

Overview

More information

Homepage, see www.siemens.com/sirius-overloadrelays
Industry Mall, see

- www.siemens.com/product?3RU2
- www.siemens.com/product?3RB3
- www.siemens.com/product?3RB2

TIA Selection Tool Cloud (TST Cloud), see <https://www.siemens.com/tstcloud/?node=ElectronicOverloadRelay>
Configuration Manual "Load Feeders – SIRIUS Modular System", see <https://support.industry.siemens.com/cs/ww/en/view/39714188>
Conversion tool for article numbers, see www.siemens.com/sirius/conversion-tool



Features

3RU21

3RB30/3RB31

3RB20/3RB21

3RB22/3RB23

3RB24

Benefits

General data

| Sizes | S00 ... S3 | S00 ... S3 | S6 ... S12 | S00 ... S12 | S00 ... S12 | |
|---|------------------|-------------------|-------------------|--|--|---|
| Seamless current range | 0.11 ... 100 A | 0.1 ... 115 A | 50 ... 630 A | 0.3 ... 630 A (up to 820 A) ¹⁾ | 0.3 ... 630 A (up to 820 A) ¹⁾ | <ul style="list-style-type: none"> • Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, etc.) • Permit the mounting of slim and compact load feeders in widths of 45 mm (S00, S0), 55 mm (S2), 70 mm (S3), 120 mm (S6) and 145 mm (S10/S12); this does not include the current measuring modules for the 3RB22 to 3RB24 evaluation modules sizes S00 to S3 • Simplify configuration • Allows easy and consistent configuration with one series of overload relays (for small to large loads) |
| Protection functions | | | | | | |
| Tripping due to overload | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> • Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload |
| Tripping due to phase asymmetry | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> • Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to phase asymmetry |
| Tripping due to phase failure | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> • Minimizes heating of three-phase motors during phase failure |
| Protection of single-phase loads | ✓ | -- | -- | ✓ | ✓ | <ul style="list-style-type: none"> • Enables the protection of single-phase loads |
| Tripping in the event of overheating by Integrated thermistor motor protection function | -- ²⁾ | -- ²⁾ | -- ²⁾ | ✓ | ✓ | <ul style="list-style-type: none"> • Provides optimum temperature-dependent protection of loads against excessive temperature rises, e.g. for stator-critical motors or in the event of insufficient coolant flow, contamination of the motor surface or long starting or braking operations • Eliminates the need for additional special equipment • Saves space in the control cabinet • Reduces wiring outlay and costs |
| Tripping in the event of a ground fault by Internal ground-fault detection (activatable) | -- | ✓ (only 3RB31) | ✓ (only 3RB21) | ✓ | ✓ | <ul style="list-style-type: none"> • Provides optimum protection of loads against high-resistance short circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc. • Eliminates the need for additional special equipment • Saves space in the control cabinet • Reduces wiring outlay and costs |

✓ Available

-- Not available

¹⁾ Motor currents up to 820 A can be recorded and evaluated by a current measuring module, e.g. 3RB2906-2BG1 (0.3 to 3 A), in combination with a 3UF1868-3GA00 (820 A/1 A) series transformer.
For 3UF18 transformers, see page 10/25.

²⁾ The SIRIUS 3RN thermistor motor protection devices can be used to provide additional temperature-dependent protection.

Protection Equipment

Overload Relays

General data



| Specifications | 3RU21 | 3RB30/3RB31 | 3RB20/3RB21 | 3RB22/3RB23 | 3RB24 | Benefits |
|--|------------------------------------|---|---|---|--|--|
| Features | | | | | | |
| RESET function | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Allows manual or automatic resetting of the device |
| Remote RESET function | ✓ (by means of separate module) | ✓ (only with 3RB31 and external auxiliary voltage 24 V DC) | ✓ (only with 3RB21 and external auxiliary voltage 24 V DC) | ✓ (electrically via external button) | ✓ (electrically with button or via IO-Link) | <ul style="list-style-type: none"> Allows the remote resetting of the device |
| TEST function for auxiliary contacts | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Allows easy checking of the function and wiring |
| TEST function for electronics | -- | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Allows checking of the electronics |
| Status display | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Displays the current operating state |
| Large current adjustment button | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Makes it easier to set the relay exactly to the correct current value |
| Integrated auxiliary contacts (1 NO + 1 NC) | ✓ | ✓ | ✓ | ✓ (2 ×) | -- | <ul style="list-style-type: none"> Allow the load to be switched off if necessary Can be used to output signals |
| Integrated auxiliary contacts (1 CO and 1 NO in series) | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Enables the controlling of contactors directly from the higher-level control system through IO-Link |
| IO-Link connection | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Reduction of wiring in the control cabinet Enables communication |
| Connection of optional hand-held device | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Enables local operation |
| Communication capability through IO-Link | | | | | | |
| Full starter functionality through IO-Link | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and star-delta (wye-delta) starting) |
| Readout of diagnostics functions | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Enables the readout of diagnostics information such as overload, open circuit, ground fault, etc. |
| Readout of current values | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Enables the readout of current values and their direct processing in the higher-level control system |
| Readout of all set parameters | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Enables the readout of all set parameters, e.g. for plant documentation |

✓ Available

-- Not available



| Features | 3RU21 | 3RB30/3RB31 | 3RB20/3RB21 | 3RB22/3RB23 | 3RB24 | Benefits |
|---|----------------|----------------|-------------|-------------------|-------------------|--|
| Design of load feeders | | | | | | |
| Short-circuit strength up to 100 kA at 690 V (in conjunction with the corresponding fuses or the corresponding motor starter protector) | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Provides optimum protection of the loads and operating personnel in the event of short circuits due to insulation faults or faulty switching operations |
| Electrical and mechanical matching to 3RT contactors | ✓ | ✓ | ✓ | ✓ ¹⁾ | ✓ ¹⁾ | <ul style="list-style-type: none"> Simplifies configuration Reduces wiring outlay and costs Enables stand-alone installation as well as space-saving direct mounting |
| Straight-through transformers for main circuit²⁾ (in this case the cables are routed through the feed-through openings of the overload relay and connected directly to the box terminals of the contactor) | -- | ✓ (S2, S3) | ✓ (S6) | ✓ (S00 ... S6) | ✓ (S00 ... S6) | <ul style="list-style-type: none"> Reduce the contact resistance (only one point of contact) Save wiring costs (easy, no need for tools, and fast) Save material costs Reduce installation costs |
| Spring-loaded terminals for main circuit²⁾ | ✓ (S00, S0) | ✓ (S00, S0) | -- | -- | -- | <ul style="list-style-type: none"> Enable fast connections Permit vibration-resistant connections Enable maintenance-free connections |
| Spring-loaded terminals for auxiliary circuits²⁾ | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Enable fast connections Permit vibration-resistant connections Enable maintenance-free connections |
| Full starter functionality through IO-Link | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and star-delta (wye-delta) starting) |
| Starter function | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Integration of feeders via IO-Link in the control system up to 630 A or 820 A |

✓ Available

-- Not available

¹⁾ Exception: Up to size S3, only stand-alone installation is possible.²⁾ Available as an alternative to screw terminals.

Protection Equipment

Overload Relays

General data



| Features | 3RU21 | 3RB30/3RB31 | 3RB20/3RB21 | 3RB22/3RB23 | 3RB24 | Benefits |
|--|---------------------|-------------------------------|-------------------------------|-------------|-------------|--|
| Other features | | | | | | |
| Temperature compensation | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Allows the use of the relays at high temperatures without derating Prevents premature tripping Allows compact installation of the control cabinet without distance between the devices/load feeders Simplifies configuration Enables space to be saved in the control cabinet |
| Very high long-term stability | ✓ | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Provides safe protection for the loads even after years of use in severe operating conditions |
| Wide setting ranges | -- | ✓ (1:4) | ✓ (1:4) | ✓ (1:10) | ✓ (1:10) | <ul style="list-style-type: none"> Minimize the configuring outlay and costs Minimize storage overhead, storage costs, and tied-up capital |
| Fixed trip class | CLASS 10, CLASS 10A | 3RB30: CLASS 10E or CLASS 20E | 3RB20: CLASS 10E or CLASS 20E | -- | -- | <ul style="list-style-type: none"> Optimum motor protection for standard starts |
| Trip classes adjustable on the device CLASS 5E, 10E, 20E, 30E | -- | 3RB31: ✓ | 3RB21: ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Enable solutions for very fast starting motors requiring special protection (e.g. Ex motors) Enable heavy starting solutions Reduce the number of variants Minimize the configuring outlay and costs Minimize storage overhead, storage costs, and tied-up capital |
| Low power loss | -- | ✓ | ✓ | ✓ | ✓ | <ul style="list-style-type: none"> Reduces power consumption and energy costs (up to 98% less power is used than for thermal overload relays) Minimizes temperature rises of the contactor and control cabinet – in some cases this may eliminate the need for control cabinet cooling Direct mounting to contactor saves space, even for high motor currents (i.e. no heat decoupling is required) |
| Internal power supply | -- ¹⁾ | ✓ | ✓ | -- | -- | <ul style="list-style-type: none"> Eliminates the need for configuration and connecting an additional control circuit |
| Supplied from an external source via IO-Link | -- | -- | -- | -- | ✓ | <ul style="list-style-type: none"> Eliminates the need for configuration and connecting an additional control circuit |

✓ Available

-- Not available

¹⁾ SIRIUS 3RU11 and 3RU21 thermal overload relays use a bimetal contactor and therefore do not require a control supply voltage.



| Features | 3RU21 | 3RB30/3RB31 | 3RB20/3RB21 | 3RB22/3RB23 | 3RB24 | Benefits |
|-----------------------------------|-------|-------------|-------------|-------------|-------|---|
| Other features (continued) | | | | | | |
| Overload warning | -- | -- | -- | ✓ | ✓ | <ul style="list-style-type: none"> Indicates imminent tripping of the relay directly on the device due to overload, phase asymmetry or phase failure through flickering of the LEDs or in the case of the 3RB24 as a signal through IO-Link Allows the imminent tripping of the relay to be signaled Allows measures to be taken in time in the event of inverse-time delayed overloading of the load for an extended period over the current limit Eliminates the need for an additional device Saves space in the control cabinet Reduces wiring outlay and costs |
| Analog output | -- | -- | -- | ✓ | ✓ | <ul style="list-style-type: none"> Allows the output of an analog output signal for actuating moving-coil instruments, feeding programmable logic controllers or transfer to bus systems Eliminates the need for an additional measuring transducer and signal converter Saves space in the control cabinet Reduces wiring outlay and costs |

✓ Available

-- Not available

Protection Equipment

Overload Relays

General data

Overview of overload relays – matching contactors

| Overload relays | Current measurement | Current range | Contactors (type, size, rating in kW) | | | | | | | |
|-----------------|---------------------|---------------|---------------------------------------|--------------------------|------------------------|----------------|----------------|--------------------|----------------|---------------|
| | | | 3RT201. | 3RT202. | 3RT203. | 3RT204. | 3RT105. | 3RT106. | 3RT107. | 3TF68/3TF69 |
| Type | A | | S00 3/4/5.5/7.5 | S0 5.5/7.5/11/15/18.5 | S2 15/18.5/22/30/37 | S3 37/45/55 | S6 55/75/90 | S10 110/132/160 | S12 200/250 | 14 375/450 |

SIRIUS 3RU21 thermal overload relays



| | | | | | | | | | | |
|--------|------------|-------------|----|----|----|----|----|----|----|----|
| 3RU211 | Integrated | 0.11 ... 16 | ✓ | -- | -- | -- | -- | -- | -- | -- |
| 3RU212 | Integrated | 1.8 ... 40 | -- | ✓ | -- | -- | -- | -- | -- | -- |
| 3RU213 | Integrated | 11 ... 80 | -- | -- | ✓ | -- | -- | -- | -- | -- |
| 3RU214 | Integrated | 28 ... 100 | -- | -- | -- | ✓ | -- | -- | -- | -- |

3RU21

SIRIUS 3RB30 electronic overload relays¹⁾



| | | | | | | | | | | |
|--------|------------|-------------|----|----|----|----|----|----|----|----|
| 3RB301 | Integrated | 0.1 ... 16 | ✓ | -- | -- | -- | -- | -- | -- | -- |
| 3RB302 | Integrated | 0.1 ... 40 | -- | ✓ | -- | -- | -- | -- | -- | -- |
| 3RB303 | Integrated | 12.5 ... 80 | -- | -- | ✓ | -- | -- | -- | -- | -- |
| 3RB304 | Integrated | 32 ... 115 | -- | -- | -- | ✓ | -- | -- | -- | -- |

3RB30

SIRIUS 3RB31 electronic overload relays¹⁾



| | | | | | | | | | | |
|--------|------------|-------------|----|----|----|----|----|----|----|----|
| 3RB311 | Integrated | 0.1 ... 16 | ✓ | -- | -- | -- | -- | -- | -- | -- |
| 3RB312 | Integrated | 0.1 ... 40 | -- | ✓ | -- | -- | -- | -- | -- | -- |
| 3RB313 | Integrated | 12.5 ... 80 | -- | -- | ✓ | -- | -- | -- | -- | -- |
| 3RB314 | Integrated | 32 ... 115 | -- | -- | -- | ✓ | -- | -- | -- | -- |

3RB31

SIRIUS 3RB20 electronic overload relays¹⁾



| | | | | | | | | | | |
|----------------|------------|-------------|----|----|----|----|----|----|----|----|
| 3RB205 | Integrated | 50 ... 200 | -- | -- | -- | -- | ✓ | -- | -- | -- |
| 3RB206 | Integrated | 55 ... 630 | -- | -- | -- | -- | -- | ✓ | ✓ | ✓ |
| 3RB201 + 3UF18 | Integrated | 630 ... 820 | -- | -- | -- | -- | -- | -- | -- | ✓ |

3RB20

SIRIUS 3RB21 electronic overload relays¹⁾



| | | | | | | | | | | |
|----------------|------------|-------------|----|----|----|----|----|----|----|----|
| 3RB215 | Integrated | 50 ... 200 | -- | -- | -- | -- | ✓ | -- | -- | -- |
| 3RB216 | Integrated | 55 ... 630 | -- | -- | -- | -- | -- | ✓ | ✓ | ✓ |
| 3RB211 + 3UF18 | Integrated | 630 ... 820 | -- | -- | -- | -- | -- | -- | -- | ✓ |

3RB21

SIRIUS 3RB22 to 3RB24 electronic overload relays¹⁾



| | | | | | | | | | | |
|---------------------|-----------------|-------------|----|----|----|----|----|----|----|----|
| 3RB22, 3RB23, 3RB24 | 3RB2906 | 0.3 ... 25 | ✓ | ✓ | -- | -- | -- | -- | -- | -- |
| | 3RB2906 | 10 ... 100 | ✓ | ✓ | ✓ | ✓ | -- | -- | -- | -- |
| | 3RB2956 | 20 ... 200 | -- | ✓ | ✓ | ✓ | ✓ | -- | -- | -- |
| | 3RB2966 | 63 ... 630 | -- | -- | -- | -- | -- | ✓ | ✓ | ✓ |
| | 3RB2906 + 3UF18 | 630 ... 820 | -- | -- | -- | -- | -- | -- | -- | ✓ |

✓ Can be used
-- Cannot be used

¹⁾ "Technical specifications" for the use of overload relays with trip class ≥ CLASS 20E, see "Short-circuit protection with fuses for motor feeders" in the Configuration Manual.

Connection methods
3RU2 thermal overload relays

- Sizes S00 and S0:
 - Main and auxiliary circuit: Either screw or spring-loaded terminals
- Sizes S2 and S3:
 - Main circuit: Screw terminals with box terminal
 - Auxiliary circuit: Either screw or spring-loaded terminals

3RB3 electronic overload relays

- Sizes S00 and S0:
 - Main and auxiliary circuit: Either screw or spring-loaded terminals
- Sizes S2 and S3:
 - Main circuit: Screw terminals with box terminal or as straight-through transformer
 - Auxiliary circuit: Either screw or spring-loaded terminals

3RB2 electronic overload relays

3RB20 and 3RB21 overload relays:

- Size S6:
 - Main circuit: With busbar connection or as straight-through transformer
 - Auxiliary circuit: Either screw or spring-loaded terminals
- Sizes S10/S12:
 - Main circuit: With busbar connection
 - Auxiliary circuit: Either screw or spring-loaded terminals

3RB22 to 3RB24 evaluation modules:

- Screw or spring-loaded terminals

3RB29 current measuring modules:

- Up to size S3: Straight-through transformers
- As from size S6:
 - Main circuit: With busbar connection
 - Auxiliary circuit: Either screw or spring-loaded terminals



Screw terminals



Spring-loaded terminals



Busbar connections



Straight-through transformers

The various terminals and straight-through transformers are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

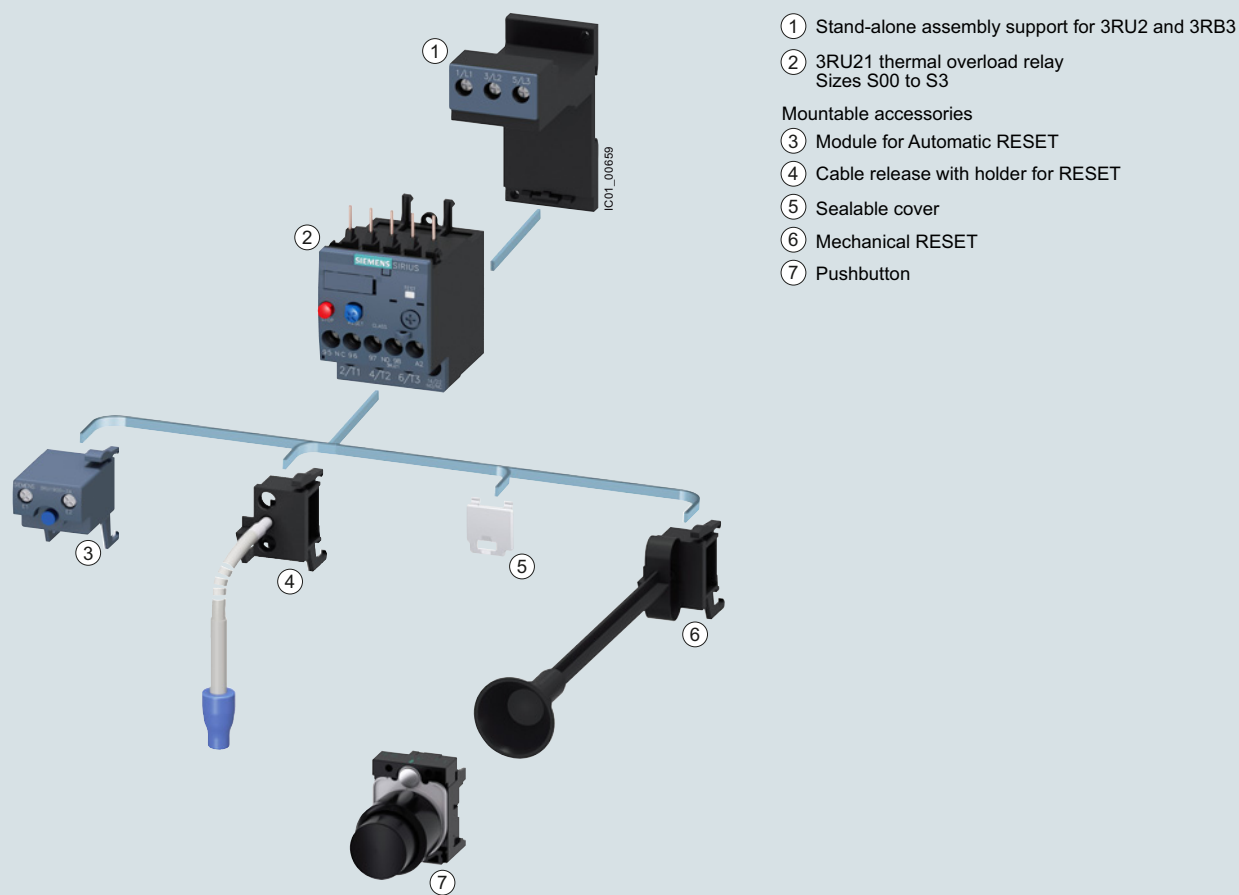
3RU2 for standard applications

Overview

More information

Homepage, see www.siemens.com/sirius-overloadrelays
 Industry Mall, see www.siemens.com/product?3RU2
 TIA Selection Tool Cloud (TST Cloud), see <https://www.siemens.com/tstcloud/?node=ElectronicOverloadRelay>
 Conversion tool for article numbers, see www.siemens.com/sirius/conversion-tool

Application Manual "SIRIUS Controls with IE3/IE4 motors", see <https://support.industry.siemens.com/cs/ww/en/view/94770820>
 Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/60298164>
 Characteristics and certificates, see <https://support.industry.siemens.com/cs/ww/en/ps/16271>



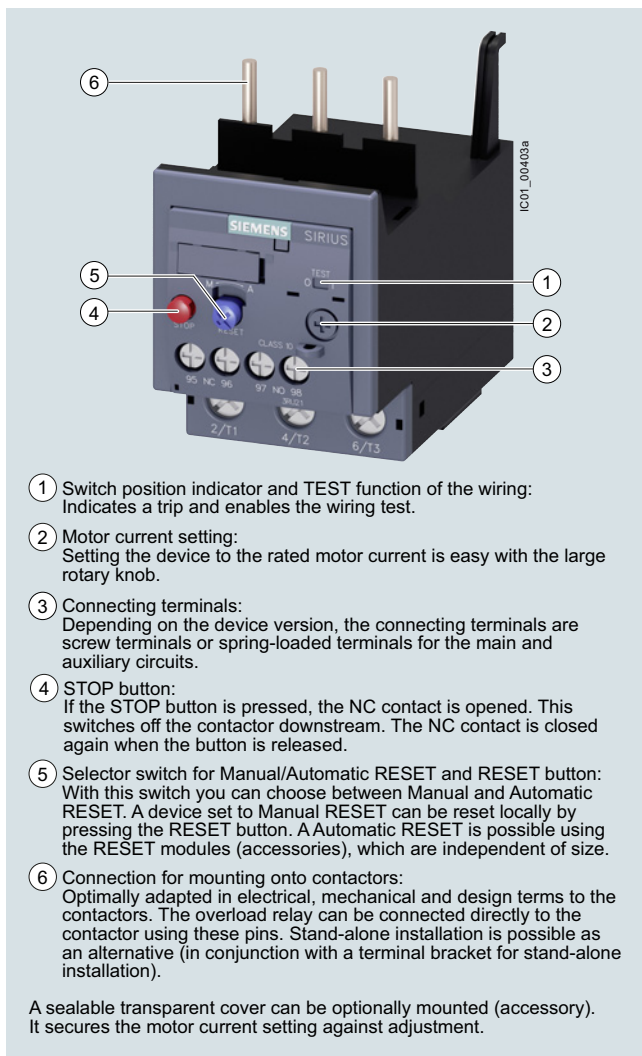
Mountable accessories for 3RU thermal overload relay

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 for standard applications



3RU21 thermal overload relays up to 100 A have been designed to provide current-dependent protection for loads with normal starting against impermissibly high temperature rises due to overload or phase failure.

An overload or phase failure results in an increase of the motor current beyond the set rated motor current. Via heating elements, this current rise heats up the bimetal strips inside the device which then bend and as a result trigger the auxiliary contacts by means of a tripping mechanism. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and the current setting I_n and is stored in the form of a long-term stable tripping characteristic curve, see [Characteristic curves](#).

The "tripped" status is signaled by means of a switch position indicator. The relay is reset manually or automatically after a recovery time has elapsed.

The 3RU2 thermal overload relays are suitable for operation with frequency converters.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials. They comply with all important worldwide standards and approvals.

Use in hazardous areas

The 3RU2 overload relays are certified in accordance with both the European explosion protection directive (ATEX) and the international explosion protection standard (IECEx), see [Certificates](#).

SIRIUS 3RU2136-4.B0 thermal overload relay

Article No. scheme

| Product versions | | Article number | | | | | |
|---|--------------------------------------|----------------|---|---|---|---|---------|
| Thermal overload relays | | 3RU2 | | | | | |
| Device type | e.g. 1 = CLASS 10, 1 NO + 1 NC | | | | | | |
| Size, rated operational current and power | e.g. 16 = 16 A (7.5 kW) for size S00 | | | | | | |
| Setting range for overload release | e.g. 0A = 0.11 ... 0.16 A | | | | | | |
| Connection methods | e.g. B = screw terminals | | | | | | |
| Installation type | e.g. 0 = mounting on contactor | | | | | | |
| Example | | 3RU2 | 1 | 1 | 6 | - | 0 A B 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.

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 for standard applications

Benefits

The most important features and benefits of the 3RU21 thermal overload relays are listed in the overview table (see "General data", page 7/79 onwards).

Application

Industries

The 3RU21 thermal overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed protection of their electrical loads (e.g. motors) under normal starting conditions (CLASS 10, 10A).

Application

The 3RU21 thermal overload relays have been designed for the protection of three-phase and single-phase AC and DC motors.

If single-phase AC or DC loads are to be protected by the 3RU21 thermal overload relays, all three bimetal strips must be heated. For this purpose, all main current paths of the relay must be connected in series.

Ambient conditions

3RU21 thermal overload relays compensate temperature in the temperature range from -40 °C to +60 °C according to IEC 60947-4-1. At temperatures from +60 °C to +70 °C, the upper set value of the setting range has to be reduced by a specific factor in accordance with the table below.

