

Overload Relays

General data

Overview



Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
General data							
Sizes	S00, S0	S2, S3	S00, S0	S2 ... S12	S00 ... S12	S00 ... S12	<ul style="list-style-type: none"> Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, etc., ...) Permit the mounting of slim and compact load feeders in widths of 45 mm (S00), 45 mm (S0), 55 mm (S2), 70 mm (S3), 120 mm (S6) and 145 mm (S10/S12); this does not include the current measuring modules for the 3RB22 to 3RB24 evaluation modules sizes S00 to S3 Simplify configuration
Seamless current range	0.11 ... 40 A	5.5 ... 100 A	0.1 ... 40 A	6 ... 630 A	0.3 ... 630 A (up to 820 A) ¹⁾	0.3 ... 630 A (up to 820 A) ¹⁾	<ul style="list-style-type: none"> Allows easy and consistent configuration with one series of overload relays (for small to large loads)
Protection functions							
Tripping due to overload	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload
Tripping due to phase unbalance	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to phase unbalance
Tripping due to phase failure	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Minimizes heating of three-phase motors during phase failure
Protection of single-phase loads	✓	✓	--	--	✓	✓	<ul style="list-style-type: none"> Enables the protection of single-phase loads
Tripping in the event of overheating by integrated thermistor motor protection function	-- ²⁾	-- ²⁾	-- ²⁾	-- ²⁾	✓	✓	<ul style="list-style-type: none"> Provides optimum temperature-dependent protection of loads against excessive temperature rises e.g. for stator-critical motors or in the event of insufficient coolant flow, contamination of the motor surface or for long starting or braking operations Eliminates the need for additional special equipment Saves space in the control cabinet Reduces wiring outlay and costs
Tripping in the event of a ground fault by internal ground-fault detection (activatable)	--	--	✓ (only 3RB31)	✓ (only 3RB21)	✓	✓	<ul style="list-style-type: none"> Provides optimum protection of loads against high-resistance short circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc. Eliminates the need for additional special equipment Saves space in the control cabinet Reduces wiring outlay and costs

✓ Available
-- Not available

¹⁾ Motor currents up to 820 A can be recorded and evaluated by a current measuring module, e.g. 3RB2906-2BG1 (0.3 to 3 A), in combination with a 3UF1868-3GA00 (820 A/1 A) series transformer.
3UF18 transformers see Chapter 10, "Monitoring and Control Devices" → "SIMOCODE 3UF Motor Management and Control Devices".

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



Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Features							
RESET function	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Allows manual or automatic resetting of the device
Remote RESET function	✓ (by means of separate module)	✓ (by means of separate module)	✓ (only with 3RB31 and external auxiliary voltage 24 V DC)	✓ (only with 3RB21 and external auxiliary voltage 24 V DC)	✓ (electrically via external button)	✓ (electrically with button or via IO-Link)	<ul style="list-style-type: none"> Allows the remote resetting of the device
TEST function for auxiliary contacts	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Allows easy checking of the function and wiring
TEST function for electronics	--	--	✓	✓	✓	✓	<ul style="list-style-type: none"> Allows checking of the electronics
Status display	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Displays the current operating state
Large current adjustment button	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Makes it easier to set the relay exactly to the correct current value
Integrated auxiliary contacts (1 NO + 1 NC)	✓	✓	✓	✓	✓ (2 ×)	--	<ul style="list-style-type: none"> Allows the load to be switched off if necessary Can be used to output signals
Integrated auxiliary contacts (1 CO and 1 NO in series)	--	--	--	--	--	✓	<ul style="list-style-type: none"> Enables the controlling of contactors directly from the higher-level control system through IO-Link
IO-Link connection	--	--	--	--	--	✓	<ul style="list-style-type: none"> Reduction of wiring in the control cabinet Enables communication
Connection of optional hand-held device	--	--	--	--	--	✓	<ul style="list-style-type: none"> Enables local operation
Communication capability through IO-Link							
Full starter functionality through IO-Link	--	--	--	--	--	✓	<ul style="list-style-type: none"> Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and wye-delta starting)
Reading out of diagnostics functions	--	--	--	--	--	✓	<ul style="list-style-type: none"> Enables the reading out of diagnostics information such as overload, open circuit, ground fault, etc.
Reading out of current values	--	--	--	--	--	✓	<ul style="list-style-type: none"> Enables the reading out of current values and their direct processing in the higher-level control system
Reading out all set parameters	--	--	--	--	--	✓	<ul style="list-style-type: none"> Enables the reading out of all set parameters, e.g. for plant documentation

✓ Available

-- Not available

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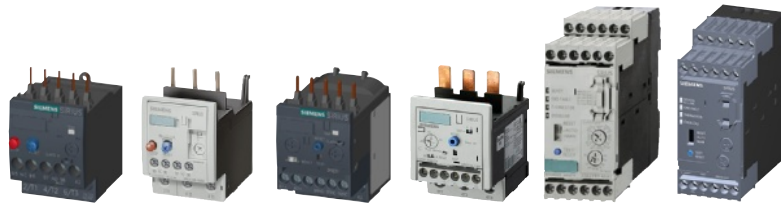


Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Design of load feeders							
Short-circuit strength up to 100 kA at 690 V (in conjunction with the corresponding fuses or the corresponding motor starter protector)	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Provides optimum protection of the loads and operating personnel in the event of short circuits due to insulation faults or faulty switching operations
Electrical and mechanical matching to 3RT contactors	✓	✓	✓	✓	✓ ¹⁾	✓ ¹⁾	<ul style="list-style-type: none"> Simplifies configuration Reduces wiring outlay and costs Enables stand-alone installation as well as space-saving direct mounting
Straight-through transformers for main circuit²⁾ (in this case the cables are routed through the feed-through openings of the overload relay and connected directly to the box terminals of the contactor)	--	--	--	✓ (S2 ... S6)	✓ (S00 ... S6)	✓ (S00 ... S6)	<ul style="list-style-type: none"> Reduces the contact resistance (only one point of contact) Saves wiring costs (easy, no need for tools, and fast) Saves material costs Reduces installation costs
Spring-type connection system for main circuit²⁾	✓	--	✓	--	--	--	<ul style="list-style-type: none"> Enables fast connections Permits vibration-resistant connections Enables maintenance-free connections
Spring-type connection system for auxiliary circuits²⁾	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Enables fast connections Permits vibration-resistant connections Enables maintenance-free connections
Ring terminal lug connection method for main and auxiliary circuits²⁾	✓	--	--	--	--	--	<ul style="list-style-type: none"> Enables fast connections Permits vibration-resistant connections Enables maintenance-free connections
Full starter functionality through IO-Link	--	--	--	--	--	✓	<ul style="list-style-type: none"> Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and wye-delta starting)
Starter function	--	--	--	--	--	✓	<ul style="list-style-type: none"> Integration of feeders via IO-Link in the control system up to 630 A or 820 A

✓ Available

-- Not available

¹⁾ Exception: up to size S3, only stand-alone installation is possible.²⁾ Alternatively available for screw terminals.



Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Other features							
Temperature compensation	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Allows the use of the relays at high temperatures without derating Prevents premature tripping Allows compact installation of the control cabinet without distance between the devices/load feeders Simplifies configuration Enables space to be saved in the control cabinet
Very high long-term stability	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Provides safe protection for the loads even after years of use in severe operating conditions
Wide setting ranges	--	--	✓ (1:4)	✓ (1:4)	✓ (1:10)	✓ (1:10)	<ul style="list-style-type: none"> Minimize the configuration outlay and costs Minimize storage overheads, storage costs, tied-up capital
Fixed trip class	CLASS 10	CLASS 10	3RB30: CLASS 10 or CLASS 20	3RB20: CLASS 10 or CLASS 20	--	--	<ul style="list-style-type: none"> Optimum motor protection for standard starts
Trip classes adjustable on the device CLASS 5, 10, 20, 30	--	--	3RB31: ✓	3RB21: ✓	✓	✓	<ul style="list-style-type: none"> Enables solutions for very fast starting motors requiring special protection (e.g. Ex motors) Enables heavy starting solutions Reduces the number of variants Minimizes the configuring outlay and costs Minimizes storage overhead, storage costs, and tied-up capital
Low power loss	--	--	✓	✓	✓	✓	<ul style="list-style-type: none"> Reduces energy consumption and energy costs (up 98 % less energy is used than for thermal overload relays). Minimizes temperature rises of the contactor and control cabinet – in some cases this may eliminate the need for controlgear cabinet cooling. Direct mounting to contactor saves space, even for high motor currents (i.e. no heat decoupling is required).
Internal power supply	-- ¹⁾	-- ¹⁾	✓	✓	--	--	<ul style="list-style-type: none"> Eliminates the need for configuration and connecting an additional control circuit
Supplied from an external voltage through IO-Link	--	--	--	--	--	✓	<ul style="list-style-type: none"> Eliminates the need for configuration and connecting an additional control circuit

✓ Available
-- Not available

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

Overload Relays

General data



Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Further characteristics (continued)							
Overload warning	--	--	--	--	✓	✓	<ul style="list-style-type: none"> Indicates imminent tripping of the relay directly on the device due to overload, phase unbalance or phase failure through flickering of the LEDs or in the case of the 3RB24 as a signal through IO-Link Allows the imminent tripping of the relay to be signaled Allows measures to be taken in time in the event of inverse-time delayed overloading of the load for an extended period over the current limit Eliminates the need for an additional device Saves space in the control cabinet Reduces wiring outlay and costs
Analog output	--	--	--	--	✓	✓	<ul style="list-style-type: none"> Allows the output of an analog output signal for actuating moving-coil instruments, feeding programmable logic controllers or transfer to bus systems Eliminates the need for an additional measuring transducer and signal converter Saves space in the control cabinet Reduces wiring outlay and costs

✓ Available
 -- Not available

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Overview of overload relays – matching contactors

Overload relays	Current measurement	Current range	Contactors (type, size, rating in kW)							
			3RT201.	3RT202.	3RT103.	3RT104.	3RT105.	3RT106.	3RT107.	3TF68/3TF69
Type	A		S00	S0	S2	S3	S6	S10	S12	Size 14
			3/4/5.5/7.5	5.5/7.5/11/15/18.5	15/18.5/22	30/37/45	55/75/90	110/132/160	200/250	375/450
SIRIUS 3RU21 thermal overload relays										
	3RU211	Integrated	0.11 ... 16	✓	--	--	--	--	--	--
	3RU212	Integrated	1.8 ... 40	--	✓	--	--	--	--	--
SIRIUS 3RU11 thermal overload relays										
	3RU113	Integrated	5.5 ... 50	--	--	✓	--	--	--	--
	3RU114	Integrated	18 ... 100	--	--	--	✓	--	--	--
SIRIUS 3RB30 solid-state overload relays¹⁾										
	3RB301	Integrated	0.1 ... 16	✓	--	--	--	--	--	--
	3RB302	Integrated	0.1 ... 40	--	✓	--	--	--	--	--
SIRIUS 3RB31 solid-state overload relays¹⁾										
	3RB311	Integrated	0.1 ... 16	✓	--	--	--	--	--	--
	3RB312	Integrated	0.1 ... 40	--	✓	--	--	--	--	--
SIRIUS 3RB20 solid-state overload relays¹⁾										
	3RB203	Integrated	6 ... 50	--	--	✓	--	--	--	--
	3RB204	Integrated	12.5 ... 100	--	--	--	✓	--	--	--
	3RB205	Integrated	50 ... 200	--	--	--	--	✓	--	--
	3RB206	Integrated	55 ... 630	--	--	--	--	--	✓	✓
	3RB201 + 3UF18	Integrated	630 ... 820	--	--	--	--	--	--	--
SIRIUS 3RB21 solid-state overload relays¹⁾										
	3RB213	Integrated	6 ... 50	--	--	✓	--	--	--	--
	3RB214	Integrated	12.5 ... 100	--	--	--	✓	--	--	--
	3RB215	Integrated	50 ... 200	--	--	--	--	✓	--	--
	3RB216	Integrated	55 ... 630	--	--	--	--	--	✓	✓
	3RB211 + 3UF18	Integrated	630 ... 820	--	--	--	--	--	--	--


✓ Can be used
-- Cannot be used

¹⁾ "Technical specifications" for the use of overload relays with trip class \geq CLASS 20 can be found in "Short-circuit protection with fuses for motor feeders", see Configuration Manuals
- "SIRIUS Configuration – Selection data for Fuseless Load Feeders", <http://support.automation.siemens.com/WW/view/en/68115040>
- "Configuring SIRIUS Innovations – Selection data for Fuseless and Fused Load Feeders", <http://support.automation.siemens.com/WW/view/en/50250599>.

Overload Relays

General data

Overview of overload relays – matching contactors (continued)

Overload relays	Current measurement	Current range	Contactors (type, size, rating in kW)							
			3RT201.	3RT202.	3RT103.	3RT104.	3RT105.	3RT106.	3RT107.	3TF68/3TF69
Type	Type	A	S00	S0	S2	S3	S6	S10	S12	Size 14
			3/4/5/7.5	5.5/7.5/11	15/18.5/22	30/37/45	55/75/90	110/132/160	200/250	375/450
SIRIUS 3RB22 to 3RB24 solid-state overload relays¹⁾										
 3RB22, 3RB23	3RB290	0.3 ... 25	✓	✓	--	--	--	--	--	--
	3RB2283/ 3RB2383/ 3RB2483+	3RB290	10 ... 100	✓	✓	✓	✓	--	--	--
		3RB295	20 ... 200	--	✓	✓	✓	✓	--	--
		3RB296	63 ... 630	--	--	--	--	--	✓	✓
		3RB290 + 3UF18	630 ... 820	--	--	--	--	--	--	✓

✓ Can be used
-- Cannot be used

¹⁾ "Technical Specifications" for the use of overload relays with trip class \geq CLASS 20 can be found in "Short-circuit protection with fuses for motor feeders", see Configuration Manuals
 - "SIRIUS Configuration – Selection data for Fuseless Load Feeders", <http://support.automation.siemens.com/WW/view/en/68115040>
 - "Configuring SIRIUS Innovations – Selection data for Fuseless and Fused Load Feeders", <http://support.automation.siemens.com/WW/view/en/50250599>.






Connection methods

Depending on the device version of the 3RU2 and 3RB3 overload relays, the terminals for screw terminals, spring-type terminals or ring terminal lug connection are configured for both the main and auxiliary circuit.

The 3RU11 thermal overload relays come with screw terminals.

The solid-state overload relays 3RB20 and 3RB21 are available with screw terminals (box terminals) or spring-type terminals on the auxiliary current side; the same applies for the evaluation modules of the 3RB22 to 3RB24 solid-state overload relays for High-Feature applications.

The 3RB29 current measuring modules are designed as straight-through modules. From size S6 upwards they are also available with an optional busbar connection.

-  Screw terminals
-  Spring-type terminals
-  Ring terminal lug connections
-  Busbar connections
-  Straight-through transformers

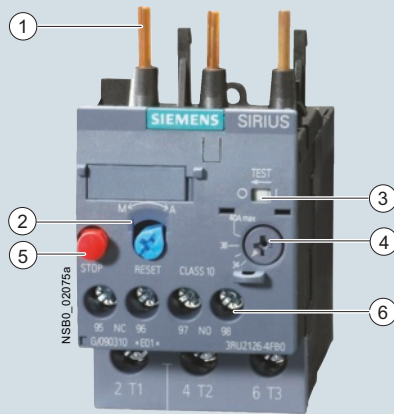
The various terminals and straight-through transformers are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A
for standard applications

Overview



- ① Connection for mounting onto contactors:
Optimally adapted in electrical, mechanical and design terms to the contactors. The overload relay can be connected directly to the contactor using these pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal bracket for stand-alone installation).
- ② Selector switch for manual/automatic RESET and RESET button:
With this switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. A remote RESET is possible using the RESET modules (accessories), which are independent of size.
- ③ Switch position indicator and TEST function of the wiring:
Indicates a trip and enables the wiring test.
- ④ Motor current setting:
Setting the device to the rated motor current is easy with the large rotary knob.
- ⑤ STOP button:
If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream. The NC contact is closed again when the button is released.
- ⑥ Connecting terminals:
Depending on the device version, the connecting terminals for screw, spring-type or ring terminal lug connection are configured for the main and auxiliary circuit.

A sealable transparent cover can be optionally mounted (accessory). It secures the motor current setting against adjustment.

SIRIUS 3RU2126-4FB0 thermal overload relay

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	
Thermal overload relays	□□□	□	□	□	□	–	□	□	□	□
SIRIUS 2nd generation		2								
Device series			□							
Size, rated operational current and power				□	□					
Setting range of the overload release							□	□		
Connection methods									□	
Installation type										□
Example	3 R U	2	1	1	6	–	0	A	B	0

Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

The 3RU21 thermal overload relays up to 40 A have been designed for inverse-time delayed protection of loads with normal starting (for "Function" see manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays", <http://support.automation.siemens.com/WW/view/en/60298164>) 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 rated motor current. Via heating elements, this current rise heats up the bimetal strips inside the device which then bend and as a result trigger the auxiliary contacts by means of a tripping mechanism. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic (see "Characteristic Curves" <http://support.automation.siemens.com/WW/view/en/34291410/134300>).

The "tripped" status is signaled by means of a switch position indicator. Resetting takes place either manually or automatically after a recovery time has elapsed (for "Function" see manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays", <http://support.automation.siemens.com/WW/view/en/60298164>).

The 3RU2 thermal overload relays are suitable for operation with frequency converters. Please follow the instructions in the manual "SIRIUS Innovations – 3RU2/3RB3 Overload Relays", see <http://support.automation.siemens.com/WW/view/en/60298164>.

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

3RU11 overload relays in sizes S2 and S3 see page 7/105 onwards.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RU21 thermal overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e.

The relays meet the requirements of IEC 60079-7 (Electrical apparatus for areas subject to explosion hazards – Increased safety "e").

EC type test certificate for Category (2) G/D exists. It has the number DMT 98 ATEX G001.

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A
for standard applications

Benefits

The most important features and benefits of the 3RU21 thermal overload relays are listed in the overview table (see "General Data", page 7/82 onwards).

Application

Industries

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

Application

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

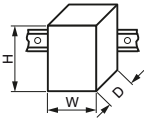

If single-phase AC or DC loads are to be protected by the 3RU21 thermal overload relays, all three bimetal strips must be heated. For this purpose, all main current paths of the relay must be connected in series.

