

## Overload Relays

### SIRIUS 3RB3 Electronic Overload Relays

#### 3RB30, 3RB31 for standard applications

#### Overview

##### More information

Homepage, see [www.siemens.com/sirius-overloadrelays](http://www.siemens.com/sirius-overloadrelays)

Industry Mall, see [www.siemens.com/product?3RB3](http://www.siemens.com/product?3RB3)

TIA Selection Tool Cloud (TST Cloud), see

<https://mall.industry.siemens.com/spice/TSTWeb?kmat=ElectronicOverloadRelay>

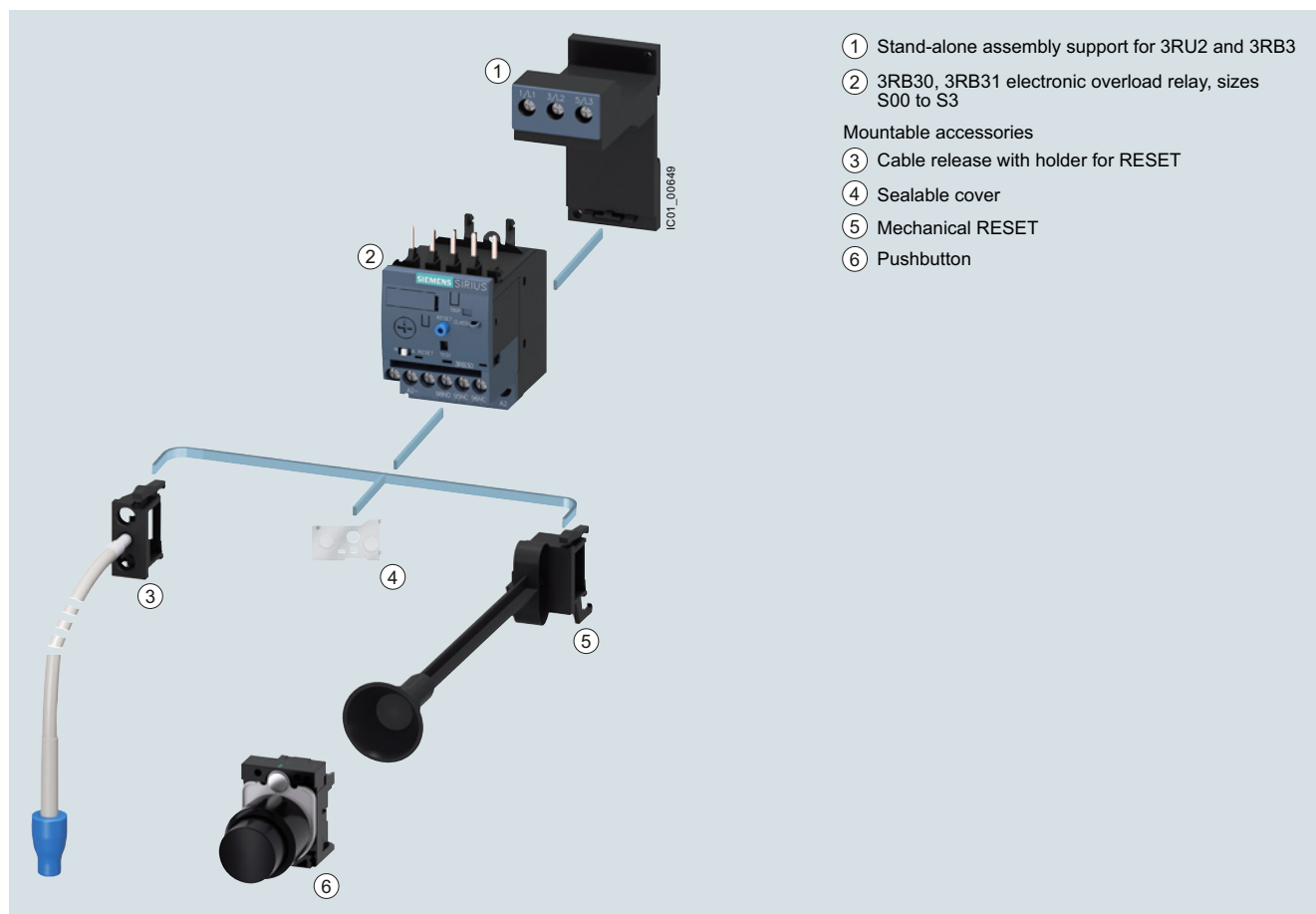
Conversion tool, e.g. from 3RB20/3RB211 to 3RB30/3RB31, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool)

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

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>

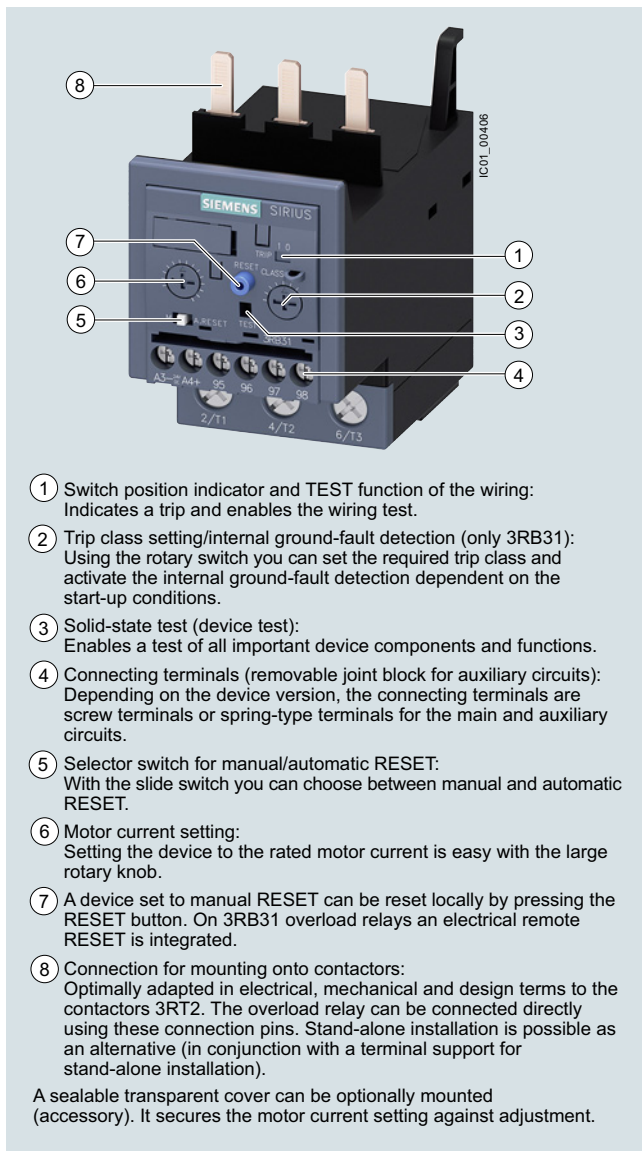


Mountable accessories for 3RB30 and 3RB31 electronic overload relays

## 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 unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set rated motor current. This current rise is detected by 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 unbalance and phase failure, the 3RB31 electronic overload relays also allow internal ground-fault detection (not possible in conjunction with contactor assemblies for 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:

- 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 09 ATEX 3001.

## Overload Relays

### SIRIUS 3RB3 Electronic Overload Relays

#### 3RB30, 3RB31 for standard applications

##### Article No. scheme

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

# Overload Relays

## SIRIUS 3RB3 Electronic Overload Relays

### 3RB30, 3RB31 for standard applications

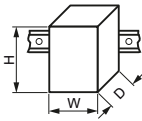
### Technical specifications

#### 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>

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>

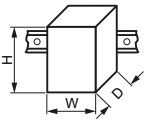
The following technical information is intended to provide an initial overview of the various types of device and functions.

| Type                                                                             |                                                                                   | 3RB3016, 3RB3113                                                                                                                                                                                                              | 3RB3026, 3RB3123                                                                                        | 3RB3036, 3RB3133                                 | 3RB3046, 3RB3143                                                    |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------|
| Size                                                                             |                                                                                   | S00                                                                                                                                                                                                                           | S0                                                                                                      | S2                                               | S3                                                                  |
| Dimensions (W x H x D)<br>(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-type 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 unbalance<br>+ ground fault (for 3RB31 only)                                                                                                                                               |                                                                                                         |                                                  |                                                                     |
| Trip class acc. to IEC 60947-4-1                                                 |                                                                                   | CLASS 3RB30: 10E, 20E;<br>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/<br>test of auxiliary contacts and wiring of control circuit by actuating the switch position indicator slide/<br>self-monitoring                                        |                                                                                                         |                                                  |                                                                     |
| • RESET button                                                                   |                                                                                   | Yes                                                                                                                                                                                                                           |                                                                                                         |                                                  |                                                                     |
| • STOP button                                                                    |                                                                                   | No                                                                                                                                                                                                                            |                                                                                                         |                                                  |                                                                     |
| Protection and operation of explosion-proof motors                               |                                                                                   |                                                                                                                                                                                                                               |                                                                                                         |                                                  |                                                                     |
| EC type-examination certificate number according to directive 2014/34/EU (ATEX)  |                                                                                   | PTB 09 ATEX 3001<br>⚠ II (2) G [Ex e] [Ex d] [Ex px]<br>⚠ II (2) G [Ex t] [Ex p]<br><a href="https://support.industry.siemens.com/cs/ww/en/view/40591327">see https://support.industry.siemens.com/cs/ww/en/view/40591327</a> |                                                                                                         |                                                  |                                                                     |
| 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-type terminals                                          |                                                                                   | IP20                                                                                                                                                                                                                          | - IP20 (front side)<br>- 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<br>(signaling contact 97/98 in position "tripped": 9 g/11 ms)                                     |                                                  | 15/11<br>(signaling contact 97/98 in position "tripped": 8 g/11 ms) |

## Overload Relays

### SIRIUS 3RB3 Electronic Overload Relays

#### 3RB30, 3RB31 for standard applications

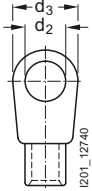
|                                                                                             |                                                                                   |                                                                          |                  |                  |                  |                  |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------|------------------|------------------|------------------|
| Type                                                                                        |                                                                                   |                                                                          | 3RB3016, 3RB3113 | 3RB3026, 3RB3123 | 3RB3036, 3RB3133 | 3RB3046, 3RB3143 |
| Size                                                                                        |                                                                                   |                                                                          | S00              | S0               | S2               | S3               |
| Dimensions (W x H x D)<br>(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-type 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<br>(corresponds to degree of severity 3)                      | kV                                                                                | 2 (power ports), 1 (signal port)                                         |                  |                  |                  |                  |
| - Surge acc. to IEC 61000-4-5<br>(corresponds to degree of severity 3)                      | kV                                                                                | 2 (line to earth), 1 (line to line)                                      |                  |                  |                  |                  |
| • Electrostatic discharge acc. to IEC 61000-4-2<br>(corresponds to degree of severity 3)    | kV                                                                                | 8 (air discharge), 6 (contact discharge)                                 |                  |                  |                  |                  |
| • Field-related interference acc. to IEC 61000-4-3<br>(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 $U_i$<br>(pollution degree 3)         | V  | 690                                                                                                            |                                | 690<br>1 000 with straight-through transformer | 1000                             |
| Rated impulse withstand voltage $U_{imp}$                      | kV | 6                                                                                                              |                                | 6<br>8 with straight-through transformer       | 8                                |
| Rated operational voltage $U_e$                                | V  | 690                                                                                                            |                                | 690<br>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<br>to<br>4 ... 16                                                                                  | 0.1 ... 0.4<br>to<br>10 ... 40 | 12.5 ... 50<br>and<br>20 ... 80                | 12.5 ... 50<br>and<br>32 ... 115 |
| Heavy starting                                                 |    | see 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",<br>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                                                                                                            |                                |                                                |                                  |

# 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              | Ø 5 ... 6                                                                                                         | Ø 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.),<br>1 or 2 conductors can be connected        |                 |                                                                                                                   |                                                                                   |                                                                |                                                                                                                       |
| • Solid or stranded                                                                | mm <sup>2</sup> | 2 x (0.5 ... 1.5) <sup>1)</sup> ,<br>2 x (0.75 ... 2.5) <sup>1)</sup> ,<br>2 x (0.5 ... 4) <sup>1)</sup>          | 2 x (1 ... 2.5) <sup>1)</sup> ,<br>2 x (2.5 ... 10) <sup>1)</sup>                 | 1 x (1 ... 50) <sup>1)</sup> ,<br>2 x (1 ... 35) <sup>1)</sup> | 2 x (2.5 ... 16) <sup>1)</sup> ,<br>2 x (10 ... 50) <sup>1)</sup> ,<br>1 x (10 ... 70) <sup>1)</sup>                  |
| • Finely stranded with end sleeve (DIN 46228-1)                                    | mm <sup>2</sup> | 2 x (0.5 ... 1.5) <sup>1)</sup> ,<br>2 x (0.75 ... 2.5) <sup>1)</sup>                                             | 2 x (1 ... 2.5) <sup>1)</sup> ,<br>2 x (2.5 ... 6) <sup>1)</sup> ,<br>max. 1 x 10 | 2 x (1 ... 25) <sup>1)</sup> ,<br>1 x (1 ... 35) <sup>1)</sup> | 2 x (2.5 ... 35) <sup>1)</sup> ,<br>1 x (2.5 ... 50) <sup>1)</sup>                                                    |
| • AWG cables, solid or stranded                                                    | AWG             | 2 x (20 ... 16) <sup>1)</sup> ,<br>2 x (18 ... 14) <sup>1)</sup> ,<br>2 x 12                                      | 2 x (16 ... 12) <sup>1)</sup> ,<br>2 x (14 ... 8) <sup>1)</sup>                   | 2 x (18 ... 2) <sup>1)</sup> ,<br>1 x (18 ... 1) <sup>1)</sup> | 2 x (10 ... 1/0) <sup>1)</sup> ,<br>1 x (10 ... 2/0) <sup>1)</sup>                                                    |
| Removable box terminals <sup>2)</sup>                                              |                 |                                                                                                                   |                                                                                   |                                                                |                                                                                                                       |
| • With copper bars <sup>3)</sup>                                                   | mm              | --                                                                                                                | --                                                                                | --                                                             | 2 x 12 x 4                                                                                                            |
| • With cable lugs <sup>4)</sup>                                                    |                 |                                                                                                                   |                                                                                   |                                                                |                                                                                                                       |
| - Terminal screw                                                                   |                 | --                                                                                                                | --                                                                                | --                                                             | M6                                                                                                                    |
| - Prescribed tightening torque                                                     | Nm              | --                                                                                                                | --                                                                                | --                                                             | 4.5 ... 6                                                                                                             |
| - Usable ring terminal lugs                                                        | mm              | --                                                                                                                | --                                                                                | --                                                             | d <sub>2</sub> = min. 6.3<br>d <sub>3</sub> = max. 19                                                                 |
|  |                 |                                                                                                                   |                                                                                   |                                                                |                                                                                                                       |
| Connection type                                                                    |                 |  Spring-type terminals         |                                                                                   |                                                                |                                                                                                                       |
| Operating devices                                                                  | mm              | 3.0 x 0.5 and 3.5 x 0.5                                                                                           |                                                                                   |                                                                |                                                                                                                       |
| Conductor cross-sections (min./max.),<br>1 conductor can be connected              |                 |                                                                                                                   |                                                                                   |                                                                |                                                                                                                       |
| • Solid or stranded                                                                | mm <sup>2</sup> | 1 x (0.5 ... 4)                                                                                                   | 1 x (1 ... 10)                                                                    | --                                                             |                                                                                                                       |
| • Finely stranded without end sleeve                                               | mm <sup>2</sup> | 1 x (0.5 ... 2.5)                                                                                                 | 1 x (1 ... 6)                                                                     | --                                                             |                                                                                                                       |
| • Finely stranded with end sleeve (DIN 46228-1)                                    | mm <sup>2</sup> | 1 x (0.5 ... 2.5)                                                                                                 | 1 x (1 ... 6)                                                                     | --                                                             |                                                                                                                       |
| • AWG cables, solid or stranded                                                    | AWG             | 1 x (20 ... 12)                                                                                                   | 1 x (18 ... 8)                                                                    | --                                                             |                                                                                                                       |
| Connection type                                                                    |                 |  Straight-through transformers |                                                                                   |                                                                |                                                                                                                       |
| Diameter of opening                                                                | mm              | --                                                                                                                |                                                                                   | 15                                                             | 18                                                                                                                    |

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

<sup>2)</sup> Cable lug and busbar connection possible after removing the box terminals.

<sup>3)</sup> 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](#).

<sup>4)</sup> When conductors larger than 25 mm<sup>2</sup> are connected, the 3RT2946-4EA2 cover is needed to maintain the required phase clearance, [see page 7/109](#).

# 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               |
| <b>Auxiliary circuit</b>                                                                        |    |                                                                                                  |                  |                  |                  |
| Number of NO contacts                                                                           |    | 1                                                                                                |                  |                  |                  |
| Number of NC contacts                                                                           |    | 1                                                                                                |                  |                  |                  |
| Auxiliary contacts – Assignment                                                                 |    | 1 NO for the signal "tripped";<br>1 NC for disconnecting the contactor                           |                  |                  |                  |
| Rated insulation voltage $U_i$<br>(pollution degree 3)                                          | V  | 300                                                                                              |                  |                  |                  |
| Rated impulse withstand voltage $U_{imp}$                                                       | kV | 4                                                                                                |                  |                  |                  |
| <b>Auxiliary contacts – Contact rating</b>                                                      |    |                                                                                                  |                  |                  |                  |
| • 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<br>(suitability for PLC control; 17 V, 5 mA)                              |    | Yes                                                                                              |                  |                  |                  |
| <b>Short-circuit protection</b>                                                                 |    |                                                                                                  |                  |                  |                  |
| • With fuse, operational class gG                                                               | A  | 6                                                                                                |                  |                  |                  |
| <b>Ground-fault protection (only 3RB31)</b>                                                     |    |                                                                                                  |                  |                  |                  |
| • Tripping value $I_{\Delta}$                                                                   |    | The information refers to sinusoidal residual currents at 50/60 Hz.<br>> $0.75 \times I_{motor}$ |                  |                  |                  |
| • Operating range $I$                                                                           |    | Lower current setting < $I_{motor}$ < 3.5 × upper current setting                                |                  |                  |                  |
| • Response time $t_{trip}$ (in steady-state condition)                                          | s  | < 1                                                                                              |                  |                  |                  |
| <b>Integrated electrical remote RESET (only 3RB31)</b>                                          |    |                                                                                                  |                  |                  |                  |
| Connecting terminals A3, A4                                                                     |    | 24 V DC, max. 200 mA for approx. 20 ms, then < 10 mA                                             |                  |                  |                  |
| 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               |
| <b>CSA, UL, UR rated data</b>                                                      |                 |                                                                                                                  |                  |                  |                  |
| Auxiliary circuit – Switching capacity                                             |                 | B600, R300                                                                                                       |                  |                  |                  |
| <b>Conductor cross-sections for auxiliary circuit</b>                              |                 |                                                                                                                  |                  |                  |                  |
| Connection type                                                                    |                 |  <b>Screw terminals</b>       |                  |                  |                  |
| Terminal screw                                                                     |                 | M3, Pozidriv size 2                                                                                              |                  |                  |                  |
| Operating devices                                                                  | mm              | ø 5 ... 6                                                                                                        |                  |                  |                  |
| Prescribed tightening torque                                                       | Nm              | 0.8 ... 1.2                                                                                                      |                  |                  |                  |
| <b>Conductor cross-sections (min./max.),</b><br>1 or 2 conductors can be connected |                 |                                                                                                                  |                  |                  |                  |
| • Solid or stranded                                                                | mm <sup>2</sup> | 1 × (0.5 ... 4) <sup>1)</sup> , 2 × (0.5 ... 2.5) <sup>1)</sup>                                                  |                  |                  |                  |
| • Finely stranded with end sleeve (DIN 46228-1)                                    | mm <sup>2</sup> | 1 × (0.5 ... 2.5) <sup>1)</sup> , 2 × (0.5 ... 1.5) <sup>1)</sup>                                                |                  |                  |                  |
| • AWG cables, solid or stranded                                                    | AWG             | 2 × (20 ... 14)                                                                                                  |                  |                  |                  |
| Connection type                                                                    |                 |  <b>Spring-type terminals</b> |                  |                  |                  |
| Operating devices                                                                  | mm              | 3.0 × 0.5                                                                                                        |                  |                  |                  |
| <b>Conductor cross-sections (min./max.),</b><br>1 or 2 conductors can be connected |                 |                                                                                                                  |                  |                  |                  |
| • Solid or stranded                                                                | mm <sup>2</sup> | 2 × (0.25 ... 1.5)                                                                                               |                  |                  |                  |
| • Finely stranded without end sleeve                                               | mm <sup>2</sup> | 2 × (0.25 ... 1.5)                                                                                               |                  |                  |                  |
| • Finely stranded with end sleeve (DIN 46228-1)                                    | mm <sup>2</sup> | 2 × (0.25 ... 1.5)                                                                                               |                  |                  |                  |
| • AWG cables, solid or stranded                                                    | AWG             | 2 × (24 ... 16)                                                                                                  |                  |                  |                  |