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

Note:

For the use of 3RU21 thermal overload relays in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see [Application Manual](#).

For more information, see [page 1/7](#).

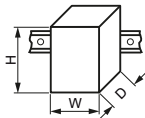

Technical specifications

More information

System Manual "SIRIUS – System Overview", see <https://support.industry.siemens.com/cs/ww/en/view/60311318>
Configuration Manual "Load Feeders – SIRIUS Modular System", see <https://support.industry.siemens.com/cs/ww/en/view/39714188>

Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/60298164>
Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16270/td>

The following technical information is intended to provide an initial overview of the various types of devices and functions.

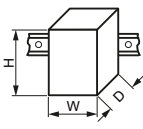
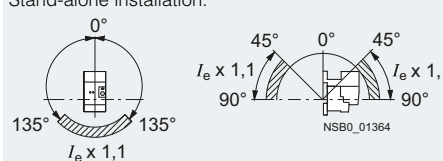
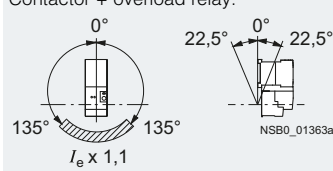
| | | | | | | |
|---|---|--|--|----------------|----------------|----------------|
| Type | | | 3RU2116 | 3RU2126 | 3RU2136 | 3RU2146 |
| Size | | | S00 | S0 | S2 | S3 |
| Dimensions (W x H x D) (overload relay with stand-alone installation support) |  | | | | | |
| • Screw terminals | mm | 45 x 89 x 80 | 45 x 97 x 95 | 55 x 105 x 117 | 70 x 106 x 124 | |
| • Spring-loaded terminals | mm | 45 x 102 x 79 | 45 x 114 x 95 | 55 x 105 x 117 | 70 x 106 x 124 | |
| General data | | | | | | |
| Tripping in the event of | | Overload and phase failure | | | | |
| Trip class acc. to IEC 60947-4-1 | CLASS | 10 | 10, 10A | | | |
| Phase failure sensitivity | | Yes | | | | |
| Overload warning | | No | | | | |
| Reset and recovery | | Manual, automatic and Remote RESET (Remote RESET in conjunction with the appropriate accessories) | | | | |
| • Reset options after tripping | | | | | | |
| • Recovery time | | Depends on the strength of the tripping current and characteristic | | | | |
| - For Automatic RESET | | min. | Depends on the strength of the tripping current and characteristic | | | |
| - For Manual RESET | | min. | Depends on the strength of the tripping current and characteristic | | | |
| - For Remote RESET | | min. | Depends on the strength of the tripping current and characteristic | | | |
| Features | | | | | | |
| • Display of operating state on device | | Yes, by means of TEST function/switch position indicator slide | | | | |
| • TEST function | | Yes | | | | |
| • RESET button | | Yes | | | | |
| • STOP button | | Yes | | | | |
| Protection of motors in hazardous environments | | | | | | |
| • Certificate of suitability/explosion protection type according to ATEX directive 2014/34/EU | | DMT 98 ATEX G 001  II (2) GD | | | | |
| • according to international standard IECEx | | IECEx BVS 15.0046 see https://support.industry.siemens.com/cs/ww/en/ps/16270/cert | | | | |

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 for standard applications

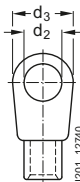
| | | | | | | |
|--|---|--|---|---|---|----------------|
| Type | | | 3RU2116 | 3RU2126 | 3RU2136 | 3RU2146 |
| Size | | | S00 | S0 | S2 | S3 |
| Dimensions (W x H x D) (overload relay with stand-alone installation support) |  | | | | | |
| • Screw terminals | mm | | 45 x 89 x 80 | 45 x 97 x 95 | 55 x 105 x 117 | 70 x 106 x 124 |
| • Spring-loaded terminals | mm | | 45 x 102 x 79 | 45 x 114 x 95 | 55 x 105 x 117 | 70 x 106 x 124 |
| General data (continued) | | | | | | |
| Ambient temperature | | | | | | |
| • Storage/transport | °C | | -55 ... +80 | | | |
| • Operation | °C | | -40 ... +70 | | | |
| • Temperature compensation | °C | | Up to +60 | | | |
| • Permissible rated current at | | | | | | |
| - Temperature inside control cabinet 60 °C | % | | 100 (current reduction is required above +60 °C) | | | |
| - Temperature inside control cabinet 70 °C | % | | 87 | | | |
| Repeat terminals | | | | | | |
| • Coil repeat terminals | | | Yes | Not required | | |
| • Auxiliary contact repeat terminals | | | Yes | Not required | | |
| Degree of protection acc. to IEC 60529 | | | IP20 | | - IP20 (front side) - Terminal IP00 (use additional terminal covers for higher degree of protection) | |
| Touch protection acc. to IEC 60529 | | | Finger-safe | | Finger-safe, for vertical contact from the front | |
| Shock resistance with sine acc. to IEC 60068-2-27 | | | g/ms | 15/11 (auxiliary contacts 95/96 and 97/98: 8 g/11 ms) | | |
| Electromagnetic compatibility (EMC) | | | | | | |
| • Interference immunity | | | Not relevant | | | |
| • Emitted interference | | | Not relevant | | | |
| Resistance to extreme climates – Air humidity | | | % | 90 | | |
| Installation altitude above sea level | | | m | Up to 2 000 | | |
| Mounting position | | | The diagrams show the permissible mounting positions for mounting onto contactors and stand-alone installation. For mounting position in the hatched area, a setting correction of 10% must be implemented. Stand-alone installation:  Contactor + overload relay:  | | | |
| Type of mounting | | | For mounting onto contactor or stand-alone installation with terminal support, screw and snap-on mounting onto standard mounting rail. | | | |

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 for standard applications

| Type | | 3RU2116 | 3RU2126 | 3RU2136 | 3RU2146 |
|---|-----------------|---|---|--|--|
| Size | | S00 | S0 | S2 | S3 |
| Main circuit | | | | | |
| Rated insulation voltage U_i (pollution degree 3) | V | 690 | | | 1000 |
| Rated impulse withstand voltage U_{imp} | kV | 6 | | | 8 |
| Rated operational voltage U_e | V | 690 | | | |
| Type of current | | Yes | | | |
| • Direct current | | Yes | | | |
| • Alternating current | | Yes, frequency range up to 400 Hz | | | |
| Current setting | A | 0.11 ... 0.16 | 1.8 ... 2.5 | 11 ... 16 | 28 ... 40 |
| | A | to 11 ... 16 | to 34 ... 40 | to 70 ... 80 | to 80 ... 100 |
| Power loss per unit (max.) | W | 4.8 ... 7.5 | 5.7 ... 9.6 | 10.5 ... 18.9 | 13.5 ... 21 |
| Short-circuit protection | | | | | |
| • With fuse without contactor | | See "Selection and ordering data", pages 7/92 ... 7/95 | | | |
| • With fuse and contactor | | "Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders", see Configuration Manual. | | | |
| Protective separation between main and auxiliary current paths Acc. to IEC 60947-1 | | | | | |
| • Screw terminals or ring terminal lug connections | V | 440 | 690: Setting range ≤ 25 A | 690 | |
| • Spring-loaded terminals | V | 440 | 440: Setting range > 25 A | 690 | |
| Conductor cross-sections of main circuit | | | | | |
| Connection type | | Screw terminals | | | Screw terminals with box terminal |
| Terminal screw | | M3, Pozidriv size 2 | M4, Pozidriv size 2 | M6, Pozidriv size 2 | 4 mm Allen screw |
| Operating devices | | mm | ∅ 5 ... 6 | ∅ 5 ... 6 | 4 mm Allen screw |
| Prescribed tightening torque | | Nm | 0.8 ... 1.2 | 2 ... 2.5 | 3 ... 4.5 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | | | |
| • Solid or stranded | mm ² | 2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾ , max. 2 x 4 | 2 x (1 ... 2.5) ¹⁾ , 2 x (2.5 ... 10) ¹⁾ | 2 x (2.5 ... 35) ¹⁾ , 1 x (2.5 ... 50) ¹⁾ | 2 x (2.5 ... 16) ¹⁾ , 2 x (10 ... 50) ¹⁾ , 1 x (10 ... 70) ¹⁾ |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾ | 2 x (1 ... 2.5) ¹⁾ , 2 x (2.5 ... 6) ¹⁾ , max. 1 x 10 | 2 x (1 ... 25) ¹⁾ , 1 x (1 ... 35) ¹⁾ | 2 x (2.5 ... 35) ¹⁾ , 1 x (2.5 ... 50) ¹⁾ |
| • AWG cables, solid or stranded | AWG | 2 x (20 ... 16) ¹⁾ , 2 x (18 ... 14) ¹⁾ , 2 x 12 | 2 x (16 ... 12) ¹⁾ , 2 x (14 ... 8) ¹⁾ | 2 x (18 ... 2) ¹⁾ , 1 x (18 ... 1) ¹⁾ | 2 x (10 ... 1/0) ¹⁾ , 1 x (10 ... 2/0) ¹⁾ |
| Removable box terminals ²⁾ | | | | | |
| • With copper bars ³⁾ | mm | -- | -- | -- | 2 x 12 x 4 |
| • With cable lugs ⁴⁾ | | | | | |
| - Terminal screw | | -- | -- | -- | M6 |
| - Prescribed tightening torque | Nm | -- | -- | -- | 4.5 ... 6 |
| - Usable ring terminal lugs | mm | -- | -- | -- | d ₂ = min. 6.3 d ₃ = max. 19 |
| | |  | | | |
| Connection type | | Spring-loaded terminals | | | |
| Operating devices | | mm | 3.0 x 0.5 and 3.5 x 0.5 | | |
| Conductor cross-sections (min./max.), 1 conductor can be connected | | | | | |
| • Solid or stranded | mm ² | 1 x (0.5 ... 4) | 1 x (1 ... 10) | -- | |
| • Finely stranded without end sleeve | mm ² | 1 x (0.5 ... 2.5) | 1 x (1 ... 6) | -- | |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 1 x (0.5 ... 2.5) | 1 x (1 ... 6) | -- | |
| • AWG cables, solid or stranded | AWG | 1 x (20 ... 12) | 1 x (18 ... 8) | -- | |
| • Max. external diameter of the conductor insulation | mm | 3.6 | 6.4 | -- | |

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

²⁾ Cable lug and busbar connection possible after removing the box terminals.

³⁾ If bars larger than 12 mm x 10 mm are connected, a 3RT2946-4EA2 cover is needed to maintain the required phase clearance, see page 7/97.



⁴⁾ If conductors larger than 25 mm² are connected, the 3RT2946-4EA2 cover is needed to maintain the required phase clearance, see page 7/97.

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 for standard applications

| Type | | 3RU2116 | 3RU2126 | 3RU2136 | 3RU2146 |
|---|-----------------|---|-------------------------|---------|---------|
| Size | | S00 | S0 | S2 | S3 |
| Auxiliary circuit | | | | | |
| Number of NO contacts | | 1 | | | |
| Number of NC contacts | | 1 | | | |
| Auxiliary contacts – Assignment | | 1 NO for the signal "tripped"; 1 NC for disconnecting the contactor | | | |
| Rated insulation voltage U_i (pollution degree 3) | V | 690 | | | |
| Rated impulse withstand voltage U_{imp} | kV | 6 | | | |
| Contact rating of the auxiliary contacts | | | | | |
| • NC, NO contacts with alternating current AC-15, rated operational current I_e at U_e - 24 V - 120 V - 125 V - 230 V - 400 V - 600 V - 690 V | A | 3 3 3 2 1 0.75 0.75 | | | |
| • NC, NO contacts with direct current DC-13, rated operational current I_e at U_e - 24 V - 110 V - 125 V - 220 V | A | 1 0.22 0.22 0.11 | | | |
| • Contact reliability (suitability for PLC control; 17 V, 5 mA) | | Yes | | | |
| Short-circuit protection | | | | | |
| • With fuse - Operational class gG - Quick | A | 6 10 | | | |
| • With miniature circuit breaker (C characteristic) | A | 6 (up to $I_k \leq 0.5$ kA; $U \leq 260$ V) | | | |
| Reliable operational voltage for protective separation between auxiliary current paths Acc. to IEC 60947-1 | V | 440 | | | |
| CSA, UL, UR rated data | | | | | |
| Auxiliary circuit – Switching capacity | | B600, R300 | | | |
| Conductor cross-sections for auxiliary circuit | | | | | |
| Connection type | |  Screw terminals | | | |
| Terminal screw | | M3, Pozidriv size 2 | | | |
| Operating devices | | mm | ø 5 ... 6 | | |
| Prescribed tightening torque | | Nm | 0.8 ... 1.2 | | |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | | | |
| • Solid or stranded | mm ² | 2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾ | | | |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾ | | | |
| • AWG cables, solid or stranded | AWG | 2 x (20 ... 16) ¹⁾ , 2 x (18 ... 14) ¹⁾ | | | |
| Connection type | |  Spring-loaded terminals | | | |
| Operating devices | | mm | 3.0 x 0.5 and 3.5 x 0.5 | | |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | | | |
| • Solid or stranded | mm ² | 2 x (0.5 ... 2.5) | | | |
| • Finely stranded without end sleeve | mm ² | 2 x (0.5 ... 2.5) | | | |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 2 x (0.5 ... 1.5) | | | |
| • AWG cables, solid or stranded | AWG | 2 x (20 ... 14) | | | |
| • Max. external diameter of the conductor insulation | mm | 3.6 | | | |

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

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 for standard applications **IE3/IE4 ready**

Selection and ordering data

3RU21 thermal overload relays for mounting onto contactor¹⁾, sizes S00 and S0, CLASS 10

Features and technical specifications:

- Connection methods
Main and auxiliary circuit: Either screw or spring-loaded terminals
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and Automatic RESET

- Switch position indicator
- TEST function
- STOP button
- Sealable covers (optional accessory)

PU (UNIT, SET, M) = 1

PS* = 1 unit

PG = 41F



3RU2116-4AB0



3RU2116-4AC0



3RU2126-4FB0



3RU2126-4AC0

| Size con- tactor | Trip class | Rated power for three-phase motors, rated value ²⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ³⁾ | SD | Screw terminals | | SD | Spring-loaded terminals | |
|------------------------|------------|--|--|--|----|-----------------|-----------------|--------------|----------------------------|-----------------|
| | | | | | | Article No. | Price per PU | | Article No. | Price per PU |
| CLASS | | | | | | kW | A | A | d | |
| Size S00 | | | | | | | | | | |
| S00 | 10 | 0.04 | 0.11 ... 0.16 | 0.5 | 2 | 3RU2116-0AB0 | 5 | 3RU2116-0AC0 | | |
| | 10 | 0.06 | 0.14 ... 0.2 | 1 | 2 | 3RU2116-0BB0 | 5 | 3RU2116-0BC0 | | |
| | 10 | 0.06 | 0.18 ... 0.25 | 1 | | 3RU2116-0CB0 | 5 | 3RU2116-0CC0 | | |
| | 10 | 0.09 | 0.22 ... 0.32 | 1.6 | | 3RU2116-0DB0 | 5 | 3RU2116-0DC0 | | |
| | 10 | 0.09 | 0.28 ... 0.4 | 2 | | 3RU2116-0EB0 | 5 | 3RU2116-0EC0 | | |
| | 10 | 0.12 | 0.35 ... 0.5 | 2 | | 3RU2116-0FB0 | 5 | 3RU2116-0FC0 | | |
| | 10 | 0.18 | 0.45 ... 0.63 | 2 | | 3RU2116-0GB0 | 5 | 3RU2116-0GC0 | | |
| | 10 | 0.18 | 0.55 ... 0.8 | 4 | | 3RU2116-0HB0 | 5 | 3RU2116-0HC0 | | |
| | 10 | 0.25 | 0.7 ... 1 | 4 | | 3RU2116-0JB0 | | 3RU2116-0JC0 | | |
| | 10 | 0.37 | 0.9 ... 1.25 | 4 | | 3RU2116-0KB0 | 5 | 3RU2116-0KC0 | | |
| | 10 | 0.55 | 1.1 ... 1.6 | 6 | | 3RU2116-1AB0 | | 3RU2116-1AC0 | | |
| | 10 | 0.75 | 1.4 ... 2 | 6 | | 3RU2116-1BB0 | | 3RU2116-1BC0 | | |
| | 10 | 0.75 | 1.8 ... 2.5 | 10 | | 3RU2116-1CB0 | | 3RU2116-1CC0 | | |
| | 10 | 1.1 | 2.2 ... 3.2 | 10 | | 3RU2116-1DB0 | | 3RU2116-1DC0 | | |
| | 10 | 1.5 | 2.8 ... 4 | 16 | | 3RU2116-1EB0 | 5 | 3RU2116-1EC0 | | |
| | 10 | 1.5 | 3.5 ... 5 | 20 | | 3RU2116-1FB0 | 5 | 3RU2116-1FC0 | | |
| | 10 | 2.2 | 4.5 ... 6.3 | 20 | | 3RU2116-1GB0 | 5 | 3RU2116-1GC0 | | |
| | 10 | 3 | 5.5 ... 8 | 25 | | 3RU2116-1HB0 | 5 | 3RU2116-1HC0 | | |
| | 10 | 4 | 7 ... 10 | 35 | | 3RU2116-1JB0 | | 3RU2116-1JC0 | | |
| | 10 | 5.5 | 9 ... 12.5 | 35 | | 3RU2116-1KB0 | 5 | 3RU2116-1KC0 | | |
| | 10 | 7.5 | 11 ... 16 | 40 | | 3RU2116-4AB0 | 5 | 3RU2116-4AC0 | | |
| Size S0 | | | | | | | | | | |
| S0 | 10 | 0.75 | 1.8 ... 2.5 | 10 | | 3RU2126-1CB0 | 5 | 3RU2126-1CC0 | | |
| | 10 | 1.1 | 2.2 ... 3.2 | 10 | | 3RU2126-1DB0 | 5 | 3RU2126-1DC0 | | |
| | 10 | 1.5 | 2.8 ... 4 | 16 | | 3RU2126-1EB0 | 5 | 3RU2126-1EC0 | | |
| | 10 | 1.5 | 3.5 ... 5 | 20 | | 3RU2126-1FB0 | 5 | 3RU2126-1FC0 | | |
| | 10 | 2.2 | 4.5 ... 6.3 | 20 | | 3RU2126-1GB0 | 5 | 3RU2126-1GC0 | | |
| | 10 | 3 | 5.5 ... 8 | 25 | | 3RU2126-1HB0 | 5 | 3RU2126-1HC0 | | |
| | 10 | 4 | 7 ... 10 | 35 | | 3RU2126-1JB0 | | 3RU2126-1JC0 | | |
| | 10 | 5.5 | 9 ... 12.5 | 35 | | 3RU2126-1KB0 | 5 | 3RU2126-1KC0 | | |
| | 10 | 7.5 | 11 ... 16 | 40 | | 3RU2126-4AB0 | | 3RU2126-4AC0 | | |
| | 10 | 7.5 | 14 ... 20 | 50 | | 3RU2126-4BB0 | | 3RU2126-4BC0 | | |
| | 10 | 11 | 17 ... 22 | 63 | | 3RU2126-4CB0 | 2 | 3RU2126-4CC0 | | |
| | 10 | 11 | 20 ... 25 | 63 | | 3RU2126-4DB0 | | 3RU2126-4DC0 | | |
| | 10 | 15 | 23 ... 28 | 63 | | 3RU2126-4NB0 | 2 | 3RU2126-4NC0 | | |
| | 10 | 15 | 27 ... 32 | 80 | | 3RU2126-4EB0 | | 3RU2126-4EC0 | | |
| | 10 | 18.5 | 30 ... 36 | 80 | | 3RU2126-4PB0 | 2 | 3RU2126-4PC0 | | |
| | 10 | 18.5 | 34 ... 40 | 80 | | 3RU2126-4FB0 | | 3RU2126-4FC0 | | |

¹⁾ With the appropriate terminal supports (see "Accessories", page 7/96), the 3RU2 overload relays for mounting on contactors can also be installed as stand-alone units.

²⁾ 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.

³⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see Configuration Manual.

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

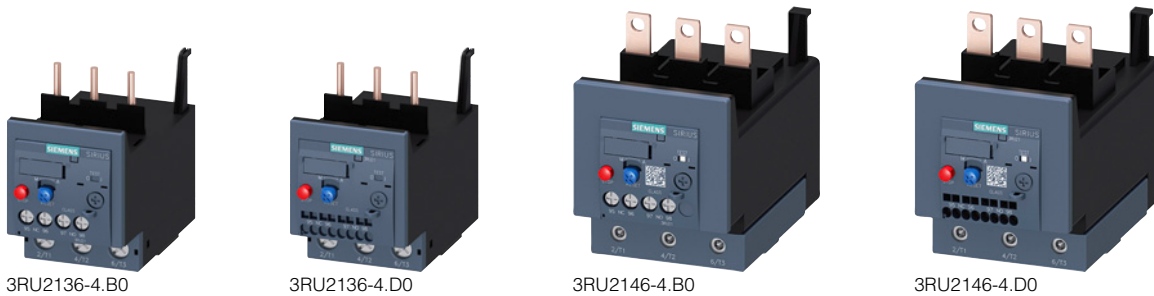
IE3/IE4 ready 3RU2 for standard applications

3RU21 thermal overload relays for mounting onto contactor¹⁾, sizes S2 and S3, CLASS 10 or 10A

Features and technical specifications:

- Connection methods
 - Main circuit: Screw terminals with box terminal
 - Auxiliary circuit: Either screw or spring-loaded terminals
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and Automatic RESET
- Switch position indicator

- TEST function
- STOP button
- Sealable covers (optional accessory)

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


| Size con- tactor | Trip class | Rated power for three-phase motors, rated value ²⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ³⁾ | SD | Screw terminals | SD | Spring-loaded terminals (on auxiliary current side) |
|---------------------|------------|--|--|--|----|-----------------|-----------------|--|
| | | | | | | Article No. | Price per PU | Article No. |
| | CLASS | kW | A | A | d | | | |
| Size S2 | | | | | | | | |
| S2 | 10 | 3 | 5.5 ... 8 | 25 | 5 | 3RU2136-1HB0 | 5 | 3RU2136-1HD0 |
| | 10 | 4 | 7 ... 10 | 35 | 5 | 3RU2136-1JB0 | 5 | 3RU2136-1JD0 |
| | 10 | 5.5 | 9 ... 12.5 | 35 | 5 | 3RU2136-1KB0 | 5 | 3RU2136-1KD0 |
| | 10 | 7.5 | 11 ... 16 | 40 | 5 | 3RU2136-4AB0 | 5 | 3RU2136-4AD0 |
| | 10 | 7.5 | 14 ... 20 | 50 | 5 | 3RU2136-4BB0 | 5 | 3RU2136-4BD0 |
| | 10 | 11 | 18 ... 25 | 63 | ▶ | 3RU2136-4DB0 | 5 | 3RU2136-4DD0 |
| | 10 | 15 | 22 ... 32 | 80 | ▶ | 3RU2136-4EB0 | 5 | 3RU2136-4ED0 |
| | 10 | 18.5 | 28 ... 40 | 80 | ▶ | 3RU2136-4FB0 | 5 | 3RU2136-4FD0 |
| | 10 | 22 | 36 ... 45 | 100 | ▶ | 3RU2136-4GB0 | 2 | 3RU2136-4GD0 |
| | 10 | 22 | 40 ... 50 | 100 | ▶ | 3RU2136-4HB0 | 2 | 3RU2136-4HD0 |
| | 10 | 30 | 47 ... 57 | 100 | ▶ | 3RU2136-4QB0 | 2 | 3RU2136-4QD0 |
| | 10 | 30 | 54 ... 65 | 125 | ▶ | 3RU2136-4JB0 | 2 | 3RU2136-4JD0 |
| | 10A | 37 | 62 ... 73 | 160 | ▶ | 3RU2136-4KB0 | 2 | 3RU2136-4KD0 |
| | 10A | 37 | 70 ... 80 | 160 | ▶ | 3RU2136-4RB0 | 2 | 3RU2136-4RD0 |
| Size S3 | | | | | | | | |
| S3 | 10 | 18.5 | 28 ... 40 | 80 | 2 | 3RU2146-4FB0 | 5 | 3RU2146-4FD0 |
| | 10 | 22 | 36 ... 50 | 125 | 2 | 3RU2146-4HB0 | 5 | 3RU2146-4HD0 |
| | 10 | 30 | 45 ... 63 | 125 | 2 | 3RU2146-4JB0 | 2 | 3RU2146-4JD0 |
| | 10 | 37 | 57 ... 75 | 160 | 2 | 3RU2146-4KB0 | 2 | 3RU2146-4KD0 |
| | 10 | 45 | 70 ... 90 | 160 | 2 | 3RU2146-4LB0 | 2 | 3RU2146-4LD0 |
| | 10 | 45 | 80 ... 100 ⁴⁾ | 200 | 2 | 3RU2146-4MB0 | 2 | 3RU2146-4MD0 |

¹⁾ With the appropriate terminal supports (see "Accessories", page 7/96), the 3RU2 overload relays for mounting on contactors can also be installed as stand-alone units.

²⁾ 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.

³⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see Configuration Manual.

⁴⁾ For overload relays > 100 A, see 3RB2 electronic overload relays, page 7/110 onwards.