Ambient conditions

The 3RU21 thermal overload relays have temperature compensation according to IEC 60947-4-1 for the temperature range of -40 to +60 °C. For temperatures from +60 to +70 °C, the upper set value of the setting range must be reduced by the factor listed in the table below.

Ambient temperature °C	Derating factor for the upper set value Current ranges	
	0.11 ... 20 A	17 ... 40 A
+60	1.0	1.0
+65	0.94	0.97
+70	0.87	0.94

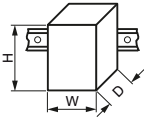
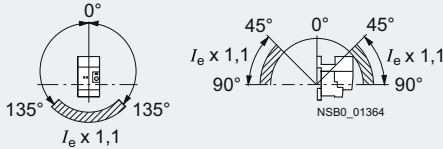
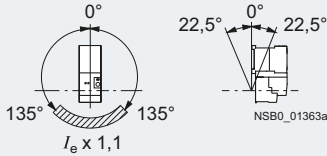
Technical specifications

Type		3RU2116	3RU2126
Size		S00	S0
Dimensions (W x H x D) (overload relay with stand-alone installation support)			
• Screw terminals	mm	45 x 89 x 80	45 x 97 x 95
• Spring-type terminals	mm	45 x 102 x 79	45 x 114 x 95
General data			
Trips in the event of		Overload and phase failure	
Trip class acc. to IEC 60947-4-1	CLASS	10	
Phase failure sensitivity		Yes	
Overload warning		No	
Reset and recovery		Manual, Automatic and Remote RESET (Remote RESET in combination with the corresponding accessories)	
• Reset options after tripping			
• Recovery time			
- For automatic RESET	min	Depends on the strength of the tripping current and characteristic	
- For manual RESET	min	Depends on the strength of the tripping current and characteristic	
- For remote RESET	min	Depends on the strength of the tripping current and characteristic	
Features			
• Display of operating state on device		Yes, by means of TEST function/switch position indicator slide	
• TEST function		Yes	
• RESET button		Yes	
• STOP button		Yes	
Safe operation of motors with "increased safety"			
type of protection			
EC type test certificate number according to directive 94/9/EC (ATEX)		DMT 98 ATEX G 001  II (2) GD, DMT 98 ATEX G 001 N1	
Ambient temperature			
• Storage/transport	°C	-55 ... +80	
• Operation	°C	-40 ... +70	
• Temperature compensation	°C	Up to 60	
• Permissible rated current at			
- Temperature inside control cabinet 60 °C	%	100 (over +60 °C current reduction is not required)	
- Temperature inside control cabinet 70 °C	%	87	
Repeat terminals			
• Coil repeat terminals		Yes	Not required
• Auxiliary contact repeat terminal		Yes	Not required
Degree of protection acc. to IEC 61140		IP20	
Touch protection acc. to IEC 61140		Screw terminals and spring-type terminals: Finger-safe for vertical contact from the front; ring terminal lug connection: Finger-safe only with optional terminal covers	
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	15/11 (auxiliary contacts 95/96 and 97/98: 8 g/11 ms)	

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays




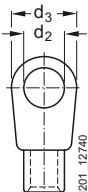
3RU2 up to 40 A
for standard applications

Type		3RU2116	3RU2126
Size		S00	S0
Dimensions (W x H x D) (overload relay with stand-alone installation support)			
• Screw terminals	mm	45 x 89 x 80	45 x 97 x 95
• Spring-type terminals	mm	45 x 102 x 79	45 x 114 x 95
General data (continued)			
Electromagnetic compatibility (EMC) – Interference immunity			
• Conductor-related interference			
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	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 according 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 according to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	EMC interference immunity is not relevant for thermal overload relays.	
Electromagnetic compatibility (EMC) – emitted interference		EMC interference immunity is not relevant for thermal overload relays.	
Resistance to extreme climates – air humidity	%	90	
Dimensions		"Dimensional drawings" see manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays", http://support.automation.siemens.com/WW/view/en/60298164 .	
Installation altitude above sea level	m	Up to 2 000; above this on request	
Mounting position		<p>The diagrams show the permissible mounting positions for mounting onto contactors and stand-alone installation. For mounting position in the hatched area, a setting correction of 10 % must be implemented.</p> <p>Stand-alone installation:</p>  <p>Contactor + overload relay:</p> 	
Type of mounting		Mounting onto contactor/stand-alone installation with terminal support (For screw and snap-on mounting onto TH 35 standard mounting rail. Technical specifications of the terminal supports see manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays", http://support.automation.siemens.com/WW/view/en/60298164 .)	

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A
for standard applications

Type		3RU2116	3RU2126
Size		S00	S0
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	690	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated operational voltage U_e	V	690	
Type of current			
• Direct current		Yes	
• Alternating current		Yes, frequency range up to 400 Hz	
Current setting			
	A	0.11 ... 0.16 up to 11 ... 16	1.8 ... 2.5 up to 34 ... 40
Power loss per unit (max.)			
	W	4.1 ... 6.3	6.2 ... 7.5
Short-circuit protection			
• With fuse without contactor		See "Selection and Ordering Data" on pages 7/95 and 7/96	
• With fuse and contactor		"Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders" see Configuration Manual "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders" http://support.automation.siemens.com/WW/view/en/50250599 .	
Protective separation between main and auxiliary current paths acc. to IEC 60947-1			
• Screw terminals or ring terminal lug connections	V	440	690: Setting ranges ≤ 25 A
• Spring-type terminals	V	440	440: Setting ranges > 25 A
Conductor cross-sections of main circuit			
Connection type  Screw terminals			
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2
Operating devices	mm	∅ 5 ... 6	∅ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm ²	2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾ , max. 2 x 4	2 x (1 ... 2.5) ¹⁾ 2 x (2.5 ... 10) ¹⁾
• Finely stranded with end sleeves (DIN 46228-1)	mm ²	2 x (0.5 ... 1.5) ¹⁾ 2 x (0.75 ... 2.5) ¹⁾	2 x (1 ... 2.5) ¹⁾ 2 x (2.5 ... 6) ¹⁾ max. 1 x 10
• AWG cables, solid or stranded	AWG	2 x (20 ... 16) ¹⁾ 2 x (18 ... 14) ¹⁾ 2 x 12	2 x (16 ... 12) ¹⁾ 2 x (14 ... 8) ¹⁾
Connection type  Spring-type terminals			
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections (min./max.)			
• Solid	mm ²	1 x (0.5 ... 4)	1 x (1 ... 10)
• Finely stranded without end sleeve	mm ²	1 x (0.5 ... 2.5)	1 x (1 ... 6)
• Finely stranded with end sleeves (DIN 46228-1)	mm ²	1 x (0.5 ... 2.5)	1 x (1 ... 6)
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)	1 x (18 ... 8)
Connection type  Ring terminal lug connections			
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2
Operating devices	mm	∅ 5 ... 6	∅ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5
Usable ring terminal lugs			
• DIN 46234 without insulation sleeve		$d_2 = \text{min. } 3.2,$ $d_3 = \text{max. } 7.5$	
• DIN 46225 without insulation sleeve			$d_2 = \text{min. } 4.3,$ $d_3 = \text{max. } 12.2$
• DIN 46237 with insulation sleeve			
• JIS C2805 Type R without insulation sleeve			
• JIS C2805 Type RAV with insulation sleeve			
• JIS C2805 Type RAP with insulation sleeve			

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

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A
for standard applications




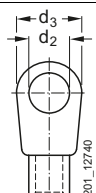
Type		3RU2116	3RU2126
Size		S00	S0
Auxiliary circuit			
Number of NO contacts		1	
Number of NC contacts		1	
Auxiliary contacts – assignment		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor	
Rated insulation voltage U_i (pollution degree 3)	V	690	
Rated impulse withstand voltage U_{imp}	kV	6	
Contact rating of the auxiliary contacts			
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e :			
- 24 V	A	4	
- 120 V	A	4	
- 125 V	A	4	
- 230 V	A	3	
- 400 V	A	2	
- 600 V	A	0.75	
- 690 V	A	0.75	
• NO contact with alternating current AC-14/AC-15, rated operational 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	0.75	
- 690 V	A	0.75	
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e :			
- 24 V	A	1	
- 60 V	A	On request	
- 110 V	A	0.22	
- 125 V	A	0.22	
- 220 V	A	0.11	
• Conventional thermal current I_{th}	A	6	
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes	
Short-circuit protection			
• With fuse			
- Operational class gG	A	6	
- Quick	A	10	
• With miniature circuit breaker (C characteristic)	A	6 ¹⁾	
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	440	
CSA, UL, UR rated data			
Auxiliary circuit – switching capacity		B600, R300	

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

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A
for standard applications

Type		3RU2116	3RU2126
Size		S00	S0
Conductor cross-sections for auxiliary circuit			
Connection type		 Screw terminals	
Terminal screw		M3, Pozidriv size 2	
Operating devices	mm	∅ 5 ... 6	
Prescribed tightening torque	Nm	0.8 ... 1.2	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm ²	2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾	
• Finely stranded with end sleeves (DIN 46228-1)	mm ²	2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾	
• AWG cables, solid or stranded	AWG	2 x (20 ... 16) ¹⁾ , 2 x (18 ... 14) ¹⁾	
Connection type		 Spring-type terminals	
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections (min./max.)			
• Solid	mm ²	2 x (0.5 ... 2.5)	
• Finely stranded without end sleeve	mm ²	2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve (DIN 46228-1)	mm ²	2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)	
Connection type		 Ring terminal lug connections	
Terminal screw		M3, Pozidriv size 2	
Operating devices	mm	∅ 5 ... 6	
Prescribed tightening torque	Nm	0.8 ... 1.2	
Usable ring terminal lugs	mm	d ₂ = min. 3.2, d ₃ = max. 7.5	
<ul style="list-style-type: none"> • DIN 46234 without insulation sleeve • DIN 46225 without insulation sleeve • DIN 46237 with insulation sleeve • JIS C2805 Type R without insulation sleeve • JIS C2805 Type RAV with insulation sleeve • JIS C2805 Type RAP with insulation sleeve 			

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

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A
for standard applications

Selection and ordering data

3RU21 thermal overload relays for mounting onto contactor¹⁾, CLASS 10

Features and technical specifications:

- Screw terminals, spring-type terminals or ring terminal lug connections²⁾
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator

- TEST function
- STOP button
- Sealable covers (optional accessory)
- Terminal covers for devices with ring terminal lug connection (optional accessory)

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



3RU2116-4AB0



3RU2116-4ACO



3RU2126-4FBO



3RU2126-4ACO

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

¹⁾ With the suitable terminal supports (see "Accessories", page 7/97), the 3RU2 overload relays for mounting on contactors can also be installed as stand-alone units.

²⁾ The 3RU21 overload relays are also available with ring terminal lug connection. The Article No. must be changed in the 10th digit to "J": e.g. 3RU2116-0AJ0.

³⁾ Observe maximum rated operational current of the devices.

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

⁵⁾ Maximum protection by fuse only for overload relay, type of coordination "2". Fuse values in connection with contactors see Configuration Manual "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders", <http://support.automation.siemens.com/WW/view/en/50250599>.

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A
for standard applications

3RU21 thermal overload relays for stand-alone installation¹⁾, CLASS 10

Features and technical specifications:

- Screw or spring-type terminals
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function
- STOP button
- Sealable covers (optional accessory)

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



3RU2116-4AB1



3RU2116-4AC1



3RU2126-4FB1



3RU2126-4FC1

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

¹⁾ Screw and snap-on mounting onto TH 35 standard mounting rail.

²⁾ Observe maximum rated operational current of the devices.

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

⁴⁾ Maximum protection by fuse only for overload relay, type of coordination "2". Fuse values in connection with contactors see Configuration Manual "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders", <http://support.automation.siemens.com/WWW/view/en/50250599>.

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

Accessories







Overview

Overload relays for standard applications

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

- Terminal support for stand-alone installation with screw or spring-type terminals for every size
- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)
- Electrical remote RESET module in three voltage variants (for all sizes)
- Sealable cover (for all sizes)
- Terminal covers for devices with ring terminal lug connection









Selection and ordering data

Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
Terminal supports for stand-alone installation								
 3RU2916-3AA01	Terminal supports for overload relays with screw terminals		Screw terminals 					
	For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail	S00 S0	▶	3RU2916-3AA01 3RU2926-3AA01		1 1	1 unit 1 unit	41F 41F
 3RU2916-3AC01	Terminal supports for overload relays with spring-type terminal		Spring-type terminals 					
	For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail	S00 S0	B B	3RU2916-3AC01 3RU2926-3AC01		1 1	1 unit 1 unit	41F 41F
 3RU2900-1A with pushbutton and extension plunger	Resetting plungers, holders and formers		3RU2900-1A		1	1 unit	41F	
	Pushbuttons with extended stroke (12 mm), IP65, \varnothing 22 mm	S00, S0	B	3SB3000-0EA11		1	1 unit	41J
	Extension plungers For compensation of the distance between the pushbutton and the unlatching button of the relay	S00, S0	A	3SX1335		1	1 unit	41J
Cable releases with holder for RESET								
 3RU2900-1.	For \varnothing 6.5 mm holes in the control panel; max. control panel thickness 8 mm							
	• Length 400 mm • Length 600 mm	S00, S0 S00, S0	▶ ▶	3RU2900-1B 3RU2900-1C		1 1	1 unit 1 unit	41F 41F

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

Accessories



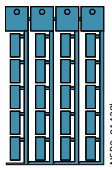
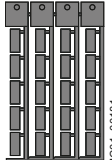
Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG			
Modules for remote RESET, electrical										
 <p>3RU1900-2A.71</p>	Operating range $0.85 \dots 1.1 \times U_N$, power consumption AC 80 VA, DC 70 W, ON period 0.2 ... 4 s, switching frequency 60/h									
	• 24 ... 30 V AC/DC	S00, S0	A	3RU1900-2AB71	1	1 unit	41F			
	• 110 ... 127 V AC/DC	S00, S0	A	3RU1900-2AF71	1	1 unit	41F			
	• 220 ... 250 V AC/DC	S00, S0	A	3RU1900-2AM71	1	1 unit	41F			
Sealable covers										
 <p>3RV2908-0P</p>	For covering the setting knobs		S00, S0	▶	3RV2908-0P	100	10 units	41E		
Terminal covers										
 <p>3RU2916-3BJ21</p>			Covers for devices with ring terminal lug connection (ensure finger-safety)		Ring terminal lug connection 					
 <p>3RU2926-3BJ21</p>			<ul style="list-style-type: none"> • Main current level <ul style="list-style-type: none"> - Cover between contactor and overload relay for direct mounting of the overload relay 		S00	C	3RU2916-3BJ21	1	10 units	41F
 <p>3RU2916-3BJ20</p>			<ul style="list-style-type: none"> - Cover for overload relay on load side 		S0	C	3RU2916-3BJ20	1	10 units	41F
 <p>3RV2928-4AA00</p>					S0	B	3RV2928-4AA00	1	1 unit	41E
 <p>3RT2916-4EA13</p>			<ul style="list-style-type: none"> • Auxiliary current level 		S00, S0	B	3RT2916-4EA13	1	10 units	41B

Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

Accessories

General accessories

Version	Size	Color	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
Tools for opening spring-type terminals										
 3RA2908-1A	Screwdrivers For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/black, partially insulated	Main and auxiliary circuit connection: 3RU2	A	Spring-type terminals 		1	1 unit	41B
						3RA2908-1A				
Blank labels										
 3RT1900-1SB20	Unit labeling plates¹⁾ for SIRIUS devices	20 mm x 7 mm	Pastel turquoise	3RU2	D	3RT1900-1SB20		100	340 units	41B
		20 mm x 7 mm	Titanium gray	3RU2	D	3RT2900-1SB20		100	340 units	41B
 3RT2900-1SB20										

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see Chapter 16, "Appendix" → "External Partners").

Overload Relays

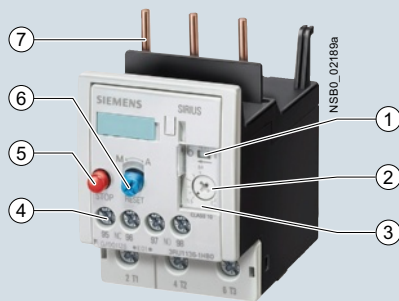
SIRIUS 3RU1 Thermal Overload Relays

3RU11 up to 100 A
for standard applications

Overview

Note:

- The 3RU11 devices (sizes S00/S0 to S3) can be found
- in the Catalog Add-On IC 10 AO · 2014 in the DVD box IC 01
 - in the Catalog Add-On IC 10 AO · 2014 at the Information and Download Center
 - in the interactive catalog CA 01
 - in the Industry Mall



- ① Switch position indicator and TEST function of the wiring:
Indicates a trip and enables the wiring test.
- ② Motor current setting:
Setting the device to the rated motor current is easy with the large rotary knob.
- ③ Transparent, sealable cover:
Secures the motor current setting and the TEST function against adjustment.
- ④ Connecting terminals:
The generously sized terminals permit connection of two conductors with different cross-sections for main and auxiliary circuits. The auxiliary circuit can be connected with screw terminals and alternatively with spring-type terminals.
- ⑤ STOP button:
If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream. The NC contact is closed again when the button is released.
- ⑥ Selector switch for manual/automatic RESET and RESET button:
With this switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. A remote RESET is possible using the RESET modules (accessories), which are independent of size.
- ⑦ Connection for mounting onto contactors:
Optimally adapted in electrical, mechanical and design terms to the contactors. These connecting pins can be used for direct mounting of the overload relay to the contactor. Stand-alone installation is possible as an alternative (partly in conjunction with a terminal support for stand-alone installation).

SIRIUS 3RU1136-1HB0 thermal overload relay

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th			
Thermal overload relays	3	R	U									
SIRIUS 1st generation			1									
Device series												
Size, rated operational current and power												
Setting range of the overload release												
Connection methods												
Installation type												
Example	3	R	U	1	1	3	6	-	1	H	B	0

Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

The 3RU11 thermal overload relays up to 100 A have been designed for inverse-time delayed protection of loads with normal starting ("Function" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681830>) 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 rated motor current. Via heating elements, this current rise heats up the bimetal strips inside the device which then bend and as a result trigger the auxiliary contacts by means of a tripping mechanism. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic (see "Characteristic Curves" <http://support.automation.siemens.com/WW/view/en/20356133/134300>).

