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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 status	✔	✔	✔
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.

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

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General data



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-loaded terminal connection system for main circuit[2]	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections	✔ (S00)	--	--
Spring-loaded 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 units/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 class > CLASS 10	• Enable 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 control 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.

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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 transformer 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.

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General data

	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**	**3TF68/69**
				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**
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	--	--	--	✔	--	--	--	--
3RB20/3RB21[1] solid-state overload relays											
	3RB2. 1	integrated	0.1 … 12	✔	--	--	--	--	--	--	--
	3RB20 2	integrated	3 … 25	--	✔	--	--	--	--	--	--
	3RB21 2	integrated	1 … 25	--	✔	--	--	--	--	--	--
	3RB2. 3	integrated	6 … 50	--	--	✔	--	--	--	--	--
	3RB2. 4	integrated	12.5 … 100	--	--	--	✔	--	--	--	--
	3RB2. 5	integrated	50 ... 200	--	--	--	--	✔	--	--	--
	3RB2. 6	integrated	55 ... 630	--	--	--	--	--	✔	✔	✔
3RB22/3RB23[1] solid-state overload relays											
	3RB22/3RB23 +	3RB29 0	0.3 … 25	✔	✔	--	--	--	--	--	--
		3RB29 0	10 ... 100	--	--	✔	✔	--	--	--	--
		3RB29 5	20 … 200	--	--	--	--	✔	--	--	--
		3RB29 6	63 ... 630	--	--	--	--	--	✔	✔	✔
		3RB29 0 + 3UF18	630 ... 820	--	--	--	--	--	--	--	✔

[1] When using the overload relays with trip class ≥ CLASS 20, see Technical Specifications, Short-Circuit Protection with Fuses for Motor Feeders and the configuring aid "Configuring SIRIUS Fuseless Load Feeders".

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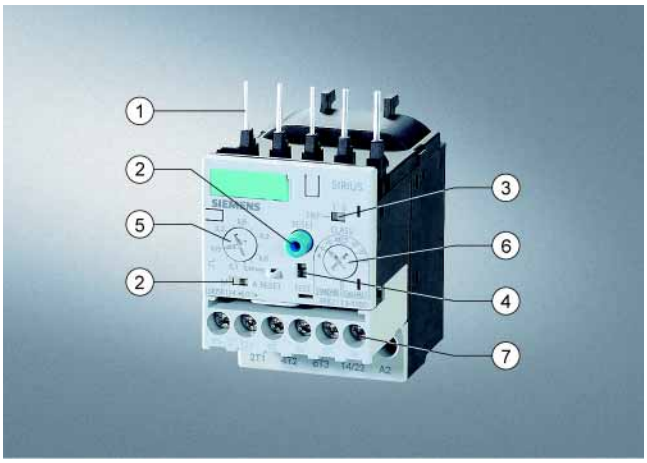
Overview



(1) Connection for mounting onto contactors:
Optimally adapted in electrical, mechanical and design terms to the contactors and soft starters, these connecting pins can be used for direct mounting of the overload relays. Stand-alone installation is possible as an alternative (in some cases in conjunction with a stand-alone installation module).

(2) Selector switch for manual/automatic RESET and RESET button:
With the slide switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. On the 3RB21 a solid-state remote RESET is integrated.

(3) Switch position indicator and TEST function of the wiring:
Indicates a trip and enables the wiring test.

(4) Solid-state test (device test):
Enables a test of all important device components and functions.

(5) Motor current setting:
Setting the device to the motor rated current is easy with the large rotary knob.

(6) 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.

(7) 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 connection and alternatively with spring-type connection.

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 (see LV 1 T, Function) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set motor rated current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding solid-state circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and set current I_e and is stored in the form of a long-term stable tripping characteristic (see LV 1 T Characteristic Curves).

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 wye-delta assemblies). 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 (see LV 1 T, Function). Resetting takes place either manually or automatically after the recovery time has elapsed (see LV 1 T, Function).

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.

Benefits

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

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3RB20, 3RB21 for standard applications

Application

Industries

The 3RB20/3RB21 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 CLASS 30), minimize project completion times, inventories and power consumption, and optimize plant availability and maintenance management.

Application

The 3RB20/3RB21 solid-state overload relays have been designed for the protection of induction 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 relay or the 3RB22/3RB23 solid-state overload relay 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 environments, ageing and temperature fluctuation.

For the temperature range from –25 C to +60 °C, the 3RB20/3RB21 solid-state overload relays compensate the temperature according to IEC 60947-4-1.

For the 3RB20/3RB21 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 (see tables below).

Type	Setting range	Derating factor for the upper set value **for stand-alone installation** at ambient temperature	
		+50 °C	+60 °C
3RB20 56/3RB21 56	50 ... 200 A	100 %	100 %
3RB20 66/3RB21 66	55 ... 250 A	100 %	100 %
3RB20 66/3RB21 66	160 ... 630 A	100 %	90 %

Type	Setting range	Derating factor for the upper set value for **mounting onto contactor** at ambient temperature	
		+50 °C	+60 °C
3RB20 56/3RB21 56	50 ... 200 A	100 %	70 %
3RB20 66/3RB21 66	55 ... 250 A	100 %	70 %
3RB20 66/3RB21 66	160 ... 630 A	100 %	70 %

"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 EEx e. The relays meet the requirements of EN 60079-7 (Electrical apparatus for potentially explosive atmospheres – Increased safety "e").

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

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

EU type test certificate for Group II, Category (2) G/D exists.

