



Type	3RU21	3RB30	3RB31
SIRIUS overload relays up to 80 A			
Applications			
• System protection	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾
• Motor protection	✓	✓	✓
• Alternating current, three-phase	✓	✓	✓
• Alternating current, single-phase	✓	--	--
• Direct current	✓	--	--
Size contactor	S00, S0, S2	S00, S0, S2	S00, S0, S2
Rated operational current I_e			
• Size S00	A Up to 16	Up to 16	Up to 16
• Size S0	A Up to 40	Up to 40	Up to 40
• Size S2	A Up to 80	Up to 80	Up to 80
Rated operational voltage U_e	V 690 AC	690 AC	690 AC
Rated frequency	Hz 50/60	50/60	50/60
Trip class	CLASS 10, 10A	CLASS 10E, 20E	CLASS 5E, 10E, 20E, 30E (adjustable)
Thermal overload releases			
A	0.11 ... 0.16 up to 70 ... 80	--	--
Electronic overload releases			
A	--	0.1 ... 0.4 up to 20 ... 80	0.1 ... 0.4 up to 20 ... 80
Pages	7/100 ... 7/102	7/119, 7/120	7/121
Accessories			
For sizes	S00 S0 S2	S00 S0 S2	S00 S0 S2
Terminal supports for stand-alone installation	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Mechanical RESET	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Cable releases for RESET	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Electrical remote RESET	✓ ✓ ✓	-- -- --	Integrated in the unit
Terminal covers			
• Ring terminal lug connections	✓ ²⁾ ✓ ²⁾ --	-- -- --	-- -- --
• For box terminals	-- -- ✓	-- -- ✓	-- -- ✓
Sealable covers for setting knobs	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Pages	7/103 ... 7/105	7/122, 7/123	7/122, 7/123

✓ Has this function or can use this accessory

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

¹⁾ The units are responsible in the main circuit for overload protection of the assigned electrical loads (e.g. motors, feeder cable, and other switching and protection devices in the respective load feeder).

²⁾ Terminal covers for ensuring finger-safe touch protection are available for 3RU21 overload relays with ring terminal lug connections for mounting onto contactors.

Protection Equipment

Overload Relays

Introduction



Type		3RU11	3RB20	3RB21	3RB22, 3RB23	3RB24
SIRIUS overload relays up to 630 A						
Applications						
• System protection		✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	
• Motor protection		✓	✓	✓	✓	
• Alternating current, three-phase		✓	✓	✓	✓	
• Alternating current, single-phase		✓	--	--	✓	
• Direct current		✓	--	--	--	
Size contactor		S3	S3 ... S12	S3 ... S12	S00 ... S12	
Rated operational current I_e						
• Sizes S00 and S0	A	--	--	--	Up to 25 and 45 mm width with current measuring modules 3RB2906-2BG1/3RB2906-2DG1	
• Size S2	A	--	--	--	Up to 100 and 55 mm width with current measuring module 3RB2906-2JG1	
• Size S3	A	Up to 100	Up to 100	Up to 100		
• Size S6	A	--	Up to 200	Up to 200	Up to 200 and 120 mm width with current measuring modules 3RB2956-2TH2/3RB2956-2TG2	
• Size S10/S12	A	--	Up to 630	Up to 630	Up to 630 and 145 mm width with current measuring module 3RB2966-2WH2	
• Size 14 (3TF68/3TF69)	A	--	Up to 630	Up to 630	Up to 820 with current measuring module 3RB2906-2BG1 and transformer 3UF1868-3GA00	
Rated operational voltage U_e	V	690/1 000 AC	690/1 000 AC	690/1 000 AC	690/1 000 AC ²⁾	
Rated frequency	Hz	50/60	50/60	50/60	50/60	
Trip class		CLASS 10	CLASS 10, 20	CLASS 5, 10, 20, 30 Adjustable	CLASS 5, 10, 20, 30 Adjustable	
Thermal overload releases	A	18 ... 25 up to 80 ... 100	--	--	--	
Electronic overload releases	A	--	12.5 ... 50 up to 160 ... 630	12.5 ... 50 up to 160 ... 630	0.3 ... 3 up to 63 ... 630	
Pages		7/111	7/130, 7/131	7/132	7/141, 7/142, 7/152	7/149, 7/152

Accessories						
For sizes		S3	S3 S6 S10/S12	S3 S6 S10/S12	S00 S0 S2 S3 S6 S10/S12	
Terminal supports for stand-alone installation		✓	3) 3) 3)	3) 3) 3)	3) 3) 3) 3) 3) 3)	
Mechanical RESET		✓	✓ ✓ ✓	✓ ✓ ✓	-- -- -- -- -- --	
Cable releases for RESET		✓	✓ ✓ ✓	✓ ✓ ✓	-- -- -- -- -- --	
Electrical remote RESET		✓	-- -- --	Integrated in the unit	Integrated in the unit	
Terminal covers		✓	✓ ✓ ✓	✓ ✓ ✓	-- -- -- ✓ ✓ ✓	
Sealable covers for setting knobs		Integrated in the unit	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	
Operator panel for 3RB24 evaluation module		--	-- -- --	-- -- --	✓ ✓ ✓ ✓ ✓ ✓	
Pages		7/112, 7/113	7/133, 7/134	7/133, 7/134	7/152 ... 7/154	

- ✓ Has this function or can use this accessory
 -- Does not have this function or cannot use this accessory

¹⁾ The units are responsible in the main circuit for overload protection of the assigned electrical loads (e.g. motors), feeder cable, and other switching and protection devices in the respective load feeder.