The "tripped" status is signaled by means of a switch position indicator. Resetting takes place either manually or automatically after a recovery time has elapsed ("Function" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681830>).

The 3RU11 thermal overload relays are suitable for operation with frequency converters. Please follow the instructions in the Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", see <http://support.automation.siemens.com/WW/view/en/35681830>.

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

They comply with all important worldwide standards and approvals.

3RU21 overload relays in sizes S00 and S0 [see page 7/95 onwards](#).

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RU11 thermal overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e.

The relays meet the requirements of IEC 60079-7 (Electrical apparatus for areas subject to explosion hazards – Increased safety "e").

EC type test certificate for Category (2) G/D exists. It has the number DMT 98 ATEX G 001.

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

Overload Relays

SIRIUS 3RU1 Thermal Overload Relays

3RU11 up to 100 A
for standard applications

Benefits

The most important features and benefits of the 3RU11 thermal overload relays are listed in the overview table (see "General Data", page 7/82 onwards).

Application

Industries

The 3RU11 thermal overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed protection of their electrical loads (e.g. motors) under normal starting conditions (CLASS 10).

Application

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

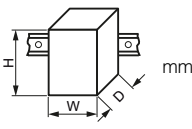

If single-phase AC or DC loads are to be protected by the 3RU11 thermal overload relays, all three bimetal strips must be heated. For this purpose, all main current paths of the relay must be connected in series.

Ambient conditions

The 3RU11 thermal overload relays have temperature compensation in accordance with IEC 60947-4-1 for the temperature range of -20 to +60 °C. For temperatures from +60 to +70 °C, the upper set value of the setting range must be reduced by the factor listed in the table below.

Ambient temperature °C	Derating factor for the upper set value
+60	1.0
+65	0.94
+70	0.87

Technical specifications

Type	3RU1136	3RU1146
Size Dimensions (W x H x D) (overload relay with stand-alone installation support)	S2 55 x 105 x 118	S3 70 x 120 x 140
		
General data		
Trips in the event of	Overload and phase failure	
Trip class acc. to IEC 60947-4-1	CLASS	10
Phase failure sensitivity	Yes	
Overload warning	No	
Reset and recovery	Manual, Automatic and Remote RESET (Remote RESET in combination with the corresponding accessories)	
• Reset options after tripping		
• Recovery time		
- For automatic RESET	min	Depends on the strength of the tripping current and characteristic
- For manual RESET	min	Depends on the strength of the tripping current and characteristic
- For remote RESET	min	Depends on the strength of the tripping current and characteristic
Features		
• Display of operating state on device	Yes, by means of TEST function/switch position indicator slide	
• TEST function	Yes	
• RESET button	Yes	
• STOP button	Yes	
Safe operation of motors with "increased safety" type of protection		
EC type test certificate number according to directive 94/9/EC (ATEX)	DMT 98 ATEX G 001  II (2) GD, DMT 98 ATEX G 001 N1	
Ambient temperature		
• Storage/transport	°C	-55 ... +80
• Operation	°C	-20 ... +70
• Temperature compensation	°C	up to 60
• Permissible rated current at		
- Temperature inside control cabinet 60 °C	%	100 (over +60 °C current reduction is not required)
- Temperature inside control cabinet 70 °C	%	87
Repeat terminals		
• Coil repeat terminals	Not required	
• Auxiliary contact repeat terminal	Not required	
Degree of protection acc. to IEC 60529	IP20 (terminal compartment: IP00 degree of protection)	
Touch protection acc. to IEC 61140	Finger-safe for vertical contact from the front	
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	8/10

Overload Relays

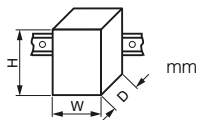
SIRIUS 3RU1 Thermal Overload Relays

3RU11 up to 100 A
for standard applications

Type

Size

Dimensions (W x H x D)
(overload relay with stand-alone installation support)



3RU1136

S2

55 x 105 x 118

3RU1146

S3

70 x 120 x 140

General data (continued)

Electromagnetic compatibility (EMC) – Interference immunity

• Conductor-related interference		
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	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 according 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 according to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	EMC interference immunity is not relevant for thermal overload relays.

Electromagnetic compatibility (EMC) – emitted interference

EMC interference immunity is not relevant for thermal overload relays.

Resistance to extreme climates – air humidity

%

100

Dimensions

"Dimensional drawings" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays"
<http://support.automation.siemens.com/WW/view/en/35681830>.

Installation altitude above sea level

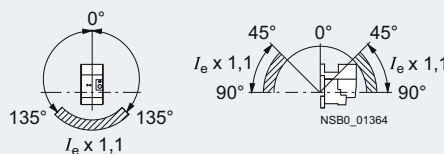
m

Up to 2 000; above this on request

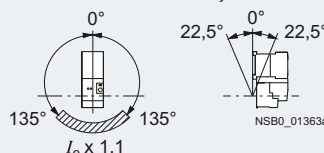
Mounting position

The diagrams show the permissible mounting positions for mounting onto contactors and stand-alone installation. For mounting position in the hatched area, a setting correction of 10 % must be implemented.

Stand-alone installation:



Contactor + overload relay:





Type of mounting

Direct mounting/stand-alone installation with terminal support
(For screw and snap-on mounting onto TH 35 standard mounting rail; size S3 also for TH 75 standard mounting rail. For technical specifications of the terminal supports see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays",
<http://support.automation.siemens.com/WW/view/en/35681830>.)

Overload Relays

SIRIUS 3RU1 Thermal Overload Relays

3RU11 up to 100 A
for standard applications


Type		3RU1136	3RU1146
Size		S2	S3
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	690	1 000
Rated impulse withstand voltage U_{imp}	kV	6	8
Rated operational voltage U_e	V	690	1 000
Type of current		Yes	
• Direct current		Yes, frequency range up to 400 Hz	
• Alternating current			
Current setting	A	5.5 ... 8 up to 40 ... 50	18 ... 25 up to 80 ... 100
Power loss per unit (max.)	W	6 ... 9	10 ... 16.5
Short-circuit protection		See "Selection and ordering data" on pages 7/105 to 7/107 See Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", http://support.automation.siemens.com/WW/view/en/35681830 → "Technical Specifications" → "Short-circuit protection with fuses/motor starter protectors for motor feeders".	
Protective separation between main and auxiliary current paths acc. to IEC 60947-1	V	500	690
Conductor cross-section of the main circuit			
Connection type		 Screw terminals with box terminal	
Terminal screw		M6, Pozidriv size 2	M8, 4 mm Allen screw
Operating devices	mm	∅ 5 ... 6	4 mm Allen screw
Prescribed tightening torque	Nm	3 ... 4.5	4 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm ²	2 x (0.75 ... 16)	2 x (2.5 ... 16)
• Finely stranded with end sleeve	mm ²	2 x (0.75 ... 16), 1 x (0.75 ... 25)	2 x (2.5 ... 35), 1 x (2.5 ... 50)
• Stranded	mm ²	2 x (0.75 ... 25), 1 x (0.75 ... 35)	2 x (10 ... 50), 1 x (10 ... 70)
• AWG cables, solid or stranded	AWG	2 x (18 ... 3), 1 x (18 ... 1)	2 x (10 ... 1/0), 1 x (10 ... 2/0)
• Ribbon cable conductors (Number x Width x Thickness)	mm	2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)
Connection type		 Busbar connection¹⁾	
Terminal screw		--	M6 x 20
Prescribed tightening torque	Nm	--	4 ... 6
Conductor cross-sections (min./max.)			
• Finely stranded with cable lug	mm ²	--	2 x 70
• Stranded with cable lug	mm ²	--	3 x 70
• AWG cables, solid or stranded, with cable lug	AWG	--	2/0
• With connecting bars (max. width)	mm	--	12

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

Overload Relays

SIRIUS 3RU1 Thermal Overload Relays

3RU11 up to 100 A
for standard applications

Type		3RU1136	3RU1146
Size		S2	S3
Auxiliary circuit			
Number of NO contacts		1	
Number of NC contacts		1	
Auxiliary contacts – assignment		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor	
Rated insulation voltage U_i (pollution degree 3)	V	690	
Rated impulse withstand voltage U_{imp}	kV	6	
Contact rating of the auxiliary contacts			
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e :			
- 24 V	A	4	
- 120 V	A	4	
- 125 V	A	4	
- 230 V	A	3	
- 400 V	A	2	
- 600 V	A	0.6	
- 690 V	A	0.5	
• NO contact with alternating current AC-14/AC-15, rated operational 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 contact, NO contact with direct current DC-13, rated operational current I_e at U_e :			
- 24 V	A	1	
- 60 V	A	On request	
- 110 V	A	0.22	
- 125 V	A	0.22	
- 220 V	A	0.11	
• Conventional thermal current I_{th}	A	6	
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes	
Short-circuit protection			
• With fuse			
- Operational class gG	A	6	
- Quick	A	10	
• With miniature circuit breaker (C characteristic)	A	6 ¹⁾	
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	440	
CSA, UL, UR rated data			
Auxiliary circuit – switching capacity		B600, R300	
Conductor cross-sections of the auxiliary circuit			
Connection type		 Screw terminals	
Terminal screw		M3, Pozidriv size 2	
Operating devices	mm	∅ 5 ... 6	
Prescribed tightening torque	Nm	0.8 ... 1.2	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm ²	2 x (0.5 ... 1.5) ²⁾ , 2 x (0.75 ... 2.5) ²⁾	
• Finely stranded without end sleeve	mm ²	--	
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5) ²⁾ , 2 x (0.75 ... 2.5) ²⁾	
• Stranded	mm ²	2 x (0.5 ... 1.5) ²⁾ , 2 x (0.75 ... 2.5) ²⁾	
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)	

¹⁾ Up to $I_k \leq 0.5$ kA; ≤ 260 V.

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

Overload Relays

SIRIUS 3RU1 Thermal Overload Relays



3RU11 up to 100 A
for standard applications

Selection and ordering data

3RU11 thermal overload relays with screw terminals on the auxiliary current side for mounting onto contactor¹⁾, CLASS 10

Features and technical specifications:

- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function
- STOP button
- Integrated sealable cover

Size contactor ²⁾	Rating for three-phase motor, rated value ³⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁴⁾	DT	Screw terminals (on auxiliary current side)	PU (UNIT, SET, M)	PS*	PG			
									Article No.	Price per PU	
Size S2											
 3RU1136-.B0	S2	3	5.5 ... 8	25	▶	3RU1136-1HB0	1	1 unit	41F		
		4	7 ... 10	35	▶	3RU1136-1JB0	1	1 unit	41F		
		5.5	9 ... 12.5	35	▶	3RU1136-1KB0	1	1 unit	41F		
			7.5	11 ... 16	40	▶	3RU1136-4AB0	1	1 unit	41F	
			7.5	14 ... 20	50	▶	3RU1136-4BB0	1	1 unit	41F	
			11	18 ... 25	63	▶	3RU1136-4DB0	1	1 unit	41F	
			15	22 ... 32	80	▶	3RU1136-4EB0	1	1 unit	41F	
			18.5	28 ... 40	80	▶	3RU1136-4FB0	1	1 unit	41F	
			22	36 ... 45	100	▶	3RU1136-4GB0	1	1 unit	41F	
				22	40 ... 50	100	▶	3RU1136-4HB0	1	1 unit	41F
Size S3											
 3RU1146-.B0				S3	11	18 ... 25	63	▶	3RU1146-4DB0	1	1 unit
	15	22 ... 32	80		▶	3RU1146-4EB0	1	1 unit	41F		
			18.5	28 ... 40	80	▶	3RU1146-4FB0	1	1 unit	41F	
			22	36 ... 50	125	▶	3RU1146-4HB0	1	1 unit	41F	
			30	45 ... 63	125	▶	3RU1146-4JB0	1	1 unit	41F	
			37	57 ... 75	160	▶	3RU1146-4KB0	1	1 unit	41F	
				45	70 ... 90	160	▶	3RU1146-4LB0	1	1 unit	41F
				45	80 ... 100 ⁵⁾	200	▶	3RU1146-4MB0	1	1 unit	41F

¹⁾ With the appropriate terminal supports (see "Accessories", page 7/108), the 3RU11 overload relays for mounting onto contactors can also be installed as stand-alone units.

²⁾ Observe maximum rated operational current of the devices.

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

⁴⁾ Maximum protection by fuse only for overload relay, type of coordination "2". Fuse values in connection with contactors, see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WWW/view/en/35681830> → "Technical Specifications" → "Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders".

⁵⁾ For overload relays > 100 A, see 3RB2 solid-state overload relays on page 7/126 onwards.

Overload Relays




SIRIUS 3RU1 Thermal Overload Relays

**3RU11 up to 100 A
for standard applications**

3RU11 thermal overload relays with screw terminals on the auxiliary current side for stand-alone installation¹⁾, CLASS 10

Features and technical specifications:

- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function
- STOP button
- Integrated sealable cover

Size contactor ²⁾	Rating for three-phase motor, rated value ³⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁴⁾	DT	Screw terminals (on auxiliary current side) 	PU (UNIT, SET, M)	PS*	PG	
					Article No.	Price per PU			
					kW	A	A		
Size S2									
	S2	15	22 ... 32	80	▶	3RU1136-4EB1	1	1 unit	41F
		18.5	28 ... 40	80	▶	3RU1136-4FB1	1	1 unit	41F
		22	36 ... 45	100	▶	3RU1136-4GB1	1	1 unit	41F
		22	40 ... 50	100	▶	3RU1136-4HB1	1	1 unit	41F
Size S3									
	S3	30	45 ... 63	125	▶	3RU1146-4JB1	1	1 unit	41F
		37	57 ... 75	160	▶	3RU1146-4KB1	1	1 unit	41F
		45	70 ... 90	160	▶	3RU1146-4LB1	1	1 unit	41F
		45	80 ... 100 ⁵⁾	200	▶	3RU1146-4MB1	1	1 unit	41F

3RU1136-4EB1

3RU1146-4JB1

- 1) Sizes S2 and S3 for screw and snap-on mounting onto TH 35 standard mounting rails, size S3 also for TH 75 standard mounting rails.
- 2) Observe maximum rated operational current of the devices.
- 3) Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

- 4) Maximum protection by fuse only for overload relay, type of coordination "2". Fuse values in connection with contactors, see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681830> → "Technical Specifications" → "Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders".

- 5) For overload relays > 100 A, see 3RB2 solid-state overload relays on page 7/126 onwards.

Overload Relays



SIRIUS 3RU1 Thermal Overload Relays

3RU11 up to 100 A
for standard applications

3RU11 thermal overload relays with spring-type terminals for mounting onto contactor¹⁾, CLASS 10

Features and technical specifications:

- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function
- STOP button
- Integrated sealable cover

Size contactor 2)	Rating for three-phase motor, rated value ³⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁴⁾	DT	Spring-type terminals (on auxiliary current side)	PU (UNIT, SET, M)	PS*	PG	Article No.	Price per PU
									kW	A
Size S2¹⁾⁵⁾										
 3RU1136-...D0	S2	3	5.5 ... 8	25	B	3RU1136-1HD0	1	1 unit	41F	
		4	7 ... 10	35	B	3RU1136-1JD0	1	1 unit	41F	
		5.5	9 ... 12.5	35	B	3RU1136-1KD0	1	1 unit	41F	
		7.5	11 ... 16	40	B	3RU1136-4AD0	1	1 unit	41F	
	▶	7.5	14 ... 20	50	B	3RU1136-4BD0	1	1 unit	41F	
		11	18 ... 25	63	B	3RU1136-4DD0	1	1 unit	41F	
		15	22 ... 32	80	▶	3RU1136-4ED0	1	1 unit	41F	
		18.5	28 ... 40	80	▶	3RU1136-4FD0	1	1 unit	41F	
		22	36 ... 45	100	▶	3RU1136-4GD0	1	1 unit	41F	
		22	40 ... 50	100	▶	3RU1136-4HD0	1	1 unit	41F	
Size S3¹⁾⁵⁾										
 3RU1146-...D0	S3	11	18 ... 25	63	B	3RU1146-4DD0	1	1 unit	41F	
		15	22 ... 32	80	B	3RU1146-4ED0	1	1 unit	41F	
		18.5	28 ... 40	80	B	3RU1146-4FD0	1	1 unit	41F	
		22	36 ... 50	125	B	3RU1146-4HD0	1	1 unit	41F	
	▶	30	45 ... 63	125	▶	3RU1146-4JD0	1	1 unit	41F	
		37	57 ... 75	160	▶	3RU1146-4KD0	1	1 unit	41F	
		45	70 ... 90	160	▶	3RU1146-4LD0	1	1 unit	41F	
		45	80 ... 100	200	▶	3RU1146-4MD0	1	1 unit	41F	

¹⁾ With the appropriate terminal supports (see "Accessories", page 7/108), the 3RU11 overload relays for mounting onto contactors can also be installed as stand-alone units.

²⁾ Observe maximum rated operational current of the devices.

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

⁴⁾ Maximum protection by fuse only for overload relay, type of coordination "2". Fuse values in connection with contactors, see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681830> → "Technical Specifications" → "Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders".

⁵⁾ Auxiliary conductor connections with spring-type terminals and main conductor connections with screw terminals.

