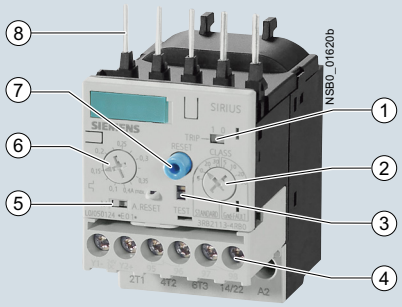
Overview



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 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 joint 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 and soft starters. 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).

SIRIUS 3RB2113-4RB0 electronic overload relays

The 3RB20 and 3RB21 electronic 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 (for "Function", see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays") 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 increase is detected by the current transformers integrated into the devices and evaluated by corresponding electronic 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 www.siemens.com/sirius/support → "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 electronic 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 (for "Function", see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays").

The 3RB2 electronic overload relays are suitable for operation with frequency converters. Please to refer to the instructions in the reference manual "Protection Equipment – 3RU1 and 3RB2 Overload Relays".

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.

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

The 3RB20/3RB21 electronic 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.

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th
	□□□	□	□	□	□	–	□	□	□	□
Electronic 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.

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

Benefits

The most important features and benefits of the 3RB20/3RB21 electronic overload relays are listed in the overview table (see "General Data", from page 7/36 onwards).

Application

Industries

The 3RB20 and 3RB21 electronic 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 area

The 3RB20 and 3RB21 electronic 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 electronic 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 electronic overload relays compensate the temperature in accordance with IEC 60947-4-1.

For the 3RB20 and 3RB21 electronic 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 %

Selection and ordering data

3RB20 electronic overload relays for mounting onto contactor[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

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


3RB2016-1RB0


3RB2026-1QD0


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) Article No.	Price per PU	DT	**Spring-type terminals** (on auxiliary current side) Article No.	Price per PU
	kW	A	A						
Size S00[1)]									
S00	0.04 … 0.09	0.1 … 0.4	1	▶	**3RB2016-1RB0**		B	**3RB2016-1RD0**	
	0.12 … 0.37	0.32 … 1.25	2	▶	**3RB2016-1NB0**		B	**3RB2016-1ND0**	
	0.55 … 1.5	1 … 4	10	▶	**3RB2016-1PB0**		A	**3RB2016-1PD0**	
	1.1 … 5.5	3 … 12	20	▶	**3RB2016-1SB0**		B	**3RB2016-1SD0**	
Size S0[1)]									
S0	0.04 … 0.09	0.1 … 0.4	1	B	**3RB2026-1RB0**		B	**3RB2026-1RD0**	
	0.12 … 0.37	0.32 … 1.25	2	▶	**3RB2026-1NB0**		B	**3RB2026-1ND0**	
	0.55 … 1.5	1 … 4	10	▶	**3RB2026-1PB0**		B	**3RB2026-1PD0**	
	1.1 … 5.5	3 … 12	20	▶	**3RB2026-1SB0**		B	**3RB2026-1SD0**	
	3 … 11	6 … 25	35	▶	**3RB2026-1QB0**		A	**3RB2026-1QD0**	
Size S2[1)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 S3[1)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 S6[2)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/S12[2)]									
S10/S12 and size 14 (3TF68/ 3TF69)	22 … 110	55 … 250	400	▶	**3RB2066-1GC2**		▶	**3RB2066-1GF2**	
	90 … 450	160 … 630	800	▶	**3RB2066-1MC2**		▶	**3RB2066-1MF2**	

1) The relays with an Article No. ending with **"0"** are designed for mounting onto contactors. With the matching terminal supports (see "Accessories", page 7/52) the sizes S00 and S0 can also be installed as stand-alone units.

2) The relays with an Article No. ending with **"2"** are designed for mounting onto contactors 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 relays, type of coordination "2". For fuse values in connection with contactors, see Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays" → "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.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate