

# Protective Devices: Overload Relays

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**Introduction**

**SIRIUS overload relays**

**SIRIUS solid-state overload relays**

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Up to 630 A,  
CLASS 10 and CLASS 20,  
non-adjustable

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Up to 820 A, CLASS 5 to 30, adjustable

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Accessories

**SIRIUS thermal overload relays**

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Up to 100 A, CLASS 10,  
non-adjustable


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Accessories

# Controlgear: Overload Relays


## Introduction

### Overview

Features	Benefits	3RB10	3RB12	3RU11
				
<b>Protective functions</b>				
<b>Tripping in the event of overload</b>	<ul style="list-style-type: none"> <li>Provides optimum current-dependent protection of loads against excessive temperature rises due to overload.</li> </ul>	✓	✓	✓
<b>Tripping in the event of phase unbalance</b>	<ul style="list-style-type: none"> <li>Provides optimum current-dependent protection of loads against excessive temperature rises due to phase unbalance.</li> </ul>	✓	✓	(✓)
<b>Tripping in the event of phase failure</b>	<ul style="list-style-type: none"> <li>Minimizes heating of three-phase motors during single-phase operation<sup>1)</sup>.</li> </ul>	✓	✓	✓
<b>Tripping in the event of overheating</b> by means of the	<ul style="list-style-type: none"> <li>Provides optimum temperature-dependent protection of loads against excessive temperature rises e.g. for stator-critical motors or in the event of insufficient coolant flow, contamination of the motor surface or for long starting or braking operations.</li> </ul>	–	✓	–
<b>integrated thermistor motor protection function</b>	<ul style="list-style-type: none"> <li>Eliminates the need for additional special equipment.</li> <li>Saves space in the switchgear cabinet.</li> <li>Reduces wiring overhead and costs.</li> </ul>	The 3RN thermistor motor protection devices can be used to provide additional protection against excessive temperature rises.		The 3RN thermistor motor protection devices can be used to provide additional protection against excessive temperature rises.
<b>Tripping in the event of a ground fault</b> by means of	<ul style="list-style-type: none"> <li>Provides optimum protection of loads against high-resistance short-circuits or ground faults due to damage to the insulation material, moisture, condensed water etc.</li> </ul>	–	✓	–
<b>internal<sup>2)</sup> or external ground fault detection.</b>	<ul style="list-style-type: none"> <li>Eliminates the need for additional special equipment.</li> <li>Saves space in the switchgear cabinet.</li> <li>Reduces wiring overhead and costs.</li> </ul>			
<b>Features</b>				
<b>RESET function</b>	<ul style="list-style-type: none"> <li>Allows manual or automatic resetting of the relay.</li> </ul>	✓	✓	✓
<b>TEST function</b>	<ul style="list-style-type: none"> <li>Allows easy checking of the function and wiring.</li> </ul>	✓	✓	✓
<b>Status display</b>	<ul style="list-style-type: none"> <li>Displays the current operating status.</li> </ul>	✓	✓	✓
<b>Large current adjustment button</b>	<ul style="list-style-type: none"> <li>Makes setting the relay to the correct current value easier.</li> </ul>	✓	✓	✓
<b>Integrated auxiliary contacts (1 NO + 1 NC)</b>	<ul style="list-style-type: none"> <li>Allows the load to be switched off if necessary.</li> <li>Can be used to output tripped signals</li> </ul>	✓	✓	✓
<b>Design of load feeders</b>				
<b>Short-circuit strength up to 100 kA at 690 V</b> (in conjunction with the corresponding fuse or circuit-breaker)	<ul style="list-style-type: none"> <li>Provides optimum protection of the loads and operating personnel in the event of short-circuits due to insulation faults or faulty switching operations.</li> </ul>	✓	✓	✓
<b>Electrical and mechanical matching to 3RT1 contactors</b>	<ul style="list-style-type: none"> <li>Simplifies configuration</li> <li>Reduces wiring overhead and costs</li> <li>Stand-alone installation or space-saving direct mounting onto contactor.</li> </ul>	✓	✓	✓
<b>Straight-through transformers</b> (in this case the short-circuit resistant cables are routed through the push-through openings of the overload relay and connected directly to the main terminals of the contactor)	<ul style="list-style-type: none"> <li>Reduces contact resistance (only one point of contact)</li> <li>Saves wiring costs (easy, no need for tools, and fast).</li> <li>Saves material costs (elimination of the busbars)</li> <li>Reduces installation costs.</li> </ul>	Only 3RB10 56-. FW0	Only 3RB12 46-...	–

1) Single-phase operation: abnormal operating status of a three-phase asynchronous motor where one phase is interrupted.

2) Special variant: see selection and ordering data.

Features	Benefits	3RB10	3RB12	3RU11
				
<b>Other features</b>				
<b>Temperature compensation</b>	<ul style="list-style-type: none"> <li>Allows the use of the relays at high temperatures without derating.</li> <li>Prevents premature tripping</li> <li>Allows compact installation of the controlgear cabinet without space between the units/load feeders</li> <li>Simplifies configuration</li> <li>Saves space in the controlgear cabinet.</li> </ul>	✓	✓	✓
<b>High long-term stability</b>	<ul style="list-style-type: none"> <li>Provides safe protection for the loads even after years of use in severe operating conditions.</li> </ul>	✓	✓	✓
<b>Wide setting ranges</b>	<ul style="list-style-type: none"> <li>Reduce the number of variants</li> <li>Minimize the engineering outlay and costs</li> <li>Minimize storage overhead, storage costs, tied-up capital.</li> </ul>	✓	✓	–
<b>Trip classes &gt; CLASS 10</b>	<ul style="list-style-type: none"> <li>For heavy starting solutions</li> </ul>	✓	✓	–
<b>Low power loss</b>	<ul style="list-style-type: none"> <li>Reduces power consumption and energy costs (up 95 % less power is used than for thermal overload relays).</li> <li>Minimizes temperature rises of the contactor and controlgear cabinet – in some cases this may eliminate the need for controlgear cabinet cooling.</li> <li>Direct mounting to contactor saves space, even for high motor currents (i.e. no heat decoupling required).</li> </ul>	✓	✓	–
<b>Internal power supply</b>	<ul style="list-style-type: none"> <li>Eliminates the need for configuring and connecting an additional control circuit.</li> </ul>	✓	–	– Uses a bimetal contactor and therefore does not require an additional control circuit.
<b>Variable adjustment of the trip classes</b> The required trip class can be adjusted by means of a six-step rotary knob depending on the current starting condition (CLASS 5, 10, 15, 20, 25 or 30).	<ul style="list-style-type: none"> <li>Reduces the number of variants</li> <li>Minimizes the configuring outlay and costs</li> <li>Minimizes storage overhead, storage costs, and tied-up capital.</li> </ul>	–	✓	–
<b>Analog output<sup>1)</sup></b>	<ul style="list-style-type: none"> <li>Allows the output of an analog output signal for actuating moving-coil instruments, feeding programmable logic controllers or transfer to bus systems.</li> <li>Eliminates the need for an additional measuring transformer and signal converter.</li> <li>Saves space in the controlgear cabinet.</li> <li>Reduces wiring overhead and costs.</li> </ul>	–	✓	–
<b>Overload warning</b>	<ul style="list-style-type: none"> <li>Indicates imminent tripping of the relay directly on the device due to overload, phase unbalance or phase failure.</li> <li>Allows the imminent tripping of the relay to be signaled<sup>1)</sup> by means of an external indicator light connected to the corresponding auxiliary contacts.</li> <li>Allows measures to be taken in time in the event of continuous current-dependent overloads.</li> <li>Eliminates the need for an additional device.</li> <li>Saves space in the controlgear cabinet.</li> <li>Reduces wiring overhead and costs.</li> </ul>	–	✓	–

1) Special variant: See selection and ordering data.

# Controlgear: Overload Relays

## Introduction

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### Contactors



Current range  
A

### 3RB10 solid-state overload relays CLASS 10 and 20



3RB10 16 0.1 ... 12 ✓

3RB10 26 0.1 ... 25<sup>1)</sup> ✓

3RB10 36 6 ... 50 ✓

3RB10 46 13 ... 100 ✓



3RB10 56 50 ... 200

3RB10 66 55 ... 250

3RB10 66 200 ... 540

3RB10 66 300 ... 630

### 3RB12 solid-state overload relays for full motor protection CLASS 5 to 30, adjustable



3RB12 46 0.25 ... 100 ✓ ✓ ✓ ✓

3RB12 with straight-through transformer for stand-alone installation only.

3RB12 53 50 ... 205

3RB12 57 125 ... 500

3RB12 62 200 ... 820



### 3RU11 thermal overload relays, CLASS 10



3RU11 16 0.11 ... 12 ✓

3RU11 26 1.8 ... 25 ✓

3RU11 36 5.5 ... 50 ✓

3RU11 46 18 ... 100 ✓

1) Trip class, CLASS 20 from 3 A to 25 A.

✓ Assembly possible

# Controlgear: Overload Relays

## Introduction



✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

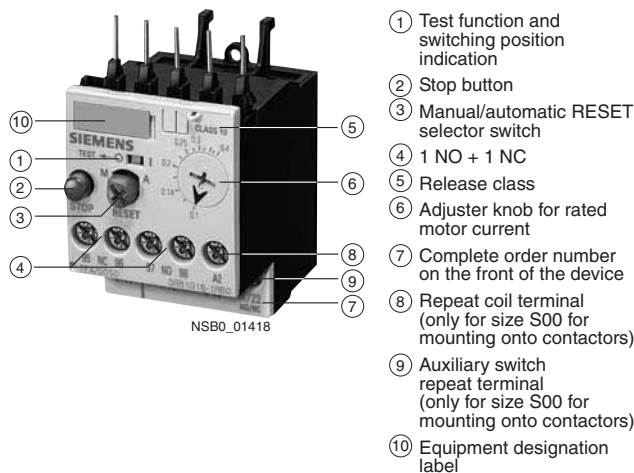
### Overview

**3RB10 solid-state overload relays with screw connection for direct mounting<sup>1)</sup> and for stand-alone installation<sup>2)</sup>, CLASS 10 and CLASS 20**

The 3RB10 solid-state overload relays up to 630 A with internal power supply have been designed for current-dependent protection of loads with normal and heavy starting (see Functions) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set motor rated current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding solid-state circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and operating current  $I_b$  and is stored in the form of a long-term stable tripping characteristic (see Characteristics). The "tripped" status is signaled by means of a switch position indicator (see Functions). The contactor is either reset manually or automatically (see Functions) after the recovery time has elapsed (see Functions).

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and recyclable materials.

They comply with important worldwide standards and approvals.



- ① Test function and switching position indication
- ② Stop button
- ③ Manual/automatic RESET selector switch
- ④ 1 NO + 1 NC
- ⑤ Release class
- ⑥ Adjuster knob for rated motor current
- ⑦ Complete order number on the front of the device
- ⑧ Repeat coil terminal (only for size S00 for mounting onto contactors)
- ⑨ Auxiliary switch repeat terminal (only for size S00 for mounting onto contactors)
- ⑩ Equipment designation label

### Specifications

The 3RB10 solid-state overload relays comply with the following standards:

- IEC 60947-1/EN 60947-1
- IEC 60947-4-1/EN 60947-4-1
- IEC 60947-5-1/EN 60947-5-1
- UL 508/CSA C 22.2.

The 3RB10 solid-state overload relays are also finger-safe acc. to EN 50274 and climate-proof acc. to IEC 60721.

- 1) With the suitable terminal brackets (see Accessories), the size S00 to S3 3RB10 solid-state overload relays for direct mounting can also be installed as stand-alone units. The 3RB10 solid-state overload relays with sizes S6 and S10/S12 can be installed as stand-alone units without additional terminal brackets. For 3TF68 and 3TF69 contactors, direct mounting is not possible.
- 2) Size S00 to S6 for screw and snap-on mounting onto 35 mm standard mounting rails, size S3 also for 75 mm standard mounting rails. For size S10 and S12, mounting onto standard mounting rails is not possible.
- 3) Please ask for approvals for dusty environments.

### Benefits

The most important features and benefits of the 3RB10 solid-state overload relays are listed in the overview table in the introduction.

### Area of application

#### Fields of application

The 3RB10 solid-state overload relays have been designed for the protection of three-phase motors in sinusoidal 50/60 Hz voltage networks.

The relay is not suitable for the protection of single-phase AC or DC loads.

For these loads, the 3RU11 thermal overload relay or the 3RB12 solid-state overload relay (only suited for the protection of single-phase AC loads) must be used.

The 3RB10 solid-state overload relays are not suitable for the protection of loads with a grounded neutral point.

#### Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive environments, ageing, and extreme temperature changes.

In the temperature range from  $-25\text{ °C}$  to  $+70\text{ °C}$ , the 3RB10 (S00 – S3) solid-state overload relays compensate the temperature according to IEC 60947-4-1.

For the 3RB10 solid-state overload relays with the sizes S6 and S10/S12, the upper setpoint of the setting range must be reduced for ambient temperatures  $\geq +60\text{ °C}$  by the factor listed in the table below.

Type	Derating factor for the upper setpoint for stand-alone installation and an ambient temperature of:		
	+50 °C	+60 °C	+70 °C
3RB10 56-.F.0	1.00	1.00	0.80
3RB10 66-.GG0	1.00	1.00	0.80
3RB10 66-.KG0	1.00	1.00	0.93
3RB10 66-.LG0	1.00	0.90	0.80

Type	Derating factor for the upper setpoint for mounting onto contactors and an ambient temperature of:		
	+50 °C	+60 °C	+70 °C
3RB10 56-.F.0	1.00	0.70	0.60
3RB10 66-.GG0	1.00	0.70	0.60
3RB10 66-.KG0	1.00	0.82	0.70
3RB10 66-.LG0	1.00	0.70	0.60

### "Increased safety" EEx type of protection

The 3RB10 solid-state overload relays comply with the regulations for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e EN 50019.

The basic safety and health requirements of ATEX guideline 94/9/EG are fulfilled by compliance with

- EN 60947-1
- EN 60947-4-1
- EN 60947-5-1
- EN 60079-14

EU type test certificates for category (2)G<sup>3)</sup> with the numbers

- PTB 01 ATEX 3306
- PTB 01 ATEX 3203
- PTB 01 ATEX 3316 have been issued.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20,  
non-adjustable

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### Design

#### Mounting options

The 3RB10 solid-state overload relays are suitable for direct and space-saving mounting onto 3RT1 contactors and 3RW30/3RW31 soft starters. The devices can also be installed as single units. Size S00 to S3 3RB10 solid-state overload relays can only be installed as single units in combination with an additional terminal bracket.

For more information on the mounting options, please consult the technical specifications as well as the selection and ordering data.

#### Connections

All sizes of the 3RB10 solid-state overload relays with screw connection can be connected to the auxiliary and main circuits. For sizes S3 to S10/S12, the main circuits can also be connected with the help of rails. The 3RB10 contactors are also available in size S6 with a straight-through transformer. In this case, the short-circuit resistant cables for the main circuit are routed directly through the push-through openings of the relay to the contactor terminals.

For more information on the different connection options, please consult the technical specifications as well as the selection and ordering data.

#### Overload relays in star-delta assemblies

When overload relays are used in combination with star-delta assemblies it must be noted that only 0.58 times the motor current flows through the line contactor. An overload relay mounted onto the line contactor must be set to 0.58 times the motor current.

An assignment of the 3RB10 solid-state overload relays to the line contactors of our 3RA star-delta assemblies can be found under "Controlgear: Contactors and Contactor Assemblies".

#### Operation with frequency converters

The 3RB10 solid-state overload relays are suitable for frequencies of 50/60 Hz and the associated harmonics. This permits the 3RB10 overload relays to be used on the incoming side of the frequency converter. If a motor contactor is required on the outgoing side of the frequency converter, Siemens recommends the 3RN thermistor motor protection devices or the 3RU11 thermal overload relays for this purpose.

### Functions

#### Control circuit

The 3RB10 solid-state overload relays have an internal power supply, i.e. they do not require an additional supply voltage.

#### Short-circuit protection

Fuses or circuit-breakers must be used for short-circuit protection. Assignments for the corresponding short-circuit protection devices to the 3RB10 solid-state overload relays with/without contactor can be found in the technical specifications or selection and ordering data.

#### Trip classes

The 3RB10 solid-state overload relays are available for normal starting conditions with trip CLASS 10 and for heavy starting conditions with trip CLASS 20. Detailed information about trip classes can be found under "Characteristics".

#### Phase failure protection

The 3RB10 solid-state overload relays are fitted with phase failure protection (see Characteristics) in order to minimize temperature rises of the load during single-phase operation.

Phase failure protection is not effective for loads with star-connection and a grounded neutral point or a neutral point which is connected to a neutral conductor.

#### Setting

The 3RB10 solid-state overload relay is set to the motor rated current by means of a rotary knob. The scale of the rotary knob is calibrated in ampere.

#### Manual and automatic reset

Automatic and manual reset is selected by pressing and turning the blue button (RESET button). If the button is set to manual reset, the overload relay can be reset directly by pressing the RESET button. Remote resetting is possible in combination with mechanical and electrical RESET modules from the accessories range (see Accessories). If the blue button is set to automatic RESET, the relay is reset automatically.

The relay can only be reset after the recovery time has elapsed.

#### Recovery time

The recovery time is permanently stored in the 3RB10 solid-state overload relay. If the button is set to automatic RESET, the recovery time is about 4 min. after tripping due to overload for sizes S00 - S3 and about 7 min. for sizes S6 - S12. The recovery time allows the load to cool down.

If the button is set to manual RESET, the device can be reset immediately.

#### TEST function

The TEST slide can be used to check whether the operating 3RB10 solid-state overload relay is working properly. Actuating the slide simulates tripping of the relay. During this simulation the NC contact (95-96) is opened and the NO contact (97-98) is closed. This tests whether the auxiliary circuit has been correctly connected to the 3RB10 solid-state overload relay. If the 3RB10 solid-state overload relay has been set to automatic RESET, the overload relay is automatically reset when the TEST slide is released. The relay must be reset with the RESET button if it has been set to manual RESET.

#### STOP function

If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream and thus the load. The load is switched on again when the STOP button is released.

#### Display of the operating status

The status of the 3RB10 solid-state overload relay is displayed by means of the position of the marking on the TEST function/switch position indicator slide. After tripping due to overload, phase unbalance or phase failure, the marking on the slide is to left on the "O" mark, otherwise it is on the "I" mark.

#### Auxiliary contacts

The 3RB10 solid-state overload relay is fitted with an NO contact for the "tripped" signal, and an NC contact for switching off the contactor.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

### Technical specifications

Type Size	3RB10 16 S00	3RB10 26 S0	3RB10 36 S2	3RB10 46 S3
Overall width	45 mm	45 mm	55 mm	70 mm
<b>General specifications</b>				
<b>Trips in the event of</b>	Overload, phase failure, and phase unbalance (> 40% acc. to NEMA)			
<b>Trip class</b>	acc. to IEC 60947-4-1	CLASS 10 and 20, depending on the version		
<b>Phase failure sensitivity</b>	Yes, trips when warm < 3 seconds			
<b>Overload warning</b>	No			
<b>Reset and recovery</b>	Manual, remote, and automatic RESET <sup>1)</sup>			
• Reset option after tripping	For automatic RESET	min.	approx. 4	
• Recovery time	For manual RESET	min.	Immediately	
	For remote RESET	min.	Immediately	
<b>Features</b>	Yes, by means of TEST function/switch position indicator slide			
• Display of operating status on device	Yes			
• TEST function	Yes			
• RESET button	Yes			
• STOP button	Yes			
<b>For safe operation of motors with "increased safety" type of protection</b>	EU type test certificate number in accordance with guideline 94/9/EU	PTB 01 ATEX 3306		
<b>Ambient temperatures</b>				
• Storage/transport	°C	-55 ... + 80		
• Operation	°C	-25 ... + 70		
• Temperature compensation	°C	up to 70		
• Permissible rated current at	Temperature inside cabinet 60 °C	%	100 (over +60 °C current reduction is not required)	
	Temperature inside cabinet 70 °C	%	100 (over +60 °C current reduction is not required)	
<b>Repeat terminals</b>	Yes			
• Coil repeat terminals	Yes			
• Auxiliary switch repeat terminal	Not required			
<b>Degree of protection</b>	acc. to IEC 60529	IP20	IP20 <sup>2)</sup>	
<b>Touch protection</b>	acc. to EN 50274	Finger-safe		
<b>Shock resistance with sine</b>	acc. to IEC 60068-2-27	g/ms	8/10 and 15/11	
<b>EMC interference immunity</b>	Limit value class B acc. to CISPR 11			
• Conductor-related interference				
- Burst	acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2	
- Surge	acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2/1 (line to ground/line to line)	
• Electrostatic discharge	acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	6/8 (contact/air discharge)	
• Field-related interference	acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	3	10 <sup>3)</sup> 10
<b>EMC interference emission</b>	Limit value class B acc. to CISPR 11			
<b>Resistance to extreme climates (air humidity)</b>	%	100		
<b>Dimensions</b>	see dimension drawings			
<b>Site altitude</b>	m	up to 2000 m above sea level		
<b>Mounting position</b>	any			
<b>Installation type/mounting</b>	Direct mounting/stand-alone installation with terminal bracket <sup>4)</sup>			
<b>Main circuit</b>				
<b>Rated insulation voltage <math>U_i</math> (pollution degree 3)</b>	V	690	1000	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6	8	
<b>Rated operating voltage <math>U_e</math></b>	V	690	1000	
<b>Type of current</b>	No			
• DC	Yes, 50/60 Hz $\pm$ 3 (other frequencies on request)			
• AC				
<b>Current setting</b>	A	0.1 - 0.4 ... 3 - 12	0.1 - 0.4 ... 6 - 25	6 - 25 ... 13 - 50 13 - 50 ... 25 - 100
<b>Power loss per unit (max.)</b>	W	approx. 0.05		
<b>Short-circuit protection</b>	with fuse without contactor	see selection and ordering data		
	with fuse and contactor	see technical specifications (short-circuit protection with fuses for motor feeders)		
<b>Safe isolation between main and auxiliary conducting path</b>	acc. to IEC 60947-1	V	on request	

1) Remote RESET in combination with the corresponding accessories.

2) Terminal compartment: IP00 degree of protection.

3) For the setting ranges 0.1 A ... 0.4 A, 0.4 A ... 1.6 A and 1.5 A ... 6 A: 3 V/m.

4) For screw and snap-on mounting onto 35 mm standard mounting rail; size S3 also for 75 mm standard mounting rail. For more detailed information about terminal brackets please see technical specifications/terminal brackets for stand-alone installation.



# SIRIUS Overload Relays

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Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

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Type	3RB10 56		3RB10 66
Size	S6		S10/S12
Overall width	120 mm		145 mm
<b>General specifications</b>			
<b>Trips in the event of</b>	Overload, phase failure, and phase unbalance (> 40% acc. to NEMA)		
<b>Trip class</b>	acc. to IEC 60947-4-1	CLASS	10 and 20, depending on the version
<b>Phase failure sensitivity</b>	Yes, trips when warm < 3 seconds		
<b>Overload warning</b>	No		
<b>Reset and recovery</b>			Manual, remote, and automatic RESET <sup>1)</sup>
• Reset option after tripping	For automatic RESET	min	approx. 7 s
• Recovery time	For manual RESET	min	Immediately
	For remote RESET	min.	Immediately
<b>Features</b>			
• Display of operating status on device	Yes, by means of TEST function/switch position indicator slide		
• TEST function	Yes		
• RESET button	Yes		
• STOP button	Yes		
<b>For safe operation of motors with "increased safety" type of protection</b>	EU type test certificate number in accordance with guideline 94/9/EU		PTB 01 ATEX 3203   PTB 01 ATEX 3316
<b>Ambient temperatures</b>			
• Storage/transport	°C		-55 ... + 80
• Operation	°C		-25 ... + 70
• Temperature compensation	°C		see area of application
• Permissible rated current at	Temperature inside cabinet 60 °C	%	see area of application
	Temperature inside cabinet 70 °C	%	see area of application
<b>Repeat terminals</b>			
• Coil repeat terminals	Not required		
• Auxiliary contact repeat terminal	Not required		
<b>Degree of protection</b>	acc. to IEC 60529		IP20 <sup>2)</sup>
<b>Touch protection</b>	acc. to EN 50274		Finger-safe with cover
<b>Shock resistance with sine</b>	acc. to IEC 60068-2-27	g/ms	8/10 and 15/11
<b>EMC interference immunity</b>			
• Conductor-related interference			
- Burst	acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2
- Surge	acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2/1 (line to ground/line to line)
• Electrostatic discharge	acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	6/8 (contact/air discharge)
• Field-related interference	acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	10
<b>EMC interference emission</b>	Limit value class B acc. to CISPR 11		
<b>Resistance to extreme climates (air humidity)</b>	%		100
<b>Dimensions</b>	see dimension drawings		
<b>Site altitude</b>	m		up to 2000 m above sea level
<b>Mounting position</b>	any		
<b>Installation type/mounting</b>	Direct mounting/stand-alone installation without additional terminal bracket <sup>3)</sup>		
<b>Main circuit</b>			
<b>Rated insulation voltage <math>U_i</math> (pollution degree 3)</b>	V		1000
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV		8
<b>Rated operating voltage <math>U_e</math></b>	V		1000
<b>Type of current</b>			
• DC	No		
• AC	Yes, 50/60 Hz $\pm$ 3 (other frequencies on request)		
<b>Current setting</b>	A	50 ... 200	55 - 250 ... 300 - 630
<b>Power loss per unit (max.)</b>	W	approx. 0.05	
<b>Short-circuit protection</b>	with fuse without contactor with fuse and contactor	see selection and ordering data see technical specifications (short-circuit protection with fuses for motor feeders)	
<b>Safe isolation between main and auxiliary conducting path</b>	acc. to IEC 60947-1	V	1000

1) Remote RESET in combination with the corresponding accessories.

2) Terminal compartment: IP00 degree of protection.

3) For screw and snap-on mounting onto 35 mm standard mounting rails (S10/S12 cannot be mounted onto standard rails).

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20,  
non-adjustable

Type Size		3RB10 16 S00	3RB10 26 S0	3RB10 36 S2	3RB10 46 S3	
Overall width		45 mm	45 mm	55 mm	70 mm	
<b>Connection for main circuit</b>						
Type of connection		Screw connection		Screw connection with box terminal	Screw connection with box terminal/bus connection <sup>1)</sup>	
<b>Screw connection</b>						
• Terminal screw		Pozidrive size 2			4 mm Allen screw	
• Tightening torque		Nm			4 ... 6	
• Conductor cross-sections (min./max.), 1 or 2 conductors	Solid	mm <sup>2</sup>	2 ... 2.5 2 x (1 ... 2.5) 2 x (2.5 ... 6) max. 2 x (2.5 ... 10)	3 ... 4.5 2 x (0.75 ... 16)	2 x (2.5 ... 16)	
	Finely stranded without end sleeve	mm <sup>2</sup>	–	–	–	
	Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5)	2 x (1 ... 2.5) 2 x (2.5 ... 6)	2 x (0.75 ... 16) 1 x (0.75 ... 25)	2 x (2.5 ... 35) 1 x (2.5 ... 50)
	Stranded	mm <sup>2</sup>	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5) max. 2 x (1 ... 4)	2 x (1 ... 2.5) 2 x (2.5 ... 6) max. 2 x (2.5 ... 10)	2 x (0.75 ... 25) 1 x (0.75 ... 35)	2 x (10 ... 50) 1 x (10 ... 70)
	AWG conductors, solid or stranded	AWG	2 x (18 ... 14)	2 x (14 ... 10)	2 x (18 ... 3) 1 x (18 ... 1)	2 x (10 ... 1/0) 2 x (10 ... 2/0)
	Ribbon cables (number x width x circumference)	mm	–	–	2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)
<b>Bus connection</b>						
• Terminal screw		Nm	–	–	M 6 x 20	
• Tightening torque		mm <sup>2</sup>	–	–	4 ... 6	
• Conductor cross-section (min./max.)	Finely stranded with cable lug	mm <sup>2</sup>	–	–	2 x 70	
	Stranded with cable lug	mm <sup>2</sup>	–	–	3 x 70	
	AWG connections, solid or stranded, with cable lug	AWG	–	–	2/0	
	With connecting bars (max. width)	mm	–	–	12	
<b>Straight-through transformer connection</b>						
• Diameter of opening		mm	–	–	–	
• Conductor cross-section (max.)	NYN	mm <sup>2</sup>	–	–	–	
	H07RN-F	mm <sup>2</sup>	–	–	–	

1) The box terminal is removable. Rail and cable lug connections are possible if the box terminal is removed.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20,  
non-adjustable

Type			3RB10 56	3RB10 66
Size			S6	S10/S12
Overall width			120 mm	145 mm
<b>Connection for main circuit</b>				
<b>Type of connection</b>			Screw connection with box terminal/bus connection/straight-through transformer connection <sup>1)</sup>	Screw connection with box terminal/bus connection <sup>1)</sup>
<b>Screw connection</b>				
• Terminal screw			4 mm Allen screw	5 mm Allen screw
• Tightening torque		Nm	10 ... 12	20 ... 22
• Conductor cross-sections (min./max.), 1 or 2 conductors	Solid	mm <sup>2</sup>	–	–
	Finely stranded without end sleeve	mm <sup>2</sup>	with 3RT19 55-4G box terminal: 2 x (1 x max. 50, 1 x max. 70) 1 x (10 ... 70)	2 x (50 ... 185) front clamping point only: 1 x (70 ... 240)
			with 3RT19 56-4G box terminal: 2 x (1 x max. 95, 1 x max. 120) 1 x (10 ... 120)	rear clamping point only: 1 x (120 ... 185)
	Finely stranded with end sleeve	mm <sup>2</sup>	with 3RT19 55-4G box terminal: 2 x (1 x max. 50, 1 x max. 70) 1 x (10 ... 70)	2 x (50 ... 185) front clamping point only: 1 x (70 ... 240)
			with 3RT19 56-4G box terminal: 2 x (1 x max. 95, 1 x max. 120) 1 x (10 ... 120)	rear clamping point only: 1 x (120 ... 185)
	Stranded	mm <sup>2</sup>	with 3RT19 55-4G box terminal: 2 x (max. 70) 1 x (16 ... 70)	2 x (70 ... 240) front clamping point only: 1 x (95 ... 300)
			with 3RT19 56-4G box terminal: 2 x (max. 120) 1 x (16 ... 120)	rear clamping point only: 1 x (120 ... 240)
	AWG conductor connections, solid or stranded	AWG	with 3RT19 55-4G box terminal: 2 x (max. 1/0) 1 x (6 ... 2/0)	2 x (2/0 ... 500 kcmil) front clamping point only: 1 x (3/0 ... 600 kcmil)
			with 3RT19 56-4G box terminal: 2 x (max. 3/0) 1 x (6 ... 250 kcmil)	rear clamping point only: 1 x (250 kcmil ... 500 kcmil)
	Ribbon cables (number x width x circumference)	mm	with 3RT19 55-4G box terminal: 2 x (6 x 15.5 x 0.8) 1 x (3 x 9 x 0.8 ... 6 x 15.5 x 0.8)	2 x (20 x 24 x 0.5) 1 x (6 x 9 x 0.8 ... 20 x 24 x 0.5)
			with 3RT19 56-4G box terminal: 2 x (10 x 15.5 x 0.8) 1 x (3 x 9 x 0.8 ... 10 x 15.5 x 0.8)	
<b>Bus connection</b>				
• Terminal screw			M 8 x 25	M 10 x 30
• Tightening torque		Nm	10 ... 14	14 ... 24
• Conductor cross-section (min./max.)	Finely stranded with cable lug	mm <sup>2</sup>	16 ... 95 <sup>2)</sup>	50 ... 240 <sup>3)</sup>
	Stranded with cable lug	mm <sup>2</sup>	25 ... 120 <sup>2)</sup>	70 ... 240 <sup>3)</sup>
	AWG conductor connections, solid or stranded, with cable lug	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
	With connecting bar (max. width)	mm	17	25
<b>Straight-through transformer connection</b>				
• Diameter of opening		mm	24,5	–
• Conductor cross-section (max.)	NYY	mm <sup>2</sup>	120	–
	H07RN-F	mm <sup>2</sup>	70	–

1) Screw connection with corresponding box terminal possible (see Accessories)

2) When connecting cable lugs to DIN 46235 use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm<sup>2</sup> to ensure phase spacing.

3) When connecting cable lugs to DIN 46234 for conductor cross-sections from 240 mm<sup>2</sup> as well as DIN 46235 for conductor cross-sections from 185 mm<sup>2</sup>, use 3RT19 66-4EA1 terminal cover to ensure phase spacing.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

Type Size	3RB10 16 S00	3RB10 26 S0	3RB10 36 S2	3RB10 46 S3
Overall width	45 mm	45 mm	55 mm	70 mm
<b>Auxiliary circuit</b>				
Auxiliary contacts: Number x (version)	1 x (1 NO + 1 NC)			
Assignment of auxiliary contacts	1 NO for the "tripped due to overload" signal; 1 NC for switching off the contactor			
Rated insulation voltage $U_i$ (pollution degree 3)	V	690		
Rated impulse withstand voltage $U_{imp}$	kV	6		
<b>Contact rating of the auxiliary contacts</b>				
• NC at AC, AC-14/AC-15	Rated operating current $I_e$ for $U_e$ :			
	- 24 V	A	4	
	- 120 V	A	4	
	- 125 V	A	4	
	- 230 V	A	3	
	- 400 V	A	2	
	- 600 V	A	1	
	- 690 V	A	1	
• NO at AC, AC-14/AC-15	Rated operating current $I_e$ for $U_e$ :			
	- 24 V	A	4	
	- 120 V	A	4	
	- 125 V	A	4	
	- 230 V	A	3	
	- 400 V	A	2	
	- 600 V	A	1	
	- 690 V	A	1	
• NC, NO at DC, DC-13	Rated operating current $I_e$ for $U_e$ :			
	- 24 V	A	1	
	- 60 V	A	0.22	
	- 110 V	A	0.22	
	- 125 V	A	0.22	
	- 220 V	A	0.11	
• Conventional thermal current $I_{th}$		A	6	
• Contact reliability	(suitable for PLC control; 17 V, 5 mA)		Yes	
<b>Short-circuit protection</b>				
• With fuse	Operational class gL/gG	A	6	
	Quick	A	10	
• With miniature circuit-breaker (C-characteristic)		A	6 <sup>1)</sup>	
Safe isolation between auxiliary circuits	IEC 60947-1	V	300	
<b>Connection for auxiliary circuit</b>				
Type of connection	Screw connection			
<b>Connection features</b>				
• Terminal screw		Nm	Pozidrive size 2	
• Tightening torque			0.8 ... 1.2	
• Conductor cross-sections (min./max.), 1 or 2 conductors	Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5)	
	Finely stranded without end sleeve	mm <sup>2</sup>	-	
	Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5)	
	Stranded	mm <sup>2</sup>	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5)	
	AWG conductor connections, solid or stranded	AWG	2 x (18 ... 14)	
<b>CSA, UL, and UR ratings</b>				
Auxiliary circuit	Switching capacity		B600, R300	

1) Up to  $I_k \leq 0.5$  kA;  $\leq 260$  V.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20,  
non-adjustable

Type Size	3RB10 56		3RB10 66	
Overall width	S6 120 mm		S10/S12 145 mm	
<b>Auxiliary circuit</b>				
<b>Auxiliary contacts: Number x (version)</b>		1 x (1 NO + 1 NC)		
<b>Assignment of auxiliary contacts</b>		1 NO for the "tripped due to overload" signal; 1 NC for switching off the contactor		
<b>Rated insulation voltage <math>U_i</math> (pollution degree 3)</b>		V	690	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		kV	6	
<b>Contact rating of the auxiliary contacts</b>				
• NC at AC, AC-14/AC-15	Rated operating current $I_e$ for $U_e$ :			
	- 24 V	A	4	
	- 120 V	A	4	
	- 125 V	A	4	
	- 230 V	A	3	
	- 400 V	A	2	
	- 600 V	A	1	
• NO at AC, AC-14/AC-15	Rated operating current $I_e$ for $U_e$ :			
	- 24 V	A	4	
	- 120 V	A	4	
	- 125 V	A	4	
	- 230 V	A	3	
	- 400 V	A	2	
	- 600 V	A	1	
• NC, NO at DC, DC-13	Rated operating current $I_e$ for $U_e$ :			
	- 24 V	A	1	
	- 60 V	A	0.22	
	- 110 V	A	0.22	
	- 125 V	A	0.22	
• Conventional thermal current $I_{th}$			A	0.11
			A	6 <sup>1)</sup>
			A	Yes
• Contact reliability		(suitable for PLC control; 17 V, 5 mA)		
<b>Short-circuit protection</b>				
• With fuse	Operational class gL/gG		A	6
	Quick		A	10
• With miniature circuit-breaker (C-characteristic)			A	6 <sup>2)</sup>
<b>Safe isolation between auxiliary circuits</b>		Acc. to IEC 60947-1	V	300
<b>Connection for auxiliary circuit</b>				
<b>Type of connection</b>		Screw connection		
<b>Connection features</b>				
• Terminal screw • Tightening torque • Conductor cross-sections (min./max.), 1 or 2 conductors	Solid		Nm	Pozidrive size 2
			mm <sup>2</sup>	0.8 ... 1.2
			mm <sup>2</sup>	2 x (0.5 ... 1.5)
			mm <sup>2</sup>	2 x (0.75 ... 2.5)
	Finely stranded without end sleeve		mm <sup>2</sup>	–
	Finely stranded with end sleeve		mm <sup>2</sup>	2 x (0.5 ... 1.5)
			mm <sup>2</sup>	2 x (0.75 ... 2.5)
Stranded			mm <sup>2</sup>	2 x (0.5 ... 1.5)
			mm <sup>2</sup>	2 x (0.75 ... 2.5)
	AWG conductor connections, solid or stranded		AWG	2 x (18 ... 14)
<b>CSA, UL, and UR ratings</b>				
<b>Auxiliary circuit</b>		Switching capacity		B600, R300

1) From 60 °C the conventional thermal current  $I_{th}$  on the auxiliary contacts is 2 A.

2) Up to  $I_k \leq 0.5$  kA;  $\leq 260$  V.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20,  
non-adjustable

### Terminal brackets for stand-alone installation

Type	3RU19 16-3AA01				3RU19 26-3AA01				3RU19 36-3AA01				3RU19 46-3AA01			
For overload relay	3RB10 16				3RB10 26				3RB10 36				3RB10 46			
Mounting type	For screw and snap-on mounting onto 35 mm standard mounting rail; Size S3, also for 75 mm standard mounting rail.															
<b>Connection for main circuit</b>																
<b>Type of connection</b>																
Screw connection																
Screw connection with box terminal																
<b>Screw connection</b>																
• Terminal screw																
Pozidrive size 2																
4 mm Allen screw																
• Conductor cross-section (min./max.), 1 or 2 conductors																
Solid mm <sup>2</sup>																
1 x (0.5 ... 2.5)   1 x (1 ... 6)   2 x (0.75 ... 16)   2 x (2.5 ... 16)																
max. 1 x (... 4)   max. 1 x (... 10)																
Finely stranded without end sleeve mm <sup>2</sup>																
Finely stranded with end sleeve mm <sup>2</sup>																
1 x (0.5 ... 2.5)   1 x (1 ... 6)   2 x (0.75 ... 16)   2 x (2.5 ... 35)																
1 x (0.75 ... 25)   1 x (2.5 ... 50)																
2 x (10 ... 50)   1 x (10 ... 70)																
Stranded mm <sup>2</sup>																
1 x (0.5 ... 2.5)   1 x (1 ... 6)   1 x (0.75 ... 35)   1 x (10 ... 70)																
max. 1 x (... 4)   max. 1 x (... 10)   1 x (0.75 ... 35)   1 x (10 ... 70)																
AWG conductor connections, solid or stranded AWG																
1 x (18 ... 14)   1 x (14 ... 10)   2 x (18 ... 3)   2 x (10 ... 1/0)																
1 x (18 ... 1)   2 x (10 ... 2/0)																
Ribbon cables mm																
–   –   2 x (6 x 9 x 0.8)   2 x (6 x 9 x 0.8)																
(number x width x circumference)																

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

### Short-circuit protection with fuses for motor feeders

for short-circuit currents up to 50 kA

Overload relays Setting range	Contactor Type	CLASS						690 V			415 V	600 V
		10		20				Fuse links <sup>1)</sup> LV HRC DIAZED NEOZED Operational class gL/gG Type of coordination <sup>2)</sup>			British Standard fuses BS 88	U <sub>L</sub> -listed fuses RK5/CLASSL
Type	Type	400 V	500 V	690 V	400 V	500 V	690 V	1	2	2	2	
<b>Size S00</b>												
0.1 A ... 0.4 A 3RB10 16	3RT10 15	0.4	0.4	0.4	0.4	0.4	0.4	25	2	–	2	1.6
0.4 A ... 1.6 A 3RB10 16	3RT10 15	1.6	1.6	1.6	1.6	1.6	1.6	25	6	–	6	6
1.5 A ... 6 A 3RB10 16	3RT10 15 3RT10 17	6 6	5 6	4 6	6 6	5 6	4 6	35 35	20 20	–	20 20	25
3 A ... 12 A 3RB10 16	3RT10 17	12	9	6.3	10	9	6.3	35	20	–	25	45
<b>Size S0</b>												
0.1 A ... 0.4 A 3RB10 26	3RT10 24	0.4	0.4	0.4	0.4	0.4	0.4	63	2	–	2	1.6
0.4 A ... 1.6 A 3RB10 26	3RT10 24	1.6	1.6	1.6	1.6	1.6	1.6	63	6	–	6	6
1.5 A ... 6 A 3RB10 26	3RT10 24	6	6	6	6	6	6	63	25	20	25	25
3 A ... 12 A 3RB10 26	3RT10 24	12	12	9	12	12	9	63	25	20	25	45
6 A ... 25 A 3RB10 26	3RT10 24 3RT10 25 3RT10 26	12 17 25	12 17 18	9 13 13	12 16 16	12 16 16	9 13 13	63 63 100	25 25 35	20 20 20	25 25 25	70 70 100
<b>Size S2</b>												
6 A ... 25 A 3RB10 36	3RT10 34 3RT10 35	25 25	25 25	20 24	22.3 25	22.3 25	20 24	125 125	63 63	50 50	63 63	100 100
13 A ... 50 A 3RB10 36	3RT10 34 3RT10 35 3RT10 36	32 40 50	32 40 50	20 24 24	22.3 29.4 32.7	22.3 29.4 32.7	20 24 24	125 125 160	63 63 80	50 50 50	63 80 80	125 150 200
<b>Size S3</b>												
13 A ... 50 A 3RB10 46	3RT10 44 3RT10 45	50 50	50 50	47 50	49 50	49 50	47 50	250 250	100 100	63 80	100 100	200 200
25 A ... 100 A 3RB10 46	3RT10 44 3RT10 45 3RT10 46 3RT10 54 3RT10 55	65 80 95 100 100	65 80 95 100 100	47 58 58 100 100	49 53 59 82 100	49 53 59 82 100	47 53 58 82 100	250 250 250 250 250	125 160 160 200 200	63 80 100 125 160	125 160 160 160 200	250 350 350 160 200
<b>Size S6</b>												
50 A ... 200 A 3RB10 56	3RT10 54 3RT10 55 3RT10 56	115 150 185	115 150 185	115 150 170	81.7 107 131	81.7 107 131	82 107 131	355 355 355	315 315 315	160 200 200	250 315 315	450 500 500
<b>Size S10/S12</b>												
55 A ... 250 A 3RB10 66	3RT10 64 3RT10 65 3RT10 66	225 250 250	225 250 250	225 265 280	160 188 213	160 188 213	160 188 213	500 500 500	400 400 400	250 315 315	400 400 400	700 800 800
200 A ... 540 A 3RB10 66	3RT10 65 3RT10 66 3RT10 75 3RT10 76 3RT12 64 3RT12 65 3RT12 66 3RT12 75 3RT12 76	265 300 400 500 225 265 300 400 500	265 300 400 500 225 265 300 400 500	265 280 400 450 225 265 300 400 500	188 213 284 355 225 265 300 400 500	188 213 284 355 225 265 300 400 500	188 213 284 355 225 265 300 400 500	500 500 630 630 500 500 500 800 800	400 400 500 500 500 500 500 800 800	315 315 400 500 400 400 400 630 630	400 400 450 500 450 450 450 800 800	800 800 1000 1200 800 800 800 1200 1200
300 A ... 630 A 3RB10 66	3TF68 3TF69	630 630	630 630	630 630	440 572	440 572	440 572	800 800	500 630	630 630	500 630	1200 1200

1) Observe operating voltage.

2) Coordination and short-circuit equipment in accordance with EN 60947-4-1:

**Type of coordination 1:** the contactor or starter must not endanger persons or the installation in the event of a short-circuit. They do not need to be suitable for further operation without repair and the renewal of parts.

**Type of coordination 2:** The contactor or starter must not endanger persons or the installation in the event of a short-circuit. They must be suitable for further use. There is a risk of contact welding.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays







Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

### Selection and ordering data

#### 3RB10 solid-state overload relays with screw connection for direct mounting<sup>1)</sup> and stand-alone installation<sup>2)</sup>, CLASS 10

Features and technical specifications

- Internal power supply
- Auxiliary contacts: 1 NO + 1 NC
- Manual/automatic RESET
- Switch position indication
- TEST function
- STOP button
- Phase failure/unbalance sensitivity
- Trip class CLASS 10

	For 3RT1 contactor and 3RW30 and 3RW31 soft starter	Suitable for three-phase motors with P <sup>3)</sup>	Setting range	Fuse gL/gG <sup>4)</sup>	DT	For direct mounting <sup>1)</sup>	PS*	Weight per PU	DT	For stand-alone installation <sup>2)</sup>	PS*	Weight per PU		
	Size <sup>5)</sup>	kW	A	A		Order No.		kg		Order No.		kg		
 3RB10 16-..B0	Size S00	S00	0.04 ... 0.09	0.1 ... 0.4	2	▶ <b>3RB10 16-1RB0</b>	1 unit	0.231	▶	▶ <b>3RB10 16-1RB1</b>	1 unit	0.269		
			0.12 ... 0.55	0.4 ... 1.6	6								▶ <b>3RB10 16-1NB0</b>	▶ <b>3RB10 16-1NB1</b>
			0.55 ... 2.2	1.5 ... 6	20								▶ <b>3RB10 16-1PB0</b>	▶ <b>3RB10 16-1PB1</b>
			1.1 ... 5.5	3 ... 12	35								▶ <b>3RB10 16-1SB0</b>	▶ <b>3RB10 16-1SB1</b>
 3RB10 26-..B0	Size S0	S0	0.04 ... 0.09	0.1 ... 0.4	2	▶ <b>3RB10 26-1RB0</b>	1 unit	0.255	-	-				
			0.12 ... 0.55	0.4 ... 1.6	6								▶ <b>3RB10 26-1NB0</b>	▶ <b>3RB10 26-1NB1</b>
			0.55 ... 2.2	1.5 ... 6	25								▶ <b>3RB10 26-1PB0</b>	▶ <b>3RB10 26-1PB1</b>
			1.1 ... 5.5	3 ... 12	35								▶ <b>3RB10 26-1SB0</b>	▶ <b>3RB10 26-1SB1</b>
			3 ... 11	6 ... 25	63								▶ <b>3RB10 26-1QB0</b>	▶ <b>3RB10 26-1QB1</b>
 3RB10 36-..B0	Size S2	S2	3 ... 11	6 ... 25	63	▶ <b>3RB10 36-1QB0</b>	1 unit	0.422	-	▶ <b>3RB10 36-1UB1</b>	1 unit	0.585		
			7.5 ... 22	13 ... 50	100									
 3RB10 46-..B0	Size S3	S3	7.5 ... 22	13 ... 50	125	▶ <b>3RB10 46-1UB0</b>	1 unit	0.695	-	▶ <b>3RB10 46-1EB1</b>	1 unit	0.941		
			11 ... 45	25 ... 100	200									
 3RB10 56-..FW0	Size S6 <sup>6)</sup>	S6 with box terminal	22 ... 90	50 ... 200	355	▶ <b>3RB10 56-1FW0</b>	1 unit	0.611	▶	▶ <b>3RB10 56-1FW0</b>	1 unit	0.611		
			S6	22 ... 90	50 ... 200								355	▶ <b>3RB10 56-1FG0</b>
 3RB10 66-..G0	Size S10/S12	S10 and S12	22 ... 110	55 ... 250	500	▶ <b>3RB10 66-1GG0</b>	1 unit	1.570	▶	▶ <b>3RB10 66-1GG0</b>	1 unit	1.570		
		S10 and S12	90 ... 250	200 ... 540	800	▶ <b>3RB10 66-1KG0</b>	1 unit	1.740	▶	▶ <b>3RB10 66-1KG0</b>	1 unit	1.740		
		Size 14 (3TF68 and 3TF69)	160 ... 450	300 ... 630	800	-	▶ <b>3RB10 66-1LG0</b>	1 unit	1.730					

1) With the suitable terminal brackets (see Accessories) the 3RB10 overload relays with size S00 to S3 for direct mounting can also be installed as stand-alone units.

The 3RB10 overload relays with sizes S6 and S10/S12 can be installed as stand-alone units without additional terminal brackets. For contactors 3TF68 and 3TF69, direct mounting is not possible.

2) Size S00 to S6 for screw and snap-on mounting onto 35 mm standard mounting rails; size S3 also for 75 mm standard mounting rails. Size S10 and S12 cannot be mounted onto standard rails.

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

4) Maximum fuse for overload relay, type of coordination 2. For fuse values for mounting onto contactor, see Technical specifications, short-circuit protection with fuses for motor feeders.

5) Observe maximum rated operating current of the units.

6) 3RB10 56-1FW0 with straight-through transformer, 3RB10 56-1FG0 with rail end pieces.



# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays







Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

### Selection and ordering data

#### 3RB10 solid-state overload relays with screw connection for direct mounting<sup>1)</sup>, CLASS 20

Features and technical specifications

- Internal power supply
- Auxiliary contacts: 1 NO + 1 NC
- Manual/automatic RESET
- Switch position indication
- TEST function
- STOP button
- Phase failure/phase failure sensitivity
- Trip class CLASS 20

	For 3RT1 contactor and soft starters 3RW30 and 3RW31	Suitable for three-phase motors with P <sup>2)</sup>	Setting range	Fuse gL/gG <sup>3)</sup>	DT	For direct mounting <sup>1)</sup>	PS*	Weight per PU
	Size <sup>4)</sup>	kW	A	A		Order No.		kg
<b>Size S00</b>								
	S00	0.04 ... 0.09 0.12 ... 0.55 0.55 ... 2.2 1.1 ... 5.5	0.1 ... 0.4 0.4 ... 1.6 1.5 ... 6 3 ... 12	2 6 20 35	▶ ▶ ▶ ▶	<b>3RB10 16-2RB0</b> <b>3RB10 16-2NB0</b> <b>3RB10 16-2PB0</b> <b>3RB10 16-2SB0</b>	1 unit 1 unit 1 unit 1 unit	0.231 0.231 0.239 0.236
<b>Size S0</b>								
	S0	1.1 ... 5.5 3 ... 11	3 ... 12 6 ... 25	35 63	▶ ▶	<b>3RB10 26-2SB0</b> <b>3RB10 26-2QB0</b>	1 unit 1 unit	0.260 0.263
<b>Size S2</b>								
	S2	3 ... 11 7.5 ... 22	6 ... 25 13 ... 50	63 100	▶ ▶	<b>3RB10 36-2QB0</b> <b>3RB10 36-2UB0</b>	1 unit 1 unit	0.426 0.422
<b>Size S3</b>								
	S3	7.5 ... 22 11 ... 45	13 ... 50 25 ... 100	125 200	▶ ▶	<b>3RB10 46-2UB0</b> <b>3RB10 46-2EB0</b>	1 unit 1 unit	0.700 0.698
<b>Size S6<sup>5)</sup></b>								
	S6 with box terminal S6	22 ... 90 22 ... 90	50 ... 200 50 ... 200	355 355	▶ ▶	<b>3RB10 56-2FW0</b> <b>3RB10 56-2FG0</b>	1 unit 1 unit	0.615 0.963
<b>Size S10/S12</b>								
	S10 and S12 S10 and S12 Size 14 (3TF68 and 3TF69)	22 ... 110 90 ... 250 160 ... 450	55 ... 250 200 ... 540 300 ... 630	500 800 800	▶ ▶ ▶	<b>3RB10 66-2GG0</b> <b>3RB10 66-2KG0</b> <b>3RB10 66-2LG0</b>	1 unit 1 unit 1 unit	1.570 1.740 1.740

1) With the suitable terminal brackets (see Accessories), the 3RB10 overload relays with size S00 to S3 for direct mounting can also be installed as stand-alone units.

The 3RB10 overload relays with sizes S6 and S10/S12 can be installed as single units without additional terminal brackets. For 3TF68/3TF69 contactors, direct mounting is not possible.

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

3) Maximum fuse for overload relay, type of coordination 2. For fuse values for mounting onto contactor see Technical specifications, short-circuit protection with fuses for motor feeders.

4) Observe maximum rated operating current of the units.

5) 3RB10 56-2FW0 with straight-through transformer, 3RB10 56-2FG0 with rail end pieces.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

### Accessories

The following accessories are available for the 3RB10 solid-state overload relays

- For the four overload relay sizes S00 to S3 one terminal bracket each for stand-alone installation
- One electrical remote RESET module in three voltage variants for all sizes.
- One mechanical remote RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for the current adjustment screw which can also be used to block the selector switch "manual/automatic RESET" (for all sizes).
- Box terminals for sizes S6 and S10/S12 as well as
- Terminal covers for sizes S2 to S10/S12.

The accessories for the overload relay sizes S00 to S3 can also be used for the thermal overload relays (exception: sealable cover).

### Characteristics

The tripping characteristics show the relationship between the tripping time and tripping current as multiples of the set current  $I_e$  and are given for symmetrical three-pole and two-pole loads from the cold state.

The smallest current used for tripping is called the minimum tripping current. According to IEC 60947-4-1, this current must be within specified limits. For the 3RB10 solid-state overload relays, the minimum tripping current corresponds to 114 % of the set current for symmetrical three-pole loads.

The tripping characteristic starts with the minimum tripping current and continues with higher tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time intervals within which the overload relays have to trip with 7.2 times the set current  $I_e$  from the cold state for symmetrical three-pole loads.

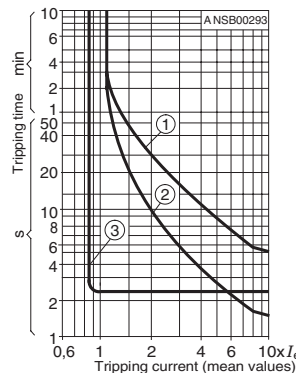
The tripping times are as follows for:

CLASS	Tripping times
10A	2 s ... 10 s
10	4 s ... 10 s
20	6 s ... 20 s
30	9 s ... 30 s

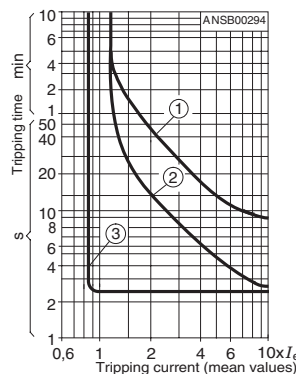
The tripping characteristic for a three-pole overload relay from the cold state (see characteristic "1") only apply if all three phases are simultaneously loaded with the same current. In the event of a phase failure or current unbalance of more than 40 %, the 3RB10 solid-state overload relay will switch off the contactor and thus the load within 3 seconds. As a result of fast tripping in accordance with the tripping characteristic for double-pole loads from the cold state (characteristic "3"), heating of the load is minimized.

Compared with a cold load, a load at operating temperature obviously has a lower temperature reserve. The 3RB10 solid-state overload relays take this fact into account by reducing the tripping time to about 30 % after carrying a load for a long time with the set current  $I_e$  in accordance with the characteristic for symmetrical loads from the warm state (see characteristic "2").

Tripping characteristic for trip class CLASS 10



Tripping characteristic for trip class CLASS 20



*These are schematic representations of characteristics. The characteristics for the individual 3RB10 solid-state overload relays can be requested from technical assistance at the following e-mail address: [Technical-assistance@siemens.com](mailto:Technical-assistance@siemens.com)*

# SIRIUS Overload Relays

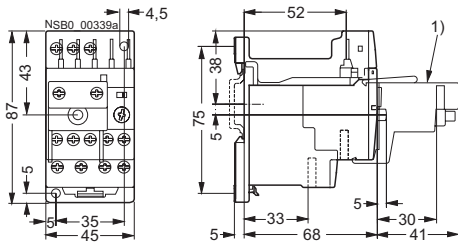
## SIRIUS Solid-State Overload Relays

Up to 630 A, CLASS 10 and CLASS 20, non-adjustable

### Dimension drawings

#### 3RB10 16-.. B.

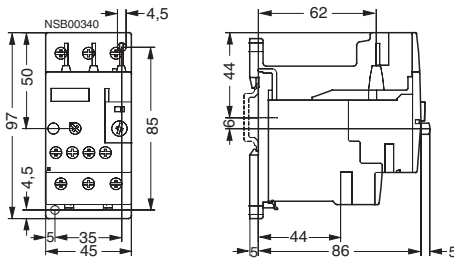
Size S00 with terminal bracket for stand-alone installation and with accessories



1) Module for remote RESET

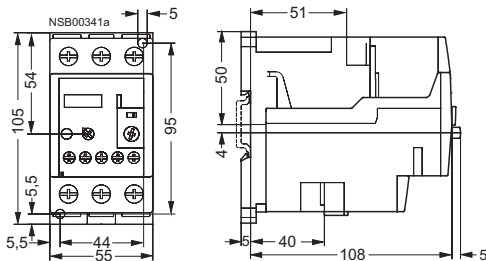
#### 3RB10 26-.. B.

Size S0 with terminal bracket for stand-alone installation



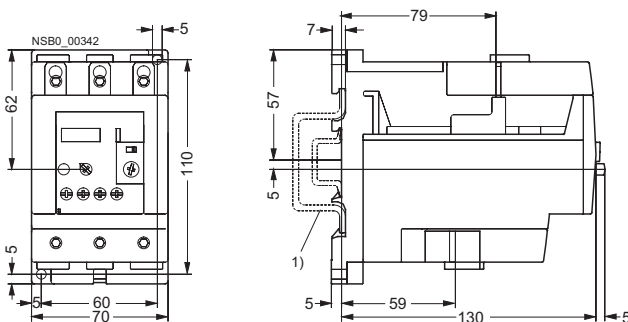
#### 3RB10 36-.. B.

Size S2 with terminal bracket for stand-alone installation



#### 3RB10 46-.. B.

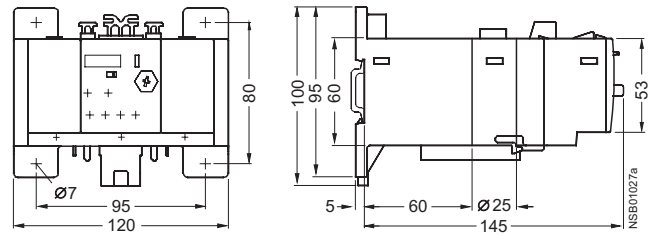
Size S3 with terminal bracket for stand-alone installation



1) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to DIN EN 50 022 or 75 mm standard mounting rail acc. to DIN EN 50 023

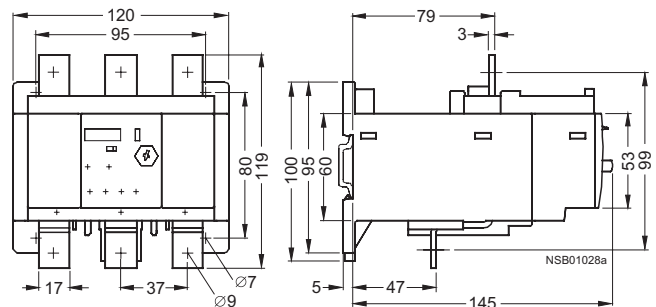
#### 3RB10 56-..FW0

Size S6



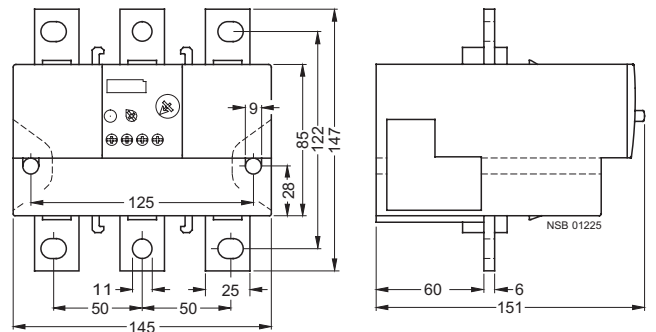
#### 3RB10 56-..FG0

Size S6



#### 3RB10 66-.. G0

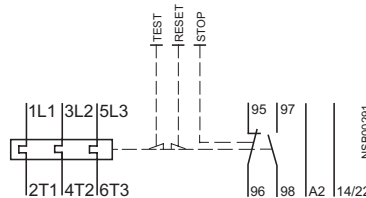
Size S10/S12



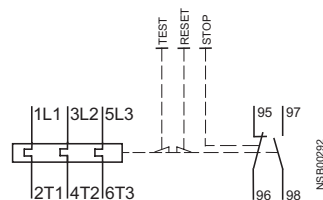
For dimension drawings of "contactor mounted onto overload relay", see contactors and contactor assemblies.

### Circuit diagrams

#### 3RB10 16 overload relays



#### 3RB10 26 to 3RB10 66 overload relays



# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

### Overview

**3RB12 solid-state overload relays for full motor protection with screw connection for direct mounting<sup>1)</sup> and stand-alone installation, CLASS 5 to CLASS 30, adjustable**

The 3RB12 solid-state overload relays up to 820 A with external power supply have been designed for current-dependent protection of loads with normal and heavy starting (see Functions) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure results in an increase of the motor current beyond the set motor rated current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding solid-state circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and set current  $I_e$  and is stored in the form of a long-term stable tripping characteristic (see Characteristics). The "tripped" status is signaled by means of a continuous red "Overload" LED.

The LED indicates imminent tripping of the relay due to overload, phase unbalance or phase failure by flashing when the limit current has been violated. This warning can also be displayed externally.

In addition to current-dependent protection of loads against excessive temperature rises due to overload, phase unbalance and phase failure, the 3RB12 solid-state overload relays also allow the temperature of the motor winding to be monitored by connecting a PTC sensor circuit. In this way, the loads can be protected against overheating caused indirectly by reduced coolant flow, for example, which cannot be detected by means of the current alone. In the event of overheating, the 3RB12 solid-state overload relay switches off the contactor, and thus the load, by means of the auxiliary contacts. The connection of the over-temperature protection is fail-safe i.e. the device trips if the connection terminals are open or if there is an open circuit.

To also protect the loads against high-resistance short-circuits or ground faults due to damage to the insulation, humidity, condensed water, etc., the 3RB12 solid-state overload relays offer the following two options for ground fault monitoring:

- Internal ground fault detection (not for star-delta assemblies) for motors with a 3-conductor connection for the detection of fault currents >30 % of the set current  $I_e$  for operation at the nominal value and
- External ground fault detection by connecting a summation current transformer for motors with 3 and 4-conductor connections for detecting sinusoidal fault currents (50/60 Hz) of 0.3 A, 0.5 A and 1 A.

In the event of a ground fault the device trips immediately and switches off the contactor, and thus the load, by means of the auxiliary contacts. The "tripped" status is signaled by means of a red "Ground fault" LED.

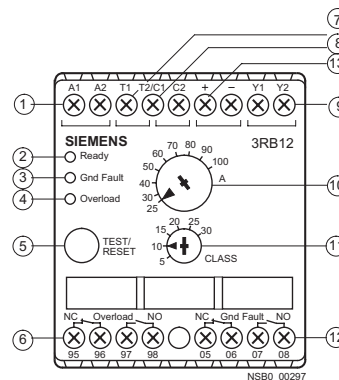
The device also continuously monitors its own operating capability (self-monitoring) and trips in the event of an internal fault. In this case the device cannot be reset.

After tripping due to overload, phase unbalance, phase failure, thermistor tripping, and ground fault, the relay is reset manually or automatically (see Functions) after the recovery time has elapsed (see Functions).

The motor current measured by the microprocessor of the 3RB12...40 solid-state overload relay is converted into an analog DC 4 mA to 20 mA output signal and then output (max. current value of the 3 phases). The analog signal can be used to actuate moving-coil instruments with 4 mA to 20 mA input (the upper limit of the scale for all sizes is 125 %) or to supply analog inputs of programmable logic controllers. In addition, the current values can be transferred via the AS-i bus system by means of an AS-Interface analog module.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials.

They comply with important worldwide standards and approvals.



- Terminals for the control supply voltages
- Green "Ready" LED
- Red "Ground Fault" LED
- Red "Overload" LED
- TEST/RESET button
- 1 NO/1 NC for overload/thermistor tripping or earth fault tripping
- Terminals for thermistor
- Terminals for external summation current transformer
- Terminals for remote or automatic RESET
- Adjuster knob for rated motor current
- Rotary knob for CLASS 5, 10, ..., 30
- 1 NO/1 NC for earth fault tripping or 1 NO/1 NC for overload warning
- Analog output 4 ... 20 mA

### Specifications

The 3RB12 solid-state overload relays comply with the following standards:

- IEC 60947-1/EN 60947-1
- IEC 60947-4-1/EN 60947-4-1
- IEC 60947-5-1/EN 60947-5-1
- UL 508/CSA C 22.2.

The 3RB12 solid-state overload relays are also finger-safe in accordance with EN 50274 and climate-proof in accordance with IEC 60721.

### Benefits

The most important features and benefits of the 3RB12 solid-state overload relays are listed in the overview table in the introduction.

1) Exception: 3RB12 46.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

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### Area of application

#### Fields of application

The 3RB12 solid-state overload relays have been designed for the protection of three-phase asynchronous and single-phase AC motors.

If single-phase AC motors are to be protected with the 3RB12 solid-state overload relay, the microprocessor must only monitor one phase conductor. For this reason, the main circuits must be connected to the current transformer as described in the operating manual for the 3RB12 solid-state overload relay.

#### Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive environments, ageing, and temperature changes.

For the temperature range from  $-25\text{ °C}$  to  $+70\text{ °C}$ , the 3RB12 solid-state overload relays compensate the temperature in accordance with IEC 60947-4-1.

#### "Increased safety" type of protection EEx e

The 3RB12 solid-state overload relays comply with the regulations for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e EN 50019.

For tripping units with DC operation, electrical isolation must be ensured by means of a battery unit or safety transformer in accordance with EN 60742.

When using 3RB12...-...1 solid-state overload relays (no change of switching status of auxiliary contacts in the event of control supply voltage failure) for the protection of EEx e motors, separate monitoring of the control supply voltage is recommended.

The basic safety and health requirements are fulfilled by compliance with

- EN 60947-1
- EN 60947-4-1
- EN 60947-5-1
- DIN VDE 0660-302
- DIN VDE 0660-303
- EN 60079-14

EU type test certificates for Category (2)  $G^1$  with the number  
• PTB 01 ATEX 3220 has been issued.

### Design

#### Mounting options

The 3RB12 solid-state overload relays can be installed as single units or mounted directly onto the contactors with the help of connecting bars (exception: 3RB12 with 70 mm overall width). For more information on the mounting options, please consult the technical specifications as well as the selection and ordering data.

#### Connections

The 3RB12 solid-state overload relays with 120 mm, 145 mm, and 230 mm width are fitted with a bus connection for the main circuits. In contrast, the main circuits for the 70 mm 3RB12 overload relay are simply routed short-circuit proof through the straight-through transformer of the relay directly to the terminals of the contactor. For motor rated currents  $I_N$  which are lower than 1.25 A, the supply conductors for the motors can be routed multiple times (n times) through the openings for each phase. The set current  $I_e$  for multiple routing of the motor supply conductors are calculated with the following formula:  $I_e = n \times I_N$  with  $n \leq 5$ .

1) Please ask for approvals for dusty environments.

The auxiliary contact terminals of all 3RB12 overload relays have screw connections.

For more information on the different connection options please consult the technical specifications as well as the selection and ordering data.

#### Overload relays in star-delta assemblies

When overload relays are used in combination with star-delta assemblies it must be noted that only 0.58 times the motor current flows through the line contactor. An overload relay mounted onto the line contactor must be set to 0.58 times the motor current.

The 3RB12 solid-state overload relays with internal ground fault detection are not suited for use with star-delta assemblies because transient current peaks are generated during the switch-over from star to delta operation. These can trigger ground fault detection.

#### Operation with frequency converter

The 3RB12 solid-state overload relays are suitable for frequencies of 50/60 Hz as well as the associated harmonics. This permits the 3RB12 overload relays to be used on the incoming side of the frequency converter.

If a motor contactor is required on the outgoing side of the frequency converter, Siemens recommends the 3RN thermistor motor protection devices or the 3RU11 thermal overload relays for this purpose.

### Functions

#### Control circuit

The 3RB12 solid-state overload relays require an external power supply, i.e. an additional supply voltage is necessary. Details about the control circuit can be found in the technical specifications.

#### Short-circuit protection

Fuses or circuit-breakers must be used for short-circuit protection. Assignments of corresponding short-circuit protection equipment for overload relays with/without contactor can be found in the technical specifications as well as in the selection and ordering data.

#### Trip classes

The 3RB12 solid-state overload relays are suitable for normal and heavy starting. The required trip class (CLASS 5, 10, 15, 20, 25 or 30) can be adjusted by means of a six-step rotary knob depending on the current starting condition. Detailed information about trip classes can be found under "Characteristics".

#### Phase failure protection

The 3RB12 solid-state overload relays are fitted with phase failure protection (see Characteristics) in order to minimize temperature rises of the load during single-phase operation.

#### Setting

The 3RB12 solid-state overload relay is set to the motor rated current by means of a rotary knob. The scale of the rotary knob is calibrated in ampere.

#### Manual and automatic reset

The overload relay can be reset by pressing the TEST/RESET button on the device. The overload relay can be reset remotely (remote RESET) by connecting a button to terminals Y1 and Y2 of the 3RB12 solid-state overload relay. In addition, terminals Y1 and Y2 can be jumpered to implement automatic resetting.

The relay can only be reset after the recovery time has elapsed.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

### Recovery time

The recovery time following current-dependent tripping due to overload, phase unbalance or phase failure is 5 min. regardless of the adjusted reset mode. This time, which is stored permanently in the microprocessor, allows the load to cool down.

However, in the event of temperature-dependent tripping by means of a connected PTC thermistor sensor circuit, the device

can only be manually or automatically reset once the winding temperature at the installation location of the PTC thermistor has fallen 5 K below its response temperature.

If the 3RB12 solid-state overload relay trips due to a ground fault, it can be switched on again immediately without a recovery time.

### TEST function

The combined TEST/RESET button can be used to check whether the relay is working correctly. If the button is pressed up to 2 s, the hardware, LEDs, current detection, thermistor and ground fault input are tested. If the button is pressed up to 5 s, the current transformer, burden, and microprocessor are tested without switching off the motor feeder. After 5 s, the motor feeder is switched off via the output relays of the 3RB12. When the motor feeder is switched off, all functions of the 3RB12 solid-state overload relay have been tested. The function of the current transformer and burden are not tested if there is no voltage on the main circuit.

### STOP function

If the TEST/RESET button is pressed, the 3RB12 solid-state overload relay switches off the contactor and thus the load after 5 s. The load is switched on again via the contactor if the TEST/RESET button is pressed once more.

### Display of the operating status

The operating status of the 3RB12 solid-state overload relay is displayed by means of three LEDs:

- Green "Ready" LED:
  - A continuous green light signals that the overload relay is ready for operation. The 3RB12 overload relay is not ready (LED "OFF") if there is no control supply voltage or if the function test was negative.
- Red "Overload" LED:
  - A continuous red light signals overload tripping due to current and/or overload while a flashing red light indicates imminent tripping due to overload (overload warning):
- Red "Ground fault" LED:
  - A continuous red light signals a ground fault.

### Auxiliary contacts

The 3RB12 solid-state overload relay has two outputs, each one has one NO contact and one NC contact. Their assignments depend on the version of the device.

A distinction between monostable and bistable 3RB12 solid-state overload relays can be made with respect to the tripping characteristics of the auxiliary contacts in the event of the reduction of the control supply voltage.

The monostable 3RB12 solid-state overload relays will enter the "tripped" state if the control supply voltage fails (> 200 ms), and return to the original state they were in before the control supply voltage failed when the voltage returns. These units are therefore especially suited for plants in which the control voltage is not strictly monitored.

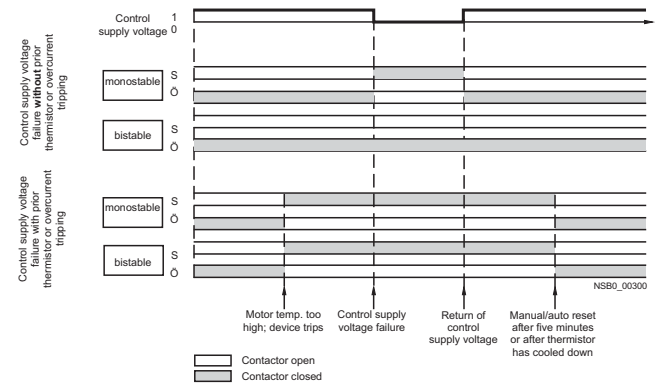
The bistable 3RB12 solid-state overload relays do not change their "tripped" or "not tripped" status if the control voltage fails. The auxiliary contacts only switch over in the event of an overload and if the supply voltage is present. These units are therefore especially suited for plants in which the control voltage is monitored separately.

### Response if the control supply voltage fails

If the control supply voltage fails for more than 0.2 s, the output relays respond differently depending on the version: Monostable or bistable.

Response of the output relays in the event of:	Monostable 3RB12 . . . . . 0	Bistable 3RB12 . . . . . 1.
Failure of the control supply voltage	Device trips	No change of the switching status of the auxiliary contacts
Return of the control supply voltage without previous tripping	Device resets	No change of the switching status of the auxiliary contacts
Return of the control supply voltage after previous tripping	Devices remain in "tripped" status Reset: For overload tripping, after 5 min.; For thermistor tripping, after the temperature has fallen 5 K below the response temperature; In the event of a ground fault the overload relay resets immediately	Devices remain in "tripped" status Reset: For overload tripping, after 5 min.; For thermistor tripping, after the temperature has fallen 5 K below the response temperature; In the event of a ground fault the overload relay resets immediately

### Monostable and bistable responses of the output relays



# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

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### Technical specifications

Type			3RB12 46	3RB12 53	3RB12 57	3RB12 62
Overall width			70 mm	120 mm	145 mm	230 mm
<b>General specifications</b>						
<b>Trips in the event of</b>	Overload, phase unbalance, phase failure (> 40% acc. to NEMA), ground fault and activation of the thermistor motor protection <sup>1)</sup>					
<b>Trip class</b>	acc. to IEC 60947-4-1	CLASS	5, 10, 15, 20, 25 and 30; adjustable by means of 6-step rotary knob			
<b>Phase failure sensitivity</b>	Yes					
<b>Overload warning</b>	Yes, from $1.5 \times I_e$ for symmetrical loads and from $0.85 \times I_e$ for unsymmetrical loads					
<b>Reset and recovery</b>						
• Reset options after tripping	For automatic RESET	min.	Manual, remote, and automatic RESET for tripping due to overcurrent: 5 (stored permanently) for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature in the event of tripping due to an ground fault: no automatic RESET			
• Recovery time	For manual RESET	min.	for tripping due to overcurrent: 5 (stored permanently) for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature in the event of tripping due to an ground fault: immediately			
	For remote RESET	min.	for tripping due to overcurrent: 5 (stored permanently) for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature in the event of tripping due to an ground fault: immediately			
<b>Features</b>						
• Display of operating status on device	Yes, with 3 LEDs: green "Ready" LED, red "Overload" LED, and red "Ground Fault" LED <sup>2)</sup>					
• TEST function	Yes, with combined TEST/RESET button <sup>2)</sup>					
• RESET button	Yes, with combined TEST/RESET button <sup>2)</sup>					
• STOP button	Yes, with combined TEST/RESET button <sup>2)</sup>					
<b>For safe operation of motors with "increased safety" type of protection</b>	EU type test certificate number in accordance with guideline 94/9/EU		PTB 01 ATEX 3220			
<b>Ambient temperature</b>						
• Storage/transport		°C	-40 ... +80			
• During operation		°C	-25 ... +70			
• Temperature compensation		°C	up to 70			
• Permissible rated current at	Temperature inside cabinet 60 °C	%	100 (over +60 °C current reduction is not required)			
	Temperature inside cabinet 70 °C	%	100 (over +60 °C current reduction is not required)			
<b>Repeat terminal</b>						
• Coil repeat terminals	Not required					
• Auxiliary contact repeat terminal	Not required					
<b>Degree of protection</b>	acc. to IEC 60529		IP20 ( $\leq 100$ A max. set current $I_e$ ) IP00 ( $> 100$ A max. set current $I_e$ )			
<b>Touch protection</b>	acc. to EN 50274		Finger-safe	Finger-safe		
<b>Shock resistance with sine</b>	acc. to IEC 60068-2-27	g/ms	15/11			
<b>EMC interference immunity</b>						
• Conductor-related interference		kV	2			
- Burst	acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2			
- Surge	acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	8			
• Electrostatic discharge	acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	V/m	10			
• Field-related interference	acc. to IEC 61000-4-3 (corresponds to degree of severity 3)					
<b>EMC interference emission</b>	Limit value class B acc. to EN 55011					
<b>Resistance to extreme climates (air humidity)</b>			%	100		
<b>Dimensions</b>	see dimensional drawings					
<b>Site altitude</b>			m	up to 2000 m above sea level		
<b>Mounting position</b>	any					
<b>Installation type/mounting</b>						
			Stand-alone installation <sup>3)</sup>	Direct mounting/stand-alone installation without additional terminal bracket <sup>4)</sup>		

1) Tripping in the event of a ground fault only for units with the order number suffixes 20 and 30 (see selection and ordering data) or in combination with external summation current transformer (see Accessories).

2) For detailed explanations, see Functions.

3) Snap-on mounting on 35 mm standard mounting rail or screw connection with accessories.

4) For screw connection.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

Type		3RB12 46 70 mm	3RB12 53 120 mm	3RB12 57 145 mm	3RB12 62 230 mm
<b>Overall width</b>					
<b>Main circuit</b>					
<b>Rated insulation voltage <math>U_i</math> (pollution degree 3)</b>	V	690 (for bare/uninsulated conductors) 1000 (for insulated conductors)	1000		
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6	8		
<b>Rated operating voltage <math>U_e</math></b>	V	690	1000		
<b>Type of current</b>		No Yes, 50/60 Hz			
• DC					
• AC					
<b>Current setting</b>	A	1.25-6.3 ... 25-100	50-205	125-500	200-820
<b>Power loss per unit (max.)</b>	W	approx. 2			
<b>Short-circuit protection</b>	With fuse without contactor With fuse and contactor	see selection and ordering data see technical specifications (short-circuit protection with fuses for motor feeders)			
<b>Safe isolation between main and auxiliary conducting path</b>	Acc. to IEC 60947-1	up to 690 V (when a main circuit cable with an impulse strength of 6 kV is used)	up to 690 V		
<b>Connection for main circuit</b>					
<b>Type of connection</b>		Straight-through transformer connection	Bus connection		
<b>Screw connection</b>					
• Terminal screw		–			
• Tightening torque	Nm	–			
• Conductor cross-section (min./max.), 1 or 2 conductors	Solid	–			
	Finely stranded without end sleeve	–			
	Finely stranded with end sleeve	–			
	Stranded	–			
	AWG conductor connections, solid or stranded	–			
	Ribbon cables (number x width x circumference)	–			
<b>Bus connection</b>					
• Terminal screw		–	M 8	M 10	M 10 or M 12
• Tightening torque	Nm	–	10 ... 14	14 ... 24	14 ... 24 (for M 10) 20 ... 25 (for M 12)
• Conductor cross-section (min./max.)	Finely stranded with cable lug	–	35 ... 95	50 ... 240	–
	Stranded with cable lug	–	50 ... 120	70 ... 240	–
	AWG conductor connections, solid or stranded, with cable lug	–	1/0 ... 250	2/0 ... 500	185 ... 240 2/0 ... 500
	With connecting bar (max. width)	–	kcmil 20 x 4	kcmil 30 x 6	kcmil 40 x 8
<b>Straight-through transformer connection</b>					
• Diameter of opening		mm	10 (units ≤ 25 A max. set current $I_e$ ) 15 (units with 100 A max. set current $I_e$ )	–	–
• Conductor cross-section (max.)	NYN H07RN-F	mm <sup>2</sup> mm <sup>2</sup>	– 10/16	–	–

5



# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

Type		3RB12 46 70 mm	3RB12 53 120 mm	3RB12 57 145 mm	3RB12 62 230 mm
<b>Overall width</b>					
<b>Auxiliary circuit</b>					
<b>Auxiliary contacts: Number x (version)</b>		2 x (1 NO + 1 NC)			
<b>Assignment of auxiliary contacts</b>		1 NO for the signal "tripped due to overload and/or thermistor" 1 NC for switching off the contactor  1 NO for the signal "tripped due to ground fault" 1 NC for switching off the contactor or 1) 1 NO for the signal "tripped due to overload and/or thermistor and/or ground fault"; 1 NC for switching off the contactor  1 NO for overload warning; 1 NC for switching off the contactor			
<b>Rated insulation voltage <math>U_i</math> (pollution degree 3)</b>	V	300			
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	4			
<b>Contact rating of the auxiliary contacts</b>					
• NC at AC, AC-14/AC-15	Rated operating current $I_e$ at $U_e$ :				
	24 V	A	6		
	120 V	A	6		
	125 V	A	2)		
	230 V	A	3		
	400 V	A	1,5		
	600 V	A	2)		
	690 V	A	2)		
• NO at AC, AC-14/AC-15	Rated operating current $I_e$ at $U_e$ :				
	24 V	A	6		
	120 V	A	6		
	125 V	A	2)		
	230 V	A	3		
	400 V	A	1,5		
	600 V	A	2)		
690 V	A	2)			
• NC, NO at DC, DC-13	Rated operating current $I_e$ for $U_e$ :				
	24 V	A	2		
	60 V	A	0,55		
	110 V	A	0,25		
	125 V	A	0,25		
	220 V	A	0,14		
• Conventional thermal current $I_{th}$		A	6		
• Contact reliability	(suitable for PLC control; 17 V, 5 mA)		2)		
<b>Short-circuit protection</b>					
• With fuse	Operational class gL/gG	A	6		
	Quick	A	10		
• With miniature circuit-breaker (C-characteristic)		A	1,6 <sup>3)</sup>		
<b>Safe isolation between auxiliary circuits</b>	acc. to IEC 60947-1	V	300		
<b>Connection of the auxiliary circuit</b>					
<b>Type of connection</b>					
Screw connection					
<b>Connection features</b>					
• Terminal screw • Tightening torque • Conductor cross-section (min./max.), 1 or 2 conductors					Pozidrive size 2
			Nm		0,8 ... 1,2
			mm <sup>2</sup>		1 x (0,5 ... 4)
	Solid				2 x (0,5 ... 2,5)
	Finely stranded without end sleeve	mm <sup>2</sup>			1 x (0,5 ... 2,5)
					2 x (0,5 ... 1,5)
	Finely stranded with end sleeve	mm <sup>2</sup>			1 x (0,5 ... 2,5)
					2 x (0,5 ... 1,5)
	Stranded	mm <sup>2</sup>			–
	AWG conductor connections, solid or stranded	AWG			without end sleeve: 2 x (20 ... 14) 1 x (20 ... 12) with end sleeve: 2 x (20 ... 15) 1 x (20 ... 14)
<b>CSA, UL, and UR ratings</b>					
<b>Auxiliary circuit</b>	Switching capacity		B300, R300		

1) The assignment of the auxiliary contacts depends on the order number suffix (see selection and ordering data).

2) On request.

3) Up to  $I_k \leq 1000$  A.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

Type		3RB12 46 70 mm	3RB12 53 120 mm	3RB12 57 145 mm	3RB12 62 230 mm
<b>Overall width</b>					
<b>Control and sensor circuit as well as analog output</b>					
<b>Rated insulation voltage <math>U_i</math> (pollution degree 3)<sup>1)</sup></b>	V	300			
<b>Rated impulse withstand voltage <math>U_{imp}</math><sup>1)</sup></b>	kV	4			
<b>Rated control supply voltage <math>U_s</math><sup>1)</sup></b>		110 ... 120 220 ... 240 24			
• AC 50/60 Hz	V				
• DC	V				
<b>Operating range<sup>1)</sup></b>		0.85 x $U_{s \text{ min}}$ ≤ $U_s$ ≤ 1.1 x $U_{s \text{ max}}$ 0.85 x $U_{s \text{ min}}$ ≤ $U_s$ ≤ 1.2 x $U_{s \text{ max}}$			
• AC 50/60 Hz					
• DC					
<b>Rated output<sup>1)</sup></b>		2			
• AC 50/60 Hz	W				
• DC	W	2			
<b>Mains buffering time<sup>1)</sup></b>	ms	200			
<b>Thermistor motor protection (PTC thermistor detector)<sup>2)</sup></b>		1.5			
• Summation cold resistance	kΩ	2.7 ... 3.1			
• Response value	kΩ	1.5 ... 1.65			
• Return value	kΩ				
<b>Response time following ground fault detection</b>		200 ... 500 500 ... 1000			
• External <sup>2)</sup>	ms				
• Internal <sup>3)</sup>	ms				
<b>Analog output</b>		4 ... 20 23 0 ... 1.25 x $I_e$ 4 mA corresponds with 0 x $I_e$ 16.8 mA corresponds with 1.0 x $I_e$ 20 mA corresponds with 1.25 x $I_e$ 10 (approx. 1/8 %)			
• Output signal	mA				
• Max. output current	mA				
• Measuring range					
• Resolution	bit				
<b>Connection for the control and sensor circuit as well as the analog output</b>					
<b>Type of connection</b>		Screw connection			
<b>Connection features</b>					
• Terminal screw		Pozidrive size 2			
• Tightening torque	Nm	0.8 ... 1.2			
• Conductor cross-section (min./max.), 1 or 2 conductors					
- Solid	mm <sup>2</sup>	1 x (0.5 ... 4) 2 x (0.5 ... 2.5) 1 x (0.5 ... 2.5)			
- Finely stranded without end sleeve	mm <sup>2</sup>				
- Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.5 ... 1.5)			
- Stranded	mm <sup>2</sup>	-			
- AWG conductor connections, solid or stranded	AWG	with end sleeve: 2 x (20 ... 14) 1 x (20 ... 12) with end sleeve: 2 x (20 ... 15) 1 x (20 ... 14)			

1) Control circuit

2) Sensor circuit.

3) In conjunction with an external summation current transformer (see Accessories).