Overload Relays

SIRIUS 3RU1 Thermal Overload Relays

Accessories

Overview

Overload relays for standard applications

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

- Terminal support for stand-alone installation of overload relays sizes S2 and S3
- Mechanical RESET (for all sizes)



- Cable release for resetting devices which are difficult to access (for all sizes)
- Electrical remote RESET module in three voltage variants (for all sizes)
- Terminal covers

Technical specifications

Terminal supports for stand-alone installation

Type	3RU1936-3AA01	3RU1946-3AA01
For overload relays	3RU1136	3RU1146
Mounting type	For screw and snap-on mounting onto TH 35 standard mounting rails, size S2 also for TH 75 standard mounting rails	
Connection for main circuit		
Connection type	Screw terminals with box terminal	
Terminal screw	M6, Pozidriv size 2	4 mm Allen screw
Operating devices	mm ∅ 5 ... 6	4 mm Allen screw
Prescribed tightening torque	Nm 3 ... 4.5	4 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm ² 2 x (0.75 ... 16)	2 x (2.5 ... 16)
• Finely stranded without end sleeve	mm ² --	--
• Finely stranded with end sleeve	mm ² 2 x (0.75 ... 16), 1 x (0.75 ... 25)	2 x (2.5 ... 35), 1 x (2.5 ... 50)
• Stranded	mm ² 2 x (0.75 ... 25), 1 x (0.75 ... 35)	2 x (10 ... 50), 1 x (10 ... 70)
• AWG cables, solid or stranded	AWG 2 x (18 ... 3), 1 x (18 ... 1)	2 x (10 ... 1/0), 1 x (10 ... 2/0)
• Ribbon cable conductors (Number x Width x Thickness)	mm 2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)

Selection and ordering data

Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Terminal supports for stand-alone installation							
 3RU19.6-3AA01	For separate mounting of overload relays; screw and snap-on mounting onto TH 35 standard mounting rail; size S3 also for TH 75 standard mounting rail	S2	▶	3RU1936-3AA01	1	1 unit	41F
		S3	▶	3RU1946-3AA01	1	1 unit	41F
Mechanical RESET							
 3RU1900-1A with pushbutton and extension plunger	Resetting plungers, holders and formers	S2, S3	▶	3RU1900-1A	1	1 unit	41F
	Pushbuttons with extended stroke (12 mm), IP65, ∅ 22 mm	S2, S3	B	3SB3000-0EA11	1	1 unit	41J
	Extension plungers For compensation of the distance between the pushbutton and the unlatching button of the relay	S2, S3	A	3SX1335	1	1 unit	41J

Overload Relays

SIRIUS 3RU1 Thermal Overload Relays

Accessories

Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
---------	------	----	-------------	--------------	-------------------	-----	----

Cable releases with holder for RESET



For \varnothing 6.5 mm holes in the control panel;
max. control panel thickness 8 mm

- Length 400 mm
- Length 600 mm

S2, S3

**3RU1900-1B**

1

1 unit

41F

S2, S3

**3RU1900-1C**

1

1 unit

41F

3RU1900-1.

Modules for remote RESET, electrical



Operating range $0.85 \dots 1.1 \times U_N$,
power consumption AC 80 VA, DC 70 W,
ON period 0.2 ... 4 s,
switching frequency 60/h

- 24 ... 30 V AC/DC
- 110 ... 127 V AC/DC
- 220 ... 250 V AC/DC

S2, S3

**3RU1900-2AB71**

1

1 unit

41F

S2, S3

**3RU1900-2AF71**

1

1 unit

41F

S2, S3

**3RU1900-2AM71**

1

1 unit

41F

3RU1900-2A.71

Terminal covers

Covers for cable lugs and busbar connections

- Length 55 mm

S3

**3RT1946-4EA1**

1

1 unit

41B

Covers for box terminals

- Length 20.6 mm
- Length 20.8 mm

S2

**3RT1936-4EA2**

1

1 unit

41B

S3

**3RT1946-4EA2**

1

1 unit

41B

General accessories

Version	Size	Color	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
---------	------	-------	---------------------	----	-------------	--------------	-------------------	-----	----

Tools for opening spring-type terminals



3RA2908-1A

Screwdrivers

For all SIRIUS devices
with spring-type
terminals

Length approx.
200 mm,
3.0 mm x 0.5 mm

Titanium
gray/
black,
partially
insulated

Main and
auxiliary
circuit
connection:
3RU1

A

Spring-type terminals

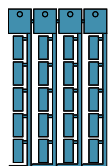
3RA2908-1A

1

1 unit

41B

Blank labels



3RT1900-1SB20

Unit labeling plates¹⁾ for SIRIUS devices

20 mm x 7 mm
Pastel
turquoise

3RU1

**3RT1900-1SB20**

100

340 units

41B

20 mm x 7 mm
Titanium
gray

3RU1

**3RT2900-1SB20**

100

340 units

41B

Adhesive inscription labels¹⁾ for SIRIUS devices

19 mm x 6 mm
Pastel
turquoise

3RU1

**3RT1900-1SB60**

100

3 060 units

41B

19 mm x 6 mm
Zinc
yellow

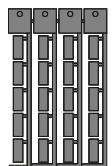
3RU1

**3RT1900-1SD60**

100

3 060 units

41B



3RT2900-1SB20

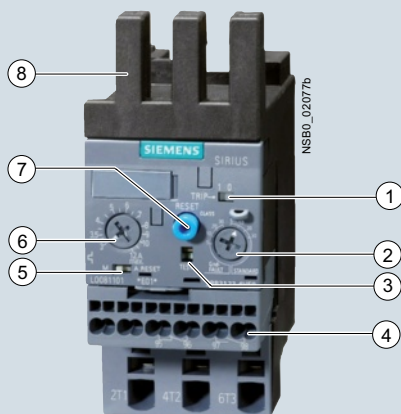
¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see Chapter 16, "Appendix" → "External Partners").

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

3RB30, 3RB31 up to 40 A
for standard applications

Overview



- ① Switch position indicator and TEST function of the wiring:
Indicates a trip and enables the wiring test.
- ② Trip class setting/internal ground-fault detection (only 3RB31):
Using the rotary switch you can set the required trip class and activate the internal ground-fault detection dependent on the start-up conditions.
- ③ Solid-state test (device test):
Enables a test of all important device components and functions.
- ④ Connecting terminals (removable joint block for auxiliary circuits):
Depending on the device version, the terminals for screw and spring-type connection are configured for the main and auxiliary circuit.
- ⑤ Selector switch for manual/automatic RESET:
With the slide switch you can choose between manual and automatic RESET.
- ⑥ Motor current setting:
Setting the device to the rated motor current is easy with the large rotary knob.
- ⑦ A device set to manual RESET can be reset locally by pressing the RESET button. On 3RB31 overload relays an electrical remote RESET is integrated.
- ⑧ Connection for mounting onto contactors:
Optimally adapted in electrical, mechanical and design terms to the contactors 3RT2. The overload relay can be connected directly using these connection pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal support for stand-alone installation).

A sealable transparent cover can be optionally mounted (accessory). It secures the motor current setting against adjustment.

SIRIUS 3RB3123-4VE00 solid-state overload relays

The 3RB30/3RB31 solid-state overload relays up to 40 A with internal power supply have been designed for inverse-time delayed protection of loads with normal and heavy starting (for "Function" see the manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays", <http://support.automation.siemens.com/WW/view/en/60314990>) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set rated motor current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding 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 current setting I_e and is stored in the form of a long-term stable tripping characteristic (see "Characteristic Curves" <http://support.automation.siemens.com/WW/view/en/34290881/134300>).

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

The "tripped" status is signaled by means of a switch position indicator. Resetting takes place either manually or automatically after the recovery time has elapsed ("Function" see manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays", <http://support.automation.siemens.com/WW/view/en/60314990>).

The 3RB3 solid-state overload relays are suitable for operation with frequency converters. Please follow the instructions in the manual "SIRIUS Innovations – 3RU2/3RB3 Overload Relays", see <http://support.automation.siemens.com/WW/view/en/60314990>.

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

3RB20 and 3RB21 overload relays in sizes S2 to S10/S12 see [page 7/126 onwards](#).

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RB30/3RB31 solid-state overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e.

The relays meet the requirements of IEC 60079-7 (Electrical apparatus for areas subject to explosion hazards – Increased safety "e").

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

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

3RB30, 3RB31 up to 40 A
for standard applications

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	
	□□□	□	□	□	□	-	□	□	□	
Solid-state overload relays	3 R B									
SIRIUS 3rd generation	3									
Device series	□									
Size, rated operational current and power	□									
Version of the automatic RESET, electrical remote RESET	□									
Trip class (CLASS)	□									
Setting range of the overload release	□									
Connection methods	□									
Installation type	□									
Example	3 R B	3	0	1	6	-	1	R	B	0

Note:

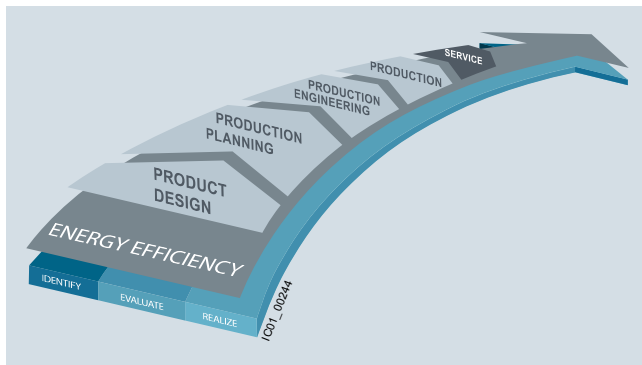
The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

Benefits

The most important features and benefits of the 3RB30/3RB31 solid-state overload relays are listed in the overview table (see "General Data" on page 7/82).

Advantages through energy efficiency



Overview of the energy management process

We offer you a unique portfolio for industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – identify, evaluate, and realize – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency (see www.siemens.com/sirius/energysaving).

3RB30/3RB31 solid-state overload relays contribute to energy efficiency throughout the plant as follows:

- Reduced inherent power loss
- Less heating of the control cabinet
- Smaller control cabinet air conditioners can be used

Application

Industries

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

Application

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

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

Ambient conditions

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

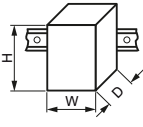

For the temperature range from -25 °C to +60 °C, the 3RB30/3RB31 solid-state overload relays compensate the temperature in accordance with IEC 60947-4-1.

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

**3RB30, 3RB31 up to 40 A
for standard applications**

Technical specifications



Type		3RB301., 3RB311.	3RB302., 3RB312.
Size		S00	S0
Dimensions (W x H x D) (overload relay with stand-alone installation support)			
• Screw terminals		45 x 89 x 80	45 x 97 x 94
• Spring-type terminals		45 x 102 x 80	45 x 116 x 95
General data			
Trips in the event of		Overload, phase failure, and phase unbalance + ground fault (for 3RB31 only)	
Trip class acc. to IEC 60947-4-1		CLASS 3RB30: 10, 20; 3RB31: 5, 10, 20 and 30 adjustable	
Phase failure sensitivity		Yes	
Overload warning		No	
Reset and recovery		Manual, automatic and remote RESET (depending on the version)	
• Reset options after tripping		Manual, automatic and remote RESET (depending on the version)	
• Recovery time		Approx. 3 min	
- For automatic RESET		Immediately	
- For manual RESET		Immediately	
- For remote RESET		Immediately	
Features		Yes, by means of switch position indicator slide	
• Display of operating state on device		Yes, test of electronics by pressing the TEST button / test of auxiliary contacts and wiring of control circuit by actuating the switch position indicator slide/ self-monitoring	
• TEST function		Yes	
• RESET button		Yes	
• STOP button		No	
Explosion protection – Safe operation of motors with "increased safety" type of protection			
EC type test certificate number according to directive 94/9/EC (ATEX)		PTB 09 ATEX 3001  II (2) GD	
Ambient temperatures			
• Storage/transport	°C	-40 ... +80	
• Operation	°C	-25 ... +60	
• Temperature compensation	°C	+60	
• Permissible rated current at			
- Temperature inside control cabinet 60 °C	%	100	100 ¹⁾
- Temperature inside control cabinet 70 °C	%	On request	
Repeat terminals			
• Coil repeat terminals		Yes	Not required
• Auxiliary contact repeat terminal		Yes	Not required
Degree of protection acc. to IEC 60529		IP20	
Touch protection acc. to IEC 61140		Finger-safe for vertical contact from the front	
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	15/12 (signaling contact 97/98 in position "tripped": 4/11g/ms)	
Electromagnetic compatibility (EMC) – Interference immunity			
• Conductor-related interference			
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2 (power ports), 1 (signal ports)	
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2 (line to earth), 1 (line to line)	
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	8 (air discharge), 6 (contact discharge)	
• Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	10	
Electromagnetic compatibility (EMC) – emitted interference		Degree of severity B according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)	
Resistance to extreme climates – air humidity	%	95	
Dimensions		"Dimensional drawings" see manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays", http://support.automation.siemens.com/WW/view/en/60314990 .	
Installation altitude above sea level	m	Up to 2 000	
Mounting position		Any	
Type of mounting		Direct mounting/stand-alone installation with terminal support	

¹⁾ Permissible rated current in case of heavy starting
Size S0 at 10 A up to 40 A:
- CLASS 20, $I_{e \max} = 32$ A,
- CLASS 30, $I_{e \max} = 25$ A.

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

**3RB30, 3RB31 up to 40 A
for standard applications**



Type		3RB301., 3RB311.	3RB302., 3RB312.
Size		S00	S0
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	690	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated operational voltage U_e	V	690	
Type of current		No	
• Direct current		Yes, 50/60 Hz $\pm 5\%$	
• Alternating current			
Current setting	A	0.1 ... 0.4 up to 4 ... 16	0.1 ... 0.4 up to 10 ... 40
Power loss per unit (max.)	W	0.05 ... 0.2	
Short-circuit protection		See "Selection and Ordering Data" on pages 7/115 to 7/117 "Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders" see Configuration Manual for "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders", http://support.automation.siemens.com/WW/view/en/50250600 .	
• With fuse without contactor			
• With fuse and contactor			
Protective separation between main and auxiliary current paths acc. to IEC 60947-1 (pollution degree 2)			
• For systems with grounded neutral point	V	690	
• For systems with ungrounded neutral point	V	600	
Conductor cross-sections of main circuit			
Connection type		 Screw terminals	
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2
Operating devices	mm	$\varnothing 5 \dots 6$	$\varnothing 5 \dots 6$
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm ²	2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾ , 2 x (0.5 ... 4) ¹⁾	2 x (1 ... 2.5) ¹⁾ , 2 x (2.5 ... 10) ¹⁾
• Finely stranded with end sleeves (DIN 46228-1)	mm ²	2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾	2 x (1 ... 2.5) ¹⁾ , 2 x (2.5 ... 6) ¹⁾ , max. 1 x 10
• AWG cables, solid or stranded	AWG	2 x (20 ... 16) ¹⁾ , 2 x (18 ... 14) ¹⁾ , 2 x 12	2 x (16 ... 12) ¹⁾ , 2 x (14 ... 8) ¹⁾
Connection type		 Spring-type terminals	
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections (min./max.)			
• Solid	mm ²	1 x (0.5 ... 4)	1 x (1 ... 10)
• Finely stranded without end sleeve	mm ²	1 x (0.5 ... 2.5)	1 x (1 ... 6)
• Finely stranded with end sleeves (DIN 46228-1)	mm ²	1 x (0.5 ... 2.5)	1 x (1 ... 6)
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)	1 x (18 ... 8)

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

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

**3RB30, 3RB31 up to 40 A
for standard applications**

Type		3RB301., 3RB311.	3RB302., 3RB312.
Size		S00	S0
Auxiliary circuit			
Number of NO contacts		1	
Number of NC contacts		1	
Auxiliary contacts – assignment		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor	
Rated insulation voltage U_i (pollution degree 3)	V	300	
Rated impulse withstand voltage U_{imp}	kV	4	
Auxiliary contacts – contact rating			
<ul style="list-style-type: none"> NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e: <ul style="list-style-type: none"> - 24 V A 4 - 120 V A 4 - 125 V A 4 - 250 V A 3 NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e: <ul style="list-style-type: none"> - 24 V A 4 - 120 V A 4 - 125 V A 4 - 250 V A 3 NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e: <ul style="list-style-type: none"> - 24 V A 2 - 60 V A 0.55 - 110 V A 0.3 - 125 V A 0.3 - 250 V A 0.11 Conventional thermal current I_{th} A 5 Contact reliability (suitability for PLC control; 17 V, 5 mA) Yes 			
Short-circuit protection			
<ul style="list-style-type: none"> With fuse, operational class gG A 6 			
Ground-fault protection (only 3RB31)			
<ul style="list-style-type: none"> Tripping value I_{Δ} Operating range I Response time t_{trip} (in steady-state condition) s 		The information refers to sinusoidal residual currents at 50/60 Hz. > $0.75 \times I_{motor}$ Lower current setting value < I_{motor} < $3.5 \times$ upper current setting value < 1	
Integrated electrical remote RESET (only 3RB31)			
Connecting terminals A3, A4		24 V DC, max. 200 mA for approx. 20 ms, then < 10 mA	
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	300	
CSA, UL, UR rated data			
Auxiliary circuit – switching capacity		3RB30: B600, R300; 3RB31: B300, R300	
Conductor cross-sections for auxiliary circuit			
Connection type		 Screw terminals	
Terminal screw		M3, Pozidriv size 2	
Operating devices	mm	Ø 5 ... 6	
Prescribed tightening torque	Nm	0.8 ... 1.2	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
<ul style="list-style-type: none"> Solid mm² 1 × (0.5 ... 4), 2 × (0.5 ... 2.5) Finely stranded with end sleeve mm² 1 × (0.5 ... 2.5), 2 × (0.5 ... 1.5) AWG cables, solid or stranded AWG 2 × (20 ... 14) 			
Connection type		 Spring-type terminals	
Operating devices	mm	3.0 x 0.5	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
<ul style="list-style-type: none"> Solid mm² 2 × (0.25 ... 1.5) Finely stranded without end sleeve mm² 2 × (0.25 ... 1.5) Finely stranded with end sleeve mm² 2 × (0.25 ... 1.5) AWG cables, solid or stranded AWG 2 × (24 ... 16) 			

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

**3RB30, 3RB31 up to 40 A
for standard applications**

Selection and ordering data

3RB30 solid-state overload relays for mounting onto contactors¹⁾, CLASS 10

Features and technical specifications:

- Screw terminals and spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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


3RB3016-1TB0





3RB3016-1TE0



3RB3026-1VB0



3RB3026-1VE0

Size contactor ²⁾	Rating for three-phase motor, rated value ³⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁴⁾	DT	Screw terminals 		Spring-type terminals 	
					Article No.	Price per PU	Article No.	Price per PU
Size S00¹⁾								
S00	0.04 ... 0.09	0.1 ... 0.4	4	▶	3RB3016-1RB0	A	3RB3016-1RE0	
	0.12 ... 0.37	0.32 ... 1.25	6	▶	3RB3016-1NB0	A	3RB3016-1NE0	
	0.55 ... 1.5	1 ... 4	20	▶	3RB3016-1PB0	A	3RB3016-1PE0	
	1.1 ... 5.5	3 ... 12	25	▶	3RB3016-1SB0	A	3RB3016-1SE0	
	2.2 ... 7.5	4 ... 16	25	▶	3RB3016-1TB0	A	3RB3016-1TE0	
Size S0¹⁾								
S0	0.04 ... 0.09	0.1 ... 0.4	4	▶	3RB3026-1RB0	A	3RB3026-1RE0	
	0.12 ... 0.37	0.32 ... 1.25	6	▶	3RB3026-1NB0	A	3RB3026-1NE0	
	0.55 ... 1.5	1 ... 4	20	▶	3RB3026-1PB0	A	3RB3026-1PE0	
	1.1 ... 5.5	3 ... 12	25	▶	3RB3026-1SB0	A	3RB3026-1SE0	
	3 ... 11	6 ... 25	50	▶	3RB3026-1QB0	A	3RB3026-1QE0	
	5.5 ... 18.5	10 ... 40	50	▶	3RB3026-1VB0	A	3RB3026-1VE0	

¹⁾ With the appropriate terminal supports (see "Accessories", page 7/118), these overload relays can also be installed as stand-alone units.