Accessories

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

- One terminal bracket each for the overload relays size S00 and S0 (sizes S2 to S12 can be installed as single units without a terminal bracket)
- One mechanical remote RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for all sizes
- Box terminal blocks for sizes S6 and S10/S12
- Terminal covers for sizes S2 to S10/S12

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Selection and ordering data

Conversion aid 3RB10 –> 3RB20

Size	Previous type		Replacement type	
	3RB10	Setting range in A	3RB20	Setting range in A
S00	**3RB10 16-□RB0**	0.1 ... 0.4	**3RB20 16-□RB0**	0.1 ... 0.4
	3RB10 16-□NB0	0.4 ... 1.6	**3RB20 16-□NB0**	0.32 ... 1.25
	3RB10 16-□PB0	1.5 ... 6	**3RB20 16-□PB0**	1 ... 4
	3RB10 16-□SB0	3 ... 12	**3RB20 16-□SB0**	3 ... 12
S0	**3RB10 26-□RB0**	0.1 ... 0.4	Use size S00	
	3RB10 26-□NB0	0.4 ... 1.6		
	3RB10 26-□PB0	1.5 ... 6		
	3RB10 26-□SB0	3 ... 12	**3RB20 26-□SB0**	3 ... 12
	3RB10 26-□QB0	6 ... 25	**3RB20 26-□QB0**	6 ... 25
S2	**3RB10 36-□QB0**	6 ... 25	**3RB20 36-□QB0**	6 ... 25
	3RB10 36-□UB0	13 ... 50	**3RB20 36-□UB0**	12.5 ... 50
S3	**3RB10 46-□UB0**	13 ... 50	**3RB20 46-□UB0**	12.5 ... 50
	3RB10 46-□EB0	25 ... 100	**3RB20 46-□EB0**	25 ... 100
S6	**3RB10 56-□FW0**	50 ... 200	**3RB20 56-□FW2**	50 ... 200
	3RB10 56-□FG0		**3RB20 56-□FC2**	
S10/S12	**3RB10 66-□GG0**	55 ... 250	**3RB20 66-□GC2**	55 ... 250
	3RB10 66-□KG0	200 ... 540	**3RB20 66-□MC2**	160 ... 630
	3RB10 66-□LG0	300 ... 630		
CLASS 10	**1**		**1**	
CLASS 20	**2**		**2**	

Conversion aid 3RB10 –> 3RB21

Size	Previous type		Replacement type	
	3RB10	Setting range in A	3RB21	Setting range in A
S00	**3RB10 16-□RB0**	0.1 ... 0.4	**3RB21 13-4RB0**	0.1 ... 0.4
	3RB10 16-□NB0	0.4 ... 1.6	**3RB21 13-4NB0**	0.32 ... 1.25
	3RB10 16-□PB0	1.5 ... 6	**3RB21 13-4PB0**	1 ... 4
	3RB10 16-□SB0	3 ... 12	**3RB21 13-4SB0**	3 ... 12
S0	**3RB10 26-□RB0**	0.1 ... 0.4	Use size S00	
	3RB10 26-□NB0	0.4 ... 1.6		
	3RB10 26-□PB0	1.5 ... 6	**3RB21 23-4PB0**	1 ... 4
	3RB10 26-□SB0	3 ... 12	**3RB21 23-4SB0**	3 ... 12
	3RB10 26-□QB0	6 ... 25	**3RB21 23-4QB0**	6 ... 25
S2	**3RB10 36-□QB0**	6 ... 25	**3RB21 33-4QB0**	6 ... 25
	3RB10 36-□UB0	13 ... 50	**3RB21 33-4UB0**	12.5 ... 50
S3	**3RB10 46-□UB0**	13 ... 50	**3RB21 43-4UB0**	12.5 ... 50
	3RB10 46-□EB0	25 ... 100	**3RB21 43-4EB0**	25 ... 100
S6	**3RB10 56-□FW0**	50 ... 200	**3RB21 53-4FW2**	50 ... 200
	3RB10 56-□FG0		**3RB21 53-4FC2**	
S10/S12	**3RB10 66-□GG0**	55 ... 250	**3RB21 63-4GC2**	55 ... 250
	3RB10 66-□KG0	200 ... 540	**3RB21 63-4MC2**	160 ... 630
	3RB10 66-□LG0	300 ... 630		
CLASS 10	**1**			
CLASS 20	**2**			

Note:

CLASS 5, 10, 20 and 30 can be adjusted on the unit

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3RB20, 3RB21 for standard applications

3RB20 solid-state overload relays with screw terminals on auxiliary current side for direct mounting[1)2)] and stand-alone installation[2)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

