Introduction




Type		3RU11	3RB20	3RB21	3RB22/3RB23
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 of contactor		S00, S0, S2, S3	S00 ... S12	S00 ... S12	S00 ... S12
Rated operational current I_e					
Size S00 Size S0	A A	to 12 to 25	to 12 to 25	to 12 to 25	} to 25
Size S2 Size S3	A A	to 50 to 100	to 50 to 100	to 50 to 100	} to 100
Size S6 Size S10/S12, Size 14 (3TF6)	A A	-- --	to 200 to 630	to 200 to 630	to 200 to 630
Rated operational voltage U_e	V	690/1000 AC[2]	690/1000 AC[3]	690/1000 AC[3]	690/1000 AC[4]
Rated frequency	Hz	50/60	50/60	50/60	50/60
Trip class		CLASS 10	CLASS 10, CLASS 20	CLASS 5, 10, 20, 30 Adjustable	CLASS 5, 10, 20, 30 Adjustable
Thermal overload releases	A A	0.11 ... 0.16 to 80 ... 100	--	--	--
Electronic overload releases	A A	--	0.1 ... 0.4 to 160 ... 630	0.1 ... 0.4 to 160 ... 630	0.3 ... 3 to 63 ... 630
Rating for induction motor at 400 V AC	kW kW	0.04 to 45	0.04 ... 0.09 to 90 ... 450	0.04 ... 0.09 to 90 ... 450	0.09 ... 1.1 to 37 ... 450

Accessories

For sizes	3RU11				3RB20						3RB21						3RB22/3RB23					
	S00	S0	S2	S3	S00	S0	S2	S3	S6	S10/S12	S00	S0	S2	S3	S6	S10/S12	S00	S0	S2	S3	S6	S10/S12
Terminal brackets for stand-alone installation	✓	✓	✓	✓	✓	✓	5)	5)	5)	5)	✓	✓	5)	5)	5)	5)	5)	5)	5)	5)	5)	5)
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				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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) Size S3 up to 1000 V AC.

3) Size S2 (only with straight-through transformer), S3, S6, S10, S12 up to 1000 V AC.

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

5) Stand-alone installation without accessories is possible.

✓ = Has this function or can use this accessory

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

General data

Overview



Features	Benefits	3RU11	3RB20/3RB21	3RB22/3RB23
General data				
Sizes	• Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, soft starters, ...) • 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) • Simplify configuration	S00 ...S3	S00 ... S12	S00 ... S12
Seamless current range	• Allows easy and consistent configuration with one series of overload relays (for small to large loads)	0.11 ... 100 A	0.1 ... 630 A	0.3 ... 630 A (... 820 A)[1]
Protection functions				
Tripping in the event of overload	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload	✓	✓	✓
Tripping in the event of phase unbalance	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to phase unbalance	(✓)	✓	✓
Tripping in the event of phase failure	• Minimizes heating of induction motors during phase failure	✓	✓	✓
Protection of single-phase loads	• Enables the protection of single-phase loads	✓	--	✓
Tripping in the event of overheating by **integrated thermistor motor protection function**	• 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	--[2]	--[2]	✓
Tripping in the event of a ground fault by **internal ground-fault detection (activatable)**	• 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	--	✓ (only 3RB21)	✓
Features				
RESET function	• Allows manual or automatic resetting of the relay	✓	✓	✓
Remote RESET function	• Allows the remote resetting of the relay	✓ (by means of separate module)	✓. (only 3RB21 with 24 V DC)	✓
TEST function for auxiliary contacts	• Allows easy checking of the function and wiring	✓	✓	✓
TEST function for electronics	• Allows checking of the electronics	--	✓	✓
Status display	• Displays the current operating state	✓	✓	✓
Large current adjustment button	• Makes it easier to set the relay exactly to the correct current value	✓	✓	✓
Integrated auxiliary contacts (1 NO + 1 NC)	• Allows the load to be switched off if necessary • Can be used to output signals	✓	✓	✓ (2 ×)

[1] Motor currents up to 820 A can be recorded and evaluated by a current measuring module, e. g. 3RB29 06-2BG1 (0.3 ... 3 A), in combination with a 3UF18 68-3GA00 (820 A / 1 A) series transformer.
For 3UF18 transformers see Chapter 7, "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.

✓ = Available
-- = Not available



Features	Benefits	3RU11	3RB20/3RB21	3RB22/3RB23
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)	• 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 3RT1 contactors	• Simplifies configuration • Reduces wiring outlay and costs • Enables stand-alone installation as well as space-saving direct mounting	✓	✓	✓[1]
Straight-through transformers for main circuit[2] (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)	• 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	--	✓ (S2 ... S6)	✓ (S00 ... S6)
Spring-type terminal connection system for main circuit[2]	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections	✓ (S00)	--	--
Spring-type terminal connection system for auxiliary circuits[2]	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections	✓	✓	✓
Other features				
Temperature compensation	• 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	• Provides safe protection for the loads even after years of use in severe operating conditions	(✓)	✓	✓
Wide setting ranges	• Reduce the number of variants • Minimize the engineering outlay and costs • Minimize storage overhead, storage costs, tied-up capital	--	✓ (1:4)	✓ (1:10)
Trip class CLASS 5	• Enables solutions for very fast starting motors requiring special protection (e. g. Ex motors)	--	✓ (only 3RB21)	✓
Trip classes > CLASS 10	• Enables heavy starting solutions	--	✓	✓
Low power loss	• Reduces power consumption and energy costs (up 98 % less power is used than for thermal overload relays). • Minimizes temperature rises of the contactor and control cabinet – in some cases this may eliminate the need for controlgear cabinet cooling. • Direct mounting to contactor saves space, even for high motor currents (i. e. no heat decoupling is required).	--	✓	✓

[1] Exception: up to size S3, only stand-alone installation is possible.