²⁾ Observe maximum rated operational current of the devices.

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

⁴⁾ Maximum protection by fuse only for overload relay, type of coordination "2". Fuse values in connection with contactors see Configuration Manual "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders"
<http://support.automation.siemens.com/WWW/view/en/50250600>.

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

**3RB30, 3RB31 up to 40 A
for standard applications**

3RB30 solid-state overload relays for mounting onto contactors¹⁾, CLASS 20

Features and technical specifications:

- Screw terminals and spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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



3RB3016-2TB0



3RB3016-2TE0



3RB3026-2VB0



3RB3026-2VE0

Size contactor ²⁾	Rating for three-phase motor, rated value ³⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁴⁾	DT	Screw terminals	DT	Spring-type terminals	
	kW	A	A		Article No.	Price per PU	Article No.	Price per PU
Size S00¹⁾								
S00	0.04 ... 0.09	0.1 ... 0.4	4	▶	3RB3016-2RB0	A	3RB3016-2RE0	
	0.12 ... 0.37	0.32 ... 1.25	6	▶	3RB3016-2NB0	A	3RB3016-2NE0	
	0.55 ... 1.5	1 ... 4	20	▶	3RB3016-2PB0	A	3RB3016-2PE0	
	1.1 ... 5.5	3 ... 12	25	▶	3RB3016-2SB0	A	3RB3016-2SE0	
	2.2 ... 7.5	4 ... 16	25	▶	3RB3016-2TB0	A	3RB3016-2TE0	
Size S0¹⁾								
S0	0.04 ... 0.09	0.1 ... 0.4	4	▶	3RB3026-2RB0	A	3RB3026-2RE0	
	0.12 ... 0.37	0.32 ... 1.25	6	▶	3RB3026-2NB0	A	3RB3026-2NE0	
	0.55 ... 1.5	1 ... 4	20	▶	3RB3026-2PB0	A	3RB3026-2PE0	
	1.1 ... 5.5	3 ... 12	25	▶	3RB3026-2SB0	A	3RB3026-2SE0	
	3 ... 11	6 ... 25	50	▶	3RB3026-2QB0	A	3RB3026-2QE0	
	5.5 ... 18.5	10 ... 40	50	▶	3RB3026-2VB0	A	3RB3026-2VE0	

¹⁾ With the appropriate terminal supports (see "Accessories", page 7/118), these overload relays can also be installed as stand-alone units.

²⁾ Observe maximum rated operational current of the devices.

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

⁴⁾ Maximum protection by fuse only for overload relay, type of coordination "2". Fuse values in connection with contactors see Configuration Manual "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders"
<http://support.automation.siemens.com/WW/view/en/50250600>.

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

**3RB30, 3RB31 up to 40 A
for standard applications**
3RB31 solid-state overload relays for mounting onto contactors¹⁾, CLASS 5, 10, 20 and 30 adjustable

Features and technical specifications:

- Screw terminals and spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal ground-fault detection (activatable)
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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


3RB3113-4TB0



3RB3113-4TE0



3RB3123-4VB0



3RB3123-4VE0

Size contactor ²⁾	Rating for three-phase motor, rated value ³⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁴⁾	DT	Screw terminals	DT	Spring-type terminals	
kW	A	A			Article No.	Price per PU	Article No.	Price per PU
Size S00¹⁾								
S00	0.04 ... 0.09	0.1 ... 0.4	4	▶	3RB3113-4RB0	A	3RB3113-4RE0	
	0.12 ... 0.37	0.32 ... 1.25	6	▶	3RB3113-4NB0	A	3RB3113-4NE0	
	0.55 ... 1.5	1 ... 4	20	▶	3RB3113-4PB0	A	3RB3113-4PE0	
	1.1 ... 5.5	3 ... 12	25	▶	3RB3113-4SB0	A	3RB3113-4SE0	
	2.2 ... 7.5	4 ... 16	25	▶	3RB3113-4TB0	A	3RB3113-4TE0	
Size S0¹⁾								
S0	0.04 ... 0.09	0.1 ... 0.4	4	▶	3RB3123-4RB0	A	3RB3123-4RE0	
	0.12 ... 0.37	0.32 ... 1.25	6	▶	3RB3123-4NB0	A	3RB3123-4NE0	
	0.55 ... 1.5	1 ... 4	20	▶	3RB3123-4PB0	A	3RB3123-4PE0	
	1.1 ... 5.5	3 ... 12	25	▶	3RB3123-4SB0	A	3RB3123-4SE0	
	3 ... 11	6 ... 25	50	▶	3RB3123-4QB0	A	3RB3123-4QE0	
5.5 ... 18.5	10 ... 40	50	▶	3RB3123-4VB0	A	3RB3123-4VE0		

¹⁾ With the appropriate terminal supports (see "Accessories", page 7/118), these overload relays can also be installed as stand-alone units.

²⁾ Observe maximum rated operational current of the devices.

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

⁴⁾ Maximum protection by fuse only for overload relay, type of coordination "2". Fuse values in connection with contactors see Configuration Manual "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders"
<http://support.automation.siemens.com/WW/view/en/50250600>.

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

Accessories

Overview







Overload relays for standard applications

The following optional accessories are available for the 3RB30/3RB31 solid-state overload relays:

- Terminal supports for stand-alone installation with screw or spring-type terminals for every size

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

Selection and ordering data



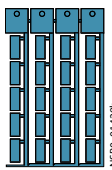
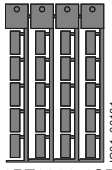
Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Terminal supports for stand-alone installation							
 3RU2916-3AA01	Terminal supports for overload relays with screw terminals For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail		S00 ▶ S0 ▶	Screw terminals  3RU2916-3AA01 3RU2926-3AA01	1 1	1 unit 1 unit	41F 41F
	 3RU2926-3AA01	Terminal supports for overload relays with spring-type terminal For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail					
 3RB3980-0A with pushbutton and extension plunger		Resetting plungers, holders and formers		S00, S0 ▶	3RB3980-0A	1	1 unit
	Pushbuttons with extended stroke (12 mm), IP65, \varnothing 22 mm		S00, S0 B	3SB3000-0EA11	1	1 unit	41J
	Extension plungers For compensation of the distance between a pushbutton and the unlatching button of the relay		S00, S0 A	3SX1335	1	1 unit	41J
Mechanical RESET							
 3RB3980-0	For \varnothing 6.5 mm holes in the control panel; max. control panel thickness 8 mm		S00, S0 ▶ S00, S0 ▶	3RB3980-0B 3RB3980-0C	1 1	1 unit 1 unit	41F 41F
	<ul style="list-style-type: none"> Length 400 mm Length 600 mm 						
Cable releases with holder for RESET							
 3RB3984-0	For covering the setting knobs		S00, S0 ▶	3RB3984-0	1	1 unit	41F
	Sealable covers						

Overload Relays

SIRIUS 3RB3 Solid-State Overload Relays

Accessories

General accessories

Version	Size	Color	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Tools for opening spring-type terminals									
 3RA2908-1A	Screwdrivers For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/black, partially insulated	Main and auxiliary circuit connection: 3RB3	A	Spring-type terminals 			
						3RA2908-1A	1	1 unit	41B
Blank labels									
 3RT1900-1SB20	Unit labeling plates ¹⁾ for SIRIUS devices	20 mm x 7 mm	Pastel turquoise	3RB3	D	3RT1900-1SB20	100	340 units	41B
		 3RT2900-1SB20	20 mm x 7 mm	Titanium gray	3RB3		D	3RT2900-1SB20	100

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see Chapter 16, "Appendix" → "External Partners").

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

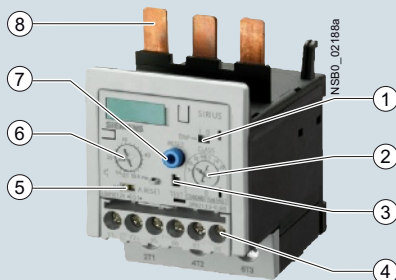
**3RB20, 3RB21 up to 630 A
for standard applications**

Overview

Note:

The 3RB20 and 3RB21 devices (sizes S00/S0 to S12) can be found

- in the Catalog Add-On IC 10 AO · 2014 in the DVD box IC 01
- in the Catalog Add-On IC 10 AO · 2014 at the Information and Download Center
- in the interactive catalog CA 01
- in the Industry Mall



- ① Switch position indicator and TEST function of the wiring: Indicates a trip and enables the wiring test.
- ② Trip class setting/internal ground-fault detection (only 3RB21): Using the rotary switch you can set the required trip class and activate the internal ground-fault detection dependent on the start-up conditions.
- ③ Solid-state test (device test): Enables a test of all important device components and functions.
- ④ Connecting terminals (removable terminal block for auxiliary circuits): The generously sized terminals permit connection of two conductors with different cross-sections for the main and auxiliary circuits. The auxiliary circuit can be connected with screw terminals and alternatively with spring-type terminals.
- ⑤ Selector switch for manual/automatic RESET: With the slide switch you can choose between manual and automatic RESET.
- ⑥ Motor current setting: Setting the device to the rated motor current is easy with the large rotary knob.
- ⑦ A device set to manual RESET can be reset locally by pressing the RESET button. On the 3RB21 overload relay a solid-state remote RESET is integrated.
- ⑧ Connection for mounting onto contactors: Optimally adapted in electrical, mechanical and design terms to the contactors 3RT1. These connecting pins can be used for direct mounting of the overload relay to the contactor. Stand-alone installation is possible as an alternative (partly in conjunction with a terminal bracket for stand-alone installation).

SIRIUS 3RB2133-4UB0 solid-state overload relay

The 3RB20 and 3RB21 solid-state overload relays up to 630 A with internal power supply have been designed for inverse-time delayed protection of loads with normal and heavy starting ("Function" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays" <http://support.automation.siemens.com/WW/view/en/35681297>) against excessive temperature rises due to overload, phase unbalance or phase failure.

An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set rated motor current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding 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 current setting I_e and is stored in the form of a long-term stable tripping characteristic (see "Characteristic Curves" <http://support.automation.siemens.com/WW/view/en/20357046/134300>).

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

The "tripped" status is signaled by means of a switch position indicator. Resetting takes place either manually or automatically after the recovery time has elapsed ("Function" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681297>).

The 3RB2 solid-state overload relays are suitable for operation with frequency converters. Please follow the instructions in the Reference Manual "Protection Equipment – 3RU1 and 3RB2 Overload Relays", see <http://support.automation.siemens.com/WW/view/en/35681297>.

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

For 3RB30 and 3RB31 overload relay sizes S00 and S0 see page 7/115 onwards.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RB20/3RB21 solid-state overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EExe.

The relays meet the requirements of IEC 60079-7 (Electrical apparatus for areas subject to explosion hazards – Increased safety "e").

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB20, 3RB21 up to 630 A
for standard applications

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	
	□□□	□	□	□	□	-	□	□	□	
Solid-state overload relays	3 R B									
SIRIUS 2nd generation	2									
Device series	□									
Size, rated operational current and power	□									
Version of the automatic RESET, electrical remote RESET	□									
Trip class (CLASS)	□									
Setting range of the overload release	□									
Connection methods	□									
Installation type	□									
Example	3 R B	2	0	3	6	-	1	Q	B	0

Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

Benefits

The most important features and benefits of the 3RB20/3RB21 solid-state overload relays are listed in the overview table (see "General Data", page 7/82 onwards).

Application

Industries

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

Application

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

The 3RU11 thermal overload relays or the 3RB22 to 3RB24 solid-state overload relays can be used for single-phase AC loads. For DC loads we recommend the 3RU11 thermal overload relay.

Ambient conditions

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

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

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

Type	Setting range	Stand-alone installation	
		Derating factor for the upper set value at ambient temperature	
		+50 °C	+60 °C
3RB2056, 3RB2156	50 ... 200 A	100 %	100 %
3RB2066, 3RB2166	55 ... 250 A	100 %	100 %
3RB2066, 3RB2166	160 ... 630 A	100 %	90 %

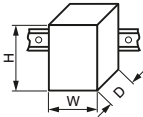
Type	Setting range	Mounting onto contactor	
		Derating factor for the upper set value at ambient temperature	
		+50 °C	+60 °C
3RB2056, 3RB2156	50 ... 200 A	100 %	70 %
3RB2066, 3RB2166	55 ... 250 A	100 %	70 %
3RB2066, 3RB2166	160 ... 630 A	100 %	70 %

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

**3RB20, 3RB21 up to 630 A
for standard applications**

Technical specifications




Type		3RB2036, 3RB2133	3RB2046, 3RB2143	3RB2056, 3RB2153	3RB2066, 3RB2163	
Size						
Dimensions (W x H x D) (overload relay with stand-alone installation support)		mm	55 x 74 x 109	70 x 86 x 124	120 x 119 x 155	145 x 147 x 156
General data						
Trips in the event of		Overload, phase failure, and phase unbalance + ground fault (for 3RB21 only)				
Trip class acc. to IEC 60947-4-1	CLASS	3RB20: 10 or 20; 3RB21: 5, 10, 20 and 30 adjustable				
Phase failure sensitivity		Yes				
Overload warning		No				
Reset and recovery		3RB20: Manual and automatic RESET; 3RB21: Manual, automatic and remote RESET				
• Reset options after tripping						
• Recovery time		Approx. 3 min				
- For automatic RESET		Immediately				
- For manual RESET		Immediately				
- For remote RESET		Immediately				
Features		Yes, by means of switch position indicator slide				
• Display of operating state on device		Yes, test of electronics by pressing the TEST button / test of auxiliary contacts and wiring of control circuit by actuating the switch position indicator slide/self-monitoring				
• TEST function		Yes				
• RESET button		No				
• STOP button		No				
Explosion protection – Safe operation of motors with "increased safety" type of protection		PTB 06 ATEX 3001 ⚠ II (2) GD				
EC type test certificate number according to directive 94/9/EC (ATEX)						
Ambient temperatures						
• Storage/transport	°C	-40 ... +80				
• Operation	°C	-25 ... +60				
• Temperature compensation	°C	+60				
• Permissible rated current at						
- Temperature inside control cabinet 60 °C, stand-alone installation	%	100	100	100	100 or 90 ¹⁾	
- Temperature inside control cabinet 60 °C, mounted on contactor	%	100	100	70	70	
- Temperature inside control cabinet 70 °C	%	On request				
Repeat terminals						
• Coil repeat terminals		Yes	Not required			
• Auxiliary contact repeat terminal		Yes	Not required			
Degree of protection acc. to IEC 60529		IP20		IP20 (terminal compartment: IP00 degree of protection)		
Touch protection acc. to IEC 61140		Finger-safe for vertical contact from the front		Finger-safe; for busbar connection with cover	Finger-safe with cover	
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	15/11 (signaling contact 97/98 in position "tripped": 4/11g/ms)				
Electromagnetic compatibility (EMC) – Interference immunity						
• Conductor-related interference						
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2 (power ports), 1 (signal ports)				
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2 (line to earth), 1 (line to line)				
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	8 (air discharge), 6 (contact discharge)				
• Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	10				
Electromagnetic compatibility (EMC) – emitted interference		Degree of severity B according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)				
Resistance to extreme climates – air humidity	%	100				
Dimensions		For "Dimensional drawings" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", http://support.automation.siemens.com/WW/view/en/35681297 .				
Installation altitude above sea level	m	Up to 2 000				
Mounting position		Any				
Type of mounting		Direct mounting/stand-alone installation with terminal support		Direct mounting/stand-alone installation		

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB20, 3RB21 up to 630 A
for standard applications

Type		3RB2036, 3RB2133	3RB2046, 3RB2143
Size		S2	S3
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	690/1 000 ¹⁾	1 000
Rated impulse withstand voltage U_{imp}	kV	6/8 ²⁾	8
Rated operational voltage U_e	V	690/1 000 ¹⁾	1 000
Type of current		No	
• Direct current		No	
• Alternating current		Yes, 50/60 Hz ±5 %	
Current setting	A	6 ... 25, 12.5 ... 50	12.5 ... 50, 25 ... 100
Power loss per unit (max.)	W	0.05	
Short-circuit protection			
• With fuse without contactor			See "Selection and Ordering Data" on pages 7/126 to 7/128
• With fuse and contactor			See Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays". http://support.automation.siemens.com/WW/view/en/35681297 → "Technical Specifications" → "Short-circuit protection with Fuses for Motor Feeders"
Protective separation between main and auxiliary current paths acc. to IEC 60947-1 (pollution degree 2)			
• For systems with grounded neutral point	V	690	
• For systems with ungrounded neutral point	V	600	
Conductor cross-sections of the main circuit			
Connection type		 Screw terminals with box terminal	
Terminal screw		M6, Pozidriv size 2	M8, 4 mm Allen screw
Operating devices	mm	∅ 5 ... 6	4 mm Allen screw
Prescribed tightening torque	Nm	3 ... 4.5	4 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm ²	2 × (1 ... 16)	2 × (2.5 ... 16)
• Finely stranded without end sleeve	mm ²	--	--
• Finely stranded with end sleeve	mm ²	2 × (1 ... 16), 1 × (1 ... 25)	2 × (2.5 ... 35), 1 × (2.5 ... 50)
• Stranded	mm ²	2 × (max. 25), 1 × (1 ... 35)	2 × (10 ... 50), 1 × (10 ... 70)
• AWG cables, solid or stranded	AWG	2 × (max. 4), 1 × (18 ... 2)	2 × (10 ... 1/0), 1 × (10 ... 2/0)
• Ribbon cables (Number x Width x Thickness)	mm	2 × (6 × 9 × 0.8)	2 × (6 × 9 × 0.8)
Connection type		 Busbar connections	
Terminal screw		--	M6 × 20
Prescribed tightening torque	Nm	--	4 ... 6
Conductor cross-sections (min./max.)			
• Finely stranded with cable lug	mm ²	--	2 × 70
• Stranded with cable lug	mm ²	--	3 × 70
• AWG cables, solid or stranded, with cable lug	AWG	--	2/0
• With connecting bars (max. width)	mm	--	12
Connection type		 Straight-through transformers	
Diameter of opening	mm	15	18




1) For version with straight-through transformer up to 1 000 V AC.