	Size of contactor [4)]	Rating for induction motor Rated value[5)]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination 2, gL/gG operational class[6)]	DT	**Screw terminals** (on auxiliary current side) Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		kW	A	A							kg
Size S00[1)]											
 3RB20 16-1RB0	S00	0.04 … 0.09	0.1 … 0.4	1	▶	**3RB20 16-1RB0**		1	1 unit	101	0.200
		0.12 … 0.37	0.32 … 1.25	2	▶	**3RB20 16-1NB0**		1	1 unit	101	0.200
		0.55 … 1.5	1 … 4	10	▶	**3RB20 16-1PB0**		1	1 unit	101	0.200
		1.1 … 5.5	3 … 12	20	▶	**3RB20 16-1SB0**		1	1 unit	101	0.200
Size S0[1)]											
 3RB20 26-1QB0	S0	1.1 … 5.5	3 … 12	20	▶	**3RB20 26-1SB0**		1	1 unit	101	0.220
		3 … 11	6 … 25	35	▶	**3RB20 26-1QB0**		1	1 unit	101	0.220
Size S2[1)3)7)]											
 3RB20 36-1UB0	S2	3 … 11	6 … 25	63	▶	**3RB20 36-1QB0**		1	1 unit	101	0.360
					▶	**3RB20 36-1QW1**		1	1 unit	101	0.230
		7.5 … 22	12.5 … 50	80	▶	**3RB20 36-1UB0**		1	1 unit	101	0.360
					▶	**3RB20 36-1UW1**		1	1 unit	101	0.230
Size S3[1)3)7)]											
 3RB20 46-1EB0	S3	7.5 … 22	12.5 … 50	160	▶	**3RB20 46-1UB0**		1	1 unit	101	0.560
		11 … 45	25 … 100	315	▶	**3RB20 46-1EB0**		1	1 unit	101	0.560
					▶	**3RB20 46-1EW1**		1	1 unit	101	0.450
Size S6 [2)7)]											
 3RB20 56-1FW2	S6 with bar connection	22 … 90	50 … 200	315	▶	**3RB20 56-1FC2**		1	1 unit	101	1.030
	S6 with box terminals				▶	**3RB20 56-1FW2**		1	1 unit	101	0.690
Size S10/S12[2)]											
 3RB20 66-1MC2	S10/S12 and size 14 (3TF68/ 3TF69)	22 … 110	55 … 250	400	▶	**3RB20 66-1GC2**		1	1 unit	101	1.820
		90 … 450	160 … 630	800	▶	**3RB20 66-1MC2**		1	1 unit	101	1.820

1) The relays with an Order No. ending with **"0"** are designed for direct mounting. With the matching terminal brackets (see Accessories) the sizes S00 and S0 can also be installed as stand-alone units.

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

3) The relays with an Order 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 fuse for overload relay, type of coordination 2. For fuse values in conjunction with contactors, see Technical Specifications, Short-Circuit Protection with Fuses for Motor Feeders.

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

*** You can order this quantity or a multiple thereof.**

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3RB20 solid-state overload relays with spring-loaded terminals on auxiliary current side for direct mounting[1)2)] and stand-alone installation[2)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

	Size of contactor[4)]	Rating for induction motor Rated value[5)]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination 2, gL/gG operational class[6)]	DT	**Spring-loaded terminals** (on auxiliary current side) Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		kW	A	A							kg
Size S00[1)]											
 3RB20 16-1RD0	S00	0.04 … 0.09	0.1 … 0.4	1	A	**3RB20 16-1RD0**		1	1 unit	101	0.200
		0.12 … 0.37	0.32 … 1.25	2	A	**3RB20 16-1ND0**		1	1 unit	101	0.200
		0.55 … 1.5	1 … 4	10	A	**3RB20 16-1PD0**		1	1 unit	101	0.200
		1.1 … 5.5	3 … 12	20	A	**3RB20 16-1SD0**		1	1 unit	101	0.200
Size S0[1)]											
 3RB20 26-1QD0	S0	1.1 … 5.5	3 … 12	20	A	**3RB20 26-1SD0**		1	1 unit	101	0.220
		3 … 11	6 … 25	35	A	**3RB20 26-1QD0**		1	1 unit	101	0.220
Size S2[1)3)7)]											
 3RB20 36-1UD0	S2	3 … 11	6 … 25	63	A	**3RB20 36-1QD0**		1	1 unit	101	0.360
					A	**3RB20 36-1QX1**		1	1 unit	101	0.230
		7.5 … 22	12.5 … 50	80	A	**3RB20 36-1UD0**		1	1 unit	101	0.360
					A	**3RB20 36-1UX1**		1	1 unit	101	0.230
Size S3[1)3)7)]											
 3RB20 46-1ED0	S3	7.5 … 22	12.5 … 50	160	A	**3RB20 46-1UD0**		1	1 unit	101	0.560
		11 … 45	25 … 100	315	A	**3RB20 46-1ED0**		1	1 unit	101	0.560
					A	**3RB20 46-1EX1**		1	1 unit	101	0.450
Size S6 [2)7)]											
 3RB20 56-1FX2	S6 with bar connection	22 … 90	50 … 200	315	A	**3RB20 56-1FF2**		1	1 unit	101	1.030
	S6 with box terminals				A	**3RB20 56-1FX2**		1	1 unit	101	0.690
Size S10/S12[2)]											
 3RB20 66-1MF2	S10/S12 and size 14 (3TF68/ 3TF69)	22 … 110	55 … 250	400	A	**3RB20 66-1GF2**		1	1 unit	101	1.820
		90 … 450	160 … 630	800	A	**3RB20 66-1MF2**		1	1 unit	101	1.820

1) The relays with an Order No. ending with **"0"** are designed for direct mounting. With the matching terminal brackets (see Accessories) the sizes S00 and S0 can also be installed as stand-alone units.

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

3) The relays with an Order 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 fuse for overload relay, type of coordination 2. For fuse values in conjunction with contactors, see Technical Specifications, Short-Circuit Protection with Fuses for Motor Feeders.