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 for standard applications **IE3/IE4 ready**

3RU21 thermal overload relays for stand-alone installation, sizes S00 and S0, CLASS 10

Features and technical specifications:

- Connection methods
Main and auxiliary circuit: Either screw or spring-loaded terminals
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and Automatic RESET

- Switch position indicator
- TEST function
- STOP button
- Sealable covers (optional accessory)

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



3RU2116-..B1



3RU2116-..C1



3RU2126-..B1



3RU2126-..C1

| Size con- tactor | Trip class | Rated power for three-phase motors, rated value ¹⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ²⁾ | SD | Screw terminals | SD | Spring-loaded terminals |
|------------------------|------------|--|--|---|----|-----------------|-----------------|----------------------------|
| | | | | | | Article No. | Price per PU | Article No. |
| | CLASS | kW | A | A | d | | | |
| Size S00 | | | | | | | | |
| S00 | 10 | 0.04 | 0.11 ... 0.16 | 0.5 | 5 | 3RU2116-0AB1 | 5 | 3RU2116-0AC1 |
| | 10 | 0.06 | 0.14 ... 0.2 | 1 | 5 | 3RU2116-0BB1 | 5 | 3RU2116-0BC1 |
| | 10 | 0.06 | 0.18 ... 0.25 | 1 | 5 | 3RU2116-0CB1 | 5 | 3RU2116-0CC1 |
| | 10 | 0.09 | 0.22 ... 0.32 | 1.6 | 5 | 3RU2116-0DB1 | 5 | 3RU2116-0DC1 |
| | 10 | 0.09 | 0.28 ... 0.4 | 2 | 5 | 3RU2116-0EB1 | 5 | 3RU2116-0EC1 |
| | 10 | 0.12 | 0.35 ... 0.5 | 2 | 5 | 3RU2116-0FB1 | 5 | 3RU2116-0FC1 |
| | 10 | 0.18 | 0.45 ... 0.63 | 2 | 5 | 3RU2116-0GB1 | 5 | 3RU2116-0GC1 |
| | 10 | 0.18 | 0.55 ... 0.8 | 4 | ▶ | 3RU2116-0HB1 | 5 | 3RU2116-0HC1 |
| | 10 | 0.25 | 0.7 ... 1 | 4 | ▶ | 3RU2116-0JB1 | ▶ | 3RU2116-0JC1 |
| | 10 | 0.37 | 0.9 ... 1.25 | 4 | ▶ | 3RU2116-0KB1 | 5 | 3RU2116-0KC1 |
| | 10 | 0.55 | 1.1 ... 1.6 | 6 | ▶ | 3RU2116-1AB1 | 5 | 3RU2116-1AC1 |
| | 10 | 0.75 | 1.4 ... 2 | 6 | ▶ | 3RU2116-1BB1 | 5 | 3RU2116-1BC1 |
| | 10 | 0.75 | 1.8 ... 2.5 | 10 | ▶ | 3RU2116-1CB1 | 5 | 3RU2116-1CC1 |
| | 10 | 1.1 | 2.2 ... 3.2 | 10 | ▶ | 3RU2116-1DB1 | 5 | 3RU2116-1DC1 |
| | 10 | 1.5 | 2.8 ... 4 | 16 | ▶ | 3RU2116-1EB1 | 5 | 3RU2116-1EC1 |
| | 10 | 1.5 | 3.5 ... 5 | 20 | ▶ | 3RU2116-1FB1 | 5 | 3RU2116-1FC1 |
| | 10 | 2.2 | 4.5 ... 6.3 | 20 | ▶ | 3RU2116-1GB1 | ▶ | 3RU2116-1GC1 |
| | 10 | 3 | 5.5 ... 8 | 25 | ▶ | 3RU2116-1HB1 | ▶ | 3RU2116-1HC1 |
| | 10 | 4 | 7 ... 10 | 35 | ▶ | 3RU2116-1JB1 | ▶ | 3RU2116-1JC1 |
| | 10 | 5.5 | 9 ... 12.5 | 35 | ▶ | 3RU2116-1KB1 | 5 | 3RU2116-1KC1 |
| | 10 | 7.5 | 11 ... 16 | 40 | ▶ | 3RU2116-4AB1 | ▶ | 3RU2116-4AC1 |
| Size S0 | | | | | | | | |
| S0 | 10 | 7.5 | 14 ... 20 | 50 | ▶ | 3RU2126-4BB1 | 5 | 3RU2126-4BC1 |
| | 10 | 11 | 17 ... 22 | 63 | 5 | 3RU2126-4CB1 | 5 | 3RU2126-4CC1 |
| | 10 | 11 | 20 ... 25 | 63 | ▶ | 3RU2126-4DB1 | 5 | 3RU2126-4DC1 |
| | 10 | 15 | 23 ... 28 | 63 | 5 | 3RU2126-4NB1 | 5 | 3RU2126-4NC1 |
| | 10 | 15 | 27 ... 32 | 80 | 5 | 3RU2126-4EB1 | 5 | 3RU2126-4EC1 |
| | 10 | 18.5 | 30 ... 36 | 80 | 5 | 3RU2126-4PB1 | 5 | 3RU2126-4PC1 |
| | 10 | 18.5 | 34 ... 40 | 80 | 5 | 3RU2126-4FB1 | 5 | 3RU2126-4FC1 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹⁾ 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⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see [Configuration Manual](#).

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

IE3/IE4 ready 3RU2 for standard applications

3RU21 thermal overload relays for stand-alone installation, sizes S2 and S3, CLASS 10 or 10A

Features and technical specifications:

- Connection methods
 - Main circuit: Screw terminals with box terminal
 - Auxiliary circuit: Either screw or spring-loaded terminals
- Auxiliary contacts 1 NO + 1 NC
- Manual and Automatic RESET
- Switch position indicator

- TEST function
- STOP button
- Sealable covers (optional accessory)

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


3RU2136-..B1



3RU2136-..D1



3RU2146-..B1



3RU2146-..D1

| Size con- tactor | Trip class | Rated power for three-phase motors, rated value ¹⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ²⁾ | SD | Screw terminals | | SD | Spring-loaded terminals | | | | |
|------------------------|------------|--|--|---|-----|-----------------|-----------------|--------------|----------------------------|-------------|-----------------|---|--|
| | | | | | | Article No. | Price per PU | | d | Article No. | Price per PU | | |
| CLASS | | | | | | kW | | A | | A | | d | |
| Size S2 | | | | | | | | | | | | | |
| S2 | 10 | 15 | 22 ... 32 | 80 | 5 | 3RU2136-4EB1 | 5 | 3RU2136-4ED1 | | | | | |
| | 10 | 18.5 | 28 ... 40 | 80 | 5 | 3RU2136-4FB1 | 5 | 3RU2136-4FD1 | | | | | |
| | 10 | 22 | 36 ... 45 | 100 | 2 | 3RU2136-4GB1 | 5 | 3RU2136-4GD1 | | | | | |
| | 10 | 22 | 40 ... 50 | 100 | 2 | 3RU2136-4HB1 | 5 | 3RU2136-4HD1 | | | | | |
| | 10 | 30 | 47 ... 57 | 100 | 2 | 3RU2136-4QB1 | 5 | 3RU2136-4QD1 | | | | | |
| | 10 | 30 | 54 ... 65 | 125 | 2 | 3RU2136-4JB1 | 5 | 3RU2136-4JD1 | | | | | |
| | 10A | 37 | 62 ... 73 | 160 | 2 | 3RU2136-4KB1 | 5 | 3RU2136-4KD1 | | | | | |
| | 10A | 37 | 70 ... 80 | 160 | 2 | 3RU2136-4RB1 | 5 | 3RU2136-4RD1 | | | | | |
| | Size S3 | | | | | | | | | | | | |
| | S3 | 10 | 30 | 45 ... 63 | 125 | 2 | 3RU2146-4JB1 | 5 | 3RU2146-4JD1 | | | | |
| 10 | | 37 | 57 ... 75 | 160 | 2 | 3RU2146-4KB1 | 5 | 3RU2146-4KD1 | | | | | |
| 10 | | 45 | 70 ... 90 | 160 | 2 | 3RU2146-4LB1 | 5 | 3RU2146-4LD1 | | | | | |
| 10 | | 45 | 80 ... 100 ³⁾ | 200 | 2 | 3RU2146-4MB1 | 5 | 3RU2146-4MD1 | | | | | |

¹⁾ 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⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see Configuration Manual.

³⁾ For overload relays > 100 A, see 3RB2 electronic overload relays, page 7/10 onwards.

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

Accessories










Overview

The following optional accessories are available for the 3RU21 thermal overload relays:

- Size-specific terminal support for stand-alone installation, in sizes S00 and S0 also with spring-loaded terminals
- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)

- Electrical Remote RESET module in three voltage variants (for all sizes)
- Sealable cover (for all sizes)
- Terminal covers for devices with screw terminals (box terminals) and ring terminal lug connections

Selection and ordering data




| Version | Size | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG | |
|---|---|-----|--|----------------------|---------------------------|--------|--------|-----|
| d | | | | | | | | |
| Terminal supports for stand-alone installation | | | | | | | | |
|  3RU2916-3AA01 | Terminal supports for overload relays with screw terminals | | Screw terminals  | | | | | |
| | For separate mounting of the overload relays; screw and snap-on mounting onto standard mounting rail | S00 | ▶ | 3RU2916-3AA01 | 1 | 1 unit | 41F | |
| | | S0 | ▶ | 3RU2926-3AA01 | 1 | 1 unit | 41F | |
| | | S2 | ▶ | 3RU2936-3AA01 | 1 | 1 unit | 41F | |
| | | S3 | 2 | 3RU2946-3AA01 | 1 | 1 unit | 41F | |
|  3RU2926-3AA01 | Terminal supports for overload relays with spring-loaded terminals | | Spring-loaded terminals  | | | | | |
| | For separate mounting of the overload relays; screw and snap-on mounting onto standard mounting rail | S00 | ▶ | 3RU2916-3AC01 | 1 | 1 unit | 41F | |
| | | S0 | ▶ | 3RU2926-3AC01 | 1 | 1 unit | 41F | |
| | | | | | | | | |
| | | | | | | | | |
|  3RU2936-3AA01 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
|  3RU2946-3AA01 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
|  3RU2916-3AC01 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
|  3RU2926-3AC01 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Mechanical RESET | | | | | | | | |
|  3RU2900-1A with pushbutton and extension plunger | Resetting plungers, holders and formers | | S00 ... S3 | 2 | 3RU2900-1A | 1 | 1 unit | 41F |
| | Pushbuttons with extended stroke (12 mm), IP65, Ø 22 mm | | S00 ... S3 | ▶ | 3SU1200-0FB10-0AA0 | 1 | 1 unit | 41J |
| | Extension plungers For compensation of the distance between the pushbutton and the unlatching button of the relay | | S00 ... S3 | ▶ | 3SU1900-0KG10-0AA0 | 1 | 1 unit | 41J |

Protection Equipment

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

Accessories

| Version | Size | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG | | | |
|--|---|------------|--|---|---|--------------|---|-----|-----------|-----|
| d | | | | | | | | | | |
| Cable releases with holder for RESET | | | | | | | | | | |
|  | For ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm | | | | | | | | | |
| | • Length 400 mm | S00 ... S3 | 2 | 3RU2900-1B | 1 | 1 unit | 41F | | | |
| | • Length 600 mm | S00 ... S3 | 2 | 3RU2900-1C | 1 | 1 unit | 41F | | | |
| 3RU2900-1. | | | | | | | | | | |
| Modules for Remote RESET, electrical | | | | | | | | | | |
|  | Operating range 0.85 ... 1.1 x U _N , Power consumption 80 VA AC, 70 W DC, ON time 0.2 ... 4 s, Switching frequency 60/h | | | | | | | | | |
| | • 24 ... 30 V AC/DC | S00 ... S3 | ▶ | 3RU1900-2AB71 | 1 | 1 unit | 41F | | | |
| | • 110 ... 127 V AC/DC | S00 ... S3 | 2 | 3RU1900-2AF71 | 1 | 1 unit | 41F | | | |
| | • 220 ... 250 V AC/DC | S00 ... S3 | ▶ | 3RU1900-2AM71 | 1 | 1 unit | 41F | | | |
| 3RU1900-2A.71 | | | | | | | | | | |
| Sealable covers | | | | | | | | | | |
|  | For covering the setting knobs | S00 ... S3 | ▶ | 3RV2908-0P | 100 | 10 units | 41E | | | |
| 3RV2908-0P | | | | | | | | | | |
| Terminal covers | | | | | | | | | | |
|  | Covers for devices with screw terminals (box terminals) Additional touch protection for fastening to the box terminals | | | Screw terminals  | | | | | | |
| | • Main current level | S2 | ▶ | 3RT2936-4EA2 | 1 | 1 unit | 41B | | | |
| | | S3 | ▶ | 3RT2946-4EA2 | 1 | 1 unit | 41B | | | |
| | 3RT2936-4EA2 | | | | | | | | | |
| General accessories | | | | | | | | | | |
| Version | Size | Color | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG | |
| | | | | d | | | | | | |
| Tools for opening spring-loaded terminals | | | | | | | | | | |
|  | Screwdrivers | | Length approx. 200 mm, 3.0 mm x 0.5 mm | Titanium gray/black, partially insulated | Main and auxiliary circuit connection: 3RU2 | 2 | Spring-loaded terminals  | 1 | 1 unit | 41B |
| | For all SIRIUS devices with spring-loaded terminals | | | | | | 3RA2908-1A | | | |
| 3RA2908-1A | | | | | | | | | | |
| Blank labels | | | | | | | | | | |
|  | Unit labeling plates ¹⁾ | | 20 mm x 7 mm | Titanium gray | 3RU2 | 20 | 3RT2900-1SB20 | 100 | 340 units | 41B |
| | For SIRIUS devices | | | | | | | | | |
| 3RT2900-1SB20 | | | | | | | | | | |
| ¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see page 16/15). | | | | | | | | | | |

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

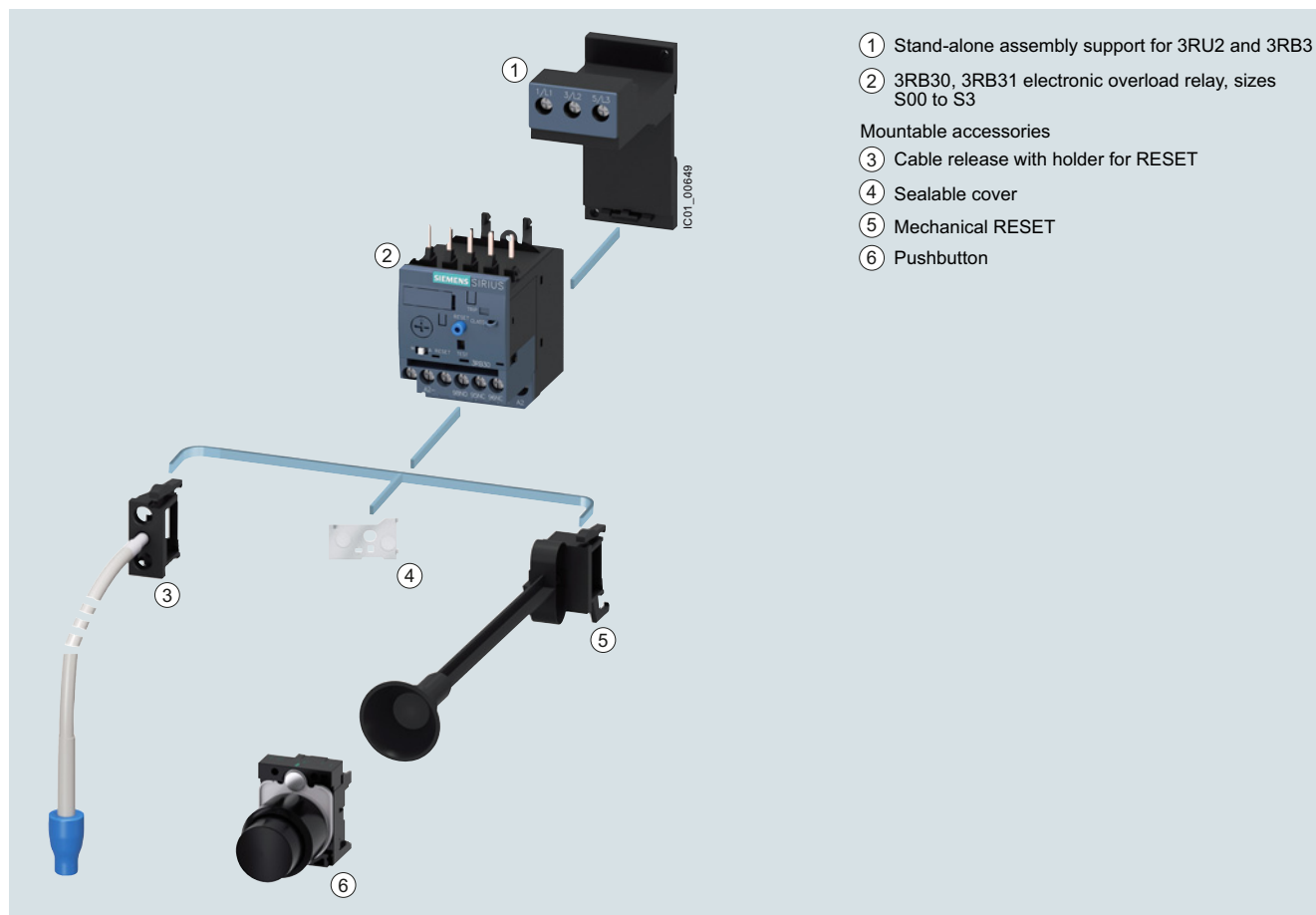
3RB30, 3RB31 for standard applications

Overview

More information

Homepage, see www.siemens.com/sirius-overloadrelays
 Industry Mall, see www.siemens.com/product?3RB3
 TIA Selection Tool Cloud (TST Cloud), see <https://www.siemens.com/tstcloud/?node=ElectronicOverloadRelay>
 Conversion tool for article numbers, see www.siemens.com/sirius/conversion-tool

Application Manual "SIRIUS Controls with IE3/IE4 motors", see <https://support.industry.siemens.com/cs/ww/en/view/94770820>
 Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/60298164>
 Characteristics and certificates, see <https://support.industry.siemens.com/cs/ww/en/ps/16276>



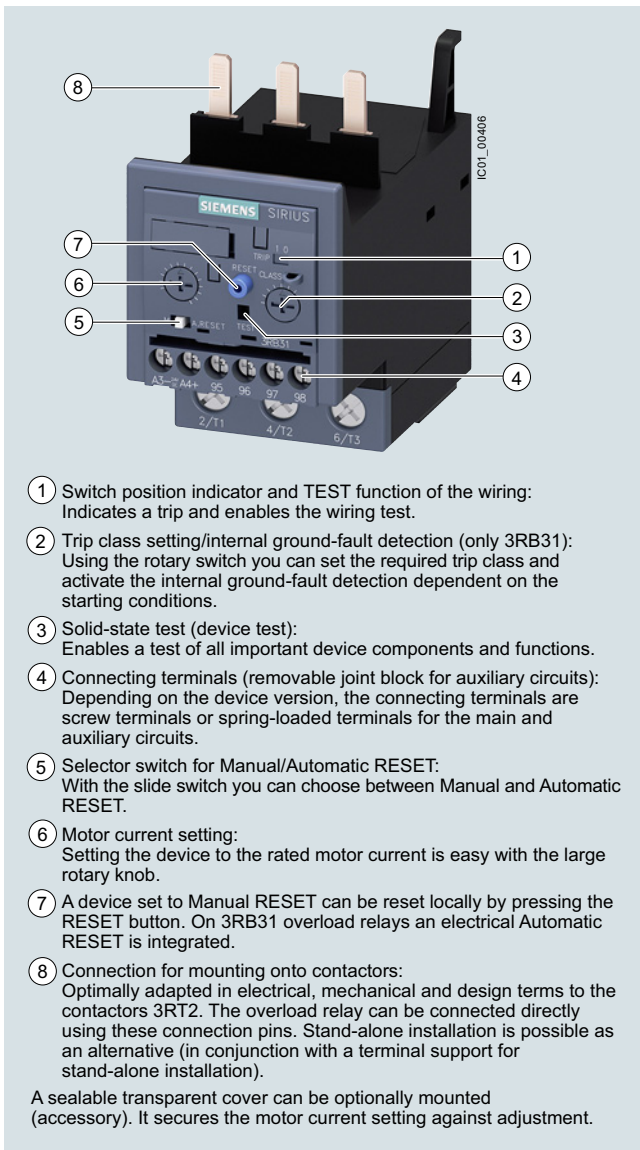
Mountable accessories for 3RB30 and 3RB31 electronic overload relays

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

3RB30, 3RB31 for standard applications



SIRIUS 3RB3133-4.B0 electronic overload relay

The 3RB30/3RB31 electronic overload relays up to 115 A with internal power supply have been designed for current-dependent protection of loads with normal and heavy starting, and to protect against excessive temperature rises due to overload, phase asymmetry or phase failure. An overload, phase asymmetry or phase failure result in an increase of the motor current beyond the set rated motor current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding electronic circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and the current setting I_e and is stored in the form of a long-term stable tripping characteristic curve (see [Characteristics](#)).

In addition to inverse-time delayed protection of loads against excessive temperature rises due to overload, phase asymmetry and phase failure, the 3RB31 electronic overload relays also allow internal ground-fault detection (not possible in conjunction with contactor assemblies for star-delta (wye-delta) starting). This provides protection of loads against high-resistance short circuits due to damage to the insulation material, moisture, condensed water, etc.

The "tripped" status is signaled by means of a switch position indicator. The relay is reset manually or automatically after the recovery time has elapsed.

The 3RB3 electronic overload relays are suitable for operation with frequency converters.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials. They comply with all important worldwide standards and approvals.

For 3RB20 and 3RB21 overload relays in sizes S6 to S10/S12, see [page 7/117 onwards](#).

Use in hazardous areas

The 3RB30/3RB31 electronic overload relays are suitable for the overload protection of motors with the following types of protection:

- II (2) G [Ex e] [Ex d] [Ex px]
- II (2) D [Ex t] [Ex p]

EC type test certificate for Group II, Category (2) G/D exists. It has the number PTB 09 ATEX 3001.

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

3RB30, 3RB31 for standard applications

Article No. scheme

| Product versions | | Article number | | | | | | |
|---|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Electronic overload relays | | 3RB3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Device type | e.g. 0 = standard device, with internal supply, for three-phase loads | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Size, rated operational current and power | e.g. 1 = 16 A (7.5 kW) for size S00 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Version of the Automatic RESET, electrical Remote RESET | e.g. 6 = switchable between Manual/Auto RESET | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Trip class (CLASS) | e.g. 1 = CLASS 10E | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Setting range of the overload release | e.g. R = 0.1 ... 0.4 A | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Connection methods | e.g. B = screw terminals for main and auxiliary circuits | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Installation type | e.g. 0 = mounting on contactor | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Example | | 3RB3 | 0 | 1 | 6 | - | 1 | R B 0 |

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

The most important features and benefits of the 3RB30/3RB31 electronic overload relays are listed in the overview table (see "General data" page 7/79 onwards).

Application

Industries

The 3RB30/3RB31 electronic overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5E to 30E), minimize project completion times, inventories and energy consumption, and optimize plant availability and maintenance management.

Application

The 3RB30/3RB31 electronic overload relays have been designed for the protection of three-phase motors in sinusoidal 50/60 Hz voltage networks. The relays are not suitable for the protection of single-phase AC or DC loads.

The 3RU21 thermal overload relay or the 3RB22/3RB23/3RB24 electronic overload relay can be used for single-phase AC loads. For DC loads we recommend the 3RU21 thermal overload relay.

Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive ambient conditions, ageing and temperature fluctuations.

For the temperature range from -25 °C to +60 °C, the 3RB30/3RB31 electronic overload relays compensate the temperature in accordance with IEC 60947-4-1.

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

Note:

For the use of 3RB30/3RB31 electronic overload relays in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see [Application Manual](#).

For more information, see [page 1/7](#).

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

3RB30, 3RB31 for standard applications

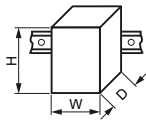
Technical specifications

More information

System Manual "SIRIUS – System Overview", see
<https://support.industry.siemens.com/cs/ww/en/view/60311318>
 Configuration Manual "Load Feeders – SIRIUS Modular System", see
<https://support.industry.siemens.com/cs/ww/en/view/39714188>

Equipment Manual, see
<https://support.industry.siemens.com/cs/ww/en/view/60298164>
 Technical specifications, see
<https://support.industry.siemens.com/cs/ww/en/ps/16276/td>

The following technical information is intended to provide an initial overview of the various types of devices and functions.