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

**Short-circuit protection with fuses for motor feeders**  
for short-circuit currents up to 50 kA

Overload relays	Contactor	CLASS															690 V		415 V	600 V					
		5 and 10			15			20			25			30			Fuse links <sup>1)</sup>	LV Type	British Standard fuses BS 88	UL-listed fuses RK5/L					
Setting range		Rated operating current I <sub>e</sub>															LV Type	LV Type	LV Type	LV Type					
		AC-3 in A at															HRC 3NA	DIA- Type	ZED 5SB	NEO- Type	ZED 5SE	Operational class	g/L/g	aM	G
(type)		400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	Type of coordination <sup>2)</sup>	1	2	2	2				
<b>1.25 A ... 6.3 A</b>																									
3RB12 46-1P	3RT10 15	6.3	5	4	6.3	5	4	6.3	5	4	6.3	5	4	6.3	5	4	35	20	–	20	25				
	3RT10 16	6.3	6.3	5.2	6.3	6.3	5.2	6.3	6.3	5.2	6.3	6.3	5.2	6.3	6.3	5.2	35	20	–	20	25				
	3RT10 17	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	35	20	–	20	25				
<b>6.3 A ... 25 A</b>																									
3RB12 46-1Q	3RT10 15	7	–	–	7	–	–	7	–	–	7	–	–	7	–	–	35	20	–	20	60				
	3RT10 16	9	6.5	–	9	6.5	–	9	6.5	–	9	6.5	–	9	6.5	–	35	20	–	20	60				
	3RT10 17	12	9	6.3	11	9	6.3	10	9	6.3	9.5	9	6.3	9	6.3	9	35	20	–	20	60				
	3RT10 24	12	12	9	12	12	9	12	12	9	12	12	9	12	12	9	63	25	20	25	70				
	3RT10 25	17	17	13	17	17	13	16	16	13	15	15	13	14	14	13	63	25	20	25	70				
	3RT10 26	25	18	13	18	18	13	16	16	13	15	15	13	14	14	13	100	25	20	25	100				
	3RT10 34	25	25	20	25	25	20	22.3	22.3	20	20.3	20.3	20.3	19.1	19.1	19.1	125	63	50	63	100				
	3RT10 35	25	25	24	25	25	24	25	25	24	25	25	24	25	25	24	125	63	50	63	100				
<b>25 A ... 100 A</b>																									
3RB12 46-1E	3RT10 34	32	32	20	25.5	25.5	20	22.3	22.3	20	20.3	20.3	20	19.1	19.1	19.1	125	63	50	63	125				
	3RT10 35	40	40	24	33	33	24	29.4	29.4	24	28	28	24	26.5	26.5	24	125	63	50	80	150				
	3RT10 36	50	50	24	38.5	38.5	24	32.7	32.7	24	29.4	29.4	24	26.5	26.5	24	160	80	50	80	200				
	3RT10 44	65	65	47	56	56	47	49	49	47	45	45	45	41.7	41.7	41.7	250	125	63	125	250				
	3RT10 45	80	80	58	61	61	58	53	53	53	47	47	47	45	45	45	250	160	80	160	250				
	3RT10 46	95	95	58	69	69	58	59	59	58	53	53	53	50	50	50	250	160	100	160	350				
<b>50 A ... 205 A</b>																									
3RB12 53-0F	3RT10 54	115	115	115	93	93	93	82	82	82	75	75	75	69	69	69	355	315	160	250	450				
	3RT10 55	150	150	150	122	122	122	107	107	107	98	98	98	90	90	90	355	315	200	315	500				
	3RT10 56	185	185	170	150	150	150	131	131	131	120	120	120	111	111	111	355	315	200	315	500				
<b>125 A ... 500 A</b>																									
3RB12 57-0K	3RT10 64	225	225	225	182	182	182	160	160	160	146	146	146	135	135	135	500	400	250	400	700				
	3RT10 65	265	265	265	215	215	215	188	188	188	172	172	172	159	159	159	500	400	315	400	800				
	3RT10 66	300	300	280	243	243	243	213	213	213	195	195	195	180	180	180	500	400	315	400	800				
	3RT10 75	400	400	400	324	324	324	284	284	284	260	260	260	240	240	240	630	500	400	450	1000				
	3RT10 76	500	500	450	405	405	405	355	355	355	325	325	325	300	300	300	630	500	500	500	1200				
	3RT12 64	225	225	225	225	225	225	225	225	225	194	194	194	173	173	173	500	500	400	450	800				
	3RT12 65	265	265	265	265	265	265	265	265	265	228	228	228	204	204	204	500	500	400	450	800				
	3RT12 66	300	300	300	300	300	300	300	300	300	258	258	258	231	231	231	500	500	400	450	800				
	3RT12 75	400	400	400	400	400	400	400	400	400	344	344	344	308	308	308	800	800	630	800	1200				
	3RT12 76	500	500	500	500	500	500	500	500	500	430	430	430	385	385	385	800	800	630	800	1200				
	3TF68	500	500	500	500	500	500	500	500	500	479	479	479	441	441	441	800	500 <sup>3)</sup>	630	500	1200				
	3TF69	–	–	–	–	–	–	500	500	500	500	500	500	500	500	500	800	630 <sup>3)</sup>	630	630	2000				
<b>200 A ... 820 A</b>																									
3RB12 62-0L	3TF68	630	630	630	630	630	630	536	536	536	479	479	479	441	441	441	1000	500 <sup>3)</sup>	630	500	1200				
	3TF69	820	820	820	662	662	662	572	572	572	531	531	531	500	500	500	1250	630 <sup>3)</sup>	630	630	2000				

1) Please observe operating voltage.

2) Coordination and short-circuit equipment in accordance with EN 60947-4-1:

**Type of coordination 1:** The contactor or starter must not endanger persons or the installation in the event of a short-circuit. They do not need to be suitable for further operation without repair and the renewal of parts.

**Type of coordination 2:** The contactor or starter must not endanger persons or the installation in the event of a short-circuit. They must be suitable for further use. There is a risk of contact welding.

3) Please ensure that the maximum AC-3 operating current has sufficient safety clearance from the nominal current for the fuse.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable



### Selection and ordering data

#### 3RB12 solid-state overload relays for full motor protection with screw connection for direct mounting<sup>1)</sup> and stand-alone installation, CLASS 5 to CLASS 30, adjustable

Features and technical specifications

- Trip classes, CLASS 5/10/15/20/25/30, adjustable
- Input T1/T2 for thermistor sensor (PTCs) for full motor protection
- Input C1/C2 for ground fault detection with additional 3UL22 summation current transformer

- Manual/automatic/remote RESET Y1/Y2
- TEST function
- 2 outputs: 1 NO and 1 NC each
- 3 LEDs for operating and status displays

	For 3RT1 contactors and soft starters 3RW30 and 3RW31	Suitable for three-phase motors with P <sup>2)</sup>	Setting range	Fuse gL/gG <sup>3)</sup>	Rated control supply voltage	DT	For direct mounting and stand-alone installation <sup>1)</sup>	PS*	Weight per PU
Size <sup>4)</sup>	kW	A	A				Order No.		kg (max.)
<b>3RB12 46 solid-state overload relays for full motor protection</b>									
 3RB12 46	S00 - S3 stand-alone installation	0.09 ... 2.2	1.25 ... 6.3 <sup>5)</sup>	25	110 V ... 120 V, 50/60 Hz 220 V ... 240 V, 50/60 Hz DC 24 V		<b>3RB12 46-1PG..</b> <b>3RB12 46-1PM..</b> <b>3RB12 46-1PB..</b>	1 unit	0.714 0.697 0.614
		3 ... 11	6.3 ... 25	125	110 V ... 120 V, 50/60 Hz 220 V ... 240 V, 50/60 Hz DC 24 V		<b>3RB12 46-1QG..</b> <b>3RB12 46-1QM..</b> <b>3RB12 46-1QB..</b>	1 unit	0.698 0.706 0.610
		11 ... 45	25 ... 100	250	110 V ... 120 V, 50/60 Hz 220 V ... 240 V, 50/60 Hz DC 24 V		<b>3RB12 46-1EG..</b> <b>3RB12 46-1EM..</b> <b>3RB12 46-1EB..</b>	1 unit	0.684 0.685 0.596
<b>3RB12 53 solid-state overload relays for full motor protection</b>									
	S6	55 ... 110	50 ... 205	500	110 V ... 120 V, 50/60 Hz 220 V ... 240 V, 50/60 Hz DC 24 V		<b>3RB12 53-0FG..</b> <b>3RB12 53-0FM..</b> <b>3RB12 53-0FB..</b>	1 unit	1.536 1.533 1.460
<b>3RB12 57 solid-state overload relays for full motor protection</b>									
	S10 and S12	110 ... 250	125 ... 500	630	110 V ... 120 V, 50/60 Hz 220 V ... 240 V, 50/60 Hz DC 24 V		<b>3RB12 57-0KG..</b> <b>3RB12 57-0KM..</b> <b>3RB12 57-0KB..</b>	1 unit	2.320 2.340 2.220
<b>3RB12 62 solid-state overload relays for full motor protection</b>									
 3RB12 62	Size 14 (3TF68 and 3TF69)	132 ... 450	200 ... 820	630	110 V ... 120 V, 50/60 Hz 220 V ... 240 V, 50/60 Hz DC 24 V		<b>3RB12 62-0LG..</b> <b>3RB12 62-0LM..</b> <b>3RB12 62-0LB..</b>	1 unit	4.260 4.296 4.253

Order number suffix

<b>Standard version</b> 1 NO + 1 NC : Overload/thermistor; 1 NO + 1 NC : ground fault 1 NO + 1 NC : Overload/thermistor/ground fault; 1 NO + 1 NC Overload warn.	<b>00</b> <b>10</b>
<b>Version with analog output</b> as standard version 3RB12...-...0; but with additional analog output signal 4 ... 20 mA for the motor current in relation to the set motor current; for the actuation of measuring instruments, processing in I&C systems, communication via bus systems, display of overload and motor current <sup>6)</sup> . 1 NO + 1 NC : Overload/thermistor; 1 NO + 1 NC : ground fault	<b>40</b>
<b>Version with internal ground fault detection<sup>7)</sup></b> as standard version, but with additional internal ground fault detection; only for 3-conductor networks, not suitable for single-phase motors or star-delta switchovers. 1 NO + 1 NC : Overload/thermistor; 1 NO + 1 NC : ground fault 1 NO + 1 NC : Overload/thermistor/ground fault; 1 NO + 1 NC Overload warn.	<b>20</b> <b>30</b>
<b>Bistable version</b> as standard version, but with bistable output relay; no change to switching status of auxiliary contacts in the event of control supply voltage failure. 1 NO + 1 NC : Overload/thermistor; 1 NO + 1 NC : ground fault 1 NO + 1 NC : Overload/thermistor/ground fault; 1 NO + 1 NC : overload warn.	<b>01</b> <b>11</b>

1) 3RB12 46 can only be installed as a stand-alone unit.

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

3) Maximum fuse for overload relay, type of coordination 2. For fuse values for mounting onto contactor see Technical specifications, short-circuit protection with fuses for motor feeders.

4) Observe maximum rated operating current of the devices.

5) The current setting range 0.25 A ... 1.25 A is achieved by looping the main circuit.

6) For more information, see Overview.

7) The internal ground fault detection detects fault currents > 30% of the set current.

# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

Up to 820 A, CLASS 5 to CLASS 30, adjustable

### Accessories

The following accessories are available for the 3RB10 solid-state overload relays

- Different summation current transformers for external ground-fault detection
- One DC voltage element
- One cover sealable for all sizes of the current and CLASS button
- Push-in lug for screw-fixing the 3RB12 46 to a mounting plate
- One baseplate for snapping on the 3RB12 53 to the 75 mm mounting rail and
- Different terminal covers.

### Characteristics

The tripping characteristics show the relationship between the tripping time and tripping current as multiples of the set current  $I_e$  and are given for symmetrical three-pole and two-pole loads from the cold state.

The smallest current used for tripping is called the minimum tripping current. According to IEC 60947-4-1, this current must be within specified limits. The limits of the minimum tripping current for the 3RB12 solid-state overload relays for symmetrical three-pole loads are between 110 % and 120 % of the set current.

The tripping characteristic starts with the minimum tripping current and continues with higher tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time intervals within which the 3RB12 solid-state overload relays have to trip with 7.2 times the set current  $I_e$  from the cold state for symmetrical three-pole loads.

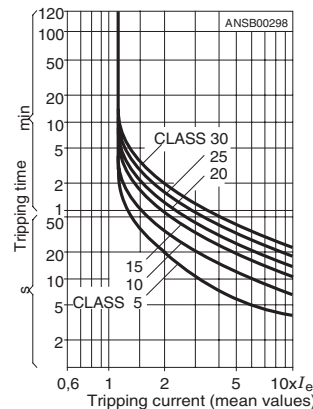
The tripping times are as follows for:

CLASS	Tripping times
10A	2 s ... 10 s
10	4 s ... 10 s
20	6 s ... 20 s
30	9 s ... 30 s

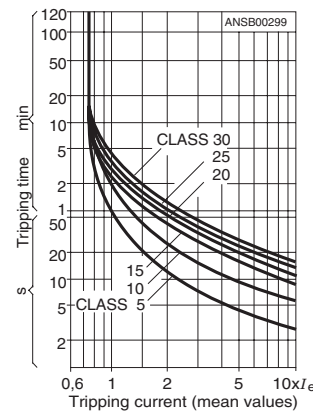
The tripping characteristics for a three-pole 3RB12 solid-state overload relay from the cold state (see "tripping characteristics for three-pole loads" diagram) only apply if all three phases are loaded simultaneously with the same current. In the event of a phase failure or a current unbalance of more than 40 %, the 3RB12 solid-state overload relay switches off the contactor more quickly in order to minimize heating of the load in accordance with the tripping characteristic for two-pole loads from the cold state (see "tripping characteristics for two-pole loads" diagram).

Compared with a cold load, a load at operating temperature obviously has a lower temperature reserve. This is taken into account by the 3RB12 solid-state overload relays by reducing the tripping time to about 30 % when loaded with the set current  $I_e$  for an extended period.

Tripping characteristics for three-pole loads



Tripping characteristics for double-pole loads



*These are schematic representations of characteristics. The characteristics for the individual 3RB12 solid-state overload relays can be requested from technical assistance at the following e-mail address: [Technical-assistance@siemens.com](mailto:Technical-assistance@siemens.com)*

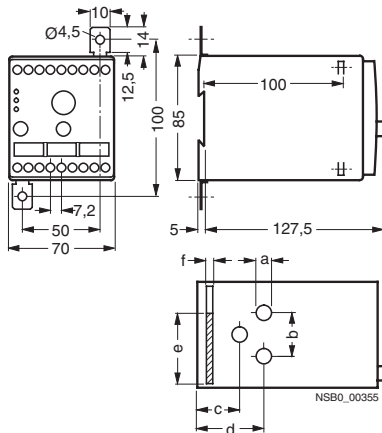
# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

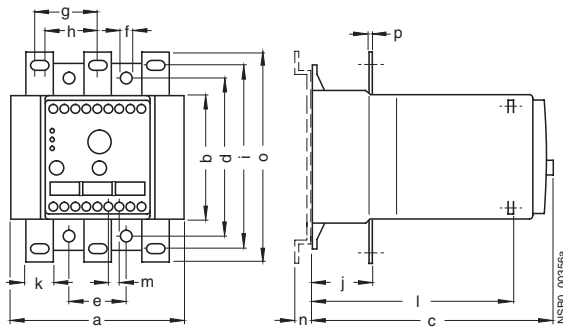
Up to 820 A, CLASS 5 to CLASS 30, adjustable

### Dimension drawings

3RB12 46



3RB12 5. and 3RB12 62



Overload relay	a	b	c	d	e	f
3RB12 46-1E	15	29	24	47	-	-
3RB12 46-1P	10	34	29	46	48	4
3RB12 46-1Q	10	34	29	46	48	4

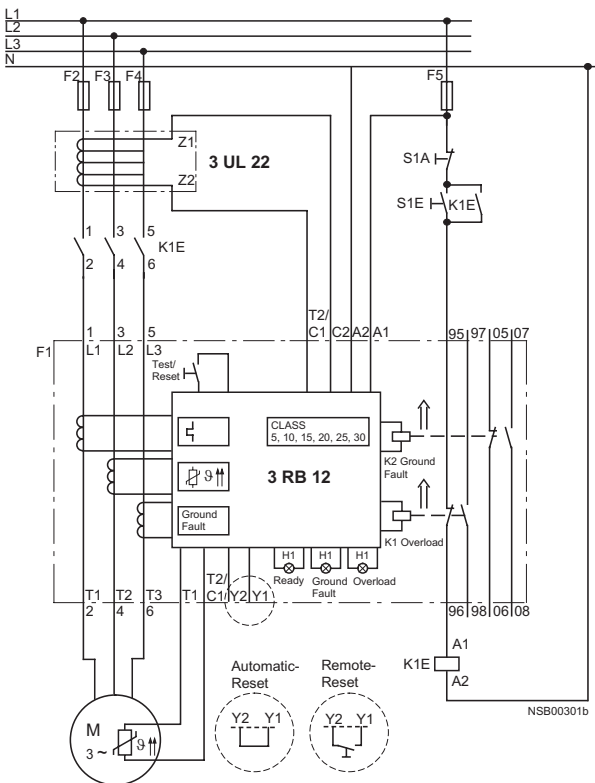
Overload relay	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
3RB12 53-0F	120	85	155	110	40	∅7	42	37	125	41	20	131	7.2	13	145	4
3RB12 57-0K	145	85	175	105	50	∅9	52	48	130	46	30	151	7.2	-	160	6
3RB12 62-0L	230	85	190	120	70	∅1	70	-	135	55	40	166	7.2	-	175	8

5

### Circuit diagrams

#### Internal circuit diagram

3RB12 overload relay, standard version

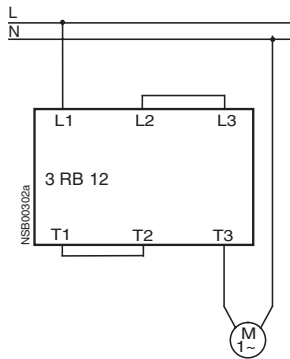


#### Connection diagrams

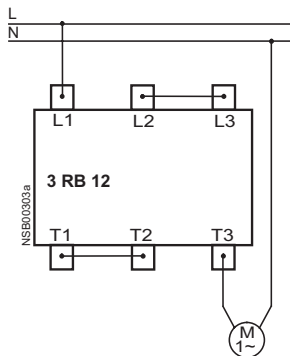
Protection of single-phase motors

(for devices without internal ground fault detection only)

3RB12 46-...0,-...1.



3RB12 53-...0,-...1.  
3RB12 57-...0,-...1.  
3RB12 62-...0,-...1.








# SIRIUS Overload Relays

## SIRIUS Solid-State Overload Relays

### Accessories

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#### Selection and ordering data

Version	For type 3RB10	DT	Order No.	PS*	Weight per PU		
Size			kg				
<b>Terminal brackets for stand-alone installation<sup>1)</sup></b>							
	For separate mounting of the overload relays; Screw and snap-on connection onto 35 mm standard mounting rail, size S3, also for 75 mm standard mounting rail. For connection of main circuit, see technical specifications.		S00	▶	<b>3RU19 16-3AA01</b>	1 unit 0.059	
			S0	▶	<b>3RU19 26-3AA01</b>	1 unit 0.078	
			S2	▶	<b>3RU19 36-3AA01</b>	1 unit 0.176	
			S3	▶	<b>3RU19 46-3AA01</b>	1 unit 0.281	
<b>Mechanical RESET<sup>1)</sup></b>							
	Resetting plunger, holder, and former Suitable pushbutton IP65 Ø 22 mm, 12 mm hub Extension plunger		S00 to S10/S12	▶ B A	<b>3RU19 00-1A</b> <b>3SB30 00-0EA11</b> <b>3SX1 335</b>	1 set 0.038 1 unit 0.021 1 unit 0.004	
	<b>Cable release with holder for RESET<sup>1)</sup></b>						
		For Ø 6.5 mm holes in the control panel; max. 8 mm control panel thickness		Length 400 mm Length 600 mm	S00 to S10/S12	▶ ▶	<b>3RU19 00-1B</b> <b>3RU19 00-1C</b>
<b>Module for remote RESET, electrical<sup>1)</sup></b>							
	Operating range 0.85 to 1.1 x U <sub>s</sub> , power consumption AC 80 VA, DC 70 W, ON period 0.2 s ... 4 s, operating frequency 60/h		AC/DC 24 V ... 30 V AC/DC 110 V ... 127 V AC/DC 220 V ... 250 V	S00 to S10/12	▶ ▶ ▶	<b>3RU19 00-2AB71</b> <b>3RU19 00-2AF71</b> <b>3RU19 00-2AM71</b>	1 unit 0.066 1 unit 0.067 1 unit 0.066
	<b>Sealable cover, transparent</b>						
	For covering the current adjustment screw and blocking the "Manual/automatic RESET" selec- tor switch		S00 to S10/S12	B	<b>3RB19 00-3B</b>	10 units 0.100	
<b>Terminal cover</b>							
	Cover for cable lug and bus connection	Length 55 mm	S3 <sup>1)</sup>	▶	<b>3RT19 46-4EA1</b>	1 unit 0.037	
		Length 100 mm	S6	▶	<b>3RT19 56-4EA1</b>	1 unit 0.067	
		Length 120 mm	S10/S12	▶	<b>3RT19 66-4EA1</b>	1 unit 0.123	
	Cover for box terminals	Length 20.6 mm	S2 <sup>1)</sup>	▶	<b>3RT19 36-4EA2</b>	1 unit 0.020	
		Length 20.8 mm	S3 <sup>1)</sup>	▶	<b>3RT19 46-4EA2</b>	1 unit 0.017	
		Length 25 mm	S6	▶	<b>3RT19 56-4EA2</b>	1 unit 0.021	
	Cover for screw connector between contactor and overload relay, without box terminals (1 unit per assembly required)	Length 30 mm	S10/S12	▶	<b>3RT19 66-4EA2</b>	1 unit 0.036	
			S6	▶	<b>3RT19 56-4EA3</b>	1 unit 0.021	
			S10/S12	▶	<b>3RT19 66-4EA3</b>	1 unit 0.061	
			S6 <sup>2)</sup>	▶	<b>3RT19 55-4G</b>	1 unit 0.237	
<b>Box terminal block</b>							
For round and ribbon cable cross-sections, see "Technical specifications"		S6	▶	<b>3RT19 56-4G</b>	1 unit 0.266		
		S10/S12	▶	<b>3RT19 66-4G</b>	1 unit 0.664		

1) The accessories are identical to those of the 3RU11 thermal overload relay.