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

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3RB20, 3RB21 for standard applications

3RB20 solid-state overload relays with screw terminals on auxiliary current side for direct mounting[1)2)] and stand-alone installation[2)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

	Size of contactor[4)]	Rating for induction motor Rated value[5)]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination 2, gL/gG operational class[6)]	DT	**Screw terminals** (on auxiliary current side) Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		kW	A	A							kg
Size S00[1)]											
 3RB20 16-2RB0	S00	0.04 … 0.09	0.1 … 0.4	1	▶	**3RB20 16-2RB0**		1	1 unit	101	0.200
		0.12 … 0.37	0.32 … 1.25	2	▶	**3RB20 16-2NB0**		1	1 unit	101	0.200
		0.55 … 1.5	1 … 4	10	▶	**3RB20 16-2PB0**		1	1 unit	101	0.200
		1.1 … 5.5	3 … 12	20	▶	**3RB20 16-2SB0**		1	1 unit	101	0.200
Size S0[1)]											
 3RB20 26-2QB0	S0	1.1 … 5.5	3 … 12	20	▶	**3RB20 26-2SB0**		1	1 unit	101	0.220
		3 … 11	6 … 25	35	▶	**3RB20 26-2QB0**		1	1 unit	101	0.220
Size S2[1)3)7)]											
 3RB20 36-2UB0	S2	3 … 11	6 … 25	63	▶	**3RB20 36-2QB0**		1	1 unit	101	0.360
					▶	**3RB20 36-2QW1**		1	1 unit	101	0.230
		7.5 … 22	12.5 … 50	80	▶	**3RB20 36-2UB0**		1	1 unit	101	0.360
					▶	**3RB20 36-2UW1**		1	1 unit	101	0.230
Size S3[1)3)7)]											
 3RB20 46-2EB0	S3	7.5 … 22	12.5 … 50	160	▶	**3RB20 46-2UB0**		1	1 unit	101	0.560
		11 … 45	25 … 100	315	▶	**3RB20 46-2EB0**		1	1 unit	101	0.560
					▶	**3RB20 46-2EW1**		1	1 unit	101	0.450
Size S6 [2)7)]											
 3RB20 56-2FW2	S6 with bar connection	22 … 90	50 … 200	315	▶	**3RB20 56-2FC2**		1	1 unit	101	1.030
	S6 with box terminals				▶	**3RB20 56-2FW2**		1	1 unit	101	0.690
Size S10/S12[2)]											
 3RB20 66-2MC2	S10/S12 and size 14 (3TF68/ 3TF69)	22 … 110	55 … 250	400	▶	**3RB20 66-2GC2**		1	1 unit	101	1.820
		90 … 450	160 … 630	800	▶	**3RB20 66-2MC2**		1	1 unit	101	1.820

1) The relays with an Order No. ending with **"0"** are designed for direct mounting. With the matching terminal brackets (see Accessories) the sizes S00 and S0 can also be installed as stand-alone units.

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

3) The relays with an Order 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 fuse for overload relay, type of coordination 2. For fuse values in conjunction with contactors, see Technical Specifications, Short-Circuit Protection with Fuses for Motor Feeders.

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

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3RB20 solid-state overload relays with spring-loaded terminals on auxiliary current side for direct mounting[1)2)] and stand-alone installation[2)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

	Size of contactor[4)]	Rating for induction motor Rated value[5)]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination 2, gL/gG operational class[6)]	DT	**Spring-loaded terminals** (on auxiliary current side) Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		kW	A	A							kg
Size S00[1)]											
 3RB20 16-2RD0	S00	0.04 … 0.09	0.1 … 0.4	1	A	**3RB20 16-2RD0**		1	1 unit	101	0.200
		0.12 … 0.37	0.32 … 1.25	2	A	**3RB20 16-2ND0**		1	1 unit	101	0.200
		0.55 … 1.5	1 … 4	10	A	**3RB20 16-2PD0**		1	1 unit	101	0.200
		1.1 … 5.5	3 … 12	20	A	**3RB20 16-2SD0**		1	1 unit	101	0.200
Size S0[1)]											
 3RB20 26-2QD0	S0	1.1 … 5.5	3 … 12	20	A	**3RB20 26-2SD0**		1	1 unit	101	0.220
		3 … 11	6 … 25	35	A	**3RB20 26-2QD0**		1	1 unit	101	0.220
Size S2[1)3)7)]											
 3RB20 36-2UD0	S2	3 … 11	6 … 25	63	A	**3RB20 36-2QD0**		1	1 unit	101	0.360
					A	**3RB20 36-2QX1**		1	1 unit	101	0.230
		7.5 … 22	12.5 … 50	80	A	**3RB20 36-2UD0**		1	1 unit	101	0.360
					A	**3RB20 36-2UX1**		1	1 unit	101	0.230
Size S3[1)3)7)]											
 3RB20 46-2ED0	S3	7.5 … 22	12.5 … 50	160	A	**3RB20 46-2UD0**		1	1 unit	101	0.560
		11 … 45	25 … 100	315	A	**3RB20 46-2ED0**		1	1 unit	101	0.560
					A	**3RB20 46-2EX1**		1	1 unit	101	0.450
Size S6 [2)7)]											
 3RB20 56-2FX2	S6 with bar connection	22 … 90	50 … 200	315	A	**3RB20 56-2FF2**		1	1 unit	101	1.030
	S6 with box terminals				A	**3RB20 56-2FX2**		1	1 unit	101	0.690
Size S10/S12[2)]											
 3RB20 66-2MF2	S10/S12 and size 14 (3TF68/ 3TF69)	22 … 110	55 … 250	400	A	**3RB20 66-2GF2**		1	1 unit	101	1.820
		90 … 450	160 … 630	800	A	**3RB20 66-2MF2**		1	1 unit	101	1.820

1) The relays with an Order No. ending with **"0"** are designed for direct mounting. With the matching terminal brackets (see Accessories) the sizes S00 and S0 can also be installed as stand-alone units.

