02 3RF2120-2A.04	3RF2900-0EA18 3RF2900-0EA18					
3RF2120-2A.22 3RF2120-2A.24						
3RF2120-2A.42 3RF2120-2A.45	3RF2900-0EA18 3RF2900-0EA18					
3RF2120-3A.02 3RF2120-3A.04	3RF2900-0EA18 3RF2900-0EA18		3RF2920-0GA13 3RF2920-0GA16	 3RF2932-0JA16	3RF2920-0KA13 3RF2920-0KA16	3RF2920-0HA13 3RF2920-0HA16
3RF2120-3A.22 3RF2120-3A.24			3RF2920-0GA33 3RF2920-0GA36		3RF2920-0KA13 3RF2920-0KA16	3RF2920-0HA13 3RF2920-0HA16
Type current = 3	30 A					
3RF2130-1A.02 3RF2130-1A.04 3RF2130-1A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18	3RF2920-0FA08 3RF2920-0FA08 3RF2920-0FA08	3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	 3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2130-1A.22 3RF2130-1A.24 3RF2130-1A.26			3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36			3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2130-1A.42 3RF2130-1A.45	3RF2900-0EA18 3RF2900-0EA18	3RF2920-0FA08 3RF2920-0FA08	3RF2950-0GA13 3RF2950-0GA16	 3RF2932-0JA16	3RF2950-0KA13 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16
3RF2130-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
Type current =	50 A					
3RF2150-1A.02 3RF2150-1A.04 3RF2150-1A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18	3RF2920-0FA08 3RF2920-0FA08 3RF2920-0FA08	3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	 3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2150-1A.22 3RF2150-1A.24 3RF2150-1A.26	  	  	3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36	 	  	3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2150-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2150-1B.04 3RF2150-1B.06	3RF2900-0EA18 3RF2900-0EA18	3RF2920-0FA08 3RF2920-0FA08	3RF2950-0GA16 3RF2950-0GA16	3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA16 3RF2950-0HA16
3RF2150-1B.22			3RF2950-0GA33			3RF2950-0HA33
3RF2150-2A.02 3RF2150-2A.04 3RF2150-2A.06	3RF2900-0EA18 3RF2900-0EA18 3RE2900-0EA18	-		-		
3RF2150-2A 14	3BE2900-0EA18					
3RF2150-2A 22						
3RF2150-2A.24 3RF2150-2A.26						
3RF2150-3A.02 3RF2150-3A.04 3RF2150-3A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18	 	3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	 3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2150-3A.22 3RF2150-3A.24 3RF2150-3A.26			3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36			3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36

 $^{1)}$  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 voltageresistant versions of the solid-state relays (3RF21 ..- ... 4 , - .... 5 or - .... 6).

**Function Modules** 

## General data

Туре	Accessories				1)	- 1)
	Converters	Load monitoring	Extended <sup>1</sup> )	Heating current monitoring <sup>1)</sup>	Power controllers"	Power regulators "
Type current -	70 A	Dasic	Extended /	5		
2DE2170-1A 02	3RE2000 0EA18	2RE2020 0EA08	2RE2050 0CA 12		2DE2050 0KA12	2DE2050 0HA12
3RF2170-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	 3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1A.05	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1A.06	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1A.22 3RF2170-1A 24			3RF2950-0GA33 3RF2950-0GA36			3RF2950-0HA33 3RE2950-0HA36
3RF2170-1A.26			3RF2950-0GA36			3RF2950-0HA36
3RF2170-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1C.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
Type current =	90 A					
3RF2190-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA13		3RF2950-0KA13	3RF2950-0HA13
3RF2190-1A.04 3RF2190-1A.06	3RF2900-0EA18 3RF2900-0EA18	3RF2920-0FA08 3RF2920-0FA08	3RF2950-0GA16 3RF2950-0GA16	3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA16 3RF2950-0HA16
3RF2190-1A.22			3RF2950-0GA33			3RF2950-0HA33
3RF2190-1A.24 3RF2190-1A.26			3RF2950-0GA36			3RF2950-0HA36
3RF2190-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2190-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2190-2A.02	3RF2900-0EA18					
3RF2190-2A.04	3RF2900-0EA18 3RE2900-0EA18					
3RF2190-2A.22						
3RF2190-2A.24						
3RF2190-2A.26						
3RF2190-3A.02	3RF2900-0EA18		3RF2990-0GA13	 2DE2022.014.16	3RF2990-0KA13	3RF2990-0HA13
3RF2190-3A.04 3RF2190-3A.06	3RF2900-0EA18		3RF2990-0GA16	3RF2932-0JA16	3RF2990-0KA16	3RF2990-0HA16
3RF2190-3A.22			3RF2990-0GA33			3RF2990-0HA33
3RF2190-3A.24			3RF2990-0GA36			3RF2990-0HA36
3RF2190-3A.20	 3RE2900-0EA18		3RE2990-0GA30	3BE2932-0.1416	3RE2990-0KA16	3RE2990_0HA16
5111 2130-5A.44	0111 2000 0EA10		0111 2000 00A10	0111 2002 00A10	0111 2000 01(A10	0111 2000 011A10

<sup>1)</sup> 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 3RF23 single-phase solid-state contactors

Туре	Accessories					
	Converters	Load monitoring		Heating current	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended <sup>1)</sup>	monitoring <sup>1)</sup>		
Type current I <sub>e</sub>	= 10.5 A					
3RF2310-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	3RF2916-0JA13	3RF2920-0KA13	3RF2920-0HA13
3RF2310-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1A.06	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1A.12	3RF2900-0EA18		3RF2920-0GA13	3RF2916-0JA13	3RF2920-0KA13	3RF2920-0HA13
3RF2310-1A.14	3RF2900-0EA18		3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1A.22			3RF2920-0GA33			3RF2920-0HA33
3RF2310-1A.24			3RF2920-0GA36			3RF2920-0HA36
3RF2310-1A.26			3RF2920-0GA36			3RF2920-0HA36
3RF2310-1A.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16

<sup>1)</sup> 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).

**Function Modules** 

General data

Туре	Accessories					
	Converters	Load monitoring		Heating current	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended <sup>1)</sup>	monitoring"		
Type current I <sub>e</sub>	= 10.5 A					
3RF2310-1B.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	3RF2916-0JA13	3RF2920-0KA13	3RF2920-0HA13
3RF2310-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1B.06	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1B.22			3RF2920-0GA33			3RF2920-0HA33
3RF2310-1B.26			3RF2920-0GA36			3RF2920-0HA36
3RF2310-2A.02	3RF2900-0EA18					
3RF2310-2A.04	3RF2900-0EA18					
3RF2310-2A.06	3RF2900-0EA18					
3RF2310-2A.22 3RF2310-2A.24						
3RF2310-2A.26						
3RF2310-3A.02	3RF2900-0EA18		3RF2920-0GA13	3RF2916-0JA13	3RF2920-0KA13	3RF2920-0HA13
3RF2310-3A.04	3RF2900-0EA18		3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
20E2210-3A.00	3NF2900-0EA10		3RF2920-0GA 10	3RF2932-0JA10	3RF2920-0RA10	3RF2920-0HA10
3RF2310-3A.22			3RF2920-0GA36			3RF2920-0HA36
3RF2310-3A.26			3RF2920-0GA36			3RF2920-0HA36
Type current Ie	= 20 A					
3RF2320-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13		3RF2920-0KA13	3RF2920-0HA13
3RF2320-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
2DE2220-1A 14	3RE2000 0EA18	5111 2320-01 A00	3RE2020 0CA16	5111 2352-00A 10	3RE2020 0KA16	3RE2020 0HA16
3RF2320-1A.14	5111 2900-0LA 10		3RE2020-0GA33		5111 2920-0IA10	3RE2020-0HA33
3RF2320-1A.22			3RF2920-0GA36			3RF2920-0HA36
3RF2320-1A.26			3RF2920-0GA36			3RF2920-0HA36
3RF2320-1A.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA 16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1B.02 3RF2320-1B.04	3RF2900-0EA18 3RF2900-0EA18	3RF2920-0FA08 3RF2920-0FA08	3RF2920-0GA13 3RF2920-0GA16	 3BE2932-0.JA16	3RF2920-0KA13 3RF2920-0KA16	3RF2920-0HA13 3RF2920-0HA16
3RF2320-1B.06	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1B.22			3RF2920-0GA33			3RF2920-0HA33
3RF2320-1B.24			3RF2920-0GA36			3RF2920-0HA36
3RF2320-1B.20	38E2900-0EA18		3BE2920-0GA16		3BE2920-0KA16	3RE2920-0HA16
3RF2320-1C 02	3BE2900-0EA18	3BE2920-0EA08	3BE2920-0GA13		3BE2920-0KA13	3BE2920-0HA13
3RF2320-1C.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1C.22			3RF2920-0GA33			3RF2920-0HA33
3RF2320-1C.24			3RF2920-0GA36			3RF2920-0HA36
3RF2320-1C.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1D.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	 3RE2032-0 IA16	3RF2920-0KA13	3RF2920-0HA13
3RF2320-1D 22			3BE2920-0GA33			3RE2920-0HA33
3RF2320-1D.24			3RF2920-0GA36			3RF2920-0HA36
3RF2320-1D.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-2A.02	3RF2900-0EA18					
3RF2320-2A.04	3RF2900-0EA18					
3RF2320-2A.06	3RF2900-0EA18					
3RF2320-2A.22 3RF2320-2A.24						
3RF2320-2A.26						
3RF2320-2C.02	3RF2900-0EA18					
3RF2320-2C.04	3RF2900-0EA18					
3RF2320-2C.22 3RF2320-2C 24						
3RF2320-2D 22						
3RF2320-2D.24						
3RF2320-3A.02	3RF2900-0EA18		3RF2920-0GA13		3RF2920-0KA13	3RF2920-0HA13
3RF2320-3A.04	3RF2900-0EA18		3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-3A.06	3KF2900-0EA18		3HF2920-0GA16	3HF2932-UJA16	3HF2920-0KA16	3RF2920-0HA16
3RF2320-3A.22 3RF2320-3A.24			3RF2920-0GA33 3RF2920-0GA36			3RF2920-0HA33 3RF2920-0HA36
3RF2320-3A.26			3RF2920-0GA36			3RF2920-0HA36
3RF2320-3A.44	3RF2900-0EA18		3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16

<sup>1)</sup> 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).

**Function Modules** 

Accessories

## **General data**

Туре

	Converters	Load monitoring	<b>–</b> , , ,2)	Heating current	Power controllers <sup>2)</sup>	Power regulators <sup>2)</sup>
<b>T</b>	00.4	Basis <sup>17</sup>	Extended <sup>2</sup>	monitoring	_	
Type current I <sub>e</sub>	= 20 A		0050000.004.40			
3RF2320-3D.02 3RF2320-3D.04	3RF2900-0EA18 3RF2900-0EA18		3RF2920-0GA13 3RF2920-0GA16	 3RF2932-0JA16	3RF2920-0KA13 3RF2920-0KA16	3RF2920-0HA13 3RF2920-0HA16
3RF2320-3D.22 3RF2320-3D.24			3RF2920-0GA33 3RF2920-0GA36			3RF2920-0HA33 3RF2920-0HA36
Type current Ie	= 30 A					
3RF2330-1A.02 3RF2330-1A.04 3RF2330-1A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18		3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	 3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2330-1A.14	3RF2900-0EA18		3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1A.22 3RF2330-1A.24 3RF2330-1A.25 3RF2330-1A.26	  	  	3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36 3RF2950-0GA36	  		3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36 3RF2950-0HA36
3RF2330-1A.44 3RF2330-1A.45	3RF2900-0EA18 3RF2900-0EA18		3RF2950-0GA16 3RF2950-0GA16	3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA16 3RF2950-0HA16
3RF2330-1B.02 3RF2330-1B.04 3RF2330-1B.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18		3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	 3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2330-1B.22 3RF2330-1B.24 3RF2330-1B.26	 		3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36			3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2330-1B.44	3RF2900-0EA18		3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1C.02	3RF2900-0EA18		3RF2950-0GA13			3RF2950-0HA13
3RF2330-1D.44	3RF2900-0EA18		3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-3A.02 3RF2330-3A.04 3RF2330-3A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18		3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	 3RF2932-0JA16 3RF2932-0JA16	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2330-3A.22 3RF2330-3A.24 3RF2330-3A.26	 		3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36	  		3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2330-3A.44	3RF2900-0EA18		3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
Type current I <sub>e</sub>	, = 40 A					
3RF2340-1A.02 3RF2340-1A.04 3RF2340-1A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18		3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	  	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2340-1A.14	3RF2900-0EA18		3RF2950-0GA16		3RF2950-0KA16	3RF2950-0HA16
3RF2340-1A.22 3RF2340-1A.24 3RF2340-1A.26	  		3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36	 		3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2340-1A.45	3RF2900-0EA18		3RF2950-0GA16		3RF2950-0KA16	3RF2950-0HA16
3RF2340-1B.02 3RF2340-1B.04 3RF2340-1B.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18		3RF2950-0GA13 3RF2950-0GA13 3RF2950-0GA13	  	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2340-1B.22 3RF2340-1B.24 3RF2340-1B.26	 		3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36			3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2340-3A.02 3RF2340-3A.04 3RF2340-3A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18		3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	 	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2340-3A.22 3RF2340-3A.24 3RF2340-3A.26			3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36	  		3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2340-3A.45	3RF2900-0EA18		3RF2950-0GA16		3RF2950-0KA16	3RF2950-0HA16
Type current I <sub>e</sub>	= 50 A					
3RF2350-1A.02 3RF2350-1A.04 3RF2350-1A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18		3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16		3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2350-1A.14	3RF2900-0EA18		3RF2950-0GA16		3RF2950-0KA16	3RF2950-0HA16
3RF2350-1A.22 3RF2350-1A.24 3RF2350-1A.26			3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36			3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2350-1A.45	3RF2900-0EA18		3RF2950-0GA16		3RF2950-0KA16	3RF2950-0HA16

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.

<sup>2)</sup> 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).

Function Modules

## General data

Туре	Accessories					
	Converters	Load monitoring		Heating current	Power controllers <sup>1)</sup>	Power regulators <sup>1)</sup>
		Basic	Extended <sup>1)</sup>	monitoring		
Type current Ie	= 50 A					
3RF2350-1B.02 3RF2350-1B.04 3RF2350-1B.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18	 	3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16		3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2350-1B.22 3RF2350-1B.24 3RF2350-1B.26	  	  	3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36			3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2350-1B.44	3RF2900-0EA18		3RF2950-0GA16		3RF2950-0KA16	3RF2950-0HA16
3RF2350-3A.02 3RF2350-3A.04 3RF2350-3A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18	 	3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16		3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2350-3A.22 3RF2350-3A.24 3RF2350-3A.26	  	  	3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36	 		3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2350-3A.44	3RF2900-0EA18		3RF2950-0GA16		3RF2950-0KA16	3RF2950-0HA16
Type current Ie	= 70 A					
3RF2370-1B.02 3RF2370-1B.04 3RF2370-1B.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18	  	3RF2950-0GA13 3RF2950-0GA16 3RF2950-0GA16	 	3RF2950-0KA13 3RF2950-0KA16 3RF2950-0KA16	3RF2950-0HA13 3RF2950-0HA16 3RF2950-0HA16
3RF2370-1B.22 3RF2370-1B.24 3RF2370-1B.26	 		3RF2950-0GA33 3RF2950-0GA36 3RF2950-0GA36			3RF2950-0HA33 3RF2950-0HA36 3RF2950-0HA36
3RF2370-3A.02 3RF2370-3A.04 3RF2370-3A.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18	  	3RF2990-0GA13 3RF2990-0GA16 3RF2990-0GA16		3RF2990-0KA13 3RF2990-0KA16 3RF2990-0KA16	3RF2990-0HA13 3RF2990-0HA16 3RF2990-0HA16
3RF2370-3A.22 3RF2370-3A.24 3RF2370-3A.26			3RF2990-0GA33 3RF2990-0GA36 3RF2990-0GA36			3RF2990-0HA33 3RF2990-0HA36 3RF2990-0HA36
3RF2370-3A.45	3RF2900-0EA18		3RF2990-0GA16		3RF2990-0KA16	3RF2990-0HA16
3RF2370-3B.02 3RF2370-3B.04 3RF2370-3B.06	3RF2900-0EA18 3RF2900-0EA18 3RF2900-0EA18		3RF2990-0GA13 3RF2990-0GA16 3RF2990-0GA16		3RF2990-0KA13 3RF2990-0KA16 3RF2990-0KA16	3RF2990-0HA13 3RF2990-0HA16 3RF2990-0HA16
3RF2370-3B.22 3RF2370-3B.24 3RF2370-3B.26			3RF2990-0GA33 3RF2990-0GA36 3RF2990-0GA36			3RF2990-0HA33 3RF2990-0HA36 3RF2990-0HA36

<sup>1)</sup> 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 voltageresistant versions of the solid-state contactors (3RF23..-...4, -....5 or -....6).

Function Modules

### General data

## Technical specifications

#### More information

System Manual and Manual, see

https://support.industry.siemens.com/cs/ww/en/view/60311318 https://support.industry.siemens.com/cs/ww/en/view/60298187 FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16231/faq

Туре 3RF29..-0EA.. 3RF29..-0FA.. 3RF29..-0GA.. 3RF29..-0HA.. 3RF29..-0JA.. 3RF29..-0KA.. General data Ambient temperature °C • During operation, derating from 40 °C -25 ... +60 °C • During storage -55 ... +80 Installation altitude 0 ... 1 000; derating from 1 000 m Shock resistance acc. to IEC 60068-2-27 g/ms 15/11 Vibration resistance acc. to IEC 60068-2-6 2 g Degree of protection IP20 Electromagnetic compatibility (EMC) • Emitted interference - Conducted interference voltage acc. to IEC 60947-4-3 Class A for industrial applications<sup>1)</sup> - Emitted, high-frequency interference Class B for residential, business and commercial applications voltage according to IEC 60947-4-3 Interference immunity - Electrostatic discharge kV Contact discharge 4; air discharge 8; behavior criterion 2 acc. to IEC 61000-4-2 (corresponds to degree of severity 3) - Induced RF fields 0.15 ... 80; 140 dBµV; behavior criterion 1 MHz acc. to IEC 61000-4-6 - 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

Туре		3RF290EA18	3RF290FA08	3RF290GA.3	3RF290GA.6
Main circuit					
Rated operational voltage U <sub>e</sub> • Operating range • Rated frequency	V AC V AC Hz	1)  		110 230 93.5 253 50/60	400 600 340 660
Rated insulation voltage Ui	V			600	
<ul><li>Voltage measuring</li><li>Measuring range</li></ul>	V			93.5 253	340 660
Mains voltage, fluctuation compensation	%			20	

1) Versions are independent of the main circuit.

Туре		3RF290HA.3 3RF290KA.3	3RF290HA.6 3RF290KA.6	3RF290JA.3	3RF290JA.6
Main circuit					
Rated operational voltage U <sub>e</sub> • Operating range • Rated frequency	V AC V AC Hz	110 230 93.5 253 50/60	400 600 340 660	110 230 93.5 253	400 600 340 660
Rated insulation voltage U <sub>i</sub>	V	600			
Voltage measuring <ul> <li>Measuring range</li> </ul>	V	93.5 253	340 660	93.5 253	340 660
Mains voltage, fluctuation compensation	%	20			

Туре		3RF290.	3RF291.	3RF293.
Control circuit				
Method of operation		DC operation	AC/DC operation	AC operation
Rated control supply voltage U <sub>s</sub> Rated control current	V mA	24 15		110
Rated frequency of the control supply voltage Hz			50/60	
Actuating voltage, max.	V	30		121
Rated control current At maximum voltage	mA	15		
Response voltage • For operating current	V mA	15 2		90
Drop-out voltage	V	5		15

**Function Modules** 

General data

2

Туре		3RF2906-0FA08	3RF2920-0FA08	3RF2920-0GA	3RF2950-0GA	3RF2990-0GA
Current measurement						
Rated operational current Ie	А	6	20		50	90
Current measurement <ul> <li>Teach range</li> <li>Measuring range</li> <li>Minimum partial load current</li> </ul>	A A A	0.25 6 0 6.6 0.25	0.65 20 0 22 0.65	0.56 20	1.62 50 0 55 1.6	2.93 90 0 99 2.9
Number of partial loads		16		1 12		

Туре		3RF2920-0HA	3RF2950-0HA	3RF2990-0HA	3RF2916-0JA	3RF2932-0JA
Current measurement						
Rated operational current Ie	А	20	50	90	16	32
Current measurement • Teach range • Measuring range • Minimum partial load current	A A A	4 20 0 22 	10 50 0 55	18 90 4 99	0.42 16 0 16 0.42	0.8 32 0 32 0.8
Number of partial loads					1 6	

Туре		3RF2904-0KA	3RF2920-0KA	3RF2950-0KA	3RF2990-0KA
Current measurement					
Rated operational current Ie	А	4	20	50	90
Current measurement					
Teach range	A	0.15 4	0.65 20	1.6 50	2.9 90
Measuring range	А	04	0 22	0 55	0 99
<ul> <li>Minimum partial load current</li> </ul>	А		0.65	1.6	2.9
Number of partial loads			16		

## Circuit diagrams

Converters



1 Internal connection

Basic load monitoring



2 Straight-through transformer

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	A2≃⊺
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	I

Extended load monitoring

- 1 Internal connection 2 Straight-through transformer
- 3 Voltage detection not electrically isolated (3 MΩ per path)

Heating current monitoring



1 Internal connection 2 Straight-through transformer

- 3 Voltage detection not electrically isolated (3 MΩ per path)

Power controller and regulator





**Function Modules** 

### SIRIUS converters for 3RF2

## Overview

#### Converters for 3RF2 solid-state switching devices

These modules are used to convert analog control signals, such as those output from many temperature controllers for example, into a pulse-width-modulated digital signal. The connected solid-state contactors and relays can therefore regulate the output of a load as a percentage.

# Application

This function module is used for conversions from an analog input signal to an on/off ratio with time basis 1 s. The module can only be used in conjunction with 3RF21 and 3RF23 single-phase solid-state switching devices or 3RF22 three-phase devices. It can be used on versions with 24 V DC and 24 V AC/DC control supply voltage.

## Note:

The use of single-pole solid-state switching devices with converters, power controllers or power regulators on AC loads in full-wave control mode is not recommended. As mutual synchronization of the function modules is not possible, fluctuations in the heating power are possible; there is no optimum settling in particular with setpoint values < 50 %.

#### Selection and ordering data

	Rated operational current Ie	Rated operational voltage U <sub>e</sub>	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	A	V	d	Article No.				kg
Converters								
	Rated control supply voltage	24 V AC/DC 	2	3RF2900-0EA18	1	1 unit	41C	0.024
3RF2900-0EA18								

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-type connections in the load circuit are not

**Function Modules** 

#### SIRIUS load monitoring for 3RF2

## Overview

## Application

suitable.

# Load 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 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 by way of a PLC-compatible output.

The principle of operation is based on permanent monitoring of the current intensity. 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 difference 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, an output is actuated and one or more LEDs indicate the fault.

#### Selection and ordering data

	Rated operational current Ie	Rated operational voltage U <sub>e</sub>	SD	Screw terminals	€	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	A	V	d	Article No.					kg
Basic load monitoring	g								
16 11	Rated control supply voltage	24 V DC							
and a second sec	6		2	3RF2906-0FA08		1	1 unit	41C	0.047
244	20		2	3RF2920-0FA08		1	1 unit	41C	0.047
	• With mounted 3RF2900-0R	A88 cover							
B- B-	6		2	3RF2906-0FA08-0KH0		1	1 unit	41C	0.069
-	20		2	3RF2920-0FA08-0KH0		1	1 unit	41C	0.070
3RF29									
Extended load monitor	oring								
16.11	Rated control supply voltage	24 V AC/DC							
and the latter	20 20	110 230 400 600	2 2	3RF2920-0GA13 3RF2920-0GA16		1 1	1 unit 1 unit	41C 41C	0.128 0.128
2.00	50 50	110 230 400 600	2 2	3RF2950-0GA13 3RF2950-0GA16		1 1	1 unit 1 unit	41C 41C	0.128 0.128
	90 90	110 230 400 600	2 2	3RF2990-0GA13 3RF2990-0GA16		1 1	1 unit 1 unit	41C 41C	0.128 0.128
3RF29									

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d					kg
<b>Optional accessories</b>							-
	Sealable covers for function modules (not for converters)	5	3RF2900-0RA88	1	10 units	41C	0.001
3RF2900-0RA88							

Special version:

Application

suitable

3RF29 ..- 0JA1.-1KK0

Deviations from the standard version

If the current is below 50 % of the lower teach current during the

LOAD LED will flicker. The device thus detects a non-connected

load, e.g. channels not required for tool heaters, and does not

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-type connections in the load circuit are not

teach routine, the device will go into "Standby" mode; the

signal a fault. This mode can be reset by re-teaching

## Solid-State Switching Devices for Resistive/Inductive Loads

**Function Modules** 

#### SIRIUS heating current monitoring for 3RF2

#### 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 six load elements, alloyed power semiconductors, a lack of voltage, or a break in the load circuit. A fault is indicated by LEDs and reported to the controller via relay output (NC).

The principle of operation is based on permanent monitoring of the current intensity. This figure is continuously compared with the reference value stored once during commissioning. 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.

#### Selection and ordering data

#### Weight per PU Rated operational current $I_e$ Rated operational voltage $U_e$ SD Screw terminals PU PS PG Æ (UNIT, SET approx. M) Article No. kg V d А Heating current monitoring<sup>1)</sup> Rated control supply voltage 24 V AC/DC 3RF2916-0JA13 3RF2916-0JA13-1KK0 16 110 ... 230 2 1 unit 41C 0 130 1 110 ... 230 5 41C 16 1 1 unit 0 130 400 ... 600 2 3RF2916-0JA16-1KK0 1 1 unit 41C 0.130 16 3RF2932-0JA13-1KK0 32 110 ... 230 2 1 unit 41C 0.130 1 32 400 ... 600 2 3RF2932-0JA16 41C 0.130 1 unit 1 32 400 ... 600 2 3RF2932-0JA16-1KK0 1 unit 41C 0.130 1

3RF29

 Supplied without control connector. The control connector can be purchased from Phoenix Contact by quoting Article No. 1982 790 (2.5 HC/6-ST-5.08).

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d					kg
<b>Optional accessories</b>							
3E52000.0EA88	Sealable covers for function modules (not for converters)	5	3RF2900-0RA88	1	10 units	41C	0.001

**Function Modules** 

SIRIUS power controllers for 3RF2

#### 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. The setpoint value is selected via a rotary knob on the module as a percentage of the 100 % power value stored.
- 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.

Note:

With the phase control operating mode, a partial load fault is detected by cyclic "scanning" of the load; the exact mode of operation is described in the data sheets!

#### Special version: Deviations from the standard version

#### 3RF2904-0KA13-0KC0

During the teach routine, the connected solid-state relay or contactor is not activated; i.e. no current will flow. No current reference value is stored. No partial-load monitoring!

3RF29 ..- 0KA1.- 0KT0

No partial-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

#### 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 ( $t_R$ ), it is controlled according to the principle of full-wave control or generalized phase control.

## Note:

In the case of resistive loads, the power is set linear to the setpoint value. During operation of inductive loads, the power control is no longer proportional and linear due to the phase shift between current and voltage.

#### Full-wave control

In this operating mode the output is adjusted to the required setpoint value by changing the on-to-off period. The period duration is predefined at one second.

#### See note about AC loads on page 2/142.

#### Generalized phase control

In this operating mode the output is adjusted to the required setpoint value by changing the current flow angle. In order to observe the limit values of the conducted interference voltage for industrial networks, the load circuit must include a reactor with a rating of at least 200  $\mu$ H.

## Selection and ordering data

	Rated operational current I <sub>e</sub>	Rated operational voltage Ue	SD	Screw terminals	Ð	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	A	V	d	Article No.					kg
Power controllers									
1.20	Rated control supply voltage	24 V AC/DC							
ALS N	4 4 20	110 230	2 2 2	3RF2904-0KA13-0KC0 3RF2904-0KA13-0KT0 3RF2920-0KA13		1 1 1	1 unit 1 unit 1 unit	41C 41C 41C	0.130 0.130 0.130
	50 90		2 2	3RF2950-0KA13 3RF2990-0KA13		1 1	1 unit 1 unit	41C 41C	0.130 0.130
All states of the second state	20 50 50	400 600	2 2 2	3RF2920-0KA16 3RF2950-0KA16 3RF2950-0KA16-0KT0		1 1 1	1 unit 1 unit 1 unit	41C 41C 41C	0.130 0.130 0.130
3RF29	90		2	3RF2990-0KA16		1	1 unit	41C	0.130

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d					kg
<b>Optional accessories</b>							-
	Sealable covers for function modules (not for converters)	5	3RF2900-0RA88	1	10 units	41C	0.001
3RF2900-0RA88							

**Function Modules** 

#### SIRIUS power regulators for 3RF2

#### Overview

# Power regulators for 3RF2 single-phase solid-state switching devices

The power regulator is a function module for the autonomous power control of complex heating systems.