2) As standard for 3RT10 54-1 contactor (55 kW).

\* This quantity or a multiple thereof can be ordered.

# SIRIUS Overload Relays

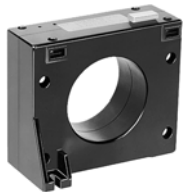
## SIRIUS Solid-State Overload Relays

### Accessories

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Version	For type	DT	Order No.	PS*	Weight per PU
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#### Summation current transformer for external ground fault monitoring



Diameter of the inlet opening	Rated fault current $I_n$	3RB12 .	B	Order No.	PS*	Weight per PU
40 mm	0.3 A	.	B	<b>3UL22 01-1A</b>	1 unit	0.595
	0.5 A		C	<b>3UL22 01-2A</b>	1 unit	0.427
	1A		C	<b>3UL22 01-3A</b>	1 unit	0.330
65 mm	0.3 A		C	<b>3UL22 02-1A</b>	1 unit	0.900
	0.5 A		C	<b>3UL22 02-2A</b>	1 unit	0.713
	1A		C	<b>3UL22 02-3A</b>	1 unit	0.568
120 mm	0.3 A		C	<b>3UL22 03-1A</b>	1 unit	3.400
	0.5 A		C	<b>3UL22 03-2A</b>	1 unit	2.800
	1A		C	<b>3UL22 03-3A</b>	1 unit	1.960

3UL22 0.-.A

#### DC voltage element



SITOP POWER 24 V/0.375 A	3RB12	DT	Order No.	PS*	Weight per PU
for operation of an 3RB12 with a control supply voltage of DC 24 V at a DC voltage of 30 V ... 264 V. Input voltage: DC 30 V ... 264 V, AC 30 V ... 187 V. Power supply for the conversion of an additional input voltage range into the DC 24 V operating voltage for all low-voltage controlgear. Output current 0.375 A.			<b>6EP1 731-2BA00</b>	1 unit	0.140

6EP1 731-2BA00

#### Covering cap, sealable



For current and CLASS adjustment button	3RB12	DT	Order No.	PS*	Weight per PU
		A	<b>3RB19 00-0A</b>	1 unit	0.006

3RB19 00-0A

#### Push-in lugs



Push-in lug for screw mounting onto a mounting plate.	3RB12 46	DT	Order No.	PS*	Weight per PU
2 units are required for each overload relay.		▶	<b>3RB19 00-0B</b>	10 units	0.100

3RB19 00-0B

#### Terminal cover



Cover for stand-alone installation or on the output side for direct mounting (1 set = 2 units)	3RB12 53	B	Order No.	PS*	Weight per PU
	3RB12 57	B	<b>3TX7 506-0A</b>	1 unit	0.044
	3RB12 62 with 3TF68	B	<b>3TX7 536-0A</b>	2 units	0.112
	3RB12 62 with 3TF69	B	<b>3TX7 686-0A</b>	1 set	0.410
		B	<b>3TX7 696-0A</b>	1 set	0.402

3TX7 506-0A



Cover between contactor and overload relay for direct mounting	3RB12 53	B	Order No.	PS*	Weight per PU
	3RB12 57	B	<b>3TX7 506-0B</b>	1 unit	0.019
	3RB12 62 with 3TF68	B	<b>3TX7 536-0B</b>	1 unit	0.055
	3RB12 62 with 3TF69	B	<b>3TX7 686-0B</b>	1 unit	0.400
		B	<b>3TX7 696-0B</b>	1 unit	0.103

3TX7 506-0B

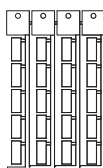
#### Baseplate



For snap-on mounting onto 75 mm standard mounting rail	3RB12 53	DT	Order No.	PS*	Weight per PU
		A	<b>3UF19 00-0JA00</b>	1 unit	0.200

3UF19 00-0JA00

#### Blank labeling plates



Device labeling plates for "SIRIUS"	Labeling area/color	3RB10/3RB12	DT	Order No.	PS*	Weight per PU
	10 mm × 7 mm pastel turquoise		D	<b>3RT19 00-1SB10</b>	816 units	0.030
	20 mm × 7 mm pastel turquoise		A	<b>3RT19 00-1SB20</b>	340 units	0.067
Sticking labels "SIRIUS"	19 mm × 6 mm pastel turquoise		D	<b>3RT19 00-1SB60</b>	4700 units	0.003
	19 mm × 6 mm pastel turquoise		C	<b>3RT19 00-1SD60</b>	4700 units	0.003

3RT19 00-1SB10

Computer labeling system  
For custom labels for device labeling plates

Available from:  
**murrplastik**  
Systemtechnik GmbH



# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

### Overview

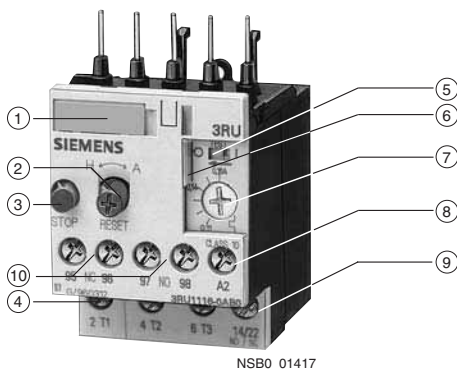
#### 3RU11 thermal overload relays with screw and Cage Clamp connection for direct mounting<sup>1)</sup> and stand-alone installation<sup>2)</sup>, CLASS 10

The 3RU11 thermal overload relays up to 100 A have been designed for current-dependent protection of loads with normal starting (see Functions) against excessive temperature rises due to overload or phase failure.

An overload or phase failure results in an increase of the motor current beyond the set motor rated current. Via heating elements inside the device, this current rise heats up the bimetal strips which then bend and as a result trigger the auxiliary contacts by means of a tripping mechanism. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and operating current  $I_e$  and is stored in the form of a long-term stable tripping characteristic (see Characteristics). The "tripped" status is signaled by means of a switch position indicator (see Functions). The contactor is either reset manually or automatically (see Functions) after the recovery time has elapsed (see Functions).

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and recyclable materials.

They comply with important worldwide standards and approvals.



- ① Equipment designation label
- ② Manual/automatic RESET selector switch
- ③ STOP button
- ④ Complete order number on the front of the device
- ⑤ Switching position indication and TEST function
- ⑥ Transparent cover, sealable (secures adjuster knob for rated motor current, TEST function and Manual/Automatic RESET setting)
- ⑦ Adjuster knob for rated motor current
- ⑧ Repeat coil terminal (only with size S00 for mounting onto contactors)
- ⑨ Auxiliary switch repeat terminal (only with size S00 for mounting onto contactors)
- ⑩ 1 NO + 1 NC

1) With the suitable terminal brackets (see Accessories), the 3RU11 thermal overload relays for direct mounting can also be installed as stand-alone units.

Size S00 3RU11 overload relays with Cage Clamp connection are only available for stand-alone installation.

2) Size S00 to S3 for screw and snap-on mounting onto 35 mm standard mounting rails, size S3 also for 75 mm standard mounting rails.

### Specifications

The 3RU11 thermal overload relays comply with the following standards:

- IEC 60947-1/EN 60947-1
- IEC 60947-4-1/EN 60947-4-1
- IEC 60947-5-1/EN 60947-5-1
- UL 508/CSA C 22.2.

The 3RU11 thermal overload relays are also finger-safe according to EN 50274 and climate-proof according to IEC 60721.

### Benefits

The most important features and benefits of the 3RU11 thermal overload relays are listed in the overview table in the introduction.

### Area of application

#### Fields of application

The 3RU11 thermal overload relays have been designed for the protection of three-phase and single-phase AC and DC motors.

If the single-phase AC or DC loads are to be protected by the 3RU11 thermal overload relays, all three bimetal strips must be heated. For this purpose, all main circuits of the relay must be connected in series.

#### Ambient conditions

The 3RU11 thermal overload relays have temperature compensation in accordance with IEC 60947-4-1 for the temperature range of  $-20\text{ °C}$  to  $+60\text{ °C}$ . For temperatures from  $+60\text{ °C}$  to  $+80\text{ °C}$ , the upper setpoint value of the setting range must be reduced by the factor listed in the table below.

Ambient temperature in °C	Derating factor for the upper setpoint value.
+60	1.0
+65	0.94
+70	0.87
+75	0.81
+80	0.73

#### "Increased safety" EEx type of protection

The 3RU11 thermal overload relays comply with the regulations for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e EN 50019.

The basic safety and health requirements are fulfilled by compliance with

- EN 60947-4-1
- EN 60947-5-1
- IEC 60079-14 1997-02
- IEC 60079-17 1996-12

EU type test certificates for category (2) G/D with the number

- DMT 98 ATEX 6001
- has been issued.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

### Design

#### Mounting options

The 3RU11 thermal overload relays can be mounted directly onto the 3RT1 contactors (exception: size S00 with Cage Clamp connection can only be installed as a stand-alone unit). The devices can also be installed as stand-alone units with the corresponding terminal brackets.

For more information on the mounting options, please consult the technical specifications as well as the selection and ordering data.

#### Connections

All sizes of the 3RU11 thermal overload relays with screw connection can be connected to the auxiliary and main conducting paths. Rails can be connected to the main conducting path terminals of size S3 overload relays if the box terminals are removed.

As an alternative, the units are also available with Cage Clamp connection. The auxiliary conducting path terminals of these units, and for size S00 the main conducting path terminals as well, are fitted with Cage Clamp connections.

For more information on the different connection options, please consult the technical specifications as well as the selection and ordering data.

#### Overload relays in star-delta assemblies

When overload relays are used in combination with star-delta assemblies it must be noted that only 0.58 times the motor current flows through the line contactor. An overload relay mounted onto the line contactor must be set to 0.58 times the motor current.

An assignment of the 3RU11 thermal overload relays to the line contactors of our 3RA star-delta assemblies can be found under "Controlgear: Contactors and Contactor Assemblies".

#### Operation with frequency converter

The 3RU11 thermal overload relays are suitable for operation with frequency converters. Depending on the frequency of the converter, a higher current than the motor current must be used in some cases due to eddy currents and skin effects.

### Functions

#### Control circuit

The 3RU11 thermal overload relays do not require an additional supply voltage for operation.

#### Short-circuit protection

Fuses or circuit-breakers must be used for short-circuit protection. Assignments for the corresponding short-circuit protection devices to the 3RU11 thermal overload relays with/without contactor can be found in the technical specifications or selection and ordering data.

#### Trip classes

The 3RU11 thermal overload relays are available for normal starting conditions with trip class CLASS 10. Detailed information about the trip classes can be found under "Characteristics".

#### Phase failure protection

The 3RU11 thermal overload relays are fitted with phase failure sensitivity (see "Characteristics") in order to minimize temperature rises of the load in the case of a phase failure during single-phase operation.

### Setting

The 3RU11 thermal overload relay is set to the motor rated current by means of a rotary knob. The scale of the rotary knob is calibrated in ampere.

#### Manual and automatic reset

Automatic and manual reset is selected by pressing and turning the blue button (RESET button). If the button is set to manual reset, the overload relay can be reset directly by pressing the RESET button. Remote resetting is possible in combination with mechanical and electrical RESET modules from the accessories range (see Accessories). If the blue button is set to automatic RESET, the relay is reset automatically.

The relay can only be reset after the recovery time has elapsed.

#### Recovery time

After tripping due to overload, the 3RU11 thermal overload relays require some time until the bimetal strips have cooled down. The device can only be reset after the bimetal strips have cooled down. This time (recovery time) depends on the tripping characteristics and strength of the tripping current.

The recovery time allows the load to cool down after tripping due to overload.

#### TEST function

The TEST slide can be used to check whether the operational 3RU11 thermal overload relay is working properly. Actuating the slide simulates tripping of the relay. During this simulation the NC contact (95-96) is opened and the NO contact (97-98) is closed. This tests whether the auxiliary circuit has been correctly connected to the overload relay. If the 3RU11 thermal overload relay has been set to automatic RESET, the overload relay is automatically reset when the TEST slide is released. The relay must be reset with the RESET button if it has been set to manual RESET.

#### STOP function

If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream and thus the load. The load is switched on again when the STOP button is released.

#### Display of the operating status

The status of the 3RU11 thermal overload relay is displayed by means of the position of the marking on the TEST function/switch position indicator slide. After tripping due to overload or phase failure, the marking on the slide is to left on the "O" mark, otherwise it is on the "I" mark.

#### Auxiliary contacts

The 3RU11 thermal overload relay is fitted with an NO contact for the "tripped" signal, and an NC contact for switching off the contactor.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

5

### Technical specifications

Type	3RU11 16	3RU11 26	3RU11 36	3RU11 46
<b>Size</b>	<b>S00</b>	<b>S0</b>	<b>S2</b>	<b>S3</b>
<b>Overall width</b>	<b>45 mm</b>	<b>45 mm</b>	<b>55 mm</b>	<b>70 mm</b>
<b>General specifications</b>				
<b>Trips in the event of</b>	Overload and phase failure			
<b>Trip class</b>	acc. to IEC 60947-4-1	CLASS	10	
<b>Phase failure sensitivity</b>	Yes			
<b>Overload warning</b>	No			
<b>Reset and recovery</b>	Manual, remote, and automatic RESET <sup>1)</sup>			
• Reset options after tripping	For automatic RESET	min.	depends on the strength of the tripping current and characteristics	
• Recovery time	For manual RESET	min.	depends on the strength of the tripping current and characteristic	
	For remote RESET	min.		
<b>Features</b>	Yes, by means of TEST function/switch position indicator slide			
• Display of operating status on device	Yes			
• TEST function	Yes			
• RESET button	Yes			
• STOP button	Yes			
<b>For safe operation of motors with "increased safety" type of protection</b>	EU type test certificate number acc. to guideline 94/9/EU		KEMA test certificate No. EX-97.Y.3235 DMT 98 ATEX 6001	
<b>Ambient temperature</b>				
• Storage/transport		°C	-55 ... + 80	
• Operation		°C	-20 ... + 70	
• Temperature compensation		°C	up to 60	
• Permissible rated current at	Temperature inside cubicle 60 °C	%	100 (over 60 °C current reduction is not required)	
	Temperature inside cubicle 70 °C	%	87	
<b>Repeat terminals</b>	Yes			
• Coil repeat terminals	Not required			
• Auxiliary contact repeat terminal	Not required			
<b>Degree of protection</b>	acc. to IEC 60529		IP20	IP20 <sup>2)</sup>
<b>Touch protection</b>	acc. to EN 50274		Finger-safe	
<b>Shock resistance with sine</b>	acc. to IEC 60068-2-27	g/ms	8/10	
<b>EMC interference immunity</b>	EMC interference immunity is not relevant for thermal overload relays			
• Conductor-related interference				
– Burst	acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	EMC interference immunity is not relevant for thermal overload relays	
– Surge	acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	EMC interference immunity is not relevant for thermal overload relays	
• Electrostatic discharge	acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	EMC interference immunity is not relevant for thermal overload relays	
• Field-related interference	acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	EMC interference immunity is not relevant for thermal overload relays	
<b>EMC interference emission</b>	EMC interference immunity is not relevant for thermal overload relays			
<b>Resistance to extreme climates (air humidity)</b>	%		100	
<b>Dimensions</b>	see dimension drawings			
<b>Site altitude</b>	m		up to 2000 m above sea level; above that level, please enquire	
<b>Mounting position</b>	The diagrams show the permissible mounting positions for direct mounting and stand-alone installation. The mounting positions shown in the shaded area must be adjusted by 10 %.			
	Stand-alone installation			
<b>Installation type/mounting</b>	Direct mounting <sup>3)</sup> /stand-alone installation with terminal bracket <sup>4)</sup>		Direct mounting/stand-alone installation with terminal bracket <sup>4)</sup>	

- 1) Remote RESET in combination with the corresponding accessories.
- 2) Terminal compartment: IP00 degree of protection.
- 3) The 3RU11 16 overload relay with Cage Clamp connection can only be installed as a stand-alone unit.

- 4) For screw and snap-on mounting onto 35 mm standard mounting rail; size S3 also for 75 mm standard mounting rail. For more detailed information about terminal brackets, please see Technical specifications/terminal brackets for stand-alone installation.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

Type Size		3RU11 16 S00	3RU11 26 S0	3RU11 36 S2	3RU11 46 S3	
Overall width		45 mm	45 mm	55 mm	70 mm	
<b>Main circuit</b>						
Rated insulation voltage $U_i$ (pollution degree 3)	V	690			1000	
Rated impulse withstand voltage $U_{imp}$	kV	6			8	
Rated operating voltage $U_e$	V	690			1000	
Type of current		Yes				
• DC		Yes, frequency range up to 400 Hz				
• AC						
Current setting	A	0.11-0.16 ... 9-12	1.8-2.5 ... 20-25	5.5-8 ... 40-50	18-25 ... 80-100	
Power loss per unit (max.)	W	3.9 ... 6.6	3.9 ... 6	6 ... 9	10 ... 16.5	
Short-circuit protection	with fuse without contactor with fuse and contactor	see selection and ordering data see Technical specifications (short-circuit protection with fuses/circuit-breakers for motor feeders)				
Safe isolation between main and auxiliary conducting path	acc. to IEC 60947-1	V	500	690		
<b>Connection for main circuit</b>						
Type of connection		Screw connection/ Cage Clamp connection <sup>1)</sup>	Screw connection	Screw connection with box terminal	Screw connection with box terminal/rail connection <sup>2)</sup>	
<b>Screw connection</b>		Pozidrive size 2				
• Terminal screw		4 mm Allen screw				
• Tightening torque		4 ... 6				
• Conductor cross-section (min./max.), 1 or 2 conductors	Solid	Nm mm <sup>2</sup>	0.8 ... 1.2 2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5) max. 2 x (1 ... 4)	2 ... 2.5 2 x (1 ... 2.5) 2 x (2.5 ... 6) max. 2 x (2.5 ... 10)	3 ... 4.5 2 x (0.75 ... 16)	2 x (2.5 ... 16)
	Finely stranded without end sleeve	mm <sup>2</sup>	–			
	Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5)	2 x (1 ... 2.5) 2 x (2.5 ... 6)	2 x (0.75 ... 16) 1 x (0.75 ... 25)	2 x (2.5 ... 35) 1 x (2.5 ... 50)
	Stranded	mm <sup>2</sup>	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5) max. 2 x (1 ... 4)	2 x (1 ... 2.5) 2 x (2.5 ... 6) max. 2 x (2.5 ... 10)	2 x (0.75 ... 25) 1 x (0.75 ... 35)	2 x (10 ... 50) 1 x (10 ... 70)
	AWG conductor connections, solid or stranded	AWG	2 x (18 ... 14)	2 x (14 ... 10)	2 x (18 ... 3) 1 x (18 ... 1)	2 x (10 ... 1/0) 1 x (10 ... 2/0)
	Ribbon cables (number x width x circumference)	mm	–	–	2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)
<b>Rail connection</b>						
• Terminal screw		Nm	–	–	–	M 6 x 20
• Tightening torque		mm <sup>2</sup>	–	–	–	4 ... 6
• Conductor cross-section (min./max.)	Finely stranded with cable lug	mm <sup>2</sup>	–	–	–	2 x 70
	Stranded with cable lug	mm <sup>2</sup>	–	–	–	3 x 70
	AWG conductor connections, solid or stranded, with cable lug	AWG	–	–	–	2/0
	With connecting bar (max. width)	mm	–	–	–	12
<b>Straight-through transformer connection</b>						
• Diameter of opening		mm	–	–	–	–
• Conductor cross-section (max.)	NYN	mm <sup>2</sup>	–	–	–	–
	H07RN-F	mm <sup>2</sup>	–	–	–	–
<b>Auxiliary circuit</b>						
Auxiliary contacts: Number x (version)		1 x (1 NO + 1 NC)				
Assignment of auxiliary contacts		1 NO for the "tripped due to overload" signal; 1 NC for switching off the contactor				
Rated insulation voltage $U_i$ (pollution degree 3)	V	690				
Rated impulse withstand voltage $U_{imp}$	kV	6				

1) For conductor cross-sections for Cage Clamp connections, see connection of the auxiliary circuit.

2) The box terminal is removable. Rail and cable lug connections are possible if the box terminal is removed.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

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Type			3RU11 16	3RU11 26	3RU11 36	3RU11 46
Size			S00	S0	S2	S3
Overall width			45 mm	45 mm	55 mm	70 mm
<b>Auxiliary circuit</b>						
<b>Contact rating of the auxiliary contacts</b>						
• NC at AC, AC-14/AC-15	Rated operating current $I_e$ for $U_e$ :					
	- 24 V	A	4			
	- 120 V	A	4			
	- 125 V	A	4			
	- 230 V	A	3			
	- 400 V	A	2			
	- 600 V	A	0.6			
	- 690 V	A	0.5			
• NO at AC, AC-14/AC-15	Rated operating current $I_e$ at $U_e$ :					
	- 24 V	A	3			
	- 120 V	A	3			
	- 125 V	A	3			
	- 230 V	A	2			
	- 400 V	A	1			
	- 600 V	A	0.6			
	- 690 V	A	0.5			
• NC, NO at DC, DC-13	Rated operating current $I_e$ at $U_e$ :					
	- 24 V	A	1			
	- 60 V	A	1 <sup>1)</sup>			
	- 110 V	A	0.22			
	- 125 V	A	0.22			
	- 220 V	A	0.11			
• Conventional thermal current $I_{th}$		A	6			
• Contact reliability	(suitable for PLC control; 17 V, 5 mA)		Yes			
<b>Short-circuit protection</b>						
• With fuse	Operational class gL/gG	A	6			
	Quick	A	10			
• With miniature circuit-breaker (C-characteristic)		A	6 <sup>2)</sup>			
<b>Safe isolation between auxiliary circuits</b>	acc. to IEC 60947-1	V	415			
<b>Connection for auxiliary circuit</b>						
<b>Type of connection</b>	Screw connection or Cage Clamp connection					
<b>Connection features</b>			Screw connection		Cage Clamp connection	
• Terminal screw			Pozidrive size 2		-	
• Tightening torque		Nm	0.8 ... 1.2		-	
• Conductor cross-sections (min./max.), 1 or 2 conductors	Solid	mm <sup>2</sup>	2 x (0.5 ... 1.5)		2 x (0.25 ... 2.5)	
			2 x (0.75 ... 2.5)			
	Finely stranded without end sleeve	mm <sup>2</sup>	-		2 x (0.25 ... 2.5)	
	Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 ... 1.5)		2 x (0.25 ... 1.5)	
			2 x (0.75 ... 2.5)			
	Stranded	mm <sup>2</sup>	2 x (0.5 ... 1.5)		-	
			2 x (0.75 ... 2.5)			
	AWG conductor connections, solid or stranded	AWG	2 x (18 ... 14)		2 x (24 ... 14)	
<b>CSA, UL, and UR ratings</b>						
<b>Auxiliary circuit</b>	Switching capacity		B600, R300			

1) on request

2) Up to  $I_k \leq 0.5$  kA;  $\leq 260$  V.