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

3) The relays with an Order 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 fuse for overload relay, type of coordination 2. For fuse values in conjunction with contactors, see Technical Specifications, Short-Circuit Protection with Fuses for Motor Feeders.

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

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3RB20, 3RB21 for standard applications

3RB21 solid-state overload relays with screw terminals on auxiliary current side for direct mounting[1)2)] and stand-alone installation[2)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

	Size of contactor [4)]	Rating for induction motor Rated value[5)]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination 2, gL/gG operational class[6)]	DT	Screw terminals (on auxiliary current side) Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		kW	A	A							kg
Size S00[1)]											
 3RB21 13-4RB0	S00	0.04 … 0.09	0.1 … 0.4	1	▶	**3RB21 13-4RB0**		1	1 unit	101	0.200
		0.12 … 0.37	0.32 … 1.25	2	▶	**3RB21 13-4NB0**		1	1 unit	101	0.200
		0.55 … 1.5	1 … 4	10	▶	**3RB21 13-4PB0**		1	1 unit	101	0.200
		1.1 … 5.5	3 … 12	20	▶	**3RB21 13-4SB0**		1	1 unit	101	0.200
Size S0[1)]											
 3RB21 23-4QB0	S0	0.55 ... 1.5	1 ... 4	10	▶	**3RB21 23-4PB0**		1	1 unit	101	0.220
		1.1 … 5.5	3 … 12	20	▶	**3RB21 23-4SB0**		1	1 unit	101	0.220
		3 … 11	6 … 25	35	▶	**3RB21 23-4QB0**		1	1 unit	101	0.220
Size S2[1)3)7)]											
 3RB21 33-4UB0	S2	3 … 11	6 … 25	35	▶	**3RB21 33-4QB0**		1	1 unit	101	0.360
					▶	**3RB21 33-4QW1**		1	1 unit	101	0.230
		7.5 … 22	12.5 … 50	100	▶	**3RB21 33-4UB0**		1	1 unit	101	0.360
					▶	**3RB21 33-4UW1**		1	1 unit	101	0.230
Size S3[1)3)7)]											
 3RB21 43-4EB0	S3	7.5 … 22	12.5 … 50	125	▶	**3RB21 43-4UB0**		1	1 unit	101	0.560
		11 … 45	25 … 100	200	▶	**3RB21 43-4EB0**		1	1 unit	101	0.560
					▶	**3RB21 43-4EW1**		1	1 unit	101	0.450
Size S6 [2)7)]											
 3RB21 53-4FC2	S6 with bar connection	22 … 90	50 … 200	355	▶	**3RB21 53-4FC2**		1	1 unit	101	1.030
	S6 with box terminals				▶	**3RB21 53-4FW2**		1	1 unit	101	0.690
Size S10/S12[2)]											
 3RB21 63-4MC2	S10/S12 and size 14 (3TF68/ 3TF69)	22 … 110	55 … 250	500	▶	**3RB21 63-4GC2**		1	1 unit	101	1.820
		90 … 450	160 … 630	800	▶	**3RB21 63-4MC2**		1	1 unit	101	1.820

1) The relays with an Order No. ending with **"0"** are designed for direct mounting. With the matching terminal brackets (see Accessories) the sizes S00 and S0 can also be installed as stand-alone units.

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

3) The relays with an Order 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 fuse for overload relay, type of coordination 2. For fuse values in conjunction with contactors, see Technical Specifications, Short-Circuit Protection with Fuses for Motor Feeders.

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

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3RB21 solid-state overload relays with spring-loaded terminals on auxiliary current side for direct mounting[1)2)] and stand-alone installation[1)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

	Size of contactor [4)]	Rating for induction motor Rated value[5)]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination 2, gL/gG operational class[6)]	DT	**Spring-loaded terminals** (on auxiliary current side) Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		kW	A	A							kg
Size S00[1)]											
 3RB21 13-4RD0	S00	0.04 … 0.09	0.1 … 0.4	1	A	**3RB21 13-4RD0**		1	1 unit	101	0.200
		0.12 … 0.37	0.32 … 1.25	2	A	**3RB21 13-4ND0**		1	1 unit	101	0.200
		0.55 … 1.5	1 … 4	10	A	**3RB21 13-4PD0**		1	1 unit	101	0.200
		1.1 … 5.5	3 … 12	20	A	**3RB21 13-4SD0**		1	1 unit	101	0.200
Size S0[1)]											
 3RB21 23-4QD0	S0	0.55 ... 1.5	1 ... 4	10	A	**3RB21 23-4PD0**		1	1 unit	101	0.220
		1.1 … 5.5	3 … 12	20	A	**3RB21 23-4SD0**		1	1 unit	101	0.220
		3 … 11	6 … 25	35	A	**3RB21 23-4QD0**		1	1 unit	101	0.220
Size S2[1)3)7)]											
 3RB21 33-4UD0	S2	3 … 11	6 … 25	35	A	**3RB21 33-4QD0**		1	1 unit	101	0.360
					A	**3RB21 33-4QX1**		1	1 unit	101	0.230
		7.5 … 22	12.5 … 50	100	A	**3RB21 33-4UD0**		1	1 unit	101	0.360
					A	**3RB21 33-4UX1**		1	1 unit	101	0.230
Size S3[1)3)7)]											
 3RB21 43-4ED0	S3	7.5 … 22	12.5 … 50	125	A	**3RB21 43-4UD0**		1	1 unit	101	0.560
		11 … 45	25 … 100	200	A	**3RB21 43-4ED0**		1	1 unit	101	0.560
					A	**3RB21 43-4EX1**		1	1 unit	101	0.450
Size S6 [2)7)]											
 3RB21 53-4FX2	S6 with bar connection	22 … 90	50 … 200	355	A	**3RB21 53-4FF2**		1	1 unit	101	1.030
	S6 with box terminals				A	**3RB21 53-4FX2**		1	1 unit	101	0.690
Size S10/S12[2)]											
 3RB21 63-4MF2	S10/S12 and size 14 (3TF68/ 3TF69)	22 … 110	55 … 250	500	A	**3RB21 63-4GF2**		1	1 unit	101	1.820
		90 … 450	160 … 630	800	A	**3RB21 63-4MF2**		1	1 unit	101	1.820