The following functions have been integrated:

- Power controller with proportional-action control for adjusting the power of the connected load. The setpoint value is selected via a rotary knob on the module as a percentage of the 100 % power value stored. Changes in the mains voltage or in the load resistance are compensated for in this case.
- 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.
- <u>Load circuit monitoring</u> for detecting load failure, alloyed power semiconductors, lack of voltage or a break in the load circuit. Partial load monitoring is not possible. Load fluctuations are compensated.

#### Application

The power regulator can be used for:

- Complex heating systems
- Heating elements with temperature-dependent resistor
- Heating elements with ageing after long-time service
- Simple indirect control of temperature

#### Selection and ordering data

#### Power control

The power regulator adjusts the power in the connected load by means of a solid-state switching device depending on the taught power and the selected setpoint. Changes in the mains voltage or in the load resistance are thus compensated by the power regulator. 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 adjustment is carried out according to the principle of full-wave control or generalized phase control.

#### Note:

In the case of resistive loads, the power is set linear to the setpoint value. During operation of inductive loads, the power control is no longer proportional and linear due to the phase shift between current and voltage.

#### Full-wave control

In this operating mode the output is adjusted to the required setpoint value by changing the on-to-off period. The period duration is predefined at one second.

See note about AC loads on page 2/142.

#### Generalized phase control

In this operating mode the output is adjusted to the required setpoint value by changing the current flow angle. In order to observe the limit values of the conducted interference voltage for industrial networks, the load circuit must include a reactor with a rating of at least 200  $\mu$ H.

	Rated operational current I <sub>e</sub>	Rated operational voltage U <sub>e</sub>	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	A	V	d	Article No.				kg
Power regulators								
	Rated control supply voltage	24 V AC/DC						
do for	20 20	110 230 400 600	2 2	3RF2920-0HA13 3RF2920-0HA16	1 1	1 unit 1 unit	41C 41C	0.130 0.130
No.	50 50	110 230 400 600	2 2	3RF2950-0HA13 3RF2950-0HA16	1 1	1 unit 1 unit	41C 41C	0.130 0.130
	90 90	110 230 400 600	2 2	3RF2990-0HA13 3RF2990-0HA16	1 1	1 unit 1 unit	41C 41C	0.130 0.130

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d					kg
<b>Optional accessories</b>							
3RF2900-0RA88	Sealable covers for function modules (not for converters)	5	3RF2900-0RA88	1	10 units	41C	0.001

Motor Starter Protectors/Circuit Breakers

Introduction

Туре

3RV20	3RV21	3RV23	3RV24
tectors/circuit breakers			

SIRIUS 3RV2 motor starter	· pro	tector	s/circı	uit brea	akers												
Applications																	
<ul> <li>System protection</li> </ul>		<b>√</b> <sup>1)</sup>				<b>√</b> <sup>1)</sup>											
<ul> <li>Motor protection</li> </ul>		1															
<ul> <li>Motor protection with overload relay function</li> </ul>						1											
<ul> <li>Starter combinations</li> </ul>										1							
<ul> <li>Transformer protection</li> </ul>														✓			
Size		S00, S	60, S2, S	33		S00, S	0, S2, S	33		S00, S	0, S2, S	33		S00, S0, S2			
Rated current In																	
<ul> <li>Size S00</li> <li>Size S0</li> <li>Size S2</li> <li>Size S3</li> </ul>	A A A A	Up to Up to Up to Up to	16 40 80 100			Up to 3 Up to 3 Up to 8 Up to 9	16 32 30 100			Up to <sup>2</sup> Up to <sup>2</sup> Up to 8	16 40 30 100			Up to 16 Up to 25 Up to 65			
Rated operational voltage $U_{\rm e}$ acc. to IEC	V	690 A	C <sup>2)</sup>			690 A0	C <sup>2)</sup>			690 AC	2 <sup>2)</sup>			690 AC <sup>2)</sup>			
Rated frequency	Hz	50/60				50/60				50/60				50/60			
Trip class		CLASS CLASS	S 10 (SC S 20 (S2	00 S3 2, S3)	),	CLASS 10 -								CLASS 1	0		
Thermal overload releases	A A	0.11	0.11 0.16 to 80 100				0.16 to	o 80 1	100	None <sup>3)</sup>				0.11 0 54 65	16 to		
Electronic releases A multiple of the rated current		13 times				13 times				13 times				20 times			
Short-circuit breaking capacity I <sub>cu</sub> at 400 V AC	kA	20/55/65/100				55/65/100				20/55/65/100			55/65/10	C			
Pages		2/162	2/165	5		2/166				2/168, 2/169				2/170			
		2/162 2/165															
Accessories																	
Accessories For sizes		S00	SO	S2	S3	S00	SO	S2	S3	S00	S0	S2	S3	S00	SO	S2	
Accessories For sizes Auxiliary switches		S00 ✓	S0 ✓	S2 ✓	S3 √	S00 ✓	S0 ✓	S2 ✓	S3 ✓	S00 ✓	S0 ✓	S2 ✓	S3 ✓	S00 ✓	S0 ✓	S2 ✔	
Accessories For sizes Auxiliary switches Signaling switches		S00 ✓	S0 ✓	S2 ✓	S3 ✓	S00 ✓	S0 ✓	S2 ✓	S3 ✓	S00 ✓	S0 ✓	S2 ✓	S3 ✓	S00 ✓	S0 ✓	S2 ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases		S00 ✓ ✓	S0 ✓ ✓	S2 ✓ ✓	S3 ✓ ✓	S00 ✓ ✓	S0 ✓ ✓	S2 ✓ ✓	S3 ✓ ✓	S00 ✓ ✓	S0 ✓ ✓	S2 ✓ ✓	S3 ✓ ✓	S00 ✓ ✓	S0 ✓ ✓	S2 ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases		S00 ✓ ✓ ✓	S0 ✓ ✓ ✓	S2 ✓ ✓ ✓	S3 ✓ ✓ ✓	S00 ✓ ✓ 	S0 ✓ ✓	S2 ✓ ✓ 	S3 ✓ ✓ 	S00 ✓ ✓ ✓	S0 ✓ ✓ ✓	S2 ✓ ✓ ✓	S3 ✓ ✓ ✓	S00 ✓ ✓ ✓	S0 ✓ ✓ ✓	S2 ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules		S00 ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ ✓	S00 ✓   ✓	S0 ✓  	S2 ✓ ✓ 	S3 ✓ ✓ 	S00 ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ ✓	S00 ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system		S00 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ ✓	S00 	S0 ✓  ✓	S2 ✓ ✓  ✓	S3 ✓  	S00 ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ ––	S00 ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters		S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ 	S00 ✓ ✓  ✓ ✓ ✓	S0 ✓  ✓  ✓	S2 ✓ ✓  ✓	S3 ✓ ✓  	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓  	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters Door-coupling rotary operating mechanisms		S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓   ✓	S00 ✓   ✓   ✓	S0 ✓  ✓ ✓ ✓ ✓	S2 ✓  ✓  ✓ 	S3 ✓    	S00 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓   ✓ ✓	S00 7 7 7 7 7 7 7 7	S0 2 2 2 2 2 2 2 2 2 2 2 2 2	S2 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters Door-coupling rotary operating mechanisms Link modules		S00 2 3 4 4 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓   ✓ ✓	S00 2   2 2 2 2 2 2 2 2 2 2 2 2 2	S0 ✓   ✓  ✓ ✓ ✓	S2 ✓  ✓  ✓  ✓ / ✓	S3 ✓             -	S00 2 2 2 2 2 2 2 2 2 2 2 2 2	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓   ✓ ✓ ✓	S00 2 2 2 2 2 2 2 2 2 2 2 2 2	S0 2 2 2 2 2 2 2 2 2 2 2 2 2	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters Door-coupling rotary operating mechanisms Link modules Enclosures for surface mounting		S00 2 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5	S0 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ – – ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S00 2   2 2 2 2 2 2 2 2 2 2 2 2 2	S0 ✓   ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓   /  / / / / /	S3 ✓     / / / / / 	S00 2 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	S0 J J J J J J J J J J J J	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ – – – – – – – – – – – – –	S00 2 2 2 2 2 2 2 2 2 2 2 2 2	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters Door-coupling rotary operating mechanisms Link modules Enclosures for surface mounting Enclosure for flush mounting		S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ – – – – – – – – – – – – –	S00 ✓   / / / / / / / / / / /	S0 ✓   ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓    / / / / / / / / / / / / /	S3 ✓     ✓ / /  	S00 2 2 2 3 4 5 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7	S0 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	S2 2 2 3 4 5 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7	S3 ✓ ✓ ✓ – – – – – – – – – – – – –	S00 2 2 2 2 2 2 2 2 2 2 2 2 2	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters Door-coupling rotary operating mechanisms Link modules Enclosures for surface mounting Enclosure for flush mounting Front plates		S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ – – – – – – – – – – – – –	S00 ✓   / / / / / / / / / / / / /	S0 ✓   / / / / / / / / / / / / /	S2 ✓   ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓         	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 3 3 3 3 3 4 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ – – – – – – – – – – – – –	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters Door-coupling rotary operating mechanisms Link modules Enclosures for surface mounting Enclosure for flush mounting Front plates Infeed system		S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ – – – – – – – – – – – – –	S00 ✓   / / / / / / / / / / / / /	S0 ✓   / / / / / / / / / / / / /	S2 ✓   ✓ ✓ ✓ ✓ ✓ ✓  ✓ ✓  ✓  	S3 ✓         	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 3 3 3 3 4 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ – – – – – – – – – – – – –	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters Door-coupling rotary operating mechanisms Link modules Enclosures for surface mounting Enclosure for flush mounting Front plates Infeed system Sealable scale covers for setting knobs		S00 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓   ✓    ✓  	S00 2   2   2   2  	S0 ✓  ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 	S3 ✓    ✓ ✓   ✓   ✓	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ – – – – – – – – – – – – –	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Accessories For sizes Auxiliary switches Signaling switches Undervoltage releases Shunt releases Isolator modules Insulated three-phase busbar system Busbar adapters Door-coupling rotary operating mechanisms Link modules Enclosures for surface mounting Enclosure for flush mounting Front plates Infeed system Sealable scale covers for setting knobs Remote motorized operating mechanisms		S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ – – – – – – – – – – – – –	S00 ✓   ✓  ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓  ✓  ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 	S3 <	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S3 ✓ ✓ ✓ – – – – – – – – – – – – –	S00 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S0 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	S2 ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	

✓ Has this function or can use this accessory

-- Does not have this function or cannot use this accessory

<sup>1)</sup> For symmetrical loading of the three phases.

<sup>2)</sup> With molded-plastic enclosure 500 V AC. For DC applications, see "Technical Specifications" → "DC Short-Circuit Breaking Capacity", page 2/158. <sup>3)</sup> For overload protection of the motors, appropriate overload relays must be used.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

# **General data**

#### Overview

More information	
Home page, see www.siemens.com/railway-components	Manual "SIRIUS Innovations – SIRIUS 3RV2 Motor Starter Protectors", see
Catalog IC 10, see www.siemens.com/ic10	https://support.industry.siemens.com/cs/ww/en/view/60279172
Industry Mall, see www.siemens.com/product?3RV2	Reference Manual "Protection Equipment – Circuit Breakers · Molded Case Circu
Configuration manual for SIRIUS controls with IE3 motors, see	Breakers', see
https://support.industry.siemens.com/cs/ww/en/view/94770820	https://support.industry.siemens.com/cs/ww/en/view/35681461
System Manual "SIRIUS Innovations – System Overview", see	UL reports of the individual devices, see
https://support.industry.siemens.com/cs/ww/en/view/60311318	www.siemens.com/sirius/manuals
Manual "SIRIUS Innovations – SIRIUS 3RV2 Motor Starter Protectors", see	Certificates, see
https://support.industry.siemens.com/cs/ww/en/view/60279172	https://support.industry.siemens.com/cs/ww/en/ps/16245/cert

The following illustration shows 3RV2 motor starter protectors/circuit breakers with the accessories which can be mounted for the sizes S00 to S3, see also "Introduction" -"Overview", page 2/147.

Accessories, see page 2/171 onwards,

tit



Mountable accessories for SIRIUS 3RV2 motor starter protectors/circuit breakers



SIRIUS motor starter protector with spring-type terminals, size S0 (left) and SIRIUS motor starter protector with screw terminals, size S00 (right)

The SIRIUS 3RV2 motor starter protectors/circuit breakers are compact, current limiting motor starter protectors/circuit breakers which are optimized for load feeders. The motor starter protectors/circuit breaker2/151s are used for switching and protecting three-phase motors of up to 55/45 kW at 400 V AC and for other loads with rated currents of up to 100 A.

The new 3RV2 motor starter protectors/circuit breakers are usually approved according to IEC and UL/CSA. According to UL 508/UL 60947-4-1, the 3RV2 motor starter protectors/circuit breakers in sizes S00 to S3 are approved as:

- "Manual Motor Controllers"
- "Manual Motor Controllers" for "Group Installations"
- "Manual Motor Controllers Suitable for Tab Conductor Protection in Group Installations"
- "Self-Protected Combination Motor Controllers (Type E)" Please note that for this approval the 3RV20 motor starter protectors must be equipped with additional infeed terminals or phase barriers. For more information, see www.siemens.com/ic10, Chapter 7 "Accessories"

Corresponding short-circuit values, see pages 2/151 to 2/154.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

General data

#### Type of construction

The 3RV2 motor starter protectors are available in four sizes:

- Size S00 width 45 mm, max. rated current 16 A, at 400 V AC suitable for three-phase motors up to 7.5 kW
- Size S0 width 45 mm, max. rated current 40 A, at 400 V AC suitable for three-phase motors up to 18.5 kW
- Size S2 width 55 mm, max. rated current 80 A, at 400 V AC suitable for three-phase motors up to 37 kW
- Size S3 width 70 mm, max. rated current 100 A, at 400 V AC suitable for three-phase motors up to 45/55 kW

#### **Connection methods**

The 3RV2 motor starter protectors/circuit breakers can be supplied with screw terminals and spring-type terminals.



#### Use in hazardous areas

The 3RV20 motor starter protectors for motor protection in sizes S00, S0, S2 and S3 have certification in accordance with both the European explosion protection directive ATEX and the international explosion protection standard (IECEx).

In accordance with the European directive (ATEX), the 3RV20 are able to switch and protect explosion-proof motors of type of protection "Increased Safety EEx e".

In accordance with the international guideline (IECEx), the 3RV20 are able to switch and protect motors of the types "Increased Safety Ex e" or "Flameproof enclosure Ex d"

#### Article No. scheme

Product versions		Article number			
Motor starter protectors/circuit	breakers	3RV2 🗆 🗆 🗆 –			
Type of motor starter protector/ circuit breaker	e.g. 0 = for motor protection/system protection				
Size	e.g. 1 = 16 A (7.5 kW) for size S00				
Breaking capacity	e.g. 1 = standard switching capacity				
Setting range for overload release	e e.g. 1A = 1.1 1.6 A				
Trip class (CLASS)	e.g. A = a (adjustable CLASS 10) / n (13 or $20 \times I_n$ )				
Connection methods	e.g. 1 = screw terminals				
With or without auxiliary switch	e.g. 0 = without				
Special versions					
Example		3RV2 0 1 1 -	- 1 A A 1 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.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

# General data

## Application

## **Operating conditions**

3RV2 motor starter protectors/circuit breakers are suitable for use in any climate. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. When installed in dusty and damp areas, suitable enclosures must be provided.

3RV2 motor starter protectors/circuit breakers can optionally be fed from the top or from below.

The permissible ambient temperatures, the maximum switching capacities, the tripping currents and other boundary conditions can be found in the technical specifications and tripping characteristics.

3RV2 motor starter protectors/circuit breakers are suitable for operation in IT systems (IT networks). In this case, the different short-circuit breaking capacity in the IT system must be taken into account, see page 2/153.

Since operational currents, starting currents and current peaks are different even for motors with identical power ratings due to the inrush current, the motor ratings in the selection tables are only guide values. The specific rated and startup data of the motor to be protected is always paramount to the choice of the most suitable motor starter protector/circuit breaker. This also applies to motor starter protectors for transformer protection.

#### Possible uses

The 3RV motor starter protectors/circuit breakers can be used:

- For short-circuit protection
- For motor protection (also with overload relay function)
- For system protection
- · For short-circuit protection for starter combinations
- For transformer protection
- As main and EMERGENCY-STOP switches
- For operation in IT systems (IT networks)
- For switching of DC currents
- In areas subject to explosion hazard (ATEX)

Special versions of 3RV2 motor starter protectors/circuit breakers can be used for low ambient temperatures down to -50°C or also for system protection. More detailed information is available on request.

# Use of SIRIUS protection devices in conjunction with IE3/IE4 motors

Note:

For the use of 3RV2 motor starter protectors/circuit breakers in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see "Configuration Manual for SIRIUS Controls with IE3 Motors" https://support.industry.siemens.com/cs/ww/en/view/94770820.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

General data

## Technical specifications

#### More information

Home page, see www.siemens.com/railway-components Catalog IC 10, see www.siemens.com/ic10 Industry Mall, see www.siemens.com/product?3RV2

# Short-circuit breaking capacity $I_{\rm cu}, I_{\rm cs}$ according to IEC 60947-2

The 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 operational voltages dependent on 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

Reference Manual "Protection Equipment – Circuit Breakers · Molded Case Circuit Breakers", see https://support.industry.siemens.com/cs/ww/en/view/35681461 UL reports of the individual devices, see www.siemens.com/sirius/manuals

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 of this back-up fuse is indicated in the tables. The rated ultimate short-circuit breaking capacity then applies as specified on the fuse.

#### Fuseless design

Motor starter protector/contactor assemblies for short-circuit currents up to 150 kA can be ordered as fuseless load feeders, see www.siemens.com/ic10, Chapter 8 "Load Feeders and Motor Starters for Use in the Control Cabinet".

		-									_			_		
Motor starter protectors/	Notor starter Rated current Up to 240 V AC <sup>1)</sup> protectors/ I <sub>n</sub>		<b>/ AC</b> <sup>1)</sup>	Up to 415 \	• 400 \ / AC <sup>2)</sup>	/ AC <sup>1)</sup> /	Up to 460 V	o 440 \ / AC <sup>2)</sup>	/ AC <sup>1)</sup> /	Up to 525 \	o 500 \ / AC <sup>2)</sup>	/ AC <sup>1)</sup> /	Up to 690 V AC <sup>1)</sup>			
circuit breakers		I <sub>cu</sub>	I <sub>CS</sub>	Max. fuse (gG)	I <sub>cu</sub>	I <sub>CS</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>cu</sub>	I <sub>CS</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>cu</sub>	I <sub>CS</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>cu</sub>	I <sub>CS</sub>	Max. fuse (gG) <sup>3)4)</sup>
Туре	А	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
Size S00																
3RV2.11	0.16 1.6 2; 2.5 3.2	100 100 100	100 100 100	  	100 100 100	100 100 100	  	100 100 100	100 100 100		100 100 100	100 100 100	 	100 10 10	100 10 10	 25 32
	4; 5 6.3 8	100 100 100	100 100 100	  	100 100 100	100 100 100	 	100 100 50	100 100 50	  63	100 100 42	100 100 42	  63	6 6 6	4 4 4	32 50 50
	10 12.5 16	100 100 100	100 100 100	  	100 100 55	100 100 30	  100	50 50 50	50 50 12.5	80 80 80	42 42 10	42 42 5	63 80 80	6 6 4	4 4 4	50 63 63
Size S0																
3RV2.21	0.16 1.6 2; 2.5 3.2	100 100 100	100 100 100	  	100 100 100	100 100 100	  	100 100 100	100 100 100	 	100 100 100	100 100 100	 	100 10 10	100 10 10	 25 32
	4; 5 6.3 8	100 100 100	100 100 100	  	100 100 100	100 100 100	  	100 100 50	100 100 50	  63	100 100 42	100 100 42	  63	6 6 6	4 4 4	32 50 50
	10 12.5 16	100 100 100	100 100 100	  	100 100 55	100 100 25	  100	50 50 50	50 50 12.5	80 80 80	42 42 10	42 42 5	63 80 80	6 6 4	4 4 2	50 63 63
	20 22; 25 28; 32 36; 40	100 100 100 100	100 100 100 100	  	55 55 55 20	25 25 25 10	125 125 125 125	50 50 30 12	10 10 10 8	80 100 125 125	10 10 10 6	5 5 5 3	80 80 100 100	4 4 3	2 2 2 2	63 63 100 100

-- 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 is  $> I_{\rm CU}.$ 

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

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

## General data

Motor starter protectors/	Up to	240 \	/ AC <sup>1)</sup>	Up to 415 \	o 400 \ / AC <sup>2)</sup>	/ AC <sup>1)</sup> /	Up to 440 V AC <sup>1)</sup> / 460 V AC <sup>2)</sup>			Up to 500 V AC <sup>1)</sup> / 525 V AC <sup>2)</sup>			Up to 690 V AC <sup>1)</sup>			
circuit breakers		I <sub>CU</sub>	I <sub>CS</sub>	Max. fuse (gG)	I <sub>cu</sub>	I <sub>CS</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>cu</sub>	I <sub>CS</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>cu</sub>	I <sub>CS</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>CU</sub>	I <sub>CS</sub>	Max. fuse (gG) <sup>3)4)</sup>
Туре	А	kA	kA	A	kA	kA	A	kA	kA	А	kA	kA	А	kA	kA	A
Size S2																
3RV2.31	14; 17 20 25	100 100 100	100 100 100	  	65 65 65	30 30 30	100 100 100	50 50 50	25 25 15	100 100 100	12 12 12	6 6 6	63 80 80	5 5 5	3 3 3	63 80 80
	32; 36 40; 45 52	100 100 100	100 100 100	 	65 65 65	30 30 30	125 160 160	50 50 50	15 15 15	125 125 125	10 10 10	5 5 5	100 100 125	4 4 4	2 2 2	100 100 125
	59; 65 73; 80	100 100	100 100		65 65	30 30	160 200	50 50	15 15	160 200	8 8	4 4	125 160	4 4	2 2	125 125
Size S2, with inc switching capac	reased ity															
3RV2.32	14; 17 20; 25 32 45 52	100 100 100 100	100 100 100 100	  	100 100 100 100	50 50 50 50	  	65 65 65 65	30 30 30 30	100 100 125 125	18 18 15 15	10 10 8 8	63 80 100 125	8 8 6 6	5 5 4 4	63 80 100 125
	59; 65 73; 80	100 100	100 100		100 100	50 50		50 50	15 15	160 200	10 10	5 5	125 160	6 6	4 4	125 125
Size S3																
3RV2.41	40 50 63 75	100 100 100 100	100 100 100 100	  	65 65 65 65	30 30 30 30	125 125 160 160	65 65 65 65	30 30 30 30	125 125 160 160	12 12 12 8	6 6 6 4	100 100 100 125	6 6 5	3 3 3 3	63 80 80 100
	84 100	100	100		65	30	160	65	30	160	8	4	125	5	3	125
Size S3, with inc switching capac	reased ity															
3RV2.42	40 50 63 75 84 100	100 100 100 100	100 100 100 100	  	100 100 100 100	50 50 50 50	  	100 100 70 70 70	50 50 50 50	 200 200 200	18 15 15 10	9 7.5 7.5 5	160 160 160 160 160	12 10 7.5 6	6 5 4 3	80 100 100 125 160

-- 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 is >  $I_{\rm cu}.$ 

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

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

General data

## Short-circuit breaking capacity I<sub>culT</sub> in the IT system (IT network) according to IEC 60947-2

3RV2 motor starter protectors/circuit breakers are suitable for use in IT systems. The values of  $I_{cu}$  and  $I_{cs}$  apply for the three-pole short circuit. In the case of a double ground fault in different phases at the input and output side of a motor starter protector/circuit breaker, the special short-circuit breaking capacity I<sub>culT</sub> applies. The specifications in the table below apply to 3RV2 motor starter protectors/circuit breakers.

If the short-circuit current at the place of installation exceeds the motor starter protector/circuit breaker's specified rated shortcircuit breaking capacity, you will need to use a back-up fuse. The maximum rated current of this back-up fuse is indicated in the tables. The rated short-circuit breaking capacity then applies as specified on the fuse.

Motor starter protectors/ circuit breakers	Rated current I <sub>n</sub>	Up to 240	<b>) V AC</b> <sup>1)</sup>	Up to 400 415 V AC <sup>2)</sup>	V AC <sup>1)</sup> /	Up to 440 460 V AC <sup>2)</sup>	/ AC <sup>1)</sup> /	Up to 500 525 V AC <sup>2</sup>	<b>V AC<sup>1)</sup>/</b>	Up to 6	<b>90 V AC</b> <sup>1)5)</sup>
		I <sub>culT</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>culT</sub>	Max. fuse (gG) <sup>3)4)</sup>	I <sub>culT</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>culT</sub>	Max. fuse (gG) <sup>3)</sup>	I <sub>culT</sub>	Max. fuse (gG) <sup>3)</sup>
Туре	A	kA	A	kA	A	kA	А	kA	А	kA	A
Size S00											
3RV2.11	0.16 0.4 0.5 0.63; 0.8	100 100 100	 	100 100 100	  	100 100 100	 	100 100 100	  	100 0.5 0.5	 4 6
	1 1.25 1.6	100 100 100	 	100 100 100	  	2 2 2	10 16 20	2 2 2	10 16 20	1.5 1.5 1.5	10 16 16
	2; 2.5 3.2 4; 5	100 100 100	 	8 8 4	25 32 32	2 2 1.5	25 32 32	2 2 1.5	25 32 32	1.5 1.5 1.5	20 25 25
	6.3; 8 10 12.5 16	100 100 100 55	  80	4 4 4 4	50 50 63 63	1 1 1 1	40 40 50 50	1 1 1 1	40 40 50 50	1 1 1 1	35 40 40 40
Size S0											
3RV2.21	0.16 0.4 0.5 0.63; 0.8	100 100 100	 	100 100 100	 	100 100 100	 	100 100 100	 	100 0.5 0.5	 4 6
	1 1.25 1.6	100 100 100	 	100 100 100		2 2 2	10 16 20	2 2 2	10 16 20	1.5 1.5 1.5	10 16 16
	2; 2.5 3.2 4; 5	100 100 100	 	8 8 4	25 32 32	2 2 1.5	25 32 32	2 2 1.5	25 32 32	1.5 1.5 1.5	20 25 25
	6.3; 8 10 12.5	100 100 100	 	4 4 4	50 50 63	1 1 1	40 40 50	1 1 1	40 40 50	1 1 1	35 40 40
	16 20 25 28; 32 36; 40	55 55 55 20	80 80 80 80	4 4 2 2	63 63 63 63	1 1 1 1	50 50 63 63	1 1 1 1	50 50 63 63	1 1 1	40 50 63 63

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

1) 5 % overvoltage.

2) Without overvoltage.

<sup>3)</sup> Back-up fuse only required if short-circuit current at installation location is  $> I_{\text{cult}}$ 

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

 $^{5)}$  Overvoltage category II applies for applications in IT systems > 600 V.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

#### **General data**

			4)		4).						
Motor starter Rated		Up to 240 V AC <sup>1)</sup>		Up to 400 V AC <sup>1</sup> //		Up to 440 V AC <sup>1</sup> //		Up to 500 V AC'// 525 V AC <sup>2</sup> )		Up to 690 V AC <sup>(1)5)</sup>	
circuit breakers	current in	I <sub>culT</sub>	Max. fuse (qG) <sup>3)</sup>	I <sub>culT</sub>	Max. fuse (qG) <sup>3)4)</sup>	I <sub>culT</sub>	Max. fuse	I <sub>culT</sub>	Max. fuse	I <sub>culT</sub>	Max. fuse (qG) <sup>3)</sup>
Туре	А	kA	A	kA	A	kA	A	kA	A	kA	(g =) A
Size S2											
3RV2031, 3RV2131, 3RV2331	14 25 32 45 52 80	100 100 100	 	8 6 4	100 125 160	6 4 3	80 100 125	6 4 3	80 100 125	4 3 2	63 80 100
Size S2, with increased switching capacity											
3RV2032, 3RV2332	14 25 32 45 52 59 80	100 100 100 100	  	8 6 6 6	100 125 160 160	6 6 6 4	80 100 125 125	6 6 6 4	80 100 125 125	4 4 4 4	63 80 100 100
Size S3											
3RV2.41	40 50 63 75 90; 100	65 65 65 65 65	125 125 160 160 160	10 8 6 5 5	63 80 80 100 125	5 3 3 2 2	50 63 63 80 100	5 3 3 2 2	50 63 63 80 100	5 3 3 2 2	50 63 63 80 100
Size S3, with increased switching capacity											
3RV2.42	40 50 63 75 90: 100	100 100 100 100 100	  	12 10 7.5 6 6	80 100 100 125 160	6 4 4 3 3	63 80 80 100 125	6 4 4 3 3	63 80 80 100 125	6 4 3 3	63 80 80 100 125

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

1) 10 % overvoltage.