2) For version with straight-through transformer up to 8 kV.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB20, 3RB21 up to 630 A
for standard applications

Type		3RB2056, 3RB2153	3RB2066, 3RB2163
Size		S6	S10/S12
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	1 000	
Rated impulse withstand voltage U_{imp}	kV	8	
Rated operational voltage U_e	V	1 000	
Type of current		No	
• Direct current		Yes, 50/60 Hz $\pm 5\%$	
• Alternating current			
Current setting	A	50 ... 200	55 ... 250, 160 ... 630
Power loss per unit (max.)	W	0.05	
Short-circuit protection		See "Selection and Ordering Data" on pages 7/126 to 7/128 See Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", http://support.automation.siemens.com/WW/view/en/35681297 → "Technical Specifications" → "Short-circuit protection with Fuses for Motor Feeders"	
Protective separation between main and auxiliary current paths acc. to IEC 60947-1 (pollution degree 2)			
• For systems with grounded neutral point	V	690	
• For systems with ungrounded neutral point	V	600	
Conductor cross-sections of the main circuit			
Connection type		 Screw terminals with box terminal	
Terminal screw	mm	4 mm Allen screw	5 mm Allen screw
Operating devices	mm	4 mm Allen screw	5 mm Allen screw
Prescribed tightening torque	Nm	1 ... 12	20 ... 22
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm ²	--	--
• Finely stranded without end sleeve	mm ²	With 3RT1955-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70); With 3RT1956-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), rear clamping point only: 1 × (70 ... 240); rear clamping point only: 1 × (120 ... 185)
• Finely stranded with end sleeve	mm ²	With 3RT1955-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70); With 3RT1956-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), Rear clamping point only: 1 × (70 ... 240); rear clamping point only: 1 × (120 ... 185)
• Stranded	mm ²	With 3RT1955-4G box terminal: 2 × (max. 70), 1 × (16 ... 70); With 3RT1956-4G box terminal: 2 × (max. 120), 1 × (16 ... 120)	2 × (70 ... 240), Rear clamping point only: 1 × (95 ... 300); rear clamping point only: 1 × (120 ... 240)
• AWG cables, solid or stranded	AWG	With 3RT1955-4G box terminal: 2 × (max. 1/0), 1 × (6 ... 2/0); With 3RT1956-4G box terminal: 2 × (max. 3/0), 1 × (6 ... 250 kcmil)	2 × (2/0 ... 500 kcmil), rear clamping point only: 1 × (3/0 ... 600 kcmil); rear clamping point only: 1 × (250 kcmil ... 500 kcmil)
• Ribbon cables (Number x Width x Thickness)	mm	With 3RT1955-4G box terminal: 2 × (6 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 6 × 15.5 × 0.8); With 3RT1956-4G box terminal: 2 × (10 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 10 × 15.5 × 0.8)	2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5)
Connection type		 Busbar connections	
Terminal screw		M8 × 25	M10 × 30
Prescribed tightening torque	Nm	10 ... 14	14 ... 24
Conductor cross-section (min./max.)			
• Finely stranded with cable lug	mm ²	16 ... 95 ¹⁾	50 ... 240 ²⁾
• Stranded with cable lug	mm ²	25 ... 120 ¹⁾	70 ... 240 ²⁾
• AWG cables, solid or stranded, with cable lug	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
• With connecting bars (max. width)	mm	15	25
Connection type		 Straight-through transformers	
Diameter of opening	mm	24.5	--



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

²⁾ When connecting cable lugs according to DIN 46234 with conductor cross-sections of 240 mm² and more, as well as to DIN 46235 with conductor cross-sections of 185 mm² and more, the 3RT1956-4EA1 terminal cover must be used to ensure the phase clearance.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB20, 3RB21 up to 630 A
for standard applications

Type	3RB2036, 3RB2133	3RB2046, 3RB2143	3RB2056, 3RB2153	3RB2066, 3RB2163
Size	S2	S3	S6	S10/S12
Auxiliary circuit				
Number of NO contacts	1			
Number of NC contacts	1			
Auxiliary contacts – assignment	1 NO for the signal "tripped"; 1 NC for disconnecting the contactor			
Rated insulation voltage U_i (pollution degree 3)	V	300		
Rated impulse withstand voltage U_{imp}	kV	4		
Auxiliary contacts – contact rating				
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e :				
- 24 V	A	4		
- 120 V	A	4		
- 125 V	A	4		
- 250 V	A	3		
• NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e :				
- 24 V	A	4		
- 120 V	A	4		
- 125 V	A	4		
- 250 V	A	3		
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e :				
- 24 V	A	2		
- 60 V	A	0.55		
- 110 V	A	0.3		
- 125 V	A	0.3		
- 250 V	A	0.11		
• Conventional thermal current I_{th}	A	5		
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes		
Short-circuit protection				
• With fuse, operational class gG	A	6		
Ground-fault protection (only 3RB21)				
• Tripping value I_{Δ}		The information refers to sinusoidal residual currents at 50/60 Hz. > $0.75 \times I_{motor}$		
• Operating range I		Lower current setting value < I_{motor} < $3.5 \times$ upper current setting value		
• Response time t_{trip} (in steady-state condition)	s	< 1		
Integrated electrical remote RESET (only 3RB21)				
Connecting terminals A3, A4		24 V DC, 100 mA, 2.4 W short-term		
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	300		
CSA, UL, UR rated data				
Auxiliary circuit – switching capacity		B300, R300		
Conductor cross-sections of the auxiliary circuit				
Connection type				
 Screw terminals				
Terminal screw		M3, Pozidriv size 2		
Operating devices	mm	ø 5 ... 6		
Prescribed tightening torque	Nm	0.8 ... 1.2		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid	mm ²	1 × (0.5 ... 4), 2 × (0.5 ... 2.5)		
• Finely stranded without end sleeve	mm ²	--		
• Finely stranded with end sleeve	mm ²	1 × (0.5 ... 2.5), 2 × (0.5 ... 1.5)		
• Stranded	mm ²	--		
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)		
Connection type				
 Spring-type terminals				
Operating devices	mm	3.0 × 0.5		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid	mm ²	2 × (0.25 ... 1.5)		
• Finely stranded without end sleeve	mm ²	--		
• Finely stranded with end sleeve	mm ²	2 × (0.25 ... 1.5)		
• Stranded	mm ²	2 × (0.25 ... 1.5)		
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)		

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

**3RB20, 3RB21 up to 630 A
for standard applications**

Selection and ordering data

3RB20 solid-state overload relays for mounting onto contactor¹⁾²⁾ and stand-alone installation²⁾³⁾, CLASS 10

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring

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



3RB2036-1UB0



3RB2046-1ED0



3RB2056-1FW2



3RB2066-1MF2

Size contactor ⁴⁾	Rating for three-phase motor, rated value ⁵⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁶⁾	DT	Screw terminals (on auxiliary current side)		Spring-type terminals (on auxiliary current side)	
					Article No.	Price per PU	Article No.	Price per PU
	kW	A	A					
Size S2¹⁾³⁾⁷⁾								
S2	3 ... 11	6 ... 25	63	▶	3RB2036-1QB0		▶	3RB2036-1QD0
				▶	3RB2036-1QW1		▶	3RB2036-1QX1
	7.5 ... 22	12.5 ... 50	80	▶	3RB2036-1UB0	A	▶	3RB2036-1UD0
				▶	3RB2036-1UW1		▶	3RB2036-1UX1
Size S3¹⁾³⁾⁷⁾								
S3	7.5 ... 22	12.5 ... 50	160	▶	3RB2046-1UB0	A	▶	3RB2046-1UD0
	11 ... 45	25 ... 100	315	▶	3RB2046-1EB0	A	▶	3RB2046-1ED0
				▶	3RB2046-1EW1		▶	3RB2046-1EX1
Size S6²⁾⁷⁾								
S6 with busbar connection	22 ... 90	50 ... 200	315	▶	3RB2056-1FC2	A	▶	3RB2056-1FF2
For mounting onto S6 contactors with box terminals				▶	3RB2056-1FW2		▶	3RB2056-1FX2
Size S10/S12²⁾								
S10/S12	22 ... 110	55 ... 250	400	▶	3RB2066-1GC2		▶	3RB2066-1GF2
and size 14 (3TF68/3TF69)	90 ... 450	160 ... 630	800	▶	3RB2066-1MC2		▶	3RB2066-1MF2

- The relays with an Article No. ending with "0" are designed for mounting onto contactor.
- The relays with an Article No. ending with "2" are designed for mounting onto contactor and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.
- The relays with an Article No. ending with "1" are designed for stand-alone installation.
- Observe maximum rated operational current of the devices.

- Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be protected must be considered when selecting the units.
- Maximum protection by fuse only for overload relay, type of coordination "2". For fuse values in connection with contactors, see the Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681297> → "Technical Specifications" → "Short-Circuit Protection with Fuses for Motor Feeders".
- The relays with an Article No. with "W" or "X" in penultimate position are equipped with a straight-through transformer.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB20, 3RB21 up to 630 A
for standard applications

3RB20 solid-state overload relays for mounting onto contactor¹⁾²⁾ and stand-alone installation²⁾³⁾, CLASS 20

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring

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



3RB2036-2UB0



3RB2046-2ED0



3RB2056-2FW2



3RB2066-2MF2

Size contactor ⁴⁾	Rating for three-phase motor, rated value ⁵⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁶⁾	DT	Screw terminals (on auxiliary current side)	DT	Spring-type terminals (on auxiliary current side)	
	kW	A	A		Article No.	Price per PU	Article No.	Price per PU
Size S2¹⁾³⁾⁷⁾								
S2	3 ... 11	6 ... 25	63	▶	3RB2036-2QB0	▶	3RB2036-2QD0	
				▶	3RB2036-2QW1	▶	3RB2036-2QX1	
	7.5 ... 22	12.5 ... 50	80	▶	3RB2036-2UB0	A	3RB2036-2UD0	
				▶	3RB2036-2UW1	▶	3RB2036-2UX1	
Size S3¹⁾³⁾⁷⁾								
S3	7.5 ... 22	12.5 ... 50	160	▶	3RB2046-2UB0	A	3RB2046-2UD0	
	11 ... 45	25 ... 100	315	▶	3RB2046-2EB0	A	3RB2046-2ED0	
				▶	3RB2046-2EW1	▶	3RB2046-2EX1	
Size S6²⁾⁷⁾								
S6 with busbar connections	22 ... 90	50 ... 200	315	▶	3RB2056-2FC2	A	3RB2056-2FF2	
For mounting onto S6 contactors with box terminals				▶	3RB2056-2FW2	▶	3RB2056-2FX2	
Size S10/S12²⁾								
S10/S12 and size 14 (3TF68/ 3TF69)	22 ... 110	55 ... 250	400	▶	3RB2066-2GC2	▶	3RB2066-2GF2	
	90 ... 450	160 ... 630	800	▶	3RB2066-2MC2	▶	3RB2066-2MF2	

¹⁾ The relays with an Article No. ending with "0" are designed for mounting onto contactor.

²⁾ The relays with an Article No. ending with "2" are designed for mounting onto contactor and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.

³⁾ The relays with an Article No. ending with "1" are designed for stand-alone installation.

⁴⁾ Observe maximum rated operational current of the devices.

⁵⁾ Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

⁶⁾ Maximum protection by fuse only for overload relay, type of coordination "2". For fuse values in connection with contactors, see the Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681297> → "Technical Specifications" → "Short-Circuit Protection with Fuses for Motor Feeders".

⁷⁾ The relays with an Article No. with "W" or "X" in penultimate position are equipped with a straight-through transformer.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

**3RB20, 3RB21 up to 630 A
for standard applications**

3RB21 solid-state overload relays for mounting onto contactor¹⁾²⁾ and stand-alone installation²⁾³⁾, CLASS 5, 10, 20 and 30 adjustable

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- Internal ground-fault detection (activatable)
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- Switch position indicator
- TEST function and self-monitoring

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



3RB2133-4UB0



3RB2143-4ED0



3RB2153-4FX2



3RB2163-4MC2

Size contactor ⁴⁾	Rating for three-phase motor, rated value ⁵⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁶⁾	DT	Screw terminals (on auxiliary current side)		Spring-type terminals (on auxiliary current side)	
					Article No.	Price per PU	Article No.	Price per PU
	kW	A	A					
Size S2¹⁾³⁾⁷⁾								
S2	3 ... 11	6 ... 25	63	▶	3RB2133-4QB0	▶	3RB2133-4QD0	
				▶	3RB2133-4QW1	▶	3RB2133-4QX1	
	7.5 ... 22	12.5 ... 50	80	▶	3RB2133-4UB0	▶	3RB2133-4UD0	
				▶	3RB2133-4UW1	▶	3RB2133-4UX1	
Size S3¹⁾³⁾⁷⁾								
S3	7.5 ... 22	12.5 ... 50	160	▶	3RB2143-4UB0	▶	3RB2143-4UD0	
	11 ... 45	25 ... 100	315	▶	3RB2143-4EB0	▶	3RB2143-4ED0	
				▶	3RB2143-4EW1	▶	3RB2143-4EX1	
Size S6²⁾⁷⁾								
S6 with busbar connection	22 ... 90	50 ... 200	315	▶	3RB2153-4FC2	▶	3RB2153-4FF2	
For mounting onto S6 contactors with box terminals				▶	3RB2153-4FW2	▶	3RB2153-4FX2	
Size S10/S12²⁾								
S10/S12 and size 14 (3TF68/3TF69)	22 ... 110 90 ... 450	55 ... 250 160 ... 630	400 800	▶	3RB2163-4GC2	▶	3RB2163-4GF2	
				▶	3RB2163-4MC2	▶	3RB2163-4MF2	

1) The relays with an Article No. ending with "0" are designed for mounting onto contactor.

2) The relays with an Article No. ending with "2" are designed for mounting onto contactor and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.

3) The relays with an Article No. ending with "1" are designed for stand-alone installation.

4) Observe maximum rated operational current of the devices.

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

6) Maximum protection by fuse only for overload relay, type of coordination "2". For fuse values in connection with contactors, see the Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681297> → "Technical Specifications" → "Short-Circuit Protection with Fuses for Motor Feeders".

7) The relays with an Article No. with "W" or "X" in penultimate position are equipped with a straight-through transformer.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

Accessories for 3RB20, 3RB21




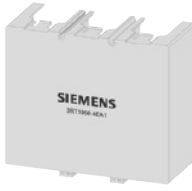


Overview

Overload relays for standard applications

The following optional accessories are available for the 3RB20 and 3RB21 solid-state overload relays:

- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)
- Sealable cover (for all sizes)
- Terminal covers for sizes S2 to S10/S12
- Box terminal blocks for sizes S6 and S10/S12

Selection and ordering data

Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
Mechanical RESET								
 <p>3RU1900-1A with pushbutton and extension plunger</p>	Resetting plungers, holders and formers	S2 ... S10/S12	▶	3RU1900-1A	1	1 unit	41F	
	Pushbuttons with extended stroke (12 mm), IP65, ø 22 mm	S2 ... S10/S12	B	3SB3000-0EA11	1	1 unit	41J	
	Extension plungers For compensation of the distance between a pushbutton and the unlatching button of the relay	S2 ... S10/S12	A	3SX1335	1	1 unit	41J	
Cable releases with holder for RESET								
 <p>3RU1900-1.</p>	For ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm	S2 ... S10/S12						
	<ul style="list-style-type: none"> • Length 400 mm • Length 600 mm 		▶	3RU1900-1B	1	1 unit	41F	
			▶	3RU1900-1C	1	1 unit	41F	
Sealable covers								
 <p>3RB2984-0</p>	For covering the setting knobs	S2 ... S10/S12	▶	3RB2984-0	1	10 units	41F	
Terminal covers								
 <p>3RT1946-4EA1</p>	Covers for cable lugs and busbar connections							
	<ul style="list-style-type: none"> • Length 55 mm • Length 100 mm • Length 120 mm 	S3 S6 S10/S12	B ▶ ▶	3RT1946-4EA1 3RT1956-4EA1 3RT1966-4EA1	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	
	Covers for box terminals							
 <p>3RT1936-4EA2</p>	<ul style="list-style-type: none"> • Length 20.6 mm • Length 20.8 mm • Length 25 mm • Length 30 mm 	S2 S3 S6 S10/S12	B ▶ ▶ ▶	3RT1936-4EA2 3RT1946-4EA2 3RT1956-4EA2 3RT1966-4EA2	1 1 1 1	1 unit 1 unit 1 unit 1 unit	41B 41B 41B 41B	
	Covers for screw terminals between contactor and overload relay, without box terminals (1 unit required per combination)	S6 S10/S12	▶ ▶	3RT1956-4EA3 3RT1966-4EA3	1 1	1 unit 1 unit	41B 41B	
	Box terminal blocks							
	 <p>3RT195-4G</p>	For round and ribbon cables						
<ul style="list-style-type: none"> • Up to 70 mm² • Up to 120 mm² • Up to 240 mm² 		S6 ¹⁾ S6 S10/S12	▶ ▶ ▶	3RT1955-4G 3RT1956-4G 3RT1966-4G	1 1 1	1 unit 1 unit 1 unit	41B 41B 41B	
For technical specifications for conductor cross-sections see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", http://support.automation.siemens.com/WW/view/en/35681297 .								



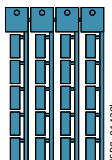
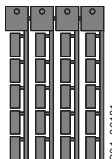
¹⁾ In the scope of supply for 3RT1054-1 contactors (55 kW).