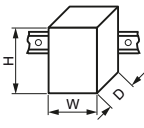
| Type | | 3RB3016, 3RB3113 | 3RB3026, 3RB3123 | 3RB3036, 3RB3133 | 3RB3046, 3RB3143 |
|---|---|---|---|------------------|------------------|
| Size | | S00 | S0 | S2 | S3 |
| Dimensions (W x H x D) (overload relay with stand-alone installation support) |  | | | | |
| • Screw terminals | mm | 45 x 89 x 80 | 45 x 97 x 94 | 55 x 105 x 117 | 70 x 106 x 124 |
| • Spring-loaded terminals | mm | 45 x 102 x 80 | 45 x 116 x 95 | 55 x 105 x 117 | 70 x 106 x 124 |
| General data | | | | | |
| Tripping in the event of | | Overload, phase failure, and phase asymmetry + ground fault (for 3RB31 only) | | | |
| Trip class acc. to IEC 60947-4-1 | Class | 3RB30: 10E, 20E; 3RB31: 5E, 10E, 20E or 30E adjustable | | | |
| Phase failure sensitivity | | Yes | | | |
| Reset and recovery | | | | | |
| • Reset options after tripping | | Manual and Automatic RESET, 3RB31 has an integrated connection for electrical Remote RESET (24 V DC) | | | |
| • Recovery time | | Approx. 3 min | | | |
| - For Automatic RESET | | Immediately | | | |
| - For Manual RESET | | Immediately | | | |
| - For Remote RESET | | Immediately | | | |
| Features | | | | | |
| • Display of operating state on device | | Yes, by means of switch position indicator slide | | | |
| • TEST function | | Yes, test of electronics by pressing the TEST button/ test of auxiliary contacts and wiring of control circuit by actuating the switch position indicator slide/ self-monitoring | | | |
| • RESET button | | Yes | | | |
| • STOP button | | No | | | |
| Protection and operation of explosion-proof motors | | | | | |
| Certificate of suitability/explosion protection type according to ATEX directive 2014/34/EU | | PTB 09 ATEX 3001 ⚠ II (2) G [Ex e] [Ex d] [Ex px] ⚠ II (2) G [Ex t] [Ex p] See https://support.industry.siemens.com/cs/ww/en/view/40591327 | | | |
| Ambient temperatures | | | | | |
| • Storage/transport | °C | -40 ... +80 | | | |
| • Operation | °C | -25 ... +60 | | | |
| • Temperature compensation | °C | +60 | | | |
| • Permissible rated current at | | | | | |
| - Temperature inside control cabinet 60 °C | % | 100 | | | |
| - Temperature inside control cabinet 70 °C | % | On request | | | |
| Repeat terminals | | | | | |
| • Coil repeat terminals | | Yes | Not required | | |
| • Auxiliary contact repeat terminal | | Yes | Not required | | |
| Degree of protection acc. to IEC 60529 | | | | | |
| • Screw terminals/spring-loaded terminals | | IP20 | - IP20 (front side) - Terminal IP00 (use additional terminal covers for higher degree of protection) | | |
| • Straight-through transformers | | -- | IP20 | | |
| Touch protection acc. to IEC 60529 | | Finger-safe | Finger-safe, for vertical contact from the front | | |
| Shock resistance with sine acc. to IEC 60068-2-27 | | g/ms | | | |
| | | 15/11 (signaling contact 97/98 in position "tripped": 9 g/11 ms) | 15/11 (signaling contact 97/98 in position "tripped": 8 g/11 ms) | | |

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

3RB30, 3RB31 for standard applications

| Type | | | 3RB3016, 3RB3113 | 3RB3026, 3RB3123 | 3RB3036, 3RB3133 | 3RB3046, 3RB3143 |
|--|---|--|------------------|------------------|------------------|------------------|
| Size | | | S00 | S0 | S2 | S3 |
| Dimensions (W x H x D) (overload relay with stand-alone installation support) |  | | | | | |
| • Screw terminals | mm | | 45 x 89 x 80 | 45 x 97 x 94 | 55 x 105 x 117 | 70 x 106 x 124 |
| • Spring-loaded terminals | mm | | 45 x 102 x 80 | 45 x 116 x 95 | 55 x 105 x 117 | 70 x 106 x 124 |

General data (continued)

Electromagnetic compatibility (EMC) – Interference immunity

| | | |
|---|-----|--|
| • Conductor-related interference | | |
| - Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3) | kV | 2 (power ports), 1 (signal port) |
| - Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3) | kV | 2 (line to earth), 1 (line to line) |
| • Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3) | kV | 8 (air discharge), 6 (contact discharge) |
| • Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3) | V/m | 10 |

Electromagnetic compatibility (EMC) – Emitted interference Degree of severity B acc. to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)

Resistance to extreme climates – Air humidity % 95

Installation altitude above sea level m Up to 2 000

Mounting position Any

Type of mounting Direct mounting/stand-alone installation with terminal support



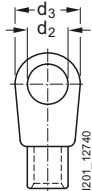


| Type | | 3RB3016, 3RB3113 | 3RB3026, 3RB3123 | 3RB3036, 3RB3133 | 3RB3046, 3RB3143 |
|--|----|--|-------------------|--|--------------------|
| Size | | S00 | S0 | S2 | S3 |
| Main circuit | | | | | |
| Rated insulation voltage U_i (pollution degree 3) | V | 690 | | 690 1 000 with straight-through transformer | 1000 |
| Rated impulse withstand voltage U_{imp} | kV | 6 | | 6 8 with straight-through transformer | 8 |
| Rated operational voltage U_e | V | 690 | | 690 1 000 with straight-through transformer | 1000 |
| Type of current | | | | | |
| • Direct current | | No | | | |
| • Alternating current | | Yes, 50/60 Hz ± 5% | | | |
| Current setting | A | 0.1 ... 0.4 | 0.1 ... 0.4 to | 12.5 ... 50 and | 12.5 ... 50 and |
| | A | 4 ... 16 | 10 ... 40 | 20 ... 80 | 32 ... 115 |
| Heavy starting | | See Equipment Manual | | | |
| Power loss per unit (max.) | W | 0.1 ... 1.1 | 0.1 ... 4.5 | 0.5 ... 4.6 | 0.9 ... 4.6 |
| Short-circuit protection | | | | | |
| • With fuse without contactor | | See "Selection and ordering data", pages 7/105 ... 7/107 | | | |
| • With fuse and contactor | | "Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders", see Configuration Manual. | | | |
| Protective separation between main and auxiliary current paths | | | | | |
| Acc. to IEC 60947-1 (pollution degree 2) | | | | | |
| • For systems with grounded neutral point | V | 690 | | | |
| • For systems with ungrounded neutral point | V | 600 | | | |

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

3RB30, 3RB31 for standard applications

| Type | | 3RB3016, 3RB3113 | 3RB3026, 3RB3123 | 3RB3036, 3RB3133 | 3RB3046, 3RB3143 |
|--|-----------------|---|---|--|---|
| Size | | S00 | S0 | S2 | S3 |
| Conductor cross-sections of main circuit | | | | | |
| Connection type | |  Screw terminals | | |  Screw terminals with box terminal |
| Terminal screw | | M3, Pozidriv size 2 | M4, Pozidriv size 2 | | 4 mm Allen screw |
| Operating devices | mm | ∅ 5 ... 6 | ∅ 5 ... 6 | | 4 mm Allen screw |
| Prescribed tightening torque | Nm | 0.8 ... 1.2 | 2 ... 2.5 | | 4.5 ... 6 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | | | |
| • Solid or stranded | mm ² | 2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾ , 2 x (0.5 ... 4) ¹⁾ | 2 x (1 ... 2.5) ¹⁾ , 2 x (2.5 ... 10) ¹⁾ | 1 x (1 ... 50) ¹⁾ , 2 x (1 ... 35) ¹⁾ | 2 x (2.5 ... 16) ¹⁾ , 2 x (10 ... 50) ¹⁾ , 1 x (10 ... 70) ¹⁾ |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾ | 2 x (1 ... 2.5) ¹⁾ , 2 x (2.5 ... 6) ¹⁾ , max. 1 x 10 | 2 x (1 ... 25) ¹⁾ , 1 x (1 ... 35) ¹⁾ | 2 x (2.5 ... 35) ¹⁾ , 1 x (2.5 ... 50) ¹⁾ |
| • AWG cables, solid or stranded | AWG | 2 x (20 ... 16) ¹⁾ , 2 x (18 ... 14) ¹⁾ , 2 x 12 | 2 x (16 ... 12) ¹⁾ , 2 x (14 ... 8) ¹⁾ | 2 x (18 ... 2) ¹⁾ , 1 x (18 ... 1) ¹⁾ | 2 x (10 ... 1/0) ¹⁾ , 1 x (10 ... 2/0) ¹⁾ |
| Removable box terminals ²⁾ | | | | | |
| • With copper bars ³⁾ | mm | -- | -- | -- | 2 x 12 x 4 |
| • With cable lugs ⁴⁾ | | | | | |
| - Terminal screw | | -- | -- | -- | M6 |
| - Prescribed tightening torque | Nm | -- | -- | -- | 4.5 ... 6 |
| - Usable ring terminal lugs | mm | -- | -- | -- | d ₂ = min. 6.3 d ₃ = max. 19 |
|  | | | | | |
| Connection type | |  Spring-loaded terminals | | | |
| Operating devices | mm | 3.0 x 0.5 and 3.5 x 0.5 | | | |
| Conductor cross-sections (min./max.), 1 conductor can be connected | | | | | |
| • Solid or stranded | mm ² | 1 x (0.5 ... 4) | 1 x (1 ... 10) | -- | |
| • Finely stranded without end sleeve | mm ² | 1 x (0.5 ... 2.5) | 1 x (1 ... 6) | -- | |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 1 x (0.5 ... 2.5) | 1 x (1 ... 6) | -- | |
| • AWG cables, solid or stranded | AWG | 1 x (20 ... 12) | 1 x (18 ... 8) | -- | |
| • Max. external diameter of the conductor insulation | mm | 3.6 | 6.4 | -- | |
| Connection type | |  Straight-through transformers | | | |
| Diameter of opening | mm | -- | | 15 | 18 |

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

²⁾ Cable lug and busbar connection possible after removing the box terminals.

³⁾ If bars larger than 12 mm x 10 mm are connected, a 3RT2946-4EA2 cover is needed to maintain the required phase clearance, [see page 7/109](#).

⁴⁾ If conductors larger than 25 mm² are connected, the 3RT2946-4EA2 cover is needed to maintain the required phase clearance, [see page 7/109](#).



Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

3RB30, 3RB31 for standard applications

| Type | | 3RB3016, 3RB3113 | 3RB3026, 3RB3123 | 3RB3036, 3RB3133 | 3RB3046, 3RB3143 |
|---|----|--|------------------|------------------|------------------|
| Size | | S00 | S0 | S2 | S3 |
| Auxiliary circuit | | | | | |
| Number of NO contacts | | 1 | | | |
| Number of NC contacts | | 1 | | | |
| Auxiliary contacts – Assignment | | 1 NO for the signal "tripped"; 1 NC for disconnecting the contactor | | | |
| Rated insulation voltage U_i (pollution degree 3) | V | 300 | | | |
| Rated impulse withstand voltage U_{imp} | kV | 4 | | | |
| Auxiliary contacts – Contact rating | | | | | |
| • NC, NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e | | | | | |
| - 24 V | A | 4 | | | |
| - 120 V | A | 4 | | | |
| - 125 V | A | 4 | | | |
| - 250 V | A | 3 | | | |
| • NC, NO contacts with direct current DC-13, rated operational current I_e at U_e | | | | | |
| - 24 V | A | 2 | | | |
| - 60 V | A | 0.55 | | | |
| - 110 V | A | 0.3 | | | |
| - 125 V | A | 0.3 | | | |
| - 250 V | A | 0.11 | | | |
| • Conventional thermal current I_{th} | A | 5 | | | |
| • Contact reliability (suitability for PLC control; 17 V, 5 mA) | | Yes | | | |
| Short-circuit protection | | | | | |
| • With fuse, operational class gG | A | 6 | | | |
| Ground-fault protection (only 3RB31) | | | | | |
| • Tripping value I_{Δ} | | The information refers to sinusoidal residual currents at 50/60 Hz. > $0.75 \times I_{motor}$ | | | |
| • Operating range I | | Lower current setting < I_{motor} < $3.5 \times$ upper current setting | | | |
| • Response time t_{trip} (in steady-state condition) | | < 1 | | | |
| Integrated electrical Remote RESET (only 3RB31) | | | | | |
| Connecting terminals A3, A4 | | 24 V DC, max. 200 mA for approx. 20 ms, then < 10 mA | | | |
| Protective separation between auxiliary current paths acc. to IEC 60947-1 | V | 300 | | | |

| Type | | 3RB3016, 3RB3113 | 3RB3026, 3RB3123 | 3RB3036, 3RB3133 | 3RB3046, 3RB3143 |
|--|-----------------|--|------------------|------------------|------------------|
| Size | | S00 | S0 | S2 | S3 |
| CSA, UL, UR rated data | | | | | |
| Auxiliary circuit – Switching capacity | | B600, R300 | | | |
| Conductor cross-sections for auxiliary circuit | | | | | |
| Connection type | |  Screw terminals | | | |
| Terminal screw | | M3, Pozidriv size 2 | | | |
| Operating devices | mm | ø 5 ... 6 | | | |
| Prescribed tightening torque | Nm | 0.8 ... 1.2 | | | |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | | | |
| • Solid or stranded | mm ² | 1 × (0.5 ... 4) ¹⁾ , 2 × (0.5 ... 2.5) ¹⁾ | | | |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 1 × (0.5 ... 2.5) ¹⁾ , 2 × (0.5 ... 1.5) ¹⁾ | | | |
| • AWG cables, solid or stranded | AWG | 2 × (20 ... 14) | | | |
| Connection type | |  Spring-loaded terminals | | | |
| Operating devices | mm | 3.0 × 0.5 | | | |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | | | |
| • Solid or stranded | mm ² | 2 × (0.25 ... 1.5) | | | |
| • Finely stranded without end sleeve | mm ² | 2 × (0.25 ... 1.5) | | | |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 2 × (0.25 ... 1.5) | | | |
| • AWG cables, solid or stranded | AWG | 2 × (24 ... 16) | | | |

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

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

IE3/IE4 ready 3RB30, 3RB31 for standard applications

Selection and ordering data



3RB30 electronic overload relays, CLASS 10E

Features and technical specifications:

- Connection methods
 - Sizes S00 and S0:
Main and auxiliary circuit: Either screw or spring-loaded terminals
 - Sizes S2 and S3:
Main circuit: Screw terminals with box terminal or as straight-through transformer
Auxiliary circuit: Either screw or spring-loaded terminals
- Overload protection, phase failure protection and asymmetry protection

- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and Automatic RESET
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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


| Size contactor | Rated power for three-phase motors, rated value ¹⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ²⁾ | SD | <div>Screw terminals</div> <div></div> | SD | <div>Spring-loaded terminals</div> <div></div> | |
|-------------------|---|---|---|----|---|-------------------|---|-----------------|
| | kW | A | A | d | Article No. | Price per PU d | Article No. | Price per PU |
| Size S00 | | | | | | | | |
| S00 | Devices for mounting onto contactor ³⁾ | | | | | | | |
| | 0.04 ... 0.09 | 0.1 ... 0.4 | 4 | ▶ | 3RB3016-1RB0 | 2 | 3RB3016-1RE0 | |
| | 0.12 ... 0.37 | 0.32 ... 1.25 | 6 | ▶ | 3RB3016-1NB0 | 2 | 3RB3016-1NE0 | |
| | 0.37 ... 1.5 | 1 ... 4 | 20 | ▶ | 3RB3016-1PB0 | 2 | 3RB3016-1PE0 | |
| | 1.5 ... 5.5 | 3 ... 12 | 25 | ▶ | 3RB3016-1SB0 | 2 | 3RB3016-1SE0 | |
| | 2.2 ... 7.5 | 4 ... 16 | 25 | ▶ | 3RB3016-1TB0 | 2 | 3RB3016-1TE0 | |
| Size S0 | | | | | | | | |
| S0 | Devices for mounting onto contactor ³⁾ | | | | | | | |
| | 0.04 ... 0.09 | 0.1 ... 0.4 | 4 | ▶ | 3RB3026-1RB0 | 2 | 3RB3026-1RE0 | |
| | 0.12 ... 0.37 | 0.32 ... 1.25 | 6 | ▶ | 3RB3026-1NB0 | 2 | 3RB3026-1NE0 | |
| | 0.37 ... 1.5 | 1 ... 4 | 20 | ▶ | 3RB3026-1PB0 | 2 | 3RB3026-1PE0 | |
| | 1.5 ... 5.5 | 3 ... 12 | 25 | ▶ | 3RB3026-1SB0 | 2 | 3RB3026-1SE0 | |
| | 3 ... 11 | 6 ... 25 | 50 | ▶ | 3RB3026-1QB0 | 2 | 3RB3026-1QE0 | |
| | 5.5 ... 18.5 | 10 ... 40 | 50 | ▶ | 3RB3026-1VB0 | 2 | 3RB3026-1VE0 | |
| Size S2 | | | | | | | | |
| S2 | Devices with screw terminals (main current side) and for mounting onto contactor ³⁾ | | | | | | | |
| | 7.5 ... 22 | 12.5 ... 50 | 250 | ▶ | 3RB3036-1UB0 | ▶ | 3RB3036-1UD0 | |
| | 11 ... 37 | 20 ... 80 | 250 | ▶ | 3RB3036-1WB0 | ▶ | 3RB3036-1WD0 | |
| | Devices with straight-through transformer for stand-alone installation | | | | | | | |
| | 7.5 ... 22 | 12.5 ... 50 | 250 | ▶ | 3RB3036-1UW1 | ▶ | 3RB3036-1UX1 | |
| | 11 ... 37 | 20 ... 80 | 250 | ▶ | 3RB3036-1WW1 | ▶ | 3RB3036-1WX1 | |
| Size S3 | | | | | | | | |
| S3 | Devices with screw terminals (main current side) and for mounting onto contactor ³⁾ | | | | | | | |
| | 7.5 ... 22 | 12.5 ... 50 | 200 | ▶ | 3RB3046-1UB0 | 2 | 3RB3046-1UD0 | |
| | 18.5 ... 55 | 32 ... 115 | 315 | ▶ | 3RB3046-1XB0 | 2 | 3RB3046-1XD0 | |
| | Devices with straight-through transformer for stand-alone installation | | | | | | | |
| | 7.5 ... 22 | 12.5 ... 50 | 200 | ▶ | 3RB3046-1UW1 | 2 | 3RB3046-1UX1 | |
| | 18.5 ... 55 | 32 ... 115 | 315 | ▶ | 3RB3046-1XW1 | 2 | 3RB3046-1XX1 | |

¹⁾ 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⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see [Configuration Manual](#).

³⁾ With the appropriate terminal supports (see ["Accessories", page 7/108](#)), these overload relays can also be installed as stand-alone units.

Note:

For reliable operational current, note derating information, see [Equipment Manual](#).

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

3RB30, 3RB31 for standard applications **IE3/IE4 ready**

3RB30 electronic overload relays, CLASS 20E

Features and technical specifications:

- Connection methods
 - Sizes S00 and S0:
Main and auxiliary circuit: Either screw or spring-loaded terminals
 - Sizes S2 and S3:
Main circuit: Screw terminals with box terminal or as straight-through transformer
Auxiliary circuit: Either screw or spring-loaded terminals
- Overload protection, phase failure protection and asymmetry protection

- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and Automatic RESET
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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



3RB3016-2.B0



3RB3026-2.B0



3RB3036-2.B0





3RB3036-2.W1



3RB3046-2.B0



3RB3046-2.W1

| Size contactor | Rated power for three-phase motors, rated value ¹⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ²⁾ | SD | Screw terminals | |  | SD | Spring-loaded terminals | |  |
|-------------------|--|---|---|----|-----------------|-----------------|---|----|----------------------------|-----------------|---|
| | kW | A | A | d | Article No. | Price per PU | | d | Article No. | Price per PU | |

Size S00

S00 *Devices for mounting onto contactor³⁾*

| | | | | | | |
|---------------|---------------|----|---|--------------|---|--------------|
| 0.04 ... 0.09 | 0.1 ... 0.4 | 4 | ▶ | 3RB3016-2RB0 | 2 | 3RB3016-2RE0 |
| 0.12 ... 0.37 | 0.32 ... 1.25 | 6 | ▶ | 3RB3016-2NB0 | 2 | 3RB3016-2NE0 |
| 0.37 ... 1.5 | 1 ... 4 | 20 | ▶ | 3RB3016-2PB0 | 2 | 3RB3016-2PE0 |
| 1.5 ... 5.5 | 3 ... 12 | 25 | ▶ | 3RB3016-2SB0 | 2 | 3RB3016-2SE0 |
| 2.2 ... 7.5 | 4 ... 16 | 25 | ▶ | 3RB3016-2TB0 | 2 | 3RB3016-2TE0 |

Size S0

S0 *Devices for mounting onto contactor³⁾*

| | | | | | | |
|---------------|---------------|----|---|--------------|---|--------------|
| 0.04 ... 0.09 | 0.1 ... 0.4 | 4 | ▶ | 3RB3026-2RB0 | 2 | 3RB3026-2RE0 |
| 0.12 ... 0.37 | 0.32 ... 1.25 | 6 | ▶ | 3RB3026-2NB0 | 2 | 3RB3026-2NE0 |
| 0.37 ... 1.5 | 1 ... 4 | 20 | ▶ | 3RB3026-2PB0 | 2 | 3RB3026-2PE0 |
| 1.5 ... 5.5 | 3 ... 12 | 25 | ▶ | 3RB3026-2SB0 | 2 | 3RB3026-2SE0 |
| 3 ... 11 | 6 ... 25 | 50 | ▶ | 3RB3026-2QB0 | 2 | 3RB3026-2QE0 |
| 5.5 ... 18.5 | 10 ... 40 | 50 | ▶ | 3RB3026-2VB0 | 2 | 3RB3026-2VE0 |

Size S2

S2 *Devices with screw terminals (main current side) and for mounting onto contactor³⁾*

| | | | | | | |
|------------|-------------|-----|---|--------------|---|--------------|
| 7.5 ... 22 | 12.5 ... 50 | 250 | ▶ | 3RB3036-2UB0 | ▶ | 3RB3036-2UD0 |
| 11 ... 37 | 20 ... 80 | 250 | ▶ | 3RB3036-2WB0 | ▶ | 3RB3036-2WD0 |

Devices with straight-through transformer for stand-alone installation

| | | | | | | |
|------------|-------------|-----|---|--------------|---|--------------|
| 7.5 ... 22 | 12.5 ... 50 | 250 | ▶ | 3RB3036-2UW1 | ▶ | 3RB3036-2UX1 |
| 11 ... 37 | 20 ... 80 | 250 | ▶ | 3RB3036-2WW1 | ▶ | 3RB3036-2WX1 |

Size S3

S3 *Devices with screw terminals (main current side) and for mounting onto contactor³⁾*

| | | | | | | |
|-------------|-------------|-----|---|--------------|---|--------------|
| 7.5 ... 22 | 12.5 ... 50 | 200 | ▶ | 3RB3046-2UB0 | 2 | 3RB3046-2UD0 |
| 18.5 ... 55 | 32 ... 115 | 315 | ▶ | 3RB3046-2XB0 | 2 | 3RB3046-2XD0 |

Devices with straight-through transformer for stand-alone installation

| | | | | | | |
|-------------|-------------|-----|---|--------------|---|--------------|
| 7.5 ... 22 | 12.5 ... 50 | 200 | ▶ | 3RB3046-2UW1 | 2 | 3RB3046-2UX1 |
| 18.5 ... 55 | 32 ... 115 | 315 | ▶ | 3RB3046-2XW1 | 2 | 3RB3046-2XX1 |

¹⁾ 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⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see Configuration Manual.

³⁾ With the appropriate terminal supports (see "Accessories", page 7/108), these overload relays can also be installed as stand-alone units.