2) 5 % overvoltage.

<sup>3)</sup> Back-up fuse only required if short-circuit current at installation location is  $> I_{\text{cult}}$ 

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

 $^{5)}$  Overvoltage category II applies for applications in IT systems > 600 V.

#### Limiter function with standard devices for 500 V AC and 690 V AC according to IEC 60947-2

The table shows the rated ultimate short-circuit breaking capacity  $I_{CU}$  and the rated service short-circuit breaking capacity  $I_{cs}$  with an upstream standard motor starter protector/circuit breaker that fulfills the limiter function at voltages 500 V AC and 690 V AC.

The short-circuit breaking capacity can be increased significantly with an upstream standard motor starter protector/circuit breaker with limiter function. The motor starter

protector/circuit breaker which is connected downstream must be set to the rated current of the load.

With motor starter protector/circuit breaker assemblies, note the clearance to grounded parts and between the motor starter protectors/circuit breaker. Short-circuit proof wiring between the motor starter protectors/circuit breaker must be ensured. The motor starter protectors/circuit breakers can be mounted side by side in a modular arrangement.

Standard motor starter protectors/circuit breakers		Rated current In	Up to 500 V AC <sup>1)</sup> /52	25 V AC <sup>2)</sup>	Up to 690 V AC <sup>1)</sup>		
	With limiter Rated current I <sub>n</sub>		I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	
Туре	Туре	A	kA	kA	kA	kA	
Size S00							
3RV2011	<b>Size S0:</b> <b>3RV2321-4EC10</b> <i>I</i> <sub>n</sub> = 32 A	2 6.3 8 10 16	 100 100	 50 50	50 20 20 <sup>3)</sup>	25 10 10 <sup>3)</sup>	
	Size S2: 3RV2331-4WC10	10 16			50	25	
	$I_{\rm n} = 52  {\rm A}$						
Size S0							
3RV2021	<b>Size S0:</b> <b>3RV2321-4EC10</b> <i>I</i> <sub>n</sub> = 32 A	16 32	100	50	20 <sup>3)</sup>	10 <sup>3)</sup>	
	Size S2: 3RV2331-4WC10	16 32			50	20	
	$I_{\rm N} = 52  {\rm A}$						
Size S2, with increas	ed switching capacity						
3RV2032	Size S2: 3RV2332-4RC10	14 80	100	50	70	35	
	I <sub>n</sub> = 80 A						
Size S3, with increas	ed switching capacity						
3RV2042	Size S3 <sup>4)</sup> : 3RV2342-4MC10	40 100	100	50	50	25	
	<i>I</i> <sub>n</sub> = 100 A						
No limiter required <sup>1)</sup> 10 % overvoltage.			<ol> <li>5 % overv</li> <li>Infeed to th</li> </ol>	oltage. e limiter is always on	the side 1L1/3L2/5L3	3.	

1) 10 % overvoltage.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

General data

#### 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.

#### 3RV2 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 may be used for this purpose. These devices must be dimensioned according to the National Electrical Code (UL) or Canadian Electrical Code (CSA). These motor starter protectors/circuit breakers 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).

The file numbers for the approval of the 3RV2 as a Manual Motor Controller are as follows:

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

Motor starter protectors/ circuit breakers		hp rating <sup>1)</sup> for FLA <sup>2)</sup> max.		Rated current I <sub>n</sub>	240 V AC UL CSA		480 V AC UL	CSA	600 V AC A UL CSA	
					$I_{\rm bc}^{3)}$	$I_{\rm bc}^{3)}$	$I_{\rm bc}^{3)}$	$I_{\rm bc}^{3)}$	$I_{\rm bc}^{3)}$	$I_{\rm bc}^{3)}$
Туре	V	Single- phase	3-phase	А	kA	kA	kA	kA	kA	kĂ
Size S00										
3RV2011, 3RV2111, 3F	V2311, 3RV	2411		0.16 12.5	65	65	65	65	30	30
FLA <sup>2)</sup> max. 16 A, 480 V 12.5 A, 600 V	115/120 200/208 230/240 460/480 575/600	1 2 2 	2 3 5 10 10	16	65	65	65	65	-	
3RV1611-0BD10				0.2	65	65	65	65	10	10
Size S0										
3RV2021, 3RV2121, 3F	V2321, 3RV	2421		0.16 12.5	65 65	65 65	65 65	65 65	30 ((20) <sup>4</sup> )	30 ((20) <sup>4</sup> )
FLA <sup>2)</sup> max. 40 A, 480 V 12.5 A, 600 V	115/120 200/208 230/240 460/480 575/600	3 5 7 1/2 	5 10 10 30 	28, 32 36, 40	65 65 65	65 65 65	50 12	50 12		
Size S2										
3RV2031, 3RV2331				14 36	65 65	65 65	65 65	65 65	25	25
FLA <sup>2)</sup> max. 80 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 15  	10 25 30 60 75	40 52 59 65 73 80	65 65 65	65 65	65 <sup>5)</sup> 65 <sup>5)</sup>	65 <sup>5</sup> 65 <sup>5</sup>	20 <sup>5</sup> 20 <sup>5</sup>	20 <sup>5</sup> 20 <sup>5</sup>
Size S2, with increa	sed switc	hing capa	city							
3RV2032, 3RV2332				14 36	100	100	100	100	25	25
FLA <sup>2)</sup> max. 80 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 15  	10 25 30 60 75	40 52 59 65 73 80	100 100 100	100 100 100	100 <sup>5)</sup> 100 <sup>5)</sup>	100 <sup>5)</sup> 100 <sup>5)</sup>	22 25 <sup>5)</sup> 25 <sup>5)</sup>	22 25 <sup>5)</sup> 25 <sup>5)</sup>
Size S3										
3RV2.41, 3RV2.42	40 75	65 65	65 65	65 65	65 65	30 10/30 <sup>6)</sup>	30 10/20 <sup>6</sup> )			
FLA <sup>2)</sup> max. 100 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 20 	15 30 40 75 100	04 100	00	00	00	00	10/30*/	10/30-7

-- No approval

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

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

4) Values in brackets only apply to 3RV2.23 motor starter protectors.

<sup>5)</sup> With Class J fuse.

<sup>&</sup>lt;sup>3)</sup> Corresponds to "short-circuit breaking capacity" according to UL/CSA.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

#### **General data**

<u>3RV20 motor starter protectors (up to 100 A) as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations"</u>

The application as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" is only available for 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. Approved fuses or a circuit breaker according to UL 489 can be used. These devices must be dimensioned according to the National Electrical Code. The 3RV20 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/ circuit breakers		hp rating <sup>1)</sup> for FLA <sup>2)</sup> max.		Rated current I <sub>n</sub>	<b>240 V AC</b> UL <i>I</i> <sub>bc</sub> <sup>3)</sup>	<b>480 Y/277 V AC</b> UL I <sub>bc</sub> <sup>3)</sup>	600 Y/347 V AC UL I <sub>bc</sub> <sup>3)</sup>
Туре	V	Single- phase	3-phase	А	kA	kA	kA
Size S00							
3RV2011				0.16 12.5	65 65	65 65	30
FLA <sup>2)</sup> max. 16 A, 480 V 12.5 A, 600 V	115/120 200/208 230/240 460/480 575/600	1 2 2 	2 3 5 10 10				
Size S0							
3RV2021				0.16 12.5	65 65	65 65	30
FLA <sup>2)</sup> max. 32 A, 480 V 12.5 A, 600 V	115/120 200/208 230/240 460/480 575/600	2 3 5 	5 10 10 20 	28; 32	50	50	1
Size S2							
3RV2031				14 36 40 52	65 65	65 65	25 22
FLA <sup>2)</sup> max. 80 A, 480 V 52 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 15  	10 25 30 60 75	59 65 73 80	65 65 65	30 20 10	
Size S2, with incre	ased swite	hing capac	ity				
3RV2032				14 36 40 52	100 100	100 100	25 22
FLA <sup>2)</sup> max. 80 A, 480 V 52 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 15  	10 25 30 60 75	59 65 73 80	100 100 100	42 30 10	
Size S3							
3RV204.				40 75 84 100	65 65	65 65	30
FLA <sup>2)</sup> max. 100 A, 480 V 75 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 20 	15 30 40 75 75	o 100			

-- No approval

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

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

3) Corresponds to "short-circuit breaking capacity" according to UL.
SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

General data

## 3RV20 motor starter protectors (up to 100 A) as "Self-Protected Combination Motor Controllers (Type E)"

UL 508/UL 60947-4-1 approval demands 1-inch through air spacing and 2-inch over surface spacing at line side for "Self-Protected Combination Motor Controllers".

Therefore, 3RV20 motor starter protectors of sizes S00 to S3 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. 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/ circuit breakers		hp rating <sup>1)</sup> for FLA <sup>2)</sup> max.		Rated current I <sub>n</sub>	$\begin{array}{c} \textbf{Up to 240 V AC} \\ \textbf{u} & \textbf{UL} & \textbf{CSA} \\ I_{\text{bc}}^{-3} & I_{\text{bc}}^{-3} \end{array}$		Up to 480 Y/277 V AC           UL         CSA $I_{10}^{(3)}$ $I_{10}^{(3)}$		Up to 600 Y/347 V AC           UL         CSA $I_{hc}^{3}$ $I_{hc}^{3}$		
Туре	V	Single- phase	3-phase	А	kA	kA	kA	kA	kA	kA	
Size S00											
3RV2011 + 3RV2928-	1H <sup>4)5)</sup>			0.16 12.5	65 65	65 65	65 65	65 65	30	30	
FLA <sup>2)</sup> max. 16 A, 480 V; 12.5 A, 600 V	115/120 200/208 230/240 460/480 575/600	1 2 2 	2 3 5 10 10	10	0.5	00	00	00			
Size S0			-								
<b>3RV2021 + 3RV2928-</b> FLA <sup>2)</sup> max. 32 A, 480 V 12.5 A, 600 V	1 <b>H<sup>4)5)</sup></b> 115/120 200/208 230/240	2 3 5	5 10 10	0.16 12.5 16 25 28; 32	65 65 50	65 65 50	65 65 50	65 65 50	30  	30  	
	460/480 575/600		20 								
Size S2											
3RV2031+ 3RV2938-1	IK <sup>4)</sup>			14 36	65 65	65 65	65 65	65 65	25	25	
FLA <sup>2)</sup> max. 73 A, 480 V 52 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 15  	10 25 30 60 75	40 32 59 73	65	65	20	20			
Size S2, with incre	eased swit	ching capa	acity								
3RV2032 + 3RV2938-	1K <sup>4)</sup>			1436	100	100	100	100	25	25	
FLA <sup>2)</sup> max. 73 A, 480 V 52 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 15  	10 25 30 60 75	40 32 59 73	100	100	30	30			
Size S3											
3RV2041/2042 + 3RT	2946-4GA07	-4)		40 75	65 65	65	65 65	65	30	30	
FLA <sup>2)</sup> max. 100 A, 480 V 75 A, 600 V	115/120 200/208 230/240 460/480 575/600	7.5 15 20 	15 30 40 75 75	04100		00		00	-		

-- No approval

<sup>1)</sup> hp rating = Power rating in horse power (maximum motor rating). Alternatively phase barrier 3RV2928-1K can be used. <sup>2)</sup> FLA = Full Load Amps/motor full load current.

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

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

# General data General data

Туре			3RV2.1.	3RV2.2.	3RV2.3.	3RV2.4.
Standards						
• IEC 60947-1, EN 60947-1 (VDE	0660 Part 100)		Yes			
<ul> <li>IEC 60947-2, EN 60947-2 (VDE)</li> <li>IEC 60947-4-1 EN 60947-4-1 (V</li> </ul>	DE 0660 Part 102)		Yes			
• UL 508/UL 60947-4-1, CSA C22	.2 No. 14/		Yes			
CSA C22.2 No. 60947-4-1						
Number of poles			3			
Max. rated current I <sub>n max</sub> (= max. rated operational curren	it I <sub>e</sub> )	A	16	40	80	100
Permissible ambient temperatur	e					
Storage/transport     Operation	I : 0 16 32 A	°C °C	-50 +80		-	
Operation	In. 0. 10 02 A	0	(current reduction abo	ve +60 °C)		
	<i>I</i> <sub>n</sub> : 36 40 A	°C		-20 +40 (The		
				mounted side-by-side		
				and they must not be		
				assembled with link		
				contactors. A lateral		
				clearance of 9 mm is		
	1.14 90 0	°C		required.)	20	
	I <sub>n</sub> . 14 60 A	C			current reduction	
					above +60 °C)	
	<i>I</i> <sub>n</sub> : 40 100 A	°C				-20 +70
						above +60 °C)
Permissible rated current at insi	de temperature of cont	rol				·
cabinet		0/	100			
• +60 °C • +70 °C		%	87			
Permissible rated current at am	pient temperature of					
enclosure (applies to motor star	ter protector/circuit bre	eaker				
inside enclosure: S0/S00 $\leq$ 32 A,	, S2 ≤ 52 A)	0/	100		100	100
• +60 °C		%	87			87
Rated operational voltage U <sub>e</sub>						
Acc. to IEC		V AC	690 (when a molded-p	lastic enclosure is used	l only 500 V)	
Acc. to UL/CSA		V AC	600			
Rated frequency		HZ	50/60			1000
	- 11	V	690			1000
Rated Impulse withstand voltage	e O <sub>imp</sub>	ĸv	0			0
<ul> <li>IEC 60947-2 (motor starter prote</li> </ul>	ctor/circuit breaker)		A			
<ul> <li>IEC 60947-4-1 (motor starter)</li> </ul>	. ,		AC-3			
Trip class CLASS	Acc. to IEC 60947-4-1				10/20	
DC short-circuit breaking capac	ity					
<ul> <li>1 conducting path 150 V DC</li> </ul>		kA	10		On	
• 2 conducting paths in series 300	) V DC	kA	10		request	
<ul> <li>3 conducting paths in series 450</li> </ul>	) V DC	kA	10			
Power loss P <sub>v</sub> for each motor	<i>I</i> <sub>n</sub> : 0.16 0.63 A	W	5			
Dependent on	In: 0.0 0.3 A In: 8 16 A	Ŵ	7			
rated current In	I <sub>n</sub> : 14 16 A	W		7	10	
(upper setting range)	L: 17 25 A	W		8	12	
$R_{\text{per conducting path}} = \frac{P}{-2}$	In: 28 32 A	Ŵ		11	14	
$I^2 \times 3$	<i>I</i> <sub>n</sub> : 36 40 A	W		14	15	
	I <sub>n</sub> . 45 5∠ A I <sub>n</sub> : 59 65 A	W			19	
	In: 73 80 A	Ŵ			21	
	In: 40 50 A	W				21
	In: 63 75 A In: 84 93 A	W				32
	<i>I</i> <sub>n</sub> : 100 A	W				38
Shock resistance	Acc. to IEC 60068-2-27	<i>g</i> /ms	25/11 (square and sine	e pulse)		

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

General data

General data									
Туре		3RV2.1.	3RV2.2.	3RV2.3.	3RV2.4.				
Degree of protection	Acc. to IEC 60529	IP20		<ul> <li>IP20 on front sic</li> <li>Terminal IP00 (u covers use addi</li> </ul>	le ise additional terminal tional terminal covers)				
Touch protection	Acc. to IEC 60529	Finger-safe		Finger-safe, for ve	ertical 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 (not for 3RV23	3 motor starter protect	ors)					
Protection of motors in hazardo	us environments	Yes (only for 3RV2	20 motor starter protect	tors)					
EC type-examination certificate European Directive 2014/34/EU	number according to (ATEX)	DMT 02 ATEX F 0	DMT 02 ATEX F 001 🚯 II (2) GD						
• According to international stand	IECEx BVS14.0102 [Ex]								
Isolating function Main and EMERGENCY-STOP switch characteristics (with corresponding accessories)	Acc. to IEC 60947-2 Acc. to DIN EN 60204-1 VDE 0113	Yes Yes							
Protective separation between main and auxiliary circuits required for PELV applications • Up to 400 V +10 % • Up to 415 V +5 % (higher voltag	Acc. to IEC 60947-1	Yes Yes							
Permissible mounting position		Any, acc. to IEC 6	0447 start command '	'l" right-hand side or top					
Mechanical endurance (operatin	100 000		52 A: 50 000, 80 A: 20 000	25 000					
Electrical endurance (operating	100 000 52 A: 50 000, 80 A: 20 000 25 000								
Max. switching frequency per he	our (motor starts) 1/h	15							

Rated data of the auxiliary switches and signaling switches	;				
		Lateral auxiliary switch with	Signaling switch	Transverse auxiliary switch	with
		1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC			1 NO + 1 NC, 2 NO
Max. rated voltage					
Acc. to NEMA (UL)	V AC	600		250	
Acc. to NEMA (CSA)	V AC	600		250	
Uninterrupted current	А	10		5	2.5
Switching capacity		1 NO + 1 NC, 2 NO, 2 NC: A600, Q300; 2 NO + 2 NC: A300, Q300	A600, Q300	B600, R300	C300, R300

Front transverse auxiliary switches			
		Switching capacity for	r different voltages
		1 CO	1 NO + 1 NC, 2 NO
Rated operational current Ie			
<ul> <li>At AC-15, alternating voltage</li> <li>24 V</li> <li>230 V</li> </ul>	A A	4 3	2 0.5
At AC-12 = I <sub>th</sub> , alternating voltage     - 24 V     - 230 V	A A	10 10	2.5 2.5
<ul> <li>At DC-13, direct voltage L/R 200 ms</li> <li>24 V</li> <li>48 V</li> <li>60 V</li> <li>110 V</li> <li>220 V</li> </ul>	A A A A	1  0.22 0.1	1 0.3 0.15  
Minimum load capacity	V mA	17 1	

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

# General data

Front transverse solid-state com	patible auxiliary switches		
			Switching capacity for different voltages
			1 CO
Rated operational voltage Ue	Alternating voltage	V	125
Rated operational current Ie /AC-14	At $U_{\rm e}$ = 125 V	А	0.1
Rated operational voltage U <sub>e</sub>	Direct voltage L/R 200 ms	V	60
Rated operational current I <sub>e</sub> /DC-13	At $U_{\rm e}$ = 60 V	А	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 <sub>e</sub>		
<ul> <li>At AC-15, alternating voltage</li> <li>24 V</li> <li>230 V</li> <li>400 V</li> <li>690 V</li> </ul>	A A A	6 4 3 1
<ul> <li>At AC-12 = <i>I</i><sub>th</sub>, alternating voltage</li> <li>24 V</li> <li>230 V</li> <li>400 V</li> <li>690 V</li> </ul>	A A A A	10 10 10 10
<ul> <li>At DC-13, direct voltage L/R 200 ms</li> <li>24 V</li> <li>110 V</li> <li>220 V</li> <li>440 V</li> </ul>	A A A A	2 0.5 0.25 0.1
Minimum load capacity	V mA	17 1

Auxiliary releases			
		Undervoltage releases	Shunt release
Power consumption			
<ul> <li>During pick-up</li> <li>AC voltages</li> <li>DC voltages</li> </ul>	VA/W W	20.2/13 20	20.2/13 13 80
<ul> <li>During uninterrupted duty</li> <li>AC voltages</li> <li>DC voltages</li> </ul>	VA/W W	7.2/2.4 2.1	
Response voltage			
• Tripping	V	0.35 0.7 x U <sub>s</sub>	0.7 1.1 x <i>U</i> s
• Pick-up	V	0.85 1.1 x U <sub>s</sub>	
Opening time maximum	ms	20	

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

General data

Connection modules for motor starter protectors/ with screw terminals	circuit breakers		
Version	Туре	3RT1900-4RE01	3RT1926-4RD01
		Connector S0	Adapter S0
General data			
Rated insulation voltage <i>U</i> <sub>i</sub> (pollution degree 3)	V	690	
Rated impulse withstand voltage U <sub>imp</sub> (pollution degree 3)	kV	6	
Rated operational voltage U <sub>e</sub>	V	440	
Rated frequency f For AC operation	Hz	50/60	
Rated operational current I <sub>e</sub> AC-3 at 400 V	А	25	
Mechanical endurance	Operating cycles	10 million	
Electrical endurance at I <sub>e</sub>	Operating cycles	1 million	
Protective separation according to IEC 60947-1 (pollution degree 3)	V	400	
Permissible ambient temperature			
During operation	°C	-25 +60	
During storage	°C	-50 +80	
Degree of protection acc. to IEC 60529		IP20 on front side	

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

## For motor protection

## Selection and ordering data

CLASS 10, without auxiliary switches









PU (UNIT, SET, M) = 1



				01112011	02/12	01112021 001		01112021 110120	
Rated current	Suitable for three-phase motors <sup>1)</sup> with <i>P</i>	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	) SD	Spring-type CC terminals C	Weight per PU approx.
In		G	<i>I</i> >	I <sub>CU</sub>		Article No.		Article No.	
А	kW	A	А	kA	d		d		kg
Size S0	0								
0.16 0.2 0.25 0.32	0.04 0.06 0.06 0.09	0.11 0.16 0.14 0.2 0.18 0.25 0.22 0.32	2.1 2.6 3.3 4.2	100 100 100 100		3RV2011-0AA10 3RV2011-0BA10 3RV2011-0CA10 3RV2011-0CA10		3RV2011-0AA20 3RV2011-0BA20 3RV2011-0CA20 3RV2011-0CA20 3RV2011-0DA20	0.294 0.296 0.296 0.295
0.4 0.5 0.63 0.8	0.09 0.12 0.18 0.18	0.28 0.4 0.35 0.5 0.45 0.63 0.55 0.8	5.2 6.5 8.2 10	100 100 100 100		3RV2011-0EA10 3RV2011-0FA10 3RV2011-0GA10 3RV2011-0HA10	* * * *	3RV2011-0EA20 3RV2011-0FA20 3RV2011-0GA20 3RV2011-0HA20	0.297 0.294 0.300 0.296
1 1.25 1.6 2	0.25 0.37 0.55 0.75	0.7 1 0.9 1.25 1.1 1.6 1.4 2	13 16 21 26	100 100 100 100		3RV2011-0JA10 3RV2011-0KA10 3RV2011-1AA10 3RV2011-1BA10		3RV2011-0JA20 3RV2011-0KA20 3RV2011-1AA20 3RV2011-1BA20	0.361 0.366 0.362 0.366
2.5 3.2 4 5	0.75 1.1 1.5 1.5	1.8 2.5 2.2 3.2 2.8 4 3.5 5	33 42 52 65	100 100 100 100		3RV2011-1CA10 3RV2011-1DA10 3RV2011-1EA10 3RV2011-1FA10		3RV2011-1CA20 3RV2011-1DA20 3RV2011-1EA20 3RV2011-1FA20	0.360 0.367 0.367 0.369
6.3 8 10 12.5 16	2.2 3 4 5.5 7.5	4.5 6.3 5.5 8 7 10 9 12.5 10 <sup>2)</sup> 16	82 104 130 163 208	100 100 100 100 55	<b>A A A A</b>	3RV2011-1GA10 3RV2011-1HA10 3RV2011-1JA10 3RV2011-1KA10 3RV2011-4AA10	* * * *	3RV2011-1GA20 3RV2011-1HA20 3RV2011-1JA20 3RV2011-1KA20 3RV2011-4AA20	0.374 0.373 0.370 0.371 0.398
Size S0									
0.63 0.8	0.18 0.18	0.45 0.63 0.55 0.8	8.2 10	100 100	2 2	3RV2021-0GA10 3RV2021-0HA10	2 2	3RV2021-0GA20 3RV2021-0HA20	0.333 0.330
1 1.25 1.6 2	0.25 0.37 0.55 0.75	0.7 1 0.9 1.25 1.1 1.6 1.4 2	13 16 21 26	100 100 100 100	2 2 2 2	3RV2021-0JA10 3RV2021-0KA10 3RV2021-1AA10 3RV2021-1BA10	2 2 2 2	3RV2021-0JA20 3RV2021-0KA20 3RV2021-1AA20 3RV2021-1BA20	0.395 0.403 0.404 0.402
2.5 3.2 4 5	0.75 1.1 1.5 1.5	1.8 2.5 2.2 3.2 2.8 4 3.5 5	33 42 52 65	100 100 100 100	2 2 2 2	3RV2021-1CA10 3RV2021-1DA10 3RV2021-1EA10 3RV2021-1EA10 3RV2021-1FA10	2 2 2 2	3RV2021-1CA20 3RV2021-1DA20 3RV2021-1EA20 3RV2021-1EA20 3RV2021-1FA20	0.402 0.406 0.400 0.408
6.3 8 10 12.5	2.2 3 4 5.5	4.5 6.3 5.5 8 7 10 9 12.5	82 104 130 163	100 100 100 100	2 2 2 2	3RV2021-1GA10 3RV2021-1HA10 3RV2021-1JA10 3RV2021-1KA10	2 2 2 2	3RV2021-1GA20 3RV2021-1HA20 3RV2021-1JA20 3RV2021-1KA20	0.411 0.408 0.410 0.407
16 20 22 25	7.5 7.5 11 11	$10^{2)} \dots 16$ $13^{2)} \dots 20$ $16^{2)} \dots 22$ $18^{2)} \dots 25$	208 260 286 325	55 55 55 55		3RV2021-4AA10 3RV2021-4BA10 3RV2021-4CA10 3RV2021-4CA10	<b>A A A</b>	3RV2021-4AA20 3RV2021-4BA20 3RV2021-4CA20 3RV2021-4CA20 3RV2021-4DA20	0.417 0.410 0.413 0.422
28 32 <sup>3)</sup>	15 15	23 28 27 32	364 400	55 55		3RV2021-4NA10 3RV2021-4EA10		3RV2021-4NA20 3RV2021-4EA20	0.453 0.430
36 <sup>4)</sup> 40 <sup>4)</sup>	18.5 18.5	30 36 34 40	432 480	20 20		3RV2021-4PA10 3RV2021-4FA10			0.383 0.384

<sup>1)</sup> 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.

<sup>2)</sup> The setting range of the thermal overload releases has been extended.

<sup>3)</sup> Suitable for use with IE3 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2.