1) The relays with an Order No. ending with **"0"** are designed for direct mounting. With the matching terminal brackets (see Accessories) the sizes S00 and S0 can also be installed as stand-alone units.

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

3) The relays with an Order 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 fuse for overload relay, type of coordination 2. For fuse values in conjunction with contactors, see Technical Specifications, Short-Circuit Protection with Fuses for Motor Feeders.

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

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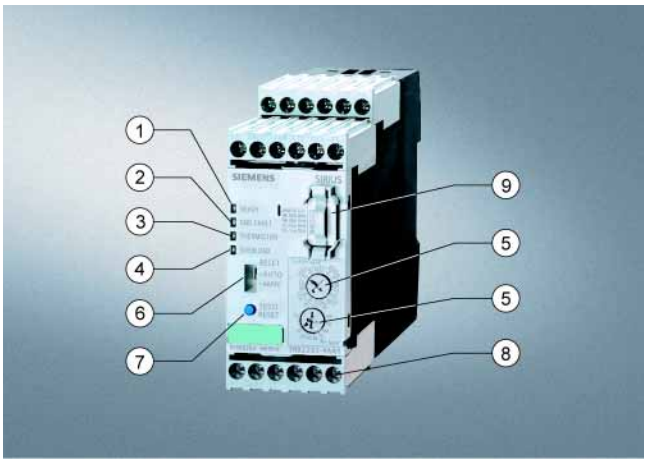
3RB22, 3RB23 for high-feature applications

Overview



3RB22/3RB23 evaluation module

(1) Green "READY" LED:
A continuous green light signals that the device is working correctly.

(2) Red "GND FAULT" LED
A continuous red light signals a ground-fault tripping.

(3) Red "THERMISTOR" LED:
A continuous red light signals an active thermistor trip.

(4) Red "OVERLOAD" LED:
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 adjustment:
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) 3RB29 85 function expansion module:
Enables more functions to be added, e.g. internal ground fault detection and/or an analog output with corresponding signals.

3RB29 06 current measuring module

The modular, solid-state overload relays with external power supply type 3RB22 (with monostable auxiliary contacts) and type 3RB23 (with bistable 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 (see LV 1 T, Function) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set motor rated current. This current rise is detected by means of a current measuring module and electronically evaluated by a special 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 set current I_e and is stored in the form of a long-term stable tripping characteristic (see LV 1 T, Characteristic Curves). 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. This warning can also issued as a signal through auxiliary contacts.

In addition to the described inverse-time delayed protection of loads against excessive temperature rises, the 3RB22/3RB23 solid-state overload relays also allow direct temperature monitoring of the motor windings (full motor protection) by connection with short-circuit and open-circuit detection 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 also protect the loads against high-resistance short-circuits due to damage to the insulation, humidity, condensed water, etc., the 3RB22/3RB23 solid-state overload relays offer the possibility of internal ground fault monitoring in conjunction with a function expansion module (for details see Selection and Ordering Data, not possible in conjunction with contactor assembly for Wye-Delta starting). In the event of a ground fault the 3RB22/3RB23 relays trip instantaneously. The "tripped" status is signaled by means of a continuous red "GND Fault" LED. Signaling through auxiliary contacts is also possible.

After tripping due to overload, phase unbalance, phase failure, thermistor tripping or ground fault, the relay is reset manually or automatically after the recovery time has elapsed (see, LV 1 T Function).

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

They comply with all important worldwide standards and approvals.

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3RB22, 3RB23 for high-feature applications

Benefits

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

Application

Industries

The 3RB22/3RB23 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 CLASS 30), minimize project completion times, inventories and power consumption, and optimize plant availability and maintenance management.

Application

The 3RB22/3RB23 solid-state overload relays have been designed for the protection of three-phase asynchronous and single-phase AC motors.

If single-phase AC motors are to be protected by the 3RB22/3RB23 solid-state overload relays, the main current paths of the current measuring modules must be series-connected (see LV 1 T, Schematics).

Ambient conditions

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

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

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

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

The 3RB22 (monostable) 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 EN 60079-7 (Electrical apparatus for potentially explosive atmospheres – Increased safety "e").

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

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

EU type test certificate for Group II, Category (2) G/D exists.