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

IE3/IE4 ready 3RB30, 3RB31 for standard applications



3RB31 electronic overload relays, CLASS 5E, 10E, 20E or 30E (adjustable)

Features and technical specifications:

- Connection methods
 - Sizes S00 and S0:
Main and auxiliary circuit: Either screw or spring-loaded terminals
 - Sizes S2 and S3:
Main circuit: Screw terminals with box terminal or as straight-through transformer
Auxiliary circuit: Either screw or spring-loaded terminals
- Overload protection, phase failure protection and asymmetry protection
- Internal ground-fault detection (activatable)

- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and Automatic RESET
- Electrical Remote RESET integrated
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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


| Size contactor | Rated power for three-phase motors, rated value ¹⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ²⁾ | SD | Screw terminals |  | SD | Spring-loaded terminals |  |
|-------------------|---|---|---|----|-----------------|---|----|----------------------------|---|
| | kW | A | A | d | Article No. | Price per PU | d | Article No. | Price per PU |
| Size S00 | | | | | | | | | |
| S00 | Devices for mounting onto contactor ³⁾ | | | | | | | | |
| | 0.04 ... 0.09 | 0.1 ... 0.4 | 4 | ▶ | 3RB3113-4RB0 | | 2 | 3RB3113-4RE0 | |
| | 0.12 ... 0.37 | 0.32 ... 1.25 | 6 | ▶ | 3RB3113-4NB0 | | 2 | 3RB3113-4NE0 | |
| | 0.37 ... 1.5 | 1 ... 4 | 20 | ▶ | 3RB3113-4PB0 | | 2 | 3RB3113-4PE0 | |
| | 1.5 ... 5.5 | 3 ... 12 | 25 | ▶ | 3RB3113-4SB0 | | 2 | 3RB3113-4SE0 | |
| | 2.2 ... 7.5 | 4 ... 16 | 25 | ▶ | 3RB3113-4TB0 | | 2 | 3RB3113-4TE0 | |
| Size S0 | | | | | | | | | |
| S0 | Devices for mounting onto contactor ³⁾ | | | | | | | | |
| | 0.04 ... 0.09 | 0.1 ... 0.4 | 4 | ▶ | 3RB3123-4RB0 | | 2 | 3RB3123-4RE0 | |
| | 0.12 ... 0.37 | 0.32 ... 1.25 | 6 | ▶ | 3RB3123-4NB0 | | 2 | 3RB3123-4NE0 | |
| | 0.37 ... 1.5 | 1 ... 4 | 20 | ▶ | 3RB3123-4PB0 | | 2 | 3RB3123-4PE0 | |
| | 1.5 ... 5.5 | 3 ... 12 | 25 | ▶ | 3RB3123-4SB0 | | 2 | 3RB3123-4SE0 | |
| | 3 ... 11 | 6 ... 25 | 50 | ▶ | 3RB3123-4QB0 | | 2 | 3RB3123-4QE0 | |
| | 5.5 ... 18.5 | 10 ... 40 | 50 | ▶ | 3RB3123-4VB0 | | 2 | 3RB3123-4VE0 | |
| Size S2 | | | | | | | | | |
| S2 | Devices with screw terminals (main current side) and for mounting onto contactor ³⁾ | | | | | | | | |
| | 7.5 ... 22 | 12.5 ... 50 | 250 | ▶ | 3RB3133-4UB0 | | ▶ | 3RB3133-4UD0 | |
| | 11 ... 37 | 20 ... 80 | 250 | ▶ | 3RB3133-4WB0 | | ▶ | 3RB3133-4WD0 | |
| | Devices with straight-through transformer for stand-alone installation | | | | | | | | |
| | 7.5 ... 22 | 12.5 ... 50 | 250 | ▶ | 3RB3133-4UW1 | | ▶ | 3RB3133-4UX1 | |
| | 11 ... 37 | 20 ... 80 | 250 | ▶ | 3RB3133-4WW1 | | ▶ | 3RB3133-4WX1 | |
| Size S3 | | | | | | | | | |
| S3 | Devices with screw terminals (main current side) and for mounting onto contactor ³⁾ | | | | | | | | |
| | 7.5 ... 22 | 12.5 ... 50 | 200 | ▶ | 3RB3143-4UB0 | | ▶ | 3RB3143-4UD0 | |
| | 18.5 ... 55 | 32 ... 115 | 315 | ▶ | 3RB3143-4XB0 | | ▶ | 3RB3143-4XD0 | |
| | Devices with straight-through transformer for stand-alone installation | | | | | | | | |
| | 7.5 ... 22 | 12.5 ... 50 | 200 | ▶ | 3RB3143-4UW1 | | ▶ | 3RB3143-4UX1 | |
| | 18.5 ... 55 | 32 ... 115 | 315 | ▶ | 3RB3143-4XW1 | | ▶ | 3RB3143-4XX1 | |

¹⁾ 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⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see Configuration Manual.

³⁾ With the appropriate terminal supports (see "Accessories", page 7/108), these overload relays can also be installed as stand-alone units.

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

Accessories










Overview

The following optional accessories are available for the 3RB30/3RB31 electronic overload relays:

- Size-specific terminal support for stand-alone installation, in sizes S00 and S0 also with spring-loaded terminals

- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)
- Sealable cover (for all sizes)

Selection and ordering data





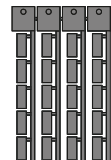
| Version | Size | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG | |
|---|--|-----|---|---------------|--------------------|--------|--------|-----|
| d | | | | | | | | |
| Terminal supports for stand-alone installation | | | | | | | | |
|  3RU2916-3AA01 | Terminal supports for overload relays with screw terminals | | Screw terminals  | | | | | |
| | For separate mounting of the overload relays; screw and snap-on mounting onto standard mounting rail | S00 | ▶ | 3RU2916-3AA01 | 1 | 1 unit | 41F | |
| | | S0 | ▶ | 3RU2926-3AA01 | 1 | 1 unit | 41F | |
| | | S2 | ▶ | 3RU2936-3AA01 | 1 | 1 unit | 41F | |
| | | S3 | 2 | 3RU2946-3AA01 | 1 | 1 unit | 41F | |
|  3RU2926-3AA01 | Terminal supports for overload relays with spring-loaded terminals | | Spring-loaded terminals  | | | | | |
| | For separate mounting of the overload relays; screw and snap-on mounting onto standard mounting rail | S00 | ▶ | 3RU2916-3AC01 | 1 | 1 unit | 41F | |
| | | S0 | ▶ | 3RU2926-3AC01 | 1 | 1 unit | 41F | |
| | | | | | | | | |
| | | | | | | | | |
|  3RU2936-3AA01 | | | | | | | | |
|  3RU2946-3AA01 | | | | | | | | |
|  3RU2916-3AC01 | | | | | | | | |
|  3RU2926-3AC01 | | | | | | | | |
| Mechanical RESET | | | | | | | | |
|  3RB3980-0A with pushbutton and extension plunger | Resetting plungers, holders and formers | | S00 ... S3 | 2 | 3RB3980-0A | 1 | 1 unit | 41F |
| | Pushbuttons with extended stroke (12 mm), IP65, ø 22 mm | | S00 ... S3 | ▶ | 3SU1200-0FB10-0AA0 | 1 | 1 unit | 41J |
| | Extension plungers | | S00 ... S3 | ▶ | 3SU1900-0KG10-0AA0 | 1 | 1 unit | 41J |
| | For compensation of the distance between a pushbutton and the unlatching button of the relay | | | | | | | |
| | | | | | | | | |

Protection Equipment

Overload Relays

SIRIUS 3RB3 Electronic Overload Relays

Accessories

| Version | | | Size | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG | | |
|---|--|------------|-------|--|---|---|-------------------|-------------------|-----|-----------|-----|
| | | | | | d | | | | | | |
| Cable releases with holder for RESET | | | | | | | | | | | |
|  | For ∅ 6.5 mm holes in the control panel; max. control panel thickness 8 mm | | | | | | | | | | |
| | • Length 400 mm | S00 ... S3 | 2 | 3RB3980-0B | 1 | 1 unit | 41F | | | | |
| | • Length 600 mm | S00 ... S3 | 2 | 3RB3980-0C | 1 | 1 unit | 41F | | | | |
| 3RB3980-0. | | | | | | | | | | | |
| Sealable covers | | | | | | | | | | | |
|  | For covering the setting knobs | | | S00 ... S3 | 2 | 3RB3984-0 | 1 | 1 unit | 41F | | |
| 3RB3984-0 | | | | | | | | | | | |
| Terminal covers | | | | | | | | | | | |
|  | Covers for devices with screw terminals (box terminals) | | | | | Screw terminals | | | | | |
| | Additional touch protection for fastening to the box terminals | | | | | | | | | | |
| | • Main current level | S2 | ► | 3RT2936-4EA2 | 1 | 1 unit | 41B | | | | |
| 3RT2936-4EA2 | | | | | | | | | | | |
| | | | | | | S3 | ► | 3RT2946-4EA2 | 1 | 1 unit | 41B |
| General accessories | | | | | | | | | | | |
| Version | | Size | Color | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG | |
| | | | | | d | | | | | | |
| Tools for opening spring-loaded terminals | | | | | | | | | | | |
|  | Screwdrivers | | | | | Spring-loaded terminals | | | | | |
| | For all SIRIUS devices with spring-loaded terminals | | | Length approx. 200 mm, 3.0 mm x 0.5 mm | Titanium gray/ black, partially insulated | Main and auxiliary circuit connection: 3RB3 | 2 | 3RA2908-1A | 1 | 1 unit | 41B |
| | 3RA2908-1A | | | | | | | | | | |
| Blank labels | | | | | | | | | | | |
|  | Unit labeling plates ¹⁾ | | | 20 mm x 7 mm | Titanium gray | 3RB3 | 20 | 3RT2900-1SB20 | 100 | 340 units | 41B |
| | For SIRIUS devices | | | | | | | | | | |
| | 3RT2900-1SB20 | | | | | | | | | | |

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see page 16/15).

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see page 16/15).

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB20, 3RB21 for standard applications

Overview

More information

Homepage, see www.siemens.com/sirius-overloadrelays

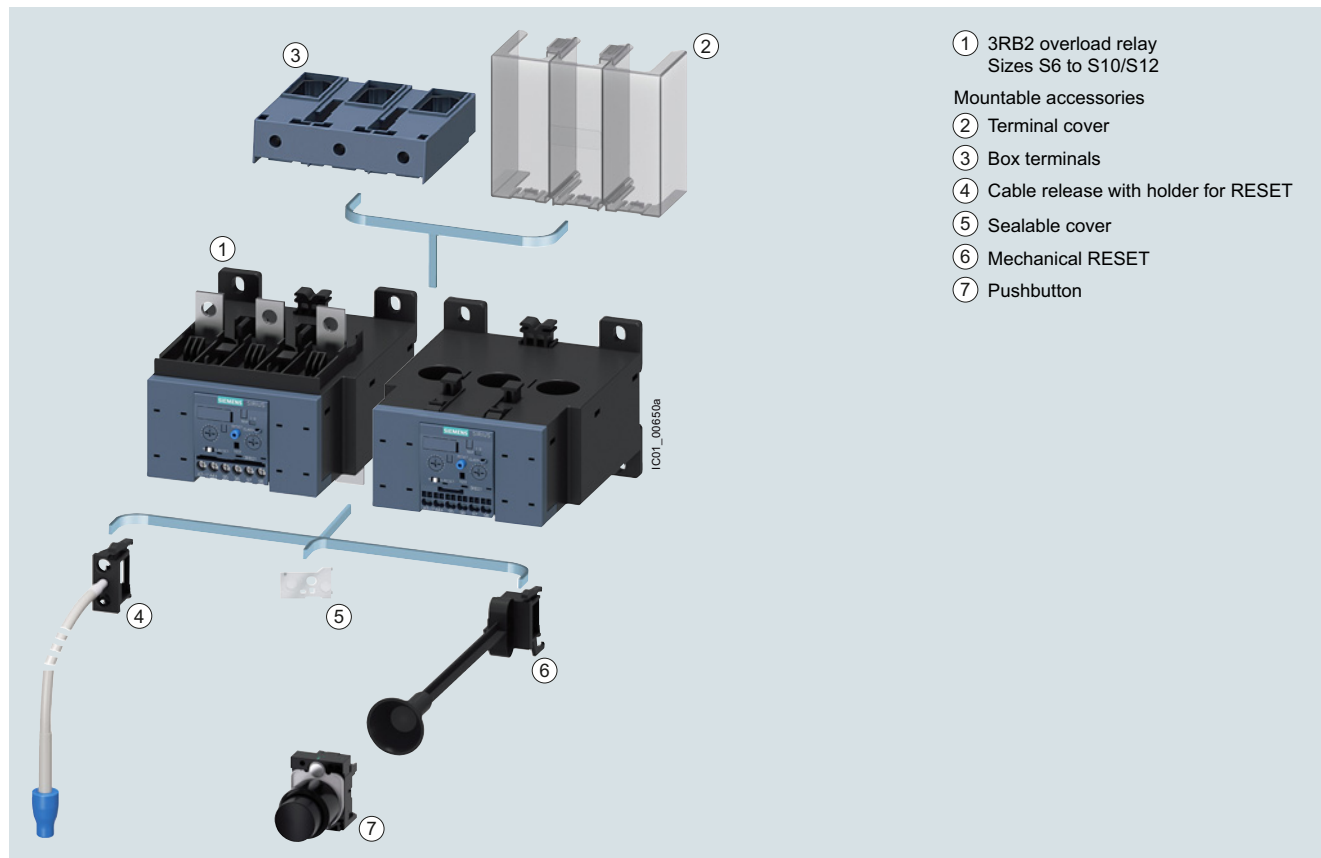
Industry Mall, see www.siemens.com/product?3RB2

Conversion tool for article numbers, see www.siemens.com/sirius/conversion-tool

Application Manual "SIRIUS Controls with IE3/IE4 motors", see <https://support.industry.siemens.com/cs/ww/en/view/94770820>

Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/60298164>

Characteristics and certificates, see <https://support.industry.siemens.com/cs/ww/en/ps/16278>



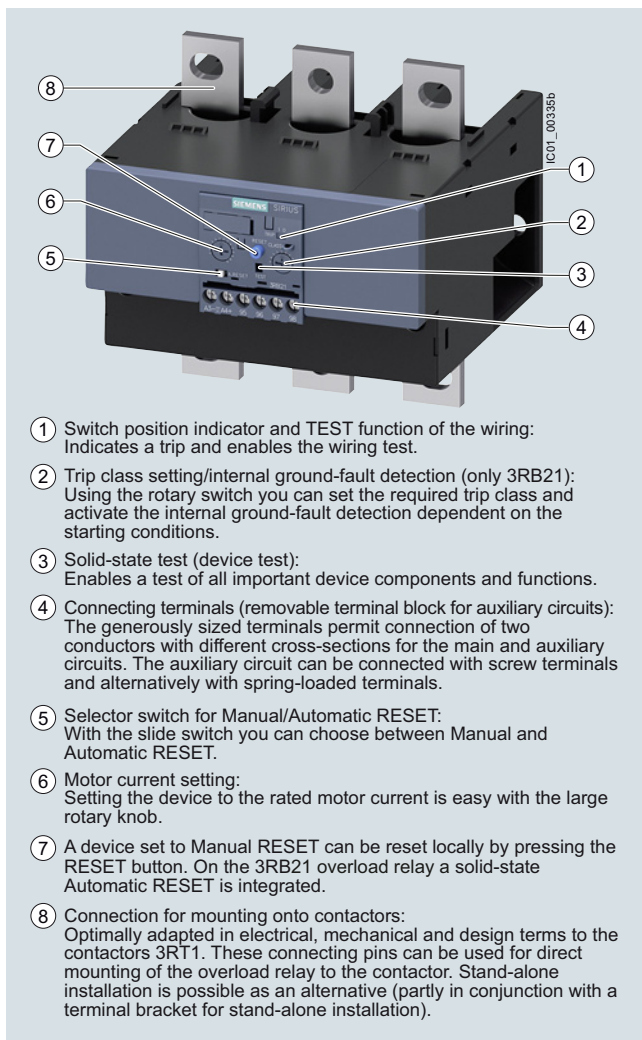
Mountable accessories for 3RB2 electronic overload relays (sizes S6 to S10/S12)

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB20, 3RB21 for standard applications



SIRIUS 3RB2153-4FW2 electronic overload relay

The 3RB20 and 3RB21 electronic overload relays up to 630 A with internal power supply have been designed for current-dependent protection of loads with normal and heavy starting (see [Equipment Manual](#)) against excessive temperature rises due to overload, phase asymmetry or phase failure.

An overload, phase asymmetry or phase failure result in an increase of the motor current beyond the set rated motor current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding electronic circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and the current setting I_n and is stored in the form of a long-term stable tripping characteristic curve, see [Characteristics](#).

In addition to inverse-time delayed protection of loads against excessive temperature rises due to overload, phase asymmetry and phase failure, the 3RB21 electronic overload relays also allow internal ground-fault detection (not possible in conjunction with contactor assemblies for star-delta (wye-delta) starting). This provides protection of loads against high-resistance short circuits due to damage to the insulation material, moisture, condensed water, etc.

The "tripped" status is signaled by means of a switch position indicator. The relay is reset manually or automatically after the recovery time has elapsed.

The 3RB2 electronic overload relays are suitable for operation with frequency converters, see [Equipment Manual](#).

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials. They comply with all important worldwide standards and approvals.

For 3RB30 and 3RB31 overload relay sizes S00 to S3, see [page 7/105 onwards](#).

Use in hazardous areas

The 3RB20/3RB21 electronic overload relays are suitable for the overload protection of motors with the following types of protection:

- Ex II (2) G [Ex e] [Ex d] [Ex px]
- Ex II (2) D [Ex t] [Ex p]

EC type test certificate for Group II, Category (2) G/D exists. It has the number PTB 06 ATEX 3001.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB20, 3RB21 for standard applications

Article No. scheme

| Product versions | | Article number | | | | | | |
|---|---|----------------------|---|---|---|---|---|-------|
| Electronic overload relays | | 3RB2 □ □ □ - □ □ □ □ | | | | | | |
| Device type | e.g. 0 = standard device, with internal supply, for three-phase loads | □ | □ | □ | □ | □ | □ | □ |
| Size, rated operational current and power | e.g. 5 = 200 A (90 kW) for size S6 | □ | □ | □ | □ | □ | □ | □ |
| Version of the Automatic RESET, electrical Remote RESET | e.g. 6 = switchable between Manual/Auto RESET | □ | □ | □ | □ | □ | □ | □ |
| Trip class (CLASS) | e.g. 1 = CLASS 10E | □ | □ | □ | □ | □ | □ | □ |
| Setting range of the overload release | e.g. F = 5 ... 200 A | □ | □ | □ | □ | □ | □ | □ |
| Connection methods | e.g. C = busbar connections main circuit; screw terminals auxiliary circuit | □ | □ | □ | □ | □ | □ | □ |
| Installation type | e.g. 2 = mounting on contactor and stand-alone installation | □ | □ | □ | □ | □ | □ | □ |
| Example | | 3RB2 | 0 | 5 | 6 | - | 1 | F C 2 |

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

The most important features and benefits of the 3RB20/3RB21 electronic overload relays are listed in the overview table (see "General data", page 7/79 onwards).

Application

Industries

The 3RB20 and 3RB21 electronic overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5E to 30E), minimize project completion times, inventories and energy consumption, and optimize plant availability and maintenance management.

Application

The 3RB20 and 3RB21 electronic overload relays have been designed for the protection of three-phase motors in sinusoidal 50/60 Hz voltage networks. The relays are not suitable for the protection of single-phase AC or DC loads.

The 3RU21 thermal overload relays or the 3RB22 to 3RB24 electronic overload relays can be used for single-phase AC loads. For DC loads we recommend the 3RU21 thermal overload relay.

Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive ambient conditions, ageing and temperature fluctuations.

For the temperature range from -25 °C to +60 °C, the 3RB20 and 3RB21 electronic overload relays compensate the temperature in accordance with IEC 60947-4-1.

For the 3RB20 and 3RB21 electronic overload relays with the sizes S6, S10 and S12, the upper set value of the setting range must be reduced for ambient temperatures > 50 °C by a certain factor.

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

Note:

For the use of 3RB20 and 3RB21 electronic overload relays in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see [Application Manual](#).

For more information, see page 1/7.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB20, 3RB21 for standard applications

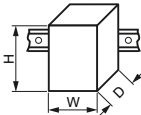
Technical specifications

More information

Configuration Manual "Load Feeders – SIRIUS Modular System", see <https://support.industry.siemens.com/cs/ww/en/view/39714188>
 Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/60298164>

Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16278/td>

The following technical information is intended to provide an initial overview of the various types of devices and functions.

| | | | | |
|---|---|----|---|--|
| Type Size Dimensions (W x H x D) (overload relay with stand-alone installation support) |  | mm | 3RB2056, 3RB2153 S6 120 x 119 x 155 | 3RB2066, 3RB2163 S10/S12 145 x 147 x 156 |
| General data | | | | |
| Tripping in the event of | | | Overload, phase failure, and phase asymmetry + ground fault (for 3RB21 only) | |
| Trip class acc. to IEC 60947-4-1 | | | CLASS | 3RB20: 10E or 20E; 3RB21: 5E, 10E, 20E and 30E adjustable |
| Phase failure sensitivity | | | Yes | |
| Overload warning | | | No | |
| Reset and recovery | | | 3RB20: Manual and Automatic RESET; 3RB21: Manual, Automatic and Remote RESET | |
| • Reset options after tripping | | | | |
| • Recovery time | | | Approx. 3 min | |
| - For Automatic RESET | | | Immediately | |
| - For Manual RESET | | | Immediately | |
| - For Remote RESET | | | Immediately | |
| Features | | | Yes, by means of switch position indicator slide | |
| • Display of operating state on device | | | Yes, test of electronics by pressing the TEST button/ test of auxiliary contacts and wiring of control circuit by actuating the switch position indicator slide/ self-monitoring | |
| • TEST function | | | Yes | |
| • RESET button | | | No | |
| • STOP button | | | | |
| Protection and operation of explosion-proof motors | | | PTB 06 ATEX 3001 ⚠ II (2) G [Ex e] [Ex d] [Ex px] ⚠ II (2) G [Ex t] [Ex p] See https://support.industry.siemens.com/cs/ww/en/view/23814648 | |
| Ambient temperatures | | | | |
| • Storage/transport | °C | | -40 ... +80 | |
| • Operation | °C | | -25 ... +60 | |
| • Temperature compensation | °C | | +60 | |
| • Permissible rated current at | | | | |
| - Temperature inside control cabinet 60 °C, stand-alone installation | % | | 100 | 100 or 90 ¹⁾ |
| - Temperature inside control cabinet 60 °C, mounted on contactor | % | | 70 | 70 |
| - Temperature inside control cabinet 70 °C | % | | On request | |
| Degree of protection acc. to IEC 60529 | | | | |
| • Screw terminals/busbar connections | | | - IP20 (front side) - Terminal IP00 (use additional terminal covers for higher degree of protection) | |
| • Straight-through transformers | | | IP20 | -- |

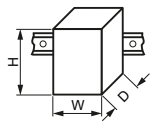
¹⁾ 90% for relay with current setting range 160 A to 630 A.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB20, 3RB21 for standard applications




| | | | | |
|---|---|----|--|--|
| Type |  | mm | 3RB2056, 3RB2153 | 3RB2066, 3RB2163 |
| Size | | | S6 | S10/S12 |
| Dimensions (W x H x D) (overload relay with stand-alone installation support) | | | 120 x 119 x 155 | 145 x 147 x 156 |
| General data (continued) | | | | |
| Touch protection acc. to IEC 60529 | | | Finger-safe with terminal covers for vertical contact from the front | |
| • Screw terminals/busbar connections | | | Finger-safe | -- |
| • Straight-through transformers | | | | |
| Shock resistance with sine acc. to IEC 60068-2-27 | | | g/ms | 15/11 (signaling contact 97/98 in position "tripped": 4 g/11 ms) |
| Electromagnetic compatibility (EMC) – Interference immunity | | | | |
| • Conductor-related interference | | | | |
| - Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3) | | | kV | 2 (power ports), 1 (signal port) |
| - Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3) | | | kV | 2 (line to earth), 1 (line to line) |
| • Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3) | | | kV | 8 (air discharge), 6 (contact discharge) |
| • Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3) | | | V/m | 10 |
| Electromagnetic compatibility (EMC) – Emitted interference | | | Degree of severity B acc. to EN 55011 (CISPR 11) and EN 55022 (CISPR 22) | |
| Resistance to extreme climates – Air humidity | | | % | 100 |
| Installation altitude above sea level | | | m | Up to 2 000 |
| Mounting position | | | Any | |
| Type of mounting | | | Direct mounting/stand-alone installation | |

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB20, 3RB21 for standard applications

| Type | | 3RB2056, 3RB2153 | 3RB2066, 3RB2163 |
|--|-----------------|---|--|
| Size | | S6 | S10/S12 |
| Main circuit | | | |
| Rated insulation voltage U_i (pollution degree 3) | V | 1 000 | |
| Rated impulse withstand voltage U_{imp} | kV | 8 | |
| Rated operational voltage U_e | V | 1 000 | |
| Type of current | | | |
| • Direct current | | No | |
| • Alternating current | | Yes, 50/60 Hz ± 5% | |
| Current setting | A | 50 ... 200 | 55 ... 250, 160 ... 630 |
| Power loss per unit (max.) | W | 0.05 | |
| Short-circuit protection | | | |
| • With fuse without contactor | | See "Selection and ordering data", pages 7/117 ... 7/119 | |
| • With fuse and contactor | | "Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders", see Configuration Manual. | |
| Protective separation between main and auxiliary current paths Acc. to IEC 60947-1 (pollution degree 2) | | | |
| • For systems with grounded neutral point | V | 690 | |
| • For systems with ungrounded neutral point | V | 600 | |
| Conductor cross-sections of the main circuit | | | |
| Connection type | |  Screw terminals with box terminal | |
| Terminal screw | mm | 4 mm Allen screw | 5 mm Allen screw |
| Operating devices | mm | 4 mm Allen screw | 5 mm Allen screw |
| Prescribed tightening torque | Nm | 10 ... 12 | 20 ... 22 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | |
| • Solid | mm ² | -- | -- |
| • Finely stranded without end sleeve | mm ² | With 3RT1955-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70); With 3RT1956-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120) | 2 × (50 ... 185), Front clamping point only: 1 × (70 ... 240); Rear clamping point only: 1 × (120 ... 185) |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | With 3RT1955-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70); With 3RT1956-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120) | 2 × (50 ... 185), Front clamping point only: 1 × (70 ... 240); Rear clamping point only: 1 × (120 ... 185) |
| • Stranded | mm ² | With 3RT1955-4G box terminal: 2 × (max. 70), 1 × (16 ... 70); With 3RT1956-4G box terminal: 2 × (max. 120), 1 × (16 ... 120) | 2 × (70 ... 240), Front clamping point only: 1 × (95 ... 300); Rear clamping point only: 1 × (120 ... 240) |
| • AWG cables, solid or stranded | AWG | With 3RT1955-4G box terminal: 2 × (max. 1/0), 1 × (6 ... 2/0); With 3RT1956-4G box terminal: 2 × (max. 3/0), 1 × (6 ... 250 kcmil) | 2 × (2/0 ... 500 kcmil), Front clamping point only: 1 × (3/0 ... 600 kcmil); Rear clamping point only: 1 × (250 kcmil ... 500 kcmil) |
| • Ribbon cables (number x width x thickness) | mm | With 3RT1955-4G box terminal: 2 × (6 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 6 × 15.5 × 0.8); With 3RT1956-4G box terminal: 2 × (10 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 10 × 15.5 × 0.8) | 2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5) |
| Connection type | | | |
| | |  Busbar connections | |
| Terminal screw | | M8 × 25 | M10 × 30 |
| Prescribed tightening torque | Nm | 10 ... 14 | 14 ... 24 |
| Conductor cross-sections (min./max.) | | | |
| • Finely stranded with cable lug | mm ² | 16 ... 95 ¹⁾ | 50 ... 240 ²⁾ |
| • Stranded with cable lug | mm ² | 25 ... 120 ¹⁾ | 70 ... 240 ²⁾ |
| • AWG cables, solid or stranded, with cable lug | AWG | 4 ... 250 kcmil | 2/0 ... 500 kcmil |
| • With connecting bars (max. width) | mm | 15 | 25 |
| Connection type | | | |
| | |  Straight-through transformers | |
| Diameter of opening | mm | 24.5 | -- |

¹⁾ When connecting cable lugs according to DIN 46235 with conductor cross-sections of 95 mm² and more, the 3RT1956-4EA1 terminal cover must be used to ensure phase clearance, see page 7/120.