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

Accessories for 3RB20, 3RB21

General accessories

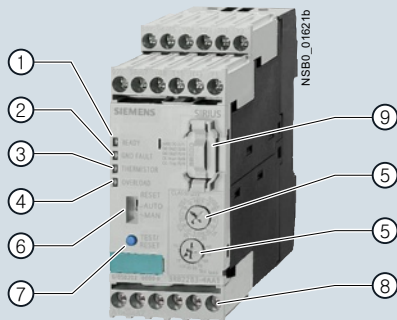
Version	Size	Color	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Tools for opening spring-type terminals									
 <p>Screwdrivers For all SIRIUS devices with spring-type terminals</p> <p>3RA2908-1A</p>	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/black, partially insulated	Main and auxiliary circuit connection: 3RB2	A	Spring-type terminals 				
					3RA2908-1A	1	1 unit	41B	
Blank labels									
 <p>3RT1900-1SB20</p>	20 mm x 7 mm	Pastel turquoise	3RB2	D	3RT1900-1SB20	100	340 units	41B	
		Titanium gray	3RB2	D	3RT2900-1SB20	100	340 units	41B	
	 <p>3RT2900-1SB20</p>	19 mm x 6 mm	Pastel turquoise	3RB2	C	3RT1900-1SB60	100	3 060 units	41B
		19 mm x 6 mm	Zinc yellow	3RB2	C	3RT1900-1SD60	100	3 060 units	41B
<p>¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see Chapter 16, "Appendix" → "External Partners").</p>									

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB22, 3RB23 up to 630 A
for High-Feature applications

Overview



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

SIRIUS 3RB22 and 3RB23 evaluation modules

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

These units have been designed for inverse-time delayed protection of loads with normal and heavy starting ("Function" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", <http://support.automation.siemens.com/WW/view/en/35681297>) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set rated motor current.

This current rise is detected by means of a current measuring module (see page 7/147) and electronically evaluated by the evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor.

The break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic (see "Characteristic Curves" <http://support.automation.siemens.com/WW/view/en/20357046/134300>).

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 flickering when the limit current has been violated. In the case of the 3RB22 and 3RB23 overload relays this warning can also be issued through auxiliary contacts.

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

To protect the loads against high-resistance short circuits due to damage to the insulation, humidity, condensed water, etc., the 3RB22 and 3RB23 solid-state overload relays offer the possibility of internal ground-fault detection in conjunction with a function expansion module (for details see "Selection and Ordering Data" page 7/137, not possible in conjunction with contactor assemblies for wye-delta starting). In the event of a ground fault the 3RB22 and 3RB23 relays trip instantaneously.

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

After tripping due to overload, phase unbalance, phase failure, thermistor or ground-fault tripping, the relay is reset manually or automatically after the recovery time has elapsed ("Function" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays" <http://support.automation.siemens.com/WW/view/en/35681297>). In conjunction with a function expansion module, the motor current measured by the microprocessor can be output in the form of an analog signal 4 mA to 20 mA DC for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.

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

The 3RB2 solid-state overload relays are suitable for operation with frequency converters. Please follow the instructions in the Reference Manual "Protection Equipment – 3RU1 and 3RB2 Overload Relays", see <http://support.automation.siemens.com/WW/view/en/35681297>.

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

Type of protection "increased safety EEx e and explosion-proof enclosure EEx d" according to ATEX Directive 94/9/EC

The 3RB22 solid-state overload relays (monostable) provide quick and reliable protection for motors with types of protection EEx e and EEx d in hazardous areas.

They comply with the requirements of IEC 60079-7 (Electrical devices for areas subject to explosion hazards - Increased safety "e" as well as for flameproof enclosure "d").

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

**3RB22, 3RB23 up to 630 A
for High-Feature applications**

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	
	□□□	□	□	□	□	-	□	□	□	
Solid-state overload relays	3 R B									
SIRIUS 2nd generation	2									
Device series	□									
Size, rated operational current and power	□									
Version of the automatic RESET, electrical remote RESET	□									
Trip class (CLASS)	□									
Setting range of the overload release	□									
Connection methods	□									
Installation type	□									
Example	3 R B	2	2	8	3	-	4	A	A	1

Note:

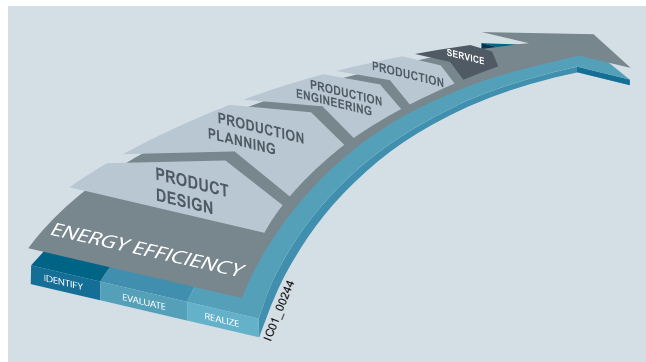
The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

Benefits

The most important features and benefits of the 3RB22 and 3RB23 solid-state overload relays are listed in the overview table (see "General Data", page 7/82 onwards).

Advantages through energy efficiency



Overview of the energy management process

We offer you a unique portfolio for industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – identify, evaluate, and realize – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency (see www.siemens.com/sirius/energysaving).

3RB22 and 3RB23 solid-state overload relays contribute to energy efficiency throughout the plant as follows:

- Reduced inherent power loss
- Less heating of the control cabinet
- Smaller control cabinet air conditioners can be used

Application

Industries

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

Application

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

If single-phase AC motors are to be protected by the 3RB22 and 3RB23 solid-state overload relays, the main current paths of the current measuring modules must be series-connected ("Circuit Diagrams" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays" <http://support.automation.siemens.com/WW/view/en/35681297>).

Ambient conditions

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

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

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB22, 3RB23 up to 630 A
for High-Feature applications

Technical specifications

Type – Overload relay: Evaluation modules	3RB2283-4A.1, 3RB2383-4A.1	
Size contactor	S00 ... S10/S12	
General data		
Trips in the event of	Overload, phase failure and phase unbalance (> 40 % according to NEMA), + ground fault (with corresponding function expansion module) and activation of the thermistor motor protection (with closed PTC sensor circuit)	
Trip class acc. to IEC 60947-4-1	CLASS	5, 10, 20 and 30 adjustable
Phase failure sensitivity	Yes	
Overload warning	Yes, from $1.125 \times I_n$ for symmetrical loads and from $0.85 \times I_n$ for unsymmetrical loads	
Reset and recovery	Manual, automatic and remote RESET	
<ul style="list-style-type: none"> Reset options after tripping Recovery time <ul style="list-style-type: none"> - For automatic RESET 	min	<ul style="list-style-type: none"> - for tripping due to overcurrent: 3 (stored permanently), - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: no automatic RESET
<ul style="list-style-type: none"> - For manual RESET 	min	<ul style="list-style-type: none"> - for tripping due to overcurrent: 3 (stored permanently), - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
<ul style="list-style-type: none"> - For remote RESET 	min	<ul style="list-style-type: none"> - for tripping due to overcurrent: 3 (stored permanently), - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
Features	Yes, with 4 LEDs	
<ul style="list-style-type: none"> Display of operating state on device 	<ul style="list-style-type: none"> - Green LED "Ready" - Red LED "Ground Fault" - Red LED "Thermistor" - Red "Overload" LED 	
<ul style="list-style-type: none"> TEST function 	Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET / self-monitoring	
<ul style="list-style-type: none"> RESET button STOP button 	Yes, with the TEST/RESET button No	
Explosion protection – Safe operation of motors with "increased safety" type of protection		
EC type test certificate number according to directive 94/9/EC (ATEX)	3RB22: PTB 05 ATEX 3022 ⚠ II (2) GD 3RB23: --	
Ambient temperatures		
<ul style="list-style-type: none"> Storage/transport 	°C	-40 ... +80
<ul style="list-style-type: none"> Operation 	°C	-25 ... +60
<ul style="list-style-type: none"> Temperature compensation 	°C	+60
<ul style="list-style-type: none"> Permissible rated current <ul style="list-style-type: none"> - Temperature inside control cabinet 60 °C - Temperature inside control cabinet 70 °C 	%	100 On request
Repeat terminals		
<ul style="list-style-type: none"> Coil repeat terminals 	Not required	
<ul style="list-style-type: none"> Auxiliary contact repeat terminal 	Not required	
Degree of protection acc. to IEC 60529	IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
Touch protection acc. to IEC 61140	Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	15/11
Electromagnetic compatibility (EMC) – Interference immunity		
<ul style="list-style-type: none"> Conductor-related interference <ul style="list-style-type: none"> - Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3) - Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3) 	kV	2 (power ports), 1 (signal ports)
<ul style="list-style-type: none"> Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3) 	kV	8 (air discharge), 6 (contact discharge)
<ul style="list-style-type: none"> Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3) 	V/m	10
Electromagnetic compatibility (EMC) – emitted interference		
Resistance to extreme climates – air humidity	%	100
Dimensions		
For "Dimensional drawings" see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", http://support.automation.siemens.com/WWW/view/en/35681297 .		
Installation altitude above sea level	m	Up to 2 000
Mounting position	Any	
Type of mounting		
<ul style="list-style-type: none"> Evaluation modules Current measuring module 	Size	Stand-alone installation S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors

Overload Relays

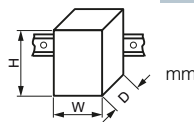
SIRIUS 3RB2 Solid-State Overload Relays

**3RB22, 3RB23 up to 630 A
for High-Feature applications**

Type – Overload relay: Evaluation modules

Size contactor

Dimensions of evaluation modules (W x H x D)



3RB2283-4A.1, 3RB2383-4A.1

S00 ... S10/S12

45 x 111 x 95

Auxiliary circuit

Number of NO contacts

2

Number of NC contacts

2

Number of CO contacts

--

Auxiliary contacts – assignment

- Alternative 1
 - 1 NO for the signal "tripped by overload and/or thermistor"
 - 1 NC for disconnecting the contactor
 - 1 NO for the signal "tripped by ground fault"
 - 1 NC for disconnecting the contactor
- or¹⁾
- Alternative 2
 - 1 NO for the signal "tripped by overload and/or thermistor and/or ground fault"
 - 1 NC for disconnecting the contactor
 - 1 NO for overload warning
 - 1 NC for disconnecting the contactor

Rated insulation voltage U_i (pollution degree 3)

V

300

Rated impulse withstand voltage U_{imp}

kV

4

Auxiliary contacts – contact rating

- NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e
 - 24 V A 6
 - 120 V A 6
 - 125 V A 6
 - 250 V A 3
- NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e
 - 24 V A 6
 - 120 V A 6
 - 125 V A 6
 - 250 V A 3
- NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e
 - 24 V A 2
 - 60 V A 0.55
 - 110 V A 0.3
 - 125 V A 0.3
 - 250 V A 0.2
- Conventional thermal current I_{th} A 5
- Contact reliability (suitability for PLC control; 17 V, 5 mA) Yes

Short-circuit protection

- With fuse, operational class gG A 6
- With miniature circuit breaker, C characteristic A 1.6

Protective separation between auxiliary current paths acc. to IEC 60947-1

V

300

CSA, UL, UR rated data

Auxiliary circuit – switching capacity

B300, R300

Conductor cross-sections of the auxiliary circuit

Connection type

Screw terminals

Terminal screw

M3, Pozidriv size 2

Operating devices

mm

3.0 x 0.5

Prescribed tightening torque

Nm

0.8 ... 1.2

Conductor cross-sections (min./max.), 1 or 2 conductors can be connected

- Solid mm² 1 x (0.5 ... 4), 2 x (0.5 ... 2.5)
- Finely stranded without end sleeve mm² --
- Finely stranded with end sleeve mm² 1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)
- Stranded mm² --
- AWG cables, solid or stranded AWG 2 x (20 ... 14)

Connection type

Spring-type terminals

Operating devices

mm

3.0 x 0.5

Conductor cross-sections (min./max.), 1 or 2 conductors can be connected



- Solid mm² 2 x (0.25 ... 1.5)
- Finely stranded without end sleeve mm² --
- Finely stranded with end sleeve mm² 2 x (0.25 ... 1.5)
- Stranded mm² 2 x (0.25 ... 1.5)
- AWG cables, solid or stranded AWG 2 x (24 ... 16)

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB22, 3RB23 up to 630 A
for High-Feature applications

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

1) Control circuit.

2) Sensor circuit.

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

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

**3RB22, 3RB23 up to 630 A
for High-Feature applications**

Selection and ordering data

Functions of the 3RB22 and 3RB23 evaluation modules in combination with the 3RB2985 function expansion modules

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

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB22, 3RB23 up to 630 A
for High-Feature applications

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

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

✓ Available



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



3RB2283-4AA1,
3RB2383-4AA1



3RB2283-4AC1,
3RB2383-4AC1

Size contactor	Version	DT	Screw terminals 		Spring-type terminals 	
			Article No.	Price per PU	Article No.	Price per PU
Evaluation modules						
S00 ... S12	Monostable	▶	3RB2283-4AA1	▶	3RB2283-4AC1	
	Bistable	▶	3RB2383-4AA1	▶	3RB2383-4AC1	

Note:

Overview of overload relays – matching contactors
see page 7/88.


Current measuring modules and related connecting cables see
page 7/148, general accessories see page 7/150 onwards.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

**3RB22, 3RB23 up to 630 A
for High-Feature applications**

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

Size contactor	Version	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
Sizes S00 to S12									
 3RB2985-2..1	S00 ... S12	For plugging into evaluation module (1 unit)							
		Analog Basic 1 modules¹⁾ Analog output DC 4 ... 20 mA, with overload warning	3RB22, 3RB23	▶	3RB2985-2AA0		1	1 unit	41F
		Analog Basic 1 GF modules¹⁾²⁾ Analog output DC 4 ... 20 mA, with internal ground-fault detection and overload warning	3RB22, 3RB23	▶	3RB2985-2AA1		1	1 unit	41F
		Analog Basic 2 GF modules¹⁾²⁾ Analog output DC 4 ... 20 mA, with internal ground-fault detection and overload ground-fault signaling	3RB22, 3RB23	▶	3RB2985-2AB1		1	1 unit	41F
		Basic 1 GF modules²⁾ with internal ground-fault detection and overload warning	3RB22, 3RB23	▶	3RB2985-2CA1		1	1 unit	41F
	Basic 2 GF modules²⁾ with internal ground-fault detection and ground-fault signaling	3RB22, 3RB23	▶	3RB2985-2CB1		1	1 unit	41F	

Note:

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

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

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

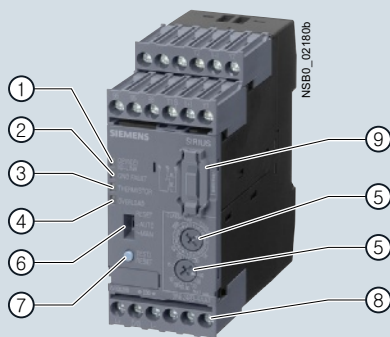
- With a motor current of between 0,3 and 2 times the current setting I_e , the unit will trip at a ground-fault current equal to 30 % of the current setting.
- With a motor current of between 2 and 8 times the current setting I_e , the unit will trip at a ground-fault current equal to 15 % of the set current.
- The response delay amounts to between 0.5 s and 1 s.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A
for High-Feature applications

Overview



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

SIRIUS 3RB24 evaluation module

The modular 3RB24 solid-state overload relay, which is powered via IO-Link (with monostable auxiliary contacts) up to 630 A (up to 820 A possible with a series transformer) have been designed for inverse-time delayed protection of loads with normal and heavy starting ("Function" see Manual "SIRIUS 3RB24 Solid-State Overload Relay for IO-Link", <http://support.automation.siemens.com/WW/view/en/46165627>) against excessive temperature rises due to overload, phase unbalance or phase failure. It comprises an evaluation unit, a current measuring module and a connecting cable.

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

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

This current rise is detected by means of the current measuring module (see page 7/147) and electronically evaluated by the evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor.

The break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic (see "Characteristic Curves" <http://support.automation.siemens.com/WW/view/en/20357046/134300>). The "tripped" status is signaled by means of a continuously illuminated red "OVERLOAD" LED and also reported as a group fault via IO-Link.

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

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

To protect the loads against incomplete ground faults due to damage to the insulation, humidity, condensed water, etc., the 3RB24 solid-state overload relays offer the possibility of internal ground-fault detection (for details, see Manual "SIRIUS 3RB24 Solid-State Overload Relay for IO-Link", <http://support.automation.siemens.com/WW/view/en/46165627>, not possible in conjunction with contactor assemblies for wye-delta starting). In the event of a ground fault, the 3RB24 relays trip instantaneously.

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

The reset after overload, phase unbalance, phase failure, thermistor or ground-fault tripping is performed manually by key on site, via IO-Link or by electrical remote RESET or automatically after the cooling time (motor model) or for thermistor protection after sufficient cooling. Power cuts in devices due to function monitors (broken wire or short-circuit on the thermistor) can only be reset on-site ("Function" see Manual "SIRIUS 3RB24 Solid-State Overload Relay for IO-Link", <http://support.automation.siemens.com/WW/view/en/46165627>).

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

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

The 3RB24 solid-state overload relay for IO-Link is suitable for operation with frequency converters. Please follow the instructions in the manual "SIRIUS 3RB24 Solid-State Overload Relay for IO-Link", see <http://support.automation.siemens.com/WW/view/en/46165627>.

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

**3RB24 for IO-Link, up to 630 A
for High-Feature applications**

Type of protection "increased safety EEx e and explosion-proof enclosure EEx d" according to ATEX Directive 94/9/EC

The electronic overload relay 3RB24 (monostable) are suitable for the overload protection of explosion-proof motors of types of protection EEx e and EEx d.

They comply with the requirements of IEC 60079-7 (Electrical devices for areas subject to explosion hazards - Increased safety "e" as well as for flameproof enclosure "d").

EC type test certificate for Group II, Category (2) G/D has been submitted. On request.