### Terminal brackets for stand-alone installation

Type			3RU19 16-3AA01	3RU19 26-3AA01	3RU19 36-3AA01	3RU19 46-3AA01
for overload relay			3RU11 16	3RU11 26	3RU11 36	3RU11 46
<b>Mounting type</b>	For screw and snap-on mounting onto 35 mm standard mounting rail; Size S3, also for 75 mm standard mounting rail.					
<b>Connection for main circuit</b>						
<b>Type of connection</b>			Screw connection			Screw connection with box terminal
<b>Screw connection</b>						4 mm Allen screw
• Terminal screw			Pozidrive size 2			
• Conductor cross-section (min./max.), 1 or 2 conductors	Solid	mm <sup>2</sup>	1 x (0.5 ... 2.5)	1 x (1 ... 6)	2 x (0.75 ... 16)	2 x (2.5 ... 16)
			max. 1 x (... 4)	max. 1 x (... 10)		
	Finely stranded without end sleeve	mm <sup>2</sup>	-			
	Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.5 ... 2.5)	1 x (1 ... 6)	2 x (0.75 ... 16)	2 x (2.5 ... 35)
					1 x (0.75 ... 25)	1 x (2.5 ... 50)
	Stranded	mm <sup>2</sup>	1 x (0.5 ... 2.5)	1 x (1 ... 6)	2 x (0.75 ... 25)	2 x (10 ... 50)
			max. 1 x (... 4)	max. 1 x (... 10)	1 x (0.75 ... 35)	1 x (10 ... 70)
	AWG conductor connections, solid or stranded	AWG	1 x (18 ... 14)	1 x (14 ... 10)	2 x (18 ... 3)	2 x (10 ... 1/0)
	Ribbon cables (number x width x circumference)	mm	-	-	1 x (18 ... 1)	2 x (10 ... 2/0)
					2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

### Short-circuit protection/circuit-breakers for motor feeders

With short-circuit currents up to 50 kA at AC 50/60 Hz 690 V.

Permissible short-circuit protection fuse for motor starters comprising overload relay and contactor, type of coordination 2<sup>1)</sup>

Setting range	Size S2									UL-listed fuses RK5	Circuit-breakers for starter protection at $I_q = 50 \text{ kA/AC } 400 \text{ V}$
	15 kW $\cong$ 3RT10 34 $I_{e \text{ max}} = 32 \text{ A}$ (at AC 50 Hz 400 V)			18.5 kW $\cong$ 3RT10 35 $I_{e \text{ max}} = 40 \text{ A}$ (at AC 50 Hz 400 V)			22 kW $\cong$ 3RT10 36 $I_{e \text{ max}} = 50 \text{ A}$ (at AC 50 Hz 400 V)				
A	gL/gG	aM	BS88	gL/gG	aM	BS88	gL/gG	aM	BS88	A	
5.5 ... 8	25	10	25	25	10	25	25	10	25	30	–
7 ... 10	32	16	32	32	16	32	32	16	32	40	–
9 ... 12.5	35	16	35	35	16	35	35	16	35	50	–
11 ... 16	40	20	40	40	20	40	40	20	40	60	–
14 ... 20	50	25	50	50	25	50	50	25	50	80	–
18 ... 25	63	32	63	63	32	63	63	32	63	100	3RV13 31-4DC10
22 ... 32	63	35	63	63	35	63	80	35	80	125	3RV13 31-4EC10
28 ... 40	63	50	63	63	50	63	80	50	80	150	3RV13 31-4FC10
36 ... 45	–	–	–	63	50	80	80	50	80	175	3RV13 31-4GC10
40 ... 50	–	–	–	–	–	–	80	50	80	200	3RV13 31-4HC10

Setting range	Size S3									UL-listed fuses RK5	Circuit-breaker for starter protection at $I_q = 50 \text{ kA/AC } 400 \text{ V}$
	30 kW $\cong$ 3RT10 44 $I_{e \text{ max}} = 65 \text{ A}$ (at AC 50 Hz 400 V)			37 kW $\cong$ 3RT10 45 $I_{e \text{ max}} = 80 \text{ A}$ (at AC 50 Hz 400 V)			45 kW $\cong$ 3RT10 46 $I_{e \text{ max}} = 95 \text{ A}$ (at AC 50 Hz 400 V)				
A	gL/gG	aM	BS88	gL/gG	aM	BS88	gL/gG	aM	BS88	A	
18 ... 25	63	32	63	63	32	63	63	32	63	100	–
22 ... 32	80	35	80	80	35	80	80	35	80	125	–
28 ... 40	80	50	80	80	50	80	80	50	80	150	–
36 ... 50	125	50	125	125	50	125	125	50	125	200	–
45 ... 63	125	63	125	160	63	160	160	63	160	250	3RV13 41-4JC10
57 ... 75	–	–	–	160	80	160	160	80	160	300	3RV13 41-4KC10
70 ... 90	–	–	–	–	–	–	160	100	160	350	3RV13 41-4LC10
80 ... 100	–	–	–	–	–	–	160	100	160	350	3RV13 41-4MC10

For type of coordination 1<sup>1)</sup>, see short-circuit protection of the contactors without overload relay under "Contactors and contactor assemblies".

1) Coordination and short-circuit equipment according to EN 60947-4-1:

**Type of coordination 1:** The contactor or starter must not endanger persons or the installation in the event of a short-circuit. They do not need to be suitable for further operation without repair and the renewal of parts.

**Type of coordination 2:** The contactor or starter must not endanger persons or the installation in the event of a short-circuit. They must be suitable for further use. There is a danger of contact welding.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

### Short-circuit protection/circuit-breakers for motor feeders

With short-circuit currents up to 50 kA at AC 50/60 Hz 690 V.

Permissible short-circuit protection fuse for motor starters comprising overload relay and contactor, type of coordination 2<sup>1)</sup>

Setting range	Size S00									UL-listed fuses RK5	Circuit-breaker for starter protection at $I_q = 50 \text{ kA/AC } 400 \text{ V}$
	3 kW $\cong$ 3RT10 15 $I_{e \text{ max}} = 7 \text{ A}$ (at AC 50 Hz 400 V)			4 kW $\cong$ 3RT10 16 $I_{e \text{ max}} = 9 \text{ A}$ (at AC 50 Hz 400 V)			5.5 kW $\cong$ 3RT10 17 $I_{e \text{ max}} = 12 \text{ A}$ (at AC 50 Hz 400 V)				
A	gL/gG	aM	BS88	gL/gG	aM	BS88	gL/gG	aM	BS88	A	
0.11 ... 0.16	0.5	-	-	0.5	-	-	0.5	-	-	1	-
0.14 ... 0.2	1	-	-	1	-	-	1	-	-	1	3RV13 21-0BC10
0.18 ... 0.25	1	-	-	1	-	-	1	-	-	1	3RV13 21-0CC10
0.22 ... 0.32	1.6	-	2	1.6	-	2	1.6	-	2	1	3RV13 21-0DC10
0.28 ... 0.4	2	-	2	2	-	2	2	-	2	1.6	3RV13 21-0EC10
0.35 ... 0.5	2	-	2	2	-	2	2	-	2	2	3RV13 21-0FC10
0.45 ... 0.63	2	-	4	2	-	4	2	-	4	2.5	3RV13 21-0GC10
0.55 ... 0.8	4	-	4	4	-	4	4	-	4	3	3RV13 21-0HC10
0.7 ... 1	4	-	6	4	-	6	4	-	6	4	3RV13 21-0JC10
0.9 ... 1.25	4	-	6	4	-	6	4	-	6	5	3RV13 21-0KC10
1.1 ... 1.6	6	-	10	6	-	10	6	-	10	6	3RV13 21-1AC10
1.4 ... 2	6	-	10	6	-	10	6	-	10	8	3RV13 21-1BC10
1.8 ... 2.5	10	-	10	10	-	10	10	-	10	10	-
2.2 ... 3.2	10	-	16	10	-	16	10	-	16	12	-
2.8 ... 4	16	-	16	16	-	16	16	-	16	16	-
3.5 ... 5	20	6	20	20	6	20	20	6	20	20	-
4.5 ... 6.3	20	6	20	20	6	20	20	6	20	25	-
5.5 ... 8	20	10	20	20	10	20	20	10	20	30	-
7 ... 10	-	-	-	20	16	20	20	16	20	40	-
9 ... 12	-	-	-	-	-	-	20	16	25	45	-

Setting range	Size S0									UL-listed fuses RK5	Circuit-breaker for starter protection at $I_q = 50 \text{ kA/AC } 400 \text{ V}$
	5.5 kW $\cong$ 3RT10 24 $I_{e \text{ max}} = 12 \text{ A}$ (at AC 50 Hz 400 V)			7.5 kW $\cong$ 3RT10 25 $I_{e \text{ max}} = 17 \text{ A}$ (at AC 50 Hz 400 V)			11 kW $\cong$ 3RT10 26 $I_{e \text{ max}} = 25 \text{ A}$ (at AC 50 Hz 400 V)				
A	gL/gG	aM	BS88	gL/gG	aM	BS88	gL/gG	aM	BS88	A	
1.8 ... 2.5	10	-	10	10	-	10	10	-	10	10	3RV13 21-1CC10
2.2 ... 3.2	10	-	16	10	-	16	10	-	16	12	3RV13 21-1DC10
2.8 ... 4	16	-	16	16	-	16	16	-	16	16	3RV13 21-1EC10
3.5 ... 5	20	6	20	20	6	20	20	6	20	20	3RV13 21-1FC10
4.5 ... 6.3	20	6	25	20	6	25	20	6	25	25	3RV13 21-1GC10
5.5 ... 8	25	10	25/32 <sup>2)</sup>	25	10	25/32 <sup>2)</sup>	25	10	32	30	3RV13 21-1HC10
7 ... 10	25	16	25/32 <sup>2)</sup>	25	16	25/32 <sup>2)</sup>	32	16	35	40	3RV13 21-1JC10
9 ... 12.5	25	20	25/32 <sup>2)</sup>	25	20	25/32 <sup>2)</sup>	35	20	35	45	3RV13 21-1KC10
11 ... 16	25	20	25/32 <sup>2)</sup>	25	20	25/32 <sup>2)</sup>	35	20	35	60	3RV13 21-4AC10
14 ... 20	-	-	-	25	20	25/32 <sup>2)</sup>	35	20	35	80	3RV13 21-4BC10
17 ... 22	-	-	-	-	-	-	35	20	35	80	3RV13 21-4CC10
20 ... 25	-	-	-	-	-	-	35	20	35	100	-

For type of coordination 1<sup>1)</sup>, see short-circuit protection of the contactors without overload relay under "Contactors and contactor assemblies".

1) Coordination and short-circuit equipment in accordance with EN 60947-4-1:

**Type of coordination 1:** The contactor or starter must not endanger persons or the installation in the event of a short-circuit. They do not need to be suitable for further operation without repair and the renewal of parts.

**Type of coordination 2:** The contactor or starter must not endanger persons or the installation in the event of a short-circuit. They must be suitable for further use. There is a danger of contact welding.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays





Up to 100 A, CLASS 10, non-adjustable

### Selection and ordering data

#### 3RU11 thermal overload relays with screw connection for direct mounting<sup>1)</sup> and stand-alone installation<sup>2)</sup>, CLASS 10

Features and technical specifications

- Auxiliary contacts: 1 NO + 1 NC
- Manual/automatic RESET
- Switch position indication
- TEST function
- STOP button
- Phase failure sensitivity
- Integrated, sealable cover
- Trip class CLASS 10

For 3RT1 contactor	Suitable for three-phase motors with P <sup>3)</sup>	Setting range	Fuse gL/gG <sup>4)</sup>	DT	For direct mounting <sup>1)</sup>	PS*	Weight per PU	DT	For stand-alone installation <sup>2)</sup>	PS*	Weight per PU	
Size <sup>5)</sup>	kW	A	A		Order No.		kg		Order No.		kg	
<b>Size S00</b>												
	S00	0.04	0.11 ... 0.16	0.5	▶	<b>3RU11 16-0AB0</b>	1 unit	0.146	B	<b>3RU11 16-0AB1</b>	1 unit	0.172
		0.06	0.14 ... 0.2	1	▶	<b>3RU11 16-0BB0</b>	1 unit	0.145	B	<b>3RU11 16-0BB1</b>	1 unit	0.173
		0.06	0.18 ... 0.25	1	▶	<b>3RU11 16-0CB0</b>	1 unit	0.147	B	<b>3RU11 16-0CB1</b>	1 unit	0.173
		0.09	0.22 ... 0.32	1.6	▶	<b>3RU11 16-0DB0</b>	1 unit	0.146	B	<b>3RU11 16-0DB1</b>	1 unit	0.173
		0.09	0.28 ... 0.4	2	▶	<b>3RU11 16-0EB0</b>	1 unit	0.146	▶	<b>3RU11 16-0EB1</b>	1 unit	0.174
		0.12	0.35 ... 0.5	2	▶	<b>3RU11 16-0FB0</b>	1 unit	0.146	▶	<b>3RU11 16-0FB1</b>	1 unit	0.175
		0.18	0.45 ... 0.63	2	▶	<b>3RU11 16-0GB0</b>	1 unit	0.147	▶	<b>3RU11 16-0GB1</b>	1 unit	0.176
		0.18	0.55 ... 0.8	4	▶	<b>3RU11 16-0HB0</b>	1 unit	0.147	▶	<b>3RU11 16-0HB1</b>	1 unit	0.174
		0.25	0.7 ... 1	4	▶	<b>3RU11 16-0JB0</b>	1 unit	0.147	▶	<b>3RU11 16-0JB1</b>	1 unit	0.175
		0.37	0.9 ... 1.25	4	▶	<b>3RU11 16-0KB0</b>	1 unit	0.149	▶	<b>3RU11 16-0KB1</b>	1 unit	0.177
		0.55	1.1 ... 1.6	6	▶	<b>3RU11 16-1AB0</b>	1 unit	0.151	▶	<b>3RU11 16-1AB1</b>	1 unit	0.178
		0.75	1.4 ... 2	6	▶	<b>3RU11 16-1BB0</b>	1 unit	0.151	▶	<b>3RU11 16-1BB1</b>	1 unit	0.178
		0.75	1.8 ... 2.5	10	▶	<b>3RU11 16-1CB0</b>	1 unit	0.150	▶	<b>3RU11 16-1CB1</b>	1 unit	0.178
		1.1	2.2 ... 3.2	10	▶	<b>3RU11 16-1DB0</b>	1 unit	0.151	▶	<b>3RU11 16-1DB1</b>	1 unit	0.178
		1.5	2.8 ... 4	16	▶	<b>3RU11 16-1EB0</b>	1 unit	0.151	▶	<b>3RU11 16-1EB1</b>	1 unit	0.178
		1.5	3.5 ... 5	20	▶	<b>3RU11 16-1FB0</b>	1 unit	0.154	▶	<b>3RU11 16-1FB1</b>	1 unit	0.182
2.2	4.5 ... 6.3	20	▶	<b>3RU11 16-1GB0</b>	1 unit	0.154	▶	<b>3RU11 16-1GB1</b>	1 unit	0.182		
3	5.5 ... 8	25	▶	<b>3RU11 16-1HB0</b>	1 unit	0.153	▶	<b>3RU11 16-1HB1</b>	1 unit	0.182		
4	7 ... 10	35	▶	<b>3RU11 16-1JB0</b>	1 unit	0.155	▶	<b>3RU11 16-1JB1</b>	1 unit	0.182		
5.5	9 ... 12	35	▶	<b>3RU11 16-1KB0</b>	1 unit	0.155	▶	<b>3RU11 16-1KB1</b>	1 unit	0.182		
<b>Size S0</b>												
	S0	0.75	1.8 ... 2.5	10	▶	<b>3RU11 26-1CB0</b>	1 unit	0.181	—			
		1.1	2.2 ... 3.2	10	▶	<b>3RU11 26-1DB0</b>	1 unit	0.183	—			
		1.5	2.8 ... 4	16	▶	<b>3RU11 26-1EB0</b>	1 unit	0.181	—			
		1.5	3.5 ... 5	20	▶	<b>3RU11 26-1FB0</b>	1 unit	0.185	—			
		2.2	4.5 ... 6.3	20	▶	<b>3RU11 26-1GB0</b>	1 unit	0.184	—			
		3	5.5 ... 8	25	▶	<b>3RU11 26-1HB0</b>	1 unit	0.184	—			
		4	7 ... 10	35	▶	<b>3RU11 26-1JB0</b>	1 unit	0.185	—			
		5.5	9 ... 12.5	35	▶	<b>3RU11 26-1KB0</b>	1 unit	0.186	—			
		7.5	11 ... 16	40	▶	<b>3RU11 26-4AB0</b>	1 unit	0.189	▶	<b>3RU11 26-4AB1</b>	1 unit	0.238
		7.5	14 ... 20	50	▶	<b>3RU11 26-4BB0</b>	1 unit	0.170	▶	<b>3RU11 26-4BB1</b>	1 unit	0.240
		11	17 ... 22	63	▶	<b>3RU11 26-4CB0</b>	1 unit	0.186	▶	<b>3RU11 26-4CB1</b>	1 unit	0.236
11	20 ... 25	63	▶	<b>3RU11 26-4DB0</b>	1 unit	0.187	▶	<b>3RU11 26-4DB1</b>	1 unit	0.238		
<b>Size S2</b>												
	S2	3	5.5 ... 8	25	▶	<b>3RU11 36-1HB0</b>	1 unit	0.316	—			
		4	7 ... 10	35	▶	<b>3RU11 36-1JB0</b>	1 unit	0.314	—			
		5.5	9 ... 12.5	35	▶	<b>3RU11 36-1KB0</b>	1 unit	0.316	—			
		7.5	11 ... 16	40	▶	<b>3RU11 36-4AB0</b>	1 unit	0.318	—			
		7.5	14 ... 20	50	▶	<b>3RU11 36-4BB0</b>	1 unit	0.315	—			
		11	18 ... 25	63	▶	<b>3RU11 36-4DB0</b>	1 unit	0.316	—			
		15	22 ... 32	80	▶	<b>3RU11 36-4EB0</b>	1 unit	0.316	▶	<b>3RU11 36-4EB1</b>	1 unit	0.480
		18.5	28 ... 40	80	▶	<b>3RU11 36-4FB0</b>	1 unit	0.321	▶	<b>3RU11 36-4FB1</b>	1 unit	0.479
		22	36 ... 45	100	▶	<b>3RU11 36-4GB0</b>	1 unit	0.329	▶	<b>3RU11 36-4GB1</b>	1 unit	0.487
		22	40 ... 50	100	▶	<b>3RU11 36-4HB0</b>	1 unit	0.320	▶	<b>3RU11 36-4HB1</b>	1 unit	0.482
<b>Size S3</b>												
	S3	11	18 ... 25	63	▶	<b>3RU11 46-4DB0</b>	1 unit	0.551	—			
		15	22 ... 32	80	▶	<b>3RU11 46-4EB0</b>	1 unit	0.553	—			
		18.5	28 ... 40	80	▶	<b>3RU11 46-4FB0</b>	1 unit	0.540	—			
		22	36 ... 50	125	▶	<b>3RU11 46-4HB0</b>	1 unit	0.543	—			
		30	45 ... 63	125	▶	<b>3RU11 46-4JB0</b>	1 unit	0.549	▶	<b>3RU11 46-4JB1</b>	1 unit	0.792
		37	57 ... 75	160	▶	<b>3RU11 46-4KB0</b>	1 unit	0.566	▶	<b>3RU11 46-4KB1</b>	1 unit	0.820
		45	70 ... 90	160	▶	<b>3RU11 46-4LB0</b>	1 unit	0.572	▶	<b>3RU11 46-4LB1</b>	1 unit	0.810
		45	80 ... 100 <sup>6)</sup>	200	▶	<b>3RU11 46-4MB0</b>	1 unit	0.580	▶	<b>3RU11 46-4MB1</b>	1 unit	0.814

1) With the suitable terminal brackets (see Accessories) the 3RU11 overload relays for direct mounting can also be installed as stand-alone units.

2) Size S00 to S3 for screw and snap-on mounting onto 35 mm standard mounting rails; size S3, also for 75 mm standard mounting rails.

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

4) Maximum fuse for overload relay, type of coordination 2. For fuse values for mounting onto contactors, see Technical specifications "Short-circuit protection with fuses/circuit-breakers for motor feeders".

5) Observe maximum rated operating current of the units.

6) For overload relays > 100 A, see 3RB10 or 3RB12.