²⁾ When connecting cable lugs according to DIN 46234 for conductor cross-sections from 240 mm², as well as DIN 46235 for cable cross-sections from 185 mm², the 3RT1956-4EA1 terminal cover must be used to ensure phase clearance, see page 7/120.

3RB20, 3RB21 for standard applications

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

Selection and ordering data

3RB20 electronic overload relays for mounting onto contactors and stand-alone installation, CLASS 10E

Features and technical specifications:



- Connection methods
 - Size S6
Main circuit: With busbar connection or as straight-through transformer (an appropriate connection kit with screws, spring washers and nuts is enclosed with the devices with busbar connection)
Auxiliary circuit: Either screw or spring-loaded terminals
 - Sizes S10/S12:
Main circuit: With busbar connection (an appropriate connection kit with screws, spring washers and nuts is enclosed)
Auxiliary circuit: Either screw or spring-loaded terminals
 - Overload protection, phase failure protection and asymmetry protection
 - Internal power supply
 - Auxiliary contacts 1 NO + 1 NC
 - Manual and Automatic RESET
 - Switch position indicator
 - TEST function and self-monitoring
- PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41G



3RB2056-1FW2



3RB2066-1MF2

| Size contactor | Rated power for three-phase motors, rated value ¹⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ²⁾ | SD | Screw terminals (on auxiliary current side) | SD | Spring-loaded terminals (on auxiliary current side) | |
|---|---|--|--|----|---|--------------|---|--------------|
| | | | | |  | |  | |
| | kW | A | A | d | Article No. | Price per PU | Article No. | Price per PU |
| Size S6 | | | | | | | | |
| Devices with busbar connection, for mounting onto contactor and stand-alone installation | | | | | | | | |
| S6 | 30 ... 90 | 50 ... 200 | 315 | ▶ | 3RB2056-1FC2 | 2 | 3RB2056-1FF2 | |
| Devices with straight-through transformer, for mounting onto contactor and stand-alone installation | | | | | | | | |
| For mounting onto S6 contactors with box terminals | 30 ... 90 | 50 ... 200 | 315 | ▶ | 3RB2056-1FW2 | ▶ | 3RB2056-1FX2 | |
| Size S10/S12 | | | | | | | | |
| Devices with busbar connection, for mounting onto contactor and stand-alone installation | | | | | | | | |
| S10/S12 | 30 ... 132 | 55 ... 250 | 400 | ▶ | 3RB2066-1GC2 | ▶ | 3RB2066-1GF2 | |
| and size 14 (3TF68/3TF69) ³⁾ | 90 ... 355 | 160 ... 630 | 800 | ▶ | 3RB2066-1MC2 | ▶ | 3RB2066-1MF2 | |

¹⁾ 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⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see [Configuration Manual](#).

³⁾ For 3TF68/3TF69 contactors, direct mounting is not possible.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB20, 3RB21 for standard applications **IE3/IE4 ready**

3RB20 electronic overload relays for mounting onto contactors and stand-alone installation, CLASS 20E

Features and technical specifications:



- Connection methods
 - Size S6
Main circuit: With busbar connection or as straight-through transformer (an appropriate connection kit with screws, spring washers and nuts is enclosed with the devices with busbar connection)
Auxiliary circuit: Either screw or spring-loaded terminals
 - Sizes S10/S12:
Main circuit: With busbar connection (an appropriate connection kit with screws, spring washers and nuts is enclosed)
Auxiliary circuit: Either screw or spring-loaded terminals
 - Overload protection, phase failure protection and asymmetry protection
 - Internal power supply
 - Auxiliary contacts 1 NO + 1 NC
 - Manual and Automatic RESET
 - Switch position indicator
 - TEST function and self-monitoring
- PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41G



3RB2056-2FW2



3RB2066-2MF2

| | | | | | | | | | |
|----------------|---|--|--|----|---|---|----|---|---|
| Size contactor | Rated power for three-phase motors, rated value ¹⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ²⁾ | SD | Screw terminals (on auxiliary current side) |  | SD | Spring-loaded terminals (on auxiliary current side) |  |
| | kW | A | A | d | Article No. | Price per PU | d | Article No. | Price per PU |

Size S6

Devices with busbar connection, for mounting onto contactor and stand-alone installation

| | | | | | | | |
|----|-----------|------------|-----|---|--------------|---|--------------|
| S6 | 30 ... 90 | 50 ... 200 | 315 | ▶ | 3RB2056-2FC2 | 2 | 3RB2056-2FF2 |
|----|-----------|------------|-----|---|--------------|---|--------------|

Devices with straight-through transformer, for mounting onto contactor and stand-alone installation

| | | | | | | | |
|--|-----------|------------|-----|---|--------------|---|--------------|
| For mounting onto S6 contactors with box terminals | 30 ... 90 | 50 ... 200 | 315 | ▶ | 3RB2056-2FW2 | ▶ | 3RB2056-2FX2 |
|--|-----------|------------|-----|---|--------------|---|--------------|

Size S10/S12²⁾

Devices with busbar connection, for mounting onto contactor and stand-alone installation

| | | | | | | | |
|---|------------|-------------|-----|---|--------------|---|--------------|
| S10/S12 | 30 ... 132 | 55 ... 250 | 400 | ▶ | 3RB2066-2GC2 | ▶ | 3RB2066-2GF2 |
| and size 14 (3TF68/3TF69) ³⁾ | 90 ... 355 | 160 ... 630 | 800 | ▶ | 3RB2066-2MC2 | ▶ | 3RB2066-2MF2 |

¹⁾ 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⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see [Configuration Manual](#).

³⁾ For 3TF68/3TF69 contactors, direct mounting is not possible.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

IE3/IE4 ready 3RB20, 3RB21 for standard applications

3RB21 electronic overload relays for mounting onto contactors and stand-alone installation, CLASS 5E, 10E, 20E and 30E adjustable

Features and technical specifications:

- Connection methods
 - Size S6
Main circuit: With busbar connection or as straight-through transformer (an appropriate connection kit with screws, spring washers and nuts is enclosed with the devices with busbar connection)
Auxiliary circuit: Either screw or spring-loaded terminals
 - Sizes S10/S12:
Main circuit: With busbar connection (an appropriate connection kit with screws, spring washers and nuts is enclosed)
Auxiliary circuit: Either screw or spring-loaded terminals
 - Overload protection, phase failure protection and asymmetry protection
 - Internal ground-fault detection (activatable)
 - Internal power supply
 - Auxiliary contacts 1 NO + 1 NC
 - Manual and Automatic RESET
 - Electrical Remote RESET integrated
 - Switch position indicator
 - TEST function and self-monitoring
- PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41G



3RB2153-4FW2



3RB2163-4MF2

| Size contactor | Rated power for three-phase motors, rated value ¹⁾ | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ²⁾ | SD | Screw terminals (on auxiliary current side) | SD | Spring-loaded terminals (on auxiliary current side) | |
|----------------|---|--|--|----|---|--------------|---|--------------|
| | kW | A | A | d | Article No. | Price per PU | Article No. | Price per PU |

Size S6

Devices with busbar connection, for mounting onto contactor and stand-alone installation

| | | | | | | | |
|----|-----------|------------|-----|---|--------------|---|--------------|
| S6 | 30 ... 90 | 50 ... 200 | 315 | ▶ | 3RB2153-4FC2 | ▶ | 3RB2153-4FF2 |
|----|-----------|------------|-----|---|--------------|---|--------------|

Devices with straight-through transformer, for mounting onto contactor and stand-alone installation

| | | | | | | | |
|--|-----------|--|--|---|--------------|---|--------------|
| For mounting onto S6 contactors with box terminals | 30 ... 90 | | | ▶ | 3RB2153-4FW2 | ▶ | 3RB2153-4FX2 |
|--|-----------|--|--|---|--------------|---|--------------|

Size S10/S12²⁾

Devices with busbar connection, for mounting onto contactor and stand-alone installation

| | | | | | | | |
|---|------------|-------------|-----|---|--------------|---|--------------|
| S10/S12 and size 14 (3TF68/3TF69) ³⁾ | 30 ... 132 | 55 ... 250 | 400 | ▶ | 3RB2163-4GC2 | ▶ | 3RB2163-4GF2 |
| | 90 ... 355 | 160 ... 630 | 800 | ▶ | 3RB2163-4MC2 | ▶ | 3RB2163-4MF2 |

¹⁾ 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⁾ Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see [Configuration Manual](#).

³⁾ For 3TF68/3TF69 contactors, direct mounting is not possible.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

Accessories for 3RB20, 3RB21







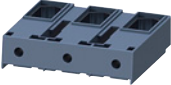
Overview

Overload relays for standard applications

The following optional accessories are available for the 3RB20 and 3RB21 electronic overload relays:

- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)
- Sealable cover (for all sizes)
- Terminal covers for sizes S6 to S10/S12
- Box terminal blocks for sizes S6 and S10/S12

Selection and ordering data

| Version | Size | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|---|--|------------------|-------------|---------------------------|-------------------|--------|-----|
| Mechanical RESET | | | | | | | |
|  | Resetting plungers, holders and formers | S6 ... S12 | 2 | 3RB3980-0A | 1 | 1 unit | 41F |
| | Pushbuttons with extended stroke (12 mm), IP65, Ø 22 mm | S6 ... S12 | ▶ | 3SU1200-0FB10-0AA0 | 1 | 1 unit | 41J |
| | Extension plungers For compensation of the distance between a pushbutton and the unlatching button of the relay | S6 ... S12 | ▶ | 3SU1900-0KG10-0AA0 | 1 | 1 unit | 41J |
| Cable releases with holder for RESET | | | | | | | |
|  | For Ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm | | | | | | |
| | • Length 400 mm | S6 ... S12 | 2 | 3RB3980-0B | 1 | 1 unit | 41F |
| | • Length 600 mm | S6 ... S12 | 2 | 3RB3980-0C | 1 | 1 unit | 41F |
| Sealable covers | | | | | | | |
|  | For covering the setting knobs | S6 ... S12 | 2 | 3RB3984-0 | 1 | 1 unit | 41F |
| Terminal covers | | | | | | | |
|  | Covers for cable lugs and busbar connections | | | | | | |
| | • Length 100 mm | S6 | ▶ | 3RT1956-4EA1 | 1 | 1 unit | 41B |
| | • Length 120 mm | S10/S12 | 2 | 3RT1966-4EA1 | 1 | 1 unit | 41B |
|  | Covers for box terminals | | | | | | |
| | • Length 25 mm | S6 | ▶ | 3RT1956-4EA2 | 1 | 1 unit | 41B |
| | • Length 30 mm | S10/S12 | 2 | 3RT1966-4EA2 | 1 | 1 unit | 41B |
|  | Covers for screw terminals Between contactor and overload relay, without box terminals (1 unit required per combination) | | | | | | |
| | | S6 | ▶ | 3RT1956-4EA3 | 1 | 1 unit | 41B |
| | | S10/S12 | 2 | 3RT1966-4EA3 | 1 | 1 unit | 41B |
| Box terminal blocks | | | | | | | |
|  | For round and ribbon cables | | | | | | |
| | • Up to 70 mm ² | S6 ¹⁾ | ▶ | 3RT1955-4G | 1 | 1 unit | 41B |
| | • Up to 120 mm ² | S6 | ▶ | 3RT1956-4G | 1 | 1 unit | 41B |
| | • Up to 240 mm ² | S10/S12 | ▶ | 3RT1966-4G | 1 | 1 unit | 41B |

¹⁾ In the scope of supply for 3RT1054-1 contactors (55 kW).



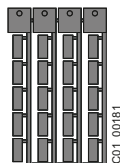
Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

Accessories for 3RB20, 3RB21

General accessories

| Version | Size | Color | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|--|--|--|--|---|-------------|--|-------------------|-----------|-----|
| | | | | | d | | | | |
| Tools for opening spring-loaded terminals | | | | | | | | | |
|  3RA2908-1A | Screwdrivers For all SIRIUS devices with spring-loaded terminals | Length approx. 200 mm, 3.0 mm x 0.5 mm | Titanium gray/black, partially insulated | Main and auxiliary circuit connection: 3RB2 | 2 | Spring-loaded terminals  | 1 | 1 unit | 41B |
| | | | | | | 3RA2908-1A | | | |
| Blank labels | | | | | | | | | |
|  3RT2900-1SB20 | Unit labeling plates¹⁾ For SIRIUS devices | 20 mm x 7 mm | Titanium gray | 3RB2 | 20 | 3RT2900-1SB20 | 100 | 340 units | 41B |
| | | | | | | | | | |

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see page 16/15).

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

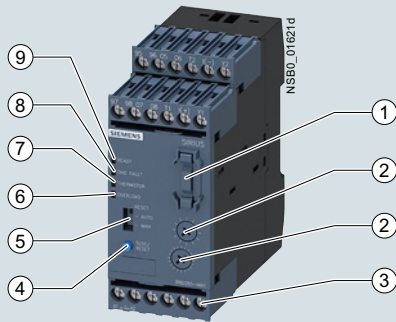
3RB22, 3RB23 for high-feature applications

Overview

More information

Homepage, see www.siemens.com/sirius-overloadrelays
 Industry Mall, see www.siemens.com/product?3RB2

Application Manual "SIRIUS Controls with IE3/IE4 motors", see <https://support.industry.siemens.com/cs/ww/en/view/94770820>
 Operating Instructions "3RB22, 3RB23 Electronic Overload Relays", see <https://support.industry.siemens.com/cs/ww/en/view/21833251>
 Characteristics and certificates see <https://support.industry.siemens.com/cs/ww/en/ps/16280>



- ① 3RB2985 function expansion module:
Enables more functions to be added, e.g. internal ground-fault detection and/or an analog output with corresponding signals.
- ② Motor current and trip class setting:
Setting the device to the motor current and to the required trip class dependent on the starting conditions is easy with the two rotary switches.
- ③ Connecting terminals (removable joint block):
The generously sized terminals permit connection of two conductors with different cross-sections for the auxiliary, control and sensor circuits. Connection is possible with screw terminals and alternatively with spring-loaded terminals.
- ④ Test/RESET button:
Enables testing of all important device components and functions, plus resetting of the device after a trip when Manual RESET is selected.
- ⑤ Selector switch for Manual/Automatic RESET:
With this switch you can choose between Manual and Automatic RESET.
- ⑥ Red LED "OVERLOAD":
A continuous red light signals an active overload trip; a flickering red light signals an imminent trip (overload warning).
- ⑦ Red LED "THERMISTOR":
A continuous red light signals an active thermistor trip.
- ⑧ Red LED "GND FAULT":
A continuous red light signals a ground-fault tripping.
- ⑨ Green LED "READY":
A continuous green light signals that the device is working correctly.

SIRIUS 3RB22 and 3RB23 evaluation modules

The 3RB22 and 3RB23 electronic overload relays up to 630 A (up to 820 A possible in combination with a series transformer) are from a modular system and comprise an evaluation unit, a current measuring module and a connecting cable. The 3RB22 overload relays (with monostable auxiliary contacts) and the 3RB23 overload relays (with bistable auxiliary contacts) are supplied from an external voltage.

They have been designed for inverse-time delayed protection of loads with normal and heavy starting against excessive temperature rises due to overload, phase asymmetry or phase failure. An overload, phase asymmetry or phase failure result in an increase of the motor current beyond the set rated motor current.

This current rise is detected by means of a current measuring module (see page 7/140) and electronically evaluated by the evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor.

The break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic curve (see Characteristics). The "tripped" status is signaled by means of a continuous red "OVERLOAD" LED.

The LED indicates imminent tripping of the relay due to overload, phase asymmetry or phase failure by flickering when the limit current has been violated. In the case of the 3RB22 and 3RB23 overload relays this warning can also be issued through auxiliary contacts.

In addition to the described inverse-time delayed protection of loads against excessive temperature rises, the 3RB22 and 3RB23 electronic overload relays also allow direct temperature monitoring of the motor windings (full motor protection!) by connection with broken-wire interlock of a PTC sensor circuit. With this temperature-dependent protection, the loads can be protected against overheating caused, for example, indirectly by reduced coolant flow and which cannot be detected by means of the current alone. In the event of overheating, the devices switch off the contactor, and thus the load, by means of the auxiliary contacts. The "tripped" status is signaled by means of a continuously illuminated "THERMISTOR" LED.

To protect the loads against high-resistance short circuits due to damage to the insulation, humidity, condensed water, etc., the 3RB22 and 3RB23 electronic overload relays offer the possibility of internal ground fault monitoring in conjunction with a function expansion module (for details, see Operating Instructions, not possible in conjunction with contactor assemblies for star-delta (wye-delta) starting). In the event of a ground fault, the 3RB22 and 3RB23 relays trip instantaneously.

The "tripped" status is signaled by means of a continuous red "Ground Fault" LED. Signaling through auxiliary contacts is also possible.

After tripping due to overload, phase asymmetry, phase failure, thermistor or ground-fault tripping, the relay is reset manually or automatically after the recovery time has elapsed.

In conjunction with a function expansion module, the motor current measured by the microprocessor can be output in the form of a DC 4 mA to 20 mA analog signal for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB22, 3RB23 for high-feature applications

With an additional AS-Interface analog module the current values can also be transferred over the AS-i bus system.

The 3RB2 electronic overload relays are suitable for operation with frequency converters.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials. They comply with all important worldwide standards and approvals.

Article No. scheme

| Product versions | | Article number | | | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Electronic overload relays | | 3RB2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Device type | e.g. 2 = monostable device for high-feature applications, supplied from external source, for three-phase loads | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Size, rated operational current and power | e.g. 8 = irrespective of size and current | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Version of the Automatic RESET, electrical Remote RESET | e.g. 3 = switchable between Manual/Auto RESET, with integral electrical Remote RESET | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Trip class (CLASS) | e.g. 4 = CLASS 5E, 10E, 20E, 30E (adjustable) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Setting range of the overload release | e.g. A = none specified | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Connection methods | e.g. A = screw terminals for auxiliary, control and main circuits | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Installation type | e.g. 1 = stand-alone installation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Example | | 3RB2 | 2 | 8 | 3 | - | 4 | A | 1 |

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

Use in hazardous areas

The 3RB22 electronic overload relays (monostable) with the 3RB29 current measuring module are suitable for the overload protection of explosion-proof motors.

EC type test certificate for category (2) G/D exists. It has the number PTB 05 ATEX 3022.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

The most important features and benefits of the 3RB22 and 3RB23 electronic overload relays are listed in the overview table, see "General data", page 7/79 onwards.

Application

Industries

The 3RB22 and 3RB23 electronic overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed and temperature-dependent protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5 to CLASS 30), minimize project completion times, inventories and power consumption, and optimize plant availability and maintenance management.

Application

The 3RB22 and 3RB23 devices have been designed for the protection of three-phase asynchronous and single-phase AC motors.

If single-phase AC motors are to be protected by the 3RB22 and 3RB23 electronic overload relays, the main current paths of the current measuring modules must be series-connected. For circuit diagrams, see [Operating Instructions](#).

Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive ambient conditions, ageing and temperature fluctuations.

For the temperature range from -25 °C to +60 °C, the 3RB22 and 3RB23 electronic overload relays compensate the temperature in accordance with IEC 60947-4-1.

Configuration notes for use of the devices below -25 °C or above +60 °C on request.

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

Note:

For the use of 3RB22 and 3RB23 electronic overload relays in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see [Application Manual](#).

For more information, see page 1/7.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB22, 3RB23 for high-feature applications

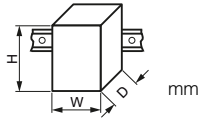

Technical specifications

More information

Application Manual "SIRIUS Controls with IE3/IE4 motors", see <https://support.industry.siemens.com/cs/ww/en/view/94770820>
 Configuration Manual "Load Feeders – SIRIUS Modular System", see <https://support.industry.siemens.com/cs/ww/en/view/39714188>

Operating Instructions "3RB22, 3RB23 Electronic Overload Relays", see <https://support.industry.siemens.com/cs/ww/en/view/21833251>
 Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16280/td>

The following technical information is intended to provide an initial overview of the various types of devices and functions.

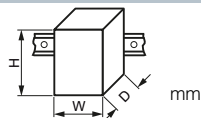
| Type – Overload relay: Evaluation modules | | | 3RB2283-4A.1 | 3RB2383-4A.1 |
|--|------|---|---|--------------|
| Size contactor | | | S00 ... S10/S12 | |
| Dimensions of evaluation modules (W x H x D) | |  | 45 x 111 x 95 | |
| General data | | | | |
| Tripping in the event of | | | Overload, phase failure and phase asymmetry (> 40% according to NEMA), + ground fault (with corresponding function expansion module) and activation of the thermistor motor protection (with closed PTC sensor circuit) | |
| Trip class acc. to IEC 60947-4-1 | | CLASS | 5E, 10E, 20E and 30E adjustable | |
| Phase failure sensitivity | | | Yes | |
| Overload warning | | | Yes, from $1.125 \times I_g$ for symmetrical loads and from $0.85 \times I_g$ for unsymmetrical loads | |
| Reset and recovery | | | Manual, Automatic and Remote RESET | |
| <ul style="list-style-type: none"> Reset options after tripping Recovery time <ul style="list-style-type: none"> - For Automatic RESET - For Manual RESET - For Remote RESET | min. | | <ul style="list-style-type: none"> - For tripping due to overcurrent: 3 (stored permanently) - For tripping by thermistor: Time until the motor temperature has fallen 5 K below the response temperature - For tripping due to a ground fault: no Automatic RESET | |
| | min. | | <ul style="list-style-type: none"> - For tripping due to overcurrent: 3 (stored permanently) - For tripping by thermistor: Time until the motor temperature has fallen 5 K below the response temperature - For tripping due to a ground fault: Immediately | |
| | min. | | <ul style="list-style-type: none"> - For tripping due to overcurrent: 3 (stored permanently) - For tripping by thermistor: Time until the motor temperature has fallen 5 K below the response temperature - For tripping due to a ground fault: Immediately | |
| Features | | | <ul style="list-style-type: none"> • Display of operating state on device | |
| | | | Yes, with four LEDs: - Green LED "Ready" - Red LED "Ground Fault" - Red LED "Thermistor" - Red LED "Overload" | |
| • TEST function | | | Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET/self-monitoring | |
| • RESET button | | | Yes, with the TEST/RESET button | |
| • STOP button | | | No | |
| Protection and operation of explosion-proof motors | | | PTB 05 ATEX 3022  II (2) GD | |
| Certificate of suitability/explosion protection type according to ATEX directive 2014/34/EU | | | see https://support.automation.siemens.com/WW/en/view/en/23115758 | |
| Ambient temperatures | | | | |
| • Storage/transport | °C | | -40 ... +80 | |
| • Operation | °C | | -25 ... +60 | |
| • Temperature compensation | °C | | +60 | |
| • Permissible rated current | | | | |
| - Temperature inside control cabinet 60 °C | % | | 100 | |
| - Temperature inside control cabinet 70 °C | % | | On request | |
| Degree of protection acc. to IEC 60529 | | | IP20 | |
| Touch protection acc. to IEC 60529 | | | Finger-safe | |
| Shock resistance with sine acc. to IEC 60068-2-27 | | g/ms | 15/11 | |