[2] Alternatively available for screw terminals.

✓ = Available

-- = Not available

General data



Features	Benefits	3RU11	3RB20/3RB21	3RB22/3RB23
Other features				
Internal power supply	• Eliminates the need for configuration and connecting an additional control circuit	--[1)]	✓	--
Variable adjustment of the trip classes (The required trip class can be adjusted by means of a rotary switch depending on the current start-up condition.)	• Reduces the number of variants • Minimizes the configuring outlay and costs • Minimizes storage overhead, storage costs, and tied-up capital	--	✓ (only 3RB21)	✓
Overload warning	• Indicates imminent tripping of the relay directly on the device due to overload, phase unbalance or phase failure • Allows the imminent tripping of the relay to be signaled • Allows measures to be taken in time in the event of continuous inverse-time delayed overloads • Eliminates the need for an additional device • Saves space in the control cabinet • Reduces wiring outlay and costs	--	--	✓
Analog output	• 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	--	--	✓

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

✓ = Available
-- = Not available

	Overload relays	Current measure-ment	Current range	**Contactors** (type, size, rating in kW)							
				3RT10 1	**3RT10 2**	**3RT10 3**	**3RT10 4**	**3RT10 5**	**3RT10 6**	**3RT10 7**	**3TF68/ 3TF69**
				S00	S0	S2	S3	S6	S10	S12	Size 14
	Type	Type	A	3/4/5.5	5.5/7.5/11	15/18.5/22	30/37/45	55/75/90	110/132/160	200/250	375/450
SIRIUS 3RU11 thermal overload relays											
	3RU11 1	Integrated	0.11 … 12	✓	--	--	--	--	--	--	--
	3RU11 2	Integrated	1.8 … 25	--	✓	--	--	--	--	--	--
	3RU11 3	Integrated	5.5 … 50	--	--	✓	--	--	--	--	--
	3RU11 4	Integrated	18 … 100	--	--	--	✓	--	--	--	--
SIRIUS 3RB20 solid-state overload relays[1)]											
	3RB20 1	Integrated	0.1 … 12	✓	--	--	--	--	--	--	--
	3RB20 2	Integrated	0.1 … 25	--	✓	--	--	--	--	--	--
	3RB20 3	Integrated	6 … 50	--	--	✓	--	--	--	--	--
	3RB20 4	Integrated	12.5 … 100	--	--	--	✓	--	--	--	--
	3RB20 5	Integrated	50 ... 200	--	--	--	--	✓	--	--	--
	3RB20 6	Integrated	55 ... 630	--	--	--	--	--	✓	✓	✓
	3RB20 1 + 3UF18	Integrated	630 ... 820	--	--	--	--	--	--	--	✓
SIRIUS 3RB21 solid-state overload relays[1)]											
	3RB21 1	Integrated	0.1 … 12	✓	--	--	--	--	--	--	--
	3RB21 2	Integrated	0.1 … 25	--	✓	--	--	--	--	--	--
	3RB21 3	Integrated	6 … 50	--	--	✓	--	--	--	--	--
	3RB21 4	Integrated	12.5 … 100	--	--	--	✓	--	--	--	--
	3RB21 5	Integrated	50 ... 200	--	--	--	--	✓	--	--	--
	3RB21 6	Integrated	55 ... 630	--	--	--	--	--	✓	✓	✓
	3RB21 1 + 3UF18	Integrated	630 ... 820	--	--	--	--	--	--	--	✓
SIRIUS 3RB22/3RB23 solid-state overload relays[1)]											
		3RB29 0	0.3 … 25	✓	✓	--	--	--	--	--	--
		3RB29 0	10 ... 100	--	--	✓	✓	--	--	--	--
	3RB22/3RB23 +	3RB29 5	20 … 200	--	--	--	--	✓	--	--	--
		3RB29 6	63 ... 630	--	--	--	--	--	✓	✓	✓
		3RB29 0 + 3UF18	630 ... 820	--	--	--	--	--	--	--	✓

[1)] "Technical Specifications" for use of the overload relays with trip Class ≥ CLASS 20 can be found under "Short-circuit protection with fuses for motor feeders", see in the project planning aid "Configuring SIRIUS Fuseless Load Feeders".

✓ = Can be used
-- = Cannot be used

Connection methods

The 3RB20 and 3RB21 relays 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 3RB22/3RB23 relays. The 3RU11 relays come with screw terminals.