<sup>4)</sup> 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. For use with IE3 motors we recommend using 3RV2 motor starter protectors size S2.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

For motor protection













Setting range for Instantaneous

3RV2042-4MA10 Short-circuit SD Screw terminals

Rated current	Suitable for three-phase motors <sup>1)</sup> with <i>P</i>	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
I <sub>n</sub>		G	[ >	I <sub>CU</sub>		Article No.				
А	kW	А	А	kA	d					kg
Size S2										
14	5.5	9.5 14	208	65		3RV2031-4SA10	1	1 unit	41E	1.092
17	7.5	12 17	260	65 65		3RV2031-4TA10	1	1 unit	41E	1.081
20 25	11	18 25	325	65		3RV2031-4DA10	1	1 unit	41E 41E	1.054
32	15	22 32	416	65		3RV2031-4EA10	1	1 unit	41E	1.058
36	18.5	28 36	520	65		3RV2031-4PA10	1	1 unit	41E	1.080
40	18.5	32 40	585	65 65		3RV2031-4UA10	1	1 unit	41E	1.074
40 50	22	40 50	741	65		201/2021 4WA10	1	1 unit	410	1.071
52 59	30	42 52	845	65		3RV2031-4WA10	1	1 unit	41E 41E	1.182
65	30	54 65	845	65		3RV2031-4JA10	1	1 unit	41E	1.178
73	37	62 73	949	65		3RV2031-4KA10	1	1 unit	41E	1.172
80 <sup>-,</sup>	37	70 80	1 040	60		3RV2031-4RA10		i unit	41E	1.180
Size SZ	, with increased s	switching capaci	ty	100						
14 17	5.5 7.5	9.5 14 12 17	208	100		3RV2032-4SA10 3RV2032-4TA10	1	1 unit	41E	1.134
20	7.5	14 20	260	100		3RV2032-41A10	1	1 unit	41E	1.139
25	11	18 25	325	100		3RV2032-4DA10	1	1 unit	41E	1.114
32	15	22 32	416	100		3RV2032-4EA10	1	1 unit	41E	1.114
36	18.5	28 36	520	100		3RV2032-4PA10	1	1 unit	41E	1.133
40 45	18.5	32 40 35 45	585 650	100		3RV2032-40A10 3RV2032-4VA10	1	1 unit	41E 41F	1.149
52	22	42 52	741	100	•	3RV2032-4WA10	1	1 unit	41F	1 167
59	30	49 59	845	100		3RV2032-4XA10	1	1 unit	41E	1.181
65	30	54 65	845	100		3RV2032-4JA10	1	1 unit	41E	1.179
73 80 <sup>2)</sup>	37	6273 70 80	949 1 040	100		3RV2032-4KA10 3RV2032-4RA10	1	1 unit	41E 41F	1.170
Size S3	01	10 00	1 0 10	100	-			1 di lit		1.100
40	18.5	28 40	520	65	1	3RV2041-4FA10	1	1 unit	41F	2 190
50	22	36 50	650	65	1	3RV2041-4HA10	1	1 unit	41E	2.229
63	30	45 63	819	65	1	3RV2041-4JA10	1	1 unit	41E	2.234
75	37	57 75	975	65	1	3RV2041-4KA10	1	1 unit	41E	2.235
84	45	65 84	1 170	65	•	3RV2031-4RA10	1	1 unit	41E	1.180
93 100 <sup>3)</sup>	45.55	80 100	1 300	65	1	3RV2041-4MA10	1	1 unit	41E 41E	2.260
Size S3	. with increased	switching capaci	tv							
40	18.5	2840	520	100	1	3RV2042-4FA10	1	1 unit	41E	2,193
50	22	36 50	650	100	1	3RV2042-4HA10	1	1 unit	41E	2.219
63	30	45 63	819	100	1	3RV2042-4JA10	1	1 unit	41E	2.243
75	37	57 75	975	100	1	3RV2042-4KA10	1	1 unit	41E	2.253
84	45 45	6584 75 02	1 170	100	1	3RV2042-4RA10	1	1 unit	41E	2.263
100 <sup>3)</sup>	45, 55	80 100	1 300	100	1	3RV2042-4MA10	1	1 unit	41E	2.279

<sup>1)</sup> 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.

<sup>2)</sup> Suitable for use with IE3 motors up to a starting current of 720 A. For higher starting currents we recommend using size S3 motor starter protectors.

3) 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 (see Catalog LV 10). Auxiliary switches and other accessories can be ordered separately (see "Accessories" from page 2/171 onwards).

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

#### For motor protection

#### CLASS 10, with transverse auxiliary switch (1 NO + 1 NC)

 $\begin{array}{l} \mathsf{PU} \; (\mathsf{UNIT}, \, \mathsf{SET}, \, \mathsf{M}) = 1 \\ \mathsf{PS}^* &= 1 \; \mathsf{unit} \\ \mathsf{PG} &= 41 \mathsf{E} \end{array}$ 









3RV2011-0EA25 with integrated transverse auxiliary switch



3RV2021-4AA15 with integrated transverse auxiliary switch



3RV2021-4AA25 with integrated transverse auxiliary switch

Rated current	Suitable for three-phase motors <sup>1)</sup> with <i>P</i>	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	SD	Spring-type ( terminals	Ω	Weight per PU approx.
I <sub>n</sub>		G	1 >	I <sub>cu</sub>		Article No.		Article No.		
A	kW	А	А	kA	d		d			kg
Size S0	D									
0.16 0.2 0.25	0.04 0.06 0.06	0.11 0.16 0.14 0.2 0.18 0.25	2.1 2.6 3.3	100 100 100		3RV2011-0AA15 3RV2011-0BA15 3RV2011-0CA15		3RV2011-0AA25 3RV2011-0BA25 3RV2011-0CA25		0.310 0.311 0.307
0.32 0.4 0.5 0.63 0.8	0.09 0.09 0.12 0.18 0.18	0.22 0.32 0.28 0.4 0.35 0.5 0.45 0.63 0.55 0.8	4.2 5.2 6.5 8.2 10	100 100 100 100 100	* * * *	3RV2011-0DA15 3RV2011-0EA15 3RV2011-0FA15 3RV2011-0GA15 3RV2011-0HA15	A A A A A	3RV2011-0DA25 3RV2011-0EA25 3RV2011-0FA25 3RV2011-0GA25 3RV2011-0HA25		0.314 0.310 0.311 0.311 0.308
1 1.25 1.6 2	0.25 0.37 0.55 0.75	0.7 1 0.9 1.25 1.1 1.6 1.4 2	13 16 21 26	100 100 100 100		3RV2011-0JA15 3RV2011-0KA15 3RV2011-1AA15 3RV2011-1BA15		3RV2011-0JA25 3RV2011-0KA25 3RV2011-1AA25 3RV2011-1BA25		0.375 0.382 0.382 0.400
2.5 3.2 4 5	0.75 1.1 1.5 1.5	1.8 2.5 2.2 3.2 2.8 4 3.5 5	33 42 52 65	100 100 100 100		3RV2011-1CA15 3RV2011-1DA15 3RV2011-1EA15 3RV2011-1FA15		3RV2011-1CA25 3RV2011-1DA25 3RV2011-1EA25 3RV2011-1FA25		0.403 0.384 0.380 0.387
6.3 8 10 12.5 16	2.2 3 4 5.5 7.5	4.5 6.3 5.5 8 7 10 9 12.5 10 <sup>2)</sup> 16	82 104 130 163 208	100 100 100 100 55	* * * * *	3RV2011-1GA15 3RV2011-1HA15 3RV2011-1JA15 3RV2011-1KA15 3RV2011-4KA15		3RV2011-1GA25 3RV2011-1HA25 3RV2011-1JA25 3RV2011-1KA25 3RV2011-4AA25		0.386 0.387 0.390 0.384 0.392
Size S0										
16 20 22 25	7.5 7.5 11 11	$10^{2)} \dots 16$ $13^{2)} \dots 20$ $16^{2)} \dots 22$ $18^{2)} \dots 25$	208 260 286 325	55 55 55 55 55		3RV2021-4AA15 3RV2021-4BA15 3RV2021-4CA15 3RV2021-4CA15 3RV2021-4DA15		3RV2021-4AA25 3RV2021-4BA25 3RV2021-4CA25 3RV2021-4CA25 3RV2021-4DA25		0.430 0.450 0.429 0.437
28 32 <sup>3)</sup> 36 <sup>4)</sup> 40 <sup>4)</sup>	15 15 18.5 18.5	23 28 27 32 30 36 34 40	364 400 432 480	55 55 20 20		3RV2021-4NA15 3RV2021-4EA15 3RV2021-4PA15 3RV2021-4FA15		3RV2021-4NA25 3RV2021-4EA25  		0.445 0.446 0.399 0.387
I) Guide v	alue for 4-nole	standard motors	at 50 Hz 400 V	AC The actua	I I	Auxiliary switches and c	h	r accessories can be ord	loro	Ч

'' 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.

<sup>2)</sup> The setting range of the thermal overload releases has been extended.

 Suitable for use with IE3 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2.

<sup>4)</sup> 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. For use with IE3 motors we recommend using 3RV2 motor starter protectors size S2.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

For motor protection

## CLASS 20, without auxiliary switches











3RV2042-4KB10

Rated current	Suitable for three-phase motors <sup>1)</sup> with <i>P</i>	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
<i>I</i> n		<b>G</b>	[ >	I <sub>CU</sub>		Article No.				
А	kW	А	A	kA	d					kg
Size S2										
14 17 20 25 32 36 40 45 52 59 65	5.5 7.5 7.5 11 15 18.5 18.5 22 22 30 30	9.5 14 12 17 14 20 18 25 22 32 28 36 32 40 35 45 42 52 49 59 54 65	208 260 325 416 520 585 650 741 845 845	65 65 65 65 65 65 65 65 65 65 65 65 65 6		3RV2031-4SB10 3RV2031-4TB10 3RV2031-4BB10 3RV2031-4BB10 3RV2031-4EB10 3RV2031-4PB10 3RV2031-4VB10 3RV2031-4VB10 3RV2031-4WB10 3RV2031-4XB10 3RV2031-4JB10	1 1 1 1 1 1 1 1 1 1 1	1 unit 1 unit	41E 41E 41E 41E 41E 41E 41E 41E 41E 41E	1.088 1.108 1.082 1.080 1.084 1.105 1.114 1.112 1.212 1.214 1.220
Size S3,	with increased s	witching capacit	ÿ							
40 50 63	18.5 22 30	28 40 36 50 45 63	520 650 819	100 100 100	2 2 2	3RV2042-4FB10 3RV2042-4HB10 3RV2042-4JB10	1 1 1	1 unit 1 unit 1 unit	41E 41E 41E	2.200 2.229 2.246
75 84 93 100 <sup>2)</sup>	37 45 45 45, 55	57 75 65 84 75 93 80 100	975 1 170 1300 1300	100 100 100 100	2 2 2 2	3RV2042-4KB10 3RV2042-4RB10 3RV2042-4YB10 3RV2042-4YB10 3RV2042-4MB10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E 41E	2.268 2.300 2.307 2.281

<sup>1)</sup> 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.

 <sup>2)</sup> 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 (see Catalog LV 10).

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

### For motor protection with overload relay function

## Selection and ordering data

#### CLASS 10, with overload relay function (automatic RESET), without auxiliary switches







3RV2111-0BA10





3RV2131-4WB10

3RV2142-4FA10

Rated current	Suitable for three-phase motors <sup>1)</sup> with <i>P</i>	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	(UNIT, SET, M)	PS*	PG	Weight per PU approx.
In		G	<i>I</i> >	I <sub>cu</sub>		Article No.				
А	kW	А	А	kA	d					kg
Size S0	0 <sup>2)</sup>									
0.16 0.2 0.25 0.32	0.04 0.06 0.06 0.09	0.11 0.16 0.14 0.2 0.18 0.25 0.22 0.32	2.1 2.6 3.3 4.2	100 100 100 100	2 2 2 2	3RV2111-0AA10 3RV2111-0BA10 3RV2111-0CA10 3RV2111-0DA10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	0.335 0.337 0.334 0.337
0.4 0.5 0.63 0.8	0.09 0.12 0.18 0.18	0.28 0.4 0.35 0.5 0.45 0.63 0.55 0.8	5.2 6.5 8.2 10	100 100 100 100	2 2 2 2	3RV2111-0EA10 3RV2111-0FA10 3RV2111-0GA10 3RV2111-0HA10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	0.339 0.341 0.338 0.338
1 1.25 1.6 2	0.25 0.37 0.55 0.75	0.7 1 0.9 1.25 1.1 1.6 1.4 2	13 16 21 26	100 100 100 100	2 2 2 2	3RV2111-0JA10 3RV2111-0KA10 3RV2111-1AA10 3RV2111-1BA10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	0.401 0.404 0.407 0.407
2.5 3.2 4 5	0.75 1.1 1.5 1.5	1.8 2.5 2.2 3.2 2.8 4 3.5 5	33 42 52 65	100 100 100 100	2 2 2 2	3RV2111-1CA10 3RV2111-1DA10 3RV2111-1EA10 3RV2111-1FA10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	0.406 0.407 0.406 0.411
6.3 8 10 12.5 16	2.2 3 4 5.5 7.5	4.5 6.3 5.5 8 7 10 9 12.5 10 <sup>3)</sup> 16	82 104 130 163 208	100 100 100 100 55	2 2 2 2 2	3RV2111-1GA10 3RV2111-1HA10 3RV2111-1JA10 3RV2111-1KA10 3RV2111-4AA10	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E 41E 41E	0.411 0.410 0.412 0.409 0.414
Size S0	2)									
16 20 22 25	7.5 7.5 11 11	10 <sup>3)</sup> 16 13 <sup>3)</sup> 20 16 <sup>3)</sup> 22 18 <sup>3)</sup> 25	208 260 286 325	55 55 55 55	2 2 2 2	3RV2121-4AA10 3RV2121-4BA10 3RV2121-4CA10 3RV2121-4DA10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	0.424 0.420 0.422 0.429
28 32 <sup>4)</sup>	15 15 2)	23 28 27 32	364 400	55 55	2 2	3RV2121-4NA10 3RV2121-4EA10	1 1	1 unit 1 unit	41E 41E	0.439 0.436
Size S2	2)									
14 17 20 25	5.5 7.5 7.5 11	9.5 14 12 17 14 20 18 25	208 260 260 325	65 65 65 65	2 2 2 2	3RV2131-4SA10 3RV2131-4TA10 3RV2131-4BA10 3RV2131-4DA10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	1.143 1.142 1.135 1.122
32 36 40 45	15 18.5 18.5 22	22 32 28 36 32 40 35 45	416 520 585 650	65 65 65 65	2 2 2 2	3RV2131-4EA10 3RV2131-4PA10 3RV2131-4UA10 3RV2131-4UA10 3RV2131-4VA10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	1.122 1.131 1.129 1.124
52 59 65 73 80 <sup>5)</sup>	32 30 30 37 37	42 52 49 59 54 65 62 73 70 80	741 845 845 949 1040	65 65 65 65 65	2 2 2 2 2	3RV2131-4WA10 3RV2131-4XA10 3RV2131-4JA10 3RV2131-4KA10 3RV2131-4RA10	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E 41E 41E	1.220 1.247 1.241 1.235 1.245

<sup>1)</sup> 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.

<sup>2)</sup> Accessories for mounting on the right and 3RV2915 three-phase busbars cannot be used.

<sup>3)</sup> The setting range of the thermal overload releases has been extended.

<sup>4)</sup> Suitable for use with IE3 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2. <sup>5)</sup> Suitable for use with IE3 motors up to a starting current of 720 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S3.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

For motor protection with overload relay function

## CLASS 10, with overload relay function (automatic RESET), without auxiliary switches (continued)





3RV2111-4FA10



3RV2111-0BA10





3RV2142-4FA10

2

Rated current	Suitable for three-phase motors <sup>1)</sup> with <i>P</i>	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
In		G	<i>I</i> >	I <sub>CU</sub>		Article No.				
А	kW	А	A	kA	d					kg
Size S3,	with increased s	witching capacit	y <sup>2)</sup>							
40 50 63	18.5 22 30	28 40 36 50 45 63	520 650 819	100 100 100	2 2 2	3RV2142-4FA10 3RV2142-4HA10 3RV2142-4JA10	1 1 1	1 unit 1 unit 1 unit	41E 41E 41E	2.260 2.301 2.293
75 84 93 100 <sup>3)</sup>	37 45 45 45, 55	57 75 65 84 75 93 80 100	975 1 170 1 300 1 300	100 100 100 100	2 2 2 2	3RV2142-4KA10 3RV2142-4RA10 3RV2142-4YA10 3RV2142-4YA10 3RV2142-4MA10	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E 41E	2.301 2.339 2.341 2.325

<sup>1)</sup> 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.

<sup>2)</sup> Accessories for mounting on the right and 3RV2915 three-phase busbars cannot be used.

<sup>3)</sup> 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 (see Catalog LV 10).

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

#### For starter combinations

# Selection and ordering data

# Without auxiliary switches

PU (UNIT, SET, M) = 1 PS\* PG = 1 unit =41E











3RV2311-4AC10

3RV2321-4AC20

Rated current	Suitable for three-phase motors <sup>1)</sup> with <i>P</i>	Thermal overload releases <sup>2)</sup>	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	SD	Spring-type O terminals	Weight per PU approx.
In		CC	1 >	I <sub>cu</sub>		Article No.		Article No.	
A	kW	A	А	kA	d		d		kg
Size S0	0								
0.16	0.04	Without	2.1	100	5	3RV2311-0AC10 3RV2311-0BC10	5 5	3RV2311-0AC20 3RV2311-0BC20	0.292
0.25	0.06	Without	3.3	100	5	3RV2311-0CC10	5	3RV2311-0CC20	0.293
0.32	0.09	Without	4.2	100	5	3RV2311-0DC10	5	3RV2311-0DC20	0.293
0.4	0.09	Without	5.2 6.5	100	5	3RV2311-0EC10 3RV2311-0EC10	5	3RV2311-0EC20	0.292
0.63	0.12	Without	8.2	100	5	3RV2311-0GC10	5	3RV2311-0GC20	0.292
0.8	0.18	Without	10	100	5	3RV2311-0HC10	5	3RV2311-0HC20	0.293
1	0.25	Without	13	100	2	3RV2311-0JC10	5	3RV2311-0JC20	0.360
1.25	0.37	Without	21	100	2	3RV2311-1AC10	5 5	3RV2311-1AC20	0.360
2	0.75	Without	26	100	2	3RV2311-1BC10	5	3RV2311-1BC20	0.363
2.5	0.75	Without	33	100	2	3RV2311-1CC10	5	3RV2311-1CC20	0.364
3.2 4	1.1	Without	42 52	100	2	3RV2311-1DC10 3RV2311-1EC10	5	3RV2311-1DC20 3RV2311-1EC20	0.364
5	1.5	Without	65	100	2	3RV2311-1FC10	5	3RV2311-1FC20	0.367
6.3	2.2	Without	82	100	2	3RV2311-1GC10	5	3RV2311-1GC20	0.375
8	3	Without	104	100	2	3RV2311-1HC10	2	3RV2311-1HC20	0.368
12.5	4 5.5	Without	163	100	2	3RV2311-1JC10	2	3RV2311-1JC20	0.371
16	7.5	Without	208	55	2	3RV2311-4AC10	2	3RV2311-4AC20	0.375
Size S0									
1.6	0.55	Without	21	100	5	3RV2321-1AC10	5	3RV2321-1AC20	0.408
2	0.75	Without	26	100	5	3RV2321-1BC10	5	3RV2321-1BC20	0.401
2.5	0.75	Without	33	100	5	3RV2321-1CC10 3RV2321-1DC10	5	3RV2321-1CC20 3RV2321-1DC20	0.399
4	1.5	Without	52	100	5	3RV2321-1EC10	5	3RV2321-1EC20	0.396
5	1.5	Without	65	100	5	3RV2321-1FC10	5	3RV2321-1FC20	0.404
6.3	2.2	Without	82	100	2	3RV2321-1GC10	5	3RV2321-1GC20	0.407
8 10	3	Without	104 130	100	2	3RV2321-1HC10 3RV2321-1 IC10	5	3RV2321-1HC20 3RV2321-1.IC20	0.403
12.5	5.5	Without	163	100	2	3RV2321-1KC10	5	3RV2321-1KC20	0.390
16	7.5	Without	208	55	2	3RV2321-4AC10	2	3RV2321-4AC20	0.412
20	7.5	Without	260	55	2	3RV2321-4BC10	2	3RV2321-4BC20	0.409
22 25	11	Without	∠oo 325	55	∠ 2	3RV2321-4DC10	э 2	3RV2321-4DC20	0.410
28	15	Without	364	55	5	3RV2321-4NC10	5	3RV2321-4NC20	0.423
32 <sup>3)</sup>	15	Without	400	55	2	3RV2321-4EC10	2	3RV2321-4EC20	0.410
36 <sup>4)</sup>	18.5	Without	432	20	2	3RV2321-4PC10		-	0 380
40 <sup>4)</sup>	18.5	Without	480	20	2	3RV2321-4FC10		-	0.370

<sup>1)</sup> 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.

<sup>2)</sup> For overload protection of the motors, appropriate overload relays must be used.

<sup>3)</sup> Suitable for use with IE3 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2.

<sup>4)</sup> 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. For use with IE3 motors we recommend using 3RV2 motor starter protectors size S2.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

For starter combinations

## Without auxiliary switches (continued)

4						
				_	_	
	_			_	_	
-	_		-	_	_	_
-	_			-	-	
	-			-	+	
-	-			-	+	-
	+	+			+	-
	-				-	-



201/2221 40010





201/2222 49010



2DV/2222 4WC10

001/0041 40010

	51	12331-43010	311/2332-43010			51112552-4110		3RV2341-4FC10		
Rated current	Suitable for three-phase motors <sup>1)</sup> with <i>P</i>	Thermal overload releases <sup>2)</sup>	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	) PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
<i>I</i> n		L C	1 >	I <sub>cu</sub>		Article No.				
A	kW	А	А	kA	d					kg
Size S2										
14	5.5	Without	208	65	2	3RV2331-4SC10	1	1 unit	41E	1.056
17	7.5	Without	260	65	2	3RV2331-4TC10	1	1 unit	41E	1.070
20	7.5	Without	260	65 65	2	3RV2331-4BC10	1	1 unit	41E	1.061
20	15	Without	416	65	2	2DV2221 4EC10	1	1 unit	41	1.044
32 36	18.5	Without	520	65	2	3RV2331-4PC10	1	1 unit	41E 41E	1.040
40	18.5	Without	585	65		3RV2331-4UC10	1	1 unit	41E	1.052
45	22	Without	650	65		3RV2331-4VC10	1	1 unit	41E	1.050
52	22	Without	741	65		3RV2331-4WC10	1	1 unit	41E	1.152
59 65	30	Without	845 845	65	2	3RV2331-4XC10 3RV2331-4JC10	1	1 unit	41E 41F	1.173
73	37	Without	949	65	2	3RV2331-4KC10	i	1 unit	41E	1.162
80 <sup>3)</sup>	37	Without	1 040	65	2	3RV2331-4RC10	1	1 unit	41E	1.168
Size S2,	, with increase	d switching capaci	ty							
14	5.5	Without	208	100	2	3RV2332-4SC10	1	1 unit	41E	1.132
17	7.5	Without	260	100	2	3RV2332-4TC10	1	1 unit	41E	1.130
20 25	7.5 11	Without	260 325	100	2	3RV2332-4BC10 3RV2332-4DC10	1	1 unit	41E 41F	1.121
32	15	Without	416	100	2	3RV2332-4EC10	1	1 unit	41E	1 111
36	18.5	Without	520	100	2	3RV2332-4PC10	1	1 unit	41E	1.131
40	18.5	Without	585	100	2	3RV2332-4UC10	1	1 unit	41E	1.138
45	22	Without	650	100	2	3RV2332-4VC10	1	1 unit	41E	1.148
52	22	Without	741	100	2	3RV2332-4WC10	1	1 unit	41E	1.149
59 65	30	Without	845	100	2	3RV2332-4AC10	1	1 unit	41E 41F	1.169
73	37	Without	949	100	2	3RV2332-4KC10	i	1 unit	41E	1.163
80 <sup>3)</sup>	37	Without	1 040	100	2	3RV2332-4RC10	1	1 unit	41E	1.167
Size S3										
40	18.5	Without	520	65	2	3RV2341-4FC10	1	1 unit	41E	2.175
50	22	Without	650	65 65	2	3RV2341-4HC10	1	1 unit	41E	2.209
75	30	Without	019	05	2	3RV2341-4JC10	1	1 unit	41E	2.200
75 84	45	Without	1170	65	2	3RV2341-4RC10	1	1 unit	41E 41E	2.230
93	45	Without	1300	65	2	3RV2341-4YC10	1	1 unit	41E	2.269
1004)	45, 55	Without	1300	65	2	3RV2341-4MC10	1	1 unit	41E	2.251
Size S3,	, with increase	d switching capaci	ty							
40	18.5	Without	520	100	2	3RV2342-4FC10	1	1 unit	41E	2.175
50 63	30	Without	65U 819	100	2	3RV2342-4HC10 3RV2342-4JC10	1	i unit 1 unit	41E 41E	2.208
75	27	Without	075	100	2	2DV2242-4KC10	- 1	1 unit	/10	2.210
84	45	Without	1170	100	2	3RV2342-4RC10	1	1 unit	41E	2.234
93	45	Without	1300	100	2	3RV2342-4YC10	1	1 unit	41E	2.259
100 <sup>4)</sup>	45, 55	Without	1300	100	2	3RV2342-4MC10	1	1 unit	41E	2.252

<sup>1)</sup> 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.

 $^{2)}\,$  For overload protection of the motors, appropriate overload relays must be used.

<sup>3</sup> Suitable for use with IE3 motors up to a starting current of 720 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S3.

<sup>4)</sup> 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 (see Catalog LV 10).