Accessories

The following accessories are available for the 3RB22/3RB23 solid-state overload relays:

- A sealable cover for the evaluation module
- Box terminal blocks for the current measuring modules size S6 and S10/S12
- Terminal covers for the current measuring modules size S6 and S10/S12
- Push-in lugs for screw mounting the size S00 to S3 current measuring modules

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Selection and ordering data

Conversion aid 3RB12 –––> 3RB22/3RB23

Size	Previous type: Overload relays (complete units) 3RB12	Setting range in A	Replacement type: Current measuring module 3RB29	Setting range in A	Evaluation module 3RB22/3RB23	Function expansion module 3RB29
S00/S0	**3RB12 46-1P□□□**	1.25 ... 6.3	**3RB29 06-2BG1**[1]	0.3 ... 3	**3RB2□ 83-4AA1**	**3RB29 85-2□□□**
			3RB29 06-2DG1[1]	2.4 ... 25		
	3RB12 46-1Q□□□	6.3 ... 25				
S2/S3	**3RB12 46-1E□□□**	25 ... 100	**3RB29 06-2JG1**[1]	10 ... 100		
S6	**3RB12 53-1F□□□**	50 ... 205	**3RB29 56-2TG2**[2]	20 ... 200		
			3RB29 56-2TH2[2]			
S10/S12	**3RB12 57-0K□□□**	125 ... 500	**3RB29 66-2WH2**[2]	63 ... 630 (820)[3]		
	3RB12 62-0L□□□	200 ... 820				

110 ... 120 V AC	**G**	Integrated	Integrated
220 ... 240 V AC	**M**	Integrated	Integrated
24 V DC	**B**	Integrated	Integrated
Standard version with ground fault signaling	**00**	Not available	**--**
Standard version with overload warning	**10**	**2**	Not required
Version with internal ground fault detection and ground fault signal	**20**	**2**	**CB1**
Version with internal ground fault detection and overload warning	**30**	**2**	**CA1**
Version with analog output	**40**	**2**	**AA0**
Bistable version with ground fault signaling	**01**	Not available	**--**
Bistable version with overload warning	**11**	**3**	Not required

1) Use 3RB29 87-2B connecting cable.

2) Use 3RB29 87-2D connecting cable.

3) 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.

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3RB22/3RB23 solid-state overload relays for full motor protection with screw terminals or spring-loaded terminals for stand-alone installation, CLASS 5, 10, 20 and 30 adjustable

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- External power supply 24 ... 240 V AC/DC
- Auxiliary contacts 2 NO +2 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- 4 LEDs for operating and status displays
- TEST function and self-monitoring
- Internal ground fault detection with function expansion module
- Screw terminals or spring-loaded terminals for auxiliary, control and sensor circuits
- Input for PTC sensor circuit
- Analog output with function expansion module

Size of contactor	Version	DT	**Screw terminals** Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Evaluation modules								
S00 ... S12	Monostable		**3RB22 83-4AA1**		1	1 unit	101	0.300
	Bistable		**3RB23 83-4AA1**		1	1 unit	101	0.300


3RB2. 83-4AA1

Size of contactor	Version	DT	**Spring-loaded terminals** Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Evaluation modules								
S00 ... S12	Monostable	A	**3RB22 83-4AC1**		1	1 unit	101	0.300
	Bistable	A	**3RB23 83-4AC1**		1	1 unit	101	0.300


3RB2. 83-4AC1

Size of contactor	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Function expansion modules								
	for plugging into evaluation module (1 unit)							
S00 ... S12	**Analog Basic 1**[1] **modules** Analog output DC 4 ... 20 mA, with overload warning		**3RB29 85-2AA0**		1	1 unit	101	0.030
	Analog Basic 1 GF[1)2)] **modules** Analog output DC 4 ... 20 mA, with internal ground fault detection and overload warning		**3RB29 85-2AA1**		1	1 unit	101	0.030
	Analog Basic 2 GF[1)2)] **modules** Analog output DC 4 ... 20 mA, with internal ground fault detection and ground fault signaling		**3RB29 85-2AB1**		1	1 unit	101	0.030
	Basic 1 GF[2)] **modules** with internal ground fault detection and overload warning		**3RB29 85-2CA1**		1	1 unit	101	0.030
	Basic 2 GF[2)] **modules** with internal ground fault detection and ground fault signaling		**3RB29 85-2CB1**		1	1 unit	101	0.030

[1)] The analog signal DC 4 ... 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 set current I_e the unit will trip at a ground-fault current equal to 30 % of the set current.
- With a motor current of between 2 and 8 times the set current 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 and 1 second.

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3RB22, 3RB23 for high-feature applications

Current measuring modules for direct mounting[1] and stand-alone installation[1)2)]

	Size of contactor[3]	Rating for induction motor Rated value[4]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination 2, gL/gG operational class[5]	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		kW	A								kg
Size S00/S0 [2)6)]											
 3RB29 06-2.G1	S00/S0	0.09 … 1.1	0.3 … 3	20	▶	**3RB29 06-2BG1**		1	1 unit	101	0.100
		1.1 … 11	2.4 … 25	63	▶	**3RB29 06-2DG1**		1	1 unit	101	0.150
Size S2/S3 [2)6)]											
 3RB29 06-2JG1	S2/S3	5.5 … 45	10 … 100	315	▶	**3RB29 06-2JG1**		1	1 unit	101	0.350
Size S6 [1)6)]											
 3RB29 56-2TG2	S6 with bar connection	11 … 90	20 … 200	315	▶	**3RB29 56-2TH2**		1	1 unit	101	1.000
	S6 with box terminals				▶	**3RB29 56-2TG2**		1	1 unit	101	0.600
Size S10/S12[1)]											
 3RB29 66-2WH2	S10/S12 and size 14 (3TF68/ 3TF69)	37 … 450	63 … 630	800	▶	**3RB29 66-2WH2**		1	1 unit	101	1.750

1) The current measuring modules with an Order No. ending with **"2"** are designed for direct mounting and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.