²⁾ With reference to the 3RB29.6 current measuring modules.

³⁾ Stand-alone installation without accessories is possible.

Overview



Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
General data							
Sizes	S00 ... S2	S3	S00 ... S2	S3 ... 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, 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 ... 80 A	18 ... 100 A	0.1 ... 80 A	12.5 ... 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

✓ 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.

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

Overload Relays

General data



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



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)	✓ (S3 ... 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⁾	✓ (S00, S0)	--	✓ (S00, S0)	--	--	--	<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 system for main and auxiliary circuits²⁾	✓ (S00, S0)	--	--	--	--	--	<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.

Overload Relays

General data



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 10A	CLASS 10	3RB30: CLASS 10E or CLASS 20E	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 5E, 10E, 20E, 30E	--	--	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 control-gear 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 Eliminates the need for configuration and connecting an additional control circuit
Supplied from an external voltage through IO-Link	--	--	--	--	--	✓	

✓ Available

-- Not available

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



Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Other 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-LinkAllows the imminent tripping of the relay to be signaledAllows measures to be taken in time in the event of inverse-time delayed overloading of the load for an extended period over the current limitEliminates the need for an additional deviceSaves space in the control cabinetReduces 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 systemsEliminates the need for an additional measuring transducer and signal converterSaves space in the control cabinetReduces wiring outlay and costs

✓ Available
-- Not available

Overload Relays

General data

Overview of overload relays – matching contactors

Overload relays	Current measurement	Current range	Contactors (type, size, rating in kW)							
			3RT201.	3RT202.	3RT203.	3RT104.	3RT105.	3RT106.	3RT107.	3TF68/3TF69
Type	A		S00 3/4/5.5/7.5	S0 5.5/7.5/11/15/18.5	S2 15/18.5/22/30/37	S3 30/37/45	S6 55/75/90	S10 110/132/160	S12 200/250	S14 375/450

SIRIUS 3RU21 thermal overload relays



3RU211	Integrated	0.11 ... 16	✓	--	--	--	--	--	--	--
3RU212	Integrated	1.8 ... 40	--	✓	--	--	--	--	--	--
3RU213	Integrated	11 ... 80	--	--	✓	--	--	--	--	--

3RU21

SIRIUS 3RU11 thermal overload relays



3RU114	Integrated	18 ... 100	--	--	--	✓	--	--	--	--
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3RU11

SIRIUS 3RB30 electronic overload relays¹⁾



3RB301	Integrated	0.1 ... 16	✓	--	--	--	--	--	--	--
3RB302	Integrated	0.1 ... 40	--	✓	--	--	--	--	--	--
3RB303	Integrated	12.5 ... 80	--	--	✓	--	--	--	--	--

3RB30

SIRIUS 3RB31 electronic overload relays¹⁾



3RB311	Integrated	0.1 ... 16	✓	--	--	--	--	--	--	--
3RB312	Integrated	0.1 ... 40	--	✓	--	--	--	--	--	--
3RB313	Integrated	12.5 ... 80	--	--	✓	--	--	--	--	--

3RB31

SIRIUS 3RB20 electronic overload relays¹⁾



3RB204	Integrated	12.5 ... 100	--	--	--	✓	--	--	--	--
3RB205	Integrated	50 ... 200	--	--	--	--	✓	--	--	--
3RB206	Integrated	55 ... 630	--	--	--	--	--	✓	✓	✓
3RB201 + 3UF18	Integrated	630 ... 820	--	--	--	--	--	--	--	✓

3RB20

SIRIUS 3RB21 electronic overload relays¹⁾



3RB214	Integrated	12.5 ... 100	--	--	--	✓	--	--	--	--
3RB215	Integrated	50 ... 200	--	--	--	--	✓	--	--	--
3RB216	Integrated	55 ... 630	--	--	--	--	--	✓	✓	✓
3RB211 + 3UF18	Integrated	630 ... 820	--	--	--	--	--	--	--	✓



3RB21

- ✓ Can be used
-- Cannot be used

¹⁾ "Technical specifications" for the use of overload relays with trip class ≥ 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>.

Overview of overload relays – matching contactors (continued)

Overload relays	Current measuring module	Current range	Contactors (type, size, rating in kW)								
			3RT201.	3RT202.	3RT203.	3RT104.	3RT105.	3RT106.	3RT107.	3TF68/3TF69	
Type	A		S00	S0	S2	S3	S6	S10	S12	S14	
		3/4/5.5/7.5	5.5/7.5/11/15/18.5	15/18.5/22/30/37	30/37/45	55/75/90	110/132/160	200/250	375/450		
SIRIUS 3RB22 to 3RB24 electronic overload relays ¹⁾											
 3RB22, 3RB23	3RB2906	0.3 ... 25	✓	✓	--	--	--	--	--	--	
	3RB2283/3RB2383/3RB2483+	10 ... 100	✓	✓	✓	✓	--	--	--	--	
		20 ... 200	--	✓	✓	✓	✓	--	--	--	
		63 ... 630	--	--	--	--	--	✓	✓	✓	
		3RB2906 + 3UF18	630 ... 820	--	--	--	--	--	--	--	✓
 3RB24											

✓ Can be used

-- Cannot be used

¹⁾ "Technical Specifications" for the use of overload relays with trip class ≥ 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>.