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB22, 3RB23 for high-feature applications

| | | | | | |
|---|--|---|---|---------------------|--|
| Type – Overload relay: Evaluation modules | | 3RB2283-4A.1 | | 3RB2383-4A.1 | |
| Size contactor | | S00 ... S10/S12 | | | |
| Dimensions of evaluation modules (W x H x D) | | 45 x 111 x 95 | | | |
|  | | mm | | | |
| General data (continued) | | | | | |
| Electromagnetic compatibility (EMC) – Interference immunity | | | | | |
| • Conductor-related interference | | | | | |
| - Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3) | | kV | 2 (power ports), 1 (signal port) | | |
| - Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3) | | kV | 2 (line to earth), 1 (line to line) | | |
| • Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3) | | kV | 8 (air discharge), 6 (contact discharge) | | |
| • Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3) | | V/m | 10 | | |
| Electromagnetic compatibility (EMC) – Emitted interference | | Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22) | | | |
| Resistance to extreme climates – Air humidity | | % | 100 | | |
| Installation altitude above sea level | | m | Up to 2 000 | | |
| Mounting position | | Any | | | |
| Type of mounting | | | | | |
| • Evaluation modules | | | Stand-alone installation | | |
| • Current measuring modules | | Size | S00 to S3: Stand-alone installation, S6 and S10/S12: Stand-alone installation or mounting onto contactors | | |
| | | | | | |
| Type – Overload relay: Evaluation modules | | 3RB2283-4A.1, 3RB2383-4A.1 | | | |
| Size contactor | | S00 ... S10/S12 | | | |
| Auxiliary circuit | | | | | |
| Number of NO contacts | | 2 | | | |
| Number of NC contacts | | 2 | | | |
| Number of CO contacts | | -- | | | |
| Auxiliary contacts – Assignment | | • Alternative 1 - 1 NO for the signal "tripped by overload and/or thermistor", - 1 NC for disconnecting the contactor, - 1 NO for the signal "tripped by ground fault", - 1 NC for disconnecting the contactor or ¹⁾ • Alternative 2 - 1 NO for the signal "tripped by overload and/or thermistor and/or ground fault", - 1 NC for disconnecting the contactor, - 1 NO for overload warning - 1 NC for disconnecting the contactor | | | |
| Rated insulation voltage U_i (pollution degree 3) | | V | 300 | | |
| Rated impulse withstand voltage U_{imp} | | kV | 4 | | |
| Auxiliary contacts – Contact rating | | | | | |
| • NC, NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e | | | | | |
| - 24 V | | A | 6 | | |
| - 120 V | | A | 6 | | |
| - 125 V | | A | 6 | | |
| - 250 V | | A | 3 | | |
| • NC, NO contacts with direct current DC-13, rated operational current I_e at U_e | | | | | |
| - 24 V | | A | 2 | | |
| - 60 V | | A | 0.55 | | |
| - 110 V | | A | 0.3 | | |
| - 125 V | | A | 0.3 | | |
| - 250 V | | A | 0.2 | | |
| • Conventional thermal current I_{th} | | A | 5 | | |
| • Contact reliability (suitability for PLC control; 17 V, 5 mA) | | | Yes | | |
| Short-circuit protection | | | | | |
| • With fuse, operational class gG | | A | 6 | | |
| • With miniature circuit breaker, C characteristic | | A | 1.6 | | |
| Protective separation between auxiliary current paths acc. to IEC 60947-1 | | V | 300 | | |
| CSA, UL, UR rated data | | | | | |
| Auxiliary circuit – Switching capacity | | B300, R300 | | | |



¹⁾ The assignment of auxiliary contacts may be influenced by function expansion modules.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB22, 3RB23 for high-feature applications

| | | | |
|---|-----------------|--|-------------|
| Type – Overload relay: Evaluation modules | | 3RB2283-4A.1, 3RB2383-4A.1 | |
| Size contactor | | S00 ... S10/S12 | |
| Control circuit | | | |
| Rated insulation voltage U_i (pollution degree 3) | V | 300 | |
| Rated impulse withstand voltage U_{imp} | kV | 4 | |
| Rated control supply voltage U_s | | | |
| • 50/60 Hz AC | V | 24 ... 240 | |
| • DC | V | 24 ... 240 | |
| Operating range | | | |
| • 50/60 Hz AC | | $0.85 \times U_{s \min} \leq U_s \leq 1.1 \times U_{s \max}$ | |
| • DC | | $0.85 \times U_{s \min} \leq U_s \leq 1.1 \times U_{s \max}$ | |
| Rated power | | | |
| • 50/60 Hz AC | W | 0.5 | |
| • DC | W | 0.5 | |
| Mains buffering time | ms | 200 | |
| Sensor circuit | | | |
| Thermistor motor protection (PTC thermistor sensor) | | | |
| • Summation cold resistance | k Ω | ≤ 1.5 | |
| • Response value | k Ω | 3.4 ... 3.8 | |
| • Return value | k Ω | 1.5 ... 1.65 | |
| Ground-fault detection | | The information refers to sinusoidal residual currents at 50/60 Hz. | |
| • Tripping value $I_{\Delta}^{(1)}$ | | | |
| - For $0.3 \times I_e < I_{motor} < 2.0 \times I_e$ | | $> 0.3 \times I_e$ | |
| - For $2.0 \times I_e < I_{motor} < 8.0 \times I_e$ | | $> 0.15 \times I_{motor}$ | |
| • Response time t_{trip} | ms | 500 ... 1 000 | |
| Analog output¹⁾²⁾ | | | |
| Rated values | | | |
| • Output signal | mA | 4 ... 20 | |
| • Measuring range | | 0 ... $1.25 \times I_e$ 4 mA corresponds to $0 \times I_e$ 16.8 mA corresponds to $1.0 \times I_e$ 20 mA corresponds to $1.25 \times I_e$ | |
| • Load, max. | Ω | 100 | |
| Conductor cross-sections for the auxiliary, control and sensor circuits as well as the analog output | | | |
| Connection type | |  Screw terminals | |
| Terminal screw | | M3, Pozidriv size 2 | |
| Operating devices | | mm | 3.0 x 0.5 |
| Prescribed tightening torque | | Nm | 0.8 ... 1.2 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | |
| • Solid or stranded | mm ² | $1 \times (0.5 \dots 4)^{(3)}, 2 \times (0.5 \dots 2.5)^{(3)}$ | |
| • Finely stranded without end sleeve | mm ² | -- | |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | $1 \times (0.5 \dots 2.5)^{(3)}, 2 \times (0.5 \dots 1.5)^{(3)}$ | |
| • AWG cables, solid or stranded | AWG | $2 \times (20 \dots 14)$ | |
| Connection type | |  Spring-loaded terminals | |
| Operating devices | | mm | 3.0 x 0.5 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | |
| • Solid or stranded | mm ² | $2 \times (0.25 \dots 1.5)$ | |
| • Finely stranded without end sleeve | mm ² | -- | |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | $2 \times (0.25 \dots 1.5)$ | |
| • AWG cables, solid or stranded | AWG | $2 \times (24 \dots 16)$ | |

¹⁾ For the 3RB22 and 3RB23 overload relays in combination with a corresponding function expansion module.

²⁾ Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. In this case the analog input module must not supply current to the analog output of the 3RB22 and 3RB23 relay.

³⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB22, 3RB23 for high-feature applications
Functions of the 3RB22 and 3RB23 evaluation modules in combination with the 3RB2985 function expansion modules

| Evaluation modules | With function expansion module | Basic functions | Inputs | T1/T2 | Y1/Y2 |
|--|--------------------------------|---|------------------------------------|---------------------------|-------------------------|
| | | | A1/A2 | | |
| 3RB2283-4AA1 3RB2283-4AC1 3RB2383-4AA1 3RB2383-4AC1 | -- | Inverse-time delayed protection, temperature-dependent protection, electrical Remote RESET, overload warning | Power supply 24 ... 240 V AC/DC | Connection for PTC sensor | Electrical Remote RESET |
| | 3RB2985-2CA1 | Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical Remote RESET, overload warning | Power supply 24 ... 240 V AC/DC | Connection for PTC sensor | Electrical Remote RESET |
| | 3RB2985-2CB1 | Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical Remote RESET, ground-fault signal | Power supply 24 ... 240 V AC/DC | Connection for PTC sensor | Electrical Remote RESET |
| | 3RB2985-2AA0 | Inverse-time delayed protection, temperature-dependent protection, electrical Remote RESET, overload warning, analog output | Power supply 24 ... 240 V AC/DC | Connection for PTC sensor | Electrical Remote RESET |
| | 3RB2985-2AA1 | Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical Remote RESET, overload warning, analog output | Power supply 24 ... 240 V AC/DC | Connection for PTC sensor | Electrical Remote RESET |
| | 3RB2985-2AB1 | Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical Remote RESET, ground-fault signal, analog output | Power supply 24 ... 240 V AC/DC | Connection for PTC sensor | Electrical Remote RESET |

| Evaluation modules | With function expansion module | Outputs | | | | |
|--|--------------------------------|---------------|---|------------------|---|--------------------------------|
| | | I (-) / I (+) | 95/96 NC | 97/98 NO | 05/06 NC | 07/08 NO |
| 3RB2283-4AA1 3RB2283-4AC1 3RB2383-4AA1 3RB2383-4AC1 | -- | No | Disconnection of the contactor (inverse-time delayed/temperature-dependent protection) | Signal "tripped" | Overload warning | Overload warning |
| | 3RB2985-2CA1 | No | Disconnection of the contactor (inverse-time delayed/temperature-dependent protection + ground fault) | Signal "tripped" | Overload warning | Overload warning |
| | 3RB2985-2CB1 | No | Disconnection of the contactor (inverse-time delayed/temperature-dependent protection) | Signal "tripped" | Disconnection of the contactor (ground fault) | Signal "ground-fault tripping" |
| | 3RB2985-2AA0 | Analog signal | Disconnection of the contactor (inverse-time delayed/temperature-dependent protection) | Signal "tripped" | Overload warning | Overload warning |
| | 3RB2985-2AA1 | Analog signal | Disconnection of the contactor (inverse-time delayed/temperature-dependent protection + ground fault) | Signal "tripped" | Overload warning | Overload warning |
| | 3RB2985-2AB1 | Analog signal | Disconnection of the contactor (inverse-time delayed/temperature-dependent protection) | Signal "tripped" | Disconnection of the contactor (ground fault) | Signal "ground-fault tripping" |

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB22, 3RB23 for high-feature applications **IE3/IE4 ready**

3RB22 and 3RB23 electronic overload relays (evaluation modules) for full motor protection for stand-alone installation, CLASS 5E, 10E, 20E and 30E (adjustable)

| Type | 3RB2283-4A.1, 3RB2383-4A.1 |
|---|---------------------------------------|
| Features and technical specifications | |
| Overload protection, phase failure protection and asymmetry protection | ✓ |
| Supplied from an external source | ✓ 24 ... 240 V AC/DC |
| Auxiliary contacts | ✓ 2 NO + 2 NC |
| Electrical Remote RESET integrated | ✓ |
| Four LEDs for operating and status displays | ✓ |
| TEST function and self-monitoring | ✓ |
| Internal ground-fault detection | ✓ (with function expansion module) |
| Screw or spring-loaded terminals for auxiliary, control and sensor circuits | ✓ |
| Input for PTC sensor circuit | ✓ |
| Analog output | ✓ (with function expansion module) |

✓ Available

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 UNIT
PG = 41G



3RB2283-4AA1,
3RB2383-4AA1



3RB2283-4AC1,
3RB2383-4AC1

| Size contactor | Version | SD | Screw terminals | | SD | Spring-loaded terminals | |
|-------------------|---------|----|-----------------|-----------------|----|-------------------------|-----------------|
| | | | Article No. | Price per PU | | Article No. | Price per PU |

Evaluation modules

| | | | | | |
|-------------|------------|---|---------------------|---|---------------------|
| S00 ... S12 | Monostable | ▶ | 3RB2283-4AA1 | ▶ | 3RB2283-4AC1 |
| | Bistable | ▶ | 3RB2383-4AA1 | ▶ | 3RB2383-4AC1 |

Note:

Overview of overload relays – matching contactors, see [page 7/84](#).

Current measuring modules and related connecting cables, see [page 7/140](#), general accessories, see [page 7/141 onwards](#).


Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

IE3/IE4 ready 3RB22, 3RB23 for high-feature applications

Function expansion modules for 3RB22 and 3RB23 overload relays (evaluation modules)

| Size contactor | Version | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|---|-------------|---|-----------------|-----------------------|-----------------|-------------------------|--------|-----|
| Sizes S00 to S12 | | | | | | | | |
|  3RB2985-2..1 | S00 ... S12 | For plugging into evaluation module (1 unit) | | | | | | |
| | | Analog Basic 1 modules ¹⁾ Analog output DC 4 ... 20 mA, with overload warning | 3RB22, 3RB23 | ▶ 3RB2985-2AA0 | | 1 | 1 unit | 41F |
| | | Analog Basic 1 GF modules ¹⁾²⁾ Analog output DC 4 ... 20 mA, with internal ground-fault detection and overload warning | 3RB22, 3RB23 | ▶ 3RB2985-2AA1 | | 1 | 1 unit | 41F |
| | | Analog Basic 2 GF modules ¹⁾²⁾ Analog output DC 4 ... 20 mA, with internal ground-fault detection and ground-fault signaling | 3RB22, 3RB23 | ▶ 3RB2985-2AB1 | | 1 | 1 unit | 41F |
| | | Basic 1 GF modules ²⁾ with internal ground-fault detection and overload warning | 3RB22, 3RB23 | ▶ 3RB2985-2CA1 | | 1 | 1 unit | 41F |
| | | Basic 2 GF modules ²⁾ with internal ground-fault detection and ground-fault signaling | 3RB22, 3RB23 | ▶ 3RB2985-2CB1 | | 1 | 1 unit | 41F |

¹⁾ The analog signal 4 mA up to 20 mA DC can be used for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.

²⁾ The following information on ground-fault protection refers to sinusoidal residual currents at 50/60 Hz:

- With a motor current of between 0.3 and 2 times the current setting I_e , the unit will trip at a ground-fault current equal to 30% of the current setting.
- With a motor current of between 2 and 8 times the current setting I_e , the unit will trip at a ground-fault current equal to 15% of the motor current.
- The response delay amounts to between 0.5 s and 1 s.

Note:

Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. In this case the analog input module must not supply current to the analog output of the 3RB22/3RB23 relay.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB24 for IO-Link for high-feature applications

Overview

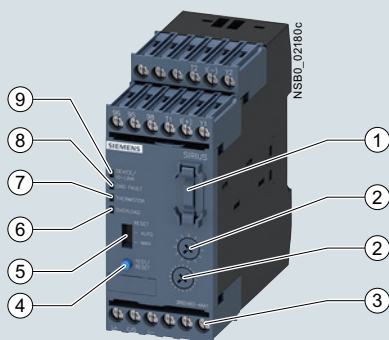
More information

Homepage, see www.siemens.com/sirius-overloadrelays
 Industry Mall, see www.siemens.com/product?3RB2

Application Manual "SIRIUS Controls with IE3/IE4 motors", see <https://support.industry.siemens.com/cs/ww/en/view/94770820>

Equipment Manual "SIRIUS 3RB24 Electronic Overload Relay for IO-Link", see <https://support.industry.siemens.com/cs/ww/en/view/46165627>

Certificates, see <https://support.industry.siemens.com/cs/ww/en/ps/16281/cert>



- ① Plug-in point for operator panel:
enables connection of the 3RA6935-0A operator panel.
- ② Motor current and trip class setting:
Setting the device to the motor current and to the required trip class dependent on the starting conditions is easy with the two rotary switches.
- ③ Connecting terminals (removable terminal block):
The generously sized terminals permit connection of two conductors with different cross-sections for the auxiliary, control and sensor circuits. Connection is possible with screw terminals and alternatively with spring-loaded terminals.
- ④ Test/RESET button:
Enables testing of all important device components and functions, plus resetting of the device after a trip when Manual RESET is selected.
- ⑤ Selector switch for Manual/Automatic RESET:
With this switch you can choose between Manual and Automatic RESET.
- ⑥ Red LED "OVERLOAD":
A continuous red light signals an active overload trip; a flickering led light signals an imminent trip (overload warning).
- ⑦ Red LED "THERMISTOR":
A continuous red light signals an active thermistor trip.
- ⑧ Red LED "GND FAULT":
A continuous red light signals an active ground-fault trip.
- ⑨ Green LED "DEVICE/IO-Link":
A continuous green light signals that the device is working correctly, a green flickering light signals the communication through IO-Link.

SIRIUS 3RB24 evaluation module

The modular, IO-Link powered 3RB24 electronic overload relays (with monostable auxiliary contacts) up to 630 A (up to 820 A possible with a series transformer) have been designed for current-dependent protection of loads with normal and heavy starting against excessive temperature rises due to overload, phase asymmetry or phase failure. It comprises an evaluation unit, a current measuring module and a connecting cable.

The evaluation module 3RB24 also offers an engine starter function: The contactors, which are connected via the auxiliary contacts, can also be actuated for operation via IO-Link. In this way, direct-on-line, reversing and wye-delta starters up to 630 A (or 830 A) can be connected to the controller wirelessly via the IO-Link controller.

An overload, phase asymmetry or phase failure result in an increase of the motor current beyond the set rated motor current.

This current rise is detected by means of the current measuring module (see page 7/140) and electronically evaluated by the evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor.

The break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic curve (see Equipment Manual). The "tripped" status is signaled by means of a continuously illuminated red "OVERLOAD" LED and also reported as a group fault via IO-Link.

The LED indicates imminent tripping of the relay due to overload, phase asymmetry or phase failure by flickering when the limit current has been violated. This warning can also be reported to the higher-level PLC via IO-Link at the 3RB24 overload relays.

In addition to the described inverse-time delayed protection of loads against excessive temperature rises, the 3RB24 electronic overload relays also allow direct temperature monitoring of the motor windings (full motor protection!) by connection with broken-wire interlock of a PTC sensor circuit. With this temperature-dependent protection, the loads can be protected against overheating caused, for example, indirectly by reduced coolant flow and which cannot be detected by means of the current alone. In the event of overheating, the devices switch off the contactor, and thus the load, by means of the auxiliary contacts. The "tripped" status is signaled by means of a continuously illuminated "THERMISTOR" LED and also reported as a group fault via IO-Link.

To protect the loads against incomplete ground faults due to damage to the insulation, humidity, condensation, etc., the 3RB24 electronic overload relays offer the possibility of internal ground-fault detection (for details, see Equipment Manual, not possible in conjunction with contactor assemblies for star-delta (wye-delta) starting). In the event of a ground fault, the 3RB24 relays trip instantaneously.

The "tripped" status is signaled by means of a flashing red LED "Ground Fault" and reported at the overload relay 3RB24 as a group fault via IO-Link.

The reset after overload, phase asymmetry, phase failure, thermistor or ground-fault tripping is performed manually by key on site, via IO-Link or by electrical Remote RESET or automatically after the cooling time (motor model) or for thermistor protection after sufficient cooling. Trips in devices initiated by function monitoring systems (broken wire or short-circuit on the thermistor) can only be reset locally.

A motor current measured by the microprocessor can be output in the form of an analog signal DC 4 mA to 20 mA for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB24 for IO-Link for high-feature applications

The current values can be transmitted to the higher-level controller via IO-Link.

The 3RB24 electronic overload relay for IO-Link is suitable for operation with frequency converters.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials. They comply with all important worldwide standards and approvals.

Use in hazardous areas

The 3RB24 electronic overload relays for IO-Link with the 3RB29 current measuring module are suitable for the overload protection of motors with the following types of protection:

- Ex II (2) G [Ex e] [Ex d] [Ex px]
- Ex II (2) D [Ex t] [Ex p]

EC type test certificate for Group II, Category (2) G/D exists. It has the number PTB 11 ATEX 3014.

Article No. scheme

| Product versions | | Article number | | | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Electronic overload relays | | 3RB2 | | | | | | | |
| Device type | e.g. 4 = monostable device for high-feature applications, supplied from external source (24 V DC), for three-phase loads | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Size, rated operational current and power | e.g. 8 = irrespective of size and current | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Version of the Automatic RESET, electrical Remote RESET | e.g. 3 = switchable between Manual/Auto RESET, with integral electrical Remote RESET | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Trip class (CLASS) | e.g. 4 = CLASS 5E, 10E, 20E, 30E (adjustable) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Setting range of the overload release | e.g. A = none specified | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Connection methods | e.g. A = screw terminals for auxiliary, control and main circuits | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Installation type | e.g. 1 = stand-alone installation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Example | | 3RB2 | 4 | 8 | 3 | - | 4 | A | A 1 |

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB24 for IO-Link for high-feature applications

Application

Industries

The 3RB24 electronic overload relays are suitable for customers from all industries who want to guarantee optimum current and temperature-dependent protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5E to 30E), minimize project completion times, inventories and energy consumption, and optimize plant availability and maintenance management.

Application

The 3RB24 electronic overload relays have been designed for the protection of three-phase asynchronous and single-phase AC motors.

In addition to protection function, these devices can be used together with contactors as direct-on-line or reversing starters (star-delta (wye-delta) start also possible), which are controlled via IO-Link. This makes it possible to directly control drives via IO-Link from a higher-level controller or on site via the optional hand-held device and also, for example, to return current values directly via IO-Link.

If single-phase AC motors are to be protected by the 3RB24 electronic overload relays, the main current paths of the current measuring modules must be series-connected (circuit diagrams, [see Equipment Manual](#)).

Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive ambient conditions, ageing and temperature fluctuations.

In the temperature range from -25 °C to +60 °C, the 3RB24 electronic overload relays compensate the temperature in accordance with IEC 60947-4-1.

Configuration notes for use of the devices below -25 °C or above +60 °C on request.

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

Note:

For the use of 3RB24 electronic overload relays in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, [see Application Manual](#).

For more information, [see page 1/7](#).

Technical specifications

More information

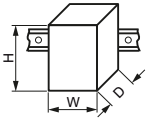
Application Manual "SIRIUS Controls with IE3/IE4 motors", see <https://support.industry.siemens.com/cs/ww/en/view/94770820>

Configuration Manual "Load Feeders – SIRIUS Modular System", see <https://support.industry.siemens.com/cs/ww/en/view/39714188>

Equipment Manual "SIRIUS 3RB24 Electronic Overload Relay for IO-Link", see <https://support.industry.siemens.com/cs/ww/en/view/46165627>

Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16281/td>

The following technical information is intended to provide an initial overview of the various types of devices and functions.

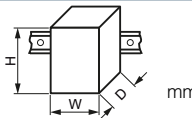
| | | | | | |
|--|--|---|---|---|--|
| Type – Overload relay: Evaluation modules | |  | | 3RB2483-4A.1 | |
| Size contactor Dimensions of evaluation modules (W x H x D) | | mm | | S00 ... S10/S12 45 x 111 x 95 | |
| General data | | | | | |
| Tripping in the event of | | | Overload, phase failure and phase asymmetry (> 40% according to NEMA), + ground fault (connectable and disconnectable) and activation of the thermistor motor protection (with closed PTC sensor circuit) | | |
| Trip class acc. to IEC 60947-4-1 | | | CLASS 5E, 10E, 20E and 30E adjustable | | |
| Phase failure sensitivity | | | Yes | | |
| Overload warning | | | Yes, from $1.125 \times I_e$ for symmetrical loads and from $0.85 \times I_e$ for unsymmetrical loads | | |
| Reset and recovery | | | Manual and Automatic RESET, electrical Remote RESET or through IO-Link | | |
| <ul style="list-style-type: none"> Reset options after tripping Recovery time <ul style="list-style-type: none"> - For Automatic RESET - For Manual RESET - For Remote RESET | | | min. | <ul style="list-style-type: none"> - For tripping due to overcurrent: 3 (stored permanently) - For tripping by thermistor: Time until the motor temperature has fallen 5 K below the response temperature - For tripping due to a ground fault: no Automatic RESET | |
| | | | min. | <ul style="list-style-type: none"> - For tripping due to overcurrent: 3 (stored permanently) - For tripping by thermistor: Time until the motor temperature has fallen 5 K below the response temperature - For tripping due to a ground fault: Immediately | |
| | | | min. | <ul style="list-style-type: none"> - For tripping due to overcurrent: 3 (stored permanently) - For tripping by thermistor: Time until the motor temperature has fallen 5 K below the response temperature - For tripping due to a ground fault: Immediately | |

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB24 for IO-Link for high-feature applications



| | | | |
|--|------|---|---|
| Type – Overload relay: Evaluation modules Size contactor Dimensions of evaluation modules (W x H x D) | |  | 3RB2483-4A.1 S00 ... S10/S12 45 x 111 x 95 |
| General data (continued) | | | |
| Features | | | |
| <ul style="list-style-type: none"> Display of operating state on device | | | Yes, with four LEDs: - Green "DEVICE/IO-Link" LED - Red LED "Ground Fault" - Red LED "Thermistor" - Red LED "Overload" |
| <ul style="list-style-type: none"> TEST function | | | Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET/self-monitoring |
| <ul style="list-style-type: none"> RESET button | | | Yes, with the TEST/RESET button |
| <ul style="list-style-type: none"> STOP button | | | No |
| Protection and operation of explosion-proof motors | | | |
| Certificate of suitability/explosion protection type according to ATEX directive 2014/34/EU | | | PTB 11 ATEX 3014 ⚠ II (2) G [Ex e] [Ex d] [Ex px] ⚠ II (2) D [Ex t] [Ex p] See https://support.industry.siemens.com/cs/ww/en/view/60524083 |
| Ambient temperatures | | | |
| <ul style="list-style-type: none"> Storage/transport | °C | | -40 ... +80 |
| <ul style="list-style-type: none"> Operation | °C | | -25 ... +60 |
| <ul style="list-style-type: none"> Temperature compensation | °C | | +60 |
| <ul style="list-style-type: none"> Permissible rated current | | | |
| <ul style="list-style-type: none"> - Temperature inside control cabinet 60 °C | % | | 100 |
| <ul style="list-style-type: none"> - Temperature inside control cabinet 70 °C | % | | On request |
| Degree of protection acc. to IEC 60529 | | | IP20 |
| Touch protection acc. to IEC 60529 | | | Finger-safe |
| Shock resistance with sine acc. to IEC 60068-2-27 | | g/ms | 15/11 |
| Electromagnetic compatibility (EMC) – Interference immunity | | | |
| <ul style="list-style-type: none"> Conductor-related interference | | | |
| <ul style="list-style-type: none"> - Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3) | kV | | 2 (power ports), 1 (signal port) |
| <ul style="list-style-type: none"> - Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3) | kV | | 2 (line to earth), 1 (line to line) |
| <ul style="list-style-type: none"> Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3) | kV | | 8 (air discharge), 6 (contact discharge) |
| <ul style="list-style-type: none"> Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3) | V/m | | 10 |
| Electromagnetic compatibility (EMC) – Emitted interference | | | Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22) |
| Resistance to extreme climates – Air humidity | | % | 100 |
| Installation altitude above sea level | | m | Up to 2 000 |
| Mounting position | | | Any |
| Type of mounting | | | |
| <ul style="list-style-type: none"> Evaluation modules | | | Stand-alone installation |
| <ul style="list-style-type: none"> Current measuring module | Size | | S00 to S3: Stand-alone installation, S6 and S10/S12: Stand-alone installation or mounting onto contactors |