2) The current measuring modules with an Order No. ending with **"1"** are designed for stand-alone installation.

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 fuse for overload relay, type of coordination 2. For fuse values in conjunction with contactors, see Technical Specifications, Short-Circuit Protection with Fuses for Motor Feeders.

6) The modules with an Order No. with **"G"** in penultimate position are equipped with a straight-through transformer.

	Size of contactor	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
									kg
Connecting cables									
 3RB29 87-2.		For connection between evaluation module and current measuring module							
	S00 ... S3	• Length 0.1 m (only for mounting of the evaluation module directly onto the current measuring module)	▶	**3RB29 87-2B**		1	1 unit	101	0.010
	S00 ... S12	• Length 0.5 m	▶	**3RB29 87-2D**		1	1 unit	101	0.020

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Overview

Overload relays for standard applications

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

- One terminal bracket each for the overload relays size S00 and S0 (sizes S2 to S12 can be installed as single units without a terminal bracket)
- One mechanical remote RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for all sizes
- Box terminal blocks for sizes S6 and S10/S12
- Terminal covers for sizes S2 to S10/S12

Overload relays for high-feature applications

The following accessories are available for the 3RB22/3RB23 solid-state overload relays:

- A sealable cover for the evaluation module
- Box terminal blocks for the current measuring modules size S6 and S10/S12
- Terminal covers for the current measuring modules size S6 and S10/S12
- Push-in lugs for screw mounting the size S00 to S3 current measuring modules

Selection and ordering data

Version	Size	DT	Order No.	Price	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Terminal brackets for stand-alone installation[1]								
 3RB29 .3-0AA1 — For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail	S00	▶	**3RB29 13-0AA1**		1	1 unit	101	0.060
	S0	▶	**3RB29 23-0AA1**		1	1 unit	101	0.080
Mechanical RESET[2]								
 3RU19 00-1A with pushbutton and extension plunger — **Resetting plungers, holders and formers**	S00 ... S10/S12	▶	**3RU19 00-1A**		1	1 set	101	0.038
Pushbuttons with extended stroke (12 mm), IP65, Ø 22 mm		B	**3SB30 00-0EA11**		1	1 unit	102	0.021
Extension plungers for compensation of the distance between a pushbutton and the unlatching button of the relay		A	**3SX1 335**		1	1 unit	102	0.004
Cable releases with holder for RESET[2]								
 3RU19 00-1. — For Ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm	S00 ... S10/S12							
• Length 400 mm		▶	**3RU19 00-1B**		1	1 unit	101	0.063
• Length 600 mm		▶	**3RU19 00-1C**		1	1 unit	101	0.073

1) Only for 3RB20/3RB21.

2) Only for 3RB20/3RB21. The accessories are identical to those of the 3RU11 thermal overload relays.

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Accessories

	Version	Size	DT	Order No.	Price	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Sealable covers									
	For covering the setting knobs • For 3RB20/3RB21	S00 ... S10/S12	▶	**3RB29 84-0**		1	10 units	101	0.020
	• For 3RB22/3RB23	–	▶	**3RB29 84-2**		1	10 units	101	0.050
Terminal covers									
 3RT19 46-4EA1	**Covers for cable lugs and rail connections** • Length 55 mm[1]	S3	▶	**3RT19 46-4EA1**		1	1 unit	101	0.037
	• Length 100 mm	S6	▶	**3RT19 56-4EA1**		1	1 unit	101	0.067
	• Length 120 mm	S10/S12	▶	**3RT19 66-4EA1**		1	1 unit	101	0.124
 3RT19 36-4EA2 The figures show mounting on the contactor	**Covers for box terminals** • Length 20.6 mm[1]	S2	▶	**3RT19 36-4EA2**		1	1 unit	101	0.016
	• Length 20.8 mm[1]	S3	▶	**3RT19 46-4EA2**		1	1 unit	101	0.023
	• Length 25 mm	S6	▶	**3RT19 56-4EA2**		1	1 unit	101	0.028
	• Length 30 mm	S10/S12	▶	**3RT19 66-4EA2**		1	1 unit	101	0.038
	Covers for screw terminals between contactor and overload relay, without box terminals (1 unit required per combination)	S6 S10/S12	▶ ▶	**3RT19 56-4EA3** **3RT19 66-4EA3**		1 1	1 unit 1 unit	101 101	0.021 0.062
Box terminal blocks									
 3RT19 5.-4G	For round and ribbon cables • Up to 70 mm^2	S6[2]	▶	**3RT19 55-4G**		1	1 unit	101	0.237
	• Up to 120 mm^2	S6	▶	**3RT19 56-4G**		1	1 unit	101	0.270
	• Up to 240 mm^2	S10/S12	▶	**3RT19 66-4G**		1	1 unit	101	0.676
	For conductor cross-sections, see LV 1 T "Technical Specifications"								
Push-in lugs									
 3RP19 03	For screw fixing of 3RB22/3RB23 overload relays	--	▶	**3RP19 03**		1	10 units	101	0.002
 3RB19 00-0B	For screw fixing of 3RB29 06 current measuring modules (2 units are required per module)	S00 ... S3	C	**3RB19 00-0B**		100	10 units	101	0.100

For more accessories (tools for spring-loaded terminals and labeling plates), see page 5/56.

1) Only for 3RB20/3RB21. The accessories are identical to those of the 3RU11 thermal overload relays.

2) In the scope of supply for 3RT10 54-1 contactors (55 kW).

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