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

## For transformer protection

# Selection and ordering data

# CLASS 10, without auxiliary switches

3RV/2411-04410

Motor starter protectors for the protection of transformers with high inrush current

PU (UNIT, SET, M) = 1 PS\* PG = 1 unit =41E









3RV2431-4WA10

		0,0110 0.				0	121 11 120	 
Rated current	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	SD	Screw terminals	I SC	Spring-type terminals	Weight per PU approx.
In	L C	<i>I</i> >	I <sub>CU</sub>		Article No.		Article No.	
A	А	A	kA	d		d		kg
Size S00	)							
0.16	0.11 0.16	3.3	100	►	3RV2411-0AA10	2	3RV2411-0AA20	0.297
0.2	0.14 0.2	4.2	100	2	3RV2411-0BA10	2	3RV2411-0BA20	0.295
0.25	0.18 0.25	5.2	100	2	3RV2411-0CA10	2	3RV2411-0CA20	0.298
0.32	0.22 0.32	0.0	100		3RV2411-0DA10	2	3RV2411-0DA20	0.297
0.4	0.28 0.4	0.∠ 10	100		3RV2411-0EA10	2	3RV2411-0EA20	0.299
0.63	0.45 0.63	13	100		3RV2411-0GA10	2	3RV2411-0GA20	0.363
0.8	0.55 0.8	16	100		3RV2411-0HA10	2	3RV2411-0HA20	0.364
1	0.7 1	21	100		3RV2411-0JA10	2	3RV2411-0JA20	0.366
1.25	0.9 1.25	26	100		3RV2411-0KA10	2	3RV2411-0KA20	0.365
1.6	1.11.0	33 42	100		3RV2411-1AA10 3RV2411-1BA10	2	3RV2411-1AA20 3RV2411-1BA20	0.368
25	18 25	52	100		3RV2411-1CA10	2	3RV2411-1CA20	0.000
3.2	2.2 3.2	65	100		3RV2411-1DA10	2	3RV2411-1DA20	0.371
4	2.8 4	82	100		3RV2411-1EA10	2	3RV2411-1EA20	0.366
5	3.5 5	104	100		3RV2411-1FA10	2	3RV2411-1FA20	0.369
6.3	4.5 6.3	130	100		3RV2411-1GA10	2	3RV2411-1GA20	0.373
8	5.5 8	163	100		3RV2411-1HA10	2	3RV2411-1HA20	0.375
12.5	7 10 9 125	208	100		3RV2411-1JA10 3RV2411-1KA10	2	3RV2411-1JA20 3RV2/11-1KA20	0.378
16	10 <sup>1)</sup> 16	286	55		3RV2411-4AA10	2	3RV2411-4AA20	0.377
Size S0								
16	10 <sup>1)</sup> 16	286	55	►	3RV2421-4AA10	2	3RV2421-4AA20	0 413
20	13 <sup>1)</sup> 20	325	55		3RV2421-4BA10		3RV2421-4BA20	0.415
22	16 <sup>1)</sup> 22	364	55		3RV2421-4CA10	2	3RV2421-4CA20	0.425
25	18 <sup>1)</sup> 25	400	55		3RV2421-4DA10	2	3RV2421-4DA20	0.428
Size S2								
14	9.5 14	328	65	2	3RV2431-4SA10			1.067
17	12 17	410	65	2	3RV2431-4TA10			1.058
20	14 20 18 25	410 512	65 65	2	3RV2431-4BA10 3RV2431-4DA10		-	1.063
20	20 20	656	65	2	2DV/2421_4EA10			1.072
36	28 36	820	65	2	3RV2431-4PA10			1 054
40	32 40	820	65	2	3RV2431-4UA10			1.052
45	35 45	922	65	2	3RV2431-4VA10			1.162
52	42 52	1 025	65	2	3RV2431-4WA10		-	1.151
59	49 59	1040	65	2	3RV2431-4XA10		-	1.186
65	54 65	1040	65	2	3RV2431-4JA10		-	1.182

<sup>1)</sup> The setting range of the thermal overload releases has been extended.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

Mountable accessories

## Overview

## Mounting location and function

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

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

#### Overview graphic, see page 2/148.

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	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.
or together.	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.
	Signaling switches	One signaling switch can be mounted on the left side of each motor starter
	Tripping 1 NO + 1 NC	protector.
	Short circuit 1 NO + 1 NC	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.
		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	Auxiliary releases	
<ul> <li>Notes:</li> <li>One auxiliary release can be mounted per motor starter protector/circuit breaker.</li> <li>Assessing approach be provided at the right</li> </ul>	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).
<ul> <li>Accessories carried be mounted at the right- hand side of the 3RV21 motor starter protectors</li> </ul>	or	
for motor protection with overload relay function.	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 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:	Isolator modules	Isolator modules can be mounted to the upper connection side of the motor starter protectors.
The isolator module for size S2     cap only be used with 3BV2 motor starter		The supply cable is connected to the motor starter protector through the isolator module.
protectors/circuit breakers up to max. 65 A - cannot be used with the transverse auxiliary switch		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
<ul> <li>The isolator module covers the terminal screws of the transverse auxiliary switch. If the isolator module is used, we therefore recommend that either the lateral auxiliary switches be fitted or that the isolator module not be mounted until the auxiliary switch has been wired.</li> </ul>		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 2/147.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

Mountable accessories

Selection and ordering data

	Version	For mo- tor starter protec- tors/ circuit breakers	SD	Screw terminals	÷	SD	Spring-type ☆ terminals □	<ul> <li>Weight</li> <li>per PU</li> <li>approx.</li> </ul>
				Article No.			Article No.	
Auvilian outebas1)		Size	d		(	d		kg
Auxiliary switches /	Transverse auxiliary							
1000	switches For mounting on the front							
3RV2901-1E	1 CO	S00 S3		3RV2901-1D				0.016
	1 NO + 1 NC 2 NO			3RV2901-1E 3RV2901-1F			3RV2901-2E 3RV2901-2F	0.017
3RV2901-2E 3RV2901-1G	Solid-state compatible transverse auxiliary switches For mounting on the front, for operation in dusty atmospheres and in solid-state circuits with low operating currents							
	1 CO	S00 S3	2	3RV2901-1G				0.016
3BV/2901-0H	Covers for transverse auxiliary switches Auxiliary switches (PS* = 10 units)	S00 S3	2	3RV2901-0H			-	0.006
3RV2901-1A 3RV2901-2A	Lateral auxiliary switches For mounting on the left 1 NO + 1 NC 2 NO 2 NC 2 NC 2 NO + 2 NC	S00 S3	2	3RV2901-1A 3RV2901-1B 3RV2901-1C 3RV2901-1J			3RV2901-2A 3RV2901-2B 3RV2901-2C 	0.045 0.045 0.045 0.086
Signaling switches <sup>2)</sup>								
3RV2921-1M 3RV2921-2M	Signaling switches One signaling switch can be mounted on the left per motor starter protector. Separate tripped and short-circuit alarms, 1 NO + 1 NC each	S00 S3		3RV2921-1M			3RV2921-2M	0.100
Isolator modules								
	<b>Isolator modules</b> <sup>2)</sup> Visible isolating distance for isolating individual motor starter protectors from the network, lockable in disconnected position	S00, S0 S2 <sup>3)</sup>	<b>A</b>	3RV2928-1A 3RV2938-1A			-	0.159 0.368

 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.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

Mountable accessories

PU (UN PS* PG	IT, SET, N	M) = 1 = 1 unit = 41E								
3RV2902	2-1AV0		3RV2902	2-2AV0		;	3RV2922-1CP0		3RV2902-2DB0	
Rated co	ntrol supp	ly voltage U <sub>s</sub>			For motor	SD	Screw terminals	SD	Spring-type	Weight
AC 50 Hz	AC 60 Hz	AC 50/60 Hz	AC/DC 50/60 Hz,	DC	tectors/circuit breakers		Ŭ			approx.
		100% ON period <sup>1)</sup>	5 s ON period <sup>2)</sup>							
							Article No.		Article No.	
V	V	V	V	V	Size	d		d		kg
Auxilia	ry releas	es <sup>3)</sup>								
Undervo	ltage rele	ases								
				24	S00 S3	2	3RV2902-1AB4		-	0.142
24	 120				S00 S3	2	3RV2902-1AB0 3RV2902-1AE0		-	0.139
	208				S00 S3	2	3RV2902-1AM1		-	0.135
230	240				S00 S3		3RV2902-1AP0		3RV2902-2AP0	0.133
400	440				S00 S3		3RV2902-1AV0		3RV2902-2AV0	0.132
415	480				S00 S3	2	3RV2902-1AV1		-	0.135
500	600		 		500 53	2	3872902-1850			0.131
auxiliarv	contacts	2 NO	ung							
24	24				S00 S3	5	3RV2922-1CB0			0 149
230	240				S00 S3	2	3RV2922-1CP0	2	3RV2922-2CP0	0.136
400	440				S00 S3	2	3RV2922-1CV0	2	3RV2922-2CV0	0.138
415	480				500 53	2	3KV2922-1CV1	2	3RV2922-2CV1	0.139
Snunt re	leases	00 04	00 70		000 00					0.100
		2024	2070 70 190		500 53	2	3RV2902-1DB0 3RV2902-1DE0	2	3RV2902-2DB0 3RV2902-2DE0	0.136
		210 240	190 330		S00 S3		3RV2902-1DP0		3RV2902-2DP0	0.134
		350 415	330 500		S00 S3	2	3RV2902-1DV0		-	0.133
		500	500		S00 S3	2	3RV2902-1DS0			0.132

<sup>1)</sup> The voltage range is valid for 100 % (infinite) ON period. The response voltage lies at 0.9 of the lower limit of the voltage range.

<sup>2)</sup> The voltage range is valid for 5 s ON period at AC 50/60Hz and DC. The response voltage lies at 0.85 of the lower limit of the voltage range. <sup>3)</sup> One auxiliary release can be mounted on the right per motor starter protector/circuit breaker (does not apply to 3RV21 motor starter protectors with overload relay function).

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

**Busbar accessories** 

## Overview

### Insulated three-phase busbar system

Three-phase busbar systems provide an easy, time-saving and clearly arranged means of feeding 3RV2 motor starter protectors/circuit breakers with screw terminals. Different versions are available for sizes S00 to S2 and can be used for the various different types of motor starter protectors/circuit breakers (size S0 up to 32 A).

The 3RV1915 and 3RV1935 three-phase busbar systems are generally unsuitable for the 3RV21 motor starter protectors for motor protection with overload relay function according to UL 489/CSA C22.2 No. 5.

The busbars are suitable for between two and five motor starter protectors/circuit breakers. 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/circuit breaker.

A combination of motor starter protectors/circuit breakers of size S00 and S0 is possible. The motor starter protectors/circuit breakers are supplied by appropriate infeed terminals.



SIRIUS three-phase busbar system size S00/S0



SIRIUS three-phase busbar system size S2

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/circuit breakers.

The three-phase busbar systems can also be used to construct "Type E Starters" according to UL/CSA. Special infeed terminals must be used for this purpose, however (see "Selection and Ordering Data", page 2/175).

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

The motor starter protectors/circuit breakers 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-tocenter 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/circuit breakers 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

For outgoing terminals, flat copper profile, etc., see Catalog LV 10 "Low-Voltage Power Distribution and Electrical Installation Technology".



SIRIUS load feeders with busbar adapters snapped onto busbars

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

Busbar accessories

2

Selection and or	dering da	ita										
	Modular spacing	Number of protectors Without lateral accessor ies	of motor starte s that can be With lateral auxiliary switch	er connected incl. auxiliary releases	Rated current I <sub>n</sub> at 690 V	For motor starter protectors	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm				А	Size	d					kg
Three-phase bus	bars <sup>1)</sup>											
	For feedi mounted protectio	ing several I side by sig n	motor starter de on standar	protectors d mountin	s with screw g rails, insu	v terminals, ulated, with t	ouch					
3RV1915-1AB	45 <sup>3)</sup>	2 3 4 5		  	63 63 63 63	S00, S0 <sup>2)</sup> S00, S0 <sup>2)</sup> S00, S0 <sup>2)</sup> S00, S0 <sup>2)</sup>		3RV1915-1AB 3RV1915-1BB 3RV1915-1CB 3RV1915-1CB 3RV1915-1DB	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	0.044 0.071 0.097 0.124
3RV1915-1BB	55 <sup>4)</sup>	  	2 3 4 5	  	63 63 63 63	S00, S0 <sup>2)</sup> S00, S0 <sup>2)</sup> S00, S0 <sup>2)</sup> S00, S0 <sup>2)</sup> S00, S0 <sup>2)</sup>		3RV1915-2AB 3RV1915-2BB 3RV1915-2CB 3RV1915-2CB 3RV1915-2DB	1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E	0.051 0.079 0.111 0.140
3RV1915-1CB		2 3 4			108 108 108	S2 S2 S2		3RV1935-1A 3RV1935-1B 3RV1935-1C	1 1 1	1 unit 1 unit 1 unit	41E 41E 41E	0.134 0.207 0.291
	63 <sup>5)</sup>			2 4	63 63	S00, S0 <sup>2)</sup> S00, S0 <sup>2)</sup>		3RV1915-3AB 3RV1915-3CB	1 1	1 unit 1 unit	41E 41E	0.052 0.121
3RV1915-1DB	75 <sup>5)</sup>	  	2 3 4	2 3 4	108 108 108	S2 S2 S2		3RV1935-3A 3RV1935-3B 3RV1935-3C	1 1 1	1 unit 1 unit 1 unit	41E 41E 41E	0.155 0.263 0.369

 Not suitable for 3RV21 motor starter protectors for motor protection with overload relay function.

<sup>2)</sup> Approved for motor starter protectors size S0 with  $I_{\rm n} \leq$  32 A.

<sup>3)</sup> For 3RV2 motor starter protectors without accessories mounted on the side. <sup>4)</sup> For 3RV2 motor starter protectors with auxiliary switches with 1 NO + 1 NC, 2 NO and 2 NC mounted on the left (9 mm wide).

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).

	Conductor co Solid or stranded	ross-section Finely stranded with end sleeve	AWG cables, solid or stranded	Tightening torque	For motor starter protectors/ circuit breakers	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm <sup>2</sup>	mm <sup>2</sup>	AWG	Nm	Size	d					kg
Three-phase infeed	d terminals										
Ann.	Connection	from top									
6 6 6	2.5 25	2.5 16	10 4	3 4	S00, S0		3RV2925-5AB	1	1 unit	41E	0.044
3RV2925-5AB	2 x (2.5 50) <sup>1),</sup> 1 x (2.5 70) <sup>1)</sup>	2 x (2.5 35) <sup>1)</sup> , 1 x (2.5 50) <sup>1)</sup>	2 x (10 1/0) <sup>1)</sup> , 1 x (10 2/0) <sup>1)</sup>	4 6	S2		3RV2935-5A	1	1 unit	41E	0.180
3RV2935-5A											
	Connection This terminal space require	from below is connected ement into acc	in place of a s count.	witch; please	e take the						
and a	2.5 25	2.5 16	10 4	Input: 4, Output: 2 2.5	S00, S0	•	3RV2915-5B	1	1 unit	41E	0.109
3RV2915-5B											
Three-phase infeed	d terminals	for constru	cting "Type	E Starters	11						
	Connection	from top									
and the second se	2.5 25	2.5 16	10 4	3 4	S00, S0	2	3RV2925-5EB	1	1 unit	41E	0.054
- A-A-A	2 x (2.5 50) <sup>1),</sup>	2 x (2.5 35) <sup>1)</sup> ,	2 x (10 1/0) <sup>1)</sup> ,	4 6	S2		3RV2935-5E	1	1 unit	41E	0.193
3RV2925-5EB	1 x (2.5 70) <sup>1)</sup>	1 x (2.5 50) <sup>1)</sup>	1 x (10 2/0) <sup>1)</sup>								
sisis											
3RV2935-5E											
1) If the all the manual is a second		- 41		a la serve la av							

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

SD

Article No.

For motor starter

protectors/circuit breakers

# **Motor Starter Protectors/Circuit Breakers**

Version

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

## **Busbar accessories**

								M)			appiox
			Size	9		d		,			ka
Covers for connec	tion tags					-		_			
3RV1915-6AB	Touch protect positions	ction for empty	y SOC S2	), SO		•	3RV1915-6AB 3RV1935-6A	1 1	10 units 5 units	41E 41E	0.003 0.006
Busbar adapters											
								-004			
ÚË.									M L		
8US1251-5DS10	8US1	1251-5DT11		8US1250-5A	S10		8US1250-5AT10	808	31211-4R7	500	
For motor starter protectors/circuit breakers	Rated current	Connecting cable	Adapter length	Adapter width	Rated voltage	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Size	A	AWG	mm	mm	V	d					kg
Busbar adapters f	or 60 mm s	ystems									
For copper busbars as Width: 12 mm and 30 Thickness: 5 mm and Also for T and double-	ccording to D mm 10 mm T special prof	IN 46433 files									
For motor starter pro	tectors/circuit	t breakers with	n screw term	ninals			Screw terminals	)			
S00, S0 <sup>2)</sup>	25	12	200	45	690	2	8US1251-5DS10	1	1 unit	1CU	0.308
S00, S0 NEW	25	12	260	45	690	2	8US1251-5DT10	1	1 unit	1CU	0.331
SO NEW	32	10	200	45	690	3	8US1251-5NS10	1	1 unit	1CU	0.319
S0 <sup>2)</sup>	32	10	260	45	690	2	8US1251-5NT10	1	1 unit	1CU	0.334
S2	80	4	200	55	690	5	8US1261-5MS13	1	1 unit	1CU	0.508
S2	80	4	260	55	690	5	8US1261-6MT10	1	1 unit	1CU	0.572
S2 <sup>1)</sup>	80	4	260	118	690	5	8US1211-6MT10	1	1 unit	1CU	0.873
S3	100/70 <sup>3)</sup>	4	215	72	690/600 <sup>3)</sup>	2	8US1211-4TR00	1	1 unit	1CU	0.620
For motor starter pro	tectors/circuit	t breakers with	n spring-type	e terminals			Spring-type	)			
S00, S0 <sup>2)</sup>	25	12	200	45	690	2	8US1251-5DS11	1	1 unit	1CU	0.316
S00, S0 <sup>2)</sup>	25	12	260	45	690	2	8US1251-5DT11	1	1 unit	1CU	0.330
SO NEW	32	10	200	45	690	5	8US1251-5NS11	1	1 unit	1CU	0.319
S0 <sup>2)</sup>	32	10	260	45	690	2	8US1251-5NT11	1	1 unit	1CU	0.352
Accessories											
Device holders			200	45		2	8US1250-5AS10	1	1 unit	1CU	0.243
For lateral mounting to busbar adapters			260	45		2	8US1250-5AT10	1	1 unit	1CU	0.264
Side modules For widening of busbar adapters			200	9		2	8US1998-2BJ10	1	10 units	1CU	0.020
Vibration and shock kits For high vibration and shock loads											
S00/S0						2	8US1998-1CA10	1	2 units	1CU	0.008
S2						5	8US1998-1DA10	1	1 unit	1CU	0.097

<sup>1)</sup> For the assembly of feeders for reversing starters comprising a motor starter protector and two contactors.

starter protector and two contacto <sup>2)</sup> Values according to UL/CSA -Rated current: 70 A at 600 V AC; -Short-circuit breaking capacity: 480 V AC: 65 kA, up to  $l_n = 30$  A, 480 Y/277 V AC: 65 kA, 600 Y/347 V AC: 20 kA.

For additional busbar adapters, see Catalog LV 10 "Low-Voltage Power Distribution and Electrical Installation Technology"

PG Weight per PU

ΡU

(UNIT,

PS\*

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

Mounting accessories

# Selection and ordering data

Accessories

	Version	For motor starter protectors/ circuit breakers	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		Size	d		,			kg
Covers								
3RV2 (size S3) with 3RT1946-4EA1 (left)	Terminal covers For cable lug and busbar connection for maintaining the required voltage clearances and as touch protection if box terminal is removed (2 units can be mounted per motor starter protector/circuit breaker)	S2	5	3RT1946-4EA1	1	1 unit	41B	0.036
3RV2908-0P	Scale covers Sealable, for covering the set current scale	3RV20, 3RV21, 3RV24: S00 S3	•	3RV2908-0P	100	10 units	41E	0.051
Andrea	Covers for devices with screw terminals (box terminals)			Screw terminals				
Tatat /	Additional touch protection for fastening to the box terminals (2 units required per device)							
3RT2936-4EA2	Main current level	S2		3RT2936-4EA2	1	1 unit	41B	0.014
		S3		3RT2946-4EA2	1	1 unit	41B	0.018
Fixing accessories	3							
	Push-in lugs For screwing the motor starter protector onto mounting plates Two units are required for each motor starter	S00, S0	2	3RV2928-0B	100	10 units	41E	0.200
3RV2928-0B	protector.							
Tools for opening	spring-type terminals							
	Screwdrivers For all SIRIUS devices with spring-type termin	nals		Spring-type terminals				
	Length approx. 200 mm, 3.0 mm x 0.5 mm titanium gray/black, partially insulated	S00 S3	2	3RA2908-1A	1	1 unit	41B	0.050
3RA2908-1A								

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

#### **Mounting accessories**

Version	For motor starter protectors/ circuit breakers	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Size	d					kg

Terminal b Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1

For extended clearances

. . . . . . . . . .



Note:

(1 and 2 inch) Phase barriers

UL 508/UL 60947-4-1 approval demands 1-inch through air spacing and 2-inch over surface spacing for "Self-Protected Combination Motor Controllers (Type E)". The following terminal blocks or phase barriers must be used for the 3RV20 motor starter protectors with screw terminals. 3RV20 motor starter protectors with spring-type terminals must be assembled with the 3RV29 infeed system for approval as "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1.

►

5

3RT2946-4GA07

3RV2928-1K

3BV/2928-1H

The terminal block or phase barriers cannot be used in combination with the 3RV19.5 three-phase busbars. For construction with three-phase busbars, see "Busbar Accessories", from page 2/174 onwards. Terminal blocks type E S00, S0 3RV2928-1H

S00, S0

S3

3RT2946-4GA07

3RV2928



-1K	(1 and 2 inch)	S2		3RV2938-1K	1	1 unit	41E	0.028
-1K								
y terminals	s, 3-pole							
1	For connection of auxiliary and control cables to the main conductor connections (for one side)	S3	5	3RT2946-4F	1	1 unit	41B	0.033

\* a.\* 3RT2946-4F

Auxilia

1

1

1

1 unit 41E

1 unit 41B

1 unit 41E

0.083

0.151

0.010

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

Mounting accessories

	Actuating voltage of contactor	Size 3RT2 contactors	3RV2 motor starter protectors/ circuit breakers	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				d					kg
Link modules for mot	tor starter protector	to contactor <sup>1)</sup>							
	For mechanical and el starter protector and c	ectrical connectio ontactor with scre	n between motor w terminals		Screw terminals				
and the first	Single-unit packaging	9							
3RA2921-1AA00	AC/DC AC DC AC/DC AC/DC	S00 S0 S0 S2 S3	S00/S0 S00/S0 S00/S0 S2 S3	► 2 2 2 ►	3RA1921-1DA00 3RA2921-1AA00 3RA2921-1BA00 3RA2931-1AA00 3RA1941-1AA00	1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B 41B	0.030 0.046 0.055 0.104 0.090
and the local	Multi-unit packaging								
	AC/DC AC DC AC/DC AC/DC	S00 S0 S0 S2 S3	S00/S0 S00/S0 S00/S0 S2 S3	▶ 2 2 ▶	3RA1921-1D 3RA2921-1A 3RA2921-1B 3RA2931-1A 3RA1941-1A	1 1 1 1	10 units 10 units 10 units 5 units 5 units	41B 41B 41B 41B 41B	0.020 0.045 0.053 0.071 0.073
3RA2931-1AA00									
A states	For mechanical and el starter protector and c	ectrical connectio ontactor with sprir	n between motor ng-type terminals		Spring-type terminals				
660	Single-unit packaging	9							
	AC/DC AC <sup>2)</sup> DC	S00 S0 S0	S00 S0 S0		3RA2911-2AA00 3RA2921-2AA00 3RA2921-2AA00	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	0.058 0.100 0.100
3BA2911-2AA00	Multi-unit packaging								
	AC/DC AC <sup>2)</sup> DC	S00 S0 S0	S00 S0 S0		3RA2911-2A 3RA2921-2A 3RA2921-2A	1 1 1	10 units 10 units 10 units	41B 41B 41B	0.055 0.091 0.091
	Spacers <sup>2)</sup> For compensating the	height on AC con	tactors						
	Single-unit packaging Multi-unit packaging	S0 S0	S0 S0	2 2	3RA2911-1CA00 3RA2911-1C	1 1	1 unit 5 units	41B 41B	0.016 0.015

3RA2911-1CA00

Link modules

### Note:

Link modules can be used in

- Size S00 up to 16 A
- Size S0 up to 32 A
- Size S2 up to 65 A

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

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

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

Mounting accessories

	Size 3RW30, 3RW40 soft starters	3RV2 motor starter protectors/circuit breakers	SD	Article No.		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			d						kg
Link modules for r motor starter prote	motor starter protector to s ector to solid-state contact	soft starter <sup>1)</sup> and tor							
	Connection between motor sta solid-state contactor with screw	rter protector and soft starter / w terminals		Screw terminals					
and the second s	Single-unit packaging								
	S00 S0 S2 <sup>2)</sup>	S00/S0 S00/S0 S2	2 2	3RA2921-1BA00 3RA2921-1BA00 3RA2931-1AA00		1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	0.055 0.055 0.104
3RA2921-1BA00	S3 <sup>57</sup>	\$357		3RA1941-1AA00		1	1 unit	41B	0.090
	Multi-unit packaging S00 S0 S $2^{2^2}$ S $3^{3^3}$	S00/S0 S00/S0 S2 S3 <sup>3)</sup>	22	3RA2921-1B 3RA2921-1B 3RA2931-1A 3RA1941-1A		1 1 1	10 units 10 units 5 units 5 units	41B 41B 41B 41B	0.053 0.053 0.071 0.073
3RA2931-1AA00									
A STREET	Connection between motor sta spring-type terminals	rter protector and soft starter		Spring-type terminals					
	Single-unit packaging								
hir	S00 S0	S00 S0	2 2	3RA2911-2GA00 3RA2921-2GA00		1 1	1 unit 1 unit	41B 41B	0.057 0.090
3RA2921-2GA00									
Noto:		1) TH	na link	modules from motor starter	nrotec	tor to ec	ft startor	and m	otor

#### Note:

Link modules can be used in

- Size S00 up to 16 A
- Size S0 up to 32 A
- Size S2 up to 65 A

<sup>17</sup> The link modules from motor starter protector to soft starter and motor starter protector to solid-state contactor cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV2.31-4K,1., 3RV2.31-4R,1., 3RV2.32-4K.1. and 3RV2.32-4R.1. motor starter protectors/circuit breakers.

<sup>2)</sup> To assemble the feeder between a motor starter protector and a soft starter in size S2, the 3RA2932-1CA00 standard mounting rail adapter must be used.

<sup>3)</sup> It is only permissible to assemble the feeder between the motor starter protector and the soft starter in size S3 on a mounting plate.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers Accessories

Mounting accessories

	Actuating voltage of contactor	Size 3RT2 contactors	3RV2 motor starter protectors/ circuit breakers	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				d					kg
Hybrid link modul	les for motor starter	protector to conta	actor <sup>1)</sup>						
	Electrical and mechar screw terminals and c	nical link between mot contactor with spring-t	or starter protector with ype terminals	١					
A14/4/2	Single-unit packagin	g							
	AC/DC AC <sup>2)</sup> /DC	S00 S0	S00 S0		3RA2911-2FA00 3RA2921-2FA00	1 1	1 unit 1 unit	41B 41B	0.047 0.074
	Multi-unit packaging	I							
3RA2911-2FA00	AC/DC AC <sup>2)</sup> /DC	S00 S0	S00 S0	► 2	3RA2911-2F 3RA2921-2F	1 1	10 units 10 units	41B 41B	0.042 0.070
littr									
3RA2921-2FA00									
	Spacers <sup>2)</sup> For compensating the	height on AC contac	tors						
150	Single-unit packaging Multi-unit packaging	I SO SO	S0 S0	2 2	3RA2911-1CA00 3RA2911-1C	1 1	1 unit 5 units	41B 41B	0.016 0.015
3BA2911-1CA00									

#### Note:

Hybrid link modules in size S00 can be used up to max. 16 A and in size S0 up to max. 32 A.

<sup>1)</sup> The hybrid link modules for motor starter protector to contactor cannot be used for 3RV2.21-4PA1. and 3RV2.21-4FA1. motor starter protectors/circuit breakers. They are only suitable for constructing direct-on-line starters.

 <sup>2)</sup> A spacer for height compensation on AC contactors size S0 is optionally available.

	For motor starter protectors/ circuit breakers	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Туре		d					kg
Connection module screw terminals	es for motor sta	rter protectors/circuit breakers with						
Stand of the		Adapters for motor starter protectors/ circuit breakers Ambient temperature $T_{u max.} = 60 \text{ °C}$		Screw terminals				
	3RV2.2	Size S0, rated operational current $I_{\rm e}$ at AC-3/400 V: 25 A	5	3RT1926-4RD01	1	1 unit	41B	0.036
3RT1926-4RD01								
	3RV2.2	Motor feeder connectors for motor starter protectors/circuit breakers Size S0	5	3RT1900-4RE01	1	1 unit	41B	0.042



2

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

#### 3RV29 infeed system

## Overview

#### More information

Home page, see www.siemens.com/railway-components Catalog IC 10, see www.siemens.com/ic10 Industry Mall, see www.siemens.com/product?3RV2

Manual "SIRIUS Innovations – SIRIUS 3RV2 Motor Starter Protectors", see https://support.industry.siemens.com/cs/ww/en/view/60279172

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

Motor starter protectors or load feeders with a rated current of maximum 32 A each can be used.

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 25 mm<sup>2</sup> (with end sleeve). A basic module has two sockets onto each of which a motor starter protector can be snapped.

Expansion modules (three-phase busbars for system expansion) are available for extending the system. 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 IEC 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 lefthand 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.

The 3RV29 infeed system is approved in accordance with IEC to 500 V. 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).



SIRIUS 3RV29 infeed system

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

3RV29 infeed system

#### (1) Three-phase busbars with infeed

A three-phase busbar with infeed unit is required for connecting the incoming supply. These modules comprise one infeed module and two 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 to spring-type terminals. They permit an infeed with conductor cross-sections of up to 25 mm<sup>2</sup> with end sleeve. 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 two or three sockets. The system can be expanded as required up to a maximum current carrying capacity of 63 A. An expansion plug is supplied with each module.

#### (3)a 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 threephase busbar for system expansion. Additional expansion plugs are therefore only required as spare parts.

#### (3)b Extra-wide expansion plug

The wide expansion plug makes the electrical connection between two three-phase busbars, thus performing the same function as the 3RV2917-5BA00 expansion plug; the electrical characteristics (e.g. a current carrying capacity of 63 A) are identical.

The 3RV2917-5E expansion plug is 10 mm wider than the 3RV2917-5BA00 expansion plug, hence in the plugged state there is a distance of 10 mm between the connected threephase 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 threephase 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 for screw or spring-type terminals.

#### (7) Contactor base

Load feeders can be assembled in the system using the S00 and S0 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 load feeders 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 S0 contactor bases are also suitable for soft starters size S00 and S0 with screw terminal.

The infeed system is designed for mounting onto a TH 35 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 load feeders, 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 feeders of sizes S00 and S0, the corresponding 3RA1921-1..., 3RA2911-2..., 3RA2921-1... or 3RA2921-2.... link modules should generally be used.

#### (8) Terminal block

The 3RV2917-5D terminal block enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components. The three phases can be fed out of the system using the terminal block; 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. In addition, the 45 mm wide TH 35 3RV1917-7B standard mounting rail option for screwing onto the support plate facilitates plugging the single-phase, two-phase and three-phase components onto the infeed system.