# SIRIUS Overload Relays





## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

### 3RU11 thermal overload relays with Cage Clamp connection for direct mounting<sup>1)</sup> and stand-alone installation<sup>2)</sup>, CLASS 10

Features and technical specifications

- Auxiliary contacts: 1 NO + 1 NC
- Manual/automatic RESET
- Switch position indication
- TEST function
- STOP button
- Phase failure sensitivity
- Integrated, sealable cover
- Trip class CLASS 10

	For 3RT1 contactor	Suitable for three-phase motors with P <sup>3)</sup>	Setting range	Fuse gL/gG <sup>4)</sup>	DT	For direct mounting (S0-S3) or stand-alone installation <sup>1)2)</sup>	PS*	Weight per PU
	Size <sup>5)</sup>	kW	A	A		Order No.		kg
<b>Size S00 for stand-alone installation<sup>6)</sup></b>								
	S00	0.04	0.11 ... 0.16	0.5	C	<b>3RU11 16-0AC1</b>	1 unit	0.183
		0.06	0.14 ... 0.2	1	C	<b>3RU11 16-0BC1</b>	1 unit	0.183
		0.06	0.18 ... 0.25	1	B	<b>3RU11 16-0CC1</b>	1 unit	0.186
		0.09	0.22 ... 0.32	1.6	C	<b>3RU11 16-0DC1</b>	1 unit	0.186
		0.09	0.28 ... 0.4	2	B	<b>3RU11 16-0EC1</b>	1 unit	0.186
		0.12	0.35 ... 0.5	2	B	<b>3RU11 16-0FC1</b>	1 unit	0.186
		0.18	0.45 ... 0.63	2	▶	<b>3RU11 16-0GC1</b>	1 unit	0.185
		0.18	0.55 ... 0.8	4	B	<b>3RU11 16-0HC1</b>	1 unit	0.187
		0.25	0.7 ... 1	4	▶	<b>3RU11 16-0JC1</b>	1 unit	0.186
		0.37	0.9 ... 1.25	4	▶	<b>3RU11 16-0KC1</b>	1 unit	0.187
		0.55	1.1 ... 1.6	6	▶	<b>3RU11 16-1AC1</b>	1 unit	0.188
		0.75	1.4 ... 2	6	▶	<b>3RU11 16-1BC1</b>	1 unit	0.191
		0.75	1.8 ... 2.5	10	▶	<b>3RU11 16-1CC1</b>	1 unit	0.189
		1.1	2.2 ... 3.2	10	▶	<b>3RU11 16-1DC1</b>	1 unit	0.190
		1.5	2.8 ... 4	16	▶	<b>3RU11 16-1EC1</b>	1 unit	0.189
		1.5	3.5 ... 5	20	▶	<b>3RU11 16-1FC1</b>	1 unit	0.193
		2.2	4.5 ... 6.3	20	▶	<b>3RU11 16-1GC1</b>	1 unit	0.194
3	5.5 ... 8	25	▶	<b>3RU11 16-1HC1</b>	1 unit	0.189		
4	7 ... 10	35	▶	<b>3RU11 16-1JC1</b>	1 unit	0.193		
5.5	9 ... 12	35	▶	<b>3RU11 16-1KC1</b>	1 unit	0.193		
<b>Size S0 for direct mounting<sup>1)7)</sup></b>								
	S0	0.75	1.8 ... 2.5	10	B	<b>3RU11 26-1CD0</b>	1 unit	0.182
		1.1	2.2 ... 3.2	10	B	<b>3RU11 26-1DD0</b>	1 unit	0.184
		1.5	2.8 ... 4	16	B	<b>3RU11 26-1ED0</b>	1 unit	0.183
		1.5	3.5 ... 5	20	B	<b>3RU11 26-1FD0</b>	1 unit	0.186
		2.2	4.5 ... 6.3	20	B	<b>3RU11 26-1GD0</b>	1 unit	0.186
		3	5.5 ... 8	25	B	<b>3RU11 26-1HD0</b>	1 unit	0.184
		4	7 ... 10	35	B	<b>3RU11 26-1JD0</b>	1 unit	0.186
		5.5	9 ... 12.5	35	B	<b>3RU11 26-1KD0</b>	1 unit	0.186
		7.5	11 ... 16	40	▶	<b>3RU11 26-4AD0</b>	1 unit	0.188
		7.5	14 ... 20	50	▶	<b>3RU11 26-4BD0</b>	1 unit	0.188
		11	17 ... 22	63	B	<b>3RU11 26-4CD0</b>	1 unit	0.186
11	20 ... 25	63	▶	<b>3RU11 26-4DD0</b>	1 unit	0.189		
<b>Size S2 for direct mounting<sup>1)7)</sup></b>								
	S2	3	5.5 ... 8	25	B	<b>3RU11 36-1HD0</b>	1 unit	0.318
		4	7 ... 10	35	B	<b>3RU11 36-1JD0</b>	1 unit	0.322
		5.5	9 ... 12.5	35	B	<b>3RU11 36-1KD0</b>	1 unit	0.317
		7.5	11 ... 16	40	B	<b>3RU11 36-4AD0</b>	1 unit	0.318
		7.5	14 ... 20	50	B	<b>3RU11 36-4BD0</b>	1 unit	0.324
		11	18 ... 25	63	▶	<b>3RU11 36-4DD0</b>	1 unit	0.322
		15	22 ... 32	80	▶	<b>3RU11 36-4ED0</b>	1 unit	0.316
		18.5	28 ... 40	80	▶	<b>3RU11 36-4FD0</b>	1 unit	0.326
		22	36 ... 45	100	B	<b>3RU11 36-4GD0</b>	1 unit	0.330
		22	40 ... 50	100	B	<b>3RU11 36-4HD0</b>	1 unit	0.326
<b>Size S3 for direct mounting<sup>1)7)</sup></b>								
	S3	11	18 ... 25	63	B	<b>3RU11 46-4DD0</b>	1 unit	0.558
		15	22 ... 32	80	B	<b>3RU11 46-4ED0</b>	1 unit	0.548
		18.5	28 ... 40	80	B	<b>3RU11 46-4FD0</b>	1 unit	0.556
		22	36 ... 50	125	B	<b>3RU11 46-4HD0</b>	1 unit	0.554
		30	45 ... 63	125	▶	<b>3RU11 46-4JD0</b>	1 unit	0.558
		37	57 ... 75	160	▶	<b>3RU11 46-4KD0</b>	1 unit	0.577
		45	70 ... 90	160	▶	<b>3RU11 46-4LD0</b>	1 unit	0.573
		45	80 ... 100	200	B	<b>3RU11 46-4MD0</b>	1 unit	0.570

1) With the suitable terminal brackets (see Accessories) the 3RU11 overload relays for direct mounting can also be installed as stand-alone units.

2) Size S00 for screw and snap-on mounting onto 35 mm standard mounting rail.

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

4) Maximum fuse for overload relay, type of coordination 2. For fuse values for mounting onto contactor, see Technical specifications "Short-circuit protection with fuses/circuit-breakers for motor feeders".

5) Observe maximum rated operating current of the units.

6) Auxiliary and main conductor terminals with Cage Clamp connection.

7) Auxiliary conductor terminals with Cage Clamp connection and main conductor terminals with screw connection.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

### Accessories

The following accessories are available for the 3RU11 thermal overload relays:

- For the four overload relay frame sizes S00 to S3 one terminal bracket each for stand-alone installation
- One electrical remote RESET module in three voltage variants for all sizes
- One mechanical remote RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes) and
- Terminal covers.

The accessories can also be used for the 3RB10 overload relays.

### Characteristics

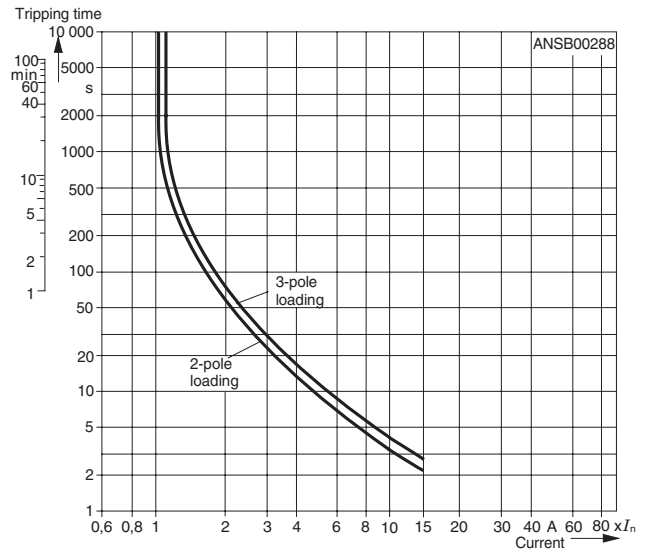
The tripping characteristics show the relationship between the tripping time and tripping current as multiples of the set current  $I_e$  and are given for symmetrical three-pole and two-pole loads from the cold state.

The smallest current used for tripping is called the minimum tripping current. According to IEC 60947-4-1, this current must be within specified limits. The limits of the minimum tripping current for the 3RU11 thermal overload relays for symmetrical three-pole loads are between 105 % and 120 % of the set current.

The tripping characteristic starts with the minimum tripping current and continues with higher tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time intervals within which the overload relays have to trip with 7.2 times the set current  $I_e$  from the cold state for symmetrical three-pole loads.

The tripping times are as follows for:

CLASS	Tripping times
10A	2 s ... 10 s
10	4 s ... 10 s
20	6 s ... 20 s
30	9 s ... 30 s



*This is the schematic representation of a characteristic. The characteristics for the individual 3RU11 thermal overload relays can be requested from Technical Assistance at the following e-mail address: [Technical-assistance@siemens.com](mailto:Technical-assistance@siemens.com)*

The tripping characteristic for a three-pole 3RU11 thermal overload relay (see characteristic for symmetrical three-pole loads from the cold state) only applies if all three bimetal strips are simultaneously loaded with the same current.

If only two bimetal strips are heated due to a phase failure, these two strips alone must generate the necessary force to trigger the tripping mechanism which would result in a longer tripping time or require a higher current. If these higher currents are applied over a longer period, they usually cause damage to the load. To avoid damage, the 3RU11 thermal overload relays are fitted with phase failure sensitivity which ensures faster tripping in accordance with the characteristic for double-pole loads from the cold state by means of a suitable mechanical mechanism.

Compared with a cold load, a load at operating temperature obviously has a lower temperature reserve. This is taken into account by the 3RU11 thermal overload relays by reducing the tripping time to about 25 % when loaded with the set current  $I_e$  for an extended period.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

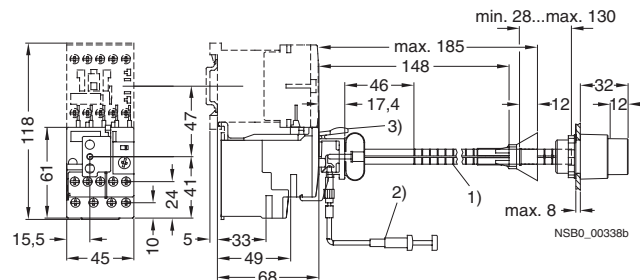
### Dimension drawings

#### Screw connection

Lateral clearance to grounded components: at least 6 mm.

#### 3RU11 16-..B0

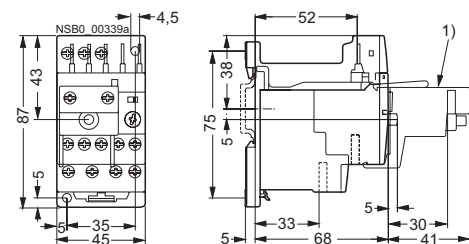
Size S00 with accessories



- 1) Mechanical RESET
- 2) Cable release (400 mm or 600 mm long, mounting on the front or laterally on the holder)
- 3) Holder for RESET
- 4) Pushbutton
- 5) Extension plunger

#### 3RU11 16-..B.

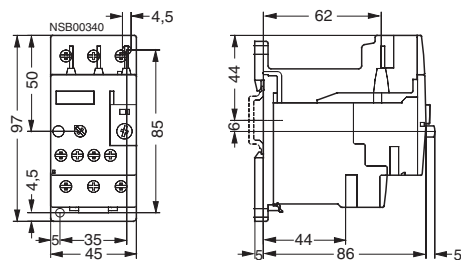
Size S00 with terminal bracket for stand-alone installation with accessories.



- 1) Module for remote RESET

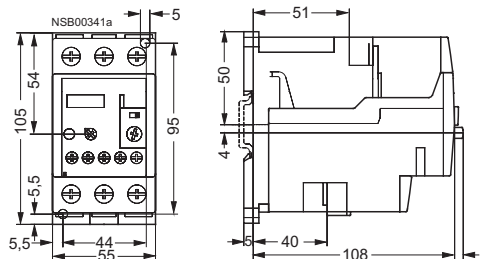
#### 3RU11 26-..B.

Size S0 with terminal bracket for stand-alone installation.



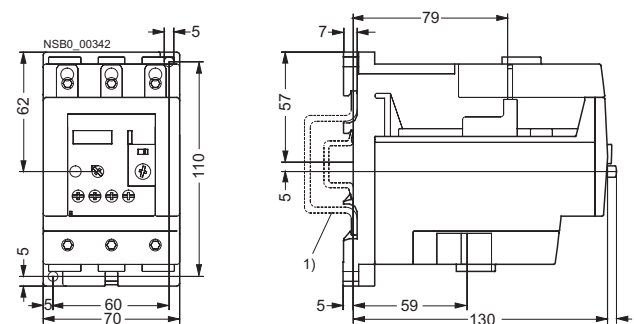
#### 3RU11 36-..B.

Size S2 with terminal bracket for stand-alone installation.



#### 3RU11 46-..B.

Size S3 with terminal bracket for stand-alone installation.



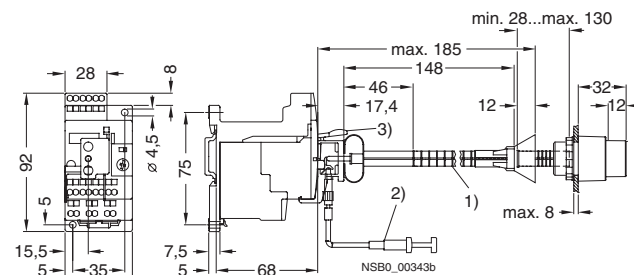
- 1) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to DIN EN 50 022 or 75 mm standard mounting rail acc. to DIN EN 50 023

#### Cage Clamp connection

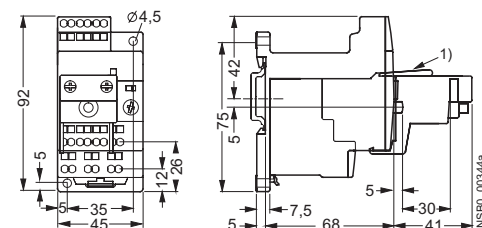
The lateral clearance to grounded components must be at least 6 mm.

#### 3RU11 16 -..C1

Size S00 with accessories (same for sizes S00 to S3).



- 1) Mechanical RESET
- 2) Cable release (400 mm or 600 mm long, mounting on the front or laterally on the holder)
- 3) Holder for RESET
- 4) Pushbutton
- 5) Extension plunger



- 1) Module for remote RESET

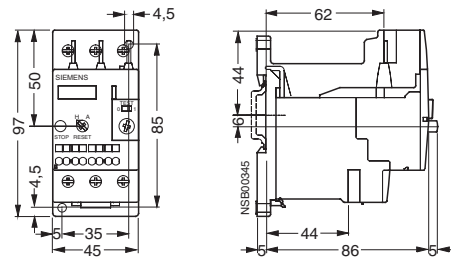
# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

Up to 100 A, CLASS 10, non-adjustable

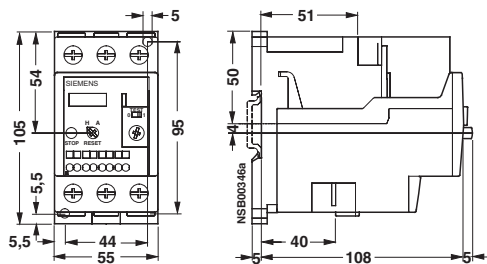
### 3RU11 26-..D.

Size S0 with terminal bracket for stand-alone installation.



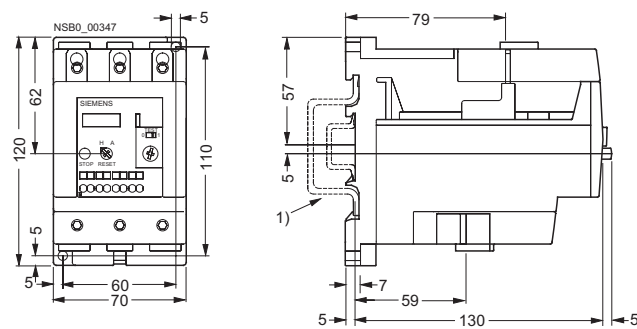
### 3RU11 36-..D.

Size S2 with terminal bracket for stand-alone installation.



### 3RU11 46-..D.

Size S3 with terminal bracket for stand-alone installation.

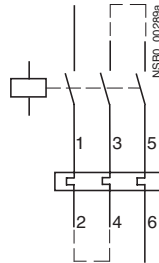


- 1) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to DIN EN 50 022 or 75 mm standard mounting rail acc. to DIN EN 50 023

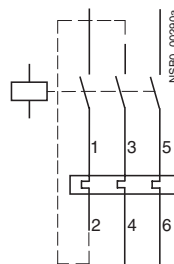
For dimension drawings of "Overload relay mounted onto contactor", see "Contactors and contactor assemblies".

## Circuit diagrams

### Protection of AC motors

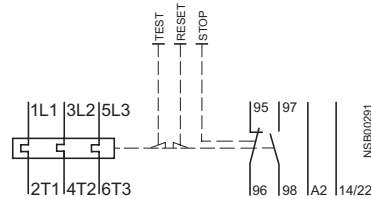


1-pole

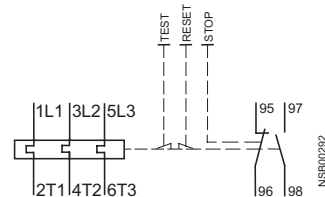


2-pole








### 3RU11 16 overload relay



### 3RU11 26 to 3RU11 46 overload relays



#### Selection and ordering data

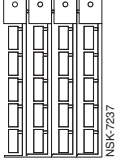
Version	For type 3RU11	DT	Order No.	PS*	Weight per PU	
	Size				kg	
<b>Terminal brackets for stand-alone installation<sup>1)</sup></b>						
 <p>3RU19 .6-3AA01</p>	For separate mounting of the overload relays; Screw and snap-on connection onto 35 mm standard mounting rail, size S3 also for mounting onto 75 mm standard mounting rail. For connection to main circuit, see Technical specifications.	S00	▶	<b>3RU19 16-3AA01</b>	1 unit 0.059	
		S0	▶	<b>3RU19 26-3AA01</b>	1 unit 0.078	
		S2	▶	<b>3RU19 36-3AA01</b>	1 unit 0.176	
		S3	▶	<b>3RU19 46-3AA01</b>	1 unit 0.281	
<b>Mechanical RESET<sup>1)</sup></b>						
 <p>3RU19 00-1A with pushbutton and extension plunger</p>	Resetting plunger, holder and former Suitable pushbutton IP65 Ø 22 mm, 12 mm hub Extension plunger	S00 ... S3	▶	<b>3RU19 00-1A</b>	1 set 0.038	
			B	<b>3SB30 00-0EA11</b>	1 unit 0.021	
			A	<b>3SX1 335</b>	1 unit 0.004	
<b>Cable releases with holder for RESET<sup>1)</sup></b>						
 <p>3RU19 00-1.</p>	For Ø 6.5 mm holes in the control panel; max. 8 mm control panel thickness	Length 400 mm Length 600 mm	S00 ... S3	▶	<b>3RU19 00-1B</b>	1 set 0.063
				▶	<b>3RU19 00-1C</b>	1 set 0.073
<b>Module for remote RESET, electrical<sup>1)</sup></b>						
 <p>3RU19 00-2A.71</p>	Working range 0.85 to 1.1 x $U_s$ , power consumption AC 80 VA, DC 70 W, ON period 0.2 s ... 4 s, operating frequency 60/h	AC/DC 24 V ... 30 V AC/DC 110 V ... 127 V AC/DC 220 V ... 250 V	S00 ... S3	▶	<b>3RU19 00-2AB71</b>	1 unit 0.066
				▶	<b>3RU19 00-2AF71</b>	1 unit 0.067
				▶	<b>3RU19 00-2AM71</b>	1 unit 0.066
<b>Terminal cover<sup>1)</sup></b>						
	Cover for cable lug and rail connection	Length 55 mm	S3	▶	<b>3RT19 46-4EA1</b>	1 unit 0.037
	Cover for box terminals	Length 20.6 mm	S2	▶	<b>3RT19 36-4EA2</b>	1 unit 0.020
		Length 20.8 mm	S3	▶	<b>3RT19 46-4EA2</b>	1 unit 0.017
<b>Tools for opening Cage Clamp terminals</b>						
 <p>8WA2 804</p>	Suitable for a max. conductor cross-section of 2.5 mm <sup>2</sup>	Approx. 100 mm length; 3.5 x 0.5 mm (orange)	For all SIRIUS units with Cage Clamp connection.	<b>8WA2 804</b>	1 unit 0.012	
		Approx. 175 mm length. 3.5 x 0.5 mm (green)		<b>8WA2 803</b>	1 unit 0.024	
		Approx. 160 mm length. 2.5 x 0.4 mm (green)		<b>8WA2 807</b>	1 unit 0.023	
 <p>8WA2 803</p>						
 <p>8WA2 807</p>						

1) The accessories are identical to those of the 3RB10 solid-state overload relay.

# SIRIUS Overload Relays

## SIRIUS Thermal Overload Relays

### Accessories

Version	For type	DT	Order No.	PS*	Weight per PU		
kg							
<b>Blank labeling plates</b>							
 3R19 00-1SB10	Device labeling plates for "SIRIUS"	Labeling area/color	3RU11	D	<b>3RT19 00-1SB10</b>	816 units	0.030
		10 mm x 7 mm pastel turquoise		A	<b>3RT19 00-1SB20</b>	340 units	0.067
		20 mm x 7 mm pastel turquoise		D	<b>3RT19 00-1SB60</b>	4700 units	0.003
	Labels for sticking for "SIRIUS"	19 mm x 6 mm pastel turquoise	3RU11	C	<b>3RT19 00-1SD60</b>	4700 units	0.003

Computer labeling system

For custom labels for device labeling plates

Available from:

**murrplastik  
Systemtechnik GmbH**