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB24 for IO-Link for high-feature applications

| | | |
|---|-----------------|--|
| Type – Overload relay: Evaluation modules | | 3RB2483-4A.1 |
| Size contactor | | S00 ... S10/S12 |
| Auxiliary circuit | | |
| Number of auxiliary switches | | 1 CO contact, 1 NO contact connected in series internally |
| Auxiliary contacts – Assignment | | <ul style="list-style-type: none"> 1 CO contact for selecting the contactor (for reversing starter function), actuated by the control system 1 NO contact for normal switching duty, actuated by the control system (opens automatically when tripping occurs) |
| Rated insulation voltage U_i (pollution degree 3) | V | 300 |
| Rated impulse withstand voltage U_{imp} | kV | 4 |
| Auxiliary contacts – Contact rating | | |
| <ul style="list-style-type: none"> NC, NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e | - 24 V | A 6 |
| | - 120 V | A 6 |
| | - 125 V | A 6 |
| | - 250 V | A 3 |
| <ul style="list-style-type: none"> NC, NO contacts with direct current DC-13, rated operational current I_e at U_e | - 24 V | A 2 |
| | - 60 V | A 0.55 |
| | - 110 V | A 0.3 |
| | - 125 V | A 0.3 |
| | - 250 V | A 0.2 |
| Conventional thermal current I_{th} | A | 5 |
| Contact reliability (suitability for PLC control; 17 V, 5 mA) | | Yes |
| Short-circuit protection | | |
| With fuse, operational class gG | A | 6 |
| With miniature circuit breaker, C characteristic | A | 1.6 |
| Protective separation between auxiliary current paths acc. to IEC 60947-1 | V | 300 |
| CSA, UL, UR rated data | | |
| Auxiliary circuit – Switching capacity | | B300, R300 |
| Conductor cross-sections of the auxiliary circuit | | |
| Connection type | |  Screw terminals |
| Terminal screw | | M3, Pozidriv size 2 |
| Operating devices | mm | 3.0 x 0.5 |
| Prescribed tightening torque | Nm | 0.8 ... 1.2 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | |
| • Solid or stranded | mm ² | 1 x (0.5 ... 4) ¹⁾ , 2 x (0.5 ... 2.5) ¹⁾ |
| • Finely stranded without end sleeve | mm ² | -- |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 1 x (0.5 ... 2.5) ¹⁾ , 2 x (0.5 ... 1.5) ¹⁾ |
| • AWG cables, solid or stranded | AWG | 2 x (20 ... 14) |
| Connection type | |  Spring-loaded terminals |
| Operating devices | mm | 3.0 x 0.5 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | |
| • Solid or stranded | mm ² | 2 x (0.25 ... 1.5) |
| • Finely stranded without end sleeve | mm ² | -- |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | 2 x (0.25 ... 1.5) |
| • AWG cables, solid or stranded | AWG | 2 x (24 ... 16) |



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

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB24 for IO-Link for high-feature applications

| | | |
|---|-----------------|--|
| Type – Overload relay: Evaluation modules | | 3RB2483-4A.1 |
| Size contactor | | S00 ... S10/S12 |
| Control circuit | | |
| Rated insulation voltage U_i (pollution degree 3) | V | 300 |
| Rated impulse withstand voltage U_{imp} | kV | 4 |
| Rated control supply voltage $U_s^{1)}$ | | |
| • DC | V | 24 through IO-Link |
| Operating range | | |
| • DC | | $0.85 \times U_{s \min} \leq U_s \leq 1.1 \times U_{s \max}$ |
| Rated power | | |
| • DC | W | 0.5 |
| Mains buffering time | ms | 200 |
| Sensor circuit | | |
| Thermistor motor protection (PTC thermistor sensor) | | |
| • Summation cold resistance | k Ω | ≤ 1.5 |
| • Response value | k Ω | 3.4 ... 3.8 |
| • Return value | k Ω | 1.5 ... 1.65 |
| Ground-fault detection | | |
| • Tripping value I_{Δ} | | The information refers to sinusoidal residual currents at 50/60 Hz. |
| - For $0.3 \times I_e < I_{motor} < 2.0 \times I_e$ | | $> 0.3 \times I_e$ |
| - For $2.0 \times I_e < I_{motor} < 8.0 \times I_e$ | | $> 0.15 \times I_{motor}$ |
| • Response time t_{trip} | ms | 500 ... 1 000 |
| Analog output¹⁾ | | |
| Rated values | | |
| • Output signal | mA | 4 ... 20 |
| • Measuring range | | 0 ... $1.25 \times I_e$ 4 mA corresponds to $0 \times I_e$ 16.8 mA corresponds to $1.0 \times I_e$ 20 mA corresponds to $1.25 \times I_e$ |
| • Load, max. | Ω | 100 |
| Conductor cross-sections for the control and sensor circuit as well as the analog output | | |
| Connection type | |  Screw terminals |
| Terminal screw | | M3, Pozidriv size 2 |
| Operating devices | mm | 3.0 x 0.5 |
| Prescribed tightening torque | Nm | 0.8 ... 1.2 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | |
| • Solid | mm ² | $1 \times (0.5 \dots 4)^{2)}$, $2 \times (0.5 \dots 2.5)^{2)}$ |
| • Finely stranded without end sleeve | mm ² | -- |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | $1 \times (0.5 \dots 2.5)^{2)}$, $2 \times (0.5 \dots 1.5)^{2)}$ |
| • Stranded | mm ² | -- |
| • AWG cables, solid or stranded | AWG | $2 \times (20 \dots 14)$ |
| Connection type | |  Spring-loaded terminals |
| Operating devices | mm | 3.0 x 0.5 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | |
| • Solid | mm ² | $2 \times (0.25 \dots 1.5)$ |
| • Finely stranded without end sleeve | mm ² | -- |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | $2 \times (0.25 \dots 1.5)$ |
| • Stranded | mm ² | $2 \times (0.25 \dots 1.5)$ |
| • AWG cables, solid or stranded | AWG | $2 \times (24 \dots 16)$ |

¹⁾ Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 overload relay.

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

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

3RB24 for IO-Link for high-feature applications **IE3/IE4 ready**

3RB24 electronic overload relays (evaluation modules) for full motor protection for stand-alone installation, CLASS 5E, 10E, 20E and 30E (adjustable)

| Type | 3RB2483-4A.1 |
|--|------------------------------------|
| Features and technical specifications | |
| Overload protection, phase failure protection and asymmetry protection | ✓ |
| Supplied from an external source | ✓ 24 V DC through IO-Link |
| Direct-on-line or reversing starters (wye-delta starting also possible) controllable through IO-Link | ✓ |
| Auxiliary contacts | ✓ 1 CO and 1 NO in series |
| Manual and Automatic RESET | ✓ |
| Remote RESET | ✓ (electrically or via IO-Link) |
| Four LEDs for operating and status displays | ✓ |
| TEST function and self-monitoring | ✓ |
| Internal ground-fault detection | ✓ |
| Screw or spring-loaded terminals for auxiliary, control and sensor circuits | ✓ |
| Input for thermistor (PTC) sensor circuit | ✓ |
| Analog output | ✓ |
| IO-Link-specific functions | |
| • Connection of direct-on-line, reversing and star-delta starters to the controller via IO-Link | ✓ |
| • On-site controlling of the starter using the hand-held device | ✓ |
| • Accessing process data (e.g. current values in all three phases) via IO-Link | ✓ |
| • Accessing parameterization and diagnostics data (e.g. tripped signals) via IO-Link | ✓ |

✓ Available

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 UNIT
PG = 41G



3RB2483-4AA1



3RB2483-4AC1

| Size contactor | Version | SD | Screw terminals | | SD | Spring-loaded terminals | |
|-------------------|---------|----|------------------------|-------------------|----|------------------------------------|-----------------|
| | | d | Article No. | Price per PU d | | Article No. | Price per PU |

Evaluation modules

| | | | | | |
|-------------|------------|---|---------------------|---|---------------------|
| S00 ... S12 | Monostable | ▶ | 3RB2483-4AA1 | 2 | 3RB2483-4AC1 |
|-------------|------------|---|---------------------|---|---------------------|

Notes:

- Overview of overload relays – matching contactors, [see page 7/84](#).
- Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 relay.

Current measuring modules and related connecting cables, [see page 7/140](#), "Accessories", [see page 7/141 onwards](#).

Overview

More information

Homepage, see www.siemens.com/sirius-overloadrelays
 Industry Mall, see www.siemens.com/product?3RB2

Application Manual "SIRIUS Controls with IE3/IE4 motors", see <https://support.industry.siemens.com/cs/ww/en/view/94770820>

Other Manuals, see <https://support.industry.siemens.com/cs/ww/en/ps/16282/man>



SIRIUS 3RB2906 current measuring module

The current measuring modules are designed as system components for connecting to evaluation units 3RB22 to 3RB24. Using these evaluation units the motor current is measured and the measured value sent to the evaluation unit for evaluation.

The current measuring modules in sizes up to S3 are equipped with straight-through transformers and can be snap-fitted under the evaluation units. The larger evaluation units are installed directly on the contactor or as stand-alone units.

Application

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

Note:

For the use of current measuring modules for 3RB22, 3RB23, 3RB24 in conjunction with highly energy-efficient IE3/IE4 motors, please read the information on dimensioning and configuration, see [Application Manual](#).

For more information, see [page 1/7](#).

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24

Technical specifications

More information

Manuals, see
<https://support.industry.siemens.com/cs/ww/en/ps/16282/man>

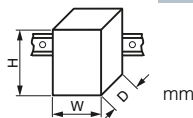
Technical specifications, see
<https://support.industry.siemens.com/cs/ww/en/ps/16282/td>

The following technical information is intended to provide an initial overview of the various types of devices and functions.

Type – Overload relays: Current measuring modules

Size contactor

Dimensions of current measuring modules
(W x H x D)



3RB2906

S00/S0
45 x 84 x 45

S2/S3
55 x 94 x 72

3RB2956

S6
120 x 119 x 145

3RB2966

S10/S12
145 x 147 x 148

Main circuit

Rated insulation voltage U_i
(pollution degree 3)

V

690

1 000

Rated impulse withstand voltage U_{imp}

kV

6

8

Rated operational voltage U_e

V

690

1 000

Type of current

- Direct current
- Alternating current

No

Yes, 50/60 Hz \pm 5%

Current setting

A

0.3 ... 3;
2.4 ... 25

10 ... 100

20 ... 200

63 ... 630

Power loss per unit (max.)

W

0.5

Short-circuit protection

- With fuse without contactor
- With fuse and contactor

See "Selection and ordering data", page 7/140

See Configuration Manual

Degree of protection acc. to IEC 60529

- Screw terminals/busbar connections

IP20

- IP20 (front side)
- Terminal IP00 (use additional terminal covers for higher degree of protection)

- Straight-through transformers

IP20

IP20

--

Touch protection acc. to IEC 60529

- Screw terminals/busbar connections

Finger-safe

Finger-safe with terminal covers for vertical contact from the front

- Straight-through transformers

Finger-safe

Finger-safe

--

Protective separation between main and auxiliary current paths

Acc. to IEC 60947-1 (pollution degree 2)

- For systems with grounded neutral point

V

690

- For systems with ungrounded neutral point

V

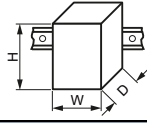



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Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24

| | | | | | | | |
|---|-----------------|---|--|----------------|--|------------------|---|
| Type – Overload relays: Current measuring modules | |  | | 3RB2906 | | 3RB2956 | 3RB2966 |
| Size contactor | | | | S00/S0 | S2/S3 | S6 | S10/S12 |
| Dimensions of current measuring modules (W x H x D) | | mm | | 45 x 84 x 45 | 55 x 94 x 72 | 120 x 119 x 145 | 145 x 147 x 148 |
| Conductor cross-sections of main circuit | | | | | | | |
| Connection type | | |  Screw terminals with box terminal | | | | |
| Terminal screw | | mm | -- | | | 4 mm Allen screw | 5 mm Allen screw |
| Operating devices | | mm | -- | | | 4 mm Allen screw | 5 mm Allen screw |
| Prescribed tightening torque | | Nm | -- | | | 10 ... 12 | 20 ... 22 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | | | | | |
| • Solid or stranded | mm ² | -- | | | With 3RT1955-4G box terminal: 2 x (max. 70), 1 x (16 ... 70) With 3RT1956-4G box terminal: 2 x (max. 120), 1 x (16 ... 120) | | 2 x (70 ... 240), Front clamping point only: 1 x (95 ... 300) Rear clamping point only: 1 x (120 ... 240) |
| • Finely stranded without end sleeve | mm ² | -- | | | With 3RT1955-4G box terminal: 2 x (1 x max. 50, 1 x max. 70), 1 x (10 ... 70) With 3RT1956-4G box terminal: 2 x (1 x max. 95, 1 x max. 120), 1 x (10 ... 120) | | 2 x (50 ... 185), Front clamping point only: 1 x (70 ... 240) Rear clamping point only: 1 x (120 ... 185) |
| • Finely stranded with end sleeve (DIN 46228) | mm ² | -- | | | With 3RT1955-4G box terminal: 2 x (1 x max. 50, 1 x max. 70), 1 x (10 ... 70) With 3RT1956-4G box terminal: 2 x (1 x max. 95, 1 x max. 120), 1 x (10 ... 120) | | 2 x (50 ... 185), Front clamping point only: 1 x (70 ... 240) Rear clamping point only: 1 x (120 ... 185) |
| • AWG cables | AWG | -- | | | With 3RT1955-4G box terminal: 2 x (max. 1/0), 1 x (6 ... 2/0) With 3RT1956-4G box terminal: 2 x (max. 3/0), 1 x (6 ... 250 kcmil) | | 2 x (2/0 ... 500 kcmil), Front clamping point only: 1 x (3/0 ... 600 kcmil) Rear clamping point only: 1 x (250 kcmil ... 500 kcmil) |
| • Ribbon cables (number x width x thickness) | mm | -- | | | With 3RT1955-4G box terminal: 2 x (6 x 15.5 x 0.8), 1 x (3 x 9 x 0.8 ... 6 x 15.5 x 0.8) With 3RT1956-4G box terminal: 2 x (10 x 15.5 x 0.8), 1 x (3 x 9 x 0.8 ... 10 x 15.5 x 0.8) | | 2 x (20 x 24 x 0.5), 1 x (6 x 9 x 0.8 ... 20 x 24 x 0.5) |
| Connection type | | |  Busbar connections | | | | |
| Terminal screw | | | -- | | | M8 x 25 | M10 x 30 |
| Prescribed tightening torque | | Nm | -- | | | 10 ... 14 | 14 ... 24 |
| Conductor cross-sections (min./max.), 1 or 2 conductors can be connected | | | | | | | |
| • Solid with cable lug | mm ² | -- | | | 16 ... 95 ¹⁾ | | 50 ... 240 ²⁾ |
| • Stranded with cable lug | mm ² | -- | | | 25 ... 120 ¹⁾ | | 70 ... 240 ²⁾ |
| • AWG cables, solid or stranded, with cable lug | AWG | -- | | | 4 ... 250 kcmil | | 2/0 ... 500 kcmil |
| • With connecting bars (max. width) | mm | -- | | | 17 | | 25 |
| Connection type | | |  Straight-through transformers | | | | |
| Diameter of opening | | mm | 7.5 | 14 | 25 | -- | |

¹⁾ When connecting cable lugs according to DIN 46235 with conductor cross-sections of 95 mm² and more, the 3RT1956-4EA1 terminal cover must be used to ensure phase clearance, [see page 7/141](#).

²⁾ When connecting cable lugs according to DIN 46234 for conductor cross-sections from 240 mm², as well as DIN 46235 for cable cross-sections from 185 mm², the 3RT1956-4EA1 terminal cover must be used to ensure phase clearance, [see page 7/141](#).

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24 **IE3/IE4 ready**

Selection and ordering data

Current measuring modules (essential accessories)



3RB2906-2BG1,
3RB2906-2DG1

3RB2906-2JG1

3RB2956-2TG2

3RB2966-2WH2

| Size contactor | Current setting value of the inverse-time delayed overload release | Short-circuit protection with fuse, type of coordination "2", operational class gG ¹⁾ | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|--|---|---|---------------------------|----|---------------------|-----------------|-------------------------|--------|-----|
| A | A | | | d | | | | | |
| Sizes S00/S0 | | | | | | | | | |
| Devices with straight-through transformer for stand-alone installation | | | | | | | | | |
| S00/S0 | 0.3 ... 3 | 20 | 3RB22 to 3RB24 | ▶ | 3RB2906-2BG1 | | 1 | 1 unit | 41G |
| | 2.4 ... 25 | 63 | | ▶ | 3RB2906-2DG1 | | 1 | 1 unit | 41G |
| Sizes S2/S3 | | | | | | | | | |
| Devices with straight-through transformer for stand-alone installation | | | | | | | | | |
| S2/S3 | 10 ... 100 | 315 | 3RB22 to 3RB24 | ▶ | 3RB2906-2JG1 | | 1 | 1 unit | 41G |
| Size S6 | | | | | | | | | |
| Devices with busbar connection, for mounting onto contactor and stand-alone installation (an appropriate connection kit with screws, spring washers and nuts is enclosed) | | | | | | | | | |
| S6 | 20 ... 200 | 315 | 3RB22 to 3RB24 | ▶ | 3RB2956-2TH2 | | 1 | 1 unit | 41G |
| Devices with straight-through transformer, for mounting onto contactor and stand-alone installation | | | | | | | | | |
| For mounting onto S6 contactors with box terminals | 20 ... 200 | 315 | 3RB22 to 3RB24 | ▶ | 3RB2956-2TG2 | | 1 | 1 unit | 41G |
| Sizes S10/S12²⁾ | | | | | | | | | |
| Devices with busbar connection, for mounting onto contactor and stand-alone installation (an appropriate connection kit with screws, spring washers and nuts is enclosed) | | | | | | | | | |
| S10/S12 and size 14 (3TF68/3TF69) ²⁾ | 63 ... 630 | 800 | 3RB22 to 3RB24 | ▶ | 3RB2966-2WH2 | | 1 | 1 unit | 41G |


¹⁾ Maximum protection by fuse only for overload relays, type of coordination "2".
For fuse values in connection with contactors, see [Configuration Manual](#).

²⁾ For 3TF68/3TF69 contactors, direct mounting is not possible.

Note:

The connecting cable between the current measuring module and the evaluation module is not included in the scope of supply; please order separately (see ["Accessories"](#)).

Accessories

| Size contactor | Version | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|---|-------------|---|-------------------|-------------|-----------------|-------------------------|--------|-----|
| | | | | d | | | | |
| Connecting cables (essential accessories) | | | | | | | | |
|  | S00 ... S3 | For connection between evaluation module and current measuring module | 3RB22 to 3RB24 | ▶ | 3RB2987-2B | 1 | 1 unit | 41F |
| | S00 ... S12 | • Length 0.1 m (only for mounting of the evaluation module directly onto the current measuring module) | 3RB22 to 3RB24 | ▶ | | 1 | 1 unit | 41F |
| 3RB2987-2. | S00 ... S12 | • Length 0.5 m | 3RB22 to 3RB24 | ▶ | 3RB2987-2D | 1 | 1 unit | 41F |

Additional general accessories, see [page 7/141](#).

Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

Accessories for 3RB22, 3RB23, 3RB24

Overview

More information

Homepage, see www.siemens.com/sirius-overloadrelays
 Industry Mall, see www.siemens.com/product?3RB2


Manuals, see <https://support.industry.siemens.com/cs/ww/en/ps/16283/man>

The following optional accessories are available for the 3RB22 to 3RB24 electronic overload relays:


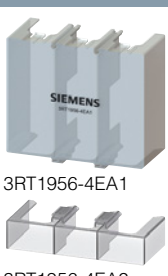


- Operator panel for the evaluation modules 3RB24
- Sealable cover for the evaluation modules 3RB22 to 3RB24
- Terminal covers for the 3RB29 current measuring modules size S6 and S10/S12
- Box terminal blocks for the 3RB29 current measuring modules size S6 and S10/S12
- Push-in lugs for screw fixing for 3RB22 to 3RB24 evaluation modules and 3RB2906 current measuring modules

Selection and ordering data

Accessories for 3RB24 overload relays

| Version | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|---|--|-------|-------------|------------------------|-------------------|---------|-----|
| Operator panels for evaluation modules | | | | | | | |
|  3RA6935-0A | Operator panels (set) | 3RB24 | 10 | 3RA6935-0A | 1 | 1 unit | 42F |
| | One set comprises: • 1 x operator panel • 1 x 3RA6936-0A enabling module • 1 x 3RA6936-0B interface cover • 1 x fixing terminal Note: The connecting cable between the evaluation module and the operator panel is not included in the scope of supply; please order separately. | | | | | | |
| | Connecting cable | 3RB24 | ▶ | 3UF7933-0BA00-0 | 1 | 1 unit | 42J |
| | Enabling modules (replacement) | 3RB24 | 10 | 3RA6936-0A | 1 | 1 unit | 42F |
| | Interface covers | 3RB24 | 10 | 3RA6936-0B | 1 | 5 units | 42F |

General accessories

| Version | Size | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|---|---|---------------------|----------------|-------------|---------------------|-------------------|----------|-----|
| Sealable covers for evaluation modules | | | | | | | | |
|  3RB2984-2 | For covering the setting knobs | -- | 3RB22 to 3RB24 | 2 | 3RB2984-2 | 1 | 10 units | 41F |
| Terminal covers for current measuring modules | | | | | | | | |
|  3RT1956-4EA1 3RT1956-4EA2 | Covers for cable lugs and busbar connections | | | | | | | |
| | • Length 100 mm | S6 | 3RB2956 | ▶ | 3RT1956-4EA1 | 1 | 1 unit | 41B |
| | • Length 120 mm | S10/S12 | 3RB2966 | 2 | 3RT1966-4EA1 | 1 | 1 unit | 41B |
| | Covers for box terminals | | | | | | | |
| | • Length 25 mm | S6 | 3RB2956 | ▶ | 3RT1956-4EA2 | 1 | 1 unit | 41B |
| | • Length 30 mm | S10/S12 | 3RB2966 | 2 | 3RT1966-4EA2 | 1 | 1 unit | 41B |
|  3RT195.-4G | Covers for screw terminals | | | | | | | |
| | Between contactor and overload relay, without box terminals (1 unit required per combination) | S6 | 3RB2956 | ▶ | 3RT1956-4EA3 | 1 | 1 unit | 41B |
| | | S10/S12 | 3RB2966 | 2 | 3RT1966-4EA3 | 1 | 1 unit | 41B |
| | Box terminal blocks for current measuring modules | | | | | | | |
|  3RT195.-4G | For round and ribbon cables | | | | | | | |
| | • Up to 70 mm ² | S6 ¹⁾ | 3RB2956 | ▶ | 3RT1955-4G | 1 | 1 unit | 41B |
| | • Up to 120 mm ² | S6 | 3RB2956 | ▶ | 3RT1956-4G | 1 | 1 unit | 41B |
| | • Up to 240 mm ² | S10/S12 | 3RB2966 | ▶ | 3RT1966-4G | 1 | 1 unit | 41B |



¹⁾ In the scope of supply for 3RT1054-1 contactors (55 kW).


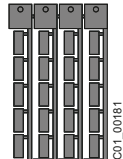
Protection Equipment

Overload Relays

SIRIUS 3RB2 Electronic Overload Relays

Accessories for 3RB22, 3RB23, 3RB24

| Version | Size | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|---|---|---------------------|----------------|-------------|-------------------|-------------------|----------|-----|
| d | | | | | | | | |
| Push-in lugs for evaluation modules and current measuring modules | | | | | | | | |
|  | For screw fixing the evaluation modules | -- | 3RB22 to 3RB24 | 5 | 3RP1903 | 1 | 10 units | 41H |
| 3RP1903 | | | | | | | | |
|  | For screw fixing the current measuring modules (2 units per module) | S00 .. S3 | 3RB2906 | 2 | 3RB1900-0B | 100 | 10 units | 41F |
| 3RB1900-0B | | | | | | | | |

| Version | Size | Color | For overload relays | SD | Article No. | Price per PU | PU (UNIT, SET, M) | PS* | PG |
|---|--|--|--|---|-------------|---|-------------------|-----------|-----|
| | | | | | d | | | | |
| Tools for opening spring-loaded terminals | | | | | | | | | |
|  | Screwdrivers For all SIRIUS devices with spring-loaded terminals | Length approx. 200 mm, 3.0 mm x 0.5 mm | Titanium gray/black, partially insulated | Main and auxiliary circuit connection: 3RB2 | 2 | Spring-loaded terminals 3RA2908-1A | 1 | 1 unit | 41B |
| Blank labels | | | | | | | | | |
|  | Unit labeling plates¹⁾ For SIRIUS devices | 20 mm x 7 mm | Titanium gray | 3RB2 | 20 | 3RT2900-1SB20 | 100 | 340 units | 41B |

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see page 16/15).