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

# 3RV29 infeed system Technical specifications

General data					
Туре					3RV29.7
Size					S00, S0
Standards					
• IEC 60947-2					✓
• IEC 60947-4-1					1
• UL 508/UL 60947	/-4-1				1
Rated current In				А	63
Permissible rated	current at insi	de temperature	of control cabinet		
Motor starter protectors/ circuit breakers	Size	Rated current	Inside temperature of control cabinet		
• 3RV2.11	S00	14 A	60 °C	%	100
		> 14 16 A	40 °C 60 °C	% %	100 87
• 3RV2.21	SO	16 A	60 °C	%	100
		> 16 25 A	40 °C 60 °C	% %	100 87
		> 25 32 A	40 °C	%	87
Permissible ambie	ent temperatur	e			
<ul> <li>Storage/transport</li> </ul>	t			°C	-50 +80
<ul> <li>Operation</li> </ul>				°C	-20 +60
Rated operational	voltage U <sub>e</sub>				
<ul> <li>Acc. to IEC</li> </ul>		10% overvoltag	ge	V AC	500
		5% overvoltage	e	V AC	525
<ul> <li>Acc. to UL/CSA</li> </ul>				V AC	600
Rated frequency				Hz	50/60
Rated impulse wit	hstand voltage	e U <sub>imp</sub>		kV	6
Short-circuit stren	ngth				Corresponds to the mounted motor starter protector or load feeder
Degree of protecti	ion acc. to IEC	60529			IP20 (In the terminal compartment of the infeed without connected IP00 conductor)
Touch protection	acc. to IEC 605	29			Finger-safe

🗸 Yes

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

3RV29 infeed system

Selection and ordering	ng data								
	Туре	Version	For 3RV20, 3RV23, 3RV24 motor starter protectors	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Thuse where bushess	with info al		Size	d					kg
Three-phase busbars	With Infeed Three-phase busbars with infeed incl. 3RV2917-6A end cover	For 2 motor starter protectors with screw or spring-type terminals • With infeed on the left • With infeed on the right	S00, S0 S00, S0	2 2	3RV2917-1A 3RV2917-1E	1	1 unit 1 unit	41E 41E	0.435 0.435
Three-phase busbars	for system expansi	on							
3RV2917-4A	Three-phase busbars incl. 3RV2917-5BA00 expansion plug	For motor starter protectors with screw or spring-type terminals • For 2 motor starter protectors • For 3 motor starter protectors	S00, S0 S00, S0	2 2	3RV2917-4A 3RV2917-4B	1	1 unit 1 unit	41E 41E	0.435 0.435
Plug-in connectors									
28/2012 54400	Plug-in connectors to make contact with motor starter protectors	<ul> <li>For spring-type terminals</li> <li>Single-unit packaging</li> <li>Multi-unit packaging</li> </ul>	S00 <sup>1)</sup> S0 <sup>2)</sup> S00 <sup>1)</sup> S0 <sup>2)</sup>	2 2 2 2	Spring-type terminals         Image: Constraint of the system           3RV2917-5AA00         3RV2927-5AA00           3RV2917-5A         3RV2927-5A	1 1 1 1	1 unit 1 unit 10 units 10 units	41E 41E 41E 41E	0.059 0.065 0.053 0.065
		<ul> <li>For screw terminals</li> <li>Single-unit packaging</li> <li>Multi-unit packaging</li> </ul>	S00 <sup>1)</sup> S0 <sup>2)</sup> S00 <sup>1)</sup> S0 <sup>2)</sup>	2 2	Screw terminals 3RV2917-5CA00 3RV1927-5AA00 3RV2917-5C 3RV1927-5A	1 1 1 1	1 unit 1 unit 10 units 10 units	41E 41E 41E 41E	0.039 0.041 0.035 0.037
$^{(1)}$ $I > 14$ A please note de	rating		<sup>2)</sup> I > 16		ease note derating				
	Туре	Version	For contactors	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Contactor bases			JIZE	u					ĸġ
3RV2927-7AA00	Contactor bases for mounting direct- on-line or reversing starters	Single-unit packaging	S00 S00, S0	2 2	3RV2917-7AA00 3RV2927-7AA00	1	1 unit 1 unit	41E 41E	0.067 0.082

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers

# 3RV29 infeed system

	Туре	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			d		111)			kg
Terminal blocks								
3RV2917-5D	Terminal blocks For integration of single-phase, two-phase and three-phase components	Single-unit packaging	2	3RV2917-5D	1	1 unit	41E	0.061
TH 35 standard moun	ting rails, width 45 mm							
SIFMENO	TH 35 standard mounting	Single-unit packaging	2	3RV1917-7B	1	1 unit	41E	0.014
	rails Acc. to IEC 60715, width 45 mm For mounting onto three-phase busbars							
SRV 1917-78	nluas							
	Extra-wide expansion plugs	Single-unit packaging	2	3RV2917-5E	1	1 unit	41E	0.044
3RV2917-5E	As accessory							
Expansion plugs								
	Expansion plugs <sup>1)</sup> As spare part	Single-unit packaging	2	3RV2917-5BA00	1	1 unit	41E	0.035
3RV2917-5BA00								
	<b>End covers</b> <sup>2)</sup> As spare part	Multi-unit packaging	2	3RV2917-6A	100	10 units	41E	0.600
3RV2917-6A	avias infeed							
	Terminal blocks for device infeed	Single-unit packaging	2	3RV2917-5FA00	1	1 unit	41E	0.010
3RV2917-5FA00								

- <sup>1)</sup> The expansion plug is included in the scope of supply of the 3RV2917-4. three-phase busbars for system expansion.
- The end cover is included in the scope of supply of the 3RV2917-1. three-phase busbars with infeed system.

# **Monitoring and Control Devices**

					Introduction
Overview					
More information					
Home page, see www.siemens.com/railway-components Catalog IC 10, see www.siemens.com/ic10		Home page Industry Ma	, see www.siemens.com/r II, see www.siemens.com,	elays /product?3RP	
Туре	3RP25				
Timing relays					
Enclosures:					
<ul> <li>17.5 mm industry and household equipment installation</li> </ul>	1				
22.5 mm industry	✓				
45 mm industry					
<ul> <li>For contactor sizes S0 to S12</li> </ul>					
Monofunction	1				
Multifunction	✓				
Monovoltage					
Combination voltage	✓				
Wide voltage range	1				
Application:					
<ul> <li>Control systems and mechanical engineering</li> </ul>	1				
Infrastructure					
Mounting onto contactors					
Page	2/190				
<ul> <li>Corresponds to or possible</li> </ul>					
Description of the second second lab					

Does not correspond to or not possible ---



-							
Voltage monitoring	 1						2/208
Current monitoring	 	1					2/211
Active current monitoring	 	1	1				2/213
Power factor monitoring	 		1				2/213
Residual current monitoring	 			1			2/216
Insulation monitoring	 				1		2/219
Speed monitoring	 					1	2/226

✓ Available

Туре

-- Not available

# **Monitoring and Control Devices**

#### Introduction

## **Connection methods**

The monitoring and control devices are available with screw or spring-type terminals.

Scrow	tormina	le
OCIEW	terrinia	13

## Spring-type terminals

The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

# "Increased safety" type of protection EEx e/d according to ATEX directive 94/9/EC

The communication-capable, modularly designed SIMOCODE promotor management system (SIRIUS Motor Management and Control Devices) protects motors of types of protection EEx e and EEx d in potentially explosive areas.

# ATEX approval for operation in areas subject to explosion hazard

The SIRIUS 3RN2 thermistor motor protection relay for PTC sensors is certified according to ATEX Ex II (2) G and D for environments with explosive gas or dust loads.

The SIRIUS SIMOCODE pro 3UF7 motor management system is certified for the protection of motors in areas subject to explosion hazard according to

- ATEX Ex I (M2); equipment group I, category M2 (mining)
- ATEX Ex II (2) GD; equipment group II, category 2 in area GD.

### General data

#### Overview



7PV15, SIRIUS 3RP25 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 relays

 Switching over 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

# Relays

Timing Relays

## SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

## Overview



### More information

Home page, see www.siemens.com/railway-components Catalog IC 10, see www.siemens.com/ic10 Industry Mall, see www.siemens.com/product?3RP25 Conversion tool, e.g. from 3RP15 to 3RP25, see www.siemens.com/sirius/conversion-tool

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 or wide voltage range
- Single or selectable time setting ranges
- Switch position indication and voltage indication by LED

#### SIRIUS 3RP25 timing relays

#### Article No. scheme

Product versions		Article n	umber			
Timing relays		3RP25				0
Product function/	Multifunction		05			7 time ranges 0.05 s 100 h
time setting ranges	With ON-delay		1 1			1 time range 0.5 10 s
			12			1 time range 1 30 s
			13			1 time range 5 100 s
			25			7 time ranges 0.05 s 100 h
			27			4 time ranges 0.05 s 240 s
	OFF-delay with control signal		35			7 time ranges 0.05 s 100 h
	OFF-delay without control signal, non-volatile, passing make contact		4 0			7 time ranges 0.05 s 600 h
	Clock-pulse relay, flashing, asymmetrical		55			7 time ranges 0.05 s 100 h
	Wye-delta function with coasting function (idling)		60			Wye-delta 1 20 s, coasting time (idling) 600 s
	Wye-delta function		74			1 time range 1 20 s
			76			1 time range 3 60 s
Connection type	Screw terminals			1		
	Spring-type terminals (push-in)			2		
Contacts	1 CO			Α		
	2 CO			в		
	Semiconductors (transistor NPN)			С		
	Semiconductors (thyristor), two-wire			Е		
	1 NO + 1 NO (wye-delta)			Ν		
	2 CO positively driven			R		
	3 NO			N O		
Control supply voltage	24 V AC/DC				B 3	
	200 240 V/380 440 V AC				M 2	
	400 440 V AC				Т2	
	12 240 V AC/DC or 24 240 V AC/DC (3RP2505RW30)				W 3	
Example		3RP25	05-	1 A	B 3 (	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.

2

## SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

#### 3RP2505 multifunctional timing relays

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

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.

#### Overview of functions

The timing relay can be clearly labeled with the selectable functions using a set of labels. This is included in the scope of supply of the multifunctional relay.

The same potential must be applied to terminals A. and B.

## Note:

The activation of loads parallel to the start input is permissible when using AC control voltage (see circuit diagram).



Circuit diagram

Identifica- tion letter	13 functions	27 functions
	1 CO, 1 NO (semiconductor), 2 CO switched in parallel, or 2 CO positively driven and switched in parallel with delay	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
Α	With ON-delay	ON-delay and instantaneous contact
В	OFF-delay with control signal	OFF-delay with control signal and instantaneous contact
С	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
н	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
к	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
М	Retriggerable interval relay with activated control signal (watchdog)	Retriggerable interval relay with activated control signal and instantaneous contact (watchdog)
		Wye-delta function

# Relays

**Timing Relays** 

## SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

## 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.

#### Standards and approvals

- 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"
SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

# Technical specifications

More information	
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16354/td	Internal circuit diagrams, see https://support.industry.siemens.com/cs/ww/en/view/103532830
Manual, see https://support.industry.siemens.com/cs/ww/en/view/103532830	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16354/faq

Article number	3RP2505A, 3RP2505C, 3RP251., 3RP2525A, 3RP2527, 3RP253., 3RP255.	3RP2505B, 3RP2505R, 3RP2525B, 3RP254., 3RP256., 3RP257.
Width x height x depth	17.5 x 100 x 90	22.5 x 100 x 90

Article number		3RP25AB30, 3RP25AW30, 3RP25BB30, 3RP25BW30, 3RP25NW30, 3RP25SW30	3RP25BT20, 3RP25NM20	3RP25CW30	3RP25EW30	3RP25RW30
General technical specifications	:					
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3, rated value	V AC	300	500	300		300
Ambient temperature <ul> <li>During operation</li> <li>During storage</li> </ul>	°C °C	-25 +60 -40 +85				-40 +70
Operating range factor of the control supply voltage, rated value • At AC - At 50 Hz • At 60 Hz • At DC		0.85 1.1 0.85 1.1 0.85 1.1	I	0.85 1.1	0.85 1.1	0.7 1.1 0.7 1.1 0.7 1.1
Switching capacity current with inductive load	А	0.01 3	0.01 3	0.01 1	0.01 0.6	0.01 3
Operational current of the auxiliary contacts • At AC-15 - At 24 V - At 250 V	A	3	3	1		3
- At 400 V • At DC-12 - At 24 V - At 125 V	A A A		3  	-  1		
- At 250 V • At DC-13 - At 24 V - At 125 V	A A A	 1 0.2	 1 0.2	1		 1 0.2
- At 250 V	A	0.1	0.1			0.1
Thermal current	A	5	5	1	0.6	5
Mechanical endurance operating cycles, typical		10 000 000				
Electrical endurance (operating cycles) for AC-15 at 230 V, typical		100 000		300 000	100 000	

Article number	3RP251	3RP252
Type of electrical connection for auxiliary and control circuits	Screw terminals	Spring-type terminals (push-in)
Design of thread of connection screw	М3	
Tightening torque	0.6 0.8 Nm	
Type of connectable conductor cross-sections • Solid • Finely stranded with end sleeve • For AWG cables • Solid • Stranded	1x (0.5 4 mm <sup>2</sup> ), 2 x (0.5 2.5 mm <sup>2</sup> ) 1x (0.5 4 mm <sup>2</sup> ), 2 x (0.5 1.5 mm <sup>2</sup> ) 1x (20 12), 2x (20 14) 1x (20 12), 2x (20 14)	1x (0.5 4 mm²) 1x (0.5 2.5 mm²) 1x (20 12) 



#### М

Retriggerable interval relay with activated control signal (watchdog)

<t

#### Legend

A ... M identification letters
☑ Timing relay energized
□ Contact closed
□ Contact open

2





м

Retriggerable interval relay with activated control signal (watchdog)

Legend

A ... M identification letters

Iming relay energized

Contact closed

Contact open

settable pulse delay)



2

A ... H identification letters
 Timing relay energized
 Contact closed
 Contact open

## SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm



Legend

- I ... M identification letters
- Contact closed
- Contact open

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 $^{1)}$  3RP2540 has a double function: Function N = OFF-delay Function O = Positive passing make contact.

## SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

#### 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 Y<sub>A</sub> timing. The idling time (coasting time) is started by applying a control signal to B./A2. When the set time  $t_{\text{Idling}}$  (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<sub>Y</sub> = Star time 1 ... 20 s

t<sub>Idling</sub> = Idling time (coasting time) 30 ... 600 s

#### Note:

The following applies to all operations: The pressure switch controls the timing via B./A2.

#### Application example based on standard operation (Operation 1): For example, use of 3RP2560 for compressor control

Frequent starting of compressors strains the network, the machine, and the increased costs for the operator. The new timing relay prevents frequent starting at times when there is high demand for compressed air. A special control circuit prevents the compressor from being switched off immediately when the required air pressure in the tank has been reached. Instead, the valve in the intake tube is closed and the compressor runs in "Idling" mode, i.e. in no-load operation for a specific time which can be set from 30 ... 600 s.

If the pressure falls within this time, the motor does not have to be restarted again, but can return to nominal load operation from no-load operation.

If the pressure does not fall within this idling time, the motor is switched off.

The pressure switch controls the timing via B./A2.

The control supply voltage is applied to A./A2 and the start contact B./A2 is open, i.e. there is no control signal on B./A2 when the control supply voltage is applied. The pressure switch signals "too little pressure in system" and starts the timing by way of terminal B./A2. The compressor is started, enters  $\Upsilon_{\Delta}$  operation, and fills the pressure tank.

When the pressure switch signals "sufficient pressure", the control signal B./A2 is applied, the idling time (coasting time) is started, and the compressor enters no-load operation for the set period of time from 30 ... 600 s. The compressor is then switched off. The compressor is only restarted if the pressure switch responds again (low pressure).

## SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

## Selection and ordering data









3RP2540-2AW30



Numbe contact	r of NO s	Number contact	r of CO s	Semi- conduct or output	Adjustable time	Control supp	ly voltage	SD	Spring-type terminals (push-in)	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Instan- tane- ous switch- ing	De- layed switch- ing	Instan- tane- ous switch- ing	De- layed switch- ing			At AC 50/60 Hz	At DC		Article No.	,			
						V	V	d					kg
13 fur	ctions									-			
0	0	0	1	No	0.05 s 100 h	12 240	12 240		3RP2505-2AW30	1	1 unit	41H	0.140
0	1	0	0	Yes	0.05 s 100 h	12 240	12 240	2	3RP2505-2CW30	1	1 unit	41H	0.141
13 fun	ctions	suitab	le for ra	ilway ap	plications								
0	0		2 <sup>1)</sup>	No	0.05 s 100 h	24 240	24 240	2	3RP2505-2RW30	1	1 unit	41H	0.173
27 fun	ctions												
0	0		2 <sup>2)</sup>	No	0.05 s 100 h	12 240	12 240	•	3RP2505-2BW30	1	1 unit	41H	0.172
ON-de	lav												
0	0	0	1	No	0.5 10 s 1 30 s 5 100 s 0.05 s 100 h	12 240 12 240 12 240 12 240 12 240	12 240 12 240 12 240 12 240	2	3RP2511-2AW30 3RP2512-2AW30 3RP2513-2AW30 3RP2525-2AW30	1 1 1	1 unit 1 unit 1 unit 1 unit	41H 41H 41H 41H	0.129 0.130 0.131 0.130
0	0	0	2	No	0.05 s 100 h	12 240	12 240		3RP2525-2BW30	1	1 unit	41H	0.160
0	1	0	0	Yes	0.05 s 240 s	12 240	12 240	2	3RP2527-2EW30	1	1 unit	41H	0.113
OFF-d	lelay w	ith cont	rol sigr	nal									
0	0	0	1	No	0.05 s 100 h	12 240	12 240		3RP2535-2AW30	1	1 unit	41H	0.138
OFF-d	elay wi	thout c	ontrol s	signal, no	on-volatile, pas	sing make c	ontact						
0	0	0	1	No	0.05 s 600 s	12 240	12 240	2	3RP2540-2AW30	1	1 unit	41H	0.161
0	0	0	2	No	0.05 s 600 s	12 240	12 240	2	3RP2540-2BW30	1	1 unit	41H	0.168
Clock	-pulse	relay, fl	ashing,	asymme	etrical								
0	0	0	1	No	0.05 s 100 h	12 240	12 240	2	3RP2555-2AW30	1	1 unit	41H	0.130
Wye-c	lelta f <u>u</u>	nctio <u>n</u> v	with c <u>oa</u>	asting <u>fu</u>	nction (idling)								
1	2	0	0	No	1 20 s	12 240	12 240	2	3RP2560-2SW30	1	1 unit	41H	0.175
Wye-c	lelta f <u>u</u>	ncti <u>on</u>											
1	1	0	0	No	1 20 s	12 240	12 240		3RP2574-2NW30	1	1 unit	41H	0.150
1	1	0	0	No	3 60 s	12 240	12 240	2	3RP2576-2NW30	1	1 unit	41H	0.152

#### Type of electrical connection

Screw terminals

• Spring-type terminals (push-in)

1) Positively-driven contacts.

2) Optionally 1 CO delayed + 1 CO instantaneous.

# Notes:

Accessories, see page 2/201.

In the case of 3RP2505, the functions can be adjusted by means of function selector switches on the device. The timing relay can be clearly labeled with the selectable functions using a set of labels. This is included in the scope of supply. The same potential must be applied to terminals A. and B. For functions, see the overview of functions on page 2/191.

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

# Accessories

More information

You can find information on configuring and dimensioning the accessories in the manual, see https://support.industry.siemens.com/cs/ww/en/view/103532830

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d		,			kg
Accessories for enclo	osures						
	Sealing covers						
	• 17.5 mm	2	3ZY1321-1AA00	1	5 units	41L	0.002
3ZY1321-1AA00		_					
	• 22.5 mm	2	3ZY1321-2AA00	1	5 units	41L	0.003
3ZY1321-2AA00							
	Push-in lugs For wall mounting	2	3ZY1311-0AA00	1	10 units	41L	0.001
3ZY1311-0AA00							
3ZY1440-0AA00	<b>Coding pins</b> For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; they enable mechanical coding of terminals	2	3ZY1440-1AA00	1	12 units	41L	0.001
Terminals for SIRIUS	devices in the industrial standard mounting rail						
enclosure							
-	Removable terminals		Screw terminals				
8	• 2-pole, 1 x 4 mm <sup>2</sup>	2	3ZY1122-1BA00	1	6 units	41L	0.010
3ZY1122-1BA00							
			Spring-type terminals				
7	• 2-note $1 \times 4 \text{ mm}^2$	2	37Y1122-2BA00	1	6 units	411	0.050
		2			0 units	ΨIL	0.000
Jools for opening-spi	ring-type terminals	_					
	Screwdrivers For all SIRIUS devices with spring-type terminals;		Spring-type terminals (push-In)				
	gray/black, partially insulated	2	3RA2908-1A	1	1 unit	41B	0.050
3RA2908-1A							

## **Relays** SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

#### **General data**

## Overview



SIRIUS 3UG4 monitoring relay

More information

Home page, see www.siemens.com/railway-components

Catalog IC 10, see www.siemens.com/ic10

Industry Mall, see www.siemens.com/product?3UG45 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).

#### Article No. scheme

Product versions		Article number	
Monitoring relays		<b>3UG4</b>	
Type of setting	e.g. analogically adjustable	5	
Functions	e.g. line monitoring	4 5	
Connection type	Screw terminals	1	
	Spring-type terminals (push-in)	2	
Contacts	e.g. 1 CO contact	A	
Supply voltage	160 260 V AC	N 2	
Example		3UG4 511-1AN20	

#### Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

#### 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

For your orders, please use the article numbers quoted in the selection and ordering data.

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Line monitoring

## Overview



#### SIRIUS 3UG4615 monitoring relay

Solid-state line monitoring relays provide maximum protection for mobile machines and plants or for unstable networks. Network and voltage faults can 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 unbalance, 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.

## 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.

# 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 network 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
	<ul> <li>Failure of the control supply voltage</li> </ul>
	Broken cable
Phase asymmetry	Overheating of the motor due to asymmetrical voltage
	<ul> <li>Detection of asymmetrically loaded networks</li> </ul>
Undervoltage	<ul> <li>Increased current on a motor with corresponding overheating</li> </ul>
	<ul> <li>Unintentional resetting of a device</li> </ul>
	Network collapse, particularly with battery power
Overvoltage	Protection of a plant against destruction due to overvoltage

#### Correct phase sequence



Wrong phase sequence



#### Line monitoring

#### 3UG4512 monitoring relays

The 3UG4512 line monitoring relay monitors three-phase networks with regard to phase sequence, phase failure and phase unbalance of 10%. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V 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 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 snd 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



SIRIUS 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





Phase failure



#### Undervoltage



#### Asymmetry



#### 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 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



## **Relays** SIRIUS 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







Туре		3UG4511 3UG4513, 3UG4614 3UG4618
General data		
Rated insulation voltage U <sub>i</sub> Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U <sub>imp</sub>	kV	6
Control circuit		
Load capacity of the output relay • Thermal current I <sub>th</sub>	A	5
Rated operational current <i>I</i> <sub>e</sub> at • AC-15/24 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	A A A	3 1 0.2 0.1
Minimum contact load at 17 V DC	mA	5
Electrical endurance AC-15	Million oper- ating cycles	0.1
Mechanical endurance	Million oper- ating cycles	10

# SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Line monitoring

2

Selection and ordering data

PU (UNIT, SET, M)	= 1
PS*	= 1 unit
PG	= 41H





3UG4511-2BP20 3UG4512-2BR20

Adjustable hysteresis	Under- voltage detection	Over- voltage detection	Stabilization time adjustable stDEL	Tripping delay time adjustable Del	Version of auxiliary contacts	Measurable line voltage <sup>1)</sup>	SD	Spring-type terminals	Weight per PU approx.
			S	s	CO contact	V	a	Article No.	kg
Monitoring	g of phase s	equence							
Auto RESEI						100 000 40	0	2110 4544 24 100	0.110
					2	160 260 AC	2	3UG4511-2BN20	0.112
					1	320 500 AC	2 2	3UG4511-2AP20 3UG4511-2BP20	0.114
					1	420 690 AC	5	3UG4511-2AQ20 3UG4511-2BQ20	0.119
Monitoring	of phase s	equence. pl	hase failure an	d phase unbal	ance		0	5004511 2BQ20	0.100
Auto RESET,	closed-circuit	principle, asy	mmetry threshold	permanently 10%	6				
					1 2	160 690 AC	2 2	3UG4512-2AR20 3UG4512-2BR20	0.114 0.135
Monitoring	g of phase s	equence, pl	hase failure, as	symmetry and	undervoltag	ge			
Analogically permanently	adjustable, Au 20%	uto RESET, clo	sed-circuit princip	ole, asymmetry ar	nd undervoltag	ge threshold			
5% of set value	1			0.1 20	2	160 690 AC	2	3UG4513-2BR20	0.137
Digitally adju Asymmetry th	stable, Auto F hreshold 0 or \$	ESET or Manu 5 20%	ual RESET, open-c	ircuit or closed-c	ircuit principle				
Adjustable 1 20 V	1		0.1 20	0.1 20	2	160 690 AC	2	3UG4614-2BR20	0.138
Monitoring	g of phase s	equence, pl	hase failure, ov	vervoltage and	undervolta	ge			
Digitally adju	stable, Auto F	ESET or Manu	ual RESET, open-c	ircuit or closed-c	ircuit principle				
Adjustable 1 20 V	1	1		0.1 20 <sup>2)</sup>	2 <sup>2)</sup>	160 690 AC	2	3UG4615-2CR20	0.140
Monitoring	g of phase s	equence, pl	hase and N co	nductor failure	, overvoltaç	ge and undervolta	ge		
Digitally adju	stable, Auto F	ESET or Manu	al RESET, open-c	ircuit or closed-c	ircuit principle				
Adjustable 1 20 V	1	1		0.1 20 <sup>2)</sup>	2 <sup>2)</sup>	90 400 AC against N	2	3UG4616-2CR20	0.150
Automatic asymmetry	correction y, overvolta	of the direct ge and und	ion of rotation ervoltage	in case of wroi	ng phase se	quence, phase fai	lure,		
Digitally adju asymmetry th	stable, Auto F nreshold 0 or 5	ESET or Manu 5 20%	al RESET, open-c	ircuit or closed-c	ircuit principle	·,			
Adjustable 1 20 V	1	1		0.1 20	2 <sup>3)</sup>	160 690 AC	2	3UG4617-2CR20	0.140
Automatic conductor	correction failure, asy	of the direct mmetry, ov	tion of rotation ervoltage and	in case of wro undervoltage	ong phase s	equence, phase a	nd N		
Digitally adju asymmetry th	stable, Auto F nreshold 0 or 5	ESET or Manu 5 20%	ial RESET, open-c	ircuit or closed-c	ircuit principle	!,			
Adjustable 1 20 V	1	1		0.1 20	2 <sup>3)</sup>	90 400 AC against N	2	3UG4618-2CR20	0.149

✓ Function available

-- Function not available

1) Absolute limit values.

 $^{2)}\,$  1 CO contact each and one tripping delay time each for  $U_{\rm min}$  and  $U_{\rm max}.$ 

<sup>3)</sup> 1 CO contact each for power system fault and phase sequence correction.

Accessories, see page 2/229.

SIRIUS 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).

## 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  $U_{\text{Del}}$  can be adjusted between 0.1 s and 20 s.

The hysteresis is adjustable 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



## 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

Undervoltage



Range monitoring



Voltage monitoring

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## 3UG4633 monitoring relays

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  $U_{\text{Del}}$  can also be adjusted, just like the ON-delay time on<sub>Del</sub>, 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 changeover contact is available as signaling contact.

With the closed-circuit principle selected

#### Overvoltage



#### Undervoltage



Range monitoring



Туре		3UG4631	3UG4632	3UG4633
General data				
Rated insulation voltage U <sub>i</sub> Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690		
Rated impulse withstand voltage Uimp	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 <sub>th</sub>	А	5		
Rated operational current <i>I</i> <sub>e</sub> at • AC-15/24 400 V • DC-13/124 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		

## Relays SIRIUS 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



#### 3UG4633-2AL30

Measuring range	Adjustable hysteresis	Rated control supply voltage $U_{\rm S}$	SD	Spring-type terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
V	V	V	d	Article No.				kg
Internal power supply, with separately adjustable ON-d								
17 275 AC/DC	0.1 150	17 275 AC/DC <sup>1)</sup>	2	3UG4633-2AL30	1	1 unit	41H	0.130
Supplied from an external a tripping delay adjustable 0.	uxiliary voltage, 1 20 s							
0.1 60 AC/DC 10 600 AC/DC	0.1 30 0.1 300	24 240 AC/DC	2 2	3UG4631-2AW30 3UG4632-2AW30	1 1	1 unit 1 unit	41H 41H	0.139 0.135

1) Absolute limit values.

Accessories, see page 2/229.

SIRIUS 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.