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

# 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-type terminals
  - Sizes S2 and S3:  
Main circuit: Screw terminals with box terminal or as straight-through transformer  
Auxiliary circuit: Either screw or spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal ground-fault detection (activatable)

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

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


| Size<br>contactor | Rated power for<br>three-phase motors,<br>rated value <sup>1)</sup>                                      | Current setting value<br>of the inverse-time<br>delayed overload<br>release | Short-circuit protection<br>with fuse, type of<br>coordination "2",<br>operational class gG <sup>2)</sup> | SD | <b>Screw terminals</b><br> | SD                   | <b>Spring-type<br/>terminals</b><br> |                 |
|-------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------|
|                   | kW                                                                                                       | A                                                                           | A                                                                                                         | d  | Article No.                                                                                                   | Price<br>per PU<br>d | Article No.                                                                                                             | Price<br>per PU |
| <b>Size S00</b>   |                                                                                                          |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
| S00               | <b>Devices for mounting onto contactor<sup>3)</sup></b>                                                  |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
|                   | 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                                                                                                            |                 |
| <b>Size S0</b>    |                                                                                                          |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
| S0                | <b>Devices for mounting onto contactor<sup>3)</sup></b>                                                  |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
|                   | 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                                                                                                            |                 |
| <b>Size S2</b>    |                                                                                                          |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
| S2                | <b>Devices with screw terminals (main current side) and<br/>for mounting onto contactor<sup>3)</sup></b> |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
|                   | 7.5 ... 22                                                                                               | 12.5 ... 50                                                                 | 250                                                                                                       | ▶  | 3RB3133-4UB0                                                                                                  | ▶                    | 3RB3133-4UD0                                                                                                            |                 |
|                   | 11 ... 37                                                                                                | 20 ... 80                                                                   | 250                                                                                                       | ▶  | 3RB3133-4WB0                                                                                                  | ▶                    | 3RB3133-4WD0                                                                                                            |                 |
|                   | <b>Devices with straight-through transformer for<br/>stand-alone installation</b>                        |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
|                   | 7.5 ... 22                                                                                               | 12.5 ... 50                                                                 | 250                                                                                                       | ▶  | 3RB3133-4UW1                                                                                                  | ▶                    | 3RB3133-4UX1                                                                                                            |                 |
|                   | 11 ... 37                                                                                                | 20 ... 80                                                                   | 250                                                                                                       | ▶  | 3RB3133-4WW1                                                                                                  | ▶                    | 3RB3133-4WX1                                                                                                            |                 |
| <b>Size S3</b>    |                                                                                                          |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
| S3                | <b>Devices with screw terminals (main current side) and<br/>for mounting onto contactor<sup>3)</sup></b> |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
|                   | 7.5 ... 22                                                                                               | 12.5 ... 50                                                                 | 200                                                                                                       | 1  | 3RB3143-4UB0                                                                                                  | 1                    | 3RB3143-4UD0                                                                                                            |                 |
|                   | 18.5 ... 55                                                                                              | 32 ... 115                                                                  | 315                                                                                                       | 1  | 3RB3143-4XB0                                                                                                  | 1                    | 3RB3143-4XD0                                                                                                            |                 |
|                   | <b>Devices with straight-through transformer for<br/>stand-alone installation</b>                        |                                                                             |                                                                                                           |    |                                                                                                               |                      |                                                                                                                         |                 |
|                   | 7.5 ... 22                                                                                               | 12.5 ... 50                                                                 | 200                                                                                                       | 1  | 3RB3143-4UW1                                                                                                  | 1                    | 3RB3143-4UX1                                                                                                            |                 |
|                   | 18.5 ... 55                                                                                              | 32 ... 115                                                                  | 315                                                                                                       | 1  | 3RB3143-4XW1                                                                                                  | 1                    | 3RB3143-4XX1                                                                                                            |                 |

<sup>1)</sup> Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

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

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