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	
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Solid-state overload relays	3 R B									
SIRIUS 2nd generation	2									
Device series	<input type="checkbox"/>									
Size, rated operational current and power	<input type="checkbox"/>									
Version of the automatic RESET, electrical remote RESET	<input type="checkbox"/>									
Trip class (CLASS)	<input type="checkbox"/>									
Setting range of the overload release	<input type="checkbox"/>									
Connection methods	<input type="checkbox"/>									
Installation type	<input type="checkbox"/>									
Example	3 R B	2	4	8	3	-	4	A	A	1

Note:

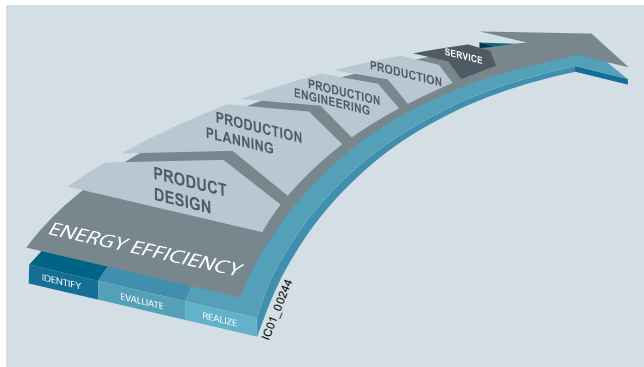
The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

Benefits

The most important features and benefits of the 3RB24 solid-state overload relays for IO-Link are listed in the overview table (see "General Data", page 7/82 onwards).

Advantages through energy efficiency



Overview of the energy management process

We offer you a unique portfolio for industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – identify, evaluate, and realize – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency (see www.siemens.com/sirius/energysaving).

3RB24 solid-state overload relays for IO-Link contribute to energy efficiency throughout the plant as follows:

- Transmission of current values
- Reduced inherent power loss
- Less heating of the control cabinet
- Smaller control cabinet air conditioners can be used

Application

Industries

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

Application

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

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

device lamps and also, for example, to return current values directly via IO-Link.

If single-phase AC motors are to be protected by the 3RB24 solid-state overload relays, the main current paths of the current measuring modules must be series-connected ("Circuit Diagrams" see [Manual "SIRIUS 3RB24 Solid-State Overload Relay for IO-Link"](http://support.automation.siemens.com/WW/view/en/46165627), <http://support.automation.siemens.com/WW/view/en/46165627>).

Ambient conditions

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

For the temperature range from -25 °C to $+60\text{ °C}$, the 3RB24 solid-state overload relays compensate the temperature in accordance with IEC 60947-4-1.

Configuration notes for use of the devices below -25 °C or above $+60\text{ °C}$ on request.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A
for High-Feature applications

Technical specifications

Type – Overload relay: Evaluation modules	3RB2483-4A.1	
Size contactor	S00 ... S10/S12	
General data		
Trips in the event of	Overload, phase failure and phase unbalance (> 40 % according to NEMA), + ground fault (connectable and disconnectable) and activation of the thermistor motor protection (with closed PTC sensor circuit)	
Trip class acc. to IEC 60947-4-1	CLASS	5, 10, 20 and 30 adjustable
Phase failure sensitivity	Yes	
Overload warning	Yes, from $1.125 \times I_n$ for symmetrical loads and from $0.85 \times I_n$ for unsymmetrical loads	
Reset and recovery	Manual and automatic RESET, electrical remote RESET or through IO-Link	
<ul style="list-style-type: none"> Reset options after tripping Recovery time <ul style="list-style-type: none"> - For automatic RESET 	min	<ul style="list-style-type: none"> - for tripping due to overcurrent: 3 (stored permanently), - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: no automatic RESET
<ul style="list-style-type: none"> - For manual RESET 	min	<ul style="list-style-type: none"> - for tripping due to overcurrent: 3 (stored permanently), - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
<ul style="list-style-type: none"> - For remote RESET 	min	<ul style="list-style-type: none"> - for tripping due to overcurrent: 3 (stored permanently), - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
Features		
<ul style="list-style-type: none"> Display of operating state on device 	Yes, with 4 LEDs <ul style="list-style-type: none"> - Green "DEVICE/IO-Link" LED - Red LED "Ground Fault" - Red LED "Thermistor" - Red "Overload" LED 	
<ul style="list-style-type: none"> TEST function 	Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET / self-monitoring	
<ul style="list-style-type: none"> RESET button STOP button 	Yes, with the TEST/RESET button No	
Explosion protection – Safe operation of motors with "increased safety EEx e and explosion-proof enclosure EEx d" type of protection		
EC type test certificate number according to directive 94/9/EC (ATEX)	On request	
Ambient temperatures		
<ul style="list-style-type: none"> Storage/transport 	°C	-40 ... +80
<ul style="list-style-type: none"> Operation 	°C	-25 ... +60
<ul style="list-style-type: none"> Temperature compensation 	°C	+60
<ul style="list-style-type: none"> Permissible rated current <ul style="list-style-type: none"> - Temperature inside control cabinet 60 °C - Temperature inside control cabinet 70 °C 	%	100 On request
Repeat terminals		
<ul style="list-style-type: none"> Coil repeat terminals Auxiliary contact repeat terminal 	Not required Not required	
Degree of protection acc. to IEC 60529	IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover	
Touch protection acc. to IEC 61140	Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover	
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	15/11
Electromagnetic compatibility (EMC) – Interference immunity		
<ul style="list-style-type: none"> Conductor-related interference <ul style="list-style-type: none"> - Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3) - Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3) Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3) Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3) 	kV	2 (power ports), 1 (signal ports)
	kV	2 (line to earth), 1 (line to line)
	kV	8 (air discharge), 6 (contact discharge)
	V/m	10
Electromagnetic compatibility (EMC) – emitted interference	Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)	
Resistance to extreme climates – air humidity	%	100
Dimensions	"Dimensional drawings" see manual "SIRIUS 3RB24 Solid-State Overload Relay for IO-Link", http://support.automation.siemens.com/WW/view/en/46165627 .	
Installation altitude above sea level	m	Up to 2 000
Mounting position	Any	
Type of mounting		
<ul style="list-style-type: none"> Evaluation modules Current measuring module 	Size	Stand-alone installation S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors

Overload Relays

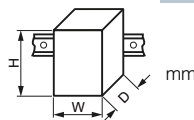
SIRIUS 3RB2 Solid-State Overload Relays

**3RB24 for IO-Link, up to 630 A
for High-Feature applications**

Type – Overload relay: Evaluation modules

Size contactor

Dimensions of evaluation modules (W x H x D)



3RB2483-4A.1

S00 ... S10/S12

45 x 111 x 95

Auxiliary circuit

Number of auxiliary switches

1 CO contact, 1 NO contact connected in series internally

Auxiliary contacts – assignment

- 1 CO contact for selecting the contactor (for reversing starter function), actuated by the control system
- 1 NO contact for normal switching duty, actuated by the control system (opens automatically when tripping occurs)

Rated insulation voltage U_i (pollution degree 3)

V 300

Rated impulse withstand voltage U_{imp}

kV 4

Auxiliary contacts – contact rating

- NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e
 - 24 V A 6
 - 120 V A 6
 - 125 V A 6
 - 250 V A 3
- NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e
 - 24 V A 6
 - 120 V A 6
 - 125 V A 6
 - 250 V A 3
- NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e
 - 24 V A 2
 - 60 V A 0.55
 - 110 V A 0.3
 - 125 V A 0.3
 - 250 V A 0.2
- Conventional thermal current I_{th} A 5
- Contact reliability (suitability for PLC control; 17 V, 5 mA) Yes

Short-circuit protection

- With fuse, operational class gG A 6
- With miniature circuit breaker, C characteristic A 1.6

Protective separation between auxiliary current paths acc. to IEC 60947-1

V 300

CSA, UL, UR rated data

Auxiliary circuit – switching capacity

B300, R300

Conductor cross-sections of the auxiliary circuit

Connection type

 **Screw terminals**

Terminal screw

M3, Pozidriv size 2

Operating devices

mm 3.0 x 0.5


Prescribed tightening torque

Nm 0.8 ... 1.2

Conductor cross-sections (min./max.), 1 or 2 conductors can be connected

- Solid mm² 1 x (0.5 ... 4), 2 x (0.5 ... 2.5)
- Finely stranded without end sleeve mm² –
- Finely stranded with end sleeve mm² 1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)
- Stranded mm² –
- AWG cables, solid or stranded AWG 2 x (20 ... 14)

Connection type

 **Spring-type terminals**

Operating devices

mm 3.0 x 0.5



Conductor cross-sections (min./max.), 1 or 2 conductors can be connected

- Solid mm² 2 x (0.25 ... 1.5)
- Finely stranded without end sleeve mm² –
- Finely stranded with end sleeve mm² 2 x (0.25 ... 1.5)
- Stranded mm² 2 x (0.25 ... 1.5)
- AWG cables, solid or stranded AWG 2 x (24 ... 16)

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A
for High-Feature applications

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

1) Control circuit.

2) Sensor circuit.

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

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

**3RB24 for IO-Link, up to 630 A
for High-Feature applications**

Selection and ordering data

3RB24 solid-state overload relays (evaluation module) for full motor protection, stand-alone installation, CLASS 5, 10, 20 and 30, adjustable

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

✓ Available



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



3RB2483-4AA1



3RB2483-4AC1

Size contactor	Version	DT	Screw terminals 	DT	Spring-type terminals 	
			Article No.	Price per PU	Article No.	Price per PU

Evaluation modules

S00 ... S12	Monostable	▶	3RB2483-4AA1	A	3RB2483-4AC1
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Notes:

- Overview of overload relays – matching contactors see page 7/88.
- Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 relay.

For current measuring modules and related connecting cables see page 7/147, "Accessories" see page 7/149 onwards.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

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

Overview



SIRIUS 3RB2906 current measuring module

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

The current measuring modules in sizes S00 to S3 up to 55 mm wide are equipped with straight-through transformers and can be snap-fitted under the evaluation units. The larger evaluation units are installed directly on the contactor or as stand-alone units.

Technical specifications

Type – Overload relays: Current measuring modules		3RB2906		3RB2956	3RB2966
		S00/S0	S2/S3	S6	S10/S12
Size contactor		45 x 84 x 45	55 x 94 x 72	120 x 119 x 145	145 x 147 x 148
Dimensions of current measuring modules (W x H x D)	mm				
Main circuit					
Rated insulation voltage U_i (pollution degree 3)	V	1 000			
Rated impulse withstand voltage U_{imp}	kV	6		8	
Rated operational voltage U_e	V	1 000			
Type of current		No		Yes, 50/60 Hz 5 %	
• Direct current		No		Yes, 50/60 Hz 5 %	
• Alternating current		Yes, 50/60 Hz 5 %		No	
Current setting	A	0.3 ... 3; 2.4 ... 25	10 ... 100	20 ... 200	63 ... 630
Power loss per unit (max.)	W	0.5			
Short-circuit protection		See "Selection and ordering data" on page 7/147 See configuration manuals			
• With fuse without contactor		<ul style="list-style-type: none"> "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders", http://support.automation.siemens.com/WW/view/en/50250039 			
• With fuse and contactor		<ul style="list-style-type: none"> "SIRIUS Configuration – Selection Data for Fuseless Load Feeders", http://support.automation.siemens.com/WW/view/en/68115041 			
Protective separation between main and auxiliary current paths acc. to IEC 60947-1 (pollution degree 2)					
• For systems with grounded neutral point	V	690			
• For systems with ungrounded neutral point	V	600			

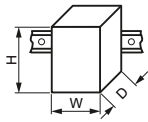
Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

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

Type – Overload relays: Current measuring modules

Size contactor

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

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

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

²⁾ When connecting cable lugs according to DIN 46234 with conductor cross-sections of 240 mm² and more as well as to DIN 46235 with conductor cross-sections of 185 mm² and more, the 3RT1956-4EA1 terminal cover must be used to ensure the phase clearance.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

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

Selection and ordering data

Current measuring modules for mounting onto contactor¹⁾ and stand-alone installation¹⁾²⁾ (essential accessories)



3RB2906-2JG1



3RB2906-2JG1



3RB2956-2TG2



3RB2966-2WH2

Size contactor ³⁾	Rating for three-phase motor, rated value ⁴⁾	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁵⁾	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	kW	A	A							
Sizes S00/S0²⁾⁶⁾										
S00/S0	0.09 ... 1.1	0.3 ... 3	20	3RB22 to 3RB24	▶	3RB2956-2TH2		1	1 unit	41G
	1.1 ... 11	2.4 ... 25	63			3RB2956-2TG2		1	1 unit	41G
Sizes S2/S3²⁾⁶⁾										
S2/S3	5.5 ... 45	10 ... 100	315	3RB22 to 3RB24	▶	3RB2906-2JG1		1	1 unit	41G
Size S6¹⁾⁶⁾										
S6 with busbar connection	11 ... 90	20 ... 200	315	3RB22 to 3RB24	▶	3RB2956-2TH2		1	1 unit	41G
For mounting onto S6 contactors with box terminals	11 ... 90	20 ... 200	315	3RB22 to 3RB24	▶	3RB2956-2TG2		1	1 unit	41G
Sizes S10/S12¹⁾										
S10/S12 and size 14 (3TF68/ 3TF69)	37 ... 450	63 ... 630	800	3RB22 to 3RB24	▶	3RB2966-2WH2		1	1 unit	41G

Note:

The connecting cable between the current measuring module and the evaluation module is not included in the scope of supply; please order separately (see page 7/148).


- The current measuring modules with an Article No. ending with "2" are designed for mounting onto contactor and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.
- The current measuring modules with an Article No. ending with "1" are designed for stand-alone installation.
- Observe maximum rated operational current of the devices.
- Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be protected must be considered when selecting the units.
- Maximum protection by fuse only for overload relay, type of coordination "2". For fuse values in connection with contactors see Configuration Manuals
 - "Configuring SIRIUS Innovations – Selection Data for Fuseless and Fused Load Feeders", <http://support.automation.siemens.com/WW/view/en/50250039>
 - "SIRIUS Configuration – Selection Data for Fuseless Load Feeders", <http://support.automation.siemens.com/WW/view/en/68115041>.
- The modules with an Article No. with "G" in penultimate position are equipped with a straight-through transformer.

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

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

Accessories

Size contactor	Version	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Connecting cables (necessary accessories)								
	S00 ... S3	For connection between evaluation module and current measuring module • Length 0.1 m (only for mounting of the evaluation module directly onto the current measuring module)	3RB24, 3RB29	▶ 3RB2987-2B		1	1 unit	41F
3RB2987-2.	S00 ... S12	• Length 0.5 m	3RB24, 3RB29	▶ 3RB2987-2D		1	1 unit	41F

Additional general accessories [see page 7/150](#).

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

Accessories for 3RB22, 3RB23, 3RB24

Overview



Overload relays for High-Feature applications

The following optional accessories are available for the 3RB22 to 3RB24 solid-state overload relays:

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

Selection and ordering data

Accessories for 3RB24 overload relays

Version	For over-load relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Operator panels for evaluation modules							
	Operator panels (set)	3RB24	A	3RA6935-0A	1	1 unit	42F
3RA6935-0A	One set comprises: • 1 x operator panel • 1 x 3RA6936-0A enabling module • 1 x 3RA6936-0B interface cover • 1 x fixing terminal <u>Note:</u> The connecting cable between the evaluation module and the operator panel is not included in the scope of supply; please order separately.						
	Connecting cable Length 2.5 m (round), for connecting the evaluation module to the operator panel	3RB24	▶	3UF7933-0BA00-0	1	1 unit	42J
	Enabling modules (replacement)	3RB24	A	3RA6936-0A	1	1 unit	42F
	Interface covers	3RB24	A	3RA6936-0B	1	5 units	42F
Manuals							
	Manual "Solid-State Overload Relay for IO-Link"	3RB24					
Manual "Solid-State Overload Relay for IO-Link"	The manual can be downloaded free of charge, see http://support.automation.siemens.com/WWW/view/en/46165627						







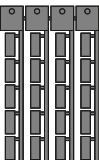
Additional general accessories [see next page](#).

Overload Relays

SIRIUS 3RB2 Solid-State Overload Relays

Accessories for 3RB22, 3RB23, 3RB24

General accessories

Version	Size	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
Sealable covers for evaluation modules									
	For covering the setting knobs	--	3RB22 to 3RB24	▶	3RB2984-2	1	10 units	41F	
Terminal covers for current measuring modules									
Covers for cable lugs and busbar connections									
	• Length 100 mm	S6	3RB2956	▶	3RT1956-4EA1	1	1 unit	41B	
	• Length 120 mm	S10/S12	3RB2966	▶	3RT1966-4EA1	1	1 unit	41B	
Covers for box terminals									
	• Length 25 mm	S6	3RB2956	▶	3RT1956-4EA2	1	1 unit	41B	
	• Length 30 mm	S10/S12	3RB2966	▶	3RT1966-4EA2	1	1 unit	41B	
Covers for screw terminals									
	between contactor and overload relay, without box terminals	S6	3RB2956	▶	3RT1956-4EA3	1	1 unit	41B	
	(1 unit required per combination)	S10/S12	3RB2966	▶	3RT1966-4EA3	1	1 unit	41B	
Box terminal blocks for current measuring modules									
	For round and ribbon cables								
	• Up to 70 mm ²	S6 ¹⁾	3RB2956	▶	3RT1955-4G	1	1 unit	41B	
	• Up to 120 mm ²	S6	3RB2956	▶	3RT1956-4G	1	1 unit	41B	
	• Up to 240 mm ²	S10/S12	3RB2966	▶	3RT1966-4G	1	1 unit	41B	
	For technical specifications for conductor cross-sections see Reference Manual "Protection Equipment – 3RU 1, 3RB2 Overload Relays", http://support.automation.siemens.com/WW/view/en/35681297 .								
Push-in lugs for evaluation modules and current measuring modules									
	For screw fixing the evaluation modules	--	3RB22 to 3RB24	B	3RP1903	1	10 units	41H	
	For screw fixing the current measuring modules (2 units per module)	S00 ... S3	3RB2906	A	3RB1900-0B	100	10 units	41F	
¹⁾ In the scope of supply for 3RT1054-1 contactors (55 kW).									
Version	Size	Color	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Tools for opening spring-type terminals									
	Screwdrivers For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/black, partially insulated	Main and auxiliary circuit connection: 3RB2	A	3RA2908-1A	1	1 unit	41B
Blank labels									
	Unit labeling plates¹⁾ For SIRIUS devices	20 mm x 7 mm	Pastel turquoise	3RB2	D	3RT1900-1SB20	100	340 units	41B
		20 mm x 7 mm	Titanium gray	3RB2	D	3RT2900-1SB20	100	340 units	41B

¹⁾ PC labeling system for individual inscription of unit labeling plates available from:

murrplastik Systemtechnik GmbH
(see Chapter 16, "Appendix" → "External Partners").