#### 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<sub>Del</sub> 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. The following options are available: response of the output relay when the control supply voltage  $U_{\rm s}$  = 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



## 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

Current undershoot



Range monitoring



## Relays SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## **Current monitoring**

Туре		3UG4621AA	3UG4621AW	3UG4622AA	3UG4622AW
General data					
Rated insulation voltage $U_i$ Pollution degree 3; overvoltage category III according to VDE 0110	V	690			
Rated impulse withstand voltage Uimp	kV	6			
Measuring circuit					
Measuring range for single-phase AC/DC current	А	0.003 0.6		0.05 15	
Measuring frequency	Hz	40 500			
Setting range for single-phase current	А	0.003 0.5		0.05 10	
Load supply voltage	V	24	max. 300 <sup>1)</sup> max. 500 <sup>2)</sup>	24	max. 300 <sup>1)</sup> max. 500 <sup>2)</sup>
Control circuit					
Load capacity of the output relay • Thermal current I <sub>th</sub>	A	5			
Rated operational current <i>I</i> <sub>e</sub> 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 concretion					

With protective separation.

<sup>2)</sup> With simple separation.

## Selection and ordering data

- Digitally adjustable, with illuminated LCD
- Auto or Manual RESET
  Open or closed-circuit principle
- 1 CO contact



Measuring range	Adjustable hysteresis	Rated control supply voltage U <sub>s</sub>	SD	Spring-type C terminals I	) PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		V	d	Article No.				kg
Monitoring of undercurrent separately adjustable ON-d	and overcurrent, elay and tripping delay (	0.1 20 s						
3 500 mA AC/DC	0.1 250 mA	24 240 AC/DC <sup>2)</sup>	2	3UG4621-2AW30	1	1 unit	41H	0.138
0.05 10 A AC/DC	0.01 5 A		2	3UG4622-2AW30	1	1 unit	41H	0.140

<sup>1)</sup> No electrical separation. Load supply voltage 24 V.

<sup>2)</sup> Electrical separation between control circuit and measuring circuit. Load supply voltage for protective separation max. 300 V, for simple isolation max. 500 V.

## Accessories, see page 2/229.

With AC currents I > 10 A it is possible to use 4NC current transformers as an accessory, see Catalog LV 10 "Low-Voltage Power Distribution and Electrical Installation Technology". SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Power factor and active current monitoring

## 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
- P.f. or *I*<sub>res</sub> (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

the entire torque range.

Overview

#### 3UG4641 monitoring relays

SIRIUS 3UG4641 monitoring relay

enables the load monitoring of motors.

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 Ires 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 Å, the set ON-delay time begins. During this time, if the set limit values are undershot or exceeded, this does not lead to a relay reaction of the changeover contact. If the operational flowing active current and/or the power factor value falls below or exceeds the respective set threshold value, the spike delay begins. When this time has expired, the relay changes its switch position. The relevant measured variables for overshooting and undershooting in the display flash. If monitoring for active current undershoot is switched off ( $I_{res} \nabla = OFF$ ), 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 Å) will result in a response of the CO contacts.

The 3UG4641 power factor and active current monitoring device

option can be used to observe and evaluate the load factor over

Whereas power factor (p.f.) monitoring is used above all for monitoring no-load operation, the active current monitoring

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 continue to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UPA or DOWNV 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  $I_{\rm res} oldsymbol{
abla}$ 



• With deactivated monitoring of active current undershooting



# **Relays** SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## Power factor and active current monitoring

## Overshooting of active current



## Undershooting of active current



Range monitoring of active current



## Overshooting of power factor



## Undershooting of power factor



## Range monitoring of power factor



2

## SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Power factor and active current monitoring

Туре		3UG4641
General data		
<b>Rated insulation voltage </b> <i>U</i> <b>i</b> Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U <sub>imp</sub>	kV	6
Control circuit		
Number of CO contacts for auxiliary contacts		2
Load capacity of the output relay • Thermal current I <sub>th</sub>	А	5
Rated operational current I <sub>e</sub> at           ● AC-15/24 400 V           ● DC-13/24 V           ● DC-13/125 V           ● DC-13/250 V	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

Measurin For power factor	g range For active current	Hysteresi adjustabl For power factor	s e For active current	ON- delay time adjust- able onDel	Tripping delay time adjust- able $I \triangle Del/$ $I \bigtriangledown Del,$ $\varphi \triangle Del/$ $\varphi \lor Del$	Rated control supply voltage $U_{s}^{1)}$ 50 AC/ 60 Hz	SD	Screw terminals	SD	Spring-type terminals	Weight per PU approx.
P.f.	A	P.f.	A	s	s	V	d	Article No.	d	Article No.	kg
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	0.151

PS\* PG

PU (UNIT, SET, M) = 1

= 1 unit

= 41H

1) Absolute limit values.

Accessories, see page 2/229.

With AC active currents  $I_{\rm res} > 10$  A it is possible to use 4NC current transformers as an accessory, see Catalog LV 10 "Low-Voltage Power Distribution and Electrical Installation Technology".

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Residual Current Monitoring

**Residual-current monitoring relays** 

## Overview



SIRIUS 3UG4625 monitoring relay

The 3UG4625 residual-current monitoring relays are used in conjunction with the 3UL23 residual-current transformers for monitoring plants in which higher residual currents are increasingly expected due to ambient conditions. Monitoring encompasses pure AC residual currents or AC residual currents with a pulsating DC fault current component (transformer type A in accordance with DIN VDE 0100-530/IEC TR 60755).

## Technical specifications

## 3UG4625 monitoring relays

The main conductor, and any neutral conductor to which a load is connected, are routed through the opening of the annular ring core of a residual-current transformer. A secondary winding is placed around this annular strip-wound core to which the monitoring relay is connected.

If operation of a plant is fault-free, the sum of the inflowing and outward currents equals zero. No current is then induced in the secondary winding of the residual-current transformer.

However, if an insulation fault occurs downstream of the residual current operated circuit breaker, the sum of the inflowing currents is greater than that of the outward currents. The differential current – 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.

## Benefits

- Worldwide use thanks to wide voltage range from 24 to 240 V AC/DC
- High measuring accuracy  $\pm$  7.5 %
- Permanent self-monitoring
- Variable threshold values for warning and disconnection
- Freely configurable delay times and RESET response
- Permanent display of the actual value and fault diagnostics via the display
- High level of flexibility and space saving through installation of the transformer inside or outside the control cabinet
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-type terminals

## Application

Monitoring of plants in which residual currents can occur, e.g. due to dust deposits or moisture, porous cables and leads, or capacitive residual currents.

## With the closed-circuit principle selected

Residual current monitoring with Auto RESET (Memory = no)



If the device is set to Auto RESET, the relay switches back to the OK state for the tripping value once the value falls below the set hysteresis threshold and the display stops flashing.

The associated relay changes its switching state if the value falls below the fixed hysteresis value of 5 % of the set warning value.

Any overshoots are therefore not stored.

## Relays SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Residual Current Monitoring

#### **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 pressing the UP  $\blacktriangle$  or DOWN  $\checkmark$  keys simultaneously for > 2 seconds, or by switching the supply voltage off and back on again.

## Note:

Do not ground the neutral conductor downstream of the residualcurrent transformer as otherwise residual current monitoring functions can no longer be ensured.

Туре		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 <sub>imp</sub>	kV	4
Control circuit		
Number of CO contacts for auxiliary contacts		2
Thermal current of the non-solid-state contact blocks, maximum	А	5
Current carrying capacity of the output relay           • At AC-15 at 250 V at 50/60 Hz           • At DC-13           - At 24 V           - At 125 V           - At 250 V	A A A	3 1 0.2 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





3UG4625-1CW30

3UG4625-2CW30

- 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

 $\begin{array}{ll} \mathsf{PU} \mbox{ (UNIT, SET, M)} = 1 \\ \mathsf{PS}^* &= 1 \mbox{ unit} \\ \mathsf{PG} &= 41 \mathrm{H} \end{array}$ 

Measura ble current	Adjust- able response value	Switch- ing hystere- sis	Adjust- able ON-delay time	Control supply voltage			SD	Screw terminals	SD	Spring-type terminals	Weight per PU approx.
	current			At AC At 50 Hz rated value	At AC At 60 Hz rated value	At DC rated value		Article No.		Article No.	
А	А	%	S	V	V	V	d		d		kg
0.01 43	0.03 40	0 50	0 20	24 240	24 240	24 240	2	3UG4625-1CW30	2	3UG4625-2CW30	0.151

Accessories, see page 2/229.

3UL23 residual-current transformers, see page 2/218.

## **Relays** SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Residual Current Monitoring

**3UL23 residual-current transformers** 

## Overview



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.

SIRIUS 3UL23 residual-current transformer

#### Selection and ordering data

Diameter of the bushing opening	Connectable cross-section of the connecting terminal	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
mm	mm <sup>2</sup>	d	Article No.				kg
Residual-current transformers (essential accessory for 3UG4625, 3	UG4825 or SIMOCODE 3UF)						
35 55 80	2.5 2.5 2.5	2 2 2	3UL2302-1A 3UL2303-1A 3UL2304-1A	1 1 1	1 unit 1 unit 1 unit	41H 41H 41H	0.131 0.207 0.340
110 140 210	2.5 2.5 4	2 2 2	3UL2305-1A 3UL2306-1A 3UL2307-1A	1 1 1	1 unit 1 unit 1 unit	41H 41H 41H	0.480 0.808 1.720

## Accessories

	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d					kg
Adapters							
	Adapters	2	3UL2900	1	2 units	41H	0.005
States of	For mounting onto standard rail for 3UL23 to diameter 55 mm						
3UL2900							

General data

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

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring

## General data

## Technical specifications

## More information

Manuals, see

https://support.industry.siemens.com/cs/ww/en/view/54382552 https://support.industry.siemens.com/cs/ww/en/view/54382528

Туре		3UG4581-1AW30	3UG4582-1AW30	3UG4583-1CW30	
General data					
Setting range for the setpoint response value 1 100 k $\Omega$ • 2 200 k $\Omega$	ies	✓ 	✓ 	J J	
Rated voltage of the network being monitor • 0 250 V AC • 0 440 V AC • 0 690 V AC • 0 300 V DC • 0 1000 V DC	ed	   	/  / 	- √ 1) - √ 1) √ 1)	
Max. leakage capacitance of the system           • 10 μF           • 20 μF		✓ 	✓ 	 V	
Output contacts • 1 CO • 2 CO or 1 CO + 1 CO, adjustable		✓ 	✓ 	 ✓	
<ul> <li>Number of limit values</li> <li>1</li> <li>1 or 2, adjustable</li> </ul>		/	✓ 	 ✓	
Principle of operation		Closed-circuit principle	Closed-circuit principle	Open-circuit/closed- circuit principle, adjustable	
Rated control supply voltage • 24 240 V AC/DC		1	1	1	
Rated frequency • 15 400 Hz • 50/60 Hz		 V	✓ 	✓ 	
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 <sub>s</sub>	Voltage range of the network being monitored				
<b>3UG3081-1AK20</b> 110 130/220 240 V AC/DC	3 × 230/400 V AC	1			
<b>3UG3081-1AW30</b> 24 240 V AC/DC	3 x 230/400 V AC	1			
<b>3UG3082-1AW30</b> 24 240 V AC/DC	24 240 V DC		1		

✓ Available

-- Not available

1) With voltage reducer module.

## Overview



SIRIUS 3UG4581 insulation monitor

#### Technical specifications

#### 3UG4581 monitoring relays

## With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with  $\ensuremath{\mathsf{Auto}}\xspace$  RESET



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.

Insulation resistance monitoring with fault storage and Manual  $\ensuremath{\mathsf{RESET}}$ 



## Relays SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring

## For ungrounded AC networks

Туре		3UG4581
General data		
<b>Rated insulation voltage U<sub>i</sub></b> 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 <sub>imp</sub>	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 <sub>th</sub>	A	4
Rated operational current I <sub>e</sub> 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 <sub>n</sub>	Measuring range U <sub>e</sub>	Rated control supply voltage Us	System leakage capacitance	SD	Screw terminals	Ð	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	V AC	kΩ	V	μF	d	Article No.					kg
Insulation monitors	s for unground	ded AC netwo	orks								
3UG4581-1AW30	0 400	1 100	24 240 AC/DC	Max. 10	5	3UG4581-1AW30		1	1 unit	41H	0.153

Accessories, see page 2/229.

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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.

#### Technical specifications

#### 3UG4582 monitoring relays

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with  $\ensuremath{\mathsf{Auto}}\xspace$  RESET



Insulation resistance monitoring with fault storage and Manual RESET



#### 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.

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## **Relays** SIRIUS 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  $\ensuremath{\mathsf{Auto}}\xspace$  RESET





Insulation resistance monitoring with fault storage and Manual  $\ensuremath{\mathsf{RESET}}$ 

Туре		3UG4582	3UG4583
General data			
Rated insulation voltage U <sub>i</sub> 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 <sub>imp</sub>	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	kΩ	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 <sub>th</sub>	A	4	
Rated operational current <i>I</i> <sub>e</sub> at • AC-15/24 400 V • DC-13/24 V	A A	3 2	
Minimum contact load at 24 V DC	mA	10	

Note:

below.

3UG4582-1AW30

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

PS\*

1 1 unit 41H

PG

Weight

per PU approx.

kg

0.160

## Selection and ordering data

- Auto or Manual RESET
- Rated control supply voltage U<sub>s</sub> 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)

Rate

volta

V

0 ... 250 AC

0 ... 300 DC

- 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 I . disconnection) or 2 CC local alarm and signalir be configured

1 CO

1...100

Max. 10

imit value ) contacts ng to the f	es (e.g. for v s for one lin PLC via sep	warning ar hit value (e parate circu	nd .g. for a uits) can					
d line ge <i>U</i> n	System leakage capaci- tance	Output relays	Measuring range U <sub>e</sub>	Broken wire detection in the measuring range	SD	Screw terminals	Ð	PU (UNIT, SET, M)
	μF		kΩ		d	Article No.		
itore								

5



3UG4582-1AW30



3UG4983-1A

Available 1

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.

Accessories, see page 2/229.

\* You can order this quantity or a multiple thereof.

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

## 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).

#### Technical specifications

#### 3UG4651 monitoring relays

The speed monitoring relay operates according to the principle of period duration measurement.

In the monitoring relay, the time between two successive rising edges of the pulse encoder is measured and compared to the minimum and/or maximum permissible period duration calculated from the set limit values for the speed.

Thus, the period duration measurement recognizes any deviation in speed after just two pulses, even at very low speeds or in the case of extended pulse gaps.

By using up to ten pulse encoders evenly distributed around the circumference, it is possible to shorten the period duration, and in turn the response time. By taking into account the number of sensors in the monitoring relay, the speed continues to be indicated in rpm.

#### ON-delay time for motor start

To be able to start a motor drive, and depending on whether the open-circuit or closed-circuit principle is selected, the output relay switches to the GO state during the ON-delay time, even if the speed is still below the set value.

The ON-delay time is started by either switching on the auxiliary voltage or, if the auxiliary voltage is already applied, by actuating the respective NC contact (e.g. auxiliary contact).

## Benefits

- 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

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 pressing the UPA or DOWNV keys simultaneously 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.

# SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Range monitoring with enable input

Speed monitoring

# With the closed-circuit principle selected

Range monitoring without enable input





Туре		3UG4651
General data		
Rated insulation voltage U <sub>i</sub> Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	300
Rated impulse withstand voltage Uimp	kV	4
Measuring circuit		
Sensor supply <ul> <li>For three-wire sensor (24 V/0 V)</li> <li>For 2-wire NAMUR sensor (8V2)</li> </ul>	mA mA	- Max. 50 Max. 8.2
Signal input • IN1 • IN2	kΩ kΩ	16, 3-wire sensor, pnp operation 1, floating contact, 2-wire NAMUR sensor
Voltage level • For level 1 at IN1 • For level 0 at IN1	V V	4.5 30 0 1
Current level • For level 1 at IN2 • For level 0 at IN2	mA mA	> 2.1 < 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 <sub>th</sub>	А	5
Rated operational current <i>I</i> <sub>e</sub> 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

PS\*

PG

PU (UNIT, SET, M) = 1

= 1 unit

= 41H

## Relays SIRIUS 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

Measuring range	Hysteresis	ON-delay time	Tripping time	Pulses per revolution	Rated control supply voltage <i>U</i> s AC/DC	SD	Spring-type terminals	Weight per PU approx.
rpm	rpm	S	S		V	d	Article No.	kg
0.1 2 200	OFF 0.199.9	0 900	0.1 99.9	1 10	24 240	2	3UG4651-2AW30	0.145

Accessories, see page 2/229.
# Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Accessories

Selection and ordering	ng data							
	Use	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			d					kg
Blank labels								
	For 3UG4	Unit labeling plates For SIRIUS devices						
		20 mm x 7 mm, pastel turquoise <sup>1)</sup>	20	3RT1900-1SB20	100	340 units	41B	0.062
	For 3UG4	Adhesive labels for SIRIUS devices						
		<ul> <li>19 mm x 6 mm, pastel turquoise</li> </ul>	15	3RT1900-1SB60	100	3060 units	41B	15.300
3RT1900-1SB20		• 19 mm x 6 mm, zinc yellow	15	3RT1900-1SD60	100	3060 units	41B	0.005
Push-in lugs and cov	ers							
	For 3UG4	<b>Push-in lugs</b> For screw fixing, 2 units are required for each device	5	3RP1903	1	10 units	41H	0.002
	For 3UG4	Sealable covers For securing against unauthorized adjustment of setting knobs	5	3RP1902	1	5 units	41H	0.003
3RP1902	For 3UG45	Sealing foil For securing against unauthorized adjustment of setting knobs	2	3TK2820-0AA00	1	1 unit	41L	0.003
Covers for insulation	monitoring re	elays						
部	For 3UG4581 and 3UG4582	Sealable, transparent covers	5	3UG4981-0C	1	1 unit	41H	0.007
3UG4981-0C	For 3UG4583		5	3UG4983-0C	1	1 unit	41H	0.010
Tools for opening sp	ring-type term	inals						
	For auxiliary circuit	Screwdrivers For all SIRIUS devices with spring-		Spring-type terminals				
3RA2908-1A	connections	type terminals; 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	3RA2908-1A	1	1 unit	41B	0.050
<sup>1)</sup> PC labeling system for i of unit labeling plates as murrplastik Systemtecht see www.siemens.com// Notes:	ndividual inscrip vailable from: nik GmbH, ic10, Chapter 16				•			

For products for mechanical bearing monitoring, e.g. condition monitoring systems, see www.siemens.com/siplus-cms.

# Safety Technology

#### Overview

#### More information

Home page, see www.siemens.com/railway-components
Catalog IC 10, see www.siemens.com/ic10
Home page, 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

		Article No.	Page
SIRIUS Safety Integrated			
<b>A</b>	3SK safety relays		
	<ul> <li>Key modules of a consistent and cost-effective safety chain</li> </ul>		
	<ul> <li>Can be used for all safety applications thanks to compliance with the highest safety requirements (PL e according to EN ISO 13849-1 or SIL 3 according to IEC 61508)</li> </ul>		
	<ul> <li>Suitable for use all over the world through compliance with all globally established certifications</li> </ul>		
	SIRIUS 3SK1 Standard basic units	3SK111	2/238
3SK111.	<ul> <li>Simple, compact devices for all important requirements for monitoring safety sensors and actuators</li> </ul>		
	SIRIUS 3SK1 Advanced basic units	3SK112	2/239
	<ul> <li>Multifunctional series of safety relays with safe relay outputs, semiconductor outputs or time-delayed outputs for:</li> </ul>		
87	- EMERGENCY-STOP monitoring		
1	- Protective door monitoring		
	- Monitoring of non-floating sensors such as light arrays, laser scanners, etc.		
3SK112.	- Monitoring of two-hand operation consoles		
	<ul> <li>Monitoring of equivalent (NC/NC) and antivalent (NO/NC) sensors</li> </ul>		
<u></u>	<ul> <li>Setting by means of DIP switch</li> </ul>		
117	SIRIUS 3SK2 basic units	3SK2	2/240
	<ul> <li>Series of safety relays that can be parameterized by software, with semiconductor outputs and independent output functions for:</li> </ul>		
	- EMERGENCY-STOP monitoring		
22	- Protective door monitoring		
3SK2	- Protective door monitoring with tumbler		
	- Monitoring of non-floating sensors such as light arrays, laser scanners, etc.		
<u></u>	- Monitoring of two-hand operation consoles		
111	<ul> <li>Monitoring of equivalent (NC/NC) and antivalent (NO/NC) sensors</li> </ul>		
	- Muting		
	Expansion units	3SK121,	2/241,
	<ul> <li>3RO and 4RO output expansions for SIRIUS 3SK1 Standard basic units, SIRIUS 3SK1 Advanced basic units and SIRIUS 3SK2 basic units</li> </ul>	3SK122, 3SK123	2/242
35K121	<ul> <li>Input expansion for SIRIUS 3SK1 Advanced basic units</li> </ul>		
001(121)	<ul> <li>Power supply for SIRIUS 3SK1 Advanced basic units</li> </ul>		
	<ul> <li>Integration of 3RM1 motor starters possible and simple integration of a main circuit component in a system configuration of the safety relays. There is no need for complex wiring between the safety evaluation unit and the actuator.</li> </ul>		
	<ul> <li>Expansion of the Standard device series by means of wiring</li> </ul>		
	• Expansion of the SIRIUS 3SK1 and SIRIUS 3SK2 Advanced device series by means of wiring or without wiring outlay by means of 3ZY12 device connectors		

#### **Connection methods**

The 3SK safety relays are available with screw or spring-type terminals (push-in).

The 3TK2810 safety relays and the 3RK3 Modular Safety System are available with screw or spring-type terminals.

Screw terminals Spring-type terminals (push-in) The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

#### 3SK safety relays: 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.

General data

## Overview



#### SIRIUS 3SK safety relays

SIRIUS 3SK safety relays are the key elements of a consistent, cost-effective safety chain. Whether you need EMERGENCY-STOP 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. Optimized solutions when selecting components are facilitated by a clearly structured component range:

- 3SK1 Standard basic units
- 3SK1 Advanced basic units
- 3SK2 basic units
- 3SK output expansions
- 3SK1 input expansions
- Accessories

#### 3SK1 Standard basic units

The 3SK1 Standard basic units are characterized by the following features:

- · Compact design
- Simple operation
- Relay and semiconductor outputs
- · Economical solution

## 3SK1 Advanced basic units

The 3SK1 Advanced basic units also offer:

- · Universal application opportunities 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 application thanks to software parameterization
- Powerful semiconductor outputs
- User-friendly diagnostics using diagnostics display and configuring software

In the case of 3SK1 Advanced basic units or 3SK2 basic units, the 3ZY12 device connector allows safety functions involving several sensors and actuators to be constructed very quickly.



System configuration example

The 3SK1 and 3SK2 Standard and Advanced series are a high-quality replacement for the 3TK28 safety relays. In their narrower design, and equipped with greater functionality, they can replace every 3TK28 device. The only exception to this are the 3TK2810 devices.

# Safety Relays

SIRIUS 3SK Safety Relays

# **General data**

# Overview of functions of the 3SK series

Туре	3SK1 Standard bas	ic units	3SK1 Advanced ba	sic 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	1	1	1	1	1	1	
<ul> <li>Non-floating</li> </ul>	✓ <sup>1)</sup>	1	1	1	1	✓	
<ul> <li>Antivalent</li> </ul>			✓	1	✓	✓	
Expandable		✓ by means of cascading	1	1			
Inputs							
Freely parameterizable					10 single-channel, 5 two-channel	20 single-channel, 10 two-channel	
Parameters							
<ul> <li>Start (auto/monitored)</li> </ul>	1	1	1	✓	A variety of functions can be set for ear input/output by means of software		
<ul> <li>Sensor connection</li> <li>2 x 1-channel/</li> <li>1 x 2-channel</li> </ul>	✓ by means of wiring	1	1	1	parameterization.		
Cross-circuit detection	✓ by means of wiring	1	1	✓			
<ul> <li>Start test ON/OFF</li> </ul>		1	1	1			
Monitoring of two-hand operation consoles according to EN 574			1	J			
<ul> <li>Pressure-sensitive mat</li> </ul>			1	1			
Safe outputs							
<ul> <li>Instantaneous</li> </ul>	1	1	1	1	Parameterizable	Parameterizable	
<ul> <li>Time-delayed</li> </ul>			✓	1	Parameterizable	Parameterizable	
Expandable with safe relay outputs	✓ by means of wiring	✓ by means of wiring	1	1	✓ 0	✓ 	
<ul> <li>Independent</li> </ul>					<b>√</b> <sup>4)</sup>	√ <sup>5)</sup>	
Device connectors			1	1	✓	✓	
Options							
<ul> <li>External memory module</li> </ul>						✓	
<ul> <li>Display on the device</li> </ul>						$\checkmark$	
External diagnostics     module can be connected					1	1	
Control supply voltage							
• 24 V DC	✓ <sup>2)</sup>	1	1	1	1	1	
• 110 240 V AC/DC	1	✓ <sup>6)</sup>	✓ <sup>3)</sup>	✓ <sup>3)</sup>			

✓ Available

-- Not available

1) 24 V basic units only.

<sup>2)</sup> 24 V AC/DC.

<sup>3)</sup> Possible using 3SK1230 power supply via device connector.

<sup>4)</sup> Up to 4 independent safe outputs, two of which via device connectors.

<sup>5)</sup> Up to 6 independent safe outputs, two of which via device connectors.

<sup>6)</sup> Possible using 3SK1230 power supply by means of wiring.

#### General data

#### 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, respond). 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	Autostart sensor input	Sensor input Monitored start	→ ON
2	Without crossover monitoring	With crossover monitoring	
3	2 x single-channel sensor connection	1 x 2-channel sensor connection	
4	With start test	Without start test	

#### 3SK2 with software

The 3SK2 safety relays are configured with the SIRIUS Safety ES software. The behavior of a 3SK2 device as well as the functioning of the individual safe outputs can thus be parameterized simply and conveniently in the logic diagram. In addition, the configuration can be printed out for documentation purposes. The software also supports the user during commissioning and troubleshooting by means of online diagnostics and the option of being able to "force" signals in the logic plan. The 3SK2 safety relays thus offer maximum flexibility and universal application options.

## Note:

For SIRIUS Safety ES, see www.siemens.com/ic10, Chapter 14 "Parameterization, Configuration and Visualization with SIRIUS".

#### 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.

# Safety Relays SIRIUS 3SK Safety Relays

#### **General data**

# Expansion option by adding the 3RM1 motor starter

With previous safety relay and motor feeder configurations, a huge amount of wiring was required to monitor motor feeders in safety applications.

With the integration of the SIRIUS 3RM1 motor starter into the SIRIUS 3SK safety relay system family, this wiring has been minimized for the first time. Motor starters up to 3 kW can easily be integrated into the safety relay system using SIRIUS 3ZY12 device connectors, without additional wiring between the evaluation unit and the motor starter.





System design using 3SK and 3RM1

#### Conventional system configuration

Article No.	scheme
-------------	--------

Product versions		Article r	number	
3SK1 safety relays		3SK1		
Device variant	Basic unit		1	
	Expansion unit		2	
Device version,	3SK11: Standard; 3SK12: Output expansion		1	
e.g.	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		F	A
e.g.	3SK11: 2 enabling circuits		E	3
	3SK11: 4 enabling circuits		C	
Type of control supply voltage	3SK1213: 24 V AC, 50/60 Hz			В 0
e.g.	3SK1: 24 V AC/DC, 50/60 Hz			В 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	111-14	АВЗО

Product versions		Article number
3SK2 safety relays		<b>35K2</b> 1 🗆 2 – 🗆 A A 1 0
Device version	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 112-1AA10

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.

General data

# Benefits

### General

- Approved for all safety applications because of its compliance with the highest safety requirements (SIL 3 and PL e)
- Universally usable thanks to adjustable parameters
- Usable worldwide thanks to globally valid certificates
- Compact SIRIUS design
- Device connectors with standard rail mounting for flexible connectability and expandability
- · Removable terminals for greater plant availability
- Yellow terminal covers clearly identify the device as a safety component
- Sensor cable up to 2 000 m long allows it to be used in extensive plants

## Relay outputs

- Different voltages can be switched through the floating contacts.
- The power relay contacts allow currents of up to 5 A at AC-15/DC-13 to be connected.

#### Semiconductor outputs

- Wear-free
- · Suitable for operation in 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.
- The power relay contacts allow currents of up to 10 A AC-15/6 A DC-13 to 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)

# 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. 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:

For SIRIUS 3RM1 motor starters, see www.siemens.com/ic10, Chapter 8.

#### 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 fullyassembled 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.

### 3SK2 safety relays

SIRIUS 3SK2 safety relays are used primarily in autonomous, more complex safety applications for which the functional scope of the 3SK1 devices is no longer sufficient, such as in the implementation of independent shutdown functions. Their function here is to evaluate the sensors and the safety-related shutdown of hazards. Also they check and monitor the sensors, actuators and safety-related functions of the safety relay.

# Safety Relays

SIRIUS 3SK Safety Relays

# General data

# Technical specifications

More information	
3SK1 manual, see	3SK2 manual, see
https://support.industry.siemens.com/cs/ww/en/view/67585885	https://support.industry.siemens.com/cs/ww/en/view/109444336
3SK1230 technical specifications, see	FAQs, see
https://support.industry.siemens.com/cs/ww/en/ps/16389/td	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:								
Ambient temperature <ul> <li>During operation</li> <li>During storage</li> </ul>	°C °C	-25 +60 -40 +80						
Installation altitude at height above sea level maximum	m	2 000						
Air pressure according to SN 31205	kPa	90 106						
Shock resistance		10 <i>g</i> /11 ms					5 <i>g</i> /10 ms	10 g/11 ms
Vibration resistance according to IEC 60068-2-6		5 500 Hz: 0.7	5 mm					
IP degree of protection of the enclosure		IP20						
Touch protection against electric shock		Finger-safe						
Rated insulation voltage	V	300		50			300	50
Impulse withstand voltage rated value	V	4 000		500			4 000	800
Safety integrity level (SIL) according to IEC 61508		SIL 3						
Performance Level (PL) according to EN ISO 13849-1		е						
T1 value for proof test interval or service duration according to IEC 61508	У	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						

Article number		3SK1111, 3SK1121AB40, 3SK1211	3SK1112, 3SK1122	3SK1120	3SK1121CB4.	3SK1213
Switching capacity current of the NO contacts of the relay outputs • At AC-15 at 230 V • At DC-13 at 24 V	A A	5 5			3 3	10 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 with high demand rate according to EN 62061	1/h	1.7 x 10 <sup>-9</sup>	1.5 x 10 <sup>-9</sup>	1.0 x 10 <sup>-9</sup>	1.3 x 10 <sup>-9</sup>	2.5 x 10 <sup>-9</sup>	3.7 x 10 <sup>-9</sup>	1.5 x 10 <sup>-9</sup>	1.0 x 10 <sup>-9</sup>
PFDavg at low demand rate according to IEC 61508		1.0 x 10 <sup>-6</sup>		7.0 x 10 <sup>-6</sup>					1.0 x 10 <sup>-6</sup>

# Safety Relays SIRIUS 3SK Safety Relays

General data

# SIRIUS 3SK2 safety relays

Article number		3SK2112- .AA10	3SK2122- .AA10
General data:			
Ambient temperature <ul> <li>During operation</li> <li>During storage</li> </ul>	°C °C	-25 +60 -40 +80	
at height above sea level maximum		2 000	
Air pressure according to SN 31205	kPa	90 106	
Shock resistance		15 <i>g</i> /11 ms	
Vibration resistance according to IEC 60068-2-6		5 500 Hz: 0.75 mm	
IP 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		SIL 3	
Performance Level (PL) according to EN ISO 13849-1		e	
T1 value for proof test interval or service duration according to IEC 61508	У	20	
EMC emitted interference according to IEC 60947-1		Class A	
<ul><li>Certificate of suitability</li><li>UL certification</li><li>TÜV approval</li></ul>		Yes Yes	
Switching capacity current of the semiconductor outputs at DC-13 at 24 V		4	
PFHD with high demand rate according to EN 62061	1/h	1.0 x 10 <sup>-8</sup>	1.2 x 10 <sup>-8</sup>
PFDavg at low demand rate according to IEC 61508		1.5 x 10 <sup>-5</sup>	1.8 x 10 <sup>-5</sup>

# Overview



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.

3SK111 Standard basic units

# Selection and ordering data





3SK1111-1AW20



3SK1	1	1	1-	1A	B3	0

								_					
Control sup	oply voltage	Number of	outputs					SD	Article No.	PU	PS*	PG	Weight
At AC At 50 Hz	At DC	As contact	ing contact	block	As cont semicor block	actless nductor c	ontact			(UNIT, SET, M)			per PU approx.
		As NO contact, instanta- neous switching	As NO contact, delayed switching	For signaling function, instanta- neous switching	Instan- tane- ous switch- ing	De- layed switch- ing	For signaling function, instanta- neous switching						
V	V							d					kg
Standard	l basic uni	ts											
24	24	3	0	1	0	0	0	►	3SK1111-□AB30	1	1 unit	41L	0.275
110 240	110 240	3	0	1	0	0	0		3SK1111-□AW20	1	1 unit	41L	0.288
	24	0	0	0	2	0	1		3SK1112-□BB40	1	1 unit	41L	0.200
Type of ele	ectrical con	nection											
Screw ter	rminals								1				
<ul> <li>Spring-ty</li> </ul>	pe terminals	(push-in)							2				

# Overview



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.

3SK112 Advanced basic units

# Selection and ordering data









3SK1122-1CB41

Control I supply y voltage at C DC	Number of As contact contact blo	outputs ing ock		As contactless semiconductor contact block			Adjustabl e OFF- delay time	SD	Article No.	PU (UNIT, SET,	PS*	PG	Weight per PU approx.
DC	As NO contact, instanta- neous switching	As NO contact, delayed switching	As NC contact for signaling function, instanta- neous switching	Instanta- neous switch- ing	De- layed switch- ing	For signal- ing func- tion, instanta- neous switching				101)			
V							s	d					kg
Advanced	d basic un	its											
24	3	0	1	0	0	0			3SK1121-□AB40	1	1 unit	41L	0.283
	2	2	0	0	0	0	0.05 3		3SK1121-□CB41	1	1 unit	41L	0.263
							0.5 30		3SK1121-□CB42	1	1 unit	41L	0.270
							5 300		3SK1121-□CB44	1	1 unit	41L	0.293
24	0	0	0	1	0	0			3SK1120-□AB40	1	1 unit	41L	0.193
				3	0	1			3SK1122-□AB40	1	1 unit	41L	0.210
				2	2	0	0.05 3		3SK1122-□CB41	1	1 unit	41L	0.210
							0.5 30		3SK1122-□CB42	1	1 unit	41L	0.216
							5 300		3SK1122-□CB44	1	1 unit	41L	0.215
<ul><li>Type of elect</li><li>Screw terr</li><li>Spring-type</li></ul>	<b>ctrical conr</b> minals be terminals	nection (push-in)							1				

• Spring-type terminals (push-in)

# Safety Relays SIRIUS 3SK Safety Relays 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.



# Starter Kit

#### 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-loaded terminal (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

## Selection and ordering data



3SK2112



Control supply voltage at DC	Number of outputs as contactless semiconductor contact block, safety-related 2-channel	Number of outputs as contactless semiconductor contact block, non-safety-related, 2-channel	Number of outputs to the device connector, safety-related	Width	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
V				mm	d					kg
3SK2 ba	sic units									
24	2	1	2	22.5		3SK2112-□AA10	1	1 unit	41L	0.230
	4	2	2	45		3SK2122-□AA10	1	1 unit	41L	0.406
<ul><li>Type of ele</li><li>Screw te</li><li>Spring-ty</li></ul>	ectrical connection rminals /pe terminals (push-in)					1 2				
Control supply voltage	Number of outputs as contactless semiconductor contact	Number of outputs as contactless semiconductor contact	Number of outputs to the device	Width	SD	Spring-type terminals (push-in)	PU (UNIT, SET,	PS*	PG	Weight per PU approx.
at DC	block safety-related 2-channel	block, non-safety-related, 2-channel	connector, safety-related			Article No.	M)			
V				mm	d					kg
3SK2 sta	arter kits									
Contains 3 USB PC ca	SK2112-2AA10 basic unit, able 3UF7941-0AA00-0	SIRIUS Safety ES Standard	and							
24	2	1	2	22.5	2	3SK2941-2AA10	1	1 unit	4N1	0.638

## Overview



3SK121 output expansion

The 3SK121 output expansions can be used to expand all 3SK basic units.

# 3SK1211 output expansion

The 3SK1211 output expansion is used to expand the safe outputs of a basic unit by adding another four safe outputs. These outputs have a switching capacity of AC-15 5 A at a switching voltage of 230 V. The devices can be connected to any 3SK basic unit by means of wiring. In addition, the devices with a 24 V DC control supply voltage can also be connected to 3SK1 Advanced and 3SK2 basic units by means of the 3ZY12 device connectors.

#### 3SK1213 output expansion

The 3SK1213 output expansion is used to expand the safe outputs of a basic unit by adding three safe outputs with high switching capacity. These outputs have a switching capacity of AC-15 10 A at a switching voltage of 230 V. The devices can be connected to any 3SK basic unit by means of wiring. As with the 3SK1211, the devices with a 24 V DC control supply voltage can also be connected to 3SK1 Advanced and 3SK2 basic units by means of the 3ZY12 device connectors.

## Note:

It is only possible to expand the Standard basic units by means of wiring. Advanced basic units and 3SK2 basic units can be expanded using the 3ZY12 device connector.

## Benefits

- · Perfect adaptation of the number of inputs
- 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 parameterizable shutdown functions on 3SK2 basic units when using device connectors

# Selection and ordering data





3SK1211-1BB40

3SK1213-1AB40

Control sup At AC At 50 Hz	ply voltage At DC	Number of outp As contacting of As NO contact, instantaneous switching	outs contact block As NO contact, delayed switching	As NC contact for signaling function, instantaneous switching	3ZY12 device connec- tors	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
V	V	_	_	_		d					kg
Output ex	pansions										
24		4	0	0	No		3SK1211-□BB00	1	1 unit	41L	0.248
	24	4	0	0	Yes		3SK1211-□BB40	1	1 unit	41L	0.231
110 240	110 240	4	0	0	No		3SK1211-□BW20	1	1 unit	41L	0.247
	24	3	0	0	Yes		3SK1213-□AB40	1	1 unit	41L	1.000
115		3	0	0	No		3SK1213-□AJ20	1	1 unit	41L	1.000
230		3	0	0	No		3SK1213-□AL20	1	1 unit	41L	1.000
<ul><li>Type of ele</li><li>Screw terr</li></ul>	<b>ctrical conn</b> e minals	ection					1				

· Spring-type terminals (push-in)

- 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

2

# Safety Relays SIRIUS 3SK Safety Relays **Expansion Units**

## Overview



#### 3SK1220 sensor expansion

With the input expansions

- 3SK1220 sensor expansion
- 3SK1230 power supply

the 3SK1 Advanced basic units can be made more flexible.

## 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

#### Selection and ordering data





3SK1220-1AB40	3SK1230-1AW20						
Version		SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d					kg
Input expansions							
Sensor expansion For safety-related expansion of th 2-channel sensor or two 1-channel	e 3SK1 Advanced basic units by adding a further el sensors		3SK1220-□AB40	1	1 unit	41L	0.166
Power supply			3SK1230-□AW20	1	1 unit	41L	0.195

# Power supply

For supplying 3SK1 Advanced basic units via 3ZY12 device connectors at voltages of 110 ... 240 V AC/DC

- Type of electrical connection
- · Screw terminals
- Spring-type terminals (push-in)

# 3SK1220 sensor expansion

The 3SK1220 input expansion allows additional sensors to be integrated easily and flexibly. The device monitors two 1-channel sensors or one 2-channel sensor, whatever their output technology (floating/single-ended).

# Note:

The 3SK1220 sensor expansion can only be connected to the 3SK1 Advanced basic units by means of the 3ZY12 device connector, see page 2/243.

#### 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.

- 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)

1

2

Accessories

# 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 co	nnectors			Device ter connecto	rmination rs
	<b>3ZY1212- 1BA00</b> (for 3SK1, width 17.5 mm)	3ZY1212- 2BA00 (for 3SK1, width 22.5 mm)	3ZY1212- 2GA00 (for 3SK2, width 22.5 mm)	<b>3ZY1212- 4GA01</b> (for 3SK2, width 45 mm)	3ZY1212- 2DA00 (for 3SK1, width 22.5 mm)	3ZY1212- 0FA01 (for 3SK1, set for enclo- sures ≥ 45 mm)
3SK1 Adva	anced basi	c units				
3SK1120	✓					
3SK1121		✓			1	
3SK1122		1			1	
3SK2 basi	c units					
3SK2112			✓			
3SK2122				1		
Output exp	pansions					
3SK1211		✓			✓	
3SK1213						1
Input expa	insions					
3SK1220	1					
3SK1230		1				

#### 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 terminal	ls	Spring-type ter (push-in)	minals					
	2-pole 3ZY1121- 1BA00	3-pole 3ZY1131- 1BA00	2-pole 3ZY1121- 2BA00	3-pole 3ZY1131- 2BA00					
3SK1 basi	c units								
3SK1111		1		1					
3SK1112	1		1						
3SK1120		1		1					
3SK1121		1		1					
3SK1122	✓ bottom	🗸 top	✓ bottom	🗸 top					
3SK2 basi	c units								
3SK2112		1		1					
3SK2122		✓ <sup>1)</sup>		✓ <sup>1)</sup>					
Output exp	pansions								
3SK1211	1		1						
3SK1213									
Input expa	nsions								
3SK1220		🗸 top		🗸 top					
3SK1230	✓ bottom		✓ bottom						

✓ Available

-- Not available

<sup>1)</sup> Two sets of terminals are required for 3SK2122.

✓ Available

-- Not available

### Selection and ordering data

		Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			d					kg
Device of in the in	connectors fo dustrial stan	or the electrical connection of SIRIUS devices dard mounting rail enclosure						
	All h	Device connectors for 3SK1						
	2	Width 17.5 mm	2	3ZY1212-1BA00	1	1 unit	41L	0.050
H111	4 1200	Width 22.5 mm	2	3ZY1212-2BA00	1	1 unit	41L	0.050
		Device connectors for 3SK2						
		Width 22.5 mm	2	3ZY1212-2GA00	1	1 unit	41L	0.678
		Width 45 mm	2	3ZY1212-4GA01	1	1 unit	41L	0.678
and the second	1 1 1 1	Device termination connectors	2	3ZY1212-2DA00	1	1 unit	41L	0.050
	- <b>4</b> 97	For 3SK1, width 22.5 mm						
3ZY1212 -1BA00	3ZY1212 -2DA00	Note: Observe positions of the slide switch, see Manual "3SK1 Safety Relays", https://support.industry.siemens.com/ cs/ww/en/view/67585885						
		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	1 unit	41L	0.050
		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	1 unit	41L	0.050
		Device termination connector sets For 3SK1213, width > 45 mm,	2	3ZY1212-0FA01	1	1 unit	41L	0.050

comprising 3ZY1212-2FA00 and 3ZY1210-2AA00

# Safety Relays SIRIUS 3SK Safety Relays

# Accessories

	Version	SD	Article No	PU	PS*	PG	Weight
		00		(UNIT,	10	1 G	per PU
				SEI, M)			approx.
		d					kg
Terminals for SIRIUS	devices in the industrial standard mounting rail						
enclosule	Removable terminals		Screw terminals				
E.			$\overline{\mathbf{U}}$				
8	• 2-pole, up to 2 x 1.5 mm <sup>2</sup> or 1 x 2.5 mm <sup>2</sup>	2	3ZY1121-1BA00	1	6 units	41L	0.013
8		2	Spring-type terminals	· ·	0 units	41L	0.013
			(push-in)				
3ZY1121-1BA00	• 2-pole, up to 2 x 1.5 mm <sup>2</sup>	2	3ZY1121-2BA00	1	6 units	41L	0.007
PC cables and adapte	• 3-pole, up to 2 x 1.5 mm <sup>2</sup> <sup>17</sup>	2	3ZY1131-2BA00	1	6 units	41L	0.010
	USB PC cables	►	3UF7941-0AA00-0	1	1 unit	42.1	0 093
576-6	For connecting to the USB interface of a PC/PG,				i dinit	.20	0.000
3UF7941-0AA00-0	for communication with 3SK2 through the system interface, recommended for use in connection with 3SK2						
	USB/serial adapters	5	3UF7946-0AA00-0	1	1 unit	42J	0.210
	For connecting an RS 232 PC cable to the USB interface of a PC						
Connecting cables fo	r 3SK2 (essential accessory for diagnostics modul	e)					
	Connecting cables						
	For connecting diagnostics module to 3SK2 basic unit						
	Length 0.1 m (flat)		3UF7931-0AA00-0	1	1 unit	42J	0.012
	<ul> <li>Length 0.5 m (flat)</li> <li>Length 0.5 m (flat)</li> </ul>		3UF7932-0AA00-0	1	1 unit	42J 42J	0.019
YF	• Length 0.5 m (round)	•	3UF7932-0BA00-0	1	1 unit	42J	0.035
3UF7932-0AA00-0	Length 1.0 m (round)		3UF7937-0BA00-0	1	1 unit	42J	0.059
	Length 2.5 m (round)	•	3UF7933-0BA00-0	1	1 unit	42J	0.121
Operating and monito	Dring modules for 3SK2	0	26//2644 24 400		1	441	0 107
Concernant of the local division of the loca	Diagnostics modules	2	33K2011-3AAUU		i unit	41L	0.107
a mail	For direct display of errors, a g, of erece circuite						
	Note:						
	The 3RK3611-3AA00 diagnostics module cannot be						
3SK2611-3AA00	operated on the 3SK2 devices.						
Door adapters for 3S	K2				1	401	0.014
	For external connection of the system interface		30F7920-0AA00-0	· ·	i unit	42J	0.014
N	e.g. outside a control cabinet						
3UF7920-0AA00-0							
Interface covers for 3	SK2						
	Interface covers		3UF7950-0AA00-0	1	5 units	42J	0.001
	For system interface						
10							
3UF7950-0AA00-0	201/0						
memory modules for	35K2 Memory modules	2	3RK3931-04400	1	1 unit	420	0 004
	For backing up the complete parameterization of the 3SK2	2			i unit	120	0.001
	safety system without a PC/PG through the system						
3RK3931-0AA00							
Software for 3SK2				-			
225	SIRIUS Safety ES						
-	Software for configuring, commissioning, operating and diagnosing of 3SK2 and 3RK3						
1.00	see www.siemens.com/ic10, Chapter 14						
	SIRIUS" or Industry Mall.						
Contraction of the local division of the loc							
3ZS1316C.10-0Y.5				1			

# Safety Relays SIRIUS 3SK Safety Relays

					Α	cces	sories
	Version	SD	Article No.	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		d					kg
Accessories for encl	osures						
- land	Sealing covers						
	• 17.5 mm (for 3SK1120 and 3SK1220)	2	3ZY1321-1AA00	1	5 units	41L	0.002
	22.5 mm (for all 3SK1 devices except 3SK1120 and 3SK1220)	2	3ZY1321-2AA00	1	5 units	41L	0.003
3ZY1321-2AA00							
9	Push-in lugs For wall mounting	2	3ZY1311-0AA00	1	10 units	41L	0.001
3ZY1311-0AA00							
3ZY1440-0AA00	Coding pins For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; enable mechanical coding of terminals, see Manual "3SK1 safety relays", https://support.industry.siemens.com/ cs/ww/en/view/67585885	2	3ZY1440-1AA00	1	12 units	41L	0.001
Blank labels							
3RT2900-1SB20	<b>Unit labeling plates</b> For SIRIUS devices 20 mm x 7 mm, titanium gray <sup>1)</sup>	20	3RT2900-1SB20	100	340 units	41B	0.062
Tools for opening sp	ring-type terminals						
3RA2908-1A	<b>Screwdrivers</b> For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	Spring-type terminals (push-in) 3RA2908-1A	1	1 unit	41B	0.050
r c labelling system for i							

of unit labeling plates available from: murrplastik Systemtechnik GmbH, see www.siemens.com/ic10, Chapter 16 Partners\*

# **Position and Safety Switches**

# Introduction

# Overview

#### More information

Home page, see www.siemens.com/railway-components Catalog IC 10, see www.siemens.com/ic10

Home page, see www.siemens.com/sirius-detecting

Industry Mall, see www.siemens.com/product?3SE

3SE523. 3SE521.





System Manual, see



Configurator, see www.siemens.com/sirius/configurators

https://support.industry.siemens.com/cs/ww/en/view/43920150

Conversion tool, see www.siemens.com/sirius/conversion-tool





3SE512.

3SE5250

3SE5413, 3SE5423

	Position swit	Compact design	Open-type					
Enclosure Plastic Metal Degree of protection	✓ ✓ IP65.	✓  IP66/IP67	✓ ✓ IP66/IP67	 ✓ IP66/IP67	 ✓ IP66/IP67	 ✓ IP66/IP67	✓ IP10 or IP20	
<b>Standards</b> IEC 60947-5-1	IP66/IP67 Mounting and operating points acc. to	Operating points acc. to EN 50047	Mounting and operating points acc. to	Operating points acc. to EN 50041	Operating points acc. to EN 50047		Mounting and operating points acc. to	
Approvals	EN 50047 CE, TÜV, UL, C	SA, CCC,	EN 50041 CE, TÜV, UL, C	CSA, CCC		CE, UL, CSA, CCC	EN 50047 CE, TÜV, UL, CSA, CCC	
Contact blocks								
2 slow-action contacts	1 NO + 1 NC, 2	2 NC	1 NO + 1 NC, 2	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	
<ul> <li>Short stroke</li> <li>With 2 × 2 mm contact gap</li> </ul>	1 NO + 1 NC 1 NO + 1 NC		5 5				<i>s</i>	
3 slow-action contacts	1 NO + 2 NC; 2	2 NO + 1 NC	1 NO + 2 NC; 2	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	1 1				 ✓	 		
Electrical specifications			•					
Insulation voltage $U_{\rm i}$ Conventional thermal current $I_{\rm the}$	400 V 6 A/10 A (3-/2-pole)		400 V 6 A/10 A (3-/2-	pole)		400 V 6 A	400 V 6 A	
Connections Cable entry M12 connector socket, 4-, 5- or 8-pole Connector socket, 6-pole + PE Molded cables	1 × M20 × 1.5 ✓ 	2 × M20 × 1.5 ✓ 	1 × M20 × 1.5 ✓ ✓	3 × M20 × 1.5 ✓ ✓	3 × M20 × 1.5 ✓ 	 V 	  	
Actuators								
Rounded plungers and roller plungers Roller levers and angular roller levers Spring rod Twist levers and rod actuators	J J J		J J J		J J  J	  	  	
Hindo switchos			v					
Plungers twist levers								
Page Ambient temperature -40 °C	2/261, 2/268	2/264	2/267, 2/270	2/271	2/271			
✓ Available								

-- Not available

# **Position and Safety Switches**

Introduction

	3SE5232, 3SE5212	3SE5132, 3SE5112	3SE5232, 3SE5242	3SE5112, 3SE5122	3SE5322
	Safety hinge switc	hes	Safety switches with separate actu	uator	Safety switches with tumbler
Enclosure Plastic Metal 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, C	CC	CE, TÜV, UL, CSA, C	200	CE, TÜV, UL, CSA, CCC
Contact blocks/outputs					
<ul> <li>2 slow-action contacts</li> <li>2 snap-action contacts</li> <li>Short stroke</li> <li>With 2 × 2 mm contact gap</li> </ul>	 1 NO + 1 NC  		1 NO + 1 NC, 2 NC 		
3 slow-action contacts • With make-before-break			1 NO + 2 NC		2 × (1 NO + 2 NC)
3 snap-action contacts	1 NO + 2 NC				
Special features					
LED status display	1		1		1
Increased corrosion protection	1		✓		✓
ASIsafe integrated	1		✓		1
Electrical specifications	100.1/		400.14		100.1/
Insulation voltage U <sub>i</sub>	400 V 6 A/10 A (3-/2-pole)		400 V		400 V
Connections	070,1077 (072 pole)		077		077
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 connector socket, 4-, 5- or 8-pole	1		1	1	1
Molded cables					
AS-Interface			✓	✓	V
Plungers twist levers					
Separate actuators			1	1	1
Hinge switches	1				
Page					
Complete units	2/263				
Modular system					
Ambient temperature –40 °C	2/273		2/273		2/274

✓ Available

-- Not available

Note:

Safety characteristics, see www.siemens.com/ic10, Chapter 16.

# General data

# Overview

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  $\ensuremath{\mathsf{3SE5}}$  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 four- or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- Versions with increased corrosion protection
- Versions for operating temperature down to -40 °C
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see www.siemens.com/ic10, Chapter 12)

#### Actuator variants

All operating mechanisms can be rotated around the axis in increments of 22.5°. The following actuator variants are available:

- · Standard, rounded and roller plungers
- · Roller levers and angular roller levers
- Spring rod
- Twist levers and rod actuators with twist lever actuator
- · Fork levers with twist lever actuator

The actuator rollers are available with various materials and diameters.



Twist actuators for twist levers and rod levers, with setting of switching direction to right, left, or right/left (standard for all twist lever actuators except fork levers)

#### 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 does not have any effect on the way the switch works. Both versions can be used in safety applications.

#### Diverse contact types

Exchangeable two and three-pole contact blocks for all enclosure sizes



Simple plug-in mounting for fast replacement of the actuator heads



Open the cover (1) Actuate the locking lever (2) Replace the head (rotatable by 16 x 22.5°) (3) Lock and close the cover (4)

#### Quick-connect technology

For plastic enclosure with a width of 31 mm



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".



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 ( $1 \times$  green +  $1 \times$  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.

**General data** 

## Article No. scheme

Product versions													
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, connector sockets					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	С	С	0	2	
N.L													

#### Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

#### 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 2/249).
- 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 2/249).
- All enclosure variants have an integrated chlorinated rubber diaphragm for high functional safety in cold and aggressive environments.
- All contact blocks are replaceable.
- The three-pole contact blocks are available for all enclosure sizes (see picture, page 2/249).

# 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 best contact blocks suited for the particular purpose. And many different actuator variants are available to match the mechanical configuration of the moving machined parts. Dimensions, fixing points and characteristics are largely in accordance with the EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

#### Standards

IEC 60947-5-1 or EN 60947-5-1

The protective measure of "total insulation" by the molded-plastic enclosure is guaranteed by the use of molded-plastic screw glands.

For your orders, please use the article numbers quoted in the selection and ordering data.

- Elements with 1 NO + 2 NC slow-action contacts with make-before-break and 2 NO + 1 NC.
- The short-stroke contact block 1 NO + 1 NC improves the precision of the switching operation through a reduced actuation path.
- The contact block with 1 NO + 1 NC snap-action contacts with 2 x 2 mm contact opening is suitable for simultaneous disconnection and signaling, particularly in the elevator industry.
- 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 saves approx. 20 to 25 % of the time when connecting (see picture, page 2/249).
- The ASIsafe electronic component is integrated in the enclosure for the versions with AS-Interface connection (see www.siemens.com/ic10, Chapter 12); an additional adapter is not required.

#### Safety position switches

For controls according to IEC 60204-1 or 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

Standards IEC 60947-5-1 and EN 60947-5-1 require 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 IEC standard 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 ⊕.

#### Contacts for every application

- <u>Snap-action contacts:</u> NC and NO contacts switch simultaneously regardless of the actuating speed ( $v_{min} = 0.01$  m/s) and contact erosion.
- <u>Slow-action contacts</u>: Difference in travel between "NC contact opens" and "NO contact closes"; the switching speed is the same as or proportional to the actuating speed ( $v_{min} = 0.4 \text{ m/s}$ ).
- 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.

Monitoring with fail-safe evaluation units from the 3SK and 3RK3 series

#### Spring rod

- Can be used for undefined actuations and changing starting conditions
- · Starting from any direction is possible

Twist levers and rod actuators

- For a high starting speed (v = 1.5 m/s)
- Variety of starting options
- Insensitive to oil, grinding dust and coarse-grained material
- Adjustment of the lever in increments of 10°
- Can be adjusted with left or right switching

#### Fork lever

- · Switchable in two directions
- Latching actuator
- For reciprocating movements
- Safe evaluation units Maximum achievable safety level according to type of switch Compact Standard Hinge Separate Tumbler actuator 122 -----3SE54 € 3SE51 / 3SE52 3SE51 / 3SE52 3SE53 3SE51 / 3SE52 3SK 3RK3 Use of only one position switch itch/safety switch Monitoring with 1 contact: SIL 1 / PL c 1 x NC contact Monitoring with 2 contacts: SIL 1 / PL c SIL 2 / PL d 2 x NC contact or 1 x NC contact + 1 x NO contact Use of a second position switch/safety switch Standard switch 3SE51 / 3SE52 Safety switch / hinge switch 3SE51 / 3SE52 SIL 3 / PLe Safety switch with separate actuator 3SE51 / 3SE52 Safety switches with tumble 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 www.siemens.com/ic10, Chapter 11.

General data